microdrones®

PUTTING MICRODRONES TO WORK FOR YOU.

General Presentation

LET'S CREATE THE FUTURE TOGETHER.

It all starts with one idea. One idea from one person who dares to rethink the way their company does what they do.

Unmanned aerial vehicles have inspired many to rethink processes, recreate their offerings, and redefine their companies and industries.

Innovation is about making things better and Microdrones is at the forefront, partnering with companies to make their work safer, more profitable, more efficient, more accurate, more effective – more *amazing.*

INDUSTRY EXPERTS

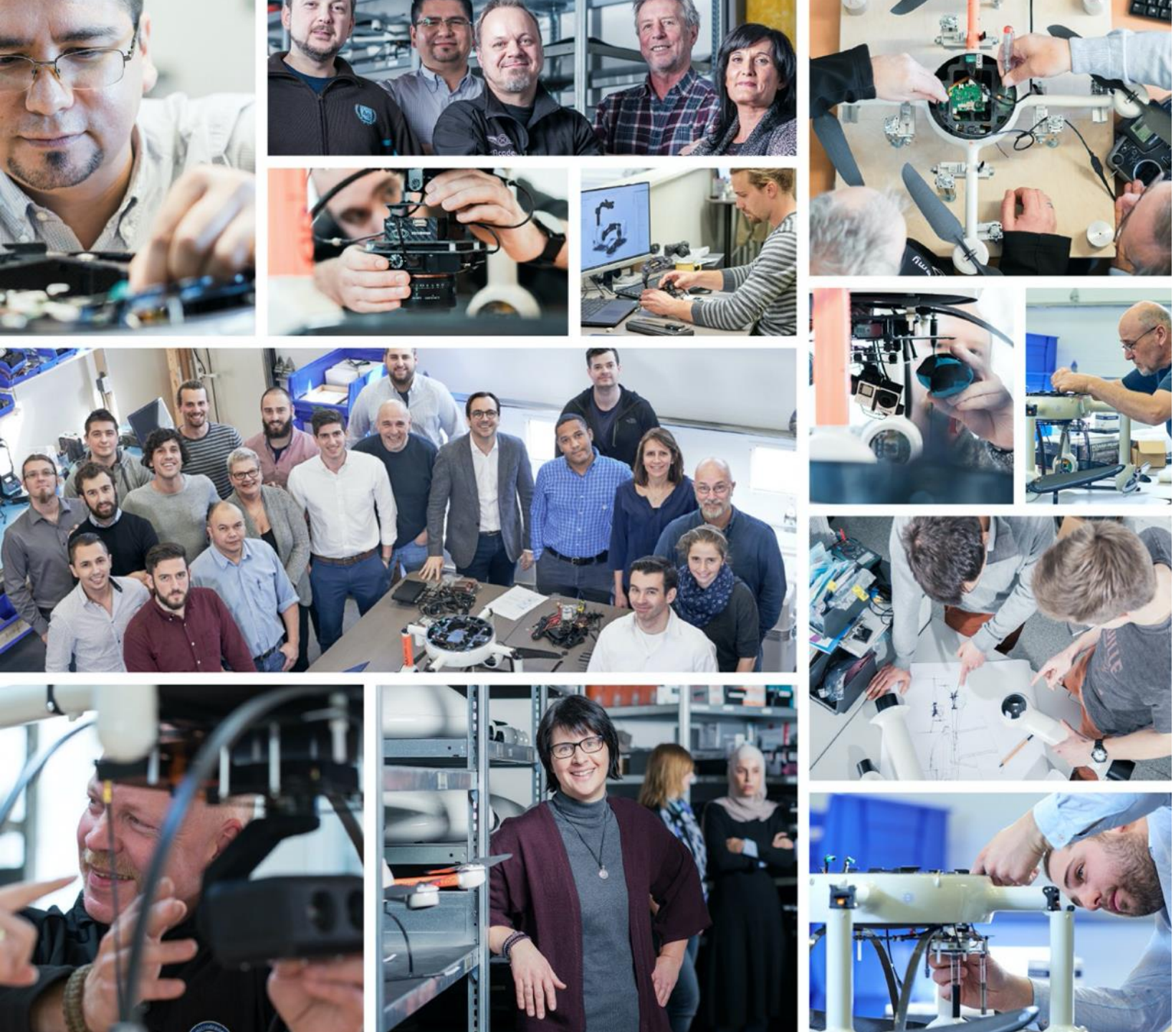
MORE THAN JUST A DRONE COMPANY

Sure we make great UAV’s, but there's a lot more to a Microdrones integrated system and that starts with your needs.

INDUSTRY EXPERTS

In order to qualify as a serious tool, a drone must be adapted and integrated with sensors and geospatial hardware. Industries are being revolutionized, not by drones, but by smart integration of drones with sensors that take advantage of a drone's ability to smoothly carry payloads high above the earth.

We aim to provide fully integrated solutions to our customers that include: a drone, sensors, software, workflow, training and ongoing support.



INTRODUCING THE MOST INNOVATIVE TEAM IN THE UAV INDUSTRY

Microdrones products are of the highest quality in the world – and this is because we employ the world's greatest team.

Our people are passionate creators, forward thinkers, and driven to change the world for the better. They come from all over the globe,but share a common vision of making great contributions to the progress of technology.

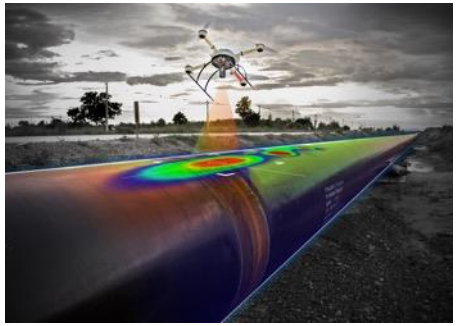
COMPLETE PROFESSIONAL GRADE UAV SOLUTIONS FOR SURVEYING, MAPPING, AND GIS

Aerial surveying is not just about the aircraft. It’s about total UAV solutions, complete with all the tools geospatial pros need to perform jobs accurately, efficiently, and safely.

Our integrated systems are designed for quick learning and easy use, so you can get your UAV services off the ground quickly.

FAST. RELIABLE. SAFE. COST-EFFECTIVE: UAV/DRONE INSPECTION TOOLS FROM MICRODRONES

Power lines. Cell towers. Oil and gas pipelines. Railways. Methane detection – all of these and so many other types of industrial inspection are made easier, safer, and more efficient with Microdrones unmanned aerial systems.



THE INDUSTRY'S BEST DRONES FOR LAND DEVELOPMENT AND CONSTRUCTION

Offering everything construction companies need to get started, mdMapper and mdLiDAR systems make it easy to:

- Create accurate 2D and 3D data, maps, and models.
- Conduct surveys – before, during, and after construction.
- Easily provide more accurate project estimates.
- Efficiently gain and share real-time project overviews more effectively monitor progress.
- Inspect structures and job sites quickly, safely, and accurately.
- Track volumes and stockpiles.
- Precisely map roads, canals, pipelines, and other linear infrastructure in one line of flight with no ground control points.
- Reduce project waste.

THE AERIAL ADVANTAGE FOR AGRICULTURE

Microdrones unmanned aerial vehicles are empowering farmers and agronomists across the globe by equipping them with the information they need to identify potential issues and mitigate loss.

Our drones offer farmers the longest flight times on the market and resilience in harsh weather. The mdCockpit app simplifies flight planning, monitoring, control, and analysis – and allows you to survey the same field the same way as many times as you wish.

Microdrones modular payloads make it easy to swap out to perform a wider variety of applications. Agriculture pros who use options like multi-spectral imaging and thermal mapping have experienced great success in improving yields – this is how Microdrones UAVs pay for themselves.

DRONES FOR MINING: QUICK DEPLOYMENT. EXTREME EFFICIENCY. COST SAVINGS. EASE.

Microdrones UAVs are taking the global mining industry by storm.

Less expensive than the helicopters traditionally used by the industry to gain an aerial perspective, drones are providing mining companies with mapping abilities that provide better results and drastically improved flexibility for a fraction of the cost.

Many Microdrones mining customers use our systems to survey mine progress multiple times per day. The mdCockpit app makes it easy to plan, monitor, control and repeat missions and flight paths.

DRONES FOR SCIENCE AND ACADEMIC RESEARCH

Microdrones is honored to partner with researchers around the globe who use our drones to advance human knowledge as they seek solutions to the world's greatest problems.

Microdrones is the trusted UAV of researchers for many reasons, but the two most important are flexibility and performance.

ALWAYS KEEP IN MIND WHAT YOU ARE TRYING TO DO

Are you trying to:

- Survey land for construction projects?
- Determine volume of material in an open pit mine?
- Calculate surface run-off?
- Detect problems with crop health?
- Minimize waste in administering crop spraying?
- Inspect structures for wear and damage?

BENEFITS OF THE MICRODRONES AIRCRAFT PLATFORM

GNSS RECEIVER

ROBUST HOUSING AND COMPONENTS

A PLUS FOR EFFICIENCY

FAILSAFE MOTORS FOR MINIMUM DOWNTIME

RAIN AND HEAT RESISTANT

STABLE FLIGHT FOR PRECISE RESULTS

microdrones®

DON’T TALK ABOUT EQUIPMENT.

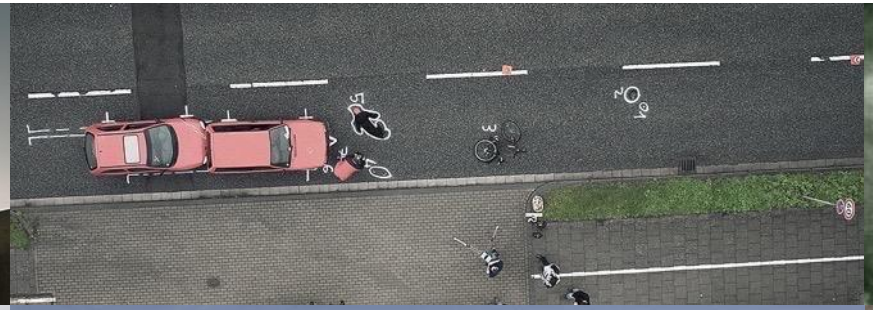
Or at least not at first.

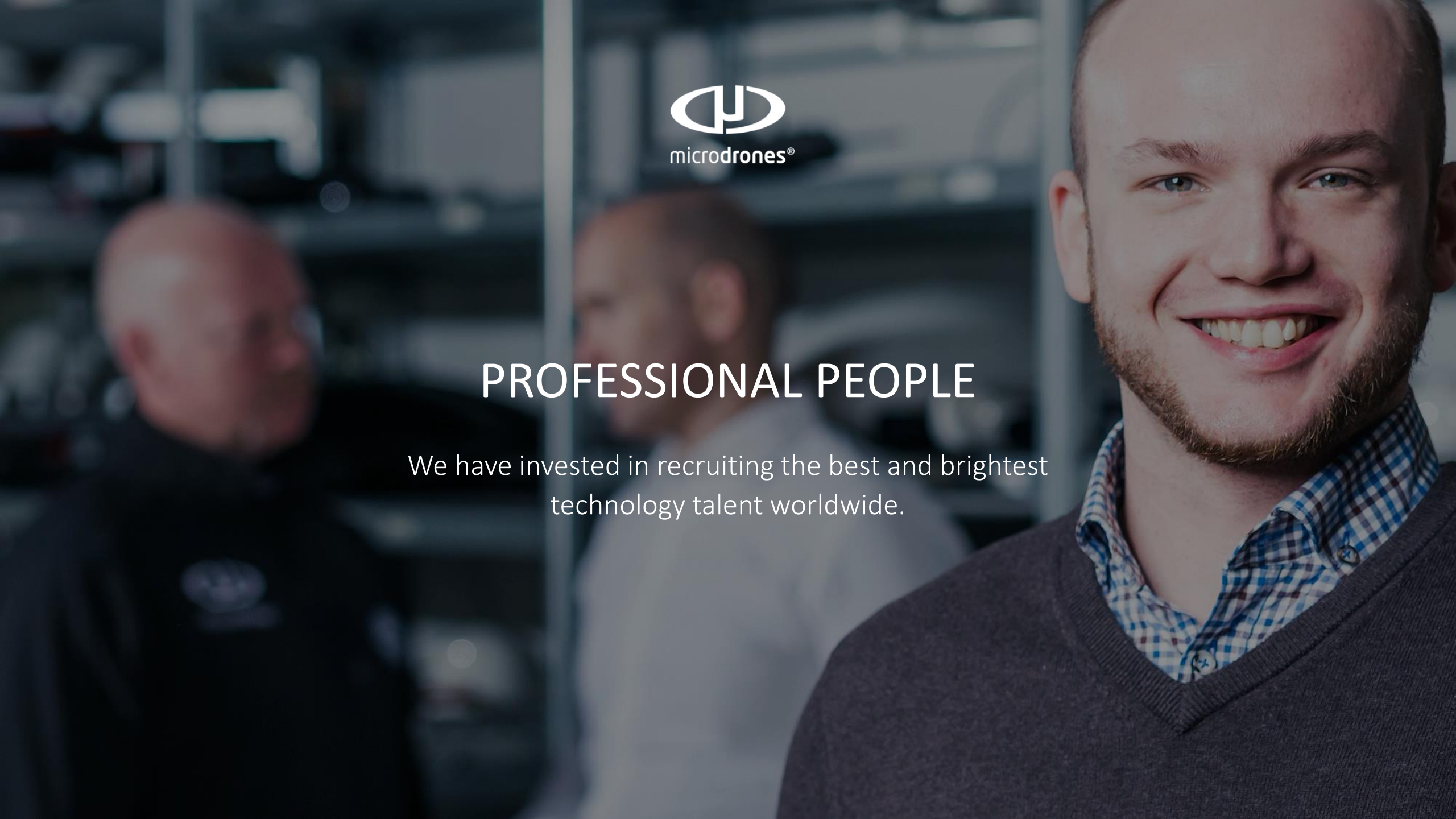
MORE THAN 1000 BUSINESSES WORLDWIDE TRUST MICRODRONES®

Since 2005, our passionate team of aircraft engineers, software developers and payload integration experts have lead the market for professional drone applications.

MADE TO DELIVER:
RELIABLE TOOLS FOR TOUGH JOBS

Surveying, land development, infrastructure inspection, environmental monitoring, precision agriculture, and public safety are done more efficiently and effectively with the help of integrated systems.



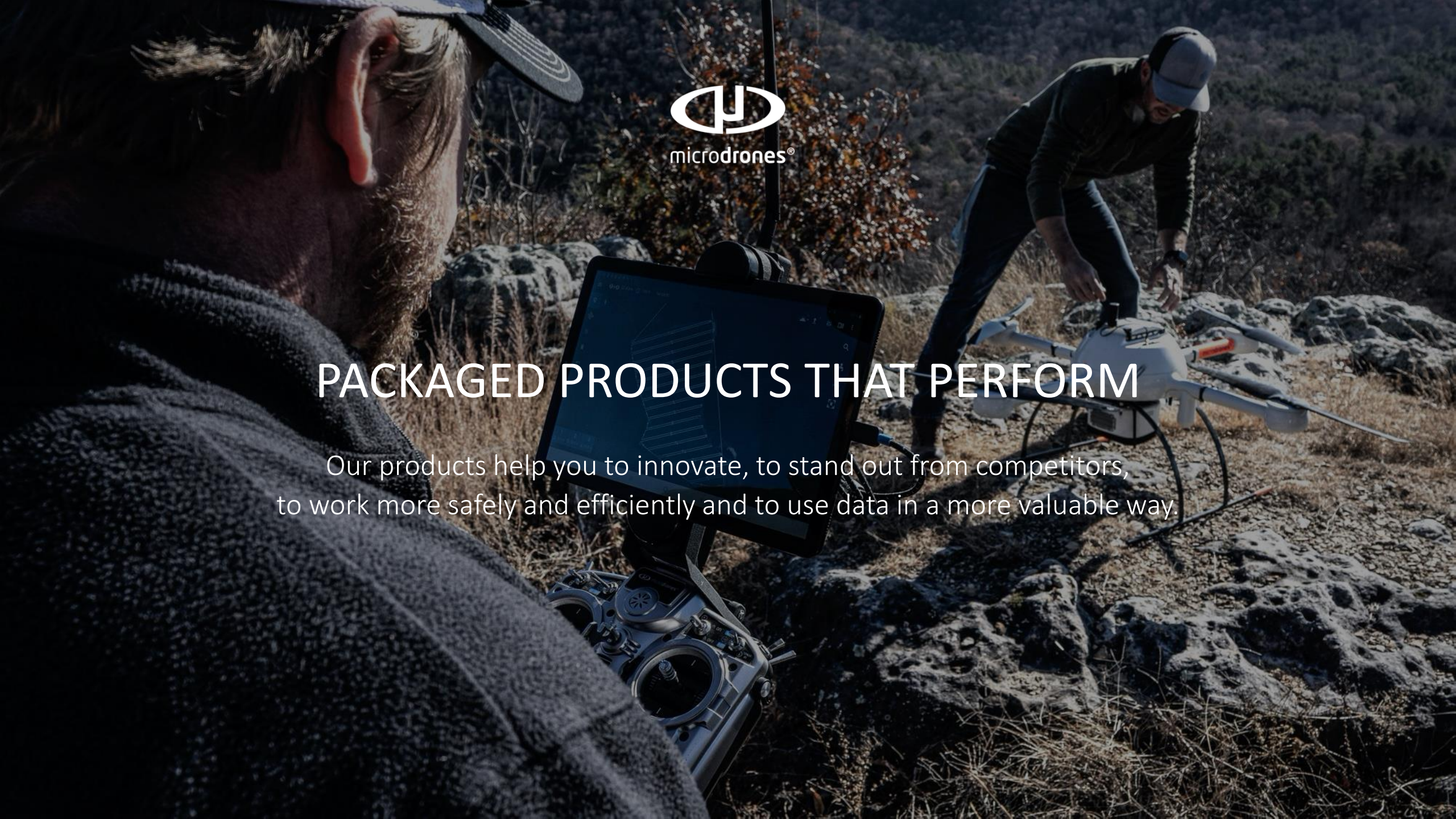


PROFESSIONAL PEOPLE

We have invested in recruiting the best and brightest technology talent worldwide.

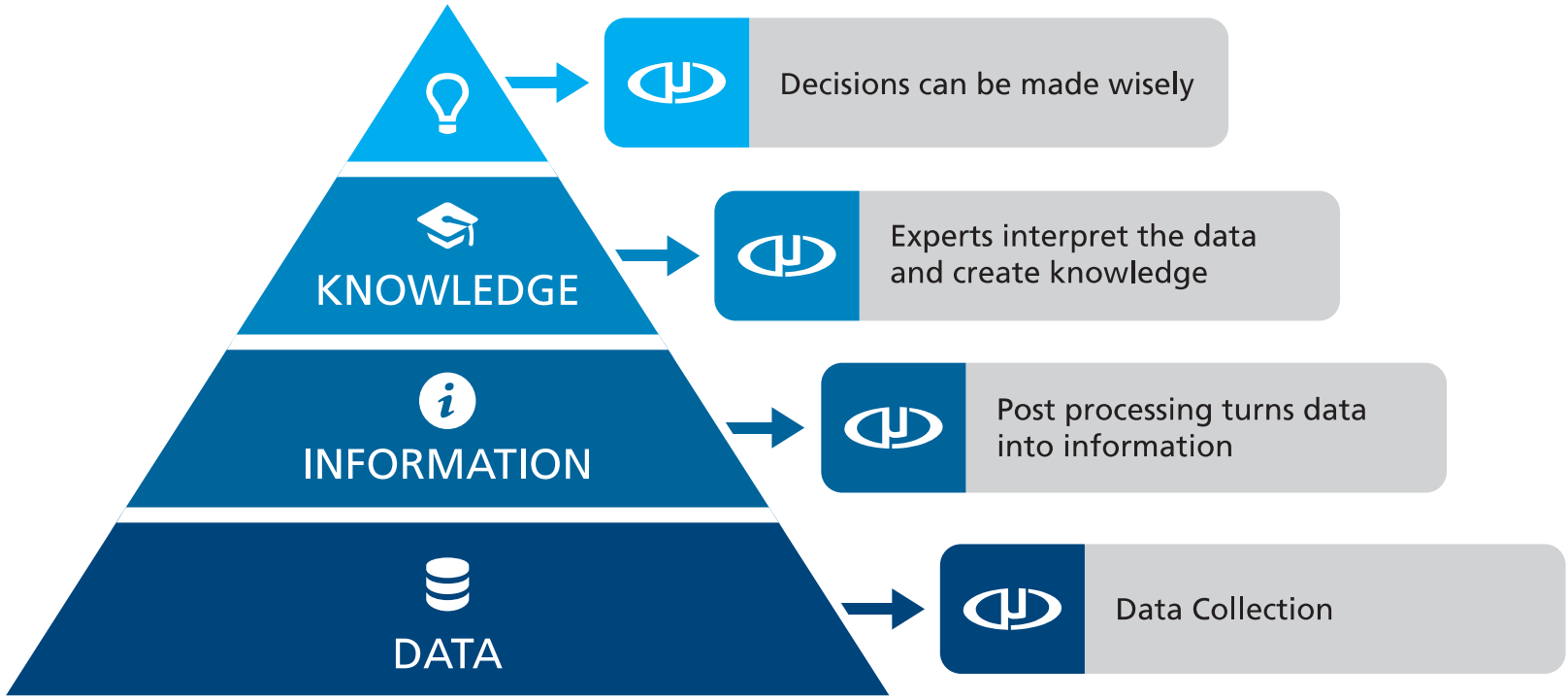
POSITIONED FOR SUCCESS

Microdrones has strategically built a global footprint to efficiently distribute products while providing you the support you need in your market.



PACKAGED PRODUCTS THAT PERFORM

Our products help you to innovate, to stand out from competitors,
to work more safely and efficiently and to use data in a more valuable way.


KNOWLEDGE
INFORMATION
DATA
Decisions can be made wisely
Experts interpret the data and create knowledge
Post processing turns data into information
Data Collection

REMEMBER THE PHRASE,
“GARBAGE IN, GARBAGE OUT!”

If you base your decision-making on inaccurate data, you (or your clients) will make bad choices and have bad results.

mdSOLUTIONS

WORK SMARTER WITH MICRODRONES INTEGRATED SYSTEMS

Want to create powerful data deliverables like 3D pointclouds, orthomosaics, or methane inspection concern maps? Microdrones Integrated Systems help you to collect data efficiently and safely while cutting costs, saving time, and converting data into useful information.

We currently offer three families of solutions that will improve your workflow for LiDAR, photogrammetry and inspection projects.

mdLiDAR

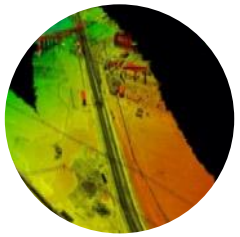
mdMAPPER

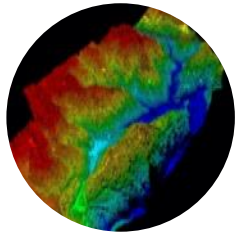
mdTECTOR

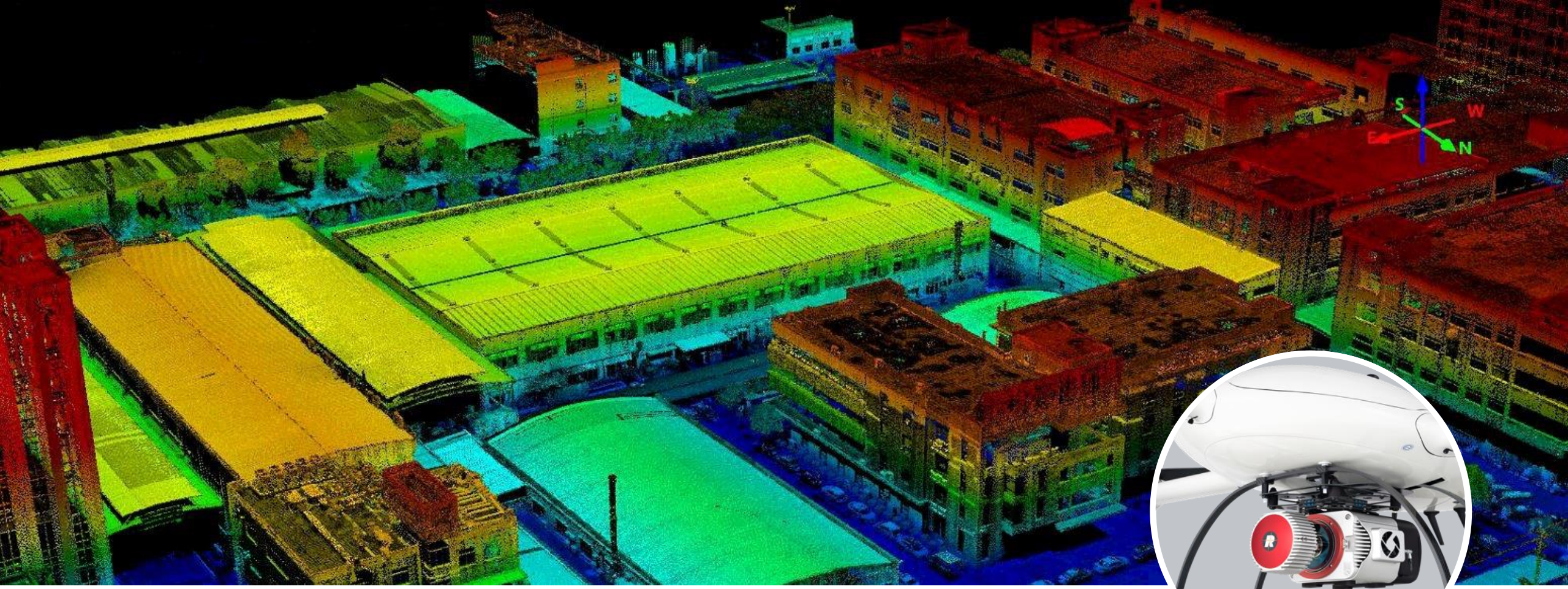
mdLiDAR
3000LR aaS

THE MOST POWERFUL DRONE LiDAR SYSTEM EVER

Go extreme with the most powerful laser scanner… extend your data collection reach from high above or collect extreme point density when flying closer to the ground.







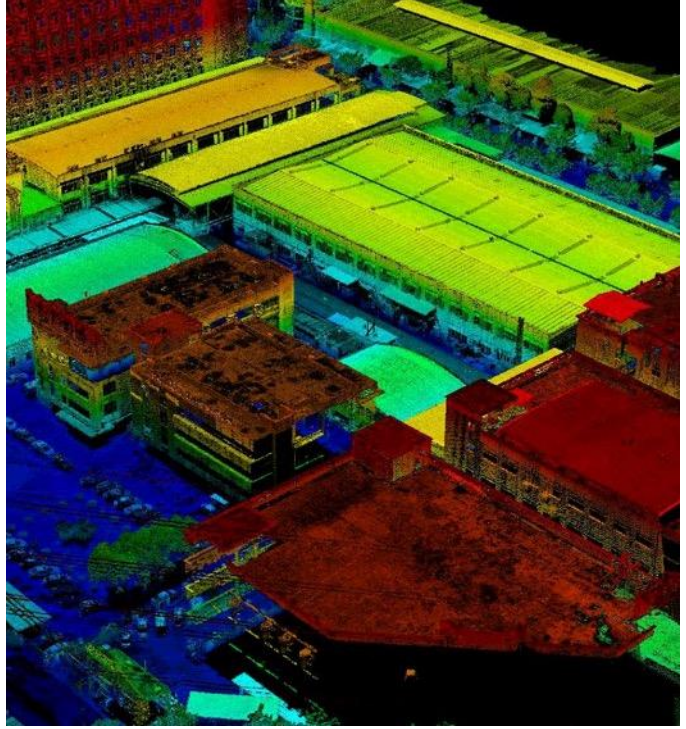
SURVEY GRADE DRONE LASER SCANNING

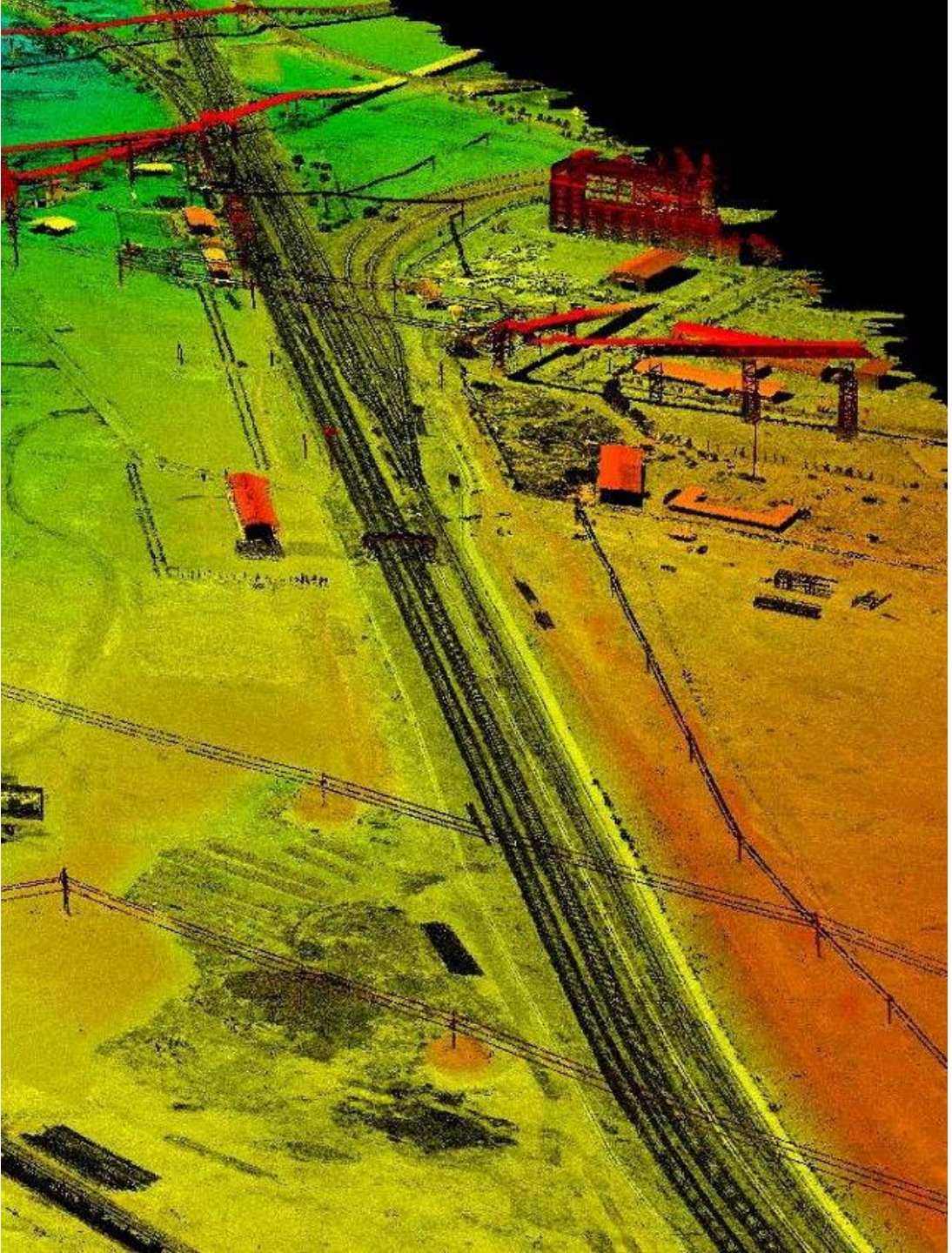
By combining our robust and field proven md4-3000 airframe, with a highly precise and accurate Riegl VUX-1UAV payload, you can capture ultra dense LiDAR data quickly and safely in the field, and then turn it into a 3D point cloud back at the office or on your laptop.

mdLiDAR
3000LR aaS

SURVEY GRADE DRONE LASER SCANNING

By combining our robust and field proven md4-3000 airframe, with a highly precise and accurate Riegl VUX-1UAV 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.





mdLiDAR
3000LR aaS

WHY SHOULD YOU INVEST IN DRONE BASED LiDAR?

In areas of high vegetation do you spend hours cutting line to topo the site? This system can help streamline your current workflows to become more efficient, while helping you to complete more projects.

EASY END-TO-END WORKFLOW:

- Simple mission planning using mdCockpit.
- User inputs the point density or flying height and drone speed

- Fully automated mission execution and real-time mission monitoring using mdCockpit

- Thorough georeferencing data processing the dual IMU Applanix APX-20 UAV DG and mdInfinity software
- Automated final point cloud processing using mdInfinity processing software

- Final point cloud in standard ASPRS LAS format usable in any GIS or CAD software environment.

mdLiDAR
3000LR aaS

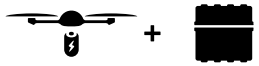
WHAT CAN YOU DO WITH IT?

mdLiDAR3000LR aaS is a versatile package that can be used for a wide range of applications. Some of the most common uses are:

SURVEY EQUIPMENT

PLATFORM

md4-3000



Charger, Flight Battery & Rugged Carrying Case

Tri Blade Quadcopter

Integrated Cooling Covers

Mag-less Navigation

COMMUNICATIONS

Encrypted Digital Data Link

mdRC

Extended Communication Range Operation

Multiple Tablet Control

SURVEY EQUIPMENT

mdLiDAR 3000LR aaS

PAYLOAD

Fully Integrated Long Range LiDAR

RIEGL

Applanix APX-20 External IMU

Trimble POWERED

SURVEY EQUIPMENT SOFTWARE

mdCockpit Tablet Software

Tap & Fly

mdINFINITY ∞ | mdaaS | DG ENABLED

DATA PROCESSING MODULES

mdLiDAR
3000LR aaS

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

mdLiDAR 3000LR aaS

SOLUTION COMPONENTS

Platform
md4-3000

Payload
- LiDAR Sensor: VUX-1UAV
- Georeferencing: Trimble APX-20 UAV DG

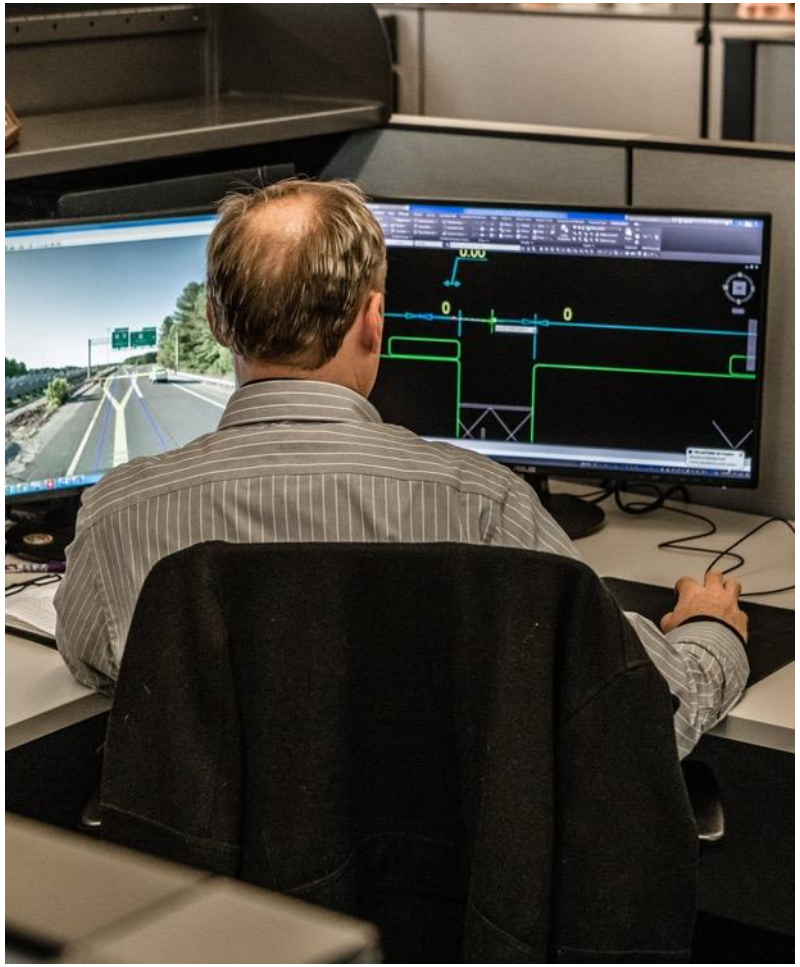
Software
- mdCockpit
- mdInfinity

TECHNICAL SPECIFICATIONS

Solution Take off Weight (TOW)
15713 g

System Operational Temperature
-10 °C to 50 °C

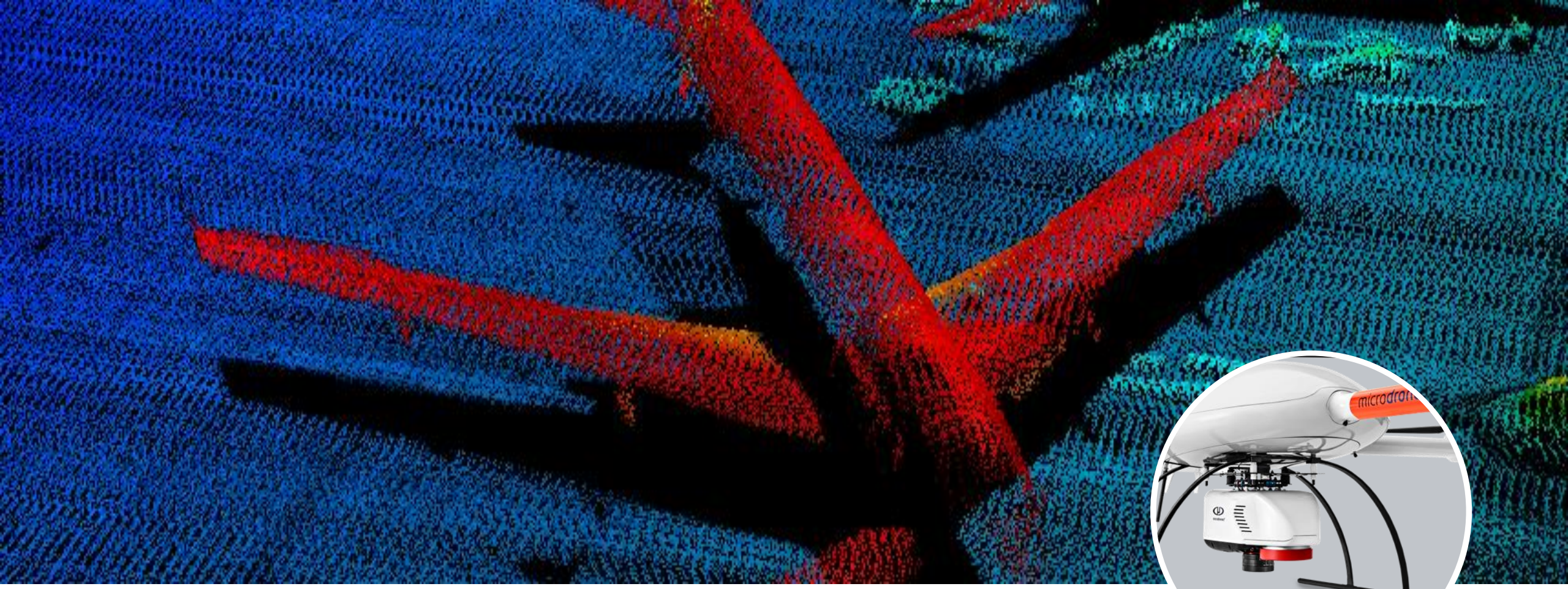
System Accuracy
- LiDAR Point Cloud:
    - Horizontal: 1-3 cm
    - Vertical: 2-4 cm



mdLiDAR
3000DL aaS

HEAVY DATA COLLECTION PROJECTS?

Our drone LiDAR survey equipment makes light work of them all: mdLiDAR3000DL aaS.



THE NEWEST LiDAR SYSTEM FROM MICRODRONES IS REVOLUTIONARY.

We perfectly integrated our heavy lifting md4-3000 drone with a Riegl miniVUX-1DL and a SONY RX1R II camera for rapidly producing colorized pointclouds.

mdLiDAR
3000DL aaS

THE ULTIMATE UNMANNED AERIAL LiDAR SOLUTION FROM MICRODRONES

By combining our robust and field proven md4-3000 airframe, with a highly precise an accurate Riegl miniVUX-1DL payload, you can capture ultra dense LiDAR data quickly and safely in the field, and then turn it into a 3D colorized point cloud back at the office or on your laptop.

mdLiDAR
3000DL aaS

WHY SHOULD YOU INVEST IN DRONE BASED LiDAR?

In areas of high vegetation do you spend hours cutting line to topo the site? This system can help streamline your current workflows to become more efficient, while helping you to complete more projects.

EASY END-TO-END WORKFLOW:

- Simple mission planning using mdCockpit.
- User inputs the point density or flying height and drone speed

- Fully automated mission execution and real-time mission monitoring using mdCockpit

- Thorough georeferencing data processing the dual IMU Applanix APX-20 UAV DG and mdInfinity software
- Automated final point cloud processing using mdInfinity processing software

- Final point cloud in standard ASPRS LAS format usable in any GIS or CAD software environment
- Quick and Accurate point cloud colorization using accurate system-produced orthomosaics and a user-friendly, seamless workflow

mdLiDAR
3000DL aaS

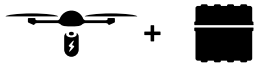
WHAT CAN YOU DO WITH IT?

mdLiDAR3000DL aaS is a versatile package that can be used for a wide range of applications. Some of the most common uses are:

SURVEY EQUIPMENT

PLATFORM

md4-3000



Charger, Flight Battery & Rugged Carrying Case

Tri Blade Quadcopter

Integrated Cooling Covers

Mag-less Navigation

COMMUNICATIONS

Encrypted Digital Data Link

mdRC

Extended Communication Range Operation

Multiple Tablet Control

SURVEY EQUIPMENT

mdLiDAR 3000DL aaS

PAYLOAD

Fully Integrated LiDAR Paired with a Sony RX1R II Camera & Quick Connect mount

RIEGL

Applanix APX-20 External IMU

Trimble POWERED

SURVEY EQUIPMENT SOFTWARE

mdCockpit Tablet Software

Tap & Fly

mdINFINITY | mdaaS | DG ENABLED

DATA PROCESSING MODULES

mdLiDAR
3000DL aaS

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
md4-3000

Payload
- LiDAR Sensor: Riegl miniVUX-1DL
- Camera: RX1R II
- Georeferencing: Trimble APX-20 UAV DG

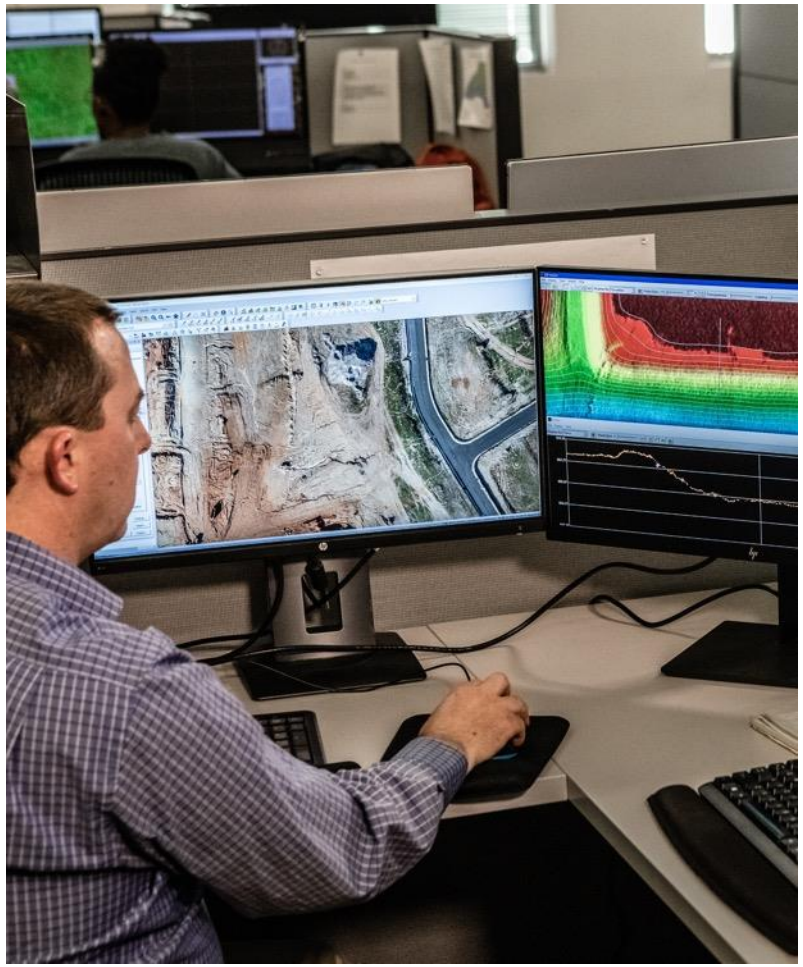
Software
- mdCockpit
- mdInfinity

TECHNICAL SPECIFICATIONS

Solution Take off Weight (TOW)
15713 g

System Operational Temperature
-10 °C to 50 °C

System Accuracy
- LiDAR Point Cloud:
    - Horizontal: 1-3 cm
    - Vertical: 2-4 cm
- Photogrammetry:
    - Horizontal: 1-2 pixels
    - Vertical: 3-4 pixels

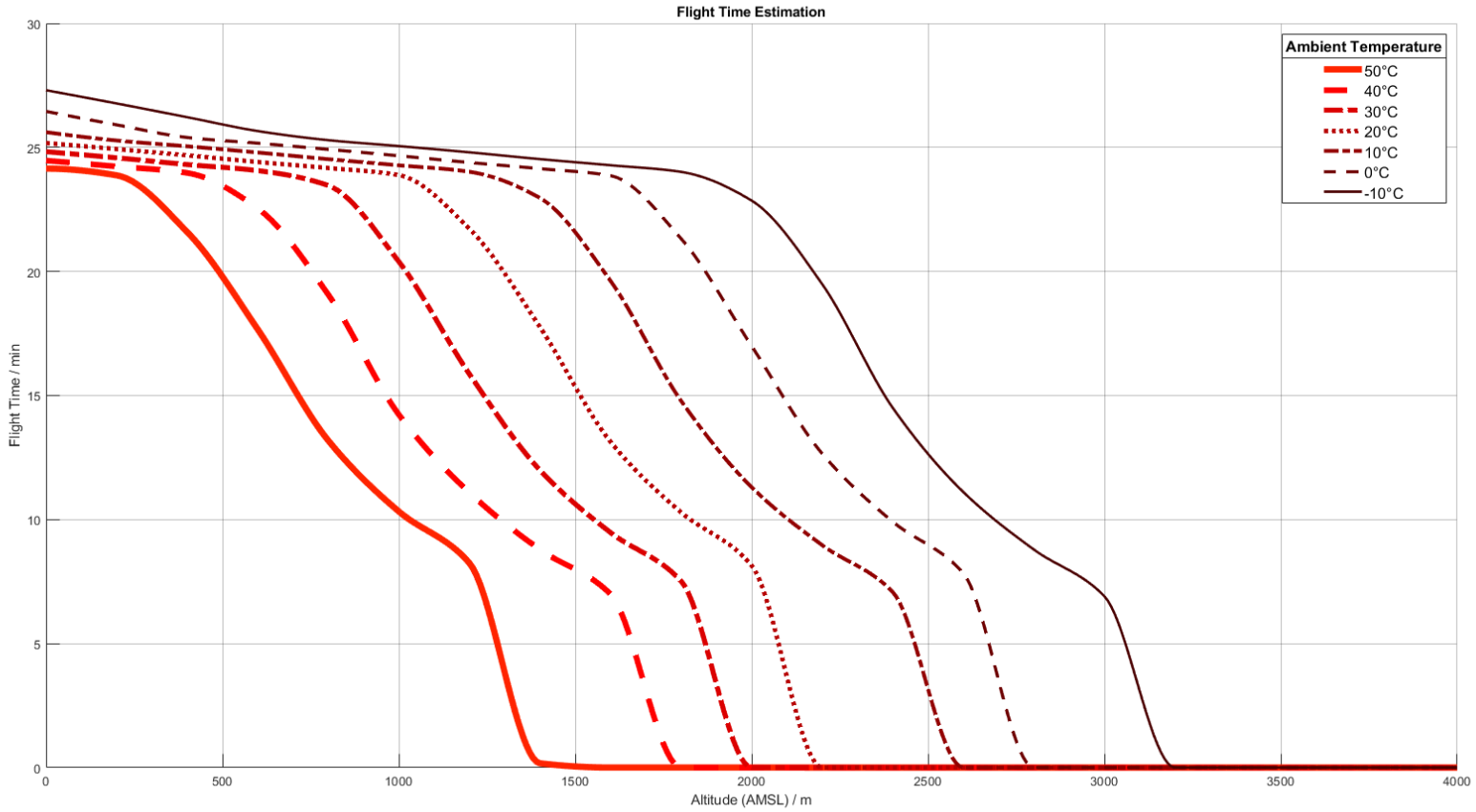


TECHNICAL SPECS

Flight altitude AGL (ft/m)*c	130/40	195/60	260/80
Speed (m/s)	**Average Point Density** in pts/m²**		
3	1291	861	645
4	968	645	484
5	774	516	387
6	645	430	322
GSD (mm)	5.3	8	10.6
Swath Width (ft/m) at 46° FOV	112/34	164/50	223/68
Number of Laser Returns	5	5	5
Example of a 20-Minute Flight (minutes)* **			
Area Coverage at 20% (overlap ac/ha)**	33/13.5	49/20	68/27.5
Area Coverage at 50% (overlap ac/ha)**	21/8.5	32/13	42/17

*Flight Altitude Above Ground Level (AGL)
**Average Point density. Note that calculation does not factor target remission (reflectivity %)
***An Example of a 20-minute flight under standard flight conditions
****Area coverage is computed for an example of a 20-minute survey (3 minutes for take-off and landing) at a drone speed of 5 m/s

TECHNICAL SPECS

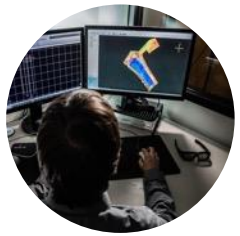


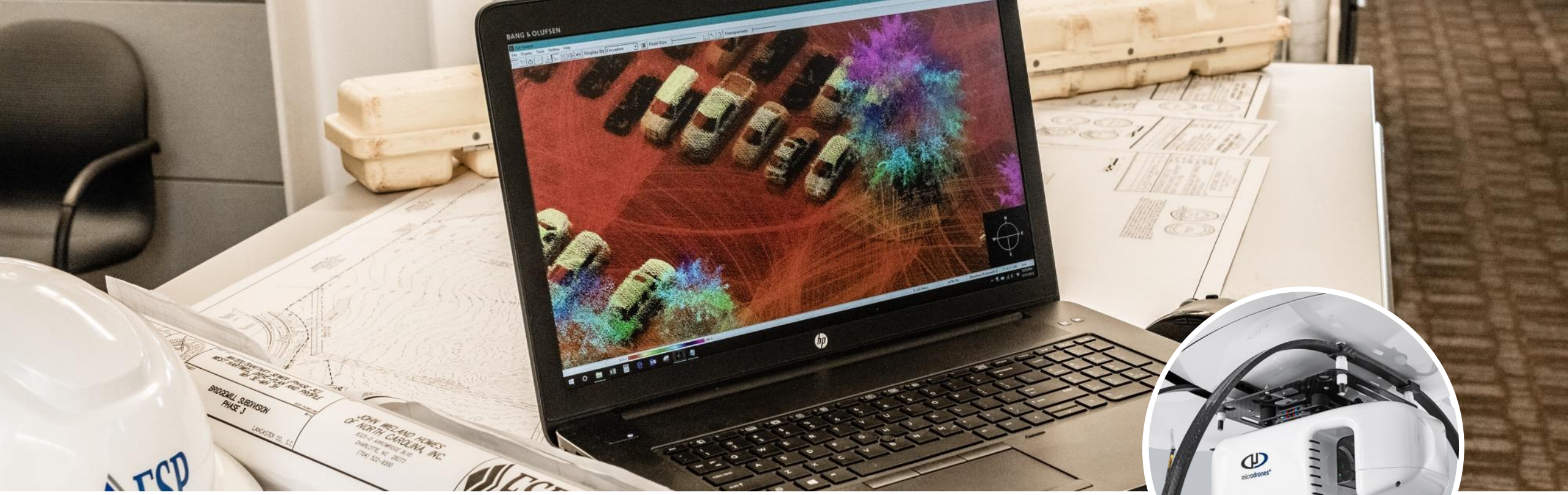
Systems are delivered with a preflight planning tool that will provide the pilot with the low battery level recommended for safe landing.

mdLiDAR
3000 aaS

EXTREME LiDAR DATA COLLECTION, WITH CONVENIENT PLANS AND DATA PROCESSING OPTIONS

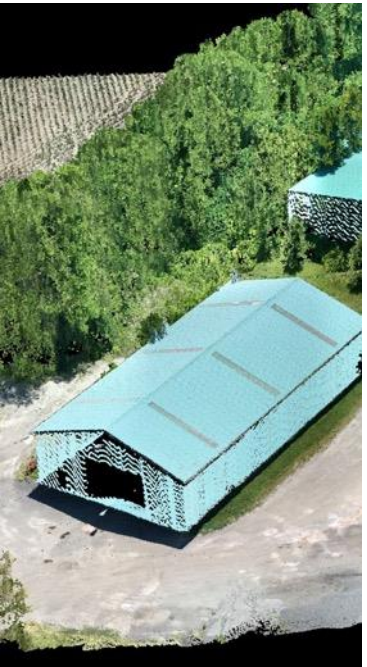
mdLiDAR3000 aaS is an end-to-end LiDAR solution combining a drone, a LiDAR payload, a fully integrated software workflow, and world class support to consistently provide quality deliverables.





THE COMPLETE PACKAGE TO ADD UNMANNED AERIAL LiDAR TO YOUR GEOMATICS SERVICES

The mdLiDAR3000 aaS uses the lifting power, resilience and efficiency of the Microdrones aircraft platform to carry a perfectly integrated Riegl miniVUX-2UAV and a Sony RX1R II camera. The result? You can quickly acquire high density and accurate LiDAR data in the field and efficiently turn it into a 3D colorized pointcloud back at the office or on your laptop.



mdLiDAR 3000 aaS

WHY SHOULD YOU INVEST IN DRONE BASED LiDAR?

In areas of high vegetation do you spend hours cutting line to topo the site? This system can help streamline your current workflows to become more efficient, while helping you to complete more projects.

EASY END-TO-END WORKFLOW:

- Simple mission planning using mdCockpit
- User inputs the point density or flying height and drone speed

- Fully automated mission execution and real-time mission monitoring using mdCockpit

- Thorough georeferencing data processing the dual IMU Applanix APX-20 UAV DG and mdInfinity software
- Automated final point cloud processing using mdInfinity processing software

- Final point cloud in standard ASPRS LAS format usable in any GIS or CAD software environment
- Quick and Accurate point cloud colorization using accurate system-produced orthomosaics and a user-friendly, seamless workflow

mdLiDAR
3000 aaS

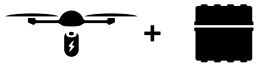
WHAT CAN YOU DO WITH IT?

mdLiDAR3000 aaS is a versatile package that can be used for a wide range of applications. Some of the most common uses are:

SURVEY EQUIPMENT

PLATFORM

md4-3000



Charger, Flight Battery & Rugged Carrying Case

Tri Blade Quadcopter

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Mag-less Navigation

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Extended Communication Range Operation

Multiple Tablet Control

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mdINFINITY ∞ | mdaaS | DG ENABLED

DATA PROCESSING MODULES

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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
md4-3000

Payload
- LiDAR Sensor: Riegl miniVUX-3UAV
- Camera: RX1R II
- Georeferencing:
  Trimble APX-20 UAV DG

Software
- mdCockpit
- mdInfinity

TECHNICAL SPECIFICATIONS

Solution Take off Weight (TOW)
14823 g

System Operational Temperature
-10 °C to 50 °C

System Accuracy
LiDAR Point Cloud:
- Horizontal: 1-3 cm
- Vertical: 2-4 cm

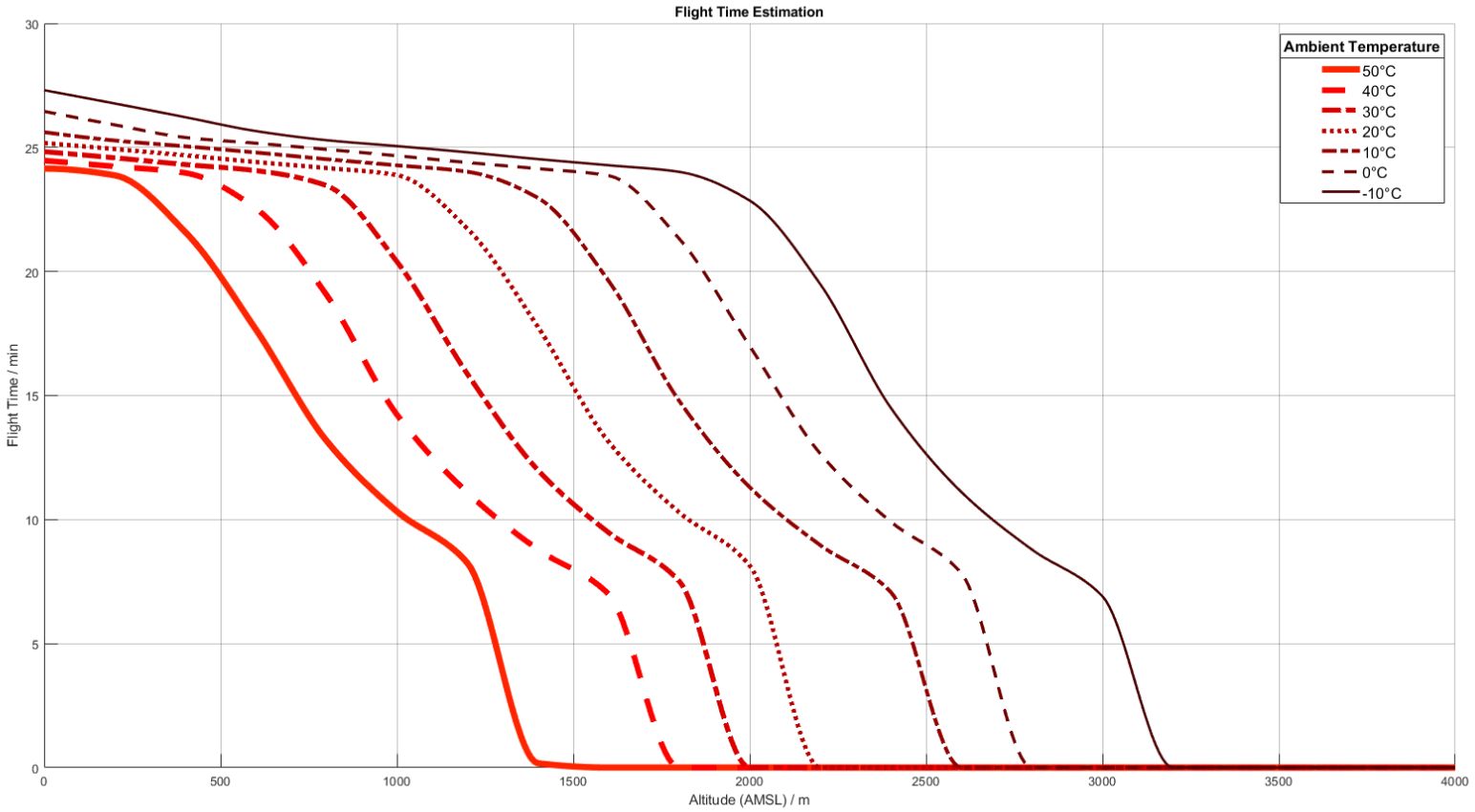
- Photogrammetry:
  - Horizontal: 1-2 pixels
  - Vertical: 3-4 pixels

TECHNICAL SPECS

Flight altitude AGL (ft/m)*	130/40	195/60	260/80
Speed (m/s)	Point Density (pts/m²)**		
3	320	213	160
4	240	160	120
5	192	128	96
6	160	106	80
GSD (mm)	5.3	8	10.6
Swath Width (ft/m) at 56° FOV	148/45	213/65	279/85
Swath Width (ft/m) at 80° FOV	230/70	328/100	443/135
Number of Laser Returns	5	5	5
Example of a 20-Minute Flight (minutes)* **			
Area Coverage at 20% Overlap (ac/ha)**	44.5/18	64/26	84/34
Area Coverage at 50% Overlap (ac/ha)**	27/11	42/17	52/21

*Flight Altitude Above Ground Level (AGL)
**Average Point density with a 30% overlap
***An example of a 20-minute Flight under standard flight conditions
****Area coverage is computed for an example of a 20-minute survey (3 minutes for take-off and landing) at a drone speed of 5 m/s at 56° Field of View (FOV)

TECHNICAL SPECS

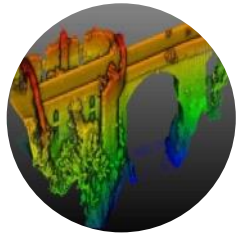


Systems are delivered with a preflight planning tool that will provide the pilot with the low battery level recommended for safe landing.

mdLiDAR
1000HR aaS

THE NEXT GENERATION OF OUR INDUSTRY LEADING DRONE LiDAR SURVEY EQUIPMENT IS HERE.

mdLiDAR1000HR aaS: HR means high resolution pointclouds and increased coverage is made easier and more accessible than ever.



SURVEY GRADE DRONE LASER SCANNING

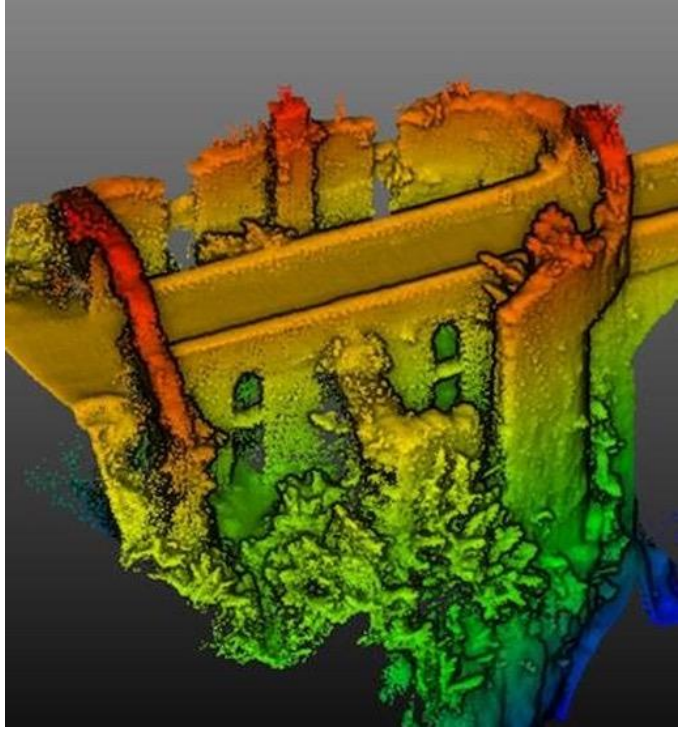
By combining our robust and field proven md4-1000 airframe, with a fully integrated high-resolution LiDAR & camera payload, you can capture ultra dense LiDAR data quickly and safely in the field, and then turn it into a 3D point cloud back at the office or on your laptop.

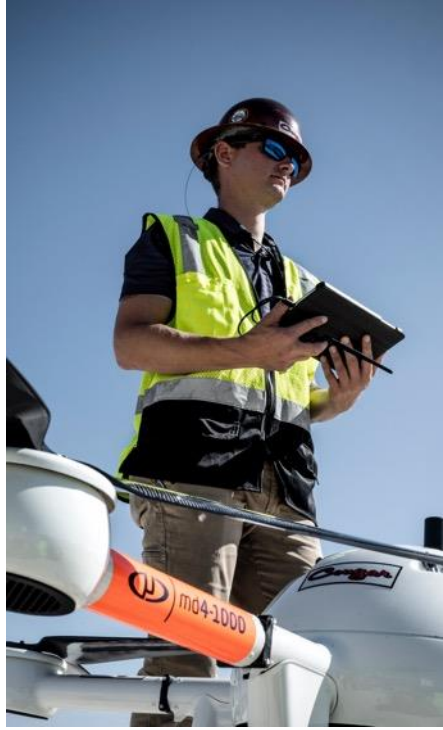
mdLiDAR
1000HR aaS

BRING HIGH RESOLUTION LASER FOCUS TO YOUR DRONE LiDAR SURVEYING PROJECTS

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.

mdLiDAR1000HR aaS is a fully integrated system for producing 3D point clouds optimized for land surveying, construction, oil & gas and mining applications.





mdLiDAR
1000HR aaS

WHY SHOULD YOU INVEST IN DRONE BASED LiDAR?

In areas of high vegetation do you spend hours cutting line to topo the site? This system can help streamline your current workflows to become more efficient, while helping you to complete more projects.

EASY END-TO-END WORKFLOW:

- Simple mission planning using mdCockpit
- User inputs the point density or flying height and drone speed

- Fully automated mission execution and real-time mission monitoring using mdCockpit

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

- 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 process in.

PROCESS

ACCURACY ASSESSMENT

Provided by Microdrones Geomatics department

- Test Area in Siegen, Germany
- 16 Check Points
- Varrying surfaces

mdLiDAR 1000HR aaS

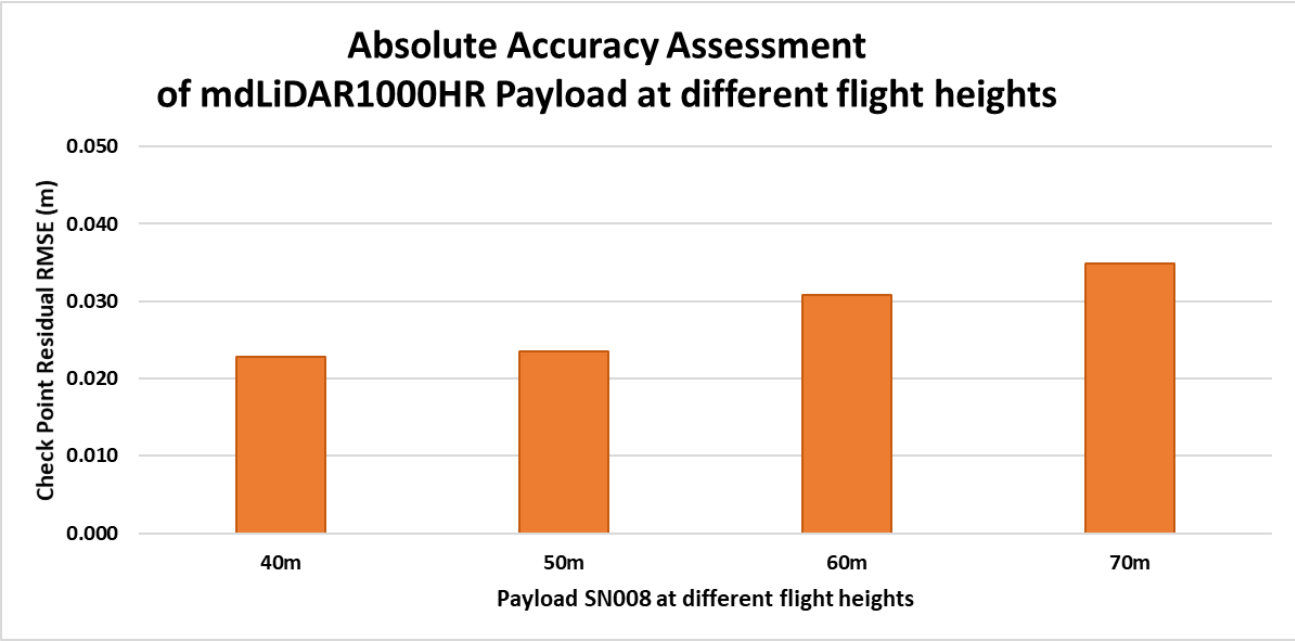
GCP ID	Horizontal Accuracy (m)	Height Accuracy (m)
G1	0.009	0.009
G2	0.009	0.008
G3	0.009	0.009
G4	0.009	0.009
G5	0.009	0.008
G6	0.008	0.008
G7	0.008	0.008
G8	0.008	0.008
G9	0.008	0.006
G10	0.008	0.006
R11	0.008	0.006
R12	0.009	0.009
R13	0.009	0.009
R14	0.009	0.009
R15	0.009	0.009
R16	0.008	0.006

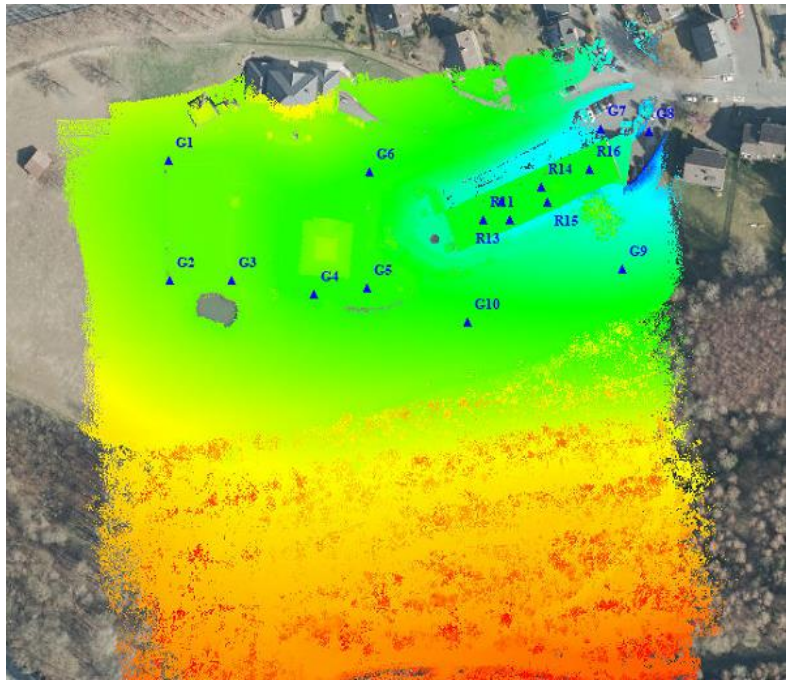
PROCESS

ACCURACY ASSESSMENT

Provided by Microdrones Geomatics department

- Test Area in Siegen, Germany
- Vertical accuracy 2cm-4cm RMSE





Processed through mdInfinty and evaluated with Global Mapper

VISUALIZE

POINT CLOUD DATA

Provided by Microdrones Geomatics department

mdLiDAR 1000HR aaS

Flight parameters

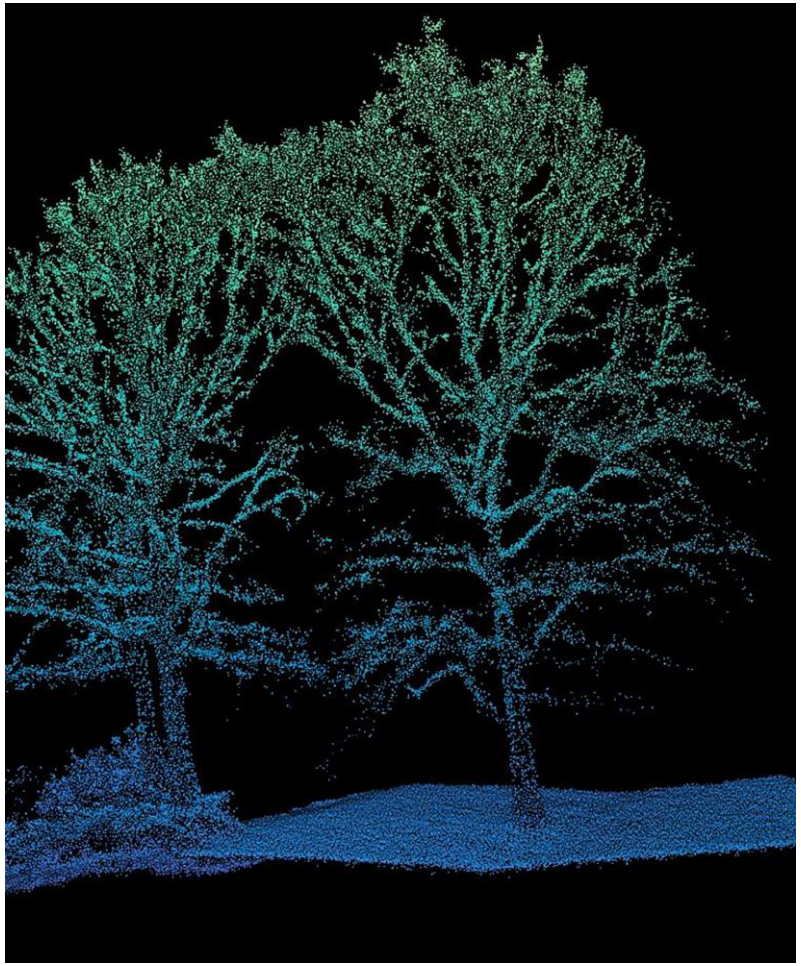
- 40m AGL
- 4 m/s
- 60% sidelap

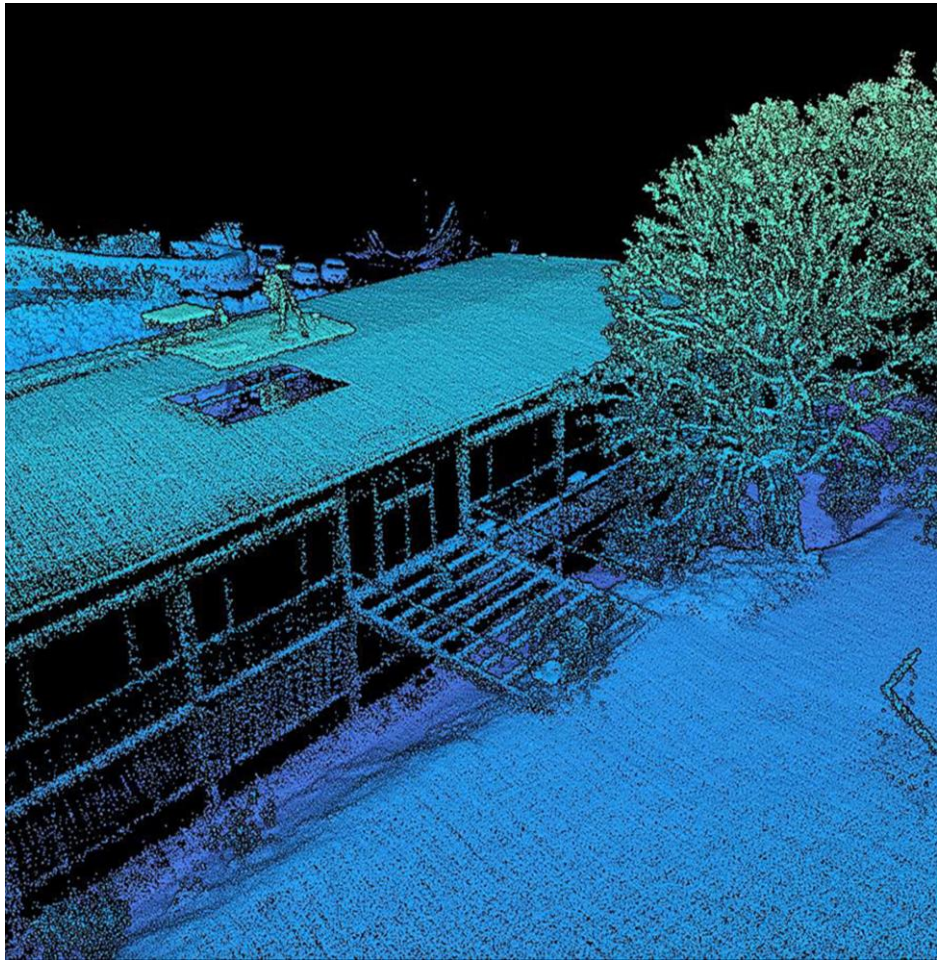
Single strip point density

- 330 pts/m²

Average point density

- 680 pts/m²





mdLiDAR
1000HR aaS

WHAT CAN YOU DO WITH IT?

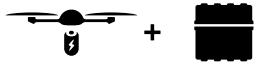
mdLiDAR1000 HR aaS is a versatile package that can be used for a wide range of applications. Some of the most common uses are:

SURVEY EQUIPMENT

mdLiDAR 1000HR aaS

PLATFORM

md4-1000



Charger & Rugged Carrying Case

Tri Blade Quadcopter

Integrated Cooling Covers

Mag-less Navigation

COMMUNICATIONS

Encrypted Digital Data Link

mdRC

Extended Communication Range Operation

Multiple Tablet Control

SURVEY EQUIPMENT

mdLiDAR 1000HR aaS

PAYLOAD

Fully Integrated High Resolution LiDAR & Camera

Applanix APX-15 UAV DG

SURVEY EQUIPMENT SOFTWARE

mdCockpit Tablet Software

Tap & Fly

mdINFINITY | mdaaS | DG ENABLED

DATA PROCESSING MODULES

mdLiDAR
1000HR aaS

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-16
- Camera Sensor: SONY IMX264
- Georeferencing: APX-15 UAV

Software
- mdCockpit
- mdInfinity

TECHNICAL SPECIFICATIONS

Solution Take off Weight (TOW)
6500 g

System Operational Temperature
-10 °C to 50 °C
14 °F to 122 °F

System Accuracy
- LiDAR Point Cloud:
    - 4 cm RMSE
- Photogrammetry:
    - Horizontal: 1-2 pixels
    - Vertical: 3-4 pixels

TECHNICAL SPECS

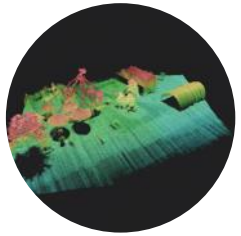
Flight Altitude AGL [1] (m/ft)	30 / 100	45 / 150	60 / 200
Speed (m/s)	**Covered square area at 30% sidelap (ha / ac)**		
4	15 / 37	25 / 62	34 / 84
6	25 / 62	34 / 84	50 / 123
8	34 / 84	50 / 123	62 / 153
Speed (m/s)	**Average Point Density in pts/m ^{2} [2,3] (square area / 1 scan line)**		
4	428 / 312	282 / 208	212 / 156
6	287 / 208	189 / 138	141 / 104
8	216 / 156	144 / 104	107 / 78
Camera GSD (mm)	21	31	41
Swath width (m/ft)	60 / 200	90 / 300	120 / 400
Number of Laser Returns	2	2	2

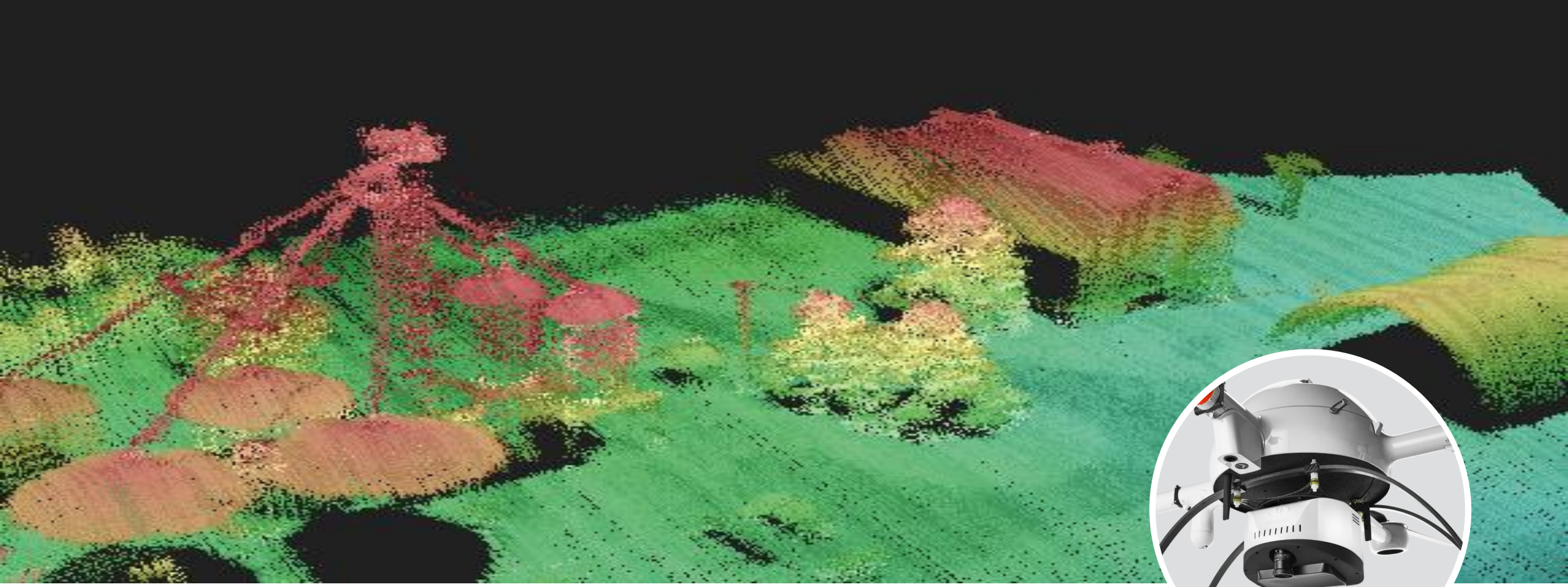
[1] Flight Altitude Above Ground Level (AGL)
[2] Coverage estimated for approximately 25 minutes of flight time
[3] Average density calculated with 30% overlap on 5 lines, average density will depend on surface type.

mdLiDAR
1000 aaS

GET STARTED WITH A DRONE LiDAR SYSTEM FOR MAKING POINTCLOUDS: mdLiDAR1000 aaS.

This is the UAV, hardware, software, workflow, training and support that surveying professionals need now with convenient mdaaS plans!





THE COMPLETE PACKAGE TO ADD UNMANNED AERIAL LiDAR TO YOUR GEOMATICS SERVICES

The mdLiDAR1000 aaS uses the lifting power, resilience and efficiency of the Microdrones aircraft platform to carry a perfectly integrated, lightweight, downward oriented LiDAR sensor that efficiently scans up to an 85 degree field of view.

mdLiDAR 1000 aaS

LiDAR + mdaaS + EASY TO USE mdInfinity SOFTWARE = EXTREME GEOSPATIAL PRODUCTIVITY

mdLiDAR1000 aaS is a fully integrated system for producing 3D point clouds optimized for land surveying, construction, oil & gas, and mining applications.

mdLiDAR1000 aaS consistently provides an accuracy of 6 cm (0.2 ft) when flown at 40 m (130 ft) at a speed of 3 m/s (6.7 mph).

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

mdLiDAR
1000 aaS

WHY SHOULD YOU INVEST IN DRONE BASED LiDAR?

The mdLiDAR1000 aaS can help streamline your current workflows to become more efficient, while helping you to complete more projects.

EASY END-TO-END WORKFLOW:

- Simple mission planning using mdCockpit.
- User inputs the point density or flying height and drone speed

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

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

- Final point cloud in standard ASPRS LAS format usable in any GIS or CAD software environment.

mdLiDAR
1000 aaS

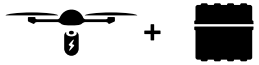
WHAT CAN YOU DO WITH IT?

mdLiDAR1000 aaS is a versatile package that can be used for a wide range of applications. Some of the most common uses are:

SURVEY EQUIPMENT

PLATFORM

md4-1000



Charger, Flight Battery & Rugged Carrying Case

Tri Blade Quadcopter

Integrated Cooling Covers

Mag-less Navigation

COMMUNICATIONS

Encrypted Digital Data Link

mdRC

Extended Communication Range Operation

Multiple Tablet Control

SURVEY EQUIPMENT

PAYLOAD

Fully Integrated LiDAR & Camera

Applanix APX-15 UAV DG

Trimble POWERED

SURVEY EQUIPMENT SOFTWARE

mdCockpit Tablet Software

Tap & Fly

mdINFINITY ∞ | mdaaS | DG ENABLED

DATA PROCESSING MODULES

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: SICK LD-MRS4
- Camera: FLIR 5MP Global Shutter
- Georeferencing: APX-15 UAV

Software
- mdCockpit
- mdInfinity

TECHNICAL SPECIFICATIONS

Solution Take off Weight (TOW)
6650 g

System Operational Temperature
-10 °C to 50 °C

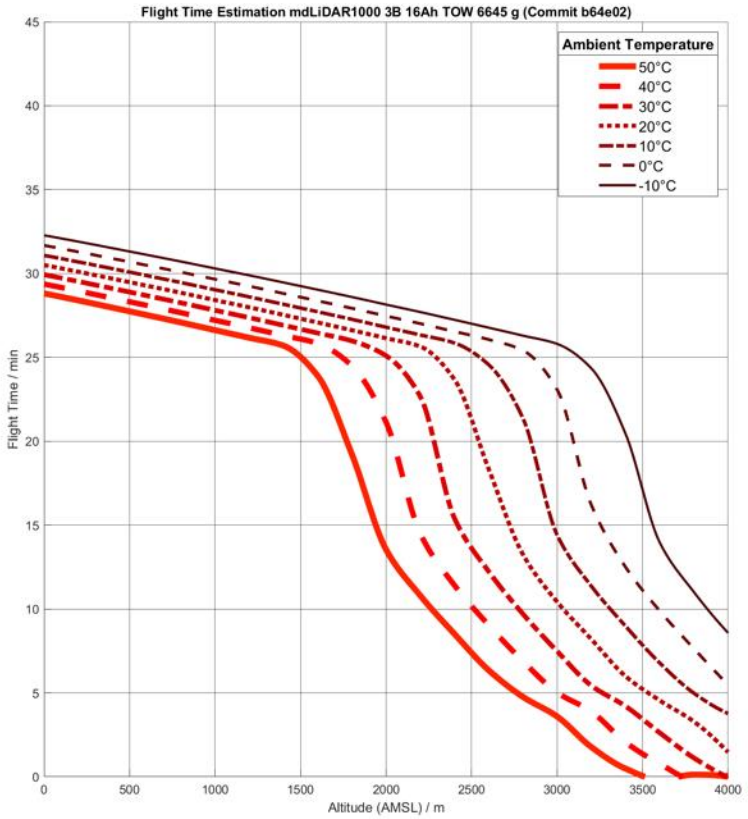
System Accuracy
- LiDAR Point Cloud:
    - Horizontal: 6 cm
    - Vertical: 6 cm
- Photogrammetry:
    - Horizontal: 1-2 pixels
    - Vertical: 3-4 pixels

TECHNICAL SPECS

Flight Altitude AGL* (ft/m)	100/30	130/40	165/50
Speed (m/s)	**Point Density (pts/m²)****		
2	197	147	118
3	131	98	78
4	98	74	59
5	78	59	47
GSD (mm)	12.9	17.2	21.4
Swath width (m/ft) at 46° FOV (m)	55	75	95
Flight Time (minutes)***	25	25	25
Number of Laser Returns	3	3	3
Area Coverage at 30% Overlap (ha)	14.7	18.6	23.6

*Flight Altitude Above Ground Level (AGL)
**Average Point density. Note that calculation does not factor target remission (reflectivity) %, Average density calculated with 30% overlap on 5 lines
***Flight time is calculated under standard flight conditions (using new Microdrones batteries)

APPROXIMATE FLIGHT TIME

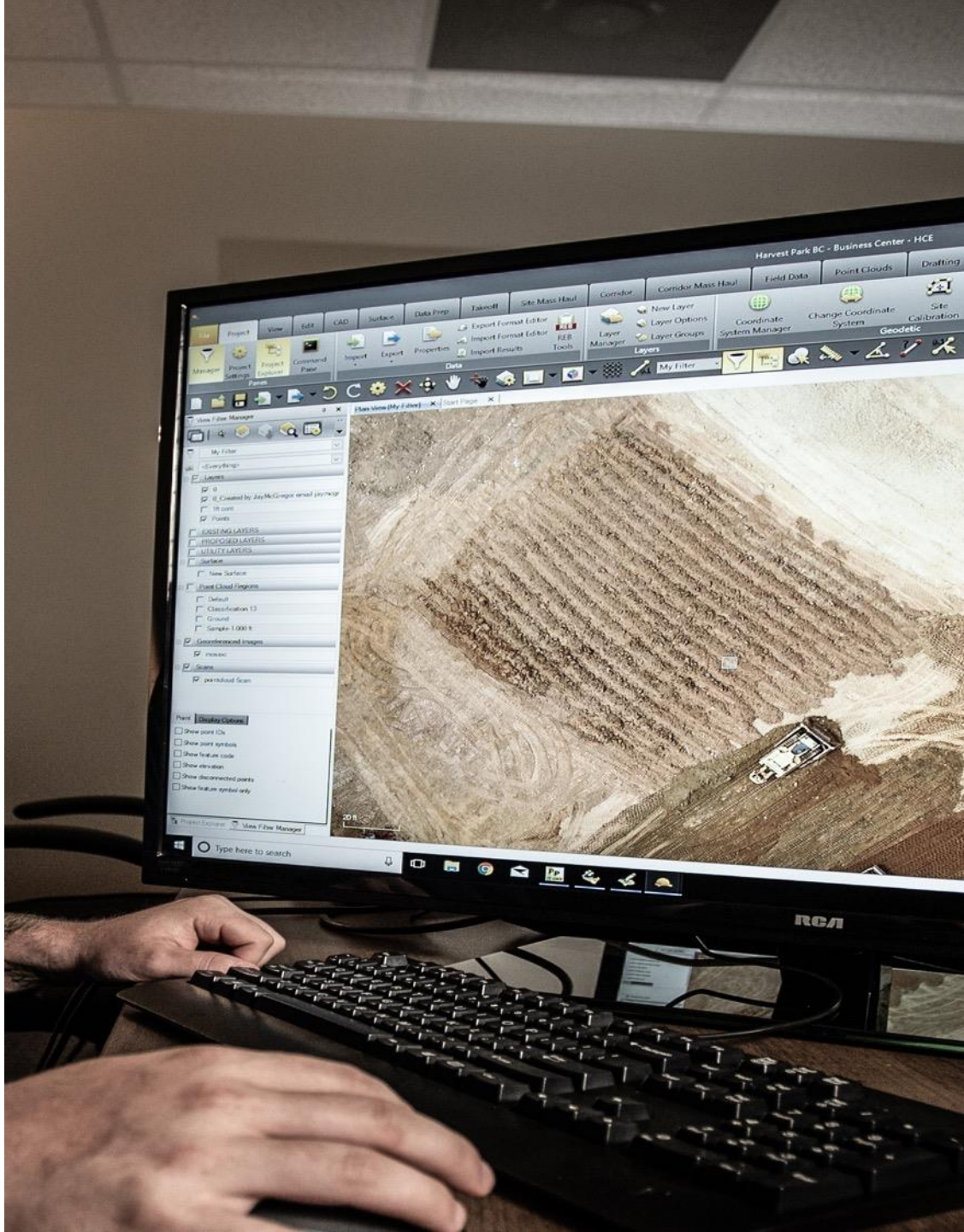


Systems are delivered with a preflight planning tool that will provide the pilot with the low battery level recommended for safe landing.

mdMAPPER
3000DμoG VHR ααS

DRONE PHOTOGRAMMETRY FOR MAPPING SERVICE PROVIDERS: WE PACKED MANNED AIRCRAFT AVIATION QUALITY INTO A UAV SYSTEM.

This system is designed, engineered and built for professional mappers to build professional grade mapping products.



QUICKLY ACQUIRE HIGHLY DENSE AND ACCURATE DATA, IN HALF THE TIME

The mdMapper3000DµoG VHR aaS combines the lifting power, resilience and efficiency of the Microdrones md4-3000 aircraft platform, with a perfectly integrated Phase One camera and the power of direct georeferencing. This results in an unparalleled one pixel mapping accuracy from a 1000 ft. drone flight height.

WHY CHOOSE mdMAPPER3000DµoG VHR aaS?

This package is all about resilience, convenience, and all-around performance. The md4-3000 UAV can stand up to intense environmental challenges, from strong winds and magnetic fields to high temperatures and voltage. It also boasts the longest flight times on the market.

THE POWER OF DIRECT GEOREFERENCING.

Unparalleled one pixel mapping accuracy from a 1000 ft. drone flight height.

FLY IN HARSH WEATHER CONDITIONS AND STAY ON SCHEDULE.

Strong winds, rain, and snow won’t stop the md4-3000.

ULTRA HIGH RESOLUTION.

mdMapper3000DµoG VHR aaS features a fully integrated PhaseOne iXM-100 Camera to capture the most accurate and dense data.

mdMAPPER
3000DµoG VHR aaS

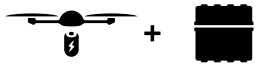
WHAT CAN YOU DO WITH IT?

mdMapper3000DµoG VHR aaS is a versatile package that can be used for a wide range of applications. Some of the most common uses are:

SURVEY EQUIPMENT

PLATFORM

md4-3000

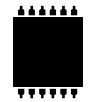


Charger, Flight Battery & Rugged Carrying Case

Tri Blade Quadcopter

Integrated Cooling Covers

Mag-less Navigation



Applanix APX-15 EI

COMMUNICATIONS

Encrypted Digital Data Link

mdRC

Extended Communication Range Operation

Multiple Tablet Control

SURVEY EQUIPMENT

mdMAPPER
3000DµoG VHR aaS

PAYLOAD

PhaseOne iXM-100 &
Quick Connect Mount

Applanix APX-15
External IMU

SURVEY EQUIPMENT SOFTWARE

mdCockpit Tablet Software

Tap & Fly

mdINFINITY | mdaaS | DG ENABLED | PPK ENABLED

DATA PROCESSING MODULES

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
md4-3000

Payload
- Camera: PhaseOne iXM-100 Camera (35 mm lens)
- Georeferencing: APX-15 EI UAV

Software
- mdCockpit
- mdInfinity

TECHNICAL SPECIFICATIONS

Solution Take off Weight (TOW)
13323 g

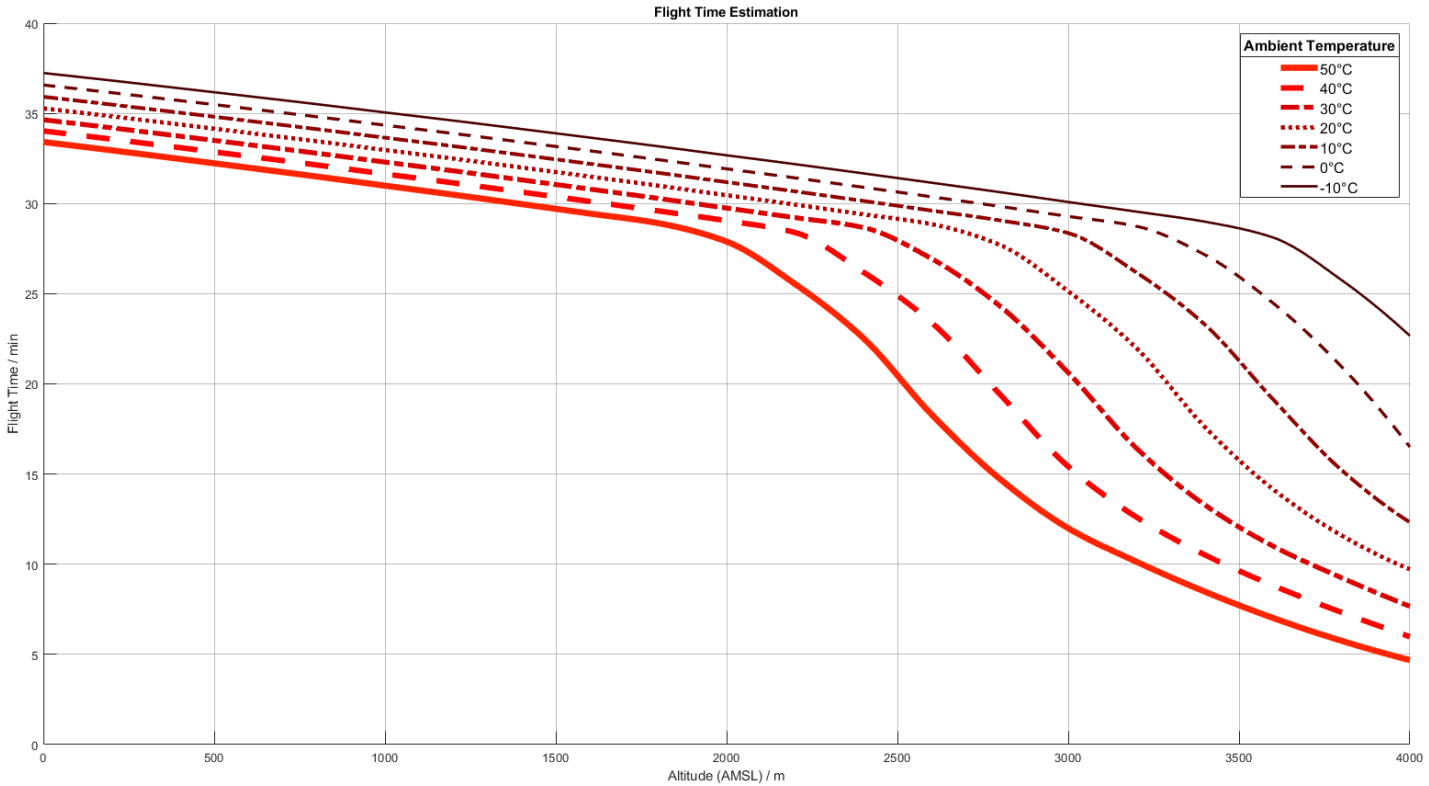
System Operational Temperature
-10 °C to 40 °C

System Accuracy
- Photogrammetry:
  - Horizontal: 1-2 pixels
  - Vertical: 2-3 pixels

TECHNICAL SPECS

		mdMapper3000DµoG VHR aaS (35 mm Lens)
Flight Parameters	**Area Covered (@120 m)**	265 ac (150 ha)
	Area Covered (@300 m)	976 ac (395 ha)
	Camera Model	Phase One iXM-100 (35 mm lens)
	Image Sensor Size	100 Megapixel
	Image Format	IIQ + JPEG/TIFF
	GSD cm/pixel (@120m)	1.3 cm
	GCP	No
	Overlaps (front/side)	80% / 40%
Post-Processing	**Method**	Optimized aerial triangulation using GNSS-Inertial solution
	Orientation	High precision sensor (INS)
	Position	High precision sensor (GNSS)
	Accuracy (flight height < 300 m)	1-2 GSD (X,Y) and 2-3 GSD (Z)
	Accuracy (flight height > 300 m)	1 GSD (X,Y,Z)
Advantages		• No GCP needed • Efficient flight planning – cover greater areas • Enables corridor mapping and area mapping

APPROXIMATE FLIGHT TIME



Systems are delivered with a preflight planning tool that will provide the pilot with the low battery level recommended for safe landing.

mdMAPPER
3000DµoG aaS

COVER MORE GROUND IN ONE FLIGHT, USE FEWER PEOPLE AND LESS EQUIPMENT ON YOUR PROJECTS

With mdMapper3000DµoG aaS, you'll acquire highly dense and accurate data in half the time.

WHY CHOOSE mdMAPPER3000DµoG aaS?

This package is all about resilience, convenience, and all-around performance. The md4-3000 UAV can stand up to intense environmental challenges, from strong winds and magnetic fields to high temperatures and voltage. It also boasts the longest flight times on the market.

READY TO UPGRADE WHEN YOU ARE.

When you are ready to upgrade to VHR or LiDAR, This system is ready to grow with you, and become a mdMapper3000 VHR aaS or a mdLiDAR3000 aaS system by purchasing the payload(s) and related firmware and software selections.

FLY IN HARSH WEATHER CONDITIONS AND STAY ON SCHEDULE.

Strong winds, rain, and snow won't stop the md4-3000.

QUICKLY AQUIRE HIGHLY DENSE AND ACCURATE DATA.

mdMapper3000DµoG aaS features a fully integrated 42.4 megapixel sony RXR1 II camera to capture the images you need.

mdMAPPER
3000DµoG aaS

WHAT CAN YOU DO WITH IT?

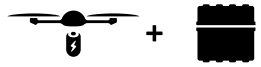
mdMapper3000DµoG aaS is a versatile package that can be used for a wide range of applications. Some of the most common uses are:

SURVEY EQUIPMENT

PLATFORM

md4-3000

md4-3000

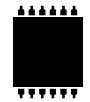


Charger, Flight Battery & Rugged Carrying Case

Tri Blade Quadcopter

Integrated Cooling Covers

Mag-less Navigation



Applanix APX-15 EI

COMMUNICATIONS

Encrypted Digital Data Link

mdRC

Extended Communication Range Operation

Multiple Tablet Control

SURVEY EQUIPMENT

mdMAPPER 3000DµoG aaS

PAYLOAD

RX1R II & Nadir Mount

Applanix APX-15 External IMU

SURVEY EQUIPMENT SOFTWARE

mdCockpit Tablet Software

Tap & Fly

mdINFINITY ∞ | mdaaS | DG ENABLED | PPK ENABLED

DATA PROCESSING MODULES

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
md4-3000

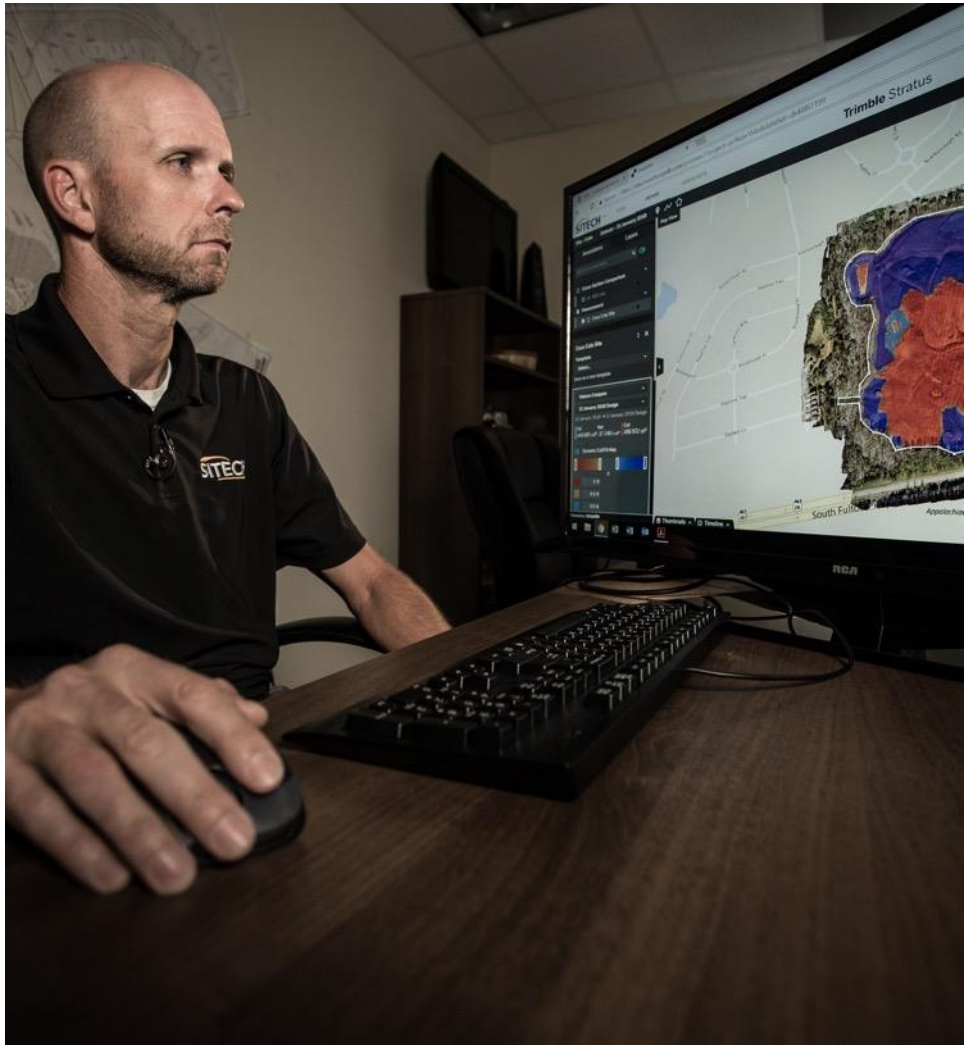
Payload
- Camera: RX1R II
- Georeferencing: APX-15 EI UAV

Software
- mdCockpit
- mdInfinity

TECHNICAL SPECIFICATIONS

Solution Take off Weight (TOW)
12373 g

System Operational Temperature
-10 °C to 50 °C



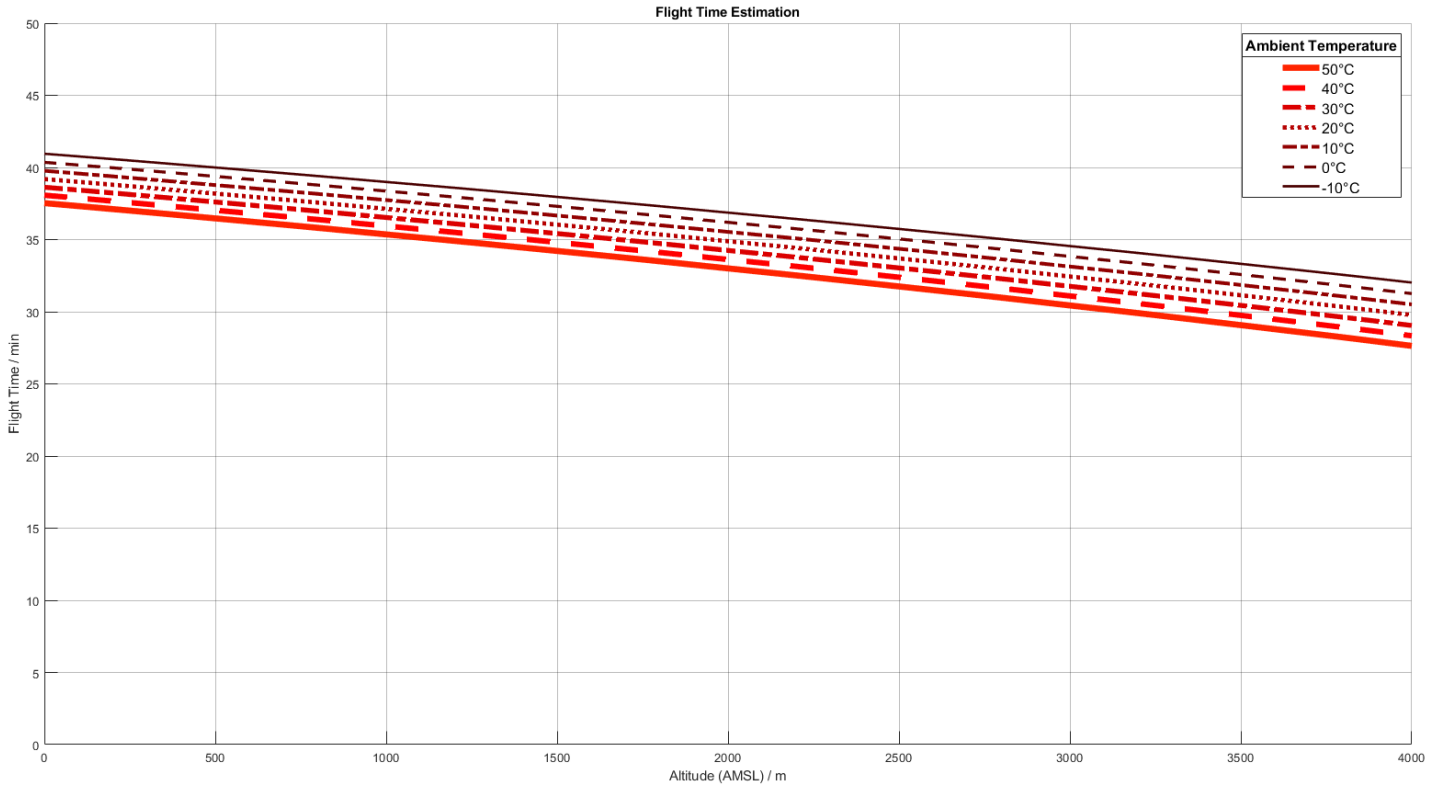
TECHNICAL SPECS

		mdMapper3000DµoG aaS
Flight Parameters	**Area Covered (@120 m)***	200 ac (80 ha)
	Camera Model**	Sony RX1R II
	Imagery Format	RAW + JPEG
	GSD cm/pixel (@120 m)	1.6 cm
	GCP	No
	Overlaps (front/side)	80% / 40%
Post-Processing	**Method**	Optimized aerial triangulation / GNSS-Inertial solution
	Orientation	High Precision Sensor (INS)
	Position	High Precision Sensor (GNSS)
	Accuracy	1-2 GSD (X,Y) and 2-4 GSD (Z)
Advantages		• No GCP needed • Efficient flight planning – cover greater areas • Efficient post-processing (EO apriori and less images) • Enables corridor mapping

* Note: Actual project completion times may vary based on desired surface coverage, altitude own, drone speed, desired mapping accuracy, and post processing methods

** The current camera models are listed. These may be replaced by equivalent or better cameras depending on availability from the manufacturer

APPROXIMATE FLIGHT TIME

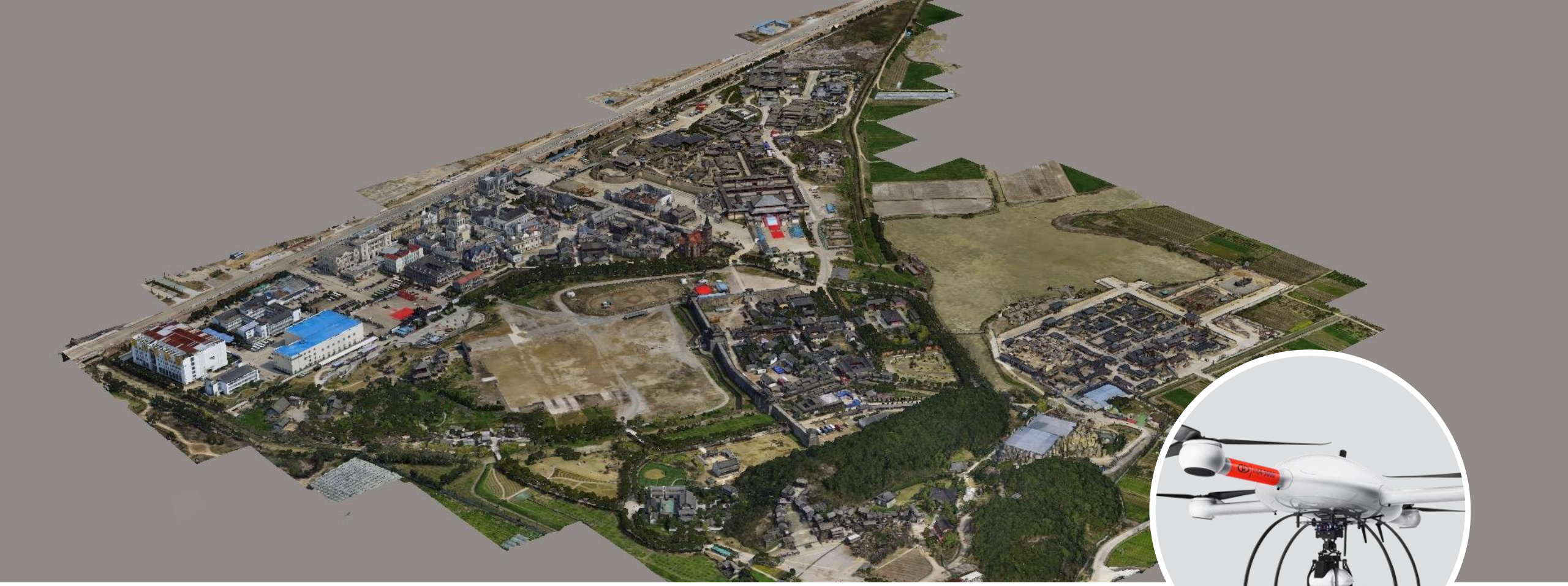


Systems are delivered with a preflight planning tool that will provide the pilot with the low battery level recommended for safe landing.

mdMAPPER
3000DμoG 3D aaS

NEED TO MODEL FINE DETAILS, TEXTURE AND ALL SIDES OF A STRUCTURE, BUILDING, CITY BLOCK OR NEIGHBORHOOD IN 3D?

mdMapper3000DμoG 3D aaS is a fully integrated drone mapping system that can be used for high wall mapping and 3d modeling.



IT FILLS A NICHE WHERE TRADITIONAL MANNED AIRCRAFT 3D MAPPING CAN’T GET CLOSE ENOUGH TO THE SUBJECT

This system gives you everything you need to plan, fly, process and visualize your architecture, remodeling, maintenance, mining and construction projects. The power and efficiency of the microdrones md4-3000 aircraft is perfectly integrated with dual imus, direct georeferencing an incredibly powerful array of five cameras, as well as mdinfinity data processing modules, workflow, training and support.

WHY CHOOSE mdMAPPER3000DµOG 3D aaS?

Five sensors capture data from multiple angles, to ensure high quality artifact-free imaging. From the real world to your laptop, you'll see 3D models showing all angles, roofs and sides of buildings, as well as the detailed texture of all surfaces.

YOUR JOB WILL BE QUICKER AND EASIER WHEN POST PROCESSING DATA FROM FIVE SENSORS.

You will capture all angles and surfaces of your subject with an integrated array of five cameras, seamlessly working together, and integrated into the processing workflow, all backed with the power of dual IMU direct georeferencing.

YOU WILL COLLECT A MASSIVE AMOUNT OF PHOTOGRAMMETRY DATA AND THE SOFTWARE DOES THE HARD WORK FOR YOU.

With the fully integrated, smart workflow of mdinfinity, the job of producing a complete data set that is georeferenced, geotagged and ready for importation into popular photogrammetry software is easy.

READY TO UPGRADE WHEN YOU ARE.

When you are ready to upgrade to VHR or LiDAR, This system is ready to grow with you, and become a mdMapper3000 VHR aaS or a mdLiDAR3000 aaS system by purchasing the payload(s) and related firmware and software selections.

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FLY IN HARSH WEATHER CONDITIONS AND STAY ON SCHEDULE.

Strong winds, rain, and snow won't stop the md4-3000.

QUICKLY AQUIRE HIGHLY DENSE AND ACCURATE DATA.

mdMapper3000DµoG 3D aaS features five integrated high resolution cameras and dual IMUs.

mdMAPPER
3000DµoG 3D aaS

WHAT CAN YOU DO WITH IT?

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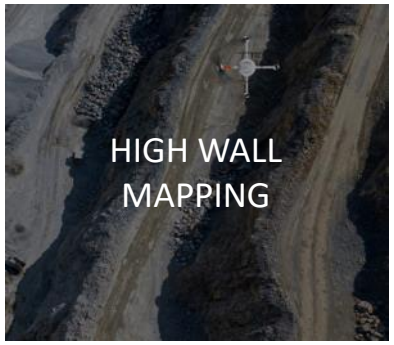
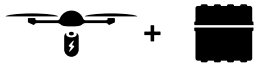


SURVEY EQUIPMENT

PLATFORM

md4-3000

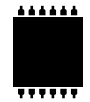


Charger, Flight Battery & Rugged Carrying Case

Tri Blade Quadcopter

Integrated Cooling Covers

Mag-less Navigation



Applanix APX-15 EI

COMMUNICATIONS

Encrypted Digital Data Link

mdRC

Extended Communication Range Operation

Multiple Tablet Control

SURVEY EQUIPMENT

mdMAPPER
3000DµoG 3D aaS

PAYLOAD

5 Integrated High Resolution Cameras

Applanix APX-15 external IMU

SURVEY EQUIPMENT SOFTWARE

mdCockpit Tablet Software

Tap & Fly

mdINFINITY | mdaaS | DG ENABLED | PPK ENABLED

DATA PROCESSING MODULES

mdMAPPER
3000DµoG 3D aaS

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
md4-3000

Payload
- Camera: 5 (Sony APS-C Sensor)
- Georeferencing: APX-15 EI UAV

Software
- mdCockpit
- mdInfinity

TECHNICAL SPECIFICATIONS

Solution Take off Weight (TOW)
12723 g

System Operational Temperature
-10 °C up to 40 °C

APPROXIMATE FLIGHT TIME

		mdMapper3000DµoG 3D aaS
Flight Parameters	**Area Covered (@120 m)***	200 ac (80 ha)
	Camera Model**	5 (Sony APS-C Sensor)
	Imagery Format	RAW + JPEG
	Resolution	120 MP Combined
	Field of View	130° Symetrical
	G.S.D. cm/pixel (@120 m)	1.7
	G.C.P.	No
	Overlaps (front/side)	80%/40%
Post-Processing	**Method**	Optimized aerial triangulation / GNSS-Inertial solution
	Orientation	High precision sensor (INS)
	Position	High precision sensor (GNSS)
	Accuracy	2-3 GSD (X,Y) and 3-5 GSD (Z)
Advantages		• No GCP needed • Efficient flight planning – cover greater areas • Efficient post-processing (EO apriori and less images) • Enables corridor mapping

* Typical project benchmark comparisons based on missions completed in Canada in 2016
** The current camera models are listed. These may be replaced by equivalent or better cameras depending on availability from the manufacturer

mdMAPPER
1000DG aaS

mdMAPPER1000DG AAS: VERSATILE, AFFORDABLE DRONE PHOTOGRAMMETRY SURVEY EQUIPMENT

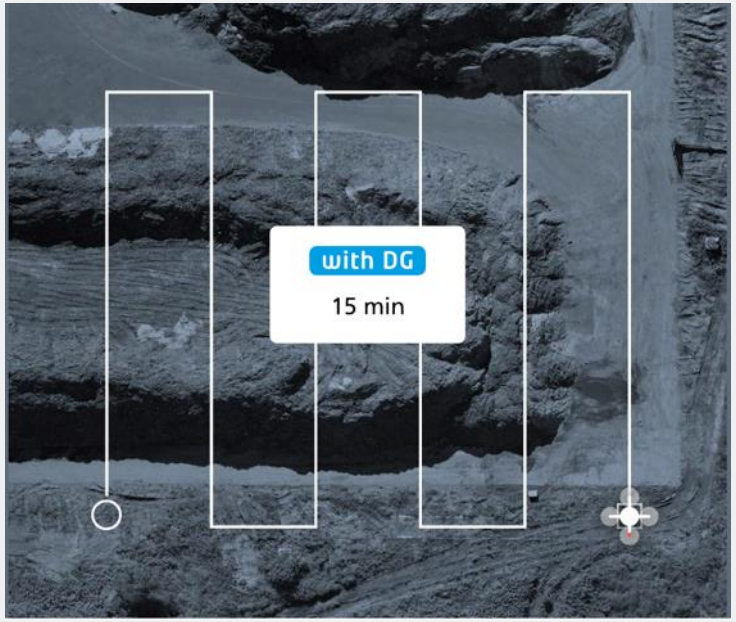
A complete UAV mapping solution that cuts cost, saves time, and pushes limits – according to the needs of your data deliverable project

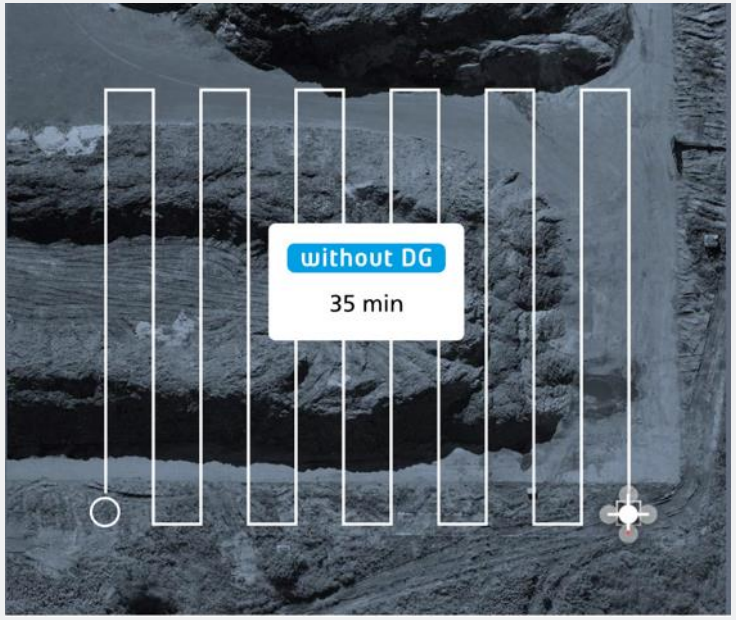
mdMAPPER
1000DG aaS

DIRECT GEOREFERENCING WILL RISE TO THE OCCASION

With DG, you won't need to install *any* ground control points (unless you want to install 1 or 2 to check your work later for quality control). You'll collect your images and post-process in a fraction of the time. Your projects will require less people and equipment. You'll safely tackle mapping jobs in dangerous locations.

Most important, you'll deliver the best possible accuracy on projects where human safety and your reputation is on the line. Best of all, DG is selectable, AFTER data collection, as a post processing option... so you are only paying for it when your client or project needs it





mdMAPPER
1000DG aaS

DON'T NEED DG? PROCESS WITH PPK; IT'S ALL SELECTABLE BY PROJECT NEED WITHIN mdINFINITY!

Microdrones customers asked for a workflow that could deliver excellent results with a handful of ground control points. We listened.

mdMapper1000DG aaS fills an important niche for customers who may not be ready for DG, and are willing to set up 1 – 3 ground control points for their projects; simply post process data in PPK within the flexible mdInfinity cloud or desktop software.

And when your business, projects or services expand to require DG, you simply choose to process your data with DG in the mdInfinity suite.

WHY CHOOSE mdMAPPER1000DG aaS?

mdMapper1000DG aaS will help you to achieve high levels of data accuracy, cover more ground in one flight, use less people and equipment on jobs all without using ground control points.

ELIMINATES YOUR NEED TO INSTALL GCPS

while meeting the most precise data requirements.

ALLOWS YOU TO PERFORM CORRIDOR MAPPING

thanks to an on-board IMU that measures orientation angles. RTK, PPK, and conventional aerial surveying methods do not measure these angles so corridor mapping becomes a major operational and logistical challenge.

DRASTICALLY REDUCES TIME SPENT

on post-processing and data collection, thanks to an impressively decreased side lap and many other elements.

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mdMAPPER
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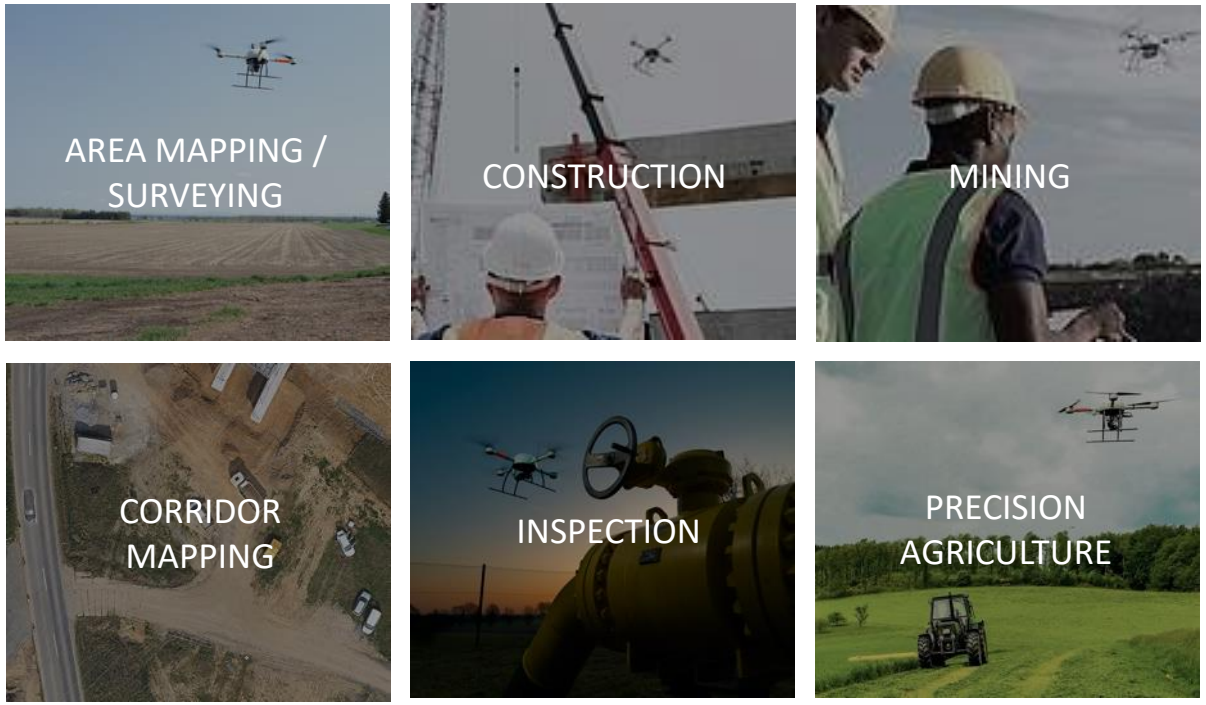
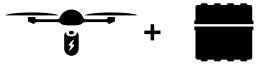


SURVEY EQUIPMENT

PLATFORM

md4-1000



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SURVEY EQUIPMENT

mdMAPPER 1000DG aaS

PAYLOAD

RX1R II & Nadir Mount

Applanix APX-15 External UAV DG

SURVEY EQUIPMENT SOFTWARE

mdCockpit Tablet Software

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mdINFINITY ∞ | mdaaS | DG ENABLED | PPK ENABLED

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mdMAPPER
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- Trajectory processing
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TECHNICAL SPECS

mdMAPPER
1000DG aaS

SOLUTION COMPONENTS

Platform
md4-1000

Payload
- Camera: RX1R II
- Georeferencing: APX-15 EI UAV DG

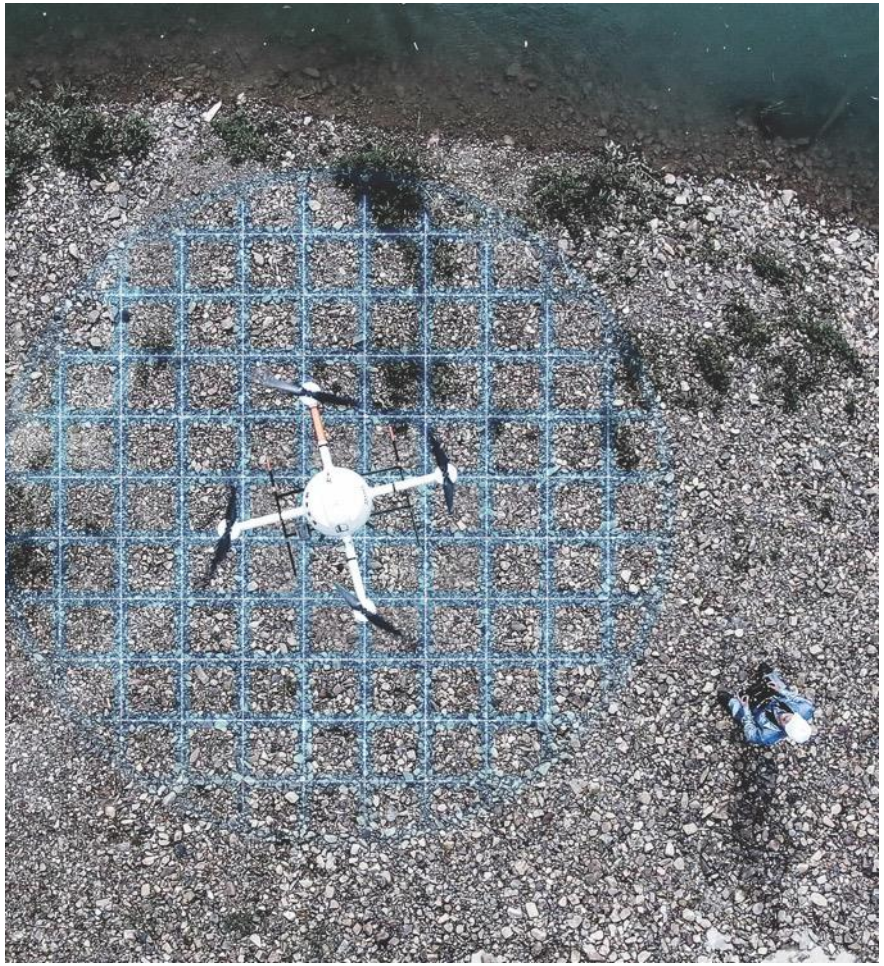
Software
- mdCockpit
- mdInfinity

TECHNICAL SPECIFICATIONS

Solution Take off Weight (TOW)
5870 g

System Operational Temperature
-10 °C to 50 °C

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



APPROXIMATE FLIGHT TIME

		mdMapper1000DG aaS
Flight Parameters	**Area Covered (@120 m)***	200 ac (80 ha)
	Camera Model**	Sony RX1R II
	Imagery Format	RAW + JPEG
	GSD cm/pixel (@120 m)	1.6 cm
	GCP	No
	Overlaps (front/side)	80% / 40%
Post-Processing	**Method**	Optimized aerial triangulation / GNSS-Inertial solution
	Orientation	High precision sensor (INS)
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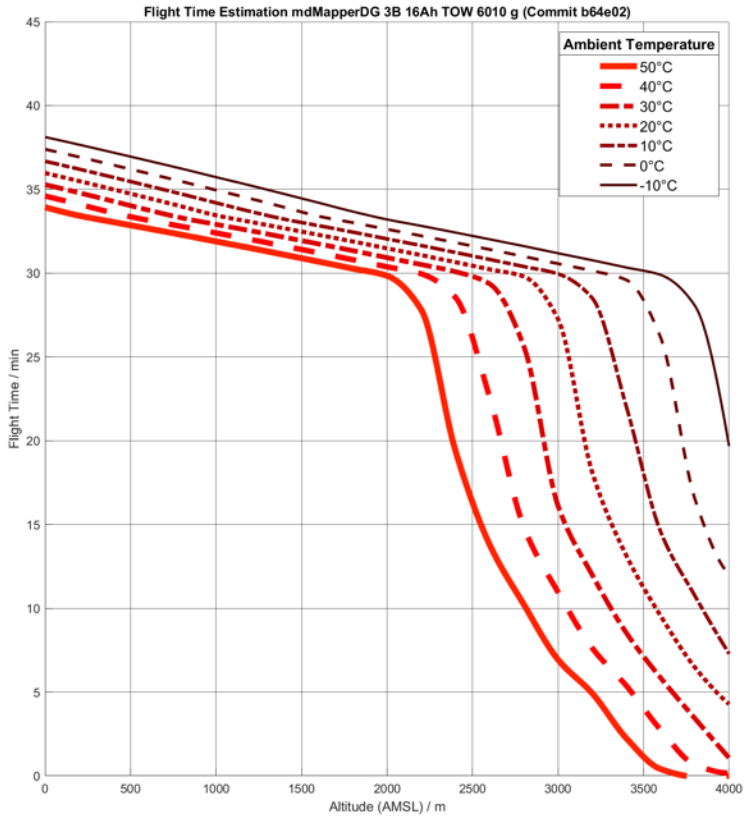

Systems are delivered with a preflight planning tool that will provide the pilot with the low battery level recommended for safe landing.

mdMAPPER
1000DG 3D aaS

COLLECT DATA AND CREATE 3D MODELS OF STRUCTURES, BUILDINGS AND NEIGHBORHOODS.

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MODEL FINE DETAILS, TEXTURE AND ALL SIDES OF STRUCTURES IN 3 DIMENSIONS.

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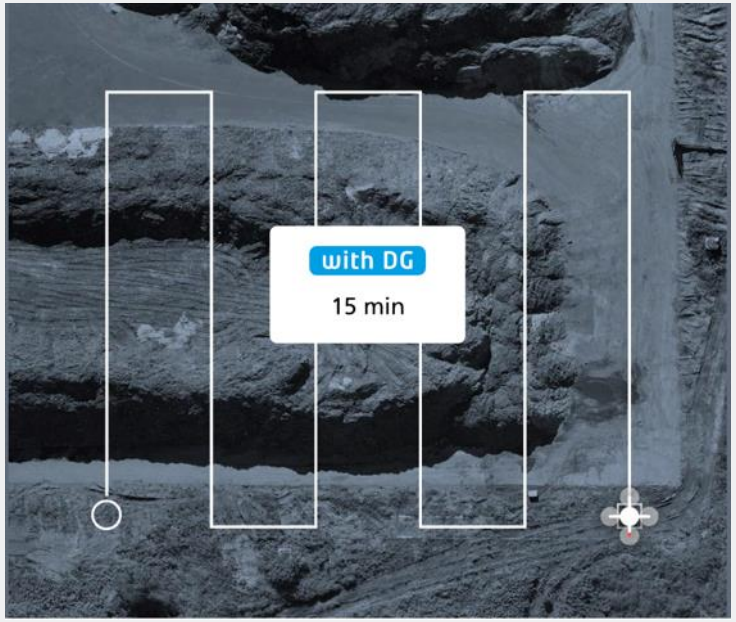

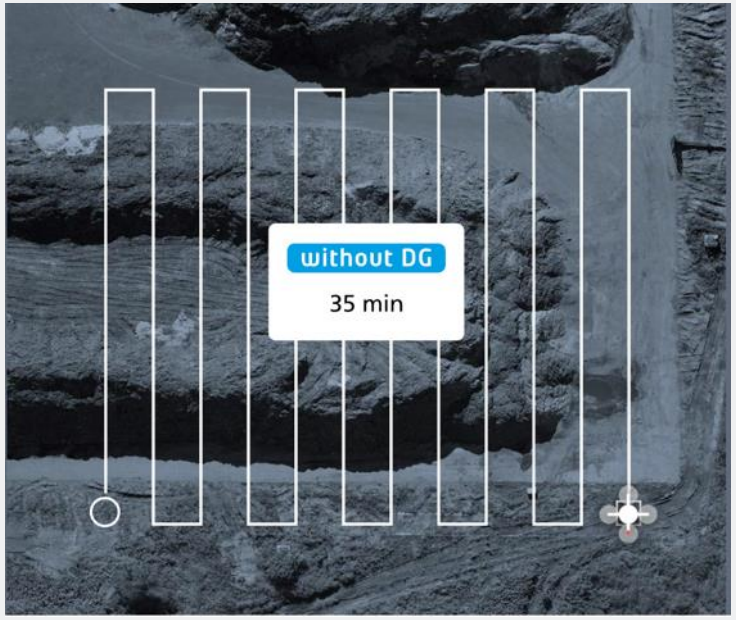

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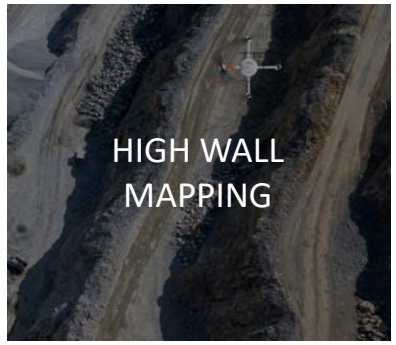
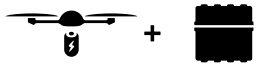


SURVEY EQUIPMENT

mdMAPPER
1000DG 3D aaS

PLATFORM

md4-1000



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SURVEY EQUIPMENT

mdMAPPER
1000DG 3D aaS

PAYLOAD

5 Integrated
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Applanix APX-15
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TECHNICAL SPECS

mdMAPPER
1000DG 3D aaS

SOLUTION COMPONENTS

Platform
md4-1000

Payload
- Camera: 5 (Sony APS-C Sensor)
- Georeferencing: APX-15 EI UAV

Software
- mdCockpit
- mdInfinity

TECHNICAL SPECIFICATIONS

Solution Take off Weight (TOW)
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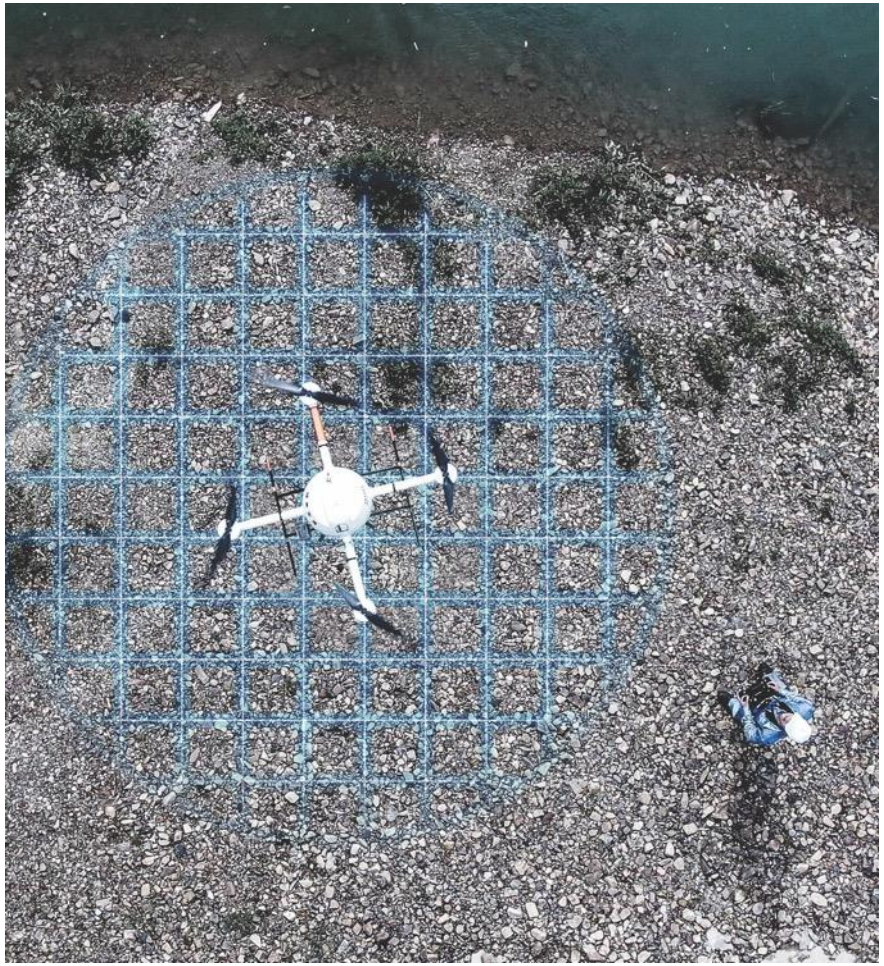

APPROXIMATE FLIGHT TIME

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Flight Parameters	**Area Covered (@120 m)***	200 ac (80 ha)
	Camera Model**	5 (Sony APS-C Sensor)
	Imagery Format	RAW + JPEG
	Resolution	120 MP Combined
	Field of View	130° Symetrical
	G.S.D. cm/pixel (@120 m)	1.7
	G.C.P.	No
	Overlaps (front/side)	80%/40%
Post-Processing	**Method**	Optimized aerial triangulation / GNSS-Inertial solution
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Advantages		• No GCP needed • Efficient flight planning – cover greater areas • Efficient post-processing (EO apriori and less images) • Enables corridor mapping

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*** Using DG single base processing

mdTECTOR
1000CH4 aaS

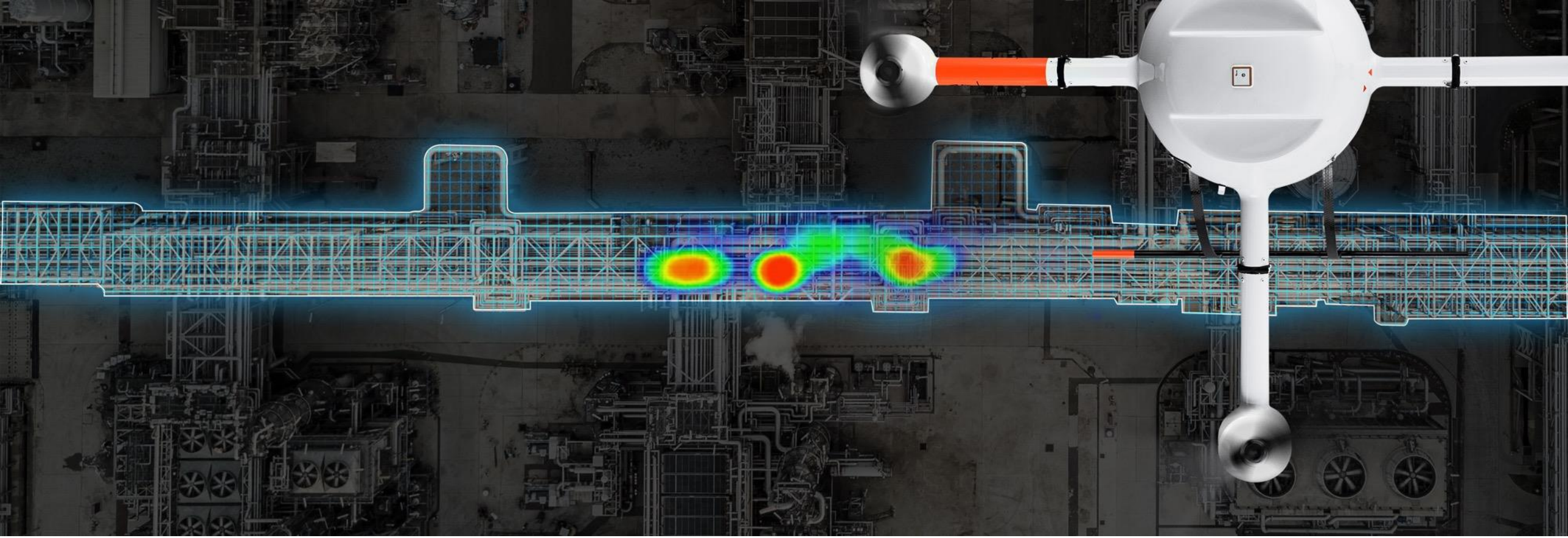
GET OVER YOUR GAS DETECTION PROBLEMS

mdTector1000CH4 aaS, is a fully integrated aerial methane inspection package. It’s purpose-built for professionals who are responsible for inspecting methane gas infrastructure.

mdTECTOR
1000CH4 aaS

IT GOES WHERE PEOPLE SHOULDN'T.

Whether your gas infrastructure is in a hard to reach riverbed or near a steep cliff… the tough, carbon-fiber built drone will easily navigate terrain that would be difficult, dirty or dangerous by traditional foot crews. Microdrones is known for its field-proven aircraft platform. It's sturdy, stable, resistant to wind and weather, as well as dust and dampness.



A DRONE PACKAGE FOR PEOPLE WHO GET STUFF DONE.

- Natural Gas Line Surveys
- Tank Inspections
- Gas Well Testing
- Landfill Emission Monitoring
- Plant Safety

BENEFITS

- Low cost compared to the expense and risk of traditional gas detection methods
- Broad range of detection, from 1 – 50,000 ppm × m
- Lightweight and easy to transport
- Easy to deploy and operate

OUTPUTS

The mdCockpit Android App provides a live data view of potential gas leaks in real time during flight.

- Methane Column Density in ppm × m
- Sensor Status
- Plot the LMm readings

The mdTector Android App allows you to graphically visualize and present all exported post-flight data on one convenient map.

- Data includes LMM reading and GNSS position
- Import TFD from md4-1000
- Quickly export data to .csv for exploitation in GIS software
- Data is displayed by color
- Toggle between Google Imagery and Google Maps

mdTECTOR
1000CH4 aaS

WHAT CAN YOU DO WITH IT?

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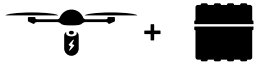
SURVEY EQUIPMENT

PLATFORM

md4-1000



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mdTECTOR 1000CH4 aaS

PAYLOAD

integrated Methane Gas Sensor & FPV Camera with Video Link

SURVEY EQUIPMENT SOFTWARE

CH4

mdCockpit Tablet Software

mdCockpit Tablet Software

Tap & Fly

mdINFINITY ∞ | mdaaS

TECHNICAL SPECS

SOLUTION COMPONENTS

Platform
md4-1000

Payload
- Sensor: Pergam Laser Methane Falcon

Software
- mdCockpit
- mdTector Viewer App

TECHNICAL SPECIFICATIONS

Solution Take off Weight (TOW)
5520 g

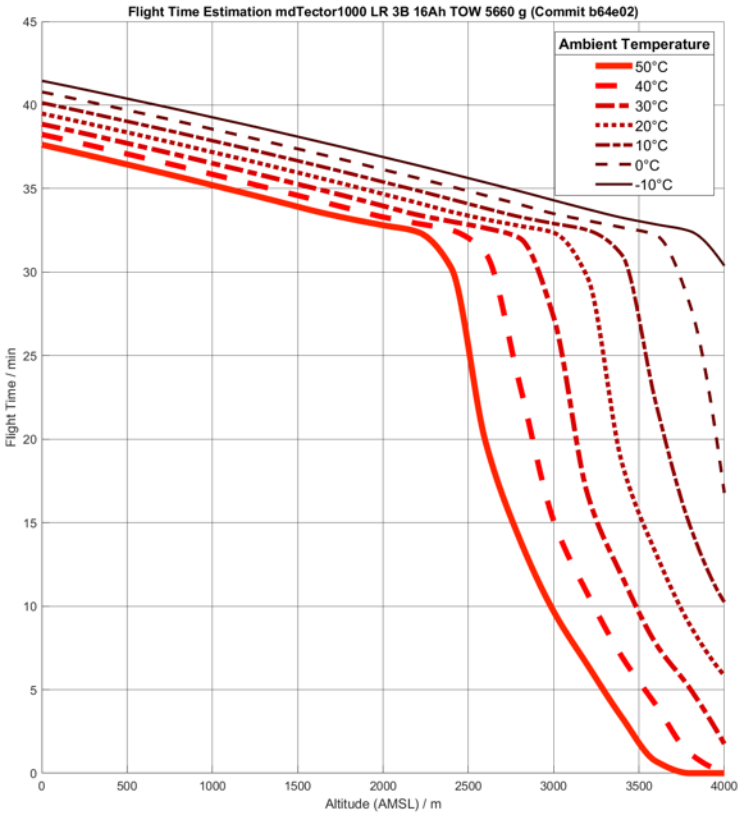
System Operational Temperature
-10 °C to 50 °C

APPROXIMATE FLIGHT TIME

	mdTector1000CH4 aaS
Target Gas	Methane (CH_4) and methane-containing gases (natural gas and similar)
Detection Limits	1 – 50,000 ppm×m
Detection Speed	0.1 seconds[1]
Distance	1.5 ft. (0.5 m) – 328 ft. (100 m)
Laser Safety Class	Guide light (green laser light): Class 3R, Measurement light (infrared laser light): Class 1
Dimensions	120 (W) × 120 (D) × 140 (H) m
Features	Live view telemetry, Live view video feedback

[1] The mdTector1000CH4 solution averages 10 data in order to record 1 value each second.
[2] Please take note that the lower distance values might represent safety issues for the UAV in terms of altitude above ground level.

APPROXIMATE FLIGHT TIME



Systems are delivered with a preflight planning tool that will provide the pilot with the low battery level recommended for safe landing.

INTRODUCING mdaaS

DRONE SURVEYING OPTIONS FOR EVERYONE

Everything you need to do drone LiDAR and surveying the right way, with convenient packages and payment options.

LET'S GET STARTED

GEOSPATIAL PRODUCTIVITY MADE SIMPLE & AFFORDABLE.

Microdrones is making it easy for professionals to get started with everything needed to use drones for complex surveying work.

What is mdaaS*?

Microdrones as a Service.

mdaaS empowers customers to deploy the full hardware and software solution as a service (HaaS and SaaS).

Microdrones delivers access to its unique data processing software solution, mdInfinity, packaged with either the purchase or rental of survey equipment.

*Note: mdaaS “Rent It” options are available in The United States, Canada, The European Economic Area, Switzerland, The United Kingdom and Australia.

FIRST LET'S ESTABLISH SOME TERMS.

INTEGRATED SYSTEMS

Complete mapping solution offered by Microdrones composed of Survey Equipment and Data Processing modules fully adapted to that Survey Equipment.

SURVEY EQUIPMENT

The necessary equipment to gather Data using a UAV. It includes the drone, the payload and Microdrones proprietary mdCockpit mission planning and control software. Data collected with the survey equipment can be processed exclusively within mdInfinity.

BUY IT!

Microdrones delivers access to our software solution with the purchase of Survey Equipment included in the fee. Clients retain full maintenance and upgrade responsibility.

RENT IT!

Microdrones delivers access to a software solution with the lease of Survey Equipment included in the fee. Clients enjoy convenient hardware as a service agreement, while Microdrones handles maintenance and upgrades.

MAINTAIN IT!

Yearly UAV & Payload maintenance for BUY IT customers.

DATA PROCESSING MODULE

Any available Software module which can process and facilitate the analysis of data through mdInfinity Software platform.

PAY PER PROJECT

Microdrones Data Processing Modules plan for clients who prefer to pay only when they need it.

UNLIMITED PLAN

Microdrones Data Processing plan for clients who use the tool extensively and need unlimited processing capabilities.

mdINFINITY

mdInfinity is a powerful ecosystem that will enable you to quickly and efficiently process geospatial data, with convenient payment options. mdInfinity is available in online and desktop versions.

SELECTION PROCESS

1

Choose your integrated system.

EXAMPLE SYSTEM

i.e. mdLiDAR1000

2

Choose how you prefer to pay for your Survey Equipment

BUY IT!
(You retain full maintenance and upgrade responsibility)

OR

RENT IT!
(You enjoy convenient *hardware as a service* agreement and Microdrones handles maintenance and upgrades.)

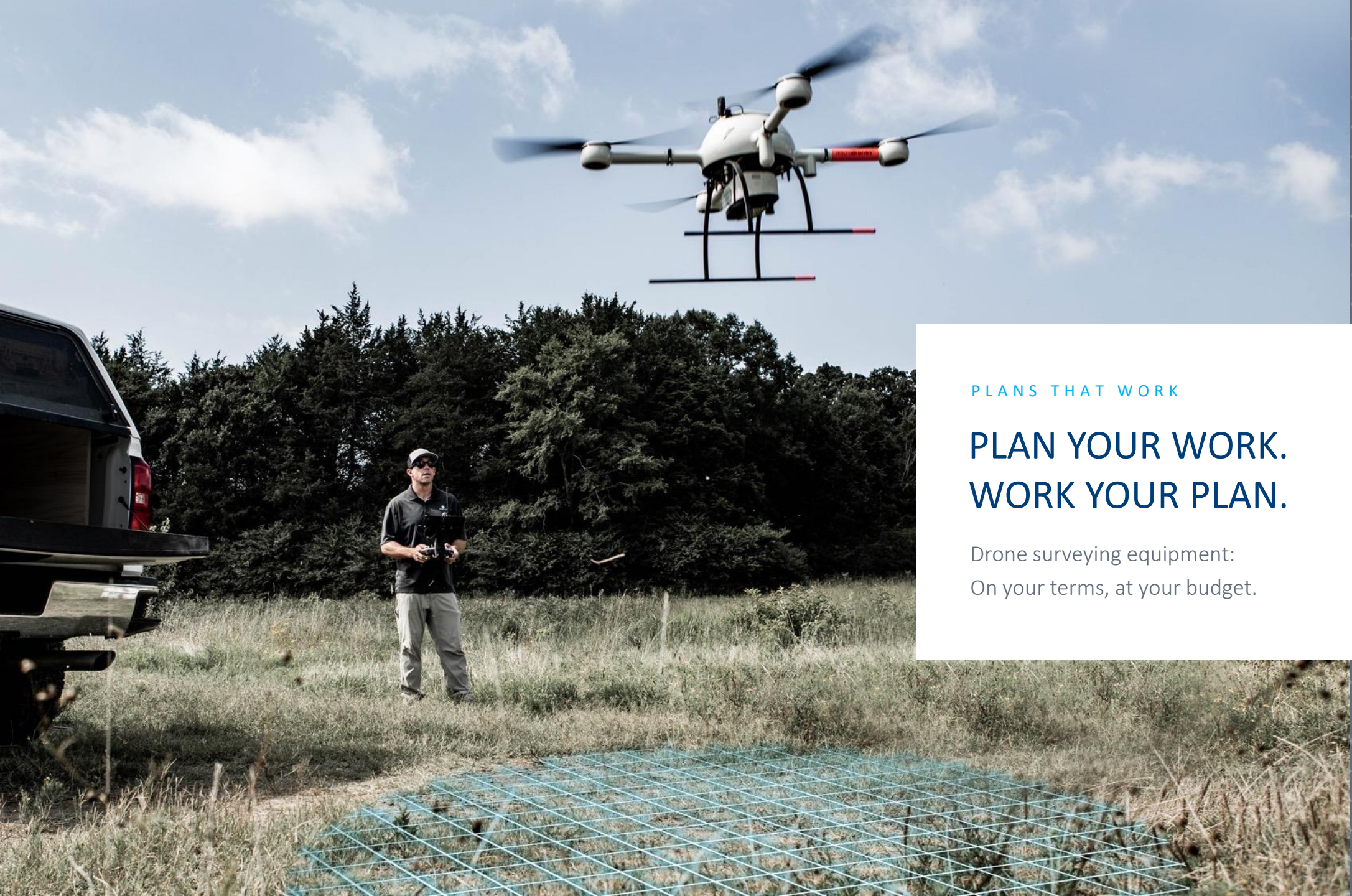
3

Choose your plans for each data processing module

PAY PER PROJECT

OR

UNLIMITED



PLANS THAT WORK

PLAN YOUR WORK. WORK YOUR PLAN.

Drone surveying equipment:
On your terms, at your budget.

BUY IT! OR RENT IT!

BUY IT!

When you buy your survey equipment from Microdrones, you have access to our modular data processing software solution as well. You own the hardware, and agree to a required annual maintenance program.

If warranty-covered repairs are needed during the 1 year warranty period, those costs are covered by Microdrones.

SURVEY EQUIPMENT

OWNERSHIP: Customer

PAYMENT: Upfront

DRONE & PAYLOAD SYSTEM: Included

TRAINING, SHIPPING & BATTERIES : Not included in price

WARRANTY: 1 Year

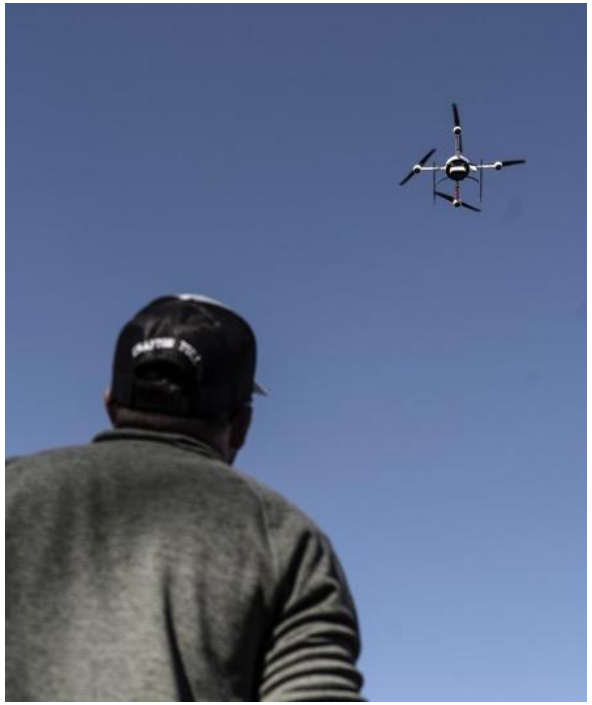
MAINTENANCE: See Salesperson for details and pricing

SURVEY EQUIPMENT SOFTWARE

MISSION PLANNING & CONTROL INCLUDED: mdCockpit – version available at the time of purchase, includes bug fixes.

SAFETY UPDATES / BUG FIX: Included for 3 years

ACCESS TO DATA PROCESSING SOFTWARE: mdInfinity (Pay Per Use or Unlimited for each module)



RENT IT!

Microdrones delivers access to our modular data processing software solution with the lease of our survey equipment. Microdrones owns the Survey Equipment. Therefore, the customer is not responsible for maintenance costs.

Microdrones will replace or update equipment worry free as needed* and ensure compatibility with any new feature. It's ALL INCLUDED!

SURVEY EQUIPMENT

OWNERSHIP: Microdrones

COMMITMENT: 24 months

PAYMENT: Monthly
Discount available with commitments greater than 24 months

INCLUDES: Drone & Payload System

TRAINING, SHIPPING & BATTERIES: Not included in price

MAINTENANCE: Included

SURVEY EQUIPMENT SOFTWARE

MISSION PLANNING & CONTROL INCLUDED: mdCockpit included and up to date for the duration of the lease

UPDATES: Survey equipment is managed by Microdrones.

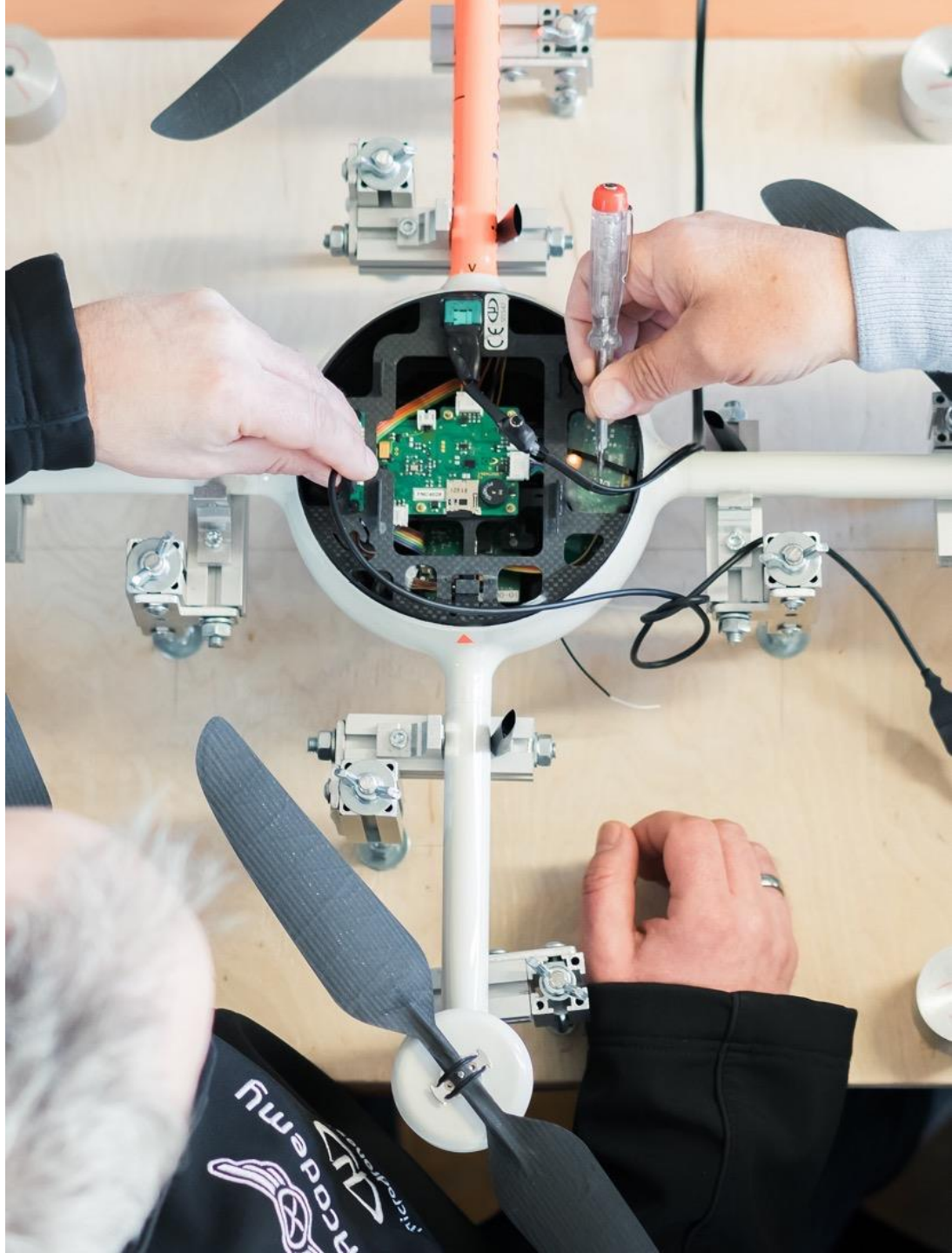
ACCESS TO DATA PROCESSING SOFTWARE: mdInfinity (Pay Per Use or Unlimited for each module)

MAINTAIN IT!

Proper maintenance is required for safe, effective deployment of any aircraft. Drones are no exception. The backbone of your Microdrones survey equipment is the aircraft.

The Maintenance Program is, overall, a rigorous inspection and maintenance routine designed specifically for your aircraft.

A professionally trained and certified technician will inspect and test the condition of your aircraft as it relates to the airframe, propulsion, electrical systems, sub systems, payload connections and flight.



MAINTAIN IT!

THE MICRODRONES SURVEY EQUIPMENT MAINTENANCE PROGRAM

MAINTAIN IT! | The Microdrones Survey Equipment Maintenance Program

Proper maintenance is required for safe, effective deployment of any aircraft.

Drones are no exception. The backbone of your Microdrones survey equipment is the aircraft.

MAINTAIN IT! | The Microdrones Survey Equipment Maintenance Program

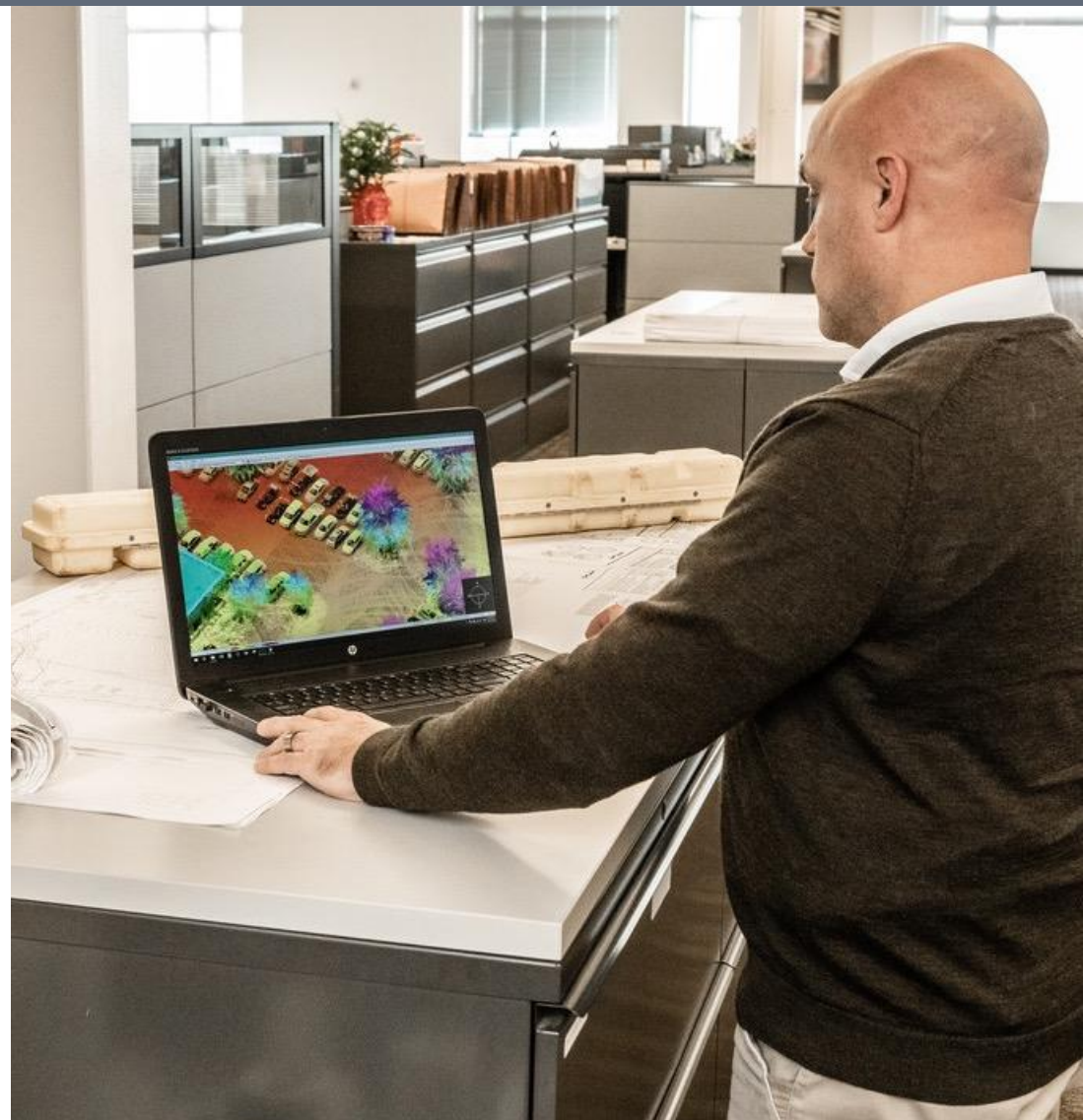
Why is Microdrones launching a maintenance program?

- Flight operation inherently presents potential safety risks. Survey Equipment needs to be properly inspected and serviced to reduce risk.

- Inspection, maintenance & service programs are familiar for all surveyors or companies using survey equipment. These programs are increasingly required by companies and stakeholders as part of their quality management process.

Who is this program for?

- All Microdrones customers must participate in this program.
- The customer is responsible for complying with all inspection and service intervals.
- Failure to complete the maintenance program means that survey equipment may not be airworthy.



MAINTAIN IT! | The Microdrones Survey Equipment Maintenance Program

The Microdrones Maintenance program consists of three parts:

- Support Fee
- Inspection
- Service

SUPPORT FEE

- The support fee covers customer support costs.
- This is a yearly fee
- It includes unlimited access to support lines (phone & e-mail)
- Support is available in 5 languages
- Diagnostic and feedback is provided within 2 business days
- Fixed cost defined per model (see slides on pricing)

MAINTAIN IT! | The Microdrones Survey Equipment Maintenance Program

INSPECTION

- Inspection of survey equipment has to be done each year or after 150 hours
- Inspection will be done by a certified inspector called L2 inspector*
- Inspection can be done (and invoiced) by dealer if they have a certified inspector*
- Inspector will follow a rigorous check list and will inspect each components
- Cost is fixed per model (see slide on pricing)
- If any replacement or repair is necessary, a quote will be sent to the customer

*The L2 Inspector License is granted to an individual, not to a company. Trained pilot (L1) can obtain the certification after following a one day training (cost of 1500USD). Technicians not familiar with Microdrones products may participate In a 3 day training program.

MAINTAIN IT! | The Microdrones Survey Equipment Maintenance Program

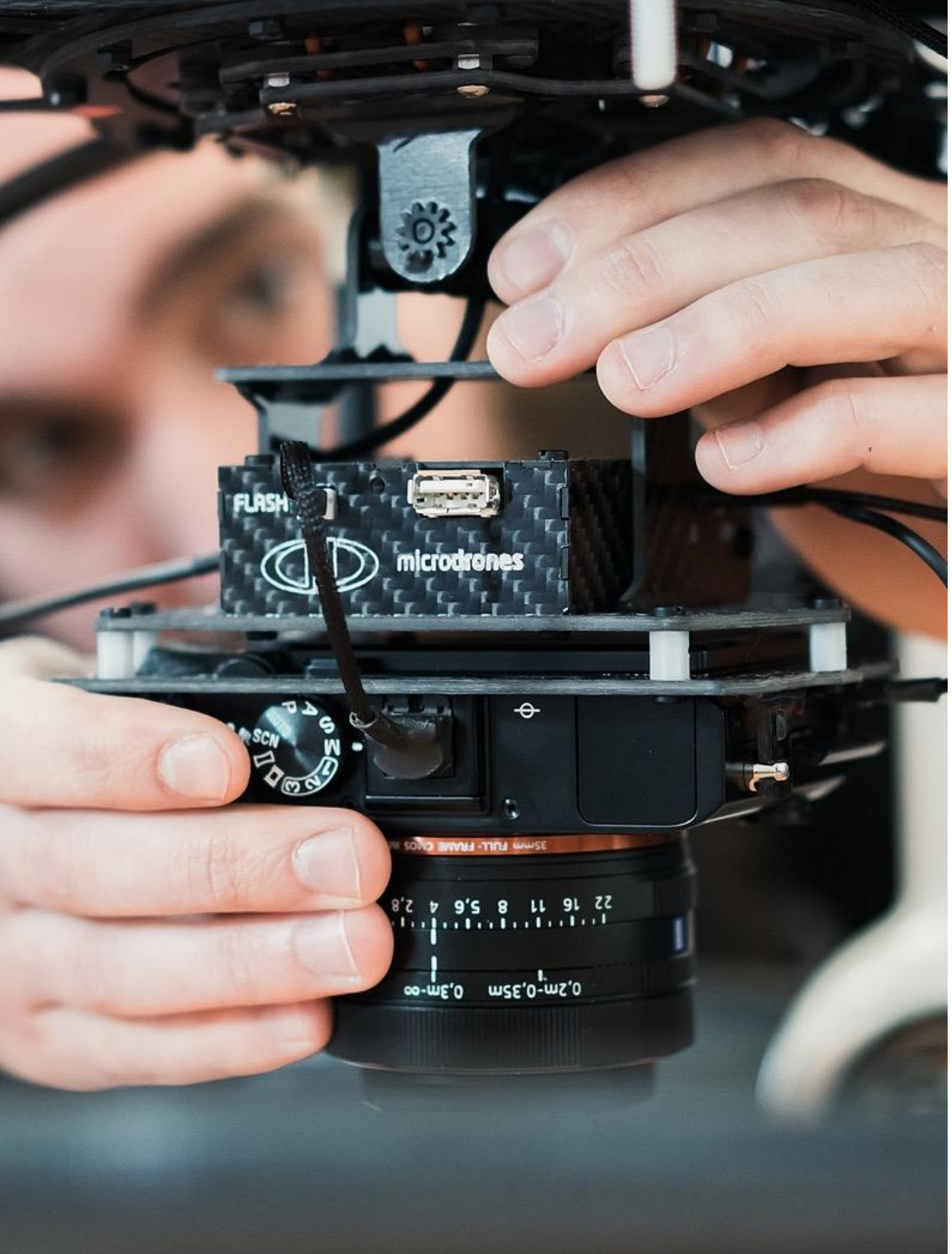
SERVICE

- When the survey equipment meets a certain number of flight hours, it will be necessary to send it to Microdrones for service
- Flight intervals for service are 300 hours & 900 hours
- The components that are at their maximum recommended life time will be replaced
- Service pricing is fixed per model

Summary of complete maintenance program:

Business Model	Support Fee	Inspection Fee	Service Fee	Firmware & Software Maintenance Fee
'Classic' Sales	Yes	Yes	Yes	Yes
mdaaS 'Buy it'	Yes	Yes	Yes	No
mdaaS 'Rent it'	No	No	No	No

All prices are available in the Price List valid from May 1st 2020

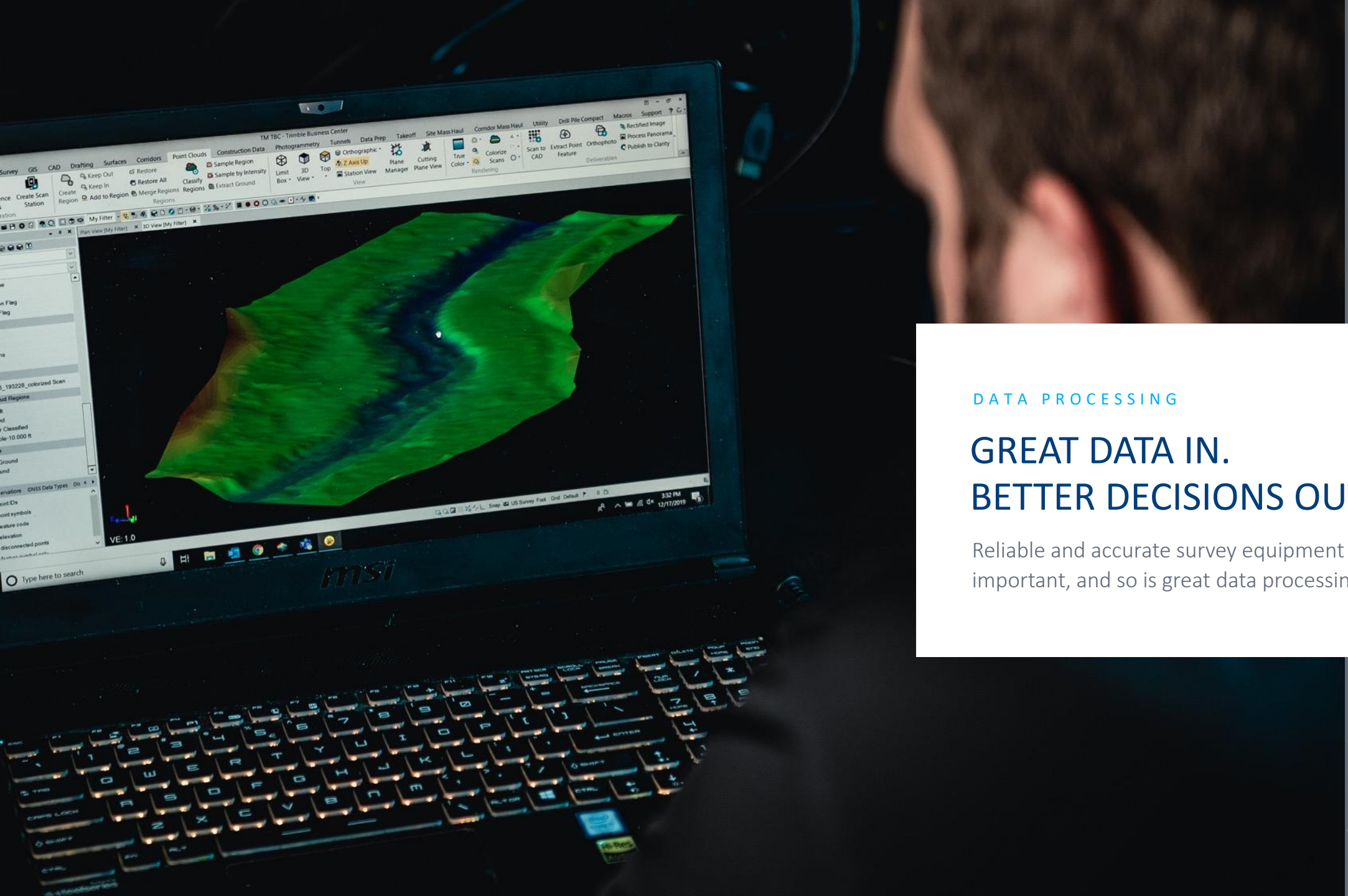


UPGRADE IT!

Microdrones is committed to constant, customer focused improvement. As such we are developing cutting edge, integrated technology that evolves rapidly.

For those of you with an older system, we are always eager to help you upgrade your previous Microdrones system to the latest standards so you can take advantage of new features and functionality.

Simply schedule a meeting with a member of our sales team, and they will assist you in collecting your current system information so they can prepare a price estimate to upgrade.



DATA PROCESSING

GREAT DATA IN. BETTER DECISIONS OUT.

Reliable and accurate survey equipment is important, and so is great data processing software.

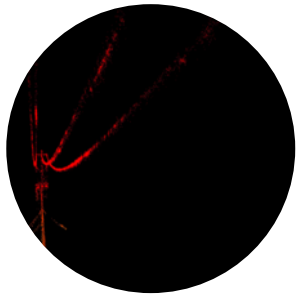
mdINFINITY

mdInfinity is a powerful ecosystem that will enable you to quickly and efficiently process geospatial data, including Trajectory Processing, Georeferencing and Boresight Calibration with convenient payment options.

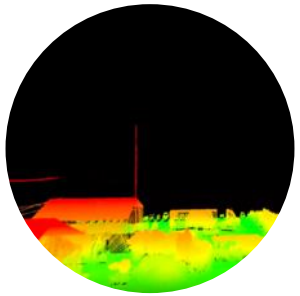
In addition mdInfinity Custom Services offers Strip Adjustment, Precision Enhancement, Point Colorization and FORMap services on demand.

- Improving the workflow -> easy, repeatable results
- Adapted to the survey equipment
- Your access point to the data processing modules
- Available online and desktop
- Custom Services available on demand

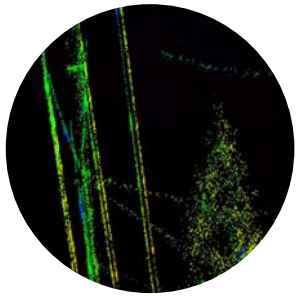
mdINFINITY | DATA PROCESSING MODULES



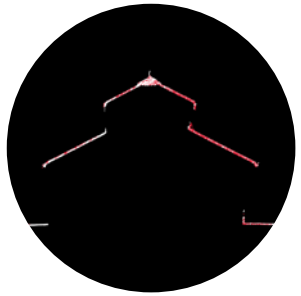
TRAJECTORY PROCESSING



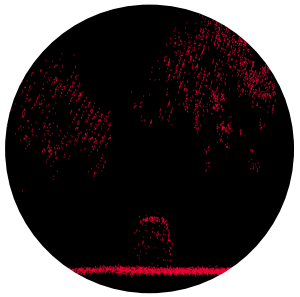
GEOREFERENCING



BORESIGHT CALIBRATION



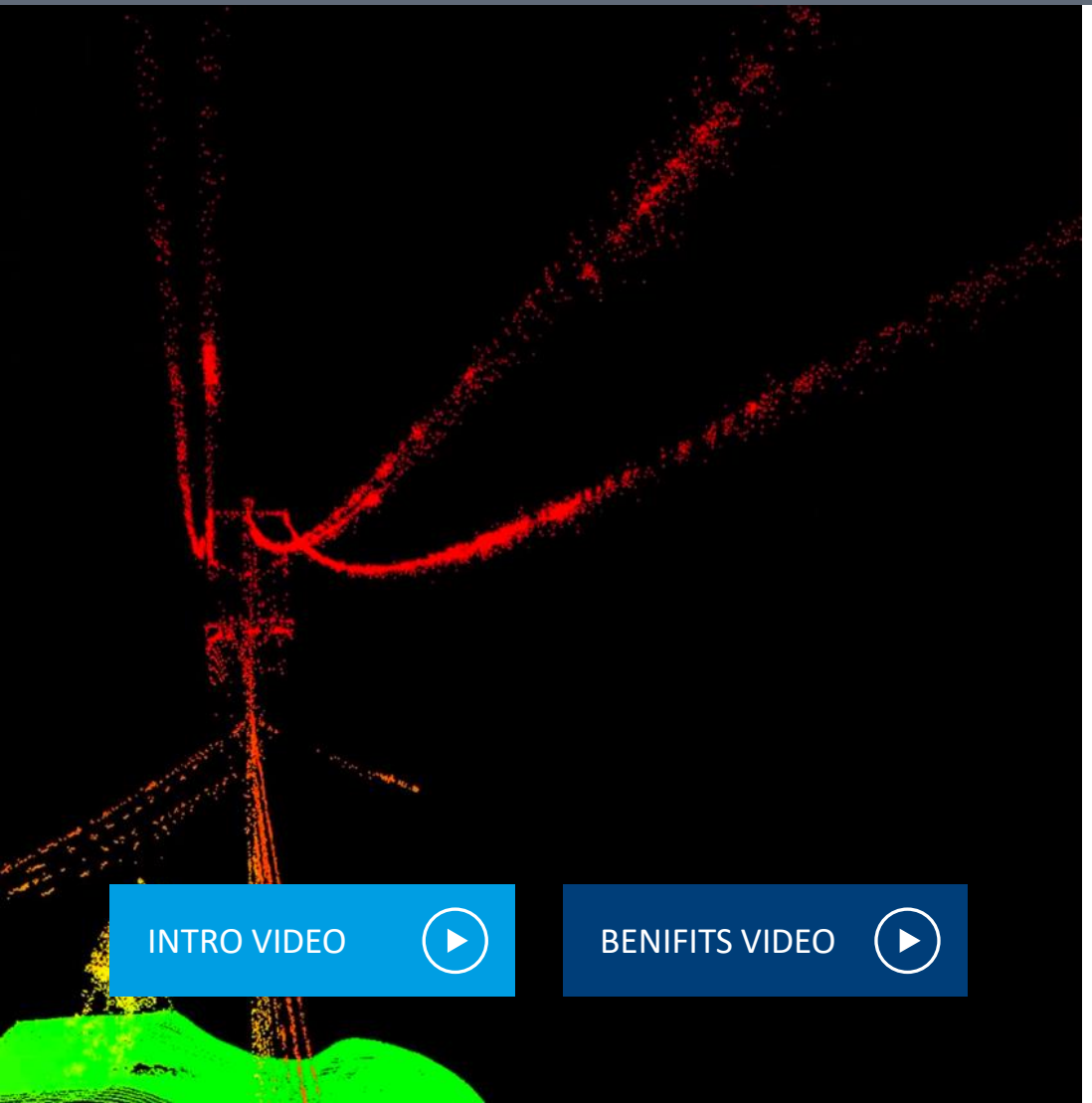
STRIP ADJUSTMENT



PRECISION ENHANCEMENT

POINT CLOUD DIRECT 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.

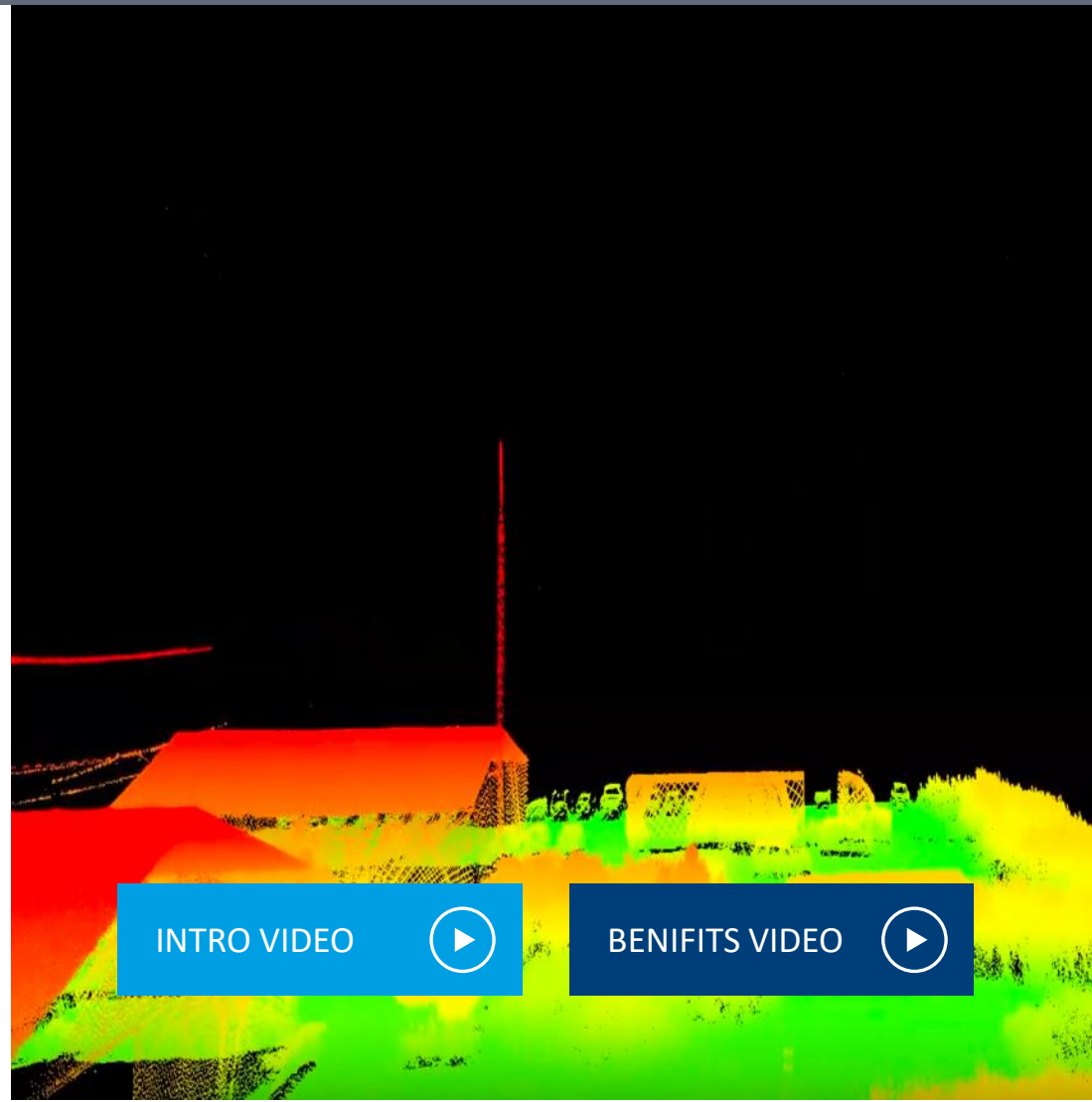
Users can validate the trajectory parameters before processing and obtain different types of EO files depending on the software they will use afterwards.

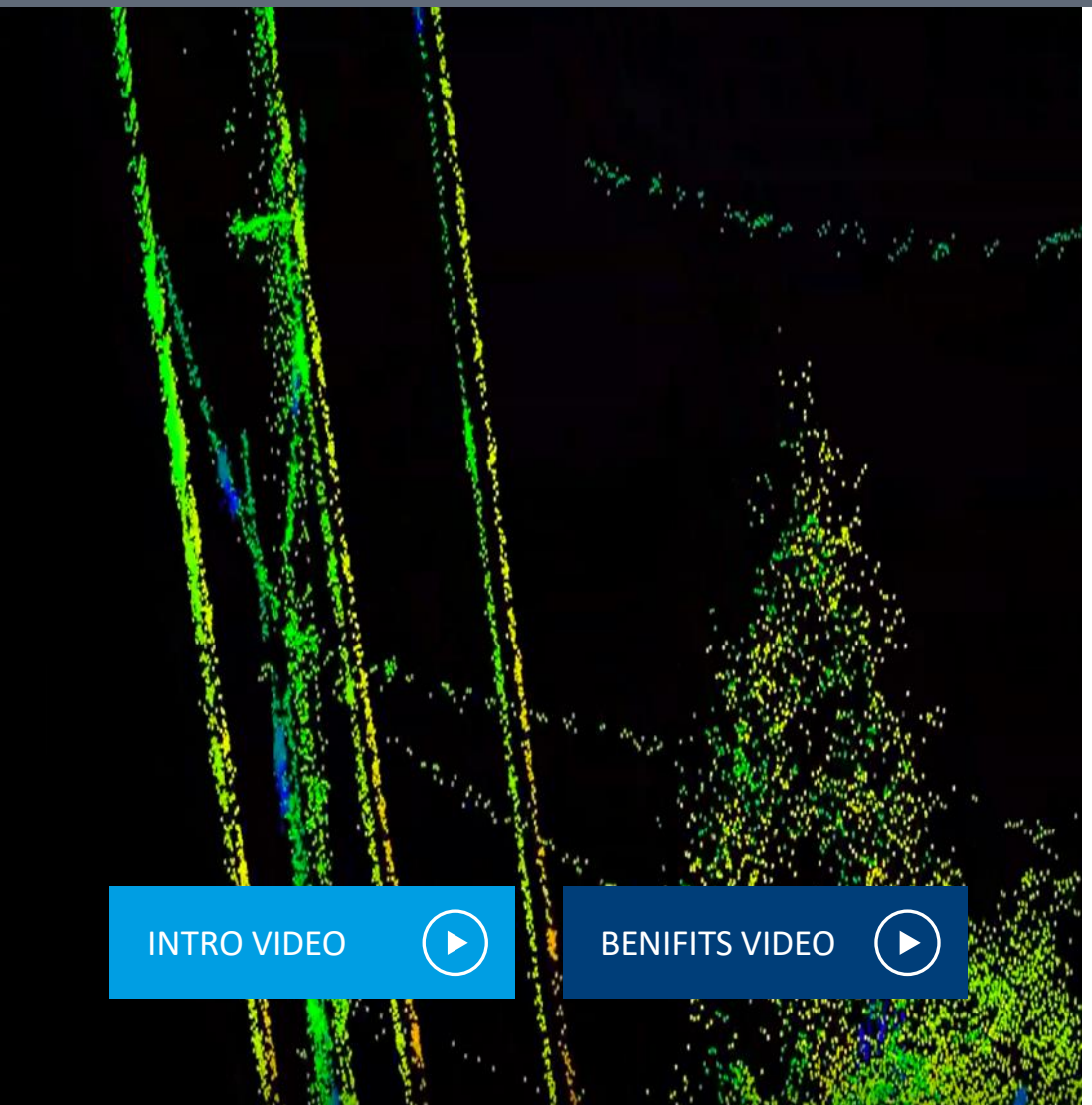
GEOREFERENCING

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.





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.

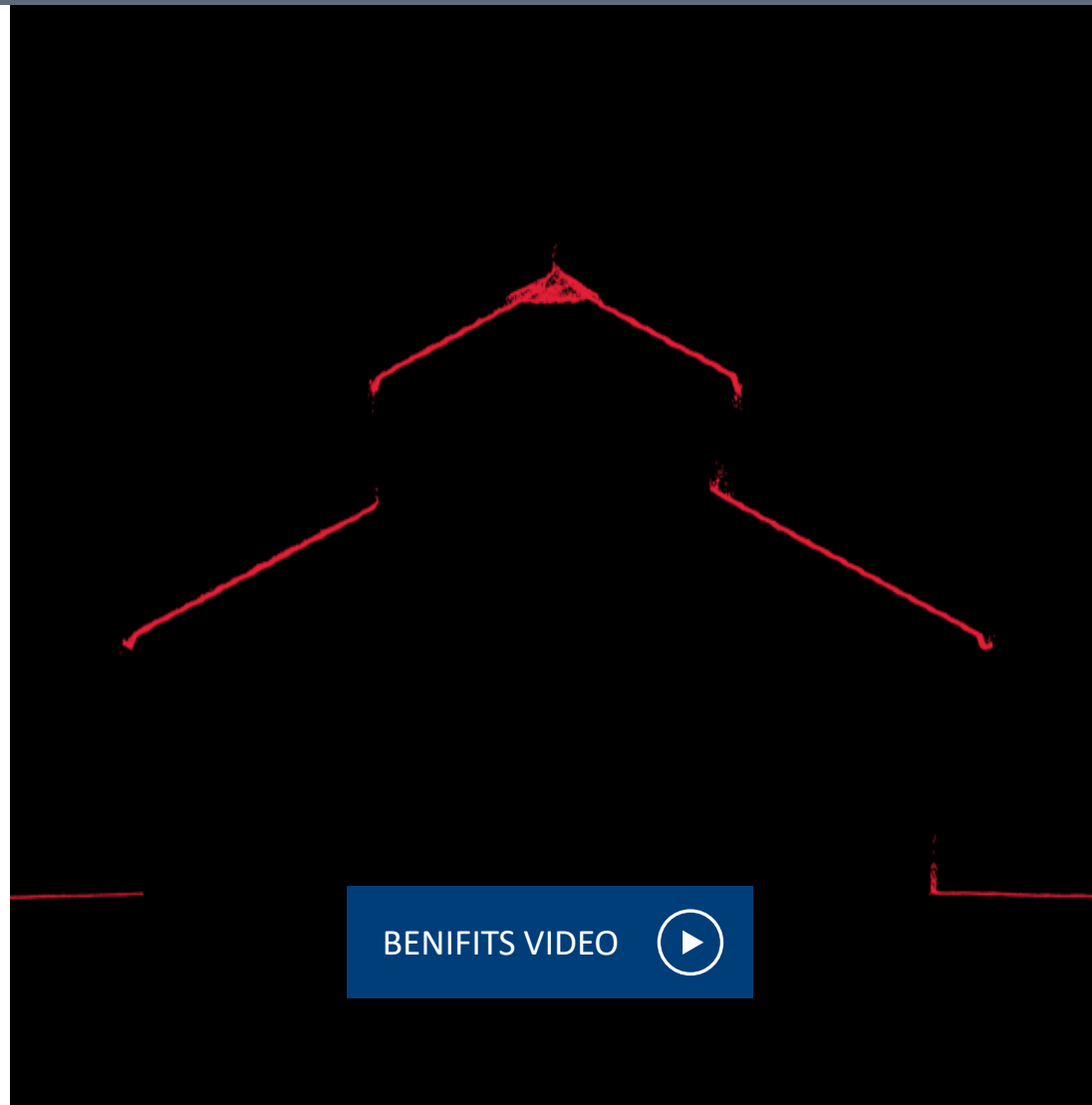
STRIP ADJUSTMENT

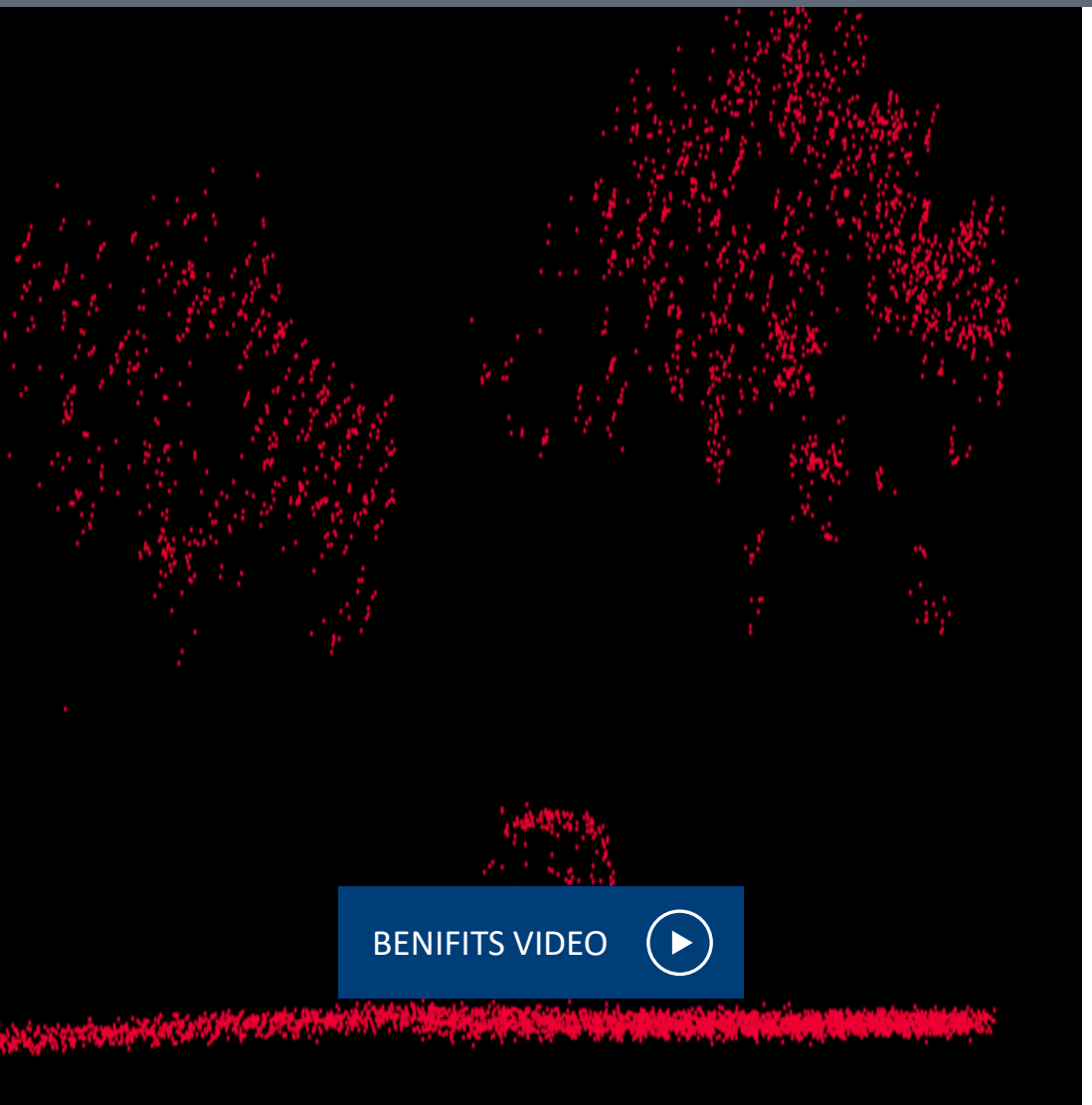
Reinforce the consistency between LiDAR survey strips.

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.

Only available through mdInfinity Custom Services





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.

Only available through mdInfinity Custom Services

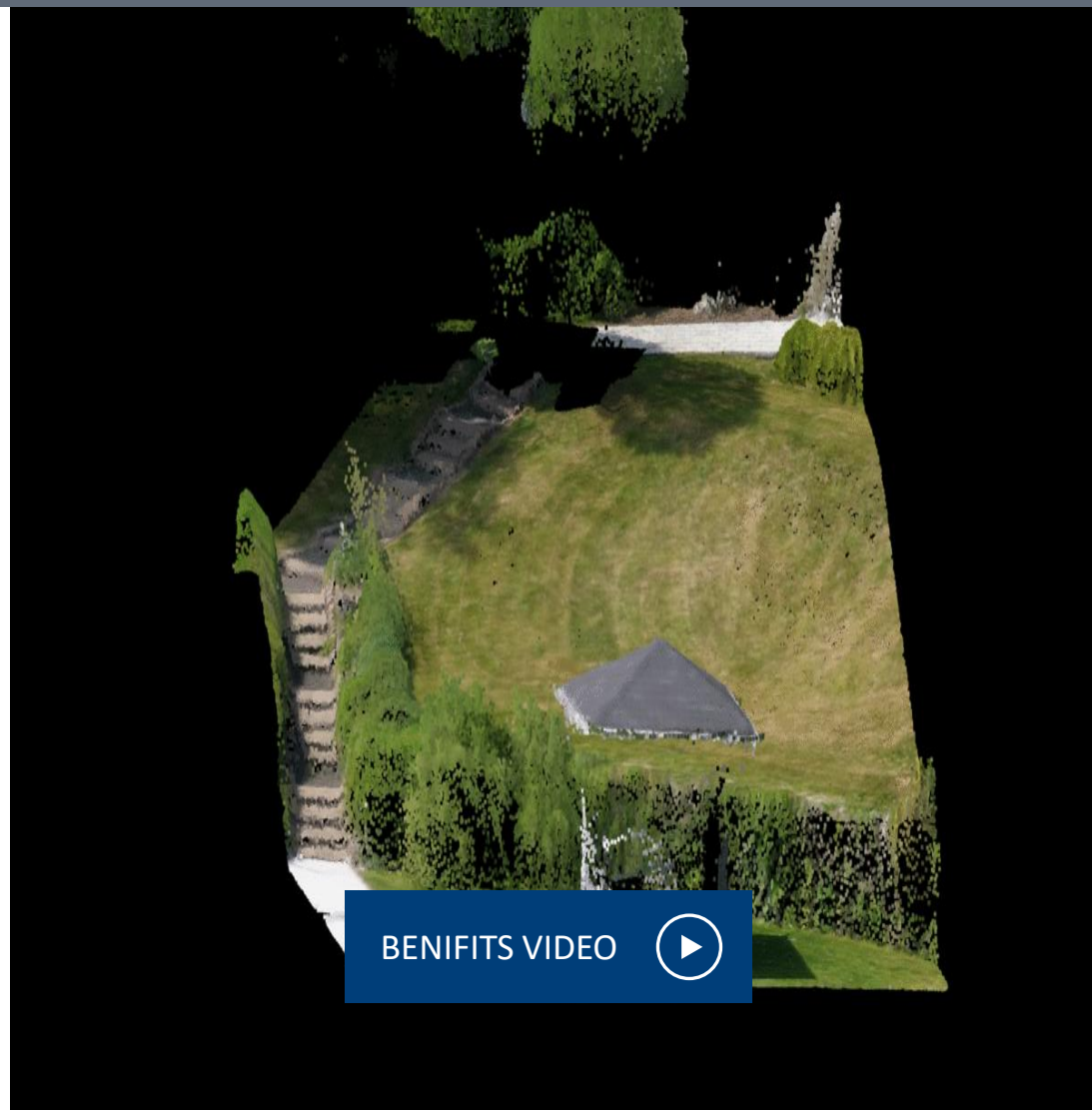
POINT CLOUD DIRECT COLORIZATION

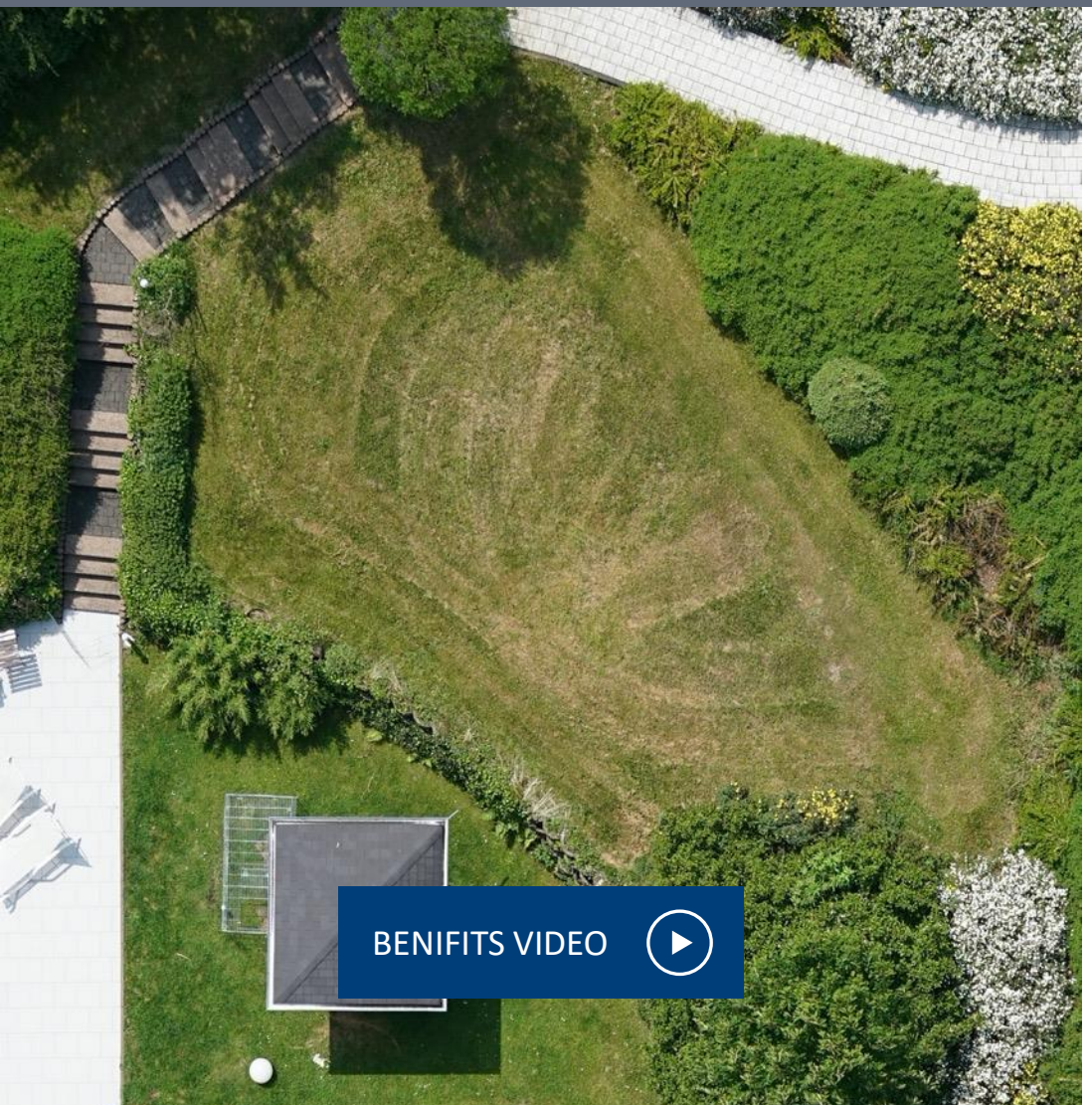
Colorize a point cloud without referring to a full photogrammetric process by managing occlusions.

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





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

DATA PROCESSING FOR THE WAY YOU WORK: UNLIMITED OR PAY PER PROJECT OPTIONS, PER MODULE

Pay for module use the way you like, as it fits your business!

PAY PER PROJECT

For Clients who prefer to pay per use

PAYMENT: Pay per project online only with a token system

USAGE: The user pays tokens for usage of the modules

mdINFINITY PLATFORM:

- Online
- Upgrades & Updates included
- Each user is given 20 tokens when creating a new account

OR

UNLIMITED

For Clients who heavily process data

PAYMENT: Monthly

USAGE: Unlimited

COMMITMENT: 12 months

mdINFINITY PLATFORM:

- Desktop and Online
- Updates included

NOTE: Each unlimited data processing module is linked to **a specific payload serial number**. You **may not** use unlimited data processing for multiple payloads. Of course, you can purchase unlimited or pay per project plans for each payload serial number you own.