

HOVERMAP

3D LiDAR Mapping and Autonomy Payload for Industrial Drones

Hovermap provides LiDAR mapping, omnidirectional collision avoidance, GPS-denied flight and advanced autonomy, allowing drones to perform a range of valuable tasks that were previously not possible

Revolutionising the utility of industrial drones

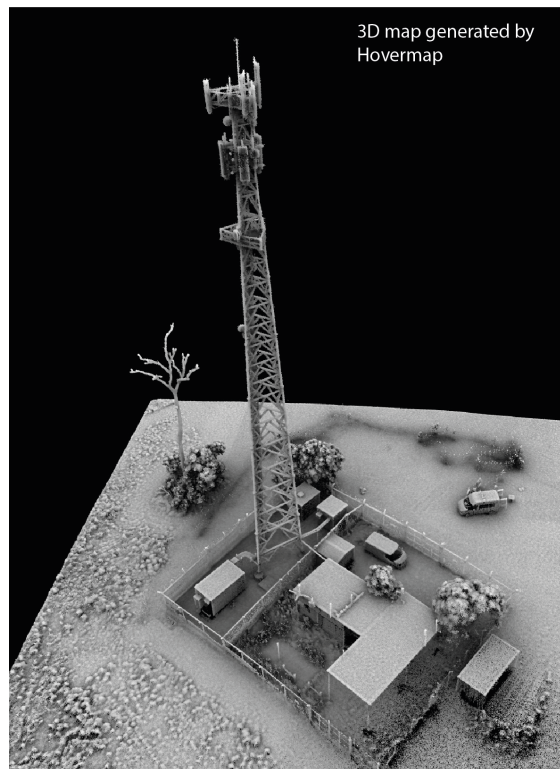
Drones are already disrupting a number of markets as they are put to use for industrial applications. They have limitations which prevent them from having even greater utility however. They cannot reliably detect and avoid obstacles in all directions, fly autonomously where there is no GPS, and require at least one skilled operator per drone. Hovermap overcomes these limitations with a combination of lidar-based sensing and autonomy. This allows drones to fly safely in challenging environments even where GPS is unavailable. They can therefore collect valuable data that is otherwise impossible to collect. Examples include mapping and exploring inaccessible areas of underground mines and inspecting telecommunication and broadcast towers.

Hovermap payload

Hovermap is a self-contained payload which includes a rotating LiDAR and on-board processing to analyse the LiDAR data in real-time. It can be mounted to any drone as a passive LiDAR mapping solution or interfaced to compatible drone autopilots to provide advanced capabilities.

SLAM-based LiDAR Mapping

Hovermap utilises Simultaneous Localisation and Mapping (SLAM) algorithms instead of heavy and expensive GPS/INS hardware. This allows accurate 3D mapping in GPS-denied environments such as indoors, underground or close to large structures. LiDAR data is logged on-board and post-processed to produce 3D point clouds. The accurate point clouds enable the generation of as-built plans of complex 3D structures or volumetric calculations of earthworks, stock piles or underground mine stopes. Automatic alignment of consecutive scans allows for the detection of small changes between scans.



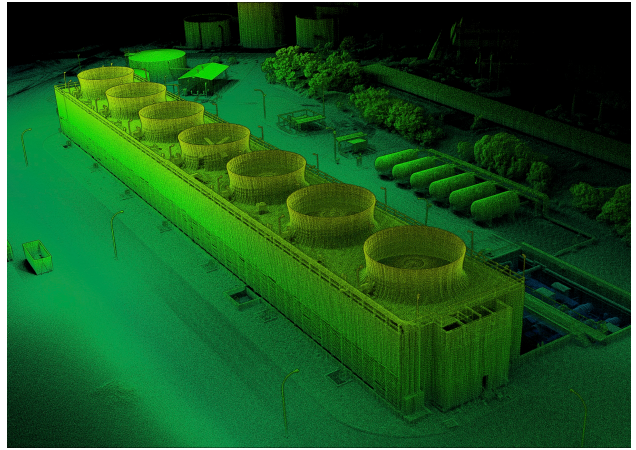
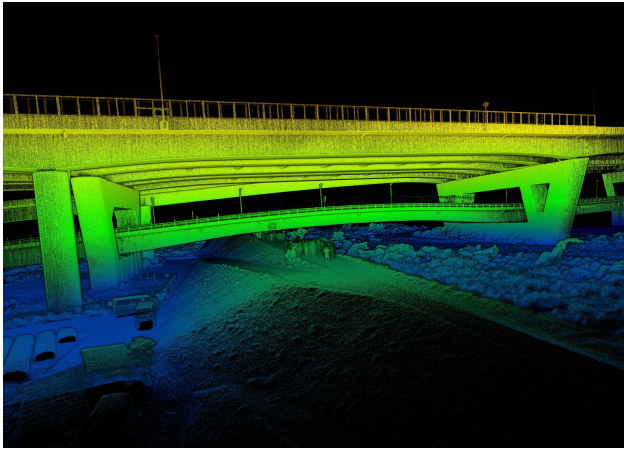
**SLAM-based
3D mapping**



**Collision avoidance
and autonomy**



GPS-denied flight



Examples of infrastructure mapped by Hovermap

Hovermap will allow asset owners to access high-fidelity, actionable data at the press of a button.

Benefits

- Unique two-in-one plug-and-play payload provides mapping and autonomy
- No GPS required for mapping
- Rapid data processing for in-field review of results
- Spherical Field of View – map and avoid collisions below, above and all around
- Suitable for night-time or low-light mapping
- Collision avoidance keeps drone safe while flying close to structures to inspect and map them
- GPS-denied flight allows flying indoors, underground or under bridges

Applications Areas

- Underground mines and tunnels
- Bridges, roads, rail
- Construction
- Quarries and stockpiles
- Energy – transmission towers and lines, substations
- Oil and Gas
- Terrain and forestry

Mapping Specifications

Lidar range	Up to 100m
Lidar accuracy	+/- 3cm
Global SLAM accuracy	+/- 0.1% typical
Angular field of view	360° x 360°
Data acquisition speed	300,000 points/sec
File size	~300MB/min
Flight speed	Up to 5m/s (scene dependant)
Laser safety class	Class 1 eye safe
Power	Max. 90W
Input voltage	12 – 54V (e.g. 4s LiPo)
Weight	1.8 kg
Point cloud file format	.laz, .ply

Autonomy Specifications

Flight Modes	Manual Pilot Assist
Autopilot Compatibility	DJI A3
Collision Avoidance field of view	360° x 360°
GPS-denied flight	Yes