Multi optic Drone S.r.l.
Advanced services for engineering and architecture

AEROPHOTOGRAMMETRY & DRONE LASER SCANNER
Who we are:
MULTIOPTIC DRONE offers a number of highly qualified Drone (UAV) services that allow you to look at reality from a new perspective, reaching unprecedented dimensions and inaccessible areas. Thanks to the powerful high-tech instruments (we are the only in Italy with Laser Scanner - LIDAR - by Drone). Multioptic Drone translates its actions into applications. Through image capture, we provide georeferenced data to cm, mapping and monitoring of areas subject to hydrogeological disruption, earthquake areas, rock walls for planning / location rockfall networks, and any type of inspection. In a very short time, data will be acquired and elaborated with advanced software.

Thanks to our collaborations with technical studies, topographies and geology, we can integrate our services with what is needed to complete the required performance (insertions in existing maps, cadastral framing, detail of works or underground networks, development of relief with sections and profiles, etc.).

Drone Laser Scanner (LIDAR) services:
Multioptic Drone is the only company in Italy to use Laser Scanner (Lidar) technology from Drone, one of the most advanced laser data capture devices in DUAL RETURN, designed and integrated with our Italian technology partner (inertial platform and post-processing software). Thanks to the inertial platform and the two GPS RTK antennas on board no need for ground control points and returns a geometric survey with centimeter accuracy. With Dual Return, in the case of surveys in the wooded areas, the top of the vegetation's hair is discriminated against by the ground, showing directly the ground detected area (DTM). Like the Laser Scanner, the Drone Laser Scanner it achieves its highest performance in the field of civil engineering, architecture, oil & gas, creating a vision impossible to achieve with traditional Earth Laser Scanners, capable of creating a full point cloud, a revolutionary result for this type of application. Our Lidar technology is the most compact, lightweight, versatile payload available on the market, ready for relief in just 5 minutes from launch. Adjustable angle of inclination allows you to detect any type of surface, from flat ground to rocky wall, passing through any type of building.

Drone topographic survey and aerophotogrammetry:
Photogrammetry is a remarkable technique that allows you to capture metric data of an object (shape and position) by capturing and analyzing a pair of stereometric frames. Drones application (aerophotogrammetry) operates through the creation of digital terrain models and orthophoto, and produces architectural and architectural reliefs for the creation of 3D models. At present, aerophotogrammetry is one of the three most reliable, economical and accurate data acquisition techniques in the territory, which is also useful in analyzing the change of territory. The photogrammetry by using drone or "aerophotogrammetry" has several technical applications thanks to the use of the ground control points acquisition system: orthophoto, geological surveys, topographic services with drone, 3D models (point cloud reconstructions, contour lines), mapping sites and territories, rendering buildings, site monitoring with hydrogeological disruption, Digital Elevation Model (DEM).
BACKPACK
There are no limits to the environments to survey while wearing our Laser Scanner. Indoors or underground, the SLAM plugin compensates the GNSS outage to obtain a complete and accurate mapping. The data can be instantly acquired with the panoramic 360° camera and the images can be displayed at any time. The wearable system is suitable to survey harsh environmental conditions.

ON BOARD
Our Laser Scanner can be mounted on any vehicle: on motor vehicles for road cadaster or 3D reconstructions; on boats for coast or riverbeds survey; on quad to survey barely accessible paths. The revolutionary 98mpixel panoramic 360° camera adds wider view and greater resolution: it is the ideal solution for those who have to colorize the point cloud and automatically extract features with 3DT Smart Processing software.

Other possible applications:
The Building Information Modeling (acronym: BIM) indicates a method for optimizing the planning, construction and management of buildings using software. Through it all the relevant data of a building can be collected, combined and digitally connected. The virtual construction can also be viewed as a three-dimensional geometric model. Building Information Modeling is used both in the construction sector for design and construction (architecture, engineering, technical systems) as well as in facility management.

The role of BIM in the construction industry (through its actors are these Architects, Engineers, Surveyors, Builders, Customers) is to support communication, cooperation, simulation and optimal improvement of a project along the complete life cycle of the built work. A BIM can contain any information regarding the building or its parts. The information most commonly collected in a BIM concerns the geographic location, the geometry, the properties of the materials / components / systems and the technical elements, the phases of construction, the maintenance operations, the end of cycle disposal.

One of the fundamental information for defining the quality level of BIM is certainly the representation of the state of affairs, whether it be free areas or buildings / artefacts. With the measurements made by drone, aerophotogrammetry or laser scanner, and with the quality of our systems, it is possible to obtain a complete and coherent representation of the state of affairs, therefore a solid and secure base on which to set the next project and the entire Building Information Modeling. We are also able to provide the full relief of the state of fact by combining the topographic / cadastral part with the relief from drone (aerofotogrammetria and laser scanner) and with the reliefs of the interior, performed with laser scanner on the shoulders or on a tripod. The resulting model of the state of affairs (point cloud), developed by our software, is exportable in all the main formats used by the BIM software currently in use.
Drone Laser scanner (LIDAR)

Possible applications:

- Contour lines.
- Rapid creation of DEM, DSM, DTM (thanks to dual return it is easy to discriminate all vegetation in order to create an accurate DTM).
- Construction sites tracking.
- Survey support to design studies.
- Monitoring survey job advancement status.
- Topographic survey.
- Monitoring surveys in areas at risk of hydrogeological disruption.
- Excavation and mining activities.
- Survey for constant monitoring of coastal erosion and cliffs.
- Survey for planning and/or retraining railway and road routes.
- 3D modeling and rendering of buildings and infrastructures for urban and architectural purposes.
- Dump monitoring for volumetric calculation and/or extension design.
- Survey for areas subject to reclamation.
- Biomass computation (forests, forestry, biogas truncated).

Main export formats:

- Point clouds (ASCII XYZ, LAZ/LAS).
- Orthomosaic (geoTIFF, jpg).
- DSM/DTM (geoTIFF).
- Contour lines (dwg, dxf, shp).
- Profile and section (dwg, dxf).
- Mesh (obj, 3ds, dae, ply, u3d, pdf, kmz).

The standard quality of Multioptic Drone is very high thanks to powerful 3.0 instruments:

- RGB sensor.
- Lidar (dual return 16 bim).
- Double GPS antennas on board with RTK correction.
- GPS ground station with RINEX data.
- Post-processing software.
Drone topographic survey and aerophotogrammetry. Possible applications:

- Contour lines.
- Azimuthal and prospective orthophoto.
- Visual inspections and appraisal.
- State of pipes and roofs.
- Rapid creation of DEM, DSM, DTM.
- Construction sites tracking.
- Survey support to design studies.
- Monitoring survey job advancement status.
- Topographic survey.
- Monitoring surveys in areas at risk of hydrogeological disruption.
- Excavation and mining activities.
- Survey for constant monitoring of coastal erosion and cliffs.
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The standard quality of Multioptic Drone is very high thanks to powerful 3.0 instruments:

- Equipped Drones with RGB sensors (20 Mpx).
- GPS ground station for GCP (Ground Control Point) with RTK connection.
- Post-processing software.
Drone Laser Scanner (LIDAR) applications
Drone BIMs project:
Drone territorial Aerophotogrammetry applications
Drone territorial Aerophotogrammetry applications hydrogeological disruption focus
Drone architectural Aerophotogrammetry applications
Benefits of our services:

• Time / cost reduction over traditional topography

• More definition of the traditional survey

• Possibility to reach otherwise inaccessible areas

• It is possible to map very wide areas in very short time

• Centimeter accuracy of the survey

• Post-processing almost immediate post-survey