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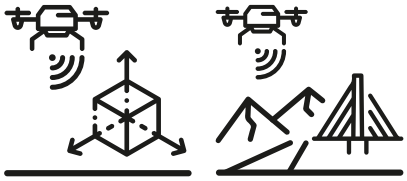
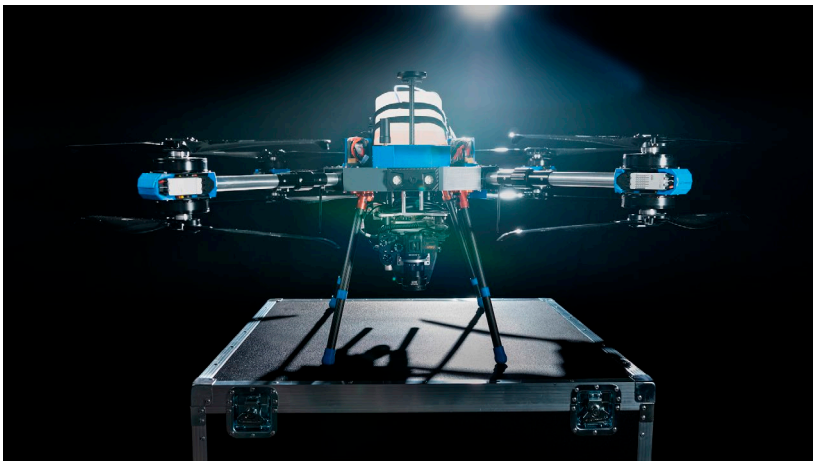
PELIXAR
ADVANCED DRONE SOLUTIONS

Technical specifications – Pelixar GEO Hybrid MRh X8



Universal multipurpose unmanned aerial system



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DESCRIPTION AND SPECIFICATION

The Pelixar GEO Hybrid is a multipurpose hybrid-powered UAV system that has high versatility and durability among drones on the market. It is designed to carry heavy and precision measurement equipment including laser scanners, bathymetric scanners, heavy cameras, and other heavy precision measurement systems.

The system consists of a UAV platform, a state-of-the-art hybrid propulsion system, a ground-based flight control station, a powerful communications module, and configurable functional equipment.

The drone is built from high-end components, strictly verified at the production stage. It is developed with particular attention to the requirements of working with expensive and heavy measurement sensors. The hybrid propulsion system combines the advantages of a LiPo battery-powered unit and a two-cylinder internal combustion engine in a Boxer arrangement with a power generator, enabling long flight times.

The platform's modularity allows a wide range of configuration possibilities and the use of the system for multiple tasks. Compatible add-on modules with the platform make the system configurable into various use cases. The platform itself can also serve as an initial base for modification toward individual customer needs, which has been achieved through a universal mounting system, a versatile flight computer, standardized electronics, and an open communications system, among other features.

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GENERAL (TECHNICAL PARAMETERS OF THE DRONE)

Catalog name	Pelixar GEO Hybrid MR X8 evo.2
Dimensions	Unfolded, without propellers: 1070×960×600 mm Assembled, with propellers: 600×680×600 mm
Diagonal dimensions	1500 mm (between engine axles)
Weight	Approximately 17 kg (with batteries, no fuel, and no load) Approx. 4 kg (with batteries and fuel, no load)
Drive configuration	X8 frame (with redundancy, 8 propellers in coaxial arrangement on 4 arms) Folding propellers 30-32 inches Fuel-injected boxer internal combustion engine with generator of about 4 kW
Payload	Approximately 6 kg maximum functional load weight
Frequency of operation (depending on configuration)	2.4000-2.4835 GHz 5.725-5.850 GHz 868 MHz
Hovering accuracy - Loiter mode	Vertical: ±0.5 m (GPS), ±0.1 m (RTK) Horizontal: ±1.5 m (GPS enabled), ±0.1 m (RTK enabled)
Positioning accuracy RTK	RTK system enabled and operational: 1 cm+1 ppm (Horizontal), 1.5 cm + 1 ppm (Vertical)
Maximum rotation speed	Pitch: 300°/s, Yaw: 100°/s
Maximum tilt angle	30° (Loiter mode)
Maximum speed of ascent	2 -6 m/s (configured according to customer requirements)
Maximum descent speed (vertical)	1 -5 m/s (configured according to customer requirements)
Maximum descent speed (angled)	7 m/s (configured according to customer requirements)

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GENERAL (TECHNICAL PARAMETERS OF THE DRONE)

Cruising speed	approx. 43 km/h (12 m/s)
Maximum altitude	4000 m
Wind resistance	Up to 80 km/h (22 m/s)
Maximum flight time	Approx. 120 minutes (load dependent)
Satellite navigation system	GPS (standard): GPS L1C/A, GLONASS L1OF, BeiDou B1I Operating temperature: -40°C to 85°C Processor: STM32F302 Position update frequency: 8 Hz RTK (optional): BDS B1I B2I, GPS L1C/A L2C, GLONASS L1OF L2OF, GALILEO E1B/C E5b, QZSS L1C/A L2C Operating temperature: -40°C to 85°C Processor: STM32F302 Position update frequency: 8 Hz Anti-jamming Anti-spoofing
Optical navigation (for precise positioning indoors, in tunnels, under bridges)	Optical flow sensor based on camera and lidar (optional): Infrared camera: - Camera range from 80 mm to ∞ - 60 lux minimum - FOV 42° Lidar: - range up to 2 m - FOV 27°
Operating temperature	-20°C to 45°C

LIGHTING

Navigation lighting	LED in omnidirectional aerial orientation
Landing lighting	LED in the downward vertical orientation

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KAMERA FPV

Resolution	1080 p
FOV (field of view)	145°
Frame rate	30 fps

BATTERY BUFFER

Name	GenAce Tattu
Type	2x LiPo 12S
Capacity	12Ah / 12 000 mAh
Voltage	44.4 V / 12S
Discharge (C)	30C
Weight	approx. 1340 g
Operating temperature	-20°C to 55°C
Storage temperature	5°C to 30°C
Charging temperature	-20°C to 45°C
Charging time	Charging the battery from the generator is done during the flight

CHARGING STATION

- To charge the operational batteries supplying the functional load

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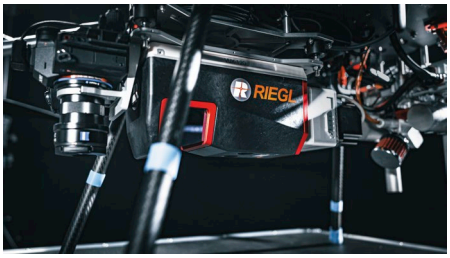
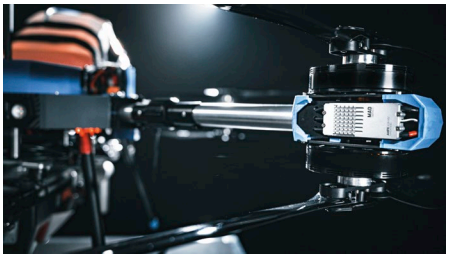
Unique drone capabilities:

Flight planning	Full ability to plan the flight of an automatic mission based on the flight plan (grid plan, circle plan, overflight plan, stopover points, designation of emergency landing area in long-distance missions, any plan defined by the operator)
Resistance to interference	The communications and control system is resistant to interference from infrastructure or foreign transmitters.
Takeoff and landing	Standard: Takeoff and landing can be fully automatic. The system is capable of landing aboard marine vessels due to the high redundancy of INS and magnetic compass systems. Advanced (optional): The Precision Guidance System of the Unmanned Aerial System's last phase of landing enables highly precise and repeatable landings on designated landing sites equipped with dedicated technical equipment.
Operational distance	The platform is capable of flying approximately 85 km during a single mission
Operational radius	Up to 7 km (Standard radio device) up to 15 km (Long-range radio device) Up to 25 km (with long-range transceiver and tracer)
Redundancy	Advanced redundancy systems and complementary key navigation equipment ensure high reliability in flight. The system has the ability to fly and land safely even if one motor/motor controller /propeller is lost. 3 heated INS systems guarantee temperature stability, 3 magnetic compasses allow precise course reading, and 2 barometers allow reliable altitude control. All signals from navigation equipment are filtered by an EKF filter, so the highest accuracy and quality signal is always used for navigation. Failure of any of the systems allows them to continue the flight mission or land safely.



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Applications:

The unmanned system is a versatile and multi-purpose base for a variety of applications. Depending on the optional equipment, it can perform tasks for a wide variety of fields, from photogrammetric and remote sensing measurements, air composition measurements, infrastructure, and wildlife monitoring, through reconnaissance and intervention patrols, to logistical tasks such as cargo transport and medical device delivery. The system is especially suited for prolonged flight operations with a flight time of more than 2 hours. Such a long flight time places the device among the world's leading commercial hybrid multi-rotorcraft with a payload of approx. 25kg

A unique feature of the product is also the ability to equip and integrate with any of the customer's sensors, thus increasing the range of possible utility applications. The platform also provides an excellent base for the customer's own R&D projects and can be customized at will. The manufacturer can equip the platform according to the customer's needs and requirements with additional dedicated and standardized power, signal, and data transmission connectors

Features:

The basic system includes a hybrid unmanned platform and a ground station. The platform is fully configured, tested, and ready to fly. Depending on the optional equipment also in offer, the platform can be delivered with different versions of functional or usable equipment. Importantly, the platform's flight settings and adjustments are optimized for every equipment version.

Possible platform versions and accessories:

Measuring version (for photogrammetric and remote sensing measurements):

Additional equipment:

- Photogrammetric camera with interchangeable lenses synchronized with flight computer;
- Remote sensing cameras synchronized with the flight computer (10 spectral channels);
- Thermal camera synchronized with a flight computer (separate thermal camera or multispectral camera with thermal channel (5 + 1))
- Sensor for measuring sunlight intensity with INS integrated with remote sensing cameras;
- Stabilization gimbal;
- Precision RTK satellite navigation system;
- Laser scanners, bathymetric scanners.

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Possible platform versions and accessories:

Measuring version (for photogrammetric and remote sensing measurements):

Capabilities:

- Automatic measurement missions on the plan of any grid (freely defined or predefined measurement grid);
- Photogrammetric measurements (orthophotomap, orthophotoplan, orthomosaic, a spatial model with texture (mesh), point clouds, volume measurements);
- Remote sensing measurements - 10 spectral channels (indexed maps, NDVI, orthophotos in different spectral ranges, precision agriculture, detection of damage and blight in agricultural and forestry land, detection and localization of nutrient and water deficiencies in crops;)
- Measurements of photovoltaic farms (construction of maps for performance testing, inventory, technical condition monitoring, performance monitoring, panel surface condition testing, detection of electrical damage to panels and so-called hot spots, preventive inspections);
- Inventory of criminal and traffic accident sites in investigations and legal proceedings;
- Laser scanning;
- Bathymetric measurements with a laser scanner.

Additional equipment of the ground station:

- Rugged type control station - an integrated, highly resistant ground control station based on the highest class computers resistant to meteorological conditions. The station allows the system to be used in extremely harsh meteorological conditions (dust, wind, water, rain);
- Radio module with guidance system (tracker) - a transmitting and receiving station module (so-called RF BOX) with directional and panel antennas, equipped with a tracking and guidance system for the drone in the air. This system enables even further flights and increases the quality and range of data transmission and control signals. It is especially recommended in applications where the mission is carried out at a great distance from the base (5- 25 km), in particularly difficult terrain (e.g., mountainous), or within the industrial infrastructure (e.g., seaports). The module is installed stationary in the landing area or can also be supplied in a portable version on a tripod.

Other equipment:

- Dedicated transport case.

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