



# GT20 GYROTRAK



 AIRIAL ROBOTICS

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## NEW HYBRID UAV TECHNOLOGY

The Gyrotrak commercial UAV introduces a new, cutting edge, disruptive hybrid technology to the market, combining the best of Gyrocopter and Helicopter.

This new concept delivers very low energy consumption forward flight as well as vertical take-off, landing, hovering, or loitering, at any time during a mission.

Gyrotrak UAV's have large payload capability, very long flight times and a high level of in-flight redundancy with safety being a priority.



## COMMERCIAL APPLICATIONS



**SURVEILLANCE** // From police to fire fighting, from SAR to security, with its long flight time and multiple payload options, GT20 is a real surveillance machine.



**TRANSPORTATION** // Multiple VTOL's during one mission, high speed, low energy flight, BVLOS missions and a mission load of up to 6.2kg qualify GT20 for serious logistic operations.



**INSPECTION** // Large horizontal structures like oil pipelines mining operations or solar fields are the perfect inspection ground for GT20 Gyrotrak BVLOS missions.

## GT20 GYROTRAK

With an empty weight of only 7.5kg and an incredible maximum take-off weight of 20kg, GT20 is an impressive and serious cargo and inspection platform – with

flight times of up to 2.5 hours with a 600g mission load. GT20 can be equipped with all types of sensors and can be tailored to each customer's needs.

Maximum Take Off Weight	20kg (44lbs)
Empty Weight (without batteries)	7.5kg (16.5lbs)
Dimensions (LWH)	1559 x 1150 x 493mm
Max. Speed	150km/h (93mph)
Cruise Speed	60-90km/h (37-55mph) – best endurance
Maximum Payload - Battery Load - Mission Load	12.5kg (26.4lbs) Gyropack S: 6.2kg, M: 7.9 kg, L: 9.5kg 3 - 6.3kg (6.6 - 13.9lbs)
Flight Time	1 hour with 6kg (13lbs) mission load 2 hours with 2kg (4.4lbs) mission load 2.5 hours with 0.6kg (1.3lbs) mission load
Power Plant	Single or double brushless main motor system and two brushless traction motors
Navigation	INS, GPS, GLONASS, GALILEO
Flight Control System	Veronte Autopilot



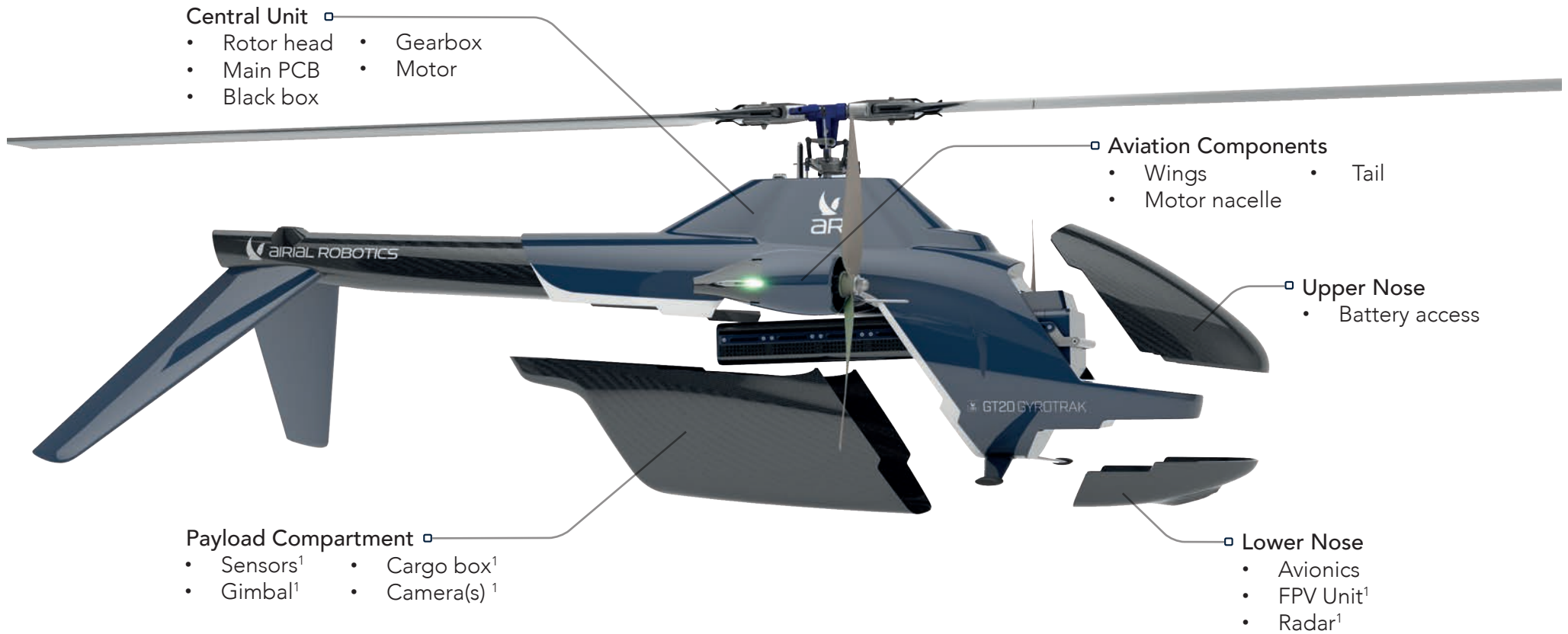
## MODULARITY

Gyrotrak's conceptual design and modular construction combines a highly flexible system architecture for the airframe which allows it to easily adapt to

different tasks and missions.

The central frame includes the rotor head, motor(s), gearbox, main PCB and

traction motors which form the basis for all Gyrotrak models. For different operation and mission options, we differentiate between Platform, Battery and Mission Loads.



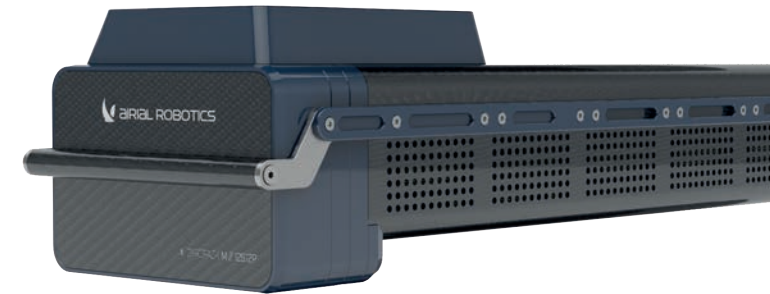
<sup>1</sup> optional accessory

## BATTERY LOAD

Each 'Gyropack' – Gyrotrak's rechargeable smart battery – is equipped with a paper ink display. Depending on the planned flight time and mission load the pilot can decide to carry one of three

battery sizes with different weights and power outputs:

Gyropack S	12S9P	6.2kg
Gyropack M	12S12P	7.9kg
Gyropack L	12S15P	9.5kg



## MISSION LOAD

The mission load is any carried operational load which can be all kinds of sensors, gimbals or cameras like Zoom, Infrared, Lidar, Multispectral etc.

Mission Load also includes deliverables that are carried as cargo..

## PLATFORM LOAD

Gyrotrak may include for example a cargo box, an FPV unit, a radar system or other permanently installed equipment. In sub-

tracting the GT20 platform weight from the 20kg MTOW, you get the maximum possible payload. A regular GT20 has a

weight of 7.5kg which makes a payload of up to 12.5kg that can be shared between the battery and the mission load.

# SAFETY FIRST

## ■ AVIATION GRADE QUALITY

Our guideline is to provide solutions for products, services and support following aviation standards. It is our mandate to offer safety and reliability at all levels of commercial UAV operation.

## ■ AUTOROTATION

One of the most striking safety features of Gyrotrak is its ability to autorotate. Since the main rotor is in autorotation mode during forward flight, Gyrotrak is able to land slowly and safely, even in the event of a motor failure.

## ■ REDUNDANCY

Gyrotrak's multiple levels of redundancy ensures continued flight even in the unlikely event that one of the systems fails.

## ■ CERTIFIED AUTOPILOT

The autopilot software and hardware navigating Gyrotrak not only has redundancy, is rock solid and many times proven, it is DO-178/ED-12 and DO-254 certified respectively – the most demanding aeronautical regulations for on-board electronics.

## ■ SAFETY & SECURITY

The system is equipped with permanent continuous health monitoring, a black box and EMI protection. All communication links are encrypted – a higher, military grade encryption is optional.

# ■ GT20 KEY FEATURES

Full composite airframe □

VLOS and BVLOS capability □

CAN Bus Technology □

All weather capability (IP rated) □

Low system complexity, economical maintenance □

Low energy consumption □

Inverted V-tail □

AIRIAL ROBOTICS

High Payload Rate □

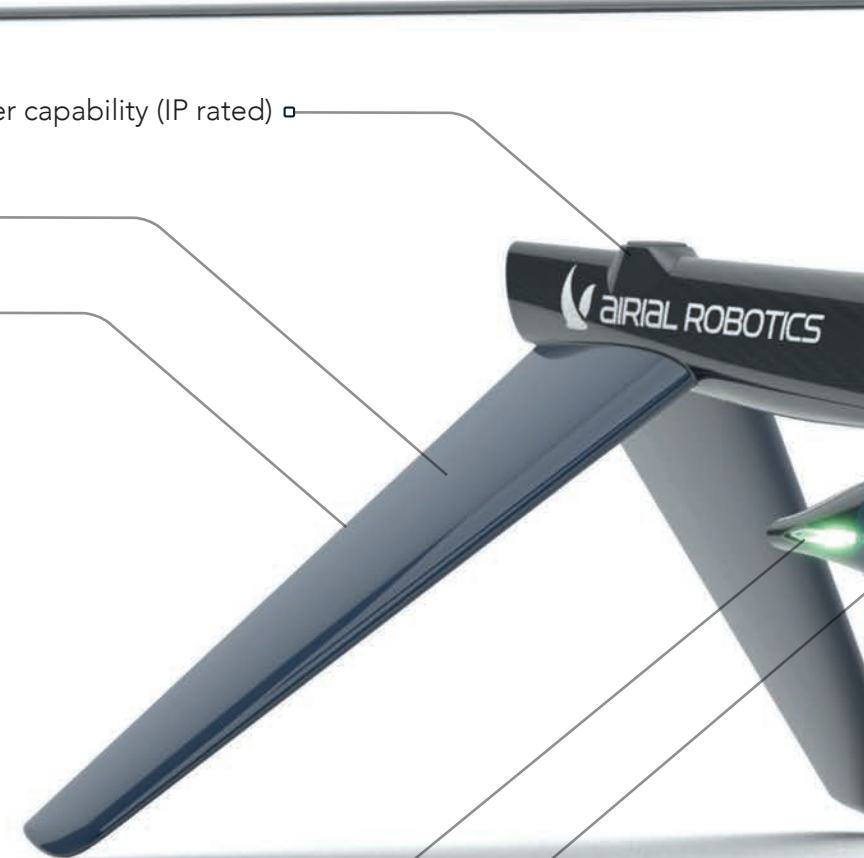
COG independent □

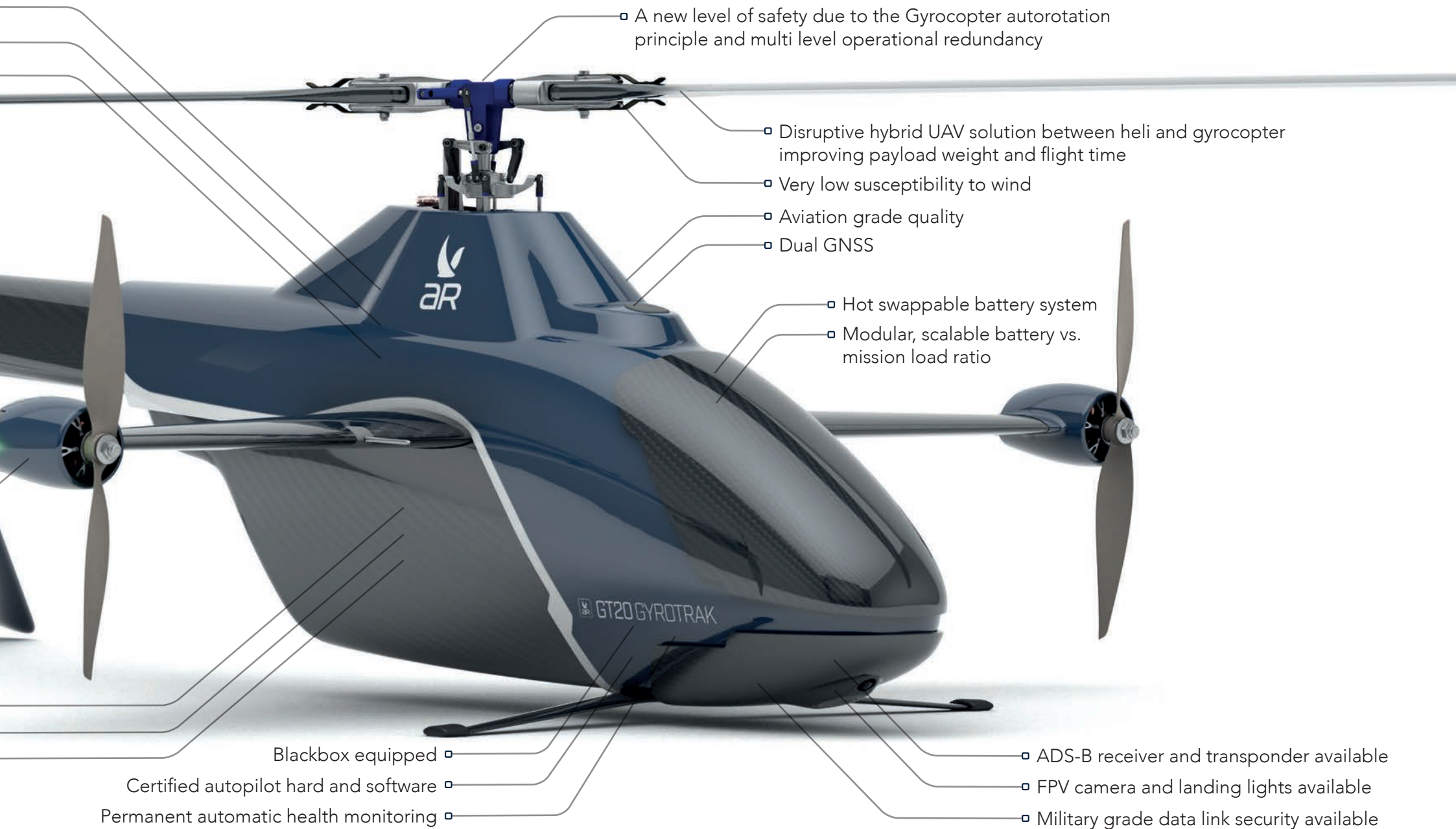
Cargo Box, various □

Sensors available

Integrated position and navigation lights □

Two traction motors for a max. speed up to 150km/h □





□ A new level of safety due to the Gyrocopter autorotation principle and multi level operational redundancy

□ Disruptive hybrid UAV solution between heli and gyrocopter improving payload weight and flight time

□ Very low susceptibility to wind

□ Aviation grade quality

□ Dual GNSS

□ Hot swappable battery system

□ Modular, scalable battery vs. mission load ratio

Blackbox equipped □

Certified autopilot hard and software □

Permanent automatic health monitoring □

□ ADS-B receiver and transponder available

□ FPV camera and landing lights available

□ Military grade data link security available

## AUTOPILOT

Gyrotrak is equipped with one of the best and probably the safest Auto Pilot Systems in the world:

Embention's Veronte Autopilot is a miniaturized high reliability avionics

system which includes a state-of-the-art suite of sensors and processors. With the embedded M2M module for 4G communications, Gyrotrak is connected to European based Cloud servers. This allows the UAV platform to perform Beyond Visual Line

of Sight (BVLOS) operations. This feature also enables online UAV telemetry synchronization and remote monitoring, making this autopilot a key instrument for Unmanned Traffic Management (UTM) systems.

## ADVANCED PERFORMANCE



**One Click Missions** // Through a user-friendly interface, allows operators to program missions (such as mapping, surveillance, delivery...) and execute them with a single click

**Sense & Avoid** // Radar, LIDAR or transponder based, permits collaborative and uncollaborative sense and avoid to be performed on autonomous missions.

**Control modes** // Fully automatic, fully manual, assisted manual and combined control modes. Selectable at any time during the flight.

**Gimbal / Tracker stabilization and pointing** // Target pointing, fixed attitude from platform, fixed attitude from ground and follow control modes.

**Simultaneous operation** // Control of up to 64 platforms & multiple control stations with control or monitoring permissions.

**Communications** // Satellite and 4G communications for BVLOS operations.

**Wind** // Inflight wind estimation for aircraft control correction.

**RTK Positioning** // Precise positioning up to cm level is possible with the embedded GNSS module, no extra hardware needed.

**Dual GNSS** // The Autopilot embedded dual GNSS for GPS positioning and enabling GNSS attitude estimation

**Redundant IMU** // Embedded redundant IMU & barometer for increased reliability and performance.



## VERONTE SYSTEM

Embention's Veronte System is designed and manufactured following the strictest safety and quality standards.

The Autopilot meets DO-178C / ED-12 and DO-254 regulations.

Fully Compliant with STANAG 4671, IEEE STD 830-1998 & STANAG 4703. DDP Veronte is supported with an evidence documentation package available for UAV / RPAS / Drone certification, valid also for the System Safety Assessment (SSA).



## GCI5 GROUND CONTROL STATION

As with the Autopilot, the GCI5 Ground Control Station is powered by Embention. Users achieve a combination of easy-to-use application, real-time response, and most importantly safe operation.

### TELEMETRY

View real time onboard UAV metrics, such as sensors, actuators, and control states.

### TELECOMMAND

Support for all synchronous operator control commands that can be sent to the Gyrotrak like operational mode switching, mission management, payload control and so on.

### MISSION PLANNING

Configure missions with waypoint definition, payload target definition and coverage analysis.

### MISSION ANALYSIS

Rebuild all recorded data from a previous flight and generate plots and reports.

### CONFIGURATION

Edit RPAS settings, such as servo trim and interface/port management

### MULTIPLE USERS

One or more operators can work simultaneously.

## KEY FEATURES

- Unlimited waypoints
- Unlimited paths
- Curve based navigation
- Cloud connectivity
- Follow me
- Relative missions
- Auto, manual, arcade
- Automations module
- One-click missions
- Adaptive control
- Inflight PID tuning
- GNSS-based attitude
- Custom calculations
- Altimeter fusion
- RTK & RTCM
- Gimbal auto-tracking
- Fly-by-camera
- Sense & avoid
- Situational awareness
- EMI protection
- DO178 & DO 254
- Onboard black box
- Control station log
- On demand telemetry
- Event activated log
- Data encryption
- Dissimilar FTS
- Dual DSP



## ■ COMMERCIAL APPLICATIONS



## ■ SURVEILLANCE

The conceptual design of Gyrotrak delivers long flight times and range, making GT20 the perfect machine for search and rescue missions covering large areas, border control, long chases, fighting extensive fires or the surveillance of larger

crowds or events. IP rated and impartial to wind, Gyrotrak is there to support and deliver its mission, whatever the weather. GT20's ability to interchange the ratio between task and battery payload ensures that the UAV can be optimally

configured to numerous different missions. While every Gyrotrak data stream is encrypted as standard, we also offer military grade encryption for applications that are very demanding in terms of high-end encryption requirements.

### Gyrotrak Advantages

- Very long flight times and range
- Configurable battery/mission load ratio
- Multiple sensor payloads/ camera modules available including; Lidar, 30x Optical Zoom, Low light and Hi-Res Thermal

- All weather capability (IP rated)
- High Speed Tracking
- Military Grade encryption available
- Aviation grade quality standards
- VLOS and BVLOS operation
- FPV camera available

### Application Areas

- Search & Rescue
- Disaster Response
- Public Safety
- Border Patrol
- Military
- Fire Fighting



## TRANSPORTATION

With its 12.5 kg payload that can be partitioned into battery and mission load, the GT20 is a great cargo machine and with the optional cargo box, it's getting even greater.

This new UAV has been developed from

### Gyrotrak Advantages

- BVLOS operation
- Long flight time and distance
- Precise VTOL
- High Payload Capacity
- All weather capability (IP rated)

the ground up to be used in BVLOS operations in all weather conditions. Through the unique hybrid technology combination of gyrocopter and helicopter, Gyrotrak can not only transport heavy payloads over long distances, it has

- Configurable Battery/Mission Load ratio
- Certified, Military Grade, Autopilot
- Center of gravity-independent cargo weight distribution

the ability to precision take off and land vertically. From cargo drones to military, from multicopter to fixed wing, the installed European Embention UAV Autopilot is certified and has proven its reliability a thousand times.

### Application Areas

- Logistics
- Military
- Industry
- Medical



## INSPECTION

With its BVLOS capability and uninterrupted flight times of up to 2.5 hours, GT20 is the perfect tool for extensive horizontal infrastructure inspection like pipelines, power lines, wind farms, perimeter security or large solar panel fields – safe

### Gyrotrak Advantages

- VLOS and BVLOS operation
- Very long range and flight time
- All weather capability (IP rated)
- Certified autopilot software
- Take-off/ landing on moving platform

and weather independent

The DO-178/ED-12 and DO-254 certified Autopilot is proven, reliable and easy to use. The hybrid concept of the GT20 unites the low energy consumption and

- ADS-B in Receiver for collision avoidance, transponder optional
- Multiple 3rd party payloads available
- Integration ready for any available sensor

outstanding flight characteristics of a Gyrocopter with the VTOL abilities of a helicopter giving it not only a long flight times and a high flight security but also the ability to hover and take-off and land vertically.

### Application Areas

- Oil and Gas Exploration
- Mining
- Naval & Maritime
- Solar industry



# FACT SHEET GT20 GYROTRAK



Flight Envelope	Speed Range 0-150km/h (0-93mph)   Top Ceiling: 9000m (29,500ft)   Max Range >150km (93mi)
Operational Conditions:	Temperature: - 15°C - 40°C ( 59°F - 104°F) Wind: Up to 10Bft   55 kts   28 m/s   101 km/h   62 mph
Precision Level	cm accuracy
Maximum Mission Load (@7.5kg Platform Load)	with Gyropack S: 6.3kg (14,3lbs)   with Gyropack M: 4.6kg (10.6lbs) with Gyropack L: 3kg (7lbs)
Maximum Flight Time	2.5h with sensor mission load (0.6kg) and large battery pack (Gyropack L) 2h with 2kg mission load and large battery pack

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