



ST- 2H100 VTOL

SUPER SILENT
MONITORING DRONE



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The system ST- 2H100 VTOL Surveillance can be used for:

- Surveillance of protected areas (military and police facilities, warehouses, fuel storages)
- state border control
- Surveillance of important infrastructure facilities (power lines, oil pipelines, gas pipelines)
- Protection of convoys of important delegations or weapons
- covert pursuit of persons or vehicles
- searching for missing persons or criminals

Users of the systems can be:

- Army
- The police
- Special police units
- Security services
- Rescuers.

The basic parts of the ST- 2H100 VTOL are :

1. UAV platform

Made of composite materials, with all electronics for operation



2. GCS (Ground control station)

Control system on the ground, that manages the UAV and Gimbal camera



3. Falcon camera

That is attached to the UAV body with 2 or 3 axes. The camera has the ability to zoom, track and geolocate the object.



4. Video link

With antennas for live transmission of the video image from the Gimbal camera to the operator's monitor



1- UAV platform ST- 2H100 VTOL electric propulsion



The ST-2H100 VTOL platform is made entirely of composite materials, which allows for exceptional strength and low weight, which is extremely important in the air. Since our designers come from aviation, they have transferred all the latest innovations in aerodynamics and aircraft construction to our UAV.

Extraordinary aerodynamics in the air enable the achievement of extraordinary results in flight time. More than 8 years of development and testing have brought the results listed in the table below.

Characteristics	ST-2H100 VTOL
Physical	
Aircraft Weight (Max)	13.5 kg
Aircraft Dimensions (Assembled)	310 x 158 cm
Propulsion	Electric or Electric+Gas
Payload Weight (Max)	3 kg
Payload Dimensions (Max)	26 x 16 x 14 cm
Communications	
Frequency (Primary)	868 MHz or 900 MHz
Transmit Power (Primary)	1 W max (configurable)
Bandwidth (Primary)	57 kbps
Range (Primary)	20+ km line of sight
Protocol (Primary)	MAVLink
Transceiver (Backup)	RC PPM
Flights	
Airspeed (Cruise)	18 m/s (65 km/h)
Airspeed (Max)	30 m/s (110 km/h)
Wind Resistance (Max)	15 m/s (54 km/h)
Range max (at Cruise)	320 km
Endurance max (at Cruise)	3 hrs. Electric
Operations	
Launch	10 x 10 m autonomous, 5 x 5 m autonomous + operator
Landing	10 x 10 m autonomous, 5 x 5 m autonomous + operator

Considering all the additional equipment installed on the UAV for the Surveillance mission, the estimated time in the air is up to 2 hours. Battery replacement time is 5-10 minutes, and the system can be in the air again.

The fuselage can be painted according to the RAL scale to the customer's wishes.

The UAV platform contains the following elements :

a) Autopilot

The autopilot is the latest and most powerful model in the eco system. Designed for UAS manufacturers. The autopilot is part of a wide ecosystem of autopilot modules and carrier boards. All models are compatible with all carriers which allows users to choose an off the shelf carrier board that best suits their needs.

Features

- Faster H7 SOC with 1MB ram
- Upgraded triple redundant IMU sensors for extra redundancy
- 2 sets of IMU are vibration-isolated mechanically, reducing the effect of frame vibration to state estimation
- IMUs are temperature-controlled by onboard heating resistors, allowing optimum working temperature of IMUs
- Fully carrierboard compatible, all inputs and outputs go through a 80-pin DF17 connector, allowing a plug-in solution for manufacturers of commercial systems. Manufacturers can design their own carrier boards to suit their specific needs now and in the future.

Specifications:

Processor:

- 32bit ARM® STM32H753 Cortex®-M7 (with DP-FPU)
- 400 Mhz/1 MB RAM/2 MB Flash
- 32 bit STM32F103 failsafe co-processor

Sensors:

- Three redundant IMUs (Accelerometers/Gyroscopes), Two Barometers, One Magnetometer
- ICM 20649 integrated accelerometer / gyro, MS5611 barometer on base board
- InvenSense ICM20602 IMU, ICM20948 IMU/MAG, MS5611 barometer on temperature controlled, vibration isolated board
- All sensors connected via SPI.

Power:

- Redundant power supply with automatic failover
- Servo rail high-power (7 V) and high-current ready
- All peripheral outputs over-current protected, all inputs ESD protected

b) Mission planner - software

Mission Planner is a full-featured ground station application for the open-source autopilot project.

Some basic activities that you can do with the help of the Mission planner:

- Load the firmware (the software) into the autopilot board that controls your vehicle.
- Setup, configure, and tune your vehicle for optimum performance.

- Plan, save and load autonomous missions into your autopilot with simple point-and-click way-point entry on Google or other maps.
- Download and analyse mission logs created by your autopilot.
- Interface with a PC flight simulator to create a full hardware-in-the-loop UAV simulator.

With appropriate telemetry hardware you can:

- Monitor your vehicle's status while in operation.
- Record telemetry logs which contain much more information than the on-board autopilot logs.
- View and analyse the telemetry logs

c) Set of the batteries

The set includes 4 LiPo batteries for VTOL engines and a LiPo battery for the main engine, which can be divided into two parts depending on the installation. In addition to the batteries, there is a charger with BMS electronics that controls charging.



d) RFD long range telemetry

RFD connection for UAV control and data verification.

This is the ideal solution for long range telemetry or communications.

Two RFD868x modems with antennas for all antenna ports. EU CE Approved

e) Transport box

The system also includes a transport box for transporting the UAV and components. The transport box measures 112x73x40 cm and is lined inside with cut foam to prevent damage. The transport box can be used both for air transport and for transporting the UAV from storage to the place of use.



2. GCS (Ground control station)

For the surveillance mission, we suggest a professional computer and an additional handheld GCS that is mobile.

The computer has the option of outputting to an additional monitor.

a professional military-grade tablet that helps drive efficiency and productivity in ways that were never previously possible.

It is especially suitable for field application in markets such as aviation, defence, or construction because of its capability to perform under extreme environments.

Technical data:

- Dimensions Screen size 10 inch / 25.4 cm
- Weight 2.64 lbs / 1200 g
- Dimension 15.8 x 8 x 3.5 inches / 401 x 202 x 88 mm



3. Falcon Camera

The Falcon camera is one of the main parts of the control system, which must be adapted to the size of the UAV.

Technical characteristics EO-IR stabilized Camera :

- Zoom on FULL HD = Optical 10x + Digital 16x = Total 160x
- EO camera resolution 1920 x 1080 pixel
- IR thermal resolution 640 x 512 px
- Stabilisation 2 axes mechanical + 2 axes electronical + software stabilization
- YAW/ROLL FOR 360° +



A special fastening system enables damping of vibrations caused by engine operation.

4. Video link

is a long-range, point-to-point, point-to-multipoint broadband video and data transmission module, and range can reach up to 100 km.

Video link together with the antennas form a reliable connection between the UAV and the GCS by transmitting the video signal



Video link Technical information :

Radio	
Frequency	1427.9-1447.9MHz, 806-826MHz
Modulation	OFDM & MCS
RF power	Up to 30dBm / 1.0 W
Bandwidth	1.4MHz/3MHz/5MHz/10MHz/20MHz (adjustable)
Encryption	AES128
Data rate	Max 30Mbps
Latency	Ethernet transmission \leq 150ms, UART \leq 20ms
Range	100km