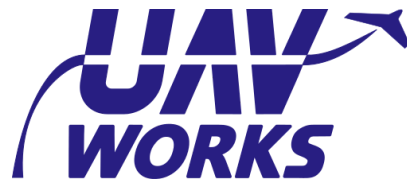




Technical Brochure



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1. General information VALAQ *Patrol*

The VALAQ *Patrol* is the ideal unmanned aerial tool for long-range and autonomy security, surveillance and emergency operations. A combination of efficiency, flight time and capabilities.

It is a totally electric, vertical take-off and landing airplane, obtaining up to 50 (40 guaranteed) minutes of continuous flight with the payload on board and with a MTOW of 4.1 kg.

The benefits of this aircraft concept are clear: longer flight times, mechanical and operational simplicity combined with the ease of operation of a multicopter in terms of takeoff and landing.

In addition, integrated NextVision's *Colibri 2* gyrostabilized visual and thermal camera captures high-resolution images and records and streams HD video with automatic object tracking capability, adding invaluable data in high demanding missions.

In order to fulfill missions' scenarios and requirements, control, telemetry and video stream can be managed independently, allowing sensible video streams being redirected to different ground stations or locations.

1.1. Key features

- Fully autonomous operation.
- Longer flight times.
- No take-off and landing infrastructures required.
- Safe automatic landings with dynamic 3 point always-in-contact retractable landing gear
- Flight efficiency increased.
- Mechanical simplicity.
- Low maintenance.
- Control, communication and streaming over 4G/LTE and point to point Datalink.
- In house design, manufacturing, assembly and test.
- Full carbon fiber structure.
- Plug and play battery change.

1.2. Standard Package

- VALAQ Patrol VTOL aircraft.
- Integrated Colibri 2 gyrostabilized camera.
- Two battery packs (2 complete flights).
- Ground control bundle (Laptop, Joystick and 5 km Datalink).
- Four ports battery charger and wires.
- Transport hard case.
- User manual (includes maintenance manual).

2. Aircraft specs

2.1. Physical

- Wingspan: 1220 mm
- Height (landed): 720 mm
- Width (landed): 530
- Width (flying): 410 mm
- Package dimensions: 1300 x 850 x 500 mm
- Weight: 4.1 kg



2.2. Performance

- Cruise speed: 65 - 80 km/h
- Maximum speed: 120 km/h
- Maximum wind take-off and landing speed: 30 km/h
- Maximum service ceiling (ASL): 2500 m
- Operational temperature range: -10 to 55 °C
- Maximum flight time in plane mode: 50 minutes.
- Guaranteed flight time in plane mode: 40 minutes.
- Combined maximum flight time for take-off and landing: 2.2 minutes.

2.3. Aerodynamics and structure

- Full carbon fiber flying wing construction.
- Motor pylons in V inverted quadcopter configuration.
- Elevons aerodynamic control for both multicopter and plane modes.
- 3 point always-in-contact automatic retractable landing gear.
- Automatic retractable camera protection mount.

2.4. Communications

- 4G LTE connection module for live control, telemetry and video stream over internet as standard.
- Point-to-point datalink for live control, telemetry and video stream up to 5 km as standard and 15 km if selected option.
- Strobe and navigation lights on wing tips.
- Communications antennas integrated into winglets.

2.5. Propulsion and electric system

- Brushless motors with combined power of 3000 W.
- 9 inches propellers.
- Flight mode dependent batteries, allowing for maximum use of capacity.
- Two 22.2 V Li-Ion batteries over wings for plane cruise mode.
- One 22.2 V Li-Po battery on the fuselage for take-off and landing.
- Total Li-Ion capacity for plane cruise mode: 284 Wh.
- Total Li-Po capacity for take-off and landing: 46.6 Wh.
- Battery charger with 4 ports as standard.
- Redundant and independent regulated power supply for internal and payload electronics.

2.6. Flight control and sensors

- Hex Technology-ProfiCNC Pixhawk 2.1 The Cube autopilot.
- 3 IMU and dual 32 bit micro controller (main and backup).
- Additional Linux computer for navigation and communication purposes.
- Additional 8 bit microcontroller for auxiliary tasks.
- GNSS system with 4 constellation support (UBLOX M8N), fast and precise location.
- Temperature compensated airspeed and barometer sensors.
- Current and voltage Hall-effect power sensor for precise battery monitoring.

3. Camera specs



3.1. Visible camera

- Visible spectrum range: 400-700 nm.
- Resolution: 1280x720 px.
- Zoom : x20 + x2 digital, (total x40) continuous zoom.
- HFOV : 60° WFOV – 3° NFOV – 1.5° DFOV.

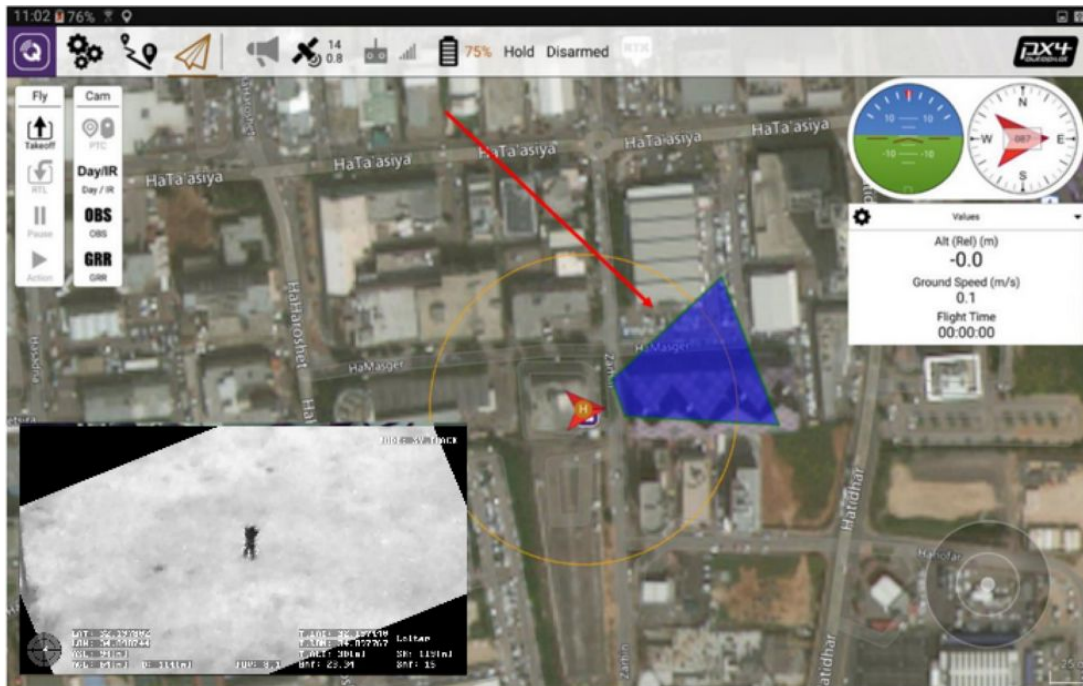
3.2. Thermal Camera

- Uncooled Infrared spectrum range: LWIR 8-12 μm .
- Resolution : 640 x 480 px.
- Zoom : x4 digital.
- HFOV : 32° W.FOV – 8° DFOV.

3.3. Additional capabilities

- Target geo reference, ground crossing location.
- Target tracking.
- Gyro and software stabilization.
- Easy interface commands.

3.4. Camera control user interface



[Colibri-2 \(180gr Day/IR Stabilized Payload\) - Short](#)

<https://youtu.be/nIQfnQUIkmM>

<https://youtu.be/cRzcPkvOuml>

4. Ground control station

4.1. Convertible Laptop

- Touch screen support.
- Up to 5 hours of battery life.
- USB 3.0 hub for ethernet connection and extra USB.
- Windows OS.
- Preconfigured with needed software.

4.2. Control Joystick

- USB connection interface.
- Multifunction buttons and camera control mini-joystick.

4.3. Ground side datalink module

- Suntor ST5NMT Datalink.

- Selectable operating frequency band (800MHz, 1.4GHz, 2.4GHz).
- Selectable operating max power.
- Three optional modes of encryption ((ZUC, SNOW3G, AES).
- Up to 5 km of range with provided antennas.
- Up to 10 hours rechargeable Li-Ion battery and mains external power supply both included.

5. Transport case

- Hard construction flight case.
- With wheels and handles for easy use and transportation.
- Dimensions: 1300 x 850 x 500 mm

6. Battery Charger

- Multi chemical battery charger.
- Four independent ports with needed cables for VALAQ Patrol batteries.
- Power supply.

7. Extra or interchangeable options

- Up to 15 km Datalink (Same specs of Suntor ST5NMT but extra range).
- Easy transport soft backpack case.
- Extra aircraft battery pack (2 Li-Ion + 1 Li-Po).
- Unlimited Operation Battery Pack and Charger (4 battery packs and 4 chargers).