UVH-170H

BUDGET PRICE

Our Budget Price, as stated below, is based on the Scope of Supply, the Terms and Conditions, the Limits of Supply and the Exclusions as specified in the present budget offer and amounts to:

BUDGET PRICE

One UVH-170H set without options is USD 198’500

Note: The UVH-170H set is completely factory assembled, wired, pre-tested and delivered to site as one transport unit, excluding the ground control module and other options, which are delivered as a separate transport unit. All pictures in this proposal are for the reference only, actual design might differ.

SCOPE OF SUPPLY & PRICE BREAKDOWN

The equipment, works and services listed below are included in our scope of supply, besides optional.
They are further described under the corresponding item number:

№	EQUIPMENT DESCRIPTION	Q-ty	Unit price, excl. VAT in USD	Total price excl. VAT in USD
1.	**Helicopter UVH-170H**	**1**	**0**	**0**
2.	**Ground control station (GCS) based Getac X500** command line, laptop, connectors, software, industrial joystick	**1**	**0**	**0**
3.	**Battery charger**	**1**	**0**	**0**
4.	**Transportation container**	**1**	**0**	**0**
	OPTIONAL EQUIPMENT			
5.	**Digital video\data link** (60 km in LoS) complete set	**1**	**0**	**0**
6.	**Fully Automated High Gain Tracking Antenna** (for video\data link)	**1**	**0**	**0**
7.	**2-axes Gyro stabilized television thermal gimbal with target coordinates detection GSG-185-FHD-XGA (R)**	**1**	**0**	**0**
8.	**For Services** refer to corresponding clause			

TERMS AND CONDITIONS

General	Arrangements, dimensions and drawings appearing in our budget offer are to be understood as preliminary only and might be modified during the detail-engineering phase and test run, in order to optimize our design. We reserve the right to select our nominated sub-suppliers.
Warranty Period	Twelve months or 500 hours of flight (five hundred), whichever comes first from issue of "Final Acceptance Certificate", but not later than 18 months from "Notification of Readiness for Dispatch", if shipment is delayed by causes beyond our reasonable control. This is provided if the operation and maintenance in accordance with the the guidelines and instructions and maintenance is performed by us or certified engineers.
Warranty Note	Warranty is not applicable for batteries.
Assigned lifetime	Assigned lifetime of equipment is 1000 hours (one thousand). This is provided if the operation and maintenance in accordance with the guidelines and instructions and maintenance is performed by us or certified engineers. Prolongation of the assigned lifetime is to be performed on manufacturer's premises
Prices	The offered price has to be understood as budget price in USD.
Delivery Time	4 months Ex-Works after Effective Date of the contract and clarification of all technical and commercial details.
Offer Validity	This budget offer is valid for 2 months, counted from issuing date.
Terms of Payment	To be discussed
Commercial Terms	To be discussed.
Security	We reserve the right to evaluate the security situation in and around the Site/Country where the service will be provided at the time the service is requested before it accepts to perform the work.
Compliance	This quotation is for information only and does not constitute agreement to offer a firm proposal in the future.

TECHNICAL DESCRIPTION

UNMANNED AERIAL COMPLEX WITH UVH-290H DRONE

consisting of:

1 UVH-170H GENERAL CHARACTERISTICS

1.1 Operation

- Operating temperature range: -35°C to +50°C
- Basing: Takeoff and landing in less than 15x15m area
- Takeoff and landing: Fully automatic
- Emergency landing: Parachute
- Ground landing equipment: Not required
- Storage / transportation: Heli in box -77kg (Packing dimensions -1300x650x800)
- Storage Portable GCS (PGCS): Box -24kg.

1.2 Basic characteristics

- Maximum cruising speed 60 km/h
- Maximum speed 100 km/h
- Length 2700 mm
- Main rotor diameter 2600 mm
- Height 860 mm
- Wheelbase 750 mm
- Engine type 4-stroke single engine
- Engine capacity 7 kW
- Max. Payload 5 kg
- Empty weight 25,6 kg
- Max. takeoff weight 36,5 kg
- Max. climbing capacity 3 m/s
- Max. wind speed while taking off or landing 14 m/s (27 kts)
- Practical range 350 km
- Practical ceiling 2500 m
- Flight time (max) 5 hours
- Parachute ballistic
- Onboard power supply 12V
- Battery type (included) Li-Ion
- Altimeter laser
- TBI (maintenance, inspections) 260 h

1.1 Gasoline Engine

- model — i-170
- operation — continuous
- engine design — four-stroke
- fuel feed — injection system
- nominal shaft power rating — 7 kW
- engine start — starter onboard
- alternator — onboard

1.2 Fuel System

1.2.1 Gasoline Fuel System

The gasoline fuel system is designed to operate on standard gasoline and comprises mainly:

- Fuel protection filter
- Fuel pump
- Main gas fuel control valve
- Main fuel manifold

1.3 Base Frame

The above-mentioned components are mounted on the base frame, made of aircraft-grade aluminum.

1.4 Fuselage

The engine, control system and other equipment are housed in an insulated and sound attenuated body suitable for different ambient conditions.

- Sound proofing and insulated body
- IP 64 (water/dust resistance) – excluding sea water
- Operating temperature range: -35°C to +50°C
- Fast dismount for easy maintenance
- External connection hole for customer's payload connection

1.5 CONTROL SYSTEM

The helicopter control system is installed under body. All cables between the control modules, instruments and sensors are pulled, connected and tested in our workshop.

1.6 "AP-10.2" AUTOPILOT SYSTEM & CONTROL SYSTEM

The system is based on CAN bus protocol, which provides the safest way for microcontrollers and devices to communicate with each other without a host computer.

The autopilot continuously controls all parameters and makes the system fully automatic.

Take-off, landing, navigation and mission execution are carries out by simply pressing the button.

The diagnostics, flight mission planning and remote control can be done wirelessly.

1.7 Technical specifications:

- Operating temperature: -35°C to +50°C
- IP rating: IP67
- Housing material: Alloy
- Connector: Amphenol
- Power supply: 5-27 V

1.8 Protection:

- Gated logic on all digital IO pins
- ESD protection
- Power supply reverse-polarity

1.9 CPUM interfaces:

- 12x servo drivers (PWM outputs)
- 12x RPM sensor inputs (hall effect sensor)
- 1-Wire interface
- TTL UART interface
- RS-485 interface
- Controller area network – CAN Aerospace
- RS-232 interface
- 4x active-ground switched power output (4.7A, @ 27V, 68mOhm)
- 12x digital inputs (timing, level)
- 12x general purpose inputs-outputs (remappable on MCU)

1.10 The following components are installed:

- Automatic control module AP-10.2 (or latest modification)
- All needed servo-drives
- Pitot tube
- GPS/QZSS, GLONASS, BeiDou MAX-M8 module and a passive built-in antenna (U-blox)
- INS microcontroller (MPU-6000 Gyroscopes and Accelerometers)
- GPS/GLONASS receiver / antenna
- Data transmission module (telemetry)
- Iridium backup data transmission system (telemetry)
- Communication antenna

1.11 Main functions of the AP-10.2:

- Automatic control of a moving object (fully automatic navigation, including taking-off and landing)
- Operating mechanisms control
- Engine control
- Semi-automatic control with automatic stabilization of a moving object
- Control of a moving object in emergency mode
- Payload control
- Payload feedback
- Telemetric receipt and transfer between control GCU and moving object

- Ground simulation mode – a simulator
- Operator training in flight simulator with A/C virtual model downloaded
- Pre-flight A/C and flight assignment testing
- On-board power control
- On-board power monitoring

1.12 PAYLOAD CONTROL

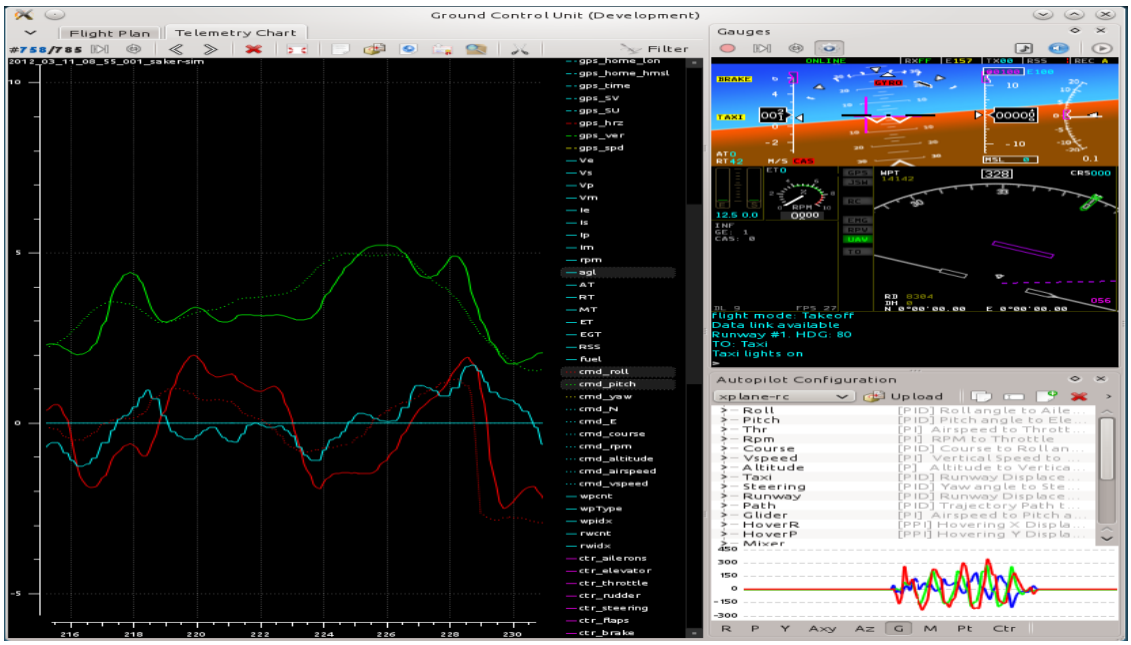
The standard connection is provided using next interfaces:

- 1-wire
- RS 232
- RS 485
- TTL UART
- CAN bus

1.13 Remote Monitoring & Diagnostic (RM&D)

Telemetry

- Control of all drone's parameters from the moment of switching-on the equipment both on the ground and in flight
- Real-time telemetry transfer to the ground control unit
- Data packet transfer when communication is reestablished
- Data recording on autopilot flash memory
- Easy telemetry analysis
- Flight review at the simulator for visualization of the A/C behavior aloft



2 RUGGED PORTABLE GROUND CONTROL (PGCS.3)

Command module for Autopilot AP systems based on rugged industrial computer. Used as a portable ground control station in combination with ground telemetry unit.

The Portable Ground Control Station (PGCS.3) is a secure computer with pre-installed software intended to monitor and control the unmanned vehicles and to display the video feed from the platform in real time. In addition to the standard keyboard, PGCS is equipped with dock-station to control the platform and the payload. It is designed for simultaneous operation by the aircraft and the payload operators.

Features:

- Equipment for communication and control
- Unmanned aerial system operator and payload operator HMI
- Industrial joysticks and switches for manual control
- Preinstalled AP and other required software
- Communication interface for tracking antenna system
- Integrated back-up telemetry modem
- AC/DC Charger

Functionality:

- Real-time telemetry information from the UAV/platform
- Payload control
- Reception, recording, storage and playback of payload information with real time display
- Control of flight modes and payload operation
- Preparation and upload of the mission
- Real-time platform health monitoring
- Preflight and post-flight inspection
- Registering target coordinates
- Flight mission control
- Flight mission protocol logging
- Flight mission simulation

Technical characteristics of laptop:

- Temperature range: -20°C..+55°C [-4°F to +131°F]
- Dimensions: 410 x 290 x 65 mm [16.1 x 11.4 x 2.5 in]
- Weight: 5.2 kg [11.4 lb] (weight varies by configuration and manufacturing process)
- Built from: magnesium alloy
- Battery: Li-Ion smart battery (8700mAh)
- IP Rating: IP65
- Certified standards: MIL-STD 810G, MIL-STD-461F
- 15.6 inch full HD display
- 3.0 GHz Intel Core i7 dual core processor
- Optional resistive touch screen
- SSD: 512 Gb
- RAM: 8 Gb

Technical characteristics of dock-station:

- Weight: 4.3 kg [9.47 lb]
- Dimensions with laptop: 656 x 332 x 110 mm [25.8 x 13 x 4.3 in]

- Built from: alloy
- 11 function buttons
- 2 rotary controls
- 2 switches
- Payload joystick
- UAV joystick
- Accelerator joystick
- Battery status indicator

Back-up telemetry modem specification:

- Telemetry command line range (<35 km [22 mi] in LoS)[1]
- Frequency of telemetry link: 902-928 MHz with hopping frequency
- Telemetry baud rate: 256 bps, compressed stream
- Telemetry modulation type: COFDM
- Telemetry TX power: 100 mW – 1W
- Telemetry: 10 Hz with compressed stream

[1] The range depends on the type of antenna used, ambient conditions, electromagnetic and radio interference within the area.

3 TRANSPORTATION CONTAINER

For quick mobilization \ demobilization, transportation and safe storage

OPTIONAL EQUIPMENT

4 LONG DISTANCE DIGITAL VIDEO\DATA LINK

Set of equipment based on super long range data modem. Expected transmission range 60 km. The range critically depends on ambient conditons, electromagnetical situation, radio interference within the area. *Additional data communication relay might be needed.

- Weight: 0.4 kg
- Operating range 60 km (Line of sight)
- Data DownLink speed 8-4 Mbit/s (Line of sight)
- 2 on-board antenna

5 HIGH GAIN DIRECTIONAL TRACKING ANTENNA

Set of equipment that allows to reach significantly longer telemetry link distance. Automatically follows the azimuth and elevation of UAV allowing stronger 2-way communication with airborne modem. Synchronized with UAVOS autopilot and video modem.

Set includes:

- Mast with 2-axes tracking mechanism
- Integrated telemetry command modem (UAVOS UV01.431329.100.211)
- Integrated compass and GPS
- Directional antenna for telemetry
- Power adapter AC\DC 110-230 ACV or 12 VDC (on request)
- All required wiring and connectors

Technical characteristics:

- Maximum weight: 13 kg [28.66 lb]
- Mast height: 5.33 m [17.48 ft]
- IP67
- Fully automatic tracking
- Azimuth 360° / Elevation 125°
- Video antenna and modem installation ready

Telemetry modem specification:

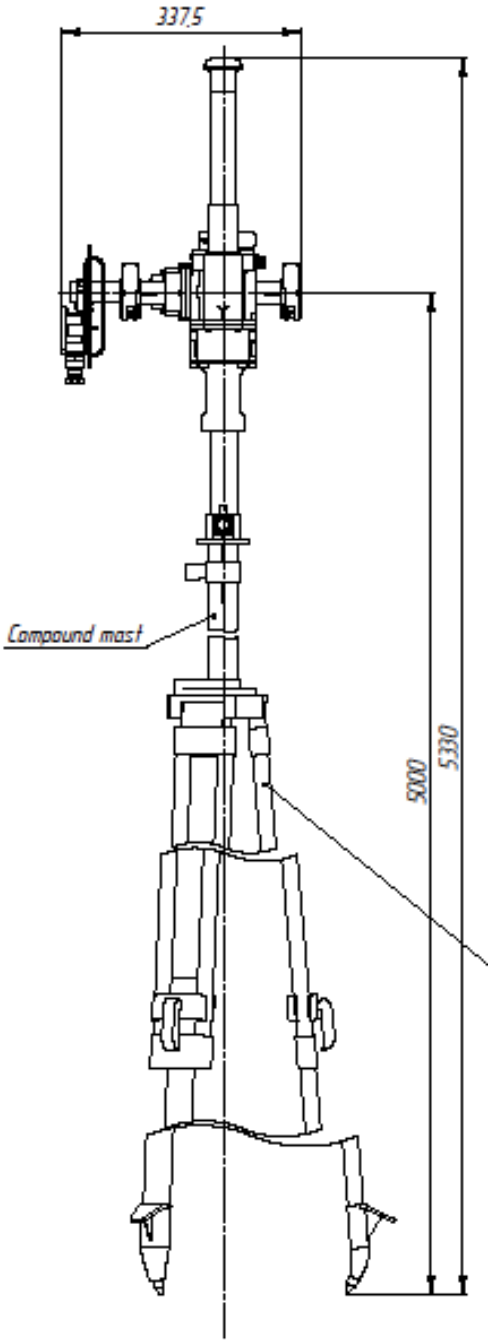
- Telemetry command line range (<100 km [62 mi] in LoS)[2]
- Video line range: depending on DataLink System
- Frequency of telemetry link: 902-928 MHz with hopping frequency
- Telemetry baud rate: 256 bps, compressed stream
- Telemetry modulation type: COFDM

[2] The range depends on the ambient conditions, electromagnetic situation and radio interference within the area.

- Telemetry TX power: 100 mW – 1W
- Telemetry: 10 Hz with compressed stream

Telemetry antenna specification:

- Type: Yagi
- Impedance: 50 Ohm
- Antenna operating frequency band: 880...970 MHz
- Antenna gain: 12 dBi
- Polarization: circular pattern



6 GSG-185-FHD-XGA (R) GYRO-STABILIZED, BIAXIAL GIMBAL

6.1 GIMBAL

Technical characteristics:

- Temperature range: -40°C..+50°C
- Dimensions: Length 200 mm, width 200 mm, height 322 mm
- IP Rating: IP65
- Weight 3.5 kg
- Body: aluminum
- Anti vibration frame
- Drying cartridge
- Direct drive
- Absolute encoder
- Two-axis rotation - 360º+
- Laser ranger: 50……5000 m (see Notes below)
- Heated protective glass (optionally)
- Altitude range: 0 … +8000 m
- Supply voltage: 12-27V
- Fully integrated video auto-tracker
- Integrated CPU
- Transfer of target coordinates to GCU
- Power consumption at 24V is 60W max
- Removable flash drive on 128 Gb

6.2 EO SENSOR (DAY CAMERA)

Technical characteristics:

- Sony FCB FHD H.264
- Resolution: HD (1920 x 1080) at 60fps and 30x optical
- Video output: HD
- Effective Pixels: Approx. 2.38 Megapixels
- Digital Zoom: 12x (360x with optical zoom)
- Optical zoom: 30x
- Lens Value: f=4.3mm (wide) to 129.0mm (tele); F1.6 to F4.7
- Horizontal Viewing Angle: 63.7°(wide end) to 2.3°(tele end) (in 1080i mode)
- Focus System: Auto (Sensitivity: normal, low), One-push AF, Manual, Interval AF, Zoom Trigger AF, Focus compensation in ICR on
- Wide-Dynamic Range and Auto ICR
- Exposure Control: Auto, Manual, Priority mode (shutter priority & iris priority), Bright, EV compensation, Slow AE

6.3 IR SENSOR

Technical characteristics:

- Thermal Imager: LWIR detector

- Lens: 50 mm f/1.4
- Imaging output H.264 Ethernet
- Operational spectral band 7.5…13 mkm
- Pitch (μm) 15 μm
- Operating temperatures range -40ºC…+50 ºC
- Matrix resolution 1024x768
- Clock frequency 10 MHz
- Accuracy of coordinates 20-30 m
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6.4 LASER RANGEFINDER

- Total measurement range 50-2500 m
- Operating temperatures range -40ºC…+65 ºC
- Transmitter Diode laser
- Laser classification Laser Class 1

7 SERVICES - OPTIONALLY

The following services are excluded from our scope of supply:

- Delivery: (*EU Countries* ⇒ DAP / DAT INCOTERMS)
  (*non-EU Countries* ⇒ DAP / DAT INCOTERMS)
- Specific technical documentation
- Drone operator training (extended)
- Payload operator training (extended)
- Drone engineer training (extended)
- Fleet manager (>10 and more drones fleet)
- Maintenance, inspections and overhauls

№	SERVICES DESCRIPTION	Q-ty	Unit price, excl. VAT in USD	Total price excl. VAT in USD
	OPTIONAL SERVICES			
1	DRONE OPERATOR TRAINING WITH PRACTICUM (20 business days course for 1 operator) at XXXXX training center	1	0	0
2	DRONE ENGINEER TRAINING WITH PRACTICUM (20 business days course for 1 engineer) at XXXXX training center	1		
3	FLEET MANAGER (for 10 and more drones fleet) 24/7 online support, fast call-outs, remote diagnostic support and consultation, spare parts and consumables stock manage and more	1	Details to be discussed	
4	DRONE OPERATOR AT CUSTOMER SITE minimum order is 5 days with max 8 work-hours per day mobilization excluded	5 days	0	0
5	DRONE OPERATOR AT CUSTOMER SITE each extra day, max 8 work-hours hours per day mobilization excluded	1 day	0	0
6	DRONE ENGINEER AT CUSTOMER SITE minimum order is 5 days with max 8 work-hours per day mobilization excluded	5 days	0	0
7	DRONE ENGINEER AT CUSTOMER SITE each extra day, max 8 work-hours hours per day mobilization excluded	1 day	0	0
8	extra hours above 8 work-hours per day		To be discussed	
9	*In case of harsh and risk environments extra charges might be added		Depends on conditions	

NOTE: Please be informed that we do not provide any UAV pilot certifying documents and do not train UAV pilots for general purposes. Mentioned above trainings exclude next general topics: international and local aerial collision regulations and rules; territorial air traffic regulations and rules; safe aerial navigation rules. Mentioned above trainings are intended to train operators to control and manage XXXXX drones through XXXXX control system and engineers to maintain and repair XXXXX specific equipment. In case of successful passing the exams, operators and engineers receive a certificate confirming completion of designated courses. We accept training for a particular operator after successfully interviewing them.