

PRIMOCO UAV

CONFIDENTIAL DOCUMENT



PRESENTATION OF PRIMOCO UAV

WWW.PRIMOCOUAV.COM



INTRODUCTION

Aviation in the Czech Republic has a history going back almost one hundred years, and today in the Czech Republic, the research, development and manufacture of the very latest aircraft technology, components and engines is at a world-class standard. Taking this tradition forward, Primoco UAV is designing and delivering innovative unmanned aerial vehicles and systems, focused on reliable performance in real world applications. Based out of our own private airport near Pisek, Czech Republic we manufacture in-house to international aviation standards. We have full authorization to export to both civilian and military organisations.

The opportunities presented by unmanned aerial vehicles are almost limitless, and significantly expand on existing options and concepts. Whatever the field – industry, agriculture, research, energy or other sectors – unmanned aerial vehicles can help you find economic solutions in areas which, just a few years ago, would never have been considered.

We look forward to delivering your Primoco UAV, which we can adapt to meet your needs and requirements. You will receive not just a state-of-the-art product, but also support from a strong company listed on the Prague Stock Exchange, PX START, a training centre for training your pilots, and full technical support for the maintenance and servicing of your investment. We will become your long-term partner – someone you can absolutely rely on.



Yours sincerely,

Ladislav Semetkovský

Chief Executive Officer and Founder



PRIMOCO UAV DESIGNED FOR ENDURANCE

At Primoco UAV, we recognized the need for a UAV designed for the civilian and governmental/military sectors. A UAV approved by regulatory authorities and licensed for military export if needed. A UAV with the endurance to fly for 15 hours and a 200 km radio range. A UAV that is built to take-off, perform and land autonomously. And to do it again the next day, and the next, reliably delivering real-time video and information capture. We took our enthusiasm for aviation and combined it with Czech engineering expertise and advanced production techniques. The UAV ONE 150 is flying real customer missions today. As a bonus, the direct costs of operating a Primoco UAV are 10% - 50% of the equivalent manned solution.

The Primoco UAV is built to be reliable. It can take off and land in daylight, at night and during poor weather conditions. And do it again, the following day and the following month. With a maximum endurance of 15 hours and a flight distance of up to 2,000 km in one mission, the Primoco UAV is a reliable platform for delivering real-time video and information capture. The UAV can be operated by remote control during each phase of flight, but additionally, the integrated auto-pilot system means that it is capable of fully automatic take-off and landing, and fully autonomous flight plan execution. Its short runway length of 300 meters provides customers the capability to execute aerial missions from remote locations and limited airport facilities. The Primoco UAV is the only choice where reliability matters.

Approvals have been received from major European and international aviation authorities for operation in unrestricted and restricted airspaces. Our UAVs are designed to operate repeatedly and reliably throughout their lifetime, delivering monitoring and data continuously to base from remote areas in an efficient and cost-effective way.

Our UAV Model ONE 150 has a maximum take-off weight of 150 kg combined with a flight time of up to 15 hours, a range from ground station of up to 200 km and an overall distance covered of up to 2,000km. This endurance combined with a cruise speed of 100–150 km/h, gives the Primoco UAV – compared to electric aircraft – unmatched performance in its category, while at the same time operating costs are kept to a minimum. The unique features of the UAV ONE 150 are the 30 kg payload and the high altitude operation (to 3,300 m above sea level) allowing extended missions with a mixed sensor payload and operation at altitudes of 2,000 m or higher.

What makes each of our planes unique, however, is the fact that each is supplied “made to measure”, i.e. made to meet the precise requirements of customers and the intended use. We can adapt the aircraft precisely to the task for which it was ordered by the client: this could mean working in agriculture, industry, energy, telecommunications, filming or searching for missing persons. The aircraft may have a single function or combine several – recording and monitoring the terrain using a camera taking still photographs or video images, perhaps conducting search and rescue missions with the help of infra-red cameras, right through to carrying highly sophisticated sensors. With the Primoco UAV, the customer can specify and carry any equipment or technology they require.

24AUG2016 AVT
14:42:43
UTC+0.0

IR SPA
AUTO

IR

47 AUTO
DFLT AUTO

N →

01-
00-
-01-
-02-
-03-

N : OFF - DISARM

ACFT
43:46:16N 240°
79:17:32W 1535FT

01 02 03 04 05

599FT 0.8KM LOS

OFF NONE

NEWPOI TGT
43:46:16N
79:18:06W



FLEXIBILITY TO DELIVER ANY MISSION

MILITARY UAV TRAINING

The Primoco One 150 UAV is an ideal platform for daily training missions, whether we consider the initial training of new pilots and operators or recurring training to maintain crew skills. For these missions the UAV can be equipped with mid-class sensors allowing crew coordination practice.

For initial training there are several special training tools available such as the industry-unique Virtual Reality headset which allows practice in manual control for new pilots. This device allows not only the practice of manual operation in various meteorological and visibility conditions, but even allows the practice of specific procedures using a realistic map of the operator's base or area of operation. The internal pilot simulator allows drilling in safety operations and mission briefing/debriefing.

LAW ENFORCEMENT

For law enforcement agencies the Primoco One 150 brings an unparalleled level of automation with a wide variety of sensors, a sustainable cost of operation and a predictable maintenance scheme. The basic law enforcement payload is an EO/IR system, where Primoco can offer several already integrated and tested solutions starting from the basic Octopus Epsilon 140 daylight system, mid-class Octopus Epsilon 175 day/night system up to the high-end Wescam day/night Mx-8 and Mx-10 systems.

The EO/IR systems come not only with optical day cameras and MWIR/SWIR sensors equipped with GPS localisation feature and automatic object tracking, but also with a laser rangefinder and pointer. The huge payload capability allows multiple sensors to be carried and the EO/IR system to be coupled with an ultra-high resolution (150 MPix) still camera. The powerful UAV datalink allows HD video live streaming up to the edge of the 200 km LOS range.



Photos with ultra high
resolution 150 Mpx.

BORDER PATROLS

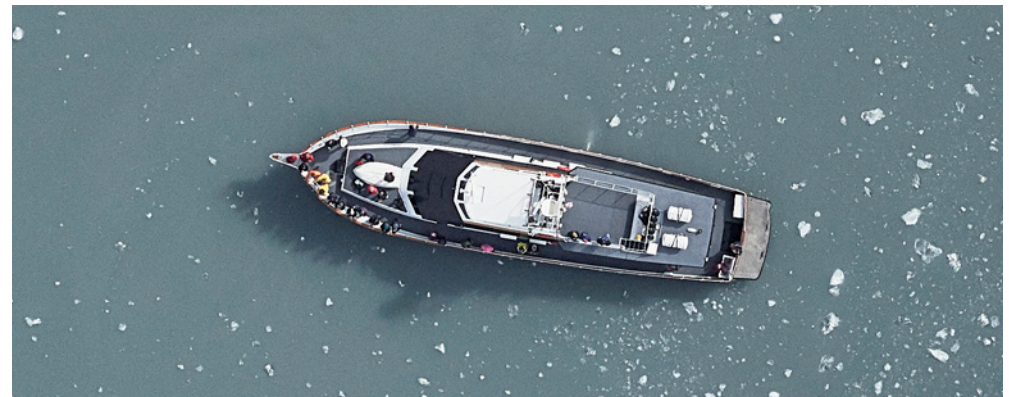
Regardless of the length of your border, the Primoco One 150 UAV is well-suited for nonstop surveillance of any border area. The sophisticated UAV navigation system consisting of GPS and inertial navigation allows safe operation on the required side of the border without any risk of crossing the line.

The border patrolling variant may be equipped with EO/IR sensors for day/night monitoring of the border situation, while the plane can carry additional equipment such as LIDAR laser scanners allowing the generation of a 3D digital terrain map, SAR radars for automatic border-line detection change or Ultra-Wide Band UWB radars for foliage and ground surface penetration. The combination of advanced sensors together with sophisticated flight automation brings to the operator a truly new level of border control capability.

MARITIME AND PORTS PATROLLING

For naval and port authorities and services the Primoco One 150 UAV comes with an Automatic Identification System derived from a device operated by US Navy for decades. The real-time identification of vessels allows early detection of potential undesirable activities. When coupled with the EO/IR sensing system or Synthetic Aperture Radar (SAR) sensor the UAV can be used for semiautomatic control and search of maritime sectors and port areas with high-precision real-time output allowing immediate response to any threat or irregularity.

Primoco provides several SAR options starting with a fixed downward looking AESA antenna array up to a solution consisting of a moveable turret allowing 360° azimuth search at long range. The SAR radars operate within the X-band and allow spot-light, strip and Ground Moving Target Indication (GMTI) operation modes.



Photos with ultra high resolution 150 Mpx.

[+] UNIFIS 3000 - Status

SYS AVI REF

ITAF2 RUN

User: Per Anders Johnsen

NAV1 109.30
NAV2 112.80
UHF1
DME1 112.80
ADF1 0318.0

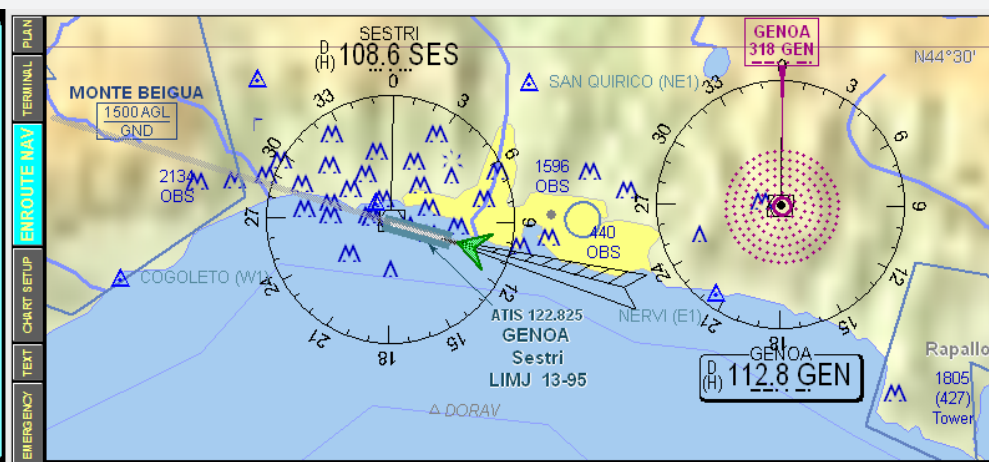
10:45:09 UTC
30 sep 2013

00:00:00 STW
0 m

VHF1 130.100

Alarm... Voice annun. Console... Help...

> Started: 10:42:18
> Activated Run 2013SEP30-ITAF2-#36
> IRU: Navigation mode
> FOx boot complete!



Flight Inspection Procedure

Run Setup... Print... Clear all

Proc.: ILS Approach

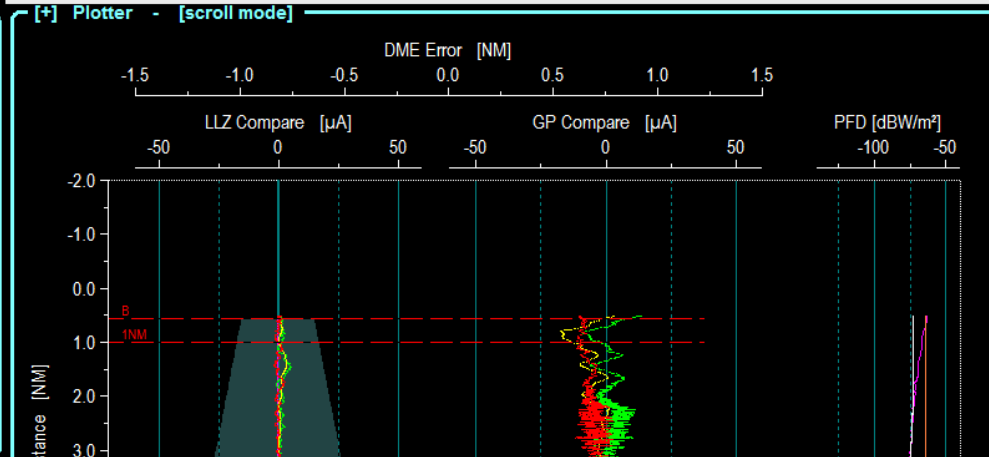
Run #: P1: 2013SEP30-ITAF2-#36 Dur.: 00:02:50
Facility: LIMJ 29 ILS CAT I Tol.: ICAO
Config: Tx1, Rx1
Notes: Test ILS, GRS on roof position

Ref Sys: GPS1 Next proc: Activate

Corrections:
GPS Quality: FIX

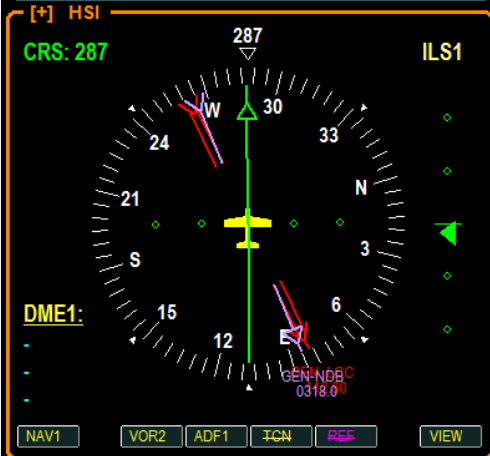
Moving map control:
Zoom: + -
Resize: R

MKR1 O M I H L
MKR2 O M I H L



[+] Numeric

Ref Dist [NM]	0.45	GPS1 GS [kts]	159
Ref Az 180 [°]	-0.01	Ref EL [°]	3.20
GPS1 Alt MSL [ft]	198.2	MKR1 SSA [dBm]	-64.7
LLZ1 90 Mod [%]	20.1	GP1 90 Mod [%]	40.7
LLZ1 150 Mod [%]	20.2	GP1 150 Mod [%]	39.1
LLZ1 SDM [%]	39.8	GP1 SDM [%]	79.8
FieldStr [dBµV/m]	82.7	FieldStr [dBµV/m]	72.5
SS [dBm]	-45.5	SS [dBm]	-44.9
LLZ1 Dev F [µA]	-1.0	GP1 Dev F [µA]	13.8
Ref AZ [µA]	-1.1	Ref EL [µA]	5.1
LLZ ERR [µA]	-0.12	GP CMP [µA]	-8.7



Calculations

	1) LLZ Appr	2) LLZ Appr	3) GP Appr	4) GP Appr	5) DME
Align err:	-0.1 µA	n/a	Domin.:	-	-
Err@T:	0.0 m	± 10.5 m	SDM:	40.0 %	n/a
Modul.:	90 Hz: 20.0 %	18 - 22 %			
	150 Hz: 20.0 %	18 - 22 %			
Zone	Avg. [µA]	Max struc [µA@NM]	In range [%]		
- A:	-0.4 µA	1.6@8.43	100.0 %		
A - B:	-0.4 µA	2.9@1.73	100.0 %		
B - C:	-0.3 µA	-	-		
C - T:	-	-	-		
B - T:	-0.3 µA	-	-		
T - D:	-	-	-		
D - E:	-	-	-		

Plotter: 1/7 Resize II Axis: Scroll Zoom Zoom: Box Reset Tools: Cursor Print

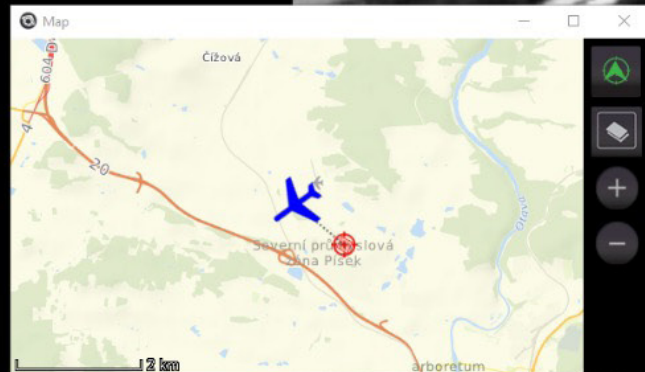
ESC Back Shift Ctrl F1 OPR Event F2 Freq Setup F3 Proc Setup F4 Stop F5 F6 F7 Polar F8 F9 Calc (L win) F10 Calc (S win) F11 Signals F12 Main Menu

AIRSPACE NAVAID SYSTEMS CALIBRATION

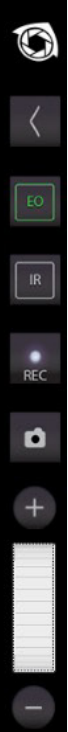
The Primoco One 150 UAV may be equipped with Flight Inspection System (FIS) payload to support the calibration of enroute- and airport NAVAID's such as ILS, VGSI, VOR, DME, NDB, Marker, GBAS, VDF and other. Sensors for military NAVAID's such as TACAN and Precision Approach Radar (PAR) can also be provided. The airborne avionics sensors and the GNSS/SBAS positioning system provides high accuracy measurements that are transmitted over high speed datalink, providing real-time data and results to the Flight Inspector on ground. The high-end Flight Inspection software allows the results of the inspection to be exported to any customized report format.

The UAV may be quickly re-equipped for the specific NAVAID to be inspected and calibrated. The Primoco One 150 UAV provides unrivalled operational cost compared to conventional full size Flight Inspection aircraft. Cooperating with leading OEM's in Flight Inspection equipment, such as Norwegian Special Mission, Primoco can offer best-in-class solutions for any customer.

MODE:
GYROSTAB:
AC POS: 49.33560N 14.10932E
AC AMSL: 1491M
SPD:
HFOV: 29.3°



TGT POS: 49.32985N 14.1199
TGT AMSL: 400M
SR: 1482M
UTC: 13:15:58.971
6 AUG 2019



RECONNAISSANCE AND SURVEILLANCE

The Primoco One 150 UAV is the platform best suited for unobtrusive surveillance and reconnaissance. The cruising altitude allows unnoticed observation since both the sound and optical detection of the system are practically excluded, while the on-board sensors reach and long-range 200 km LOS operation ensure perfect conditions for intelligence gathering.

The payload range allows installation of EO/IR sensors of various sizes and performance classes, SAR radars both with fixed and gimbal-mounted antenna, laser LIDAR scanner, ultra-high resolution (150 MPix) still cameras and RF detectors. The combination of the sensors' parameters with multi-sensor on-board capability ensures perfect intelligence collection during both day and night conditions even from remote areas with no risk to personnel. As an add-on an intelligent self-learning software can be provided which automatically evaluates the gathered data and highlights nonconformities.

ELECTRONIC WARFARE

One of the world beating features of the Primoco One 150 UAV is its capability for Electronic Warfare deployment. The plane can be equipped with a sophisticated ITAR-free set of electronic and radio-frequency jammers and receivers allowing it to perform electronic attacks, stand-off jamming, stand-in jamming, self-protection and convoy protection jamming, threat emitter simulation, emitter simulation during jamming, electronic protection training and other missions.

At a small percentage of the cost of currently used Electronic Warfare systems, the Primoco One 150 allows unparalleled capability in the area of traditional and modern coherent jamming or a combination of these for an affordable cost without any export restrictions. Its long endurance of 15 hours together with a 200 km LOS range ensures a true stand-off capability.



PIPELINES AND ENERGYLINES MONITORING

For the oil and energy industry the Primoco One 150 UAV brings a cost-effective platform for daily use with sophisticated technology and automatization of pipelines and transmission line monitoring. The plane is operated and controlled from a Ground control station with very advanced level of automatization for easy mission planning and preparation. Due to the LOS range of 200 km and operating speed of up to 150 km/h it can provide a higher monitoring capacity than any other platform, no matter if manned or unmanned.

The sensor suite can consist of a day HD camera, day/night HD camera, ultra-high resolution (150 MPix) still camera, laser LIDAR scanner or other sensors. All items are equipped with self-alignment capability and GPS localisation function to provide real-time transfer of gathered data to the Ground control station and optionally to the operator's HQ.



DISASTER RELIEF

The Primoco One 150 UAV is an ideal platform for large-area disaster relief and can be used for a variety of incidents such as flooding, earthquakes, volcanic eruptions or forest fires. The airplane is typically used in a dangerous environment for disaster scope monitoring, preventive and rescue activities monitoring and even people-in-distress localisation and providing guidance for assistance. Unlike the majority of manned airplanes the UAV can safely operate at night which is a key factor for eliminating quick-spreading threats such as flooding water or wildland fires. The UAV can provide real-time data to the HQ for immediate action and successful people and property preservation.

The UAV can be equipped with various sets of sensors starting with EO/IR day/night cameras, localisation devices and other special equipment.

ENVIRONMENTAL PROTECTION AND RESEARCH

The Primoco One 150 UAV was proven as an ideal platform for environmental monitoring. When counting animals it can provide unobtrusive flights over the area of interest without disturbing wildlife. This is mostly because of the minimal noise footprint, which allows the on-board sensors to obtain a true status of the animal population count. For these missions the plane is equipped with an ultra-high resolution camera with 150 MPix resolution allowing the operator to zoom-in on any areas of interest.

The UAV may also be equipped with atmosphere sampling devices for aerial pollution sampling and detection including tracking the movements of polluted air in the atmosphere.



Photo courtesy of Phase One

RAILWAY MONITORING

For large countries the railroad network is part of the critical infrastructure. As such, it should be a subject to regular inspection and maintenance. The Primoco One UAV allows remote detection of any irregularities ensuring in-time detection of possible threats and hazards. The wide selection of sensors allows, for example, detection of railroad track cracks or loose bolts. The advanced mission planning and control/execution systems enables the operator to easily pre-program the route with one-click circling over any identified defect.

For these missions, the UAV is equipped with an ultra-high resolution camera with a 150 MPix resolution allowing the operator to zoom-in on any areas of interest. The resolution presents every 3 cm on the ground as one Pixel and thus it can detect small details of possible irregularities.



TARGET DRONE

The Primoco UAV family can be effectively used as a realistic target simulation for any military unit starting with anti-aircraft battalions through to mechanised infantry and air forces. The Primoco target drones come with on-board equipment consisting of target miss indicators allowing determination of barrel firing accuracy as well as with radar reflectors (Luneburg lens) and IR emitters. The combination of on-board equipment allows the simulation of various targets with different characteristics. The plane may be painted in customer-selected colours matching the desired paint scheme of the opponent.

The size of the aircraft enables practice shooting at short to mid distance. The Primoco target drones require a short (300m) runway for operation and (unless hit with live ammunition) can be reused after landing with significant cost benefits to the operator.



**PRIMSCO
UAV**

Upgrades and
Updates

Operational
support

Acquisition

Training

Maintenance
support

Depot level
maintenance

UAV LIFE CYCLE SUPPORT – “ONE STOP SHOP” FOR ALL SERVICES

Acquisition

- UAV acquisition as per customer’s specification including payload
- UAV leasing as per customer’s specification including payload
- UAV as a service using company-owned UAVs with pre-defined configuration
- Other UAV services as per mutual agreement

Training

- Theoretical education of the pilots and operators
- Simulator training using Virtual Reality headsets and simulators
- Flight training with scaled-down and full-sized UAVs
- All activities at own airfield with asphalt runway and dedicated airspace

Maintenance support

- Scheduled maintenance with spare parts deliveries
- Unscheduled maintenance with deployable teams
- Remote online support for systems calibration
- Removed parts swap service and spare parts delivery

Depot level maintenance

- Unscheduled maintenance after airplane damage
- Remaining service life assessment and its extension
- Modification of the airplane configuration for new payload
- Ground control station refurbishment after extensive use

Upgrades and Updates

- Service bulletins check and implementation
- New components and systems installation
- New payloads integration and installation
- Ground control station upgrading for higher computing capability

Operational support

- Assessment of customer’s intent and capabilities to operate the UAVs
- Legal support of the operation within the customer’s country
- Technical support for UAV inventory setup and operation startup
- Online access to manuals, service bulletins and flight logs



PRIMCO UAV

UAV ONE 150

POWERING HIGHER

With a maximum distance travelled of 2,000 km, a UAV ONE 150 mission can take many forms. Its dual mode camera delivers thermal, HD images and video images for local recording and instant viewing at the Ground Control Station via the high bandwidth encrypted telemetry links. A variety of other sensors are often installed, such as magnetic field, LIDAR for 3D mapping and meteorological data recorders. The restrictions on operational distance often found in small rotor-based UAVs are eliminated with a UAV ONE 150.

Payload flexibility

The maximum payload of 30 kg can be used to deliver sensitive monitoring instruments to a required location or to follow a defined flight path, and to return them to base without the complexity and costs of a fully manned mission. Using the datalink, payloads can be remotely controlled and powered with up to 1,000 W for all UAV ONE 150 payloads.

Hi tech design for economy and endurance

The lightweight hi-tech airframe combined with the 25 HP engine mean that the UAV ONE 150 can cover a wide area in a one day mission, reducing the time taken to survey large areas and improving the efficiency of your teams' mapping tasks. With a maximum time in the air of 15 hours the design of the UAV ONE 150 demonstrates its ability to be a reliable platform.

Track moving or stationary targets

The tracking capability of the onboard camera and software have given monitoring teams a new standard to work against – A UAV that can work through the day and night hours without refueling with the ability to track a specific target, either stationary or moving. The UAV ONE 150 can stay on-station as needed with a 'Hover and hold' mode to provide remote coverage for the maximum possible period and a 'Follow target mode' to maintain discrete observation of specific subjects.

Return on Investment

The UAV ONE 150 is designed and built to maximize the return on your investment in the most economic and versatile way possible. Its ability to work at a maximum altitude of up to 3,300 metres provides a complete aerial platform for civilian and security applications at a practical price. The ability to operate at higher altitudes gives the UAV ONE 150 a high degree of operational flexibility in complex terrain, extending its capabilities to allow new mission profiles.



TECHNICAL SPECIFICATIONS

ONE 150

Wingspan:	4.85 m
Length:	3.65 m
Maximum take-off weight:	150 kg
Payload:	1 – 30 kg
Maximum range from GCS:	200 km
Maximum distance:	2,000 km
Cruising speed:	100 – 150 km/h
Endurance:	15 hours
Maximum altitude:	3,300 metres (FL100)
Runway length:	300 metres
Navigation system:	GPS/Glonass/Galileo/Beidou
Air traffic control:	Transponder S-Mode
Communication:	Radio Datalink 5 - 6 GHz or Satellite Communication
Equipment:	Standard HD/MWIR camera on gimbal mount Options including Lidar sensor Customized sensors / payload as required
Shipping format:	Container 290 x 125 x 100 cm



OK X045X

NO MAGNETIC MATERIALS

Technical specifications and identification label on the right side of the machine.

UAV ONE DESIGNED FOR PORTABILITY

Often, UAV manufacturers focus on the aerial part of the mission, forgetting that the largest part of most UAV operations is the transport of the aircraft and the flight team to the operational area. The UAV ONE 150 is built around a single vehicle delivery concept - the team and the aircraft can fit in a light van.

**FITS IN A CAR - DIMENSIONS IN SHIPPING FORM:
290 x 125 x 100 CM**

The dimensions of the shipping container, purpose built for the UAV ONE models, means that it can fit in a large estate car or light van, so that the team of 2 or 3 people can arrive at their destination as fast and as economically as possible, without requiring special transport, driving licenses or permits.

**IN THE AIR IN UNDER 30 MINUTES FROM THE BOX
- ASSEMBLY TIME 30 MINUTES FOR 2 PEOPLE**

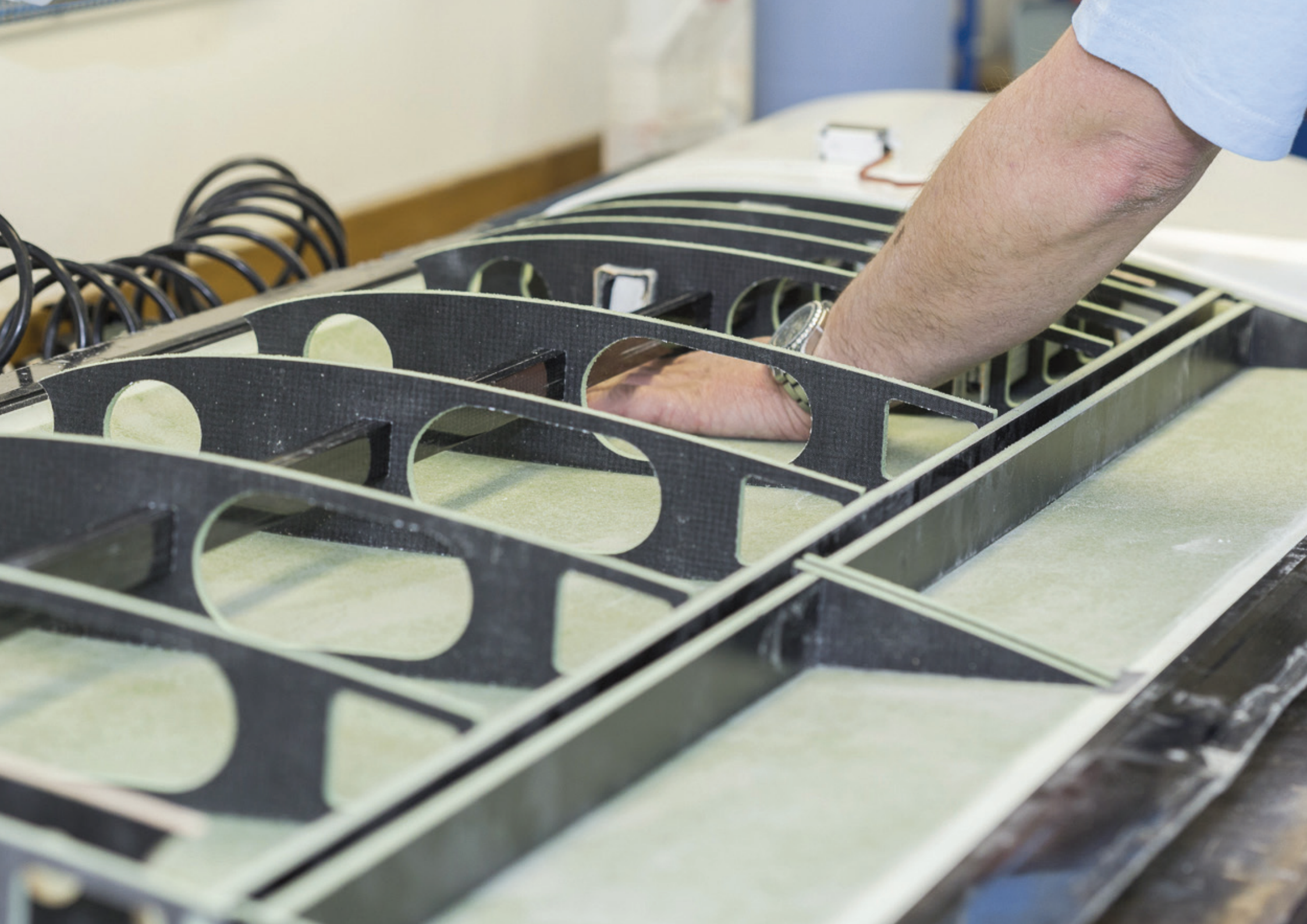


PRIMOCO ENGINE 340

The new Primoco 340 gasoline aero engine represents the latest in engine design for specialist UAV, microlight and model aircraft applications. Its 25HP output provides an outstanding power to weight ratio with a performance that can take your aircraft further, higher and faster. We engineered the Primoco Engine 340 from scratch to focus on durability and reliability. We specified the highest quality components and demanded precision machining techniques. Our experience taught us that the typical small aero engine is designed to fail – often built to a price point, using lower grade metallic alloys and poor-quality machining techniques. Our use of Czech engineering expertise and top-quality components has created an engine that combines power and economy with low vibration, minimal noise and outstanding durability.

TECHNICAL SPECIFICATIONS

Engine:	Four cylinder, Four stroke
Cooling:	Air-cooled
Displacement:	340 CCM
Power:	25 HP
Max RPM:	5,000
Maximum CHT:	160 C
Starter:	Electric
Generator:	24V / 1,000W
Time between overhaul (TBO):	400 hours
Ignition system:	Fully electronic



ORIGIN OF TECHNOLOGY & EXPORT LICENSE

Primoco UAV declares that the Model One UAV series is an original development of our company, designed and manufactured in Prague, Czech Republic, including the electronic management systems and all fuselage components, as well as the engine and all electrical systems. Additional components are incorporated from companies in the United States (Transponder), Spain (Autopilot system), Germany (Servos), Latvia/Australia/Israel (Camera) and Norway (Communications). Military and non-military usage licenses have been approved by the Czech regulatory authorities.

AIRFRAME

The hi-tech composite structure in the Primoco UAV model ONE 150 has a number of advanced features. The airframe uses a 100% composite of fibre glass and carbon fibre for minimum weight with maximum strength. The skin of the wings and fuselage is formed from a composite fibre sandwich with a foam filling, glued with aircraft grade epoxy resin and supported with carbon mouldings for increased strength. After bonding, the composite skin is vacuum moulded and hardened in specialist ovens. The paintwork is applied using a two-part aerospace standard white finish. Finally, the skin is covered with a vinyl film wrap. The landing gear is manufactured using aviation grade duralumin. The landing gear is steered via a servo-motor and braking is provided by electromagnetic brakes on the main undercarriage.

MCSO UA



ELECTRICAL SYSTEM

UAV ONE 150

Electrical system:	24/12V DC alternator (600 – 1,000 W)
Battery:	24/12V, 1 hour backup, charged in flight
Power supply to:	Flight Control Unit, Datalink Servo-motors, Lighting Accessories – Camera, Payload, Sensors
Wing Illumination:	Navigation and collision avoidance LEDs on wings
Forward Illumination:	High Performance LED on nose undercarriage

The Primoco UAV has a 24/12V DC electrical system. The on-board electrical system ensures a power supply for the Flight Control Unit, datalink, steering the aircraft, the servo-motors, illuminating the aircraft and for its accessories – the camera and transponder. In case of alternator failure, the aircraft can run its electrical systems for 1 hour. Illumination of the aircraft is provided by collision avoidance LED lights located on the wings and a high-performance landing LED light unit on the nose undercarriage.

Flight Plan Editor

Auto Land Def. altitude 2500 ft Def. speed 60 kn

Auto 1 ✖ +

Flight Plan Config

Update

V. speed Loiter on last WP

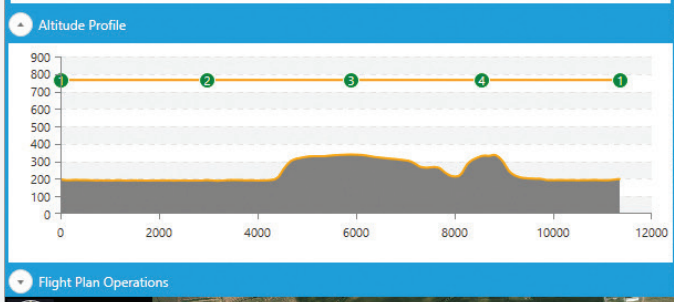
Is absolute

Visualization

Center Hide others

	Position	ASL	AGL	Speed	Dist.	Hdg.	Δ Alt.	Config
1	N 49° 58' 35.73", E 014° 22' 55.02"	2500	1848	60.00	2.81	113	0	Config
2	N 49° 59' 59.73", E 014° 24' 08.86"	2500	1866	60.00	2.98	029	0	Config
3	N 50° 00' 26.44", E 014° 21' 47.70"	2500	1387	60.00	2.92	286	0	Config
4	N 49° 59' 10.97", E 014° 20' 44.62"	2500	1414	60.00	2.64	208	0	Config

[Click here to add new item](#)



Gauges

RPM: 1.67 K, 1.43 K

Left 1: 3.33 K

Left 2: 6.67

Right 1: 3.33 K

Right 2: 36.67

Fuel Press: 5.2 Bar

Fuel Tank: 55.4

Current: 3.33, 1.06

Average: 3.33, 1.06

Average L: 3.33, 1.8

Consumed: 18.33, 0.01

Consumed L: 166.67, 0.02

Cowl: 50.7 °C

OAT: 50.19.22 °C

Primary Flight Display

MAN 1.1 G

IAS: 0, 10, 20, 30, 40, 50, 60, 70, 80, 90

GPS: 270, 303, 330

BAR: 662, 630, 262, 230

0% 2% 0% 1%

User Switches

- Engine Economy
- Engine Starter
- Lights Positional
- Light Landing

Alarms

Visionair OK-X045Y

GCS GPS ERROR

ALTERNATOR

NOT RECORDING

RPM

LOW SPEED

TOO LOW

WOW ON

PITOT TUBE

FAILSAFE DISARMED

Autopilot List

OK-X045Y AP-31 MANUAL

Clear list... Add AP... Discover...

FLIGHT CONTROL SYSTEM

The Primoco UAV has a unique advanced Flight Control System. The plane is controlled remotely during all its flight phases and has the ability to start, land and conduct a flight completely automatically according to its flight plan. In the UAV, the Flight Control System is handled by the autopilot and datalink with multiple redundant CPUs.

The autopilot provides safe and controlled execution of remote flight plans including:

- Auto take-off
- Auto flight plan execution (waypoints)
- Fly-to
- Hover/hold and Follow Target
- Auto Return-To-Base (RTB) in case of communications failure
- Auto landing
- Manual override
- Camera (payload) stabilization, pointing and control

TRANSPONDER

For air traffic identification, a fully compliant S-mode transponder comes standard with the Primoco UAV. The transponder is a piece of equipment that responds to the interrogation impulses of the secondary surveillance radar of air traffic control. An S mode data packet contains information about the aircraft including its flight altitude and GPS position, as well as providing information to ensure safe transit of the aircraft in relation to surrounding traffic. This unique feature allows the Primoco UAV to operate safely in civilian airspace.



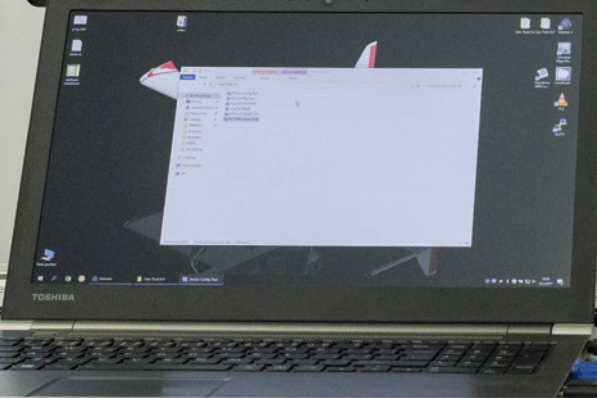
COMMUNICATION AND TRACKING

Primoco UAVs are all equipped with an encrypted high bandwidth communication link for both real time video transmission and command & control of the aircraft from the GCS. As standard, a 200 km telemetry and communication system is delivered with your UAV which gives you the capability to manage missions based around an airfield relatively close to your operational area. Upgrading your UAVs to the high-end BLOS (Beyond Line of Sight) networked communication & telemetry system means that the range and scope of your missions can cover areas with no local landing facilities or extend the distances covered in each survey. The extended operational area means that the crew and team can stay in one location, resulting in shorter mission periods and the ability to cover awkward shaped areas in one day, thus improving the speed of data collection and reducing costs.

The long-range broadband communication is delivered through phased array technology with electronic beam steering and narrow radiation beams providing a capability which is unmatched by conventional systems. If you specify networked units, the system can handle signal obstructions providing stable and robust wireless connections for reliable operations in rural areas.

FREQUENCY USED:

- 5 – 6 GHz (4W).
- Maximum user data throughput: 15 Mbps.
- Available ranges: 40 km, 100 km and 200 km.



118

Backup battery

PRIMSCO UAV



GROUND CONTROL STATION – A ONE BOX SOLUTION, JUST CONNECT ANTENNA.

Primoco The ground based part of the Flight Control System is all managed from one box that is portable and complete. To setup up, open the box, connect the antenna and turn it on:

- Datalink + related systems. All mounted into a robust transportation box.
- GCS
- Central computer
- Software
- Joystick for manual flight mode
- Antenna system
- Camera operator display + management console

Primary Flight Display

IAS: 0, GPS: 322, BAR: 0

Flight Plan Editor

Auto Land Def. altitude 2500 ft Def. speed 60 kn

Auto 1 x +

Flight Plan Config

Update V. speed Loiter on last WP

Is absolute

Visualization

Center Hide others

	Position	ASL	AGL	Speed	Dist.	Hdg.	Δ Alt.	Config
1	N 49° 20' 35.80", E 014° 04' 58.38"	2500	1108	60.00	2.25	312	0	Config
2	N 49° 21' 19.67", E 014° 05' 25.86"	2500	1041	60.00	1.46	022	0	Config
3	N 49° 21' 11.90", E 014° 06' 11.14"	2500	1130	60.00	0.94	105	0	Config
4	N 49° 20' 15.98", E 014° 06' 34.34"	2500	1157	60.00	1.79	165	0	Config
5	N 49° 19' 47.36", E 014° 06' 22.18"	2500	1205	60.00	0.92	195	0	Config

Click here to add new item

Altitude Profile

Flight Plan Operations

Move 0.00 km Azimuth 0 Shift

Change altitude 0 ft Up Down

Set altitude 0 ft Set ASL Set AGL

Rotate 0 deg around waypoint Anticlockwise Clockwise

Mirror around waypoint Horizontal Vertical

Invert waypoints order Invert

User Switches

- 4 Engine Economy
- 5 Engine Starter
- 6 Lights Positional
- 7 Light Landing

Alarms

Visionair OK-X045Y

GCS GPS ERROR NOT RECORDING

ALTERNATOR RPM NO REPORT

LOW SPEED ENGINE ECU TOO LOW

RADIOALTIMETER WOW ON

PITOT TUBE FAILSAFE DISARMED

Gauges

RPM, Left 1, Left 2, Right 1, Right 2, Fuel Pressue, Fuel Tank, Current, Average, Average L, Consumed, Consumed L, Cowl, OAT

Autopilot List

OK-X045Y AP-31 UNKNOWN

Clear list... Add AP... Discover...

PILOT SOFTWARE

The intuitive software provides a complete control system for the pilot to manage the pre-flight planning, flight execution and monitoring of the UAV. The software allows waypoints to be set up and adjusted in flight, whilst also providing full access to the UAV controls, instruments and datalink monitoring. Separation of the pilot and payload operator roles is built into the system to maximise the safety and security of every flight.

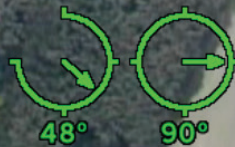
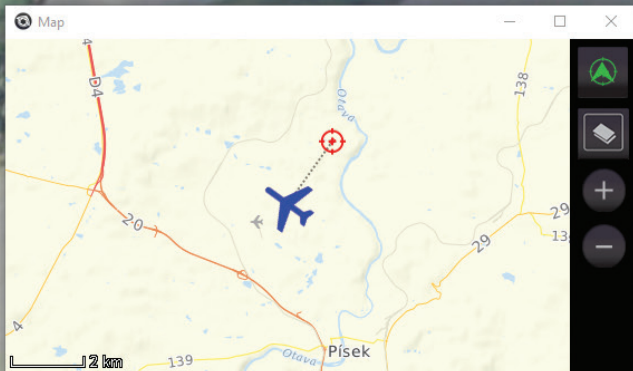
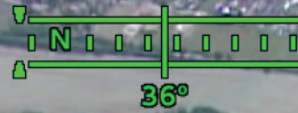
REAL TIME CONTROL AND AUTO PILOT BACKUP

The UAV can be controlled directly by the pilot at any point for the execution of tricky or variable missions including specific mission segments. The combination of flight planning with autopilot execution and failover modes gives the Primoco UAV a best-in-class approach to air safety and mission control. The self-landing return to base capability in case communications are disrupted is a particular benefit to avoid complex and costly recovery of lost UAVs.

SIMULATION

A simulator is highly recommended for keeping your pilots skilled and up to date, at modest cost. It consists of a computer connected to the real autopilot to enable practising the same control modes and functionalities as the genuine GCS.

MODE:
GYROSTAB:
AC POS: 49.34558N 14.12457E
AC AMSL: 1594M
SPD:
HFOV: 62.9°



TGT POS: 49.36095N 14.14143E
TGT AMSL: 388M
SR: 2424M
UTC: 13:20:00.377
6 AUG 2019



SENSOR, CAMERA AND PAYLOAD PACKAGES FOR EVERY MISSION

ACQUIRE AND DELIVER DATA RELIABLY IN REAL-TIME

With a Primoco UAV system you can acquire the data you need 100% reliably when your mission requires it. A wide range of options are available for the main front mounted optical sensor which can even be configured to your own requirements. The basic camera is fully gyro-stabilized and has multiple sensors including HD daylight, 30x optical zoom and an infrared camera with a choice of six lenses. The stable, gimballed, system provides reliable data capture, on board recording and transmission for the optional LIDAR, Hyperspectral and geo-tracking capabilities.

A PAYLOAD CAPACITY FOR EVERY REQUIREMENT

The internal payload of up to 30 kg can be used to expand sensor capabilities and recording packages to cover almost any imaginable requirement for remote monitoring and sensing. A range of magnetic, meteorological and geological sensors are available. It is even possible to create a remote radio retransmission station with the UAV hover/hold Autopilot mode.



OCTOPUS EPSILON 175 STABILISED FOUR-SENSOR GIMBAL WITH MWIR

SMALLEST 4-SENSOR EO / MWIR GIMBAL WITH
LONG RANGE CONTINUOUS ZOOM CAPABILITY

System specifications

Stabilization	<75 μ rad
Weight	2.6kg / 5.73lb
Size	Diameter - 175mm / 6.88 in Height - 220mm / 8.66 in
Environmental Protection	IP64 (IP66 optional)
Operating Temperature	-25 to +50° C / -13 to 122° F
Rotation Limits	360° continuous pan -80° to +10° elevation
Slew rate	120 deg/sec
Power	35W typical / 150W peak
Input Voltage	24 Volts
Video Out	Digital H.264 encoded video Analog PAL or NTSC
Control Interface	RS 232, Ethernet

Onboard Image Processor Specifications

Object tracking	Yes
Scene steering	Yes
Software stabilization	Yes
Software roll correction	Yes
HD Video output	720p HD output
Onboard Video Recording Snapshots	32 Gb onboard memory
H.264 encoding	Yes
Moving Target Indicator	Yes
Video Enhancement	Yes
Geo-Location Feature	Yes
Moving Map Software	Yes
Picture-in-picture	Yes

EO Sensor

Type	EO sensor
Global shutter	Yes
Vertical FOV	37.9°-1.3°
Resolution	HD 1280×720px
Optical zoom	30x

Laser Rangefinder

Type	Diode laser
Range	Up to 5000m (static applications) Up to 2500m (dynamic applications)
Accuracy	Better than 1m

Class I (Eyesafe)

Laser Pointer

Class IIIb

Wavelength	830nm
Power output	50mW

IR Sensor

Type	MWIR 3-5 μ staring array, cooled
IR Lens	15x zoom lens 18 - 275 mm
Vertical FOV	24.2° - 1.5°
Resolution	SD 640 \times 512px
Frame rate	30 Hz

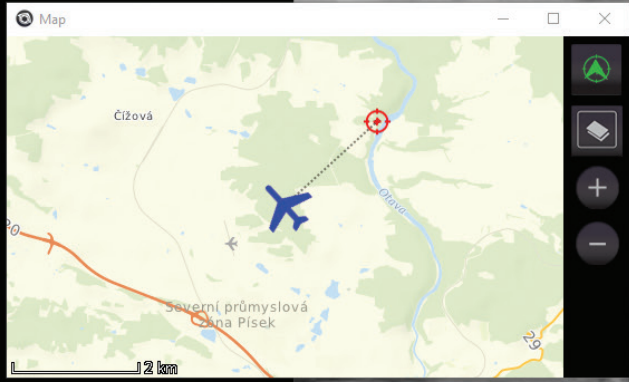
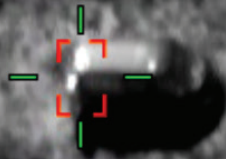
IR Sensor DRI

Target	Human (1,7 \times 0,5m)	NATO (2,3 \times 2,3m)
Detection	8600m	12400m
Recognition	2900m	7000m
Identification	1400m	3500m

MODE:
 GYROSTAB:
 AC POS: 49.34406N 14.12596E
 AC AMSL: 1594M
 SPD:
 HFOV: 1.5°



48°



47°

90°

TGT POS: 49.35598N 14.1461E
 TGT AMSL: 391M
 SR: 2316M
 UTC: 13:20:05.545
 6 AUG 2019



x1





OCTOPUS EPSILON 140 STABILIZED DUAL-SENSOR UAV GIMBAL

MOST ADVANCED MICRO EO / IR GIMBAL FOR LONG-RANGE SURVEILLANCE

System specifications	140	140Z
Stabilization	<150 μ rad	
Weight	1.73kg / 3.81lb	1.76kg / 3.88lb
Size	Diameter - 140mm / 5.51in Height - 189mm / 7.44in	
Environmental Protection	IP64	
Operating Temperature	-25 to +50° C	
Rotation Limits	360° continuous pan -80° to +30° elevation	
Slew rate	120 deg/sec	
Power	20W typical / 50W peak	
Input Voltage	24 Volts	
Video Out	Digital H.264 encoded video Analog PAL or NTSC	
Control Interface	RS 232, Ethernet	

Onboard Image Processor Specifications

Object tracking	Yes
Scene steering	Yes
Software stabilization	Yes
Software roll correction	Yes
HD Video output	720p HD output
Onboard Video Recording Snapshots	32 Gb onboard memory
H.264 encoding	Yes
Moving Target Indicator	Yes
Video Enhancement	Yes
Geo-Location Feature	Yes
Moving Map Software	Yes
Picture in Picture	Yes

Laser Rangefinder

Class I (Eyesafe)

Type	Diode laser
Range	Up to 5,000m (static applications) Up to 2,500m (dynamic applications)
Accuracy	Better than 1m

Laser Pointer

Class IIIb

Wavelength	830nm
Power output	50mW

EO Sensor

Type	EO sensor
Global shutter	Yes
Vertical FOV	37.9°-1.3°
Resolution	HD 1280×720px
Optical zoom	30x

IR Sensor

140

140Z

Type	LWIR uncooled	LWIR uncooled
IR Lens	60mm	3.3x zoom lens 18 - 60mm
Vertical FOV	7.7°	24.2° - 7.7°
Resolution	SD 640×512px	SD 640×512px
Frame rate	30Hz or 9Hz	

IR Sensor DRI

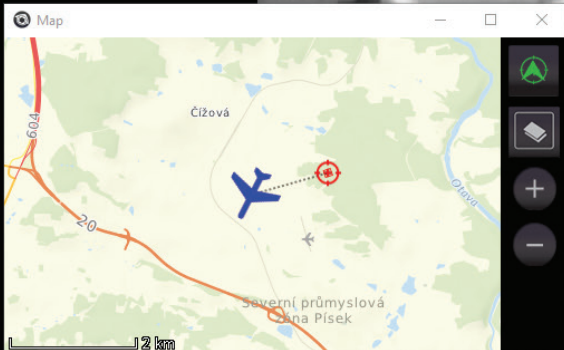
Target	Human (1,7×0,5m)	NATO (2,3×2,3m)
Detection	2,000m	2,760m
Recognition	625m	846m
Identification	375m	307m

MODE:
 GYROSTAB:
 AC POS: 49.34521N 14.10217E
 AC AMSL: 1695M
 SPD:
 HFOV: 3.4°


 72°



[Home]
 [Back]
 [EO]
 [IR]
 [REC]
 [Camera]
 [+]
 [Zoom]
 [-]




 55° 225°

TGT POS: 49.34833N 14.1187
 TGT AMSL: 419M
 SR: 1787M
 UTC: 13:31:01.884
 6 AUG 2019

[Location] [Play] [Pause] [Progress Bar]



PRIMCO UAV

MAINTENANCE AND OPERATION

RELIABILITY IS KEY TO YOUR SUCCESS

High quality production ensures your aircraft leaves our factory perfect. To keep your investment in perfect condition, it needs maintenance from trained professionals. Our planned maintenance programs keep the servicing of your UAV simple and cost effective to maximize flight hours. To ensure your maintenance is simple and non-demanding, whatever the circumstances, we are always happy to help you service the aircraft. At the same time, we will train your pilots and mechanics in basic maintenance of the aircraft. Detailed maintenance guides are included in the Service Guide.

Aircraft maintenance sets out a series of regular operations every 25–100–200–400 hours. It primarily involves a thorough inspection of all mechanical parts and the engine. The aircraft's airframe and electrical system is maintenance-free.

A standard spare parts package for the first 400 flight hours (FHs) per aircraft are available. The alternative 800 FHs package is convenient for intensive daily use or remote locations.

AUTOMATED MAINTENANCE MANAGEMENT

Our Internet based Flight Operation System will allow you to smoothly monitor each flight and will remind you about all necessary maintenance in advance. Features include scheduling, journey logs, aircraft maintenance logs, a list of all aircraft components and order forms for spare parts, with everything coordinated to match the operations manual and directly linked over the internet to the manufacturing floor of our company. This allows Primoco to make assumptions ahead of time on the spare parts each customer will require and when, and to make sure these are always manufactured, shipped and delivered in time to keep the downtime of your aircraft to the absolute minimum.

 L E T I Š T Ě P Í S E K



TRAINING

All Primoco UAVs come with full pilots' and mechanics' training to ensure safe and efficient operation.

As per UAV/UAS standards, distinction is made between:

- External Pilot; capable of the entire aircraft manual operation from take-off to landing, plus handling all the on-board systems, and
- Internal Pilot; taught to operate all the on-board systems while the aircraft is running on autopilot.

Training lasts for 8 - 12 weeks, depending on pilot experience. The training comprises a full theoretical and practical training program with a strict emphasis on risk management and safety for the crew and the area of operation.

THEORETICAL TRAINING CONSISTS OF:

- Aviation law
- General knowledge concerning UAVs
- Flight planning and performance, risk management
- Human performance and limitations
- Meteorology
- General navigation and radio navigation
- Operational procedures
- Principles of flight
- Communications

PRACTICAL TRAINING CONSISTS OF:

- Pre-flight preparation, Risk Management
- Standard starting preparation
- Take-off
- Training in controlling the machine in flight, developing a sense of how to orientate the machine
- Training in controlling the machine without using automatic functions
- Training in controlling the machine using automatic functions
- Ending the flight
- Landing



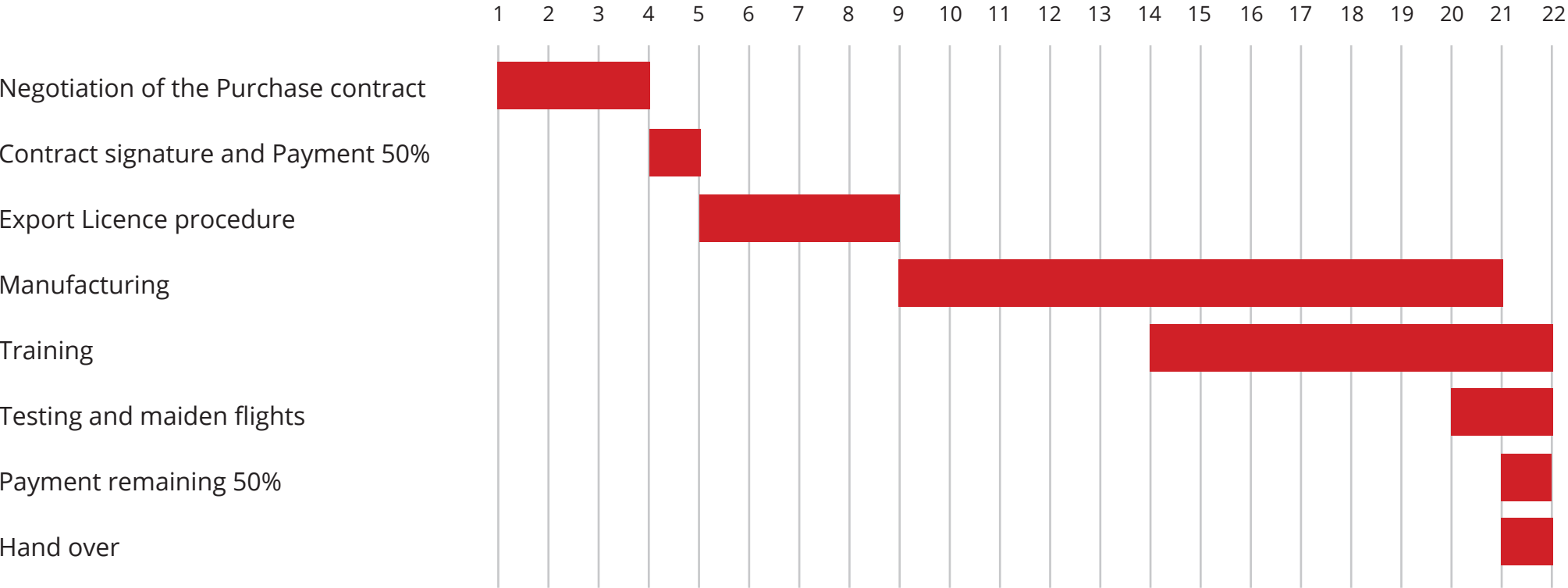
PRIMSCO UAV

DANGER

DELIVERY TIME



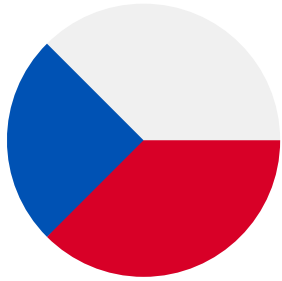
Indication of production and delivery cycle is shown as follows:





REFERENCE

Where does Primoco UAV fly?



CZECH REPUBLIC



MALAYSIA



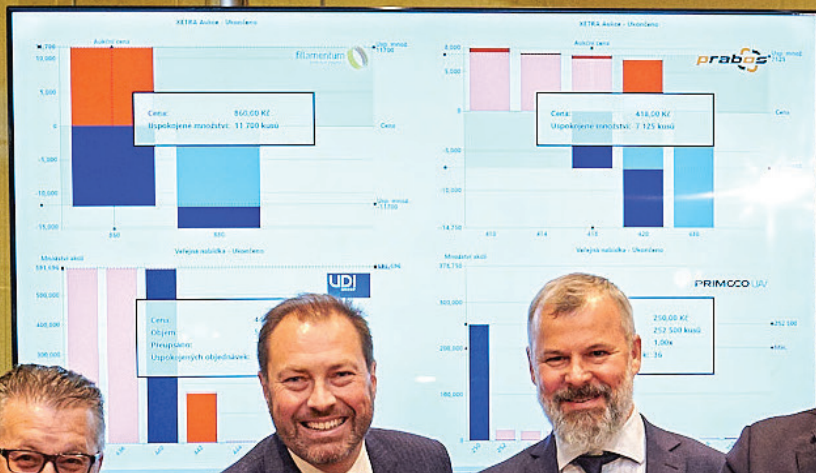
BURKINA FASO



FINLAND (aerial work)



RUSSIA (aerial work)



COMPANY DETAILS

Company name:	Primoco UAV SE
Registered office:	Výpadová 1563/29f, 15300 Prague, Czech Republic
Manufacturing location:	Prague, Czech Republic
Employees:	30
Auditors:	TPA Czech Republic
Legal form:	Joint-stock company
ID No.:	03794393
Legal Entity Identifier:	LEI 315700ZD9L6SRNJ3PL58

Chief Executive Officer	Ladislav Semetkovský / Phone +420 603 469 606
Vice President of Sales	Jakub Fojtík / Phone: +420 605 857 437
Website:	www.primocouav.com
Email:	sales@primoco.com
Bank details:	Komerční banka, a.s. (Société Générale Group)
Account No:	CZ5101000001079695190277 / KOMBCZPPXXX

DECLARATION

—

This presentation (offer) represents a joint offer of goods supply made by companies Primoco UAV SE, having its registered office at Výpadová 1563/29f, Postal Code 153 00, Prague 5 – Radotín, Czech Republic, Company ID No.: 037 94 393, registered in the commercial Registry kept with the Municipal Court in Prague, Section H, Insert 1546 (“**Primoco UAV SE**”) and Primoco UAV Defence, having its registered office at Výpadová 1563/29f, Postal Code: 153 00, Praha 5 – Radotín, Czech Republic, Company ID No.: 081 05 111, registered in the commercial registry kept with the Municipal Court in Prague, Section C, Insert 313076 (“**Primoco UAV Defence**”). Depending on the circumstances the subject of the offer can be considered as (i) goods of dual-use within the meaning of the Council Regulation (EC) No 428/2009 of 5 May 2009 setting up a Community regime for the control of exports, transfer, brokering and transit of dual-use items (“**Dual Use Goods**”) or (ii) military equipment within the meaning of the Czech Act No. 38/1994 Coll. on Foreign Trade with Military Material, as amended (“**Military Equipment**”). Offering party and supplier of the Dual Use Goods is exclusively Primoco UAV. Offering party and supplier of the Military Equipment is exclusively Primoco UAV Defence.