



## UAV Shepherd

The most advanced Shepherd powered by U-pilot extend its capabilities beyond the limits of an usual model aircraft. Mixing the latest composites materials with the vanguard of avionics we offer under a turnkey agreement a fully system for being operated on a whole world which is lacking lot of things.



Its fuselage made of Kevlar® and Carbon Fabrics with Epoxy resin for the Aerospace Industries provide, together with the EPP wing, a high level of ruggedized to this UAV.

Each part can be easily replaced for a new one in minutes improving the MTBF and therefore its reliability. Definitely you will purchase a system tested and made for working in extreme conditions.

As any requirement depends on its mission, you can select which payload your Shepherd needs up to a 800gr into the main deck and wing. Our customers are usually interested on extra battery for extended operations, Night vision sensors and FLIR® technology. If you have any enquire do not hesitate in ask about it.

The Shepherd is built to imitate the looks of a rapacious bird. This characteristic makes it an ingenious, unique and useful system for wild life control and surveillance applications.

This allows observation from sky going undetected on ground: nobody suspects of a bird flying-by. While in flight is very difficult to tell apart from a real bird.

It looks so real that the shepherd is also great for pest control in locations where birds are a problem: airports, ports, wind farms, etc. The birds recognise the Shepherd as a predator for them and leave the area. The Shepherd presents a solution effective against bird pest without the problems associated with falconry. It does not need to sleep, does not stop working breeding season, does not need to change feathers, etc.

When combined the fantastic and realistic looks with the Airelectronics' flight control system a very capable UAV appears: allowing very discreet over the hill surveillance, it also can be applied to the automation of pest control by allowing inexpert users to manage the flight of the platform, making the controlled zones free of bird pest.

Using a standard computer, the user can plan, fly and modify the UAV mission in real time in the easiest possible way thanks to the U-Pilot flight control system and the U-See ground station software. The operator doesn't need any previous flight experience and it is not even necessary to have a manual joystick because the system can fly 100% in automatic mode: from the take-off to the landing. In case of a communications problem the plane will come back home and land safely.





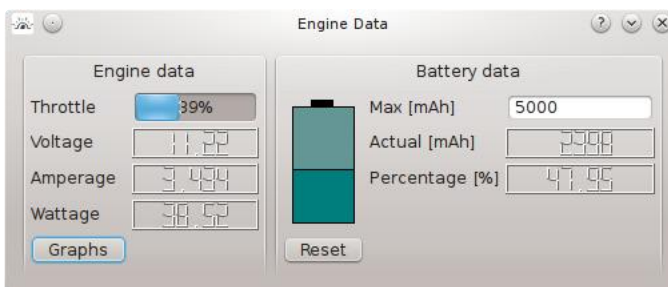
## UAV Shepherd

Due to the fact than the plane has been built using composites and EPP its weight is really low, so it is really easy to hand launch it and to land it: any operator can do it, even without any previous skill, and it will land on its fuselage without big damage in almost any terrain.

After long optimization tests done on the field the best engine-propeller relationship has been selected and special engine control law has been designed achiving the best possible endurance.

The brain for the plane is the Airelectronics' U-Pilot flight control system, which is embedded inside the plane's fuselage. Being based in FPGA technology, U-Pilot's configurability and flexibility is unsurpassed and the advanced sensor mixture using extended Kalman filtering assures an optimal attitude and navigation control.

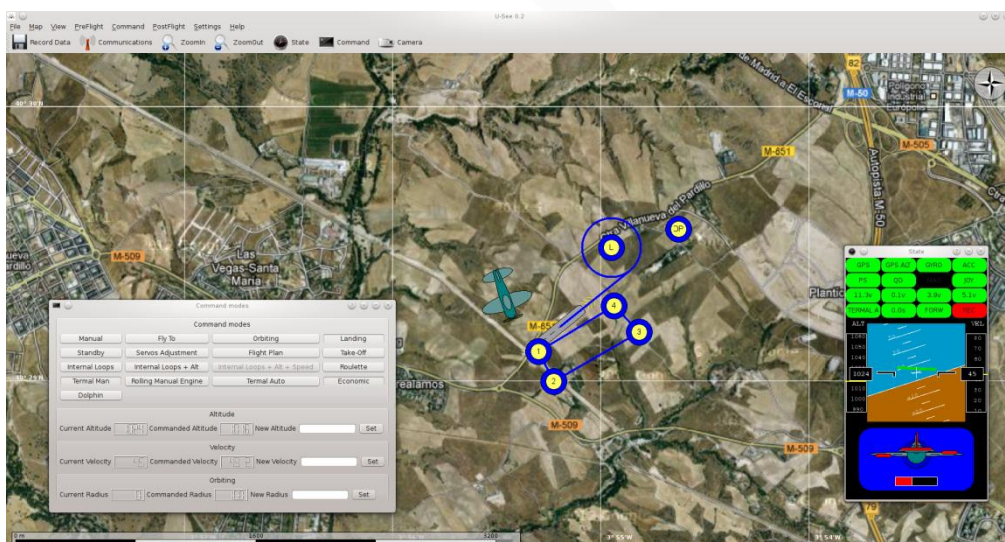
It can be adapted to control any payload you want, and has camera control capabilities already built-in, including geo-reference of a camera image.



U-Pilot can fly the aircraft using waypoint navigation, even when the GPS signal has been lost by using dead-reckoning navigation. Can also orbit around a ground location and can fly directly towards a map clicked location.

Its control laws has been optimized for the control of the electric motor the UAV Shepherd uses, having automatic modes that take advantage of the energy present in the atmosphere: The plane has capability to climb taking advantage of the convective activity (thermal soaring). This way it gains flight time and extends its range. This gives almost unlimited loiter time over a forest fire.

It monitors the amount of energy that came from the batteries and uses the batteries up to the point it is bingo time.







## UAV Shepherd

### Highlights



#### Thermal Soaring

Take advantage of the atmosphere energy



#### Fully autonomous

No human intervention required during flight



#### Multi-Payload

The plane can accomodate a great number of payloads



#### Affordable

Unlike other solutions, the prices are reasonable



#### Hull renovation

We will supply you a new hull free of charge if yours is damaged



#### Bat. monitoring

Real time battery monitoring assures that you won't loose the aircraft due to overuse



#### Real-Time Video Feed

Using a video transmitter you can receive real-time the video feed



#### Flight-Plan

Automatic flight plan following allows to complete unattended missions



#### Camera geo-reference

The system can give geo-referenced images

### Possible Applications



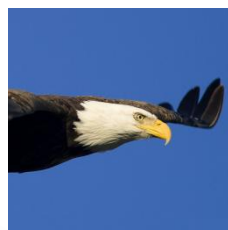
#### Border control

Survillance in terrestrial and maritime borders



#### Police Usage

Demonstration control, anti-drug operations



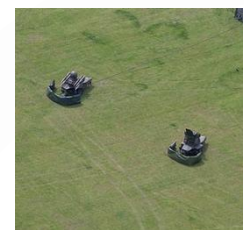
#### Bird Control

Airports, ports, windfarms, etc.



#### Fire Fighting

Monitor Active fires, avoid reactivation of controlled fires



#### Military

Forward observer, over the hill recon missions





## UAV Shepherd





### Flight control Specification

#### Flight control

Attitude Estimation & control..... 1000Hz rate  
Flight-plan..... Up to 200 way-points  
Speed Control..... Auto-throttle  
Take-Off & Landing..... Automatic

#### GPS Positioning

SBAS..... Global coverage  
Differential navigation..... available on request

#### Interface with Payloads & Actuators

PWM & GPIO outputs.....30  
PWM rate (configurable)..... Configurable  
RS-232 ports..... 4 RS-232 compliant ports  
RS-232 Rates..... 9600 – 115200 bps  
External ADC channels.....3 channel 12bit - 0-30 V  
Main Voltage supply supervisor

#### Telemetry

Data-Link Frequency .....900MHz/1.4 Ghz/2.4GHz  
Power.....1 W  
Range.....100 km / 80km / 40 km  
baud rate..... 115200 bps

#### Air Data System

Dynamic pressure sensor range..... 0 – 200 km/h  
Static pressure, low altitude option ..... 0-2000 m  
Static pressure, high altitude option..... 0-4000 m

#### Camera Control

Protocols..... VISCA®, Controp & PWM  
..... Other protocols upon request  
Camera modes..... Geo-Pointed, Stable, Manual

### Minimum Hardware for Control Computer

The recommended hardware is the MacBook Pro 13" with BootCamp and Microsoft Windows 7.

OS.....Linux, Windows orMacOs X  
Processor..... Intel Core i5  
RAM..... 2GB  
Hard drive..... 5 free Gb  
Video Card.....OpenGL supported  
Screen..... at least 13"  
Ports ..... 1 RS-232 port  
..... (native or through USB adaptor)

### Plane Specification

#### Dimensions

Length..... 1100 mm  
Wing Span..... 1650 mm

#### Weights

Empty Weight.....2,0 kg.  
Maximum Take-Off Weight..... 2,8 kg.

#### Endurance

3000 mAh battery option..... 30 min minimum  
6000 mAh battery option..... 50 min minimum  
8000 mAh 4s battery option..... 90 min minimum

Typical Cruising speed..... 50 km/h