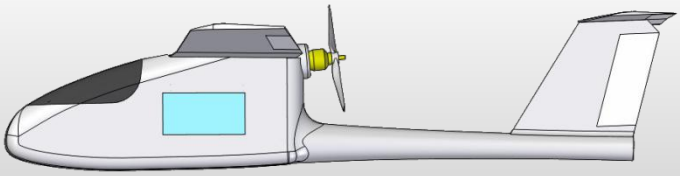
airelectronics
UAV AUTOPILOTS



Skywalker Kit

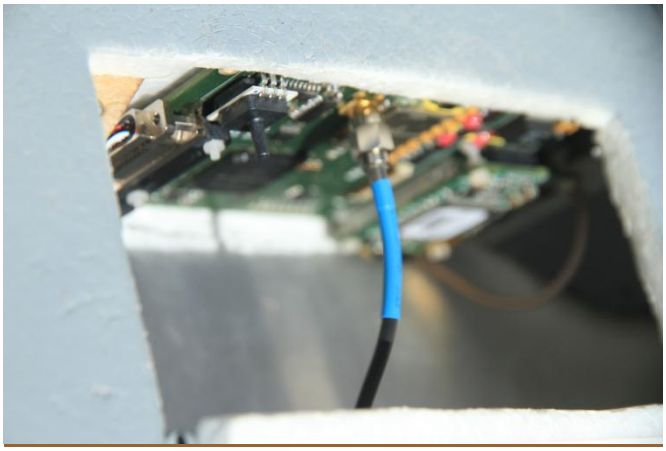
We offer a complete solution for a user that need to put a payload in a advanced position at low cost completely designed by the Spanish company Airelectronics.

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 came back home and land safely.

The plane is based in COTS materials (Commercial off-the-shelf) and has been adapted to became a complete UAV. Due to the fact than the plane has been built using composites and EPO its weight is really low (1.3 kg without the payload) 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. Payload weight can be up to 1.2 kg giving to the system a really good payload weight / total weight relationship.

The use of EPO, a material that comes from the elapor, reduces weight and makes the integration of the payload an easy task. It is an incredible easy to work material. It also has "shape memory": in case of a crash the material will deform itself and will came back to its original shape.

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



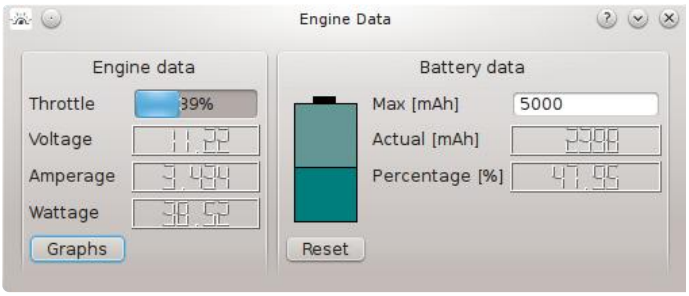
The brain for the plane is the Airelectronics' U-Pilot flight control system, which is embedded inside the plane's fuselage, leaving a lot of space on board to install a payload. Being based in FPGA technology, U-Pilot's configurability and flexibility is unsurpassed and the advanced sensor mixture using 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.

Skywalker Kit

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 Skywalker 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.

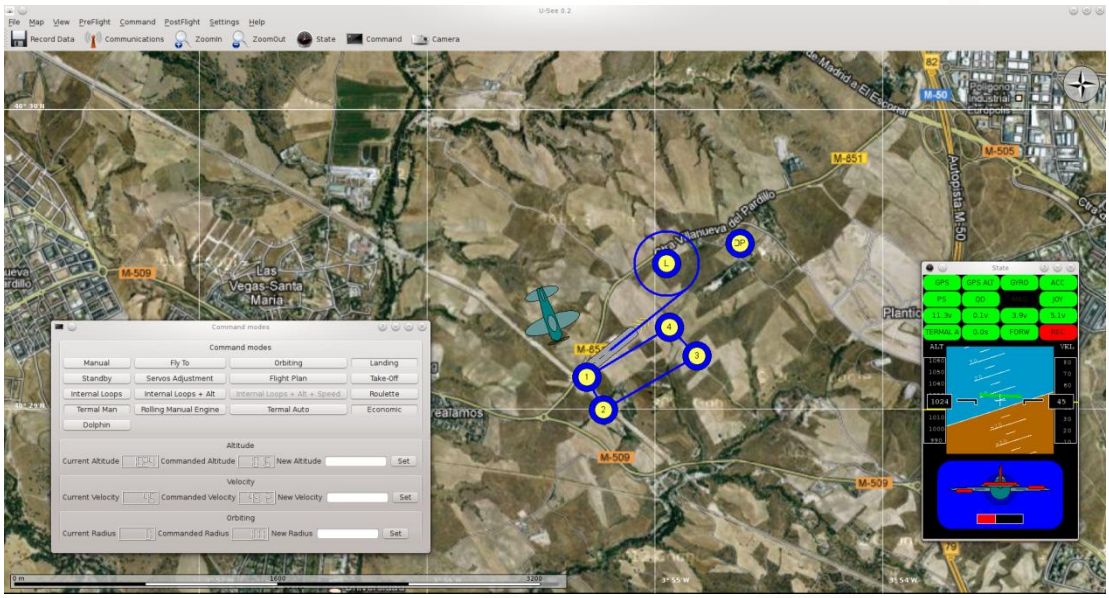


The UAV Skywalker is available in the basic and Pro versions, providing the latter some additional features that are useful in some applications.

The electronics inside the Skywalker Pro have sensor redundancy, meanwhile the plane has a belly protection that reduces the damage absorbed by the hull when landing in hard environments.

The Skywalker Pro features a new Li-Ion Battery that doubles the standard Skywalker endurance and allows the plane to perform a high slope takeoff, recommended when working in areas with obstacles.

To allow landing in these areas, the Pro version also has spoilers that allow the plane to land within a few meters. A landing and takeoff slope diagram can be found at the end of this document.



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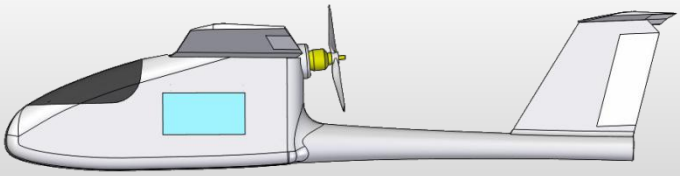


Skywalker Kit

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

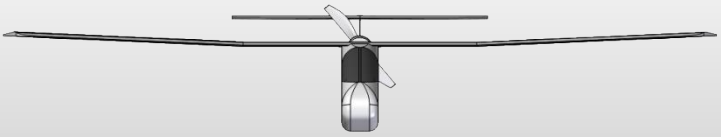
Border control
Survillance in terrestrial and maritime borders

Police Usage
Demonstration control, anti-drug operations

Agriculture
Status of crops, Forest mass control, study of soil

Fire Fighting
Monitor Active fires, avoid reactivation of controlled fires

Military
Forward observer, over the hill recon missions



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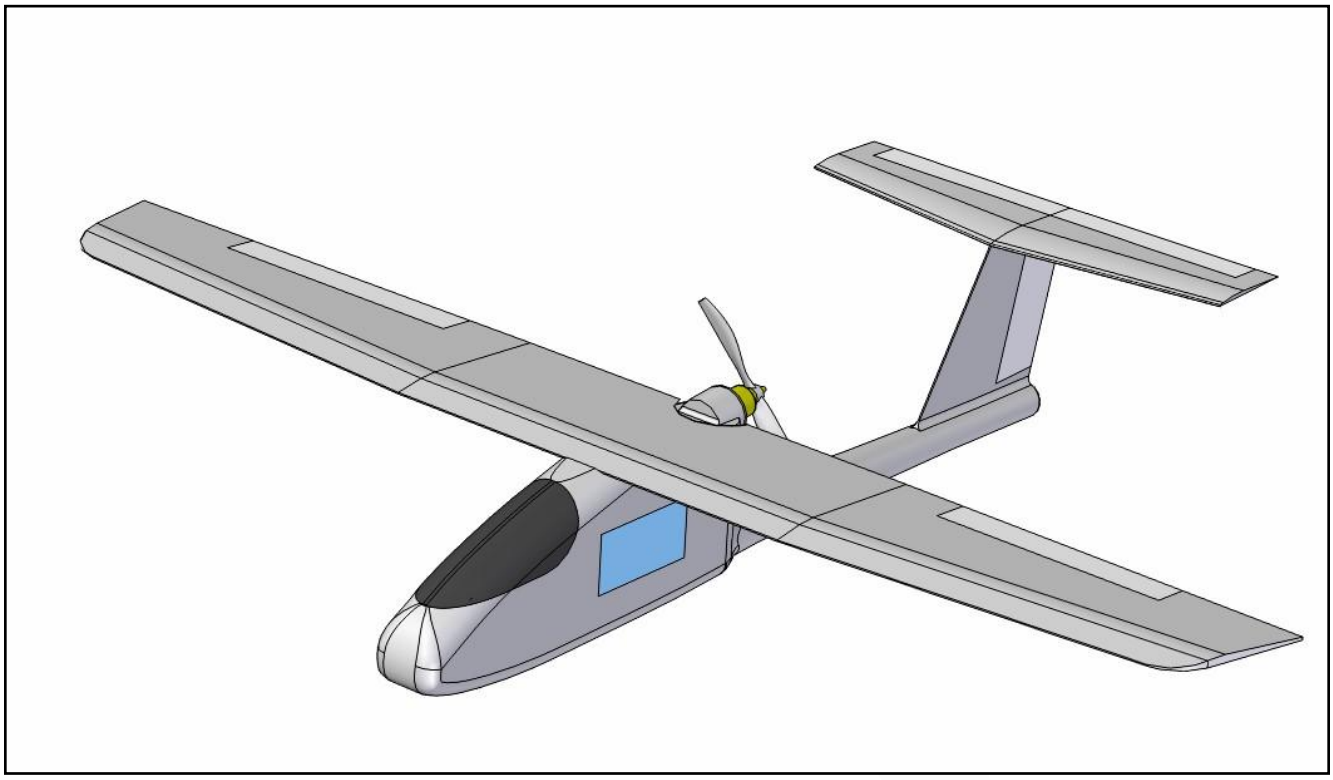

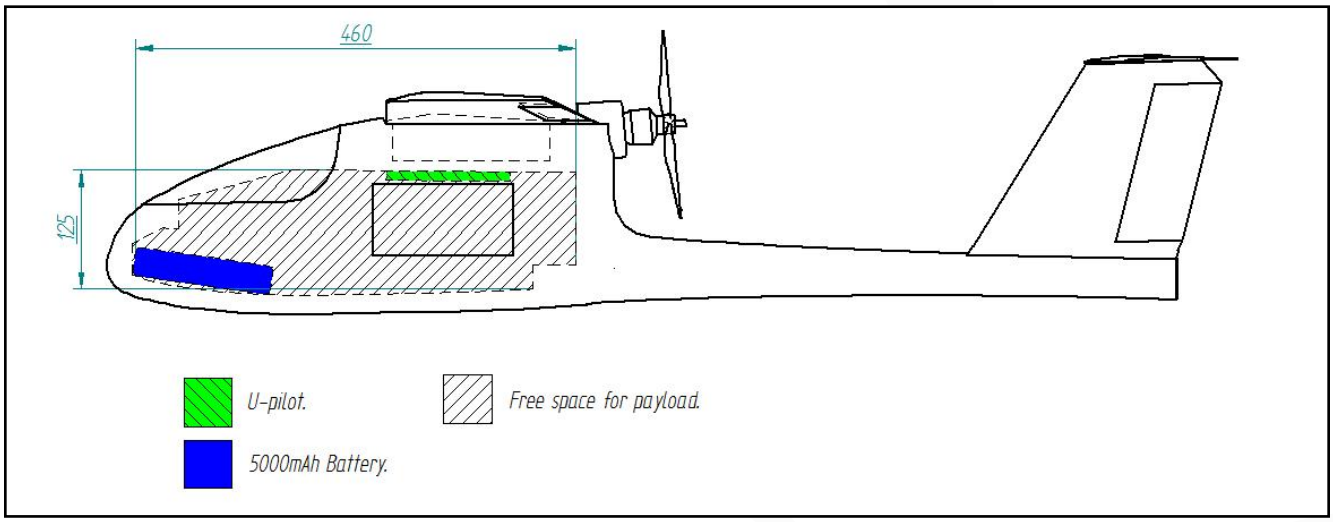

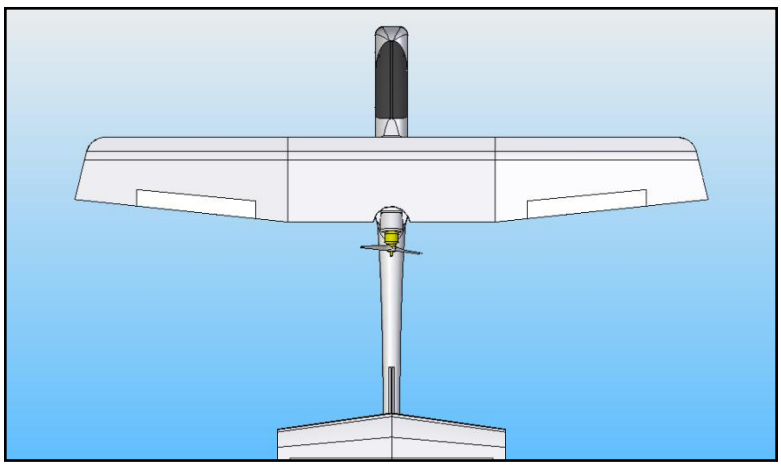

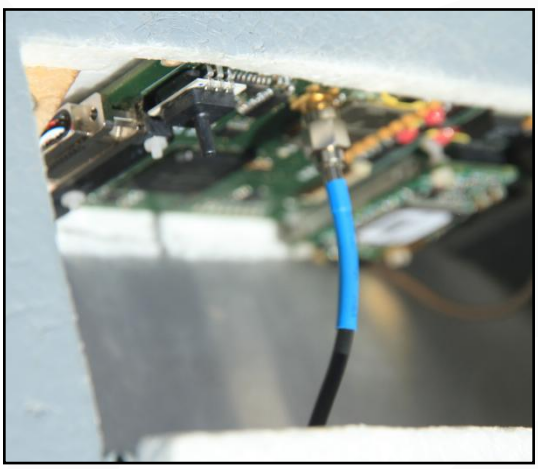

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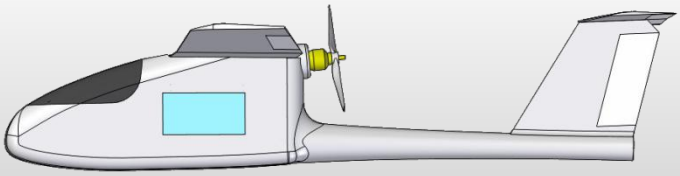

Skywalker Kit

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
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

Cammera 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..... Windows or Linux
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..... 1680 mm/1880mm
.....(Two Options available)
Payload Bay..... 3450 cm^3

Weights

Empty Weight.....1,3 kg.
Maximum Take-Off Weight..... 3,0 kg.

Endurance

5000 mAh battery option.....30 min minimum
10000 mAh battery option.....1 hour minimum
Long Endurance battery option..... Up to 2.7 hours
Typical Crusing speed..... 45 km/h