Octocopter Kit

airelectronics
UAV AUTOPILOTS

We offer a complete solution for users that need a platform to carry heavy payloads when rotary wing capabilities are required.

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 because the system can fly 100% in automatic mode: from the take-off to the landing. In case of a communications problem the aircraft will came back home and land safely.

The octocopter frame is made of carbon fiber and light materials obtaining a total empty weight, including motors and wiring, of 4.0 kg. The legs of the vehicle allow the multirotor to safely land even when the terrain is not completely horizontal. The equipied rotors make the octopoter capable of reaching a maximum takeoff weight of 9 kilograms, with 5 free kilograms for payload and batteries.

The brain for the UAV is the Airelectronics' U-Pilot flight control system. The small form factor of the new U-Pilot OneBoard leaves almost all the platform free to attach 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.

The autopilot can be adapted to control any payload you want, and it has camera control capabilities already built-in, including geo-reference of a camera image. This plattform is suitable for multiple purposes, from precission agriculture to surveillance or border control.

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

The attitude and navigation control has been optimized to control the rotary wing UAV with very smooth and controlled transitions, hovering and navigation. The control algorithms are also capable to react upon a failure of a rotor, allowing the octocopter to safely land even with an engine stopped.

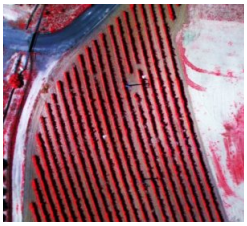
Possible Applications

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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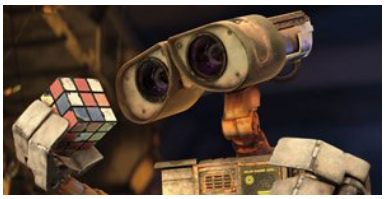
Highlights

Real-Time Video Feed

Using a video transmitter you can receive real-time video

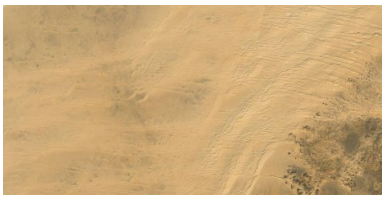


Fully autonomous

No human intervention required during flight

Affordable

Unlike other solutions, the prices are reasonable



Camera geo-reference

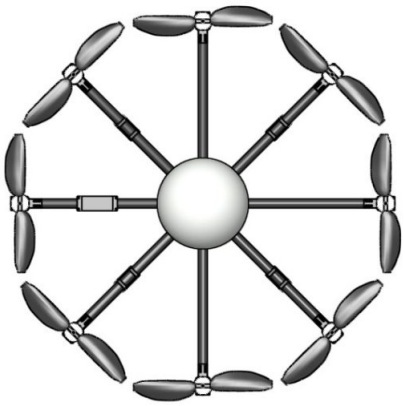
The system can give geo-referenced images

Multi-Payload

The vehicle can accomodate a great number of payloads

Flight-Plan

Automatic flight plan following allows to complete unattended missions



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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, Stabilized, 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)

Vehicle Specification

Dimensions

Rotors..... 380 mm
Overall Diameter..... 1410 mm
Height.....470 mm

Weights

Empty Weight.....4,0 kg.
Maximum Take-Off Weight..... 9,0 kg.

Endurance

Up To (view chart below).....36 min.