Parrot AR.Drone

Quadricopter controlled by iPod touch® / iPhone®

Main features

- Ad-hoc digital Wi-Fi liaison (no need for a Wi-Fi router). Range: up to 50 meters (164,05 feet)
- 2 video cameras with live streaming on the iPod touch® / iPhone® screen
- Automatic stabilization and full piloting assistance (up to 6 meters/19,7 feet altitude)
- Tactile control interface on iPod touch® / iPhone® with beginner and expert modes
- Maximum running speed: 5 m/s; 18 km/h
- Maximum altitude with liaison: 50 meters (164,05 feet)
- Running time: about 12 minutes
- Safety system:
    - o EPP hull for indoor flight;
    - o Automatic locking of propellers in the event of contact;
    - o UL2054 battery;
    - o Control interface with emergency button to stop the motors.
- Dimensions:
    - o With protective hull (indoor flight): 52,5x51,5cm (20,7x20,3 inches) - Weight: 400 g
    - o With shaped hull (outdoor flight): 45x29cm (17,7x11,4 inches) - Weight: 360 g

Radio digital liaison

- Wi-Fi b/g module embedded, configured in ad-hoc mode for a maximum mobility

Video

- **Front camera:**
    - VGA camera (640x480 pixels), 93° wide-angle diagonal lens, CMOS sensor
    - Encoding and streaming of images on iPod touch® / iPhone® (20 fps)
    - Enemy drone detection
        - o Validation of shots
        - o Estimate of distance
        - o Detection distance: 5 meters
    - Tag detection
        - o Tag position calculation
        - o Calculation of virtual objects position
        - o Detection distance : 5m
    - Video feedback on the iPod touch®/ iPhone® screen

- **Vertical camera : High speed camera**
    - o QCIF camera (176x144 pixels), 64° diagonal lens, CMOS sensor
    - o Calculation of horizontal shifting speed: 60 fps
    - o Encoding and streaming of images on iPod touch® / iPhone® (20 fps)

- **Autopilot**
  - Automatic take-off and landing.
  - Automatic stabilization indoor and outdoor (wind < 15km/h, altitude limited to 6 meters / 19,7 feet)
  - Automatic speed regulation (altitude limited to 6 meters / 19,7 feet)
  - Dual mode indoor (precision) or outdoor (speed)

- **Control via tactile interface with iPod touch® / iPhone®**
  - Beginner (2 fingers) and Expert (1 finger) modes
  - Use the iPod touch® / iPhone® accelerometer to control the AR.Drone
  - Reproduce movements of the iPod touch/iPhone (forward, backward, left, right)
  - Emergency button to stop the motors

- **Complete Inertial Measurement Unit**
  - Accelerometer MEMS 3 axis
  - Gyrometers MEMS 2 axis XY and 1 axis Z
  - Angular velocity estimation
  - Yaw, pitch and roll angle estimation
  - Measurement frequency : 200 Hz
  - Patented anti-vibration system

- **Ultrasound altimeter**
  - Emission frequency: 40kHz
  - Range 6 meters
  - Measures frequency: 25 Hz
  - Patented anti-ultrasonic sound (coming from another AR.Drone) system

- **On-board computer**
  - CPU Parrot P6 ARM926 core 32bits-468MHz
  - Embedded Linux platform
  - DDR 128 MB RAM
  - Flash 128 MB memory
  - Firmware update via Wi-Fi or USB

- **Aeronautic and structure**
  - High-efficiency propellers (specially designed for the Parrot AR.Drone)
  - Carbon tube structure
  - Fiber-reinforced PA66 plastic
  - EPP hull to protect the propellers for indoor flights
  - Shaped EPP hull for outdoor flight

- **Motors and energy**
  - 4 interchangeable brushless motors (3,500 rpm, power:15W)
  - 4 controllers of brushless motors (digital command) and locking detection
  - Lithium Polymer battery (3 cells, 11,1V, 1000 mAh) UL2054
  - Battery charging time: 90 minutes