

# osFlexQuad



## Overview

The osFlexQuad autopilot delivers unprecedented command and control of today's multi-rotor vehicles (quad-rotors, hex-rotors, octa-rotors and custom configurations). It is robust and flexible enough to handle almost any actuator and payload currently on the market or in development.

## AirwareOS Compatible

osFlexQuad runs AirwareOS, a comprehensive platform for small commercial UAS development. By providing the essential elements of an operating system, AirwareOS handles the details and shifts the development focus to your UAS application.

## Key Features

- Simultaneously control 8 high-speed servos and 8 or more digital ESCs
- Advanced payload power regulation removes the need for multiple batteries or eliminator circuits
- Includes either a short-range XBee or long-range Microhard modem

## Technical Specifications

### MECHANICAL

- Dimensions: 2.65" x 2.65" x 0.8"
- Weight: 63 grams (including Linux computer and Microhard datalink radio)

### ELECTRICAL

- Input voltage range: 5.5 V to 26 V
- Ideal for 2-6 cell LiPo batteries
- 30 W high-efficiency switching regulator provides:
  - Power for Linux computer
  - 5 V for payloads and servos @ 4 Amps
  - 3.3 V for datalink and payloads @ 3 Amps
- Battery voltage and current monitoring

### RC SERVO INTERFACE

- Eight RC servo PWM outputs supporting update rates of 50 to 500 Hz
- Servos can be powered from an external source or regulated power can be provided at up to 4 Amps

### DATALINK RADIO

- Digi XBee, RFMonolithics, or Microhard modems supported
- Frequencies available for unlicensed operation in Europe, Australia, North America, India, and more
- 1 km or up to 60 km range Line-of-Sight
- up to 1.2 Mbps link rate
- Mesh-network and TDMA supported for multiple-vehicle communications

### PAYLOAD INTERFACES

- 2 USB 2.0 Hosts
- up to 4 serial ports (UART / SPI)
- I2C and CAN 2.0B
- 4 GPIO / 14-bit analog inputs

### OPERATOR INTERFACES

- Power switch located onboard or remote
- 2 programmable LED indicators and buttons
- Audio speaker (87dB output)



## os-Series Common Features

### SOFTWARE FUNCTIONALITY

- Aircraft platforms supported: fixed-wing, conventional helicopters, multi-rotor
- Waypoint following (fly-through and stop-at)
- Autonomous take-off and landing
- Control modes: attitude, velocity, position, airspeed, altitude, ground-track
- Loiter and Precision 3D hover-hold
- Onboard data logging: INS values, controller values, operator inputs, and custom data
- GPS stare-at
- Pan and tilt servo control for gimbaled cameras
- Telemetry downlink
- Fail-safe modes enabling manual control

### INS/GPS WITH AIR DATA

- Autopilot-assisted manual steering modes
- Integrated inertial, GPS, magnetic, and pitot-static data
- Extended Kalman-filter based solution
- Tri-axial 2,000°/sec MEMS gyros
- Tri-axial 16 g MEMS accelerometers
- Tri-axial 2.5 gauss magnetometer
- Temperature compensated (-40°C to +85°C)
- GPS receiver with 5 Hz PVT data with WAAS
- Static and dynamic pressure sensors (19,500 ft altitude std)

	FW	VTOL
EKF Filter States	17	20
Attitude Solution	100 Hz	500 Hz
Velocity Solution	25 Hz	500 Hz
Position Solution	25 Hz	250 Hz
Accel. Bias Est	Startup	250 Hz
Altitude Filtering	Standard	Enhanced

### LINUX COMPUTER

- 1 GHz single-board computer with 512 MB of RAM, ARM Cortex A-8 processor running at 800MHz, Ubuntu 12.04 operating system
- 8 GB SD card for program storage and data logging
- INS solution, payloads, datalink radio, actuators, and GPIO accessible by one hardware independent API
- Cross-compiling, real-time debugging, and file-transfer available over Ethernet
- Command line interface available over datalink radio or serial connection