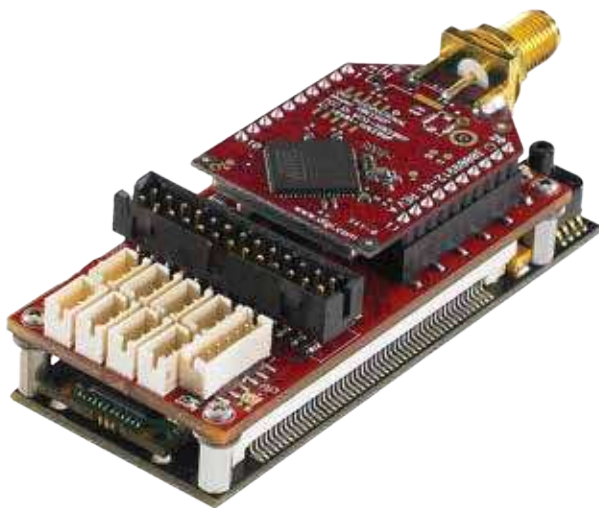


osNanoPilot



Overview

The osNanoPilot autopilot delivers unprecedented command and control of today's micro fixed-wing and helicopter Unmanned Aerial Systems. Tiny and extremely light, it is still robust and flexible enough to handle a variety of actuator and payload configurations currently on the market or in development. The osNanoPilot is perfect for weight and size sensitive applications which still require a rich feature set.

AirwareOS Compatible

osNanoPilot 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

- Tiny, ultra-light form factor, yet still includes onboard Linux computer and sophisticated INS/GPS with Air Data
- Ability to interface with payloads over I2C, CAN, and UART with 26-pin vehicle interface connector
- Utilizes Digi mesh-network datalink radio with a variety of frequencies available or an external radio

Technical Specifications

MECHANICAL

- Dimensions: 2.65" x 1.15" x 0.8"
- Weight: 32 grams (including Linux computer and XBee datalink radio)

ELECTRICAL

- Input voltage range: 5 V to 22 V
- Ideal for 2-5 cell Li-Po batteries
- 7.5 W switching regulator provides:
 - Power for on-board Linux computer and datalink
 - 5 V for payloads @ 175 mAmps
 - 3.3 V for radio and payloads @ 1.5 Amps
- Battery voltage and external current monitoring

RC SERVO INTERFACE

- Eight PWM outputs supporting RC servo update rates of 50 to 500 Hz or 16 servos using S.BUS
- One RC Servo connector can be configured for PPM or S.BUS input from a receiver

DATALINK RADIO

- Supports Digi FHSS modems with mesh-networking for multi-vehicle support
- 868 MHz / 900 MHz / 920 /MHz / 2.4 GHz
- Up to 156 Kpbs link rate
- Up to 14 km range line-of-sight
- Also supports external long-range modems

PAYLOAD INTERFACES

- USB 2.0 Host (175 mA supplied)
- Up to 2 serial ports (Low voltage)
- I2C and CAN 2.0B
- GPIO / 14-bit analog inputs

OPERATOR INTERFACES

- Remote power switch
- Remote LED and operator input button



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