



YAPP Micropilot Datasheet

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1. ABSTRACT

This short document will give a brief overview of the Yaap Micropilot.

2. YAAP MICROPILOT

PRODUCT OVERVIEW:

YAAP is an high performance micropilot designed to allow autonomous flight of UAS with operational constraints. Its small size and reduced weight are especially indicated for mini and micro Unmanned Systems. It contains cinematic and static sensors, as well as a dedicated Flight Software with an embedded Kalman Filter.



MAIN FEATURES:

The main features of the *YAAP* autopilot are in the followings summarized:

- Altitude hold, airspeed hold, waypoint navigation by means of GPS and sensor fusion Kalman filter.
- Waypoints management directly from GCS.
- Completely independent operation including autonomous takeoff and landing.
- 3-axis gyros, accelerometers, magnetometers, GPS receiver, pressure altimeter, pressure airspeed sensors, all on a single circuit board.
- Control from 6 to 24 servos.
- Emergency status management.
- Full dead reckoning by means of a sensor fusion Kalman filter.
- Control system parameters configurable by means of a dedicated interface software.
- Multi UAV ready.

MAIN SPECIFICATIONS:

The main specifications of the YAAP micropilot are in the followings summarized:

- Characteristics
 - 3 axis accelerometer, gyro and magnetometer
 - Barometric and Differential Pressure sensors
 - All sensors are temperature compensated from -20 °C to +70 °C
 - Dimensions: 9.2[cm] x 6[cm] x 3.6[cm]
 - Weight: 60 [gr]
- Sensor Fusion Kalman Filter
 - Real time attitude (100Hz)
 - Real time position (50Hz)

DATASHEET:

Detailed specifications of the YAAP micropilot are in the followings summarized:

Dimension	
Weight	60 gr
Dimension	60 mm x 92 mm x 36 mm

Roll and Pitch	
Update Rate	100Hz
Dynamic Range	±90°
Accuracy (in static)	±0.1°
Accuracy (in dynamic)	±1.5°

Accelerometers	
Update Rate	350Hz
Dynamic Range	±10g
Resolution	14 bit
Nonlinearity	0.2% of FS
0 g Offset vs. Temperature	5mg/°C delta from +25°C
Noise Density	185ug/√Hz @ +25°C
3 dB Bandwidth	350Hz
Sensor Resonant Frequency	10kHz
Temperature Operating Range	-40~+85°C

Gyros	
Update Rate	350Hz

Dynamic Range	±300°/s
Resolution	14 bit
Nonlinearity	0.1% of FS
Drift over Temperature	±1°/s Delta from 25°C
Linear Acceleration Effect	0.05°/s/g
Noise Density	0.05°/s/√Hz @25°C
3 db Bandwidth	350Hz
Sensor Resonant Frequency	14kHz
Temperature Scale Factor	6.88 LSB/°C
Temperature Operating Range	-40~+85°C

Magnetometer

Field measurement range	±11 Gauss
Field measurement resolution	0,00015 Gauss
Sample rate	2000 sample/sec
Sensor frequency	175 Kh
Storage Temperature	-40 +125°C
Linearity	0,60%

Barometric altimeter

Update Rate	9Hz
Pressure Range	30 to 120 kPa
Accuracy	Max ±0.3%FS
Offset Stability	±0.08%FS
Temperature Operating Range	-20 +70°C
Temperature Compensated	YES
Resolution	1,5 Pa

Airspeed Pitot

Update Rate	10Hz
Differential Pressure Range	0 to 1250kPa
Dynamic Range in speed	45m/s
Sensitivity	5mV/kPa
Offset	± 0,35mV
Null Shift over Temperature	± 0,025 mV
Temperature Operating Range	-40~+85°C
Resolution	12 bit