

AP04M - The autopilot solution for experimental and light sport aircraft

AP04M is UAV Navigation's most versatile system in its autopilot product line. Based on its highly reliable AP04 UAV autopilot, the AP04M inherits the same technology that allows UAVs to fly constantly in IFR.

The AP04M is used on experimental and light aircraft ranging from simple ultra lights to 250Kt+ speedsters. The AP04M is compatible with many of the most popular EFIS systems in the market.

The AP04M provides all flight data to be displayed on an EFIS system, including: roll, pitch, yaw, IAS, TAS, ground speed, track, heading, angle of attack, rate of turn, side slip, position. It can also estimate wind and continue providing accurate position estimates even on GPS failure scenarios.

The AP04M is capable of controlling unstable aircraft, providing a pitch/roll interface for the pilot while hiding the stabilization dynamics, greatly reducing pilot workload - much like the flight control systems in fighter aircrafts.

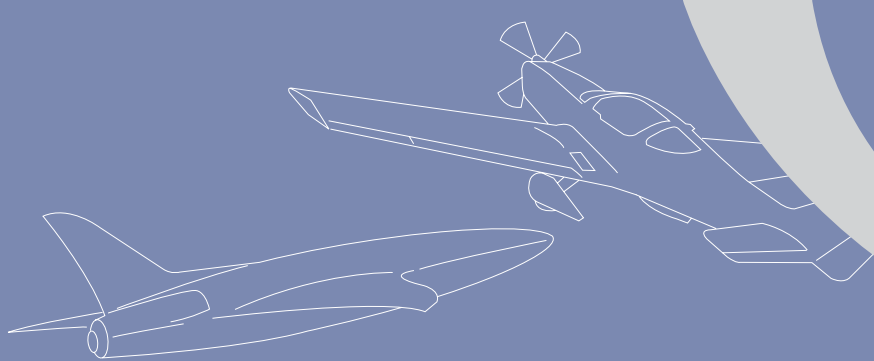
Unlike traditional altitude hold or roll steering autopilots, the AP04M is fully aware of the flight envelope of the aircraft that it is flying and it will maintain appropriate airspeed, while it follows a fully three-dimensional flight plan.



The AP04's redundant dual micro-processors provide the highest level of safety, automatically switching upon detection of computational failure. Additional redundancy built into the software allows the AP04 to survive all individual sensor failures, while maintaining accurate estimates of attitude and position. Additionally, its ruggedized enclosure is both impact resistant and waterproof.

UAV Navigation is a privately owned company that specializes in the design of flight control systems for manned and unmanned aircraft.





AP04M - Autopilot technical specifications

FLIGHT CONTROL

Fully automatic, multi-waypoint, 3D flight-plan following.

Axis	3 (roll,pitch,yaw)
Auto throttle	Yes
Auto takeoff landing	Yes

COMMUNICATIONS

Baud rate	115.2 kb/s (full duplex)
Method	RS232

I/O

I/O lines	16
PWM rate	50 Hz or 200 Hz
PWM signal	1 ms to 2ms high, 1us steps
RS232 ports baud rate	4.8K, 9.6K, 19.2K, 38.4K

REDUNDANCY & SAFETY

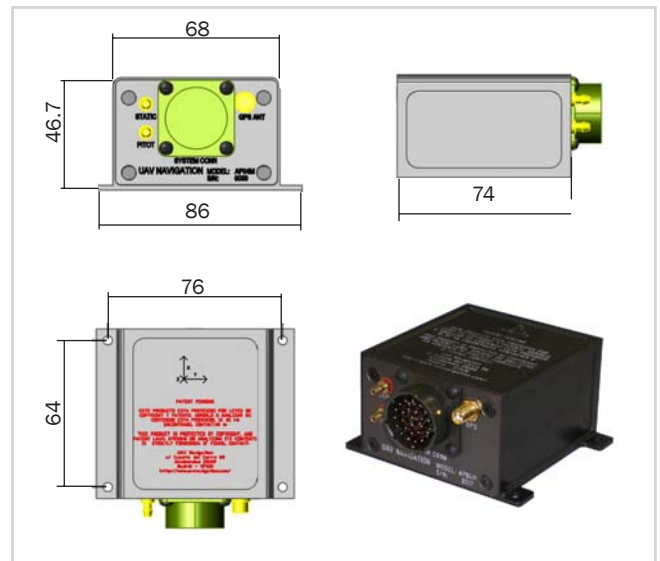
Redundant processors	2
Online sensor diagnostics	Yes
Sensor failure tolerance	All single, several multiple

ADS

Airspeed	LSP	25 Kt-150 Kt
	normal	35 Kt-250 Kt
	HSP	45 Kt-450 Kt
Altimeter		0 to 20,000 ft

AHRS

Accelerometer	3 axis
Max. acceleration	10G (vertical)
Angular rate sensors	3 axis
Max. angular rate	300°/s
Magnetometer	3 axis
Magnetic attitude compensation	Yes



GPS

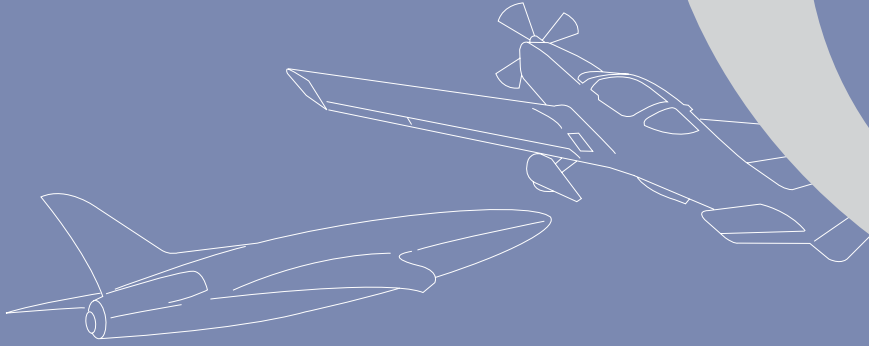
Channels	12
Differential	Yes

ELECTRICAL

Supply (unregulated)	7 V to 36 V
Power consumption	2.5 W

MECHANICAL/ENVIRONMENTAL

Size (mm, H x W x L)	46.7 x 68.0 x 74.0
Weight	180 g
System connector	MS3112E-16-26P
Pressure connectors diameter	3.0 mm
GPS RF connector	SMA female
Temperature range	-40°C to +85°C
Mounting screws	M4



AP04M - Ordering codes



Airspeed range:

- N Normal airspeed (35-250Kt)
- L Low airspeed (25-150Kt)
- H High airspeed (45-450Kt)

Software options:

- FW Standard fixed wing autopilot
- AH Attitude and heading reference system, 20 Hz output (no flight control laws)
- FS Standard fixed wing autopilot 6DOF
- HC Helicopter autopilot
- HS Helicopter autopilot 6DOF
- TG Target autopilot
- TS Target autopilot 6DOF
- QD Quad heli autopilot
- F5 Standard fixed wing autopilot, 50 Hz output
- BT Boat autopilot
- A5 Attitude and heading reference system, 50Hz output (no flight control laws)

I/O Configurations:

- ST Standard: 12 x servo (PWM) outputs, 1 x I2C port, 1 x RPM input
- S1 1 serial port: 8 x servo (PWM) outputs, 1 x RS232 UART, 1 x I2C port, 1 x RPM input
- S2 2 serial ports: 6 x servo (PWM) outputs, 2 x discrete (PWMX) outputs, 2 x RS232 UART, 1 x I2C port, 1 x RPM input
- 42 1 differential serial port: 6 x servo (PWM) outputs, 1 x RS422 UART, 1 x I2C port, 1 x RPM input
- D2 2 discrete outputs: 8 x servo (PWM) outputs, 2 x discrete outputs, 1 x RS232 UART, 1 x I2C port, 1 x RPM input
- EC External comm loop: 10 x servo (PWM) outputs, link between CPU & datalink exposed on connector
- NR No radio: 8 x servo (PWM) outputs, 1 x I2C port
- E1 External comm loop 1 serial port: 8 x servo (PWM) outputs, 1 x RS232 UART