

AP04SDK - The autopilot development kit

The AP04 is UAV Navigation's most complete system in its autopilot product line. It is a fully integrated autopilot with manual override, radio link, and payload control capabilities.

The AP04SDK inherits all the features of the AP04 and allows the customer to load his own software for implementing his own flight control algorithms, payload control, or any other mission task

The AP04SDK greatly simplifies the task of UAV system designers that want to carry their own computer onboard by providing an integrated, rugged, embedded computer with no connectivity or integration hassles. Imagine having the flexibility to implement almost any desired system functionality in an incremental fashion, being able to fly your platform from the first day and with no hardware changes throughout the development of your project.

The AP04SDK's architecture allows the customer's software to have access to all the AP04 telemetry and control, as well as have full control of the datalink to the ground. Applications can be written in a totally transparent mode, maintaining full system compatibility with the AP04 ground station, or using the customer's communications protocol.

The AP04SDK comes complete with a skeleton application written in C language that the user can modify and obtain functionality right from the beginning.



Examples of uses of the AP04SDK include:

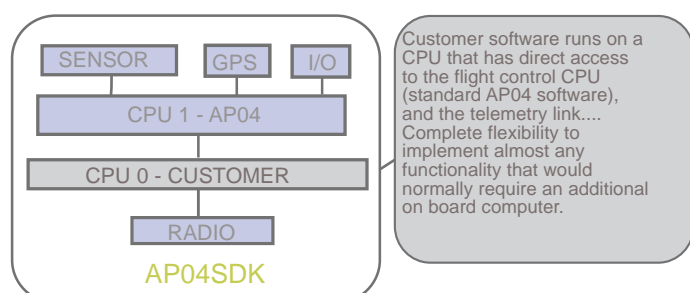
Custom flight control software development: using the state calculated by the standard AP04 CPU (position, velocity, angles, angular velocities), the customer can design his own control laws and command flight control surface deflections.

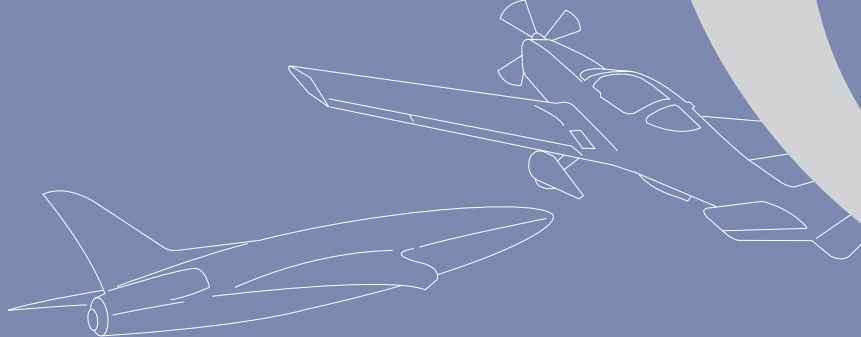
Payload control: receiving customer commands from the datalink, the customer software can act on payloads through servos or serial port communications, and report any payload information down through the datalink, all while repeating flight commands and telemetry between the standard AP04 CPU and the ground station.

Mission computer: since the customer software will run on a CPU that is both aware of the flight control CPU and the ground communications, it is perfectly suited to host higher mission-related control logic, such as flight plan modification, complex emergency operations, or others.

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

AP04SDK SYSTEM ARCHITECTURE:





AP04SDK - Autopilot technical specifications

SDK CPU

| | |
|--------------|-------------|
| Architecture | RISC 32 bit |
| RAM | 256 KB |
| Flash | 2 MB |

PAYLOAD MANAGEMENT

| | |
|--------------------|-----------------------|
| Servo or I/O lines | 16 |
| Gyro-stabilization | Yes |
| Flare/parachute | Auto or manual firing |

COMMUNICATIONS

| | |
|----------------------------|-----------------------------------|
| Baud rate | 115.2 kb/s (full duplex) |
| Range | 100 km |
| Frequency | 902-928 MHz (1.3 GHz option) |
| Method | Frequency hopping spread spectrum |
| Simultaneous multiple UAVs | Yes |

I/O

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

REDUNDANCY & SAFETY

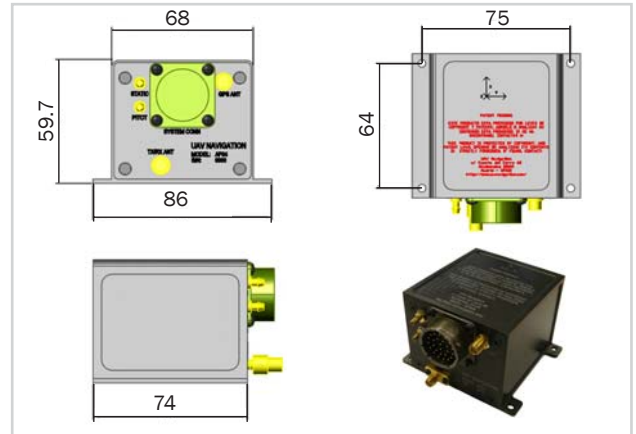
| | |
|---------------------------|------------------------------|
| Online sensor diagnostics | Yes |
| Sensor failure tolerance | All single, several multiple |

ADS

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

GPS

| | |
|--------------|-----|
| Channels | 12 |
| Differential | Yes |



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 |

INTERFACES

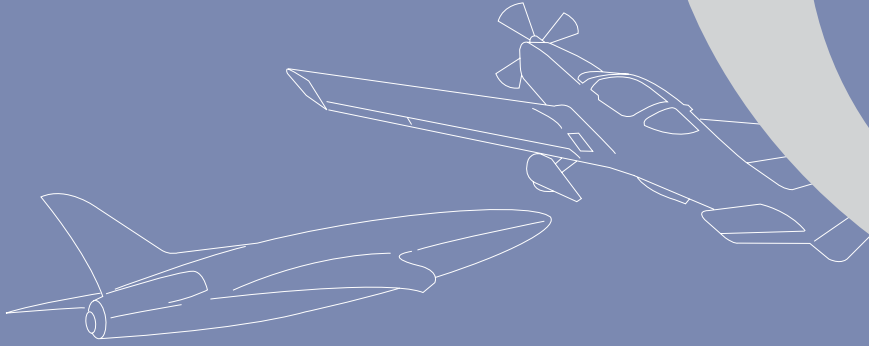
| | |
|---------------------------|--|
| E/O or IR PTZ | Canon, VISCA, IAI/Tamam, etc. |
| Engine management/control | Directed Perception, EM02, JetCAT, AMT, etc. |

ELECTRICAL

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

MECHANICAL/ENVIRONMENTAL

| | |
|------------------------------|--------------------|
| Size (mm, H x W x L) | 59.7 x 68.0 x 74.0 |
| Weight | 270 g |
| System connector | MS3112E-16-26P |
| Pressure connectors diameter | 3.0mm |
| Radio link RF connector | SMA female |
| GPS RF connector | SMA female |
| Temperature range | -40°C to +85°C |
| Mounting screws | M4 |



AP04SDK - Ordering codes

