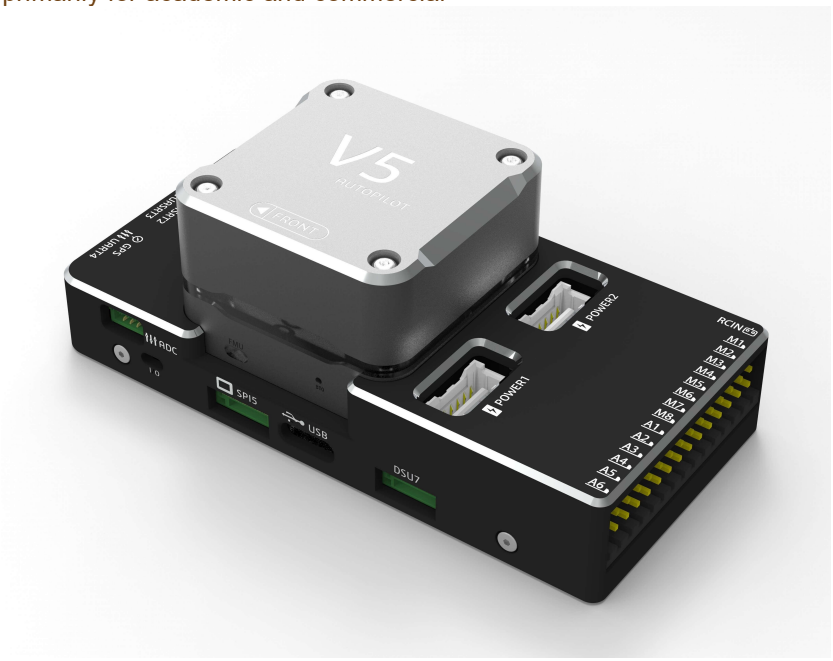
V5 AutoPilot

V5 AutoPilot® is an advanced autopilot designed and made in CUAV® . The board is is based on the **FMUv5** open hardware design. It is fully compatible with both PX4 and ArduPilot firmware. intended primarily for academic and commercial



develop.

Quick Summary

- Main FMU Processor: STM32F765
  - 32 Bit Arm® Cortex®-M7, 216MHz, 2MB memory, 512KB RAM
- IO Processor: STM32F100
  - 32 Bit Arm® Cortex®-M3, 24MHz, 8KB SRAM
-

On-board sensors:

-
  - Accelerometer/Gyroscope: ICM-20689
  - Accelerometer/Gyroscope: BMI055
  - Magnetometer: IST8310
  - Barometer: MS5611
-

Interfaces:

-
  - 8-14 PWM outputs (6 from IO, 8 from FMU)
  - 3 dedicated PWM/Capture inputs on FMU
  - Dedicated R/C input for CPPM
  - Dedicated R/C input for ppm/DSM and S.Bus
  - analog / PWM RSSI input
  - S.Bus servo output

- 5 general purpose serial ports
- 4 I2C ports
- 4 SPI buses
- 2 CANBuses with serial ESC
- Analog inputs for voltage / current of 2 batteries

- Power System:
  - Power: 4.3~5.4V
  - USB Input: 4.75~5.25V
  - Servo Rail Input: 0~36V
- Weight and Dimensions:
  - Weight: 90g
  - Dimensions: 44x84x12mm
- Other Characteristics:
  - Operating temperature: -20 ~ 80°c（Measured value）

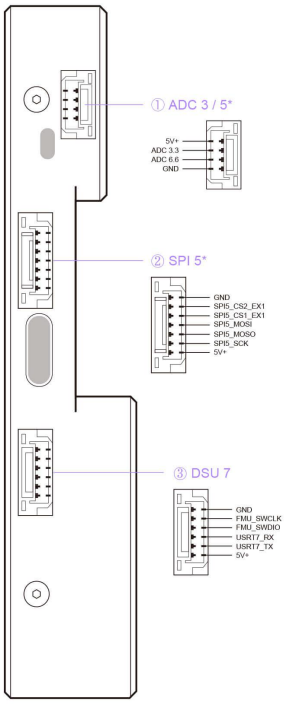
Purchase

Order from CUAV.

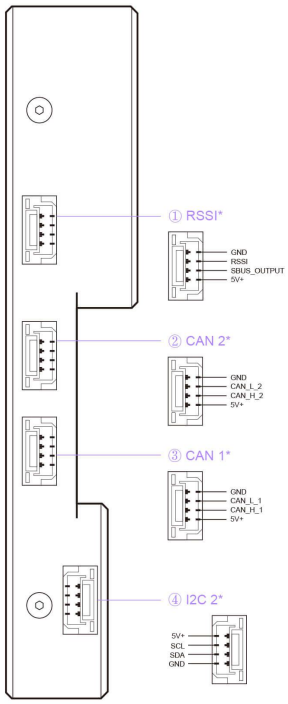
connection

CUAV V5 Autopilot Interface Definition
V5飞控接口定义

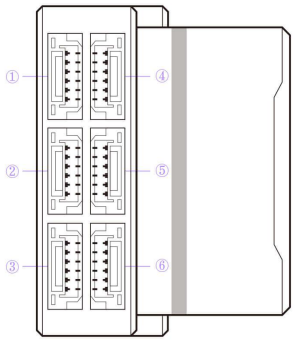
| Front View 前视图



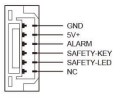
| Back View 后视图



| Left View 左视图

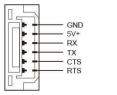


① SAFETY



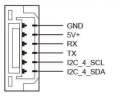
④ I2C 3 / 4

② TELEM 2 / UASRT 3



⑤ TELEM 1 / UASRT 2

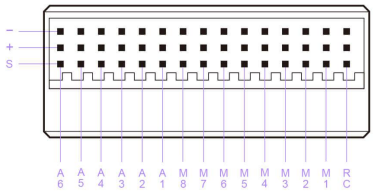
③ UART 4 / GPS 2



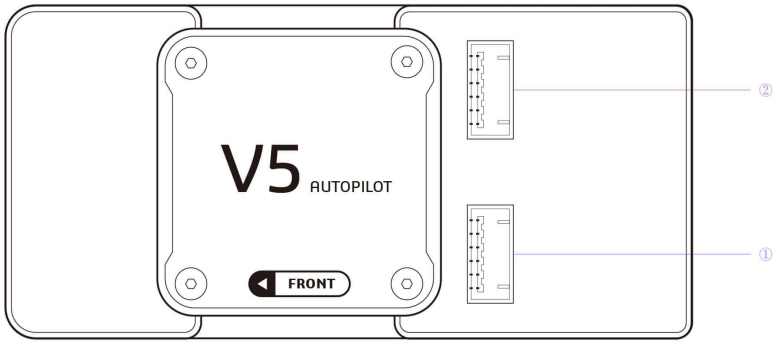
⑥ GPS 1

Ps: names with * means interface that matches Dronecode standard. For details please see following link:
带*号为Dronecode标准接口，详细接口定义请参照:
https://wiki.dronecode.org/workgroup/connectors/start?s[]=connector

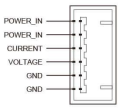
| Right View 右视图



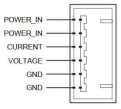
| Top View 俯视图



② POWER MODULES 2 or SMART BATTERY



① POWER MODULES 1



Ps: POWER_IN = 4.8 ~ 5.4V

DSU7 is a new interface for cuav naming, including fmu swd and uart7 interfaces. When V5 runs PX4 firmware,uart7 is used as the DEBUG interface; when running ArduPilot firmware; uart7 is used as the communication serial port and usb is used to debug the output.

> The RCIN interface is limited to powering the rc receiver and cannot be connected to any power/load.

Voltage Ratings

V5 AutoPilot can be triple-redundant on the power supply if three power sources are supplied. The three power rails are: **POWER1**, **POWER2** and **USB**.

> The output power rails **FMU PWM OUT** and **I/O PWM OUT** (0V to 36V) do not power the flight controller board (and are not powered by it). You must supply power to one of **POWER1**, **POWER2** or **USB** or the board will be unpowered.

Normal Operation Maximum Ratings

Under these conditions all power sources will be used in this order to power the system:

1. **POWER1** and **POWER2** inputs (4.3V to 5.4V)
2. **USB** input (4.75V to 5.25V)

Building PX4 Firmware

```
make px4fmu-v5_default upload
```

Building ArduPilotFirmware

```
./waf configure --board fmuv5 ./waf copter --upload
```

Debug Port

The system's serial console and SWD interface operate on the **FMU Debug** port. Simply connect the FTDI cable to the Debug & F7 SWD connector. To access the I/O Debug port, the user must remove the V5-AutoPilot shell. Both ports have standard serial pins and can be connected to a standard FTDI cable (3.3V, but 5V tolerant).

Peripherals

- Digital Airspeed Sensor
- Telemetry Radio Modules
- Rangefinders/Distance sensors

Supported Platforms / Airframes

Any multicopter / airplane / rover or boat that can be controlled with normal RC servos or Futaba S-Bus servos. The complete set of supported configurations can be seen in the Airframes Reference.

Further info

- FMUv5 reference design pinout.
- V5 AutoPilot docs
- CUAV Github