

Quadrotor Drone

ATPL604

Features

- Flight speed 0~20M/S;
- Maximum take-off weight 10Kg;
- Standard load is 1.5Kg, maximum load is 3Kg;
- The maximum flight altitude can reach 5,000 meters;
- Supports system-wide multi-frequency positioning and orientation, and can simultaneously track multiple frequency points such as BDS B1/B2(B3)+GPS L1/L2+GLONASS L1/L2+Galileo E1/E5b+QSZS;
- Appearance size 530mm×400mm×220mm;
- Wheelbase 950mm;
- Support PPK and RTK modes to work at the same time;
- Landing accuracy: horizontal $\leq \pm 0.2\text{m}$, elevation $\leq \pm 0.5\text{m}$;
- GPS hovering accuracy: vertical: $\pm 0.5\text{ m}$, horizontal: $\pm 1.5\text{m}$;
RTK hovering accuracy: vertical: $\pm 0.1\text{ m}$, horizontal: $\pm 0.1\text{ m}$;
- Built-in "black box" to record flight data;
- Wind resistance: $\leq 12\text{m/s}$;
- Operating temperature: $-20\sim 85^{\circ}\text{C}$;
- Standard flight time is 50 minutes;
- The transmission distance of the remote control is up to 15 kilometers;
- 6S 16000mAh×2 lithium polymer battery;

Application

- Aerial photography and mapping
- Power line inspection
- geological survey
- fast shipping
- Urban emergency surveillance

Description

ATPL604 quad-rotor UAV is a pure electric UAV multi-platform carrier aircraft for industry applications, covering short and medium range lasers, oblique photography, upright gimbal cameras and pods, megaphones, searchlights and other security loads. Modular design, one-click replacement of various loads, adaptable to various operating modes. It adopts a foldable X-shaped quad-rotor structure, with stable flight attitude, high safety and long flight time. The carbon fiber one-piece body has good aerodynamics, advanced structure, high strength and light weight.

ATPL604 four-rotor drone adopts composite material integrated molding process and carbon fiber wet paste integrated molding technology IWF. It has high strength and light weight. The weight of the empty shell only accounts for 15.7% of the take-off weight of the entire aircraft. It is lighter and stronger. The body allows the drone to carry heavier loads or achieve longer flight times. The flight time is more than 50 minutes when carrying a 1.4kg Lidar and starting the operation.

The ATPL604 quad-rotor drone has a convenient operation process that can be completed by one person. It takes less than 2 minutes for one person to complete the unpacking, installation, route planning, and drone lift-off operations. The clever detachable composite tripod design makes it easy to operate. It has an excellent shock-absorbing effect when lowered; the foldable X-shaped structure of the machine arm makes it take up less space and is more convenient to store, making it easy for small family cars to transfer between multiple machines.

ATPL604 four-rotor UAV has a maximum flight time of 65 minutes, a maximum speed of 15M/S, a maximum resistance to strong winds of 12.5M/S, a maximum altitude of 5000M, and can work in an environment of $-20\sim 85^{\circ}\text{C}$.

ATPL604 four-rotor drone comes with a CNC integrated remote control with screen. The remote control can share data to the computer through WIFI; the remote control signal transmission distance is up to 15 kilometers.



1. Flight control system

- 1) Industrial-grade hardware, stable and reliable;
- 2) The processor performance is up to 1027 DMIPS, powerful and efficient;
- 3) 3-degree IMU redundant design, seamless data switching;
- 4) 15 PWM outputs, 2 CAN interfaces, 4 UART interfaces;
- 5) GPS hovering accuracy: vertical: ± 0.5 m, horizontal: ± 1.5 m;
- 6) RTK hover accuracy: vertical: ± 0.1 m, horizontal: ± 0.1 m;
- 7) Built-in "black box" to record flight data;
- 8) The flight control operating temperature is $-20\sim 85^{\circ}\text{C}$, adaptable to various environments;
- 9) Comprehensive protection mechanism supports automatic return when the battery is low, the remote control is disconnected, and the ground station is disconnected to ensure flight safety;

2. Ground station control software

- 1) Fully automatic one-click task generation, smart and fast;
- 2) Support ground-like flight and safe operation;
- 3) Support electronic fence;
- 4) Complete pre-flight inspection;
- 5) Supports resume flight after breakpoint, making large-area operations worry-free;
- 6) Supports guided flight, worry-free in emergencies;
- 7) One-click support for multiple payload platforms;
- 8) Intelligent regional and strip task planning;
- 9) Support pod video access;
- 10) Flight log record playback;
- 11) Complex task planning, importing scope files, and one-click production;
- 12) Support RTK positioning mode;

3. GNSS system

- 1) Supports system-wide multi-frequency positioning and orientation, and can simultaneously track multiple frequency points such as BDS B1/B2(B3)+GPS L1/L2+GLONASS L1/L2+Galileo E1/E5b+QSZZ;
- 2) RTCM format adaptive recognition, no need to specify differential data input type;
- 3) Positioning and orientation are output simultaneously, with a data output rate of up to 20HZ
- 4) Support RTK and PPK modes to work at the same time
- 5) USB direct copy data

4. Smart battery

- 1) Equipped with battery indicator light to display the current battery capacity
- 2) With charging overvoltage protection function. When the charging voltage is too high, charging will automatically stop.
- 3) With charging overcurrent protection function. When the charging current is too large, charging will automatically stop.

- 4) With battery balancing function. The battery can automatically adjust to keep its internal cell state basically consistent.
- 5) It has discharge undervoltage protection function. When the battery voltage drops to a certain value, it automatically stops discharging.
- 6) With short circuit protection function. When the battery is short-circuited, it automatically stops discharging.
- 7) It has self-discharge function. When the battery is not used for a long time, the battery can automatically discharge to the storage voltage.

5. Application areas

Drones are a high-tech and cutting-edge technology industry. With the development of science and technology, in addition to military and police applications such as border patrol, emergency response, and maritime surveillance, drones are also widely used in various industries in the field of people's livelihood. They are subdivided in the following The field has great commercial value.

- 1) Meteorology: The rigorous and scientific workflow of drones solves the problem of super-cooled water freezing during shadow operations. Equipped with a complete system of bomb racks, catalytic flame strips, and excitation control devices, it can accurately collect stable, reliable, and complete meteorological data at different altitudes to meet the professional needs of the meteorological industry for weather prediction and shadow operations.
- 2) Surveying and mapping: Through low-altitude drone surveying and mapping remote sensing systems, global positioning, geographical information, and engineering surveying technologies are used to perform multi-resolution, multi-scale, multi-time and space, and multi-type three-dimensional descriptions. Provide accurate data support for scientific decision-making and land and resources management in aspects such as land remediation monitoring, farmland water conservancy construction, and infrastructure settings.
- 3) Electric power: A hybrid vertical take-off and landing fixed-wing drone equipped with a dual-light pod can obtain image data of power transmission channels to help the power industry avoid dangers, improve inspection quality and work efficiency, and complete inspection tasks quickly and accurately.
- 4) Transportation: As the core and hotspot of technological industry innovation, unmanned aerial vehicles can quickly and accurately understand on-site conditions, assist the transportation industry in improving road transportation and operation monitoring capabilities, improve the industry's collaborative law enforcement capabilities, and strengthen government service management efficiency.
- 5) Water conservancy: UAVs use modern scientific methods to form a real-time, thorough and comprehensive water conservancy sensing system, improve work efficiency, and enhance overall operation and supervision capabilities.
- 6) Environmental protection: The UAV remote sensing system can quickly identify the ecological environment and protection management status according to customer needs, achieve rapid, accurate and efficient collection of multi-dimensional data, and play an important role in environmental monitoring, inspection, emergency response and other aspects.
- 7) Smart city: UAV remote sensing technology can obtain surface information in a short time, achieve comprehensive perception and rapid extraction of picture information of various elements within

the city, provide accurate data support for scientific decision-making in urban development, and assist in defining smart cities. , sort out the urban development context.

