

DianChen Autopilot System Specification

1. Intro

DianChen autopilot is a very reliable and completely open source drone self-driving system. Its hardware solution is derived from Pixhawk. We have integrated the autopilot and multi-Rotor carrier board (which can be customized according to the needs of customer models), buck module and galvanometer module, forming a highly integrated structure. After optimization and integration, the DAP autopilot system not only reduces the complexity of wiring to the greatest extent, but also has smaller size, stronger anti-interference performance, IMU built-in isolation and shock absorption, and more stable flight performance. Other sides, on the basis of high integration, we carried out modular separation design for the autopilot and realized the combination of removable and pluggable carrier plate, which provided the possibility and convenience of hardware secondary opening for the customized carrier plate of the drone manufacturer. DAP autopilot supports rotor, fixed wing, vertical takeoff and landing fixed wing, vehicle, ship and other models. It has rich interfaces: support dual-channel GPS signal, battery monitoring signal, up to 14 output channels (8-channel main output+6-channel auxiliary output), 12C protocol extension interface, USB extension interface, protocol data serial port and so on.

2. After-Sale Service

From the date of purchase within 60 day, if the store has quality problems (non-artificial, and without appearance damage), buyer can replace the same product free of charge. If the store is used in the mainland of China, the transportation cost arising from the replacement shall be borne by the seller, and other transportation costs shall be borne by the buyer. Transportation costs incurred by maintenance shall be borne by the buyer.

2.1 Purchase vouchers or transaction records of the network platform shall be provided for maintenance.

2.2 From the date of purchase within 60 days, if there are quality problems in normal use (non-artificial, and without appearance damage), you can replace the same product with purchase vouchers.

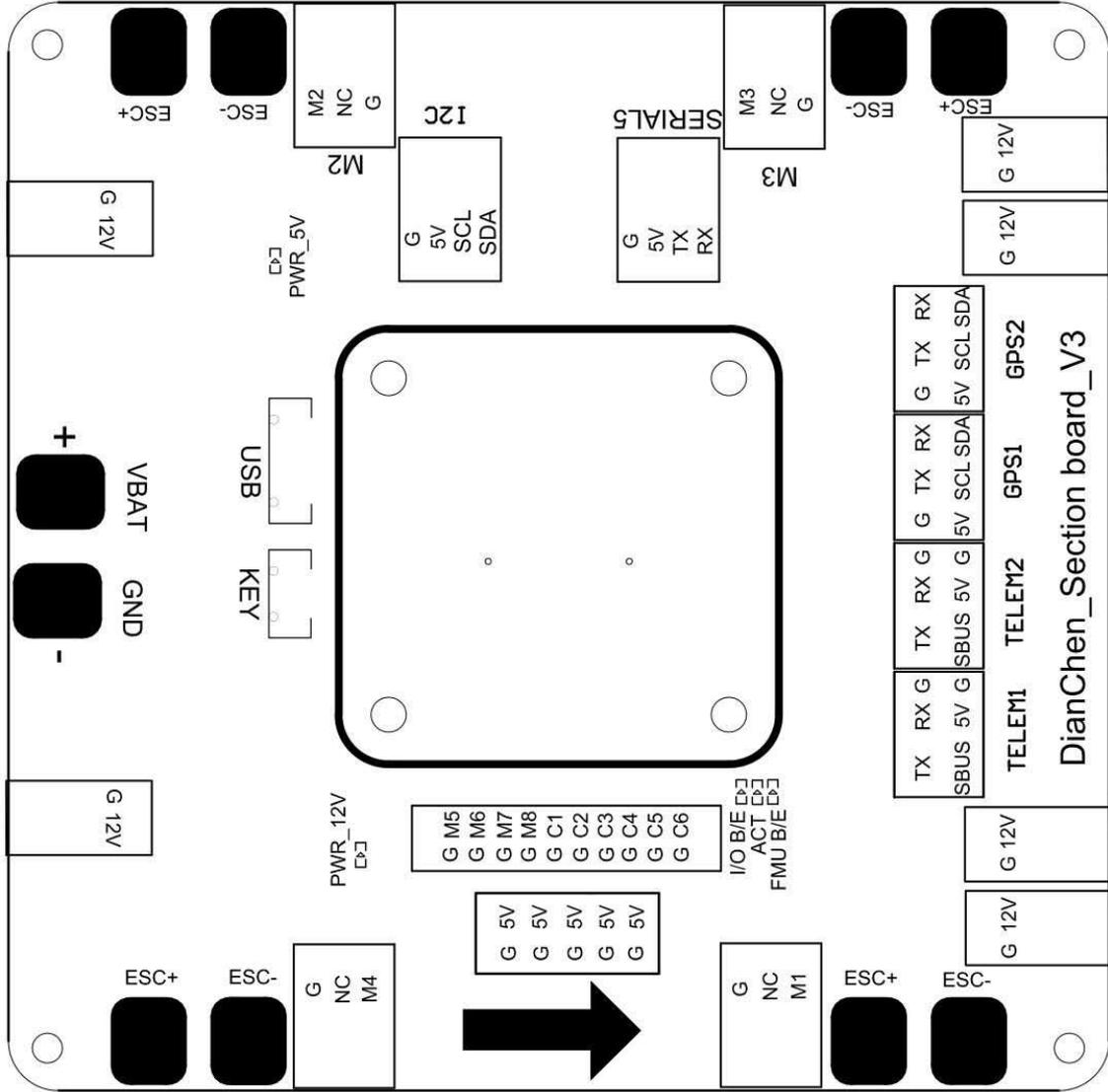
2.3 We will provide lifelong after-sales service for DAP autopilot. Within a year if the stores develop malfunction/fault, we have one year warranty. If it is over the warranty period or man-made damage, modification, dismantling, the user must pay for postage and maintenance costs.

3. Autopilot Parameter Specification

Master Processor	STM32F427VIT6 (32 Bit ARM Cortex-M4F, 180MHz)
Driver Processor	STM32F103CBT6 (32 Bit ARM Cortex-M3, 72MHz)
Remote Control processor	STM32F030C8T6 (32 Bit ARM Cortex-M0, 48MHz)
Inertial Sensor	MPU6000、LSM303D、L3GD20H、HMC5983、MS5611
GPS Module Model	uBLOXNE0-M8N(With compass)
GPS Positioning Accuracy	Less than 1m (open environment)
Output Channel	8-channel main output (m1-m8), 6-channel auxiliary output (a1-a6)
ESC Signal	Refresh rate of 50Hz~400Hz PWM signal
Receiver Signal	SBUS、PPM
Indicator light	Color LED highlighting indicator
USB Connector	Micro-USB interface, 15 cm USB special interface extension cord
Data Storage	Kingston 8GB TF Card
Ground Station Interface	USB、RS232 serial port
Aircraft Type	Three, four, six, eight rotor, helicopter, fixed wing, wing, composite wing
Power Performance	10v-35v (3s-8s) power consumption: average 3W, peak 6W
Operating Environment	-20℃ ~ +60℃
Weight	Autopilot:62g Multi-Rotor Carrier Board:50g
Size (No Interface)	Autopilot: 44*44*25mm Multi-Rotor Carrier Board: 110mm*110mm
USB Serial Port	USB to RS232, interface rj12-6p
Shock Absorber	Built-in damping cotton

4. Interface Definition Diagram

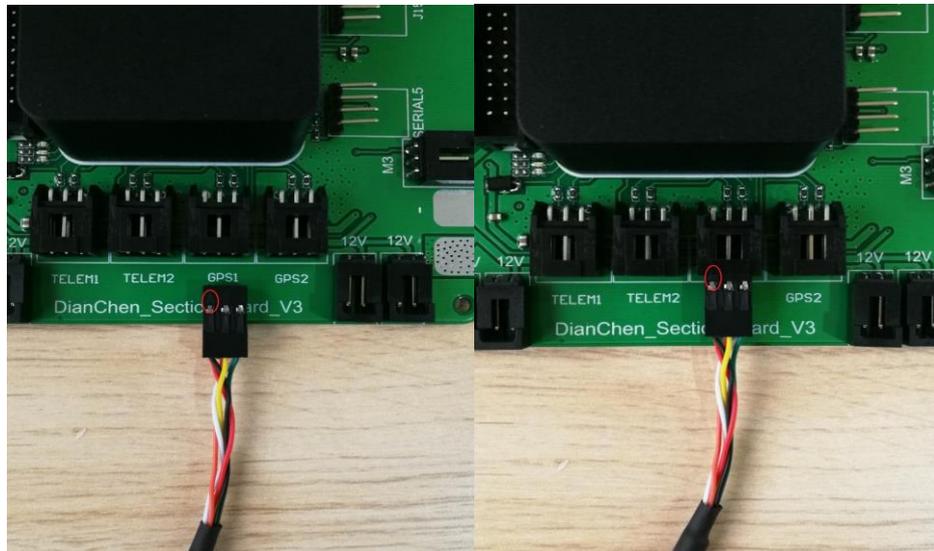
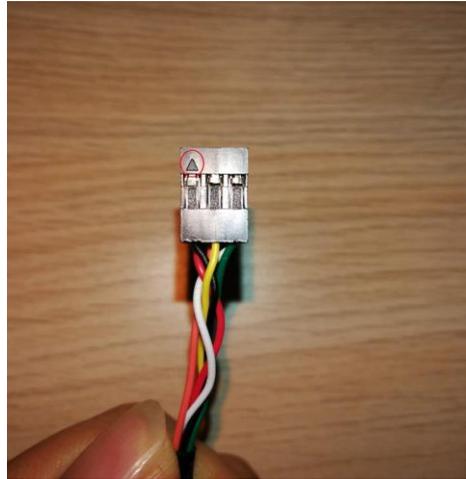
DianChen Section Board



Main Mark	Meaning
VBAT/GND	Power Input(3S-8S)
5V 、 12V output	5-channel 5V output(on the right), 6-channel 12V output (four channels in the front and 2 channels in the end)
ESC+/ESC-	ESC power output(board left and right each 2 channels)
M1-M8	Main output 8-channel (M1、 M4 in the right,M2、 M3 in the left,M5-M8 Abreast C1-C6
C1-C6	Auxiliary output channel 6
USB	USB extension cord interface (same as PIX's SERIAL0 interface)
TELEM1	Communication ports (TELEM1/SERIAL1 with PIX), TX for digital or OSD RX, RX for digital or OSD TX
TELEM2	Communication ports (TELEM2/SERIAL2 with PIX), TX for digital or OSD RX, RX for digital or OSD TX
RC	Parallel 2-channel receiver signal ports (located at the lower row of TELEM1 and TELEM2 rows respectively) support SBUS and PPM
GPS1	GPS port (same as PIX's GPS/SERIAL3), TX connected to GPS1's RX, RX connected to GPS1's TX; SCL and SDA are external compass interfaces
GPS2	GPS port (same as PIX's GPS/SERIAL4), TX connected to GPS2's RX, RX connected to GPS2's TX; SCL and SDA are external compass interfaces
SERIAL5	Serial port (same as PIX's SERIAL5) NOTE:(GPS can't be used)
I2C	I2C bus extension module interface, support extended sensor
ATTENTION	(G= ground, 5V=5V voltage output, 12V=12V voltage output, NC= empty)

5. GPS and LED Connect Way

5.1 GPS Connect Way



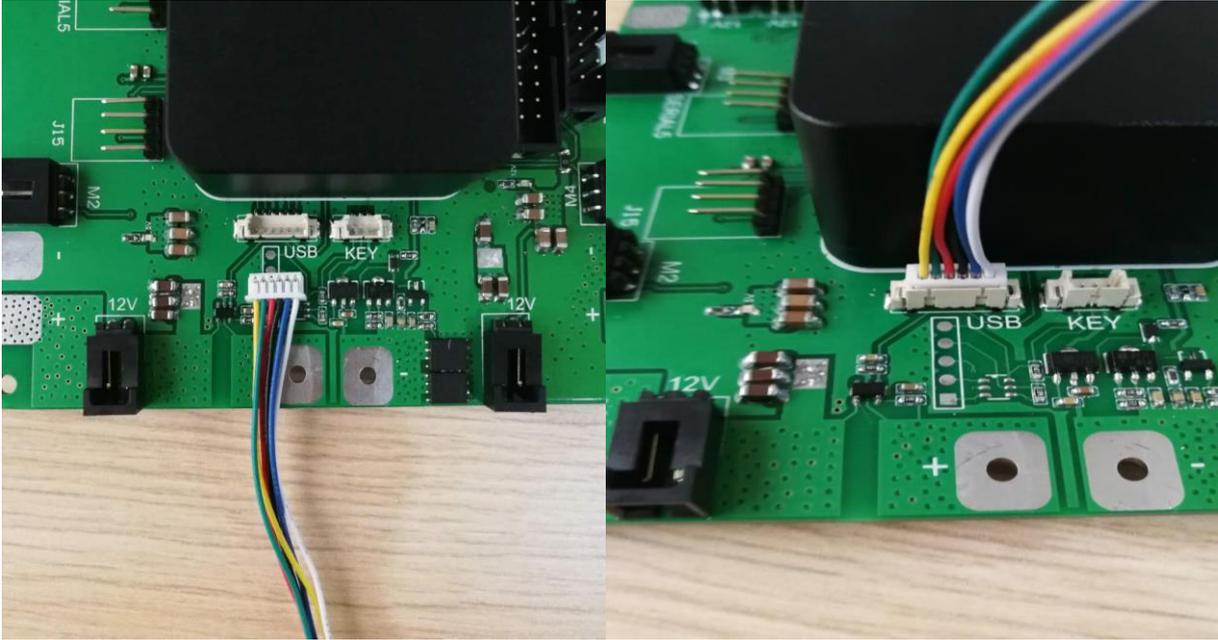
Note: If use double GPS, insert the second GPS into GPS2 port and set autopilot parameters

SERIAL4_PROTOCOL=5

GPS_TYPE2=1

GPS-AUTO_SWITCH=1 或 2

5.2 LED Connect Way



6. Advice for User

6.1 Users need to be familiar with the operation of the ground station software and various menu functions.

6.2 Users need to learn how to calibrate acceleration, magnetic compass, remote control and ESC.

6.3 Users need to learn how to consult and modify the contents in the parameter list.

6.4 When assemble the drone, the user needs to learn to check the installation direction and motor sequence.

6.5 Generally, relevant installation settings and sensor calibration have been done for users with requirements when products leave the factory. Users only need to calibrate the remote control and ESC, configure the aircraft layout type, and debug the rudder surface direction of the steering gear.

6.6 In the first test flight, please use STAB mode for multi-rotor, and then test other flight modes step by step.

6.7 There will be a lot of questions in the first use. First of all, please refer to the manual chapter patiently. If you cannot solve the problems, please contact our after-sales department.