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Intelligent Robot

AUTOFLY

spring

Drone Manufacturing and Control Using Open Platform

Mission Flight Autofly Using GPS and GCS

※ GPS (Global Positioning System) / GCS (Ground Control System)

HANBACK ELECTRONICS

Since 1984

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Homepage

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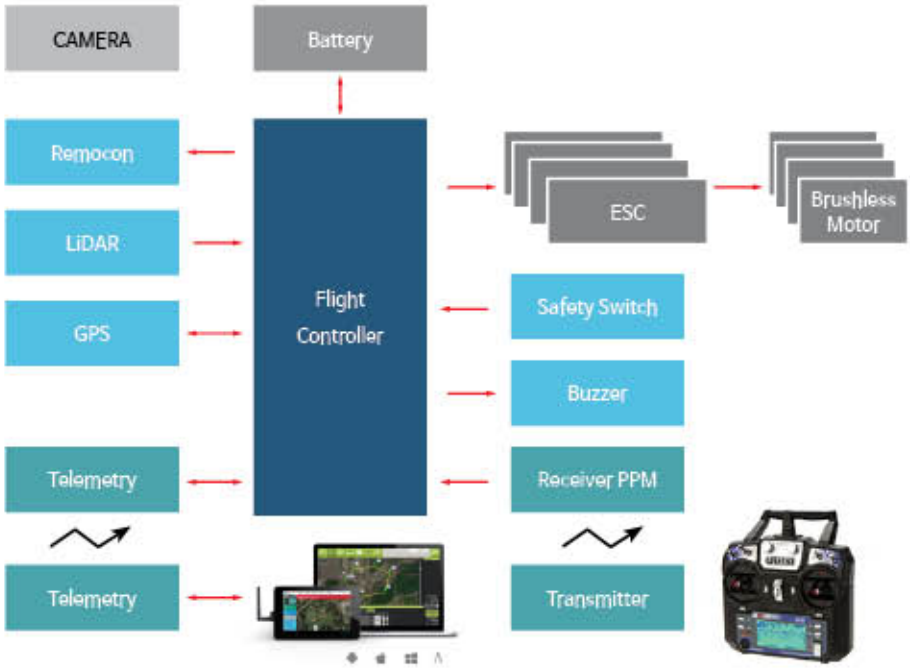
Product

- Drone flight and control (driver source code and flight mode source code provided)
- 4-propeller Quad Copter
- Learn how to assemble hardware and fly with open source
- Hovering function using LiDAR
- Drone flight using controller
- Support Ground Control System capable of drone control on Windows or Android OS
- Support auto-flight using GPS and Ground Control System configured in drone
- Mission planning function : Waypoint routing, event execution (Go to designated place and carry out mission (photographing, collecting geographic information, etc.))

Block Diagram



Hardware Spec

Item	Spec
Flight Controller	Processor : Cortex-M4F 168MHz / 252MIPS
	14 PWM / Servo outputs (8 with failsafe and manual override, 6 auxiliary, high-power compatible)
	Abundant connectivity options for additional peripherals (UART, I²C, CAN)
	Backup system integrates mixing, providing consistent autopilot and manual override mixing modes (fixed wing use)
	Redundant power supply inputs and automatic failover
	External safety switch
	Multicolor LED main visual indicator
	High-power, multi-tone piezo audio indicator
	microSD card for high-rate logging over extended periods of time
	16GB TF Card
Frame	Wheel-base 450mm 4EA, Landing Support 4EA, BASE PCB(For Fixing Frames)
Motor	Brushless, 22x12mm, 920RPM/V, 4EA
ESC	5.6V ~ 16.8V(2~3 Cell LiPo, 5~12 Cell NiHm Battery Support), Constant Current 30A(less than 40A 10 secd), BEC 2A 4ea
Propeller	For Prevention of Loosening(CW / CCW) 2 sets ea, 9x4.5 inch
Guard	For Prevention of Contact between surrounding obstacles and propellers, 13 inch
GPS	168dBm navigation Sensitivity, Navigation update rate up to 10Hz, include Digital Compass Sensor
LiDAR	- Operating Range : 0.3m ~ 12m
	- Applicable voltage range : 4.5V ~ 6V (Serial TTL Level is 3.3V)
	- Acceptance angle : 2.3º
	- Frequency : 100Hz
	- Accuracy : 1%(~6m), 2%(6m~12m)
	- Laser Wavelength : 850nm
	- Light Sensitivity : 70,000lux
	- Communication Interface : UART

Item	Spec
Battery	11.1V, 3S1P, 45C+ 2800mAh Li-Polymer Battery
Charger	Charging Power 20W, Charge Current 1.6A, Balance Charging Current : 16mmA
Telemetry	Radio Telemetry Air/Ground Module with OTG Cable
	Support MWC / APM / PIXHAWK / PX4 open source Flight Controller, etc
	Receivers sensitivity : -118dBm
	MAVLink framework agreement
	FHSS
	2way full-duplex communication adaptive TDM
Camera	CMOS Sensor : SONY 179 8M
	Viewing Angle : 170º
	Focus 12cm ~ Unlimited
	LCD 2.0" LTPS LCD
	Storage : Micro SD 16GB
	Video Output : 4K (3264 * 1836) 30FPS, MP4
	Effective Pixels : 16M /12M / 8M / 5M / 2M, JPEG
	RF Remocon : Single Shot, Recording Movie
Controller/ Receiver	Controller 10channel, Receiver: 14channels
	RF Range 2.40 ~ 2.48GHz
	Band width : 500kHz
	Band : 142
	RF Power : Less than 20dBm
	2.4GHz System : AFHDS 2A and AFHDS
	Code Type : GFSK
	Sensitivity : 1024
	DSP Port : PS2, Output : PPM
	KC Certification
Dimension	Size : 520 x 520 x 230 (Except Propeller Guard)
	Weight: 2.3kg

Software Spec

Item	Spec
Firmware	[ArduPilot Platform Support and Source Description]
	- Support Copter, Plane, Rover, Antenna Tracker
	- Package for Integrated Controlling of Peripheral Sensor Controller and Output Device
	- Support Code or Function executed on Controller

Item	Spec
GCS	[Mission Planner(Windows Environment)]
	- Open Source(GPLv3)
	- Specify (with a Mouse Click) Halfway Point Using Google Map, etc
	- Select 'Mission' from Dropdown Menu
	- Download and Analyze Mission Record File
	[QGround Control (Android Environment)]
	- Open Source(GPLv3)
	- Platform : Windows , Linux, Android, iOS
	- Mission Planning for autonomons fright
	- Marking the Location, Flight Trajectory, and Waypoint of Body on Flight Map

Port Driver

Port Name	Related File
SPKT/DSM	AP_RCProtocol_DSM.cpp
TELEM 2	AP_Radio.cpp
	AP_Radio_backend.cpp
TELEM 1	GCS_MAVLink.cpp
USB	USBDriver.cpp
SPI	SPIDevice.cpp
POWER	
SWITCH	AP_Arming.cpp
BUZZER	Buzzer.cpp
SERIAL 4/	AP_RangeFinder_Light-WareSerial.cpp

Port Name	Related File
GPS	AP_GPS_NMEA.cpp
CAN	CAN.cpp
I2C	I2CDevice.cpp
ADC 6.6V	Analogin.cpp
ADC 3.3V	
LED	AP_BoardLED.cpp
SD	DataFlash.cpp
RCIN	RCInput.cpp
AUX OUT	SRV_Channel_aux.cpp
	AP_Relay.cpp
MAIN OUT	SRV_Channel_aux.cpp

Flight Software

Function	Related File
Auto-flight mode	mode_auto.cpp
Loiter mode	mode_loiter.cpp
Land mode	mode_land.cpp
Altitude hold mode	mode_althold.cpp
Circular flight mode	mode_circle.cpp
Return to home mode	mode_rtl.cpp
Sports mode	mode_sport.cpp
Throw mode	mode_throw.cpp
Data communication	GCS_mavlink.cpp
Total file size	860KB

Contents

- Drone Intro : Definition / Type / Configuration / Principles of Operation / Frame Selection / Flight Controller Selection / Ground Station Selection / Hardware, Firmware, Software Preparation / Additional Hardware / Safety Precautions
- Drone Manufacturing : Hardware Assembly / Mission Planner Installation / Firmware Programming / Connecting Mission Planner and Ardupilot / Hardware Set-up
- Flight : Flight Mode Set-up / Safety Inspection Before Motor Operation / Start & Stop Motor / Tips for Beginners / Basic Tuning / Measuring Vibration / Hovering Set-up / Trimming Set-up / Safety Device / Pre-Flight Checklist
- Advanced Set-up : Auto Tune / Auxiliary Function / Gyro Calibration / Battery Power Limit Set-up / EKF / Flight Time Record / Take-off & Landing Control Set-up / Motor Scaling Ratio Set-up / Offset Compensation Set-up for Sensor Location / Sensor Check / Remote Port Configuration / Tuning
- Flight Controller and Source : Flight Controller Hardware / Source Code
- GCS-Mission Planner : Mission Planning through Waypoint and Event / Mission Command List / Application
- GCS-QGROUND CONTROL : Intro / Download and Install App / Menu / Planning / Set-up / Flight / Application
- LogData : Diagnose problems using Log Data / Analyze Dataflash Log Data / Remote Communication Log Data / Save and Execute Log Data
- Others : FPV / Indoor Flight Guide / Multi-Flight / Antenna Tracking / Simulation / Reference

Examples

[WayPoint Routing using Mission Planner]

[Hovering using GPS and LiDAR]

※ The product will be delivered in the pre-assembly state. Support is sold separately.