Holybro

PRODUCT CATALOG

UAV Hardware Manufacturer

- Autopilot Flight Controller ▪ GPS & RTK System ▪ Telemetry Radio ▪ ESC
- Power Module ▪ Development Drone Kit ▪ FPV

Company Profile

Holybro is a company specializing in the research, development, and manufacture of essential electronic systems for unmanned vehicles. We focus on the best known open-source and open hardware-based autopilots in the world, as well as GPS, telemetry radio, and much more.

Holybro products are utilized by various user groups such as hobbyist, commercial drone manufacturers, public and private aerospace research and development institutes, and militaries across the globe. Our mission is to innovate and manufacture high quality products to serve our customers across the world. Through the years, we have contributed and establish a close relationship with Dronecode, PX4, Ardupilot, Betaflight, INAV, BLheli32 and more.

Our factory has ISO9001-2015 international quality system certification, and most products have obtained CE and FCC certification.

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ESC

GPS & RTK System

Telemetry Radio

Drone Development Kit

Power Module

pixhawk® 6C

Features

- High performance H7 Processor with clock speed up to 480 MHz

- New cost-effective design with low-profile form factor

- Redundant inertial measurement unit (IMU) from Bosch® & InvenSense®

- Integrated vibration isolation system

- IMUs are temperature-controlled by onboard heating resistors

- Follows Pixhawk FMUv6C & Connector Standard

- Fully Supported in PX4 & Ardupilot open source autopilot system

The Pixhawk® 6C is the latest update to the successful family of Pixhawk® flight controllers, based on the Pixhawk® FMUv6C Open Standard and Connector Standard. The FMUv6C open standard includes high-performance, low-noise IMUs on board, designed to be cost effective while having IMU redundancy.

Inside the Pixhawk® 6C, you can find an STMicroelectronics®-based STM32H743, paired with sensor technology from Bosch® & InvenSense®, giving you flexibility and reliability for controlling any autonomous vehicle, suitable for both academic and commercial applications. Support by PX4 and Ardupilot open source.

Specification

FMU Processor	STM32H743 – Arm® Cortex®–M7 480MHz, 2MB memory, 1MB SRAM
IO Processor	STM32F103 – Arm® Cortex®–M3 72MHz, 64KB SRAM
Accel/Gyro	ICM–42688-P
	BMI055
Compass	IST8310
Barometer	MS5611

Electrical Data

Max Input Voltage	6V
USB Power Input	4.75~5.25V
Servo Rail Input	0–36V (Unpowered)
Current Ratings	Telem1 Max output current limiter: 1.5A.
	All other port combined output current limiter: 1.5A

Interfance

PWM out	16 (8 From IO, 8 From FMU)
UART	5 (Telem1&2&3, GPS1 & 2)
I2C	2 Bus (1 standalone, 1 in GPS2 Port)
CAN	2 Bus
Debug	Pixhawk FMU Debug Full
	Pixhawk I/O Debug Full
Power Input	2 Power Input Ports (Analog)
SBUS Output	Available
R/C Input	Dedicated R/C input for Spektrum / DSM and S.BUS, CPPM, analog / PWM RSSI

Mechanical Data

Operating Temp	–40 ~ 85°c
Dimension	84.8 * 44 * 12.4 mm
Weight	34.6g (Plastic) or 59.3g (Aluminum)

Pixhawk® 6C mini

Features

- High performance H7 Processor with clock speed up to 480 MHz
- New cost-effective design in a even smaller form factor
- Redundant inertial measurement unit (IMU) from Bosch® & InvenSense®
- Integrated vibration isolation system
- Temperature-controlled IMU
- Follows Pixhawk FMUv6C & Connector Standard
- Fully Supported in PX4 & Ardupilot open source autopilot system

The Pixhawk® 6C Mini is the latest update to the successful family of Pixhawk® flight controllers, based on the Pixhawk® FMUv6C Open Standard and Connector Standard. It shares the same STMH743 microprocessor and internal sensors as the Pixhawk 6C.

Compared to the standard Pixhawk 6C, this Mini version has a built-in PWM header, and some ports have been removed in order to fit this Mini form factor.

Specification

FMU Processor	STM32H743 – Arm® Cortex®–M7 480MHz, 2MB memory, 1MB SRAM
IO Processor	STM32F103 – Arm® Cortex®–M3 72MHz, 64KB SRAM
Accel/Gyro	ICM–42688–P
	BMI055
Compass	IST8310
Barometer	MS5611

Electrical Data

Max Input Voltage	6V
USB Power Input	4.75~5.25V
Servo Rail Input	0–36V (Unpowered)
Current Ratings	Telem1 Max output current limiter: 1.5A.
	All other port combined output current limiter: 1.5A

Interface

PWM out	14 (8 From IO, 6 From FMU)
UART	4 (Telem1, 2, GPS1 & 2)
I2C	2 Bus (1 standalone, 1 in GPS2 Port)
CAN	2 Bus
Debug	Pixhawk FMU Debug Mini
Power Input	1 Power Input Ports (Analog)
R/C Input	Dedicated R/C input for Spektrum / DSM and S.BUS, CPPM, analog / PWM RSSI

Mechanical Data

Operating Temp	–40 ~ 85°c
Dimension	85.3 * 39 * 16.2 mm
Weight	39.2g

Pixhawk® 6X

Features

- High performance H7 Processor with clock speed up to 480 MHz
- Modular: separated FMU and Base system
- Redundancy: 3x Temp Controlled IMU sensors & 2x Barometer
- Triple redundancy domains: Isolated sensor domains with separate buses and power control
- Ethernet interface
- Pixhawk Autopilot Bus, FMUv6X, and Connector Standards.
- Fully Supported in PX4 & Ardupilot

Inside the Pixhawk® 6X, you can find an STM based STM32H753, paired with sensor technology from Bosch® and InvenSense®, giving you flexibility and reliability for controlling any autonomous vehicle. It has triple redundancy: 3 temperature-controlled IMU sensors and 2 barometer sensors on separate buses.

Its modular form factor allows ultimate flexibility due to the ability to use any baseboard design for the project's needs. Holybro has provided 3 different baseboards to choose from: the standard, mini, and CM4 baseboards. You can use baseboard by any manufacturer as long as it follows the Pixhawk Autopilot Bus standard.

Specification

FMU Processor	STM32H753 – Arm® Cortex®–M7 480MHz, 2MB memory, 1MB SRAM
IO Processor	STM32F103 – Arm® Cortex®–M3 72MHz, 64KB SRAM
Accel/Gyro	ICM–20649 or BMI088
	ICM–42688–P
	ICM–42670–P
Compass	BMM150
Barometer	2x BMP388

Electrical Data

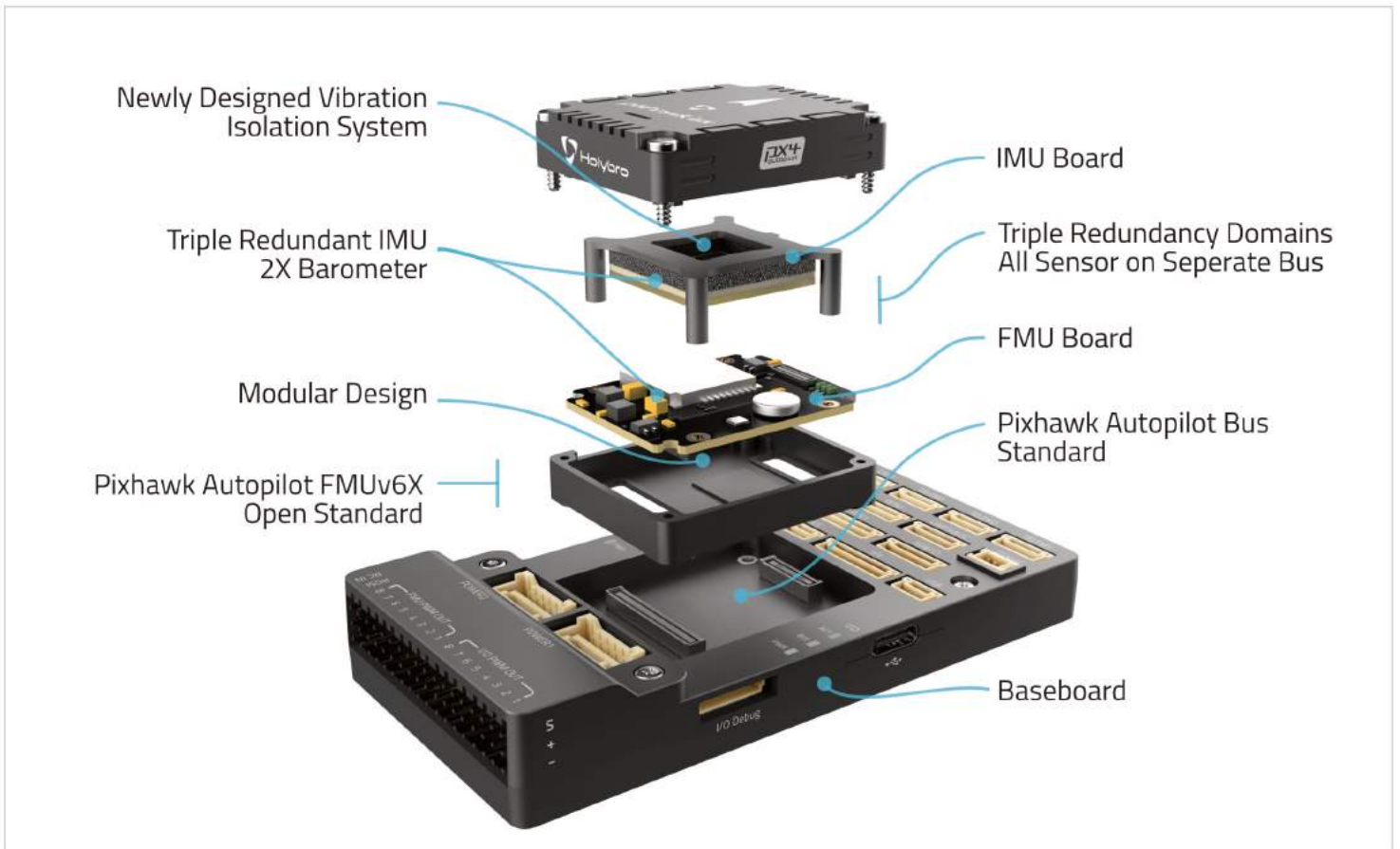|	
Max Input Voltage	6V
USB Power Input	4.75~5.25V
Servo Rail Input	0–36V (Unpowered)
Current Ratings	Telem1 Max output current limit: 1.5A.
	All other port combined output current limiter: 1.5A

Interface

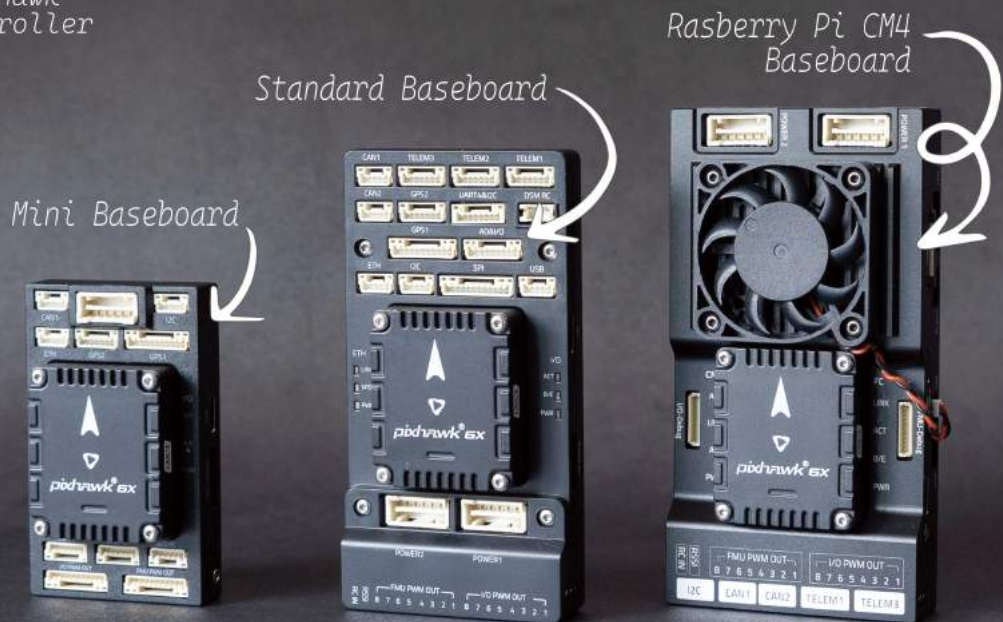|	
PWM out	16 (8 From IO, 8 From FMU)
UART	6 (Telem1 & 2 & 3, GPS1 & 2, UART4)
I2C	2 Bus (1 standalone, 1 in GPS2 Port)
CAN	2 Bus
Debug	Pixhawk FMU Debug Full
	Pixhawk I/O Debug Full
Power Input	2 Power Input Ports (Digital)
USB	2 (Type-C & 4P JST GH)
Ethernet	Supported (4P JST GH)
Others	SPI, AD & IO, SBUS Out
R/C Input	Dedicated R/C input for Spektrum / DSM and S.BUS, CPPM, analog / PWM RSSI

Mechanical Data

Operating Temp	-40 ~ 85°c
Dimension	38.8 x 31.8 x 14.6mm
Weight	23g

Newly Designed Vibration Isolation System

Triple Redundant IMU 2X Barometer

Modular Design

Pixhawk Autopilot FMUv6X Open Standard

IMU Board

Triple Redundancy Domains All Sensor on Seperate Bus

FMU Board

Pixhawk Autopilot Bus Standard

Baseboard

pixhawk® 6x
The Most Advanced Pixhawk Autopilot Flight Controller

Rasberry Pi CM4 Baseboard

Standard Baseboard

Mini Baseboard

4

pix32 v6
Flight Controller

Features

- High performance H7 Processor with clock speed up to 480 MHz
- New cost-effective design with low-profile form factor
- Redundant inertial measurement unit (IMU) from Bosch® & InvenSense®
- Integrated vibration isolation system
- IMUs are temperature-controlled by onboard heating resistors
- Effortless baseboard customization

Pix32 v6 a variant of the Pixhawk 6C. It is comprised of a separate flight controller and carrier board which are connected by a 100 pin connector. This flight controller is perfect for people that is looking for a affordable and modular flight controller that can use a customized baseboard.

We have made the pix32 v6 base board schematics public. By using a customize baseboard, you can make sure that the physical size, pinouts and power distribution requirements match your vehicle perfectly, ensuring that you have all the connections you need and none of the expense and bulk of connectors you don't.

Specification

FMU Processor	STM32H743 – Arm® Cortex®–M7 480MHz, 2MB memory, 1MB SRAM
IO Processor	STM32F103 – Arm® Cortex®–M3 72MHz, 64KB SRAM
Accel/Gyro	ICM–42688-P
	BMI055
Compass	IST8310
Barometer	MS5611

Electrical Data

|	
Max Input Voltage	6V
USB Power Input	4.75~5.25V
Servo Rail Input	0–36V (Unpowered)
Current Ratings	Telem1 Max output current limiter: 1.5A.
	All other port combined output current limiter: 1.5A

Interface

PWM out	16 (8 From IO, 8 From FMU)
UART	5 (Telem1&2&3, GPS1 & 2)
I2C	2 Bus (1 standalone, 1 in GPS2 Port)
CAN	2 Bus
Debug	Pixhawk FMU Debug Mini
Power Input	2 Power Input Ports (Analog)
SBUS Output	Available
R/C Input	Dedicated R/C input for Spektrum / DSM and S.BUS, CPPM, analog / PWM RSSI

Mechanical Data

Operating Temp	-40 ~ 85°c
Dimension	44.8 * 44.8 * 13.5mm
Weight	36g

pix32 v6
Flight Controller
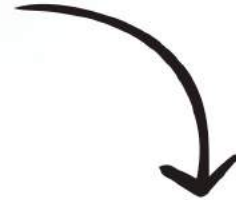
Create Your Own Custom
Baseboard Design

Pix32 v6
Mini-Baseboard

Pix32 v6
Standard Baseboard

Using the reference design file
provided by Holybro, this drastically
minimize your engineering R&D time

Your Own Custom Baseboard
Designed for Your Vehicle

Features

- High performance H7 Processor with clock speed up to 480 MHz

- Redundant inertial measurement unit (IMU) from Bosch® & InvenSense®

- Built-in Vibration isolation system to filter out high frequency vibration and reduce noise to ensure accurate readings

- IMUs are temperature-controlled by onboard heating resistors, allowing optimum working temperature of IMUs

- 2 power ports & 5 general purpose serial ports

- Two Power ports for redundancy

Durandal is a flight controller designed by Holybro utilizing the STM32H7 microcontroller series. It comes with built-in vibration isolation system and integrated IMU heater for sensors temperature control.

Specification

FMU Processor	STM32H743 – Arm® Cortex®–M7 480MHz, 2MB memory, 1MB SRAM
IO Processor	STM32F100/F103 32 Bit Arm ® Cortex®
Accel/Gyro	ICM–20602
	BMI088
Compass	IST8310
Barometer	MS5611

Electrical Data

|	
Max Input Voltage	6V
USB Power Input	4.75~5.25V
Servo Rail Input	0–36V
Current Ratings	Telem1 Max output current limiter: 1.5A.
	All other port combined output current limiter: 1.5A

Interfance

13 PWM outputs (8 from IO, 5 from FMU)

5 general purpose serial ports

3 I2C ports

4 SPI buses

Up to 2 CANBuses for dual CAN

Analog inputs for voltage / current of 2 batteries

6 dedicated PWM/Capture inputs on FMU

Dedicated R/C input for Spektrum / DSM

Dedicated R/C input for CPPM and S.Bus

Dedicated S.Bus servo output and analog / PWM RSSI input

2 additional analog inputs

Mechanical Data

Operating Temp	-40 ~ 85°c
Dimension	80*45*20.5mm
Weight	68.8g

Durandal

The Durandal Autopilot Flight Controller uses a built-in vibration isolation system to isolate high-frequency vibration to ensure sensor accuracy.

Vibration Isolation Foam

IMU Board with Epoxy Potting

Counterweight

Main Board

PX4 autopilot

ARDUPILOT
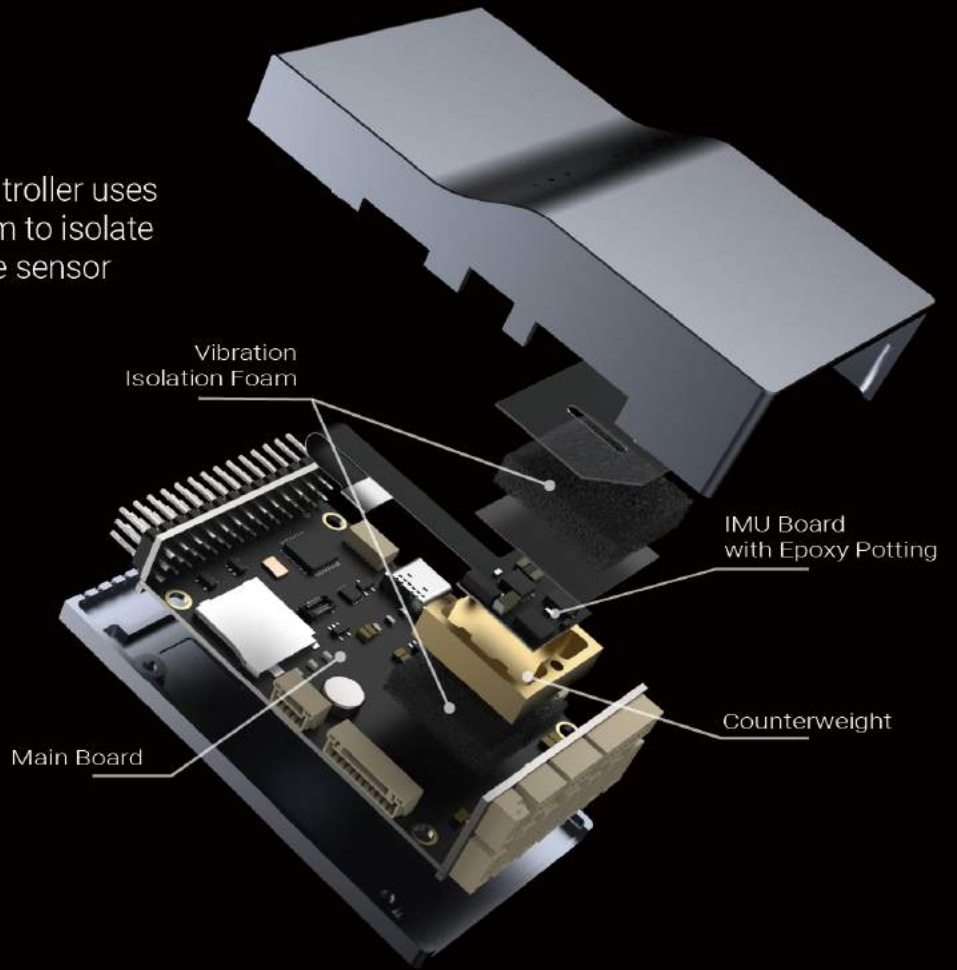
Durandal

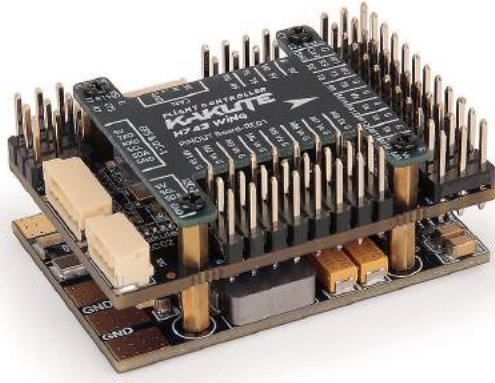| H7 Processor | High Performance IMU | IMU Redundancy | Built-in Vibration Isolation |

PX4 autopilot   ARDUPILOT

kakute H743-WING

Features

- MCU - STM32H743, 480 MHz, 1MB RAM, 2MB Flash
- IMU - IMU: ICM-42688P (SPI3)
- Baro - BMP280 (I2C4)
- OSD - AT7456E (SPI2)
- Blackbox: MicroSD card slot on SDMMC2
- 7x Uarts (1,2,3,5,6,7,8) with built-in inversion.
- 14x PWM outputs, 1x CAN, 5x ADC (Bat1/Curr1, Bat2/Curr2 and RSSI)
- 3x I2C (I2C1 and I2C2 for external devices, I2C4 for onboard sensors)
- 3x LEDs for FC STATUS (Blue, Red) and 3.3V indicator (Green)
- USB/DFU Key Extender with USB Type-C
- Dual Camera Inputs switch
- 5V/9V(12V) for Camera/VTX power switch
- High-precision Current Sense (90A continuous, 220A peak)
- Battery Voltage Sensor: 5K:25.5K (Scale 1800 in INAV, BATT_VOLT_MULT 18.18 in ArduPilot)
- Mounting: 25 x 25mm, M2 hole
- Dimensions: 45x 30 x 13.5 mm
- Weight: 28g with USB extender
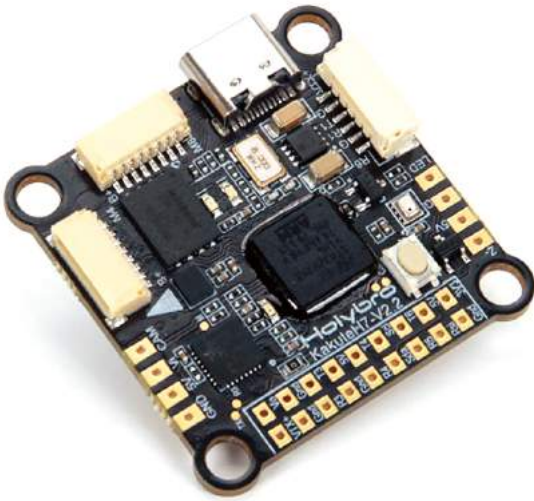
SKU: 11063

Kakute H7 V1
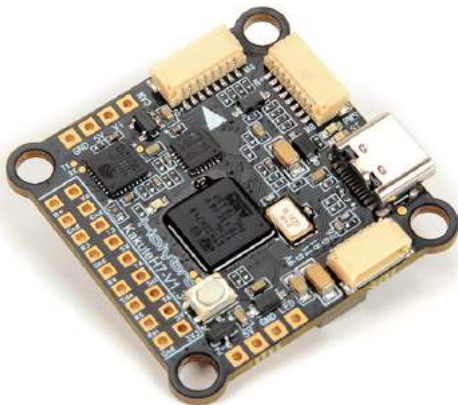
Features

- MCU - STM32H743 32-bit processor running at 480 MHz
- IMU - MPU6000
- Barometer - BMP280
- OSD - AT7456E
- Onboard Bluetooth chip - ESP32-C3
- 6x UARTs (1,2,3,4,6,7; UART2 is used for Bluetooth telemetry)
- 9x PWM Outputs (8 Motor Output, 1 LED)
- 2x JST-SH1.0 8pin ESC port (4in1 ESCs, x8/Octocopter compatible)
- 1x JST-SH1.0 6pin VTX port (For HD System like Caddx Vista & Air Unit)
- Battery input voltage: 2S - 8S
- BEC 5V 2A Cont.
- BEC 9V 3A Cont
- USB Type-C
- Mounting - 30.5 x 30.5mm/Φ4mm hole with Φ3mm Grommets
- Dimension - 35x35mm
- Weight - 8g

SKU: 11065

Kakute H7 V2

Features

- MCU – STM32H743 32-bit processor running at 480 MHz
- IMU – BMI270
- Barometer – BMP280
- OSD – AT7456E
- Onboard Bluetooth chip – ESP32-C3
- SpeedyBee IOS & Android App Compatible
- VTX ON/OFF Pit Switch – Switch can be enable using USER1 in Betaflight Mode tab.
- Warning: Do not enable this pit switch if you are using DJI FPV Remote Controller
- 6x UARTs (1,2,3,4,6,7; UART2 is used for Bluetooth telemetry)
- 9x PWM Outputs (8 Motor Output, 1 LED)
- Battery input voltage: 2S-8S
- BEC 5V 2A
- BEC 9V 3A
- Mounting – 30.5 x 30.5mm/ 4mm hole with 3mm Grommets
- Dimension – 35x35mm
- Weight – 8g
- Support Betaflight, INAV, PX4, Ardupilot

*SKU: 11058*

Kakute H7 Mini

Features

- MCU – STM32H743 32-bit processor running at 480 MHz
- IMU – MPU6000
- Barometer – BMP280
- OSD – AT7456E
- Onboard Flash: 128Mbits
- VTX ON/OFF Pit Switch – Switch can be enable using USER1 in Betaflight Mode tab. Warning: Do not enable this pit switch if you are using DJI FPV Remote Controller
- 6x UARTs (1,2,3,4,6,7)
- 9x PWM Outputs (8 Motor Output, 1 LED)
- Battery input voltage: 2S-6S BEC 5V 2A
- Mounting – 20 x 20mm, 3.6mm hole with M3 & M2 Grommets
- Dimension – 31x30x6mm
- Weight – 5.5g
- Support Betaflight, INAV, PX4, Ardupilot

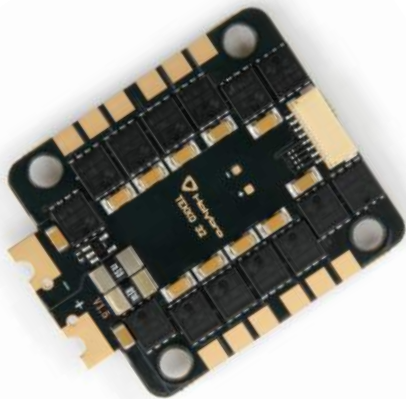*SKU: 11052*

Tekko32 F4 4in1 Mini 50A ESC
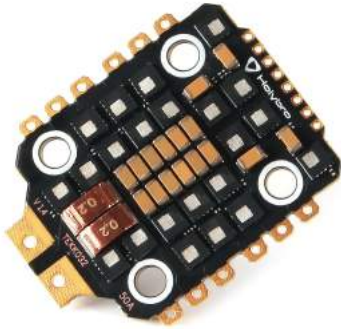
Features

- BLHeli_32 firmware
- Burst Current: 60A x4
- PWM Frequency: 16k to 96k
- Supports MultiShot/OneShot/Proshot/PWM etc
- Supports 4-6S lipo input
- Mounting holes: 20x20mm (M2& M3 Rubber Gourmet Included)
- Size: 32 x 40 mm

SKU: 31155

Tekko32 F4 4in1 50A ESC

Features

- F4 MCU @ 150Mhz (compared to F3 @108Mhz & F0 @48Mhz)
- PWM Frequency: 16k to 96k
- Continuous Current: 50A x4
- Burst Current: 60A x4
- Supports 4-6S battery
- Dimensions: 48x37x6mm / Weight: 13.8g
- Mounting holes: M4 30.5x30.5mm (M3 grommets included)

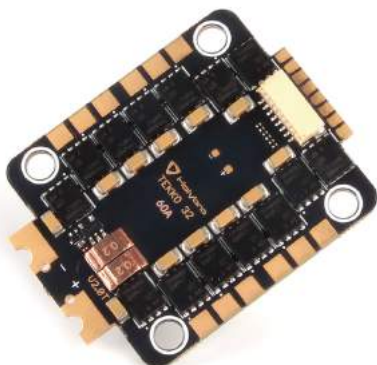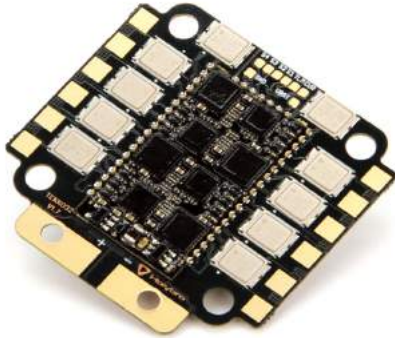*SKU: 31102*

Tekko32 F4 4in1 60A ESC

Features

- Fast F4 MCU @150MHz (compared to F3 @108MHz & F0 @48MHz)
- PWM Frequency: 16k to 96k
- Continuous Current: 60A x4
- Burst Current: 70A x4
- Battery Supports: 4-6S
- Mounting holes: M4 30.5x30.5mm (M3 grommets included)
- Size: 48x37x6mm

SKU: 31156

Tekko32 F4 Metal 4in1 65A ESC

Features

- New & faster F4 MCU @ 150Mhz, PWM Frequency: 16k to 96k
- Metal-cased MOSFET for excellent heat dissipation
- Massive on-board capacitance for noise filtering at 2068uf
- 3 oz copper PCB design to allow bigger current and better heat dissipation
- Continuous Current: 65A x4, Burst Current: 75A x4
- Supports 4-6S battery
- Dimensions: 43 x 44mm / Weight: 15.8g
- Mounting holes: M4 30.5x30.5mm (M3 grommets included)

SKU: 31097

Tekko32 F4 45A ESC

Features

- F4 MCU with BLHELI32 firmware Dshot1200 up to 32kHz
- PWM up to 48k
- Small size & low weight
- On-Board RGB LED
- Build in Current sensor
- 2-6s LIPO input
- Size: 17.3*34.3*4.5mm
- Weight: 5.8g

SKU: 31104

Unicore UM982

Features

- Dual antennas allow Moving Baseline Yaw (GPS Heading) with just one module

- Can replace the traditional compass/magnetometer

- Perfect for system/environment with high magnetic interference

- Excellent RTK performance

Tips: It is recommended to use the H–RTK F9P–Base orF9P Helical as your base station because it's simple setup procedure in Mission Planner & QGroundControl. Neither MP nor QGC can configure the UM982 automatically as base station at this moment, additional manual setup is required.

	Unicore UM982
Application	Rover,Moving Baseline Rover, Base Station (Recommend using H-RTK F9P-Base as base station)
Compass	IST8310
GNSS	BDS B1I/B2I/B3I,GPS L1C/A/L2P (Y)/L2C/L5, GLONASS L1/L2,Galileo E1/E5a/E5b,QZSS L1/L2/L5
Antennas Peak Gain (MAX)	2dBi
LNA Gain (typical)	33±2dB
Time-TO-First Fix	Cold start: ≤ 30s Hot start: ≤ 5s
RTK-SurveyIn-Time	≤5 minute @2.0mCEP
Data and Update Rate	20 Hz Positioning & Heading 20 Hz Raw Data observation
Port	Port 1: GH1.25 10-pin Port 2: USB Type-c Port 3: UART 2 (GH1.25 6pin)
Cable Length	GH 10P: 150mm GH 10P: 400mm GH 10P to 6P: 300mm
Antenna Connection Type	Board: SMA female Antenna: SMA male
Baud rate: (Adjustable)	230400 5Hz default
Working voltage	4.75V~5.25V
Current Consumption	~350mA
Dimensions	Board: 34.8*58.9*14.4mm Antenna Diameter: 27.5mm Antenna height: 59mm
Weight	37.9g (without antennas)

H-RTK F9P Ultralight

Features

- H-RTK F9P Ultralight is an ultra-lightweight RTK GNSS module with U-blox ZED-F9P, an IST8310 compass, and an integrated helical antenna. It is designed specifically for weight-conscious applications where every gram counts.

- The H-RTK F9P Ultralight can receive and track multiple GNSS systems. Owing to the multi-band RF front-end architecture, all four major GNSS constellations (GPS, GLONASS, Galileo, and BDS) can be received concurrently. All satellites in view can be processed to provide an RTK navigation solution when used with correction data.

	H-RTK F9P Ultralight	
GNSS module	u-blox ZED-F9P	
Compass	IST8310	
Weight	21.4g	
Application	Rover (Aircraft)	
Receiver type	■ GPS L1C/A L2C ■ Galileo E1 E5b ■ GLONASS G2 G1 ■ BDS B1l B2l	
Sensitivity	Tracking	-163dBm
	Reacquisition	-147dBm
Time-To-First-Fix[1]	Cold Start	≤35 s
	Warm Start	20s
	Hot Start	1 s
Position accuracy[2]	Autonomous	2.0 m CEP
	DGNSS	0.5m CEP
	RTK	1cm+1ppm (Horizontal)[3]
Accuracy of time pulse signal	RMS	30ns
Velocity accuracy	GNSS	0.1 m/s
	D-GNSS	0.05 m/s
Operational limits[4]	Dynamics	≤ 4 g
	Altitude	18000 m
	Velocity	515 m/s
Baud Rate	38400-230400 bps （Default 38400 bps）	
Max navigation update rate	10Hz (If you need a greater navigation update rate, please contact us)	

1. All satellites at ≥-130dBm

2. CEP, 50%, 24 hours static, ≥-130dBm, > 8SVs

3. Based on 30km, the accuracy error increases by 1cm every 10km from the base station

4. Assuming Airborne < 4 g platform

DroneCAN H-RTK F9P - Rover

Features

- U-blox F9P Module
- STM32G473 processor
- BMM150 compass
- DroneCAN Protocol
- Ceramic Patch Antenna with 20dB LNA
- Water Resistant
- This model can be used on the rover (aircraft)

DroneCAN H-RTK F9P - Helical

Features

- U-blox F9P Module
- STM32G473 processor
- Helical Antenna with 36dB LNA
- BMM150 compass
- DroneCAN Protocol
- Antenna can either be attached to the module directly or connected via a SMA cable
- UART2 port exposed, allowing YAW/Heading
- This model can be used either on the rover (aircraft) or as a base station.

DroneCAN Benefit

- CAN has been specifically designed to deliver robust and reliable connectivity over relatively large distances.
- Wiring is less complicated as you can have a single bus for connecting all your DroneCAN peripherals.
- Does not occupy any serial port of the flight controller, and different CAN devices can be connected to the same CAN bus via a CAN splitter board.
- It allows users to configure and update the firmware of all CAN-connected devices centrally

DRONECAN H-RTK COMPARISON

	DroneCAN H-RTK F9P Rover	**DroneCAN H-RTK F9P Helical**
SKU	12034	12037
Intended Application	Rover (aircraft) only	Rover (aircraft) or Base station
GNSS Receiver	U-blox ZED-F9P high precision GNSS module	U-blox ZED-F9P high precision GNSS module
Antenna	Ceramic Patch Antenna with 20dB LNA	Helical Antenna with 36dB LNA
Processor	STM32G473	STM32G473
Magnetometer	BMM150	BMM150
GNSS	BeiDou, Galileo, GLONASS, GPS / QZSS	BeiDou, Galileo, GLONASS, GPS / QZSS
GNSS Band	B1I, B2I, E1B/C, E5b, L1C/A, L1OF, L2C, L2OF	B1I, B2I, E1B/C, E5b, L1C/A, L1OF, L2C, L2OF
Positioning accuracy	3D FIX: 1.5 m / RTK: 0.01 m	3D FIX: 1.5 m / RTK: 0.01 m
Communication Protocol	DroneCAN 1Mbit/s	DroneCAN 1Mbit/s
Antennas Peak Gain (MAX)	L1: 4.0dBi	L1: 2dBi
	L2:1.0 dBi	L2: 2dBi
Time-TO-First Fix	Cold start: ≤29s	Cold start: ≤25s Hot start: ≤1s
	Hot start: ≤1s	
Navigation Update Rate	RAW: 20Hz Max RTK: 8Hz Max	RAW: 20Hz Max RTK: 8Hz Max
		Moving Base RTK: 5Hz Max
Cable Length	27cm or 50cm	N/A
Antenna Connection Type	N/A	Board: SMA female Antenna: SMA male
Working voltage:	4.75V~5.25V	4.75V~5.25V
Current Consumption	~250mA	~250mA
Dimensions	Diameter: 80mm Height: 20mm	Board: 51.1*35*22.9mm Antenna Diameter: 27.5mm Antenna height: 59mm
Weight	123g	58g

H-RTK F9P - Rover Lite

Features

- U-blox F9P Module
- IST8310 compass
- Ceramic Patch Antenna with 20dB LNA
- Water Resistant
- Tri-colored LED indicator
- Integrated safety switch
- Used on the rover (aircraft)

H-RTK F9P - Helical

Features

- U-blox F9P Module
- IST8310 compass
- Helical Antenna with 36dB LNA
- UART2 port exposed, allowing YAW/Heading
- Tri-colored LED indicator
- Integrated safety switch
- Can be used either on the rover (aircraft) or as a base station

H-RTK F9P - Base

Features

- U-blox F9P Module
- IST8310 compass
- Helical Antenna with 36dB LNA
- Tri-colored LED indicator
- Integrated safety switch
- Used as a base station
- The board is the same as number 2 above, but it is equipped with a high-gain antenna.
- The search speed and positioning accuracy are the highest among the three models.

H-RTK COMPARISON

Product Model	H-RTK F9P Rover lite	H-RTK F9P Helical	H-RTK F9P Base
Application	Rover (aircraft) only	Rover (aircraft) or base	Base station only
GNSS	GPS L1C/A	GPS L1C/A	GPS L1C/A
	GPS L2C GLONASS L1Oz	GPS L2C GLONASS L1Oz	GPS L2C GLONASS L1Oz
	GLONASS L2OFz) BeiDou B1	GLONASS L2OFz) BeiDou B1	GLONASS L2OFz) BeiDou B1
	BeiDou B2Hz)	BeiDou B2Hz)	BeiDou B2Hz)
	Galileo E1-B/CH	Galileo E1-B/CH	Galileo E1-B/CH
	Galileo E5b	Galileo E5b	Galileo E5b
Antennas Peak Gain (MAX)	L1: 4.0dBi L2:1.0 dBi	2dBi	5.5dBi
LNA Gain typical	20.5±1dB	33±2dB	40±2dB
Time-TO-First Fix	Cold start:≤29s Hot	Cold start:≤25s Hot	Cold start:≤24s Hot
RTK-SurveyIn-Time	N/A	≤5 minute @2.0mCEP	≤5 minute @1.5mCEP
Data and Update Rate	RAW: 20Hz Max RTK: 8Hz Max	RAW: 20Hz Max RTK: 8Hz	RAW: 20Hz Max RTK: 8Hz
		Moving Base RTK: 5Hz Max	Moving Base RTK: 5Hz Max
Port	GH1.25 10pin cable	Port 1: GH1.25 10-pin	Port 1: GH1.25 10-pin
	or GH1.25 6pin cable	Port 2: USB Type-c Port 3:	Port 2: USB Type-c Port 3:
Cable Length	26cm	GH 10P: 150mm, GH 10P:	SMA-TNC: 5m
Antenna Connection Type	N/A	Board: SMA female	Board: SMA female
		Antenna: SMA male	Antenna: TNC female
			Male-male SMA-TNC cable
Baud rate:	115200 5Hz (default) can	115200 5Hz (default) can	115200 5Hz (default) can
Working voltage:	4.75V~5.25V	4.75V~5.25V	4.75V~5.25V
Current Consumption	~250mA	~250mA	~250mA
Dimensions	Diameter: 76mm Height: 20mm	Board: 34.8*52.7*12.9mm Antenna Diameter: 27.5mm Antenna height: 59mm	Board: 34.8*52.7*12.9mm Antenna Diameter: 152mm Antenna height: 62.2mm
Weight	106g	49g	469g

GPS & RTK SYSTEM

M9N GPS Module   M10 GPS Module   Micro M10 GPS

Features

- Ublox Neo-M9N or M10 module
- Industry leading −167 dBm navigation sensitivity
- Cold starts: 26s
- LNA MAX2659ELT+
- 25 x 25 x 4 mm ceramic patch antenna
- Rechargeable Farah capacitance
- Low noise 3.3V regulator
- Current consumption: less than 150mA @ 5V
- Fix indicator LEDs
- Protective case
- 26cm cable included
- Diameter 50mm total size, 32 grams with case.(Micro M10 16g)
- M9N: Concurrent reception of up to 4 GNSS (GPS, Galileo, GLONASS, BeiDou)
- M10: Concurrent reception of up to 4 GNSS (GPS, Galileo, GLONASS,BeiDou)
- Micro M10: Concurrent reception of up to 4 GNSS (GPS, Galileo, GLONASS,BeiDou)

GPS & RTK SYSTEM

DroneCAN
M9N GPS Module

DroneCAN Benefit

- CAN has been specifically designed to deliver robust and reliable connectivity over relatively large distances.

- Wiring is less complicated as you can have a single bus for connecting all your DroneCAN peripherals.

- It allows users to configure and update the firmware of all CAN-connected devices centrally

- Does not occupy any serial port of the flight controller, and different CAN devices can be connected to the same CAN bus via a CAN splitter board.

	DroneCAN M9N
GNSS Receiver	Ublox NEO M9N
Number of Concurrent GNSS	Up to 4 GNSS (GPS, Galileo, GLONASS, BeiDou)
Processor	STM32G4 (170MHz, 512K FLASH)
Compass	BMM150
Frequency Band	GPS: L1C/A GLONASS: L10F Beidou: B1I Galileo: E1B/C
GNSS Augmentation System	SBAS: WAAS, EGNOS, MSAS, QZSS
Navigation Update	5Hz Default(10Hz MAX)
Accuracy	2.5m
Speed Accuracy	0.05 m/s
Max # of Satellites	22+
Communication Protocol	DroneCAN @ 1 Mbit/s
Supports Autopilot FW	PX4, Ardupilot
Port Type	GHR-04V-S
Antenna	25 x 25 x 4 mm ceramic patch antenna
Voltage	4.7-5.2V
Power consumption	Less than 200mA @ 5V
Temperature	-40~80C
Size	Diameter: 54mm Thickness: 14.5mm
Weight	36g
Cable Length	26cm
Other	LNA MAX2659ELT+ RF Amplifier
	Rechargeable Farah capacitance
	Low noise 3.3V regulator

TELEMETRY RADIO

Microhard Radio

Features

- Available in 902–928 MHz & 840-945 MHz
- Support Point-to-Multipoint connection
- Transmit Power 100mW to 1W (20-30dBm)
- USB Type-C port, integrated USB to UART converter
- 6-position JST-GH connector, can be directly connected to the TELEM port on various flight controllers
- High voltage BEC onboard, Support DC7~35V voltage supply
- UART transmission LED indicator
- Three-stage RSSI LED indicator

	Microhard P900	Microhard P840
Frequency Range	902 to 928 MHz	840 to 845 MHz
Transmit Power (Software Adjustable)	100mW to 1W (20-30dBm)	100mW to 1W (20-30dBm)
Link Rate	Up to 276 kbps	Up to 345 kbps
Serial Baud Rate	Up to 230.4kbps asynchronous	300 bps to 230 kbps
Max Range (Ideal Condition)	Up to 40 miles (60km)	Up to 60 miles (100 km)
Spreading Method	Frequency Hopping Spread Spectrum (FHSS)	Frequency Hopping/Fixed Frequency, GMSK, 2GFSK, 4GFSK, QPSK
Operating Modes	Mesh, Point-to-Point, Point-to-Multi-point, Store and Forward, Auto Routing, Self Healing, Packet Routing Modes	Point-to-Point, Point-to-Multipoint, Store & Forward Repeater, Peer-to-Peer
Input Voltage	DC7~35V	DC7~35V
	(4-position JST-GH)	(4-position JST-GH)
Power Consumption	Sleep < 1mA Idle 3.5mA Rx: 45mA to 98mA Tx : 1000mA to 1400mA	Sleep: < 1mA Idle: 20mA Rx: 45mA to 98mA Tx Peak: 2A
Weight	42g (without antenna) 69g (with antenna)	42g (without antenna) 69g (with antenna)
Error Detection	32 bits of CRC, ARQ	32 bits of CRC, ARQ

Sik Telemetry Radio v3

Features

- Open-source SIK firmware
- Plug-n-play for Pixhawk Standard Flight Controller
- Easiest way to connect your Autopilot and Ground Station
- Interchangeable air and ground radio
- Micro-USB port (Type-C Adapter Cable Included)
- 6-position JST-GH connector
- Configurable through Mission Planner & APM Planner Dimension

Specification

- 100 mW maximum output power (adjustable) -117 dBm receive sensitivity
- RP-SMA connector=
- 2-way full-duplex communication through adaptive TDM UART interface
- Transparent serial link
- MAVLink protocol framing
- Frequency Hopping Spread Spectrum (FHSS) Configurable duty cycle
- Error correction corrects up to 25% of bit errors Open-source SIK firmware
- 28 x 53 x 10.7mm (without antenna)

Electrical Data

- Supply voltage: 5V DC (from USB or JST-GH)
- Transmit current: 100 mA at 20dBm
- Receive current: 25 mA
- Serial interface: 3.3 V UART
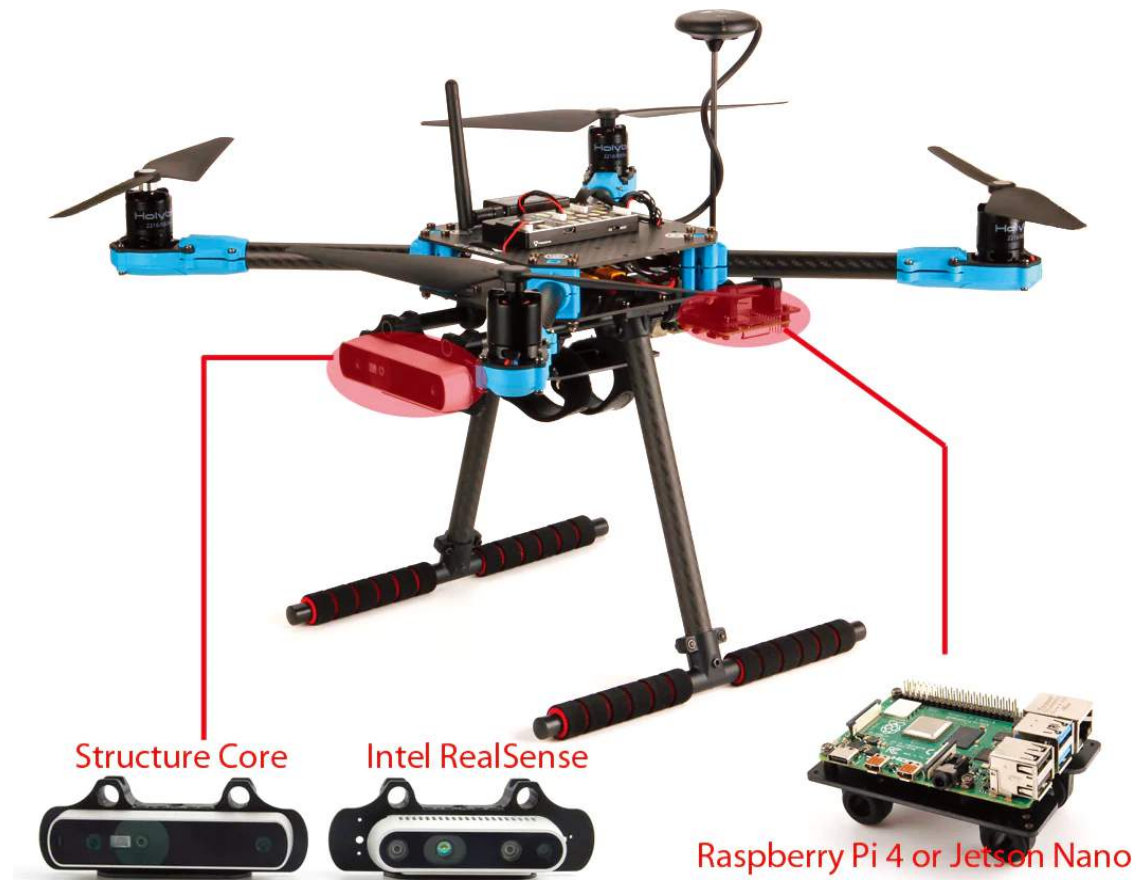
PX4 Development Kit - X500v2

Features

- All new Pixhawk 6C or Pixhawk 6X Flight Controller with M10 GPS and Plug & play SiK Telemetry Radio

- New frame design with minimal assembly time (~30 minutes), No soldering required

- Carbon Fiber frame with fiber-reinforced nylon connectors providing easy & straightforward installation

- Pre-installed motors & ESCs with simple XT30 power plugs for PDB

- Power distribution board (PDB) with XT60 & XT30 plugs

- Mount for companion computer such as Raspberry Pi & Nvidia Jetson Nano

- Optional depth camera mount for Intel RealSense & Structure Core

PX4 Development Kit - X500v2

Structure Core   Intel RealSense

Raspberry Pi 4 or Jetson Nano

*Depth Camera & Companion Computer Not Included

Includes

- PX4 Development Kit - X500 v2 Includes:
- Autopilot Flight controller: Pixhawk 6C & PM02 V3 or Pixhawk 6X (Standard Base) & PM02D-6S
- M10 GPS Module, SiK Telemetry Radio V3 433/915MHz
- Depth Camera Mount (Sold Seperately)
- X500 V2 Frame Kit (SKU30120)
- Preinstalled Items:
    * Motors - Holybro 2216 KV920 Motor (4 pcs) with XT30 Plug
    * ESCs - BLHeli S ESC 20A (4 pcs) with XT30 Plugs - Compatible with 4S Battery
    * 1045 Propellers (6 pcs)
    * Power Distribution Board (XT60 plug for battery & XT30 plug for ESCs & peripherals)

X500 v2 Almost Ready to Fly Kit

Features

- New design and minimal assembly time (~20 minutes)
- No soldering required
- Carbon Fiber frame with fiber-reinforced nylon connectors providing easy & straightforward installation
- Pre-installed motors & ESCs with simple XT30 power plugs for PDB
- Power distribution board (PDB) with XT60 & XT30 plugs - no soldering needed
- Platform board for various device such as companion computer like Raspberry Pi & Nvidia Jetson Nano
- Optional depth camera mount for Intel RealSense & Structure Core

Includes

- X500 V2 Frame Kit
- With Preinstalled Items:
- Motors - Holybro 2216 KV920 Motor (4 pcs)
- ESCs - BLHeli S ESC 20A (4 pcs)
- 1045 Propellers (6 pcs)
- Power Distribution Board – XT60 plug for battery & XT30 plug for ESCs & peripherals
- Note: Depth camera mount is sold separately.

X500 V2 Frame Kit

Features

- New design and minimal assembly time (~20 minutes)
- Carbon Fiber frame with fiber-reinforced nylon connectors providing easy & straightforward installation
- Platform board for various device such as companion computer like Raspberry Pi & Nvidia Jetson Nano
- Optional depth camera mount for Intel RealSense & Structure Core

Includes

- Body - Full Carbon Fiber Top & Bottom plate (144 x 144mm, 2mm thick)
- Arm - High strength & ultra-lightweight 16mm carbon fiber tubes with newly designed fiber reinforced nylon connectors
- Landing gear - 16mm & 10mm diameter carbon fiber tubes with strengthened & improved plastic tee connectors.
- Platform board - With mounting holes for GPS & popular companion computer such as the Raspberry Pi 4 & Jetson Nano
- Dual 10mm Ø rod x 250 mm long rail mounting system
- Battery mount with two Battery Straps
- Hand tools for installation

DRONE DEVELOPMENT KIT

S500 v2 Development Kit

Features

- Easy to assemble, no soldering required
- Frame is made of mixture of carbon reinforced plastic and carbon rods
- Pre-solder ESC and power module
- Lower Cost

Includes

- Pixhawk 6C Flight Controller (Plastic Case)
- PM02 V3-12S Power Module
- M10 GPS Module
- SiK Telemetry Radio V3 433/915MHz
- S500 V2 Frame Kit
- Motors - Holybro 2216 KV920 Motor (4 pcs)
- ESCs - BLHeli S ESC 20A (4 pcs)
- 1045 Propellers (4 pcs)

X500 V2 Frame Kit

Includes

- Frame is made of mixture of carbon reinforced plastic and carbon rods
- Motors - 2216 KV920
- BLHeli S ESC 20A
- Propeller 1045 V2 Update
- Battery Straps

X500 V2 Frame Kit

Includes

- Frame is made of mixture of carbon reinforced plastic and carbon rods
- Dimensions:383*385*240mm
- Wheelbase:480mm
- Weight:782g

DRONE DEVELOPMENT KIT

QAV 250 Complete Kit

Includes

- Pix32 v6 autopilot & M10 GPS
- Carbon fiber 250 airframe with hardware
- Motors – 2207 KV1950
- 5" Plastic Props
- Fully assembled Power Management Board with ESCs (BLHeli S ESC 20A)
- 433MHz Telemetry Radio/ 915MHz Telemetry Radio
- 5.8G FPV Video Transmitter
- Micro OSD V2
- HD Micro FPV Camera
- Power and Radio Cables
- Battery Straps

QAV 250 Basic Kit

Includes

- Everything in the Complete kits, but without the following:
  * 5.8G FPV Video Transmitter
  * Micro OSD V2
  * HD Micro FPV Camera

QAV250 ARF Kit

Includes

- Carbon fiber 250 airframe with hardware
- Micro Power Module (PM06 v2)
- Motors – 2207 KV1950
- 5" Plastic Props
- Fully assembled Power Management Board with ESCs(BLHeli S ESC 20A)
- Battery Straps

QAV250 Frame Kit

Includes

- Carbon fiber 250 airframe with hardware
- Battery Straps

Kopis X8 Cinelifter 5" Kit - Ducted

Kopis X8 Cinelifter 5" Kit – Cage

Feature

- 5" compact design with injection molded ducts
- Perfect for indoor flying near people and outdoor cursing
- Easily Swappable duct to cage design (purchase separately)
- Ducted design provides smooth flight & excellent flight efficiency
- Caged design provided greater maneuverability, especially in winy situation

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Kopis Cinematic X8 7" Kit

Feature

- Made for 7" propeller
- Camera platform shock absorption structure with 10 silicone damping balls
- Spacing between top and bottom plates: 22mm
- Camera platform elevation: 0 ~ 25 ° Adjustable
- Wheelbase: 396mm
- Weight: 1124g
- Frame weight: 640g

POWER MODULE (DIGITAL)

PM02D   PM03D   PM06D   PM08D

Model	PM02D	PM03D	PM06D	PM08D
SKU	15011, 15013	15011, 15013	15020	15024
Input Voltage	LV: 2~6S / HV: 2~12S	2~6S	2~14S	2~14S
PCB Cont./Burst Current Rating	60A/100A	60A/120A	70A/120A	200/1000A
Max Current Sensing	LV: 164A / HV:327A	164A	327A	327A
Output Voltage	5.2V/3A Max	5.2V/3A Max 8V/12A 3A Selectable	5.2V/3A Max	5.2V/3A Max *2
Ports	XT60 6Pin Molex 2.0mm	XT60 6Pin Molex 2.0mm XT30 *6 (optional) 10 B+ Pads	XT60 6Pin Molex 2.0mm B+ Pads *4	6Pin Molex 2mm *2
Built-in Power Distribution	No	Yes	Yes	No
PWM Header	No	No	No	No
Dimensions	25 x 25 x10 mm	84 x 78 x 12 mm	35 x 35 x10 mm	101 x 45 x 26 mm
Weight	20g	59g	24g	151g
Mounting Hole	N/A	45 x 45 mm	30.5 x 30.5 mm	79 x 38.1mm
Applicable Products	Pixhawk 5X & 6X	Pixhawk 5X & 6X	Pixhawk 5X & 6X	Pixhawk 5X & 6X

POWER MODULE (ANALOG)

PM02

PM06

PM07

PM08

Model	PM02 V3	PM06 V2	PM07	PM08
SKU	15010	15019	15008	15021
Input Voltage	2~12S	2~14S	2~14S	2~14S
PCB Cont./Burst Current Rating	60A/100A	70A/120A	90A/140A	200A/1000A
Max Current Sensing	120A	120A	120A	237.6A
Output Voltage	5.2V/3A Max	5.2V/3A Max	5.2V/3A Max *2	5.2V/3A Max
Ports	XT60 6Pin GHR 1.15mm	XT60 6Pin GHR 1.15mm B+ Pads *4	XT60 6Pin GHR 1.15mm *2 B+ Pads *8 PWM Header	6Pin GHR 1.15mm
Built-in Power Distribution	No	Yes	Yes	No
PWM Header	No	No	Yes	No
Dimensions	25 x 25 x10 mm	35 x 35 x10 mm	68 x 50 x 10 mm	101 x 45 x 26 mm
Weight	20g	24g	43.8g	151g
Mounting Hole	N/A	30.5 x 30.5 mm	45 x 45 mm	79 x 38.1mm
Applicable Products	Pixhawk 6C & 6C Mini, Pix32 V6	Pixhawk 6C & 6C Mini, Pix32 V6	Pixhawk 6C & 6C Mini, Pix32 V6	Pixhawk 6C & 6C Mini, Pix32 V6

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