MINDPX

Autopilot System



User Guide

V1.2

AirMind

Component List



- 1. MindPX
- 2. 6-pin cable
- 3. 4-pin cable
- 4. 4 to 6 pin convertor cable
- 5. PPM encoder
- 6. Voltage/Current detector

- 7. USB cable
- 8. M2 countersink screw × 6
- 9. Light pipe × 2 (removed after v2.6)
- 10. 3M tape
- 11. TF card
- 12. Buzz

Quick self check

Before mounting please perform following quick check for any potential damages to MindPX during logistic:

- 1. Check if any pin headers on the rear are bended or contacted
- 2. Check if the enclosed case is broken or damaged
- 3. Check if accessories are intact

If any situation above, please contact your local sales representatives for replacement.

1. Mounting 2. Wiring 3. Calibrating	Quick Start MindPX can control 2-rotors, 3 rotors, 4 rotors, 6 rotors and 8 rotors. Follow the instructions to quickly start your air journey!
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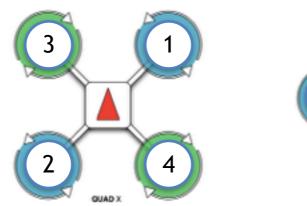
1. Mounting

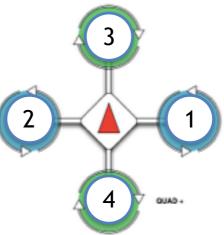


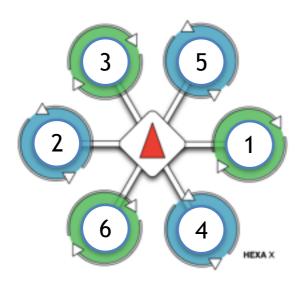
Adhere 3M tape here

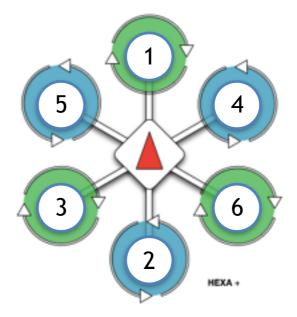
Heading

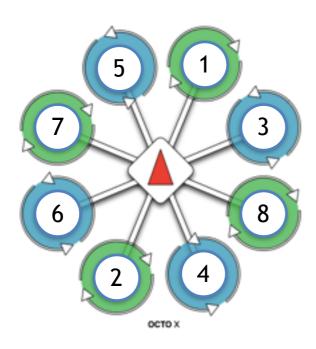
- Adhere on the bottom of MindPX as illustrated
- Attach MindPX to the frame. Please keep the front of MindPX consistent with frame's front.
- Attach MindPX to the frame. Please keep the front of MindPX consistent with frame's front.
- Airframe Orientation

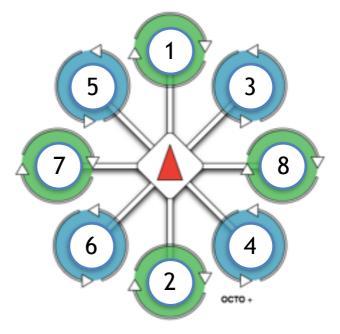


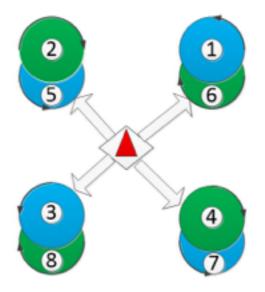


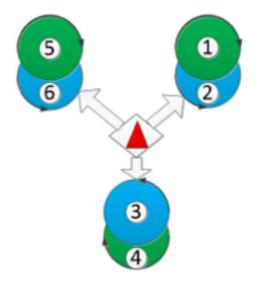




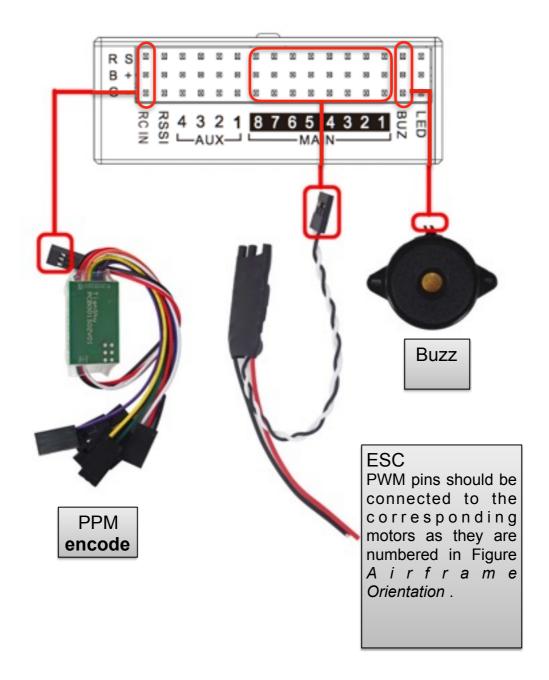




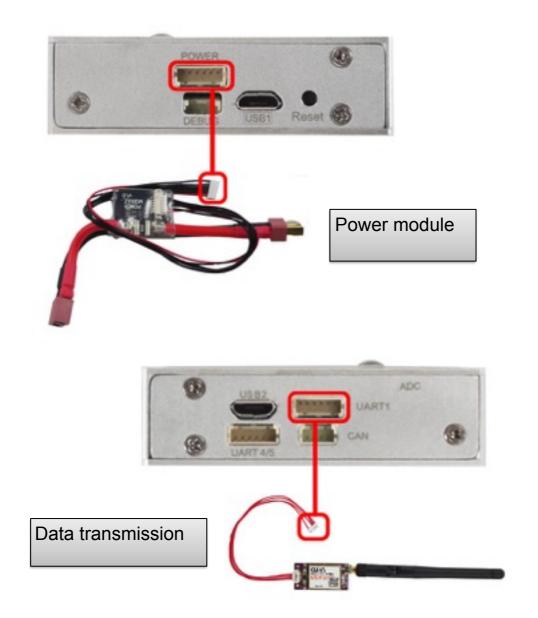


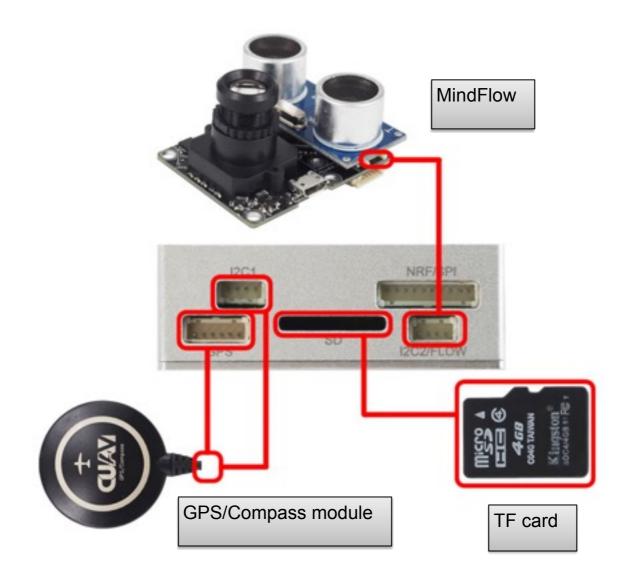


2. Wiring

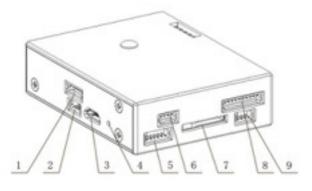


Note: the rear connector panel may look different from the pictures above in different versions of MindPX hardware. Before V2.6, only 6 PWM outputs are supported. If your version is earlier than V2.6, please use only 1~6 PWM outputs.

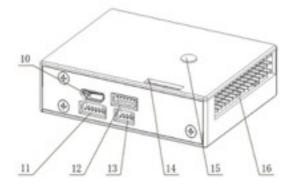




PIN



- 1. Power
- 2. Debug (refresh bootloader)
- 3. USB1 (refresh firmware)
- 4. Reset
- 5. UART3 (GPS)
- 6. I2C1(external compass)
- 7. TF card slot
- 8. NRF/SPI(Remote Control)



- 9. I2C2 (MindFLow)
- 10. USB2 (Serial 2 to USB)
- 11. UART4,5
- 12. UART1 (Telemetry)
- 13. CAN
- 14. ADC
- 15. Tricolor Light
- 16. Looper

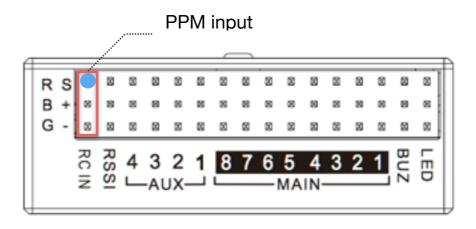
Looper

3. Radio Receiver

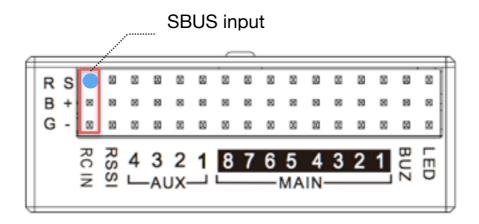
MindPX supports a wide variety of radio receivers (since V2.6) including: PPM/SBUS/DSM/DSM2/DSMX.

MindPX also support FrSky bi-direction telemetry D and S.Port.

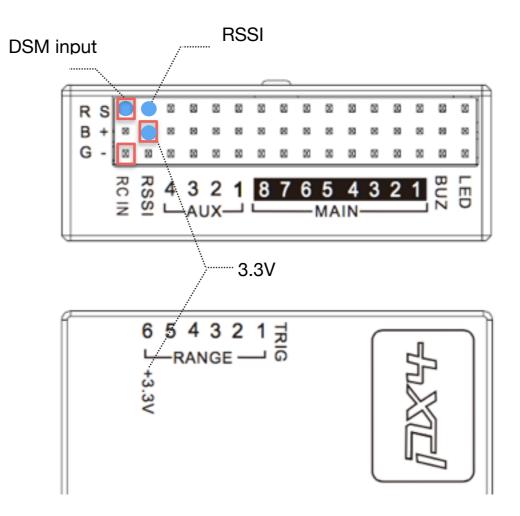
1) PPM



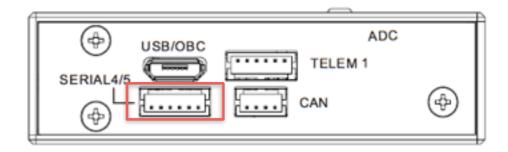
2) SBUS (supported in V2.6 and after)



3) DSM (supported in V2.6 and after)



4) FrSky (supported in V2.6 and after)



- For D series with D.port Connect Serial 4 TX to D.port RX. Connect also GND.

- For X series with S.port (smart port)

Sold Serial 4 TX/RX together, and connect to S.port pin $_{\circ}\,$ Connect also GND.

4. Calibrating

Before you take off you need to calibrate the copter first. QGroundControl needs to be installed first which can be downloaded from:

http://www.qgroundcontrol.org/downloads

1) Install QGroundControl

1. Agree License



2. Select installation path

Setup will install QGroundcontrol in the fi different folder, click Browse and select continue.	
Destination Folder	
C:\Program Files (x86)\ggroundcontrol	Browse
bace required: 249.2MB bace available: 129.3GB	

3. Start installation

Check the components y you don't want to install	tup: Installation Opt · · · · · · · · · · · · · · · · ·
Select components to install:	reate Start Menu Shortcuts
Space required: 249.2MB	
Cancel Nullsoft Instal	l System v3.0b0 < Back Install

4. Install PX4 driver

遗	px4 driver Setup	- • ×
S	Welcome to the px4 driver Se	etup Wizard
	The Setup Wizard allows you to change the features are installed on your computer or your computer. Click Next to continue or C Setup Wizard.	to remove it from
	Back	Cancel
5. Agree driver software lie	cense	
過	px4 driver Setup	×

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tek	Version 3, 29 June 2007 pyright (C) 2007 Free Software Foundation, Inc. tp://fsf.org/> eryone is permitted to copy and distribute batim copies this license document, but changing it is not owed.

6. Select driver installation path

	px4 driver Setup	
Destination Folder		4
Click Next to install to	the default folder or click Change to choose and	other.
Install px4 driver to:		
C: Program Files (x86)\px4 driver \	_
Change		
	<u>Back</u>	Cancel
art driver installat		Cancel

谩	px4 driver Setup	-		<
Ready to inst	all px4 driver		S	•
Click Install to installation set	begin the installation. Click Back to review or change a tings. Click Cancel to exit the wizard.	ny of your		
	Back		Cancel]

8. Continue driver installation

设备驱动程序安装向导
欢迎使用设备驱动程序安装向导!
此向导帮助您安诺软件驱动程序。没有这些驱动程 序,有些计算机设备无法运行。
要继续,请单击"下一步"。
< 上一步(B) 下一步(N) > 取消

9. Finish PX4 driver installation

此计算机上成功地安装了此驱动程序。 現在集可以将设备连接到此计算机。如果此设备附有说明, 请先阅读。	正在完成设备驱动)程序安装向导	
驱动程序名 状态 ^ ✓Arduino LLC (www.a可以使用了 ✓FIDI CDM Driver Pa可以使用了	此计算机上成功地安装了	此驱动程序。	
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设备驱动程序安装向导



QGro	undcontrol Setup: Com	npleted -	
Show details			

2) The calibration process

Connect MindPX USB1 port to your PC with USB cable, and start QGroundcontrol.

1. Drop down "connect" menu on top right corner, and select pixhawk on

COMx(depending on your computer configuration)



2. Select frame type

- After frame selected, the "airframe" label on the left will turn from red to green, indicating setting is successful. The corresponding label will turn to green after each calibration succeeds.

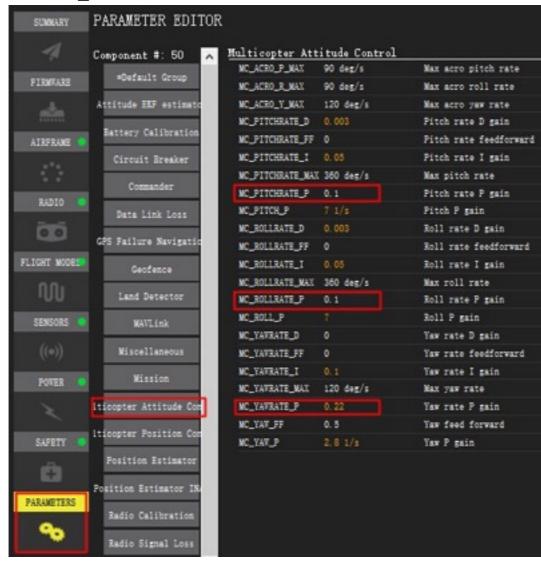


Calibration for 250 frames

Because QGroundControl doesn't originally support 250 frames, at the first step of calibration, you should choose DJI Flame Wheel 330 as a replacement. Before taking off, it is necessary to adjust parameter of airframe 330.

Choose PARAMETER Tab, adjust PID parameters in Multicopter Attitude Control, set MC_PITCHRATE_P, MC_ROLLRATE_P to 0.1,





3) Caliberating remote controller

- Mode 1 is set to left throttle, Mode 2 is set to right throttle.

SUMMARY	RADIO CONFIG
4	Attitude Controls Roll Stode 1 Stode 2
FIRMWARE	Pitch
ntn.	Yax
AIRFRAME 😐	Throttle
- 62	Skip Cancel Calibrate
24010	Channel Monitor
	Radio Config Cancel
	Before calibrating you should zero all your trims and subtrims. Click Ok to start Calibration.

- Move throttle stick according to prompts in software

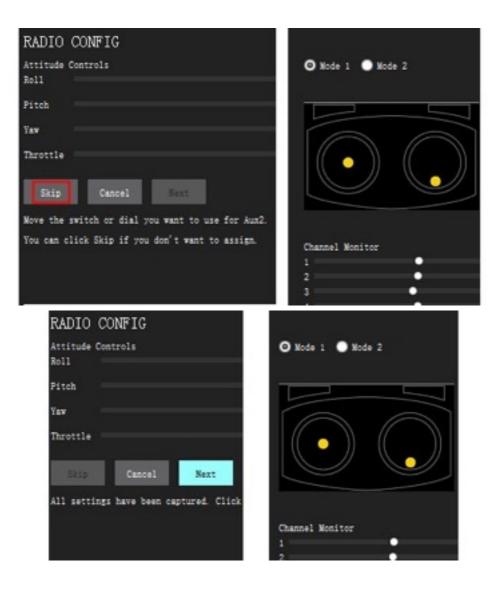
Attitude Controls Roll	⊙ Mode 1 ● Mode 2
Pitch	
Yaw	
Throttle	
Skip Cancel Next	
Lower the Throttle stick all the way down as shown in diagram. Reset all transmitter trims to center.	
It is recommended to disconnect all motors for additional safet	Channel Monitor
Click Next to continue	2
RADIO CONFIG	
Attitude Controls Roll	🔘 Mode 1 🌑 Mode 2
Pitch	
Yaw	
Throttle	
Skip Cancel Next	
Move the Throttle stick all the way down and leave it there	
	Channel Monitor
	1

- Move all the transmitter switches/dials to their extreme position

RADIO CONFIG	
Attitude Controls Boll	O Mode 1 ● Mode 2
Pitch Taw	
Throttle	
Cancel Next Move all the transmitter switches and/or dials back and forth to their extreme positions.	
	Channel Monitor
	2

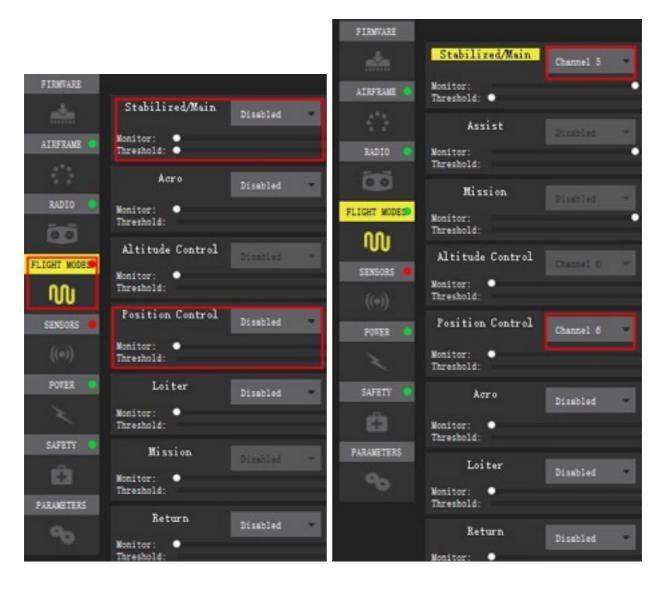
- Skip remaining steps

RADIO CONFIG	
Attitude Controls Roll	◙ Mode 1 ● Mode 2
Pitch	
Yax Throttle	
Skip Cancel Next Wove the switch or dial you want to use Click Next to continue. If you won't be using Flaps, click Skip.	Channel Monitor
RADIO CONFIG	
Attitude Controls Roll	O Mode 1 O Mode 2
Pitch Fax Throttle Skip Cancel Next	
Nove the switch or dial you want to use for Aux1.	
You can click Skip if you don't want to assign.	Channel Monitor



4) Configure Channels

- Set main mode to channel 5, set position control to channel 6 (channel number may vary depending on your remote controller)

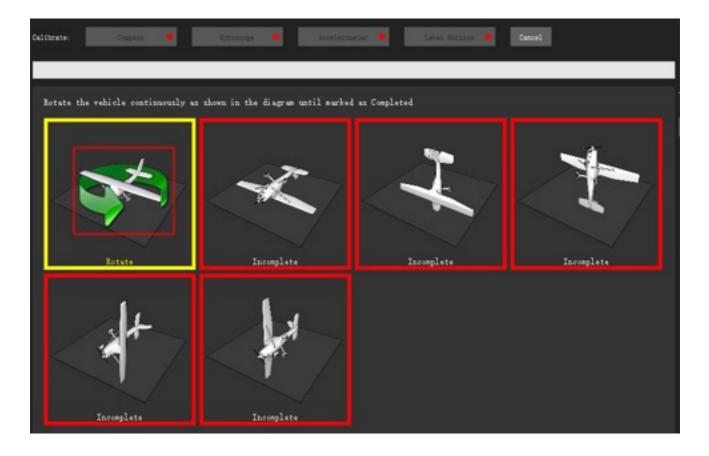


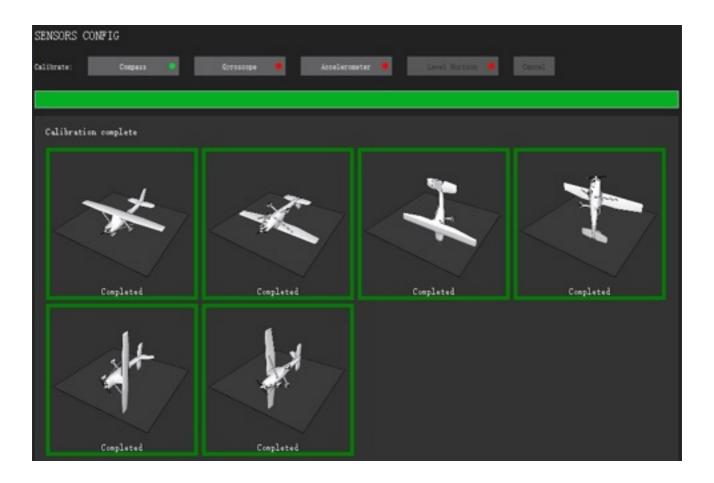
- Use channel 5 to select between 3 modes: manual mode, assist mode, and auto mode.
- Under assist mode, use channel 6 to switch between altitude-control mode or position-control mode

5) Sensor Calibration Compass

SUMMARY	SENSORS CONFIG
-1	Calibrate: Compass Cyroscope Accelerometer 🗨
FIRMFARE	
nin	
AIRFRAME 💿	Start the individual calibration steps by clicking one of the buttons above.
<>	
RADIO 🧶	
00	
FLIGHT WODES	
ល	
SENSORS • ((•))	

- Rotate frame to specified orientation according to software prompts.





Gyro

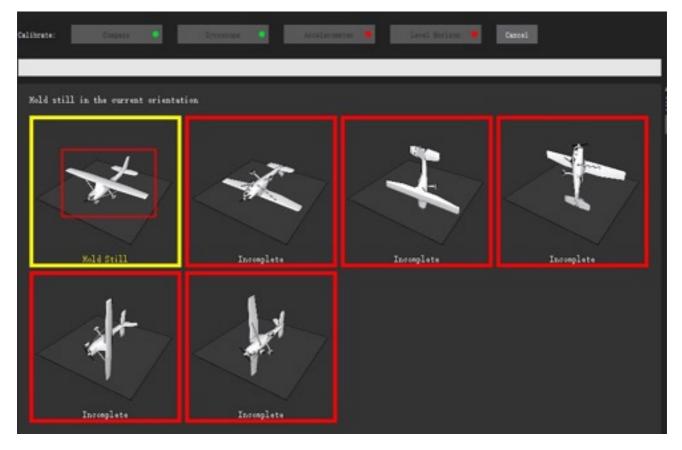
- Place frame into one of the incomplete orientation show on software screen, and hold it still. Proceeds according to software prompts.

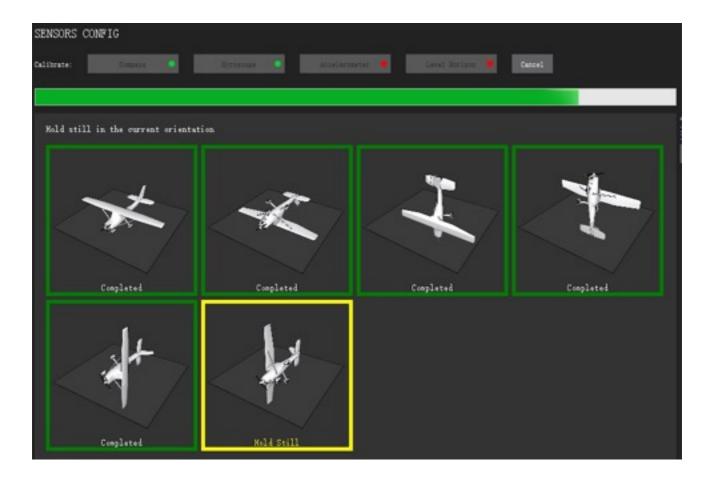


SENSORS CO	NFIG		n (1991)	48 - 17 AB	
Californie:	Cospans	Cottosooge 🔍	Accelermeter 🧶		Carrel
Calibration	complete				
-	×				
	Completed				

Accelerometer

- Place frame into one of the incomplete orientation show on software screen, and hold it still. Proceeds according to software prompts.





FAQ

1. MindPX

Q: What is the environments requirements for MindPX? A: MindPX working temperature range: -10C ~ 100C; MindPX working humidity range: 10%~90% RH

Q: What is the maximum controllable range of MindPX A: 1~2km, depending on transmiting power of your remote controller

Q: What is the maximum flight speed? A: About 100km/h (depends on your rotors and frames)

Q: What is the hardware requirements for hardware ground station? A: MindPX can be connected to ground station via a USB cable, or a wireless data transmission module.

Q: Can navigation mode be interrupted?

A: You can switch mode using remote controller.

Q: What if MindPX loosing connection with remote controller during flight? A: MindPX will control the copter return to where it launches automatically in this case. Or you can also set it to auto landing as you demanded.

Q: How to retrieve MindPX source code and hardware schematics/layouts? A: You can download *source code* from: <u>https://github.com/airmind/MindPX</u> You can download schematics/*layouts* from: <u>https://github.com/airmind/Hardware</u>

2. Accessories

Q: What is the cruise time of battery in one charge, and how long it takes to charge a battery?

A: Typically for a 1500mah battery, the cruise time is about 15 minutes for normal load. It takes about 2 hrs to charge the battery to full.

Q: What if the copter ran out of battery?

A: MindPX will trigger alarm when battery level goes down below threshold. The flashing LED will turn yellow and buzzer beeps.

Q: Can MindPX filming from the air and transmit video back to ground? A: You can purchase additional video capture and transmitting devices and mount it onto the frame.