PIONEER MINI

Quick Start Guide

v. 2.3

Contents

Introduction

Thank you for choosing Pioneer Mini drone kit!

This kit was created as a first step into the world of autonomous drone flights
and a perfect solution for learning the basics of programming and piloting.
The assembled drone allows to perform flights in manual mode as well as
using flight scripts with positioning control by drone sensors.

We always work to make Pioneer drones better and add new features.
Check our website to get information about the latest news and updates.

https://www.geoscan.aero/en/products/pioneer/

Safety Measures

- Carefully check a drone for damages before every flight.

- Check the right position of battery connector before connect it.

- Disconnect the battery connector from main board after flights.

- Do not disassemble or deform the batteries (don't drop and pierce).

- Store the batteries in dry cool place without direct sunlight.

- Rotated propellers are dangerous. Do not touch them, when power is on.

- Avoid flights near people, animals, aircrafts and other objects.

- The route, altitude, flight distance should comply with local laws and restrictions.

- Take into account the right to respect for private and family life, when you taking photos and videos by drone.
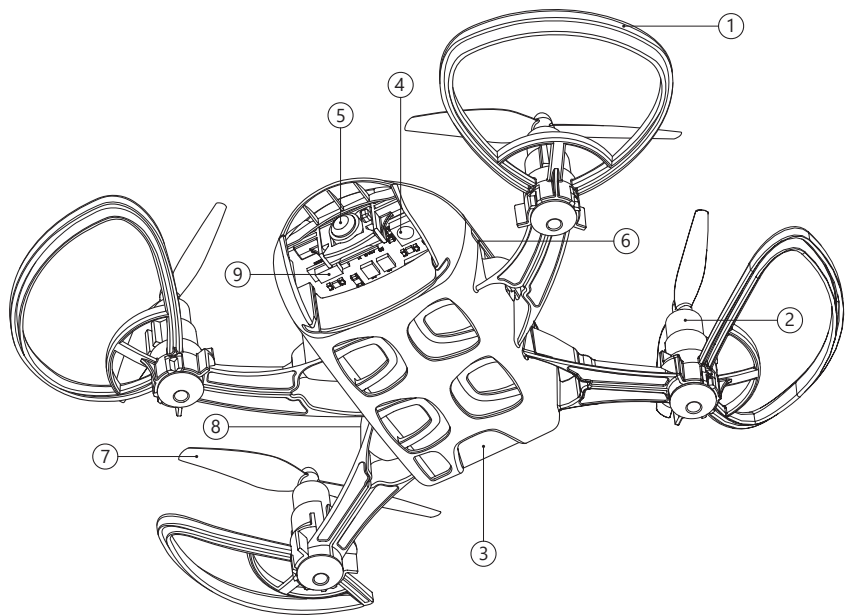
Drone Components

1 Propeller guards

2 Brushed motors

3 Battery

4 Optical flow sensor

5 2 MP camera

6 MicroSD card slot

7 Propellers

8 MicroUSB port

9 Connector for extension modules

Specifications

Type . . . . quadcopter

Flight time . . . . up to 10 min

Flight speed . . . . up to 20 km/h

Drone weight . . . . 100 g

Max takeoff weight . . . . 120 g

Dimensions . . . . 175 × 140 × 38 mm

Motors . . . . 8520 brushed motors

Battery . . . . LiPo 1S 3.7 V

Flight distance . . . . up to 50 m

Propellers . . . . 65 mm

Camera . . . . 2 MP

Operating temperature range . . . . from 0 to + 40 °C

Supported microSD card capacity (card is not included) . . . . up to 16 Gb

Specifications, design and included components of drone kit can be changed by the manufacturer without prior notice.

In The Box

1	CW propeller (3 pcs.)	**10**	M1,2×5 screws (4 pcs.)
2	CCW propeller (3 pcs.)	**11**	Rubber acoustic band
3	CW motor (2 pcs.)	**12**	Battery
4	CCW motor (2 pcs.)	**13**	Rubber landing dots (4 pcs.)
5	Propeller guard (4 pcs.)	**14**	Micro screwdriver
6	Main board		
7	MicroUSB cable		
8	Frame		
9	Top cover		

Optional accessories:

- Multicharger
- BT/WIFI remote controller

Drone Assembly

The section describes how to assemble Pioneer Mini drone.

Prepare a comfortable place for drone assembly.

The kit includes small parts, so make sure that you won't lose them during assembly.

black
white

red
blue

red
blue

black
white
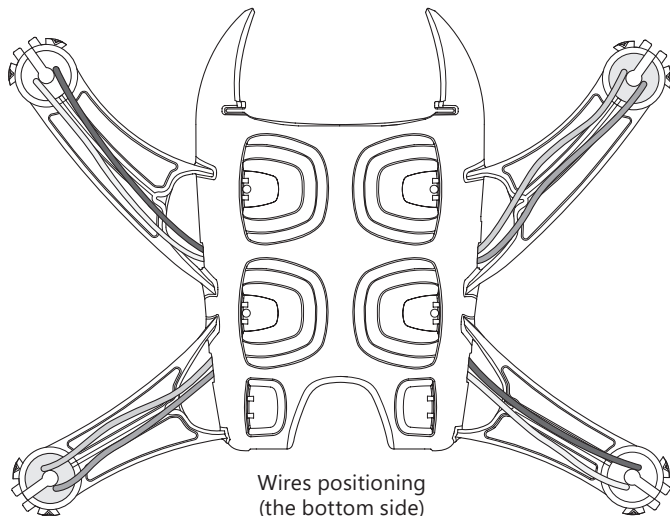
Wires positioning
(the bottom side)

Step 1

Required parts: the frame, CW motor – 2 pcs., CCW motor – 2 pcs.

Carefully put 4 motors in slots of drone arms as shown in the pictures.

Follow wires positioning picture to place the motors and their wires in the right slots.

Do not pinch the wires during installation.
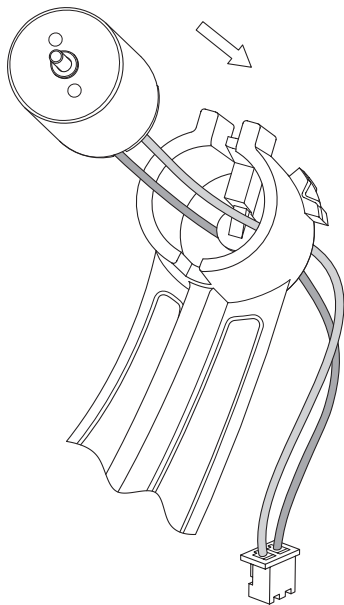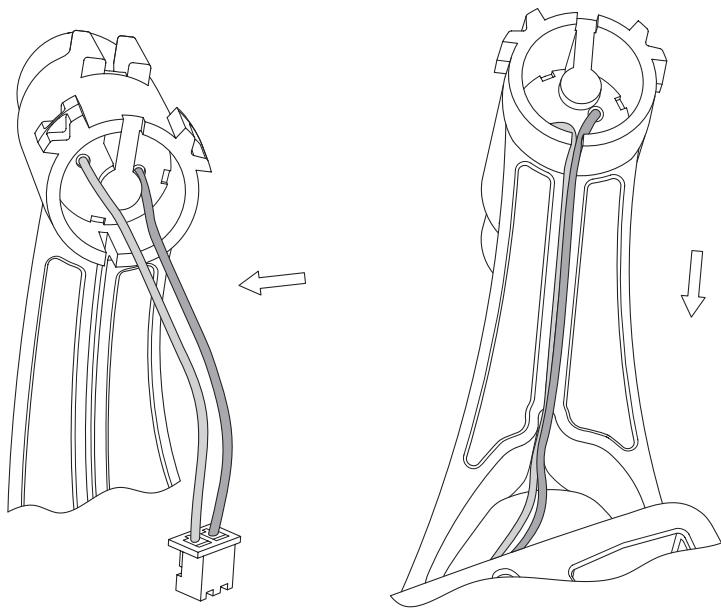
Step 2

Required parts: *the frame, CW motor – 2 pcs., CCW motor – 2 pcs.*

The wires should be placed in special grooves under each arm.

Do not use sharp items to place them!
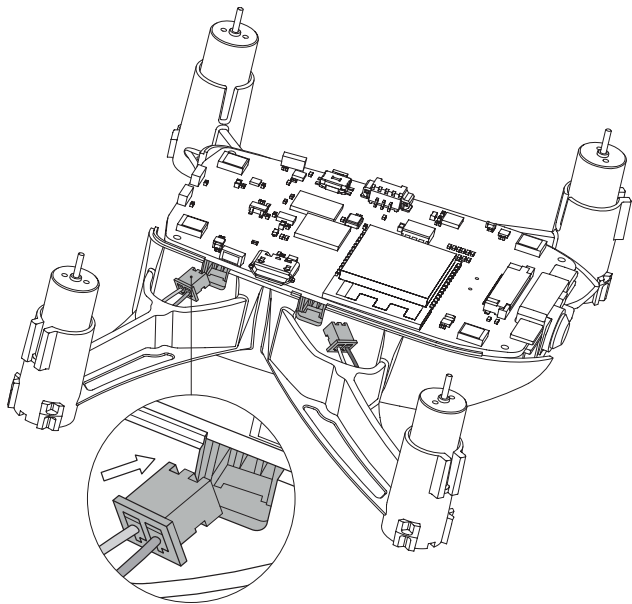
Do not forget to remove protective stickers from optical flow sensor, rangefinder and camera.
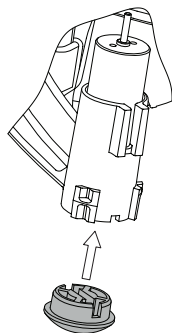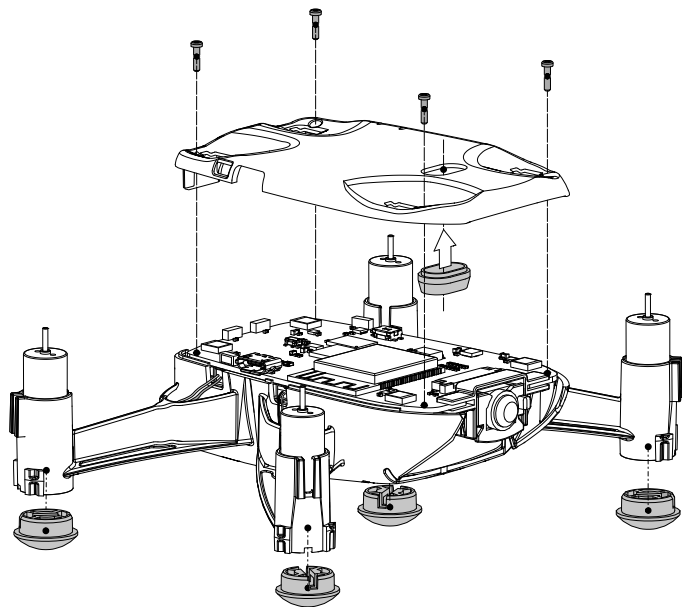
Step 3

Required parts: *the result of step 2, the main board with pre-installed camera module.*

Place the main board on drone frame.
Attach 4 connectors of motors (2 on each side) to main board ports.

Be careful during installation of main board.
*Take care to avoid a damage of board components.*
Do not allow contact with water.

Step 4

Required parts: *the result of step 3, M1.2×5 screws −4 pcs.,*
top cover, rubber landing dots − 4 pcs., rubber acoustic band.

Place rubber acoustic band under the top cover and attach it to result of step 3.
Mount the cover by M1.2×5 screws as shown in the picture.
Do not forget to place rubber acoustic band. Insert it easily from the bottom side of top cover.

Insert rubber landing dots in slots of drone arms as shown in the picture.
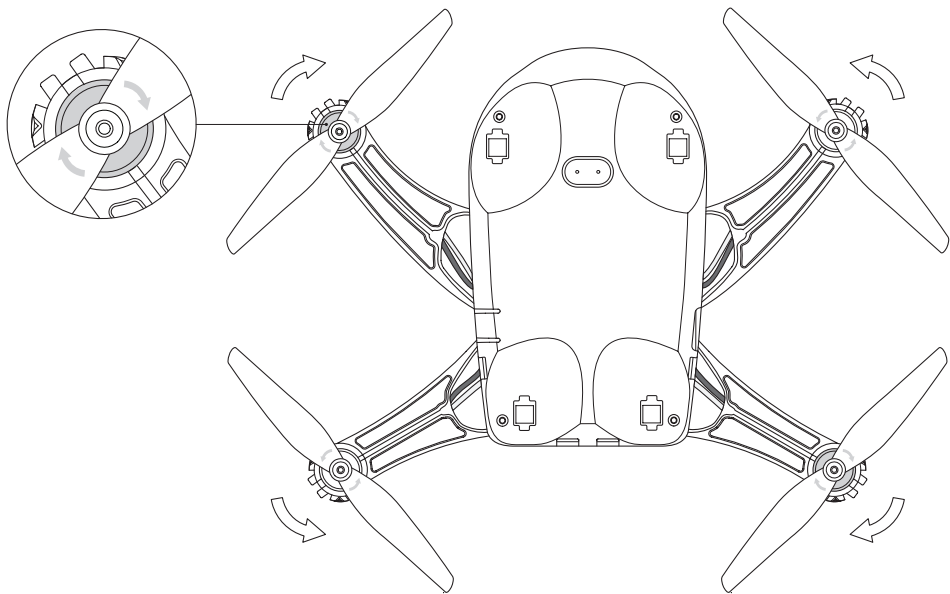Dots and arms should be matched as shown in the picture.
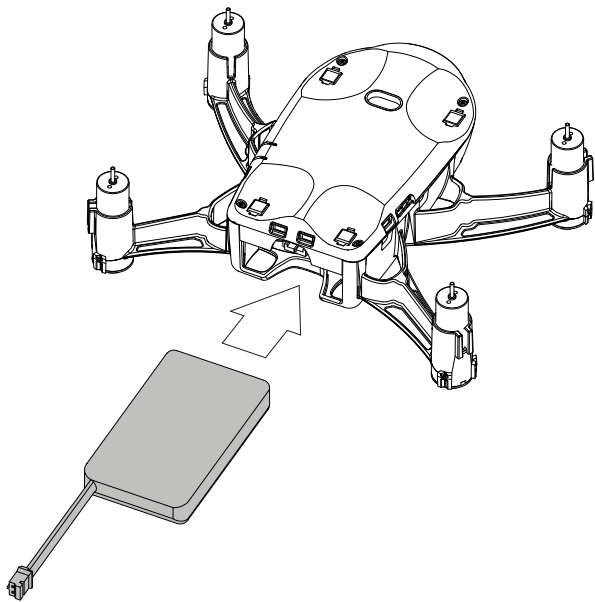
Step 5

Required parts: *the result of step 4, the battery.*

Carefully insert the battery into the battery slot.
Connect the connector of battery to the slot of main board.

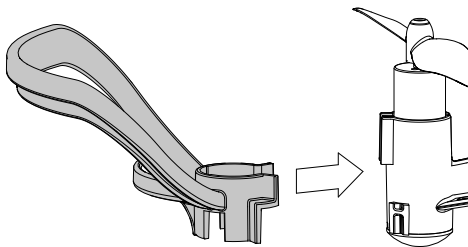 *Please note that the connector has supports for the right positioning.*

Step 6

Required parts: *the result of step 5,*
CW propeller − 2 pcs., CCW propeller − 2 pcs.

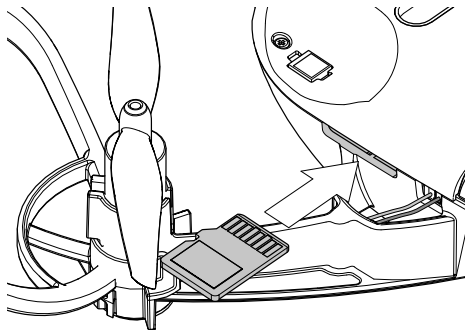Attach the propellers to motor shafts and lock them by rotation in directions as shown in the picture.
Also, you can check the right lock directions by arrows directly on the propellers.

Step 7

Required parts: the result of step 6, propeller guard - 4 pcs.

Lock 4 propeller guards on drone arms as shown in the picture.
Check that they are securely locked.

Step 8

Required parts: *assembled drone, microSD card.*

Insert microSD card in microSD slot.
Do not use excessive force when insert
or remove the memory card.
The capacity of microSD should not
exceed 16 GB in FAT32 file system.

Battery Charging

Use microUSB cable from drone kit and microUSB slot of main board to charge a drone battery.

If you have a multicharger (not included in standard kit), you can charge up to 4 batteries.

Charging via microUSB

The main way of charging.

Insert the battery into drone slot and connect it to main board.

Take microUSB cable from drone kit and connect it to USB port of PC or USB charger.
Plug microUSB connector of cable in microUSB slot of drone.

Charge voltage via USB – 5 V.
Recommended charge current – no more than 2 A.

Multicharger Setup

Connect a multicharger to USB charger or PC **without connected batteries**!

If a multicharger works normally, 4 LEDs on charger should turns green and lights up one by one.

Make sure that charging voltage is 4.2 V. You can check it by comparing of the direction of LEDs lights up and the arrow on multicharger. If it's not same, press and hold for 3 seconds the button on the backside of charger.

Make sure that charger LEDs lights up in 4.2 V direction before connect the batteries!

Charging via Multicharger

Carefully attach each connector of battery to individual charge connector of multicharger.
Each battery connector has plastic support elements for the right positioning.
You can charge up to 4 attached batteries.

Flashing of green charging channel LED on charger body means charging process.
When the battery is fully charged, a channel LED will light up green.

⚠️ *Charge voltage — 5 V.*
Charge current – no more than 2 A.

Before Flight

Carefully follow local laws and regulations for the airspace use and photo/video recording in areas where you are using a drone.

Do not fly near people and animals.

Always keep an eye on the direction of drone flight.

Do not fly near power lines, cell phone towers, railroads, roadways or in crowded areas.

Carefully check drone parts for damages before each flight.
If part damage is detected, repair it with replacement parts.
Do not fly if a damage cannot be repaired.

⚠️ *Flight control equipment (phone or remote controller) should always be turned on BEFORE drone power to avoid uncontrolled actions of drone.*

Turn off flight control equipment only AFTER drone turning off.

Flight Control

Manual control of drone is provided by Geoscan Jump app for Android or IOS.
Download the latest app version from Google Play, HUAWEI AppGallery
or Apple App Store before start.
This quick start guide covers the basic flight control elements only.
Please follow in-app tips to use programming blocks and other features.

Google Play

Apple App Store

HUAWEI AppGallery

Follow these steps to connect Pioneer Mini drone to your smartphone via Wi-Fi:

1 Download Geoscan Jump app.
2 Turn drone power on by pushing on power button on the side of top cover. Drone status LED will light up.
3 Connect your phone to drone Wi-Fi hotspot (hotspot name: Pioneer_mini_xxx; password: 12345678).
4 Launch Geoscan Jump app.
5 Press **START** button to launch motors.
6 Use flight control sticks to control drone flight and landing.
7 Press **STOP** button to stop motors.

Left stick   **Right stick**

Left rotation   Right rotation   Up / Down   Forward / Back   Left / Right

Features

Use all drone systems and sensors for programming, learning, and flying in autonomous mode.

Pioneer Mini drone can be controlled by flight scripts. You can program a drone's flight using programming blocks directly in **Geoscan Jump** mobile app or with **Pioneer Station**, **TRIK Studio**, **Arduino IDE** and other compatible software.

The positioning of the drone in airspace is provided by data from sensors and systems installed on board.

Pioneer Mini drone is equipped with the following equipment:

1   Optical flow sensor

The sensor for controlling a drone's position in airspace by visual tracking the drone's movements relative to objects around.
This allows the drone to hold its position in airspace and fly in automatic mode without using additional navigation system and ground equipment.

2   Photo/videocamera

2 MP camera with video streaming function via Wi-Fi.

3   Indoor positioning system with infrared and ultrasonic sensors

Sensors for local flight navigation by infrared and ultrasonic signals from beacons. The system uses a data from beacons to determine a position, speed and flight direction of drone in airspace.

4   ESP-32

Microcontroller unit for advanced programming tasks.

5   Changeable modules

Connector for extension modules.

6   Rangefinder sensor

Additional positioning control.

7   Barometric pressure sensor

Real-time information about the drone's flight altitude.

8   Current and voltage sensor

Real-time information about the state of battery.

9   Inertial measurement unit (IMU)

Unit includes 3-axis gyroscope and 3-axis acceleration sensor.

Community

Join Pioneer community!

Stay tuned to get the latest news and updates.
Share your stories and ask questions.
Get tips and answers directly from developers.

Help us to make Pioneer drones even better by leaving your feedbacks and comments.

Pioneer Mini page on Geoscan website:
https://www.geoscan.aero/en/products/pioneer/mini