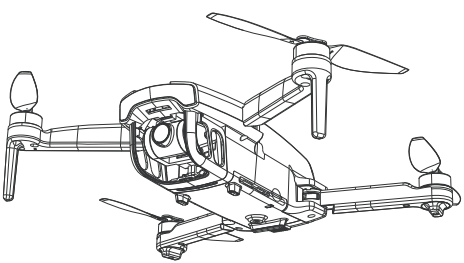
Ruko®

14+
for age

User Manual

v2.0



F11MINI

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☎ + 1 949-394-4635 | Mon-Sun 6PM-4AM(PST)

rukotoy.com

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+ 1 949-394-4635 | Mon-Sun 6PM-4AM(PST)

+86 19129317359

Contents

1 Using This Manual

1.1 Legend

Recommend Warning Hints & Tips Reference

1.2 Read Before the First Flight

- Read the following documents before using the Ruko F11MINI aircraft.

  ①User Manual
  ②Quick Guide & Safety Disclaimer

- It is recommended to watch all tutorial videos on the official website and read the Quick Guide & Safety Disclaimer before using for the first time. Prepare for the first flight before reviewing the Quick Start Guide and refer to this User Manual for more information.

1.3 Download the Ruko Mini app

- Make sure to use Ruko Mini app during flight. Scan the following QR code to download the latest version of the app.

(For Android) (For iOS)

- Ruko Mini app is compatible with Android 6.0 or above, iOS 10.0.2 or above, dual-band Wi-Fi (2.4GHz and 5.8GHz) phones.

1.4 Video Tutorials

• Scan the QR code to watch the tutorial videos to ensure correct and safe use of the product.

2 Product Profile

2.1 Introduction

- **Ruko F11MINI** is equipped with upgraded frame arm to carry larger propellers, which allows it to resist level 4 winds(7m/s). The aircraft has a maximum flight speed of 3.5m/s (normal mode) and 7m/s (sport mode), with a total maximum flight time of 60 minutes, provided by two Intelligent Flight Batteries (the parameters are tested in a windless environment) .
- The Ruko F11MINI is beginner friendly with easy operation and a weight of less than 249 grams (no FAA registration required). You can also start the intelligent flight modes (GPS Follow, Route Planning, Fly Around) on the Ruko Mini app, bringing you a better flight experience.

Feature Highlights

- **Camera:** With a 120°FOV lens and a 90° adjustable camera, Ruko F11MINI can shoot 4K photos and 2.7k@25fps video to show you a broad field of vision.
- **Video Transmission:** With a maximum image transmission distance of 1640 feet, you can save the video in 2K@50fps (smooth) or 2.7k@25 fps (default)on the SD card, and 720p@25 fps (default) / 2k@25 fps (high resolution) in the album of Ruko Mini app.

- **Intelligent Flight Modes:** GPS Follow, Route Planning and Fly Around. The aircraft can follows or flies around you with one click in the Ruko Mini app. It also can flies along the path you marked in the app.

Product list

Drone

Remote Controller

Intelligent Flight Battery

Camera Cover

Spare Propeller

Fixed Cover

Screwdriver

Screw

USB Charging Cable

User Manual

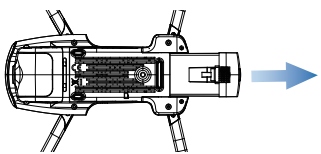
Quick Guide & Safety Disclaimer

2.2 Using for the First Time

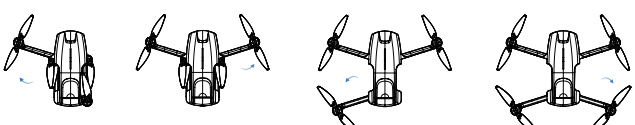
Preparing the Aircraft

• All propellers are folded before the aircraft is package. Follow the steps below to prepare the aircraft.

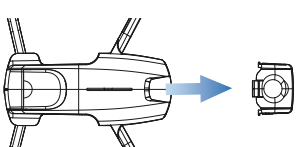
① Install the Intelligent Flight Battery into the battery compartment and push it inside until you hear a "click" from the battery buckle.



② Unfold the front arms, followed by the rear arms, and then all the propellers.



③ Remove the camera cover from the aircraft's camera.

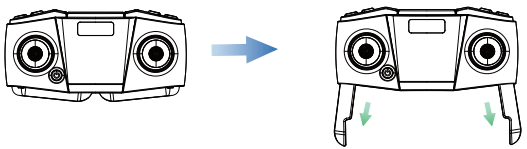


⚠ • Unfold the front arms before unfolding the rear arms.
• Before powering on the aircraft, ensure that the front and rear arms are extended and the aircraft is placed on the horizontal ground.

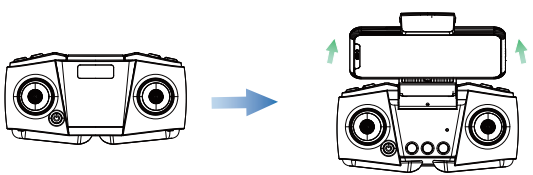
Preparing the Remote Controller

Follow the steps below to prepare the Ruko remote controller.

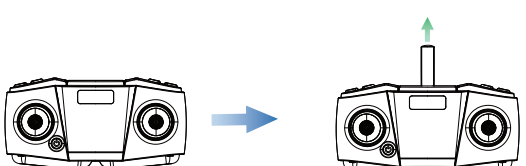
① Unfold the remote controller handle.



② Unfold the mobile phone holder.



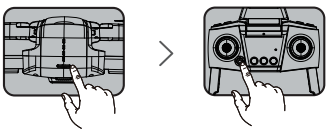
③ Unfold the antenna.



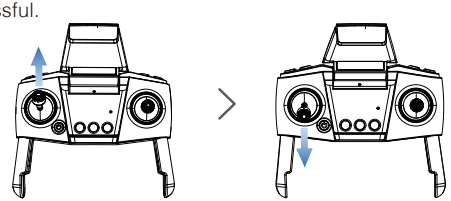
⚠ • The maximum transmission distance of the remote controller is 500 meters.

Pairing Remote Controller with Aircraft

① Press the power button once to turn on the remote controller.



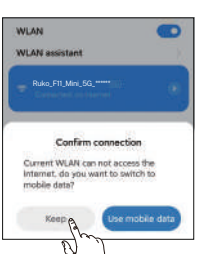
② Push up the left joystick to 12 o'clock and the controller will make a "beep" sound. Then push it down to 6 o'clock and the controller will make a "beep" sound again, meaning that it is ready to be paired with the aircraft. The indicator light will change from flashing to always on, which means the pairing is sucessful.



Wi-Fi Connection

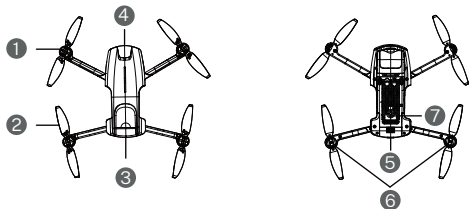
① Open the mobile phone Wi-Fi setting page.

② Connect the mobile phone to aircraft's Wi-Fi (name:Ruko_F11_Mini_5G_******)



2.3 Diagram

Aircraft Diagram



① Motor

② Propellers

③ Intelligent Flight Battery

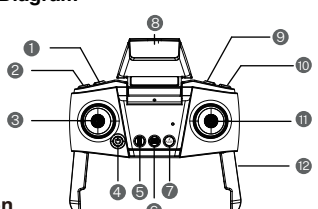
④ Camera

⑤ Power Button

⑥ LED Indicator Light

⑦ Optical Flow Lens

Remote Controller Diagram



① **Shutter Button**
Press once to take a picture.

② **Record Button**
Press once to start recording, and press again to stop recording.

③ **Left Control Joystick**

(American control joystick) Use a control joystick to control aircraft movements.The left control joystick is the throttle lever, which can adjust the aircraft's altitude and nose direction. (Up/Down, Left Rotation/Right Rotation). The Japanese hand's control joystick functions is different from the American control joystick.

④ **Power Button**

Press once to start, press again to turn off the remote controller

⑤ **One-Tap Takeoff/Landing**

One-click takeoff: After unlocking the motor, press one button to automatically take off upto a height of about 4.92 feet(1.5 meters).
One-click landing: Press one button to land the aircraft in flight and the aircraft will descend to the ground at the existing coordinates.

⑥ **Compass Calibration**

A. Short press to enter the calibration of compass.
B. GPS mode/attitude mode;
Press and hold the button for 3 seconds to turn off the GPS (GPS is turned on by default when it is turned on, do not turn it off when flying outdoors to avoid losing the aircraft);Press and hold the button for another 3 seconds to turn on the GPS.

⑦ **Smart RTH Button**

Press the button to let the Aircraft automatically return to the take-off position (Due to GPS signal problems (commercial class), the landing position may be slightly different from the take-off position. The range of deviation is within about 10 feet(3 meters)(diameter); Press the RTH button once again to cancel the intelligent return during the return flight.

⑧ **Mobile Phone Holder**

Flip up to open the holder for placing mobile phones. The width of the phone holder is adjustable. The maximum adjustable width is up to 3.1 inches.

⑨ **Adjust the Camera Angle up.**

⑩ **Adjust the Camera Angle down.**

⑪ **Right Control Joystick/Speed Adjustment**

The right joystick controls the direction of the aircraft, the Japanese hand's joystick function in reverse to the American joystick function.

Press the right joystick inward to adjust the flight modes. The normal mode(default speed) or sport mode(fast speed), press the right joystick to switch between two flight modes.

⑫ **Mobile Phone Clamps**

Push outwards to open the two mobile phones. clamps of remote controller for easy manipulation of the control stick of remote controller.

⑬ **Rapid Descent**

Press the ② and ⑩ for 3s at the same time to start the rapid descent function. It prevents the drone from ramming around when it loses control/drifts, it will fall to the ground at the current position at a speed of 2m/s.

3 Aircraft

F11MINI aircraft is mainly composed of a flight remote controller, a communication system, a video downlink system, a propulsion system and an Intelligent Flight Battery.

3.1 Flight Mode

F11MINI has two flight modes, which can be switched by pressing the right joystick inward.

Normal Mode

After the drone is turned on, the normal mode is turned on by default, the maximum ascending speed is 2m/s, and the maximum descending speed is 1m/s. The maximum tilt angle is 20° and the maximum flight speed is 3.5m/s.

Sport Mode

In sports mode, tthe maximum ascending speed is 3m/s, and the maximum descending speed is 1m/s. In a windy environment, it is recommended to switch to the sport mode, so that the drone can gain more power and fly more stably. The maximum tilt angle is 30° and the maximum flight speed is 7m/s.

- When flying the drone indoors, you need to turn off the GPS, and then enter the attitude mode(ATTI). The ATTI mode adopts optical flow sensor positioning air pressure altitude control system, so the aircraft may be more easily affected by its surrounding environment. Please avoid strong light when flying.

⚠
- When wind speed is high, sport mode should be maintained to improve wind resistance effect.
- When flying in sport mode, the pilot should reserve at least 3 meters of braking distance to ensure flight safety .
- When flying in sport mode, the power of the aircraft will be greatly improved, please reserve enough flying space to ensure the safety of the flight.

3.2 Calibration and Aircraft Status Indicator

The F11MINI aircraft's status indicator is located under the rear arm of aircraft to indicate the current status of the flight control system. Please refer to the following table for the status of the flight control system represented by different blinking modes.

	Blinking status of the indicator	Conditions
	The rear light is yellow and doesn't flash	Optical flow mode
	The rear light is green and doesn't flash	GPS mode
	The rear light flashes twice continuously and then stops for 1.5S	Recording video
	The rear light flashes fast	Compass or gyroscope calibration is required
	The rear light is red and flashes	Aircraft low battery warning
	The rear light is red and doesn't flash	Non-optical flow fixed-point mode
	The rear light is yellow and flashes slowly	Compass calibration is required

3.3 Return to Home

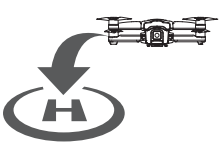
- The F11MINI aircraft has an automatic return-to-home function in GPS mode, making the aircraft return to the take-off point. The Return to Home (RTH) function brings the aircraft back to the last recorded home point.There are three types of RTH: Smart RTH, Low Battery RTH, and Signal Disconnection RTH. If you activate the RTH function under the condition that the aircraft successfully recorded the home point and GPS signal is good, the aircraft will automatically return to the home point and land.

	GPS	Description
Home Point	Using 5 bars of signal	When flying outdoors, the GPS signal icon is displayed with 3 bars or more for the first time, and the take-off location will record the aircraft's current position as the Home Point.During the flight, if the aircraft lands at a new location, the point from which it retook off will become the latest home point, and the aircraft will return to the latest home point.

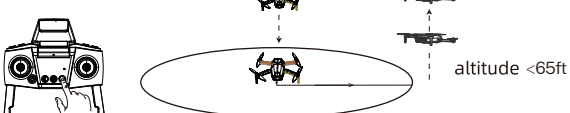
Smart RTH

- When the pilot needs the aircraft to return home automatically, he can click the smart RTH button on remote controller or tap the return on the Ruko Mini app to activate RTH. During the return home, short press the smart return button on the remote controller or click the return icon on the F11MINI interface again to exit the return home.

- In GPS mode (stays on), long press to activate, the automatic return function. During the return process,the user can operate the aircraft to ascend, descend, forward, backward, fly to the left or right to avoid obstacles, or long press the return button or push up the throttle stick to cancel return.

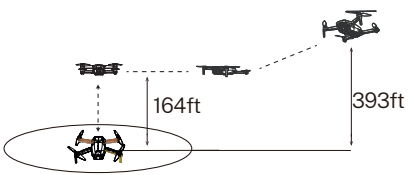


- If the flight altitude is below 65ft (20m), the aircraft will automatically ascend to the default return altitude of 65 feet(20 meters) before returning home.



- If the flight altitude is between 65ft to 164ft (20m to 50m) , the aircraft will return from the current altitude to the take-off point.(Pay attention to maintaining the flying height to avoid hitting people or obstacles.
- If the flight altitude is between 164ft (50m) to 393ft (120m),the aircraft will directly fly to the default altitude of 164ft (50m), then return to the Home Point.

- If the flight altitude is below 65 feet (20 meters), the aircraft will automatically ascend to the default return altitude of 65 feet (20 meters) before returning home.

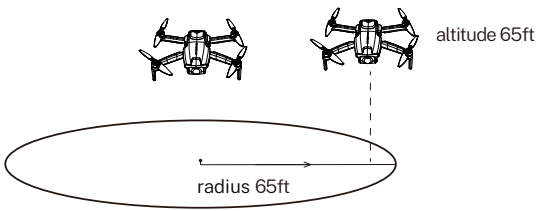


- The drone is not equipped with an obstacle avoidance function. During the flight, please judge the flight situation reasonably, avoid obstacles in time, and set the corresponding flight and return height according to the flight environment.

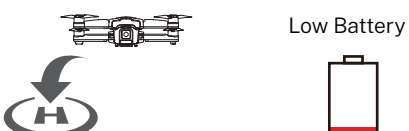
Low Battery RTH

- When the intelligent flight battery is too low or there is not enough power to return home,the user should land the aircraft as soon as possible to avoid damage to the aircraft or other dangers.
- In order to prevent unnecessary dangers due to insufficient battery power, when the aircraft battery power is low, the low battery return home function will be automatically triggered.
- According to the remaining power after returning, there are 2 situations after returning:

① First-level low battery: the aircraft returns to the point 65 feet (20 meters) above the take off point and hover. After hovering, you can continue flying the aircraft at a height of 65 feet (20 meters) and within a radius of 65 feet (20 meters).

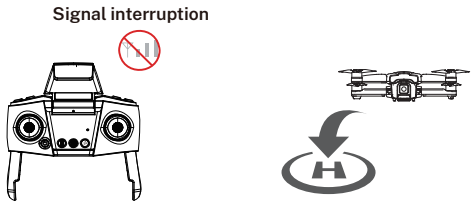


② Second-level low battery: the aircraft will fly directly from the current altitude to the poin tabove the Home Point and then descend to the ground.



- Must pay attention to the flight altitude when the battery is low. Avoid hitting obstacles due to the low flying altitude when returning home with the second-level low battery.The remaining power after returning is related to the return distance, wind speed, and wind direction.
- When the aircraft is more than 65 feet (20 meters) away from the return point, the return can not be canceled. You can control the joysticks on the remote control to avoid obstacles. When the aircraft is less than 65 feet (20 meters) away from the return point,the return can be canceled.

Lost Signal RTH



When the remote controller has low battery or is turned off or loses signal for 10 seconds, the aircraft will enter the auto-return mode and return to the take-off point.
If the signal is recovered during the return home process, the aircraft will stop returning and rebind with the remote controller signal, and the remote control can control the aircraft again at this time.

Automatic Return to Home process when signal is lost:

① Aircraft stores its position when taking off after the GPS signal is successfully received,and records it as the home point.
② Trigger RTH (triggered by low battery of remote controller, signal loss, etc.).
③ After triggering the Return-to-Home function, the aircraft adjusts the nose direction and starts to return home.
④ The aircraft automatically flies over the home point, then starts to land, and completes the home return.

- When out of control, the aircraft cannot avoid obstacles.
- When the GPS signal is weak, the aircraft cannot return to home automatically.

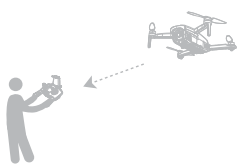
3.4 Intelligent Flight Mode

F11MINI has three intelligent flight modes to meet the user's shooting needs: GPS Follow, Route Planning and Fly Around. The operation can be completed by one click, which is simple and fast.

Before taking off, please make sure to download and install the Ruko Mini app on your mobile phone, connect the mobile phone to the aircraft Wi-Fi, turn on the GPS on the remote controller, and select an open environment with good GPS signal.

GPS Follow

In this mode, the aircraft will lock on to the user and can track user's movement. It works within a radius and height of 164 feet (50 meters) after you turn on the positioning function of your phone.

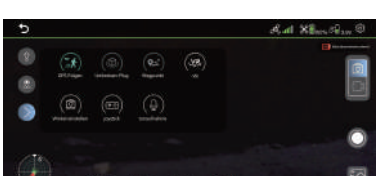


Using GPS Follow

① Launch the aircraft and make sure the flying range within 10-50m (32-164 ft) for best effect.

② Tap the icon  on the app interface to start the "GPS Follow" mode.

③ "Follow me mode is ready" will be displayed on the app interface and try to fly. The aircraft will track your movements to fly.



Exiting GPS Follow

Tap the icon  on the app interface again to exit the GPS Follow mode.

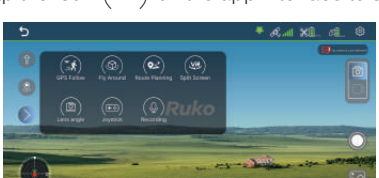
- The GPS Follow function only works when the GPS signal is strong. Please avoid high buildings, trees, and areas where Wi-Fi signal might be interfered.
- Aircraft is not equipped with obstacle avoidance function. Please use it in open areas free of obstacles.
- The follow function can only work within a radius and height of 164 feet (50 meters), and it will not be available beyond the specified range.
- To use this function, the positioning function of the mobile phone must be turned on,otherwise the follow mode can't be realized

Route Planning

In this mode, aircraft flies along paths marked with waypoints (up to 10) on the app's map at a normal mode speed of 3.5m/s, freely switching to a sport mode of 7m/s, but you can only choose to the app within the red circle in the map, which is to limit the flight range.

Using Route Planning

① Make sure the map is loaded before launching the aircraft.
② Launch aircraft and ensure flight height is higher than the nearby obstructions.
③ Tap the icon  on the app interface to start the Route Planning.



④ Mark interested of points (up to 10) which you plan to fly on app map's within red circle (limited flight range).

⑤ Tap "Delete Single Point" or "Delete All" to reset the marked point.

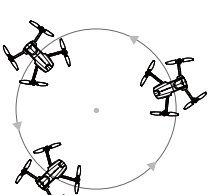
⑥ Confirm the marked points are correct and tap . The aircraft will start waypoint flight.

Exiting Route Planning

Tap the icon on the app interface again or the delete to exit the Route Planning.

- The Route Planning function only works when the GPS signal is strong. Please avoid high buildings, trees, and areas where Wi-Fi signal might be interfered.
- Aircraft is not equipped with obstacle avoidance function. Please use it in open areas free of obstacles.

Fly Around



- In this mode, the aircraft will fly around the target center point with a radius. The right joystick push forward/backward to control the radius of the aircraft's circle of 5-20m (16-65 ft), and push left/right controls the direction and speed of the aircraft's circle, that is, the aircraft will fly around counterclockwise/clockwise.

Using Fly Around

① Launch the aircraft and make it hover around the target center point.
② Fly to the target point where you want the aircraft to fly around.
③ Tap the icon  on the app to activate Fly Around mode, and the aircraft will start flying around the center.

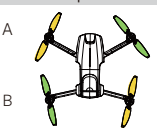
Exiting Fly Around

Tap the icon  on the app interface again to exit the Fly Around.

- The default surround mode radius is 16 feet (5m), and the maximum radius is 65 feet (20m).
- The flying speed of the surround mode radius depends on the surround mode radius, the larger radius, the faster the flying speed.

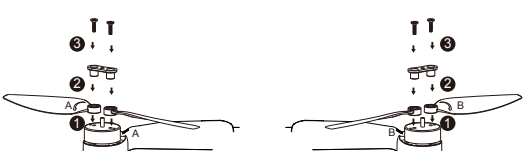
3.5 Propellers

The adjacent propellers on the motors of the F11MINI are forward and reverse propellers. The two propellers on the same motor are the same, and the propellers are marked with A and B respectively. The rotation directions of the propellers with the same mark are the same.

Propellers	Mark A	Mark B
 Installation location	 Installed to the motor with A mark on the arm	 Installed to the motor with B mark on the arm

Attaching the Propellers

Taking the camera direction as the front, the left front arm and right rear arm must be equipped with propellers marked with A; the right front arm and left rear arm must be equipped with propellers marked with B. Use a screwdriver to install and make sure the screws are tightened.



Detaching the Propellers

Use the screwdriver to detach the propellers from the motors.

- Please use the propellers provided by Ruko, and do not mix propellers of different types.
- Please check whether the propeller is installed correctly and tightly before each flight.
- Before each flight, please check to make sure that the propellers are in good condition.

3.6 Intelligent Flight Battery

The F11MINI intelligent flight battery has a capacity of 2100mAh, a rated voltage of 7.6V, and with charge and discharge management functions. This battery uses high-energy and large-capacity batteries to increase the flight time of the aircraft.

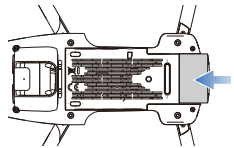
Battery Features

- Balance Protection: Automatically balance the internal battery cell voltage to protect the battery.
- Overcharge Protection: Overcharge will seriously damage the battery. When the battery is full, remove the charger device in time.
- Over-discharge Protection: Over-discharge will seriously damage the battery. When the battery is not used for flight, the battery will automatically discharge to protect the battery life.
- Short Circuit Protection: When the battery detects a short circuit, the output will be cut off to protect the battery.
- Easy Charging: No need for a dedicated power adapter, just Android charger and USB charging head.

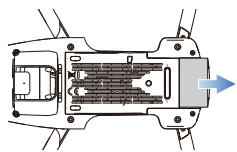
- Please read carefully and strictly abide by Ruko's Requirements in this User Manual, Quick Guide & Safety Disclaimer, and stickers on the battery surface before using
- the battery. The user shall bear the consequences caused by failure to use it as required.

Using the Battery

- Install the intelligent flight battery into the battery compartment and push it down until you hear a "click" from the battery buckle, indicating that it pops up and locks. Make sure the battery is in place.



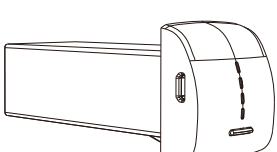
- To remove the battery, press the buckles on both sides of the battery and pull it out of the battery compartment.



- Do not install the battery into the aircraft or remove the battery from the aircraft when the battery power is turned on.
- Otherwise, the poor contact of the battery interface during the operation may cause the battery to short-circuit and burn the aircraft. The battery must be installed or removed with the battery power turned off.

Checking Battery Level

Press and hold the power button, after the indicator light turns on to the fourth, release the power button to check the current battery level.



Powering On/Off

Press the power button once and then press again and hold two seconds to power the aircraft on or off. When the drone is powered on, the four LEDs on the battery will show the current battery life.

Low Temperature Notice

- When using the battery in a low-temperature environment, make sure that the battery is fully charged. The discharge capacity of the battery will be reduced when working in a low-temperature environment.
- In a low-temperature environment, due to the battery output power limitation, the aircraft's wind resistance and flight performance will be reduced. Please be careful. You need to be extra cautious when flying in low-temperature and high-altitude environments.

Charging the Battery

Before using the intelligent flight battery, be sure to fully charge it. Please use a 5V/2A or 5V/3A USB charging plug.
In the charging state, the battery power indicator will flash and indicate the current charge level;when the fourth indicator light is always on, it indicates that the charging is complete.After charging is complete, please remove the charger in time.

(Not included)

Daily Preservation Advice

- It is recommended to charge and discharge it once a month, do not store with a full charge, keep 50%-60% of the power, the storage temperature is 50°F-104°F(10-40C)°C, and the best storage temperature is 66.2°F-69.8°F(19-21°C).

① If water enters the battery and the battery protection board fails,the battery cannot be used normally. Do not use the battery in rain or in a humid environment, as this may cause the battery to self-ignite or even explode.

② If the battery is squeezed, deformed and dropped from a high altitude, it is forbidden to use it again.Prolonged exposure to high temperatures is forbidden. High temperatures will cause the internal pressure of the battery to become too high and cause an explosion.

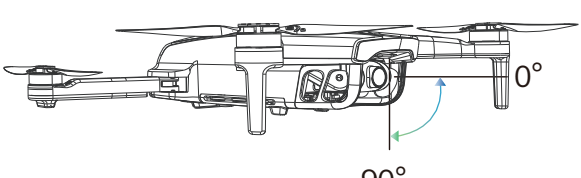
③ The positive and negative poles are short-circuited for a long time (such as the battery contacts have water, short-circuit caused by hair or foreign objects, etc.). If it exceeds 30 minutes, the protection board IC will fail and disconnect, and the battery cannot be used normally.

④ It is forbidden to use fast chargers that exceed the battery's rated power for charging.It is recommended to use a 5V/2A or 5V/3A charger.

⑤ If the aircraft has not been used for a month, the battery must be removed to prevent the battery from being discharged for a long time.

3.7 Camera Overview

The camera uses an upgraded 5GHz Wi-Fi FPV real-time transmission function, equipped with a 120°FOV lens and a 90° adjustable camera, which can stably shoot 2.7K HD video and 4K ultra-clear images, providing you with a broad field of vision for unforgettable moments.



The aircraft camera angle can be adjusted from -90° to 0°.
Image output format: JPG
Video output format: MP4
Pixel

F11MINI	Picture	Video
APP	4096×2304P	2048×1080P@25FPS 1280×720P@25FPS
Micro SD Card	4096×2304P	2688×1512P@25FPS 2048×1080P@50FPS

Micro SD card storage settings

You can choose 2K@50FPS (smooth) or 2.7K@25FPS (default) when saving the video on the Micro SD card.

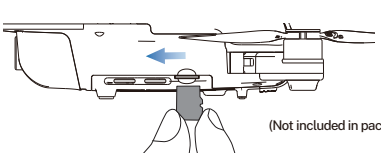
Real-time video transmission

① F11MINI has a maximum of 2K@25FPS real-time video transmission, you can switch to 720P@25FPS according to the flight situation.

② When you install a Micro SD card, no matter which storage setting you choose, the real-time video transmission can be switched between 2K@25FPS or 720P@25FPS and stored in the album in the Ruko Mini app.

Storing Photos and Videos

- F11MINI is equipped with a micro SD card slot for storage space expansion.
- Card speed: 10M/s.
- File format: support FAT32 format.
- Memory capacity: a memory card with a memory capacity of 128G or less.



- Check whether the capacity of the memory card is sufficient. If the capacity of the memory card is insufficient, videos and pictures cannot be stored.
- If you cannot save pictures or videos, try formatting the memory card.
- After the memory card is installed, the photo and video files will be stored in the memory card, and the photos and videos will not be stored on the mobile phone.
- You must turn on the aircraft and connect to the aircraft Wi-Fi to copy or download the photos or videos stored in the aircraft memory card to the phone.

4 Remote Controller

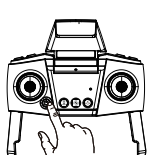
4.1 Remote Controller Profile

F11MINI remote controller uses the 2.4 GHz frequency band, and the remote controller distance is up to 1640FT (unobstructed and interference-free environment). The folding handle can stably place the mobile phone, and the maximum adjustable width is 3.1 inches. Remote controller built-in 380mAh capacity battery, charging time is 60 minutes, the longest working time is about 10 hours.

4.2 Using the Remote Controller

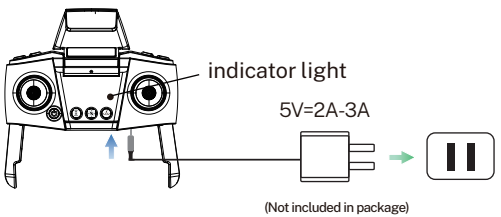
Powering On/Off

- Press the power button to turn on or turn off the controller.
- Check the remote controller's battery lavel at the upper of the app after connecting it to your mobile phone.



Charging the Battery

Connect the remote controller Micro USB interface to the charger for charging, and it can be fully charged in about 50 minutes. Please remove the charger device when fully charged.

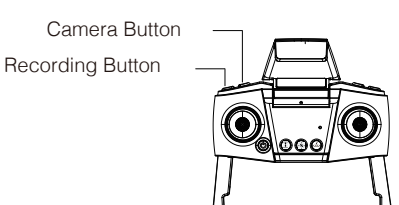


Remote Controller's Light Description
Red light on: Charging
Red light off: Charging is completed

① The green light flashes when the power is turned on, and the green light is always on after the left joystick is pushed up and down to pair Remote controller with the aircraft well.
② Blinking during flight indicates that the Remote controller is at low battery

Controlling the Camera

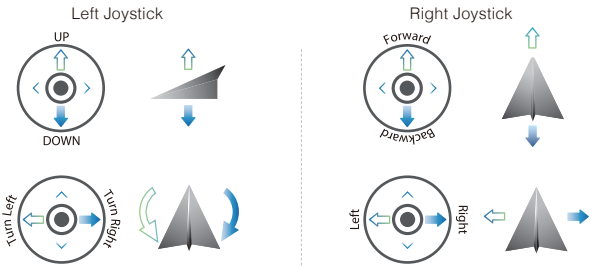
Recording Button: Press once to switch to recording mode or start/stop recording.
Camera Button: Press once to switch to camera mode or take a photo.



Joystick Control Aircraft

The control method of the remote controller joystick is as follows:

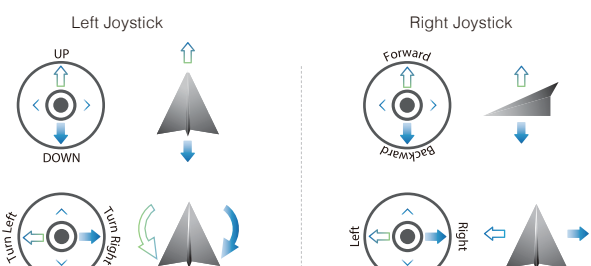
American hand's control （Mode 1）



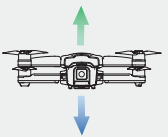
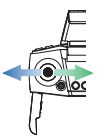
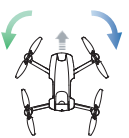
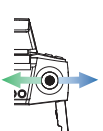
Switching to Japanese Hand's Control Stick

① Turn on the aircraft.
② Press and hold the record button to turn on the power of the remote controller
③ Push up and down the right joystick to pair the remote controller with aircraft.

American hand's control （Mode 2）



⚠ • It will back to the default American control mode when turn off the remote controller and turn on again.

Remote Controller (Defalut Mode)	Aircraft Direction	Remarks
		Throttle Stick: Moving the left stick up or down change the aircraft's altitude. Push up and the aircraft rises. Pull down the lever and the aircraft lowers. When released, the joystick is in the middle position and the aircraft remains hovering. When the aircraft takes off, the throttle lever must be pushed up and the aircraft takes off off the ground (please push the stick slowly to prevent the aircraft from suddenly rush up).
		Yaw Stick: Moving the left stick to the left or right change the aircraft heading. Push the stick to the left and the aircraft will rotate counterclockwise. Push the stick to the right and the aircraft rotates clockwise. In the neutral position, the angular velocity of rotation is zero, and the aircraft does not rotate. The joystick offset corresponds to the angle of the aircraft left and right tilt. The greater the offset, the greater the tilt angle and the faster the flight speed.
		Pitch Stick: Moving the right stick up and down changes the aircraft's pitch. Push the stick up and the aircraft leans forward and flies forward. Pull down the lever, the aircraft tilts backwards and flies backwards. The aircraft's front and rear directions remain level in the neutral position. The joystick offset corresponds to the angle of the aircraft left and right tilt. The greater the offset, the greater the tilt angle and the faster the flight speed.
		Roll Stick: Moving the right stick to the left or right changes the aircraft's roll. Push the stick to the left, the aircraft tilts to the left and flies to the left. Push the stick to the right, the aircraft tilts to the right and flies to the right. The left and right directions of the aircraft remain horizontal in the middle position. The joystick offset corresponds to the angle of the aircraft left and right tilt. The greater the offset, the greater the tilt angle and the faster the flight speed.

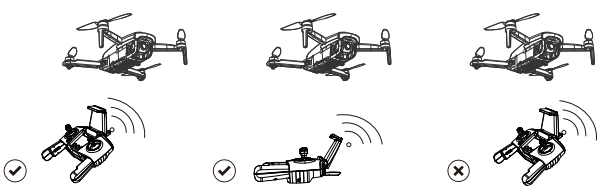
⚠ • The forward direction of the aircraft is based on the direction of the nose.

Smart RTH Button

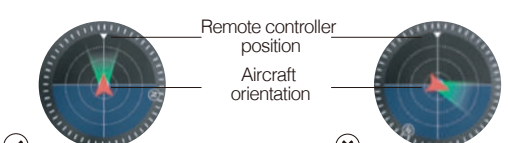
Tap the smart RTH button on the remote controller, and the aircraft will activate the automatic return home function. Tap it again to exit the smart return home. The aircraft is hovering in the mid-air of the return home. At this time, you can operate the joystick to control the aircraft.

4.3 Communication Range of remote controller

When controlling the aircraft, the position and distance between the remote controller and the aircraft should be adjusted in time, and the antenna position should be adjusted to ensure that the aircraft is always within the best communication range.



Install the mobile phone into the remote controller bracket, refer to the aircraft flight direction of the Attitude Indicator in the app, and the attitude Indicator points straight ahead (perpendicular to the coordinates), indicating that the remote controller is facing the aircraft.



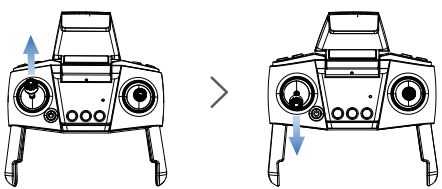
4.4 Linking the remote controller

Before each aircraft flight, you need to link with the remote controller. After the linking is successful,you can control the flight of the aircraft. The steps for the pairing are as follows:

① Turn on aircraft.

② Turn on remote controller.

③ Push the left stick of remote controller up to 12 o'clock position and down to 6 o'clock position, and after the aircraft emits a beep, it means the linking is successful.

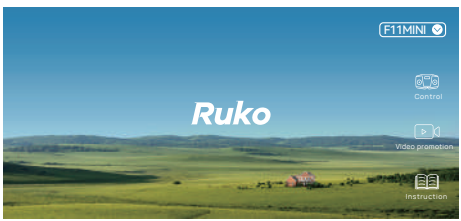


- The remote controller pairs with aircraft successfully if the light on the remote controller changes from fast flashing to always on.
- Before each flight, check the power of the remote controller. The indicator light on remote controller will flash and the remote controller will "beep" when the battery is low.
- When using the remote controller handle to hold a mobile phone, be sure to press it firmly to prevent the mobile phone from slipping off.
- Keep the battery at around 3.8-3.9V, and recharge it every month or so to keep the battery active.
- Please remember to turn off the power of the remote controller

5 Ruko Mini APP

5.1 Home

After running Ruko Mini app, enter the homepage.



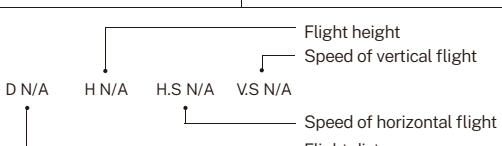
Control
Operate the aircraft through the app page buttons to realize the functions of the aircraft.

Video Promotion
Click to enter the flight YouTube video website, where you can view the flight guidance of the corresponding product.

Instruction
Click to view the user manual, instructions videos and quick start.

5.2 Camera View

	Back		Shooting Mode
	Compass Interference Value		Shutter/Record Button
	GPS Status		Photo Album
	Aircraft Battery Level		Attitude Indicator
	Controller Battery Level		More Features
	System Settings		RTH
SD	SD Card		Auto Takeoff/Landing



① **Aircraft Status Indicator Bar**
In flight: Display the flight status of the aircraft and various warning information.

② **Compass Interference Value**
It shows the interference value of the compass. When the environmental interference is too large, it will prompt the compass to be disturbed in the aircraft status indicator bar.

③ **GPS Status**
Used to display the GPS signal strength, 3 bars indicate that the GPS signal meets the flight requirements, 1 or 2 bars indicate that the GPS signal is weak, and the flight position needs to be changed.

④ **Aircraft Battery Level**
Display the current Intelligent Flight Battery power and voltage, and the power progress bar displays.

⑤ **Controller Battery Level**
Display the current remote controller battery power and voltage, and the power progress bar displays.

⑥ **System Settings**
System settings include flight range settings, data recording, english and metric unit switching, route display, reminder information and voice prompt settings.

Parameter
Tap the icon to enter parameter interface.

Beginner mode: In this mode, the aircraft's farthest flight distance and altitude is 98ft,and the return altitude is 65ft, so that the aircraft can fly more safely within sight.

Flight distance: Set the longest distance to fly.
Flight altitude: Set the maximum flight altitude.Storage settings：Set the smooth mode or default mode.
Real-time video transmission: The pixel of the video when it's saved in the Ruko Mini app.
Image transmission parameter display: Click the button to display or close the pixels display of the video real-time image transmission.

Track

Max mileage: The longest mileage for a single flight.
Max altitude: The highest single flight altitude.
Max speed: The fastest single flight speed.
All flight records: The date, location, distance, duration and maximum altitude of each flight.
Find drone: It shows the last position of the aircraft when it lost the image transmission signal. Open the map to find the position where the aircraft is disconnected from the app.
Export flight log: You can export the flight log data.

Unit: Switch between metric and imperial measurement units.
Voice prompt: turn on or off the aircraft status voice prompt of the app.
Operation Frequency selection: You can select the frequency band according to your region.
Aircraft information display: app version, Wi-Fi version, ID number.

⑦ **SD Card**
Check the SD card capacity and formatting.

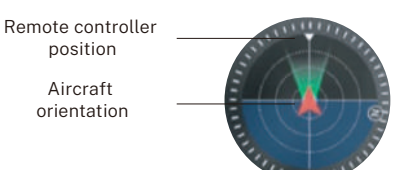
⑧ **Shooting Mode**
Choose to take a picture or record a video.

⑨ **Shutter/Record Button**
Tap to start shooting photos or recording video.

⑩ **Photo Album**
Tap to view captured videos and photos.

⑪ **Flight Status Parameters**
D N/A: Flight distance.
H N/A: Flight height.
H.S N/A: Speed of horizontal flight (forward or backward).
V.S N/A: Speed of vertical flight (ascending or descending).

⑫ **Attitude Indicator**
Display information of the orientation of the aircraft, and position of the remote controller.



⑬ More Features

	**GPS Follow**	The aircraft track the movement of the remote controller.
	**Fly Around**	The aircraft fly around in circle with the current position as the center.
	**Route Planning**	The aircraft will fly follow a path of your selected two to ten waypoints.
	**Split Screen**	VR split screen interface, used with VR glasses.
	**Lens Angle**	Adjust the shooting angle of the aircraft camera.
	**Joystick**	Trigger the on-screen joystick to control the aircraft.
	**Recording**	When it is turned on, your video will include ambient sound.

⑭  RTH

Tap to initiate Smart RTH and have the aircraft return to the last recorded home point and turn off the motors. Tap it again to cancel the return.

⑮  Auto Takeoff/Landing

After unlocking the aircraft, click one button to take off, tap it again to descend the aircraft, you can cancel the descent by push up the throttle stick.

⑯  Back

Tap to return to the home screen.

- Before using the Ruko Mini app, please correctly enable the required permissions for the app:
  ①Allow Ruko Mini to get your location. Otherwise, the following functions cannot be realized.
  ② Allow Ruko Mini to connect to the mobile phone on the local network, otherwise you will not be able to see the aircraft image transmission screen.
  ③Allow Ruko Mini to access to albums, recordings and other permissions.
- When using the Ruko Mini app on your phone, please keep your phone running smoothly and close other background software that you do not use.
- The map used in the map interface needs to be downloaded from the Internet. Before using this function, do not connect to the aircraft Wi-Fi, and connect the Mobile Phone to the Internet to cache the map.
- **Please download the correct** app, otherwise it will not work with the aircraft.

6 Flight

After the installation preparation is complete, please conduct flight training or training first.It is recommended to conduct training in the beginner mode. Please choose a suitable flight environment when flying. The flight altitude is limited to 393ft, and the local laws and regulations must be strictly observed during flying. Please be sure to read the F11MINI Quick Guide & Safety Disclaimer, and understand the safety precautions before flying.

6.1 Flight Environment Requirements

- Do not fly in severe weather such as strong wind, snow, rain, and fog.
- Choose an open place with no obstructions around as the flying field. The compass and GPS signals on the aircraft will be interfered by buildings, mountains, and trees. It is recommended to fly in an open area with a diameter of 32 ft without interference. It is recommended that the flight altitude be greater than 49 ft to avoid ground obstacles and other signal interference from the ground.
- When flying, keep in sight and control, and stay away from obstacles, crowds, etc. When flying on the water surface, please be more than 9 ft above the water surface.
- The remote controller may be interfered by high-voltage lines, communication base stations or transmission towers. Please fly away from these areas.
- Please fly below 6561 ft above sea level to ensure that the air pressure setting function of the aircraft can work normally.
- When GPS is active, the aircraft can achieve stable hovering, intelligent return to home, and intelligent flight functions. When the GPS function fails, these functions cannot be implemented.The aircraft will be unable to hover, drifting away in the direction of the wind.

6.2 Pre-Flight Checklist

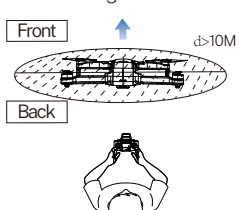
① Make sure the remote controller, Intelligent Flight Battery, and mobile phone are fully charged.
② Make sure that the aircraft arms are fully extended.
③ Make sure that the battery compartment cover is fastened firmly and the intelligent flight battery is installed firmly.

④ Make sure that the propellers are free from damage, aging, deformation, no foreign matter entanglement, and secure installation.
⑤ Make sure that GPS is turned on to avoid that it would be lost when flying outdoor in an open area.
⑥ Make sure that the 4 motors can start normally after power-on, and the rotation speeds are consistent.
⑦ Make sure that you have connected the Wi-Fi named" Ruko_F11_Mini_5G_******" exactly after app access right and internets permission with your phone.
⑧ Make sure the camera is clean.
⑨ If you need to replace parts, be sure to use original parts.
⑩ Make sure to use original accessories, otherwise it may cause danger to the safe use of the aircraft.For details on accessory support, please refer to the accessory support page in the appendix of the user manual.

6.3 Pairing remote controller with Aircraft

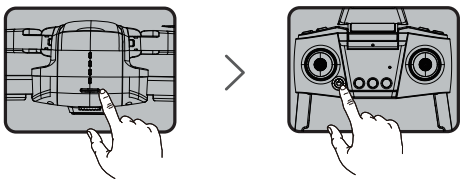
Aircraft needs to carry out a series of calibration work before flying, the main purpose is to avoid the accident that the aircraft loses control and crashes caused by the inaccurate GPS signal during the flight.
Before calibrating the aircraft, you need to pair the remote controller with the aircraft, and connect the smartphone to the aircraft's Wi-Fi.

① Unfold the four arms of the aircraft and place them on an open level ground with the nose facing forward and the tail facing the pilot.

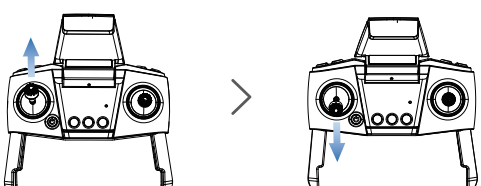


② Long press the power button of aircraft, the motor light will be on and you will hear a beeping sound, indicating that the aircraft has been turned on.

③ Press the remote controller power button once to turn on the remote controller.

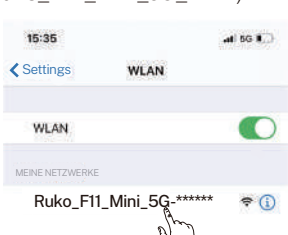


④ Push up the left stick of remote controller to **12 o'clock** and then pull it down to **6 o'clock** to pair the remote controller with the aircraft. After the aircraft emits a "beep" sound, the remote controller's light changes from flashing to always on, which means the pairing is successful.

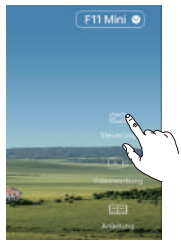


6.4 Wi-Fi Connection

① Open the phone Wi-Fi setting page.
② Connect the mobile phone to aircraft's Wi-Fi (name: **Ruko_F11_Mini_5G_******).



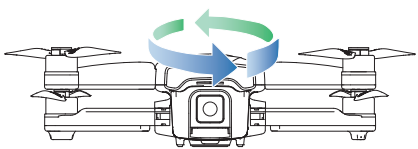
③ Click on the app to enter the control interface. Wi-Fi connection is successful if the mobile phone displays the compass calibration screen of the aircraft.



- When the Android phone is connected to aircraft Wi-Fi (named **Ruko_F11_Mini_5G_******), as the aircraft Wi-Fi has no network, wait for about 10-40 seconds on the phone Wi-Fi setting page, the phone will pop up the network setting option to ask whether to continue connect to aircraft Wi-Fi, please set it continue to use aircraft Wi-Fi, so as not to cause to the app to be unable to see the image transmission screen.
- Please turn off the VPN switch of the phone to avoid the app not being able to see the image transmission screen.
- If the mobile phone is set to priority on internet speed and the app cannot see the image transmission screen, please set the mobile phone to airplane mode and try.
- Aircraft image transmission Wi-Fi is 5G, mobile phone WLAN function must be supported;
- dual-band Wi-Fi, 2.4G+5G, can be applied.
- The aircraft Wi-Fi can only support one mobile phone. When one mobile phone is connected to the aircraft Wi-Fi, other mobile phone will not be able to connect to the Wi-Fi.

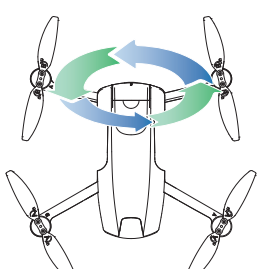
6.5 Compass Calibration Before Flight

① At this time, you need to follow the prompts to pick up the aircraft at a distance of 1m from the ground and rotate the aircraft horizontally for 2-3 laps until the app interface prompts to enter the vertical calibration. (No fixed direction of rotation required.) Please keep the aircraft flat when rotating horizontally, otherwise it will take more turns to complete the calibration.



Horizontal Calibration
The indicator changes from slow flashing to fast flashing

② Pick up the aircraft at a distance of 1m from the ground, and rotate the aircraft 2-3 laps vertically with the camera facing upwards until the prompt of vertical calibration on the app interface disappears. (No fixed direction of rotation required.) After the compass calibration is completed, place the aircraft on a level ground.

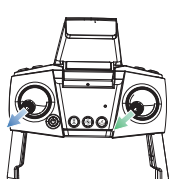


Vertical Calibration
The indicator changes from fast flashing to always on

- The aircraft must be calibrated with the compass every time it is turned on before it can take off. The aircraft light turns yellow and flashes slowly after pairing, the aircraft can be calibrated in steps ① and ②.
- When the aircraft is flying in a circle or out of control in a complex environment, the aircraft compass calibration is not standard or interfered. Please land the aircraft manually in time to manually calibrate the aircraft (refer to the first step of calibrating the compass).
- When calibrating the aircraft, please open the arm to avoid the influence of the magnetic field of the motor.
- If the user want to calibrate the compass again, press  on the remote controller to enter the compass calibration process.

6.6 Gyroscope Calibration

① Make sure the aircraft is placed on level ground.
② Click the icon CALIBRATE in the app to calibrate the gyroscope or pull the left and right joysticks of the remote controller into 7 o'clock position together.



③ The aircraft starts to calibrate the gyroscope automatically when the rear light flashes fast.
④ The gyroscope calibration is completed when the light changes back to the original light state.

⑤ After the calibration is completed, "Fly" is displayed in the app, and you can now prepare to take off.

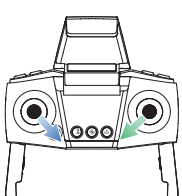
- When the aircraft's flight state is tilted and unstable, please land the aircraft on a level ground for gyroscope/horizontal calibration.
- Horizontal correction cannot be performed when the fuselage is tilted more than 10 degrees.

6.7 Starting/Stopping the Motors

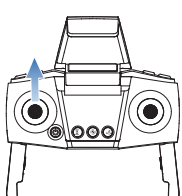
Starting the Motors

Method 1:
Push the joysticks into 5 & 7 o'clock position to start the motor. Please release the joysticks immediately after the motor starts rotating.

Method 2:
Push up the left joystick of the remote controller.



Method 1

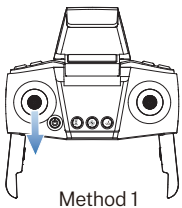


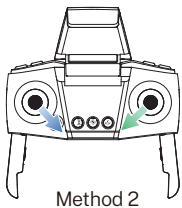
Method 2

Stopping the Motors

Method 1: After the aircraft takes off, push the throttle stick to the lowest position and operate the aircraft to land until the motor stops, then release the joystick.

Method 2: When the flight is not taking off, push the joysticks into 5 & 7 o'clock position to start the motor. After the motor is turned off, please release the joystick immediately.





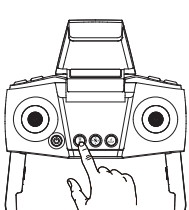
⚠ • Please choose a flat ground to land.

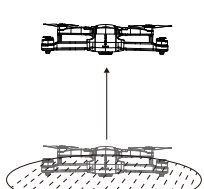
6.8 Auto Takeoff/Landing

Auto Takeoff

After the aircraft is calibrated, the user can use the automatic take-off function:

① Start the motor after confirming the safe take-off conditions.
② Click the One-key Takeoff button on remote controller or enter the app and click ⇧ to take off.
③ The aircraft will take off automatically and hover at a distance of 4 ft from the ground.

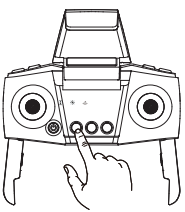


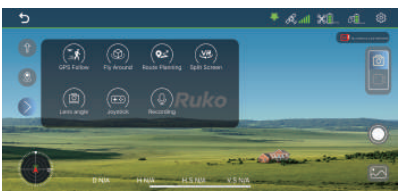


Auto Landing

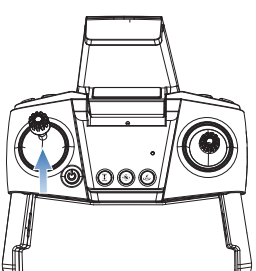
After the aircraft takes off, users can choose to use the automatic landing function:

① Confirm the safe landing conditions, click the One-key Takeoff button on remote controller or enter the app, click, and long press the button to confirm to enter the automatic landing.

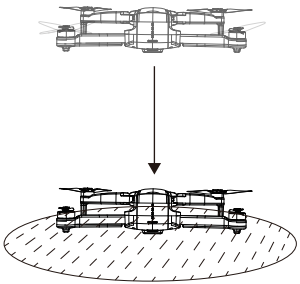




②When the aircraft is descending, push the throttle lever of the remote controller up and immediately open it to exit the automatic landing process.



③ The aircraft landed on the ground and turned off the motors by itself.



6.9 How to take off the Ruko F11MINI Drone

Basic Flight Steps

①Place the aircraft on a flat and open ground with the nose facing forward and the tail facing the pilot.

②Power on the aircraft.

③Turn on the power of remote controller, push the left joystick up to 12 o'clock and pull it down to 6 o'clock to pair remote controller with aircraft.

④Connect the mobile phone to aircraft's Wi-Fi Perform pre-flight inspection. open the Ruko Mini app,and enter the camera interface.

⑤After the aircraft compass calibration is completed, in GPS mode, the indicator light on the rear arm of the aircraft turns green and doesn't flash.

⑥Complete the gyroscope calibration.

⑦Unlock the motor.

⑧Slowly push the throttle stick upward to let the aircraft take off smoothly.

⑨Pull down the throttle stick to lower the aircraft.

⑩ After landing, pull the throttle stick to the lowest position and hold it until the motor stops.

⑪ Turn off the power of aircraft and remote controller in turn after shutdown.

6.10 Aerial Photography Tips & Tricks Perform pre-flight inspection

- It is recommended to take photos or videos in low-speed.
- Choose sunny and less windy weather for shooting.
- Push the stick as little as possible during the flight to make the Aircraft fly smoothly.

Awareness of flight safety is very important for the safety of you, the surrounding people and the environment. Please read the "Quick Guide & Safety Disclaimer"carefully.

7 Appendix

7.1 Specifications

Parameter	
Model	F11MINI
Weight	245g/8.64oz
Size	Unfold 27.5×23×5.5cm; Folded 15×8.5×5.5cm
Max Flight Altitude	393 feet
Max Flight Distance	1640 feet
Max Image Transmission Distance	1640 feet (open and non-interference)
Image Transmission Frequency	5G
Motor Model	1503 brushless motor
Satellite system	GPS/GLONASS
Flight time	About 30 minutes

P.S.

- The battery working time can be up to 30 mins when flying the aircraft at a constant speed and in windless & 77°F(25°C) weather.
- It is recommended to fly the aircraft in 50-104°F(10-40°C) weather.
- The lower the temperature, the faster the power loss and the shorter the battery life.

Intelligent Flight Battery	
Battery Capacity	2100mAh
Standard Voltage	7.6V
Charging Time	About 3.5 hours
Charging Temperature	50°F to 104°F (10℃ to 40℃)

Remote Controller	
Working Frequency	2.4GHz
Max Flight Distance	1640 feet
Battery Capacity	380mAh
Standard Voltage	3.7V
Working Time	About 10 hours

7.2 Accessories Support


Battery


Propeller


Arm


Remote Controller

All of the above accessories can be searched and purchased on Amazon, and you can enter the Ruko store to buy them yourself.

Be sure to use original accessories. The use of non-original accessories may cause danger to the safe use of the aircraft.

7.3 Common Problems and Solutions

Question	Reason	Solutions
The motors cannot be started	Without GPS signal or weak GPS signal	Turn on the aircraft in an open area with strong GPS signal, because the aircraft will not be able to search for enough GPS signals When it is indoors or in a sheltered place
	The red light flashes	The aircraft has low battery. Please charge the battery in time
	The yellow light flashes	The compass is not calibrated. Please refer to the "Calibration Before Flight" section of the user manual
	Doesn't switch to the indoor mode when flying indoors	Switch to the indoor mode when flying indoors
	The positions of left and right joystick are not correct	Push the left and right joysticks simultaneously to 5 o'clock and 7 o'clock for 2 seconds
		Or push up the left joystick to unlock the motor
Unstable flight	Flying too low, affected by aircraft airflow	Please fly the aircraft above 9.84ft(3 meters)
	The gyroscope is not calibrated	Place the aircraft on a horizontal surface and conduct gyroscope/horizontal calibration. Please refer to the "Gyroscope Calibration " section of the user manual
	The propellers become deformed and incomplete	Replace the propellers with new ones
	GPS signal is unstable. Flying near buildings and in obstructed places	Please fly the aircraft in an open area free of obstacles within the circle of radius 32.81 ft(10 meters)
Can't fly far or can only fly within a distance of 98ft (30 meters)	The beginner mode isn't turned off	Enter the app setting interface,turn off the beginner mode to set the flight distance and altitude, and save the settings
	Aircraft low battery	Charge the battery in time because it can only fly within a range of 98ft (30 meters) when the aircraft returns from low power
The aircraft will roll over or fail to take off after changing the propellers	4 propellers are installed backwards or a wrong propeller is installed	When installing the propeller, install it according to the corresponding mark
Out of control, spinning around on its own, abnormal sound	The remote controller signal is interfered or the aircraft exceeds the range of remote control	Please fly the aircraft outdoors without interference, and ensure that it is within a controllable range
	Compass interference	Please manually land the aircraft in time and calibrate the compass. Please make sure to fly away from the buildings, trees, power lines, and signal towers
	The propellers become deformed and incomplete	Replace the propellers with new ones

Question	Reason	Solutions
SD card cannot store photos or videos	The SD card is full	Delete SD card contents
	Incorrect storage file format settings	When formatting the SD card, select the FAT32 file format
	Problem of SD card	Try to format the SD card or replace the SD card
No photo or video storage on your phone	Album storage permission is not turned on	Please set it correctly when popping up album permissions
	After the SD card is installed, the phone does not store photos and videos, they are all stored on the SD card	Connect to aircraft Wi-Fi to download video from app to mobile phone
Video freezes, image transmission distance is short	The aircraft is out of Wi-Fi range	Fly the aircraft within the range of the Wi-Fi
	Wi-Fi image transmission signal interference	Fly the aircraft in an unobstructed open area free of buildings, high-voltage wires and signal towers
	The remote controller and the mobile phone are not pointed at the direction of the aircraft	Point the remote controller and the mobile phone at the flying direction of the aircraft to maintain the strongest signal connection
	Phone performance freezes	Close unused apps running in the background to maintain the best performance of the phone
App does not display the interface	The phone is not connected to Wi-Fi	Connect your mobile phone to the Wi-Fi : Ruko_F11_Mini_5G-******
	The phone version is too low	Android 6.0 and above, IOS 10.02 and above
	When connecting to the aircraft's Wi-Fi, the network is not set or set incorrectly	Set the Wi-Fi correctly
		Turn the phone to airplane mode
	The reason why the iPhone can connect to Wi-Fi, but cannot see the image is that the network permission popped up by the app is not set to allow	Reinstall the app and select allow when the network permission pops up
	VPN switch is turned on	Turn off the VPN switch
App crash or its functions are abnormal	Wrong app downloaded	Download the correct app
	The phone version is old and not compatible with the app	Give us your mobile phone version model and we will give you a corresponding solution
Phone cannot connect to Wi-Fi	It is the first time to connect your phone to the Wi-Fi	Try connecting a few more times or restart the phone
The Wi-Fi name is not displayed	The phone is a single band phone	Use the dual band devices that support both 2.4 GHz and 5 GHz/5.8 GHz
	Wi-Fi has not been activated	Wait for about 30 seconds after turning on the aircraft and keep refreshing the Wi-Fi list while the Wi-Fi is activated
GPS signal is weak	Turning on the aircraft indoors	GPS signals cannot be found indoors.Please search for GPS signals in an open place outdoors
	Under the tree, next to the building, in an obstructed place	Please stay away from obstacles for more than 32.81 feet(10 meters), and search for GPS signals in an open area

Question	Reason	Solutions
The aircraft automatically flies upwards when pressing one key return home	Set safe return altitude	When the flight altitude is less than 65.6ft (20 meters), the aircraft will automatically rise to the height of 65.6ft (20 meters) before returning home
The aircraft cannot be paired with the remote controller	Doesn't push up and down the left joystick to pair the remote controller with aircraft	Turn on the aircraft and remote controller, push up the left joystick to 12 o'clock and then pull down to 6 o'clock position to pair remote controller with aircraft
Cannot charge battery/Cannot fully charge battery	Using inferior charger or charging on the computer with unstable voltage output	Use a mobile USB charger that ensures constant stable voltage output(5V) and amperage output(2-3A)
	Using inferior charging cables	Please use the original factory charging cable to charge
Short battery life	Flying in windy weather	Flying in windy weather will accelerate power loss
	The battery is not fully charged	Please use a charger with 5V/3A to charge it
	Flying in cold weather	In low-temperatures, the chemical reaction of the lithium battery is slowed down and the energy cannot be fully released
The product has slight marks	We tested all aircraft before shipping	In order to give you the best experience, we tested functions of all aircraft before shipping. Therefore, it is inevitable that there will be slight traces. However, it can be guaranteed that all aircraft are 100% brand new

Ruko Tech Support
https://rukotoy.com/support-drones

This User Manual is subject to change without notice.

You can check the recently updated version of "User Manual" on Ruko's official website
https://rukotoy.com/support-drones

If you have any questions or suggestions about the User Manual, please contact us via the following email:
rukodrone@gmail.com

Ruko®

rukotoy.com

CONTACT US FOR MORE TECH SUPPORT

+ 1 949-394-4635 | Mon-Sun 6PM-4AM(PST)

+86 19129317359 rukodrone@gmail.com