

AK28 HD/HD+ ENTERPRISE SMART CONTROLLER USER MANUAL



V1.1

May 2020

Thank you for purchasing SIYI Technology's product.

After a series of technology breakthroughs intended for extremely long-range UAV control transmission combined with high resolution video streaming, we are pleased to introduce the AK28 HD and HD+. The AK28 HD/HD+ is integrated with the latest 1080p HD video transmission while taking advantage of the most advanced frequency hopping technology and anti-interference RF algorithms.

The Sky Station is made of CNC crafted aviation aluminum which not only makes the unit marvelous in its appearance, but also provides a remarkable level of cooling.

To support as many video streaming devices as possible, there are both an Ethernet port as well as an HDMI input on the receiver.

The brand new AK28 HD/HD+ system will present you with a flexible live experience whether it's for FPV flight or aerial video streaming.

To maintain a safe and orderly public space and to ensure you a good using experience of AK28 HD/HD+ transmitter, please read this manual carefully. If you have any issue using the product, please consult the manual or check online pages of AK28 HD/HD+ on SIYI Technology's official website (<http://www.siyi.biz>). You can also inquire our after-sale service coordinator (support@siyi.biz).

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1 READ TIPS

1.1 Icon Definition

Please pay more attention to content indicated with the following marks:

 **DANGER** Dangerous manipulation probably leads to human injuries.

 **WARNING** Warnings on manipulation possibly leads to human injuries.


 **CAUTION** Cautions on what manipulation may lead to property loss.


 **Prohibited**  **Mandatory**  **Mark**


1.2 Flight Safety


AK28 HD/HD+ Enterprise Smart Controller is designed for professional application in specific industries, users who approaches to the device should have at least the basic ability to manipulate it. Any irregular or irresponsible manipulations of the device may cause damages or lead to property loss or human injuries. Non-adult users must follow their trainer's guidance or the supervision of an adult. Disassembling or modification on AK28 HD/HD+ system is prohibited without permission from its manufacturer, SIYI Technology.


To maintain a safe and orderly public space and to ensure you a good using experience of SIYI's products, please read the prohibited and mandatory terms carefully.


 Do not use AK28 HD/HD+ system to control your aircraft/vehicle at places with intensive crowd (a square, a park), or at places with many obstructions (a street, a parking lot), or in fields with strong magnetic or interference (an electricity plant, a radar station, railways), or in any other fields where an irregular flight/operation may cause property loss or human injuries.


 Do not hold or cover transmitter antenna or obstruct its transmission by any means in a flight or an operation.


 Never point your transmitter antenna's upper ends straightly to your aircraft/vehicle while it is working, they are the weakest part for transmission.

 Do not start your aircraft/vehicle when you are tired, drunk, in sickness or any circumstances you are not feeling good.

 Do not take off your aircraft when it is rainy, windy or at night.

 Do not power off the transmitter while your aircraft's/vehicle's engines and motors are still working.

 Please always try to control your aircraft/vehicle within sight range.

 Make sure that your AK28 HD/HD+ transmitter's screen display the FC control center and you can monitor their status before starting your aircraft/vehicle.

- ❗ Do not forget to check battery level of the transmitter and the receiver before starting your aircraft/vehicle.
- ❗ Always power off your aircraft/vehicle first, AK28 HD/HD+ transmitter the second.
- ❗ Before changing any settings for the transmitter, make sure your aircraft's/vehicle's engines are powered off and their motor wires are off connection, in case of a sudden switch on.
- ❗ When you start your aircraft/vehicle for the first time, make sure that the fail-safe settings in your AK28 HD/HD+ transmitter is activated.
- ❗ Always switch on the transmitter first and hold the throttle joystick at its bottom position, then power on your aircraft/vehicle.

1.3 Precautions on Charging AK28 HD/HD+

AK28 HD/HD+ transmitter is equipped with a replaceable and chargeable 12960mAh LiPo 1S battery and a 5V/2A Micro-USB charger adapter.

- ⊘ Do not use any USB chargers over 5V output to charge the transmitter.
- ⊘ For the best charging experience, please power off your transmitter before charging. The charging current should not exceed 2A.
- ⊘ Stop charging immediately if you found the charger damaged, broken or overheat.
- ⊘ Stop charging immediately if there was a peculiar smell, smokes or leaks. In such cases you shall sent the transmitter back to your dealer for after-sales service.

⊘ Do not charge AK28 HD/HD+ transmitter when temperature is high or battery temperature is over 60°C.

⚠ DANGER



Keep AK28 HD/HD+ away from any places that babies or kids may reach easily while it is under charging, better there is supervision from an adult in case of emergency.



You can also stockpile spare batteries for AK28 HD/HD+ transmitter and charge up to three AK28 HD/HD+ batteries through a professional battery charging hub designed and manufactured by SIYI.

The spare batteries and the battery charging hub are sold separately.

1.4 Precautions on Using SD Card

-  Do not disassemble, bend, press, abandon or damage SD card by any means.
-  Stop using the SD card if you find it soaked by water, oil or any other chemical liquid.

CAUTION

A SD card is also an electronic product, keep it away from static electricity.

Keep the Micro-SD card slot clean in case of blocking by sand or dirt.

Keep the SD card in slot while you are downloading or uploading data; taking out it mistakenly, hitting it or shattering it may cause damage or data loss.

Keep the SD card away from places that a baby or a kid may reach in case that it was swallowed mistakenly by the baby/kid.

1.5 How to Use SIM Card on AK28 HD/HD+

Coming soon

1.6 Precautions on Storage/Carrying/Recycling

CAUTION

Always place your AK28 HD/HD+ transmitter at places where babies or kids do not reach.

 **DANGER**

AK28 HD/HD+ transmitter should be placed as below:

Not too hot (above 60°C) or too cold (under -20°C);

Not under direct sunshine or too dusty or too wet;

Not on an unstable holder which lacks of solid supports or may cause vibration;

Not nearby steam or other heat sources.

2 PRODUCT INTRODUCTION

2.1 Product Features

1080P HD Digital Video Transmission

Integrated with an HD digital video transmission system, the AK28 HD/HD+ is equipped with both HDMI and Ethernet ports for the most flexible video stream input. Making the system available to more cameras, gimbals, and multi-functional pods. The built-in FPV application supports a floating window for video image display over any ground control systems. Images can be zoomed in and out with the app. In QGroundControl, the video images are perfectly displayed in the system without the need for an additional app.

Extremely Long Transmission Distance

Using the brand-new video transmission system which is applied with advanced anti-interference RF algorithm, the control distance of AK28 HD can reach up to 5 kilometers, of AK28 HD+ it can reach up to 15KM. The world is widely open for you now!

iUAV OS Customized Operating System

Powered by Android, the iUAV OS is an improved operating system built on deep knowledge of drone user requirement. This provides a positive user experience, improved stability, convenience and efficiency. There are many hardware

extensions ports on AK28HD/HD+ which will lead to infinite possibilities, to explore more uses and drone applications. The AK28 HD/HD+ SDK will be shared with the global development community for their secondary development.

QGroundControl

QGroundControl users can check their live video stream on the ground station directly. Switching between the video image and the map view fast and freely.

Industry-level Protection

Considering the complicated working conditions of agricultural drones outdoors, the completely waterproof and dustproof process has been done to key connectors on AK28 operating panel, such as the shell, the switches, external ports, etc. With this process, the controller and its system can still work in smooth and stable performance despite how bad the environment could be.

High Brightness & Resolution LCD Screen

Under direct sunlight, you can still have a clear view of real-time screen display due to AK28 HD/HD+'s 7-inch, high brightness, and high definition LCD screen.

Replaceable High Capacity LiPo Battery

AK28 HD/HD+ uses the same high capacity lipo battery for top-class smartphone brands. The battery features low internal resistance, long working time, and an

excellent power curve for the operating system. These are the exactly cool features which most drone operations require, especially the long-lasting ones.

The Pursuit of Perfect Industrial Design


A Product with Quality and Dignity

AK28 series are not merely hardware with open system, but also carriers of various tastes and free branding. Metallic operating panel with various choices of color can be perfectly compatible with your drone design. And laser logo helps you a lot with promoting your brand.

2.2 Parts

2.2.1 At a Glance




 Mark: Press and hold the power button three seconds to power on AK28 HD/HD+ transmitter.

2.2.2 Button/Switch Types and the Default Channel Definitions

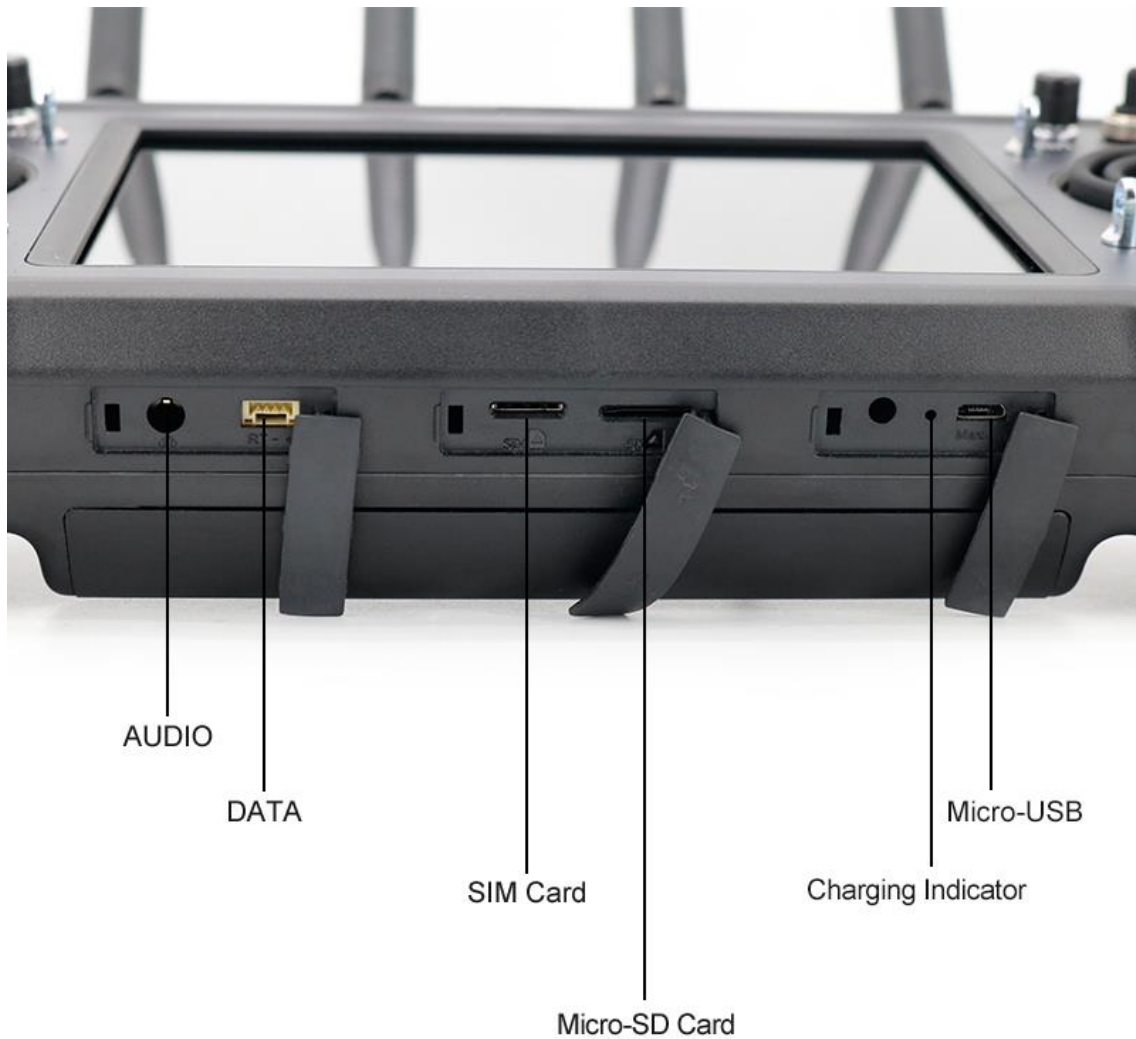
AK28 HD/HD+ transmitter has 16 channels in total. Each channel is controlled by an independent switch or button. Please refer to the form below for the default channel definitions from channel 1 to 16.

Channel No.	Joysticks / Buttons / Switches
1	Joystick J1
2	Joystick J2
3	Joystick J3
4	Joystick J4
5	3-Stage Switch SA
6	3-Stage Switch SB
7	3-Stage Switch SC
8	3-Stage Switch SD
9	3-Stage Switch SE
10	3-Stage Switch SF
11	Left Dial LD1
12	Right Dial RD1
13	Self-Reset Button S1
14	Self-Reset Button S2
15	Left Dial LD2
16	Right Dial RD2

 Mark: Self-locking button stays in the position you press them to; Self-resetting button rebound to original position after a press.

Mark: AK28 HD/HD+ transmitter supports customized channel definitions as well. Please refer to the chapter “SIYI TX APP” in this manual for detail.

2.2.3 Ports on AK28 HD/HD+



Port Function

AUDIO: Audio output.

DATA: Upgrading transmitter firmware.

SIM Card: Insert your SIM card to use cellular network.

SD Card: Insert your SD card to read and storage files.

Charging Indicator: Check charging status of your transmitter.

Micro-USB: Charging, file transferring, upgrade Android system.

2.3 Technical Specification

Overall

Channels	16 Channels
Applicable Model	Planes / Helicopters / Gliders / Quadcopters / Multi-rotors / Vehicles / Boats / Robots
Compatible FC	Open Source Flight Controllers: PIX/APM, etc.
Joystick Resolution	4096 grades
Frequency Band	Radiolink & Telemetry: 2400 MHz ~ 2483 MHz HD Video Transmission: 5100 MHz ~ 5800 MHz HD+ Video Transmission: 1427 ~ 1447 MHz
Radiolink & Datalink Range	15 km / 9.3 miles (unobstructed, free of interference)
Videolink Range	HD: 5 km / 3.1 miles (unobstructed, free of interference) HD+: 15 km / 9.3 miles (unobstructed, free of interference)
Video Quality	1080p
Battery Type & Watt Hour	Replaceable and Chargeable 3.7V 12690mAh Li-Po 1S Battery 47 Wh
Battery Life	HD: 4 Hours HD+ 3 Hours
Charging Port Type	Micro-USB (5V/2A)
Wireless Type & Function	2.4GHz (radiolink/datalink) HD: 5.8GHz (videolink) HD+:1.4GHz (videolink) Bluetooth (datalink communication) WIFI (internet)
Packing Size	37x27x18 cm
Packing Weight	2.9 kg (3.5kg by volume)

Ground Station (Transmitter)

Operating System	Android 7.0 2G RAM & 16G ROM
Screen Type	7-inch High Brightness LCD Screen
Battery Type & Watt Hour	Replaceable & Chargeable 3.7V 12690mAh Li-Po 1S Battery; 47 Wh
Duration	HD: 4 Hours HD+ 3 Hours
Battery Working Temperature	0 ~ 55 (°C)
Charging Port Type	Micro-USB; 5V/2A
Charging Time	About 9 hours (through Micro-USB) 5 hours (3 batteries through charging hub)
Dimensions	308 x 148 x 72 mm (antennas folded)
Net Weight	1300 g

Sky Station (Receiver)

Signal Output	14 channels of SBUS, 5 channels of PWM
Datalink Ports (to FC)	UART, CAN (optional)
Video Input	Ethernet Port / HDMI
Antenna Gain	5 dBi
Working Voltage	15 – 50V
Telemetry Voltage	15 – 50V
Operating Temperature	-10 to 55 (°C)
Dimensions	61 x 60 x 21 mm (without antenna)
Net Weight	82g (without antenna)

HDMI Converter

Camera Port	Micro HDMI Standard HDMI (optional), Mini HDMI (optional)
Video Input	Micro HDMI
Operating Temperature	-10 to 55 (°C)
Dimensions	82 x 65 x 17 mm
Net Weight	62 g

2.4 Packing List

AK28 HD

- 1 x AK28 HD Transmitter
- 1 x AK28 HD Sky Station
- 4 x 5.8G Rod Antenna (along with 3 x extension feeder)
- 3 x 2.4G Rod Antenna (along with 2 x extension feeder)
- 1 x 4-pin Data Cable / Flight Controller Cable
- 1 x 8-pin Ethernet Camera Cable
- 1 x OTG Micro-USB Cable
- 1 x USB Charger (5V/2A)
- 1 x Upgrading Tool
- 1 x Strap Belt
- 1 x Storage Case

AK28 HD+

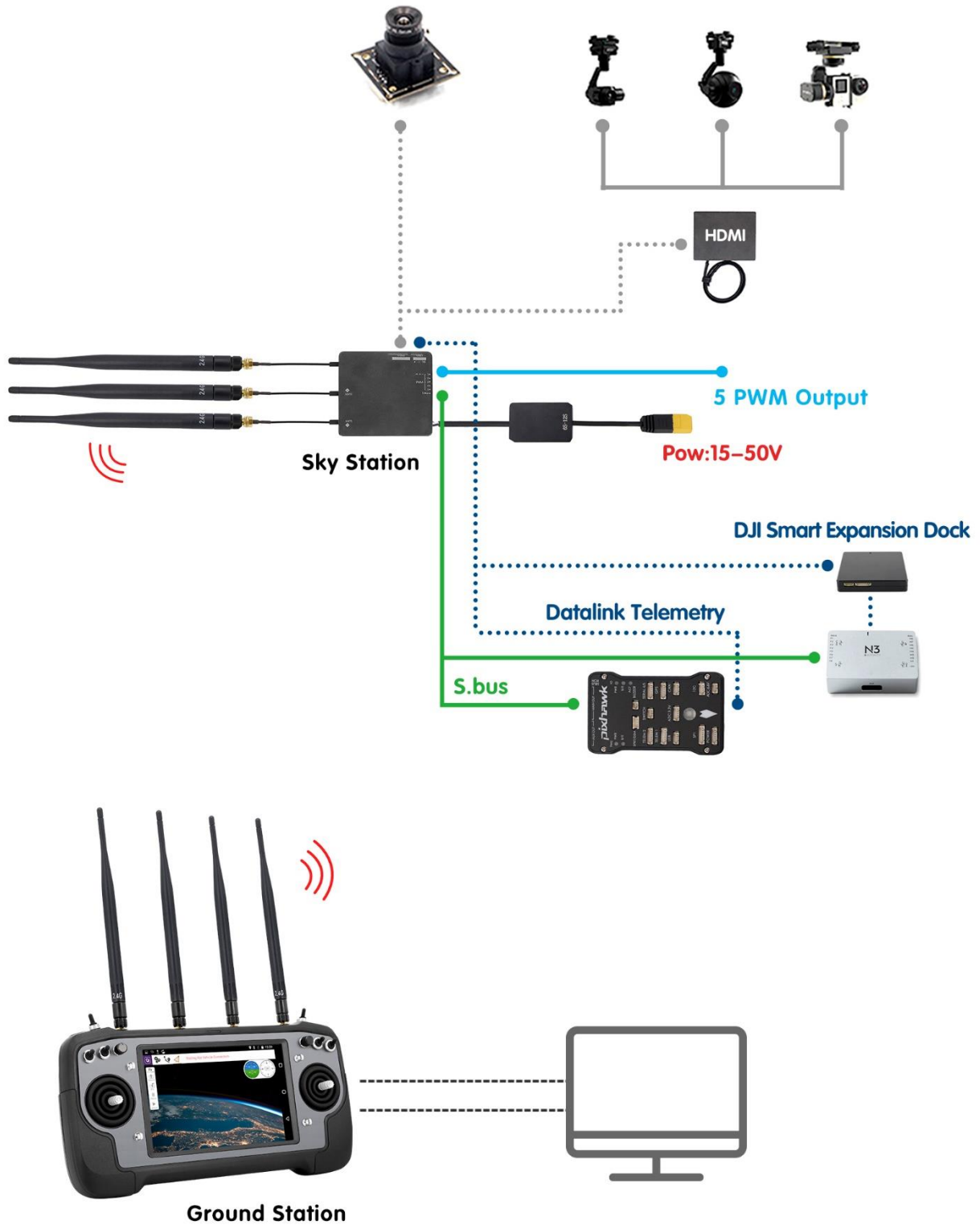
- 1 x AK28 HD+ Transmitter
- 1 x AK28 HD Sky Station
- 4 x 1.4G Rod Antenna (with 3 x extension feeder)
- 3 x 2.4G Rod Antenna (with 2 x extension feeder)
- 1 x 4-pin Data Cable / Flight Controller Cable
- 1 x 8-pin Ethernet Camera Cable
- 1 x OTG Micro-USB Cable
- 1 x USB Charger (5V/2A)
- 1 x Upgrading Tool
- 1 x Strap Belt
- 1 x Storage Case
- 1 x Battery Charging Hub (with AC adapter)

Optional

- 1 x HDMI Converter (with Micro HDMI Data Cable)

2.5 AK28 HD/HD+ Common Diagram

AK28HD Diagram



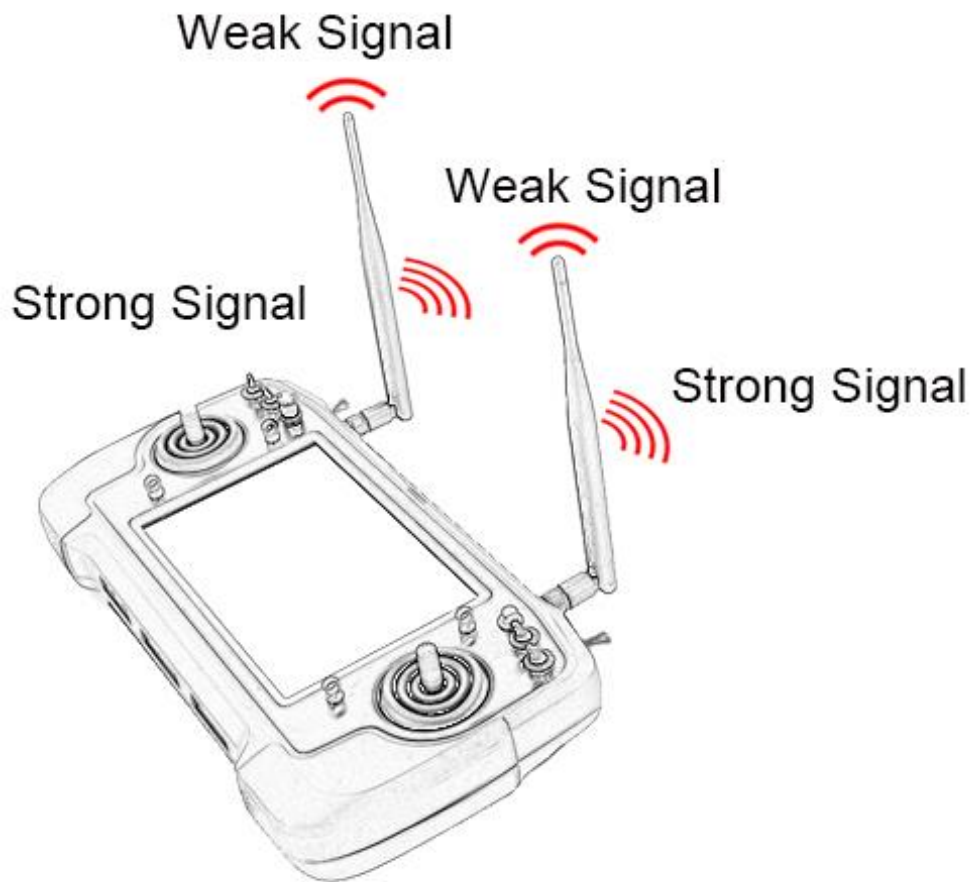
2.6 Transmitter LED Indicator Definitions

The LED indicator on top of the touchscreen has three colors and different frequencies to indicate AK28 HD/HD+ transmitter's different working status.

- Solid Green: Good communication.
- Green Blinks: Blinking frequency indicates AK28 HD/HD+ transmitter's RF signal strength. The faster it blinks, the worse the signal is.
- Slow Red Blinks: Transmitter firmware does not match.
- Fast Red Blinks: Transmitter is linking/binding with receiver.
- Triple Red Blinks: RF initialization failed.
- Four Red Blinks: Joysticks require calibration.
- Solid Yellow: No communication between transmitter and receiver.
- Triple Yellow Blinks: Video transmission abnormal.
- Yellow Blinks: System voltage abnormal.
- ● ● Fast Red-Green-Yellow Blinks: Upgrading mode.
- ● ● Red-Green-Yellow Blinks in every 5 seconds: Receiver under wireless upgrading.

3 GET READY TO USE AK28 HD/HD+

3.1 How to Place Transmitter Antennas Right

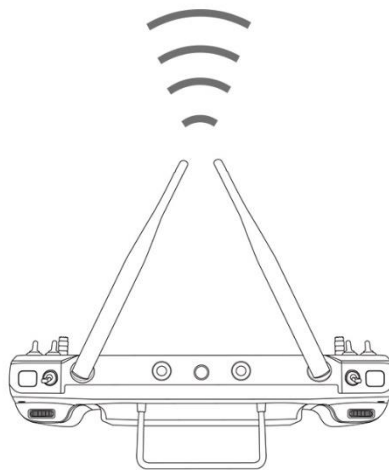


A

Mark: AK28 HD/HD+ transmitter has the best signal strength when the antennas are placed horizontally (A, B). Thus, please avoid pointing antennas' upper end straightly to your aircraft and do not fold the antennas (C).

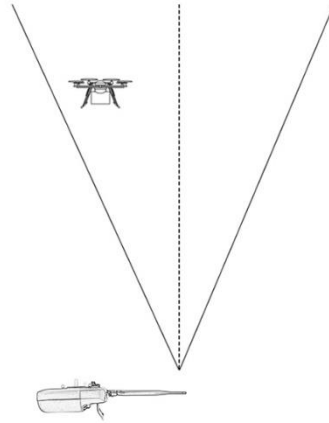


B

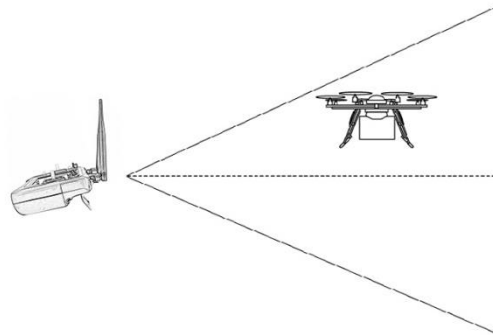


C

3.1.1 Good Antenna Angle of Transmitter

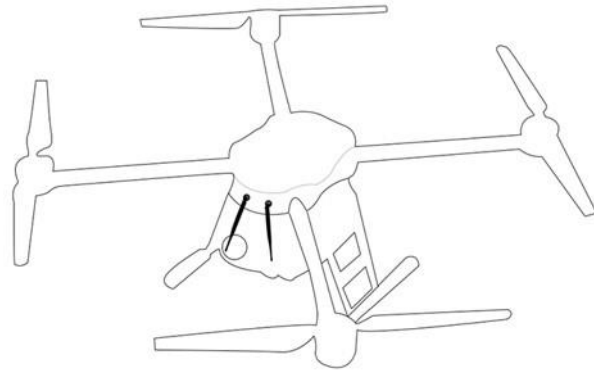


Aircraft in front of the transmitter



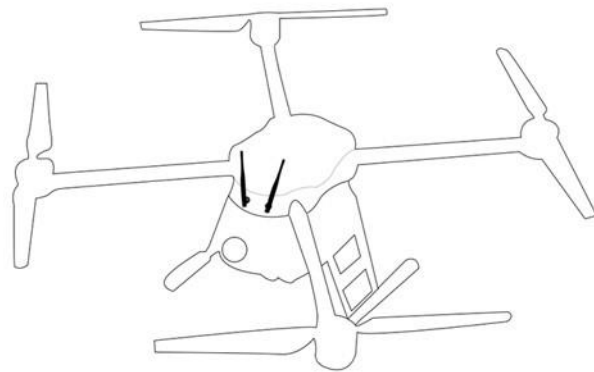
Aircraft up from the transmitter

3.1.2 Good Antenna Angle of Sky Station



Flying high

(Altitude higher than 10 meters, **antennas should be placed downwards**)



Flying low

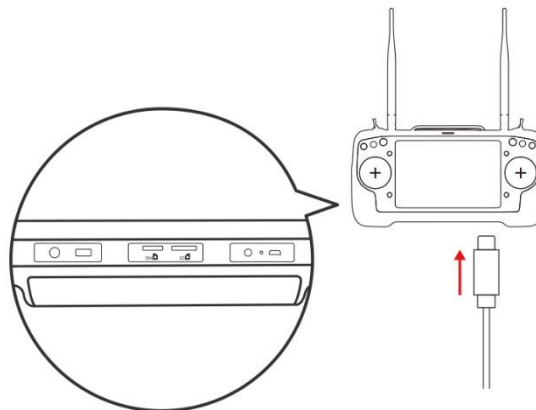
(Altitude lower than 10 meters, **antennas should be placed upwards**)

! WARNING

Do not fold or cover antennas and avoid any obstruction between the transmitter and the aircraft in flight, otherwise there will be an obvious decrease to transmission signal quality.

3.2 How to Charge AK28 HD/HD+ Transmitter

Before charging your AK28 HD/HD+ transmitter, please read the part “1 READ TIPS - 1.3 Precautions on Charging AK28 HD/HD+ Transmitter” carefully.




Transmitter Power Off Charging


Please use the original OTG Micro-USB cable coming in AK28 HD/HD+ packing list for connecting the Micro-USB port on bottom transmitter to the USB port on the charger adapter. When the charging indicator is solid red, transmitter is under charging. When the charging indicator turns to solid green, charging is finished.

Transmitter Power On Charging

AK28 HD/HD+ system pops “USB inserted, please confirm before disconnecting datalink/videolink function and switching to charging or file transferring function”.

Then click “Yes”.

 Mark: Please make sure that the charging current is less than 2A or it may cause damage to battery.

 Mark: AK28 HD/HD+ transmitter is equipped with a replaceable 12690mAh LiPo 1S battery. Charging time is about 10 hours using a standard **5V/2A** charger adapter. Charging time may change according to chargers made under different standard, please also pay an attention to the charging indicator when you are charging the transmitter.

Charging Indicator Definition

Power Off Charging

 Solid Red: Transmitter is under charging.

 Solid Green: Charging is finished.

Power on Charging

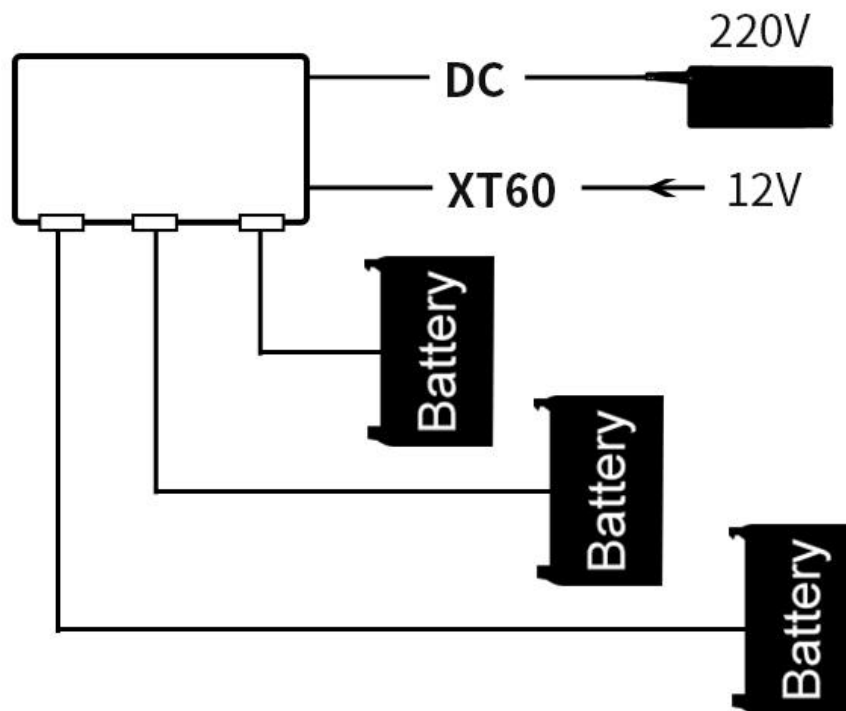
 Solid Yellow: Transmitter is under charging.

 Solid Green: Charging is finished.

*How to Charge AK28 HD/HD+ with Battery Charging Hub

The battery charging hub takes about five hours to charge up to three batteries

charging simultaneously. It works with two power input options, 220V power to its DC port and 12V power to its XT60 port.

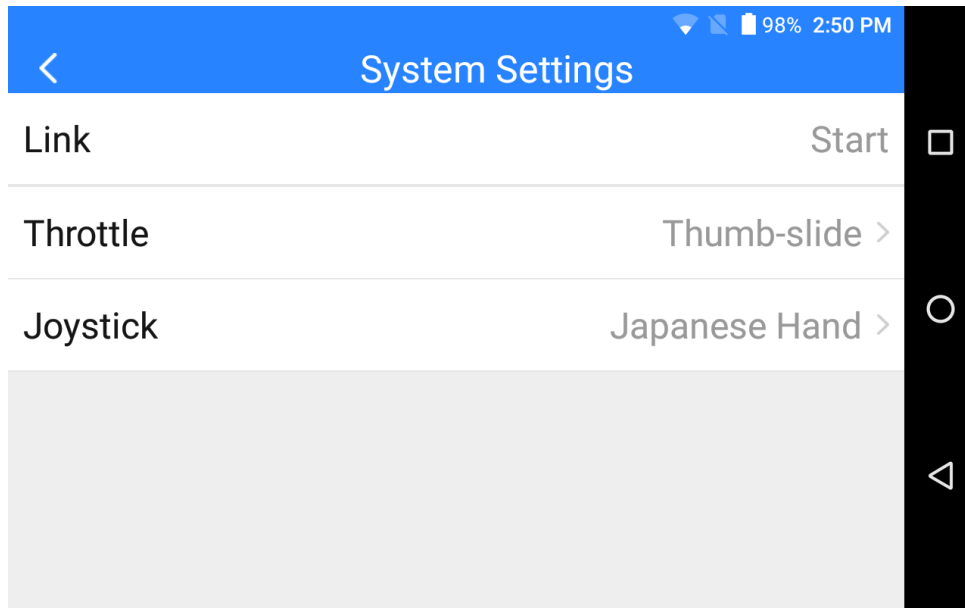


3.3 How to Link/Bind AK28 HD/HD+ Transmitter to the Sky Station

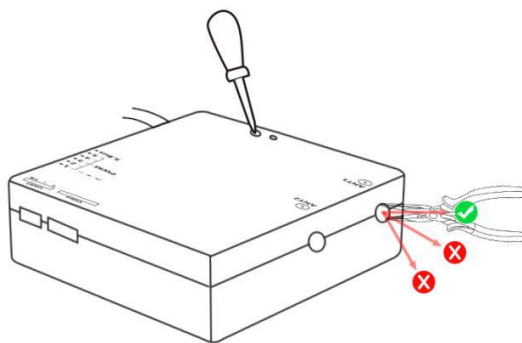
Each unit of AK28 HD/HD+ transmitter is assigned with a unique ID code. Before linking the receiver to AK28 HD/HD+ transmitter, the receiver identifies the transmitter ID (**Linking/Binding**) first. After the first linking process between the transmitter and the receiver is done, the transmitter ID will be memorized in the receiver so that you don't have to repeat the process before the next flight/operation (except when your transmitter has to be linked with a different receiver).

Linking/Binding Steps

1. Please keep your AK28 HD/HD+ transmitter one meter away from the receiver and power on both of them;
2. In your smartphone screen menu, open “SIYI TX” and tap on “System Settings”;



3. Turn to the receiver, stick a pin or needle to the linking button inside the linking hole, press and hold the button for 3 seconds till the status indicator blinks red which means the receiver is ready for linking;



4. Tap on “Link - Start” and wait for a second, if the transmitter indicator and the

receiver both blink green, linking is finished.

WARNING

Before linking the transmitter to the receiver, please make sure your aircraft motors have no power connected (E.S.C are off connection).

Reboot the receiver when linking steps are finished, and try to manipulate on the transmitter to confirm if it works well.

When you are going to pull out the antenna, please do use a pliers to pull out its MMCX connector vertically. If you pull it out from a side, the antenna connector could be damaged.

Please pay an attention to the antenna frequency when you are going to connector it to the receiver. The 2.4GHz antenna goes to the connector with 2.4GHz marking and the 5.8GHz antenna goes to the connector with 5.8GHz marking.

Please avoid the situation that AK28 HD/HD+ system is working too long without antenna connected. The RF module could be damaged in that way.

3.4 Throttle Joystick Type

AK28 HD/HD+ transmitter supports both “Thumb-slide” and “Self-centering” throttle joysticks. Users decide which type to use according to their preference. Generally, if your AK28 HD/HD+ transmitter has been set up as “Thumb-slide” throttle joystick, then the throttle type in “System Settings” should be “Thumb-slide” as well.

Steps

Open “SIYI TX”, tap on “System Settings – Throttle – Self-centering/Thumb-slide” to choose your favorite throttle type.

4 OPERATING SYSTEM

4.1 Tips

Screenshot

Users can tap on the screenshot button in the Android system notification menu or double click transmitter power button to make screenshots.

4.2 Download System Application

The very necessary applications, “SIYI TX”, has been pre-installed in AK28 HD/HD+ transmitter before delivery. Users can visit SIYI Tech’s official website (http://www.siyi.biz/cn/AK28_HD/downloads/) or contact SIYI Tech’s technical support email (support@siyi.biz) to download and update the same applications if they were not in your system when you have got it.

4.3 How to Import Files and Install System Application

Method 1

Copy the APK from PC to a TF card and insert the TF card to the slot on AK28 HD/HD+ transmitter. Then you can read and install the file through the “File Manager” application in AK28 HD/HD+ system.

Method 2

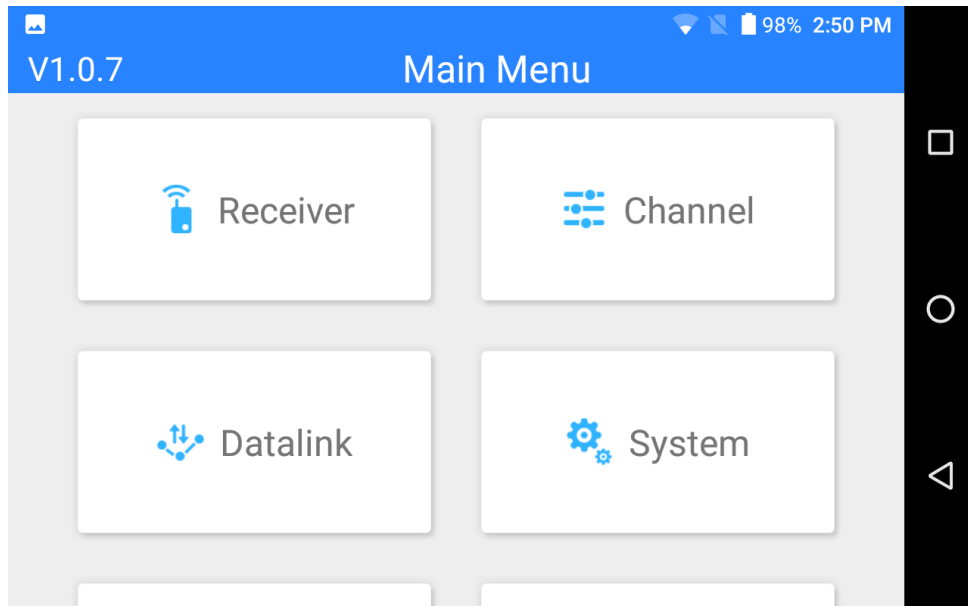
Connect AK28 HD/HD+ transmitter to your PC through an OTG Micro-USB cable and in AK28 HD/HD+ system screen it will pop up “USB inserted, please confirm before disconnecting datalink/videolink function and switching to charging or file transferring function”. Tap on “Yes”, then open “Computer” file in your PC system and find the new file driver detected. Copy the APK into the driver and you can read and install the file through the “File Manager” application in AK28 HD/HD+ system.

 **WARNING**

AK28 HD/HD+ is a professional handheld ground station for enterprise UAV which requires a stable system. Please do not install any application which does work for your UAV system in case of any danger to flight safety.

5 SIYI TX

Users can set up AK28 HD/HD+ transmitter through the system application “SIYI TX”.



5.1 Channel Settings

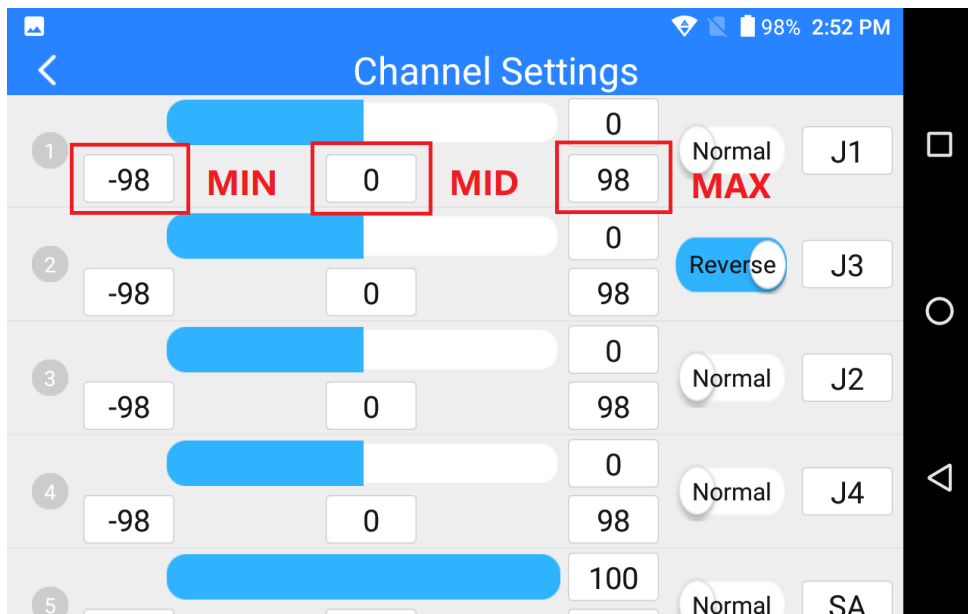
Users can set the output value and middle point value and switch output direction (normal/reversed) and change mapping definition for each channel of AK28 HD/HD+ transmitter.

5.1.1 End Point

Users can set the output value of a channel and its maximum/minimum limit.

Steps

1. Please refer to the picture below. Slide the blue bar in your target channel to the target output value. When the channel output is normal, tap on the left/right box to input value of the minimum/maximum limit, the range is between -150 and 150.
2. After setting, output value of the channel will not exceed the limit even under “Program Mix*” function in order to protect the servo and some other external device.



5.1.2 Middle Point

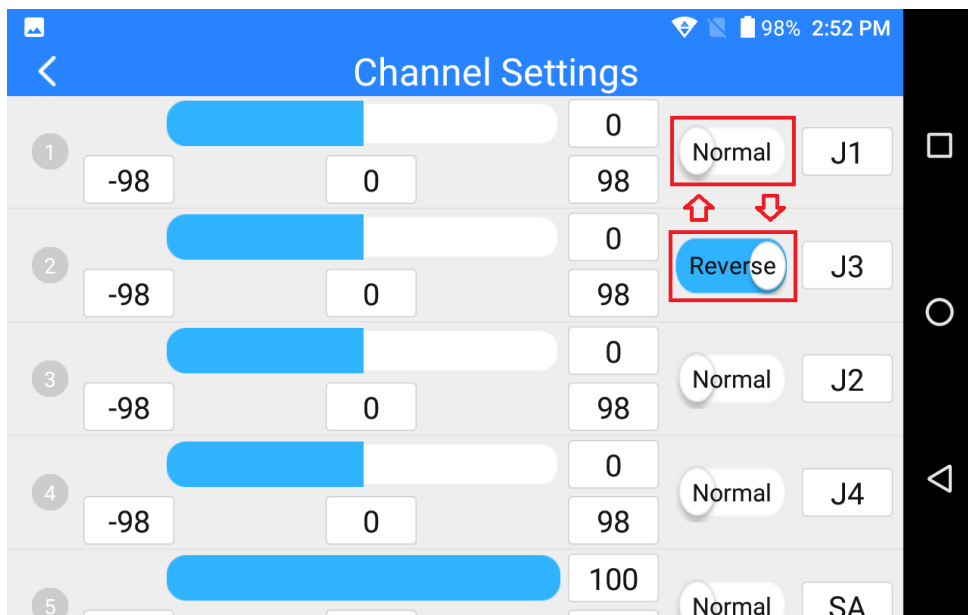
Please refer to the picture above. Tap on the box below the middle of your target channel to input value of the middle point.

5.1.3 Channel Reverse

Users can reverse a channel's output direction through "Channel Reverse".

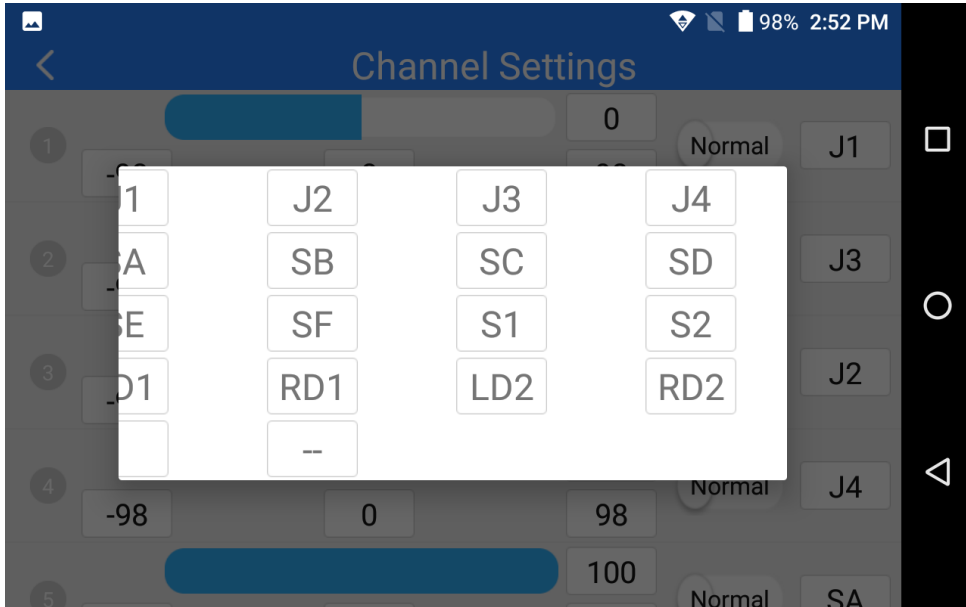
Steps

1. When your AK28 HD/HD+ transmitter is linked to a new model, please confirm if all the servos, buttons, and switches have been mapped to right channels as you need.
2. Try to manipulate the joysticks, switches, buttons, and dials on your AK28 HD/HD+ transmitter to confirm if the output direction of each channel is normal or reversed.
3. Please refer to the picture below. Tap on the "Normal/Reversed" box to switch the channel direction and the box will show if the channel is normal or reversed.



5.1.4 Channel Mapping

All 14 channels of AK28 HD/HD+ transmitter can be mapped freely as you need to the joysticks, switches, buttons, and dials.



Steps

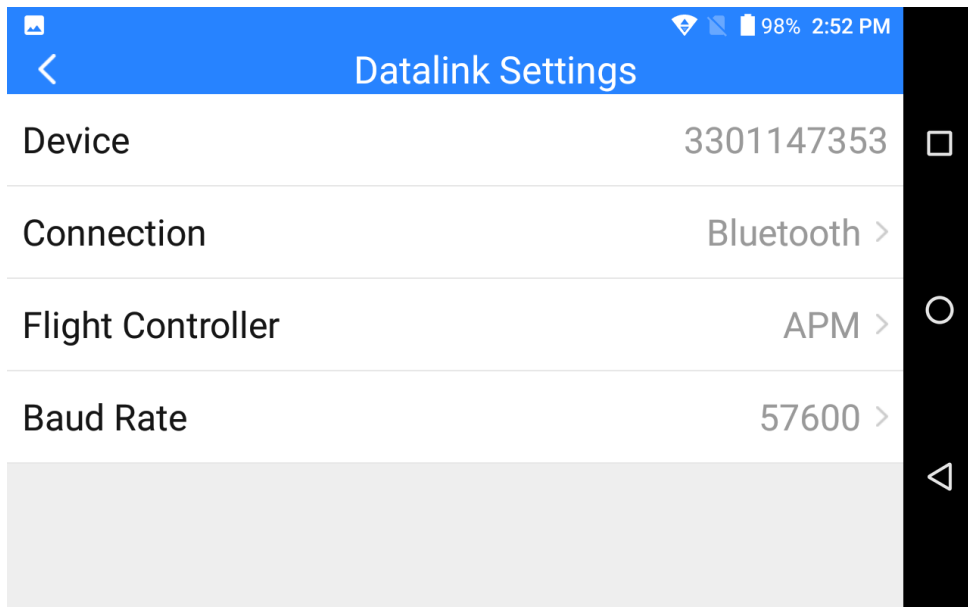
1. Please refer to the picture above. Tap on the last box on right of your target channel to open the list of all joysticks, switches, buttons, and dials.
2. In AK28 HD/HD+ transmitter system, channel 1-4 is default to be Aileron, Elevator, Throttle, and Rudder.
3. Let's take example of Channel 1 (Aileron). Tap on the "J1" box on right of Channel 1 and select a joystick/switch/button/dial in the list. In the box it will show the selected joystick/switch/button/dial.

5.2 Datalink Settings

Users can set datalink output mode, flight controller type, and baud rate through datalink settings function.

Datalink Output Mode

AK28 HD/HD+ transmitter supports two datalink output modes: A-USB and Bluetooth. Tap on “Connect” to switch output mode.



- **Mark:** The Bluetooth module can only support one pair of devices, so while you are using Bluetooth as your datalink output mode, please do not shut down the Bluetooth function in AK28 HD/HD+ system or use the system Bluetooth to pair with any other device.

Flight Controller Types

AK28 HD/HD+ transmitter can support most of the popular flight controllers on

market, such as open source flight controllers under Mavlink protocol (Pixhawk, APM, etc.).

Baud Rate

If your flight controller type was not listed here, you can still set a baud rate accordingly to yours to match.

5.3 System Settings

Under “System Settings”, users can link AK28 HD/HD+ transmitter with the sky station, switch throttle type and joystick type.

Link/Bind

Tap on “Link” to make linkage between AK28 HD/HD+ transmitter and the sky station.

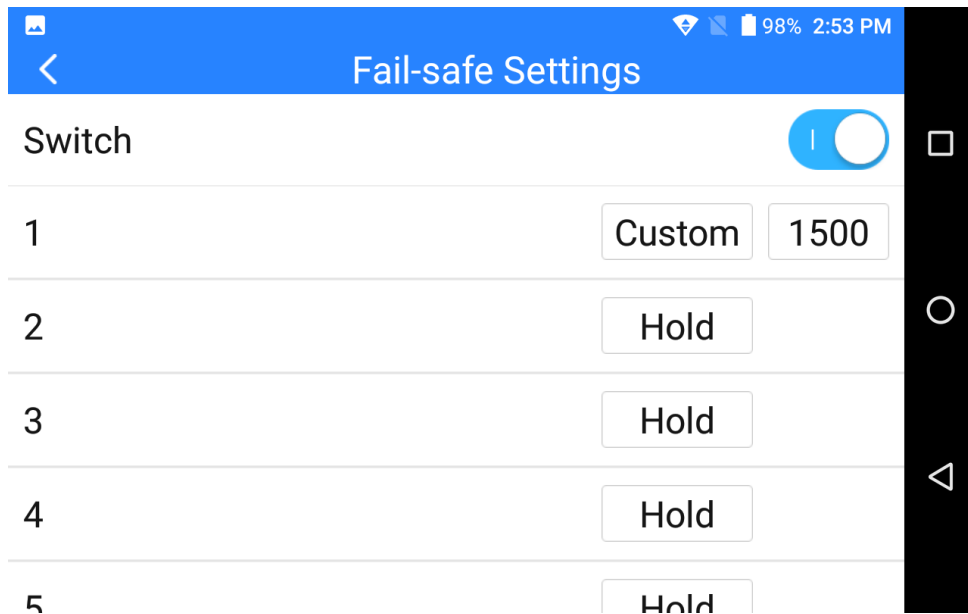
Throttle Type

Tap on “Throttle” to switch throttle joystick type between Self-centering and Thumb-slide.

Joystick Type

Tap on “Joystick” to select a joystick control type (Mode 1/Mode 2/Custom).

5.4 Fail-safe



Before linking AK28 HD/HD+ transmitter to the receiver, do not forget to do fail-safe settings and turn on the function, thus if your transmitter lost linkage with receiver, fail-safe function will run automatically and immediately to protect your model from a crash.

Steps

1. Make sure the transmitter is linked to receiver.
2. Open “SIYI TX” and enter fail-safe menu.
3. Please refer to the picture above. Under fail-safe menu, the function is default to be off and it displays “HOLD” in each channel. Under this circumstance, if

your transmitter lost linkage with sky station, the receiver will output the last channel value received from your transmitter.

4. Turn on the switch up-right in the screen to activate fail-safe function.
5. When the function is activated, please tap on your target channel box to switch it from “HOLD” to “CUSTOM: 1500”. Then tap on the value box to input the channel value according to your requirement.
6. The value box will show your fail-safe value.

5.5 RC Relay

RC replay is designed for specific enterprise UAV application, such as power line inspection, extremely long-range flight relay. It supports two transmitters at most.



How to Use RC Relay Function

1. Prepare two AK28 HD/HD+ transmitters, mark them with 1 and 2.
2. Bind/link the transmitter 1 to the sky station first and the transmitter 1 is the slave transmitter.

3. Then bind/link the transmitter 2 to the sky station and the transmitter is always the master transmitter even if you restart the sky station or transmitter.
4. Use the SE switch on the master transmitter to switch control between transmitter 1 and 2.
5. The transmitter in control is the master transmitter. Only the master transmitter receives images from the receiver.

WARNING

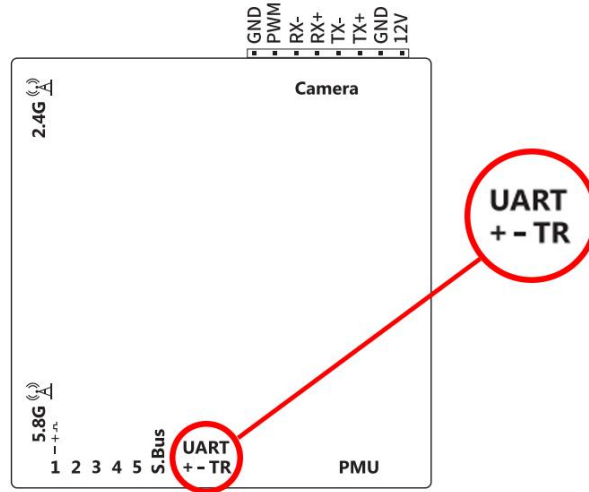
The RC replay function requires unique firmware.

Please do not forget to do fail-safe settings and turn on the function, thus if any of your transmitters lose control to the UAV, the fail-safe function will run automatically to protect your UAV from a crash.

While you are switching control from transmitter 1 to transmitter 2, if the receiver fails receiving signal from transmitter 2, transmitter 1 will go on to take control.

6 SKY STATION (RECEIVER)

6.1 At a Glance



Port Definition

Camera: HD video input from Ethernet camera or HDMI.

UART: Datalink port for telemetry output/input.

S.Bus: S.Bus signal output.

PWM1-5: Signal output from PWM channel 1 to 5.

2.4G: 2.4GHz antenna (remote control and telemetry).

5.8G: 5.8GHz antenna (HD video transmission).

6.2 Datalink Connection with FC

The UART port is for telemetry signal output/input. Please refer to the prints around the port for making connection.

The “+” and “-” port on AK28 HD/HD+ sky station should be connected to the positive and negative end on your flight controller. And the “T” and the “R” port should be crossing connected to the “R” and the “T” serial port.

6.3 Datalink Connection with Ground Station

USB Connection

Enter “Datalink Settings” in “SIYI TX” and change the connection method to “A-USB”. Open your ground control station and select USB connection accordingly. If your GCS may pop up “Please confirm to authorize USB”, please tap on “Yes”.

Bluetooth Connection

Enter “Datalink Settings” in “SIYI TX” and change the connection method to “Bluetooth”. Then activate Bluetooth function in the Android system settings and search for Bluetooth device name as “33*****”. Connect to the device and input password “1234” to match. Go to your ground control station and connect to the matched Bluetooth device.

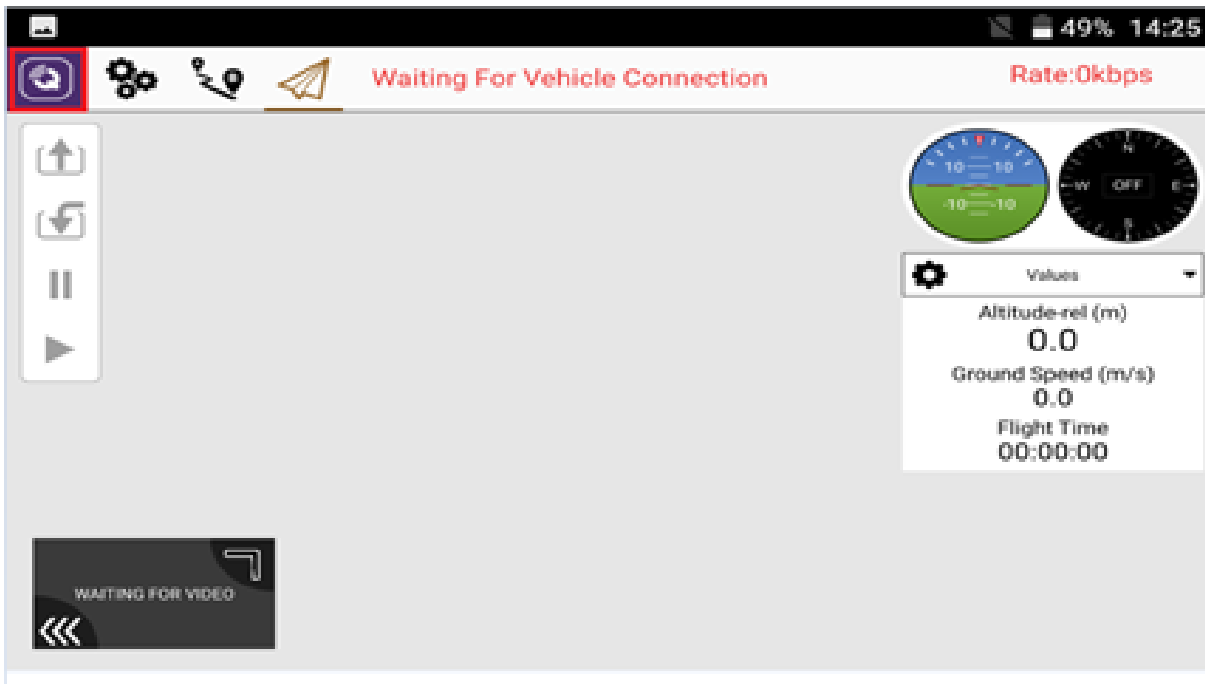
6.4 Videolink Module

6.4.1 Connect to an HDMI Camera

AK28 HD/HD+ can work with a camera which supports HDMI video output.

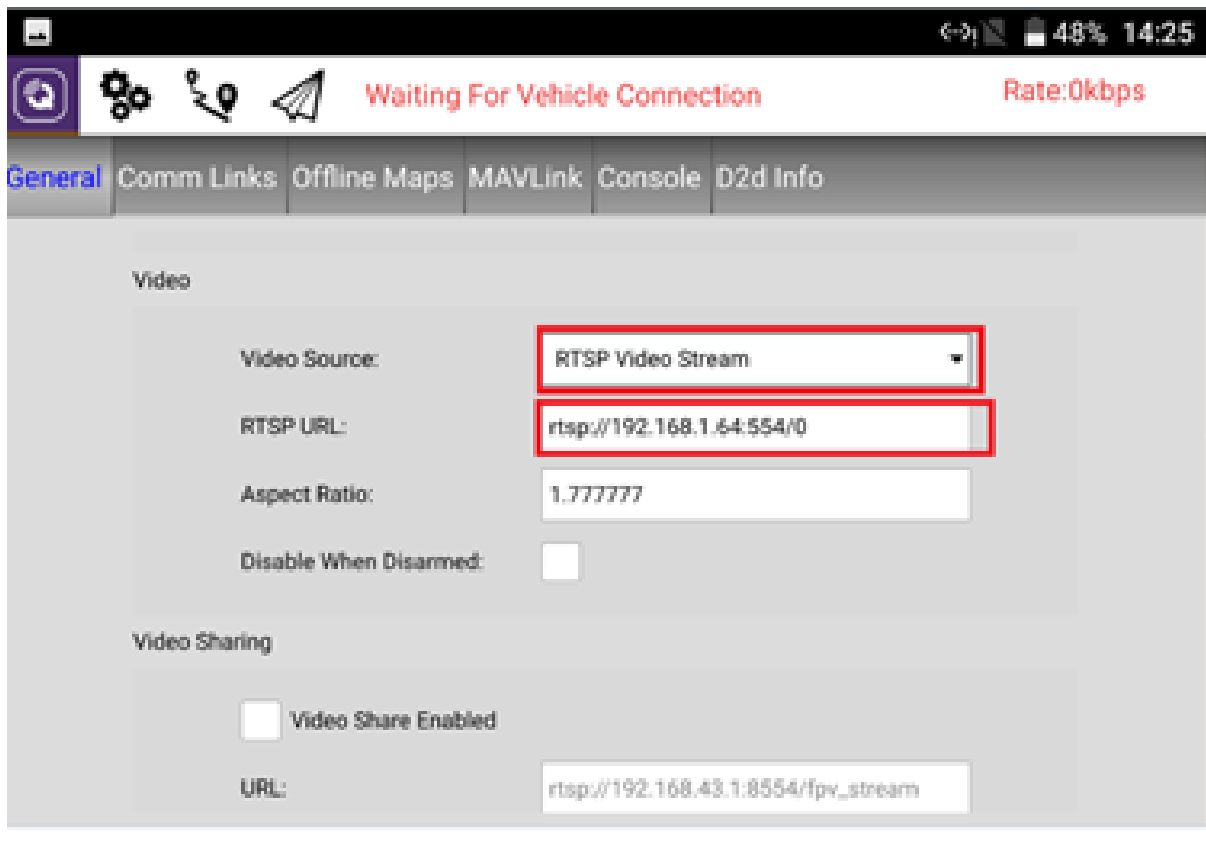
Steps

1. Use a HDMI Data Cable to connect your camera to the Micro HDMI port on the HDMI module.
2. Then use the 8-pin Ethernet Camera Cable to connect the HDMI module to the Camera port on the Sky Station.
3. Make sure that the transmitter has been binded/linked with the Sky Station.
4. Power on the transmitter, the sky station, and the camera.
5. Open QGroundControl and tap on the Settings menu.



6. In the General menu, choose “RTSP Video Stream” for Video Source. And input

“rtsp://192.168.1.64:554/0”. Mind that there should be no SPACE input.



7. The video stream should be ok now.

6.4.2 Connect to an Ethernet Camera

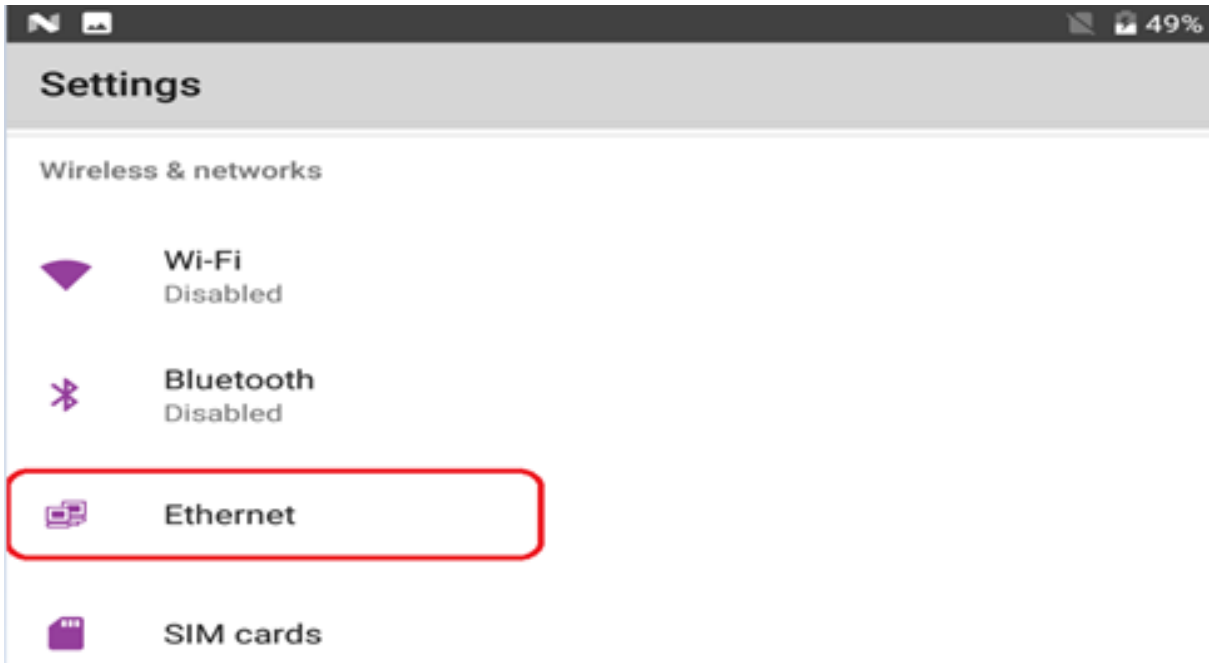
AK28 HD/HD+ can work with an Ethernet camera which uses universal IP camera protocol.

Steps

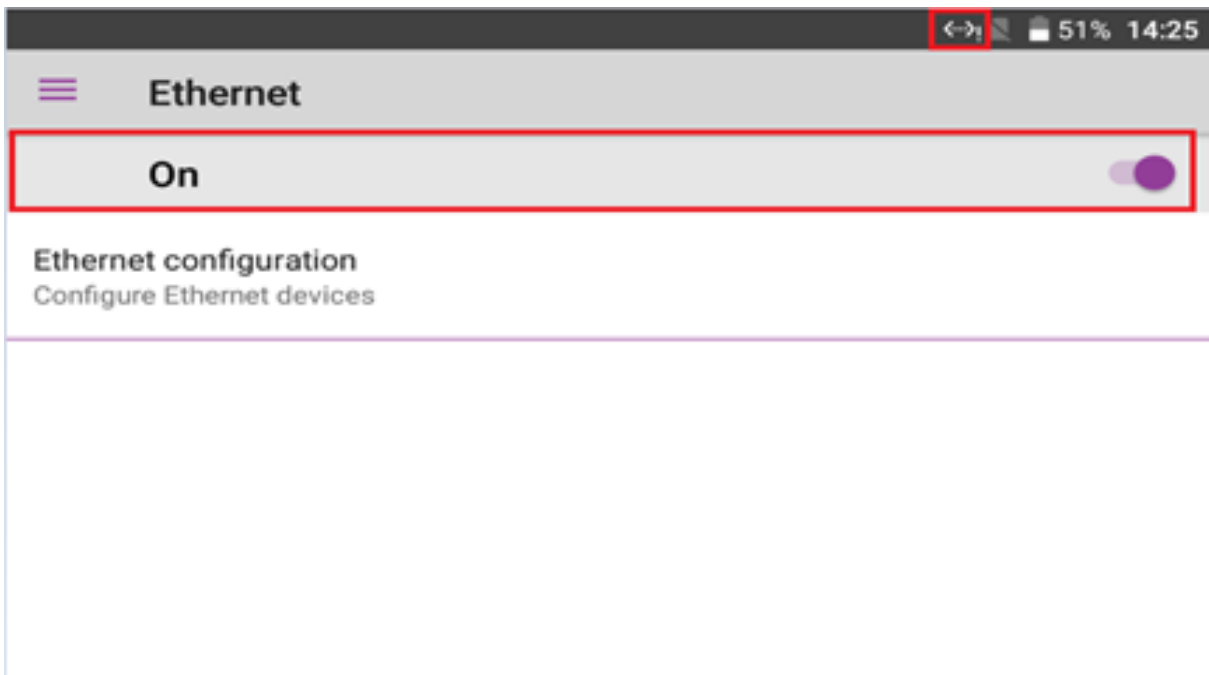
1. The gateway of the sky station is “192.168.1.1”. So please change the camera IP address to any address from “192.168.1.2 - 254”, otherwise the network

cannot work.

2. Go to Camera Settings, check video display and copy the URL.
3. Go to Android Settings and turn on Ethernet function.



4. There will be an Ethernet icon in Android status bar.



5. The IP address should be configured as "Automatically Acquired".

6. Download a video player in your Android system.
7. Paste the URL into the player and the video stream should be ok.

6.4.3 Configuration

Frequently Used Settings

Sky Station IP Address: 192.168.1.1

Transmitter IP Address: 192.168.2.1


HDMI Converter IP Address: 192.168.1.64

Ethernet Camera IP Address Range: 192.168.1.2 ~ 192.168.1.254

Common Video Player: QGroundControl, Easy Player

Video Display URL: Please refer to the address given in camera settings. Cameras from different manufacturers come with different URL.

Network Checking Tool: Ping Tools

 **Mark:** QGroundControl and Ping Tools are installed in the transmitter before delivery.

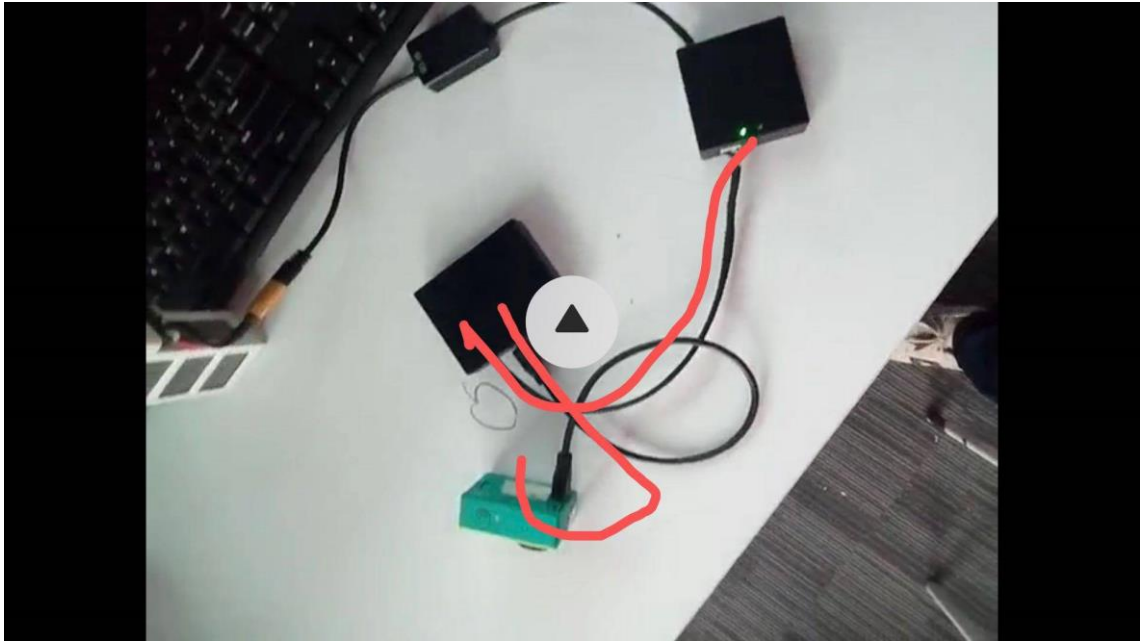
6.4.4 Why No Image in My Device?

Please use the Ping Tools application to check if the network is working well when

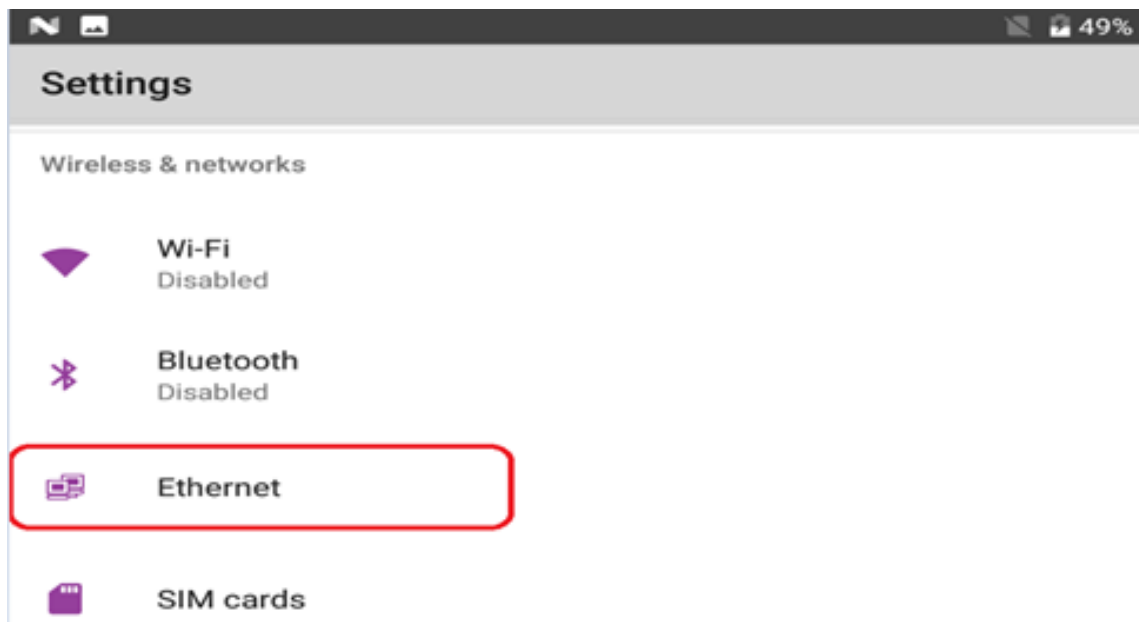
there is no image displayed in the video player.

Steps

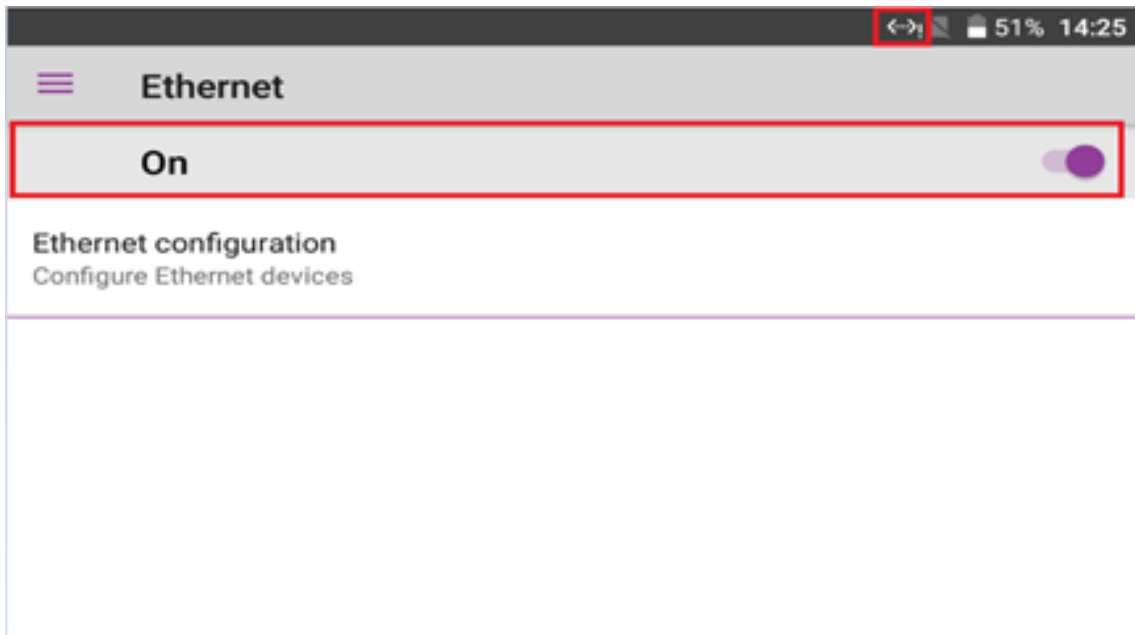
1. Connect all devices (transmitter, receiver, camera) and power them on.



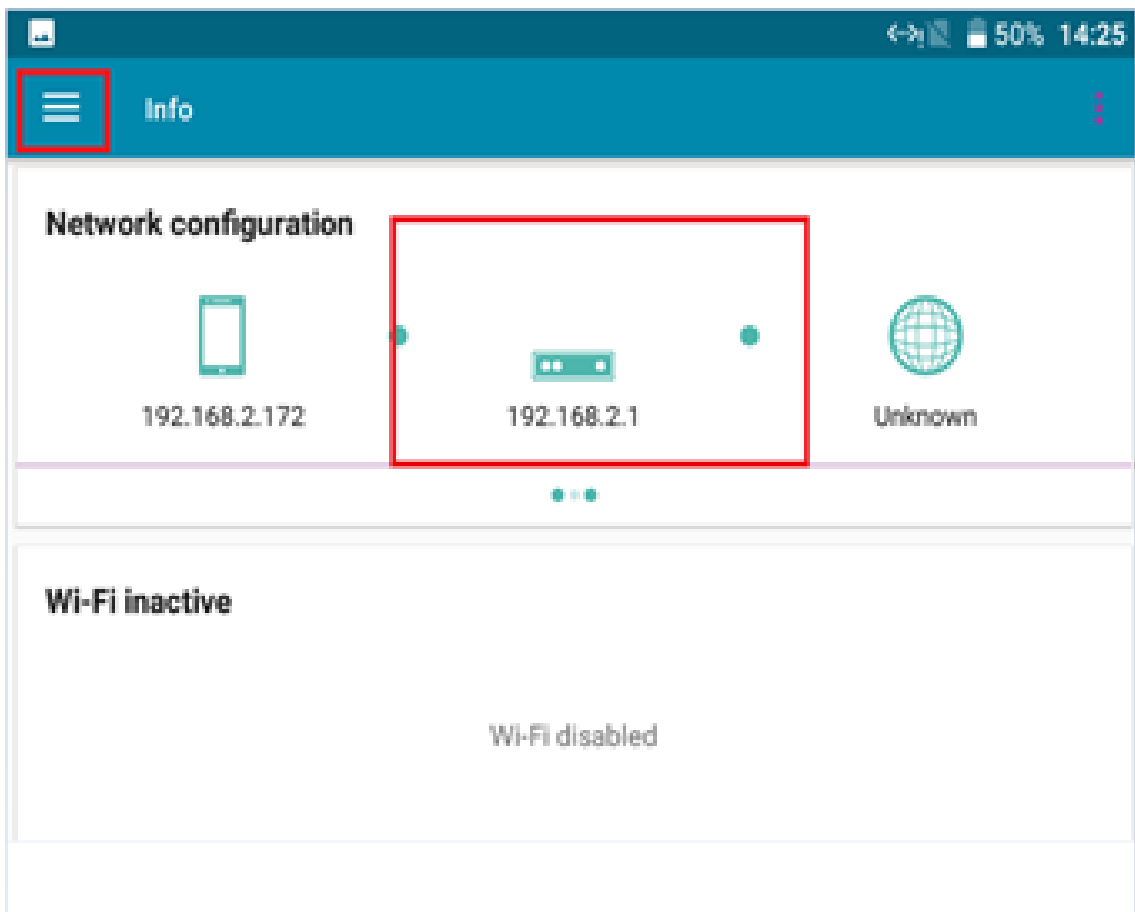
2. Turn on Ethernet function



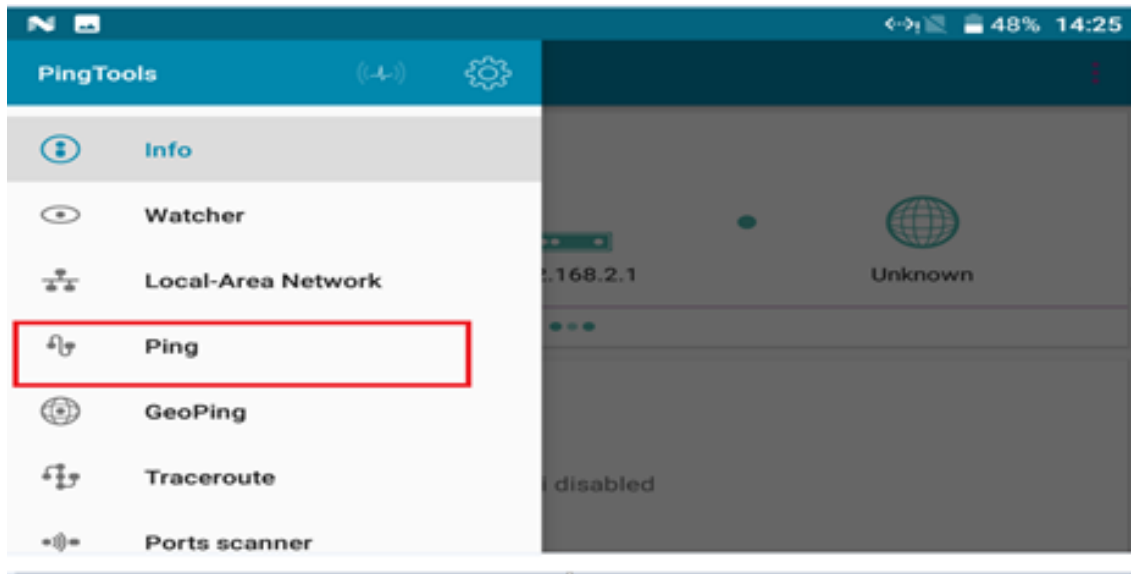
3. There will be an Ethernet icon in Android status bar.



4. Open PING tools. IP address displays 192.168.2.1 as in the picture below.
Then tap on the Settings menu.

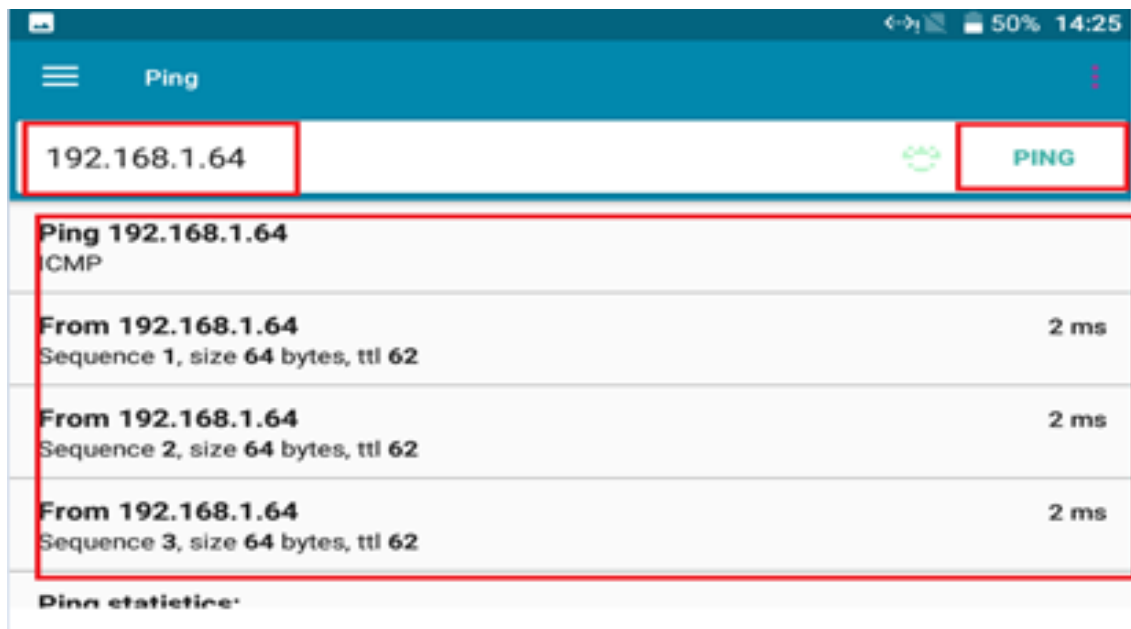


5. Tap on “Ping”

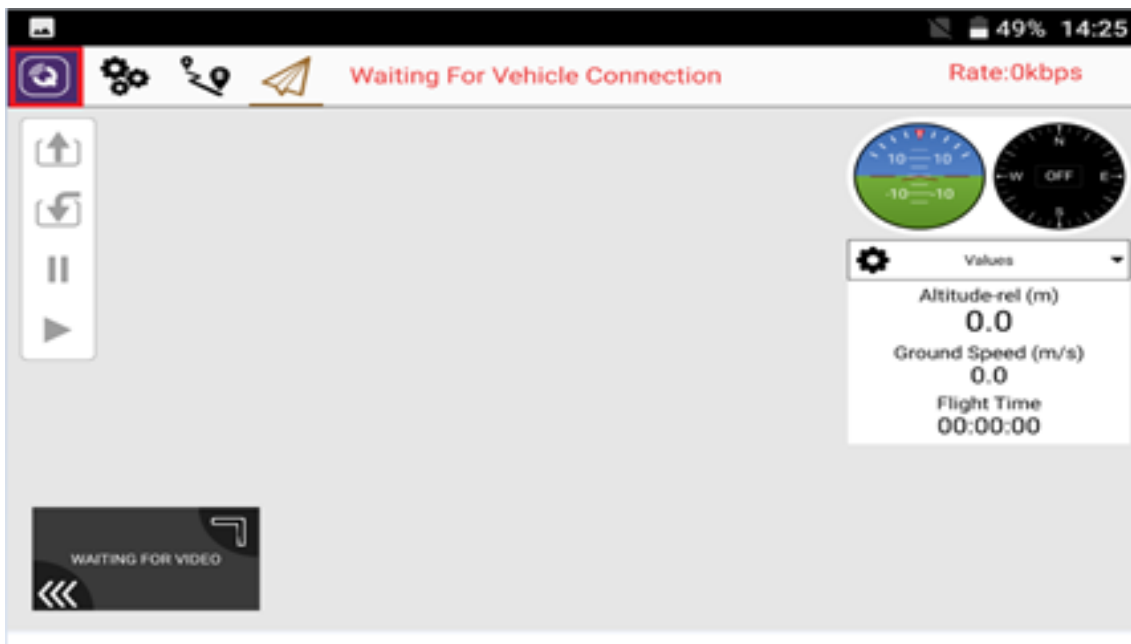


6. Input “192.168.1.64” and click “PING”. There will be data stream feedback below.

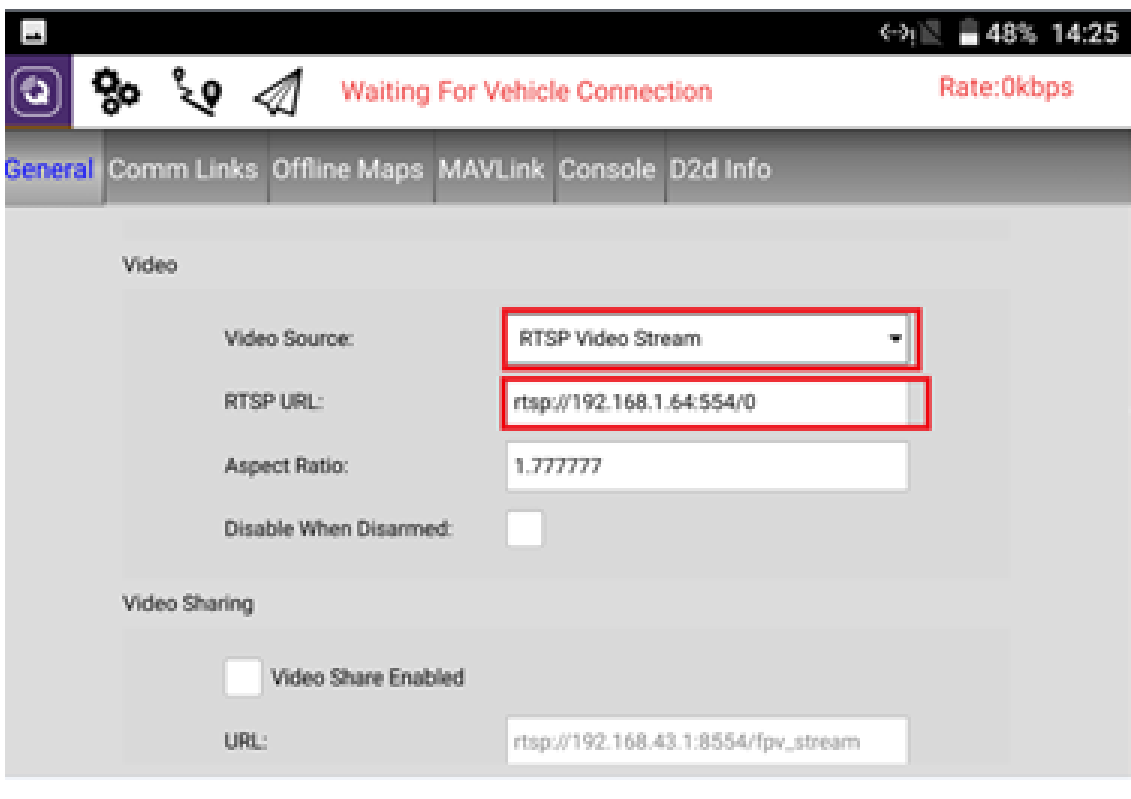
This step is to ensure that the transmitter has good connection with the HDMI module.



7. Open QGroundControl and tap on the Settings menu.



8. In the General menu, choose “RTSP Video Stream” for Video Source, and input “rtsp://192.168.1.64:554/0”. Mind that there should be no SPACE input.



9. The video stream should be ok now.

7 Firmware and Voice Upgrading

AK28 HD/HD+ transmitter and the sky station support firmware upgrading through PC.

Before upgrading AK28 HD/HD+ transmitter, it is necessary to download the software “SIYI Assistant v1.2.0” and connect AK28 HD/HD+ transmitter to your PC using the original OTG USB cable with the upgrading tool.

Steps

1. Please visit the AK28 HD/HD+ download page on SIYI Tech’s official website to download all necessary software, application and firmware one by one.

Link: http://www.siyi.biz/cn/AK28_HD/downloads/

2. Release the “.zip” files and install “SIYI Assistant v1.2.0” on your PC.
3. Then use the original OTG USB cable with the upgrading tool to connect AK28 HD/HD+ transmitter to your computer.
4. Run “SIYI Assistant v1.2.0” to check AK28 HD/HD+ transmitter’s current firmware version. If they are not the latest versions, then tap on “Upgrade” to enter firmware upgrading menu.
5. Load the latest firmware files and tap on “Upgrade” and wait till the process is finished.

To upgrade firmware for the receiver, please using the original OTG Micro-USB cable to connect the receiver to your PC and repeat the step 4-5 above.

8 After-sale Service

8.1 To-be-repair Procedure

If you meet any difficulties using SIYI Technology's product, please send your email to support@siyi.biz or consult your sales manager directly.

If it was a confirmed product defect or damage which requires returning or replacement or repairing, SIYI engineers will guide you for the process.

8.2 After-sale Policy

SIYI Technology guarantees that, subject to the following conditions, Return & Refund Service, Replacement Service and Warranty Repair Service can be requested. Please contact SIYI directly (support@siyi.biz or your sales manager) or your authorized SIYI dealer for more detail.

8.2.1 7-Day Return & Refund

You can request Return & Refund Service:

Within seven (7) days of receiving a product if the product has no manufacturing defect, has not been activated and is still in new or like-new condition.

Within seven (7) days of receiving a product if the product has a manufacturing defect.

Return & Refund Service will not be provided where:

It is requested beyond seven (7) calendar days of receiving a product.

A product sent to SIYI for Return & Refund Service does not include all original accessories, attachments or packaging, or any item is not in new or like-new condition, i.e. with cracks, dents or scratches.

A legal proof of purchase, receipt or invoice is not provided or is reasonably believed to have been forged or tampered with.

Any fault or damage of the product is caused by unauthorized use or modification of the product, including exposure to moisture, entry of foreign bodies (water, oil, sand, etc.) or improper installation or operation.

Product labels, serial numbers, waterproof marks, etc. show signs of tampering or alteration.

Damage is caused to the product by uncontrollable external factors, including fire, floods, high winds or lightning strikes.

A product is not delivered to SIYI within seven (7) calendar days after Return & Refund Service confirmation is sent from SIYI.

Other circumstances stated in this policy.

8.2.2 15-Day Replacement

You can request Replacement Service:

Within fifteen (15) calendar days of receiving the product if the product has sustained a substantial damage in transit, provided always that the damage proof issued by the carrier can be provided to SIYI.

Within fifteen (15) calendar days of receiving the product if the product does not match the original description of the product in one or more significant respects.

Within fifteen (15) calendar days of receiving the product if the product suffers performance failure.

Replacement Service will not be provided where:

Service is requested more than fifteen (15) calendars days after receiving a product.

Legal proof-of-purchase, receipts, or invoices are not provided, or are reasonably believed to have been forged or tampered with.

A product sent to SIYI for replacement does not include all original accessories, attachments and packaging, or contains items damaged by user error.

A product is found to have no defects after all appropriate tests are conducted by SIYI.

Any fault or damage of the product is caused by unauthorized use or modification of the product, including exposure to moisture, entry of foreign bodies (water, oil, sand, etc.) or improper installation or operation.

Damage is caused by uncontrollable external factors, including fires, floods, high winds, or lightning strikes.

Received product has not been sent back to DJI seven (7) calendar days after replacement confirmation from DJI.

Proof of damage during transit issued by the carrier cannot be provided.

Other circumstances stated in this policy.

8.2.3 1-Year Warranty Repair

You can request warranty repair service:

If a product does not function as warranted during the warranty period, you may obtain after-sales service by contacting SIYI's service center. You will need to provide a valid proof-of-purchase, receipt or order number for the warranty service.

Charges may apply for services not covered by this Limited Warranty. Please contact SIYI for information specific to your location.

Please note that the warranty service is only available in the respective SIYI service regions where you purchased your SIYI product.

Warranty Repair service will not be provided where:

Crashes or fire damage caused by non-manufacturing factors, including but not limited to pilot errors.

Damage caused by unauthorized modification, disassembly, or shell opening not in accordance with official instructions or manuals.

Damage caused by improper installation, in correct use, or operation not in accordance with official instructions or manuals.

Damage caused by non-authorized service provider.

Damage caused by unauthorized modification of circuits and mismatch or misuse of the battery and charger.

Damage caused by operation in bad weather (i.e. strong winds, rain, sand/dust storms, etc.)

Damage caused by operating the product in an environment with electromagnetic interference (i.e. in mining areas or close to radio transmission towers, high-voltage wires, substations, etc.)

Damage caused by operating the product in an environment suffering from interference from other wireless devices (i.e. transmitter, video-downlink, Wi-Fi signals, etc.)

Damage caused by reliability or compatibility issues when using unauthorized third-party parts.

Damage caused by operating the unit with a low-charged or defective battery.

Products or parts with an altered identification label or from which the identification label has been removed.

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support@siyi.biz