MICROMULTICOPTER AVIATION

Drone ground station

ETLAS MOBILE II

User Manual

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Exempt statement

Before using this product, please read this document carefully to understand your legitimate rights and interests, responsibilities and security descriptions; otherwise, it may bring property loss, security accidents and personal safety hazards.Once this product is used, it is deemed to have understood, recognized, and receives all the terms and content of this statement.The user promises to be responsible for all the consequences of their actions and all the consequences.The user promises to use this product only on the proper purpose, and agree to this terms and other related policies and guidelines.

Our company does not bear all the losses caused by the user's failure to use this manual.

Within the framework allowed by the law, we are not responsible for any indirect, punitive, and accidental damage (including the loss of your purchase, use or not using this product).

When using this device, we need to comprehensively understand the relevant norms and use it with caution. The third -party personal and property damage caused by the accident will not bear the responsibility of it.Within the scope permitted by laws and regulations, our company has the right to interpret the above clauses.Our company has the right to update, revised or terminate the content of this manual and the content of the exemption statement without advance notice.

Product Description

- All-in-one: Radio link, RC link, and video link integrated
- Powerful video transmission link, up to 1080p@60fps VTX supported
- Built-in 5.5 inches LCD touchscreen with 1000nit and 1080p resolution;
- Includes QGC software
- Support secondary development, with Android SDK provided
- Up to 20km transmission distance(ideal environment)
- Low latency down to 110 ms, from HDMI-in to display
- Up to 13 control channels, with customize bottom and assigned SBUS value;
- 5.8GHz Wi-Fi Supported
- Compatible with Ardupilot and PX4 firmware
- Supported video type: HDMI*1 and Ethernet*1
- Support USB / WIFI cast screen
- External batteries, 2*18650 detachable batteries

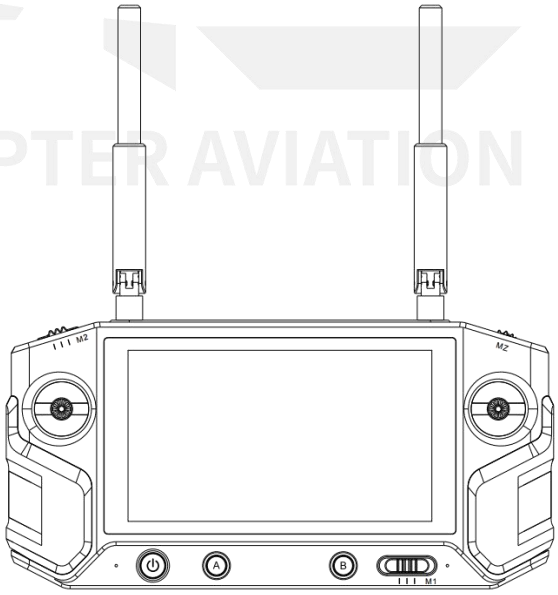
Hardware Spec

- Memory: Sky-Side LPDDR3 1GB, ground-end LPDDR3 2GB
- Sky-Side/Ground-end EMMC: 4GB
- VTX Distance: FCC 20km CE/SRRC/MIC 12km
- VTX Latency: Down to 110 ms
- VTX Resolution: 720p@30fps, 1080p@30/60fps
- Frequency: 2.4GHz ISM

- Receiving Sensitivity: -99dBm@20MHz BW
- Interference Recovery: less than 1sec

Ground-End:

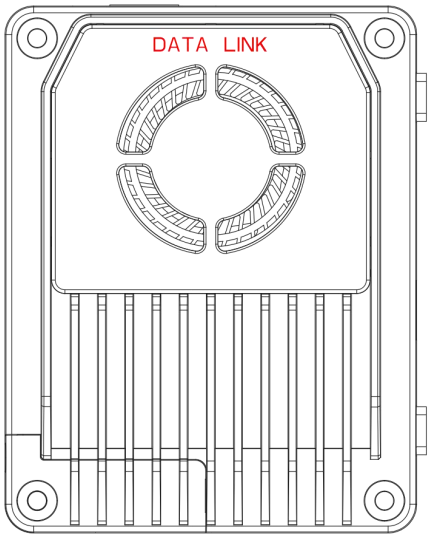
- Screen: 5.5 inches LCD touchscreen with 1000nit and 1080p resolution
- Built-in QGC software
- WIFI: 5.8GHz supported
- Channels: Equipped with 13 channels: 2*joysticks, 3*scroll wheels, 2*three-gear switches, and 4*bottoms
- 4G and Bluetooth: Built-in worldwide 4G module and Bluetooth module
- Built-in speaker and microphone
- External Connector: USB Type-C for charging/debugging/transfer files/HDMI-out(Type-c to HDMI adapter required)
- Battery: External batteries, 2*18650 detachable batteries Spec:INR18650-35E/3450mA/4.2V/Positive Shape Tip/Samsung
- Built-in GPS, Gyro, compass, Barometer
- Antenna: 1*Omnidirectional antenna, 1*Directional antenna, MINI BNC connector, detachable



（ ETLAS MOBILE II ）

Sky-Side:

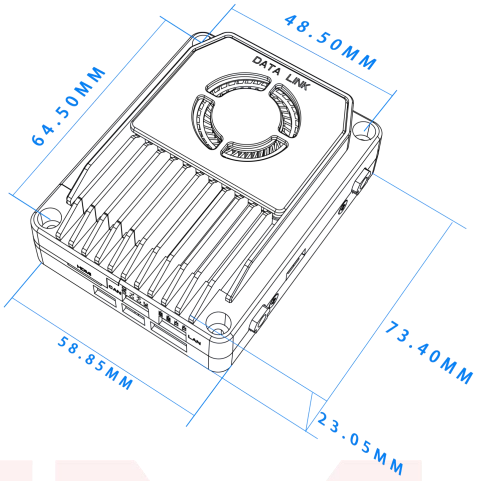
- Frame: Aluminum
- Weight: 104g
- Size: 76.5*76.5*21.4mm
- Signal Frequency: 20MHz/10MHz
- Power Consumption: Average power consumption on one side less than 4W
- HDMI: External video signal input(Priority)
- 4PIN Ethernet: Ethernet video signal input
- Power Connector: Powering range DC 12-24V, XT30 connector
- UART connector: 3.3V / 5V Electric Level UART connector
- Sbus Connector: Two-way RC output, S.bus1and S.bus2
- Micro USB: For debugging and upgrade, OTG mode supported
- Press Hole: For pairing and reset indicator
- Indicator: To indicate pairing, VTX status, and video input status
- MCX Antenna port: To transfer data signal to ground-end



(Sky-Side)

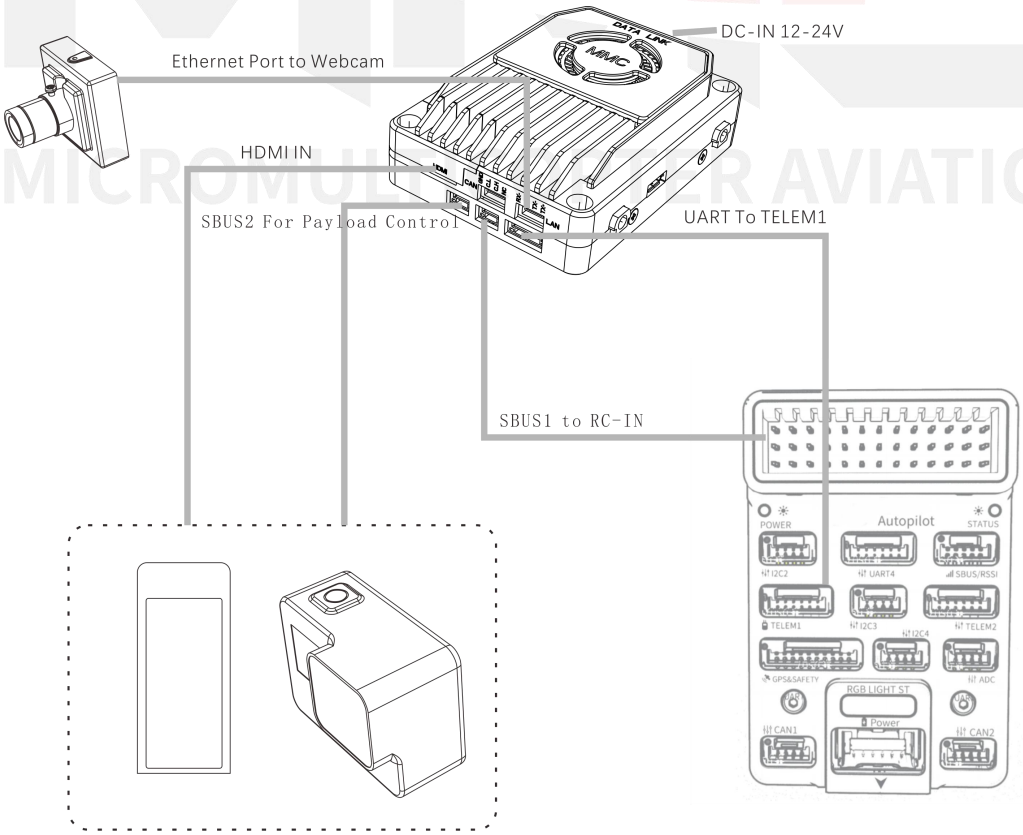
Assemble

4-1 · Size specification



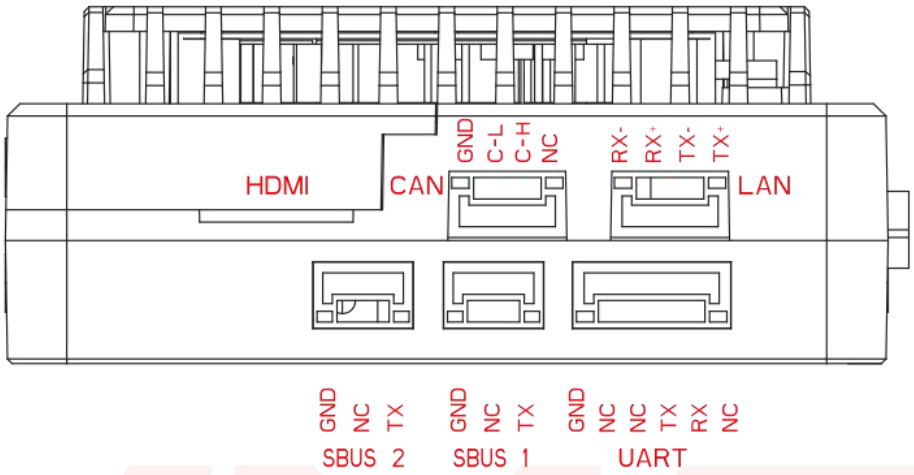
4-2 · Connector Definition

Sky-Side Wiring Diagram:

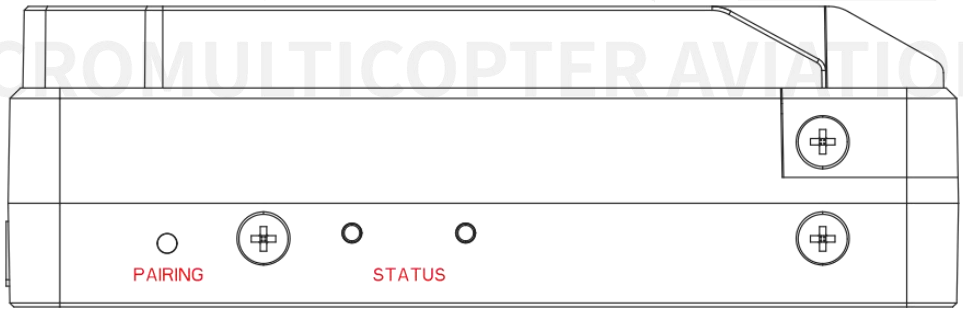


Sky-Side connector, as shown below:

UART serial port is TTL level and baud rate is 115200.



4-3 · Sky-Side Status Indicators



Indicator 1: The status of pairing and VTX connection

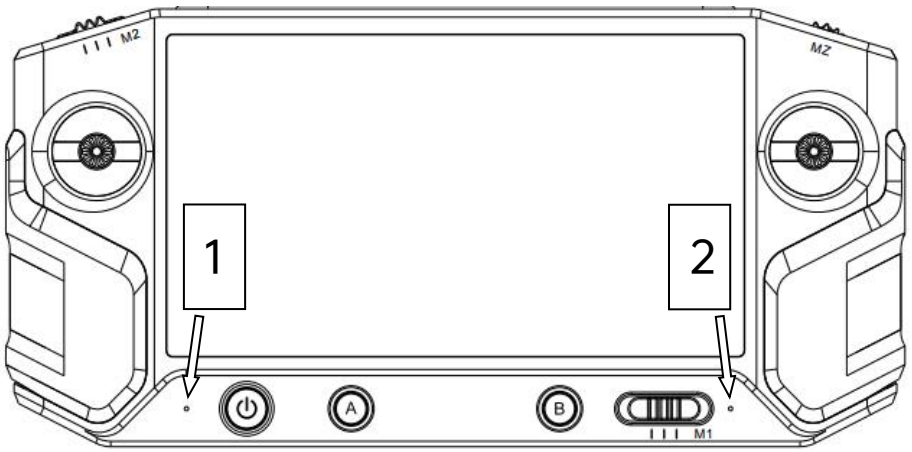
Red light flashing: Pairing Green light on: Sky-Side and Ground-End connected

Red light on: Sky-Side and Ground-End not connected

Indicator 2: HDMI Input Signal Status

Red light on: No HDMI input Green light on: HDMI input connected

4-4 · Bottoms and Indicators



1) Bottoms

Indicator 1: Power Status

Red light flashing: Low power level

Blue light flashing: Battery charging

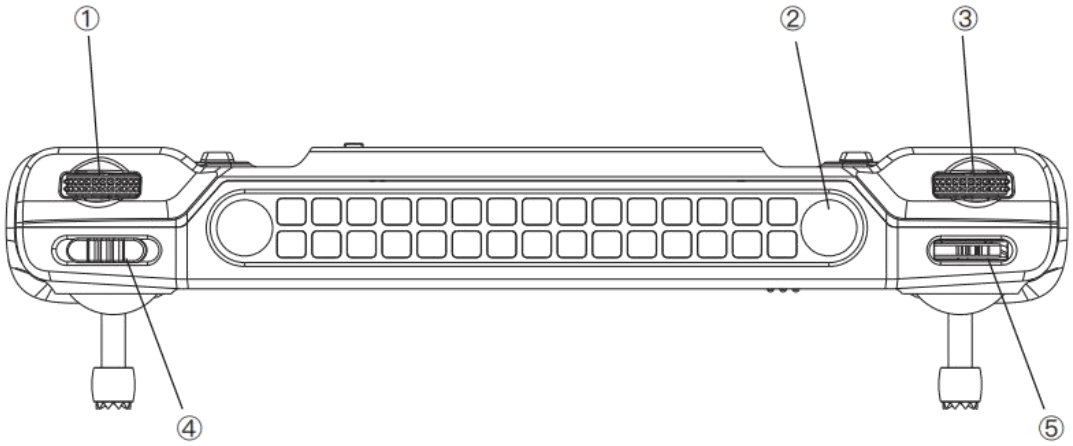
Green light on: Charging complete

Indicator 2: VTX Connection Status

Red light flashing: Connection failed

Green light on: VTX connected

2) Key definition



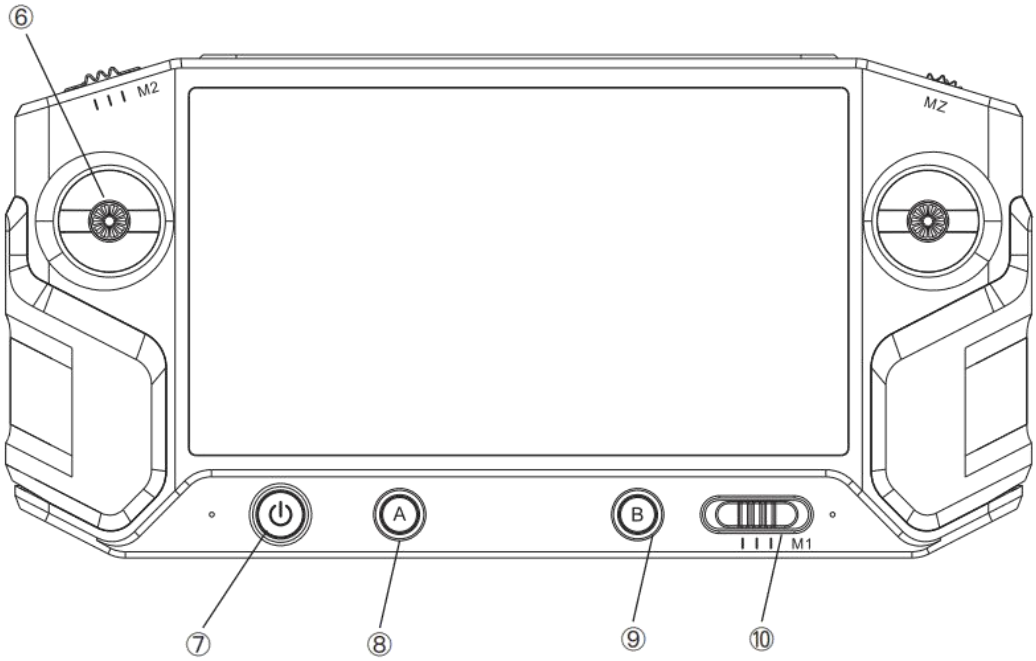
① ML Thumb Wheel: adjust yaw angle of the payload

② Antenna connector: connection to MINI BNC

③ MR Thumb Wheel: adjust pitch angle of the payload

④ Three-way-switch M2: switch among different flight modes

⑤ MZ Thumb Wheel: zooming control



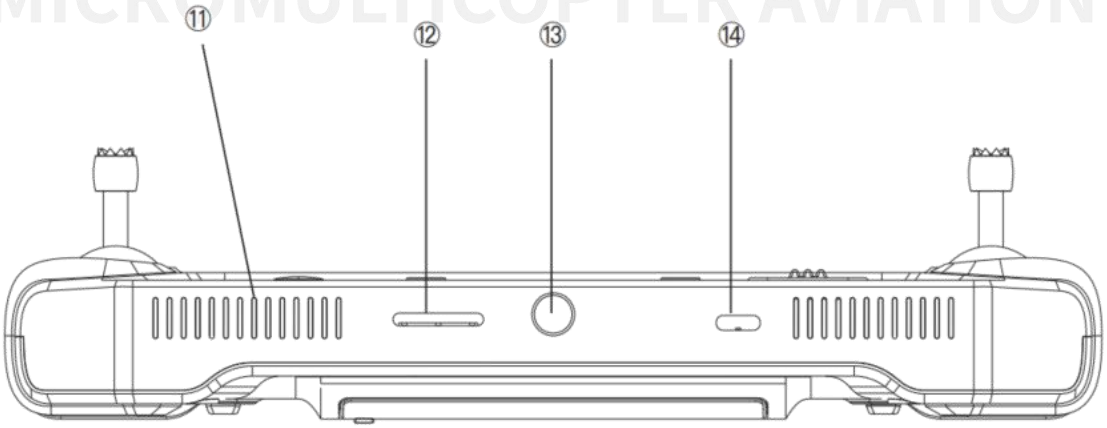
⑥ Joystick (for UAV remote control)

⑦ Power switch

⑧ A key, self-define channel key

⑨ B key, self-define channel key

⑩ Three-way switch M1, self-define three-way switch

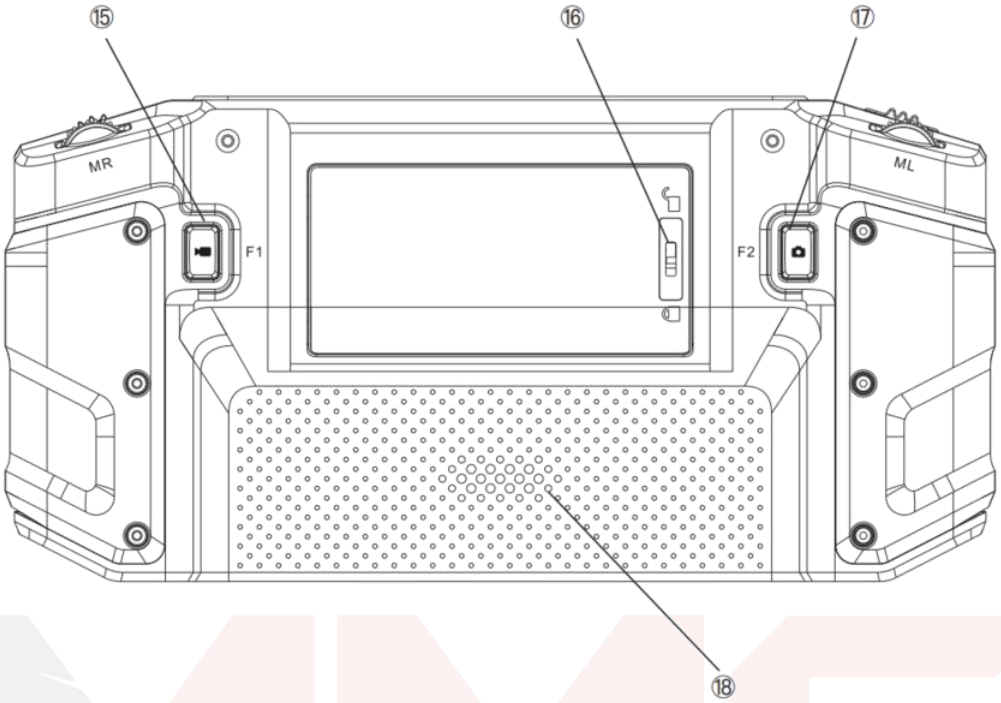


⑪ Air outlet for cooling

⑫ 4G sim card slot and TF card slot

⑬ Reserved interface for tripod

⑭ USB Type-C connector



⑮ Video key F1

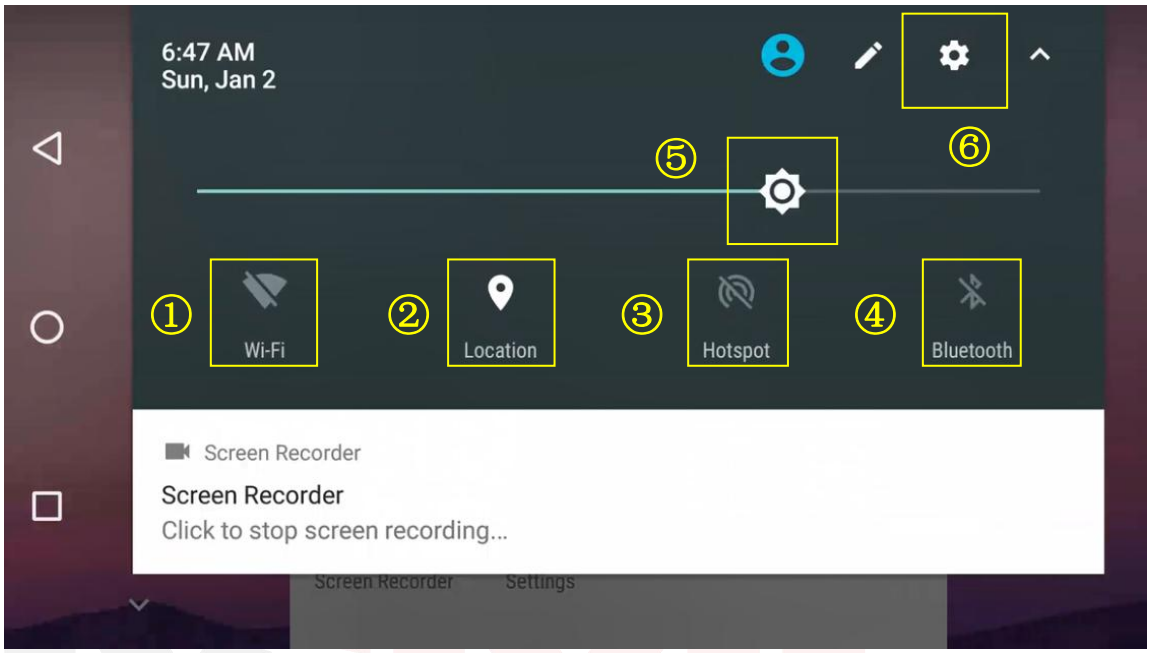
⑯ Battery compartment buckle

⑰ Photo key F2

⑱ Speaker socket

System Setting Interface

5-1 · Drop-down menu



① WIFI switch for access to the internet to download map

② GPS positioning

③ Wireless hotspot (compatible with other communication devices)

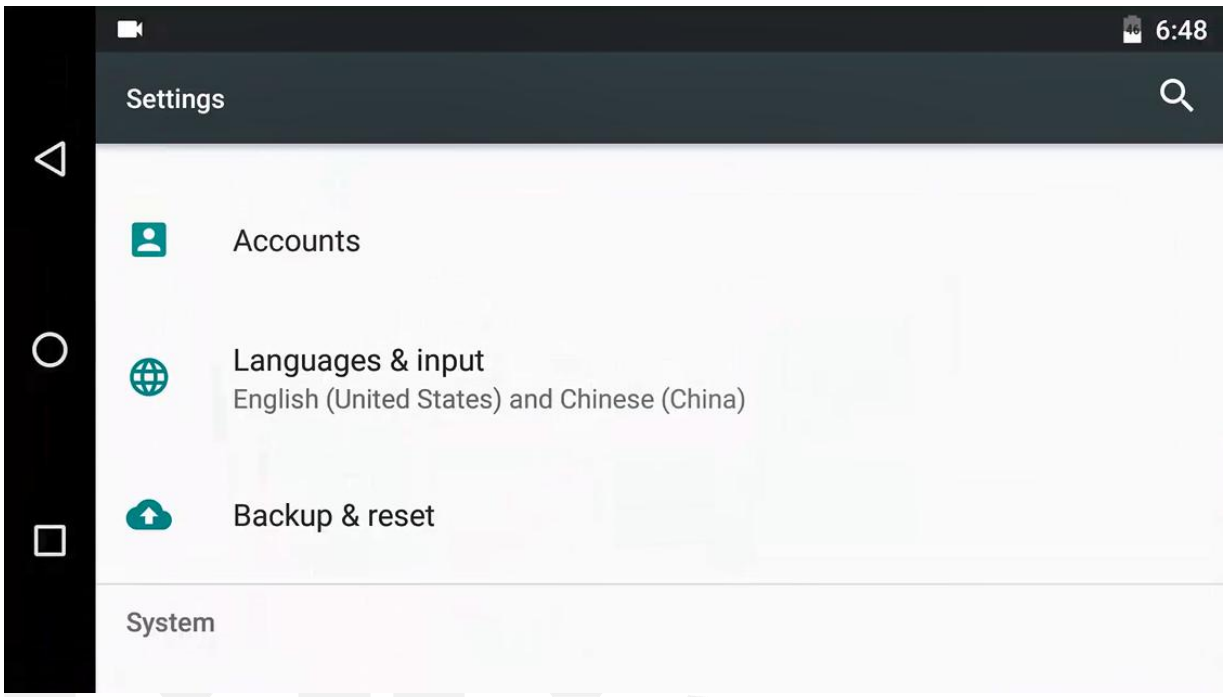
④ Bluetooth

⑤ Brightness adjustment of screen

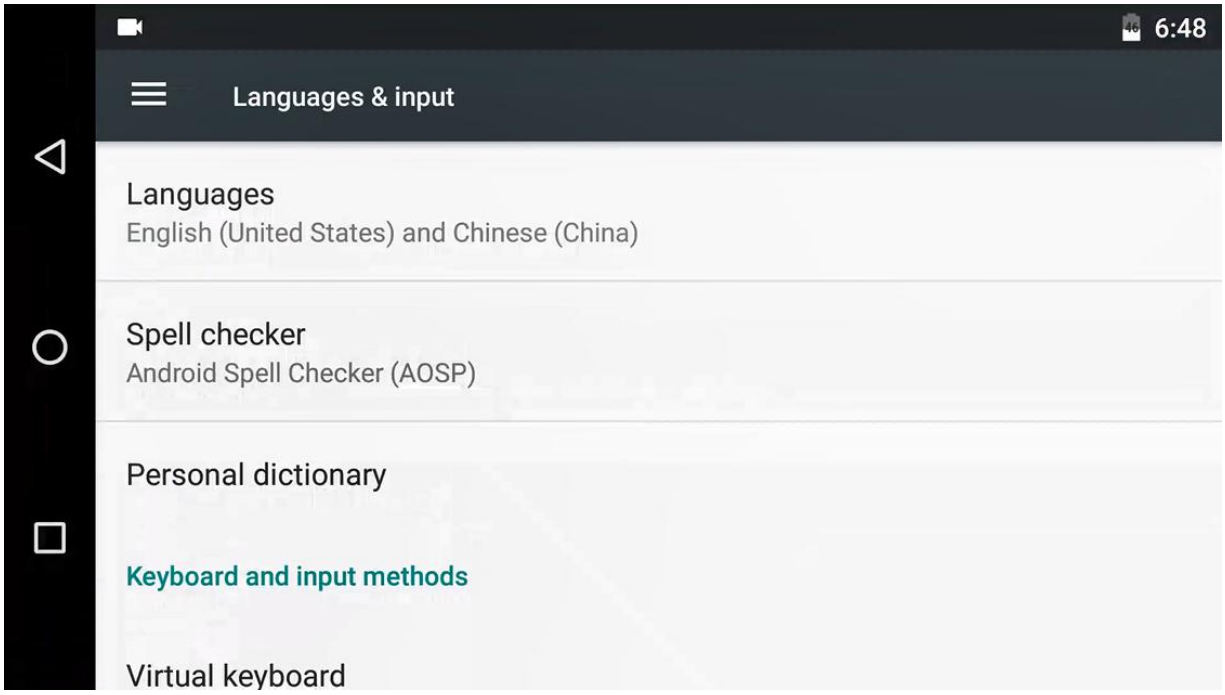
⑥ Entrance into system setting interface

5-2 · Set System Language

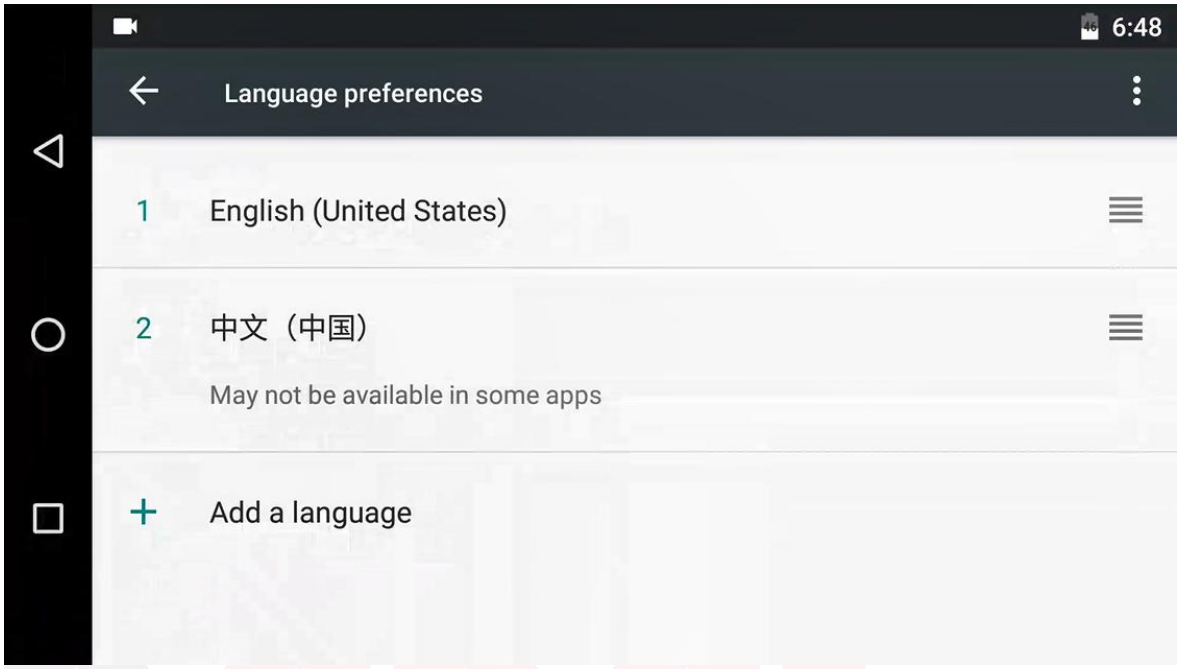
1) Enter into system setting interface and choose "language & input"



2) Click to choose the language



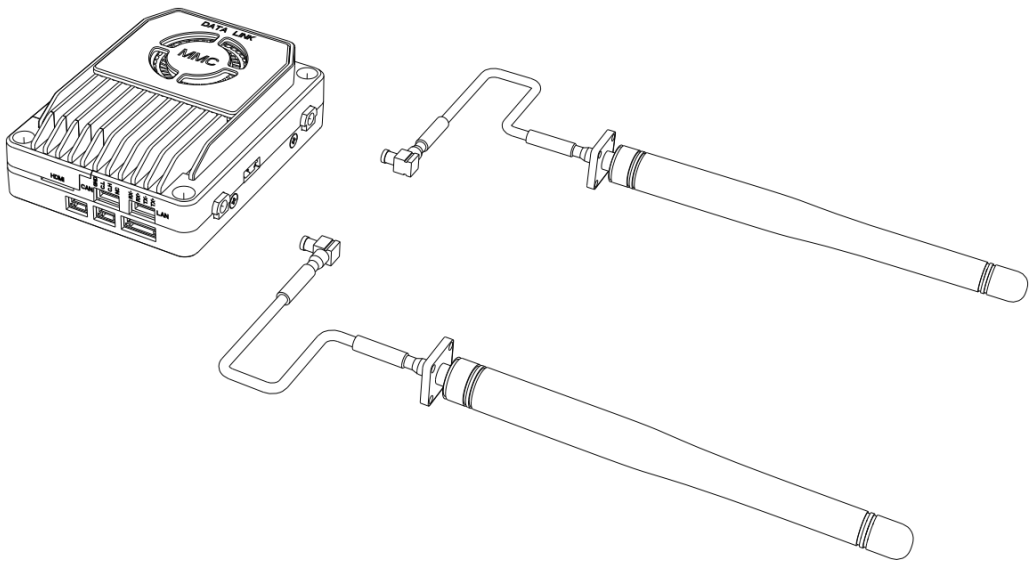
3) Click "add language" to add another language and then click and drag the chosen bar to the top



5-3 · Install Antenna

1) Install Antenna at Sky/Drone End

Connect MCX soft feeder to MCX base and tighten up both 2.4G rubber rod antennas onto the SMA connectors(as picture below);



2) Install Antenna at Etlas Mobile II

① take out the handle and antenna and install them onto the controller

② Make sure both pointer and mounting hole of antenna are aligned to those of controller's and then press down in clockwise rotation

③ press down in anti-clockwise rotation to uninstall

Attention: the fixation angle of antenna is 90°, please don't twist it by force

Open-source & SDK

6-1 · Open-source QGC

Etlas Mobile II supports QGroundControl Version 4.0.11 with its specific functions. For source code, please check

https://github.com/mmcuavqgc/EtlasMobile2.git

6-2 · SDK

1) Download Addresses

Android SDK https://github.com/mmcuavqgc/EtlasSDK.git

SDK interface https://github.com/mmcuavqgc/EtlasSDK/wiki

Android SDK demo https://github.com/mmcuavqgc/EtlasSDKExample.git

2) SDK description

Type	Compatibility
minSdkVersion system	Minimum 21
Development environment	Suggest to use the latest "Android Studio" for development
Update time	2020-11-24

"DEMO" has integrated SDK. Please refer to "DEMO" for integrating SDK.

Test "DEMO" and understand the transfer rules before integration.

AndroidManifest.xml file

Set permission:

<!-- necessary permissions -->

<uses-permission android:name="android.permission.INTERNET"/>

<uses-permission android:name="android.permission.READ_EXTERNAL_STORAGE"/>

<uses-permission android:name="android.permission.WRITE_EXTERNAL_STORAGE"/>

Import "aar" file

Copy "remote_sdk.aar" and paste onto your "app/libs" directory. Make sure of importing from "build.gradle" file.

<!-- import "aar" -->

implementation files('libs/sdk.aar')

Interface Calling Process

The calling logic of "DEMO" is based on "SDK." For more SDK calling, refer to "MainActivity."

Acquire "AirController"

```
AirController mAirController = new AirController(this, new AirControlListener() {
        @Override
    public void onCameraReset() {
    }
}); // "this" is the base class of Context, such as "Activity"
mAirController.start(); // Activate service connection
```

Notice that must call "start();". This class is the base class of other classes' standard performance. Please remember to release the resource by call the "stop();" when you don't need this service.

Example of gaining DataStream

```
DataStream mDataStream = new DataStream (mAirController, 1, new DataStreamListener()
{
    @Override
    public void onDataReceived(byte[] data) {
        // Call this method when receiving data
    }
    @Override
    public void onUartReady(boolean b) {
        // Call this method when standby or not gaining/setting UART baud rate
    }
    @Override
```

```
    public void onSetUartBaudrateDone(Types.Result result) {
        // Call this method after setting UART baud rate's application finished
    }
});
mDataStream .start();
```

Notice that must call "start();". Release the resource by call the "stop();" when you don't need this service.

Example of gaining VideoStream

```
VideoStream mVideoStream = new VideoStream(mAirController,  new
VideoStreamListener() {
    @Override
    public void onVideoStreamIdChanged(int id) {
        // Call this method when changing the video stream ID of this VideoStream
    }
    @Override
    public void onPlayReady(boolean ready) {
        // Call this method when video stream is ready to play
    }
    @Override
    public void onPlayStateChanged(boolean playing) {
        // Call this method when the playing status is changed, "true" is playing
```

```
        }

        @Override

        public void onVideoStreamResolutionChanged(Types.Resolution resolution) {

            // Call this method when changing the resolution of video stream

        }

});

mVideoStream.start();

// Set the video display view, refer to the usage in DEMO

mVideoStream.setSurface(surface);

// Play the video

mVideoStream.play();
```

Notice that must call "start();". Release the resource by call the "stop();" when you don't need this service. For other methods please refer to "Interface Documentation" or DEMO.

Operational Setting

7-1 · Frequency

1) One-to-one/single operator frequency setting

Click "setting-more-video transmission setting-choose single controller mode-enable frequency" and then within the next 10 seconds, long press the frequency button at drone/sky end for about 3 seconds to enter into the frequency enabling status;

2) Switch between single and dual operator modes

When one want to switch into dual operator, choose one Etlas Mobile II as "master" and the other "slave" from the video transmission setting interface. Press the frequency button from drone/sky end for 10 seconds and wait until both indicating LED turn off which means successful mode switching.

3) Dual operator/one-to-two frequency setting

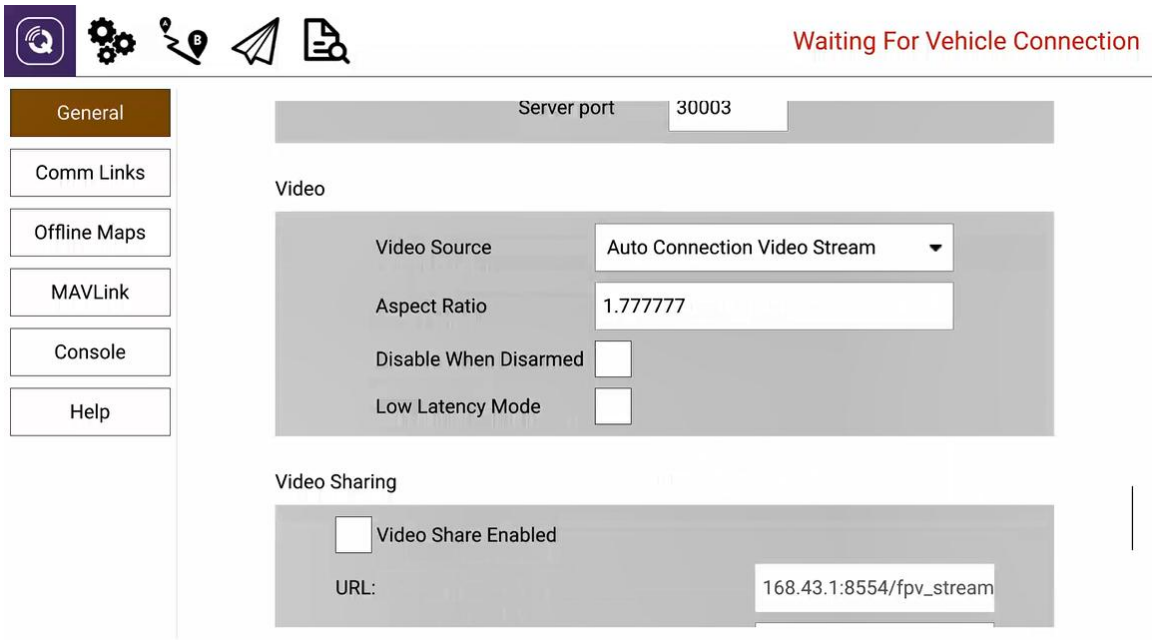
Click both "enable frequency" of the controller interface. And then press frequency button at drone/sky end for 3 seconds in the next 10 seconds to enable frequency;

7-2 · Image Display

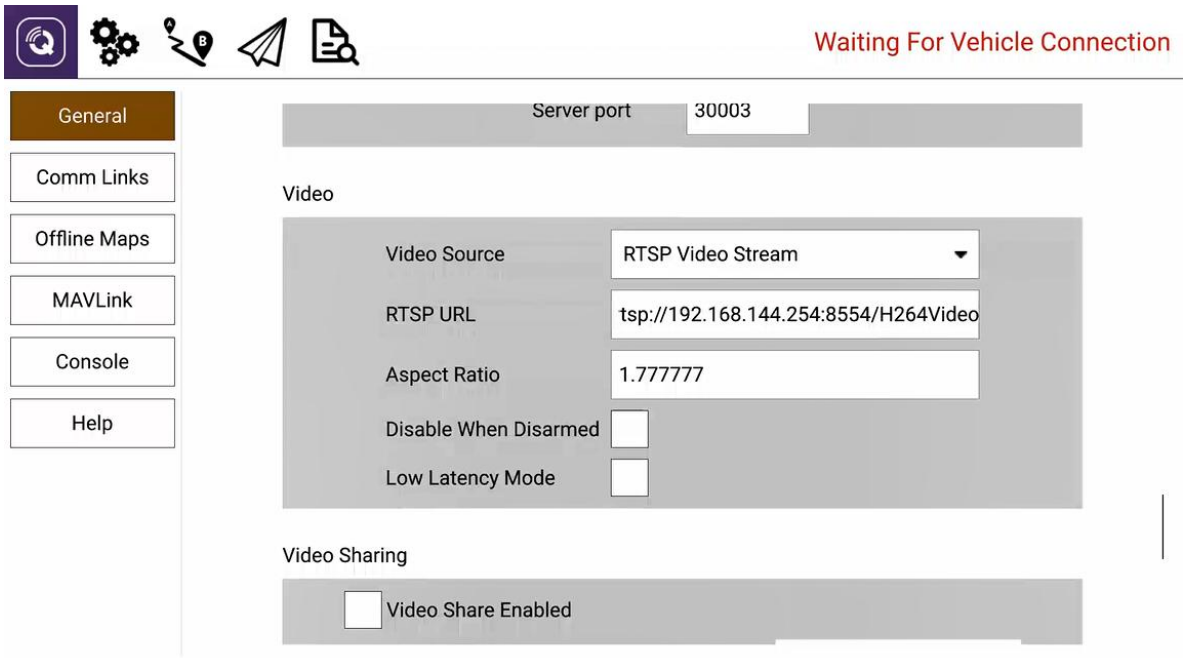
1) Image Connection

① **HD Image Test:** by use of the 20pin, the HD images from drone/sky end will be imported.

Choose "Auto Connection Video Stream" of "Video Source"and check if there is normal image display as below:



② **Internet Graphic Test:** by use of 4pin network interface, the communication unit at drone/sky end is connected to the web cameras. Set camera into "192.168.1.XX" network segment and make sure of the video streaming address; from "Video Source" ground segment, choose "RTSP Video Stream" and then input steaming address of webcam at "RTSP URL." go back to the video interface and see if images are normally displayed as below:



③ Description of video stream address;

HD HDMI video input:

The first mock exam is the one to one mode. rtsp://192.168.0.10:8554/H264Video 。

The host video stream address is in one to two mode. rtsp://192.168.0.254:8554/H264Video , the video stream playback address of the slave is rtsp://192.168.0.254:8554/H264VideoSub ;

Webcam video input:

The first mock exam mode is one to one mode, one to two mode, the same as the host and slave video stream play address, the playback address for the webcam, rtsp:xxxxxxxxxx

2) Video Display

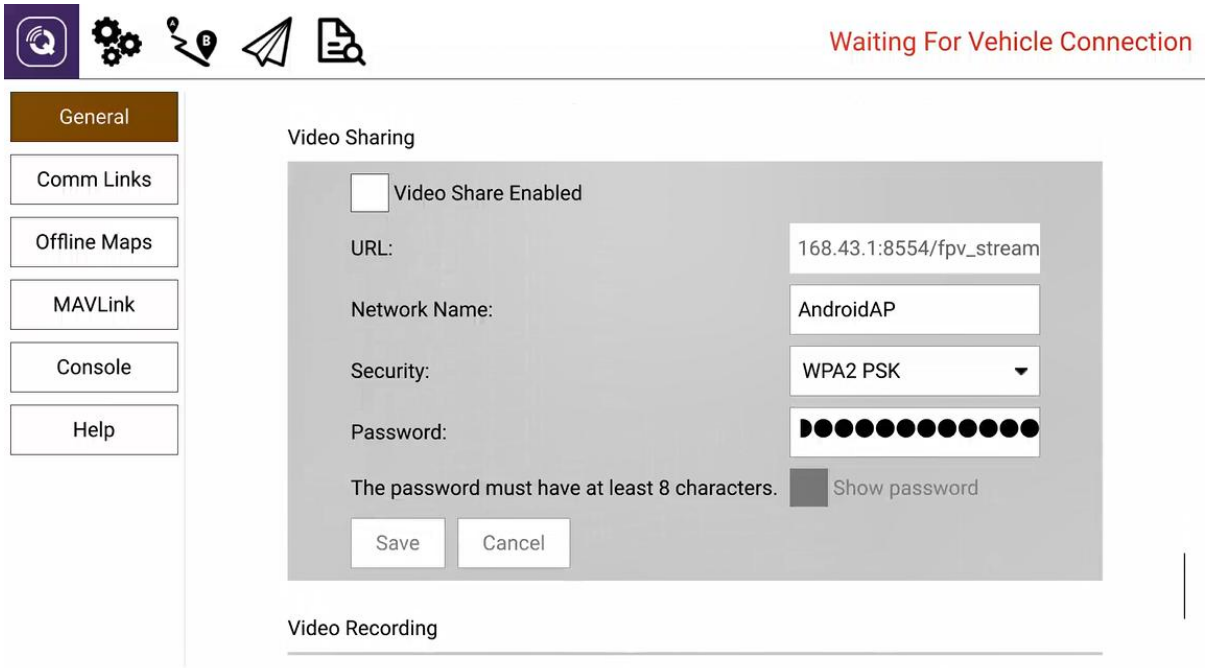
3) Share Video

In the setting interface, select "video share enabled". At this time, bully II will share a 5g frequency hotspot named "androidap". The password can be changed in the system setting. Please note that the password length should be greater than 8 bits; The video stream address of HD video input is" rtsp://192.168.43.1:8554/fpv_ Stream ", connect other devices to the hotspot of" Android AP ", use the video stream player, and enter the video stream address to play;

Note: when one to two, the video stream address of the main remote controller: rtsp://192.168.43.1:8554/fpv_ stream

Video stream address of auxiliary remote controller: rtsp://192.168.46.1:8554/fpv_ stream

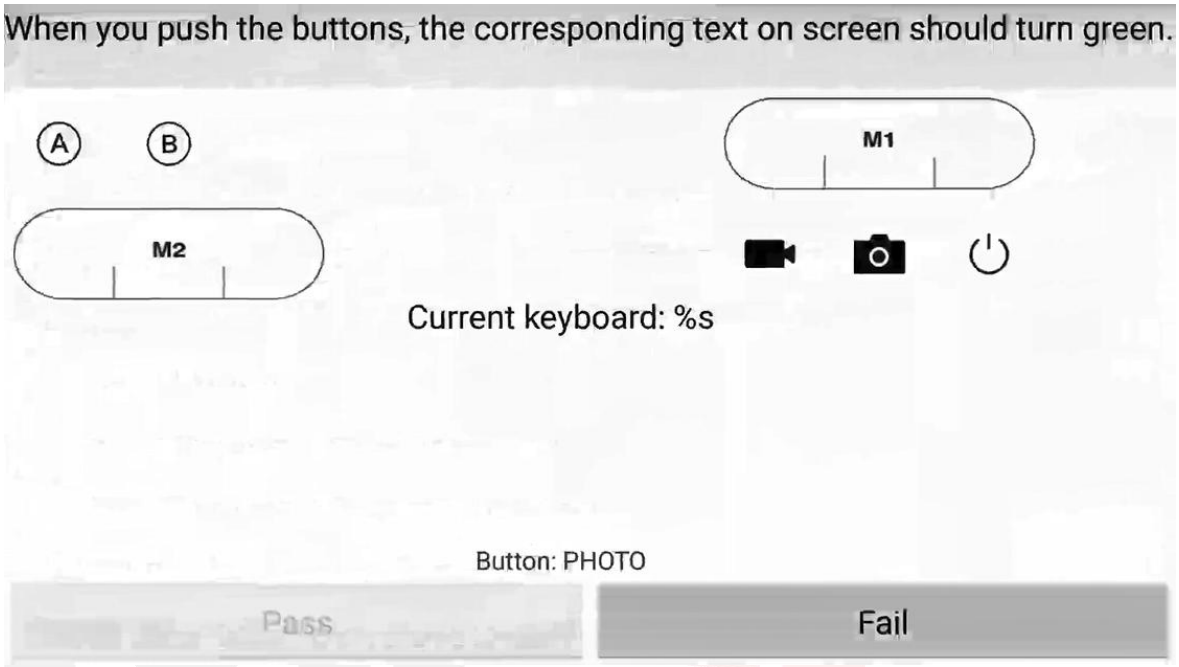
If the network video stream is accessed through the network port, you need to configure the webcam gateway to 192.168.1.10, connect the hotspot of "androidap", and share the video through the video stream address of the webcam



7-3 · Calibrate Controller

1) Calibrate Key

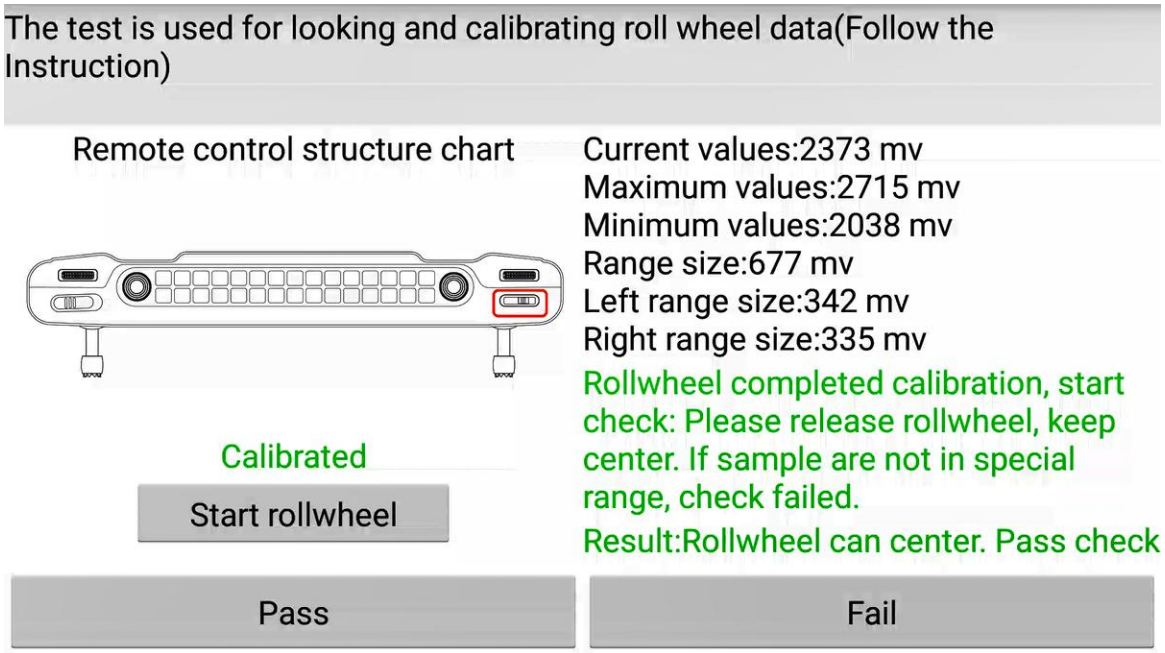
Touch every physical key and see if each one of them respond normally.



2) Calibrate Roller

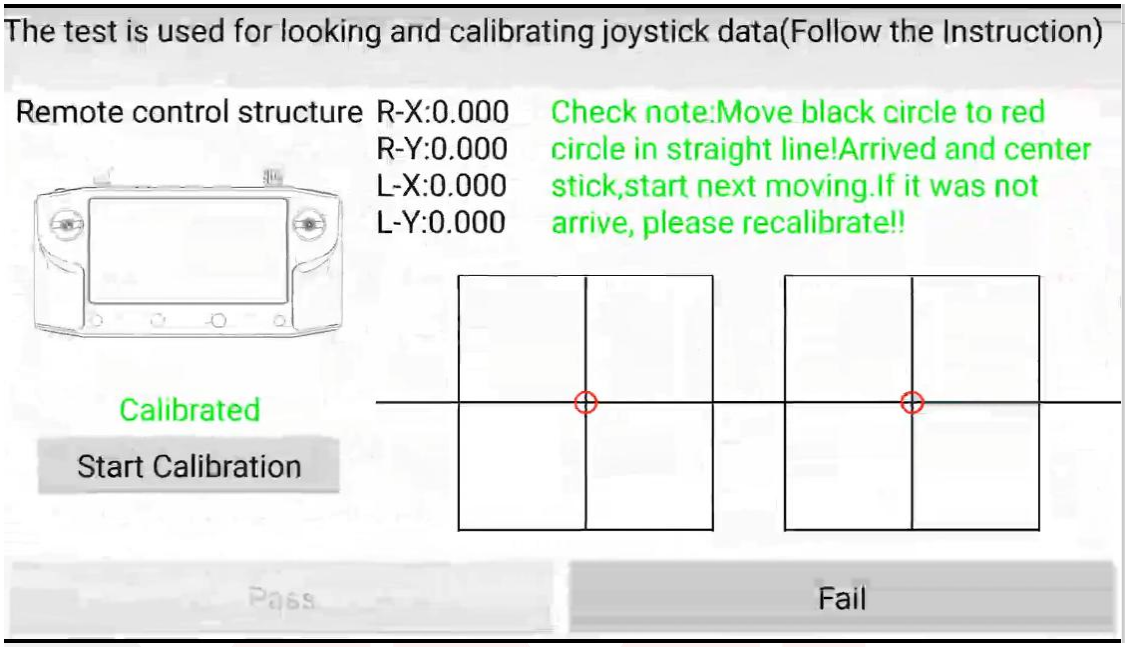
Click "Start rollwheel" and left/right tune as instructions; collect both Max.and Min. Values.

There will be a successful prompt after calibration.



3) Calibrate Joystick

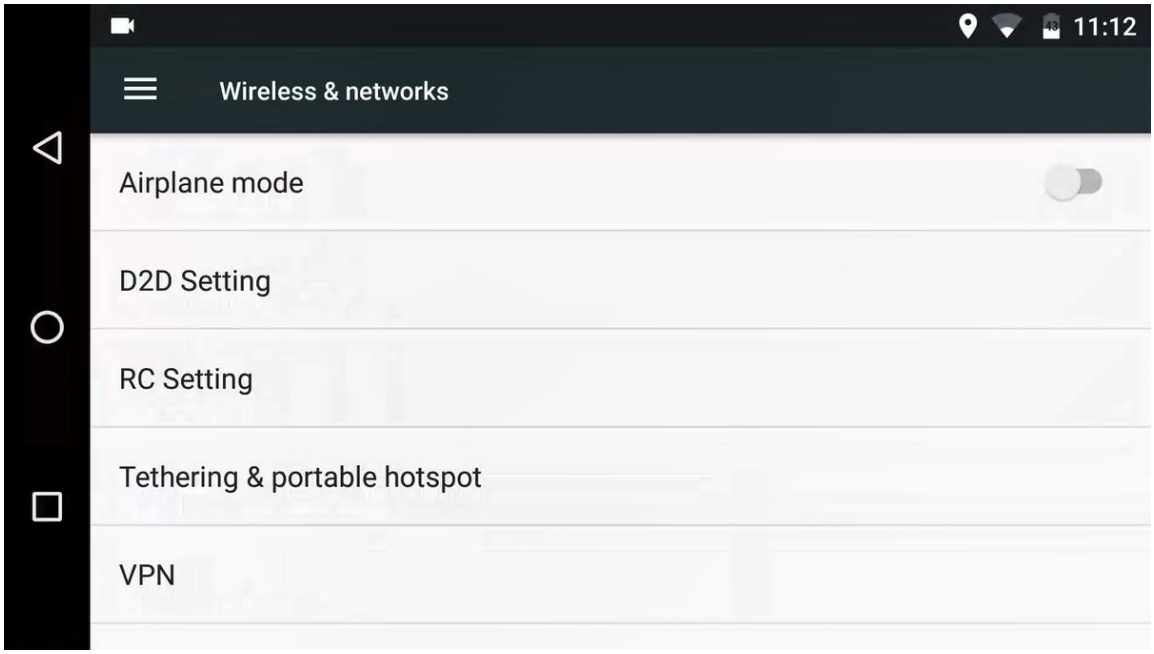
Click "Start Calibration" and calibrate following instructions



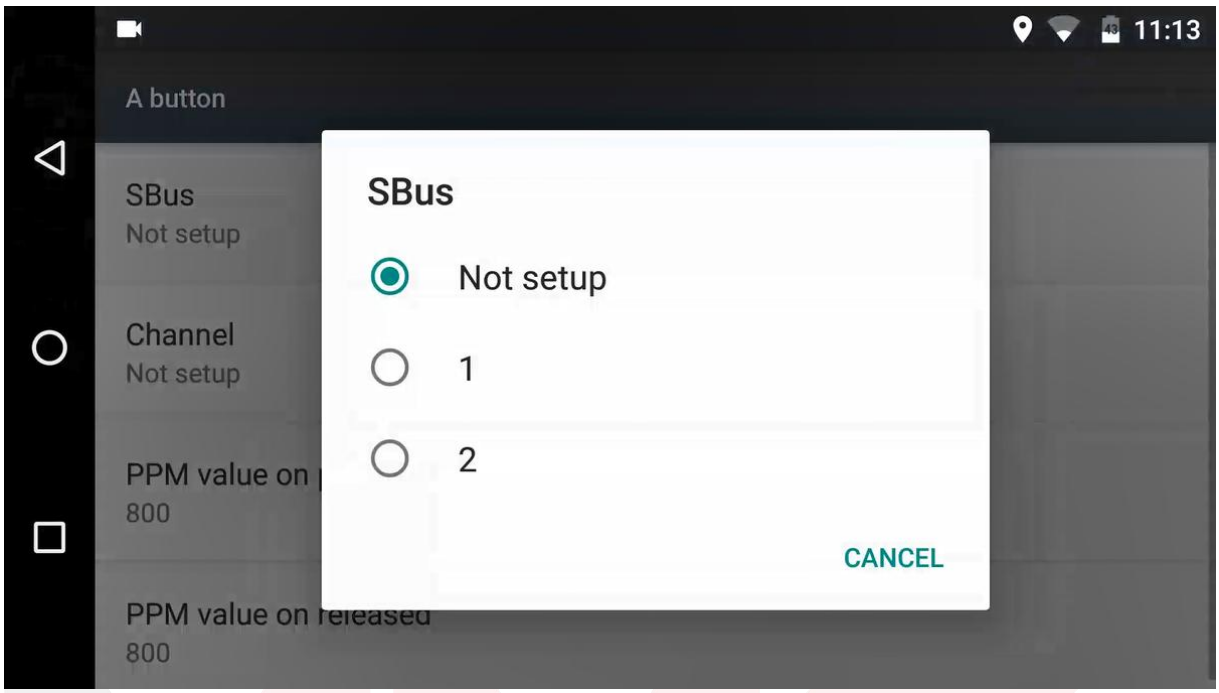
7-4 · Set Channels

1) Channel Setting

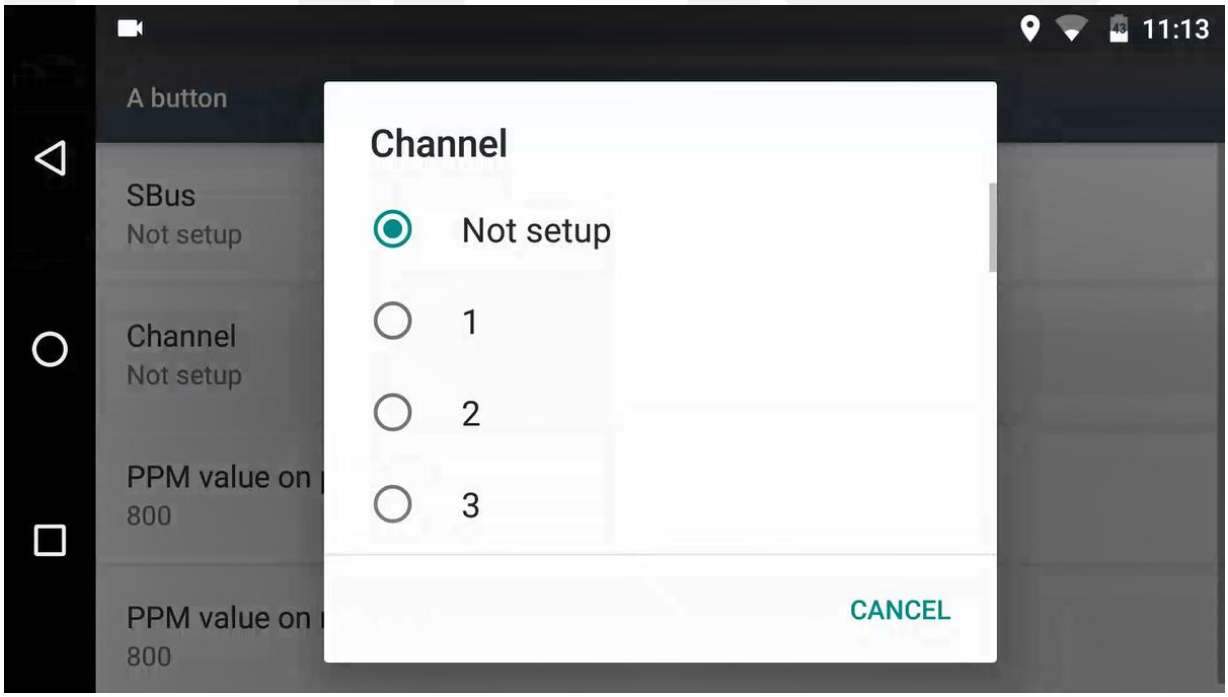
Click "setting"-"more"-"controller channel setting" to enter:



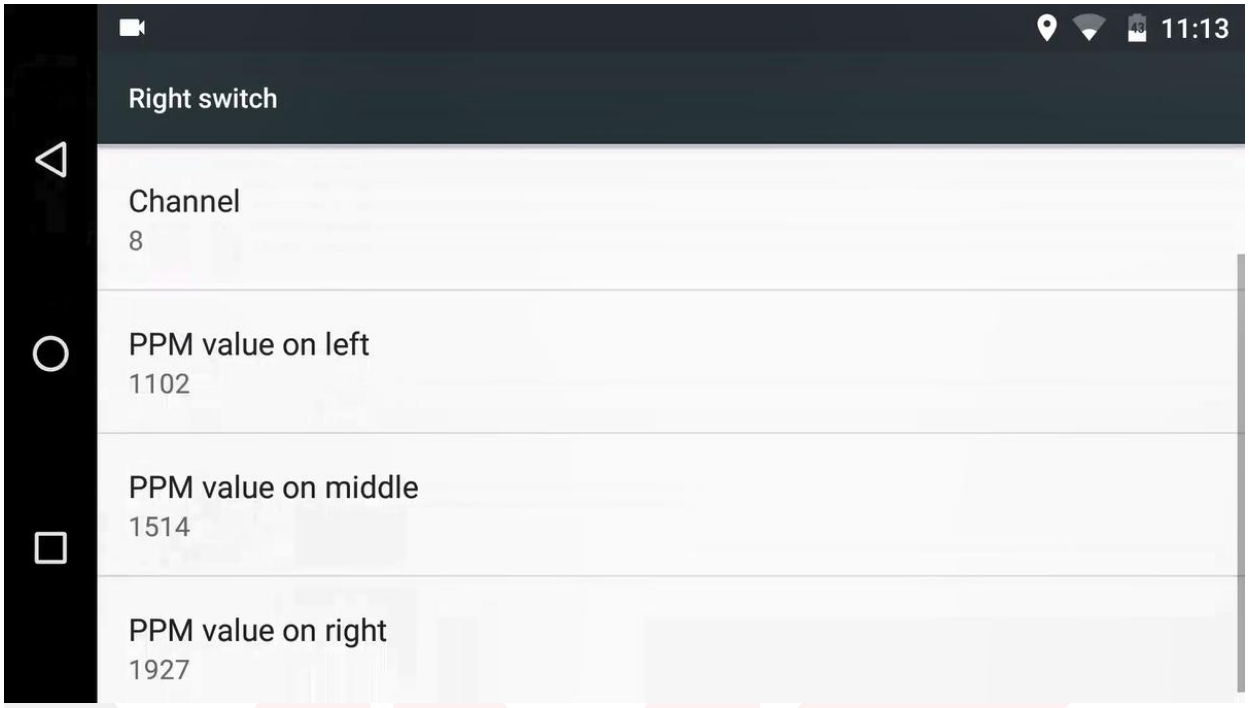
The output of each key can be set SBus1 "1," SBus2 "2" or no setting "not setup"



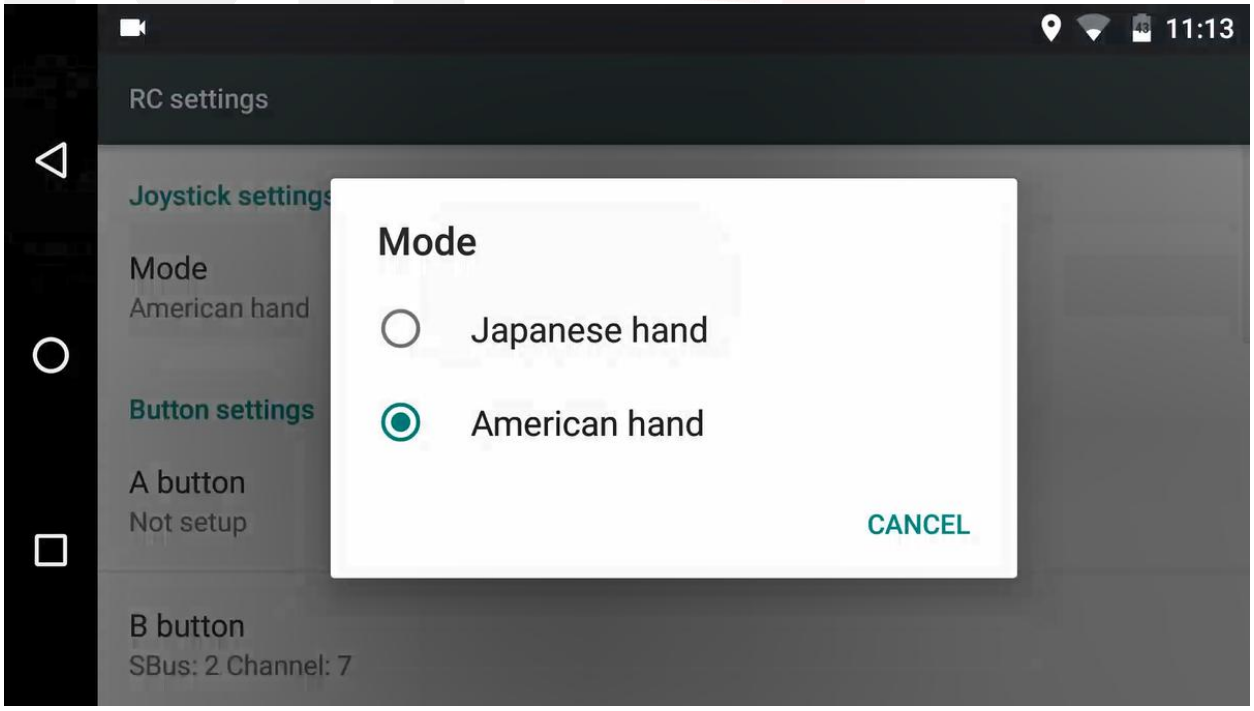
Then choose "Channel" and select the output channel number you want. As with key type, can set the output value of both when it's touched and by default.



As with the three-way switch, you can set the output value of every way;



2) Set between MODE1 (Japanese hand) & MODE 2 (American hand)



Packing List

① Etlas Mobile II*1

② MINI BNC omni antenna *2

③ Sky/drone end unit*1

④ MCX-to-SMA feeder*2

⑤ 2.4G antenna*2

⑥ 18650 battery*2

⑦ Packing box for antenna*1

⑧ Packing foam*2

⑨ 6PIN JST cable*1

⑩ 4PIN JST cable*1

⑪ 3PIN JST-to-Dupont cable*2

⑫ 20PIN HD cable*1

⑬ 20PIN-to-HD adapter*1

⑭ TypeC USB cable*1

⑮ User manual*1

Cautions

- Choose 5V/2A or 9V/2A charging adapter. 9V/2A can be used for fast charging.
- For long-term storage, please unplug the battery and store it in a cool and dry place.
- Please set the channel and the joystick mode before take-off. Do not change those setting during flight for safety.
- The power input of the sky-side is DC 12-24V, and the power supply should be within this range(12-24V), otherwise it might burn out the image transmission.
- The Etlas Mobile II only supports 5.8G WIFI frequency, 2.4G WIFI frequency cannot be connected and searched. Please use 5.8G WIFI to use the network.

Tel（24h*7）：400 808 2021

E-Mail：info@mmcuav.com

Website：www.mmcuav.cn