RAK WisCam

Quick Start Guide V1.2

Shenzhen Rakwireless Technology Co., Ltd

www.rakwireless.com

info@rakwireless.com

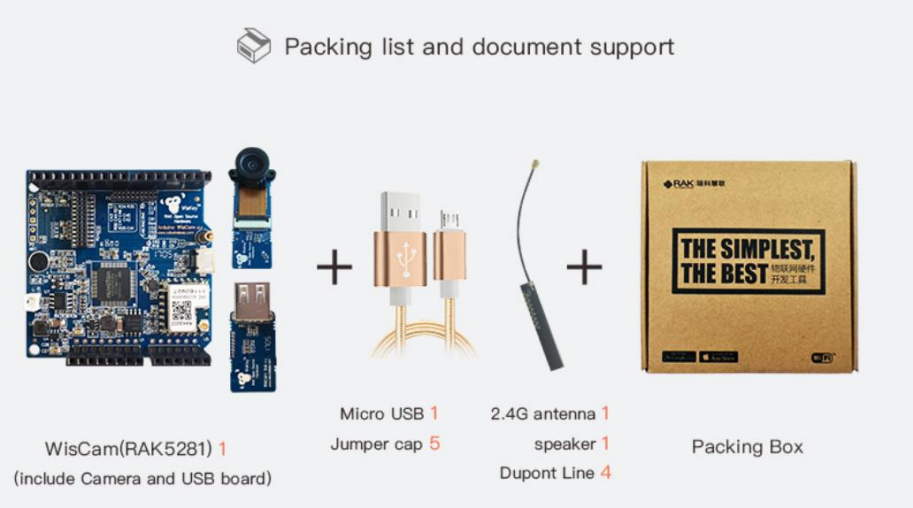
ETDX16100930

Content

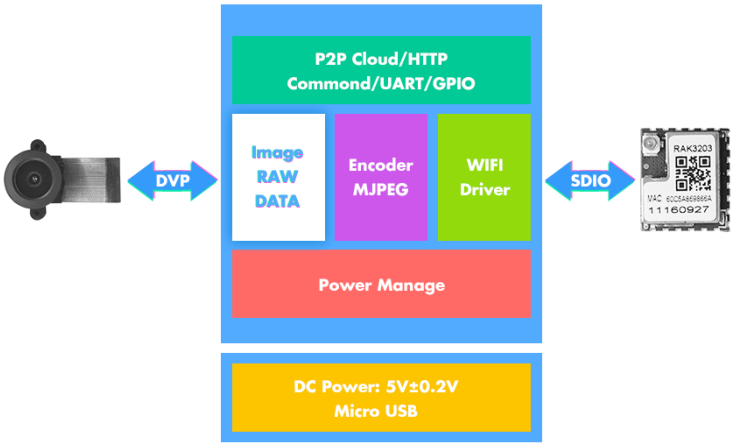
1 WisCam Overview

RAK WisCam is ultra-low-cost Modular Based Evaluation Kit to help the developer to design Wi-Fi video product with Linux OS and work with Arduino NUO board. WisCam can transmit video through Wi-Fi to APPs and all the source codes are available on the Github. WisCam also integrate Nabto P2P cloud to create the video connection anywhere with Internet .

WisCam supports YUV RAW data so developers can make video scaling (up to x1~x8 scaling), video cropping , video overlapping etc. or change CMOS image sensor.



2 WisCam Chart

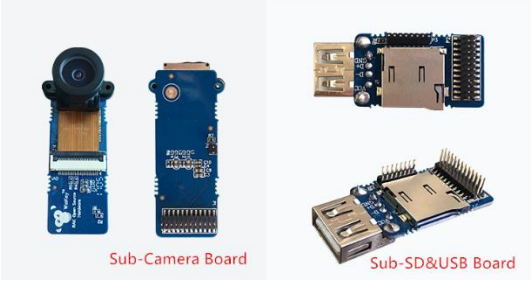


3 WisCam Feature

- High-CPU
  N32905R3DN is built on the ARM926EJ- 32-bit RISC CPU core. The frequency can be up to 200MHz@1.8V.
- Wi-Fi Access

WisCam uses RTL8189FTV Wi-Fi chipset and it supports IEEE 802.11 b/g/n protocol, 2.4GHz Band, 1T1R antenna and SDIO interface. High-speed wireless connection can be up to 150 Mbps.

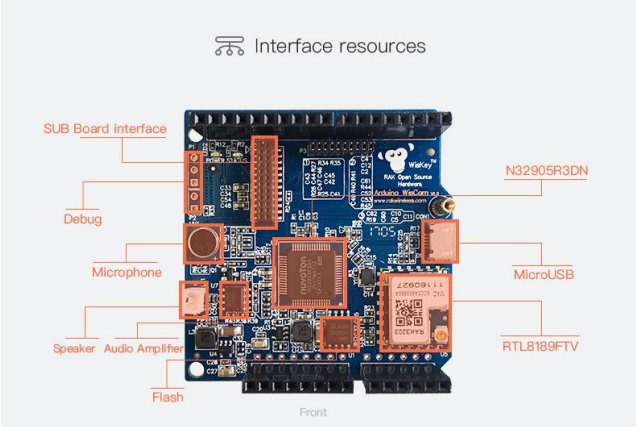
- Easy To Use
  Once you power on WisCam, you can play the video in mobile apps or Windows program.
- Video RAW DATA
  RAW DATA will make video scaling (up to x1~x8 scaling), video cropping , video overlapping etc. or change CMOS image sensor.
- Open All Source Code
  All software source code is available on Github and you can download it.
  https://codeload.github.com/RAKWireless/WisCam/zip/master
- Arduino compatible
  RAK WisCam fully compatible with Arduino UNO development board in hardware so it can extend your application with Arduino UNO.
- P2P Cloud Server
  WisCam also has integrated the P2P cloud server(Nabto P2P) to make playing the video anywhere when you access the internet . The mobile APP(Android and IOS) can play the video and interact bidirectional audio between WisCam and APPs.
- Video Recording
  WisCam can record up to 640x480@30FPS RGB MJPEG video.
- UART for development
  WisCam provides UART interface to communicate with Host MCU or Arduino board. This allows you to focus on your application development.
- Mobile APPs
  WisCam provides the source code of mobile app to discover the device and play video. Source code is available on github(https://codeload.github.com/RAKWireless/Wisview-RTSP/zip/master) or website (http://www.rakwireless.com/en/download/).
- Rich Peripherals
  WisCam provides a 10-bit ADC, a MIC-phone, a UART, a speaker and a dozen of GPIOs(the number will change with different Sub-Board).
- Multi- Accessories
  WisCam also provide accessories to make your application more amusing and easier to use. Sub-Camera and Sub-SD&USB are the critical parts in your application. Sub-Camera is using for collecting the image sensors and play in APPs via Wi-Fi. Sub-SD&USB is using for USB storage or UVC function and more accessories will be available in the near future.



4 Hardware Introduction

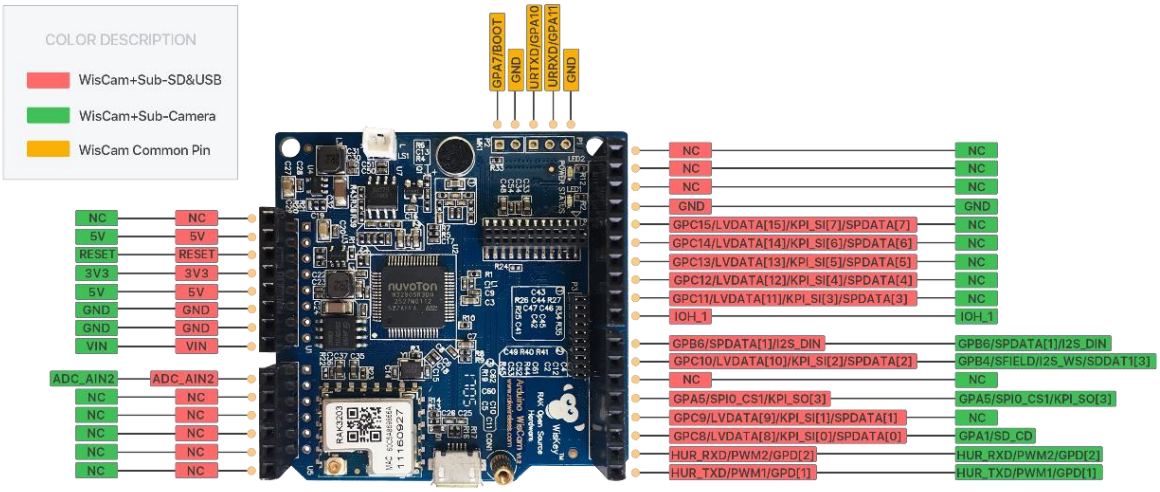
4.1 Interface & Parts

Flash： 128Mbit



WisCam Top View

4.2 Pin definition



PIN	Default Config
HUR_TXD/PWM1/GPD[1]	UART Transparent TXD with 3.3V level
HUR_RXD/PWM2/GPD[2]	UART Transparent RXD with 3.3V level
IOH1	Speaker Enable PIN High_Level : Disable(Default) Low_Level : Enable
BOOT/GPA7	Run into Recovery Mode or Normal Mode Normal Mode: Set High_Level(Default) when power on Recovery Mode: Set Low_Level when power on, Burn firmware.
URTXD/ GPA10	Debug UART TXD with 3.3V level
URRXD/ GPA11	Debug UART RXD with 3.3V level

5V	Power Supply input, DC5V. And another 5V PIN can output 5V Power at the same time. If use micro-USB as a power source, the two 5V PIN are work as output power source.
3.3V	Output Power source, DC3.3V.
VIN	Reserved

5 Compile and Upgrade

5.1 Working Mode

WisCam has 2 modes as following.

1) UVC(USB Camera)
The UVC mode is activated when the WisCam board is connected to the PC via a USB cable. You can see the video with UVC capture utility.
2) Wi-Fi Camera: Power supply from the Arduino board, USB cable with AC-DC adaptor or other DC adaptor(Not from PC USB).
WisCam board has Arduino pin header form factor so connect it to the Arduino board and supply the power to the Arduino board or use USB cable without PC USB interface . Then the Wi-Fi AP works and you can connect it with your mobile phone and see the video streaming via Wi-Fi.

5.2 Compile Source Code

Compile OS : Linux OS
1 Download source code: https://codeload.github.com/RAKWireless/WisCam/zip/master

or git clone https://github.com/RAKWireless/WisCam.git

2 cd WisCam

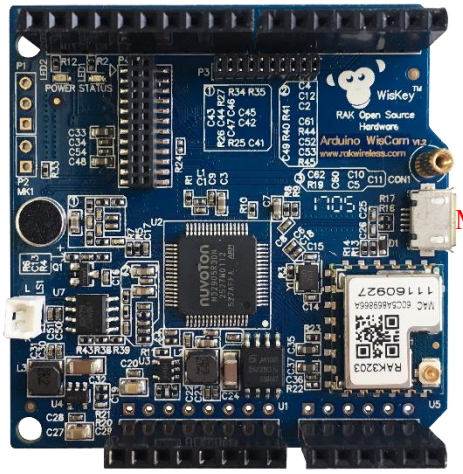
```
3 sudo chmod -R 755 ./
```

```
4 ./scripts/build.sh
```

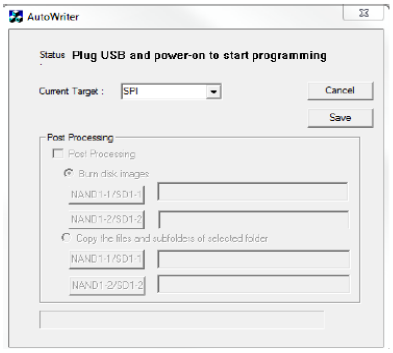
5.3 Burn Firmware

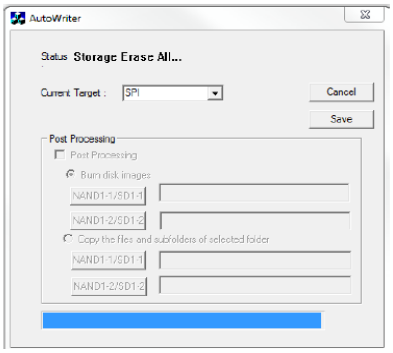
1) After Compile, Copy output/autowriter_gc0308 to your windows PC. Or Download the factory firmware from github: https://github.com/RAKWireless/WisCam/blob/master/Wiscam%20Factory%20Firmware%20200170504.zip

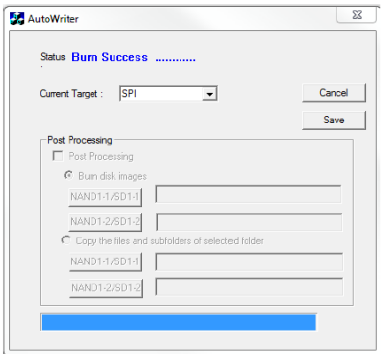
2) Connect BOOT PIN to GND.
3) Connect Wiscam to Windows PC with Micro-USB Cable. Then Wiscam's power is turned on and operate in Recovery(Boot) mode.



4) Execute AutoWriter.exe in folder autowriter_gc0308 and the select Current Target as SPI then WisCam will burn firmware automatically. If the Status is "Burn Success……", the burning is completed.







6 Play Video

WisCam support RTSP (Real Time Streaming Protocol) video and audio stream and it have Nabto P2P cloud server, Telnet and UART transparent transmission.

Connect the WisCam board to the Arduino board and supply the power to the Arduino board. Then the red LED is turned on .After 5 seconds, blue LED is blinking. After 30 seconds, you can connect the SoftAP with your mobile phone.

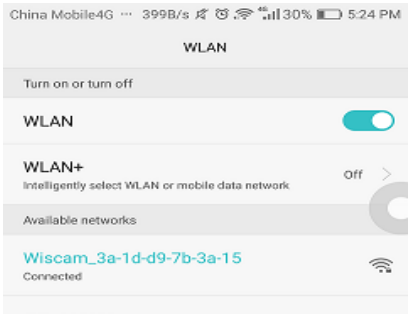
Default Configuration:
Power on as SoftAP;
Default SSID: WisCam+MAC address, For example: WisCam-3a-1d-d9-7b-3a-15
Default Password:12345678
Default Gateway IP: 192.168.100.1
Default Subnet Mask: 255.255.255.0
Video Encode Format: MJPEG.

6.1 Local Video in WiFi Mode

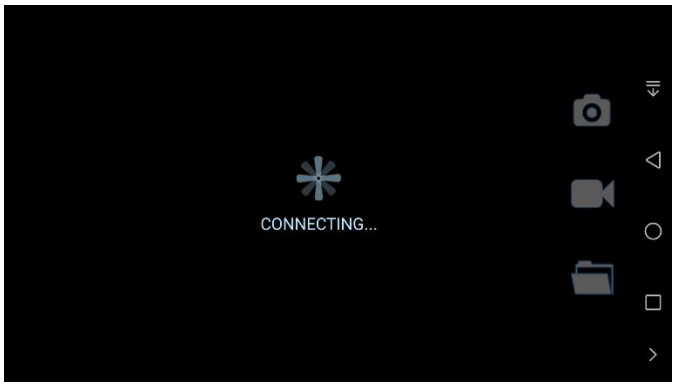
（1）Smartphone APPs

1 Install app:
iOS: you can download IOS App at the App Store “WisCam”
Android: https://www.pgyer.com/wiscam

2 Connect the WisCam default SSID (Password is 12345678) and open the WisCam app.



3 Then click play icon to scan and play the video.



（2）Windows PC:

In Windows OS, you can see the video through “WisView Windows PC Tool” or “VLC Player”.

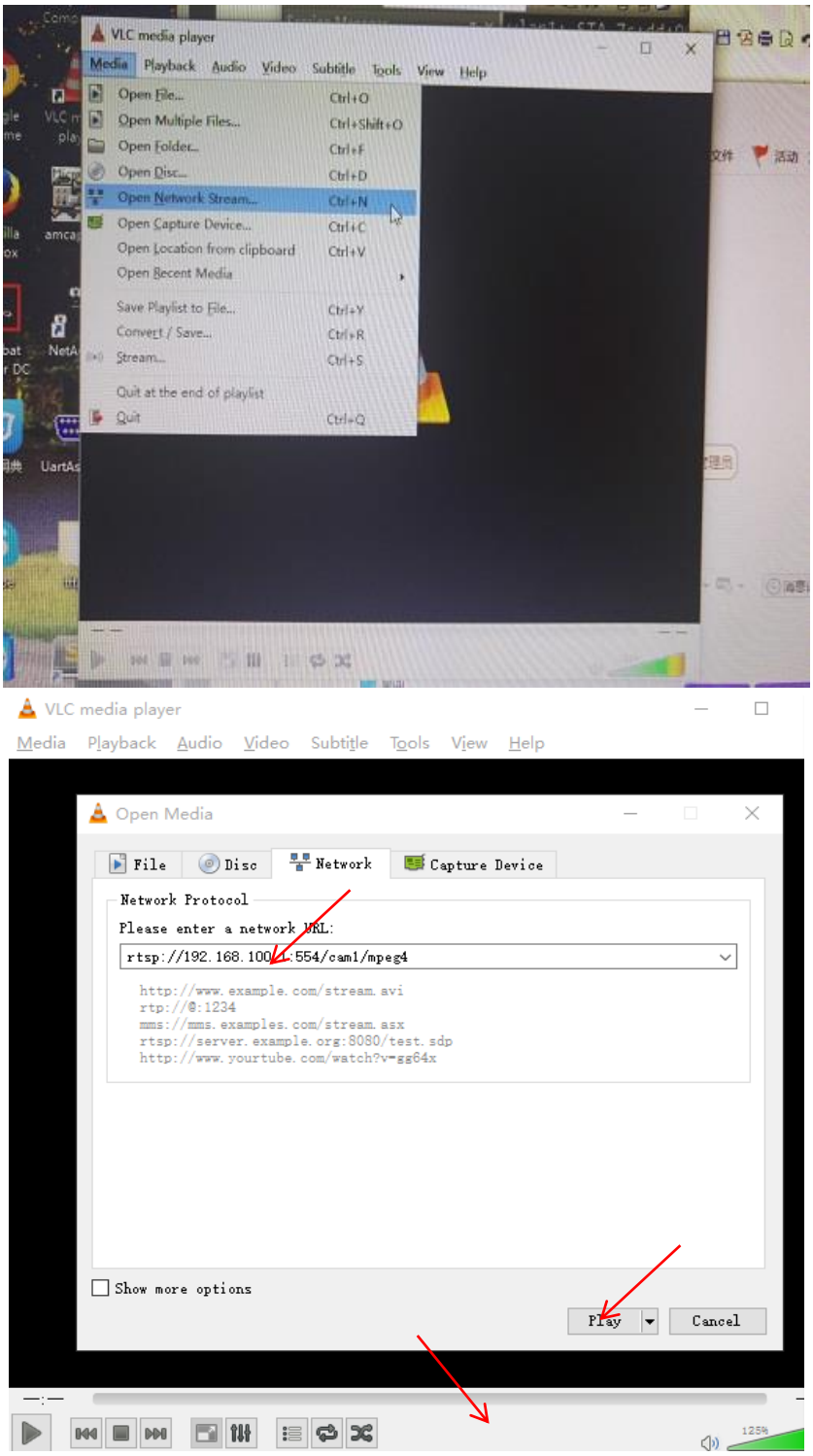
WisView Windows PC Tool: https://github.com/RAKWireless/Wisview-RTSP/tree/master/Wisview/bin/Debug

You can also download the WisView Windows PC Tool source code from github.

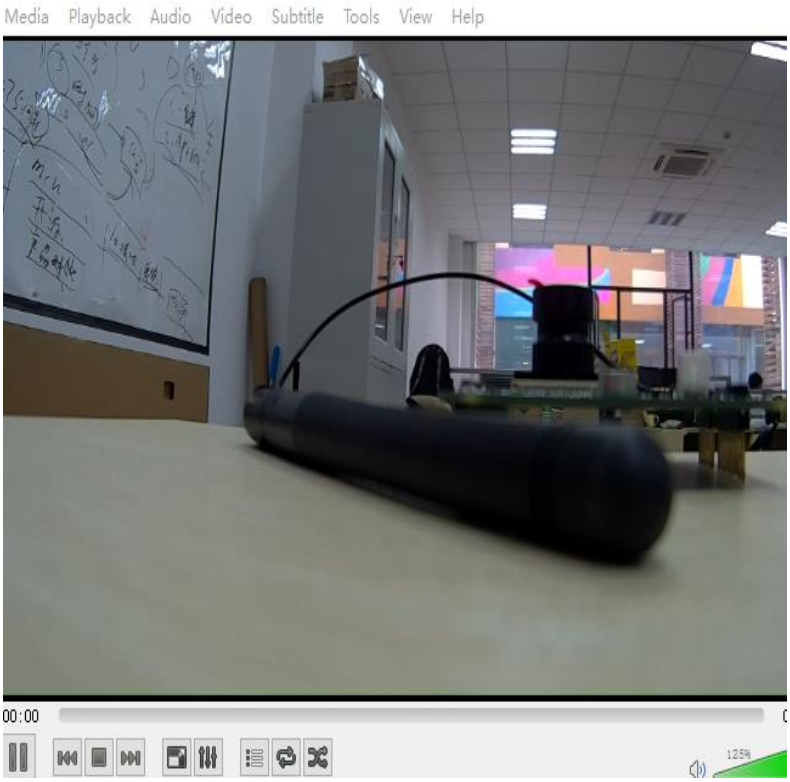
https://github.com/RAKWireless/Wisview-RTSP

VLC Player: http://get.videolan.org/vlc/2.2.4/win32/vlc-2.2.4-win32.exe

If you use VLC Player ,please Input URL:rtsp://192.168.100.1:554/cam1/mpeg4.



Finally, you can play the video in VLC.



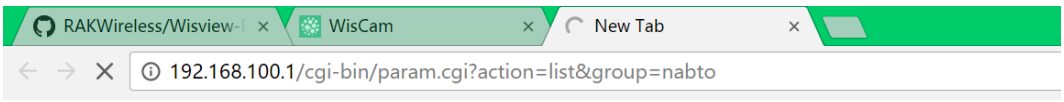
6.2 Remote video in WiFi Mode

1) Nabto Overview

Nabto platform provides direct real-time connectivity with no firewall or dynamic IP hassle and control the embedded devices directly from HTML-in real-time or stream data directly to and from device.
Now nabto start by default with no password, so you can change nabto id and password through “nabto” command.

You can get the nabto ID with http command.Please use your PC or smartphone to connect the wiscam’s Soft-AP , then open the broswer to input the link (command) to get the current module’s Nabto ID :

http://192.168.100.1/cgi-bin/param.cgi?action=list&group=nabto



Then add the id(lx520...) in the picture is just for test, you can change it though http command(**http://192.168.100.1/cgi-bin/param.cgi?action=update&group=nabto&nabto_id= lx520.xxxxxx.rakwireless.com &Nabto_key= xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx**) or change /mnt/nand1-2/etc/nabtonat_config in your terminal(For more information, refer to the Program Guide).

Exactly id:

nabto_id: lx520.xxxxxx.rakwireless.com

Nabto_key: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Note: If you need new Nabto ID to test , please contact this email <steven.tang@rakwireless.com> to get new ID.

2) Download APP

If need to test the remote function ,you have to download a new APP for testing .

Android

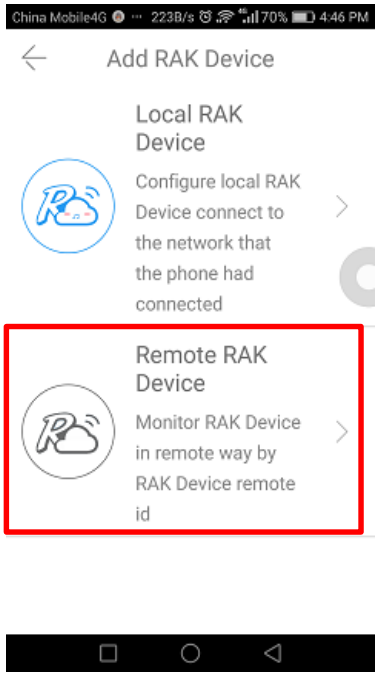
https://www.pgyer.com/rakvideotest

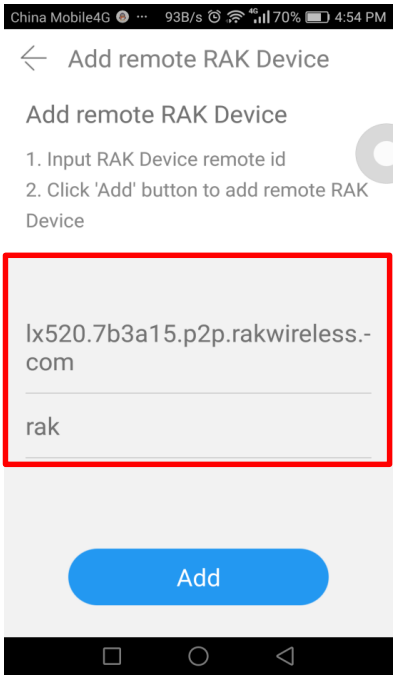
IOS

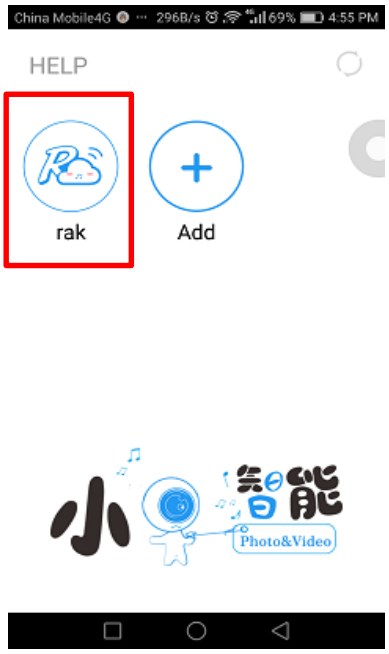
Search RAKVIDEO in APP STORE

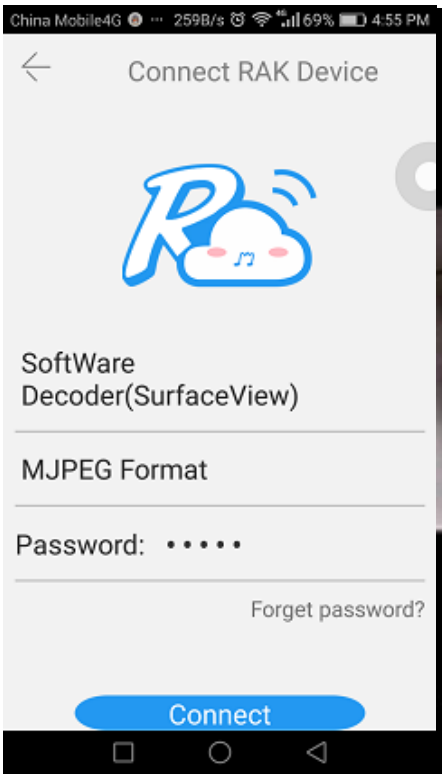
3) Add Remote Device

Input the nabto ID to Add remote device. And then select software decode(surfaceview),MJPEG Format and default password admin.then you will play the video in APPs.(the following picture is from android APP).









6.3 UVC mode

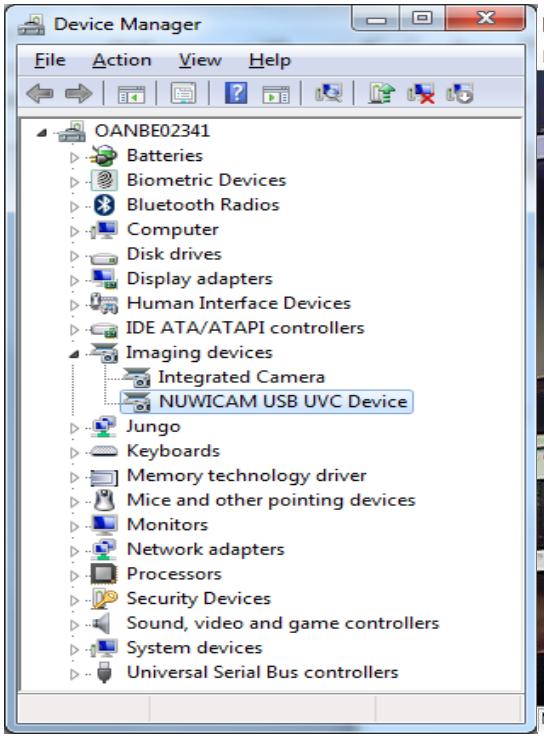
WisCam supports UVC (USB Video Class) mode.

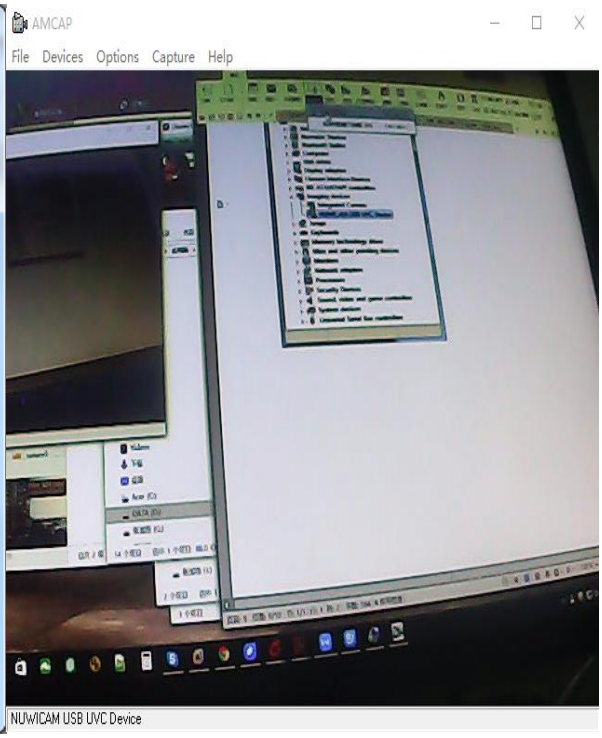
1 Connect the board to the PC using micro USB cable. The Power RED LED will light and Blue LED will be off all the time .

2 The board will reboot and Windows UVC driver will be installed automatically.

3 You can see ‘NUWICAM USB UVC Device’ in device manager Windows.

4 Open UVC capture utility to test UVC function. For example, “WebcamViewer” or “AMCap”





7 Revision & History

Version	Modification content	Author	Date
V1.0	Create the Document	Wentao.Sun	2016-11-16
V1.1	Update the document format Update picture.	Lampo	2017-02-06
V1.2	Update the document format Update picture.	Steven	2017-05-06