RAK ARDUINO VIDEO DEVELOPMENT BOARD GUIDE V1.0

深圳市瑞科慧联窗体顶端

Shenzhen Rakwireless Technology Co., Ltd

www.rakwireless.com

info@rakwireless.com

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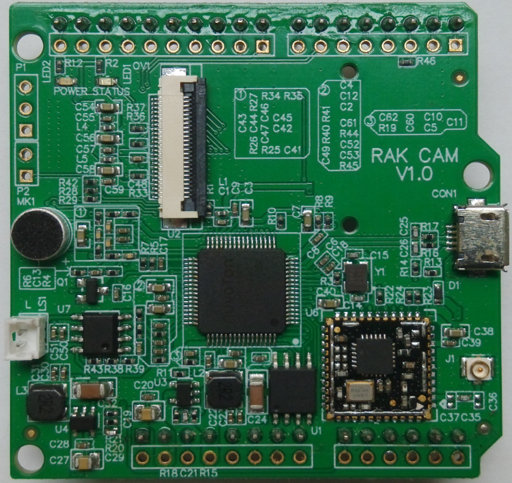
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**1. Module Introduction**

RAK CAM is a development board witch can transmit video through WIFI，it can be powered separately. In addition ,RAK CAM fully compatible with Arduino development board，so it can be used in conjunction with the Arduino development board.

This document mainly describes the hardware structure of the module and how to use the video transmission method ,so that developers can understand and be familiar with the module more quickly.



CAMIF

Antenna Interface

N32905R3DN

MicroUSB

Microphone

Audio Amplifier

Horn Interface

Debug

Flash

RTL8189FTV

1 RAK CAM Top View

Gpio A5

Recovery factory

[unvarnished](I:/Dict/6.3.69.8341/resultui/frame/javascript:void(0);)

[transmission](I:/Dict/6.3.69.8341/resultui/frame/javascript:void(0);)

HORN



Gpio A3 B4 B6

Nothing

Burn

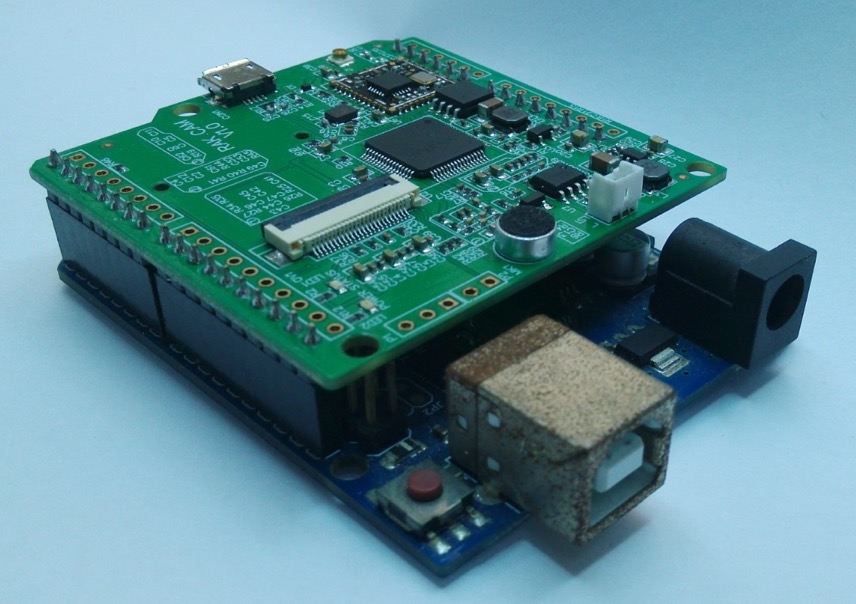
Debug

ADC

POWER

2 RAK CAM Bottom View

**2. Hardware Introduction**



3 Fully Compatible With Arduino

窗体顶端

**serial console:**

on the back of the board ,you can see "debug port",connect it to your serial console  and the Baud rate is 115200



debug

**Source compilation：**

1 download source : <https://github.com/RAKWireless/rak_5280_arduino>

Or git clone <https://github.com/RAKWireless/rak_5280_arduino>

2 cd rak\_5280\_arduino

3 scripts/build.sh

4 if permission denied you can change permission:

sudo chmod u+x ./\* -R

then execute build.sh again

**Burn:**

1 copy output/autowriter\_gc0308 to your windows

2 enter “recover mode”



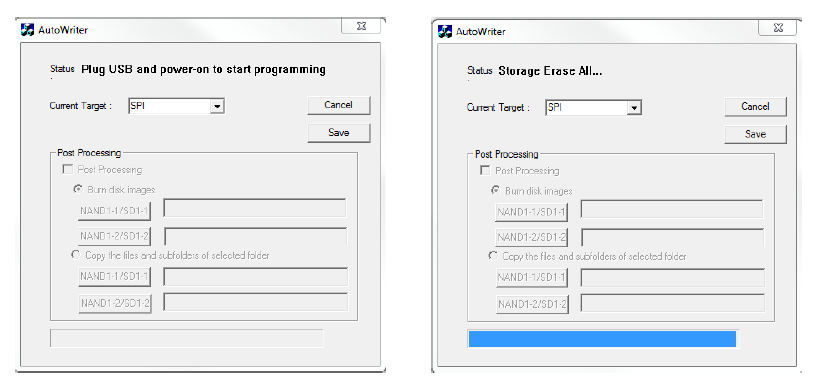
short circuit

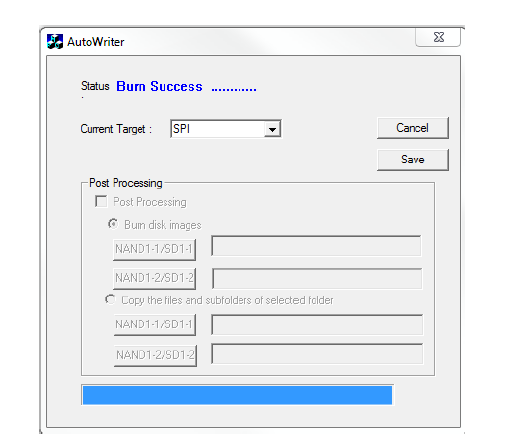
3 connect your development board to pc with USB

4 enter autowriter\_gc0308 and execute AutoWriter.exe

5 it will autoburn

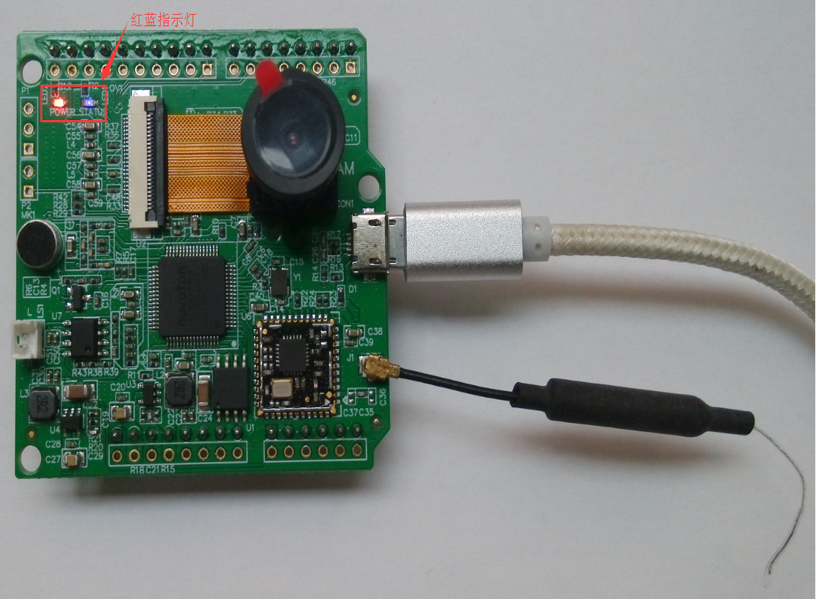
6 save and normal start





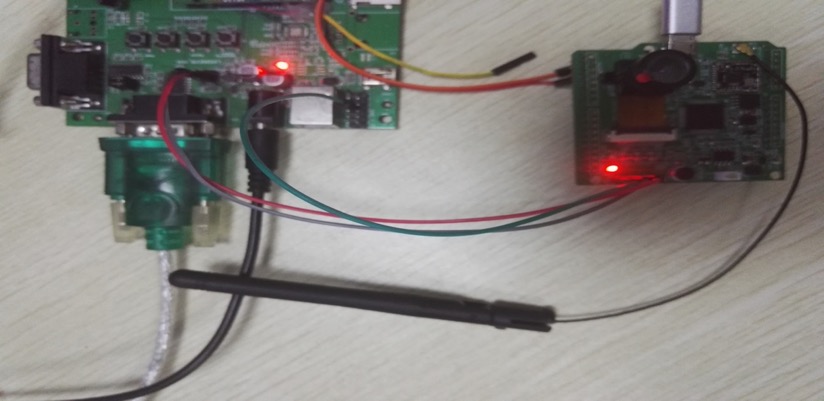
1. **Development Board Use Guidance**
2. Install the antenna and camera of RAK CAM development board in the corresponding position，and power supply with the Micro USB（Voltage：5V，I am here to demonstrate a separate power supply situation, but you can combine with Arduino when you use it）Normal phenomenon：the red light is on ,and the blue light flashes after a few seconds，

Example:



5 RAK CAM Normal Start

Then connect to the serial port,for example:



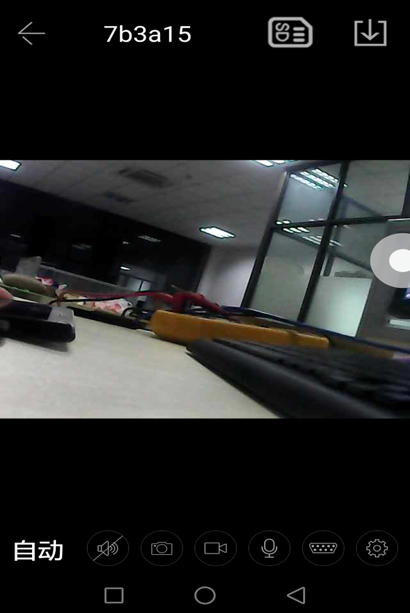
1. By default,the AP starts,and ssid: NuWicam+mac address

Example：NuWiCam-3a-1d-d9-7b-3a-15；

Password:12345678

IP：192.168.100.1

Connect your phone to the module,then open your App you can watch the video in your App



In Windows watch the video through VLC media player

Input URL,and player



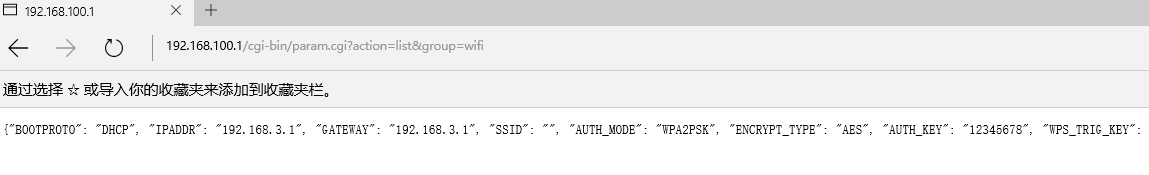
**（3）change AP to STA (connect the module to the router)**

Distribute Network through the “list”command (behind the interface command),you can see the wifi-related information.

BOOTPROTO：

STATIC：the static ip, you can manually set the ip and gateway ,and you can see the ip and gateway through the “list” command;

DHCP: the dynamic ip，ip address randomly assigned,but you can’t see the ip and gateway throngh the “list” command ,you can connect to the serial port and view the ip address through “ifconfig” command.



<1>When you distribute Network you can open the web,and input command（By default :DHCP,you can change it through command）： http://<IP-Address>/cgi-bin/param.cgi?action=update&group=wifi&SSID=wifi name

http://<IP-Address>/cgi-bin/param.cgi?action=update&group=wifi&AUTH\_KEY=wifi password



<2> restart the development board (the board will connect to the router)

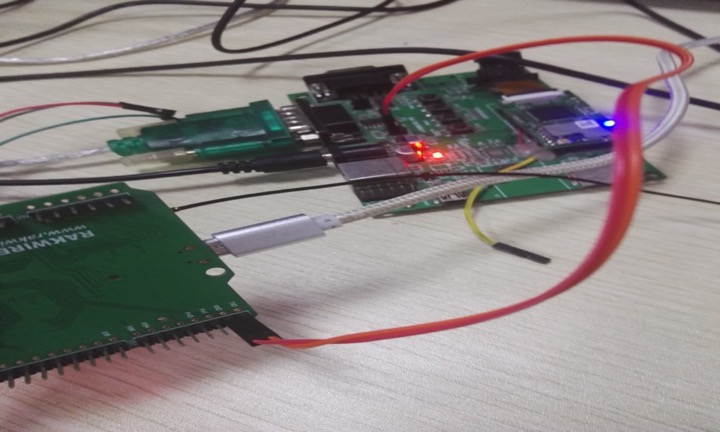
<3> connect your phone to the internet

<4> watch the video with your App

<5>In STA : if you want to restore factory (AP), you can pull down the GPIOA5 about 5 seconds

**（4）Transparent Transmission Text**

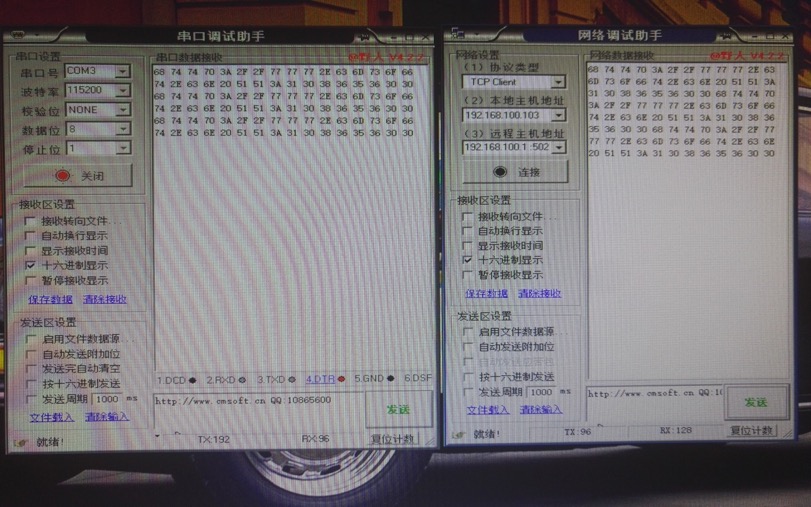
Connect to the port:



Through the serial assistant and network assistant test：

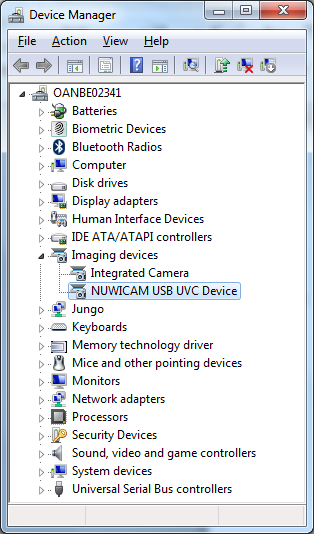
Serial debugging assistant：115200 N 8 1

Network debugging assistant：port 502



1. **Uvc module：**

Start with USB way ,then see the driver after startup



Finally you can watch the video through software ‘WebcamViewer’ or ‘AMCap’

1. **Nabto**

Nabto is a point-to-point remote access and control of connected device .Remote control embedded devices directly from HTML-in real-time. Or stream date directly to and from devices . Securely .No firewall hassle.

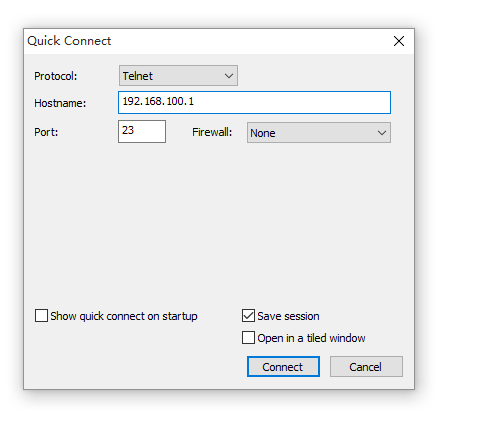
Now nabto start by default with no password, so you can change nabto id and password through “nabto” command, finally restart.

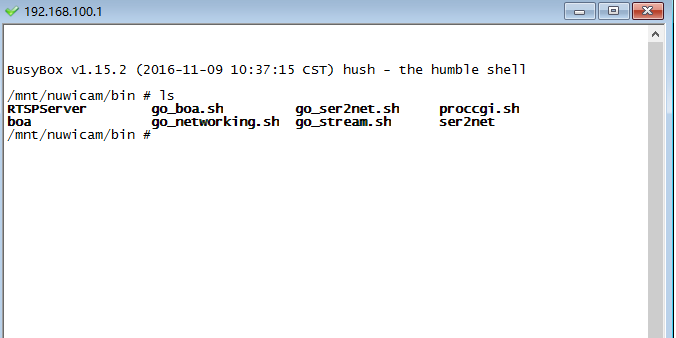
1. **Telnet**

Our module also supports remote control:**Telnet**

you can use your tool connect ,choose Telnet and input your hostname ,then connect ,finally you can control your board.

for example:





**（8）Interface Command**

**1 http://<IP-Address>/cgi-bin/param.cgi?action=list&group=wifi**

|  |  |  |
| --- | --- | --- |
| **Name** | **Value** | **Description** |
| BOOTPROTO | STATIC or DHCP | Boot protocol |
| IPADDR | xxx.xxx.xxx.xxx | IP address for static |
| GATEWAY | xxx.xxx.xxx.xxx | Gateway static |
| SSID | String | SSID |
| AUTH\_MODE | OPEN/SHARED/WPAPSK/WPA2PSK | Authentication mode |
| ENCRYPT\_TYPE | NONE/WEP/TKIP/AES | Encryption type |
| AUTH\_KEY | String | Authentication key |
| WPS\_TRIG\_KEY | HOME | WPS key |
| AP\_SSID | String | SSID |
| AP\_AUTH\_KEY | String | Soft AP’s authentication key |
| AP\_CHANNEL | 1 ~ 13, AUTO | Soft AP’s channel |

**http://<IP-Address>/cgi-bin/param.cgi?action=update&group=wifi&{Name}={Value}**

|  |  |  |
| --- | --- | --- |
| **List Name** | **Value** | **Description** |
| BOOTPROTO | STATIC or DHCP | Boot protocol |
| IPADDR | xxx.xxx.xxx.xxx | IP address for static |
| GATEWAY | xxx.xxx.xxx.xxx | Gateway static |
| SSID | String | SSID |
| AUTH\_MODE | OPEN/SHARED/WPAPSK/WPA2PSK | Authentication mode |
| ENCRYPT\_TYPE | NONE/WEP/TKIP/AES | Encryption type |
| AUTH\_KEY | String | Authentication key |
| WPS\_TRIG\_KEY | HOME | WPS key |
| AP\_SSID | String | SSID |
| AP\_AUTH\_KEY | String | Soft AP’s authentication key |
| AP\_CHANNEL | 1 ~ 13 | Soft AP’s channel |

AP\_AUTH\_KEY:AP password > 8 bits

**2 http://<IP-Address>/cgi-bin/param.cgi?action=list&group=stream**

Check the video resolution and baudrate

|  |  |  |
| --- | --- | --- |
| **Name** | **Value** | **Description** |
| VINWIDTH | 8~4096 | Unit: pixel |
| VINHEIGHT | 8~4096 | Unit: pixel |
| JPEGENCWIDTH | 8~4096 | Unit: pixel |
| JPEGENCHEIGHT | 8~4096 | Unit: pixel |
| BITRATE | 1024~8192 | Unit: Kbps |

**http://<IP-Address>/cgi-bin/param.cgi?action=update&group=stream&{Name}={Value}**

Modify the video resolution and baudrate

|  |  |  |
| --- | --- | --- |
| **Name** | **Value** | **Description** |
| VINWIDTH | 8~4096 | |
| VINHEIGHT | 8~4096 | |
| JPEGENCWIDTH | 8~4096 | |
| JPEGENCHEIGHT | 8~4096 | |
| BITRATE | 1024~8192 | Unit: Kbps |

**3 http://<IP-Address>/cgi-bin/param.cgi?action=list&group=nabto**

Check the nabto id and password

|  |  |  |
| --- | --- | --- |
| **Name** | **Value** | **Description** |
| nabto\_id | xxxxxxx | Nabto id |
| Nabto\_key | xxxxxxx | Nabto key |

**http://<IP-Address>/cgi-bin/param.cgi?action=update&group=nabto&{Name}={Value}**

Modify the nabto id and password

|  |  |  |
| --- | --- | --- |
| **Name** | **Value** | **Description** |
| nabto\_id | xxxxxxxx | Nabto id |
| Nabto\_key | xxxxxxxx | Nabto key |

**4 http://<IP-Address>/cgi-bin/restart.cgi?group={Name}**

|  |  |  |
| --- | --- | --- |
| **Name** | **Value** | **Description** |
| wifi | wifi | Restart Wi-Fi start-up procedure. |
| board | board | Reset board. |
| stream | stream | Restart RTSP server. |

# Open-source List

|  |  |  |
| --- | --- | --- |
| **Item** | **Description** | **URL& Major modification** |
| linux-2.6.35.4 | Linux kernel | http://www.linux.org/ |
| busybox.1.15.2 | Linux shell | http://www.busybox.net/about.html |
| dnsmasq-2.60 | DHCP server | http://www.thekelleys.org.uk/dnsmasq/doc.html |
| hostapd | Wi-Fi access point and authentication server | http://hostap.epitest.fi/wpa\_supplicant/ |
| spook-20050207 | RTSP server | http://www.litech.org/spook/ |
| wireless-tool.29 | Network configuration utilities | http://www.hpl.hp.com/personal/Jean\_Tourrilhes/Linux/Tools.html |
| wpa\_supplicant | IEEE 802.11i supplicant | http://hostap.epitest.fi/wpa\_supplicant/ |
| ser2net-2.10.0 | Serial to Network Proxy | http://ser2net.sourceforge.net/ |
| boa-0.94.13 | Light-weight Webserver | http://www.boa.org/ |

# 4. Modification Record

|  |  |  |  |
| --- | --- | --- | --- |
| Version | Author | Time | Modify The Content |
| V1.0 | Wentao.Sun | 2016/10/26 | Create the Document |