

# Arduino Examples User Guide

## V1.2

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## Document History

Version	Completion Time	Revision Record	Author	Auditor
V1.0	2019/1/15	Initial Release	Huang Leilei	Wang Min
V1.1	2019/1/18	Update firmware updating	Huang Leilei	Wang Min
V1.2	2019/1/25	Add note for updating firmware	Huang Leilei	Wang Min

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## 1 Introduction

### 1.1 Purpose

This document describes examples of W600-Arduino EV board developing package.

### 1.2 Readers

W600 developers and application project developers.

Winner Micro

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## 2 How to update firmware

Note:


How to compile Arduino IDE:

Push Arduino IDE test key (  ) or select **【Sketch】** -> **【Verify/Compile】** to compile sketch.

Note: the FLS file should be updated to W600 Arduino EV board when the first using this EV board.

### 2.1 Auto Upload Firmware

Arduino IDE has it's own updating function. For convenience to developers, current wmttools has supported updating function from the version number 0.2.0.

When using Arduino IDE updating function, developer should push the icon , (or **【Sketch】**->**【Upload】**), and then select the correct UART port connected with EV board (**【Tools】** -> **【Port】**). Then the compiling and uploading can be done.

#### 2.1.1 Python Environment Dependence (Optional)

We support exe program with uploading function for Windows environment. We suggest developer using Win7.

As we use Python to deal with updating operation, the Python default environment should be setted up. (following is the simple description, the detailed information is in REAMDME.md in source code package):

- 1) Install Python Environment (suggest version 3.4).
- 2) Modify the environment variables of the system according to actual situation.
- 3) Install 3 Python pacakage: pyserial, xmodem and pyprind.

### 2.2 Manual Uploading

After compiling the SDK, the sketch\_dec27a.ino.sec.img, sketch\_dec27a.ino.FLS and sketch\_dec27a.ino.gz.img can be generated in the folder Temp\arduino\_build\_488192 (the Arduino IDE can generate a folder arduino\_build\_xxxx, attention to the folder's creation time, the img file can be saved in the latest folder). Upload sketch\_dec27a.ino.gz.img or sketch\_dec27a.ino.sec.img into W600\_Arduino EV board.

### 2.3 Note

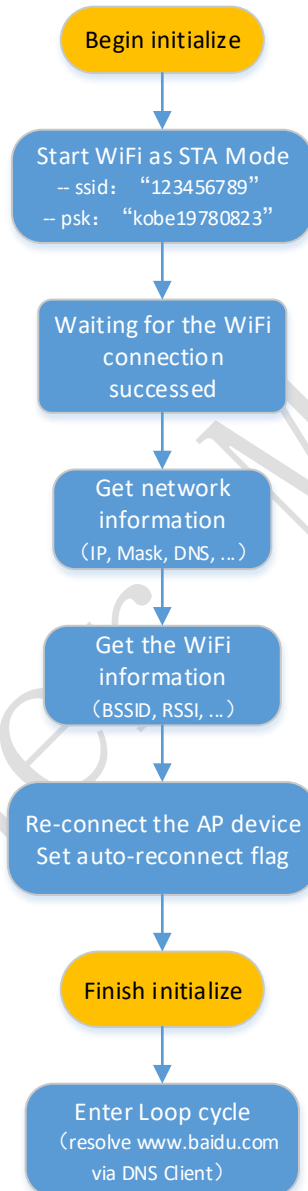
- 1) We suggest uploading .FLS file for the first time using W600\_Arduino EV board.
- 2) In order to effectively use Arduino IDE automatic uploading function, developers should confirm the firmware can work normally, and each task can be scheduled normally (the at+command can work normally, if at+command has no response, please push the RST key on the EV board interval 8 seconds, until "The target is waiting for the firmware file ..." is printed (at this time '-', '\', '|', '/' will be printed for loop)), then the operation of uploading can be continue.
- 3) If automatic uploading failed or no response for a long time (more than 30 seconds), developers can update with manual mode.

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### 3 sketch\_dns

#### 3.1 Function Description

sketch\_dns example code includes Wi-Fi Station and DNS Client functions. Wi-Fi Station example includes not only joining AP function but also inquiring Wi-Fi and network status information. Refer to following flowchart:



#### 3.2 How to do

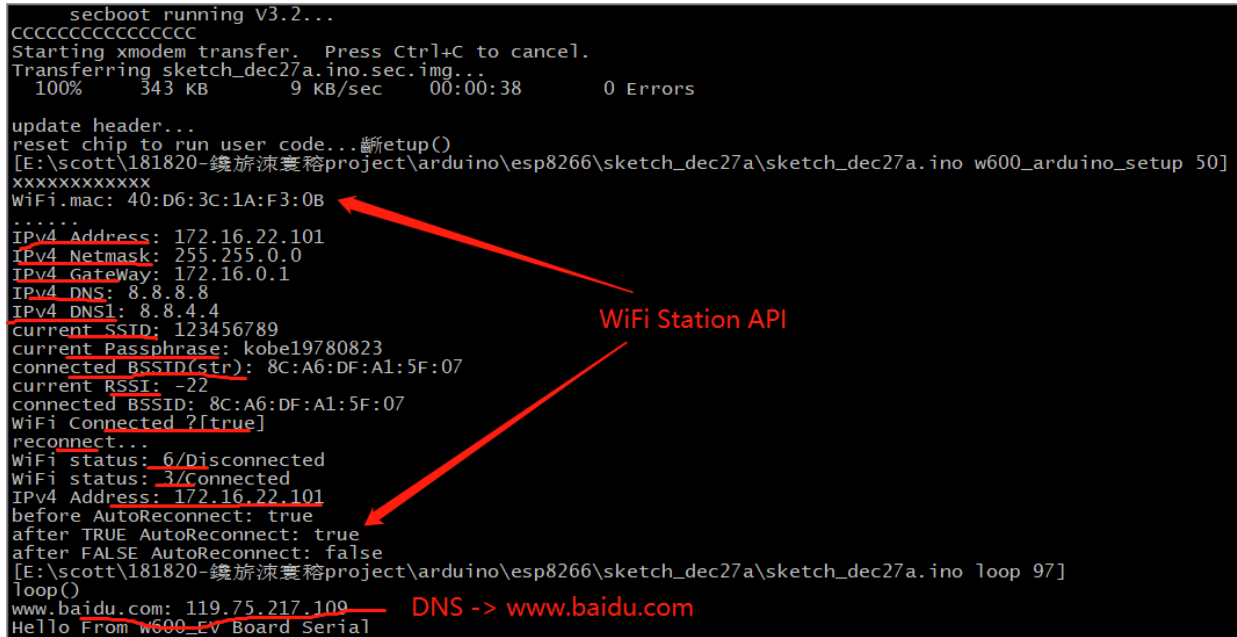
- 1) Copy content of w600-arduino-x.x.x\examples\sketch\_dns.cpp to editing area of Arduino IDE.
- 2) Select Generic W600 board ( **【Tools】** -> **【Board】** ).
- 3) Compiling and uploading method can be referred to chapter 2.

### 3.3 Testing Result

This sample code can be running automatically on W600\_Arduino EV board. Following is the effectiveness:

```
secboot running V3.2...
CCCCCCCCCCCCCCCC
Starting xmodem transfer. Press Ctrl+C to cancel.
Transferring sketch_dec27a.ino.sec.img...
100% 343 KB 9 KB/sec 00:00:38 0 Errors

update header...
reset chip to run user code.. 断setup()
[E:\scott\181820-钱族凉袁裕project\arduino\esp8266\sketch_dec27a\sketch_dec27a.ino w600_arduino_setup 50]
xxxxxxxxxxxx
WiFi.mac: 40:D6:3C:1A:F3:0B
.....
IPv4 Address: 172.16.22.101
IPv4 Netmask: 255.255.0.0
IPv4 Gateway: 172.16.0.1
IPv4 DNS: 8.8.8.8
IPv4 DNS1: 8.8.4.4
current SSID: 123456789
current Passphrase: kobe19780823
connected BSSID(str): 8C:A6:DF:A1:5F:07
current RSSI: -22
connected BSSID: 8C:A6:DF:A1:5F:07
WiFi Connected ?[true]
reconnect...
WiFi status: 6/Disconnected
WiFi status: 3/Connected
IPv4 Address: 172.16.22.101
before AutoReconnect: true
after TRUE AutoReconnect: true
after FALSE AutoReconnect: false
[E:\scott\181820-钱族凉袁裕project\arduino\esp8266\sketch_dec27a\sketch_dec27a.ino loop 97]
loop()
www.baidu.com: 119.75.217.109 DNS -> www.baidu.com
Hello From W600-EV Board Serial
.....
```



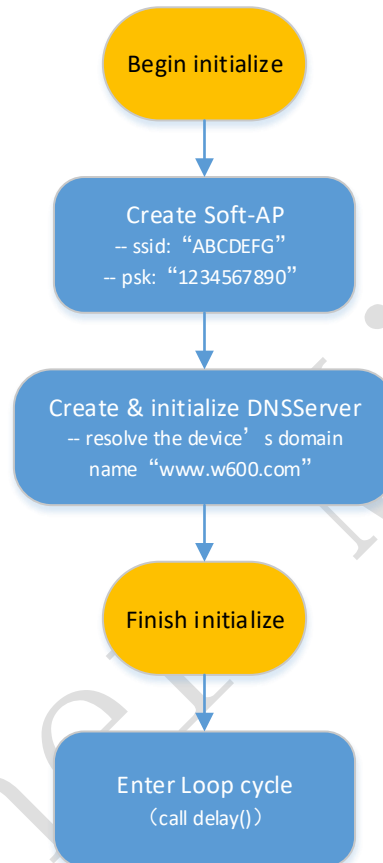


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## 4 sketch\_dnsserver

### 4.1 Function Description

As following flowchart, sketch\_dnsserver example code can realize 2 functions: creating soft AP and initial local DNSServer. After these 2 functions have finished, the program will jump into the main loop waiting other stations to join the soft AP:

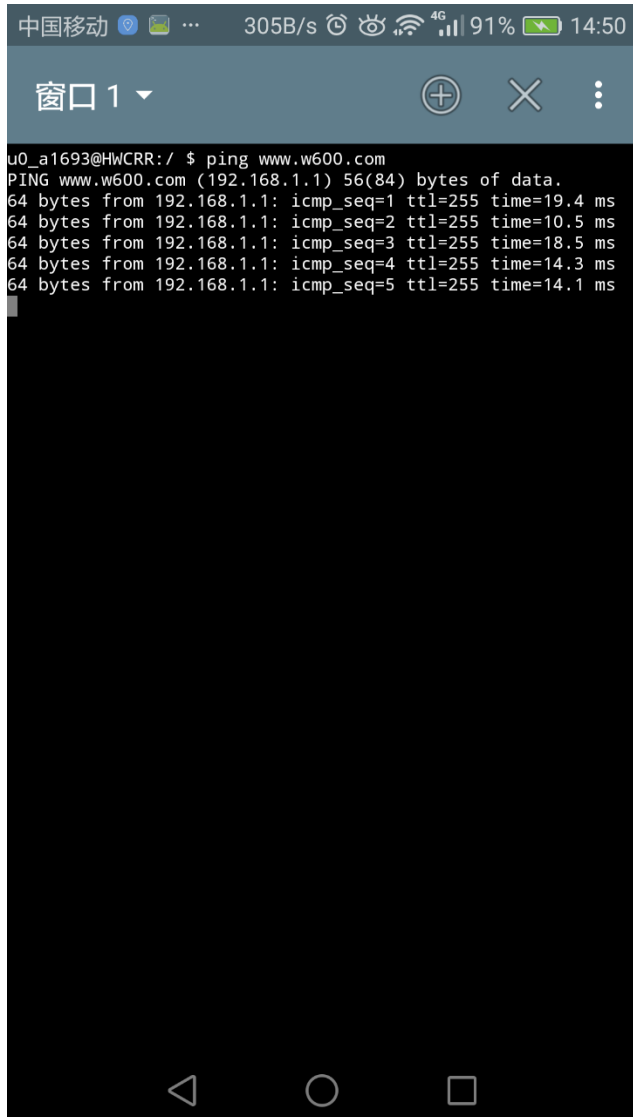


### 4.2 How to do

- 1) Copy content of w600-arduino-x.x.x\examples\sketch\_dnsserver.ino to editing area of Arduino IDE.
- 2) Select Generic W600 board ( **【Tools】** -> **【Board】** ).
- 3) Compiling and uploading method can be referred to chapter 2.

### 4.3 Testing Result

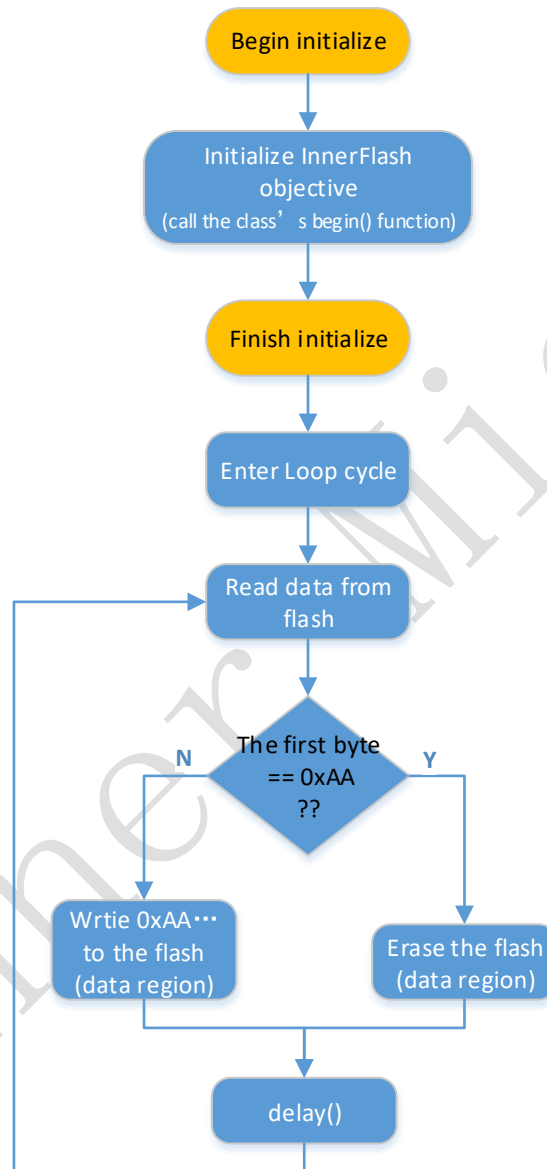
- 1) Use Android smart phone to connect with soft AP (ABCDEFGH).
- 2) Open the terminal simulator on Android phone.
- 3) Input : ping www.w600.com in the simulator app.
- 4) Receive the response from W600 Arduino EV board, as following figure:



## 5 sketch\_innerflash

### 5.1 Function Description

W600 integrates internal Flash for saving img and user data. W600 Arduino SDK also supports reading and writing Flash API. Following is the flowchart of this example:



### 5.2 How to do

- 1) Copy the content of `w600-arduino-x.x.x\examples\ sketch_innerflash.ino` to editing area of Arduino IDE.
- 2) Select Generic W600 board ( **【Tools】** -> **【Board】** ).
- 3) Compiling and uploading method can be referred to chapter 2.

### 5.3 Testing Result

This example program also does not need manual operation. Every time a loop is executed, the reading and

writing can be operated alternately.

```
secboot running V3.2...
CCCCCCCCCCCCCCCC
Starting xmodem transfer. Press Ctrl+C to cancel.
Transferring sketch_dec27a.ino.sec.img...
 100%    334 KB    9 KB/sec    00:00:37    0 Errors

update header...
reset chip to run user code... 断setup()
[E:\scott\181820-綾旗涼夏裕project\arduino\esp8266\sketch_dec27a\sketch_dec27a.ino w600_arduino_setup 17]
xxxxxxxxxxxx
[E:\scott\181820-綾旗涼夏裕project\arduino\esp8266\sketch_dec27a\sketch_dec27a.ino loop 108]
loop()
write ok

.....
.....
.....
[E:\scott\181820-綾旗涼夏裕project\arduino\esp8266\sketch_dec27a\sketch_dec27a.ino loop 108]
loop()
erase ok

.....
.....
.....
[E:\scott\181820-綾旗涼夏裕project\arduino\esp8266\sketch_dec27a\sketch_dec27a.ino loop 108]
loop()
write ok

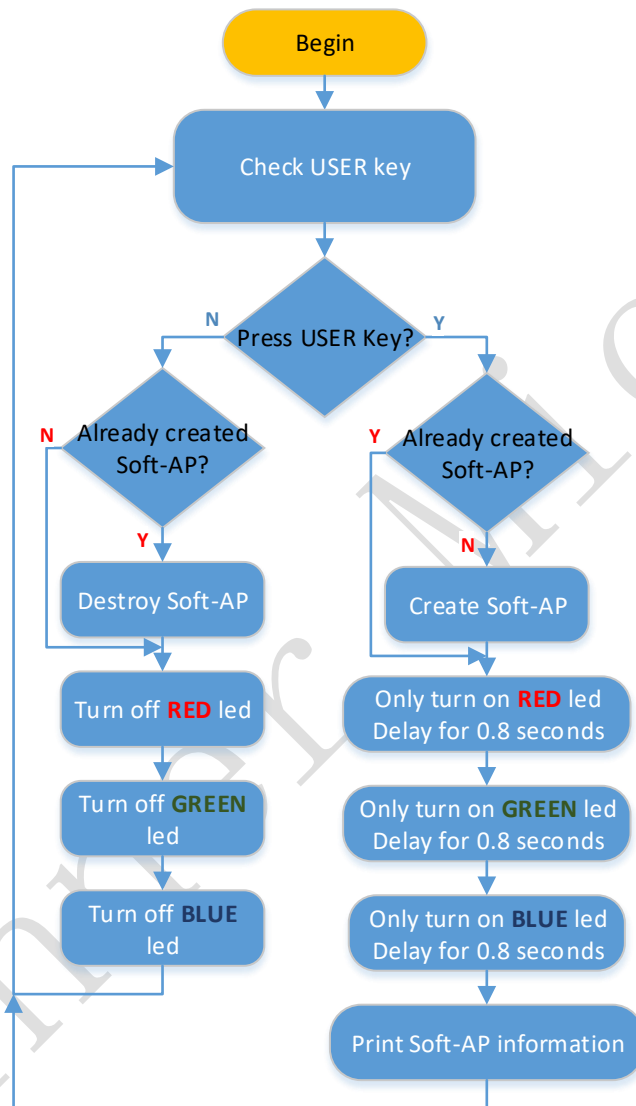
.....
.....
.....
[E:\scott\181820-綾旗涼夏裕project\arduino\esp8266\sketch_dec27a\sketch_dec27a.ino loop 108]
loop()
erase ok

..... ..
```

## 6 sketch\_led\_ap

### 6.1 Function Description

This example includes several functions: USER Button key, LED twinkle, Creating soft AP and delete soft AP. Refer to following flowchart:



### 6.2 How to do

- 1) Copy the content of w600-arduino-x.x.x\examples\sketch\_led\_ap.ino to editing area of Arduino IDE.
- 2) Select Generic W600 board (【Tools】->【Board】).
- 3) Compiling and uploading method can be referred to chapter 2.

### 6.3 Testing Result

Because the example will operate the tricolor LED, so the 3 switches on the EV board should be turned to ON. When pushing User Button key, following information should be printed from UART0:

```

Starting xmodem transfer. Press Ctrl+C to cancel.
Transferring sketch_dec27a.ino.sec.img...
100% 343 KB 9 KB/sec 00:00:38 0 Errors

update header...
reset chip to run user code...断setup()
[E:\scott\181820-无线测速器\project\arduino\esp8266\sketch_dec27a\sketch_dec27a.ino w600_arduino_setup 6]
xxxxxxxxxxxx
[E:\scott\181820-无线测速器\project\arduino\esp8266\sketch_dec27a\sketch_dec27a.ino loop 127]
loop()
Hello From W600_EV Board Serial

USET BTN: 1
USET BTN: 0 Press USER Button
-----
STANUM: 0
AP IP: 192.168.1.1
AP MAC: 42:D6:3C:1A:F3:0B
AP SSID: ABCDEFG
AP PSK: 1234567890
-----
STANUM: 0
AP IP: 192.168.1.1
AP MAC: 42:D6:3C:1A:F3:0B
AP SSID: ABCDEFG
AP PSK: 1234567890
-----
STANUM: 1 Connected by one Station
AP IP: 192.168.1.1
AP MAC: 42:D6:3C:1A:F3:0B
AP SSID: ABCDEFG
AP PSK: 1234567890
-----
STANUM: 1
AP IP: 192.168.1.1
AP MAC: 42:D6:3C:1A:F3:0B
AP SSID: ABCDEFG
AP PSK: 1234567890
-----
STANUM: 1
AP IP: 192.168.1.1
AP MAC: 42:D6:3C:1A:F3:0B
AP SSID: ABCDEFG
AP PSK: 1234567890
-----
STANUM: 0
AP IP: 192.168.1.1
AP MAC: 42:D6:3C:1A:F3:0B
AP SSID: ABCDEFG
AP PSK: 1234567890
-----
STANUM: 0
AP IP: 192.168.1.1
AP MAC: 42:D6:3C:1A:F3:0B
AP SSID: ABCDEFG
AP PSK: 1234567890
-----
STANUM: 0
AP IP: 192.168.1.1
AP MAC: 42:D6:3C:1A:F3:0B
AP SSID: ABCDEFG
AP PSK: 1234567890
-----
STANUM: 0
AP IP: 192.168.1.1
AP MAC: 42:D6:3C:1A:F3:0B
AP SSID: ABCDEFG
AP PSK: 1234567890
-----
STANUM: 0
AP IP: 192.168.1.1
AP MAC: 42:D6:3C:1A:F3:0B
AP SSID: ABCDEFG
AP PSK: 1234567890
-----
sta mac: 20:A6:80:15:F4:76 The MAC address of the station
-----
STANUM: 1 Station connects to the hot-point
AP IP: 192.168.1.1
AP MAC: 42:D6:3C:1A:F3:0B
AP SSID: ABCDEFG
AP PSK: 1234567890
-----
STANUM: 1
AP IP: 192.168.1.1
AP MAC: 42:D6:3C:1A:F3:0B
AP SSID: ABCDEFG
AP PSK: 1234567890
-----
STANUM: 1
AP IP: 192.168.1.1
AP MAC: 42:D6:3C:1A:F3:0B
AP SSID: ABCDEFG
AP PSK: 1234567890
-----
STANUM: 0 Station leave
AP IP: 192.168.1.1
AP MAC: 42:D6:3C:1A:F3:0B
AP SSID: ABCDEFG
AP PSK: 1234567890
-----
STANUM: 0
AP IP: 192.168.1.1
AP MAC: 42:D6:3C:1A:F3:0B
AP SSID: ABCDEFG
AP PSK: 1234567890
-----
STANUM: 0
AP IP: 192.168.1.1
AP MAC: 42:D6:3C:1A:F3:0B
AP SSID: ABCDEFG
AP PSK: 1234567890
-----
STANUM: 0
AP IP: 192.168.1.1
AP MAC: 42:D6:3C:1A:F3:0B
AP SSID: ABCDEFG
AP PSK: 1234567890
-----
USET BTN: 1 Release USER Button, and destroy the soft-AP
Disconnect AP

```

---

## 7 sketch\_MsTimer1

### 7.1 Function Description

This example will demonstrate timer, PWM, tone.

### 7.2 How to do

- 1) Copy the content of w600-arduino-x.x.x\examples\sketch\_MsTimer1.cpp to the editing area of Arduino IDE.
- 2) Select Generic W600 board ( **【Tools】** -> **【Board】** ).
- 3) Compiling and uploading method can be referred to chapter 2.

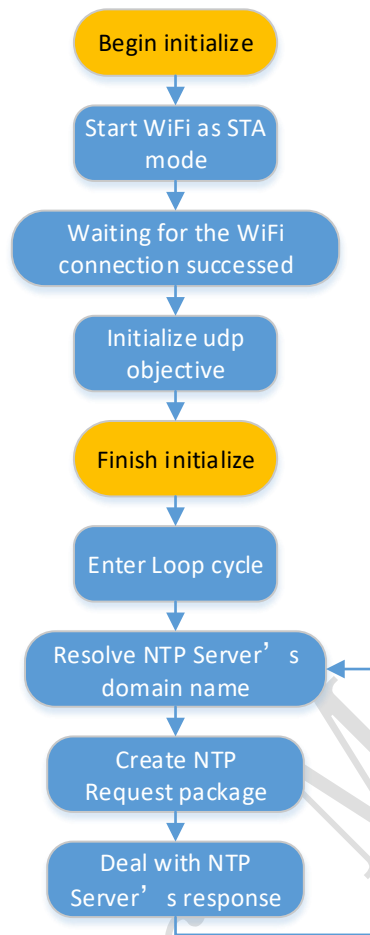
### 7.3 Testing Result

The timer information will appear through inserted Serial0 and the capturing output content from PB12. By defaultly no other Pin connected with PB12, developers can use cable to connect PB12 with PWM1 or PWM2 to test corresponding function.

## 8 sketch\_ntp\_client

### 8.1 Function Description

This example realizes packing and unpacking the ndp protocol by interaction of NTP protocol. Following is the flowchart:



## 8.2 How to do

- 1) Copy the content of w600-arduino-x.x.x\examples\sketch\_ntp\_client.ino to the editing area of Arduino IDE.
- 2) Select Generic W600 board ( **【Tools】** -> **【Board】** ).
- 3) Compiling and uploading method can be referred to chapter 2.

## 8.3 Testing Result

Following is the result with one process of NTP Client:



```
secboot running V3.2...
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Starting xmodem transfer. Press Ctrl+C to cancel.
Transferring sketch_dec27a.ino.sec.img...
  100%    348 KB    8 KB/sec    00:00:39    0 Errors

update header...
reset chip to run user code...
Connecting to 123456789
.....
WiFi connected
IP address:
172.16.22.103
Starting UDP
Local port: 2345
sending NTP packet...
packet received, length=48
Seconds since Jan 1 1900 = 3755587516
Unix time = 1546598716
The UTC time is 10:45:16
The Local time is 18:45:16
```

---

## 9 sketch\_oneshot

### 9.1 Function Description

This example shows oneshot function. Oneshot is Winner Micro's config method to join the Wi-Fi to Router.

### 9.2 How to do

- 1) Copy the content of w600-arduino-x.x.x\examples\sketch\_oneshot.ino to the editing area of Arduino IDE.
- 2) Select Generic W600 board ( **【Tools】** -> **【Board】** ).
- 3) Compiling and uploading method can be referred to chapter 2.

### 9.3 Testing Result

The detailed operation can be referred to the oneshot user guide.

---

## 10 sketch\_Serial

### 10.1 Function Description

This example shows the functions of Serial (Serial0 & Serial1(name of SerialM1 on W600 Arduino EV board)).

Through Serial0, the example supports number printing, character string printing.

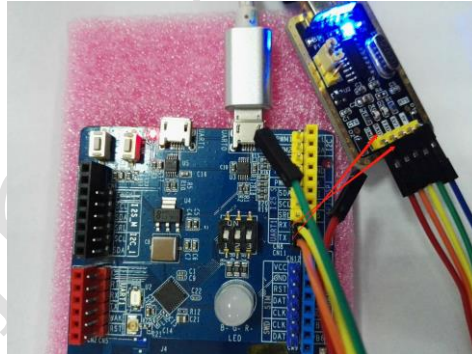
Through SerialM1, there are 6 parts of operation. Every part can be operated during on circle. SerialM1.parseInt() - parsing integer data in receiving buffer, SerialM1.parseFloat() - parsing floating data in receiving buffer, SerialM1.readBytes() - reading buffer data, SerialM1.readBytesUntil() - reading buffer data based on setted termination condition, SerialM1.find() - looking for strings in buffer, SerialM1.peek() and SerialM1.read() – writing and reading single byte function.

### 10.2 How to do

- 1) Copy the content of w600-arduino-x.x.x\examples\ sketch\_Serial.ino to the editing area of Arduino IDE.
- 2) Select Generic W600 board ( **【Tools】** -> **【Board】** ).
- 3) Compiling and uploading method can be referred to chapter 2.

### 10.3 Testing Result

This example needs a serial debugging tools. Following figure is the connecting method:



Following figure shows a whole testing process:

```

1010
** test_println_f **
123.45
123.4560000000
123.45600000000000030
123.45600000
123.45
[E:\scott\181820-錢旂涑寰裕project\arduino\esp82
A
before read, SerialM1.available: 29
SerialM1.parseInt(): 12345

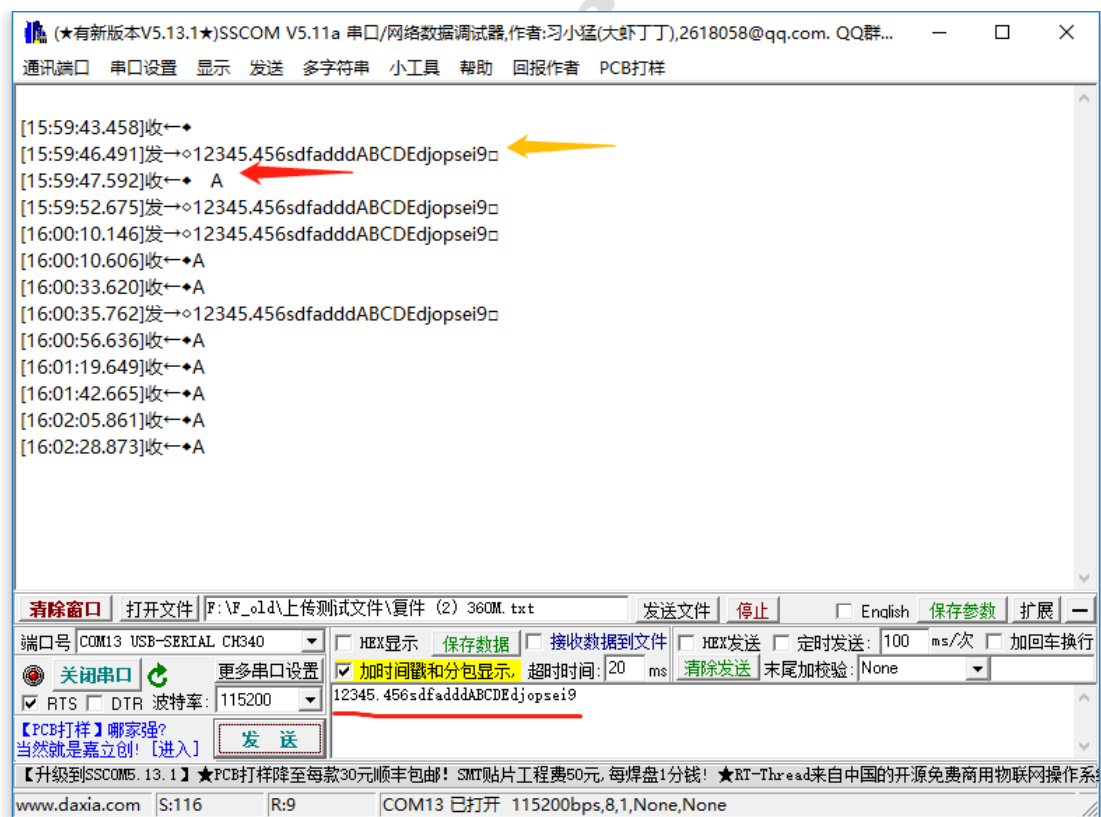
[E:\scott\181820-錢旂涑寰裕project\arduino\esp82
A
before read, SerialM1.available: 82
SerialM1.parseFloat(): 456.000000

[E:\scott\181820-錢旂涑寰裕project\arduino\esp82
A
before read, SerialM1.available: 78
readBytes buf: sdfaddAB

[E:\scott\181820-錢旂涑寰裕project\arduino\esp82
A
before read, SerialM1.available: 98
readBytesUntil buf: CDEdjopse

[E:\scott\181820-錢旂涑寰裕project\arduino\esp82
A
before read, SerialM1.available: 88
SerialM1.find("12345"): 1
SerialM1.find("ABCDE"): 1

```



---

## 11 sketch\_sta

### 11.1 Function Description

This example shows basic Wi-Fi functions by Station mode, it includes joining the Wi-Fi, querying status, parsing DNS and so on.

### 11.2 How to do

- 1) Copy the content of w600-arduino-x.x.x\examples\ sketch\_sta.ino to the editing area of Arduino IDE.
- 2) Select Generic W600 board ( 【Tools】 -> 【Board】 ).
- 3) Compiling and uploading method can be referred to chapter 2.

### 11.3 Testing Result

After uploading the firmware, W600 Arduino program will join the given SSID automatically, print out the network information and Wi-Fi information. Following figure is an example:

```
Starting xmodem transfer. Press Ctrl+C to cancel.
Transferring sketch_dec27a.ino.sec.img...
 100%   343 KB    9 KB/sec   00:00:38    0 Errors

update header...
reset chip to run user code...
[E:\scott\181820-无线速容项目\project\arduino\esp8266\sketch_dec27a\sketch_dec27a.ino w600_arduino_setup 32]
WiFi.mac: 40:D6:3C:1A:F3:0B
.....
IPv4 Address: 172.16.22.105
IPv4 Netmask: 255.255.0.0
IPv4 GateWay: 172.16.0.1
IPv4 DNS: 8.8.8.8
IPv4 DNS1: 8.8.4.4
connected BSSID(str): 8C:A6:DF:A1:5F:07
current RSSI: -20
Hello From W600_EV Board Serial

www.baidu.com: 119.75.217.109

.....
Hello From w600_EV Board Serial

www.baidu.com: 119.75.217.109
...

```

---

## 12 sketch\_wifi\_client

### 12.1 Function Description

This example will create a Wi-Fi connecting first, and then create http connecting with remote server, then send GET request to target url, and print out the information.

### 12.2 How to do

- 1) Copy the content of w600-arduino-x.x.x\examples\ sketch\_wifi\_client.ino to the editing area of Arduino IDE.
- 2) Select Generic W600 board ( **【Tools】** -> **【Board】** ).
- 3) Compiling and uploading method can be referred to chapter 2.

### 12.3 Testing Result



```
100% 356 KB 8 KB/sec 00:00:40 0 Errors
update header...
reset chip to run user code...
Connecting to 123456789
.....
WiFi connected
IP address:
172.16.22.105
connecting to y.wdyichen.cn
Requesting URL: /test/w60x.php
HTTP/1.1 200 OK
Date: Mon, 07 Jan 2019 08:40:25 GMT
Server: Apache/2.4.23 (Win32) OpenSSL/1.0.2j PHP/5.4.45
X-Powered-By: PHP/5.4.45
Content-Length: 1545
Connection: close
Content-Type: text/html

w600 is an embedded Wi-Fi SoC chip which is complying with IEEE802.11b/g/n international standard and which supports multi interface, multi protocol. It can be easily applied to smart appliances, smart home, health care, smart toy, wireless audio & video, industrial and other IoT fields. This SoC integrates Cortex-M3 CPU, Flash, RF Transceiver, CMOS PA, BaseBand. It applies multi interfaces such as SPI, UART, GPIO, I2C, PWM, I2S, 7816. It applies multi encryption and decryption protocol such as PRNG(PseudorandomNumberGenerator)/SHA1/MD5/RC4/DES/3DES/AES/CRC.

Beijing Winner Microelectronics Co.,Ltd.Winner Micro is a professional IC design company, focusing on the development and sale of specific wireless communications chips and solutions in the Internet of Things field. The products are mainly used in smart home, intelligent home appliances, health care, video monitoring, industrial applications and other fields.

A group of highly qualified personnel from Peking University, Tsinghua University, Chinese Academy of Sciences and other domestic first-class gather here, with more than a decade of research and development experience in wireless communication chips, more than 80% of which have PhD or MD. Adhering to the years of design and application development experience, Winner Micro is one of the most comprehensive technical and widely-applied companies in this field, occupying a high market share in a number of application areas by international competitive products. It is a pioneer and leader in the industry.

closing connection
```