# W60X_SDK DEMO User Guide
# V0.5

## Document History

| Version | Completion Date | Revision Record | Author | Auditor |
|---------|-----------------|-----------------|--------|---------|
| V0.1 | 20180830 | Initial Release | Chenzx | |
| V0.2 | 20180921 | Rearranged | Ligh | |
| V0.3 | 20181012 | Update figures | Ligh | |
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# Content

## 1   Introduction

### 1.1  Purpose

This document describes the demo code of W600 SDK for developers.

### 1.2  Readers

FAE, software engineers of SDK user.

## 2   Demo Introduction

All the macro definitions for demo codes are in wm_demo.h. Corresponding macro should be opened before running these demo. We suggest user only open certain macro with certain demo. Demo code should run under the control console, define DEMO_CONSOLE to enable the control console.

## 3   DEMO Function Description

### 3.1  **Demo for Wi-Fi Join AP**

Tips: There are 4 demos for this operation.

#### 3.1.1   t-connect

Tips: Using API to join AP

1. Enable macro definition DEMO_CONNECT_NET
2. Compile the project, update new firmware, then the related commands can be printed in control console through UART0.
3. Send command t-connect ("TEST_N40_6","1234567890") through UART0. All the commands require enter key.
4. After joined AP, the IP can be printed through UART0.

#### 3.1.2   t-oneshot

Tips: Before executing network configuration demo, an APP namded OneShotActivity should be installed to mobile phone)

1. Enable macro definition DEMO_CONNECT_NET.
2. Compile the project, update new firmware, then the related commands can be printed in control console through UART0.

3. Send t-oneshot through UART0.

4. Mobile phone should be connected with target AP, open OneShotActivity APP, input correct SSID and password and click Start Configuration.

5. After the W60X has joind AP, IP information can be printed through UART0.

### 3.1.3 t-oneshot（airkiss configuration）

1. Enable macro DEMO_CONNECT_NET；

2. Compile the project, update new firmware, then the related commands can be printed in control console through UART0.

3. Send t-oneshot through UART0.

4. Open Wechat APP, enter AirKiss website, input SSID and password, click "Connect" button.

5. IP information can be printed through UART0 after W60X joined AP.

### 3.1.4 t-webcfg configuration

1. Enable macro DEMO_CONNECT_NET

2. Compile the project, update new firmware, then the related commands can be printed in control console through UART0.

3. Send t-webcfg through UART0.

4. Mobile should connect with an AP named "softap_XXXX" (XXXX is the last 4 numbers of W60X MAC), open a mobile browser and visit the IP address 192.168.1.1, choose the target SSID from list table, input password, press "save " button..

5. IP information can be printed through UART0 after W60X joined AP.

## 3.2 **Demo for TCP Client**

1. Enable macro DEMO_STD_SOCKET_CLIENT and DEMO_CONNECT_NET.

2. Compile the project, update new firmware, then the related commands can be printed in control console through UART0.

3. Send t-connect ("TEST_N40_6","1234567890") through UART0 or t-oneshot to make W60X join AP.

4. Open TCP debugging assistant tools on PC (IP is 192.168.1.100, port number is 1000), PC should be in the same local area network with W60X.

5. Send t-sockc(1000,192.168.1.100) through UART0 to make W60X set up connection with TCP server. After connected to TCP server successfully, UART0 will print socket number.

6. The received data length will print to W60X's UART0 after received data from server.

The length is the total length each time data received from server.

7. Send t-skcsnd(0,1) to UART0 to set UART1 passthrough.

8. The serial port tools should set the baudrate with 115200, the parity with None, the data bit with 8, stop bit with 1. Enable UART1 to transfer data between W60X and server through UART1.

Tips: Send demohelp to UART0, the control console information will be printed by UART0.

## 3.3 **Demo for TCP Server**

1. Enable macro DEMO_STD_SOCKET_SERVER and DEMO_CONNECT_NET

2. Compile and update the new firmware, the corresponding information can be printed on control console through UART0.

3. Send t-connect("HUAWEI-6SEWE5","123456789") or t-oneshot through UART0 to make W60X join AP.

4. Send t-socks(2000) through UART0 to make W60X used as tcp server, the listen port number will be printed by UART0.

5. Open TCP debugging assistant tools on PC which is in the same local area network with W60X. Set up tcp client with W60X's IP and Port Number in the tools. Connect the W60X server. After connected successfully, the client information will be printed through UART0 (W60X server can accept only 7 clients).

6. Client sends data to W60X, the received data length will be printed through UART0, The length is the total length each time data received from client.

7. Send t-skssnd(1,16,0) to UART0 (socket number is 1, data length is 16), and PC client will receive data from W60X.

8. Send t-skssnd(1,0,1) to UART0 to set socket 1 to transfer data through UART1.

9. The serial port tools should set the baudrate with 115200, the parity with None, the data bit with 8, stop bit with 1. Enable UART1 to transfer data between W60X and client through UART1.

## 3.4 **Demo for UDP**

Tips: There are 4 programs for this demo and the packet capture card should be used.

### 3.4.1 UDP Broadcast

1. Enable macro DEMO_UDP and DEMO_CONNECT_NET

2. Compile, update the new firmware, the corresponding information will be printed in control console through UART0.

3. Send t-connect("TEST_N40_6","1234567890") or t-oneshot to UART0 to make W60X join AP.

4. Send t-udp(0,1000,0) to UART0, and print:

    udp demo,cast:0, port:1000

    localip : 192.168.1.104

    local port :3000

5. Open UDP debugging assistant tools on PC which should be in the same local area network with W60X. Set UDP port number 1000.

6. Send t-sndudp(10) through UART0, the packet capture card will catch the package from W60X to AP with the Desination Ethernet Broadcast. At the same time, the debugging assistant tools will receive 10 number of data.

7. Send data from debugging assistant tools. When W60X received data, the IP and data length will be printed through UART0.

3.4.2  UDP Unicast

1. Enable macro DEMO_UDP and DEMO_CONNECT_NET.

2. Compile, update the new firmware, the corresponding information will be printed in control console through UART0.

3. Send t-connect("TEST_N40_6","1234567890") or t-oneshot through UART0 to make W60X join AP.

4. Send t-udp(1,1001,192.168.1.100) to UART0, and print:

    udp demo,cast:1, port:1001

    localip : 192.168.1.104

    local port :3000

5. Open UDP debugging assistant tools on PC (PC's IP is 192.168.1.100) which is in the same local area network with W60X. Set UDP port number 1001.

6. Send t-sndudp(10) through UART0, the packet capture card will catch the package from W60X to AP with the destination PC net card. At the same time, the debugging assistant tools will receive 10 number of data.

7. Send data from debugging assistant tools. When W60X received the data, the IP and data length will be printed through UART0.

3.4.3  UDP Multicast

1. Enable macro DEMO_UDP and DEMO_CONNECT_NET.

2. Compile, update the new firmware, the corresponding information will be printed in control box through UART0.

3. Send t-connect("TEST_N40_6","1234567890") or t-oneshot through UART0 to make W60X join AP.

4. Send t-udp(2,5100,224.1.2.1) through UART0, and print:

>　udp demo,cast:2, port:5100
>
>　localip : 192.168.1.104
>
>　local port :3000
>
>　setmuticast

5. Open the multicast tools on PC which is in the same local area network with W60X. Add address (multicaset address is 224.1.2.1, port number is 5100) in receive testing box, select the address and click receive button.

6. Send t-sndudp(1024) through UART0, multicast tools display no package has lost.

7. Open TCP debugging assistant tools on PC, set target multicast address 224.1.2.1 and target port number 3000. Send data from debugging assistant tools. When W60X received the data, the IP and data length will be printed through UART0.

## 3.5 **Demo for APSTA**

1. Enable macro DEMO_APSTA.

2. Compile, update the new firmware, the corresponding information will be printed in control console through UART0.

3. Open TCP debugging assistant tools on PC which is in the same local area network with W60X. Enable UDP 65530 port and set hexadecimal display.

4. Send t-apsta("TEST_N40_6","1234567890","softapssid") through UART0.

5. The softap's IP and W60X sta's IP will be printed through UART0. The debugging assistant tools will receive the mac address sent by sta. make another sta join softap as soon as possible, and the mac address sent by sta will be received by UDP's 65530 port.

6. Softap is unencrypted. When mobile joined this softap, the information of equipment on-line will be printed through UART0, and the mobile can ping the sta which has joined the softap.

## 3.6 **Demo for UART1**

1. Enable macro DEMO_ UARTx.

2. Compile, update the new firmware, the corresponding information will be printed in control console through UART0.

3. Send t-uart=(9600,0,0) through UART0 to modify parameters of UART1.

4. The serial port tools should set the baudrate with 9600, the parity with None, the data bit with 8, stop bit with 1. Enable UART1 and send data, the data received by UART1 will be printed.

## 3.7 **Demo for SoftAP**

1. Enable macro DEMO_SOFT_AP.
2. Compile, update the new firmware, the corresponding information will be printed in control console through UART0.
3. Send t-softap("softap1s","1234567890",6,4,1) through UART0.
4. The ap named "softap1s" can be scanned by mobile, after connected with this ap, the mac address of mobile will be printed through UART0.

## 3.8 **Demo for WPS**

Tips: There are 2 programs for this demo, wps should be supported by router.

3.8.1  t-wps-start-pbc
1. Enable macro DEMO_WPS.
2. Compile, update the new firmware, the corresponding information will be printed in control console through UART0.
3. Send t-wps-start-pbc trought UART0, press WPS key of router, waiting for printed information through UART0.
    [CMD]t-wps-start-pbcStart WPS pbc mode ...
    WiFi JOIN SUCCESS
    NET UP OK,Local IP:192.168.1.101
3.8.2  t-wps-start-pin
1. Enable macro DEMO_WPS.
2. Compile, update the new firmware, the corresponding information will be printed in control console through UART0.
3. Send t-wps-get-pin through UART0, the pin number will be printed through UART0 and be stored into W60X.
4. Input pin number to AP, start connecting.
5. Send t-wps-start-pin through UART0, waiting for printed information through UART0.
    [CMD]t-wps-start-pinStart WPS pin mode ...
    WiFi JOIN SUCCESS
    NET UP OK,Local IP:192.168.1.101

3.9 **Demo for GPIO**

Tips: There are 2 program for this demo.

3.9.1    t-gpio (use PB13 and PB14)

1.  Enable macro DEMO_ GPIO；

2.  Compile, update the new firmware, the corresponding information will be printed in control console through UART0.

3.  Send t-gpio through UART0, then print following information:

    gpioB[13] default value==[0]

    gpioB[13] floating high value==[1]

    gpioB[13] floating low value==[0]

    gpioB[13] pulllow high value==[1]

    gpioB[13] pulllow low value==[0]

    gpioB[14] default value==[0]

    gpioB[14]floating high value==[1]

    gpioB[14]floating low value==[0]

    gpioB[14] pulllow high value==[1]

    gpioB[14] pulllow low value==[0]

3.9.2    t-gpioirq (use PA1)

1.  Enable macro DEMO_ GPIO.

2.  Compile, update the new firmware, the corresponding information will be printed in control console through UART0.

3.  Send t-gpioirq through UART0, pull low PA1 and print following information:

    int flag =1

    after int io =0

4.  Pull high PA1, following information will be printed through UART0:

    int flag =1

    after int io =1

3.10 **Demo for FLASH**

1.  Enable macro DEMO_ FLASH.

2.  Compile, update the new firmware, the corresponding information will be printed in control box through UART0.

3.  Send t-flash through UART0, "success" will be printed through UART0.

### 3.11 Demo for Encyption/Decryption

1. Enable macro DEMO_ ENCRYPT；

2. Compile, update the new firmware, the corresponding information will be printed in control console through UART0.

3. Send t-crypt through UART0, and print:

[CMD]t-cryptRNG out:

C4 5F 5E FE A7 E 99 CC 1E 7

RNG out:

14 8F 2E 44 B7 3E 29 29 EE 7C 58 48 E9 C6 6B CC 18 97 52 37

rc4 test success

aes ecb test success

aes cbc test success

aes ctr test success

des ecb test success

des cbc test success

3des ecb test success

3des cbc test success

CRYPTO_CRC_TYPE_8 normal value:0x000000B7

CRYPTO_CRC_TYPE_8 INPUT_REFLECT value:0x000000E2

CRYPTO_CRC_TYPE_8 OUTPUT_REFLECT value:0x000000ED

CRYPTO_CRC_TYPE_8 INPUT_REFLECT | OUTPUT_REFLECT value:0x00000047

CRYPTO_CRC_TYPE_16_MODBUS normal value:0x0000B69B

CRYPTO_CRC_TYPE_16_MODBUS INPUT_REFLECT value:0x0000642A

CRYPTO_CRC_TYPE_16_MODBUS OUTPUT_REFLECT value:0x0000D96D

CRYPTO_CRC_TYPE_16_MODBUS INPUT_REFLECT | OUTPUT_REFLECT value:0x00005426

CRYPTO_CRC_TYPE_16_CCITT normal value:0x00008CC2

CRYPTO_CRC_TYPE_16_CCITT INPUT_REFLECT value:0x00005CA9

CRYPTO_CRC_TYPE_16_CCITT OUTPUT_REFLECT value:0x00004331

CRYPTO_CRC_TYPE_16_CCITT INPUT_REFLECT | OUTPUT_REFLECT value:0x0000953A

CRYPTO_CRC_TYPE_32 normal value:0x3C514E40

CRYPTO_CRC_TYPE_32 INPUT_REFLECT value:0x715268A8

CRYPTO_CRC_TYPE_32 OUTPUT_REFLECT value:0x02728A3C

CRYPTO_CRC_TYPE_32 INPUT_REFLECT | OUTPUT_REFLECT value:0x15164A8E

md5 test success

sha1 test success

### 3.12 **Demo fro RSA**

1.  Enable macro DEMO_ RSA.
2.  Compile, update the new firmware, the corresponding information will be printed in control console through UART0.
3.  Send t-rsa through UART0, and print:

    [CMD]t-rsarsa test start

    rsa128 test sucess

    rsa256 test sucess

    rsa512 test sucess

    rsa1024 test sucess

    rsa2048 test sucess

    rsa test end

### 3.13 **Demo for RTC**

1.  Enable macro DEMO_ RTC；
2.  Compile, update the new firmware, the corresponding information will be printed in control console through UART0.
3.  Send t-rtc through UART0 to start up RTC clock. After 20 seconds, the RTC clock will be printed to indicate RTC interrupt happened.

### 3.14 **Demo for Timer**

1.  Enable macro DEMO_ TIMER.
2.  Compile, update the new firmware, the corresponding information will be printed in control console through UART0.
3.  Send t-timer through UART0 to start up timer, the timer irq will be printed every 2 seconds which indicate timer interrupt happened.

### 3.15 **Demo for PWM**

1.  Enable macro DEMO_ PWM.
2.  Compile, update the new firmware, the corresponding information will be printed in control console through UART0.
3.  Send t-pwm=(1,10000,99,4,0) through UART0. The oscilloscope will detect the waveforms with 10Hz and 39% (99/255) duty cycle from PB17.

4. The first parameter of above command is the channel number. No.0~4 indicates 5 PWM channels from PB18~PB14.

## 3.16 Demo for PMU

Tips: There are 2 program for this demo.

### 3.16.1 t-pmuT0

1. Enable macro DEMO_ PMU.
2. Compile, update the new firmware, the corresponding information will be printed in control console through UART0.
3. Send t-pmuT0 through UART0. Set timer0 as wakeup source and enter standby, the reset will be printed after 10 seconds which indicate the wakeup interrupt of timer0 happened.

### 3.16.2 t-pmuT1

1. Enable macro DEMO_ PMU.
2. Compile, update the new firmware, the corresponding information will be printed in control console through UART0.
3. Send t-pmuT1 through UART0. Set timer1 as wakeup source and enter standby, the reset will be printed after 5 seconds which indicate the wakeup interrupt of timer1 happened.

## 3.17 Demo for NTP

Tips: There are 2 program for this demo.

### 3.17.1 t-ntp

1. Enable macro DEMO_ NTP and DEMO_CONNECT_NET.
2. Compile, update the new firmware, the corresponding information will be printed in control console through UART0.
3. Send t-connect("TEST_N40_6","1234567890") or t-oneshot through UART0 to make W60X join AP.
4. Send t-ntp through UART0 and the current time will be printed.

### 3.17.2 t-setntps

1. Enable macro DEMO_ NTP and DEMO_CONNECT_NET.
2. Compile, update the new firmware, the corresponding information will be printed in control console through UART0.
3. Send t-setntps("120.25.108.11", "ntp.sjtu.edu.cn", "us.pool.ntp.org") through UART0.

Configure ntp server manually.

4. Reset W60X and send t-queryntps through UART0, and print

    [CMD]t-queryntps"120.25.108.11","ntp.sjtu.edu.cn","us.pool.ntp.org"

5. Send t-connect("TEST_N40_6","1234567890") or t-oneshot through UART0 to make W60X join AP.

6. Send t-ntp through UART0 and the current time will be printed.

### 3.18 **Demo for HTTP**

Tips: There are 4 programs for this demo. Tomcat server (place script files) and hfs server should be used.

The hfs server and tomcat server can be downloaded from internet. The hfs server can be used directly. Tomcat server (version 7.0.34 and 8.5.23 have been verigied) should add some script files in it. The detailed process is to replace webapps/TesetWeb by TestWeb supplied by W60X SDK's Doc(such as httpget,httpput and httppost scripts have been realized) Common Steps(3.18.1, 3.18.2, 3.18.3):

1. Enable macro DEMO_HTTP and DEMO_CONNECT_NET

2. Compile, update the new firmware, the corresponding information will be printed in control console through UART0.

3. Send t-connect("TEST_N40_6","1234567890") or t-oneshot through UART0 to make W60X join AP.

4. User make PC join the same AP. Open tomcat server and place test files

### 3.18.1 t-httpget

1. Send t-httpget throught UART0,UART0 will print

    [CMD]t-httpgetLocation: http://192.168.1.100:8080/TestWeb/
    HTTP Client v1.0
    Start to receive data from remote server...
    <html>
    <body>
    <h2>Hello World!</h2>
    <form method="POST" action="/TestWeb/login.do">
     userd: <input id="user" type="text" name="user"/>
     <input type="submit" value="Submit" />
     <div> </div>
    </form>

```
        </body>
        </html>
```

HTTP Client terminated 1000 (got 213 b)

3.18.2  t-httpput

1.  Sent t-httpput=(user=winnermicroput) through UART0,UART0 print

Location: http://192.168.1.100:8080/TestWeb/login_put.do
HTTP Client v1.0
Start to receive data from remote server...

```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=GBK">
<title>Insert title here</title>
</head>
<body>
:winnermicroput
</body>
</html>
```

HTTP Client terminated 1000 (got 277 b)

3.18.3  t-httppost

1.  Send t-httppost =(user=winnermicropost) throught UART0, UART0 print

Location: http://192.168.1.100:8080/TestWeb/login.do
HTTP Client v1.0
Start to receive data from remote server...

```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=GBK">
<title>Insert title here</title>
</head>
<body>
:winnermicropost
</body>
</html>
```

HTTP Client terminated 1000 (got 278 b)

### 3.18.4 t-httpfwup

1. Enable mcaro DEMO_HTTP and DEMO_CONNECT_NET.

2. Compile and update the new firmware, the corresponding information will be printed in control console through UART0.

3. Send t-connect("TEST_N40_6","1234567890") or t-oneshot throught UART0 to make W60X join AP.

4. User make PC(IP:192.168.1.100) join the same AP. Open hfs server, set port 8080 and put upgrade firmware named WM_W600_GZ.img into server directory.

5. Send t-httpfwup=(http://192.168.1.100:8080/WM_W600_GZ.img) through UART0, when upgrading, UART0 will print progress percentage, after download successfully, W60X will reset.

## 3.19 **Demo for I2C**

Tips: In this demo, AT24CXX is used as I2C slave device



1. Enable macro DEMO_ I2C

2. Compile and update the new firmware, the corresponding information will be printed in control console through UART0.

3. Make W60X connected with AT24CXX pin by pin

4. W60X's PB11 to AT24CXX 's SCL, PB12 to SDA, GND to GND,VCC to 3.3v

5. Send t-i2c throught UART0, UART0 print

    [CMD]t-i2c

    AT24CXX check success

    read data is:AT24CXX I2C TEST OK

3.20 **Demo for SSL server**

Tips：This demo needs to enable macro TLS_CONFIG_SERVER_SIDE_SSL, when other demos enabled, disable the macro. This demo needs to download openssl or other tools that can connect to ssl server.

Operation steps:

1. Eanble macro DEMO_ SSL_SERVER and DEMO_CONNECT_NET

2. Compile and update the new firmware, the corresponding information will be printed in control console through UART0.

3. Send t-connect("TEST_N40_6","1234567890") or t-oneshot through UART0 to make W60X join AP(static ip:192.168.1.104).

4. Send t-ssl-server throught UART0, UART0 print

    [CMD]t-ssl-server

    ssl server task

    Listening on port 4433

5. User make PC join the same AP and execute command "openssl s_client –connect 192.168.1.104:4433"

6. After step 5, UART0 print

     accept fd 1

     tls_mem_alloc cp 2001ef88

     tls_ssl_server_handshake rc 0

    cp->time.tv_sec 0

Below figure is to use openssl tool(needs to install) to connect ssl server successfully.

### 3.21 Demo for Web sockets

Tips: There are 2 demos, needs to install WEBSOCKET test server on PC.

3.21.1 Websocket without encryption

1. Eanble macro DEMO_WEBSOCKETS and DEMO_CONNECT_NET, disable macro LWS_USE_SSL.

2. Compile and update the new firmware, the corresponding information will be printed in control console through UART0.

3. Send t-connect("TEST_N40_6","1234567890") or t-oneshot throuth UART0 to make W60X join AP.

4. If using WEBSOCKET_SERVER test server, user should make PC join the same AP and make its IP as 192.168.1.100, and open command line to execute command "websocketd --port=8080 echo_client.bat".

5. Send t-websockets through UART0, UART0 print

  [CMD]t-websocketsCLIENT_ESTABLISHED

  send {"msg_type":"keepalive"} 2

recv:websocket server send

recv:{"msg_type":"keepalive"} 2

3.21.2 Websocket with encryption

1. Enable macro DEMO_ WEBSOCKETS,DEMO_CONNECT_NET and
   LWS_USE_SSL. If using test server, please modify code as the Notice step in C file
   wm_websockets_demo.c（Tips: Only test server needs to care Notice step 3）.
2. Compile and update the new firmware, the corresponding information will be printed in
   control console through UART0.
3. Send t-connect("TEST_N40_6","1234567890") or t-oneshot throught UART0 to make
   W60X join AP.
4. If using WEBSOCKET_SERVER test server, user should make PC join the same AP
   and make its IP as 192.168.1.100, and open command line to execute command"
   websocketd --port=8080 --ssl --sslcert="certificate.pem" --sslkey="key.pem"
   echo_client.bat"
5. Send t-websockets through UART0, UART0 print
       [CMD]t-websocketsCLIENT_ESTABLISHED
       send {"msg_type":"keepalive"} 1
       recv:websocket server send

       recv:{"msg_type":"keepalive"} 1

## 3.22 **Demo for I2S**

Tips：This demo needs two W60X modules, one for master, the other for slave

1. Enable macro DEMO_ I2S
2. Compile and update the new firmware, the corresponding information will be printed in
   control console through UART0
3. Connect Line map between master and slave

| Master Pins | Slave Pins |
|-------------|------------|
| PB8_M_SCL | PB15_S_SCL |
| PB9_M_SDA | PB14_S_SDA |
| PB10_M_RL | PB16_S_RL |
| GND | GND |

4. Send t-i2s=(0,2,44100,16,0,0) throught UART0 to slave W60X and make I2S as interrupt mode

5. Send t-i2s=(0,1,44100,16,0,0) throught UART0 to master W60X and uart0 print send 1024

6. Slave W60X received data with length 1024 and print to UART0

7. Send t-i2s=(0,2,44100,16,0,1) throught UART0 to slave W60X and maks I2S as DMA mode

8. Send t-i2s=(0,1,44100,16,0,1) throught UART0 to master W60X and UART0 print send 1024

9. Slave W60X received data with length 1024 and print to UART0

## 3.23 **Demo for master SPI**

Tips：this demo needs to download slave code

1. Eanble macro DEMO_ MASTER_SPI.

2. Compile and update the new firmware, the corresponding information will be printed in control console through UART0.

3. Open KEIL project at directory STM32_SOC_TEST_SLAVE_SPI\Project\STM32F10x_StdPeriph_Template\MDK-ARM\Project and compiled, download to STM32 board throught jlink.
   Tips:
   STM32 develop board: **STM32_Mini_V2.0**
   STM32 develop boardversion:**STM32F10x_StdPeriph_Template V3.5.0**
   STM32 test code:



4. W60X module PIN connected to stm32(PA9 tx，PA10 rx as print port).

| W60X Pins | STM32 pins |
|-----------|------------|
| PB15 | PB12 (CS) |
| PB16 | PB13(CK) |

| PB17 | PB14(SO) |
|------|----------|
| PB18 | PB15(SI) |
| GND | GND |

5. Send t-mspi-s(1000000,0) through UART0 and send data with length 1500, STM32
   UART print

   down data len: 1500

6. Send t-mspi-r throught UART0,W60X UART0 print

   [CMD]t-mspi-rSPI Master receive 1500 byte, modeA, little endian
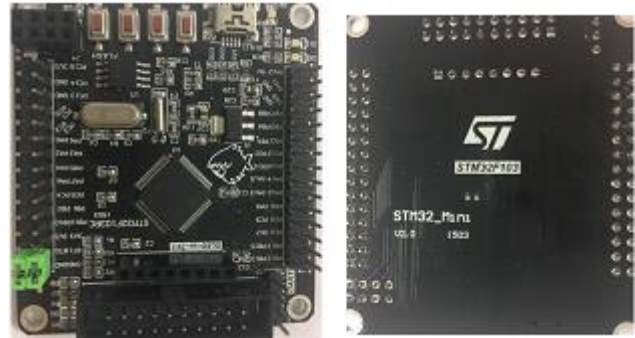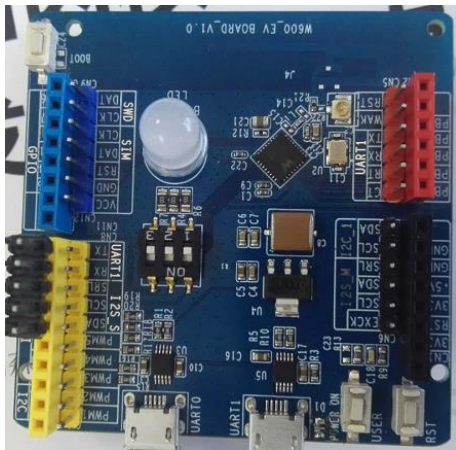
   rcv data len: 1500.

3.24 **Demo for slave SPI**

Tips: This demo needs to download master code.

STM32 develop board type:STM32_Mini_V2.0

W60X need to serial resistance with tens ohm between W600 arduino board and STM32 board.

Below is W600 arduino board (left), stm32 board(right).



1. Enable macro DEMO_ SLAVE_SPI
2. Compile and update the new firmware, the corresponding information will be printed in control console through UART0
3. Open stm32 project(stm32_ucos_ri\uCOSDemo), after compiled, download to stm32 through jlink.
4. W60X module pin to stm32 pin (PA9 tx, PA10 rx as print port).

| W60X Pins | STM32 pins |
|-----------|------------|
| PB15 | PA4 (CS) |

| PB16 | PA5(CK) |
| --- | --- |
| PB17 | PA7(MO) |
| PB18 | PA6(MI) |
| PB14 | PA0(CTS) |
| GND | GND |

5.   Send t-sspi=(0) throught UART0

6.   Reset stm32 board, W60X module UART0 print

      HspiRxCmdCb

      rx[5] :5a 00 05 01 60

      RX ok 100

      RX ok 200

      RX ok 300

7.   Stm32 print

      ###kevin debug ...

      tx start cmd

      kevin debug TX_BUFF_AVAIL = 3, cmdlen=8

      RX ok 100

      RX ok 200

      RX ok 300