



FSC-BW256B programming user guide

Release 2.1

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Chapter 1

Introduction

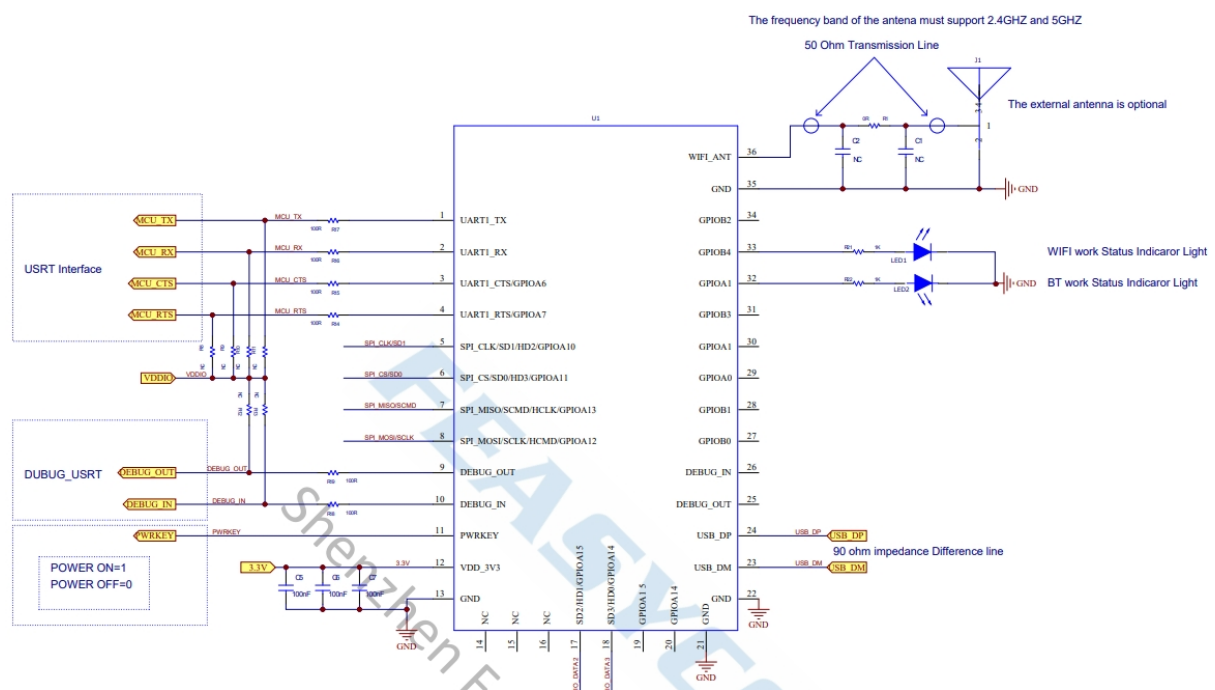
[中文版]

1.1 Description

This design guide is intended for engineers developing BW256B Wi-Fi SOC modules

Hardware description

2.1 Pin diagram



2.2 Pin Description

Pin	Pin Name	Type	Pin Descriptions
1	UART_TX	O	Serial port TX
2	UART_RX	I	Serial port RX
3	UART_CTS	I	Serial port flow control pin(High effective)
4	UART_RTS	O	Serial port flow control pin(High effective)
9	UART_LOG_OUT	O	Module debugging serial port TX
10	UART_LOG_IN	I	Module debugging serial port RX
11	Pwrkey	I/O	power key(software reset pin)
12	VDD_3V3	VDD	3.3V power supply
13	GND	VSS	Ground connection
21	GND	VSS	Ground connection
22	GND	VSS	Ground connection
32	LED0	I/O	Bluetooth is connected to output high
33	LED1	I/O	Wi-Fi is connected to output high level
35	GND	VSS	Ground connection
36	EXT_ANT	ANT	antenna

2.3 Hardware Design Notes

- Simple module testing only needs to connect VDD/GND/UART_RX/UART_TX
- The programming manual provides only a simple description of the IO port. For more detailed instructions and precautions, please refer to the design document
- After drawing the schematic, please send it to Feiyitong for review to avoid the Bluetooth or Wi-Fi distance is not optimal

2.4 Hardware interface

- GPIO
- PWM
- UART

- USB 2.0
- SPI
- SDIO 3.0
- I2S Master/Slave
- Analog Input/Output

2.5 Support Bluetooth protocol

- SPP Client (Serial Port Profile)
- SPP Server (Serial Port Profile)
- GATT Server (Generic Attribute Profile)

2.6 Supports the Wi-Fi protocol

- TCP (Transmission Control Protocol)
- UDP (USER Datagram Protocol)
- HTTP (Hypertext Transfer Protocol)
- HTTPS (Hypertext Transfer Protocol Secure)
- MQTT (Message Queuing Telemetry Transport)
- SSL (Secure Socket Layer)

2.7 Module default parameter

2.7.1 Wi-Fi default Settings

Wi-Fi Mode	STA Mode
Local AP SSID	FSC-BW256B-AP
Local AP Password	12345678
Local AP Channel	1
Local AP IP Address	192.168.1.1

2.7.2 Bluetooth default Settings

BLE Name	FSC-BW256B-LE
BLE Mode	LE-Peripheral
SPP Name	FSC-BW256B
SPP PAIRCODE	0000
SPP COD	0x680

2.7.3 Serial port default Settings

Baudrate	921600bps
Data Bits	8
Parity	None
Stop Bits	1

Chapter 3

Commands Table

3.1 Specification

Applies to the entire document

- {} : Content between {} is optional
- << : Content behind << represents a **COMMAND** from Host
- >> : Content behind >> represents a **RESPONSE/EVENT** to Host

3.2 Instruction format

AT+Command{=Param1{,Param2{,Param3...}}}<CR><LF>

- All commands start with “AT” , end with <CR><LF>
- <CR> means “carriage return” , corresponds to hex value 0x0D
- <LF> means “line feed” , corresponds to hex value 0x0A
- If Command has Parameter, Parameter follows behind ‘=’
- If Command has multiple Parameters, Parameter must be separated by ‘,’
- If Command has Response, Response starts with <CR><LF>, ends with <CR><LF>
- Module will always report command’ s execution result by using **OK** for success or **ERR<code>** for failure

Error Code	Meaning
001	Failed
002	Invalid parameter
003	Invalid state
004	Command mismatch
005	Busy
006	Command not supported
007	Profile not turned on
008	No memory
Others	Reserved for future use

3.3 Event format

<CR><LF>+Indication{=Param1{,Param2{,Param3...}}}<CR><LF>

- All events start with <CR><LF> and end with <CR><LF>
- If the event contains parameters, the parameters should come after “=”
- If the event contains multiple parameters, the parameters should be split with “,”

Example:

Mobile phone sends “1234567890” through GATT

>> +GATTDATA=10,1234567890

3.4 General Commands

3.4.1 AT - Serial port test instruction

Command	AT
Response	OK
Description	Use the AT command to test whether the serial communication is normal

Example:

<< AT

>> OK

3.4.2 AT+VER - Read Firmware Version

Command	AT+VER
Response	+VER=Param1,Param2
Param1	Module type
Param2	Firmware version

Example:

<< AT+VER

>> +VER=FSC-BW256B,V4.4.6

>> OK

3.4.3 AT+BAUD - Read/Write UART Baudrate

Command	AT+BAUD{=Param}
Param	2400/4800/9600/19200/38400/57600/115200/128000/ 230400/256000/460800/512000/921600/1000000/1382400 2000000/3000000/3250000
Response	+BAUD=Param
Param	Returns the currently set baud rate

Example:

Read baud rate

<< AT+BAUD

>> +BAUD=921600

>> OK

Set the baud rate

<< AT+BAUD=115200

>> OK

3.4.4 AT+TPMODE - Read/Write Throughput Mode

Command	AT+TPMODE{=Param}
Param	1:Enable transparent transmission mode 0:Disable transparent transmission mode
Response	+TPMODE=Param
Param	Return to the current transparent transmission mode settings
Description	When the transparent transmission mode is enabled and a TCP, GATT or other connections are established, the serial port of the module will output the original data received from the remote end, and the data received by the serial port of the module will also be directly sent to the remote end. When the transparent transmission mode is turned off, the serial port of the module will only process the received data in any state, and the data received by the module from the remote end will be output in command format from the serial port.

Example:

Read Current Throughput Mode

```
<< AT+TPMODE
```

```
>> +TPMODE=0
```

```
>> OK
```

Enable Throughput Mode

```
<< AT+TPMODE=1
```

```
>> OK
```

3.4.5 AT+REBOOT - Software Reset

Command	AT+REBOOT
Response	OK
Description	The module releases all connections to the remote device and then restarts

Example:

<< AT+REBOOT

>> OK

3.4.6 AT+RESTORE - Restore Factory Setting

Command	AT+RESTORE
Response	OK
Description	Module restore all factory settings then reboot

Example:

<< AT+RESTORE

>> OK

3.4.7 AT+STAT - Read Connection Status

Command	AT+STAT
Response	+STAT=Param1, Param2, Param3, Param4, Param5, Param6, Param7,Param8
Param1	Connection status in WIFI STA mode
Param2	Connection status of the module as TCP server
Param3	Connection status of the module as TCP client
Param4	Connection status of the BLE slave of the module
Param5	Connection status of the module SPP
Param6	Module Connection status of SSL Client
Param7	Module MQTT connection status
Description	0: uninitialized 1: ready 2: connecting 3: connected

Example:Read Current Status

<< AT+STAT

>> +STAT=0,1,3,1,0,0,0

>> OK

3.4.8 AT+NAME - Read/Write Bluetooth BR/EDR name

Command	AT+NAME{=Param1{,Param2}}
Param1	BR/EDR Bluetooth name(1~25 Bytes ASCII)
Param2	MAC address suffix(0/1,default:1) 0-Disable suffix 1-Enable suffix “-XXXX” (lower 4 bytes of MAC address) after local name
Response	+NAME=Param
Description	Set the Bluetooth name if there is a parameter, otherwise just read

Example:

Example Query the BR/EDR Bluetooth name

```
<< AT+NAME
```

```
>> +NAME=FSC-BW256B-XXXX
```

```
>> OK
```

Set the BR/EDR Bluetooth name and turn off the suffix

```
<< AT+NAME=ABC,0
```

```
>> OK
```

Write Bluetooth BLE Name as “ABC” and add MAC address suffix

```
<< AT+NAME/LENAM=ABC,1
```

```
>> OK
```

3.4.9 AT+LENAM - Read/Write Bluetooth BLE Name

Command	AT+LENAM{=Param1{,Param2}}
Param1	BR/EDR Bluetooth name(1~25 Bytes ASCII)
Param2	MAC address suffix(0/1,default:1) 0-Disable suffix 1-Enable suffix “-XXXX” (lower 4 bytes of MAC address) after local name
Response	+LENAM=Param
Description	Set the Bluetooth name if there is a parameter, otherwise just read

Example:

Example Query the BLE Bluetooth name

```
<< AT+LENAM
```

```
>> +LENAM=FSC-BW256B-XXXX
```

```
>> OK
```

Set the BLE Bluetooth name and turn off the suffix

```
<< AT+LENAM=ABC,0
```

```
>> OK
```

Set the BLE Bluetooth name to ABC and automatically add an address suffix

```
<< AT+LENAM=ABC,1
```

```
>> OK
```

3.4.10 AT+DSCA - Disconnect WiFi or Bluetooth connection

Command	AT+DSCA
Response	OK
Description	The module is disconnected from Wifi or Bluetooth

Example:

Disconnect from the AP

```
<< AT+DSCA=1
```

```
>> OK
```

Disconnect from BLE

```
<< AT+DSCA=2
```

```
>> OK
```

3.5 SPP Command

3.5.1 AT+ADDR-Read Bluetooth BR/EDR MAC

Command	AT+ADDR
Response	+ADDR=Param
Param	MAC address of the module Bluetooth BR/EDR(12 Bytes ASCII)
Description	Only Read Supported. Not Support Write

Example:

```
<< AT+ADDR
```

```
>> +ADDR=DC0D300016F4
```

```
>> OK
```

3.5.2 AT+SPPSTAT-Read the SPP status

Command	AT+SPPSTAT
Response	+SPPSTAT=Param
Param	0:Uninitialized 1:Read 2:Connecting 3:Connected
Description	Example Query the SPP connection status

3.5.3 AT+SPPDISC-Disconnects the SPP

Command	AT+SPPDISC
Response	OK
Description	Disconnects the current SPP connection to the remote device

3.5.4 AT+SPPSEND-Sends SPP data

Command	AT+SPPSEND=Param1,Param2
Param1	Length of data to be sent
Param2	The content of the data to be sent
Response	OK:Send complete ERR002:The parameter or format is incorrect ERR003:Bluetooth connection failed
Description	The data length should be less than 1000

Example:

Module sends “123”

<< AT+SPPSEND=3,123

>> OK

3.5.5 AT+SSP-Query/modify the BT pairing mode

Command	AT+SSP{=Param}
Param	0: Easy pairing mode (default) 1: Pairing code mode
Response	OK
Description	

Example:

Displays the pairing mode

<< AT+SSP

>> +SSP=0

>> OK

Is set to pairing code mode

<< AT+SSP=1

>> OK

3.5.6 AT+PIN - Read/Write Bluetooth BLE PIN Code

Command	AT+PIN{=Param}
Param	pairing code
Response	OK
Description	The default pairing code is 0000. The value contains a maximum of 15 characters and is valid only in pairing code mode, that is, SSP=1

Example:

Displays the BT pairing code

```
<< AT+PIN
```

```
>> +PIN=0000
```

```
>> OK
```

Set the pairing code to 12345678

```
<< AT+PIN=12345678
```

```
>> OK
```

3.5.7 AT+COD - Read/Write the BT device type

Command	AT+COD{=Param}
Param	Device type (hexadecimal)
Response	OK
Description	Default printer (0x680)

Example:

Read the Bluetooth device type

<< AT+COD

>> +COD=680

>> OK

Change the Bluetooth device type to HeadPhone(0x418)

<< AT+COD=418

>> OK

3.6 BLE Command

3.6.1 AT+LEADDR - Read the Bluetooth BLE MAC

Command	AT+LEADDR
Response	+LEADDR=Param
Param	Module' s BLE MAC address (12 Bytes ASCII)
Description	Only Read Supported

Example:

<< AT+LEADDR

>> +LEADDR=DD0D300016F4

>> OK

3.6.2 AT+GATTSEND - Send BLE Data in Peripheral Mode

Command	AT+GATTSEND=Param1,Param2
Param1	Length of data to be sent
Param2	Content of data to be sent
Response	OK:Send complete ERR002:The parameter or format is incorrect ERR003:The Bluetooth connection is down
Description	The data length should be less than 1000

Example:

Send “123” to remote BLE Device

<< AT+GATTSEND=3,123

>> OK

3.6.3 AT+GATTSTAT - Read the BLE connection status

Command	AT+GATTSTAT
Response	+GATTSTAT=Param
Param	0: uninitialized 1: ready 2: connecting 3: connected
Description	

Example:

Displays the BLE connection status

```
<< AT+GATTSTAT
```

```
>> +GATTSTAT=3
```

```
>> OK
```

3.6.4 AT+ADVDATA-Query/Modify BLE Broadcast Data

Command	AT+ADVDATA=Param
Param	BLE broadcast content
Response	OK: Send complete ERR002:The parameter or format is incorrect
Description	Data length should be less than 31 bytes

Example:

Change BLE broadcast content

```
<< AT+ADVDATA=1234
```

```
>> OK
```

Query BLE broadcast data, return as hexadecimal.

```
>> +ADVDATA=31323334
```

```
>> OK
```

3.6.5 AT+ADVCLR-Restore default BLE broadcast data

Command	AT+ADVCLR
Response	OK: Send complete
Description	

Example:

Restore default BLE broadcast data

```
<< AT+ADVCLR
```

```
>> OK
```

3.7 Wi-Fi Command

3.7.1 AT+ROLE - Read/Write Wi-Fi Mode

Command	AT+ROLE{=Param}
Param	1: STA mode 2: AP mode
Response	+ROLE=Param
Description	Module will reboot after setting

Example:

Read Current Wi-Fi Mode

```
<< AT+ROLE
```

```
>> +MODE=1
```

```
>> OK
```

Example:

Write AP Mode

```
<< AT+MODE=2
```

```
>> OK
```

3.7.2 AT+SCAN - Scan Devices

Command	AT+SCAN=5(scan for surrounding hot spots)
Response	+SCAN=Param1,Param2,Param3,Param4,Param5,Param6
Param1	Scan serial number
Param2	has a fixed value of 5, indicating the scanning hotspot
Param3	Address code of the hotspot
Param4	Indicates the signal value between the module and the hotspot
Param5	Channels
Param6	Indicates the hotspot name
Description	

Example:

Scan for surrounding hot spots

```
<< AT+SCAN=5
```

```
>> +SCAN=1,5,F0B4292428F0,-42,11,Feasycom_D710_2.4G
```

```
>> +SCAN=2,5,F0B4292428F1,-44,153,Feasycom_D710_5G
```

```
>> +SCAN=3,5,98BB991F6B45,-48,13,GOCLOUD_1F6B46
```

3.7.3 AT+RAP - Read Connected AP' s information/Connect to Remote AP

Command	AT+RAP=<Param1>,<Param2>
Param1	AP' s SSID
Param2	AP' s password,if way of encryption is OPEN, no need to set this parameter
Response	OK
Description	1. This command needs to be sent in STA mode or coexistence mode, that is, +ROLE=1 or 3 2. The module uses WPA2 encryption to connect to the hotspot by default 3. To connect to the hotspot whose encryption mode is OPEN, set the first parameter, for example AT+RAP=Feasycom 4. Send AT+RAP to query the hotspot name

Example:

Indicates the hot spot whose name is test and password is 12345678

```
<< AT+RAP=test,12345678
```

```
>> OK
```

Queries the current hotspot

```
<< AT+RAP
```

```
>> +RAP=test,12345678
```

```
>> OK
```

Connect to the test hotspot without a password

```
<< AT+RAP=test
```

```
>> OK
```

3.7.4 AT+CAP-Clear hotspot information

Command	AT+CAP
Response	OK
Description	It will only clear the current connection hotspot information, it will not disconnect actively, and will not connect again next time you reboot.

Example:

<< AT+CAP

>> OK

3.7.5 AT+LIP - Read Current Local IP Address

Command	AT+LIP
Response	+LIP=Param
Param	IP address
Description	When the module successfully connects to the hotspot, it will get an IP address, otherwise "0.0.0.0" is returned

Example

Queries the IP address of the current module

<< AT+LIP

<< +LIP=192.168.1.100

>> OK

3.7.6 AT+MDNSEN - Enable/Disable MDNS Function

Command	AT+MDNSEN{=Param}
Param	0:Disable(default) 1:Enables
Response	+MDNSEN=Param

Example:

Read Whether mDNS Function is Enabled

```
<< AT+MDNSEN
```

```
>> +MDNSEN=0
```

```
>> OK
```

Enable mDNS Function

```
<< AT+MDNSEN=1
```

```
>> OK
```

3.7.7 AT+DHCP - Read/Write IP Distribution Mode

Command	AT+DHCP{=Param}
Param	0:Use static IP 1:Use dynamic IP(default)
Response	+DHCP=Param
Description	If a static IP address is used for connection, ensure that the static IP address, mask, gateway, and DNS Settings are correct. Otherwise, network communication may be interrupted

Example:

Read IP Distribution Mode

<< AT+DHCP

>> +DHCP=1

>> OK

Use static IP

<< AT+DHCP=0

>> OK

3.7.8 AT+SIP - Read/Write Static IP

Command	AT+SIP{=Param}
Param	IPV4 Address
Response	+SIP=Param
Description	This command can be used when +DHCP=0

Example:

Read Static IP Address

<< AT+SIP

>> +SIP=0.0.0.0

>> OK

Write Static IP Address as “192.168.0.23”

<< AT+SIP=192.168.0.23

>> OK

3.7.9 AT+GW - Read/Write Gateway

Command	AT+GW{=Param}
Param	IPV4 Address
Response	+GW=Param
Description	This command can be used when +DHCP=0

Example:

Read Gateway Address

<< AT+GW

>> +GW=192.168.1.1

>> OK

Write Gateway Address as “192.168.10.1”

<< AT+GW=192.168.10.1

>> OK

3.7.10 AT+MASK - Read/Write Subnet Mask

Command	AT+MASK{=Param}
Param	IPV4 Address
Response	+MASK=Param
Description	This command can be used when +DHCP=0

Example:

Read Subnet Mask

```
<< AT+MASK
```

```
>> +MASK=255.255.0.0
```

```
>> OK
```

Write Subnet Mask as “255.255.255.0”

```
<< AT+MASK=255.255.255.0
```

```
>> OK
```

3.7.11 AT+DNS - Read/Write DNS Address

Command	AT+DNS{=Param}
Param	IPV4 Address
Response	+DNS=Param
Description	This command can be used when +DHCP=0

Example:

Read DNS

```
<< AT+DNS
```

```
>> +DNS=0.0.0.0
```

```
>> OK
```

Write DNS Address as “8.8.8.8”

```
<< AT+DNS=8.8.8.8
```

>> OK

3.7.12 AT+LHNAME - Read/Write the STA name

Command	AT+LHNAME{=Param}
Param	Device name (up to 32 bytes)
Response	+LHNAME=Param
Description	FSC-BW256B(Default)

Example:

Read the STA device name of the module

<< AT+LHNAME

>> +LHNAME=FSC-BW256B

>> OK

Write STA device name is my_test

<< AT+LHNAME=my_test

>> OK

3.7.13 AT+APAC - Read/Write Automatically Connect to AP

Command	AT+APAC{=Param}
Param	0:Disable 1:Enable(default)
Response	+APAC=Param
Description	This command can be used when +ROLE=1 or 3

Example:

Read Whether Automatically Connect to AP Function is Enabled

<< AT+APAC

>> +APAC=1

>> OK

Enable Automatically Connect to AP Function

<< AT+APAC=1

>> OK

3.7.14 AT+RSSI - Read Signal Strength Between Module And AP

Command	AT+RSSI
Response	+RSSI=Param
Param	RSSI value (-99 ~ 0)
Description	The result of RSSI is 0 when disconnect from AP.

Example:

Read RSSI

<< AT+RSSI

>> +RSSI=-56

>> OK

3.7.15 AT+MAC - Read Wi-Fi MAC Address

Command	AT+MAC
Response	+MAC=Param
Param	Wi-Fi MAC Address(12 Bytes ASCII)
Description	MAC address can only be read , not be written

Example:

```
<< AT+MAC
>> +MAC=DC0D30800204
>> OK
```

3.7.16 AT+APINFO - Read information about connected AP

Command	AT+APINFO
Response	+APINFO=Param1,Param2,Param3,Param4
Param1	AP MAC address (12 Bytes ASCII)
Param2	1: 5G 0: 2.4G
Param3	The frequency band of AP
Param4	Indicates the SSID of AP
Description	Read can only be made if the hotspot is connected

Example:

```
<< AT+APINFO
>> +APINFO=B4F02429F128,1,5765,Feasycom_D710_5G
>> OK
```

3.7.17 AT+LAP - 查询/设置 AP 模式参数

Command	AT+LAP{=Param1,Param2,Param3}
Param1	The SSID of the module as a AP
Param2	The password of the module as a AP
Param3	The IP address of the module as a AP
Response	+LAP=Param1, Param2, Param3
Description	If the module is configured as a AP with OPEN encryption, no need to set the Param2, such as AT+LAP=FSC-BW256B-AP,192.168.1.1

Example:

Read AP Mode Configuration

<< AT+LAP

>> +LAP=FSC-BW236-AP,12345678,192.168.1.1

>> OK

Write AP Mode Configuration

<< AT+LAP=test,12345678,192.168.10.1

>> OK

3.7.18 AT+CHANNEL - Read/Write the AP mode channel

Command	AT+CHANNEL{=Param}
Param	module as a channel in AP mode
Response	+CHANNEL=Param
Description	Module will decide whether to turn on 2.4G or 5G hotspot based on channel selection

Example:

Read the AP mode channel

```
<< AT+CHANNEL
```

```
>> +CHANNEL=1
```

```
>> OK
```

Write the AP mode channel

```
<< AT+CHANNEL=157
```

```
>> OK
```

3.7.19 AT+WLANC - Start SOCKET/MQTT/WEBSOCKET

Command	AT+WLANC=Param
Param	3:Enable TCP/UDP/SSL 4:Connect to MQTT or cloud platform 5:Starts the WEBSOCKET
Response	OK
Description	This command can only be used after the SOCKET or MQTT configuration is completed

3.8 TCP/UDP Command

3.8.1 AT+SOCK - Read/Write SOCKET

Command	AT+SOCK{=Param1,Param2,Param3,Param4} Param4}
Param1	Protocol Type(TCPS,TCPC,UDP,SSL)
Param2	Port of Module
Param3	Remote Address
Param4	Remote Port
Response	+SOCK=Param1, Param2, Param3, Param4
Description	The TCP SERVER is enabled after power on, default port is 9100 Param3 and Param4 can be omitted if module works as a TCP Server or a UDP

Example:

Read SOCKET Configuration

```
<< AT+SOCK
```

```
>> +SOCK=TCPS,9100,0.0.0.0,0
```

```
>> OK
```

Module works as **TCP Server**, local port is 8080

```
<< AT+SOCK=TCPS,8080
```

```
>> OK
```

Module works as **TCP client**, local port is 8080,remote server address is “192.168.0.224”
,remote server port is 6000

```
<< AT+SOCK=TCPC,8080,192.168.0.224,6000
```

```
>> OK
```

Module works as **UDP**,local port is 4000

```
<< AT+SOCK=UDP,4000
```

```
>> OK
```

3.8.2 AT+MAXCON - Queries and sets the maximum number of Clients allowed to connect in TCP Server mode.

Command	AT+MAXCON=Param
Param	Maximum number of Clients allowed (default 3, range 1~6)
Response	OK
Description	This command setting affects the ID setting of the AT+WFSSEND send and the ID on the +WFDATA return

Example:

Send the maximum connect number is 3

<< AT+MAXCON=3

>> OK

Queries the maximum number of connections to a TCP server

<< AT+MAXCON

>> MAXCON=3

>> OK

3.8.3 AT+WFSEND - Sends SOCKET data to the remote device

Command	AT+WFSEND=Param1,Param2,Param3
Param1	Indicates the ID of the TCP/UDP connection
Param2	Send data length (not more than 1460 bytes)
Param3	Sends data content
Response	OK
Description	The overall length of the instruction does not exceed 2k bytes When the module functions as the TCP server, it can be connected by a maximum of three remote clients by default. The ids of the three remote clients are 0, 1, and 2 respectively; When a module functions as a TCP client, the communication ID is 3 by default; When UDP is enabled on the module, the communication ID is 4 by default.

Example:

Sends data to the TCP Client

```
<< AT+WFSEND=0,3,123
```

```
>> OK
```

Sends data to the TCP Server

```
<< AT+WFSEND=3,3,123
```

```
>> OK
```

Sends data to UDP

```
<< AT+WFSEND=4,3,123
```

```
>> OK
```

3.8.4 AT+SSLSEND - Send SSL data to the remote server

Command	AT+SSLSEND=Param1,Param2
Param1	Send Data Length
Param2	Send Data Content
Response	OK
Description	The length of the instruction does not exceed 2k bytes

Example:

After connecting to httpbin.org, get data via GET method

```
<< AT+SSLSEND=40,GET /get HTTP/1.1\r\nHost: httpbin.org\r\n\r\n
```

```
>> (return page content)
```

3.8.5 AT+CLOSE - Close Connection as TCP client

Command	AT+CLOSE
Response	OK
Description	This command can be used to disconnect from a remote TCP Server ,if module works as a TCP Client

Example:

```
<< AT+CLOSE
```

```
>> OK
```

3.8.6 AT+IDLETO - Read/Write the automatic disconnection time of TCP Server short connections without data

Command	AT+IDLETO{=Param}
Param1	Short connection Duration of automatic disconnection without data (unit s, default is 0, that is, long connection)
Response	OK
Description	

Example:

Read the automatic disconnection time without data for the short connection of the module

```
<< AT+IDLETO
```

```
>> +IDLETO=0
```

```
>> OK
```

Write the time for automatically disconnecting the module without data short connection to 5 seconds

```
<< AT+IDLETO=5
```

```
>> OK
```

3.8.7 AT+BRDDATA - Read/Write UDP broadcast data

Command	AT+BRDDATA{=Param1,Param2,Param3}
Param1	UDP broadcast port
Param2	UDP broadcast interval (unit s)
Param3	UDP Broadcast content (up to 128 bytes)
Response	OK
Description	

Example:

Read UDP broadcast data

```
<< AT+BRDDATA
```

```
>> +BRDDATA=6000,5,
```

```
>> OK
```

Read the time for automatically disconnecting the module without data short connection to 5 seconds

```
<< AT+BRDDATA=6000,5,hello world
```

```
>> OK
```

3.8.8 AT+BRDEN - Read/Write the UDP broadcast switch

Command	AT+BRDEN{=Param}
Param	0: Disables UDP broadcast, 1: Enables UDP broadcast
Response	OK
Description	

Example:

Read the UDP broadcast switch

```
<< AT+BRDEN
```

```
>> +BRDEN=0
```

```
>> OK
```

Enable UDP broadcast

```
<< AT+BRDEN=1
```

```
>> OK
```

3.9 HTTP Command

3.9.1 AT+HTTP - Access the HTTP server

Command	AT+HTTP=Param1,Param2,Param3{,Param4}
Param1	HTTP Request Method, only support GET and POST
Param2	HTTP server' s address
Param3	HTTP server' s URI
Param4	Resume breakpoint to support This Parameter can be omitted. Format is “Range:bytes=starting byte-ending byte”
Response	OK
Description	AT+HTTP Used to access the HTTP server. If you need to access the HTTPS server, use the AT+HTTPS command instead The default port for accessing the HTTP server is 80, and the default port for accessing the HTTPS server is 443. If you want to change the port, specify the port following the server address. For example, if the specified port is 778, 192.168.0.179:778 can be used

Example:

Access Github,and read all the data

```
<< AT+HTTP=GET,www.github.com,/
```

```
>> OK
```

```
>> {Data Content}
```

Access Github,and read bytes from the 3rd to the 10th

```
<< AT+HTTP=GET,www.github.com/,Range:bytes=3-10
```

```
>> OK
```

```
>> {Data Content}
```

Access HTTPS Server with port **778** to download file named “**test.bin**” in the “**OTA**” directory

```
<< AT+HTTPS=GET,192.168.0.179:778,/OTA/test.bin
```

```
>> OK
```

```
>> {Data Content}
```

POST param1=test_data1¶m2=test_data2 to <http://httpbin.org/post>

```
<< AT+HTTP=POST,httpbin.org,/post,param1=test_data1&param2=test_data2
```

```
>> OK
```

```
>> {Data Content}
```

Note:

- “<http://httpbin.org>” is available for testing **HTTP**
-

3.10 MQTT Command

3.10.1 AT+BROKER - Read/Write MQTT broker

Command	AT+BROKER{=Param}
Param	MQTT server address
Response	+BROKER=Param
Description	“gpssensor.ddns.net” is available for testing MQTT

Example:

Read MQTT broker

```
<< AT+BROKER
```

```
>> +BROKER=gpssensor.ddns.net
```

```
>> OK
```

Write MQTT broker

```
<< AT+BROKER=gpssensor.ddns.net
```

```
>> OK
```

3.10.2 AT+CLIENTID - Read/Write MQTT Client ID

Command	AT+CLIENTID{=Param}
Param	MQTT Client ID
Response	+CLIENTID=Param

Example:

Read MQTT Client ID

```
<< AT+CLIENTID
```

```
>> +CLIENTID=user
```

```
>> OK
```

Write MQTT Client ID

```
<< AT+CLIENTID=447a74ab3e60494e8c97dad36b00399b
```

```
>> OK
```

3.10.3 AT+USERNAME - Read/Write MQTT USERNAME

Command	AT+USERNAME{=Param}
Param	MQTT USERNAME
Response	+USERNAME=Param

Example:

Read MQTT USERNAME

```
<< AT+USERNAME
```

```
>> +USERNAME=admin
```

```
>> OK
```

Write MQTT USERNAME

```
<< AT+USERNAME=admin
```

```
>> OK
```

3.10.4 AT+MQTTPWD - Read/Write MQTT password

Command	AT+MQTTPWD{=Param}
Param	MQTT MQTTPWD
Response	+MQTTPWD=Param

Example:

Read MQTT password

```
<< AT+MQTTPWD
```

```
>> +MQTTPWD=12345678
```

```
>> OK
```

Write MQTT password

```
<< AT+MQTTPWD=12345678
```

```
>> OK
```

3.10.5 AT+SUBTPC - Read/Subscribe MQTT Topic

Command	AT+SUBTPC{=Param1,Param2}
Param1	Topic
Param2	QOS, only can be 0,1,2
Response	+SUBTPC=Param1,Param2

Example:

Read MQTT TOPIC

```
<< AT+SUBTPC
```

```
>> +SUBTPC=/fsc/bw236/get,0
```

```
>> OK
```

Write MQTT TOPIC

```
<< AT+SUBTPC=/fsc/bw236/test,2
```

```
>> OK
```

Note:

- This command returns an error if you repeatedly subscribe to the TOPIC with the same name
 - Currently, you can subscribe to a maximum of 5 different topics. If you do not meet the usage requirements, you are advised to use wildcard characters in actual use
-

3.10.6 AT+UNSUBTPC - Unsubscribe Specify MQTT Topic

Command	AT+UNSUBTPC=Param
Param	Specify the topic to be unsubscribed
Response	OK
Description	There is no need to specify a QoS value when unsubscribes

Example:

```
<< AT+UNSUBTPC=/fsc/bw236/get
```

```
>> OK
```

3.10.7 AT+UNSUBALL - Unsubscribe from all MQTT topics

Command	AT+UNSUBALL
Response	OK

Example:

```
<< AT+UNSUBALL
```

```
>> OK
```

3.10.8 AT+MQTTSEND - Send MQTT Data

Command	AT+MQTTSEND=Param1,Param2,Param3,Param4
Param1	Publish Topic
Param2	QOS(0,1,2)
Param3	Payload length
Param4	Payload
Response	OK

Example:

```
<< AT+MQTTSEND=fsc/bw236/get,0,3,abc
```

```
>> OK
```

3.10.9 AT+MQTTMODE - Read/Write MQTT Mode

Command	AT+MQTTMODE{=Param}
Param	0: Connect to general MQTT Server(default) 1: Connect to Ali Cloud Platform 2: Connect to QCloud Platform(Tencent)
Response	OK
Description	Module connects to different cloud platforms by switching MQTT modes

Example:

```
<< AT+MQTTMODE
>> +MQTTMODE=0
>> OK
```

3.10.10 AT+MQTTPORT - Read/Write MQTT Port

Command	AT+MQTTPORT{=Param}
Param	MQTT port, default is 1883
Response	+MQTTPORT=Param
Description	Based on the actual server port

Example:

Read MQTT Port

```
<< AT+MQTTPORT
>> +MQTTPORT=1883
>> OK
```

Write MQTT Port as 8883

```
<< AT+MQTTPORT=8883
```

```
>> OK
```

3.10.11 AT+MQTTKAI - Read/Write MQTT Keepalive

Command	AT+MQTTKAI{=Param}
Param	MQTT Keepalive time:uint is second,default value is 60
Response	+MQTTKAI=Param

Example:

Read MQTT Keepalive

```
<< AT+MQTTKAI
```

```
>> +MQTTKAI=60
```

```
>> OK
```

Write MQTT Keepalive as 300 seconds

```
<< AT+MQTTKAI=300
```

```
>> OK
```

Note:

- Set the value based on the actual platform usage restrictions.
- General platforms, such as Alicloud, require an MQTT keepalive period of 30 to 1200 seconds
- If module is disconnected unexpectedly more than {keepalive period * 1.5}, the MQTT server will automatically disconnect module

3.11 Firmware Upgrade (Remote OTA)

3.11.1 AT+OTA - Remote OTA

Command	AT+OTA=Param
Param	Name of the firmware to be upgraded
Response	OK
Description	The firmware name is provided by feasycom engineering or technical support team members. The module will return \$OTA=1 after a successful upgrade

Example:

```
<< AT+OTA=Feasycom_V426
```

```
>> OK
```

```
>> $OTA=1
```

Note:

- Do not operate other commands or functions during the upgrade. Otherwise, the upgrade may fail or cause unexpected situations
-

Chapter 4

Events Table

4.1 MQTT Indication

4.1.1 +MQTTSTAT - MQTT Status

Format	+MQTTSTAT=Param
Param	(0) uninitialized (1) ready (2) connecting (3) connected

4.1.2 +MQTTDATA - MQTT Received Data

Format	+MQTTDATA=Param1,Param2,Param3
Param1	Topic
Param2	Payload length
Param3	Payload

Example: Receive data “1234567890” from MQTT Server

```
>> +MQTTDATA=/fsc/bw236/get,10,1234567890
```

4.2 SSL Indication

4.2.1 +SSLDATA - SSL Receive Data

Format	+SSLDATA=Param1,Param2
Param1	Payload length
Param2	Payload

Example: Receive data “1234567890” from SSL Client

```
>> +SSLDATA=10,1234567890
```

4.3 STA mode connection status indication

4.3.1 +WLANSTAT - STA mode connection status

Format	+WLANSTAT=Param
Param	(0) 未初始化 (1) 未连接 (2) 连接中 (3) 已连接

Example: STA connect WiFi successfully

```
>> +WLANSTAT=3
```

4.4 SOCKET Indication

4.4.1 +WFDATA - Receive SOCKET Data

Format	+WFDATA=Param1,Param2,Param3
Param1	TCP/UDP Connection ID
Param2	Payload length
Param3	Payload

Example: Receive data “1234567890” from remote **SOCKET** device

```
>> +WFDATA=5,10,1234567890
```

Note:

- For details about the connection ID, see the **AT+WFSEND** command

4.5 GATT Indication

4.5.1 +GATTSTAT - GATT Status

Format	+GATTSTAT=Param
Param	(0) uninitialized (1) ready (2) connecting (3) connected

4.5.2 +GATTDATA - Receive GATT Data

Format	+GATTDATA=Param1,Param2
Param1	Payload length
Param2	Payload

Example: Receive GATT data “1234567890” from remote device

>> +GATTDATA=10,1234567890

4.6 SPP indication

4.6.1 +SPPSTAT - SPP status

Format	+SPPSTAT=Param
Param	(0) Uninitialized (1) No connection (2) Connecting (3) Connected

4.6.2 +SPPDATA - SPP receives data

Format	+SPPDATA=Param1,Param2
Param1	Payload length
Param2	Payload

Example: Data received from remote device via SPP “1234567890”

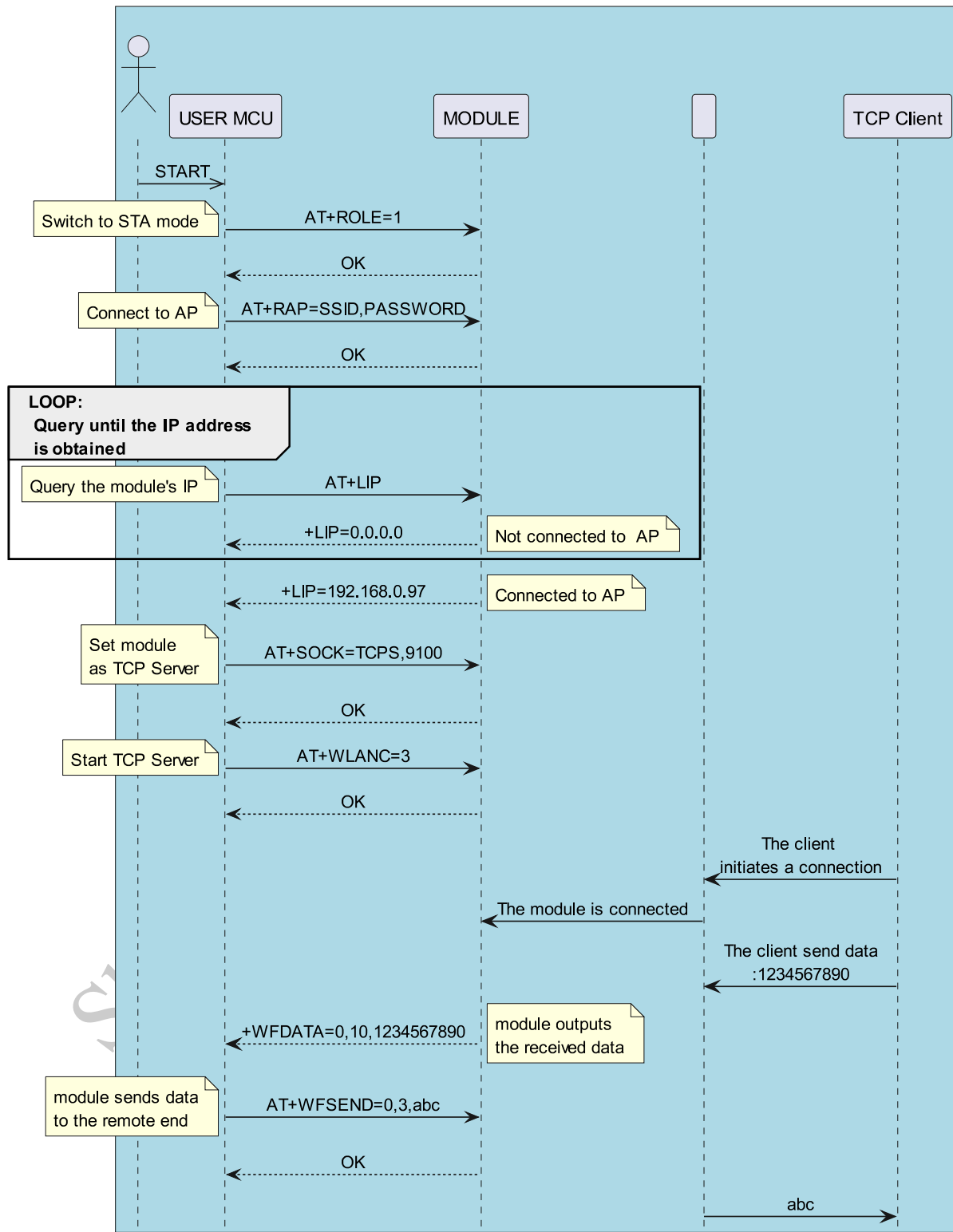
>> +SPPDATA=10,1234567890

Chapter 5

Application Scenarios

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5.1 TCP Server Application



1、 Switch to STA mode

Send: <<AT+ROLE=1

Response: >> OK

2、 Connect to AP

Send: << AT+RAP=ssid,password

Response: > OK

3. Query module IP address :

Send: << AT+LIP

Response: >> +LIP=192.168.0.97

>> OK

4、 Set the module to TCP server and port number to 9100

Send: << AT+SOCK=TCPS,9100

Response: >> OK

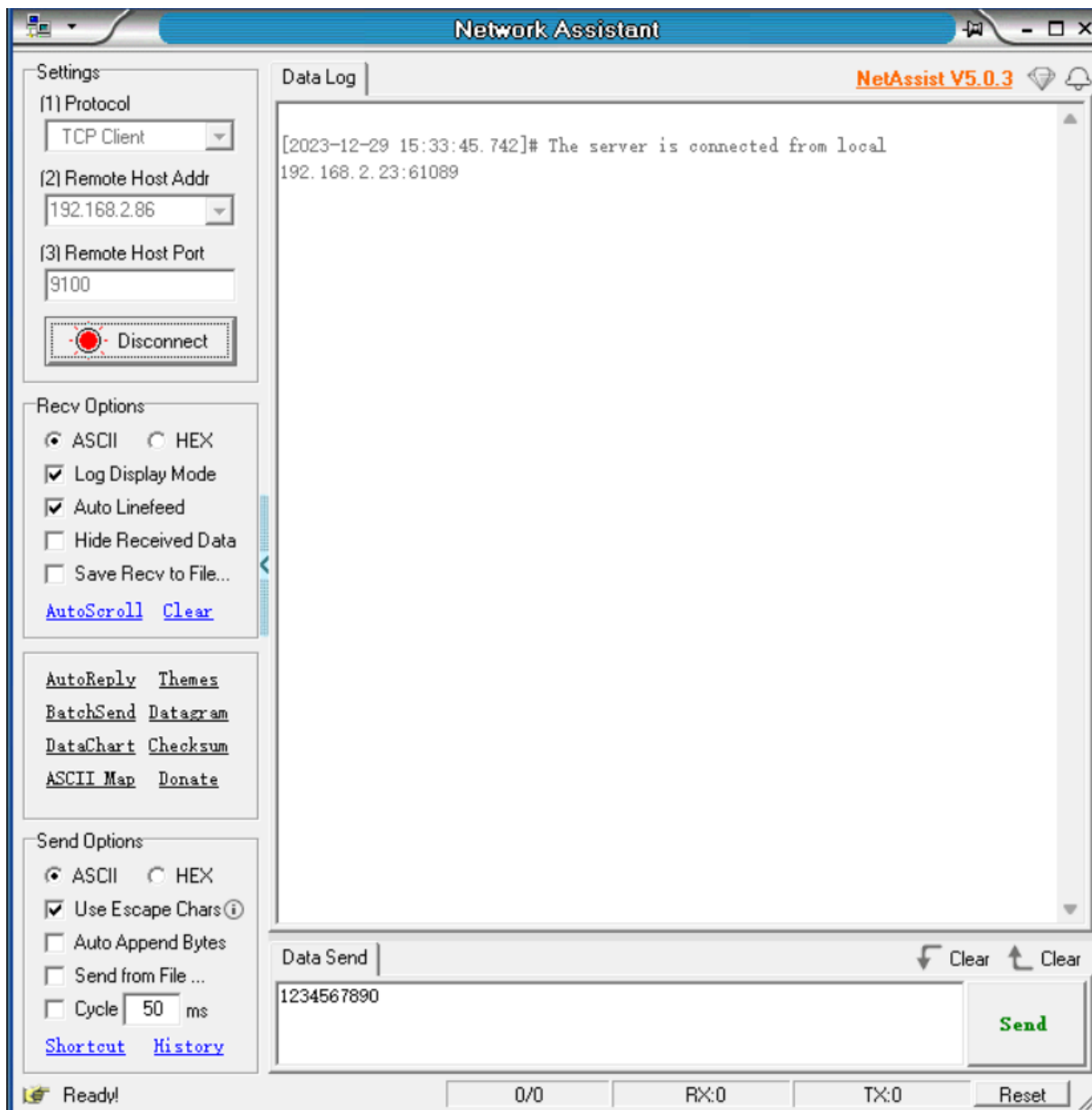
5、 Module create TCP server

Send: << AT+WLANC=3

Response: >> OK

6、 The PC and the module are connected to the same hotspot. Use the network debugging tool on the PC to connect to the TCP client

Connector module



7、Receive data

<< +WFDATA=0,10,1234567890

<< +WFDATA=1,10,1234567890

<< +WFDATA=2,10,1234567890

8、Send data

Send: << AT+WFSEND=0,3,abc

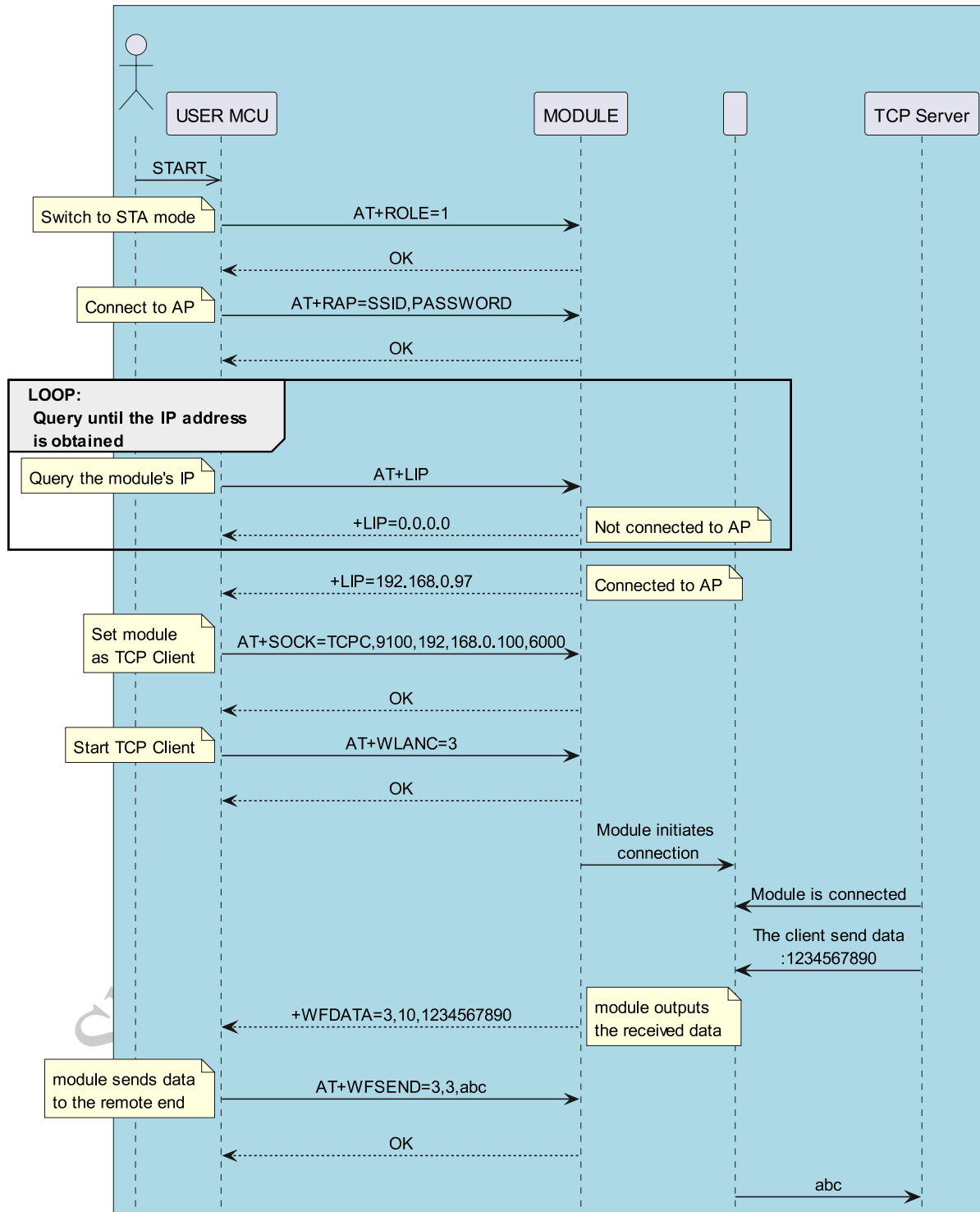
Response: << OK

Note:

- **Note:** To use transparent data transmission, send AT+TPMODE=1 before setting the Wi-Fi mode
-

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5.2 TCP Client Application



1. Switch to STA mode

Send:<< AT+ROLE=1

Response:>> OK

2、 Connect to AP

Send:<< AT+RAP=ssid,password

Response:>> OK

3、 Query the module IP address

Send:<< AT+LIP

Response:>> +LIP=192.168.0.97

>> OK

4、 PC and module connected to the same hotspot, using the network debugging tool on the PC,

Create a TCP server, for example, the IP address is 192.168.0.79 and the port number is 8080

5、 Set the module as TCP client and configure the remote IP address and port number

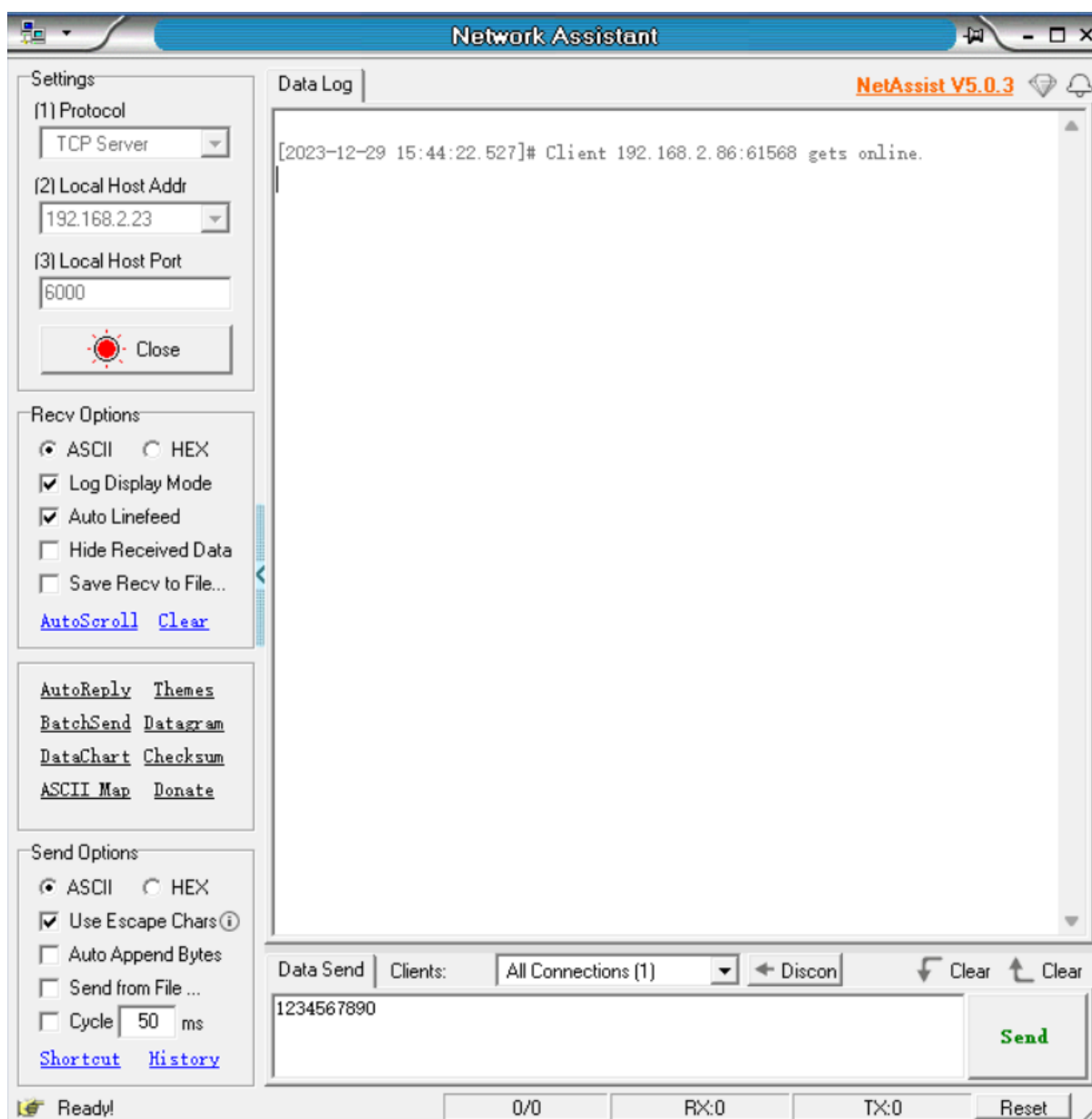
Send:<< AT+SOCK=TCPC,9100,192.168.0.79,8080

Response:>> OK

6、 The module functions as a TCP client to initiate a connection to the remote end

Send:<< AT+WLANC=3

Response:>> OK



7、Received data

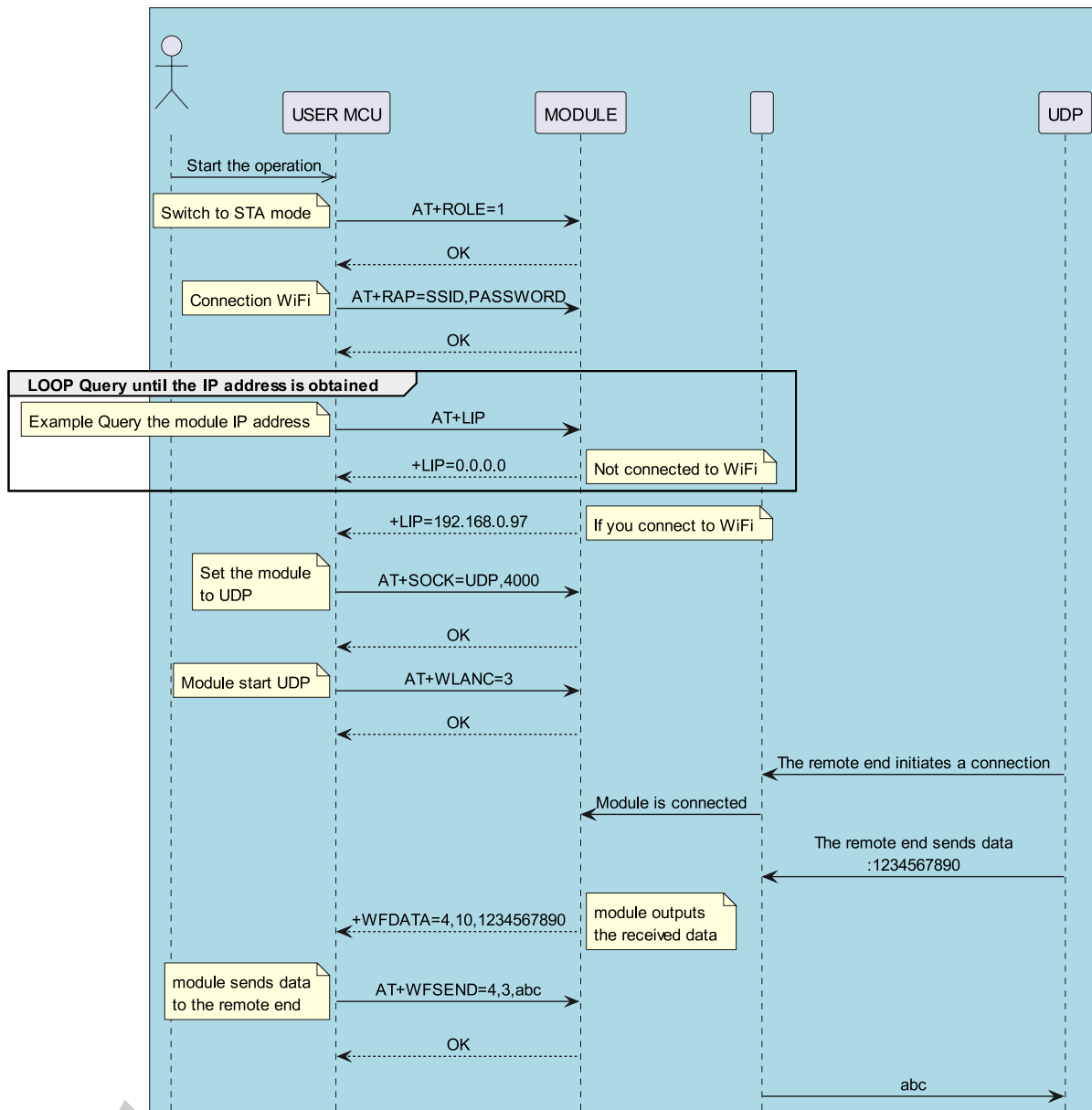
Send:<< +WFDATA=3,10,1234567890

Response:<< OK

Note:

- **Note:** To use transparent data transmission, send AT+TPMODE=1 before setting the Wi-Fi mode

5.3 UDP application



1. Switch to STA mode

Send:<< AT+ROLE=1

Respond:>> OK

2. Connect to AP

Send:<< AT+RAP=ssid,password

Respond:>> OK

3、 Query the IP address to check whether AP is connected

Send:<< AT+LIP

Respond:>> +LIP=192.168.0.97 >> OK

4、 Configure the module as UDP

Send:<< AT+SOCK=UDP,4000

Respond:>> OK

5、 The module enables the UDP Server

Send:<< AT+WLANC=3

Respond:>> OK

6.The PC and the module are connected to the same hotspot. On the PC, use the network debugging tool to open a UDP

Client, the target IP address is 192.168.0.97, and the target port number is 4000.

7、 Received data

<< +WFDATA=4,10,1234567890

8. Send data

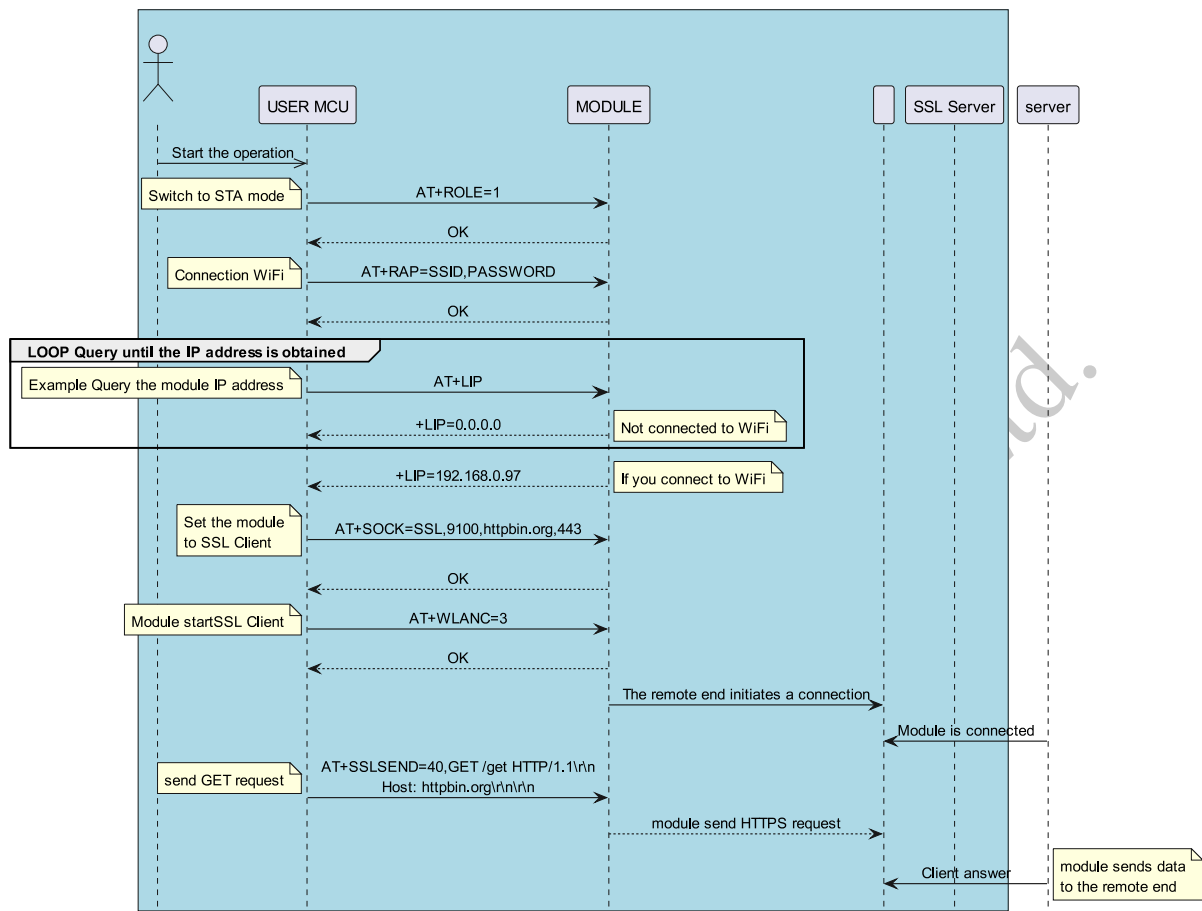
Send:<< AT+WFSEND=4,3,abc

Respond:<< OK

Note:

- **Note:** To use transparent data transmission, send AT+TPMODE=1 before setting the Wi-Fi mode
-

5.4 SSL Client Application



1. Switch to STA mode

Send:<< AT+ROLE=1

Respond:>> OK

2. Connect to AP

Send:<< AT+RAP=ssid,password

Respond:>> OK

3. Query the IP address to check whether AP is connected

Send:<< AT+LIP

Respond:>> +LIP=192.168.0.97 >> OK

4. Set the module as SSL client and configure the remote server and port number.

Send:<< AT+SOCK=SSL,9100,httpbin.org,443

Response:>> OK

5. Module initiates connection to remote as SSL client

Send:<< AT+WLANC=3

Response:>> OK

6. Send a related request, such as a GET request

Send:<< AT+SSLSEND=40,GET /get HTTP/1.1\r\nHost: httpbin.org\r\n\r\n

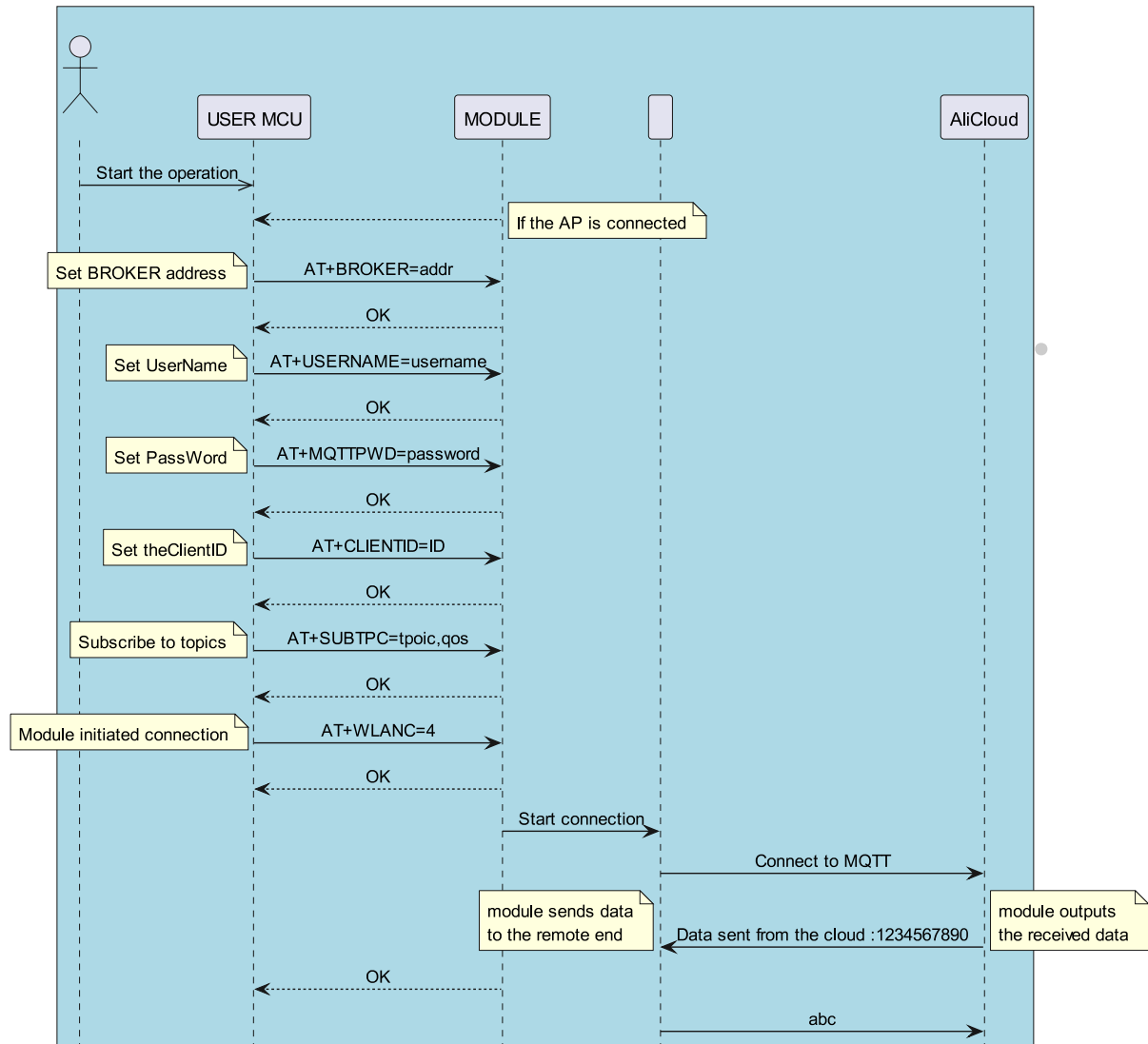
7. Received data

<< +SSLDATA=Detailed Data

Note:

- **Note:** To use transparent data transmission, send AT+TPMODE=1 before setting the Wi-Fi mode
-

5.5 MQTT Application



1. Switch to STA mode

Send:<< AT+ROLE=1

Response:>> OK

2. Connect to AP

Send:<< AT+RAP=ssid,password

Response:>> OK

3. Example Query the module IP address

Send:<< AT+LIP

Response:>> +LIP=192.168.0.87

>> +LIP=192.168.0.87

4、 Set BROKER address

Send:<< AT+BROKER=gpssensor.ddns.net

Response:>> OK

5、 Set User Name

Send:<< AT+USERNAME=admin

Response:>> OK

6. Set Password

Send:<< AT+MQTTPWD=12345678

Response:>> OK

7. Subscribe to topics

Send:<< AT+SUBTPC=user/get

Response:>> OK

8、 Connect MQTT

Send:<< AT+WLANC=4

Response:>> OK

9. Receive data from the cloud platform

1234567890

10.Send data to the cloud platform

Send:<< AT+MQTTSEND=/user/post,0,3,abc

Response:>> OK

5.6 Switch Throughput Mode to Command Mode

Specific Instruction Process Description

When **Throughput Mode** is enabled, any command is transmitted as data

The module provides a way to exit the **Throughput Mode** to send command

```
<< +++
```

```
<< a
```

```
>> a
```

```
>> +ok
```

Note:

- The above data format is different from the normal AT command which ends with **<CR><LF>**
 - The above data does not have any terminator attached
-

5.7 Network Configuration and OTA

5.7.1 OTA by AT Command

Specific Instruction Process Description

1、Switch to STA Mode.

```
<< AT+ROLE=1
```

```
>> OK
```

2、Connect to AP

```
<< AT+RAP=ssid,password
```

```
>> OK
```

3、Query the IP address to check whether AP is connected

<< AT+LIP

>> +LIP=192.168.0.87

4、The upgrade starts. The firmware name is provided by the engineer or related personnel

<< AT+OTA=Feasycom_V555

>> OK

>> \$OTA=1

Note:

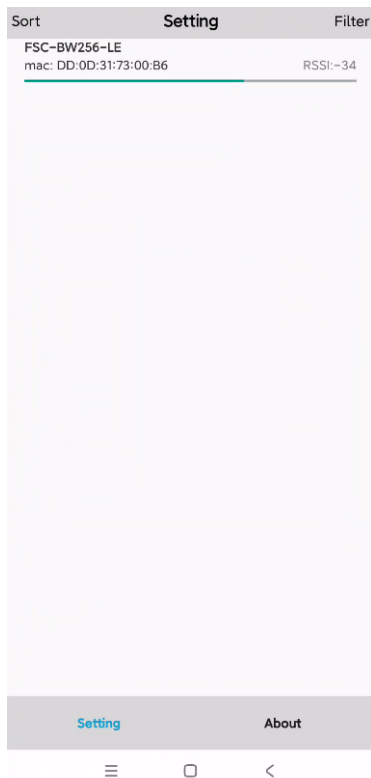
- The firmware is stored in the specific server and the upgrade mode can be changed as required by customers
 - Module needs to access the Internet, otherwise it will fail
-

5.7.2 OTA by FeasyWiFi APP

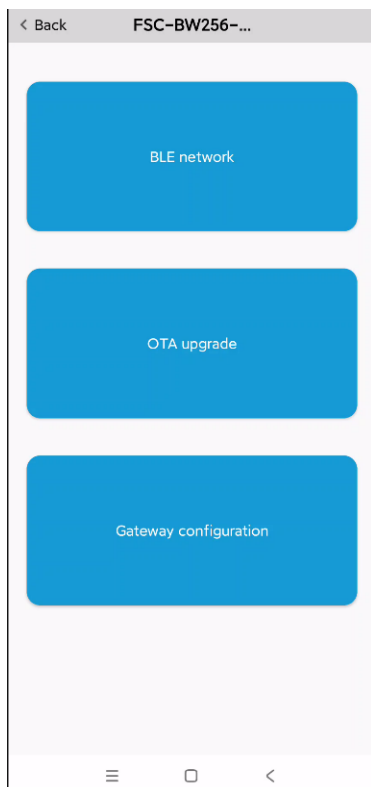
Specific Instruction Process Description

1、Download FeasyWiFi APP from **APP STORE** or **GOOGLE PLAY**

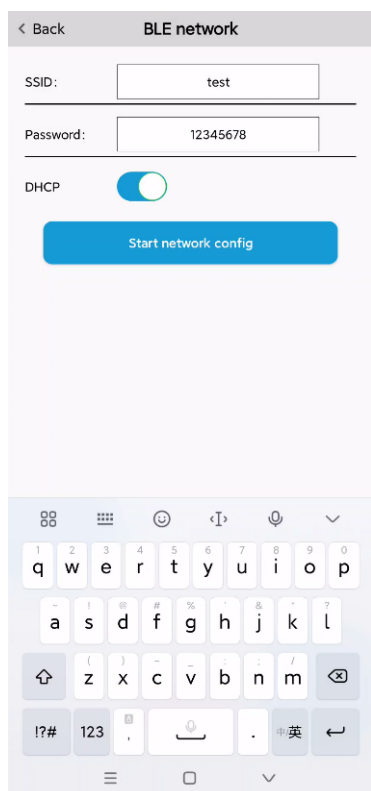
2、Enter the APP interface , search and connect to the target module



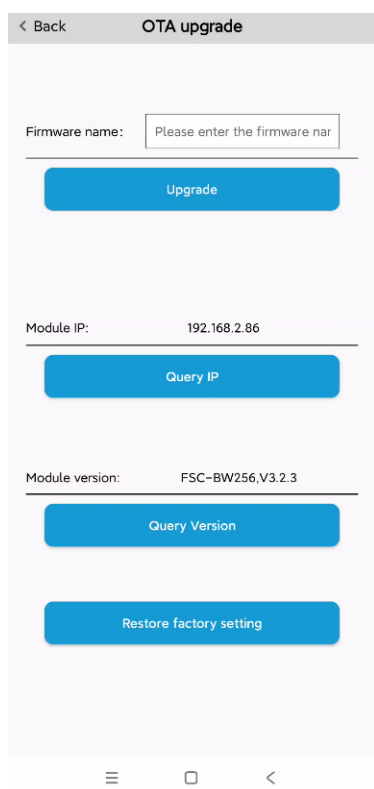
3、 After the correct connection, it will jump to the following interface, click the Bluetooth network first



4、 On the Bluetooth distribution screen, enter the hotspot name and password, and click Start



5、 After the network is configured successfully, return to the previous page and select OTA upgrade. You can query the IP address and enter the firmware to be upgraded

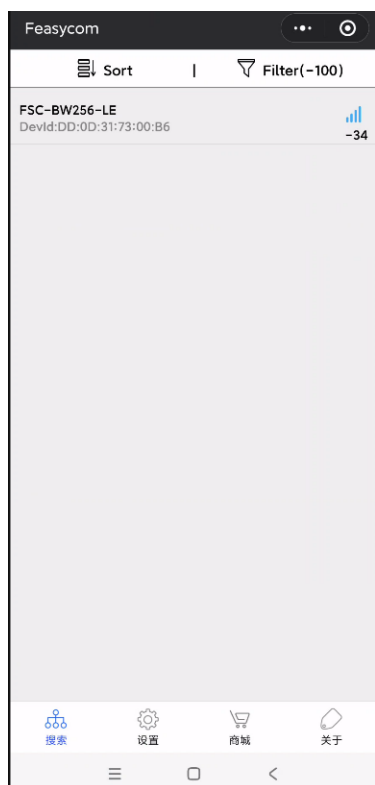
**Note:**

- The hotspot needs to support access to the Internet.

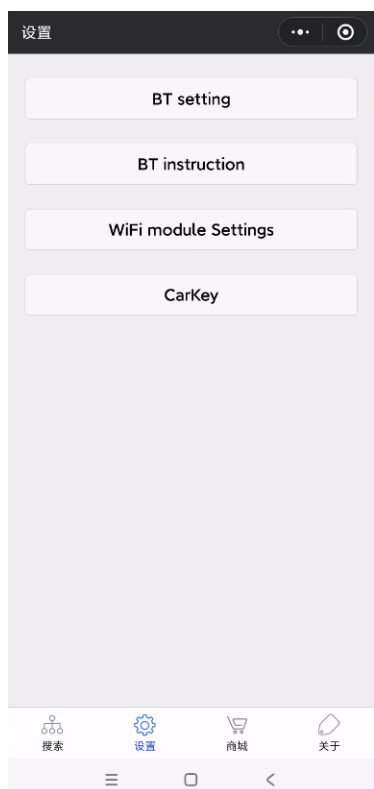
5.7.3 Wechat mini program distribution network and OTA usage instructions

Specific process description

1、 Wechat search open the small program “Bluetooth serial port” small program, the interface is as follows, click the setting button below



2、The setting interface is as follows: Click WiFi module setting (the Bluetooth command tool is used to send air commands, that is, to send AT commands in Bluetooth mode to configure the module)



3、Bluetooth networking first



4、Connect the device that needs to be upgraded by Bluetooth, enter the distribution network interface, enter the hotspot and password to be connected, and click OK



5、After the network distribution is successful, return to the previous interface, select in-flight upgrade, enter the firmware to be upgraded, click OK, and wait until the upgrade is complete



Note:

- The hotspot needs to support access to the Internet.

Chapter 6

Appendix

6.1 Download PDF version

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