BW236 programming user guide

Release 5.3.2

Table of contents

Chapter 1

Introduction

[中文]

1.1 Description

This design guide is suitable for engineers to develop FSC-BW236 Wi-Fi SoC module

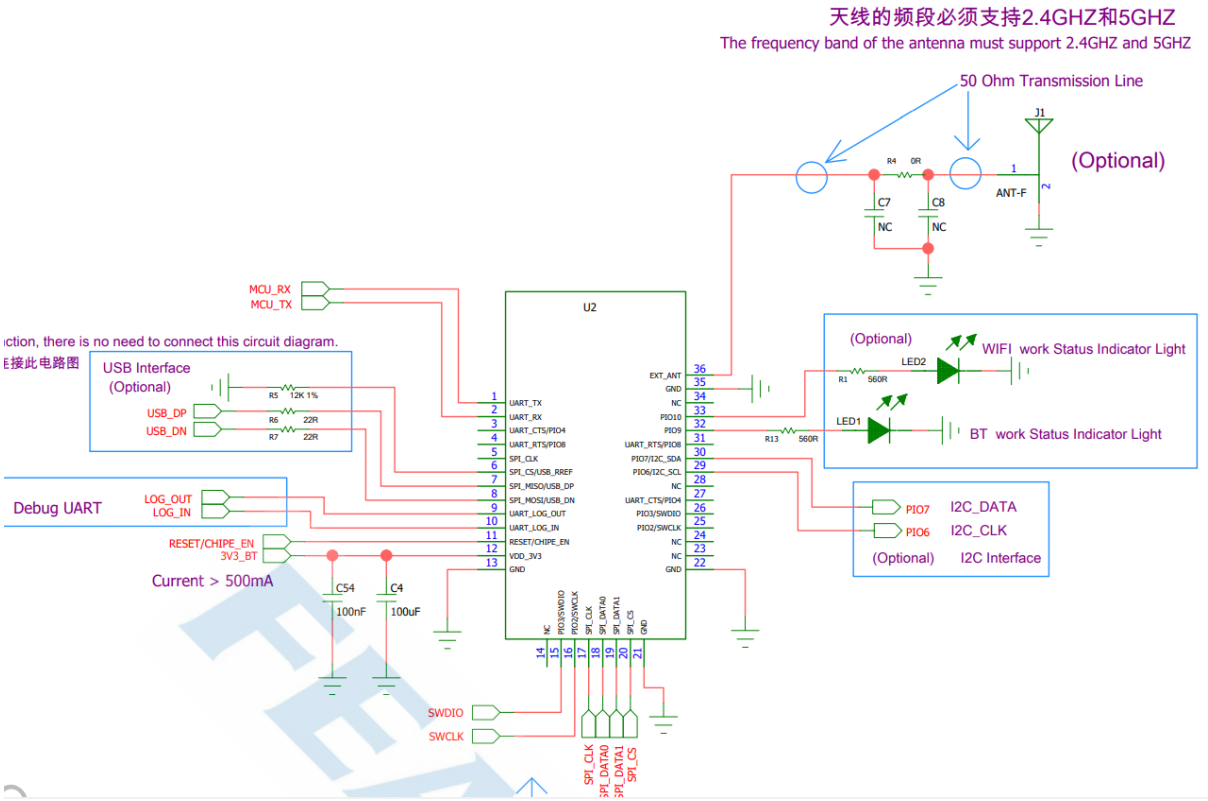
1.2 Module Default Settings

Bluetooth Mode	LE-Peripheral
Bluetooth Name	FSC-BW236-LE
Wi-Fi Mode	STA Mode
Local AP SSID	FSC-BW236-AP
Local AP Password	12345678
Local AP IP Address	192.168.1.1
UART Baudrate	115200/8/N/1

Chapter 2

Hardware Description

2.1 Pin Figure



2.2 Pin Description

Pin	Pin Name	Type	Pin Descriptions
1	UART_TX	O	UART TX
2	UART_RX	I	UART RX
3	UART_CTS	I	UART CTS(Active High)
4	UART_RTS	O	UART RTS(Active High)
9	UARG_LOG_OUT	O	DEBUG UART TX
10	UARG_LOG_IN	I	DEBUG UART RX
11	RESET/CHIP_EN	I/O	RESET, Active Low
12	VDD_3V3	VDD	3.3V Power Supply
13	GND	VSS	GND
21	GND	VSS	GND
22	GND	VSS	GND
32	LED0	I/O	Output High Level When Bluetooth Connected
33	LED1	I/O	Output High Level When Wi-Fi Connected
35	GND	VSS	GND
36	EXT_ANT	ANT	Antenna Option

2.3 Hardware Design Notes

- Module only needs to connect VDD/GND/UART_RX/UART_TX for a simple test
- Programming manual only provides a simple description of the IO port. For more detailed description, please refer to the hardware design document
- Feasycom is glad to review your schematic diagram for a best result of Bluetooth/Wi-Fi distance

Chapter 3

Function Description

3.1 Hardware Interface

- GPIO
- PWM
- UART
- SPI SLAVE
- I2S Master/Slave
- Analog Input/Output

Profiles & Features

3.2 Bluetooth

- GATTS (Generic Attribute Profile LE-Peripheral role)
- GATTC (Generic Attribute Profile LE-Central role)

3.3 Wi-Fi

- TCP (Transmission Control Protocol)
- UDP (USER Datagram Protocol)

- HTTP (Hypertext Transfer Protocol)
- MQTT (Message Queuing Telemetry Transport)
- WEB SOCKET

Chapter 4

Command Description

4.1 Specification

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

4.2 Command 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

Example:

Read Module’s Version

<< AT+VER

>> +VER=FSC-BW236,V4.2.5

>> OK

Send Bluetooth Data When Disconnected

<< AT+GATTSEND=3,123

>> ERR003

4.3 Event Format

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

- All Events start with **<CR><LF>**, end with **<CR><LF>**
- If Event has Parameter, Parameter follow behind **‘=’**
- If Event has multiple Parameters, Parameter must be separated by **‘,’**

‘Example:’’

Remote BLE Device Send “1234567890” to Module

>> +GATTDATA=10,1234567890

Chapter 5

Commands Table

5.1 General Commands

5.1.1 AT - UART Test Command

Command	AT
Response	**OK**
Description	Test whether the UART is working

Example:

<< AT

>> OK

5.1.2 AT+VER - Read Firmware Version

Command	AT+VER
Response	**+VER=Param1,Param2**
`Param1`	Module Type
`Param2`	Firmware Version

Example:

<< AT+VER

>> +VER=FSC-BW236,V4.2.5

>> OK

5.1.3 AT+BAUD - Read/Write UART Baudrate

Command	**AT+BAUD{=Param}**
`Param`	2400/4800/9600/19200/38400/57600/115200(default)/128000/ 230400/256000/460800/512000/921600/1000000/1382400 2000000/3000000/4000000/5000000/6000000
Response	**+BAUD=Param**
`Param`	All baudrates supported by current module
Description	Baudrate will be changed after module reboot

Example:

Read Baudrate

<< AT+BAUD

>> +BAUD=115200

>> OK

Write Baudrate

<< AT+BAUD=9600

>> OK

5.1.4 AT+TPMODE - Read/Write Throughput Mode

Command	**AT+TPMODE{=Param}**
`Param`	1:Enable 0:Disable
Response	**+TPMODE=Param**
`Param`	Module’s current throughput mode
Description	When TCP/GATT profile connected and throughput mode is on, the AT command will be de-active, every byte received via physical UART will be sent to air, vice versa

Example:

Read Current Throughput Mode

<< AT+TPMODE

>> +TPMODE=0

>> OK

Enable Throughput Mode

<< AT+TPMODE=1

>> OK

5.1.5 AT+LPM - Enter Low Power Mode

Command	**AT+LPM{=Param}**
`Param`	1:Enter Light Sleep 2:Enter Deep Sleep
Response	**OK**
Description	After module enters lignth sleep, it maintains connection with the hotspot and TCP, and can be waked up through WLAN RX data. The power consumption is about 30mA. After module enters deep sleep, all functions will be stopped and the power consumption is about 10uA. Pull up the 7th pin of the module to wake up.

Example:

Enter Light Sleep

<< AT+LPM=1

>> OK

5.1.6 AT+SCAN - Scan Devices

Command	AT+SCAN=Param1{,Param2}{,Param3}
Param1	5:Scan AP around 1:Scan BLE devices 0:Stop Scanning
Param2	Only take effect when scanning BLE devices scan duration (unit: second) is specified After a timeout, module stops scaning
Param3	Only take effect when scanning BLE devices BLE device’ s name is specified After a timeout, module stops scanning

Response	**+SCAN=param1,param2,param3,param4,param5,param6**
`Param1`	Scan AP: Sequence Numbers Scan BlE device: Sequence Numbers
`Param2`	Scan AP: 5(changeless) Scan BLE device:BLE device address type
`Param3`	Scan AP: AP’s MAC address Scan BLE device: BLE device’s MAC address
`Param4`	Scan AP: RSSI for module and AP Scan BLE device: RSSI for module and BLE device
`Param5`	Scan AP: Length of AP’s SSID Scan BLE device: Length of BLE device’s name
`Param6`	Scan AP: AP’s SSID Scan BLE device:BLE device’s name
Description	Scan AP: in STA Mode Scan BLE device:in Central Mode

Example:

Scan AP

<< AT+SCAN=5

>> +SCAN=1,5,9C9D7E7E0AF3,-45,18,Feasycom_D710_2.4G

>> +SCAN=2,5,9C9D7E7E0AF2,-47,16,Feasycom_D710_5G

>> +SCAN=3,5,D4DA210B8505,-50,13,Redmi_8502_5G

Scan BLE devices

<< AT+SCAN=1

>> +SCAN=1,0,DC0D94B9105C,-92,8,Feasycom

>> +SCAN=2,1,27AD5E8F09D6,-66,9,Feasycom1

>> +SCAN=3,0,DC0D300005B4,-82,9,Feasycom2

>> +SCAN=4,0,DC0D1EDA2008,-92,9,Feasycom3

Scan Specified BLE Device For 10s

<< AT+SCAN=1,10,FSC-BT976

>> +SCAN=1,0,DC0D3000073D,-66,9,FSC-BT976

5.1.7 AT+REBOOT - Software Reset

Command	**AT+REBOOT**
Response	**OK**
Description	Module Reboot

Example:

<< AT+REBOOT

>> OK

5.1.8 AT+RESTORE - Restore Factory Setting

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

Example:

<< AT+RESTORE

>> OK

5.1.9 AT+BTEN - Enable/Disable Bluetooth

Command	AT+BTEN{=Param}
`Param`	1: Enable 0: Disable
Description	Only take effect immediately

5.1.10 AT+STAT - Read Connection Status

Command	**AT+STAT**
Response	**+STAT=Param1, Param2, Param3, Param4, Param5, Param6, Param7**
`Param1`	Connection Status in BLE Peripheral Mode
`Param2`	Connection Status in BLE Central Mode
`Param3`	Connection Status to Access Point
`Param4`	Connection Status as Tcp Server
`Param5`	Connection Status as Tcp Client
`Param6`	Connection Status as SSL client
`Param7`	Connection Status as MQTT client
Description	0: uninitialized 1: ready 2: connecting 3: connected

Example:Read Current Status

<< AT+STAT

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

>> OK

5.1.11 AT+DSCA - Disconnect From AP or BLE Device

Command	AT+DSCA=Param
Param	1:Disconnect the module from the AP 2:Disconnect the module from the BLE device
Response	**OK**
Description	Command can be used only in STA mode or Peripheral mode.

Example:

Disconnect the module from the AP

<< AT+DSCA=1

>> OK

Disconnect the module from the BLE device

<< AT+DSCA=2

>> OK

5.2 Bluetooth Command

5.2.1 AT+ADDR/LEADDR - Read Bluetooth MAC

Command	AT+ADDR/LEADDR
Response	**+ADDR/LEADDR=Param**
Param	Module’s LE MAC address (12 Bytes ASCII)
Description	Only Read Supported

Example:

<< AT+ADDR/LEADDR

>> +ADDR/LEADDR=DC0D30010203

>> OK

5.2.2 AT+NAME/LENAME - Read/Write Bluetooth BLE Name

Command	**AT+NAME/LENAME{=Param1{,Param2}}**
Param1	BLE local 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/LENAME=Param**
Description	

Example:

Read Bluetooth BLE Name

<< AT+NAME/LENAME

>> +NAME/LENAME=FSC-BW236-XXXX

>> OK

Write Bluetooth BLE Name as “ABC”

<< AT+NAME/LENAME=ABC,0

>> OK

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

<< AT+NAME/LENAME=ABC,1

>> OK

5.2.3 AT+GATTSEND - Send BLE Data in Peripheral Mode

Command	**AT+GATTSEND=Param1,Param2**
`Param1`	Payload length (1~999)
`Param2`	Payload (1~999 Bytes UTF8)
Response	**OK**
Description	If throughput mode is enable, this command is de-active

Example:

Send “123” to remote BLE Device

<< AT+GATTSEND=3,123

>> OK

5.2.4 AT+MODE: Read/Write Bluetooth Mode

Command	**AT+MODE{=Param}**
`Param`	0: BLE Peripheral 1: BLE Central
Response	**+MODE=Param**
Description	Module will reboot after setting

Example:

Read Current Bluetooth Mode

<< AT+MODE

>> +MODE=0

>> OK

Write BLE Central Mode

<< AT+MODE=1

>> OK

5.2.5 AT+LECONN - Connect to Remote BLE Device in Central Mode

Command	**AT+LECONN=Param1,Param2**
`Param1`	BLE device’s MAC address type(0:public,1:random)
`Param2`	BLE device’s MAC address
Response	**OK**
Description	Only take effect in BLE Central Mode

Example:

Connect to Remote Device

<< AT+LECONN=0,DC0D30600002

>> OK

5.2.6 AT+GATTAC - Read/Write Auto Connection Setting in BLE Central Mode

Command	**AT+GATTAC{=Param}**
`Param`	0: Disable 1: Enable(default)
Response	**+GATTAC=Param**
Description	Only take effect after reboot

Example:

Read Whether Auto Connection Setting is Enabled

<< AT+GATTAC

>> +GATTAC=1

>> OK

Disable Auto Connection Function

<< AT+GATTAC=0

>> OK

5.2.7 AT+LESEND - Send Data in BLE Central Mode

Command	**AT+LESEND=Param1,Param2**
`Param1`	Payload length (1~999)
`Param2`	Payload (1~999 Bytes UTF8)
Response	**OK**
Description	If throughput mode is enable, this command is de-active

Example:

<<AT+LESEND=10,1234567890

>> OK

5.2.8 AT+GATTSTAT - Read Connection Status

Command	**AT+GATTSTAT**
Response	**+GATTSTAT=Param1**
`Param1`	Connection Status in BLE Peripheral/Central Mode
Description	0: uninitialized 1: ready 2: connecting 3: connected

5.2.9 AT+TYPE - Read/Write BLE Connectition Type

Command	AT+TYPE{=Param}
Param	0:Unbound 1:Binding without PIN code 2:Bingding with PIN code
Response	**+TYPE=Param**
Param	Module’s GATT connection type

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

Command	AT+PIN{=Param1}
Param1	BLE local PIN Code(32 - bit unsigned integer number)
Response	**+PIN=Param**
Description	

Example:

Read Bluetooth PIN Code

<< AT+PIN

>> +PIN=123456

>> OK

Write Bluetooth PIN Code as “996”

<< AT+PIN=996

>> OK

5.3 Wi-Fi Command

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

Command	**AT+ROLE{=Param}**
`Param`	1:STA Mode 2:AP Mode 3:STA+AP Concurrent Mode
Response	**+ROLE=Param**
Description	Module will reboot after setting

Example:

Read Current Wi-Fi Mode

<< AT+ROLE

>> +ROLE=1

>> OK

Write AP Mode

<< AT+ROLE=2

>> OK

5.3.2 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	**+RAP=Param1,Param2**
Description	This command can be used in STA mode or STA+AP concurrent mode Module adapts different encryption ways automatically

Example:

Connect to AP named “test”,and AP’s password is “12345678”

<< AT+RAP=test,12345678

>> OK

Read Current Connected AP’s Information

<< AT+RAP

>> +RAP=test,12345678

>> OK

Connect AP named “test”,and AP’s encryption way is OPEN

<< AT+RAP=test

>> OK

5.3.3 AT+BRAP - Connect to AP by BSSID

Command	**AT+BRAP{=Param1}{,Param2}**
`Param1`	AP’s BSSID(MAC address)
`Param2`	AP’s password,if way of encryption is OPEN, no need to set this parameter
Response	**+BRAP=Param1,Param2**
Description	This command can be used in STA mode or STA+AP concurrent mode Module adapts different encryption ways automatically

Example:

AP’s BSSID is “1063C85FCB9F”,and AP’Password is “12345678”

<< AT+BRAP=1063C85FCB9F,12345678

>> OK

Read Current Connected AP’s Information

<< AT+BRAP

>> +BRAP=1063C85FCB9F,12345678

>> OK

AP’s BSSID is “1063C85FCB9F”,and AP’s encryption way is OPEN

<< AT+BRAP=1063C85FCB9F

>> OK

5.3.4 AT+CAP - Clear Connected AP’s Information

Command	**AT+CAP**
Param	None
Response	**OK**
Description	Clear Connected AP’s Information

Example:

Clear Connected AP’s Information

<< AT+CAP

>> OK

5.3.5 AT+BSSID - Read Connected AP’s BSSID

Command	**AT+BSSID**
Response	**+BSSID=Param**
Description	If “ERR003”is returned, it indicates that the module is not currently connected to the AP

Example:

Read Connected AP’s MAC Address

<< AT+BSSID=1063C85FCB9F

>> OK

5.3.6 AT+LIP - Read Current Local IP Address

Command	**AT+LIP**
Response	**+LIP=Param**
Description	If “0.0.0.0” is returned, it indicates that the module is not currently connected to the AP

Example:

Read Local IP Address

<< AT+LIP=192.168.0.224

>> OK

5.3.7 AT+MDNSEN - Enable/Disable MDNS Function

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

Example:

Read Whether mDNS Function is Enabled

<< AT+MDNSEN

>> +MDNSEN=0

>> OK

Enable mDNS Function

<< AT+MDNSEN=1

>> OK

5.3.8 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

5.3.9 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

5.3.10 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

5.3.11 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

5.3.12 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

5.3.13 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

5.3.14 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

5.3.15 AT+STAMP - Read Time Stamp

Command	**AT+STAMP**
Response	**+STAMP=Param**
`Param`	value (unit:second)
Description	Module needs to access the Internet,otherwise it will fail.

Example:

Read Time Stamp

<< AT+STAMP

>> +STAMP=1682319289

>> OK

5.3.16 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

5.3.17 AT+SCFG - Simple Config

Command	AT+SCFG=Param
Param	1:Start Simple Config 2:Start Air-Kiss Config 0:Stop Simple Config
Response	**OK**
Note	This command should be used with **Feasy-WiFi** and **Airkiss** APP

5.3.18 AT+WEBCFG - WEB Config

Command	AT+WEBCFG=Param
Param	1:Start WEB Config 0:Stop WEB Config
Response	**OK**
Description	This command can be used when **+ROLE=2**

Example:

Start WEB Config

<< AT+WEBCFG=1

>> OK

5.3.19 AT+WPSCFG - WPS Config

Command	**AT+WPSCFG=Param**
Param	1:Start WPS Config
Response	**OK**

Example:

Start WPS Config

<< AT+WPSCFG=1

>> OK

5.3.20 AT+LAP - Read/Write AP Mode Configuration

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-BW236-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

5.4 TCP Command

5.4.1 AT+SOCK - Read/Write SOCKET

Command	**AT+SOCK{=Param1,Param2,Param3, 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

5.4.2 AT+WLANC - Start SOCKET/MQTT

Command	**AT+WLANC=Param**
`Param`	3:Connection with TCP/UDP/SSL 4:Connection with MQTT or cloud platform 5:Connection with WEB Socket
Response	**OK**
Description	This command can only be used after the **SOCKET** or **MQTT** configuration is completed

5.4.3 AT+MAXCON - Read/Write Max Connections As TCP Server

Command	**AT+MAXCON=Param**
`Param`	Max Connections
Response	**+MAXCON=Param**
Description	Default Max Connections is 3

Example:

Read Max Connections

<< AT+MAXCON

>> +MAXCON=3

>> OK

Write Max Connections as 1

<< AT+MAXCON=1

>> OK

5.4.4 AT+WFSEND - Send SOCKET Data to Remote Device

Command	**AT+WFSEND=Param1,Param2,Param3**
`Param1`	TCP/UDP Connection ID
`Param2`	Payload length (1~999)
`Param3`	Payload (1~999 Bytes UTF8)
Response	**OK**
Description	When the module is used as TCP server, it can be connected by 3 remote clients and connection ID is 0,1,2; When the module is used as TCP client, the ID is 3; When the module is UDP, the ID is 4. The connection ID will vary with the **MAXCON** setting, such as the **MAXCON** is 6, the ID as TCP Server is 0 ~ 5, and the ID as the **TCP Client** is 6, the ID as **UDP** is 7

Example:

Send data to **TCP Client**

<< AT+WFSEND=0,3,123

>> OK

Send data to **TCP Server**

<< AT+WFSEND=3,3,123

>> OK

Send data to **UDP**

<< AT+WFSEND=4,3,123

>> OK

5.4.5 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

5.5 WEBSOCKET Command

5.5.1 AT+WEBSOCK - Read/Write WEBSOCKET Address

Command	**AT+WEBSOCK=Param1,Param2**
`Param1`	WSC : Module works as **Client** WSS : Module works as **Server**
`Param2`	Remote Server Address if Module works as **Client** Local IP Address if Module works as **Server**
Response	**+WEBSOCK=Param1,Param2**
Description	Param2 should start with **ws://** or **wss://**,

Example:

Module works as client

<< AT+WEBSOCK=WSC,ws://192.168.0.188:443/read

>> OK

Example:

Module works as server

<< AT+WEBSOCK=WSS,ws://192.168.0.144

>> OK

Note:

- **PORT** configuration can be omitted.80 is default for **ws**,433 is default for **wss**
- WEBSOCKET and TCP can’ t be used at the same time.

5.5.2 AT+WSSEND - Send Websocket Data

Command	**AT+WSSEND=Param1{,Param2},Param3,Param4**
`Param1`	WSC : Module works as **Client** WSS : Module works as **Server**
`Param2`	Specify the client ID. This parameter is only required if the module works as **Server**
`Param3`	Payload length
`Param4`	Payload
Response	**OK**
Description	Module supports one **Client** by default if works as **Server**. Therefore, Param2 is 1 when sending data

Example:

Module sends data as **Client**

<< AT+WSSEND=WSC,10,0123456789

>> OK

Example:

Module sends data as **Server**

<< AT+WSSEND=WSS,1,10,0123456789

>> OK

5.5.3 AT+WSCLS - Close Websocket

Command	**AT+WSCLS**
Response	**OK**
Description	Close Connection With Websocket

Example:

Close Websocket

<< AT+WSCLS

>> OK

5.5.4 AT+WSSTAT - Read Websocket Status

Command	**AT+WSSTAT**
Response	**+WSSTAT=Param1,Param2**
Description	0: uninitialized 1: ready 2: connecting 3: connected Param1: Module’s websocket status when works as **Client** Param2: Module’s websocket status when works as **Server**

Example:

Read Websocket Status

<< AT+WSSTAT

>> +WSSTAT=3,0

>> OK

5.6 HTTP Command

5.6.1 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** is used to access **HTTP** server **AT+HTTPS** is used to access **HTTPS** server The default port of **HTTP** server is 80, default port of **HTTPS** server is 443 **Param2** can be set like this **“x.x.x.x:port”** ,if port of server need to be specified

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&param2=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**

5.7 MQTT Command

5.7.1 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

5.7.2 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

5.7.3 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

5.7.4 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

5.7.5 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:

- The command will return an error if the same topic is subscribed repeatedly
- Maximum of five different subscribed topics is 5

5.7.6 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

5.7.7 AT+UNSUBALL - Unsubscribe All MQTT Topics

Command	**AT+UNSUBALL**
Response	**OK**

Example:

<< AT+UNSUBALL

>> OK

5.7.8 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

5.7.9 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

5.7.10 AT+MQTTS - Enable/Disable MQTT with SSL/TLS

Command	AT+MQTTS{=Param}
Param	0: Disable(default) 1: Enable
Response	**+MQTTS=Param**

Example:

Read whether SSL/TLS is enabled

<< AT+MQTTS

>> +MQTTS=0

>> OK

Enable SSL/TLS for MQTT

<< AT+MQTTS=1

>> OK

5.7.11 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

5.7.12 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

---

5.7.13 AT+MQTTVER - Read/Write MQTT Version

Command	**AT+MQTTVER{=Param}**
`Param`	MQTT Verison(3 or 4,default is 3)
Response	**+MQTTVER=Param**
Note	

Example:

Read MQTT Version

<< AT+MQTTVER

>> +MQTTVER=3

>> OK

Use MQTT Version as 3

<< AT+MQTTVER=3

>> OK

5.7.14 AT+MQTTCLS - Close MQTT Connection

Command	**AT+MQTTCLS**
Response	**OK**

Example:

<< AT+MQTTCLS

>> OK

5.8 Cloud Platform Command

5.8.1 AT+DEVNAME - Read/Write Device Name

Command	**AT+DEVNAME{=Param}**
`Param`	Device Name
Response	**+DEVNAME=Param**

Example:

Read Device Name

<< AT+DEVNAME

>> +DEVNAME=printer

>> OK

Write Device Name

<< AT+DEVNAME=printer

>> OK

5.8.2 AT+PROKEY - Read/Write Product Key

Command	**AT+PROKEY{=Param}**
`Param`	Product Key
Response	**+PROKEY=Param**

Example:

Read Product Key

<< AT+PROKEY

>> +PROKEY=a1jdkjfuh

>> OK

Write Product Key

<< AT+PROKEY=a1jdkjfuh

>> OK

5.8.3 AT+DEVSECRET - Read/Write Device Secret

Command	**AT+DEVSECRET{=Param}**
`Param`	Device Secret
Response	**+DEVSECRET=Param**

Example:

Read Device Secret

<< AT+DEVSECRET

>> +DEVSECRET=15kjdfydfhnflh

>> OK

Write Device Secret

<< AT+DEVSECRET=15kjdfydfhnflh

>> OK

5.9 EAP Command

5.9.1 AT+EAPEN - Read/Write EAP enterprise encryption

Command	AT+EAPEN{=Param}
Param1	1 Enable EAP enterprise encryption 0 Disable EAP enterprise encryption
Response	+EAPEN=Param
Description	Switch mode, Only take effect after reboot

Example:

<< AT+EAPEN=1

>> OK

5.9.2 AT+EAPMODE - Read/Write EAP encryption

Command	AT+EAPMODE{=Param}
Param1	1 tls 2 peap 3 ttls
Response	+EAPMODE=Param
Description	Switch mode, Only take effect after reboot

Example:

Set the encryption mode to peap

<< AT+EAPMODE=2

>> OK

5.9.3 AT+EAPCFG - Read/Write EAP connection parameters

Command	**AT+EAPCFG{=Param1,Param2,Param3,Param4}**
`Param1`	SSID
`Param2`	Username
`Param3`	Password
`Param4`	Identity
Response	**+EAPCFG=Param1,Param2,Param3,Param4**
Description	Module will automatically connect to AP after setup

Example:

<< AT+EAPCFG=Feasycom,test,12345678,test

>> OK

5.10 The Firmware Update(OTA)

5.10.1 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 the engineering or technical support personneland The module will return $OTA=1 after a successful upgrade

Example:

<< AT+OTA=Feasycom_V429

>> OK

>> $OTA=1

Note:

- It’s best not to operate other commands or functions during the upgrade. Otherwise, the upgrade may fail or cause unexpected situations

---

Chapter 6

Events Table

6.1 MQTT Indication

6.1.1 +MQTTSTAT - MQTT Status

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

6.1.2 +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

6.2 WEBSOCKET Indication

6.2.1 +WSSTAT - WEBSOCKET 状态

Format	+WSSTAT=Param1,Param2
Param1	(0) uninitialized (1) ready (2) connecting (3) connected
Param2	(0) uninitialized (1) ready (2) connecting (3) connected

6.3 SSL Indication

6.3.1 +SSLSTAT - SSL Client Status

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

6.3.2 +SSLDATA - Receive SSL Data

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

Example: Receive data “1234567890” from **SSL Server**

>> +SSLDATA=10,1234567890

6.4 SOCKET Indication

6.4.1 +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=3,10,1234567890

Note:

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

6.5 GATT Indication

6.5.1 +GATTSTAT - GATT Status

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

6.5.2 +GATTDATA - Receive GATT Data

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

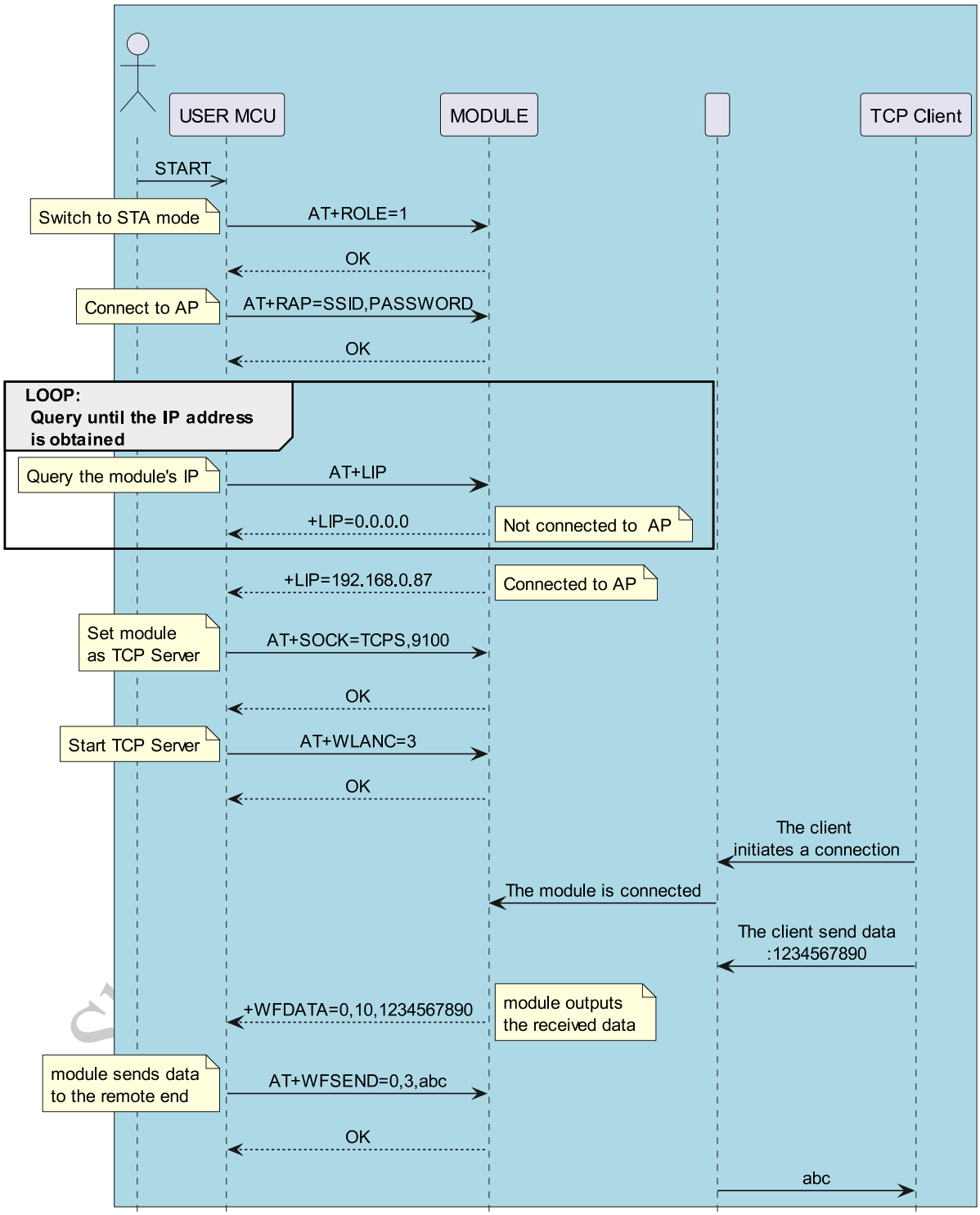
Example: Receive GATT data “1234567890” from remote device

>> +GATTDATA=10,1234567890

Chapter 7

Application Scenarios

7.1 TCP Server Application



Specific Command 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、Set module as **TCP Server** with port 9100

<< AT+SOCK=TCPS,9100

>> OK

5、Start TCP Server

<< AT+WLANC=3

>> OK

6、Send Data

<< AT+WFSEND=0,3,123

>> OK

7、Received Data

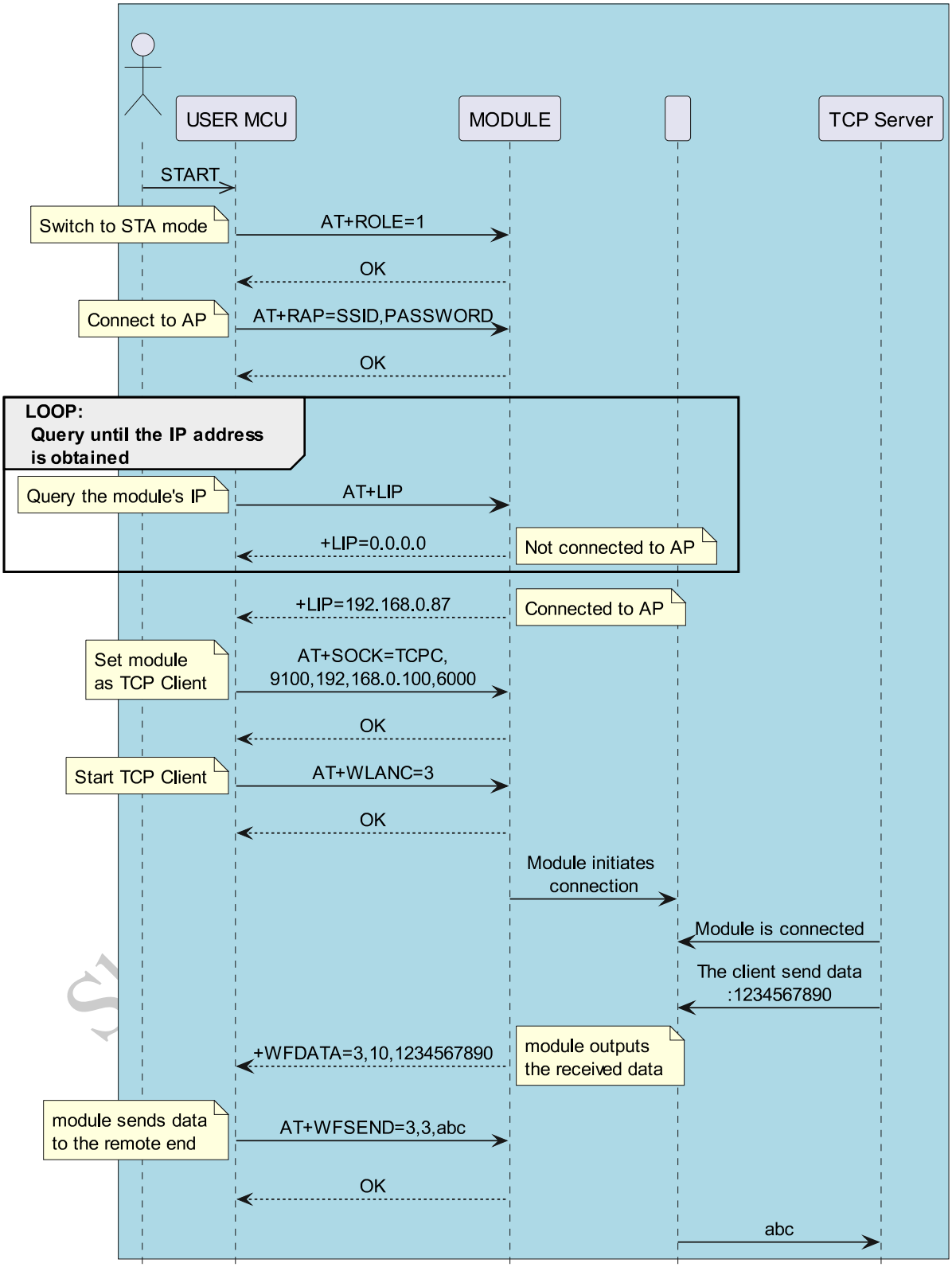
<< +WFDATA=0,10,1234567890

Note:

- **Throughput Mode** should be set at the beginning
- The module is in STA mode by default. Step 1 can be omitted
- The module enables a TCP server with port 9100 by default. Step 4 and 5 can be omitted

---

7.2 TCP Client Application



Specific Command 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、Set module as **TCP Client** with port 9100,configure the IP and port of the remote server

<< AT+SOCK=TCPC,9100,192.168.0.100,6000

>> OK

5、Start TCP Client

<< AT+WLANC=3

>> OK

6、Send Data

<< AT+WFSEND=3,3,123

>> OK

7、Received Data

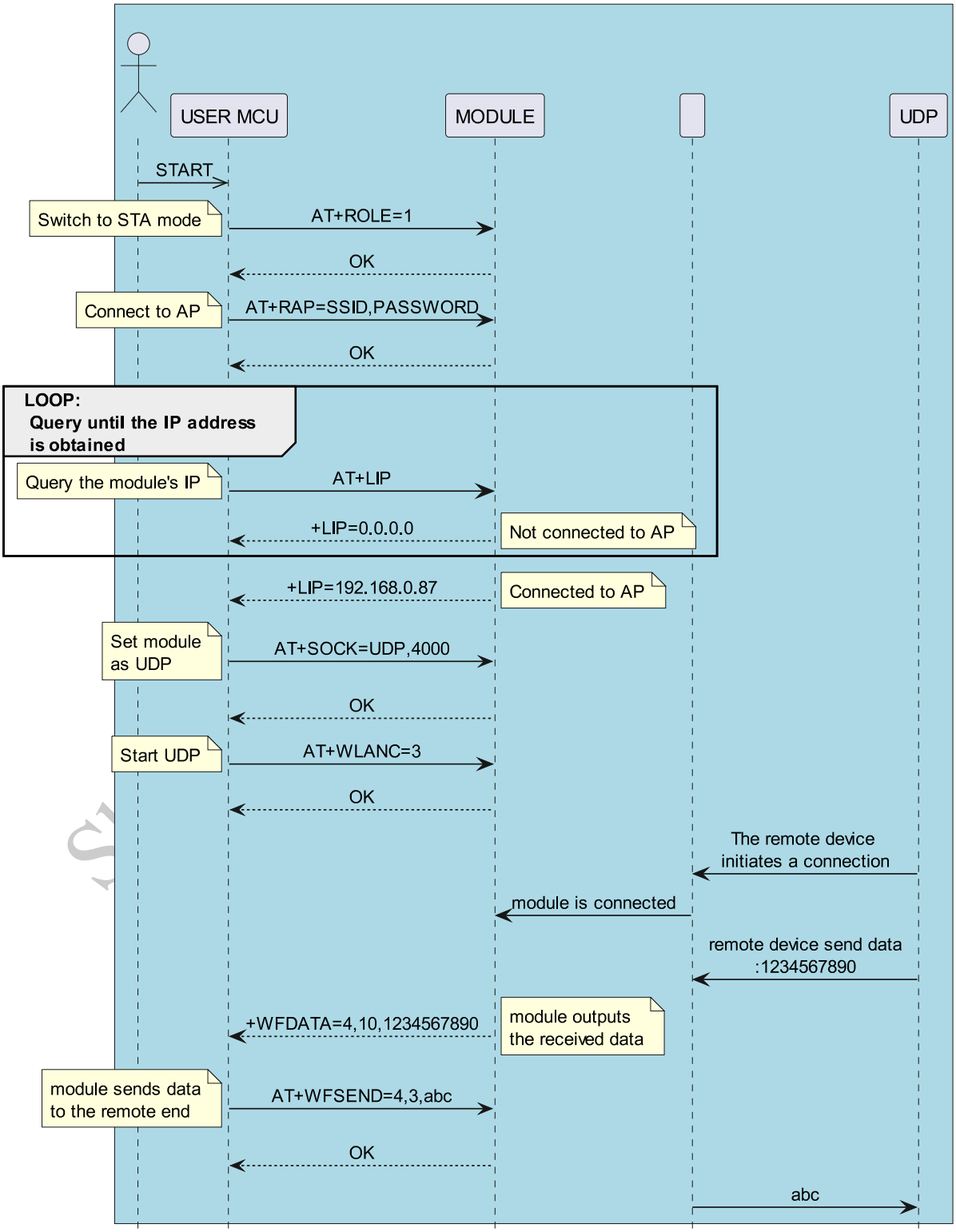
<< +WFDATA=3,10,1234567890

Note:

- **Throughput Mode** should be set at the beginning

- The module is in STA mode by default. Step 1 can be omitted

7.3 UDP Application



Specific Command 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 the hotspot is connected

<< AT+LIP

>> +LIP=192.168.0.87

4、Set module as **UDP**

<< AT+SOCK=UDP,4000

>> OK

5、Start UDP

<< AT+WLANC=3

>> OK

6、Send Data

<< AT+WFSEND=4,3,123

>> OK

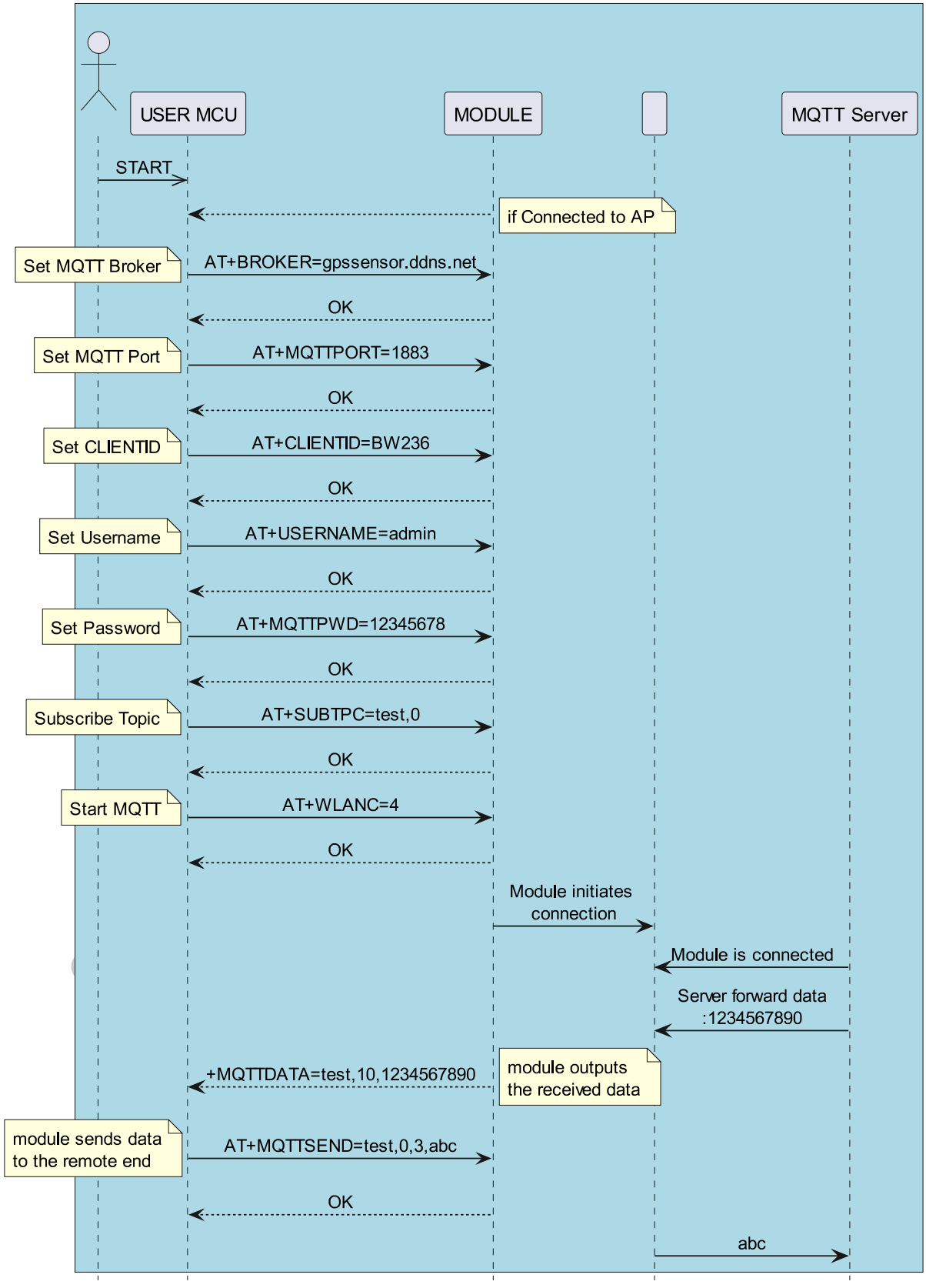
7、Received Data

<< +WFDATA=4,10,1234567890

Note:

- **Throughput Mode** should be set at the beginning

7.4 MQTT Application



Specific Command 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、Set Broker

<< AT+BROKER=gpssensor.ddns.net

>> OK

5、Set MQTT Port

<< AT+MQTTPORT=1883

>> OK

6、Set Client ID

<< AT+CLIENTID=BW236

>> OK

7、Set Username

<< AT+USERNAME=admin

>> OK

8、Set Password

<< AT+MQTTPWD=12345678

>> OK

9、Subscribe MQTT Topic

<< AT+SUBTPC=topic,0

>> OK

10、Start MQTT

<< AT+WLANC=4

>> OK

11、Receive Data

<< +MQTTDATA=topic,10,1234567890

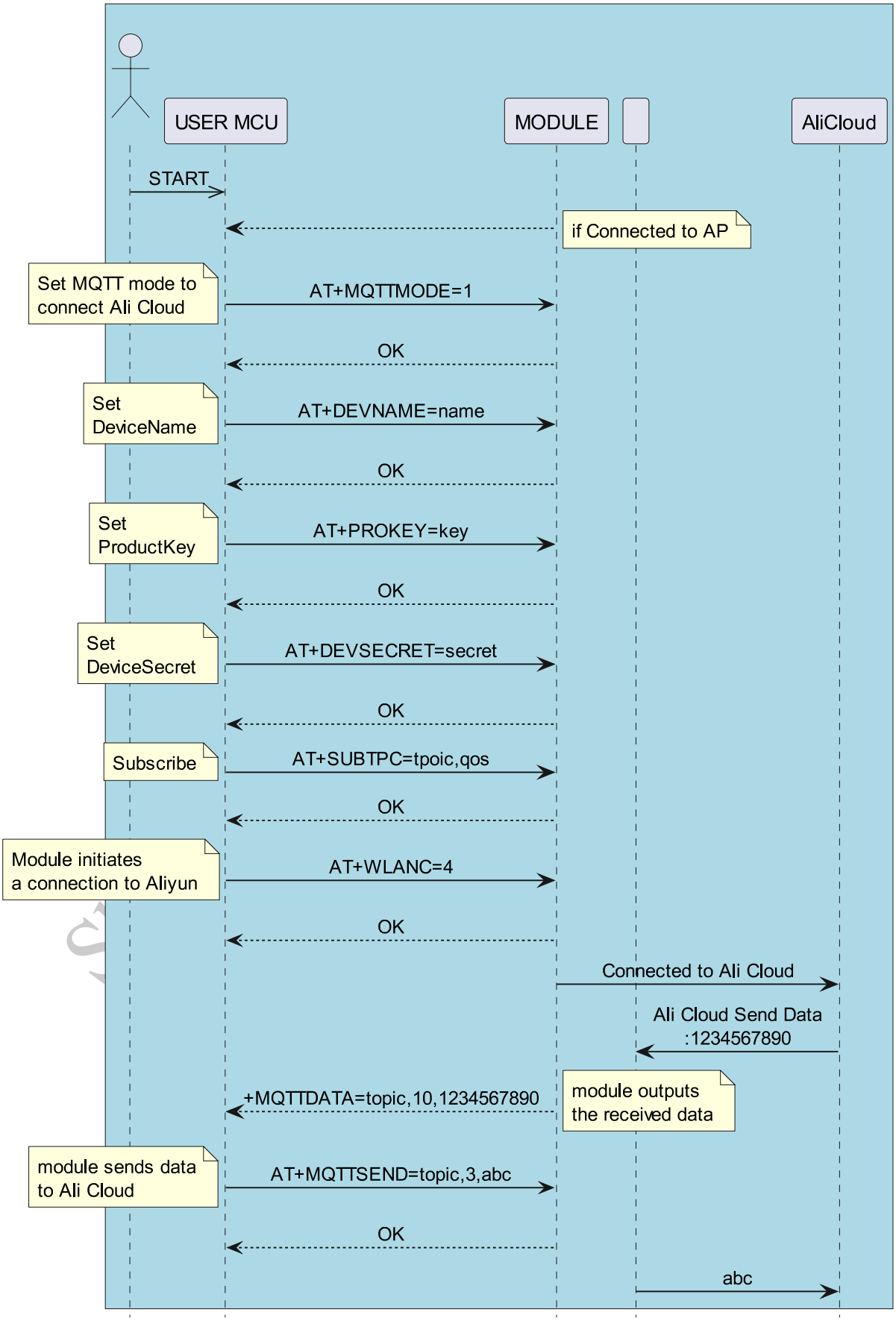
12、Send Data

<< AT+MQTTSEND=topic,0,3,abc

Note:

- Need to subscribe to the topic before initiating a connection
- **MQTTMODE** should be set to **0**

7.5 Ali Cloud Platform Application



Specific Command 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

5、Set MQTT mode to connect Ali Cloud

<< AT+MQTTMODE=1

>> OK

6、Set Device Name

<< AT+DEVNAME=name

>> OK

7、Set ProductKey

<< AT+PROKEY=key

>> OK

8、Set DeviceSecret

<< AT+DEVSECRET=secret

>> OK

9、Subscribe

<< AT+SUBTPC=topic,qos

>> OK

10、Initiates a connection

<< AT+WLANC=4

>> OK

11、Send Data

<< AT+MQTTSEND=topic,3,abc

>> OK

12、Receive Data

<< +MQTTDATA=topic,10,1234567890

Note:

- Before establishing a connection ,must subscribe at least one topic
- **Throughput Mode** should be set at the beginning

7.6 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

7.7 Network Configuration and OTA

7.7.1 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:

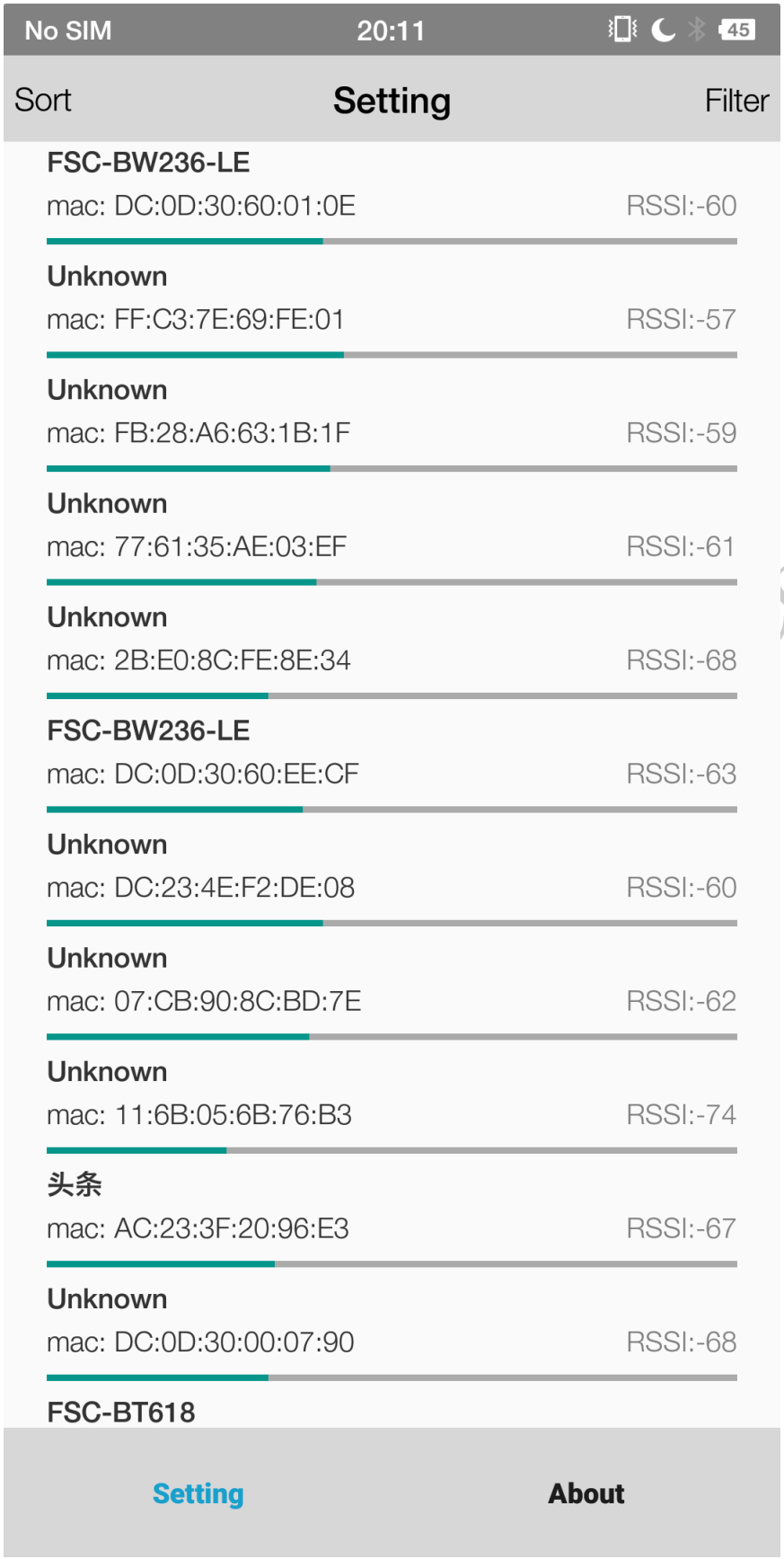
- The firmware is stored in the specific server and the upgrade mode can be changed as required by customers
- Module needs to access the Internet,otherwise it will fail

7.7.2 OTA by FeasyWiFi APP

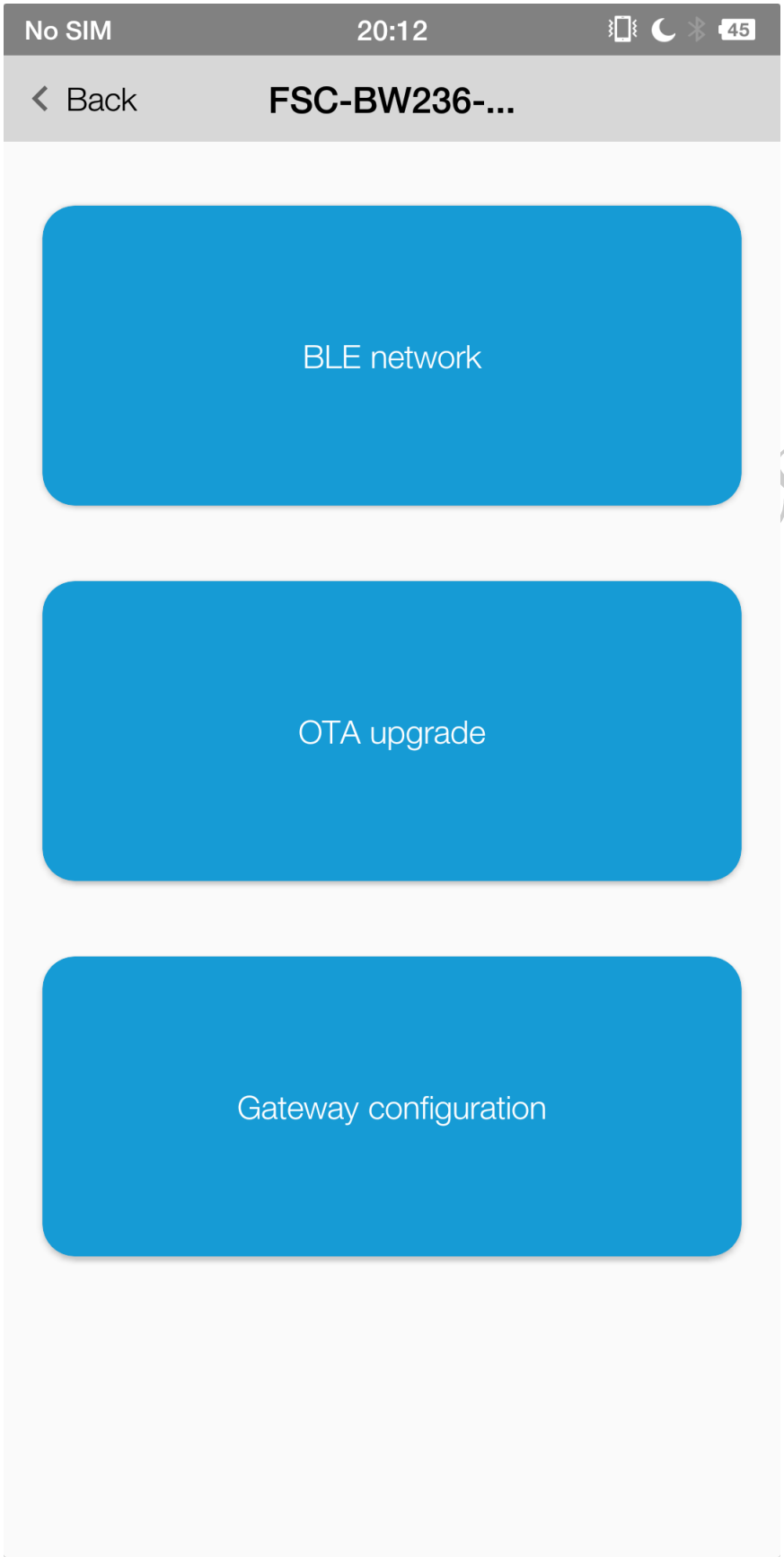
Specific Instruction Process Description

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

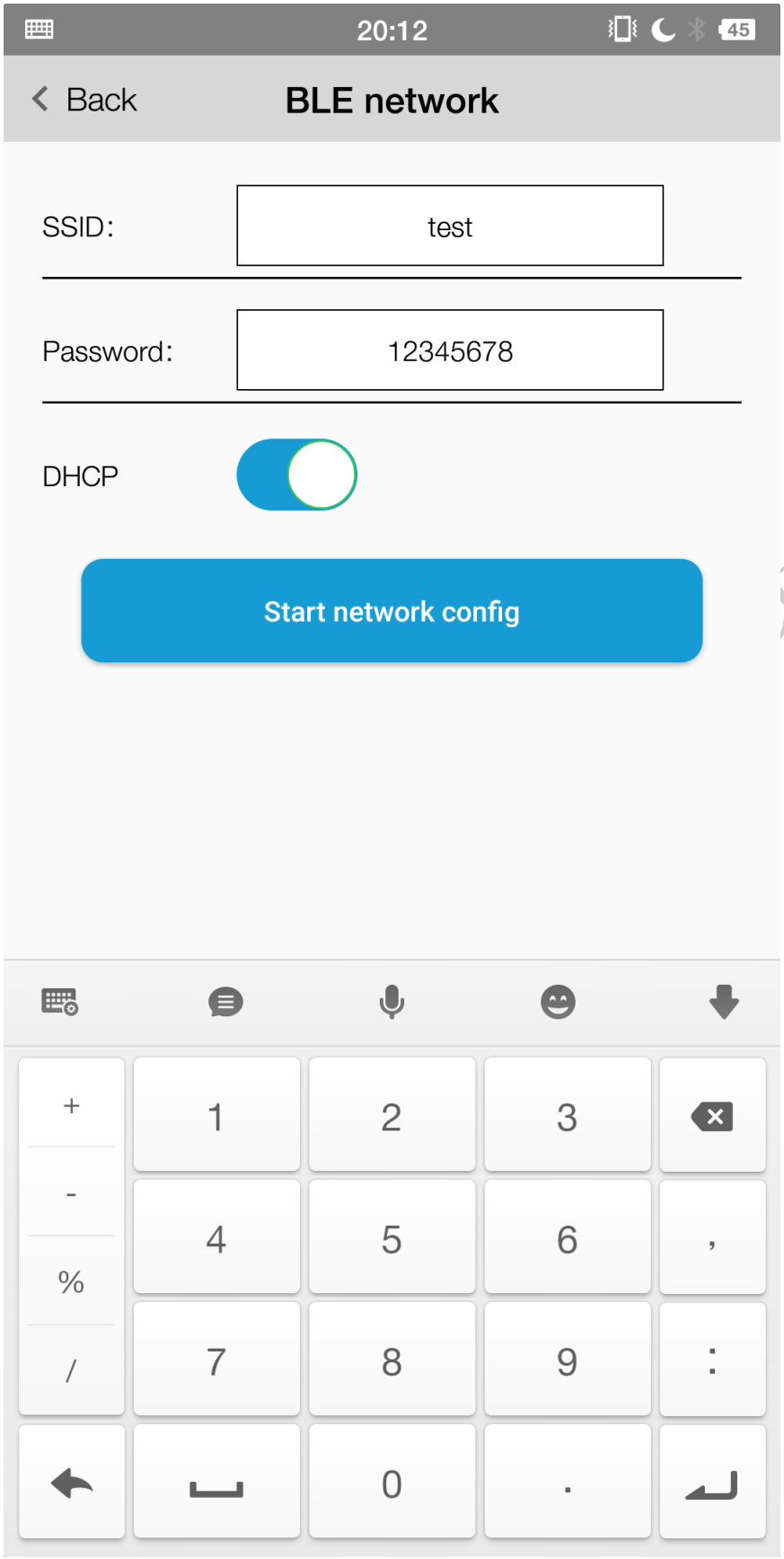
2、Enter the APP interface , search and connect to the target module


No SIM
20:11
45
Sort
Setting
Filter
FSC-BW236-LE
mac: DC:0D:30:60:01:0E
RSSI:-60
Unknown
mac: FF:C3:7E:69:FE:01
RSSI:-57
Unknown
mac: FB:28:A6:63:1B:1F
RSSI:-59
Unknown
mac: 77:61:35:AE:03:EF
RSSI:-61
Unknown
mac: 2B:E0:8C:FE:8E:34
RSSI:-68
FSC-BW236-LE
mac: DC:0D:30:60:EE:CF
RSSI:-63
Unknown
mac: DC:23:4E:F2:DE:08
RSSI:-60
Unknown
mac: 07:CB:90:8C:BD:7E
RSSI:-62
Unknown
mac: 11:6B:05:6B:76:B3
RSSI:-74
头条
mac: AC:23:3F:20:96:E3
RSSI:-67
Unknown
mac: DC:0D:30:00:07:90
RSSI:-68
FSC-BT618
Setting
About

2、After correct connection, it will jump to the following interface:

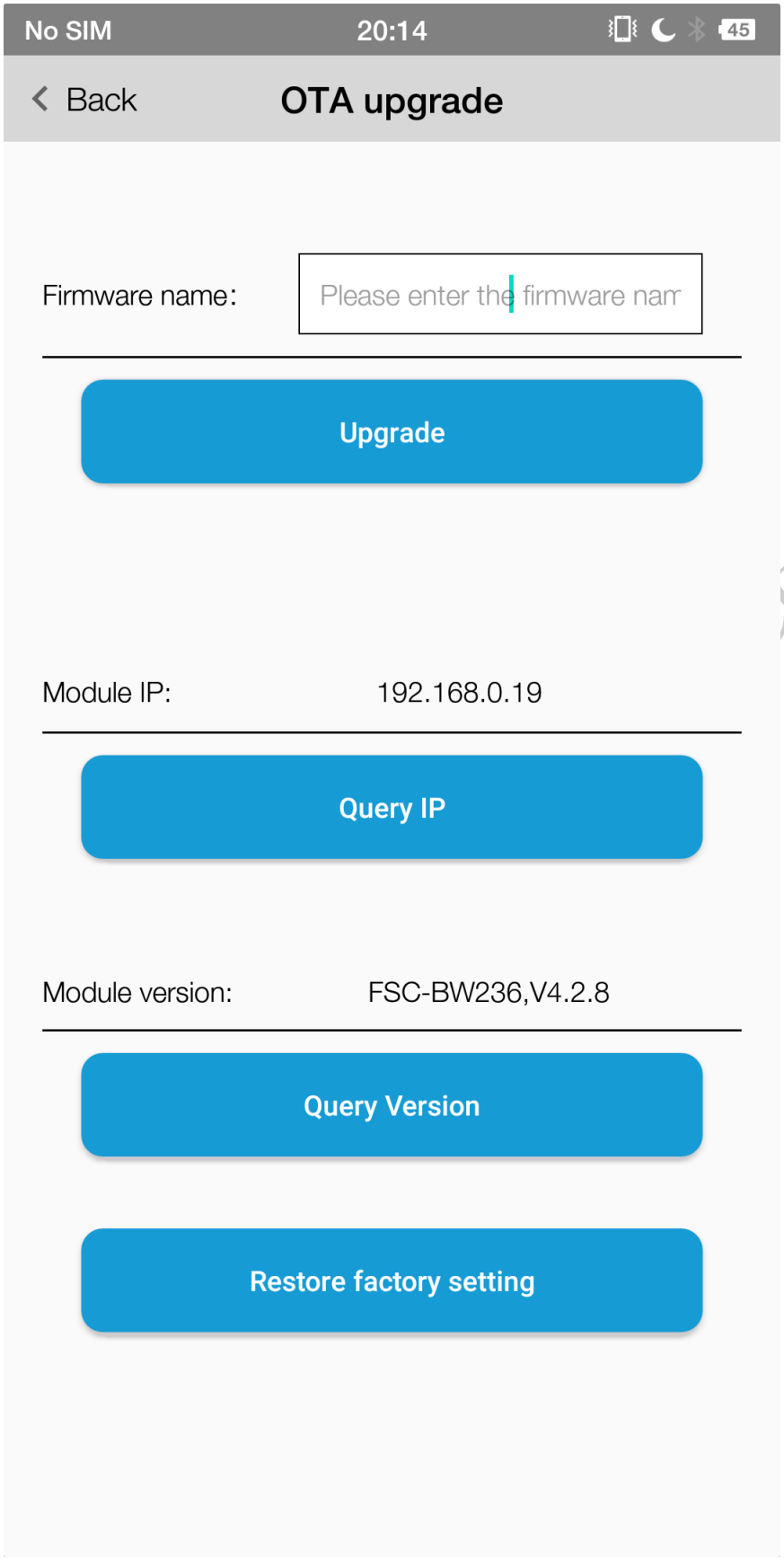


3、Enter the AP’s SSID and password on the **BLE Network** page, then click the **Start Network Config** button


20:12
45
Back
BLE network
SSID:
test
Password:
12345678
DHCP
Start network config
+
1
2
3
-
4
5
6
,
%
7
8
9
:
/
0
.

4、Return to the previous page after the network configuration is successful,

choose **OTA upgrade**, enter firmware name then click the **Upgrade** button


No SIM
20:14
45
Back
OTA upgrade
Firmware name:
Please enter the firmware nam
Upgrade
Module IP:
192.168.0.19
Query IP
Module version:
FSC-BW236,V4.2.8
Query Version
Restore factory setting

Note:

- Module needs to access the Internet,otherwise it will fail

Chapter 8

Appendix

8.1 Download PDF Document

download PDF Document