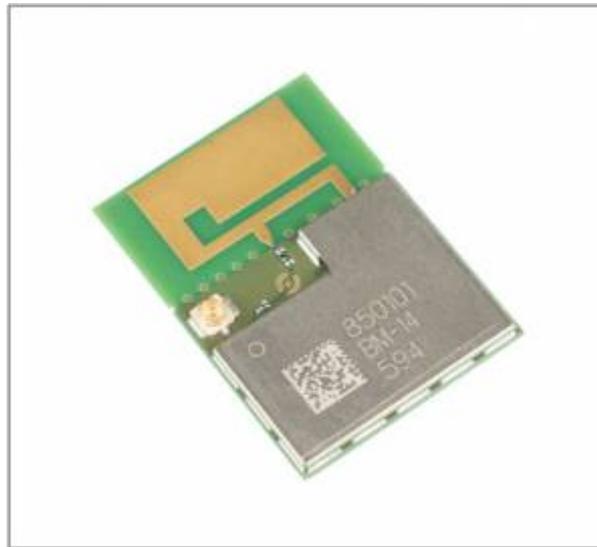


WizFi250 Programmer's Guide

Overview

This document provides programmers with all commands and explanations about WizFi250 control. Basically programmers can control WizFi250 with commands set, known as AT command - the character string format. In this document, we describe what AT commands are used, how each command operates and how programmers have to handle those commands to get the expected response.



2013/09/04 12:11 · [jeonggw](#)

AT Command Set

This section provides a list of WizFi250 AT commands and their effects. Users can input commands and parameters through USART line. Every command starts with the characters "AT". Any other initial character will cause an error in return. Commands and parameters are all ASCII characters, e.g. When

you input 'AT+MMSG=1', you can input ASCII characters 'A', 'T', '+', 'M', 'M', 'S', 'G', '=', '1' and 'Enter Key' which should be CR(0x0d), but neither CRLF(0x0d, 0x0a) nor LF(0x0a).

Some parameters are mandatory and the others are optional. (refer to [Command Tables](#)) Parameters must be entered in an order of format column given by the command tables. Even though an optional parameter is not used, the comma delimiters must still be included in the command. In most cases, valid commands return the characters [OK]. Invalid inputs return [ERROR]. The possible responses sent by WizFi250 to the user side are described at [Responses](#). Below is a possible example which users can input. As you can see, WizFi250 return "\r\n" back instead of "\r", which means user (host system) always handle '\r\n' as a only delimiter.

Input by User	AT\r (0x61 0x74 0x0d)
Output from WizFi250	AT\r\n[OK]\r\n (0x0d 0x0a 0x5b 0x4f 0x4b 0x5d 0x0d 0x0a) (* "AT\r\n" is Echo back of user input)

Responses

Responses are listed below.

Response	Meaning
[OK]	Command Request Success
[ERROR]	Command Request Fail
[ERROR: INVALID INPUT]	Wrong command or parameter
[ERROR: INVALID SCID]	Wrong Socket ID
[ERROR: WiFi Status]	Wrong WiFi Status (Some commands work only with Wi-Fi Joined status)
[ERROR: Mode Status]	Wrong Mode Status (Some commands do not work in Data mode)
[CONNECT x]	TCP Connection established & Socket Open
[DISCONNECT x]	TCP Connection closed & Socket Close
[Link-Up Event]	WiFi Connection was established
[Link-Down Event]	WiFi Connection was closed
[Reset Event]	System reset occurred (not by user)

2013/09/04 12:13 · [jeonggw](#)

Command List

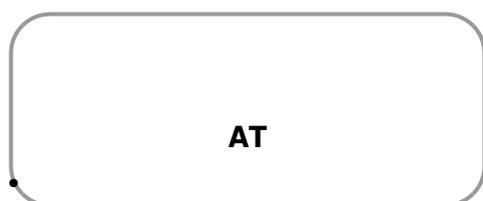
Basic Commands		Management Commands	
AT	Terminal Check	AT+MPROF	Profile Management
WiFi Commands		AT+MFDEF	Perform Factory Reset
AT+WJOIN	WiFi Association	AT+MRESET	Perform System Reset
AT+WLEAVE	WiFi Disassociation	AT+MMSG	Set Message Print Level

AT+WSCAN	WiFi Scan	AT+MMAC	Set MAC Address
AT+WSET	WiFi Configuration	AT+MINFO	Get System Information
AT+WSEC	WiFi Security Configuration	AT+MECHO	Set Echo Mode
AT+WNET	Network Configuration	AT+MHELP	Print Command Description and Usage
AT+WSTAT	Get Current WiFi Status		
AT+WREG	Country Configuration	AT+MMCUPS	MCU Power Save Enable/Disable
AT+WWPS	WiFi WPS Connection	AT+MWIFIPS	Wi-Fi Power Save Enable/Disable
Network Commands			
AT+SCON	Socket Open/Connect	AT+MCWUI	Change WebServer User Information
AT+SMGMT	Socket Management	AT+USET	UART Configuration
AT+SSEND	Data Send	AT+MSPI	SPI Configuration
Function Commands			
AT+SDATA	Return to Data Mode	AT+FPING	PING Test
AT+SFORM	Define Data Receive Header Form	AT+FDNS	DNS Query
		AT+FWEBS	Launch Web Server
		AT+FGPIO	GPIO Control
		AT+Fsock	SOCKET Extension Option
		AT+FOTA	Launch OTA Mode

2013/09/04 14:50 · [jeonggw](#)

Basic Commands

Basic commands are listed below.



Format:

```
AT
```

- **Meaning:** Terminal Check

Check if AT Command Terminal is working.

- **Response:**

```
[OK]
```

2013/09/04 12:14 · [jeonggw](#)

WiFi Commands

Commands related to WiFi are listed below.



Format:

```
AT+WJOIN
```

- **Meaning:** WiFi Association

In the **STA** mode, it joins with the BSS selected by AT+WSET, AT+WSEC.
And in the **AP** mode, it starts to run as an Access Point.

- There are 2 Wi-Fi modes in WizFi250, STA mode and SoftAP mode. When users execute AT+WJOIN command, the current Wi-Fi mode works as the one previously selected by user input. It can be selected or checked by AT+WSET and AT+WSEC commands, and it is the only way to handle Wi-Fi mode.
- **SoftAP mode does not support WEP security method.**

- **Response:**

```
Joining : (SSID)
Successfully joined : (SSID)

[Link-Up Event]
IP Addr   : xxx.xxx.xxx.xxx
Gateway   : xxx.xxx.xxx.xxx
[OK]
```

```
Already Associated : (Mode)
[OK]
```



AT+WLEAVE

Format:

AT+WLEAVE

- **Meaning:** WiFi Disassociation

In the STA mode, it leaves current BSS, but in the SoftAP mode, it stops to run as Access Point.

- **Response:**

[Link-Down Event]
[OK]

[OK]

AT+WSCAN

Format:

AT+WSCAN=<SSID> , <BSSID> , <Channel>

- **Meaning:** WiFi Scan

Return the scan results filtered by parameters.

- <SSID>: SSID Filter (Optional)
Scan only the AP which has this SSID.
- <BSSID>: BSSID Filter (Optional)
Scan only the AP which has this BSSID.
- <Channel>: Channel Filter (Optional)
Scan only the AP in this Channel.

* When combining these filters, it works at the same time. For example, if you enter AT+WSCAN=TestAP,00:08:DC:11:22:33', it only scans the AP which has TestAP as SSID and 00:08:DC:11:22:33 as BSSID in all the channel.

Examples)

- AT+WSCAN=TestAP
- AT+WSCAN=,,6
- AT+WSCAN=,08:00:DC:11:22:33,11

• **Response:**

```
Index/SSID/BSSID/RSSI (-dBm)/MaxDataRate(Mbps)/Security/RadioBand
(GHz)/Channel
...
[OK]
```



Format:

```
AT+WSET=<WiFiMode>,<SSID>,<BSSID>,<Channel>
```

• **Meaning:** WiFi Configuration

<WiFiMode>: WiFi Mode to set (Required)
This changes current WiFi mode.

Parameter	Meaning
0	Set Wi-Fi mode as STA mode
1	Set Wi-Fi mode as AP mode

<SSID>: Target/Own SSID (Required, Max: 32 Character)

Mode	Meaning
STA	The SSID of target AP
AP	Its own SSID to run

<BSSID>: Target BSSID (Optional, Form: xx:xx:xx:xx:xx:xx)

Mode	Meaning
STA	The BSSID of target AP
AP	Not used. if any, it will be ignored

<Channel>: Target/Own Channel (Optional)

Mode	Meaning
STA	In STA mode, the Channel of target AP
AP	In AP mode, its own Channel to run (Default: 6)

* There are 2 Wi-Fi modes in WizFi250, STA mode and SoftAP mode. When users execute AT+WJOIN command, it works as Wi-Fi mode previously selected by the user. It can be selected or checked by AT+WSET and AT+WSEC commands, and it is the only way to handle Wi-Fi mode.

* AT+WSET, AT+WSEC commands save its parameters into the profile automatically, so the user does not need to save the current profile.

Examples)

- AT+WSET=0,WizFiAP
- AT+WSET=0,WizFiAP,08:00:DC:11:22:33,1

• **Response:**

```
[OK]
```

• **Format:**

```
AT+WSET=?
```

• **Meaning:** Get Current Setting

• **Response:**

```
<WiFiMode> , <SSID> , <BSSID> , <Channel>
[OK]
```



Format:

```
AT+WSEC=<WiFiMode> , <SecType> , <PreSharedKey>
```

• **Meaning:** WiFi Security Configuration

<WiFiMode>: Target WiFi mode to set (Required)

Parameter	Meaning
0	Set Wi-Fi mode as STA mode
1	Set Wi-Fi mode as AP mode

<SecType>: Security type (Required)

Parameter	Meaning
OPEN	None
	WiFi Auto Security
WEP	WEP (* Not support at SoftAP mode)
WPA	WPA1 - TKIP
WPAAES	WPA1 - AES
WPA2AES	WPA2 - AES
WPA2TKIP	WPA2 - TKIP
WPA2	WPA2 - Mixed

<PreSharedKey>: Security key value (OPEN: N/A, Other: Required)

Method	Length
WEP	5 or 13 (ASCII), 10 or 26 (HEX)
WPA	8 ~ 63 (ASCII), 128 (HEX)

* There are 2 Wi-Fi modes in WizFi250, STA mode and SoftAP mode. When users execute AT+WJOIN command, it works as Wi-Fi mode previously selected by the user. It can be selected or checked by AT+WSET and AT+WSEC commands, and it is the only way to handle Wi-Fi Wi-Fi mode.

* AT+WSET, AT+WSEC commands save its parameters into the profile automatically, it works as Wi-Fi mode previously selected by the user.

Examples)

- AT+WSEC=0,WEP,12345
- AT+WSEC=1,WPA2,12345678
- AT+WSEC=0,,123456789

• **Response:**

[OK]

• **Format:**

AT+WSEC=?

• **Meaning:** Get Security Setting of Current Mode

• **Response:**

<WiFiMode> , <SecType> , <PreSharedKey>

[OK]

AT+WNET

Format:

AT+WNET=<DHCP> , <IP> , <SN> , <GW>

• **Meaning:** Network Configuration

<DHCP>: DHCP On/Off (Optional)

Parameter	Meaning
0	DHCP Off, Static
1	DHCP On, DHCP Client
Mode	Meaning
STA	DHCP Client On/Off
AP	Not used. if any, it will be ignored

<IP>: IP Address (Optional)

<SN>: Subnet Mask (Optional)

<GW>: Gateway Address (Optional)

Mode	Meaning
STA	AP(Router) gateway address
AP	Not used. if any, it will be ignored

* When you turn DHCP On in STA Mode, <IP>,<SN>,<GW> are not needed. If you input them at this time, they will be stored in the memory. They can be used later when set as Static(DHCO Off) without inputting these parameters.

* In AP mode, DHCP Server will always run despite DHCP option, and Gateway option will not be used, So both options will be ignored.

• **Response:**

[OK]

• **Format:**

```
AT+WNET=?
```

- **Meaning:** Get Current Network Setting

Note that <IP>,<SN>,<GW> address of response are not actual addresses, but addresses stored in the memory. So when DHCP is on, it usually different from actual addresses.

- **Response:**

```
<DHCP> , <IP> , <SN> , <GW>  
[OK]
```

AT+WSTAT

Format:

```
AT+WSTAT
```

- **Meaning:** Get Current WiFi Status

- **Response:**

```
IF/SSID/IP-Addr/Gateway/MAC/TxPower (dBm)/RSSI ( -dBm)  
...  
[OK]
```

AT+WREG

Format:

```
AT+WREG=<Country>
```

- **Meaning:** Country Configuration

Input a two letter country code (ISO 3166-1 A2) like US.

• **Response:**

```
[OK]
```

• **Format:**

```
AT+WREG=?
```

• **Meaning:** Get Current Country Setting

Refer to ISO 3166-1 A2

• **Response:**

```
<Country>
[OK]
```



Format:

```
AT+WWPS=<Mode>,<PinNum>
```

• **Meaning:** WiFi WPS Connection

Join with an AP through WPS method

<Mode>: WPS Mode (Required)

Parameter	Meaning
0	WPS_PBC_MODE
1	WPS_PIN_MODE

<PinNum>: Pin Number (Pin Mode: Required, PBC Mode: N/A)

* The maximum pin number letter is 8.

Examples)

- AT+FWPS=0
- AT+FWPS=1,12345670

• **Response:**

[OK]

2013/09/04 13:04 · [jeonggw](#)

Network Commands

Commands related to Network are listed below.

AT+SCON

Format:

AT+SCON=<OpenType>, <SocketType>, <RemoteIP>, <RemotePort>, <LocalPort>, <DataMode>

- **Meaning:** Socket Open/Connect (User can use max 8 sockets.)

Opens a socket and if it is a TCP Client, establishes TCP connection with remote peer device.

<OpenType>: Socket open type (Required)

Parameter	Meaning
O	open at Once
S	register as a Service
SO	open at Once & register as a Service

* AT ONCE: Assigns a socket immediately and if the socket is a TCP Client, tries to connect peer socket.

* AS SERVICE: Registers its information to the profile. When WiFi Joined, socket open/connect will be performed automatically. If you want to use this after reset, It should be saved by using AT+MPROF=S

<SocketType>: Socket protocol to use (Required)

Parameter	Meaning
TSN	TCP Server Normal
TSS	TCP Server Secured
TCN	TCP Client Normal
TCS	TCP Client Secured
USN	UDP Server Normal
UCN	UDP Client Normal

* 'Secured' means TCP connection through SSL Encryption.

* Actually, there is no Server/Client concept in UDP protocol. This concept is used to decide peer address purposes. If a UDP Server receives any packet, its default peer address will be changed to the address of the packet, so if you send data after that, it goes to the changed address. But If you use UDP Client, its ...default address stored by AT+SCON will never be changed.

<RemotelP>: Remote IP address

Protocol	Parameter Application
TCP Server	N/A
TCP Client	Required
UDP Server	Optional
UDP Client	Required

<RemotePort>: Remote port number
Same condition with upper, RemotelP

<LocalPort>: Local port number (Required)
Local port number should not be duplicated with others which have opened before. When the value is 0, in case the socket was a TCP/UDP Client, a random port number will be selected. If it was a TCP/UDP Server, it will return an error message.

<DataMode>: Mode to run (Optional, default: 0)

Parameter	Meaning
0	Open as Command mode
1	Open as Data mode

* About Command/Data mode, refer to [Command mode & Data mode](#)

Examples)

- AT+SCON=0,TSN,,,5000,0
- AT+SCON=S,UCN,192.168.0.10,12345,5000,1 (Profile must be saved)

• **Response:**

[OK]

• **Format:**

```
AT+SCON=?
```

• **Meaning:** Get Previous Input Parameters

Use for check if previous input parameters are correct.

• **Response:**

```
<OpenType>,<SocketType>,<RemoteIP>,<RemotePort>,<LocalPort>,<DataMode>  
[OK]
```



Format:

```
AT+SMGMT=<SocketID>
```

• **Meaning:** Socket Management - Socket Close

Closes the selected socket and releases all its resources.

<SocketID>: Socket ID (Required)

Parameter	Meaning
0 ~ 7	The socket ID to close
ALL	All the opened sockets

* Opened socket information can be found by using '?' option.

Examples)

- AT+SMGMT=5
- AT+SMGMT=ALL

• **Response:**

```
[OK]
```

• **Format:**

```
AT+SMGMT=?
```

• **Meaning:** Socket Management - Get Opened Socket Status

This prints all of the opened sockets statuses.

• **Response:**

```
Number of Sockets : x (SCID/Socket/Mode/Remote/Local/DataMode)
<SocketID>,<SocketAddr>,<SocketType>,<RemoteIP>,<RemotePort>,<LocalPort
>,<DataMode>
...
[OK]
```



Format:

```
AT+SSEND=<SocketID>,<RemoteIP>,<RemotePort>,<S
endSize>,<Timeout>
```

• **Meaning:** Data Send

This is used only in command mode, not in data mode. It is not required in data mode as you can input directly, but if you exit from data mode to command mode by inputting '+++', you can send data through this command.

<SocketID>: Socket ID (Required)

<RemoteIP>: Remote IP Address

Protocol	Parameter Application
TCP Server	N/A
TCP Client	N/A
UDP Server	Optional
UDP Client	Optional

* In case of TCP Server waiting for a client on listen state or in case of undecided remote

address of the UDP Server (meaning its remote address is 0.0.0.0:0), this command will fail.

<RemotePort>: Remote Port Number
Same condition with upper, RemoteIP

<SendSize>: Data size to send (Required)
Valid Range: 1 ~ 100,000,000 Byte

<Timeout >: Set timeout value (milliseconds unit) (Optional)
If the transmission takes time more time than timeout value, it will fail and return error response. Default value is 10s + (100s / 1 MB)

Examples)

- AT+SSEND=0,,,3
- AT+SSEND=1,192.168.0.100,5000,1000000,50000

• **Response:**

[OK]



Format:

AT+SDATA

• **Meaning:** Return to Data Mode

In data mode, it can be changed to command mode temporarily by using serial +++ input. After that, to return to the data mode, you can use this command. If it is not data mode, [ERROR] response will be returned.

• **Response:**

[OK]



AT+SFORM

Format:

```
AT+SFORM=<Format>,<Start>,<Delim>,<End>,<Cls1>,<Cls2>
```

• **Meaning:** Define Data Receive Header Form

Define the header of received data which is used at command mode. For example, default receiving format look like below.

```
"{0,192.168.0.216,59834,5}hello(0xd)(0xa)"
```

This means ASCII code "hello" was received from 192.168.0.216:59834 by socket ID 0, and its length was 5. You can change this format to suit your system through this command. Factory default option is

```
"111111111,7B,2C,7D,0D,0A"
```

<Format>: Decide each of header items to use. (Required)

If you want to set it to active, input '1', if not, input '0'.

Order	Meaning
0	Header Start
1	Socket ID
2	Delimiter
3	Remote IP Address
4	Remote Port Number
5	Data Length
6	Header End
7	Data End 1/2
8	Data End 2/2

* At default format, '{ '}' is header start and end, ',' is delimiter, 0xd,0xa is data end 1,2.

< Start>: Header Start Character (Required)

< Delim>: Delimiter Character (Required)

< End>: Header End Character (Required)

< Cls1>: Data End Character 1/2 (Required)

< Cls2>: Data End Character 2/2 (Required)

Examples)

- AT+SFORM=111111111,7B,2C,7D,0D,0A
- AT+SFORM=101100110,5B,2F,5D,0D,00

• **Response:**

```
[OK]
```

• **Format:**

```
AT+SF0RM=?
```

• **Meaning:** Get Current Data Receive Header Form

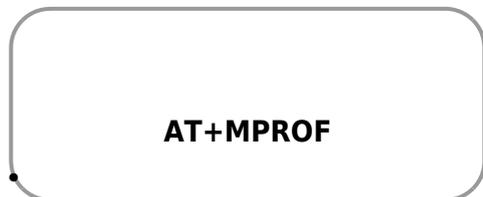
• **Response:**

```
<Format>,<Start>,<Delim>,<End>,<Cls1>,<Cls2>  
[OK]
```

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Management Commands

Commands related to system management are listed below.



Format:

```
AT+MPROF=<Action>
```

• **Meaning:** Profile Management

You can save/load the environmental information in the RAM to/from flash ROM, or check the setting values in both of them through this command.

<Action>: The action to perform (Required)

Parameter	Meaning
VD	Get saved profile
VG	Get current profile
L	Load profile
S	Save profile

* There is no '?' option at this command.

Examples)

- AT+MPROF=S

• **Response:**

```
[OK]
+WSET=...
+WSEC=...
+WNET=...
+WREG=...
+SCON=...
+SFORM=...
+MMSG=...
+MMAC=...
+USET=...
+MECHO=...
+FWEBS=...
[OK]
```

AT+MFDEF

Format:

```
AT+MFDEF=FR
```

- **Meaning:** Perform Factory Reset

Factory Reset means that all of environmental variables return back to the default state. (You can check that by using AT+MPROF command)

• **Response:**

```
[OK]
```

AT+MRESET

Format:

AT+MRESET

- **Meaning:** Perform System Reset

System will reboot after this command.

- **Response:**

[OK]

AT+MMSG

Format:

AT+MMSG=<Level>

- **Meaning:** Set Message Print Level

<Level>: Message Print Level (Required)

Parameter	Meaning
1	Print Responses
2	Print Responses, Events (Default)
3	Print Responses, Events, Debug Logs

Examples)

- AT+MMSG=2

- **Response:**

[OK]

- **Format:**

```
AT+MMSG=?
```

- **Meaning:** Get Current Message Print Level

- **Response:**

```
<Level>  
[OK]
```

AT+MMAC

Format:

```
AT+MMAC=<MAC>
```

- **Meaning:** Set MAC Address

<MAC>: MAC Address (separated by colon) (Required)

Examples)

- AT+MMAC=00:08:DC:11:22:33

- **Response:**

```
[OK]
```

- **Format:**

```
AT+MMAC=?
```

- **Meaning:** Get Current MAC Address

- **Response:**

```
<MAC>
```

[OK]

AT+MINFO

Format:

AT+MINFO

- **Meaning:** Get System Information
- **Response:**

```
FW version / HW version
<FWver> / <HWver>
[OK]
```

AT+MECHO

Format:

AT+MECHO=<Action>

- **Meaning:** Set Echo Mode

If you turn the echo mode off, you cannot see the characters that you inputted returning. It is easy to use to turn off when Host MCU handles AT Command control.

<Action>: Echo Mode (Required)

Parameter	Meaning
0	Echo Off
1	Echo On (Default)

Examples)

- AT+MECHO=0

• **Response:**

```
[OK]
```

• **Format:**

```
AT+MECHO=?
```

• **Meaning:** Get Current Echo Mode

• **Response:**

```
<Mode>  
[OK]
```

AT+MHELP

Format:

```
AT+MHELP
```

• **Meaning:** Print Command Description and Usage

This is command usage guide for user convenience.

• **Response:**

```
...  
[OK]
```

AT+MMCUPS

Format:

```
AT+MMUCUPS=<Action>,<Timeout>
```

• **Meaning:** MCU Power Save Enable/Disable

MCU Power Save Mode can be selected through this command.

<Action> : MCU Power Save Mode (Required)

Parameter	Meaning
0	MCU Power Save Mode Disable
1	MCU Power Save Mode Enable

* while using MCU Power Save Mode, WizFi250 cannot use serial communication.

<Timeout> : MCU Power Save Timeout value (Required)

Valid Range : 10 ~ 3600000 (unit:ms)

cc

• **Response:**

```
[OK]
```



Format:

```
AT+MWIFIPS=<Action>,<Delay>
```

• **Meaning:** Wi-Fi Power Save Enable/Disable

Wi-Fi power save mode can be selected through this command.

<Action> : Wi-Fi Power Save Mode (Required)

Parameter	Meaning
0	Wi-Fi Power Save Mode Disable
1	Wi-Fi Power Save Mode Enable
2	Enables power save mode while attempting to maximize throughput

* To using Wi-Fi Power Save Mode, WizFi250 has to connect to Access Point. And WizFi250 can only use this mode in station mode.

<Delay > : Return to Sleep Delay

If it is set with a bigger value, the performance will improve but the power consumption will rise.

Action	Application
0	N/A
1	N/A
2	Required

* This parameter is used only to set 2 of <Action> parameter.

* It must be set to a multiple of 10. When set to 0, the timeout period default to 2 beacon intervals (approximately 204ms).

* It can be set to 0 ~ 90

• **Response:**

[OK]

• **Format:**

AT+MWIFIPS=?

• **Meaning:** Get Current Wi-Fi Power Save Status

<Status > : Current Wi-Fi Power Save Status

Return value	Meaning
0	Wi-Fi Power Save Mode Disable
1	Wi-Fi Power Save Mode Enable

• **Response:**

[OK]

AT+MCWUI

Format:

```
AT+MCWUI=<Current ID>,<Current P/W><New ID>,<New P/W>
```

- **Meaning:** Change Web Server's User Information

User ID and User Password used by web server can be changed through this command

<Current ID> : Current ID (Required)

- Default value is admin

<Current P/W> : Current Password (Required)

- Default value is admin

<New ID> : New ID which you want to change (Required)

- Max length of New ID : 20 bytes

<New P/W> : New Password which you want to change (Required)

- Max length of New Password : 20 bytes

Examples)

- AT+MCWUI=admin,admin,newid,newpassword

- **Response:**

```
[OK]
```

- **Format:**

```
AT+MCWUI=?
```

- **Meaning:** Get Current user ID and user P/W

- **Response:**

<Current ID>,<Current P/W>
[OK]



Format:

AT+USET=<Baudrate>,<Parity>,<WordLen>,<StopBit>,<FlowCon>

• **Meaning:** UART Configuration

UART parameter can be set through this command. Factory default parameter is "115200,N,8,1,N".

<Baudrate>: Set the Baud-Rate. (Required)

Parameter	Meaning
300	300 bps
600	600 bps
1200	1200 bps
2400	2400 bps
4800	4800 bps
9600	9600 bps
14400	14400 bps
19200	19200 bps
38400	38400 bps
57600	57600 bps
115200	115200 bps
230400	230400 bps
460800	460800 bps
921600	921600 bps
1843200	1843200 bps

<Parity>: Set the Parity-Bit type. (Required)

Parameter	Meaning
N	None
O	(Reserved)
E	(Reserved)

<WordLen>: Set the Word-Length. (Required)

Parameter	Meaning
7	(Reserved)
8	8 bits

* 7 bits word length with no parity bit is not allowed.

<StopBit>: Set the Stop-Bit. (Required)

Parameter	Meaning
0.5	0.5 bits
1	1 bits
1.5	1.5 bits
2	2 bits

<FlowCon>: Set the Flow-Control method. (Required)

Parameter	Meaning
N	None
HW	Hardware Flow Control

Examples)

- AT+USET=115200,N,8,1,N
- AT+USET=921600,N,8,2,HW

• **Response:**

[OK]

• **Format:**

AT+USET=?

- **Meaning:** Get Current UART Setting

• **Response:**

<Baudrate>,<Parity>,<WordLen>,<StopBit>,<FlowCon>
[OK]

AT+MSPI

• **Format:**

```
AT+MSPI=<Interface>,<SPI Option>
```

• **Meaning:** SPI Configuration

<Interface>: Choice of interface (Required)

If <Interface> set 0, WizFi250 Will set the interface it received first. For example, If MCU sends UART signal to WizFi250, WizFi250 will be set as UART interface. On the other hand, If MCU send SPI signal to WizFi250, WizFi250 will be set as SPI interface.

Parameter	Meaning
0	Auto(Default)

<SPI Option>: Configure SPI Option (Optional when use SPI)

Value	Bit3	Bit2	Bit1	Bit0
0	LSB_FIRST		CLOCK_IDLE_LOW	CLOCK_FALLING_EDGE
1	MSB_FIRST		CLOCK_IDLE_HIGH	CLOCK_RISING_EDGE

Examples(Received through SPI interface):

- **AT+MSPI=0,0** (SET LSB_FIRST, CLOCK_IDLE_LOW, CLOCK_FALLING_EDGE)
- **AT+MSPI=0,1** (SET LSB_FIRST, CLOCK_IDLE_LOW, CLOCK_RISING_EDGE)
- **AT+MSPI=0,2** (SET LSB_FIRST, CLOCK_IDLE_HIGH, CLOCK_FALLING_EDGE)
- **AT+MSPI=0,3** (SET LSB_FIRST, CLOCK_IDLE_HIGH, CLOCK_RISING_EDGE)
- **AT+MSPI=0,8** (SET MSB_FIRST, CLOCK_IDLE_LOW, CLOCK_FALLING_EDGE)
- **AT+MSPI=0,9** (SET MSB_FIRST, CLOCK_IDLE_LOW, CLOCK_RISING_EDGE)
- **AT+MSPI=0,10** (SET MSB_FIRST, CLOCK_IDLE_HIGH, CLOCK_FALLING_EDGE)
- **AT+MSPI=0,11** (SET MSB_FIRST, CLOCK_IDLE_HIGH, CLOCK_RISING_EDGE)

Examples(Received through UART interface):

- **AT+MSPI=0** (SET UART Interface)

• **Response:**

```
[OK]
```

• **Format:**

```
AT+MSPI=?
```

• **Meaning:** Get Current Interface and SPI Option

• **Response:**

```
<Interface>,<SPI Option>
[OK]
```

<Interface>: UART/SPI

Parameter	Meaning
1	UART
2	SPI

2013/09/04 13:06 · [jeonggw](#)

Function Commands

Commands related to additional functions are listed below.



Format:

```
AT+FPING=<RepeatCnt>,<TargetIP>
```

• **Meaning:** PING Test

<RepeatCnt>: Repeat Count (Required)
Valid Range: 1 ~ 1,000,000 (unit:ms)

<TargetIP>: Target IP Address (Required)

Examples)

- AT+FPING=3,192.168.0.10

• **Response:**

```
Ping Reply : xxx ms
...
```

[OK]

AT+FDNS

Format:

AT+FDNS=<HostName>,<Timeout>

• **Meaning:** DNS Query

<HostName>: The domain name to search (Required)

<Timeout>: Maximum Delay (milliseconds unit) (Required)

Valid Range: 1 ~ 1,000,000 (unit:ms)(Recommend: 1000)

Examples)

- AT+FDNS=www.google.com,1000

• **Response:**

xxx.xxx.xxx.xxx
[OK]

AT+FWEBS

Format:

AT+FWEBS=<Action>,<Type>

• **Meaning:** Launch Web Server

Web server can be set through this command. The default setting is to start web server when Wi-Fi link up event occurs. (Factory default parameter is "1,A")

<Action>: The action to perform (Required)

Parameter	Meaning
0	Web server Stop
1	Web server Start

<Type> : The web server launch type (Required)

Parameter	Meaning
A	Web server start when Wi-Fi link up event occurs
M	Web server start when enter AT+FWEB S command after Wi-Fi is joined.

* If <Action> parameter is 1 and Wi-Fi is joined, WizFi250 starts web server immediately without regard for <Type> parameter. If Wi-Fi is not joined, web server is started according to <Type> parameter. If you want to use <Type> parameter after reset, it should be saved using AT+MPROF=S

Examples)

- AT+FWEB S=1,A
- AT+FWEB S=0,M

• **Response:**

```
[OK]
```

• **Format:**

```
AT+FWEB S=?
```

• **Meaning:** Get Current WEB Server Status and Type

<Status>: Current WEB Server status

Return value	Meaning
0	Web server Stop
1	Web server Run

• **Response:**

```
<Status>,<Type>
[OK]
```

AT+FGPIO

Format:

```
AT+FGPIO=<action:0>,<gpio_number>
AT+FGPIO=<action:1>,<gpio_number>,<gpio_value>
AT+FGPIO=<action:2>,<gpio_number>,<config_value>
```

- **Meaning:** GPIO Control Function

GPIO can be set through this command.
 <action>: The action to perform (Required)

Return value	Meaning
0	Get GPIO value when <mode> is 0
1	Set GPIO value when <mode> is 1
2	GPIO Initialize

<gpio_number>: Available GPIO number (Required)

Return value	Meaning
1	GPIO 1
5	GPIO 5
6	GPIO 6
7	GPIO 7
8	GPIO 8

<config_value>: Current GPIO Configuration Value (It can be used when action is 2)

Return value	Meaning
0	INPUT_PULL_UP (Input with an internal pull-up resistor)
1	INPUT_PULL_DOWN (Input with an internal pull-down resistor)
2	INPUT_HIGH_IMPEDANCE (Input - must always be driven, either actively or by an external pullup resistor)
3	OUTPUT_PUSH_PULL (Output actively driven high and actively driven low - must not be connected to other active outputs)
4	OUTPUT_OPEN_DRAIN_NO_PULL (Output actively driven low but is high-impedance when set high - can be connected to other open-drain/open-collector outputs. Needs an external pull-up resistor)
5	OUTPUT_OPEN_DRAIN_PULL_UP (Output actively driven low and is pulled high with an internal resistor when set high - can be connected to other open-drain/open-collector outputs)

<gpio_value>: Current GPIO Value (It can be used when action is 1)

Return value	Meaning
0	Low
1	High

Examples)

- AT+FGPIO=2,6,3
- AT+FGPIO=0,1
- AT+FGPIO=1,5,1

• **Response:**

If <action> is 0

```
<gpio_value>
[OK]
ex)
AT+FGPIO=0,1
0
[OK]
```

If <action> is 1 or 2

```
[OK]
```

• **Format:**

```
AT+FGPIO=?
```

• **Meaning:** Get Current GPIO Setting

<mode>: Current GPIO mode

Return value	Meaning
0	Input
1	Output

* <mode> can be set to 0 automatically when <config_value> is set to 0,1 or 2. If <config_value> is set to 3,4 or 5, <mode> can be set to 1 automatically.

<gpio_number>: Available GPIO number

<config_value>: Current GPIO Configuration Value

<gpio_value>: Current GPIO Value

Examples)

- AT+FGPIO=?

• **Response:**

```
{<mode>,<gpio_num>,<config_value>,<set_value>}
[OK]

ex)
{1,1,3,0},{1,5,3,0},{1,6,3,0},{1,7,3,0},{1,8,3,0}
[OK]
```



Format:

```
AT+FSOCK=<Option>,<Value>
```

• **Meaning:** SOCKET Extension Option

This is for extended options of Socket. It will be added continuously.

<Option>: Extended options of Socket (Required)

Parameter	Meaning
1	TCP Send error timeout (value : 2000~10000ms)

<Type> : Value of extended option (Required)

Examples)

- AT+FSOCK=1,5000

• **Response:**

```
[OK]
```

• **Format:**

```
AT+FSOCK=?
```

• **Meaning:** Get Current extended options of socket

• **Response:**

```
<Extened option 1>
[OK]
```

AT+FOTA

Format:

```
AT+FOTA
```

• **Meaning:** Launch OTA Mode

User can update firmware in OTA mode which can be entered by this command. Refer to [Wi-Fi OTA](#)

• **Response:**

```
[OK]
```

2013/09/04 13:06 · [jeonggw](#)

Command mode & Data mode

There are two user interface modes between WizFi250 and User-System.

Command mode is the default communication mode and all AT Commands can be used only at this mode. Through AT Commands, users can do 'WiFi Configuration', 'Sending/Receiving Data', 'Managing System', and so on. WizFi250 treats all received data from users as AT command. If all received data follows the correct command format, WizFi250 processes it and returns a proper response to user.

Data mode, on the other hand, is the mode which passes data of application layers to peer devices directly, without AT commands or any other interventions. It can be considered as a black box which passes all USART input to USART output directly. Its concept is simple but to enter this mode, Users need to set the environment properly through AT Commands.

Entering Data mode

Users can enter Data mode by writing '1' at '<DataMode>' parameter of AT+SCON command. Make sure that there are no open sockets before performing this, because Data mode works with one socket only. (So if you try to open another socket in data mode it will fail). If the socket of Data mode is closed, the mode will be changed to Command mode automatically so users can input AT Commands. If users set AT+SCON command as service with data mode option and save the profile, Data mode will be started when WiFi is joined, so the user does not need to set environments anymore. If the system boots or reboots at that time, WiFi Join will also be started automatically. Users can exit from data mode temporarily by entering '+++' in a row (Wait for a second until [OK] response show up). Any AT Command can be entered during Data mode except AT+SCON command. If you want to return to data mode again, you just need to enter AT+SDATA. If you want to exit Data mode completely, close the socket by using 'AT+SMGMT=0' or 'AT+SMGMT=ALL'.

Data transmission in Command mode

In Command mode, you can make more than one socket, and you can send/receive data through opened sockets at the same time by using AT Command. You can send data to specific socket opened through AT+SSEND command and receive data with information header which informs you on the socket number, the peer address and the received data length.

2013/09/04 13:07 · [jeonggw](#)

2013/09/04 12:11 · [jeonggw](#)

I/O PIN

PIN Description

Pin Name	Direction	Description
BOOT	IN	<p>Enter into boot mode</p> <p>When boot or reset is performed, if this pin is tied low, it will enter into boot mode. Users can do APP/DCT(DCT : Device Configuration Table for WizFi250-Configuration-Data) upload or factory recovery in the boot mode through UART.</p> <ul style="list-style-type: none"> ◆ LOW : Start as boot mode ◆ HIGH: Start as application mode
FUNCTION	IN	<p>Perform pre-defined action</p> <p>Perform pre-defined action at the booting or while running. This can be used when UART cannot be used. (Refer to FUNCTION Pin Usage)</p>
LED1	OUT	<p>Indicate WiFi Association</p> <p>When WiFi is joined (associated) with router in STA mode or with station in AP mode, it will be changed to low state (LED On). And when left(disassociated), it will be returned to high state (LED Off).</p> <ul style="list-style-type: none"> ◆ LOW (LED ON) : WiFi is Associated ◆ HIGH(LED OFF): WiFi is Not associated
LED2	OUT	<p>Indicate Data/Command Mode</p> <p>If serial (UART or SPI) interface mode is data mode, this pin will be tied low state (LED On). And if it is command mode, it will be tied high state (LED Off).</p> <ul style="list-style-type: none"> ◆ LOW (LED ON) : Data Mode ◆ HIGH(LED OFF): Command Mode
SPI_DATA_READY	OUT	<p>Indicates that there is data to send through SPI</p> <p>When WizFi250 has data to send in the SPI mode, this will be changed to high state. This pin can be used for awakening host MCU.</p>
GPIO 1	IN/OUT	<p>User Defined GPIO 1</p> <p>User can utilize this pin for GPIO through AT Command.</p>
GPIO 5	IN/OUT	<p>User Defined GPIO 5</p> <p>User can utilize this pin for GPIO through AT Command.</p>
GPIO 6	IN/OUT	<p>User Defined GPIO 6</p> <p>User can utilize this pin for GPIO through AT Command.</p>
GPIO 7	IN/OUT	<p>User Defined GPIO 7</p> <p>User can utilize this pin for GPIO through AT Command.</p>

GPIO 8	IN/OUT	User Defined GPIO 8 User can utilize this pin for GPIO through AT Command.
Reserved	-	Reserved for future use

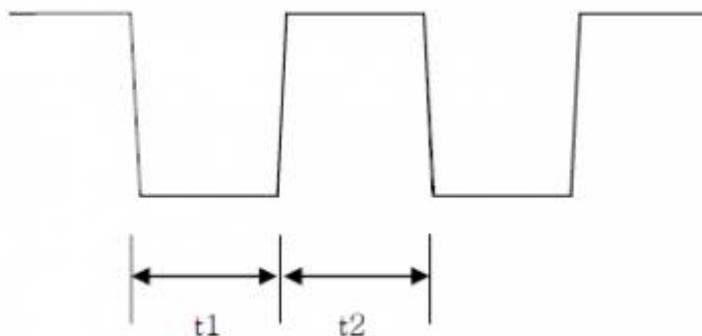
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FUNCTION Pin Usage

Through the function pin, users can perform specific actions without AT Command.

Action	How to enter
Factory Recovery	While booting or reset, keep low state (pressing the button) together with BOOT pin over 3.5 seconds
AP Mode	During running state, tie it to low state and release it for once. Refer to time diagram below.
OTA Mode	While running state, tie it to low state and release it for twice. Refer to time diagram below.
Factory Default	During running state, tie it to low state and release it for thrice. Refer to time diagram below.

Time sequence graph is as below.



Variable	Min	Typ	Max
t1	100 ms	-	200 ms
t2	100 ms	-	200 ms

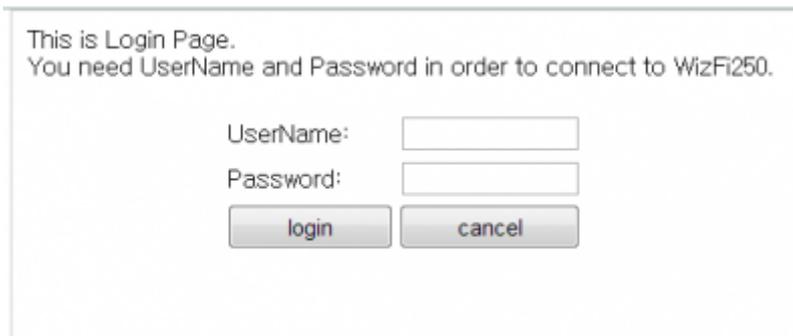
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2013/09/04 13:11 · [jeonggw](#)

How to Use Web Configuration

Main Page

This picture shows the main page of WizFi250's web server. In order to enter this page, WizFi250 should operate as SoftAP mode or associate to target AP as STA mode. The web server is launched automatically when joined to target AP or operate SoftAP. If you do not want to operate the web server, you can use <AT+FWEB> command. For detailed information about <AT+FWEB> command, refer to [AT+FWEB](#). After entering this page, users have to input user id and user password. Its default value is admin. If you want to change user id or user password, you can use <AT+MCWUI> command. For detailed information about <AT+MCWUI> command, refer to [AT+MCWUI](#).



After input user information, user can choose an item to perform among below listed 5 items.



WizFi250 Configuration

Select a configuration method ...



S2W Setting & Scan Network



WPS(Push button)



WPS(PIN)



Change to OTA Mode



GPIO Control



Serial Setting



User Information Setting

2013/09/04 13:13 · [jeonggw](#)

Serial to Wi-Fi Setting

If you select “S2W Setting & Scan Network” icon, you can enter into web page as shown in this picture. On this page, you can set parameters for using AP Mode or Station Mode and TCP/UDP.

Set AP Mode

If you want to use AP Mode and TCP Server, you can select parameter as shown on picture. If you want to use TCP Server or UDP Server, you don't need to input <Remote IP> and <Remote Port>.

WIZnet WizFi250 Serial to Wi-Fi Setting

Step 1 : Select Serial to Wi-Fi Configuration Value

Mode(AP/Station)

Protocol(TCP/UDP)

Remote IP

Remote Port

Local Port

If WizFi250 was set successfully, you will see the success message as below.

WIZnet WizFi250 Serial to Wi-Fi Setting

Step 1 : Select Serial to Wi-Fi Configuration Value

Mode(AP/Station)

Protocol(TCP/UDP)

Remote IP

Remote Port

Local Port

Setting Result

And after checking success result, click the <Next_Step> button in order to move on to the next page. If wrong value was inputted, WizFi250 will return fail message like below.

WIZnet WizFi250 Serial to Wi-Fi Setting

Step 1 : Select Serial to Wi-Fi Configuration Value

Mode(AP/Station)

Protocol(TCP/UDP)

Remote IP

Remote Port

Local Port

Result

On the next page users can set AP information like SSID, Security and Security Key value as below.

WizFi250 Serial to Wi-Fi Setting

Step 2 : WizFi250 Set AP Mode

WizFi250 AP Setting

SSID	<input type="text" value="WizFi250_AP"/>
Security	<input type="text" value="OPEN"/>
Pre-Shared Key	<input type="text"/>

WizFi250 AP Network Setting

Wi-Fi IP Address	<input type="text" value="192.168.12.1"/>
Gateway IP Address	<input type="text" value="192.168.12.1"/>
Subnet Mask	<input type="text" value="255.255.255.0"/>

If it finishes successfully, the user will see the message as below.

WizFi250 Serial to Wi-Fi Setting

Step 2 : WizFi250 Set AP Mode

WizFi250 AP Setting

SSID	<input type="text" value="WizFi250_AP"/>
Security	<input type="text" value="OPEN"/>
Pre-Shared Key	<input type="text"/>

WizFi250 AP Network Setting

Wi-Fi IP Address	<input type="text" value="192.168.12.1"/>
Gateway IP Address	<input type="text" value="192.168.12.1"/>
Subnet Mask	<input type="text" value="255.255.255.0"/>

Success:WizFi250 will be restart

Station Mode

If the user sets Station Mode on this web page, the user can select protocol and other information as Remote IP, Remote Port and Local Port. In this example, we will explain how to set Station Mode and TCP Client.



WizFi250 Serial to Wi-Fi Setting

Step 1 : Select Serial to Wi-Fi Configuration Value

Mode(AP/Station)

Protocol(TCP/UDP)

Remote IP

Remote Port

Local Port

If WizFi250 was set successfully, you will see the success message as below.



WizFi250 Serial to Wi-Fi Setting

Step 1 : Select Serial to Wi-Fi Configuration Value

Mode(AP/Station)

Protocol(TCP/UDP)

Remote IP

Remote Port

Local Port

Setting Result

Then you can select DHCP mode or Static mode. In this example we chose DHCP mode. When using DHCP, it is not required to select IP information.



WizFi250 Serial to Wi-Fi Setting

Step 2 : WizFi250 Set Station Mode

WizFi250 Station Network Setting

DHCP Mode

Wi-Fi IP Address

Gateway IP Address

Subnet Mask

Enter a Password and then Select the <Join> button you want to associate to SSID.



If you can see “Device Started. Web server and access point stopped. See UART for further information.” message in the web browser and “Successfully joined” message in the serial terminal, WizFi250 is associated to AP successfully.

This picture is serial message when WizFi250 is associated to AP successfully.

```
Joining : Wiznet_Kaizen  
Successfully joined : Wiznet_Kaizen
```

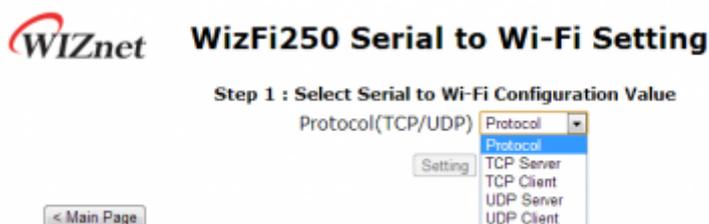
```
[Link-Up Event]  
IP Addr  : 192.168.15.7  
Gateway  : 192.168.15.1
```

```
[CONNECT 0]
```

2013/09/04 13:14 · [jeonggw](#)

WPS(Push Button)

This section explains how to set the protocol as TCP or UDP and then associate to Access Point by WPS method. If you select „WPS(Push button)“, you can see the web page as on this picture. For more detailed information, refer to [Serial to Wi-Fi Setting](#).



If you click the next_step button after finishing the setting, the web page will be shown as below.



WizFi250 WPS-PBC Configuration

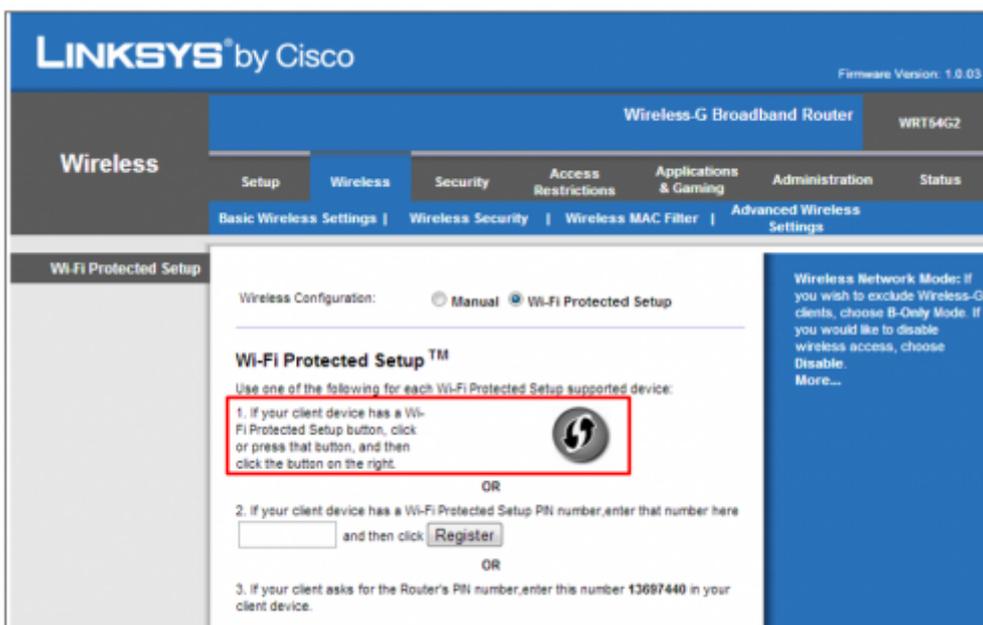


WPS Push Button

Press the WPS button on your Wi-Fi Access Point.

Click

If you click the <Go> button on this web page, WizFi250 will scan the Access-Point in order to connect to it. The Access-Point must be set with <WPS-PBC> function as in this picture.
(In this example, we used LINKSYS Access-Point)



This picture shows the log message stating that WizFi250 finished the WPS function successfully.

```
Looking for WPS AP
Associated
Sending EAPOL start
Received Identity request
Sending Identity
Received WPS Start
Sending M1
Received M2
Sending M3
Received M4
Sending M5
Received M6
Sending M7
Received M8

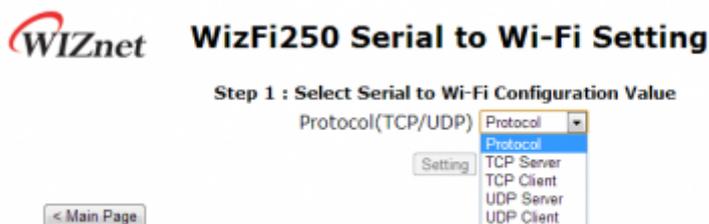
[Link-Down Event]
WizFi250 Version 0.0.2.3 (WIZnet Co.Ltd)
Joining : WizFiDemoAP
Successfully joined : WizFiDemoAP

[Link-Up Event]
IP Addr      : 192.168.3.109
Gateway      : 192.168.3.1
```

2013/09/04 13:14 · jeonggw

WPS(PIN)

This section explains how to set the protocol as TCP or UDP and then associate it to the Access Point by WPS method. If you select "WPS(PIN)", you will see the webpage as shown in this picture. For detailed information, refer to [Serial to Wi-Fi Setting](#).



If you click the next_step button after finishing the setting, the web page will be shown as below.



WizFi250 WPS-PIN Configuration



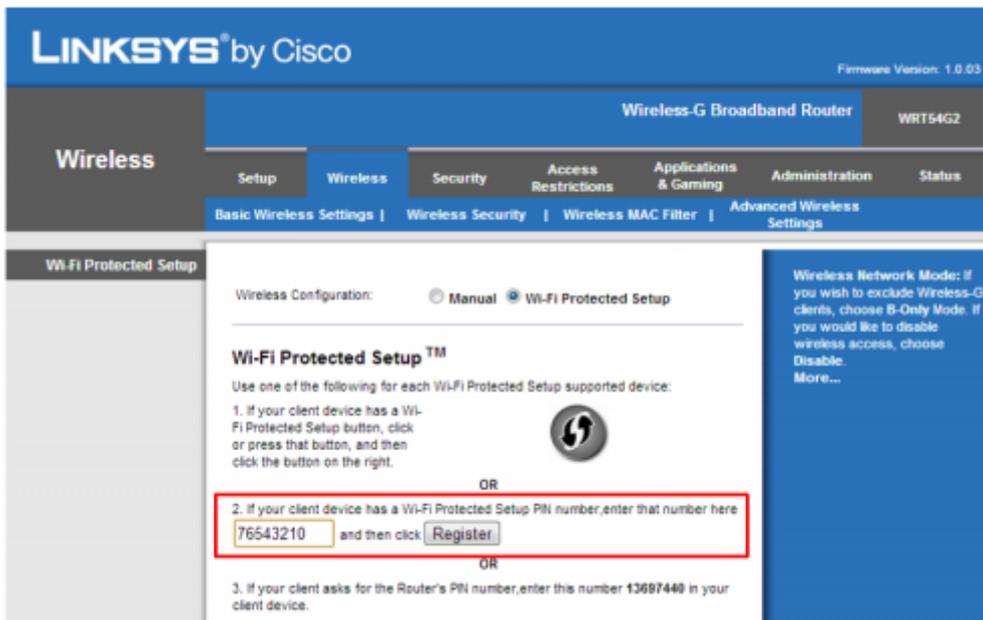
WPS PIN

Enter the following WPS Enrollee PIN in your Wi-Fi Access Point.
(the PIN includes a CRC, a random PIN may fail the CRC check)

PIN

Click

If you enter PIN number and click <Go> button, WizFi250 will scan the Access-Point in order to connect to it. Access-Point must be set as <WPS-PIN> function as below. (In this example, we used LINKSYS Access-Point)



If the WPS-PIN function is successful, you will see a serial log message as on this picture.

```
Looking for WPS AP
Associated
Sending EAPOL start
Received Identity request
Sending Identity
Received WPS Start
Sending M1
Received M2
Sending M3
Received M4
Sending M5
Received M6
Sending M7
Received M8

[Link-Down Event]
WizFi250 Version 0.0.2.3 (WIZnet Co.Ltd)
Joining : WizFiDemoAP
Successfully joined : WizFiDemoAP

[Link-Up Event]
IP Addr      : 192.168.3.109
Gateway      : 192.168.3.1
```

2013/09/04 13:15 · [jeonggw](#)

Change to OTA Mode

If you select “Change to OTA Mode” icon, you will see the web page as on this picture.



If you click the <Change to OTA mode> button on this page, WizFi250 will run in OTA Mode. For detailed information about OTA Mode, refer to [Upload newest firmware in OTA mode](#)

2013/09/04 13:15 · [jeonggw](#)

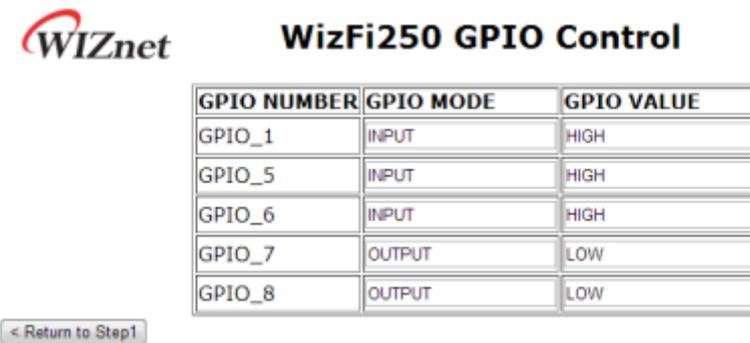
GPIO Control

If you select the "GPIO Control" icon you will see the web page as shown on this picture.



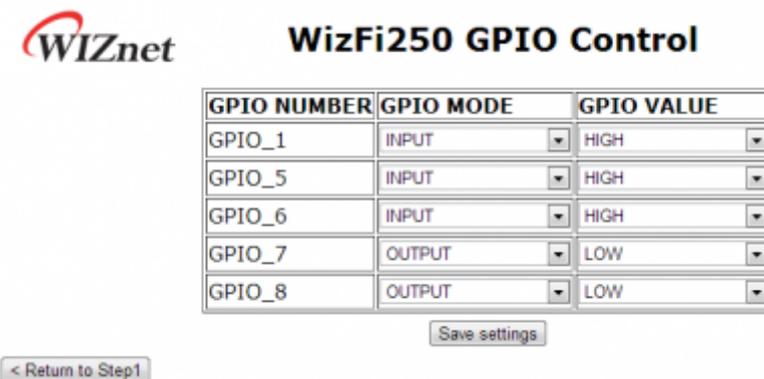
On this page, you can select "Get GPIO Status" menu or "Set GPIO Status" menu.

If you click "Next" button after selecting "Get GPIO Status" menu, you can see the web page as this picture.



On this page, you can check the real time GPIO status of WizFi250.

If you select "Set GPIO Status" menu, you will see the web page as on this picture.



On this page, you can set gpio mode and gpio value of WizFi250.

* When set as output mode... mode, WizFi250 will set gpio config value to OUTPUT_PUSH_PULL.

* When set as input mode, WizFi250 will set gpio config value to INPUT_HIGH_IMPEDANCE.

For detailed information about it, refer to [AT+FGPIO](#).

Serial Setting

If you select “Serial Setting” icon, you can see the web page as this picture.



The screenshot shows the 'WizFi250 Serial Configuration' page. It features the WIZnet logo on the left and the title 'WizFi250 Serial Configuration' in the center. Below the title, there are five dropdown menus for configuration: Baudrate (115200), Parity (None), Word Length (8), Stop Bit (1), and Flow Control (N). A 'Set Serial Config' button is located below these menus. At the bottom left, there is a '< Main Page' button.

On this page, you can set serial information. When you select the <Set Serial Config> button after your choice values, WizFi250 will be restarted in order to change serial information.

For detailed information about it, refer to [AT+USET](#).

2014/01/06 08:34 · [kaizen](#)

User Information Setting

If you select the „User Information“ icon, you will see the web page as in this picture.



The screenshot shows the 'WizFi250 User Information Setting' page. It features the WIZnet logo on the left and the title 'WizFi250 User Information Setting' in the center. Below the title, there are four input fields: Current ID, Current Password, New ID, and New Password. A 'Setting' button is located below these fields. At the bottom left, there is a '< Main Page' button.

On this page, you can change user id and user password. For changing user information, you have to input current id and password.

If you select <Setting> button after input value, WizFi250 will be restarted in order to change user information.

For detailed information about it, refer to [AT+MCWUI](#).

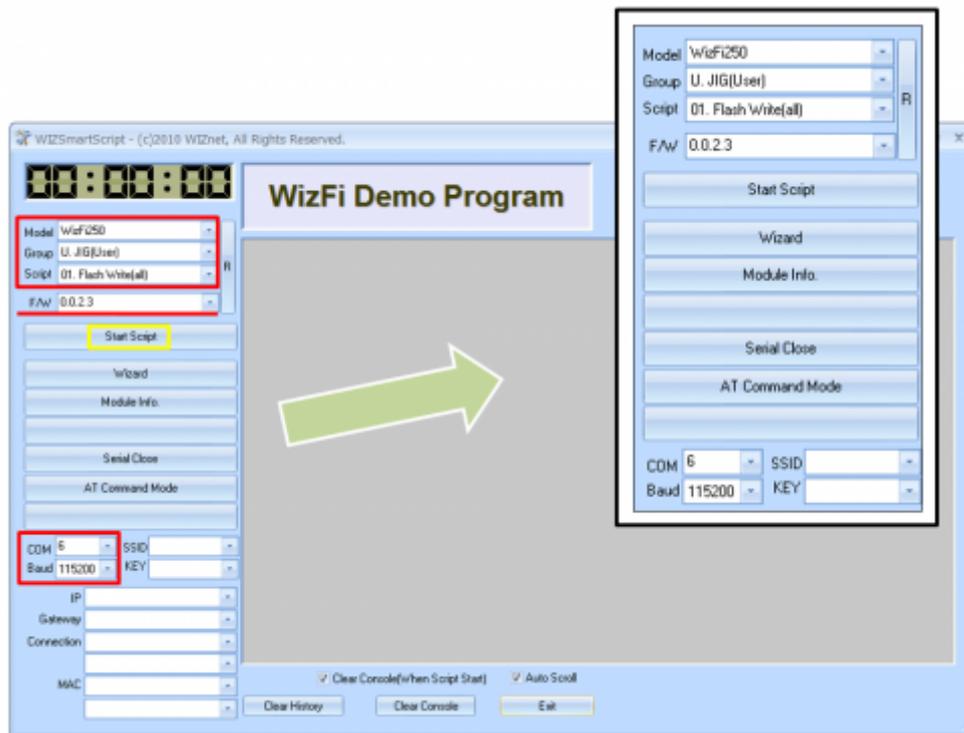
2014/01/06 08:41 · [kaizen](#)

2013/09/04 13:13 · [jeonggw](#)

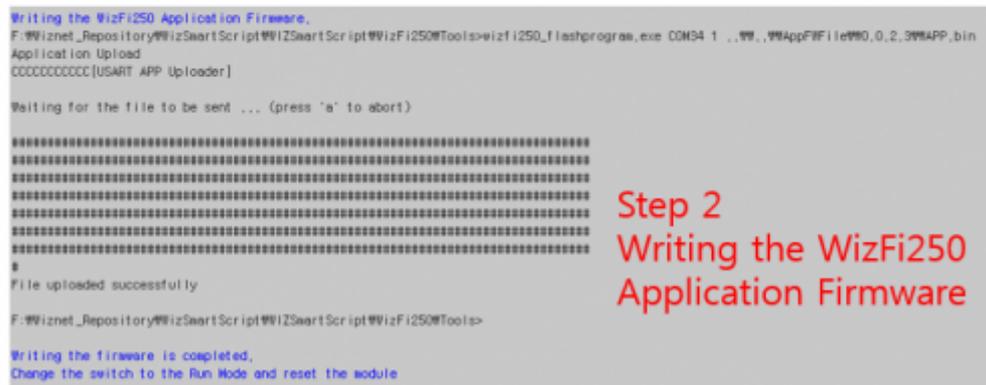
How to Upgrade Firmware

Serial Line-APP+DCT

- 1. Download WIZSmartScript from WIZnet homepage and install it
- 2. Run WizFi250 in Boot Mode. (refer to boot pin in the [PIN Description](#))
- 3. Run WIZSmartScript and fill in options(RED) as below. (**COM Port should match yours**)
And Click the 'Start Script' buton (Yellow).



- 4. Check the log that shows up as below. After 4 seconds, download will be started. First, write the DCT, then write the WizFi250 application firmware. If it is a success step1 message and step2 message. (execute "02-A. Flash Write(app) if step2 fails)



If you want to change firmware binary file, just copy it to 'AppFWFile' folder.

2013/09/04 13:16 · jeonggw

Wi-Fi OTA(Over the Air) - APP

Start OTA mode using AT+FOTA Command

- 1. Turn on OTA mode by entering the command as below.

AT+FOTA

[OK]

Start OTA mode using WEB Server

- 1. Run WizFi250 in command mode, and operate the WizFi250 as below.

```
AT+WLEAVE
```

```
[OK]
```

```
AT+FWEB=1,A
```

```
[OK]
```

```
AT+WSET=1,(SSID)
```

```
[OK]
```

```
AT+WSEC=1,(EncryptionType),(PreSharedKey)
```

```
[OK]
```

```
AT+WNET=0,192.168.0.2,255.255.255.0,192.168.0.2
```

```
[OK]
```

```
AT+WJOIN
```

```
[OK]
```

```
[Link-Up Event]
```

```
IP Addr : 192.168.0.1
```

```
Gateway : 192.168.0.1
```

```
[OK]
```

- 2. Connect your PC Wi-Fi to the Wizfi250, open the web browser and enter the IP address of WizFi250 which you can find by using '[AT+WSTAT](#)'



WizFi250 Configuration

Select a configuration method ...



S2W Setting & Scan Network



WPS(Push button)



WPS(PIN)



Change to OTA Mode



GPIO Control



Serial Setting

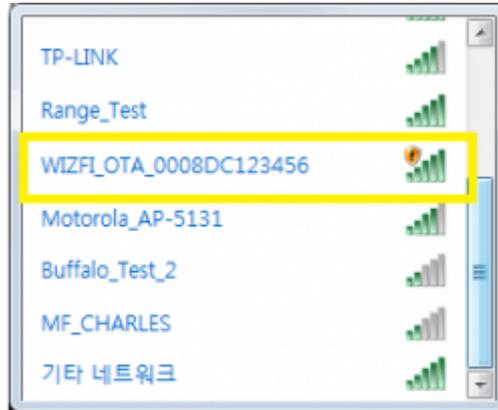


User Information Setting

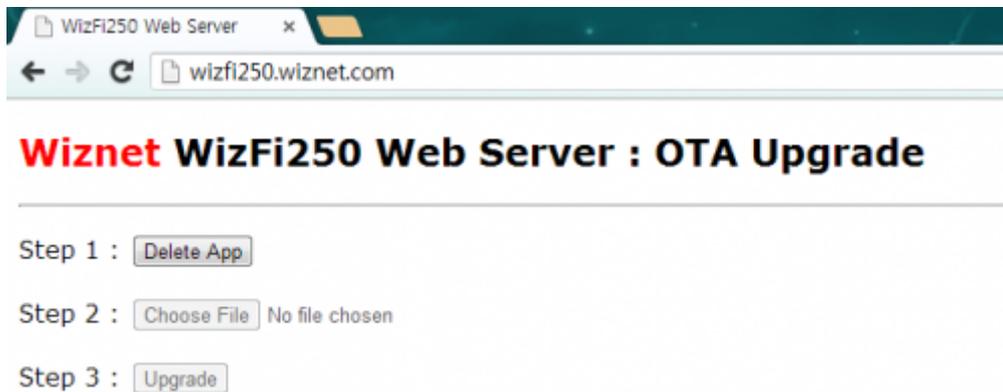
- 3. Click the 'Over the Air' icon

Upload newest firmware in OTA mode

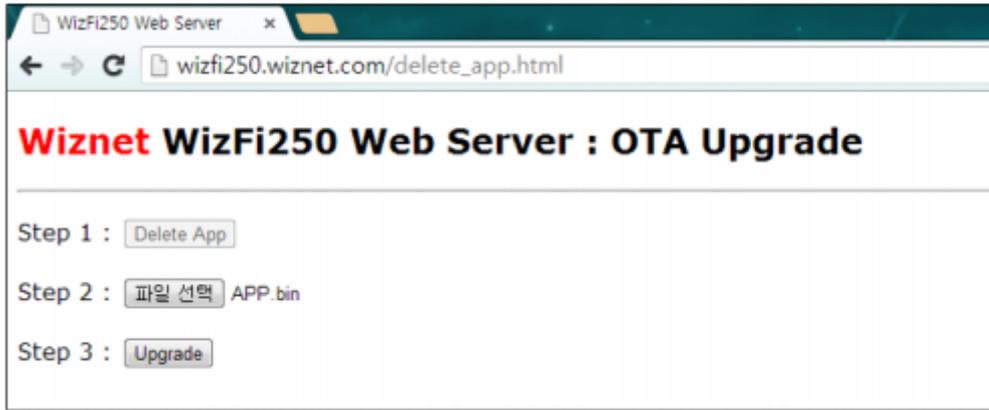
- 1. Now you can connect to the WizFi250 OTA Access Point from your PC. Connect your PC WLAN to the AP which the name WIZFI_OTA_(MAC-Address).



- 2. Open the WEB browser and go to 'wizfi250.wiznet.com'. (If the browser failed to find the page, disconnect the other network connections and try again). When successful, it should look like below.
- 3. Click the 'Delete App' button, and wait until internal flash memory is erased. (Before writing firmware, internal flash must be erased. Otherwise it does not work properly.).



- 4. After erase, click the second button, 'Choose File', and select the firmware file you want to upload.
- 5. Click the second button, 'Select file', and choose the FW file you want to upgrade. And finally, click the 'Upgrade' button to start upgrading. (**You have to use APP.bin file. This file is in WIZSmartScript\AppFWFile\Version\APP.bin**)



- 6. Wait for a second until upgrade is finished and check if it shows a complete message as below.



- 7. Check if WizFi250 is upgraded and works well.

2013/09/04 13:16 · [jeonggw](#)

Firmware Recovery

This section explains how to recover firmware when a critical problem occurred in WizFi250 application firmware.

- 1. Input low signal to BOOT pin and FUNCTION pin.
- 2. Reboot WizFi250
- 3. If WizFi250 starts the firmware procedure you will see a serial message as below. If this procedure succeeds, WizFi250 will be reset to factory default firmware.


```
AT+WSET=0,WizFiDemoAP (AT command for setting WiFi association)
[OK]

AT+WSEC=0,WPA2,12345678 (AT command for setting WiFi security)
[OK]

AT+WNET=0,192.168.12.101,255.255.255.0,192.168.12.1 (AT command for setting
Static IP address)
[OK]

AT+WJOIN (AT command executing AP association)
Joining : WizFiDemoAP
Successfully joined : WizFiDemoAP

[Link-Up Event]
IP Addr : 192.168.12.101
Gateway : 192.168.12.1
[OK]

AT+WLEAVE (AT command making disassociation from AP association)

[Link-Down Event]
[OK]
```

2013/09/04 13:20 · [jeonggw](#)

Station Mode using WPA2 DHCP

This section explains how to connect WizFi250 to target AP with DCHP Client Mode

```
AT (Sent AT command with 0x0d (Hex of Enter button))
[OK] (Response meaning successful execution)

AT+WSET=0,WizFiDemoAP (AT command for setting WiFi association)
[OK]

AT+WSEC=0,WPA2,12345678 (AT command for setting WiFi security)
[OK]

AT+WNET=1 (AT command for setting DHCP)
[OK]

AT+WJOIN (AT command executing AP association)
Joining : WizFiDemoAP
Successfully joined : WizFiDemoAP
```

```
[Link-Up Event]
  IP Addr    : 192.168.12.13
  Gateway    : 192.168.12.1
[OK]

AT+WLEAVE          (AT command making disassociation from AP association)

[Link-Down Event]
[OK]
```

2013/09/04 13:20 · [jeonggw](#)

AP Mode using WPA2 Static IP

This section explains how to set AP mode using WizFi250. In AP mode, WizFi250 have to set static IP address. (AT+WNET=0,xxx,xxx,xxx) After setting AP mode, WizFi250 will operate DHCP Server. Thus, when smart phone or other devices connect to WizFi250, WizFi250 will give IP address to connected device.

```
AT          (Sent AT command with 0x0d (Hex of Enter button))
[OK]        (Response meaning successful execution)

AT+WSET=1,WizFi250_AP  (AT command for setting WiFi association information)
[OK]

AT+WSEC=1,WPA2,12345678 (AT command for setting WiFi security)
[OK]

AT+WNET=0,192.168.12.105,255.255.255.0,192.168.12.1 (AT command for setting
Static IP address)
[OK]

AT+WJOIN          (AT command executing run AP mode)
Joining : WizFi250_AP

[Link-Up Event]
  IP Addr    : 192.168.12.105
  Gateway    : 192.168.12.1
[OK]

AT+WLEAVE          (AT Command disassociating from AP association)

[Link-Down Event]
[OK]
```

2013/09/04 13:20 · [jeonggw](#)

2013/09/04 13:20 · [jeonggw](#)

Examples - Data Communication

Method of setting TCP Client and exchanging data in Data Mode

Socket Open

This section explains how to open <TCP Client Socket> and communicate with peer system. Below is an example showing how to set TCP Client and change the mode to data mode. It also explains parameters of <AT+SCON> command.

(AT+SCON=<OpenType>,<SocketType>,<RemoteIP>,<RemotePort>,<LocalPort>,<DataMode>)

If you enter <O> or <SO> value to <Open Type> parameter, WizFi250 will try to connect to TCP Server immediately. But when using <S> value, WizFi250 will try to connect to TCP Server after reboot and you have to set <SocketType>,<RemoteIP>,<RemotePort> and <LocalPort> as below. In order to set WizFi250 to data mode, you have to enter 1 value to <Data Mode> parameter of <AT+SCON> command. For detailed information to this command, refer to [AT+SCON](#).

- Mode: Data Mode, TCP Client
- Remote IP : 192.168.12.102
- Remote Port : 5000
- Local Port : 5001

```
AP Association ( Refers to Association & Disassociation
Example )

AT+SCON=0,TCN,192.168.12.102,5000,5001,1 ( AT command connecting with a TCP
Client Socket )
[OK]

[CONNECT 0] => At this point, a TCP connection is
done
```

Exchanging data with a peer system

If WizFi250 successfully connects to a peer system, WizFi250 will print [CONNECT(CID)] message and enter data mode. In data mode, WizFi250 can send serial data to peer system and receive network data from peer system without other translation.

Socket Close

In order to close TCP connection, WizFi250 has to switch to AT Command Mode. (When +++ message entered, WizFi250 can be changed to AT Command Mode.) After being changed to AT Command Mode, TCP Connection can be closed by using <AT+SMGMT=CID> or <AT+SMGMT=ALL> command.

Checking Socket Status

After being changed to AT Command Mode, TCP Connection can be closed by using <AT+SMGMT=CID> or <AT+SMGMT=ALL> command.

```
AT+SMGMT=?  
Number of Sockets : 1 (SCID/Socket/Mode/Remote/Local/DataMode)  
0/TCN/192.168.12.23:5000/5001/1  
[OK]
```

2013/09/04 13:20 · [jeonggw](#)

Method of setting TCP Server and exchanging data in Data Mode

Socket Open

This section explains how to open <TCP Server Socket> and communicate with peer system. Below is the example for setting TCP Server and then changing to data mode. For detailed information about <AT+SCON> command, refer to [AT+SCON](#) and [Socket Open](#).

- Mode : Data Mode, TCP Server
- Local Port : 5000

```
AP Association ( Refer to Association & Disassociation Example )
AT+SCON=0,TSN, , ,5000,1 ( AT command listening with a TCP Server Socket )
[OK]
[CONNECT 0] <= When TCP connection is done, you can see this message
```

Exchanging data with a peer system

Exchanging data with its peer system is the same as previous [Exchanging data with a peer system](#).

Socket Close

Closing socket connection is the same as previous [Socket Close](#).

Checking Socket Status

Checking socket status is the same as previous [Checking Socket Status](#).

2013/09/04 13:20 · [jeonggw](#)

Method of setting UDP Client and exchanging data in Data Mode

Socket Open

This section explains how to open <UDP Client Socket> and communicate to peer system. Below is an example for setting up UDP Client and changing into data mode. For detailed information about <AT+SCON> command, refer to [AT+SCON](#) and [Socket Open](#).

- Mode : Data Mode, UDP Client
- Remote IP : 192.168.12.23
- Remote Port : 5001
- Local Port : 5000

```

AP Association          ( Refer to Association & Disassociation Example
)

AT+SCON=0,UCN,192.168.12.23,5001,5000,1
[OK]

[CONNECT 0]           <= At this point, a UDP connection is
done

```

Exchanging data with a peer system

Exchanging data with its peer system is the same as previous [Exchanging data with a peer system](#).

Socket Close

Closing socket connection is the same as previous [Socket Close](#).

Checking Socket Status

Checking socket status is the same as previous [Checking Socket Status](#).

2013/09/04 13:21 · [jeonggw](#)

Method of setting UDP Server and exchanging data in Data Mode

Socket Open

This section explains how to open <UDP Server Socket> and communicate to peer system. Below is an example for setting up UDP Server and changing into data mode. For detailed information about <AT+SCON> command, refer to [AT+SCON](#) and [Socket Open](#).

- Mode: Data Mode, UDP Server
- Local Port: 5000

```

AP Association          ( Refer to Association & Disassociation Example
)

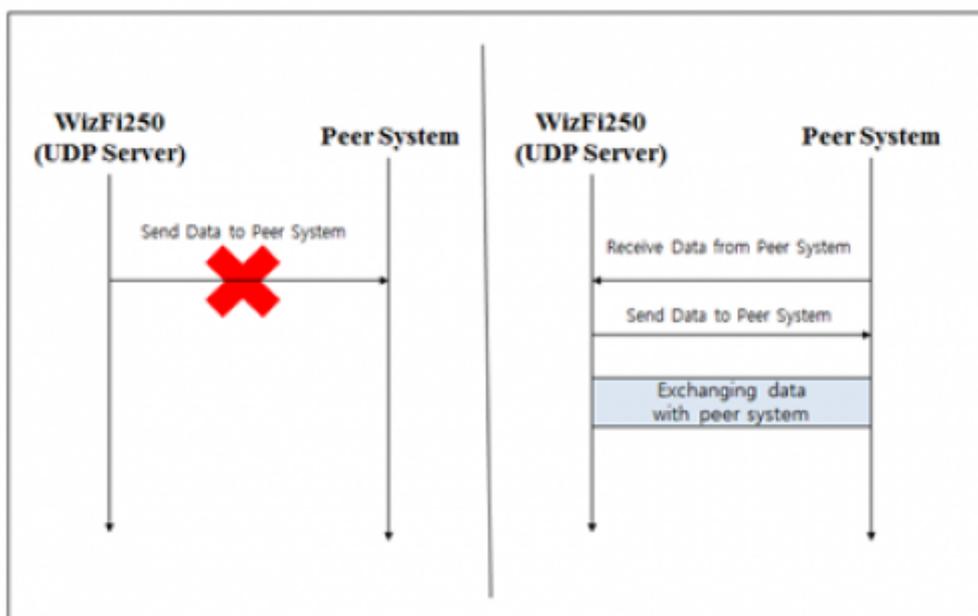
```

```
AT+SCON=0,USN, , ,5000,1  
[OK]
```

```
[CONNECT 0]                                     <= At this point, a UDP connection is  
done
```

Exchanging data with a peer system

<UDP Server Mode> can connect UDP connection without peer system information like IP address and port number. But before peer system is connected to WizFi250, WizFi250 does not send data to peer system because WizFi250 does not know its information. Thus peer system must send data to WizFi250 in order to know peer system's information like below.



The other information for exchanging data is same as [Exchanging data with a peer system](#).

Socket Close

Closing socket connection is the same as previous [Socket Close](#).

Checking Socket Status

Checking socket status is the same as previous [Checking Socket Status](#).

2013/09/04 13:21 · [jeonggw](#)

Method of setting TCP Client and exchanging data in Command Mode

Socket Open

This section explains how to set <TCP Client> in <Command Mode> and communicate to peer system. Below is the example for setting TCP Client on the Command Mode . In order to enter in the Command Mode, you have to enter 0 value to <Data Mode> parameter of <AT+SCON> command. For detailed information to this command, refer to [AT+SCON](#)

- Mode : Command Mode, TCP Client
- Remote IP: 192.168.12.23
- Remote Port : 5000
- Local Port : 5001

```
AP Association          ( Refer to Association & Disassociation Example )
AT+SCON=0,TCN,192.168.12.23,5000,5001,0
[OK]
[CONNECT 0]           <= At this point, a TCP connection is done
```

Exchanging data with a peer system

If WizFi250 connects to peer system successfully, WizFi250 will print [CONNECT(CID)] message. At this time, WizFi250 is in command mode. In order to send data to peer system, you have to use <AT+SSEND=CID, Destination IP, Destination Port, Data Length> command. If you input serial command like <Data Length> , WizFi250 will send serial data to peer system.

```
AT+SSEND=0,,,5      ( Sending data to a Socket with CID 0 )
Hello                <= When serial data is 5byte, WizFi250 send this data to peer system
[OK]
{0,192.168.12.23,5000,11}Hi WizFi250 ( Receiving data from pear system )
```

Socket Close

In <AT Command Mode>, TCP connection can be closed through <AT+SMGMT=CID> or <AT+SMGMT=ALL> command.

Checking Socket Status

In <AT Command Mode>, Information of connected sockets are shown by using <AT+SMGMT=?> command.

```
AT+SMGMT=?  
Number of Sockets : 1 (SCID/Socket/Mode/Remote/Local/DataMode)  
0/TCN/192.168.12.23:5000/5001/0  
[OK]
```

2013/09/04 13:21 · [jeonggw](#)

Method of setting TCP Server and exchanging data in Command Mode

Socket Open

This section explains how to set <TCP Server> in <Command Mode> and communicate to peer system. Below is the example for setting TCP Server on the Command Mode. For detailed information about <AT+SCON> command, refer to [AT+SCON](#) and [Socket Open](#).

- Mode : Command Mode, TCP Server
- Local Port : 5000

```
AP Association ( Refer to Association & Disassociation Example )  
  
AT+SCON=0,TSN, , ,5000,0 ( AT command listening with a TCP Server Socket )  
[OK]  
  
[CONNECT 0]
```

Exchanging data with a peer system

Exchanging data with its peer system is the same with previous [Exchanging data with a peer system](#).

Socket Close

Closing socket connection is the same with previous [Socket Close](#).

2013/09/04 13:21 · [jeonggw](#)

Method of setting UDP Client and exchanging data in Command Mode

Socket Open

This section explains how to set <UDP Client> in <Command Mode> and communicate to peer system. Below is an example for setting UDP Client on Command Mode. For detailed information about <AT+SCON> command, refer to [AT+SCON](#) and [Socket Open](#).

- Mode : Command Mode, UDP Client
- Remote IP : 192.168.12.23
- Remote Port : 5001
- Local Port : 5000

```
AP Association                ( Refer to Association & Disassociation Example
)

AT+SCON=0,UCN,192.168.12.23,5001,5000,0
[OK]

[CONNECT 0]                  <= At this point, a UDP connection is
done
```

Exchanging data with a peer system

Exchanging data with its peer system is the same as previous [Exchanging data with a peer system](#).

Socket Close

Closing socket connection is the same as previous [Socket Close](#).

2013/09/04 13:21 · [jeonggw](#)

Method of setting UDP Server and exchanging data in Command Mode

Socket Open

This section explains how to open <UDP Server Socket> in Command Mode and communicate to peer system. Below is an example for setting UDP Server on Command Mode. For detailed information about <AT+SCON> command, refer to [AT+SCON](#) and [Socket Open](#).

- Mode : Command Mode, UDP Server
- Local Port : 5000

```
AP Association          ( Refer to Association & Disassociation Example )
AT+SCON=0,USN, , ,5000,0
[OK]
[CONNECT 0]
```

Exchanging data with a peer system

<UDP Server Mode> of WizFi250 can connect UDP connection without peer system information like IP address and port number. Before peer system is connected to WizFi250, WizFi250 does not send data to peer system. So you should be careful when using <UDP Server Mode>.

```
{0,192.168.12.23,5001,11}Hi WizFi250 ( Receiving data from peer system )
AT+SSEND=0,,,5          ( Sending data to a Socket with CID 0 )
Hello                   <= When serial data is 5byte, WizFi250 send this data to
peer system
[OK ]
```

2013/09/04 13:21 · [jeonggw](#)

AT+SCON

AT+SCON=<OpenType>,<SocketType>,<RemotelP>,<RemotePort>,<LocalPort>,<DataMode>

This section explains the usage of <Open Type> parameter of <AT+SCON> command. This table describes values of <Open Type> parameter.

Parameter	Meaning
S	Register as a Service
O	Open at Once
SO	Open at Once & Register as a Service

<S> : Register as a Service

When using this parameter, WizFi250 will try to connect to peer system using TCP or UDP when power is on.

```

AT+WLEAVE
[OK]

AT+WSET=0,WizFiDemoAP
[OK]

AT+WSEC=0,WPA2,12345678
[OK]

AT+WNET=1
[OK]

AT+SCON=S,TSN,,,5000,0
[OK]

AT+MPROF=S
[OK]

AT+MRESET
[OK]
WizFi250 Version 0.9.0.0 (WIZnet Co.Ltd)
Joining : WizFiDemoAP
Successfully joined : WizFiDemoAP

[Link-Up Event]
  IP Addr      : 192.168.12.10
  Gateway      : 192.168.12.1

AT+SMGMT=?
Number of Sockets : 1 (SCID/Mode/Remote/Local/DataMode)
0/TSN/0.0.0.0:0/5000/0
[OK]

```

<O> : Open at Once

When using this parameter, WizFi250 will try to connect to peer system using TCP or UDP when enter the <AT+SCON> command. For using this parameter, WizFi250 should be already associated with AP or running AP mode. In this section, we have only explained steps in Station Mode. In AP Mode, you can use this command like in Station Mode

```
AT+WLEAVE
[OK]

AT+WSET=0,WizFiDemoAP
[OK]

AT+WSEC=0,WPA2,12345678
[OK]

AT+WNET=1
[OK]

AT+WJOIN
Joining : WizFiDemoAP
Successfully joined : WizFiDemoAP

[Link-Up Event]
  IP Addr    : 192.168.12.10
  Gateway    : 192.168.12.1
[OK]

AT+SCON=0,TCN,192.168.12.23,5000,,0
[OK]

[CONNECT 0]
```

<SO> Open at Once & Register as a Service

When using this parameter, you can use functions of <S> and <O> at the same time. When using this parameter, WizFi250 will try to connect to peer system momentarily. And if you restart WizFi250, WizFi250 will try to connect to AP and peer system.

```
AT+WLEAVE
[OK]

AT+WSET=0,WizFiDemoAP
[OK]

AT+WSEC=0,WPA2,12345678
[OK]
```

```
AT+WNET=1
[OK]

AT+WJOIN
Joining : WizFiDemoAP
Successfully joined : WizFiDemoAP

[Link-Up Event]
  IP Addr   : 192.168.12.10
  Gateway   : 192.168.12.1
[OK]

AT+SCON=S0,TCN,192.168.12.23,5000,,0
[OK]
[CONNECT 0]

AT+MPROF=S
[OK]

AT+MRESET
[OK]

WizFi250 Version 0.9.0.0 (WIZnet Co.Ltd)
Joining : WizFiDemoAP
Successfully joined : WizFiDemoAP

[Link-Up Event]
  IP Addr   : 192.168.12.10
  Gateway   : 192.168.12.1

[CONNECT 0]
```

2013/09/04 13:22 · [jeonggw](#)

Example of SSL Connection

This section explains how to connect to and communicate with SSL server. To connect to SSL server, use <TCS(TCP Client SSL)> / <TSS(TCP Server SSL)> parameter of <AT+SCON> command. (When using UDP, WizFi250 cannot use SSL Connection.) In order to use SSL connection, you can use AT command as below.

```
AT+SCON=S0,TCS,199.59.148.212,443,5000,0
[OK]

[CONNECT 0]
AT+SSEND=0,,,18
```

```

GET / HTTP/1.1{0x0d}{0x0a}
{0x0d}{0x0a}
[OK]
{0,173.194.33.38,443,990}HTTP/1.1 302 Found
Location: https://www.google.co.kr/
Cache-Control: private
Content-Type: text/html; charset=UTF-8
Set-Cookie:
  PREF=ID=3e64d81fb97c7e6c:FF=0:TM=1371553236:LM=1371553236:S=H3NKySD63UwelF_z;
  expires=Thu, 18-Jun-2015 11:00:36 GMT; path=/; domain=.google.com
Set-Cookie:
  NID=67=vtzYXz5msxRYz0-KzH5EKgcnABE4_Y0cbUG1RGXufiQM2PNc84gyr8012VNk00ap8MUCm
  GNQfnfsGMarSS9Jlkb7MiZdIQxrJg-FL1uKUqgSBA2CGIEqI5syrKnNW2YK; expires=Wed,
  18-Dec-2013 11:00:36 GMT; path=/; domain=.google.com; HttpOnly
P3P: CP="This is not a P3P policy! See
http://www.google.com/support/accounts/bin/answer.py?hl=en&answer=151657 for
more info."
Date: Tue, 18 Jun 2013 11:00:36 GMT
Server: gws
Content-Length: 222
X-XSS-Protection: 1; mode=block
X-Frame-Options: SAMEORIGIN

<HTML><HEAD><meta http-equiv="content-type"
content="text/html; charset=utf-8"><TITLE>302
Moved</TITLE></HEAD><BODY><H1>302 Moved</H1>The document has moved<A
HREF="https://www.google.co.kr/">here</A>.
</BODY></HTML>
[DISCONNECT 0]

```

2013/09/04 13:22 · [jeonggw](#)

Example of Multi Socket Connection

This section explains how to use <Multi Socket Connection> function. WizFi250 can use max 8 TCP or UDP sockets. In order to use <Multi Socket Connection> function, you can use AT command as below. In this example, the peer system was running a loop back program. So if peer system received data from WizFi250, peer system will send received data to WizFi250.

```

AP Association

AT+SCON=0,TCN,192.168.12.23,5000,5001,0
[OK]

[CONNECT 0]
AT+SCON=0,TSN,,,6000,0

```

```
[OK]

[CONNECT 1]
AT+SCON=0,UCN,192.168.12.23,7000,7000,0
[OK]

[CONNECT 2]
AT+SCON=0,USN,,,8000,0
[OK]

[CONNECT 3]
AT+SMGMT=?
Number of Sockets : 4 (SCID/Socket/Mode/Remote/Local/DataMode)
0/TCN/192.168.12.23:5000/5001/0
1/TSN/192.168.12.23:58769/6000/0
2/UCN/192.168.12.23:7000/7000/0
3/USN/0.0.0.0:/8000/0
[OK]

AT+SSEND=0,,,16
Hello_TCP_Client
[OK]

{0,192.168.12.23,5000,16}Hello_TCP_Client

AT+SSEND=1,,,16
Hello_TCP_Server
[OK]

{1,192.168.12.23,58769,16}Hello_TCP_Server

AT+SSEND=2,,,16
Hello_UDP_Client
[OK]

{2,192.168.12.23,7000,16}Hello_UDP_Client
{3,192.168.12.23,8000,16}Hello_UDP_Server
AT+SSEND=3,,,16
Hello_UDP_Server
[OK]
```

2013/09/04 13:22 · [jeonggw](#)

2013/09/04 13:20 · [jeonggw](#)

Appendix

2013/09/03 13:11 · [jeonggw](#)

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