WizFi250 Programmer's Guide

Overview

This document provides programmers with all command and explanation 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 command are used, how each command operates and how programmers have to handle those commands to get the response as expected.

2013/09/04 12:11 · jeonggw

AT Command Set

This section provides a list of WizFi250 AT commands and their effects. User can input commands and parameters through USART line. Every command starts with the characters "AT", any other initial characters will cause an error to be returned, and commands and parameters are all ASCII character,

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 nether CRLF(0x0d, 0x0a) nor LF(0x0a).

Some parameters are mandatory and the others are optional. (refer to Command Tables) Parameters must be entered in order given in format column of 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 user 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

This category is for responses.

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 just at Wi-Fi Joined status)
[ERROR: Mode Status]	Wrong Mode Status (Some commands does 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 (which is 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+USET	UART Configuration
AT+SCON	Socket Open/Connect		**Function Commands**	
AT+SMGMT	Socket Management		AT+FPING	PING Test
AT+SSEND	Data Send		AT+FDNS	DNS Query
AT+SDATA	Return to Data Mode		AT+FWEBS	Launch Web Server
AT+SFORM	Define Data Receive Header Form		AT+FGPIO	GPIO Control
			AT+FOTA	Launch OTA Mode

2013/09/04 14:50 · jeonggw

Basic Commands

This category is for basic commands.

- **AT**　　　　　　　**Format:**

  ```
  AT
  ```

- **Meaning:** Terminal Check

  Check if AT Command Terminal is working.

- **Response:**

  ```
  [OK]
  ```

2013/09/04 12:14 · jeonggw

WiFi Commands

This category is for commands related to WiFi.

- **AT+WJOIN**

  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 user execute AT+WJOIN command, it works as current Wi-Fi mode which 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.

  * If combine these filters, it works at the same time. for example, if you enter
  AT+WSCAN=TestAP,00:08:DC:11:22:33', it only scan the AP which has TestAP as SSID and
  00:08:DC:11:22:33 as BSSID in the all 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]
```

- **AT+WSET**

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 user execute AT+WJOIN command, it works as current Wi-Fi mode which 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 Wi-Fi mode.

* AT+WSET, AT+WSEC commands save its parameters into the profile automatically, so user

does not need to save current profile for it.

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]
```

AT+WSEC

- **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
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 user execute AT+WJOIN command, it works as current Wi-Fi mode which 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 Wi-Fi mode.

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

Examples)

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

- **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. But if you input them at this time, it will just be stored at the memory. And later it can be used when you set it as Static(DHCP 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 is not actual addresses, but just the addresses stored at 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]
```

AT+WWPS

- **Format:**

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

- **Meaning:** WiFi WPS Connection

    Join with a 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

This category is for commands related to Network.

-
  AT+SCON
  Format:

```
AT+SCON=<OpenType>,<SocketType>,<RemoteIP>,<Re
motePort>,<LocalPort>,<DataMode>
```

- **Meaning:** Socket Open/Connect

 여러 소켓들이 연결 가능한 것
Open a socket and if it is TCP Client, establish 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: Assign a socket immediately and if socket is TCP Client, try to connect peer socket.

* AS SERVICE: Register its information to the Profile and then when WiFi Joined, socket open/connect will be performed automatically. If you want to use this after reset, 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 the TCP Connection through SSL Encryption.

* Actually, there is not Server/Client concept in UDP protocol, but we are using this concept for deciding peer address purpose. 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 toward changed address. But If you use UDP Client, its default address which stored by AT+SCON will never be changed.

<RemoteIP>: 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, RemoteIP

<LocalPort>: Local port number (Required)
Local port number should not be duplicated with the others which have opened before. And when this value is 0, if the socket was TCP/UDP Client, a random port number will be selected. But if it was TCP/UDP Server, it will return 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=O,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

  Used for checking if previous input parameters are correct.

- **Response:**

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

AT+SMGMT

- **Format:**

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

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

  Close the selected socket and release all its resources.

  <SocketID>: Socket ID (Required)

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

  * 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 print all of the status of the opened sockets.

- **Response:**

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

AT+SSEND

- **Format:**

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

- **Meaning:** Data Send

  This is used only at command mode, not at data mode. If you are in data mode, you do not need this, because you just 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 the case that the TCP Server is waiting for a client on listen state, or in the case that the

remote address of the UDP Server is not decided (it means its remote address is 0.0.0.0:0), this command will be failed.

<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 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]
```

- **AT+SDATA** **Format:**

```
AT+SDATA
```

- **Meaning:** Return to Data Mode

In the data mode, it can be changed to command mode temporally 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+SFORM=?
```

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

- **Response:**

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

2013/09/04 13:06 · jeonggw

Management Commands

This category is for commands related to system management.

<div style="border:1px solid #999; border-radius:20px; display:inline-block; padding:20px;">

AT+MPROF

</div>

- **Format:**

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

- **Meaning:** Profile Management

  You can save/load the environmental information in the RAM to/from flash ROM, or can 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+MMCUPS=<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

❌ MCU Power Save Mode Disable가 기본 값 설 정임
* while using MCU Power Save Mode, WizFi250 can not use serial communication.

<Timeout> : MCU Power Save Timeout value (Required)
Valid Range : 10 ~ 3600000 (unit:ms)

Examples)

- AT+MMCUPS=1,10000

- **Response:**

```
[OK]
```

AT+MWIFIPS

- **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

* For using Wi-Fi Power Save Mode, WizFi250 have 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 bigger value, performance will get better but power consumption will rise up.

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+USET | 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]
```

2013/09/04 13:06 · jeonggw

Function Commands

This category is for commands related to additional functions.

- **AT+FPING**

Format:

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

- **Meaning:** PING Test

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

    <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 (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 occur Wi-Fi link up event. (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 occur
M	Web server start when enter AT+FWEBS command after Wi-Fi is joined.

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

Examples)

- AT+FWEBS=1,A
- AT+FWEBS=0,M

- **Response:**

```
[OK]
```

- **Format:**

  > AT+FWEBS=?

- **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]
```

 GPIO 1, 5, 6, 7, 8 □□□ 9,14 □□ □□ □□ □□ □

- **AT+FOTA**

Format:

```
AT+FOTA
```

- **Meaning:** Launch OTA Mode

    User can update firmware at 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, user can do 'WiFi Configuration', 'Sending/Receiving Data', 'Managing System', and so on. WizFi250 treat all received data from user as AT command. If all received data follows correct command format, WizFi250 process it and return a proper response to user.

Data mode is, on the other hand, the mode which passes data of application layer to peer device 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, user need to set environment properly through AT Commands.

Entering Data mode

User can enter Data mode by writing '1' at '<DataMode>' parameter of AT+SCON command. Make sure that there is not any socket opened before performing this, because Data mode is just working with only one socket. (Because of that, if you try to make another socket opened when data mode, it will be failed). And if the socket of Data mode is closed, the mode will be changed to Command mode automatically so user could be able to input AT Commands. If user set AT+SCON command as service

with data mode option and save the profile, Data mode will be started when WiFi is joined, so user does not need to set environments any more. If system do boot or reboot at that time, WiFi Join also be started automatically. User can exit from data mode temporally by entering '+++' in a row (Should wait for a second until [OK] response show up). Then you can enter any AT Command 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 at Command mode

At the Command mode, you can make more than one socket, and can send/receive data through opened sockets at the same time by using AT Command. You can send data to specific socket which is opened through AT+SSEND command and receive data with information header which can inform you 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	Enter into boot mode When boot or reset is performed, if this pin is tied low, it will enter into boot mode. User can do APP/DCT upload or factory recovery in the boot mode through UART. ♦ LOW : Start as boot mode ♦ HIGH: Start as application mode
FUNCTION	IN	Perform pre-defined action Perform pre-defined action at the booting or while running. This can be used when UART cannot be used. (Refer to FUNCTION Pin Usage)

LED1	OUT	Indicate WiFi Association 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 leaved (disassociated), it will be returned to high state (LED Off). ♦ LOW (LED ON) : WiFi is Associated ♦ HIGH(LED OFF): WiFi is Not associated
LED2	OUT	Indicate Data/Command Mode 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). ♦ LOW (LED ON) : Data Mode ♦ HIGH(LED OFF): Command Mode
SPI_DATA_READY	OUT	Indicate that there is data to send through SPI 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.
GPIO 1	IN/OUT	User Defined GPIO 1 User can utilize this pin for GPIO through AT Command.
GPIO 5	IN/OUT	User Defined GPIO 5 User can utilize this pin for GPIO through AT Command.
GPIO 6	IN/OUT	User Defined GPIO 6 User can utilize this pin for GPIO through AT Command.
GPIO 7	IN/OUT	User Defined GPIO 7 User can utilize this pin for GPIO through AT Command.
GPIO 8	IN/OUT	User Defined GPIO 8 User can utilize this pin for GPIO through AT Command.
Reserved	-	Reserved for future use

2013/09/04 13:11 · jeonggw

FUNCTION Pin Usage

Through the function pin, user can perform specific action without AT Command.

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

OTA Mode	While running state, tie it to low state and release it twice. Refer to below time diagram
Factory Default	While running state, tie it to low state and release it thrice. Refer to below time diagram

Time sequence graph is as below.
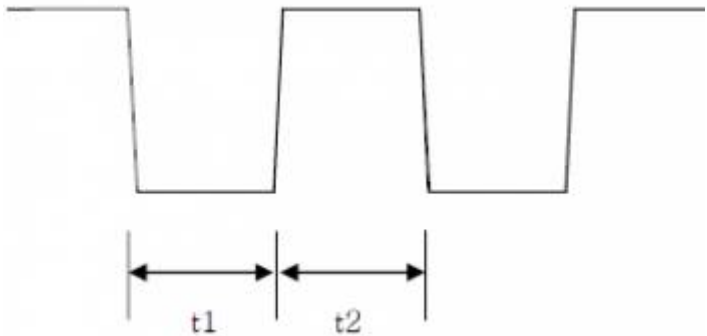
Variable	Min	Typ	Max
t1	200 ms	-	500 ms
t2	200 ms	-	500 ms

2013/09/04 13:12 · jeonggw

2013/09/04 13:11 · jeonggw

How to Use Web Configuration

Main Page

This picture is 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. And then launch the web server using <AT+FWEBS> command. For detailed information about <AT+FWEBS> command, refer to AT+FWEBS. After entering this page, user can choose item to perform among below 4 items.

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 this picture. In this page, you can set parameters for using TCP Server/Client or UDP Server/Client connection. If you want to use TCP Server or UDP Server, you don't need to input <Remote IP> and <Remote Port>.

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

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

Enter a Password and then select <Join> button which 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 web browser and "Successfully joined" message in serial terminal, WizFi250 is associated to AP successfully.
This picture is serial message when WizFi250 is associated to AP successfully.

```
WizFi250 Version 0.0.2.1 (WIZnet Co.Ltd)
Joining : WizFiDemoAP
Successfully joined : WizFiDemoAP

[Link-Up Event]
   IP Addr    : 192.168.3.104
   Gateway    : 192.168.3.1
```

2013/09/04 13:14 · jeonggw

WPS(Push Button)

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

If you click next_step button, after finishing setting, you can show web page as below.

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

This picture is log message that WizFi250 finish WPS function successfully.

2013/09/04 13:14 · jeonggw

WPS(PIN)

This section explains how to set protocol as TCP or UDP and then associate to Access Point by WPS method. If you select "WPS(PIN)" picture, you can see web page as this picture. For detailed information, refer to Serial to Wi-Fi Setting.

If you click next_step button, after finishing setting, you can show web page as below.

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

If success WPS-PIN function, you can see serial log message as 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 can see the web page as this picture.

In this page, if you click the <Change to OTA mode> button, WizFi250 will run as OTA Mode. For detailed information about OTA Mode, refer to Upload newest firmware in OTA mode
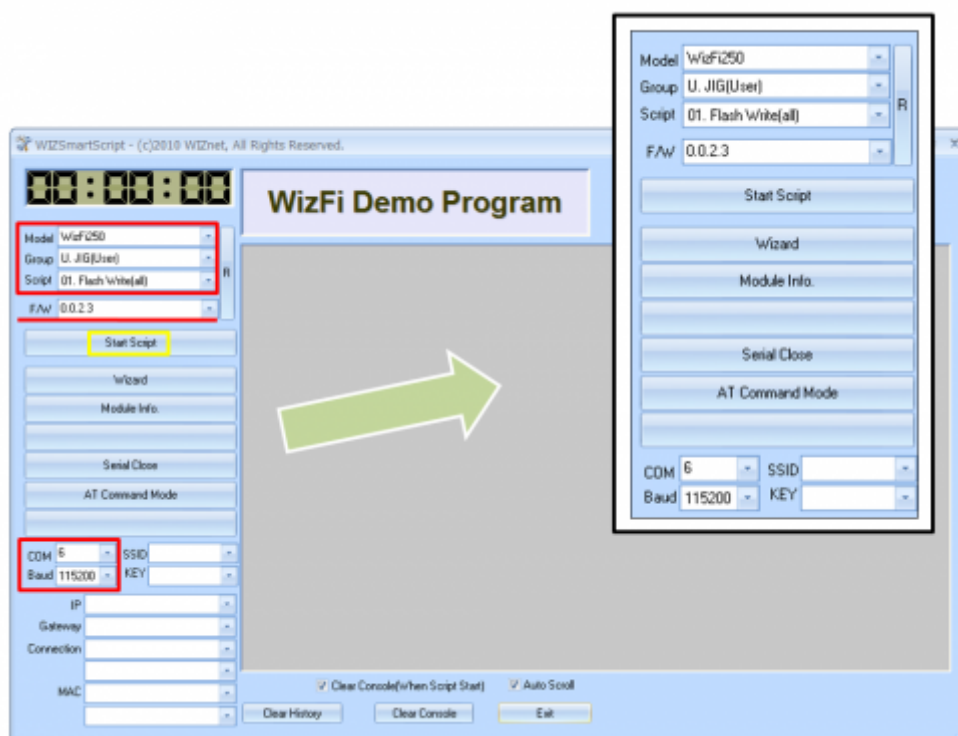
2013/09/04 13:15 · jeonggw

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 as Boot Mode. (refer to boot pin in the PIN Description)
- 3. Run WIZSmartScript and fill some options(RED) as below. (**COM Port should match yours**)
  And Click the 'Start Script' buton (Yellow).

- 4. Check below log showed up. After 4 seconds, download will be started. First Step is writing the
  DCT. And second step is writing the WizFi250 application firmware. If it is success, you can see
  step1 message and step2 message. (execute "02-A. Flash Write(app) if step2 fails)

Step 1
Writing the DCT

Step 2
Writing the WizFi250
Application Firmware

☞ 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 below.

AT+FOTA

```
[OK]
```

Start OTA mode using WEB Server

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

```
AT+WLEAVE
[OK]

AT+FWEBS=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. And open the WEB browser and enter the IP address of WizFi250 which you can find by using 'AT+WSTAT'

- 3. Click the 'Over the Air' icon

- 4. Click the 'Change to OTA mode' button, then WizFi250 will enter OTA mode.
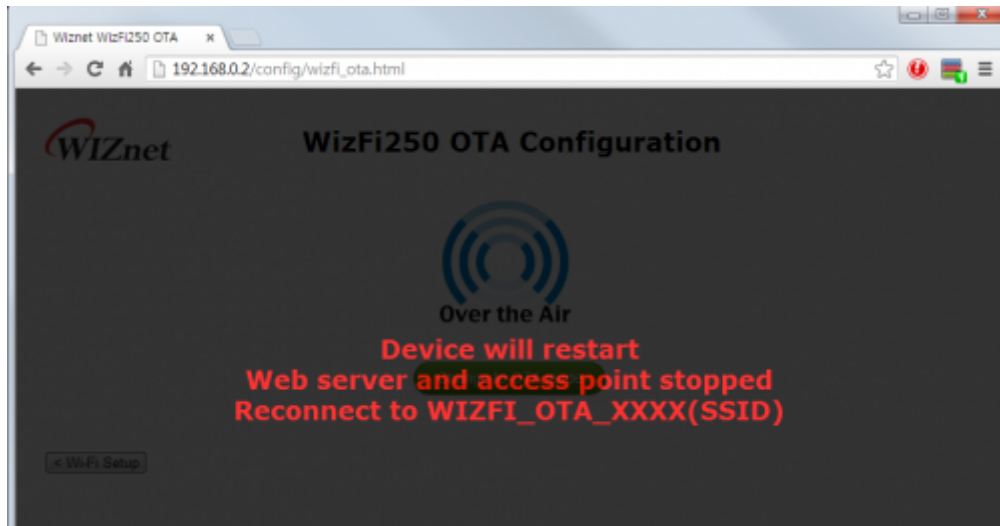
Start OTA mode using FUNCTION pin

- 1. If entered the OTA Mode using FUNCTION pin, you could see the messages as below.(Refer to FUNCTION Pin Usage)

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 name is WIZFI_OTA_(MAC-Address).

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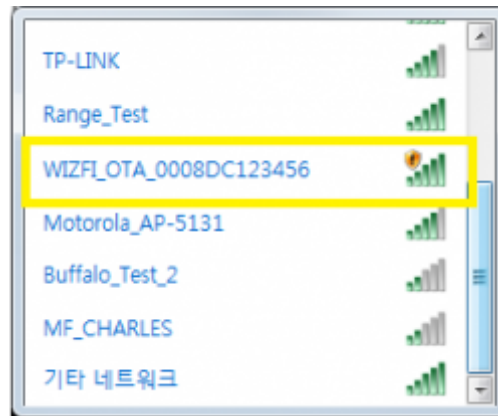 (Before writing firmware, internal flash must be erased. Otherwise it does not work properly.).

- 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 upgrade.
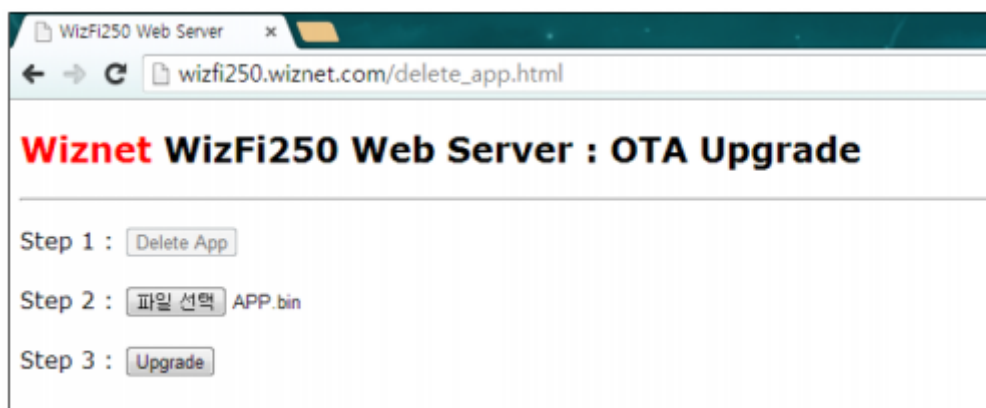
- 6. Wait for a second until upgrade is finished. And then check if it prints complete message like below.

- 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 critical problem occurred in WizFi250 application firmware.

- 1. Input low signal to BOOT pin and FUNCTION pin.
- 2. Reboot WizFi250
- 3. If WizFi250 start to do firmware recovery procedure, you can see serial message as below. If succeed this procedure, WizFi250 will be recovered to factory default firmware.

- 4. If you want to upload newest firmware to WizFi250, you have to use OTA mode.

For detailed information for starting OTA mode, refer to Wi-Fi OTA.
- 5. And then, you can upload newest firmware using web browser. For detailed information for uploading newest firmware in web page, refer to Wi-Fi OTA - Upload newest firmware in OTA mode.

2013/09/04 13:17 · jeonggw

2013/09/04 13:16 · jeonggw

Examples - Association & Disassociation

Station Mode using WPA2 Static IP

This section explains how to connect to AP using WizFi250 with static IP address. In this example, target AP information is as below. (SSID : WizFiDemoAP, Security : WPA2, Key : 12345678)

```
AT                              (Sent AT command followed 0x0d)
[OK]                            (Response which means executed
successfully)

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

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

AT+WNET=0,192.168.12.101,255.255.255.0,192.168.12.1      (AT command setting
the network information for WizFi250 itself using DHCP)
[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 followed 0x0d)
[OK]                            (Response which means executed successfully)

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

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

AT+WNET=1       (AT command setting the network information for WizFi250
itself using 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 followed 0x0d)
[OK]                            (Response which means executed successfully)


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


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


AT+WNET=0,192.168.12.105,255.255.255.0,192.168.12.1     (AT command setting
the network information for WizFi250 itself. In this mode, you can't set
DHCP mode)
[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 making disassociation 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 the example for setting TCP Client and then changing mode to data mode. This explains about 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 if 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                    ( Refer to Association & Disassociation
Example )

AT+SCON=O,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 connect to peer system successfully, 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 translatation.

Socket Close

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

Checking Socket Status

After switch to AT Command Mode, You can see information of connected socket using <AT+SMGMT=?> 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 with previous Exchanging data with a peer system.

Socket Close

Closing socket connection is the same with previous Socket Close.

Checking Socket Status

Checking socket status is the same with 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 the example for setting UDP Client and then changing to 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 with previous Exchanging data with a peer system.

Socket Close

Closing socket connection is the same with previous Socket Close.

Checking Socket Status

Checking socket status is the same with 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 the example for setting UDP Server and then changing to 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=O,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 systems information like IP address

and port number. But before peer system is connected to WizFi250, WizFi250 doesn't send data to peer system because WizFi250 doesn't know its information. Thus peer system must send data to WizFi250 in order to know peer system's information like below.
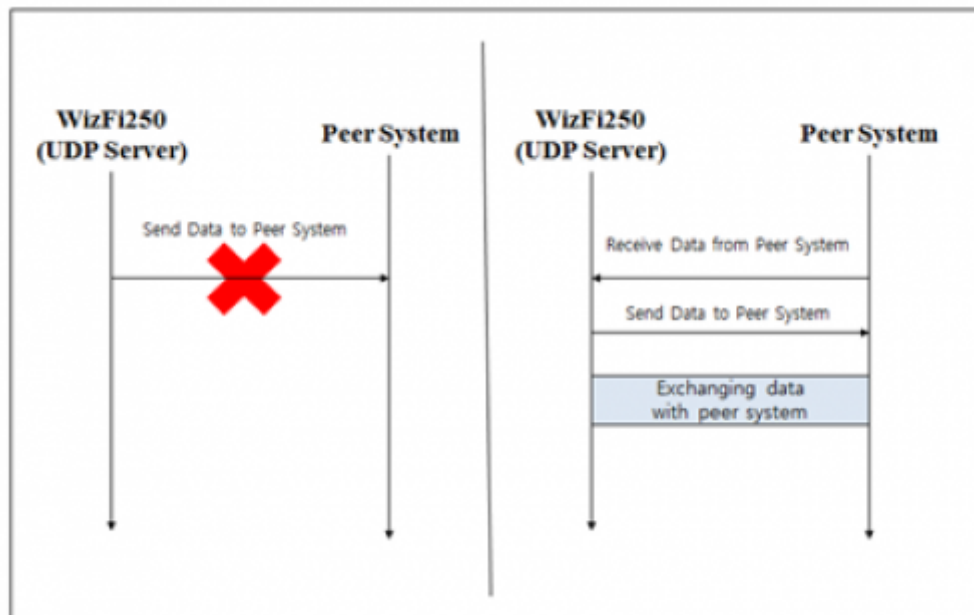
The other information for exchanging data is same to Exchanging data with a peer system.

Socket Close

Closing socket connection is the same with previous Socket Close.

Checking Socket Status

Checking socket status is the same with 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 be 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 connect to peer system successfully, WizFi250 will print [CONNECT(CID)] message. At this time, WizFi250 is 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>, you can close the TCP connection using <AT+SMGMT=CID> or <AT+SMGMT=ALL> command.

Checking Socket Status

In <AT Command Mode>, You can show information of connected socket 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=O,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 the example for setting UDP Client on the 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=O,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 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 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 the example for setting UDP Server on the 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=O,USN, , ,5000,0
[OK]

[CONNECT 0]
```

Exchanging data with a peer system

<UDP Server Mode> of WizFi250 can connect UDP connection without peer systems information like IP address and port number. Before peer system is connected to WizFi250, WizFi250 doesn't send data to peer system. So you should be careful when use <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>,<RemoteIP>,<RemotePort>,<LocalPort>,<DataMode>

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

If use 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

If use 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 was already associated with AP or
running AP mode. In this section, we was only explained in Station Mode. In AP Mode, you can use this
command the same to Station Mode

STA로 동작하는 경우와 SoftAP로써도 동작할 수

```
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=O,TCN,192.168.12.23,5000,,0
[OK]

[CONNECT 0]
```

<SO> Open at Once & Register as a Service

When use this parameter, you can use function of <S> and <O> at the same time. If use this
parameter, WizFi250 will try to connect to peer system momently. And if you restart WizFi250,
WizFi250 will try to connect 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=SO,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 and communicate to SSL server. For connecting SSL server, You should use <TCS(TCP Client SSL)> / <TSS(TCP Server SSL)> parameter of <AT+SCON> command. (In using UDP, WizFi250 can't 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=vtzYXz5msxRYzO-KzH5EKgcnABE4_YOcbUG1RGXufiQM2PNc84gyr8O12VNkOOap8MUCm
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 socket. In order to use <Multi Socket Connection> function, you can use AT command as below. In this example, Peer system was running loop back program. So if peer system received data from WizFi250, peer system will send received data to WizFi250.

```
AP Association

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

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

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

[CONNECT 2]
AT+SCON=O,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