WiFi Command Reference Guide

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1. Preface

This document provides a detailed description of each command supported by the WiFi serial AT command interface. Each description explains parameters and the expected behaviors of each command and response.

2. Overview

This chapter gives a basic overview of the WiFi interface. Further configuration commands are detailed in the *WiFi Configuration Guide*.

2.1 WiFi Serial Interface Overview

WiFi is an application layer that provides data communication between two devices. A serial port is used to communicate with a host device through an AT command interface as shown below.
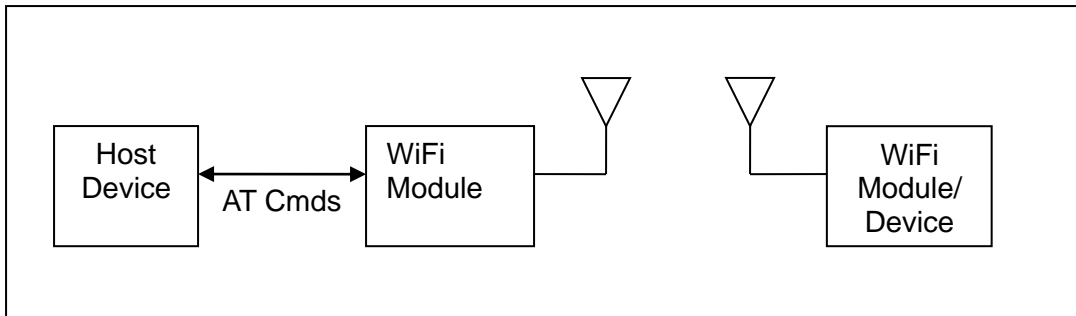
Wifi serial provides the following basic features:

- Point-to-point connection. Wifi only supports a connection with one host device at a time.
- Command and Bypass modes: it is possible to switch between Command and Bypass (data transmit/receive) modes during an active connection.

2.2 UART Factory Defaults

UART: 115200 baud, no parity, 1 stop bit, 8 data bits

3. AT Commands

This chapter details the each of the WiFi AT commands including brief descriptions of behavior, syntax of the command, context of the command, and types of responses.

This WiFi Reference Guide covers the following commands:

Table Key:

✓ – command is supported in this release

U – command has been updated for this release, see release notes

X – command not supported in this release

Command	WiFi Cmd v1.0	WiFi Cmd v1.1	WiFi Cmd v1.2	WiFi Cmd v1.3
Build	✓	✓	✓	✓
Bypass	✓	✓	✓	✓
ChangeBaud	✓	✓	✓	✓
GetMACAddress	✓	✓	✓	✓
GPIOConfig	x	x	x	x
GPIORead	x	x	x	x
GPIOWrite	x	x	x	x
HostEvent	✓	✓	✓	✓
Join	✓	✓	✓	✓
PING	x	x	x	x
Reset	✓	✓	✓	✓
Scan	✓	✓	✓	U
Showdev	x	✓	✓	✓
Shownetwork	x	✓	✓	✓
Showconnection	x	✓	✓	✓
SocketOpen	✓	✓	✓	✓
SocketClose	x	✓	✓	✓
Unjoin	x	✓	✓	✓
Version	x	x	x	x
ShowVersion	x	x	✓	✓

WiFi Command Summary

- The following subsections describe each of these commands in detail, including a description of behavior, syntax (including possible parameter values), and types of responses.
- Some responses will not be "immediate". Where applicable, these will be noted and will include an approximate delay before response.
- For commands with optional parameters, all possible forms will be listed under the syntax subsection.
- Error responses are described in Section **Error! Reference source not found.** Error Responses.
- All commands and replies, except the escape sequence, are terminated with a CR/LF.

3.1 Build

The **Build** command is used to return the current build ID of the application firmware.

3.1.1 Syntax

```
AT+WF Build
```

3.1.2 Responses

If the operation is successful, the response is:

```
AT-WF Wifi Build [date]
```

where [date] is the date code of the application firmware.

3.2 Bypass

The **Bypass** command is used to return the Wifi interface to the bypass mode, if a connection is still available. The possible use for this is to change a setting after a connection has been made (such as the UART baud rate). If the Wifi interface does not have a connection, it will respond as if the connection is down.

3.2.1. Syntax

```
AT+WF Bypass
```

3.2.2. Responses

If a connection is still available, the response is:

```
AT-WF -BypassMode-
```

If there is currently no connection, the response is:

```
AT-WF ConnectionDown
```


3.3 ChangeBaud

The host sends the **ChangeBaud** command in order to change the local UART speed to a new speed identified by the host. This setting will only remain in effect during the current session - until reset.

3.3.1. Syntax

```
AT+WF ChangeBaud [rate]
```

Where [rate] is the new baud rate:

- 2400

- 4800
- 9600
- 19,200
- 38,400
- 57,600
- 115,200
- 230,400
- 460,800
- 921,600

3.3.2. Responses

If the change is accepted, the response is:

```
AT-WF Baudrate Changed
```

The actual change will not occur until the response has been completely transmitted.

3.4 GetMACAddress

The **GetMACAddress** command is used to read the local device's MAC address.

3.4.1. Syntax

```
AT+WF GetMACAddress
```

3.4.2. Responses

If the operation is successful, the response is:

```
AT-WF MAC_ADDR = [MAC addr]
```

Where [MAC addr] is the local device's MAC address.

3.5 GPIOConfig

The **GPIOConfig** command is used to configure a GPIO pin to input or output.

3.5.1 Syntax

```
AT+WF GPIOConfig [GPIO Pin] [Configuration]
```

Where [GPIO Pin] is the Pin number, 0 – 15, of the desired GPIO to configure. [Configuration] is "i" or "I" for input and "o" or "O" for output.

3.5.2 Responses

If the operation is successful, the response is:

```
AT-WF GPIOConfigDone
```

3.6 GPIORead

The GPIORead command is used to read a GPIO pin. A GPIO may be read while configured as either an input or output.

3.6.1 Syntax

```
AT+WF GPIORead [GPIO Pin]
```

Where [GPIO Pin] is the Pin number, 0 – 15, of the desired GPIO to read.

3.6.2 Responses

If the operation is successful, the response is:

```
AT-WF GPIOReadDone [result]
```

Where [result] is either a 1 to indicate high, or 0 to indicate low.

3.7 GPIOWrite

The **GPIOWrite** command is used to set a GPIO pin to high or low. A GPIO may only be set when configured as an output.

3.7.1 Syntax

```
AT+WF GPIOWrite [GPIO Pin] [Setting]
```

Where [GPIO Pin] is the Pin number, 0 – 15, of the desired GPIO to read. [Setting] is a 1 to set a pin to high and a 0 to set a pin to low.

3.7.2 Responses

If the operation is successful, the response is:

```
AT-WF GPIOWriteDone
```

3.8 HostEvent

The **HostEvent** command is used to enable/disable the host notification strings. This will override the default setting in the dynamic configuration only for the current session; until reset.

3.8.1 Syntax

```
AT+WF HostEvent [Enable/Disable]
```

Where [Enable/Disable] is an "e" or "E" character to enable this parameter and a "d" or "D"

character to disable it.

3.8.2 Responses

If the feature is successfully enabled, the response is:

```
AT-WF HostEvent Enabled
```

If the feature is successfully disabled there is no response because the events have been disabled.

3.9 Join

The **Join** command is used to join a specified AP, it is valid when module in STA mode.

3.9.1 Syntax

```
AT+WF Join [SSID] [Passphrase]
```

The parameter SSID and Passphrase are optional; usage:

- If no parameter input, uses the default SSID and Passphrase in the configuration variable section where [SSID] is configured in SSID, [Passphrase] is configured in PassPhrase.
- If parameter [SSID] and [Passphrase] are present, ignores the configuration items in favor of these parameters.
- If only [SSID] but no [Passphrase], joins a router or AP with no passphrase.
- Only [Passphrase] is invalid.

3.9.2 Responses

If the **Join** is successful:

```
AT-WF JoinOk [SSID]
```

If the **Join** is not successful:

```
AT-WF JoinFailed [SSID]
```

3.10 PING

The **PING** command is used to ping a remote host.

3.10.1 Syntax

```
AT+WF PING [Addr]
```

Where [Addr] is the remote IP address

3.10.2 Responses

If the operation is successful, the response is:

```
AT-WF Ping [result]
```

Where [result] is the ping test results.

3.11 Reset

The **Reset** command is used to reset the Wifi interface. This is provided in the event that a host application wants to perform a software reset for error recovery. There is a response prior to reset to verify the command was received by the Wifi interface. A reset requires 2 seconds approximately.

3.11.1 Syntax

```
AT+WF Reset
```

3.11.2 Responses

If the operation is successful, the response is:

```
AT-WF ResetPending
```

3.12 Scan

The **Scan** command is used to find nearby Access Points, it is valid when module in STA mode.

3.12.1 Syntax

```
AT+WF Scan (both 2.4G and 5G)

AT+WF Scan LB (only 2.4G)

AT+WF Scan HB (only 5G)
```

3.12.2 Responses

Upon finding an Access Point:

```
BSSID          Signal          Freq          SSID      Flags

[Mac Address]  [Signal Level] [Frequency] [SSID]    [Flags]
```

Otherwise, if no AP found, no information shows out.

```
BSSID          Signal          Freq          SSID      Flags
```

3.13 Showdev

The **Showdev** command is used to show the STA devices joined with the local device. It is only valid when configured in AP mode.

3.13.1 Syntax
```
AT+WF Showdev
```

3.13.2 Responses
Each STA device's information is shown. The maximum number of devices is determined by the configuration section MaxSTACount value. For each STA device joined, its IP address is listed, or the IP address may be invalid:
```
[n] IP:x.x.x.x
```
If the local device is in STA mode, the result is (case not supported):
```
STA Mode!
```

3.14 Shownetwork
The **Shownetwork** command is used to show the network built with module.

3.14.1 Syntax
```
AT+WF Shownetwork
```

3.14.2 Responses
Whend in AP mode, displays the station information list:
```
Station list

[1] - IP= 192.168.0.3, MAC= cc:af:78:a4:0f:ed

Total of 1 stations.
```

In STA mode, shows the SSID and IP address of the devices joined:
```
AT-WF In network [SSID]!

AT-WF Local IP: 192.168.0.3
```

3.15 Showconnection
The **Showconnection** command is used to show a TCP link established with the local device. It shows the remote device's role and IP address. Invalid with UDP protocol.

3.15.1 Syntax
```
AT+WF Showconnection
```

3.15.2 Responses
If IPProtocol = TCP (alternatively 0), configured as a TCP server, shows the TCP client list:

```
TCP Client    [IP address]
```

If IPProtocol = TCP Client (alternatively 2), configured as a TCP client, shows the TCP server IP adddress:

```
TCP Server    [IP address]
```

3.16 SocketOpen

The **SocketOpen** command has a different function depending upon the IP protocol in use. Configured by the IPProtocol section.

- If IPProtocol = TCP (alternatively 0), starts a TCP server. If there is client, starts a connection and the module will enter bypass mode.
- If IPProtocol = UDP (alternatively 1), opens a UDP socket and enter bypass mode,
- If IPProtocol = TCP Client (alternatively 2), connects to a TCP server. If link is established, it enters bypass mode.

Related configuration Settings:

```
HostIPAddr: remote device IP address

HostPort:  remote device listen port number

LocalPort:  local listen port number
```

3.16.1 Syntax

```
AT+WF SocketOpen
```

3.16.2 Responses

- When IPProtocol = TCP:

```
AT-WF StartTCPServer
```

- When IPProtocol = UDP:

```
AT-WF –BypassMode-
```

- When IPProtocol = TCP Client:

```
AT-WF –BypassMode-
```

3.17 SocketClose

The **SocketClose** command has a different function depending upon the IP protocol in use. Configured by the IPProtocol section.

- If IPProtocol = TCP, stops the TCP server. When there is a TCP link, it disconnects the link and stops the server.
- If IPProtocol = UDP, closes a UDP socket and returns to command mode.
- If IPProtocol = TCP Client, disconnects from the TCP server.

3.17.1 Syntax

```
AT+WF SocketClose
```

3.17.2 Responses

- When IPProtocol = TCP,

```
AT-WF ConnectionDown
```

```
AT-WF StopTCPServer
```

- When IPProtocol = UDP,

```
AT-WF -CommandMode-
```

- When IPProtocol = TCP Client,

```
AT-WF ConnectionDown
```


3.18 Unjoin

The **Unjoin** command is used to disconnect the WLAN link from STA to AP or router.

3.18.1 Syntax

```
AT+WF Unjoin
```

3.18.2 Responses

If the operation is successful, the response is:

```
AT-WF Unjoin
```


3.19 Version

The **Version** command used to return the current version of the Wifi serial interface.

3.21.1 Syntax

```
AT+WF Version
```

3.21.2 Responses

If the operation is successful, the response is:

```
AT-WF WiFi Cmd Ver [x.y]
```

Where [x.y] is the current command version of the Wifi Interface.

3.20 ShowVersion

The **ShowVersion** command used to return the current hardware and software versions of Wifi module.

3.20.1 Syntax

```
AT+WF ShowVersion
```

3.20.2 Responses

If the operation is successful, the response is:

```
HW: [ACC1340]

APP Ver:[160312R]

WSM Ver:[WSC_A04.09.0082 V1.0 Apr 13 2016 14:40:28]

SDD Ver:[ADB_2905_1250_R20_Low_SMPS_v7.01]

BTLD size:[2372]
```

Where these [ ] show the WIFI chip type, the application version, the WSM/SDD/bootloader version in WIFI chip.

4. Error Responses

This chapter details the error responses that occur under specific circumstances.

There are five error responses that can occur beyond error responses specific to a particular command. They are:

```
ErrInvalidParam

ErrExecution

ErrFormat

ErrNumParam

ErrUnkownCmd
```

The following subsections detail the different error responses.

4.1 ErrExecution

The **ErrExecution** error response will be sent if the command cannot complete for any reason.

4.2 ErrFormat

The **ErrFormat** error response will be sent if Wifi receives a command (text terminated by a carriage return or line feed) that does not match the expected format of starting with "AT+WF ".

4.3 ErrInvalidParam

The **ErrInvalidParam** error response will be sent if the parameters for the requested command are not correct. The parameter(s) will be echoed back to the user starting from the parameter that was rejected.

Examples of commands that produce this error response are given in the following table.

Example	Response	Reason
AT+WF ChangeBaud 1600	AT-WF ErrInvalidParam 1600	Numeric parameter is out of range (specified baud rate is not supported by command).

Example command with <ErrInvalidParam>

4.4 ErrNumParam

The **ErrNumParam** error response will be sent if there are too few parameters for the requested command. A command sent with too many parameters does not generate an error; instead, the extra parameters are ignored.

Note: some commands will accept a multiple number of parameters.

Examples of commands that produce this error response are given in the following table.

Example	Reason
AT+WF	The minimum number of parameters was not specified.

Example command with <ErrNumParam>

4.5 ErrUnknownCmd

The *ErrUnknownCmd* error response will be sent if the requested command is not recognized. The unrecognized command will be echoed back to the host. Any parameters given will be ignored.

```
AT-WF ErrUnknownCmd [unrecognized command]
```

An accepted command always starts with the command identifier:

```
AT+WF
```

5. Other Responses

The following subsections describe types of responses that occur under specific circumstances, not necessarily as a result of a specific command. They are:

- Reset
- Fcotoryinit
- Escape Sequence

5.1 Reset

Upon a hardware reset or software reset (such as the **Reset** command), Wifi will respond as follows after the reset is complete:

```
AT-WF ResetPending
```

```
AT-WF -CommandMode-
```

Because the MAC address of the local device is reported during this response, the response is different than a response to the Escape Sequence.

5.2 Factoryinit

The **Factoryint** command used to reset all the configurations by default values, It will execute a reset action, so the response is the same with the reset.

```
AT-WF ResetPending
```

```
AT-WF -CommandMode-
```

5.3 Escape Sequence

If the Escape sequence, "^#^$^%", is received and no connection is active, Wifi will immediately respond with:

(Note: there is no CR or LF after these characters)

```
AT-WF -CommandMode-
```

When the Escape Sequence is received while a connection is still active and there is no data for 1 second, Wifi will respond (after 1 second of no data) with the CommandMode reply. Wifi will now be in command mode.