Espressif ESP8266EX: AT Instruction Set

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2014.8.12	0.15	XuJingjie	1、Added Timeout and IP settings for AP 2、Edited description for server functions 3、Support DNS
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Table of Contents

Version Info 2
Table of Contents 3
1 Overview 5
2 Command Description 6
3 AT Command Listing 7
4 Basic AT Command Set 9
4.1 Overview 9
4.2 Commands 9
4.2.1 AT – Test AT startup 9
4.2.2 AT+RST – Restart module 9
4.2.3 AT+GMR – View version info 9
4.2.4 AT+GSLP – Enter deep-sleep mode 10
4.2.5 ATE – AT commands echo 10
4.2.6 AT+RESTORE – Factory reset 10
4.2.7 AT+UART – UART configuration 10
5 WIFI functions 12
5.1 Overview 12
5.2 Commands 12
5.2.1 AT+CWMODE – WIFI mode 12
5.2.2 AT+CWJAP – Connect to AP 13
5.2.3 AT+CWLAP – List available APs 14
5.2.4 AT+CWQAP – Disconnect from AP 14
5.2.5 AT+CWSAP – Configuration of softAP mode 15
5.2.6 AT+CWLIF – IP of stations 16
5.2.7 AT+CWDHCP – Enable/Disable DHCP 16
5.2.8 AT+CWAUTOCONN – Auto connect to AP or not 16
5.2.9 AT+CIPSTAMAC – Set mac address of station 17
5.2.10 AT+CIPAPMAC – Set mac address of softAP 17
5.2.11 AT+ CIPSTA – Set ip address of station 18
5.2.12 AT+ CIPAP – Set ip address of softAP 18
6 TCP/IP Related 19
6.1 Overview 19
6.2 TCP/IP 19
6.2.1 AT+ CIPSTATUS – Information about connection 19
6.2.2 AT+CIPSTART – Start connection 20
6.2.3 AT+CIPSEND – Send data 21
6.2.4 AT+CIPCLOSE – Close TCP or UDP connection 22
6.2.5 AT+CIFSR – Get local IP address 23
6.2.6 AT+ CIPMUX – Enable multiple connections 23

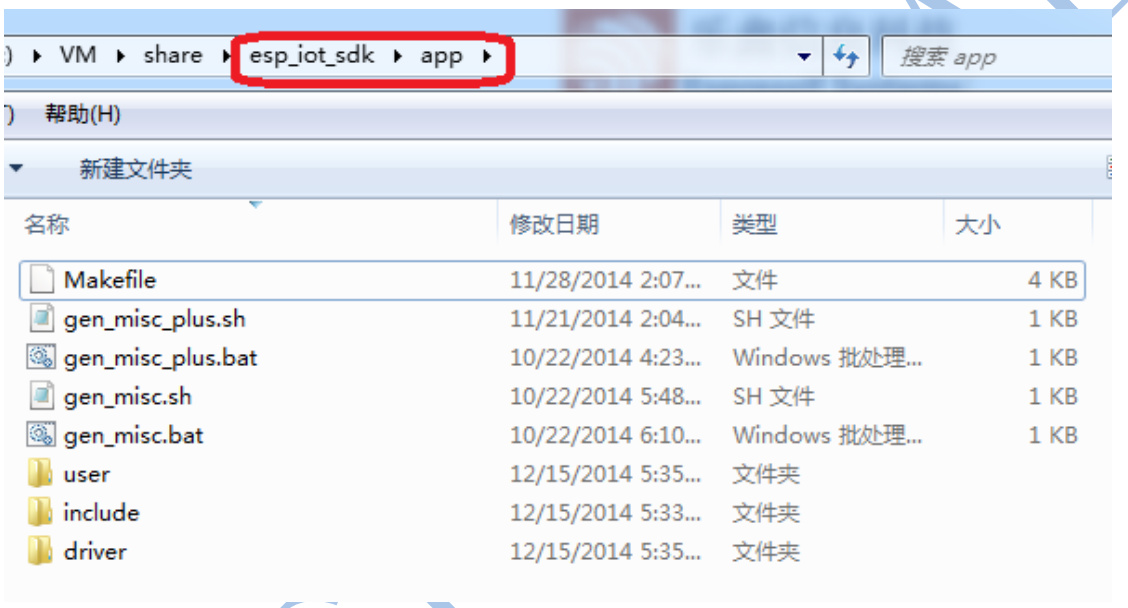
6.2.7 AT+ CIPSERVER – Configure as TCP server 24
6.2.8 AT+ CIPMODE – Set transfer mode 24
6.2.9 AT+ CIPSTO – Set TCP server timeout 25
6.2.10 AT+ CIUPDATE – Update through network 25
6.2.11 AT+PING – Function Ping 26
6.2.12 +IPD – Receive network data 26
7 Appendix 27
8 Q&A 28

1 Overview

This is the documentation for Espressif AT command Command set and usage.

Command set is divided into: Basic AT commands, Wifi function, AT commands, TCP / IP Toolbox AT commands.

Copy all files in folder “at” to folder “app” in esp_iot_sdk to compile.



Download:

boot.bin, downloads to flash 0x00000

user1.bin, downloads to flash 0x01000

blank.bin, downloads to flash both 0x3E000 and 0x7E000 to factory initialize

Note: Please make sure that correct BIN(\esp_iot_sdk\bin\at) is already in the chip (ESP8266) before the AT commands listed in this documentation can be used.

2 Command Description

Each Command set contains four types of AT commands.

Type	Command Format	Description
Test	AT+<x>=?	Query the Set command or internal parameters and its range values.
Query	AT+<x>?	Returns the current value of the parameter.
Set	AT+<x>=<…>	Set the value of user-defined parameters in commands and run.
Execute	AT+<x>	Runs commands with no user-defined parameters.

Note:

1. Not all AT Command has four commands.
2. [] = default value, not required or may not appear
3. String values require double quotation marks, for example: AT+CWSAP="ESP756290","21030826",1,4
4. Baud rate = 115200
5. AT Command ends with "\r\n"

3 AT Command Listing

Commands	Description
Basic	
AT	Test if AT startup
AT+RST	Restart
AT+GMR	View version info
AT+GSLP	Enter deep-sleep mode
ATE	AT commands echo
AT+RESTORE	Factory Reset
AT+UART	UART configuration
Wi-Fi	
AT+CWMODE	WIFI mode（station/softAP/station+softAP）
AT+CWJAP	Connect to AP
AT+CWLAP	Lists available APs
AT+CWQAP	Disconnect from AP
AT+CWSAP	Set parameters under AP mode
AT+CWLIF	Get stations' ip which are connected to ESP8266 softAP
AT+CWDHCP	Enable/Disable DHCP
AT+CWAUTOCONN	Connect to AP automatically when power on
AT+CIPSTAMAC	Set mac address of ESP8266 station
AT+CIPAPMAC	Set mac address of ESP8266 softAP
AT+CIPSTA	Set ip address of ESP8266 station
AT+CIPAP	Set ip address of ESP8266 softAP
TCP/IP	
AT+CIPSTATUS	Get connection status
AT+CIPSTART	Establish TCP connection or register UDP port
AT+CIPSEND	Send data
AT+CIPCLOSE	Close TCP/UDP connection
AT+CIFSR	Get local IP address
AT+CIPMUX	Set multiple connections mode
AT+CIPSERVER	Configure as server
AT+CIPMODE	Set transmission mode

AT+CIPSTO	Set timeout when ESP8266 runs as TCP server
AT+CIUPDATE	For OTA（upgrade through network）
AT+PING	Function Ping
Data RX	
+IPD	Data received from network

4 Basic AT Command Set

4.1 Overview

Basic	
Command	**Description**
AT	Test AT startup
AT+RST	Restart module
AT+GMR	View version info
AT+GSLP	Enter deep-sleep mode
ATE	AT commands echo or not
AT+RESTORE	Factory Reset
AT+UART	UART configuration

4.2 Commands

4.2.1 AT – Test AT startup

AT – Test AT startup	
Type：execute Command： **AT**	Response： OK
	Param description：null

4.2.2 AT+RST – Restart module

AT+RST – Restart module	
Type ： execute Command： **AT+RST**	Response： OK
	Param description：null

4.2.3 AT+GMR – View version info

AT+GMR – View version info	
Type ： execute Command：	Response： <number> OK

AT+GMR	Param description： < number > version info，length：8 bytes
Note	For example，response is 0017xxxxxx，then 0017 means the AT version.

4.2.4 AT+GSLP – Enter deep-sleep mode

AT+GSLP – Enter deep-sleep mode	
Type ： set Command： **AT+GSLP=<time>**	Response： <time> OK
	Param description： < time > ms , set the sleep time of ESP8266 in ms. ESP8266 will wake up after X ms in deep-sleep.
Note	Hardware has to support deep-sleep wake up (XPD_DCDC connects to EXT_RSTB with 0R).

4.2.5 ATE – AT commands echo

ATE – AT commands echo	
Type ： execute Command： **ATE**	Response： OK
	Param description： ATE0 ： Disable echo ATE1 ： Enable echo

4.2.6 AT+RESTORE – Factory reset

AT+RESTORE – Factory reset	
Type ： execute Command： **AT+RESTORE**	Response： OK
Note	Reset configuration to default factory settings The chip will restart.

4.2.7 AT+UART – UART configuration

AT+UART – UART configuration	
Type ： set	Response：

Command： AT+UART=<baudrate>,<databits>,<stopbits>, <parity>,<flow control>	OK
	Param description： <baudrate> UART baudrate <databits> data bits 5：5 bits data 6：6 bits data 7：7 bits data 8：8 bits data <stopbits> stop bits 1：1 bit stop bit 2：1.5 bit stop bit 3：2 bit stop bit <parity> parity 0：None 1：Odd 2：EVEN <flow control> flow control 0：disable flow control 1：enable RTS 2：enable CTS 3：enable both RTS and CTS
Note	1. This configuration will store in Flash user parameter area. 2. To enable flow control hardware need to support it too. MTCK is UART0 CTS , MTDO is UART0 RTS 3. Baudrate range: 110~115200*40
Example	AT+UART=115200,8,1,0,3

5 WIFI functions

5.1 Overview

WIFI	
Command	**Description**
AT+CWMODE	WIFI mode（station/softAP/station+softAP）
AT+CWJAP	Connect to AP
AT+CWLAP	Lists available APs
AT+CWQAP	Disconnect from AP
AT+CWSAP	Set parameters under AP mode
AT+CWLIF	Get station's ip which is connected to ESP8266 softAP
AT+CWDHCP	Enable/Disable DHCP
AT+CWAUTOCONN	Connect to AP automatically or not when power on
AT+CIPSTAMAC	Set mac address of ESP8266 station
AT+CIPAPMAC	Set mac address of ESP8266 softAP
AT+CIPSTA	Set ip address of ESP8266 station
AT+CIPAP	Set ip address of ESP8266 softAP

5.2 Commands

5.2.1 AT+CWMODE – WIFI mode

AT+CWMODE - WIFI mode（station/softAP/station+softAP）	
Type：test Function: Get value scope of wifi mode. Command： **AT+CWMODE=?**	Response： +CWMODE:(value scope of <mode>) OK
	Param description： <mode>1 means Station mode 2 means AP mode 3 means AP + Station mode
Type：query Function: Query ESP8266's current wifi mode. Command：	Response： +CWMODE:<mode> OK
	Param description：

AT+CWMODE?	The same as above.
Type：set Function: Set ESP8266 wifi mode Command： **AT+CWMODE=<mode>**	Response： OK Param description： The same as above.
Note	This configuration will store in Flash system parameter area.
Example	AT+CWMODE=3

5.2.2 AT+CWJAP – Connect to AP

AT+CWJAP – Connect to AP	
Type：query Function: Query AP's info which is connect by ESP8266. Command： **AT+ CWJAP?**	Response： + CWJAP:<ssid> OK Param description： <ssid> string, AP's SSID
Type：set Function: Set AP's info which will be connect by ESP8266. Command： **AT+ CWJAP =<ssid>,<pwd >**	Response： OK ERROR Param description： <ssid> string, AP's SSID <pwd> string, MAX: 64 bytes ASCII This command needs station mode enable. Escape character syntax is needed if "SSID" or "password" contains any special characters (' ,' 、' " ' and' \')
Note	This configuration will store in Flash system parameter area.
Example	AT+ CWJAP ="abc"，"0123456789" If SSID is "ab\,c"

	and password is “0123456789”\” AT+CWJAP =“ab\\\,c”，“0123456789\” \\”

5.2.3 AT+CWLAP – List available APs

AT+CWLAP - Lists available APs	
Type：set Function: Search available APs with specific conditions. Command： **AT+ CWLAP =** **<ssid>,< mac >,<ch>**	Response： + CWLAP: <ecn>,<ssid>,<rssi>,<mac>,<ch> OK ERROR Param description： The same as below.
Type ： execute Function: Lists all available APs. Command： **AT+CWLAP**	Response： + CWLAP: <ecn>,<ssid>,<rssi>,<mac>,<ch> OK ERROR Param description： < ecn >0 OPEN 1 WEP 2 WPA_PSK 3 WPA2_PSK 4 WPA_WPA2_PSK <ssid> string, SSID of AP <rssi> signal strength <mac> string, MAC address
Example	AT+CWLAP="wifi","ca:d7:19:d8:a6:44",6 Or find AP with specific ssid： AT+CWLAP="wifi"," "

5.2.4 AT+CWQAP – Disconnect from AP

AT+CWQAP - Disconnect from AP	
Type：test Function: Only for test	Response： OK

Command： **AT+CWQAP=?**	Param description：
Type ： execute Function: Disconnect from AP. Command： **AT+ CWQAP**	Response： OK Param description：

5.2.5 AT+CWSAP – Configuration of softAP mode

AT+ CWSAP – Configuration of softAP mode	
Type：Query Function: Query configuration of softAP mode. Command： **AT+ CWSAP?**	Response： + CWSAP:<ssid>,<pwd>,<chl>,<ecn> Param description: The same as below.
Type：Set Function: Set configuration of softAP mode. Command： **AT+ CWSAP=** **<ssid>,<pwd>,<chl>,** **<ecn>**	Response： OK ERROR Note: This CMD is only available when softAP mode enable, and need to follow by AT+RST to make it works. Param description： <ssid> string, ESP8266 softAP' SSID <pwd> string, MAX: 64 bytes ASCII <chl> channel id < ecn >0 OPEN 2 WPA_PSK 3 WPA2_PSK 4 WPA_WPA2_PSK
Note	This configuration will store in Flash system parameter area.
Example	AT+CWSAP="ESP8266","1234567890",5,3

5.2.6 AT+CWLIF – IP of stations

AT+ CWLIF – ip of stations which are connected to ESP8266 softAP	
Type ： execute Function: Get ip of stations which are connected to ESP8266 softAP Command： **AT+CWLIF**	Response： <ip addr>,<mac> OK
	Param description： <ip addr> ip address of stations which are connected to ESP8266 softAP <mac> mac address of stations which are connected to ESP8266 softAP

5.2.7 AT+CWDHCP – Enable/Disable DHCP

AT+ CWDHCP – Enable/Disable DHCP	
Type ： set Function: Enable/Disable DHCP. Command： **AT+CWDHCP=<mode>,<en>**	Response： OK
	Param description： <mode> 0 : set ESP8266 softAP 1 : set ESP8266 station 2 : set both softAP and station <en> 0 : Enable DHCP 1 : Disable DHCP
Note	This configuration will store in Flash user parameter area.

5.2.8 AT+CWAUTOCONN – Auto connect to AP or not

AT+CWAUTOCONN – Connect to AP automatically or not	
Type ： set Function: Connect to AP automatically or not. Command： **AT+CWAUTOCONN=**	Response： OK
	Param description： <enable> 0 : do not auto-connect to AP when power on 1 : connect to AP automatically when power on

<enable>	Default is enable, ESP8266 station will connect to AP automatically when power on.
Note	This configuration will store in Flash system parameter area.

5.2.9 AT+CIPSTAMAC – Set mac address of station

AT+ CIPSTAMAC – Set mac address of ESP8266 station	
Type ： query Function: Get mac address of ESP8266 station. Command： **AT+CIPSTAMAC?**	Response： +CIPSTAMAC:<mac> OK
	Param description： <mac> string, mac address of ESP8266 station
Type ： set Function: Set mac address of ESP8266 station. Command： **AT+CIPSTAMAC=<mac>**	Response： OK
	Param description： <mac> string, mac address of ESP8266 station
Note	This configuration will store in Flash user parameter area.
Example	AT+CIPSTAMAC="18:fe:35:98:d3:7b"

5.2.10 AT+CIPAPMAC – Set mac address of softAP

AT+ CIPAPMAC – Set mac address of ESP8266 softAP	
Type ： query Function: Get mac address of ESP8266 softAP. Command： **AT+CIPAPMAC?**	Response： +CIPAPMAC:<mac> OK
	Param description： <mac> string, mac address of ESP8266 softAP
Type ： set Function: Set mac address of ESP8266 softAP. Command：	Response： OK
	Param description： <mac> string, mac address of ESP8266 softAP

AT+CIPAPMAC=<mac>	
Note	This configuration will store in Flash user parameter area.
Example	AT+CIPAPMAC="1a:fe:36:97:d5:7b"

5.2.11 AT+ CIPSTA – Set ip address of station

AT+ CIPSTA – Set ip address of ESP8266 station	
Type ： query Function: Get ip address of ESP8266 station. Command： **AT+CIPSTA?**	Response： +CIPSTA:<ip> OK
	Param description： <ip> string, ip address of ESP8266 station
Type ： set Function: Set ip address of ESP8266 station. Command： **AT+CIPSTA=<ip>**	Response： OK
	Param description： <ip> string, ip address of ESP8266 station
Note	This configuration will store in Flash user parameter area.
Example	AT+CIPSTA="192.168.6.100"

5.2.12 AT+ CIPAP – Set ip address of softAP

AT+ CIPAP – Set ip address of ESP8266 softAP	
Type ： query Function: Get ip address of ESP8266 softAP. Command： **AT+CIPAP?**	Response： +CIPAP:<ip> OK
	Param description： <ip> string, ip address of ESP8266 softAP
Type ： set Function: Set ip address of	Response： OK

ESP8266 softAP. Command： **AT+CIPAP=<ip>**	Param description： <ip> string, ip address of ESP8266 softAP
Note	This configuration will store in Flash user parameter area.
Example	AT+CIPAP="192.168.5.1"

6 TCP/IP Related

6.1 Overview

TCP/IP	
Command	**Description**
AT+ CIPSTATUS	Get connection status
AT+CIPSTART	Establish TCP connection or register UDP port
AT+CIPSEND	Send data
AT+CIPCLOSE	Close TCP/UDP connection
AT+CIFSR	Get local IP address
AT+CIPMUX	Set multiple connections mode
AT+CIPSERVER	Configure as server
AT+CIPMODE	Set transmission mode
AT+CIPSTO	Set timeout when ESP8266 runs as TCP server
AT+CIUPDATE	Upgrade firmware through network
AT+PING	Function PING

6.2 TCP/IP

6.2.1 AT+ CIPSTATUS – Information about connection

AT+ CIPSTATUS – Information about connection	
Type ： execute Function: Get information about connection.	Response： STATUS:<stat> + CIPSTATUS:<id>,<type>,<remote_ip>,<remote_port>,

Command: **AT+** **CIPSTATUS**	<local_port>,<tetype> OK
	Param description： <stat> 2: Got IP 3: Connected 4: Disconnected <id> id of the connection (0~4), for multi-connect <type> string, “TCP” or “UDP” <remote_ip> string, remote IP address. <remote_port> remote port number <local_port> ESP8266 local port number <tetype> 0: ESP8266 runs as client 1: ESP8266 runs as server

6.2.2 AT+CIPSTART – Start connection

AT+CIPSTART – Establish TCP connection or register UDP port, start connection	
Type ： test Function: Get the information of param. Command: **AT+CIPSTART=?**	Response： 1) If AT+CIPMUX=0 +CIPSTART:(<type>),(<IP address>),(<port>)[,(<local port>),(<mode>)] +CIPSTART:(<type>),(<domain name>),(<port>)[,(<local port>),(<mode>)] OK 2) If AT+CIPMUX=1 +CIPSTART:(id),(<type>),(<IP address>),(<port>)[,(<local port>),(<mode>)] +CIPSTART: (id), (<type>),(<domain name>),(<port>)[,(<local port>),(<mode>)]
	Param description：null
Type ： Set Function: Start a connection as client. Command: 1)Single connection **(+CIPMUX=0)** **AT+CIPSTART=**	Response： OK or ERROR If connection already exists, returns ALREAY CONNECT
	Param description： <id> 0-4 , id of connection <type> string, “TCP” or “UDP”

<type>,<addr>,<port> **[,(<local port>),(<mode>)]** 2)Multiple connection (+CIPMUX=1) **AT+CIPSTART=** **<id><type>,<addr>,<port>** **[,(<local port>),(<mode>)]**	<addr> string, remote ip <port> string, remote port [<local port>] for UDP only [<mode>] for UDP only 0 : destination peer entity of UDP will not change. 1 : destination peer entity of UDP can change once. 2 : destination peer entity of UDP is allowed to change. Note: [<mode>] can only be used when [<local port>] is set.
Example	AT+CIPSTART="TCP","192.168.101.110",1000 Refer to “Espressif AT Command Examples”

6.2.3 AT+CIPSEND – Send data

AT+CIPSEND – Send data	
Type ： test Function: Only for test. Command: **AT+CIPSEND=?**	Response： OK Param description： null
Type ： Set Function: Set length of the data that will be sent. For normal send. Command: 1)For single connection: (+CIPMUX=0) **AT+CIPSEND=<length>** 2) For multiple connection: (+CIPMUX=1) **AT+CIPSEND=**	Wrap return “>” after set command. Begins receive of serial data, when data length is met, starts transmission of data. If connection cannot be established or gets disconnected during send, returns ERROR If data is transmitted successfully, returns SEND OK Note: This CMD Param description： <id> ID no. of transmit connection <length> data length, MAX 2048 bytes

<id>,<length>	
Type ： execute Function: Send data. For unvarnished transmission mode. Command: **AT+CIPSEND**	Response： Wrap return “>” after execute command. Enters unvarnished transmission, 20ms interval between each packet, maximum 2048 bytes per packet. When single packet containing “+++” is received, it returns to command mode. This command can only be used in unvarnished transmission mode which require to be single connection mode.
Example	Refer to “Espressif AT Command Examples”

6.2.4 AT+CIPCLOSE – Close TCP or UDP connection

AT+CIPCLOSE – Close TCP or UDP connection	
Type ： test Function: Only for test. Command: **AT+CIPCLOSE=?**	Response： OK
Type ： Set Function: Close TCP or UDP connection. Command:	Response： No errors, returns OK If connection <id> is disconnected, returns Link is not
For multiply connection mode **AT+CIPCLOSE=<id>**	Param description： <id> ID no. of connection to close, when id=5, all connections will be closed. (id=5 has no effect in server mode)
Type ： execute Command: For single connection mode **AT+CIPCLOSE**	Response： OK or If no such connection, returns ERROR Prints UNLINK when there is no connection

6.2.5 AT+CIFSR – Get local IP address

AT+CIFSR – Get local IP address	
Type ： Test Function: Only for test. Command: **AT+CIFSR=?**	Response： OK
Type ： Execute Function: Get local IP address. Command: **AT+ CIFSR**	Response： + CIFSR:<IP address> + CIFSR:<IP address> OK ERROR
	Param description： <IP address> IP address of ESP8266 softAP IP address of ESP8266 station

6.2.6 AT+ CIPMUX – Enable multiple connections

AT+ CIPMUX – Enable multiple connections or not	
Type ： Query Function: Get param config. Command: **AT+ CIPMUX?**	Response： + CIPMUX:<mode> OK
	Param description： The same as below.
Type ： Set Function: Set connection mode. Command: **AT+ CIPMUX=<mode>**	Response： OK If already connected, returns Link is builded
	Param description： <mode>0 single connection 1 multiple connection
Note	1. “AT+CIPMUX=1” can only be set when transparent transmission disabled (“AT+CIPMODE=0”) 2. This mode can only be changed after all connections are disconnected. If server is started,

	reboot is required.
Example	AT+CIPMUX=1

6.2.7 AT+ CIPSERVER – Configure as TCP server

AT+ CIPSERVER – Configure as TCP server	
Type : Set Function: Set TCP server. Command: **AT+ CIPSERVER=** **<mode>[,<port>]**	Response: OK
	Param description: <mode> 0 Delete server (need to follow by restart) 1 Create server <port> port number, default is 333
Note	1、Server can only be created when AT+CIPMUX=1 2、Server monitor will automatically be created when Server is created. 3、When a client is connected to the server, it will take up one connection, be gave an id.
Example	AT+ CIPMUX=1 AT+ CIPSERVER=1,1001

6.2.8 AT+ CIPMODE – Set transfer mode

AT+ CIPMODE – Set transfer mode	
Type : Query Function: Query transfer mode. Command: **AT+ CIPMODE?**	Response: + CIPMODE:<mode> OK
	Param description: The same as below.
Type : Set Function: Set transfer mode. Command: **AT+CIPMODE=<mode>**	Response: OK If already connected, returns Link is builded
	Param description: <mode>0 normal mode 1 unvarnished transmission mode

Note	AT+CIPMODE=1 will trigger a storage in Flash user parameter area with its TCP connection. If power off during AT+CIPMODE=1, then power on it will be still in transparent transmission mode maintain previous configuration.
Example	AT+CIPSTART="TCP","192.168.101.110",8080 AT+CIPMODE=1

6.2.9 AT+ CIPSTO – Set TCP server timeout

AT+ CIPSTO – Set TCP server timeout	
Type ： Query Function: Query server timeout. Command: **AT+CIPSTO?**	Response： + CIPSTO:<time> OK
	Param description： The same as below.
Type ： Set Function: Set server timeout. Command: **AT+CIPSTO=<time>**	Response： OK
	Param description： < time> TCP server timeout, range 0~7200 seconds
Note	ESP8266 as TCP server, will disconnect to TCP client which didn't communicate with it evenif timeout. If AT+CIPSTO=0, it will never timeout. We don't recommend that.
Example	AT+ CIPMUX=1 AT+ CIPSERVER=1,1001 AT+CIPSTO=10

6.2.10 AT+ CIUPDATE – Update through network

AT+ CIUPDATE – update through network	
Type ： execute Function: Start upgrade. Command: **AT+ CIUPDATE**	Response： +CIPUPDATE:<n> OK
	Param description： <n> 1 found server 2 connect server

	3 got edition 4 start update
Note	Firmware upgrade depends on network condition. It will return ERROR if upgrade fail，please wait a while.

6.2.11 AT+PING – Function Ping

AT+PING – Function Ping	
Type ： set Function: Start upgrade. Command: **AT+PING=<ip>**	Response： +<time> OK Or ERROR // means ping fail
	Param description： <ip> : string, host ip or domain name <time> : response time of ping
Example	AT+PING=”192.168.1.1” AT+PING=”www.baidu.com”

6.2.12 +IPD – Receive network data

+IPD – Receive network data	
1)Single connection: **(+CIPMUX=0)** **+IPD,<len>:<data>** 2) Multiple connection **(+CIPMUX=1)** **+IPD,<id>,<len>:<data>**	NOTE: When the module receives network data, it will send the data through the serial port using +IPD command Param description： <id> id no. of connection <len> data length <data> data received

7 Appendix

ESP8266 AT commands below will save in Flash:

Command	*Example*
Save in Flash user parameter area	
AT+UART	AT+UART=115200,8,1,0,3
AT+CWDHCP	AT+CWDHCP=1,1
AT+CIPSTAMAC	AT+CIPSTAMAC="18:fe:35:98:d3:7b"
AT+CIPAPMAC	AT+CIPAPMAC="1a:fe:36:97:d5:7b"
AT+CIPSTA	AT+CIPSTA="192.168.6.100"
AT+CIPAP	AT+CIPAP="192.168.5.1"
AT+CIPMODE	AT+CIPSTART="TCP","192.168.101.110",8080 AT+CIPMODE=1
Save in Flash system parameter area	
AT+CWMODE	AT+CWMODE=3
AT+CWJAP	AT+CWJAP=“abc”，“0123456789”
AT+CWSAP	AT+CWSAP="ESP8266","1234567890",5,3
AT+CWAUTOCONN	AT+CWAUTOCONN=1

NOTE:

(1) We will check the new setting with original configuration from flash first，only if the configuration changes，we will write it to flash.

(2) To 512KB flash, default setting:

user parameter area is 0x3C000 ~ 0x40000, 16KB;

system parameter area is 0x7C000~0x80000, 16KB

To 1MB flash (or larger than 1MB), default setting:

user parameter area is 0x7C000 ~ 0x80000, 16KB;

system parameter area is the last 16KB of flash.

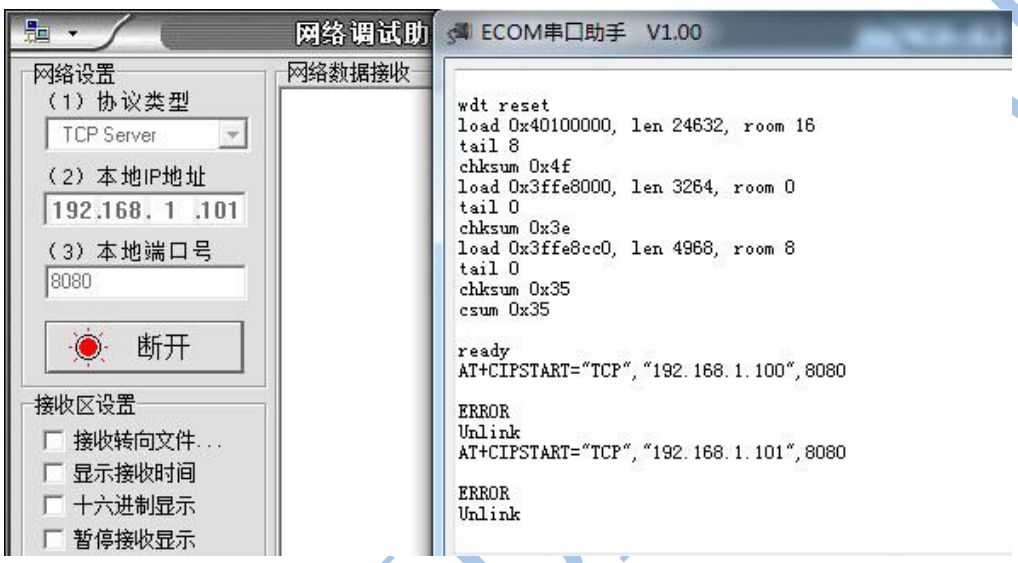
8 Q&A

If you have any question about AT Commands, please contact us (support-at@espressif.com) with information as follows:

(1) Version info of AT : Using “AT+GMR” to get the version info.

Hardware Module info：example AITHINK ESP-01

(2) Screenshot or steps of the test steps, for example:



(3) Log:

```
ets Jan  8 2013,rst cause:1, boot mode:(3,3)

load 0x40100000, len 26336, room 16
tail 0
chksum 0xde
load 0x3ffe8000, len 5672, room 8
tail 0
chksum 0x69
load 0x3ffe9630, len 8348, room 8
tail 4
chksum 0xcb
csum 0xcb
SDK version:0.9.1
addr not ack when tx write cmd
mode : sta(18:fe:34:97:d5:7b) + softAP(1a:fe:34:97:d5:7b)
```