ESP8266 AT Instruction Set

Version 0.25

Espressif Systems IOT Team

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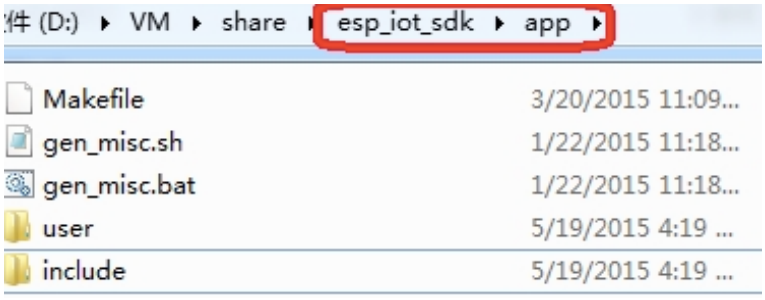
1. Preambles

AT commands set is divided into: Basic AT commands, WiFi related AT commands, TCP / IP AT commands.

Copy all files in folder "at" to folder "app" in esp_iot_sdk if users need to compile AT.



Download:

boot.bin, downloads to flash 0x00000

user1.bin, downloads to flash 0x01000

blank.bin, factory initialize,

AT_v0.22 or version before that，corresponding to 512KB flash size，blank.bin downloads to flash both 0x3E000 and 0x7E000

AT_v0.23 or version later than that, corresponding to 1024KB flash size，blank.bin downloads to flash both 0x7E000 and 0xFE000

If users compile AT themselves, please refer to document “2A-ESP8266_IOT_SDK_User_Manual” chapter “flash map”, blank.bin need to download into user parameter area and system parameter area both in chapter “flash map”;

Please use Espressif official flash download tool http://bbs.espressif.com/viewtopic.php?f=5&t=433

select corresponding flash size while downloading.

Notes:

- 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.
- AT has already taken priority 0 and 1 of system_os_task , so only one task of priority 2 is allowed to set up by user.
- AT returns messages below to show status of Wi-Fi connection of ESP8266 station
  - WIFI CONNECTED - Wi-Fi connected
  - WIFI GOT IP - ESP8266 station got IP from AP
  - WIFI DISCONNECT - Wi-Fi disconnected

2. Command Description

Each Command set contains four types of AT commands.

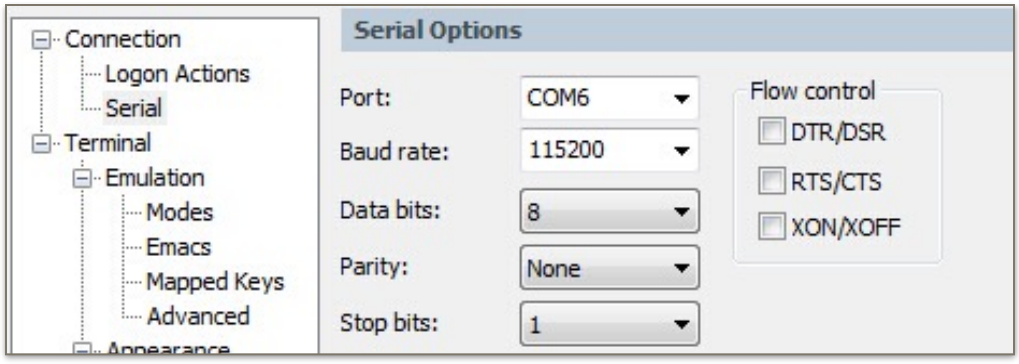
Type	Command Format	DescrIPtion
Test	AT+<x>=?	Query the Set command or internal parameters and its range values.
Query	AT+<x>?	Returns the current value of the parameter.
Set	AT+<x>=<…>	Set the value of user-defined parameters in commands and run.
Execute	AT+<x>	Runs commands with no user-defined parameters.

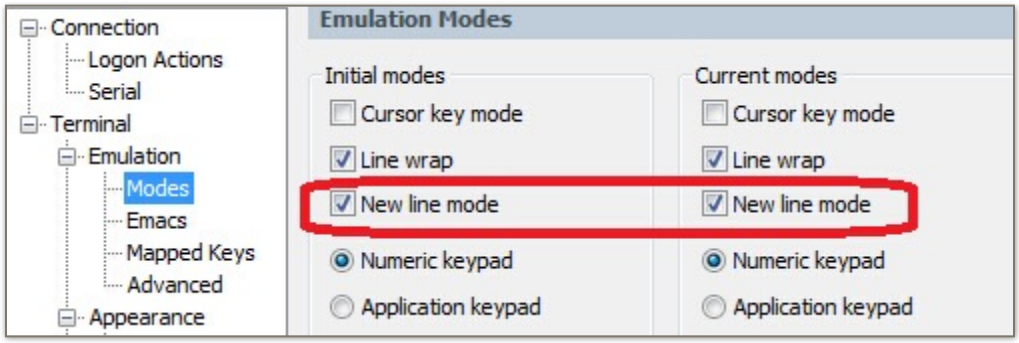
Notes:

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. Baudrate = 115200
5. AT Commands has to be capitalized, and end with "/r/n"





3. Basic AT Command Set

3.1. Overview

The ESP8266 wireless WiFi modules can be driven via the serial interface using the standard AT commands. Here is a list of some basic AT commands that can be used.

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, [@deprecated]
AT+UART_CUR	UART current configuration
AT+UART_DEF	UART default configuration, save to flash
AT+SLEEP	Sleep mode
AT+RFPOWER	Set RF TX Power
AT+RFVDD	Set RF TX Power according to VDD33

3.2. Commands

1. AT – Test AT startup

The type of this command is "executed". It's used to test the setup function of your wireless WiFi module.

AT - Test AT startup	
Response	`OK`
Parameters	`null`

2. AT+RST – Restart module

The type of this command is "executed". It's used to restart the module.

AT+RST - Restart module	
Response	OK
Parameters	null

3. AT+GMR – View version info

This AT command is used to check the version of AT commands and SDK that you are using, the type of which is "executed".

AT+GMR - View version info	
Response	< AT version info > < SDK version info > < compile time > OK
Parameters	< AT version info > information about AT version < SDK version info > information about SDK version < compile time > time of the bin was compiled

4. AT+GSLP – Enter deep-sleep mode

This command is used to invoke the deep-sleep mode of the module, the type of which is "set". A minor adjustment has to be made before the module enter this deep sleep mode, i.e., connect XPD_DCDC with EXT_RSTB via **0R**.

AT+GSLP=<time>	
Response	<time> OK
Parameters	The time unit of < time > is ms. ESP8266 will wake up after X ms and then enter the deep sleep mode.

5. ATE – AT commands echo

This command ATE is an AT trigger command echo. It means that entered commands can be echoed back to the sender when ATE command is used. Two parameters are possible. The command returns "OK" in normal cases and "ERROR" when a parameter other than 0 or 1 was specified.

ATE - AT commands echo	
Response	OK
Parameters	ATE0: Switch echo off ATE1: Switch echo on

6. AT+RESTORE – Factory reset

This command is used to reset all parameters saved in flash (according to appendix), restore the factory default settings of the module. The chip will be restarted when this command is executed.

AT+RESTORE - Factory reset	
Response	OK
Notes	Restore factory default settings. The chip will restart.

7. AT+UART – UART configuration

This command sets the UART configuration and writes the new configuration to the flash. It is stored as the default parameter and will also be used as the default baudrate henceforth. [THIS API IS DEPRECATED.]

AT+UART=<baudrate>,<databits>,<stopbits>,<parity>,<flow control> **This API is deprecated, please use AT+UART_CUR or AT+UART_DEF instead.**		
Example	AT+UART=115200,8,1,0,3	
Response	OK	
Parameters	<baudrate>	Baudrate range: 110 to 115200*40 (4.608 Mega)
	<databits>	5: 5 bits data 6: 6 bits data 7: 7 bits data 8: 8 bits data
	<stopbits>	1: 1 bit stop bit 2: 1.5 bit stop bit 3: 2 bit stop bit

AT+UART=<baudrate>,<databits>,<stopbits>,<parity>,<flow control> This API is deprecated, please use AT+UART_CUR or AT+UART_DEF instead.		
	<parity>	0: None 1: Odd 2: EVEN
	<flow control>	0: disable flow control 1: enable RTS 2: enable CTS 3: enable both RTS and CTS
Notes	• This configuration will also store the baud rate as the default rate in the user parameter area in the Flash for boot up. • Flow control needs hardware support: MTCK is UART0 CTS and MTDO is UART0 RTS.	

8. AT+UART_CUR – current UART configuration

This command sets the current UART configuration; it does not write to the flash device. Hence there is no change in the default baudrate.

AT+UART_CUR=<baudrate>,<databits>,<stopbits>,<parity>,<flow control>		
Example	AT+UART_CUR=115200,8,1,0,3	
Response	OK	
Parameters	<baudrate>	Baudrate range: 110 to 115200*40 (4.608 Mega)
	<databits>	5: 5 bits data 6: 6 bits data 7: 7 bits data 8: 8 bits data
	<stopbits>	1: 1 bit stop bit 2: 1.5 bit stop bit 3: 2 bit stop bit
	<parity>	0: None 1: Odd 2: EVEN
	<flow control>	0: disable flow control 1: enable RTS 2: enable CTS 3: enable both RTS and CTS
Notes	• This configuration will **NOT** be stored in the flash; unlike the AT+UART command. • Flow control needs hardware support: MTCK is UART0 CTS and MTDO is UART0 RTS.	

9. AT+UART_DEF – default UART configuration

This command sets the UART configuration and save it to flash. It is stored as the default parameter and will also be used as the default baudrate henceforth.

AT+UART_DEF=<baudrate>,<databits>,<stopbits>,<parity>,<flow control>		
Example	AT+UART_DEF=115200,8,1,0,3	
Response	OK	
Parameters	<baudrate>	Baudrate range: 110 to 115200*40 (4.608 Mega)
	<databits>	5: 5 bits data 6: 6 bits data 7: 7 bits data 8: 8 bits data
	<stopbits>	1: 1 bit stop bit 2: 1.5 bit stop bit 3: 2 bit stop bit
	<parity>	0: None 1: Odd 2: EVEN
	<flow control>	0: disable flow control 1: enable RTS 2: enable CTS 3: enable both RTS and CTS
Notes	• This configuration will be stored in the flash user parameter area. • Flow control needs hardware support: MTCK is UART0 CTS and MTDO is UART0 RTS.	

10. AT+SLEEP – sleep mode

This command sets ESP8266 sleep mode. It can only be used in station mode，default to be modem-sleep mode .

AT+SLEEP - sleep mode	
Command	**AT+SLEEP?**
Response	+SLEEP:<sleep mode> OK
Parameters	<sleep mode> 0 means disable sleep mode <sleep mode> 1 means light-sleep mode <sleep mode> 2 means modem-sleep mode
Command	**AT+SLEEP=<sleep mode>**
Response	OK
Parameters	The same as above.

11. AT+RFPOWER – set RF TX Power

This command sets ESP8266 RF TX power, it is not precise, it is setting the maximum value of RF TX power.

AT+RFPOWER - set RF TX Power	
Example	**AT+RFPOWER=50**
Command	**AT+RFPOWER=<TX power>**
Response	OK
Parameters	<TX power> maximum value of RF TX power, range 0 ~ 82

12. AT+RFVDD – set RF TX Power according to VDD33

This command sets ESP8266 RF TX power according to VDD33. To get the power voltage of ESP8266 VDD3P3, TOUT pin has to be suspended.

AT+RFVDD - set RF TX power according to VDD33	
Command	**AT+RFVDD?**
Response	+RFVDD:<VDD33> OK
Parameters	<VDD33> power voltage of ESP8266 VDD33, unit: 1/1024 V TOUT pin has to be suspended to measure VDD33.
Command	**AT+RFVDD=<VDD33>**
Response	OK
Parameters	<VDD33> power voltage of ESP8266 VDD33, range [1900, 3300]
Command	**AT+RFVDD**
Response	OK
Note	"AT+RFVDD" will automatically set RF TX power according to VDD33. TOUT pin has to be suspended.

4. WiFi Functions Overview

WiFi Connectivity Functions Invoked by AT commands	
Command	**Description**
AT+CWMODE	WIFI mode（sta/AP/sta+AP）, [@deprecated]
AT+CWMODE_CUR	WIFI mode（sta/AP/sta+AP） Won't save to Flash
AT+CWMODE_DEF	WIFI default mode（sta/AP/sta+AP） Save to Flash
AT+CWJAP	Connect to AP, [@deprecated]
AT+CWJAP_CUR	Connect to AP, won't save to Flash
AT+CWJAP_DEF	Connect to AP, save to Flash
AT+CWLAP	Lists available APs
AT+CWQAP	Disconnect from AP
AT+CWSAP	Set configuration of ESP8266 softAP [@deprecated]
AT+CWSAP_CUR	Set configuration of ESP8266 softAP Won't save to Flash.
AT+CWSAP_DEF	Set configuration of ESP8266 softAP Save to Flash.
AT+CWLIF	Get station's IP which is connected to ESP8266 softAP
AT+CWDHCP	Enable/Disable DHCP, [@deprecated]
AT+CWDHCP_CUR	Enable/Disable DHCP, won't save to Flash
AT+CWDHCP_DEF	Enable/Disable DHCP, save to Flash
AT+CWAUTOCONN	Connect to AP automatically when power on
AT+CIPSTAMAC	Set mac address of ESP8266 station [@deprecated]
AT+CIPSTAMAC_CUR	Set mac address of ESP8266 station Won't save to Flash.

AT+CIPSTAMAC_DEF	Set mac address of ESP8266 station Save to Flash.
AT+CIPAPMAC	Set mac address of ESP8266 softAP [@deprecated]
AT+CIPAPMAC_CUR	Set mac address of ESP8266 softAP Won't save to Flash.
AT+CIPAPMAC_DEF	Set mac address of ESP8266 softAP Save to Flash.
AT+CIPSTA	Set IP address of ESP8266 station, [@deprecated]
AT+CIPSTA_CUR	Set IP address of ESP8266 station Won't save to Flash.
AT+CIPSTA_DEF	Set IP address of ESP8266 station Save to Flash.
AT+CIPAP	Set IP address of ESP8266 softAP, [@deprecated]
AT+CIPAP_CUR	Set IP address of ESP8266 softAP Won't save to Flash.
AT+CIPAP_DEF	Set IP address of ESP8266 softAP Save to Flash.

4.1. Commands

1. AT+CWMODE – WiFi mode

The function of this AT command is to get the value scope of WiFi mode, including station mode, softAP mode, and station+softAP mode, enquiry about the information of WiFi mode, or set the WiFi mode.

AT+CWMODE - WiFi mode	
[@deprecated]. Please use AT+CWMODE_CUR or AT+CWMODE_DEF instead.	
Command	**AT+CWMODE=?**
Response	+CWMODE:(value scope of <mode>) OK
Parameters	Please refer to AT command settings.
Command	**AT+CWMODE?**
Response	+CWMODE:<mode> OK
Parameters	Please refer to AT command settings.
Command	**AT+CWMODE=<mode>**
Response	OK
Parameters	<mode>1 means Station mode \<mode>2 means softAP mode <mode>3 means AP + Station mode
Notes	This setting will be stored in the flash system parameter area. It won't be erased even when the power is off and restarted.

2. AT+CWMODE_CUR – current WiFi mode

There are three WiFi working modes: Station mode, softAP mode, and the co-existence of Station mode and softAP mode. This command is used to acquire the existing WiFi mode, or to set a customised WiFi mode.

AT+CWMODE_CUR - Set WIFI mode（sta/AP/sta+AP）, won't save to Flash	
Example	**AT+CWMODE_CUR=3**
Command	**AT+CWMODE_CUR=?**
Response	+CWMODE_CUR:(value scope of <mode>) OK
Parameters	<mode>1 means Station mode <mode>2 means softAP mode <mode>3 means AP + Station mode
Command	**AT+CWMODE_CUR?**
Response	+CWMODE_CUR:<mode> OK
Parameters	<mode>1 means Station mode <mode>2 means softAP mode <mode>3 means AP + Station mode
Command	**AT+CWMODE_CUR=<mode>**
Response	OK
Parameters	<mode>1 means Station mode <mode>2 means softAP mode <mode>3 means AP + Station mode
Notes	This configuration will not store in Flash.

3. AT+CWMODE_DEF – default WiFi mode

AT+CWMODE_DEF - WIFI mode (sta/AP/sta+AP), save to Flash	
Example	AT+CWMODE_DEF=3
Command	**AT+CWMODE_DEF=?**
Response	+CWMODE_DEF:(value scope of <mode>) OK
Parameters	<mode>1 means Station mode <mode>2 means softAP mode <mode>3 means AP + Station mode
Command	**AT+CWMODE_DEF?**
Response	+CWMODE_DEF:<mode> OK
Parameters	<mode>1 means Station mode <mode>2 means softAP mode <mode>3 means AP + Station mode
Command	**AT+CWMODE_DEF=<mode>**
Response	OK
Parameters	<mode>1 means Station mode <mode>2 means softAP mode <mode>3 means AP + Station mode
Notes	This configuration will store in Flash system parameter area.

4. AT+CWJAP – Connect to AP

AT+CWJAP - Connect to AP [@deprecated]. Please use AT+CWJAP_CUR or AT+CWJAP_DEF instead.	
Example	AT+CWJAP ="abc", "0123456789" If SSID is "ab/,c" and password is "0123456789"/" AT+CWJAP =“ab///,c", "0123456789/"//" If several APs have the same SSID as “abc”,target AP can be found by bssid: AT+CWJAP =“abc”,“0123456789”,”ca:d7:19:d8:a6:44”
Command	**AT+CWJAP?**
Response	+CWJAP:<ssid>,<bssid>,<channel>,<rssi> OK
Parameters	<ssid> string, AP’s SSID
Command	**AT+CWJAP=<ssid>,<pwd>[,<bssid>]**
Response	OK or +CWJAP:<error code> FAIL
Parameters	<ssid> string, AP’s SSID <pwd> string, MAX: 64 bytes ASCII [<bssid>] string, AP’s bssid(MAC address), for several APs may have the same SSID <error code> only for reference,it’s not reliable <error code> 1 connecting timeout <error code> 2 wrong password <error code> 3 can not found target AP <error code> 4 connect fail This command needs station mode enable. Escape character syntax is needed if "SSID" or "password" contains any special characters (’,’、’"’and’/’)
Notes	This configuration will store in Flash system parameter area.

5. AT+CWJAP_CUR – Connect to AP，for current

AT+CWJAP_CUR - Connect to AP, won't save to Flash	
Example	AT+CWJAP_CUR ="abc","0123456789" If SSID is "ab/,c" and password is "0123456789"/" AT+CWJAP_CUR="ab///,c","0123456789/"//" If several APs have the same SSID as "abc",target AP can be found by bssid: AT+CWJAP_CUR="abc","0123456789","ca:d7:19:d8:a6:44"
Command	**AT+CWJAP_CUR?**
Response	+CWJAP_CUR:<ssid>,<bssid>,<channel>,<rssi> OK
Parameters	<ssid> string, AP's SSID
Command	**AT+CWJAP_CUR=<ssid>,<pwd>[,<bssid>]**
Response	OK or +CWJAP:<error code> FAIL
Parameters	<ssid> string, AP's SSID <pwd> string, MAX: 64 bytes ASCII [<bssid>] string, AP's bssid(MAC address), for several APs may have the same SSID <error code> only for reference,it's not reliable <error code> 1 connecting timeout <error code> 2 wrong password <error code> 3 can not found target AP <error code> 4 connect fail This command needs station mode enable. Escape character syntax is needed if "SSID" or "password" contains any special characters (',' 、'"'and'/')
Notes	This configuration will not store in Flash .

6. AT+CWJAP_DEF – Connect to AP，save as default

AT+CWJAP_DEF - Connect to AP and save AP info to flash	
Example	AT+CWJAP_DEF="abc","0123456789" If SSID is "ab/,c" and password is "0123456789"/" AT+CWJAP_DEF="ab///,c","0123456789/"//" If several APs have the same SSID as "abc",target AP can be found by bssid: AT+CWJAP_DEF ="abc","0123456789","ca:d7:19:d8:a6:44"
Command	**AT+CWJAP_DEF?**
Response	+CWJAP_DEF:<ssid>,<bssid>,<channel>,<rssi> OK
Parameters	<ssid> string, AP's SSID
Command	**AT+CWJAP_DEF=<ssid>,<pwd>[,<bssid>]**
Response	OK or +CWJAP:<error code> FAIL
Parameters	<ssid> string, AP's SSID <pwd> string, MAX: 64 bytes ASCII [<bssid>] string, AP's bssid(MAC address), for several APs may have the same SSID <error code> only for reference,it's not reliable <error code> 1 connecting timeout <error code> 2 wrong password <error code> 3 can not found target AP <error code> 4 connect fail This command needs station mode enable. Escape character syntax is needed if "SSID" or "password" contains any special characters (',' 、 '"'and'/')
Notes	This configuration will store in Flash system parameter area.

7. AT+CWLAP – List available APs

AT+CWLAP - Lists available APs	

Example	AT+CWLAP
	  List of all available AP's detected by ESP8266
	AT+CWLAP="wifi","ca:d7:19:d8:a6:44",6
	  Find AP with specific SSID and MAC at specific channel.
	AT+CWLAP="wifi"
	  Find AP with specific SSID

Command	**AT+CWLAP=<ssid>,<mac>,<ch>**
Response	+CWLAP:<ecn>,<ssid>,<rssi>,<mac>,<ch> OK ERROR
Parameters	<ecn> 0 OPEN <ecn> 1 WEP <ecn> 2 WPA_PSK <ecn> 3 WPA2_PSK <ecn> 4 WPA_WPA2_PSK <ssid> string, SSID of AP <rssi> signal strength <mac> string, MAC address
Command	**AT+CWLAP**
Response	+CWLAP:<ecn>,<ssid>,<rssi>,<mac>,<ch> OK ERROR
Parameters	The same as above

8. AT+CWQAP – Disconnect from AP

AT+CWQAP - Disconnect from AP	
Command	**AT+CWQAP=?**
Response	OK
Parameters	null
Command	**AT+ CWQAP**
Response	OK
Parameters	null

9. AT+CWSAP – Configuration of softAP mode

AT+ CWSAP - Configuration of softAP mode [@deprecated]. Please use AT+CWSAP_CUR or AT+CWSAP_DEF instead.	
Example	AT+CWSAP="ESP8266","1234567890",5,3
Command	**AT+CWSAP?**
Response	+CWSAP:<ssid>,<pwd>,<chl>,<ecn>
Parameters	<ssid> string, ESP8266 softAP' SSID <pwd> string, range: 8 ~ 64 bytes ASCII <chl> channel id <ecn> 0 OPEN <ecn> 2 WPA_PSK <ecn> 3 WPA2_PSK <ecn> 4 WPA_WPA2_PSK
Command	**AT+CWSAP=<ssid>,<pwd>,<chl>,<ecn>**
Response	OK ERROR
Parameters	The same as above.
Notes	This CMD is only available when softAP mode enable. ESP8266 softAP don't support WEP. This configuration will store in Flash system parameter area.

10. AT+CWSAP_CUR – Current config of softAP mode

AT+CWSAP_CUR - Set configuration of softAP mode, won't save to Flash	
Example	AT+CWSAP_CUR="ESP8266","1234567890",5,3
Command	**AT+CWSAP_CUR?**
Response	+CWSAP_CUR:<ssid>,<pwd>,<chl>,<ecn>
Parameters	<ssid> string, ESP8266 softAP' SSID <pwd> string, range: 8 ~ 64 bytes ASCII <chl> channel id < ecn >0 OPEN < ecn >2 WPA_PSK < ecn >3 WPA2_PSK < ecn >4 WPA_WPA2_PSK
Command	**AT+CWSAP_CUR=<ssid>,<pwd>,<chl>,<ecn>**
Response	OK ERROR
Parameters	The same as above.
Notes	This command is only available when softAP mode enable. ESP8266 softAP don't support WEP. This configuration will not store in Flash.

11. AT+CWSAP_DEF – Default config of softAP mode

AT+ CWSAP_DEF - Set configuration of softAP mode, save to Flash	
Example	AT+CWSAP_DEF="ESP8266","1234567890",5,3
Command	**AT+CWSAP_DEF?**
Response	+CWSAP_DEF:<ssid>,<pwd>,<chl>,<ecn>
Parameters	<ssid> string, ESP8266 softAP' SSID <pwd> string, range: 8 ~ 64 bytes ASCII <chl>channel id < ecn >0 OPEN < ecn >2 WPA_PSK < ecn >3 WPA2_PSK < ecn >4 WPA_WPA2_PSK
Command	**AT+CWSAP_DEF=<ssid>,<pwd>,<chl>,<ecn>**
Response	OK ERROR
Parameters	The same as above.
Notes	This command is only available when softAP mode enable. ESP8266 softAP don't support WEP. This configuration will store in Flash system parameter area.

12. AT+CWLIF – IP of stations

This command is used to get the IP of stations that are connected to ESP8266 softAP.

AT+ CWLIF- IP of stations which are connected to ESP8266 softAP	
Response	<IP addr>,<mac> OK
Parameters	<IP addr> IP address of stations which are connected to ESP8266 softAP <mac> mac address of stations which are connected to ESP8266 softAP
Notes	This command only available when ESP8266 softAP DHCP enable.

13. AT+CWDHCP – Enable/Disable DHCP

AT+ CWDHCP - Enable/Disable DHCP	
[@deprecated]. Please use AT+CWDHCP_CUR or AT+CWDHCP_DEF instead.	
Command	**AT+CWDHCP?**
Response	DHCP disabled or enabled now?
Parameters	Bit0: 0 – softap dhcp disable 1 – softap dhcp enable bit1: 0 – station dhcp disable 1 – station dhcp enable
Command	**AT+CWDHCP=<mode>,<en>**
Response	OK
Parameters	<mode> 0 : set ESP8266 softAP 1 : set ESP8266 station 2 : set both softAP and station <en> 0 : Disable DHCP 1 : Enable DHCP
Notes	This configuration will store in Flash user parameter area. This configuration interact with static IP related AT commands(AT +CIPSTA related and AT+CIPAP related): If enable DHCP, static IP will be disabled; If enable static IP, DHCP will be disabled; This will depends on the last configuration.

14. AT+CWDHCP_CUR – Enable/Disable DHCP

AT+CWDHCP_CUR - Enable/Disable DHCP, won't save to Flash	
Example	AT+CWDHCP_CUR=0,1
Command	**AT+CWDHCP_CUR=<mode>,<en>**
Response	OK
Parameters	<mode> 0 : set ESP8266 softAP 1 : set ESP8266 station 2 : set both softAP and station <en> 0 : Disable DHCP 1 : Enable DHCP
Notes	This configuration will not store in Flash. This configuration interact with static IP related AT commands(AT +CIPSTA related and AT+CIPAP related): If enable DHCP, static IP will be disabled; If enable static IP, DHCP will be disabled; This will depends on the last configuration.

15. AT+CWDHCP_DEF – Enable/Disable DHCP and save to Flash

AT+CWDHCP_DEF - Enable/Disable DHCP and save to Flash	
Example	AT+CWDHCP_CUR=0,1
Command	**AT+CWDHCP_DEF=<mode>,<en>**
Response	OK
Parameters	<mode> 0 : set ESP8266 softAP 1 : set ESP8266 station 2 : set both softAP and station <en> 0 : Disable DHCP 1 : Enable DHCP
Notes	This configuration will store in Flash user parameter area. This configuration interacts with static IP related AT commands(AT +CIPSTA related and AT+CIPAP related): If enable DHCP, static IP will be disabled; If enable static IP, DHCP will be disabled; This will depend on the last configuration.

16. AT+CWAUTOCONN – Auto connect to AP or not

AT+CWAUTOCONN - Connect to AP automatically or not	
Example	AT+CWAUTOCONN=1
Command	**AT+CWAUTOCONN=<enable>**
Response	OK
Parameters	<enable> 0 : do not auto-connect to AP when power on 1 : connect to AP automatically when power on Default is enable, ESP8266 station will connect to AP automatically when power on.
Notes	This configuration will store in Flash system parameter area.

17. AT+CIPSTAMAC – Set mac address of station

AT+ CIPSTAMAC - Set mac address of ESP8266 station [@deprecated]. Use AT+CIPSTAMAC_CUR or AT+CIPSTAMAC_DEF instead.	
Example	AT+CIPSTAMAC="18:fe:35:98:d3:7b"
Command	**AT+CIPSTAMAC?**
Response	+CIPSTAMAC:<mac> OK
Parameters	<mac> string, mac address of ESP8266 station
Command	**AT+CIPSTAMAC=<mac>**
Response	OK
Parameters	<mac> string, mac address of ESP8266 station
Notes	This configuration will store in Flash user parameter area.

18. AT+CIPSTAMAC_CUR – Set mac address of station

AT+ CIPSTAMAC_CUR - Set mac address of ESP8266 station, won't save to Flash	
Example	AT+CIPSTAMAC_CUR="18:fe:35:98:d3:7b"
Command	**AT+CIPSTAMAC_CUR?**
Response	+CIPSTAMAC_CUR:<mac> OK
Parameters	<mac> string, mac address of ESP8266 station
Command	**AT+CIPSTAMAC_CUR=<mac>**
Response	OK
Parameters	<mac> string, mac address of ESP8266 station
Notes	This configuration will not store in Flash.

19. AT+CIPSTAMAC_DEF – Set mac address of station, save as default

AT+ CIPSTAMAC_DEF - Set mac address of ESP8266 station, save to Flash	
Example	AT+CIPSTAMAC_DEF="18:fe:35:98:d3:7b"
Command	**AT+CIPSTAMAC_DEF?**
Response	+CIPSTAMAC_DEF:<mac> OK
Parameters	Param description <mac> string, mac address of ESP8266 station
Command	**AT+CIPSTAMAC_DEF=<mac>**
Response	OK
Parameters	<mac> string, mac address of ESP8266 station
Notes	This configuration will store in Flash user parameter area.

20. AT+CIPAPMAC – Set mac address of softAP

AT+ CIPAPMAC - Set mac address of ESP8266 softAP [@deprecated]. Use AT+CIPAPMAC_CUR or AT+CIPAPMAC_DEF instead.	
Example	AT+CIPAPMAC="1a:fe:36:97:d5:7b"
Command	**AT+CIPAPMAC?**
Response	+CIPAPMAC:<mac> OK
Parameters	<mac> string, mac address of ESP8266 softAP
Command	**AT+CIPAPMAC=<mac>**
Response	OK
Parameters	<mac> string, mac address of ESP8266 softAP
Notes	This configuration will store in Flash user parameter area.

21. AT+CIPAPMAC_CUR – Set mac address of softAP

AT+CIPAPMAC_CUR - Set mac addr of ESP8266 softAP, won't save to Flash	
Example	AT+CIPAPMAC_CUR="1a:fe:36:97:d5:7b"
Command	**AT+CIPAPMAC_CUR?**
Response	+CIPAPMAC_CUR:<mac> OK
Parameters	<mac> string, mac address of ESP8266 softAP
Command	**AT+CIPAPMAC_CUR=<mac>**
Response	OK
Parameters	<mac> string, mac address of ESP8266 softAP
Notes	This configuration will not store in Flash.

22. AT+CIPAPMAC_DEF – Set mac address of softAP and save as default

AT+ CIPAPMAC_DEF - Set mac address of ESP8266 softAP, save to Flash	
Example	AT+CIPAPMAC_DEF="1a:fe:36:97:d5:7b"
Command	**AT+CIPAPMAC_DEF?**
Response	+CIPAPMAC_DEF:<mac> OK
Parameters	<mac> string, mac address of ESP8266 softAP
Command	**AT+CIPAPMAC_DEF=<mac>**
Response	OK
Parameters	<mac> string, mac address of ESP8266 softAP
Notes	This configuration will store in Flash user parameter area.

23. AT+CIPSTA – Set IP address of station

AT+ CIPSTA - Set IP address of ESP8266 station [@deprecated]. Please use AT+CIPSTA_CUR or AT+CIPSTA_DEF instead.	
Example	AT+CIPSTA="192.168.6.100","192.168.6.1","255.255.255.0"
Command	**AT+CIPSTA?**
Response	+CIPSTA:<IP> OK
Parameters	<IP> string, IP address of ESP8266 station
Command	**AT+CIPSTA=<IP>[,<gateway>,<netmask>]**
Response	OK
Parameters	<IP> string, IP address of ESP8266 station [<gateway>] gateway [<netmask>] netmask
Notes	This configuration will store in Flash user parameter area. Only after ESP8266 station connected to AP, station IP can be got and inquiried. This configuration interacts with DHCP related AT commands(AT +CWDHCP related): If enable static IP, DHCP will be disabled; If enable DHCP, static IP will be disabled; This will depend on the last configuration.

24. AT+CIPSTA_CUR – Set IP address of station

AT+CIPSTA_CUR - Set IP address of ESP8266 station, won't save to Flash	
Example	AT+CIPSTA_CUR="192.168.6.100","192.168.6.1","255.255.255.0"
Command	**AT+CIPSTA_CUR?**
Response	+CIPSTA_CUR:<IP> OK
Parameters	Param description <IP> string, IP address of ESP8266 station
Command	**AT+CIPSTA_CUR=<IP>[,<gateway>,<netmask>]**
Response	OK
Parameters	<IP> string, IP address of ESP8266 station [<gateway>] gateway [<netmask>] netmask
Notes	This configuration will not store in Flash. Only after ESP8266 station connected to AP, station IP can be got and inquiried. This configuration interacts with DHCP related AT commands(AT +CWDHCP related): If enable static IP, DHCP will be disabled; If enable DHCP, static IP will be disabled; This will depend on the last configuration.

25. AT+CIPSTA_DEF – Set IP address of station and save as default

AT+CIPSTA_DEF – Set IP address of ESP8266 station, save to Flash	
Example	AT+CIPSTA_DEF="192.168.6.100","192.168.6.1","255.255.255.0"
Command	**AT+CIPSTA_DEF?**
Response	+CIPSTA:<IP> OK
Parameters	<IP> string, IP address of ESP8266 station
Command	**AT+CIPSTA_DEF=<IP>[,<gateway>,<netmask>]**
Response	OK
Parameters	<IP> string, IP address of ESP8266 station [<gateway>] gateway [<netmask>] netmask
Notes	This configuration will store in Flash user parameter area. This configuration interacts with DHCP related AT commands(AT +CWDHCP related): If enable static IP, DHCP will be disabled; If enable DHCP, static IP will be disabled; This will depend on the last configuration.

26. AT+ CIPAP – Set IP address of softAP

AT+ CIPAP - Set IP address of ESP8266 softAP [@deprecated]. Please use AT+CIPAP_CUR or AT+CIPAP_DEF instead.	
Example	AT+CIPAP="192.168.5.1",“192.168.5.1”,“255.255.255.0”
Command	**AT+CIPAP?**
Response	+CIPAP:<IP> OK
Parameters	<IP> string, IP address of ESP8266 softAP
Command	**AT+CIPAP=<IP>[,<gateway>,<netmask>]**
Response	OK
Parameters	<IP> string, IP address of ESP8266 softAP [<gateway>] gateway [<netmask>] netmask
Notes	This configuration will store in Flash user parameter area. ESP8266 only support class C IP address This configuration interacts with DHCP related AT commands(AT +CWDHCP related): If enable static IP, DHCP will be disabled; If enable DHCP, static IP will be disabled; This will depend on the last configuration.

27. AT+CIPAP_CUR – Set IP address of softAP

AT+CIPAP_CUR - Set IP address of ESP8266 softAP, won't save to Flash	
Example	AT+CIPAP_CUR="192.168.5.1",“192.168.5.1”,“255.255.255.0”
Command	**AT+CIPAP_CUR?**
Response	+CIPAP_CUR:<IP> OK
Parameters	<IP> string, IP address of ESP8266 softAP
Command	**AT+CIPAP_CUR=<IP>[,<gateway>,<netmask>]**
Response	OK
Parameters	<IP> string, IP address of ESP8266 softAP [<gateway>] gateway [<netmask>] netmask
Notes	This configuration will not store in Flash. ESP8266 only support class C IP address This configuration interacts with DHCP related AT commands(AT +CWDHCP related): If enable static IP, DHCP will be disabled; If enable DHCP, static IP will be disabled; This will depend on the last configuration.

28. AT+CIPAP_DEF – Set IP address of softAP, save as default

AT+ CIPAP_DEF - Set IP address of ESP8266 softAP, save to Flash	
Example	AT+CIPAP_DEF="192.168.5.1",“192.168.5.1”,“255.255.255.0”
Command	**AT+CIPAP_DEF?**
Response	+CIPAP_DEF:<IP> OK
Parameters	<IP> string, IP address of ESP8266 softAP
Command	**AT+CIPAP_DEF=<IP>[,<gateway>,<netmask>]**
Response	OK
Parameters	<IP> string, IP address of ESP8266 softAP [<gateway>] gateway [<netmask>] netmask
Notes	This configuration will store in Flash user parameter area. ESP8266 only support class C IP address This configuration interacts with DHCP related AT commands(AT +CWDHCP related): If enable static IP, DHCP will be disabled; If enable DHCP, static IP will be disabled; This will depend on the last configuration.

29. AT+CWSTARTSMART – Start SmartConfig

AT+CWSTARTSMART - Start SmartConfig	
Example	AT+CWMODE=1 AT+CWSTARTSMART=1
Command	**AT+CWSTARTSMART =<type>**
Response	OK
Parameters	< type> SmartConfig protocol type 1: ESP_TOUCH 2: AirKiss
Notes	• You can apply for more documents about our SmartConfig from Espressif; • Has to be ESP8266 station mode; • Message "Smart get wifi info" means Smart Config get AP's information successfully, then ESP8266 try to connect to target AP, print "WIFI CONNECTED" and "WIFI GOT IP" if succeed; • ESP8266 can't do anything during SmartConfig so please wait till it succeed or use command "AT+CWSTOPSMART" to stop SmartConfig.

30. AT+CWSTOPSMART – stop SmartConfig

AT+CWSTOPSMART stop SmartConfig	
Command	**AT+CWSTOPSMART**
Response	OK
Notes	No matter SmartConfig succeed or not, please always call "AT +CWSTOPSMART" to release the buffer it took.

5. TCP/IP Related AT Commands

5.1. Overview

TCP/IP	
Command	**Description**
AT+ CIPSTATUS	Get connection status
AT+CIPSTART	Establish TCP connection or register UDP port
AT+CIPSEND	Send data
AT+CIPSENDEX	Send data, if <length> or "\0" is met, data will be sent
AT+CIPSENDBUF	Write data into TCP-send-buffer
AT+CIPBUFRESET	Reset segment ID count
AT+CIPBUFSTATUS	Check status of TCP-send-buffer
AT+CIPCHECKSEQ	Check if a specific segment is sent or not
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+SAVETRANSLINK	Save transparent transmission link to Flash
AT+CIPSTO	Set timeout when ESP8266 runs as TCP server
AT+CIUPDATE	Upgrade firmware through network
AT+PING	Function PING
AT+CIPDINFO	Show remote IP and remote port with "+IPD"

5.2. TCP/IP

1. AT+CIPSTATUS – Information about connection

AT+CIPSTATUS – Information about connection	
Command	**AT+CIPSTATUS**
Response	STATUS:<stat> +CIPSTATUS:<link ID>,<type>,<remote_IP>,<remote_port>, <local_port>,<tetype>
Parameters	<stat> <stat> 2: Got IP <stat> 3: Connected <stat> 4: Disconnected <link 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> <tetype> 0: ESP8266 runs as client <tetype> 1: ESP8266 runs as server

2. AT+CIPSTART – Start connection

AT+CIPSTART - Establish TCP connection or register UDP port, start connection	
Example	AT+CIPSTART="TCP","192.168.101.110",1000 Refer to "Espressif AT Command Examples"
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:(link ID),(<type>),(<IP address>),(<port>)[,(<local port>),(<mode>)] +CIPSTART: (link ID), (<type>),(<domain name>),(<port>)[,(<local port>),(<mode>)]
Parameters	null
Single connection	(+CIPMUX=0) **AT+CIPSTART=<type>,<remote IP>,<remote port>[,<UDP local port>,<UDP mode>][,<TCP keep alive>]**
Multiple connection	(+CIPMUX=1) **AT+CIPSTART=<link ID>,<type>,<remote IP>,<remote port>[,<UDP local port>,<UDP mode>][,<TCP keep alive>]**
Response	OK or ERROR If connection already exists, returns ALREAY CONNECT
Parameters	<link ID> ID of the connection (0~4), for multi-connect <type> string, "TCP" or "UDP" <remote IP> string, remote IP <remote port> string, remote port [<UDP local port>] for UDP only [<UDP mode>] In UDP transparent transmission, it has to be 0. [<UDP mode>] 0 : destination peer entity of UDP will not change. [<UDP mode>] 1 : destination peer entity of UDP can change once. [<UDP mode>] 2 : destination peer entity of UDP is allowed to change. Note: [<UDP mode>] can only be used when [<UDP local port>] is set. [<TCP keep alive>] default 0. unit: 500 milliseconds. [<TCP keep alive>] 0 : disable TCP keep-alive [<TCP keep alive>] 1 ~ 7200 : TCP keep-alive interval

3. AT+CIPSEND – Send data

AT+CIPSEND - Send data	
Command	**AT+CIPSEND=?**
Response	OK
Parameters	null
Single connection	(+CIPMUX=0) **AT+CIPSEND=<length>**
Multiple connection	(+CIPMUX=1) **AT+CIPSEND=<link ID>,<length>**
UDP Transmission	**AT+CIPSEND=[<link ID>,]<length>[,<remote IP>,<remote port>]**
Response	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
Parameters	<link ID> ID of the connection (0~4), for multi-connect <length> data length, MAX 2048 bytes [<remote IP>] UDP transmission can set remote IP when send data [<remote port>] UDP transmission can set remote port when send data
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 normal command mode. This command can only be used in transparent transmission mode which require to be single connection mode. For UDP transparent transmission, <UDP mode> has to be 0 in command “AT+CIPSTART”
Notes	Please refer to "Espressif AT Command Examples" for more examples.

4. AT+CIPSENDEX – Send data

AT+CIPSENDEX - Send data	
Command	**AT+CIPSENDEX=?**
Response	OK
Parameters	null
Single connection	(+CIPMUX=0) **AT+CIPSENDEX=<length>**
Multiple connection	(+CIPMUX=1) **AT+CIPSENDEX=<link ID>,<length>**
UDP Transmission	**AT+CIPSENDEX=[<link ID>,]<length>[,<remote IP>,<remote port>]**
Response	Wrap return ">" after set command. Begins receive of serial data, when data length or “\0” is met, starts transmission of data. So if sending “\0” is needed, please send it as “\\0” If connection cannot be established or gets disconnected during send, returns ERROR If data is transmitted successfully, returns SEND OK
Parameters	<link ID> ID of the connection (0~4), for multi-connect <length> data length, MAX 2048 bytes

5. AT+CIPSENDBUF – Write data into TCP-send-buffer

AT+CIPSENDBUF - Write data into TCP-send-buffer	
Single connection	(+CIPMUX=0) **AT+CIPSENDBUF=<length>**
Multiple connection	(+CIPMUX=1) **AT+CIPSENDBUF=<link ID>,<length>**
Response	<current segment ID>,<segment ID of which sent successfully> OK > Wrap return ">" begins receiving of serial data, when data <length> is met, send it; data more than <length> will be discarded, and returns “busy” If connection cannot be established,or it’s not a TCP connection , or buffer full, or some other error occurred, returns ERROR If data is transmitted successfully, (1)for single connection, returns <segment ID>,SEND OK (2)for multiple connection, returns <link ID>,<segment ID>,SEND OK
Parameters	<link ID> ID of the connection (0~4), for multi-connect <segment ID> uint32, starts from 1, add 1 every time be called; <length> data length, data more than <length> will be discarded, MAX 2048 bytes
Note	This command only write data into TCP-send-buffer, so it can be called continually, needn’t wait for “SEND OK”;if a TCP segment is sent successfully, it will return <segment ID>,SEND OK

6. AT+CIPBUFRESET – Reset segment ID count

AT+CIPBUFRESET - Reset segment ID count	
Single connection	(+CIPMUX=0) **AT+CIPBUFRESET**
Multiple connection	(+CIPMUX=1) **AT+CIPBUFRESET=<link ID>**
Response	OK If connection is not established or there are still TCP data wait for sending, returns ERROR
Parameters	<link ID> ID of the connection (0~4), for multi-connect

7. AT+CIPBUFSTATUS – Check status of TCP-send-buffer

AT+CIPBUFSTATUS - Check status of TCP-send-buffer	
Example	Single connection, AT+CIPBUFSTATUS returns 20,15,10,200,7 20 : means the latest segment ID is 19, next time we call AT +CIPSENDBUF, the segment ID returned will be 20; 15: means TCP segment of which ID is 15 is the latest segment that sent (may not succeed) ; 10: means TCP segment of which ID is 10 sent successfully; 200: TCP-send-buffer remain 200 bytes that available; 7: available TCP queue number, it's not reliable; when queue number is 0, no more TCP data can be sent.
Single connection	(+CIPMUX=0) **AT+CIPBUFSTATUS**
Multiple connection	(+CIPMUX=1) **AT+CIPBUFSTATUS=<link ID>**
Response	<next segment ID>, < segment ID of which has sent >, < segment ID of which sent successfully>, <remain buffer size>, <queue number> OK If connection is not established, returns ERROR
Parameters	<link ID> ID of the connection (0~4), for multi-connect <next segment ID> next segment ID will be got by AT+CIPSENDBUF; <segment ID of which has sent> the latest segment that sent (may not succeed) ; <segment ID of which sent successfully> the latest segment that sent successfully; <remain buffer size> TCP-send-buffer remain buffer size; <queue number> available TCP queue number, it's not reliable; when queue number is 0, no more TCP data can be sent.

8. AT+CIPCHECKSEQ – Check if specific segment sent successfully or not

AT+CIPCHECKSEQ - Check if specific segment sent successfully or not	
Single connection	(+CIPMUX=0) **AT+CIPCHECKSEQ=<segment ID>**
Multiple connection	(+CIPMUX=1) **AT+CIPCHECKSEQ=<link ID>,<segment ID>**
Response	[<link ID>,]<segment ID> ,<status> OK If connection is not established, returns ERROR
Parameters	<link ID> ID of the connection (0~4), for multi-connect <segment ID> segment ID got by AT+CIPSENDBUF; <status> TRUE, sent successfully; FALSE, send fail
Note	Only keep status of the latest 32 segments at most.

9. AT+CIPCLOSE – Close TCP or UDP connection

AT+CIPCLOSE - Close TCP or UDP connection	
Command	**AT+CIPCLOSE=?**
Response	OK
Multiple connection	**AT+CIPCLOSE=<link ID>**
Response	OK or ERROR
Parameters	<link ID> ID no. of connection to close, when ID=5, all connections will be closed. (ID=5 has no effect in server mode)
Single connection	**AT+CIPCLOSE**
Response	OK or If no such connection, returns ERROR

10. AT+CIFSR – Get local IP address

AT+CIFSR - Get local IP address	
Command	**AT+CIFSR=?**
Response	OK
Command	**AT+ CIFSR**
Response	+ CIFSR:<IP address> + CIFSR:<IP address> OK ERROR
Parameters	<IP address> IP address of ESP8266 softAP IP address of ESP8266 station
Note	Only after ESP8266 station connected to AP, station IP can be got and inquiried.

11. AT+CIPMUX – Enable multiple connections

AT+ CIPMUX - Enable multiple connections or not	
Example	AT+CIPMUX=1
Command	**AT+CIPMUX?**
Response	+ CIPMUX:<mode> OK
Parameters	<mode>0 single connection <mode>1 multiple connection
Command	**AT+CIPMUX=<mode>**
Response	OK If already connected, returns Link is builded
Parameters	The same as above.
Notes	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. 3. If TCP server is started, has to delete TCP server first, then change to single connection is allowed.

12. AT+CIPSERVER – Configure as TCP server

AT+ CIPSERVER - Configure as TCP server	
Example	AT+ CIPMUX=1 AT+ CIPSERVER=1,1001
Command	**AT+ CIPSERVER=<mode>[,<port>]**
Response	OK
Parameters	<mode>0 Delete server <mode>1 Create server <port> port number, default is 333
Notes	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.

13. AT+CIPMODE – Set transfer mode

AT+ CIPMODE - Set transfer mode	
Example	AT+CIPMODE=1
Command	**AT+CIPMODE?**
Response	+ CIPMODE:<mode> OK
Parameters	<mode>0 normal mode <mode>1 UART-WiFi passthrough mode, only for TCP single connection.
Command	**AT+CIPMODE=<mode>**
Response	OK If already connected, returns Link is builded
Parameters	<mode>0 normal mode <mode>1 UART-WiFi passthrough mode, only for TCP single connection.
Notes	This configuration would not save into Flash.

14. AT+SAVETRANSLINK – Save transparent transmission link to Flash

AT+SAVETRANSLINK - Save transparent transmission link to Flash	
Example	AT+SAVETRANSLINK=1,"192.168.6.110",1002,"TCP"
Command	**AT+SAVETRANSLINK =<mode>,<remote IP>,<remote port>[,<type>][,<TCP keep alive>][,<UDP local port>]**
Response	OK or ERROR
Parameters	<mode> 0： normal mode，cancel enter UART-WiFi passthrough mode when power on 1： save UART-WiFi passthrough mode <remote IP> remote IP <remote port> remote port [<type>] TCP or UDP, default to be "TCP" [<TCP keep alive>] TCP keep alive, default to be disabled 0: disable TCP keep alive 1 ~ 7200: keep-alive detect time interval, unit: 500 ms [<UDP local port>] local port if enter UDP transparent transmission when power on.
Notes	1. This command will save the UART-WiFi passthrough mode and its link into Flash user parameter area，ESP8266 will enter UART-WiFi passthrough mode since next power on. 2. As long as the IP, port numerical conformance to specification, we will save them to Flash

15. AT+CIPSTO – Set TCP server timeout

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

16. AT+CIUPDATE – Update through network

AT+ CIUPDATE – update through network	
Command	**AT+ CIUPDATE**
Response	+CIPUPDATE:<n> OK
Parameters	<n> 1 found server <n> 2 connect server <n> 3 got edition <n> 4 start update
Notes	Firmware upgrade depends on network condition. It will return ERROR if upgrade fail, please wait a while. 1. If using Espressif AT BIN (\esp_iot_sdk\bin\at), "AT+CIUPDATE" will download new AT BIN from Espressif Cloud。 2. If using user-compiled AT BIN, users need to make their own "AT +CIUPDATE" to upgrade, Espressif provide a demo in \esp_iot_sdk \example\at 3. AT BINs on server have to be named as "user1.bin" and "user2.bin"

17. AT+PING – Function Ping

AT+PING - Function Ping	
Example	AT+PING="192.168.1.1" AT+PING="www.baidu.com"
Command	**AT+PING=<IP>**
Response	+<time> OK Or ERROR // means ping fail
Parameters	Param description <IP> : string, host IP or domain name <time> : response time of ping

18. AT+CIPDINFO – Show remote IP and port with "+IPD"

AT+CIPDINFO - Show remote IP and port with "+IPD" (received data from network)	
Example	AT+CIPDINFO=1
Command	**AT+CIPDINFO=<mode>**
Response	OK Or ERROR
Parameters	Param description <mode> 0: won't show remote IP and port with "+IPD" <mode> 1: show remote IP and port with "+IPD"

19. +IPD – Receive network data

+IPD - Receive network data	
Single connection	**(+CIPMUX=0)** **+IPD,<len>[,<remote IP>,<remote port>]:<data>**
Multiple connection	**(+CIPMUX=1)** **+IPD,<ID>,<len>[,<remote IP>,<remote port>]:<data>**
Parameters	<remote IP> remote IP, enabled by command "AT+CIPDINFO=1" <remote port> remote port, enabled by command "AT+CIPDINFO=1" <ID> id no. of connection <len> data length <data> data received
Notes	When the module receives network data, it will send the data through the serial port using +IPD command.

6. Appendix

ESP8266 AT commands below will save configuration parameters into flash:

AT Command	*Example*
Save into flash user parameter area	
AT+UART_DEF	AT+UART_DEF=115200,8,1,0,3
AT+CWDHCP_DEF	AT+CWDHCP_DEF=1,1
AT+CIPSTAMAC_DEF	AT+CIPSTAMAC_DEF="18:fe:35:98:d3:7b"
AT+CIPAPMAC_DEF	AT+CIPAPMAC_DEF="1a:fe:36:97:d5:7b"
AT+CIPSTA_DEF	AT+CIPSTA_DEF="192.168.6.100"
AT+CIPAP_DEF	AT+CIPAP_DEF="192.168.5.1"
AT+SAVETRANSLINK	AT+SAVETRANSLINK =1,"192.168.6.10",1001
Save into flash system parameter area	
AT+CWMODE_DEF	AT+CWMODE_DEF=3
AT+CWJAP_DEF	AT+CWJAP_DEF="abc"，"0123456789"
AT+CWSAP_DEF	AT+CWSAP_DEF="ESP8266","12345678",5,3
AT+CWAUTOCONN	AT+CWAUTOCONN=1

- We will check the new setting with original configuration from flash first，only if the configuration changes，we will write it to flash.
- To 512KB flash, default setting:

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

  system parameter area is `0x7C000`~`0x80000`, 16KB
- To 1024KB flash, default setting:

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

  system parameter area is `0xFC000` ~ `0x100000`, 16KB.
- If users compile AT themselves, please refer to document "2A-ESP8266__IOT_SDK_User_Manual" chapter "flash map"

  user parameter area is the "User param" area in chapter "flash map";

  system parameter area is always the last 16KB of flash.

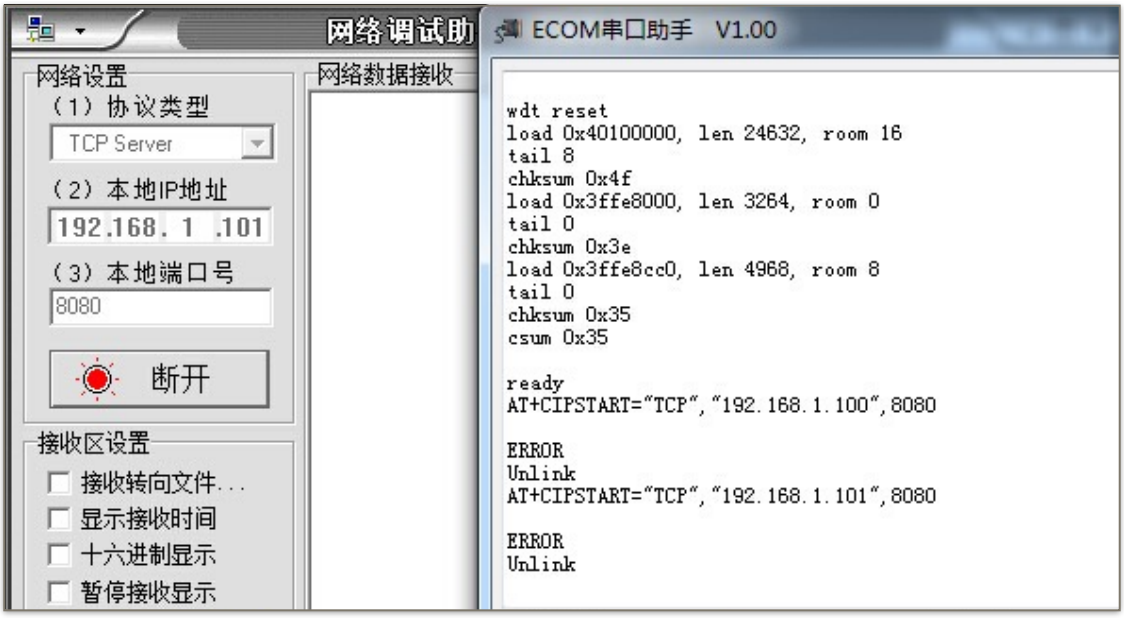
7. Q&A

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

- **Version info of AT** : Using "AT+GMR" to get the version info.

  Hardware Module info: example Ai-thnker ESP-01

- **Screenshot or steps of the test steps,** for example:



- **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)
```