EWM103-W15 AT Command Manual



Chengdu Ebyte Electronic Technology Co.,Ltd.

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1 Overview

The meaning, syntax, response and examples of AT commands of W15 series products of Chengdu Ebyte Electronic Technology Electronic Co., Ltd.

2 Features

- Support multiple baud rates
- Support WEB network configuration
- Support BLE network configuration
- Support TCP Sever, TCP Client, UDP, MQTT
- Two working modes: STATION and AP
- Support serial port transparent transmission
- Support multiple encryption methods
- Support module serial port AT command configuration
- Parameters are saved after power off

3 Instruction Description

AT commands can be divided into the following four types:

type	Instruction Format	describe
Test Instructions	AT+<x>=?	This command is used to query the parameters and value range of the setting instruction.
Query command	AT+<x>?	This command is used to return the current value of a parameter.
Setting Instructions	AT+<x>=<…>	This command is used to set user-defined parameter values.
Execute Instructions	AT+<x>	This command is used to execute a function whose variable parameters are immutable and controlled by the internal program of the module.

Notice:

Not every AT command has the above four types of commands.

- [] The values in brackets are default values and may not be filled in or displayed.
- Use double quotes to represent string data "String", for example, AT+CWSAP=" EWM103-W15 ","21030826 "
- The default baud rate is 115200.
- The instructions are not case sensitive.
- End with a carriage return line feed (CRLF). Please make sure to set the serial port tool to "new line mode".

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● Tips	● illustrate
● ready	● Device initialization completed flag

3.1 System control command list

Instruction	Describe
AT	Test AT startup
AT+CMD	Query all commands and command types supported by the current firmware
AT+RST	Restart module
AT+GMR	Query version information
ATE	Enable or disable the echo function
AT+RESTORE	Restore factory settings
AT+UART_CUR	Set the current temporary configuration of UART, do not save to flash
AT+UART_DEF	Set UART default configuration and save to flash
AT+SLEEPWKCFG	Set Light-sleep wakeup source and wakeup GPIO
AT+SLEEP	Set Sleep Mode

3.2 System Control Instructions

3.2.1 AT-test AT start

Execute Instructions	AT
response	OK
Parameter Description	AT OK

3.2.2 AT+CMD queries all commands and command types supported by the current firmware

Execute Instructions	AT+CMD?
response	+CMD:<index>,<AT command name>,<support test command> ,<support query command> , <→<support set command> ,<support execute command>
Parameter Description	<index> : AT command number <AT command name> ： AT command name <support test command> : 0 means not supported, 1 means supported <support query command> : 0 means not supported, 1 means supported <support set command> : 0 means not supported, 1 means supported <support execute command> : 0 means not supported, 1 means supported

3.2.3 AT+RST-Restart module

Execute Instructions	AT+RST
response	OK
Parameter Description	-

3.2.4 AT+GMR-View version information

Execute Instructions	AT+GMR
response	<AT version info> OK
Parameter Description	-

3.2.5 ATE-enable or disable AT echo function

Setting Instructions	ATE0 or ATE1
response	OK
Parameter Description	ATE0: Disable echo ATE1: Enable echo

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Notice	No save after power off

3.2.6 AT+RESTORE - Restore factory settings

Execute Instructions	AT+RESTORE
response	OK
Parameter Description	This command will erase all parameters saved in flash and restore to default parameters.

3.2.7 AT+UART_CUR-Set UART current temporary configuration, do not save to Flash

Execute Instructions	Query command: AT+UART_CUR?	Set the command: AT+UART_CUR=<baudrate>,<databits>,<stopbits>,<parity>,<flow control>
response	+UART_CUR: <baudrate>,<databits> ,<stopbits>,<parity>,<flow control> OK	OK
Parameter Description	<baudrate>: UART baud rate, range [80, 3 000000] <databits>: data bits 5 : 5 data bits 6 : 6 data bits 7 : 7 data bits 8 : 8 data bits <stopbits>: stop bits 1 : 1 stop bit 2 : 1.5 bit stop bit 3 : 2 stop bits <parity>: check digit 0: None 1: Odd 2: Even <flow control>: flow control 0: Disable flow control 1: Enable RTS 2: Enable CTS 3: Enable RTS and CTS at the same time	
Notice	This setting is not saved in flash. This version does not support flow control yet.	

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Example	AT+UART_CUR=115200 , 8 , 1,0,0

3.2.8 AT+UART_DEF - Set UART default configuration and save to Flash

Execute Instructions	Query command: AT+UART_DEF?	Set the command: AT+UART_DEF=<baudrate>,<databits>,<stopbits>,<parity>,<flow control>
response	+UART_DEF:<baudrate >,<databits>,<stopbits >,<parity>,<flow control> OK	OK
Parameter Description	<baudrate>: UART baud rate range [80,3000000] <databits>: data bits 5 : 5 data bits 6 : 6 data bits 7 : 7 data bits 8 : 8 data bits <stopbits>: stop bits 1 : 1 stop bit 2: 1.5 bit stop bit 3: 2 stop bits <parity>: check digit 0 ： None 1 : Odd 2 : Even <flow control>: flow control 0: Disable flow control 1: Enable RTS 2: Enable CTS 3: Enable RTS and CTS at the same time	
Notice	This setting is saved in the flash and remains effective after a power-on restart. This version does not support flow control yet.	
Example	AT+UART_DEF=115200 , 8 , 1,0,0	

3.2.9 AT+SLEEPWKCFG: Set the Light-sleep wakeup source and wakeup GPIO

Execute	AT+SLEEPWKCFG=<wakeup source>,<param1>[,<param2>]

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Instructions	
response	AT+SLEEPWKCFG= <wakeup source>,<param1>[,<param2>] OK
Parameter Description	<wakeup source>: wakeup source 0: Keep the configuration, not supported yet 1: Keep the configuration, not supported yet 2: GPIO wake-up <param1>: When the wake-up source is a timer, this parameter indicates the sleep time in milliseconds. When the wakeup source is GPIO, this parameter indicates the GPIO pin <param2>: When the wake-up source is GPIO, this parameter indicates the wake-up level. 0: Low level 1: High level
Notice	Currently this function is fixed to A7 pin wake up
Example	AT+SLEEPWKCFG=2,11,0 Only the last parameter is relevant, the wake-up level must be configured first Then AT+SLEEP=1 enters sleep mode immediately

3.2.10 AT+SLEEP Set sleep mode

Execute Instructions	AT+ SLEEP
response	AT+ SLEEP=1 OK
Parameter Description	The module enters deep sleep
Notice	To wake up via the A7 pin, you must first configure the wakeup mode via AT+SLEEPWKCF G Then give the A7 pin a level of more than 100ms to wake up

4 Basic function instructions

4.1 Basic function command list

Instruction	Describe
AT+CWMODE	Set the device working mode (STA/AP)
AT+CWJAP	Connect to ap
AT+CWQAP	Disconnect from the AP

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AT+CWLAP	Start Scanning
AT+CWSAP	Configure softap parameters
AT+CIPSTAMAC	Query/set the mac in module sta mode
AT+CIPAPMAC	Query/set module mac in AP mode
AT+CIPSTA	Query/set the module's IP address in sta mode
AT+CIPAP	Query/set the module's IP address in AP mode
AT+CWLIF	Query the information of the station connected to SoftAP
AT+CWDHCP	Enable/Disable DHCP
AT+CWDHCPS	Query/set the IP address range assigned by SoftAP DHCP
AT+CWAUTOCONN	Whether to automatically connect to AP after power on

4.2 Basic Function Instructions

4.2.1 AT+CWMODE-Query/set Wi-Fi mode

Instruction	Query command: AT+CWMODE?	Setting command: AT+CWMOE=<mode>,[<auto_connect>]
response	+CWMODE:<mode> OK	OK
Parameter Description	<mode>: 0: None 1: Station mode 2: SoftAP mode	
Example	AT+CWMODE=1	

4.2.2 AT+CWJAP-Query/set the connection to the specified AP

Instruction	Query command: AT+CWJAP?	Setting command: AT+CWJAP=<ssid>,<pwd>,<bssid>
Response	+CWJAP:<ssid>,<passwd>	OK or +CWJAP:<error code> ERROR
Parameter Description	<ssid>: SSID of the target AP If the SSID and password contain special characters such as ,", ", \\, etc., they need to be escaped .	

	AT supports connecting to APs with Chinese SSIDs, but the Chinese SSIDs of some routers or hotspots are not in UTF-8 encoding format. You can scan the SSID first, and then connect using the scanned SSID. <pwd>: Password up to 63 bytes ASCII <bssid>: MAC address of the target AP. This parameter cannot be omitted when multiple APs have the same SSID. <channel>: channel number <rssi>: signal strength <pci_en>: PCI certified
Notice	Save after power off, automatically connect after power on by default, connection only supports 3 parameters
Example	AT+CWJAP=" EWM103-W15 ","12345678"

4.2.3 AT+CWLAP-Scan AP information around the device

Query command	AT+CWLAP
response	+CWLAP:[<ssid>,<mac>,<channel>,<scan_type>,<scan_time_min>,<scan_time_max>]
Parameter Description	● <ecn>: encryption method ➢ 0: OPEN ➢ 1: WEP ➢ 2: WPA_PSK ➢ 3: WPA2_PSK ➢ 4: WPA_WPA2_PSK ➢ 5: WPA2_ENTERPRISE ➢ 6: WPA3_PSK ➢ 7: WPA2_WPA3_PSK [ESP32-C3 Only] 8: WAPI_PSK ● <ssid>: string parameter, AP's SSID ● <rssi>: signal strength ● <mac>: string parameter, AP's MAC address ● <channel>: channel number ● <scan_type>: Wi-Fi scan type ➢ 0: Active scanning ➢ 1: Passive Scan ● <scan_time_min>: The shortest scan time for each channel, unit: milliseconds, range: [0,1500]. If the scan type is passive scan, this parameter is invalid. ● <scan_time_max>: Maximum scan time for each channel, unit: milliseconds, range: [0,1500]. If set to 0, the firmware uses the default parameter value, active scanning is 120 ms, passive scanning is 360 ms ● <freq_offset>: frequency offset (reserved item)

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	● <freqcal_val>: Frequency calibration value (reserved item) ● <pairwise_cipher>: pairwise encryption type ➢ 0: None ➢ 1: WEP40 ➢ 2: WEP104 ➢ 3: TKIP ➢ 4: CCMP ➢ 5: TKIP and CCMP ➢ 6: AES-CMAC-128 ➢ 7: Unknown ● <group_cipher>: Group encryption type, the same as the enumeration value of the <pairwise_cipher> parameter ● <bgn>: 802.11 b/g/n, if the bit is set to 1, it means enabling the corresponding mode, if it is set to 0, it means disabling the corresponding mode ➢ bit 0: Whether to enable 802.11b mode ➢ bit 1: Whether to enable 802.11g mode ➢ bit 2: Whether to enable 802.11n mode ● <wps>: wps flag ➢ 0: Do not support WPS ➢ 1: Support WPS

4.2.4 AT+CWSAP-Configure Softap mode parameters

Instruction	Query command: AT+CWSAP?	Set the command: AT+CWSAP=<ssid>,<pwd>,<chl >,<ecn> [,<ssid hidden>]
Response	+CWSAP=<ssid>,<pwd>,<chl>,<ecn> ,<ssid hidden>	OK or ERROR
Parameter Description	● <ssid>: string parameter, AP's SSID ● <pwd>: string parameter, password length range: 8-63 bytes ASCII ● <cnl>: channel number, 1-13 ● <ecn>: encryption method, does not support WEP ➢ 0: OPEN ➢ 2: WPA_PSK ➢ 3: WPA2_PSK ➢ 4: WPA_WPA2_PSK ● [<ssid hidden>] (optional parameter): The default value is 0, which enables broadcasting of SoftAP SSID ➢ Broadcast SSID ➢ Do not broadcast SSID	

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Notice	If you want to set an open password, the <pwd> field needs to be filled in
Example	AT+CWSAP=" EWM103-W15 ","12345678",13,6,0

4.2.5 AT+CWLIF-Query the information of the Station connected to the SoftAP

Execute Instructions	Execute command: AT+CWLIF
response	+CWLIF:<index>,<ip addr>,<mac> OK
Parameter Description	● <index>：station id ● <ip addr>: Station IP address connected to EWM103-W15 SoftAP ● <mac>: MAC address connected to EWM103-W15 SoftAP
Notice	This command cannot query static IP, and only supports EWM103-W15 SoftAP and connected Station. Valid when DHCP is enabled

4.2.6 AT+CWQAP - disconnect from AP

Execute Instructions	Execute command: AT+CWQAP
response	OK
Parameter Description	-

4.2.7 AT+CWDHCP-Set DHCP

Instruction	Query command: AT+CWDHCP?	Set the command: AT+CWDHCP=<mode>,<en>
Response		OK
Parameter Description	● Bit0: ➢ 0: SoftAP DHCP is disabled ➢ 1: SoftAP DHCP is enabled ● Bit1: ➢ 0: Station DHCP is disabled ➢ 1: Station DHCP is enabled	● <mode>： ➢ 0: Set EWM103-W15 SoftAP ➢ 1: Set up EWM103-W15 Station ● <en>： ➢ 0: Disable DHCP ➢ 1: Enable DHCP

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Notice	This setting is saved in Flash. This setting command and the command for setting static IP (AT+CIPSTA series and AT+CIPAP series) affect each other: ● If DHCP is enabled, the static IP will be invalid; ● If you set a static IP, DHCP is turned off; The last setting is used
Example	AT+CWDHCP=0,1

4.2.8 AT+CWAUTOCONN - Enable automatic connection to AP after power on

Execute Instructions	AT+CWAUTOCONN=<enable>
response	OK
Parameter Description	● <enable>: ➢ 0: Do not automatically connect to AP upon power-on ➢ 1: Automatically connect to AP upon power on
Notice	● <auto_connect>: Whether to enable the automatic connection to AP function when switching the device's Wi-Fi mode (for example, switching from SoftAP or No Wi-Fi mode to Station mode or SoftAP mode). The default value is 1. When the parameter is not specified, the default value is used, that is, automatic connection is enabled. ➢ 0: Disable the function of automatically connecting to AP ➢ 1: Enable the function of automatically connecting to AP. If the configuration of automatically connecting to AP has been saved in flash, the device will automatically connect to AP.
Example	AT+CWAUTOCONN=0

4.2.9 AT+CIPSTA-Set the IP address of EWM103-W15 Station

Instruction	Query command: AT+CIPSTA?	Setting command: AT+CIPSTA=<ip>,<gateway>,<netmask>
Response	+CIPSTA :<ip>,<gateway>,<netmask> OK	OK
Parameter Description	● <ip>: string, IP address of EWM103-W15 Station ● <gateway>: Gateway ● <netmask>: subnet mask	

Notice	The AT+DHCP setting will affect this command. When setting a dynamic IP, the static IP will be invalid.
Example	AT+CIPSTA=”192.168.1.100”,”192.168.1.1”,”255.255.255.0”

4.2.10 AT+CIPAP-SET EWM103-W15 SoftAP IP address

Instruction	Query command: AT+CIPAP?	Setting command: AT+CIPAP=<ip>,<gateway>,<net mask>
Response	+CIPAP:<ip>,<gateway>,<netmask> OK	OK
Parameter Description	● <ip>: string, IP address of the station ● <gateway>: Gateway ● <netmask>: subnet mask	
Notice	The AT+DHCP setting will affect this command. When setting a dynamic IP, the static IP will be invalid.	
Example	AT+CIPAP=”192.168.1.100”,”192.168.1.1”,”255.255.255.0”	

4.2.11 AT+CIPSTAMAC-Set EWM103-W15 Station MAC address

Instruction	Query command: AT+CIPSTAMAC?	Setting command: AT+CIPSTAMAC=<mac>
Response	+CIPSTAMAC:<mac> OK	OK
Parameter Description	● <mac>: string parameter, indicating the MAC address of the Station	
Notice	● The MAC address of the SoftAP is different from that of the Station. Do not set the same MAC address for both . ● Bit 0 of a MAC address cannot be 1. For example, a MAC address can be “1a:…” but cannot be “15:…” . ● FF:FF:FF:FF:FF:FF and 00:00:00:00:00:00 are invalid addresses and cannot be set . ● It takes effect immediately and will not be saved when power is off .	
Example	AT+CIPSTAMAC=”22:6D:CD:09:37:23”	

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4.2.12 AT+CIPAPMAC - Set EWM103-W15 SoftAPMAC address

Execute Instructions	Query command: AT+CIPAPMAC?
Response	+CIPAPMAC:<mac> OK
Parameter Description	● <mac>: string parameter, indicating the MAC address of the SoftAP .
Notice	● SoftAP The MAC address is different from that of the Station. Do not set the same MAC address for both . ● Bit 0 of the MAC address cannot be 1. For example, the MAC address can be “1a:…” but cannot be “15:…” . ● FF:FF:FF:FF:FF:FF and 00:00:00:00:00:00 are invalid addresses and cannot be set .
Example	AT+CIPAPMAC="18:fe:35:98:d3:7b"

5 TCP/IP related instructions

Instruction	Describe
AT+CIPDOMAIN	Domain name resolution
AT+CIPSTART	Establish TCP, UDP transmission or TLS connection
AT+CIPSTATUS	Query TCP/UDP/SSL connection status and information
[Only applicable to transparent mode +++	Exit transparent mode
AT+CIPSEND	Sending Data
AT+CIPCLOSE	Close TCP/UDP/SSL transport
AT+CIFSR	Query the IP address and MAC address of the device

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AT+CIPMUX	Setting up multiple connections
AT+CIPSERVER	Setting up a TCP server
AT+CIPMODE	Set the transfer mode
AT+CIPSNTPCFG	Setting the time zone and SNTP server
AT+CIPSNTPTIME	Query SNTP time
AT+CIPRECONNINTV	TCP client reconnection interval
AT+CIPRECVTYPE	Query/set socket receive mode
AT+CIPRECVDATA	Get socket data in passive receive mode
AT+CIPRECVLEN	Query the length of socket data in passive receive mode
AT+PING	Ping the remote host
AT+CWDHCPS	Query/set the IP address range assigned by SoftAP DHCP
AT+CIPSERVERMAXCONN	Query/set the maximum number of connections allowed by the server
AT+CIPDINFO	Settings+IPD message details

5.1 TCP/IP Command List

5.2 TCP/IP Command Description

5.2.1 AT+CIPDOMAIN-domain name resolution function

Setting Instructions	AT+CIPDOMAIN=<domain name>
response	+CIPDOMAIN:<IP address>
Parameter Description	<domain name>: The domain name to be resolved. The domain name with a length less than 64 characters can be supported.
Example	AT+CWMODE=1 //Set station mode AT+CWJAP=xx,xx //Need to connect to an AP device that accesses the WAN AT+CIPDOMAIN=www.baidu.com //Domain name resolution

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5.2.2 AT+CIPSTART - establish a TCP, UDP or SSL connection

TCP transport:

Setting Instructions	TCP single connection (AT+CIPMUX=0): AT+CIPSTART=<type>,<remote IP>,<remote port>[,<TCP keep alive>]	TCP multiple connections (AT+CIPMUX=1): AT+CIPSTART=<link ID>,<type>,<remote IP>,<remote port>[,<TCP keep alive>]
response	OK or ERROR	
Parameter Description	● <link ID> connection ID, [0, 3] for multiple links ● <type>Connection type, TCP, UDP, TLS ● <remote IP> remote ip ● <remote port> remote port ● <TCP keep alive>socket opt	
Example	AT+CIPSTART=TCP,192.168.4.2,1000	

UDP transport:

Setting Instructions	UDP single connection (AT+CIPMUX=0): AT+CIPSTART=<type>,<remote IP>,<remote port>[,<local port>]	UDP multiple connections (AT+CIPMUX=1): AT+CIPSTART=<link ID>,<type>,<remote IP>,<remote port>,<remote port>[,<local port>]
response	OK or ERROR If the connection already exists, it returns ALREADY CONNECT	
Parameter Description	● <link ID>: Network connection ID (0~ 3), used for multiple connections ● <type>: string parameter, connection type, "TCP", "UDP" or "SSL" ● <remote IP>: string parameter, remote IP address ● <remote port>: remote port number ● <local port >: When transmitting via UDP, set the local listening port so that other devices can ● Send UDP data to EWM103-W15 device through this port	
Example	AT+CIPSTART=”UDP”,”192.168.4.10”,9527,9527	

SSL Connection:

Setting Instructions	AT+CIPSTART=[<link ID>,]<type>,<remote IP>,<remote port>[,<TCP keep alive>]
response	OK

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	or ERROR If the connection already exists, it returns ALREADY CONNECT
Parameter Description	● <link ID>: Network connection ID [0-3] , used for multiple connections ● <type>: string parameter, connection type, TCP, UDP or TLS ● <remote IP>: string parameter, remote IP address ● <remote port>: remote port number ● <TCP keep alive>: TCP keep alive detection time, this function is disabled by default ➢ 0: Disable TCP keep alive function ➢ 1~7200: detection time, in seconds
Notice	● SSL connection does not support transparent transmission ● SSL requires more space. If the space is insufficient, the system will restart.
Example	AT+CIPSTART=SSL,www.baidu.com,443

5.2.3 AT+CIPSTATUS queries TCP/UDP/SSL connection status and information

Setting Instructions	AT+CIPSTATUS
response	STATUS:<stat>+CIPSTATUS:<link ID>,<"type">,<"remote IP">,<remote port>,<local port>,<tetype> OK
Parameter Description	● <stat>: Status of the W15station interface ● <link ID>: Network connection ID (0 ~ 3), used for multiple connections ● <"type">: string parameter, indicating the transmission type: "TCP", "UDP", "SSL", "TCPv6", "UDPv6" or "SSLv6" ● <"remote IP">: string parameter, indicating the remote IPv4 address or IPv6 address ● <remote port>: remote port value ● <local port>: W15 local port value ● <tetype>: ➢ 0: W15 device as client ➢ 1: W15 device as server

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5.2.4 +++-Exit transparent transmission mode

Special execution instructions	+++
Function	Exit transparent transmission mode and enter AT configuration mode
return	ENTER AT MODE
Parameter Description	● Applicable only in transparent mode . ● This special execution instruction contains three identical + characters (ASCII code: 0x2b), and there is no CR-LF character at the end of the instruction . ● There is no command response for this special execution command .

5.2.5 AT+CIPSEND-send data

instruction	Set the command: ● Single connection: (AT+CIPMUX=0) AT+CIPSEND=<length> ● When multiple connections are connected: (AT+CIPMUX=1) AT+CIPSEND=<link ID>,<length>	Execute the command: AT+CIPSEND
response	Send data of the specified length. After receiving this command, it will return to line break ">", then start receiving serial port data. When the data length reaches <length>, it will send the data and return to normal command mode, waiting for the next AT command. If the connection is not established or is disconnected, returns: ERROR If the data is sent successfully, it returns: SEND OK	After receiving this command, return to the new line first. Enter transparent transmission mode to send data, with a maximum of 1024 bytes per packet. When a single packet of "+++" is input, it returns to the normal AT command mode. When sending "+++" to exit transparent transmission, please wait at least 1 second before sending the next AT command. This command must be used in transparent transmission mode and single connection. If UDP transparent transmission is used, the parameter <UDPmode> of the command AT+CIPSTART must be 0

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Parameter Description	● <link ID>: Network connection ID number (0~4), used for multiple connections ● <length>: numeric parameter, indicating the number of ● The maximum length is 8192 ● [<remoteIP>]: UDP transmission can set the remote IP ● [<remoteport>]: You can set the peer port for UDP transmission	Currently, the cache has limited connections. More than 2 TCP connections will cause insufficient memory.

5.2.6 AT+CIPCLOSE - close TCP, UDP, SSL transmission

Instruction	Setting instructions (for multiple connections): AT+CIPCLOSE=<link ID>	Execute command (for single connection): AT+CIPCLOSE
Response	OK	
Parameter Description	<link ID>: The link ID number that needs to be closed	

5.2.7 AT+CIFSR-Query the IP address and MAC address of the device

Execute Instructions	AT+CIFSR
response	● +CIFSR:APIP,<SoftAP IP address> ● +CIFSR:APMAC,<SoftAP MAC address> ● +CIFSR:STAIP,<STA IP address> ● +CIFSR:STAMAC,<STA MAC address>
Parameter Description	● <IP address>： ➢ SoftAP IP address ➢ Station IP address ● <MAC address>： ➢ SoftAP mac address ➢ Station mac address
Notice	The query output of this command follows the working mode of the device. When working in Station mode, only the IP and MAC address of Station mode are output. The same is true for other modes. When set to STA or mode, the device will be assigned an IP only after connecting to the router.

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	Otherwise, it will be "0.0.0.0"

5.2.8 AT+CIPMUX-Set up multiple connections

Instruction	Query command: AT+CIPMUX?	Setting command: AT+CIPMUX=<mode>
response	+CIPMUX:<mode> OK	
Parameter Description	● <mode>: ➢ 0: Single connection mode ➢ 1: Multi-connection mode	
Notice	● The default is single connection . ● Only in non-transparent transmission mode (AT+CIPMODE=0) can it be set to multiple connections. The connection mode must be set when no connection is established . ● If a TCP server is established and you want to switch to a single connection, you must shut down the server (AT+CIPSERVER). The server only supports multiple connections .	
Example	AT+CIPMUX=0	

5.2.9 AT+CIPSERVER-establish TCP connection

Execute Instructions	AT+CIPSERVER=<mode>,<port>,<type>
response	OK
Parameter Description	● <mode>: ➢ 0: Shut down the server ➢ 1: Set up the server ● <port>: ➢ Port Number ● <type>: Server type TCP (default), TLS
Notice	● TCP server can be enabled only in multi-connection mode (AT+CIPMUX=1) ● After creating a TCP server, automatically establish a TCP server listener ● When a TCP client accesses, it will automatically occupy a connection ID
Example	AT+CIPMUX=1 AT+CIPSERVER=1,1001

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5.2.10 AT+CIPMODE-Set the transmission mode

Instruction	Query command: AT+CIPMODE?	Setting command: AT+CIPMODE=<mode>
Response	+CIPMODE:<mode> OK	OK
Parameter Description	● <mode>: ➢ 0: Normal transmission mode ➢ 1: Transparent transmission mode, only supports TCP single connection and UDP fixed communication peer	
Notice	● This setting is not saved to Flash ● When transmitting in transparent mode, if the connection is disconnected, EWM103-W15 will keep trying to reconnect until CIPCLOSE is called.	
Example	AT+CIPMODE=1	

5.2.11 AT+PING-ping the remote host

Execute Instructions	AT+PING=<“host”>
Response	AT+PING="host" +PING:7
Parameter Description	● <host>: string parameter, indicating the IPv4 address, IPv6 address, or domain name of the peer host ● <time>: ping response time, unit: milliseconds
illustrate	If the remote host is a domain name string, ping will first resolve the domain name through DNS, and then ping the remote IP address.
Example	AT+PING="192.168.1.1"

5.2.12 AT+CIPSNTPCFG - Set the time zone and SNTP server

Instruction	Query command: AT+CIPSNTPCFG?	Set the command: AT+CIPSNTPCFG=<enable>[,<timezone>] [,<SNTP server>]
Response	+CIPSNTPCFG: <enable>[,<timezone>] [,<SNTP server>],	OK

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	OK	
Parameter Description	● <enable>: ➢ 0: SNTP is disabled ➢ 1: SNTP enabled <timezone>: time zone, range: [-11,13]; if SNTP is enabled, this parameter is required; otherwise, no need to fill in ● <SNTP server0>: The first SNTP server	
Notice	AT+CIPSNTPCFG=1,8,"cn.ntp.org.cn","ntp.sjtu.edu.cn" Enable SNTP server and set China time zone (UTC+08:00)	

5.2.13 AT+CIPSNTPTIME-Query SNTP time

Instruction	Query command: AT+CIPSNTPTIME?
Response	+CIPSNTPTIME:<time> OK
Parameter Description	<time>: The time obtained through SNTP query The format is as follows: +CIPSNTPTIME:Thu Jan 1 08:00:00 1970
Example	AT+CWMODE=1 AT+CWJAP=" EWM103-W15 ","123456789" AT+CIPSNTPTIME?

5.2.14 AT+CIPRECVMODE-query/set socket receiving mode

Instruction	Query command: AT+CIPRECVMODE?	Set the command: AT+CIPRECVMODE=<mode>
Response	+CIPRECVMODE:<mode> OK	OK
Parameter Description	● <mode>: socket data receiving mode, default value: 0 ➢ 0: Active mode, all received socket data is sent to the host MCU immediately, with the header "+IPD" ➢ 1: Passive mode, all received socket data is saved to the internal buffer (socket receiving window, the device defaults to 2048 bytes), waiting for MCU to read. For TCP and SSL connections, if the buffer is full, the socket transmission will be blocked; for UDP transmission, if the buffer is full, data loss will occur .	
illustrate	● This configuration cannot be used in Wi-Fi transparent mode. ● When EWM103- W15 receives socket data in passive mode, it will prompt different information according to different situations . ➢ When multiple connections are connected (AT+CIPMUX=1), the prompt is	

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	+IPD, <link ID>, <len>; ➢ When single connection is used (AT+CIPMUX=0), the prompt is +IPD,<len>. ● <len> indicates the total length of the socket data in the buffer. ● Once an +IPD is reported, AT+CIPRECVDATA should be run to read the data. Otherwise, the next +IPD will not be reported to the host MCU before the previous +IPD is read. ● In the case of a disconnect, the buffered socket data still exists and can still be read by the MCU until AT+CIPCLOSE is sent. In other words, if +IPD has been reported, the CLOSED message for this connection will never appear until you send AT+CIPCLOSE or read all the data via the AT+CIPRECVDATA command.
Example	AT+CIPRECVMODE=1

5.2.15 AT+CIPRECVDATA - Get socket data in passive receive mode

Setting Instructions	AT+CIPRECVDATA=<SOCKET ID>,<LEN>
Response	+CIPRECVDATA:<SIZE> <DATA>
Parameter Description	● <link_id>: connection ID in multi-connection mode. ● <len>: The maximum value is: 0x7fffffff. If the actual received data length is smaller than this parameter value, the actual length of the data will be returned. ● <actual_len>: the actual length of the data obtained. ● <data>: the data to be obtained. ● [<remote IP>]: string parameter, indicating the remote IP address, enabled by the AT+CIPDINFO=1 command. ● [<remote port>]: peer port, enabled by AT+CIPDINFO=1 command.
Example	● AT+CIPRECVMODE=1 ➢ // For example, if the host MCU receives 100 bytes of data from connection 0, ➢ // Then the message "+IPD,0,100" will be displayed. ➢ // Then, you can read these 100 bytes of data by running the following command: AT+CIPRECVDATA=0,100

5.2.16 AT+CIPDINFO-Set+IPD message details

Setting	AT+CIPDINFO=<mode>

Instructions	
Response	OK
Parameter Description	● <mode>: ➢ 0: In the “+IPD” and “+CIPRECVDATA” messages, do not prompt the peer IP address and port information . ➢ 1: In the "+IPD" and "+CIPRECVDATA" messages, the peer IP address and port information are indicated .
Example	AT+CIPDINFO=1

5.2.17 AT+CIPRECVLEN: Query the length of socket data in passive receiving mode

Query command	AT+CIPRECVLEN?
Response	AT+CIPRECVLEN? +CIPRECVLEN:0
Parameter Description	<LEN0>: The total length of data received by socket 0 link
Example	AT+CIPRECVLEN? +CIPRECVLEN:100,,,,, OK

5.2.18 AT+CWDHCPS query/set the IP address range assigned by SoftAP DHCP

Query command	AT+CWDHCPS?
Response	+CWDHCPS:<lease time>,<start IP>,<end IP>OK
Setting Instructions	AT+CWDHCPS=<enable>,<lease time>,<start IP>,<end IP>
Response	OK
Parameter Description	● <enable>: ➢ 1: Set DHCP server information, subsequent parameters must be filled in ➢ 0: Clear DHCP server information, restore default values, and no need to fill in subsequent parameters

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	● <lease time>: lease time, unit: minute, value range: [1,2880] ● <start IP>: The starting IP of the ESP SoftAP DHCP server IP address pool ● <end IP>: End IP of the ESP SoftAP DHCP server IP address pool
Example	AT+CWDHCPS=1,3,"192.168.4.10","192.168.4.105"

5.2.19 AT+CIPSERVERMAXCONN Query/set the maximum number of connections allowed by the server

Query command	AT+CIPSERVERMAXCONN?
Response	+CIPSERVERMAXCONN:<num> OK
Setting Instructions	AT+CIPSERVERMAXCONN=<num>
response	OK
Parameter Description	● <num>: The maximum number of connections allowed by the TCP or SSL server
Example	● AT+CIPMUX=1 ● AT+CIPSERVERMAXCONN=2 ● AT+CIPSERVER=1,80

6 MQTT related commands

6.1 MQTT Command List

MQTT Instruction List	
AT+MQTTUSERCFG	Setting up MQTT user configuration
AT+MQTTCONNCFG	Set up MQTT connection configuration
AT+MQTTCONN	Connecting to MQTT brokers
AT+MQTTPUB	Publish MQTT information as a string
AT+MQTTPUBRAM	Publishing MQTT messages in binary format

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AT+MQTTSUB	Subscribing to an MQTT Topic
AT+MQTTUNSUB	Unsubscribe from an MQTT topic
AT+MQTTCLEAN	Closing the MQTT connection

6.2 MQTT Command Description

6.2.1 AT +MQTTUSERCFG - Set MQTT user configuration

Setting Instructions	AT+MQTTUSERCFG=<LinkID>,<scheme>,<client_id>,<username>,<password>,<cert_key_ID>,<CA_ID>,<path>
Response	OK
Parameter Description	● <LinkID> supports only link ID 0. ● <scheme> ➢ 0: MQTT over TCP. ➢ 1: MQTT over TLS (no certificate verification) ● client certificate). ● <client_id>MQTT client ID. Maximum length: 256 bytes. ● <username> is the username for logging into the MQTT broker. Maximum length: 64 bytes. ● <password> is the key for logging into the MQTT broker. Maximum length: 64 bytes. ● <cert_key_ID> certificate ID. Not supported yet, value should be 0 ● <CA_ID> CA ID. Not supported yet, value should be 0 ● <path>The path to the resource.
Notice	If the parameter contains ',', you need to use the escape character \, to enter
Example	AT+MQTTUSERCFG=0,1,"a1rFV5g1Oa6.IotDevClient_2|securemode=2\,signmethod=hmacsha256\,timestamp=1740965263301|","IotDevClient_2&a1rFV5g1Oa6","1831076d6269242e7534a261e54e01b0e7587ee3bde649dee969e1374fdeb140",0,0,"/"

6.2.2 AT +MQTTCONN - connect to MQTT brokers

Instruction	Query command: AT+MQTTCONN?	Set the command: AT+MQTTCONN=<LinkID>,<host>,<port>,<reconnect>
Response	+MQTTCONN:<LinkID>,<state>,<scheme><host>,<port>,<path>,<reconnect> OK	OK Connection successful: +MQTTCONN:OK Failed: +MQTTCONN:ERROR

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Parameter Description	Parameter Description: ● <LinkID> only supports link ID 0. ● <host>MQTT broker domain name. Maximum length: 64 bytes. ● <port>MQTT broker port number. Maximum value: port number 65535. ● <path> path. Maximum value is 64 ● <reconnect> ➢ 0: MQTT will not automatically reconnect. ➢ 1: MQTT will automatically reconnect. This will consume more resources. ● <state>MQTT state ➢ disconnected: disconnected state ➢ connected: connected status ● <scheme> 1: MQTT over TCP; 2: MQTT over TLS (without certificate verification); 3: MQTT over TLS (verify server certificate); 4: MQTT over TLS (providing client certificate); 5: MQTT over TLS (verify server certificate and provide client certificate); 6: MQTT over WebSocket (based on TCP); 7: MQTT over WebSocket Secure (based on TLS, without certificate verification); 8: MQTT over WebSocket Secure (based on TLS, verify server certificate); 9: MQTT over WebSocket Secure (based on TLS, providing client certificate); 10: MQTT over WebSocket Secure (based on TLS, verify server certificate and provide client certificate)
Notice	AT+MQTTCONN=0,"a1rFV5g1Oa6.iot-as-mqtt.cn-shanghai.aliyuncs.com",1883,1

6.2.3 AT +MQTTPUB - Publish MQTT message as string

Setting Instructions	AT+MQTTPUB=<LinkID>,<topic>,<data>,<qos>,<retain>
Response	OK
Parameter Description	● <LinkID> currently only supports Link ID 0 . ● <topic>MQTT topic. Maximum length: 128 bytes. ● <length>The length of the MQTT message . ● The maximum value is limited by the MQTT_BUFFER_SIZE_BYTE macro and available memory. The default value of MQTT_BUFFER_SIZE_BYTEE is 1024. ● <qos > qos message, can be set to 0, 1 or 2. Default value: 0. ● <retain> Release retain .
Notice	This command cannot send data \0. If you need to send \0, use the AT+MQTTPUBRAW command instead .

6.2.4 AT+MQTTPUBRAW - Publish long MQTT message

Setting Instructions	AT+MQTTPUBRAW=<LinkID>,<topic>,<length>,<qos>,<retain>
Response	response: OK > The symbol > indicates that the AT is ready to receive serial data and data can now be entered. When the message length requirement determined by the parameter <length> is met, the transmission begins. If the transmission is successful, return +MQTTPUBRAW:OK If the sending fails, return +MQTTPUBRAW:FAIL
Example	AT+MQTTPUBRAW=0,"light", 10 ,0,0
Parameter Description	● <LinkID> Currently only link ID 0 is supported. ● <topic>MQTT topic. Maximum length: 128 bytes. ● <length> The maximum length of the MQTT message is 1024 ● The maximum value is limited by the macro MQTT_BUFFER_SIZE_BYTE and available memory. The default value of MQTT_BUFFER_SIZE_BYTE is 1024. ● <qos> qos message, can be set to 0, 1 or 2. Default value: 0. ● <retain>Release retain.

6.2.5 AT +MQTTSUB - Subscribe to MQTT topic

Instruction	Query command: AT+MQTTSUB?	Set the command: AT+MQTTSUB =<LinkID>,<topic1>,<qos>
Response	+MQTTSUB:<LinkID>,<topic1>,<qos> > +MQTTSUB:<LinkID>,<topic2>,<qos> > ... OK	OK When receiving an MQTT message for a subscribed topic, it will prompt +MQTTSUBRECV:<LinkID>,<topic>, <data_length>,data
Example	AT+MQTTSUB=0,"light" ,0	
Parameter Description	● <linkID> Currently only link ID 0 is supported. ● <state> ● <"topic">Subscribed topic. ● <qos>The subscribed QOS.	

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6.2.6 AT+MQTTUNSUB - Unsubscribe from MQTT topic

Setting Instructions	AT+MQTTUNSUB=<LinkID>,<topic>
Response	OK
Parameter Description	● <linkID> Currently only link ID 0 is supported. ● <topic>MQTT topic. Maximum length: 128 bytes.
Example	AT+MQTTUNSUB =0, "light"

AT +MQTTCLEAN - Close the MQTT connection

Setting Instructions	AT+MQTTCLEAN=<LinkID>
response	OK
Parameter Description	<linkID> Currently only link ID 0 is supported.
Example	AT+ MQTTCLEAN =0

MQTT Notes

- Generally speaking, AT MQTT commands respond within 10 seconds, except for AT+MQTTCONN command. For example, if the router cannot access the Internet, AT+MQTTPUB command will respond within 10 seconds. However, AT+MQTTCONN command may take more time because of retransmission of data packets in a bad network environment .

7 Related auxiliary instructions

7.1 WEB command list

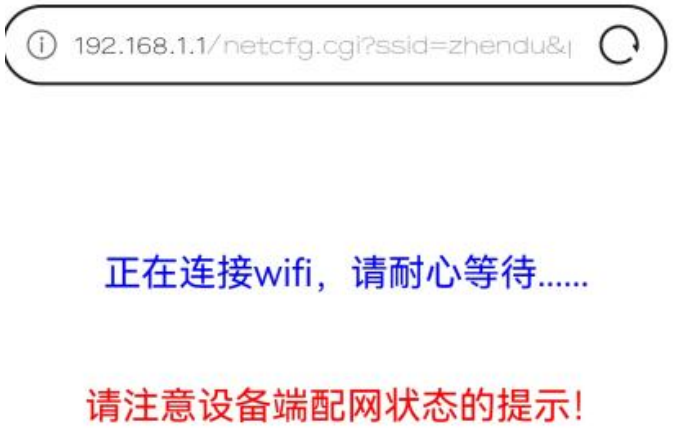
Instruction	Illustrate
AT+WEBSERVER	To perform the Web configuration function, you need to be in AP mode
AT+WEBSERVER=0	Disable the Web configuration function

7.2 WEB Usage Steps

Step	Content

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1	Restore factory settings : AT+RESTORE
2	Switch to AP mode : AT+CWMODE=2
3	Set fixed IP : AT+CIPAP="192.168.1.1"
4	WiFi name and password in setup mode : AT+CWSAP="Lighting","123456789",5,0,3,0
5	Set TCP multi-connection mode : AT+CIPMUX=1
6	● Start web configuration : AT+WEBSERVER=1,80,60 ● The three parameters are: ➢ <enable>: Enable startup ➢ <port>: TCP port number ➢ <timeout>: network configuration timeout
7	● Use your phone to search for the device's wifi name. We have set it to Lighting here, so the system wifi page searches for the wifi with the connection name Lighting. ● After the connection is successful, open any browser and enter the fixed IP we set. Here it is set to "192.168.1.1". After entering, the page is displayed as shown below: 
8	In the drop-down box of the Wi-Fi name, select the hotspot we want to connect to, enter the hotspot password, and then click Connect to Hotspot, which will jump to the following page:

	
9	After the device is successfully connected to the network, "WIFI CONNECTED" will be output "WIFI GOT IP" command means the network configuration is successful . AT+CIPAP="192.168.1.1" OK AT+CWSAP="Lighting","123456789",5,3,3,0 busy p... T+CIPMUX=1 OK AT+WEBSERVER=1,80,60 OK +STA_CONNECTED:"42:b7:f4:a3:8c:d6" +STA_DISCONNECTED:"42:b7:f4:a3:8c:d6" +STA_CONNECTED:"42:b7:f4:a3:8c:d6" +DIST_STA_IP:"42:b7:f4:a3:8c:d6","192.168.1.101" +STA_DISCONNECTED:"42:b7:f4:a3:8c:d6" WIFI CONNECTED WIFI GOT IP
10	/Close web configuration : AT+WEBSERVER=0 (no need to execute after configuration is complete, exit immediately if executed in the middle of configuration)

8 BLE related commands

8.1 BLE command list

Instruction	Illustrate
AT+BLEPAIRSTART	To perform BLE network configuration, you need to be in sta mode
AT+BLEPAIRSTOP	Disable BLE network configuration function

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8.2 BLE usage steps

Step	Content
1	Restore factory settings : AT+RESTORE
2	Switch to station mode: AT+CWMODE=1
3	Start Bluetooth network configuration : AT+BLEPAIRSTART
4	● Search Shanghai Liangniu Semiconductor Technology in the official account, select "BLE Network Configuration" in "Tools", and enter the mini program. Note that you need to enter from the official account for the first time, perform Bluetooth location authorization, and connect your phone to the WIFI (2.4G) to be configured. ● Then enter the password ● Click the connect button to enter the Bluetooth search interface: 
5	Click the device and wait for the network configuration to succeed. 
6	the connection times out (2 minutes), you need to enter AT+BLEPAIRSTART again.

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	AT+BLEPAIRSTART OK +CWJAP:4 ERROR AT+BLEPAIRSTART OK +BLECONN:0,"5c:6e:27:cc:a1:4f" WIFI CONNECTED WIFI GOT IP ssid=zhendu password=123456789 +BLEDISCONN:0 OK
7	Turn off Bluetooth network configuration: AT+BLEPAIRSTOP (no need to execute after network configuration is completed, and exit immediately when executing in the middle of configuration)

9 Update Record

Version	time	content	Modified by
V1.0	2025-4-25	First edition	ALL

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