WiFi Module Features:

Wireless standards supported: IEEE 802.11 b/g/n
Low-power operation
UART interface
Supports AT Commands
Supports Multi TCP (up to 5 channel)
FCC/CE certified

Technical Parameters

	Parameters	Specification
Wireless Parameters	Certification	FCC/CE
	Wireless standard	802.11 b/g/n
	Frequency range	2.412GHz-2.484GHz
	Transmit Power	802.11b: +16 +/-2dBm (@11Mbps)
		802.11g: +14 +/-2dBm (@54Mbps)
		802.11n: +13 +/-2dBm (@HT20, MCS7)
	Receiver Sensitivity	802.11b: -93 dBm (@11Mbps ,CCK)
		802.11g: -85 dBm (@54Mbps OFDM)
		802.11n: -82 dBm (@HT20, MCS7)
	Antenna	Internal: On-board Chip antenna
Hardware Parameters	Data Interface	UART
	Operating Current	Peak [Continuous T X]: ~200mA Normal [Wi Fi ON/OFF, DTIM=100ms] Average: ~12mA, Peak: 200mA Standby: <200uA(Reserved)
	Operating Temp.	-40℃- 85℃
	Storage Temp.	-45℃- 125℃
	Dimensions and Size	22mm×13.5mm×3mm
Software Parameters	Network Mode	STA /AP/STA+AP
	Security Mechanism	WEP/WPA-PSK/WPA2-PSK
	Encryption	WEP64/WEP128/TKIP/AES
	Network Protocol	IPv4, TCP/UDP/HTTP
	Use configuration	AT+ instruction set

MangoCube WiFi connections:

Function Type:

1. Wireless Networking

There are two Wireless Networking Modes:

AP (Access Point): It's a wireless access point. Similar example is Wireless Router in home-network.

STA (Station/Client): In wireless networking Station is similar to Mobile Phone, tablet, PC which connects to Wireless Router (AP).

AP+STA: It is combination of both AP and STA functionalities, Module in AP+STA mode can connect to other AP or other STA devices can connect to it which is similar to 'Tethering' in Smart phones.

2. Wireless Transparent Transmission

The WiFi module supports Serial transparent wireless transmission which is similar to using UART (serial) communication, but wirelessly. Once configured, the module can automatically connect to the default wireless network and server after power on.

User can also create customised software/App to use module in Wireless transmission mode. Following parameters needs to be configured to use the WiFi module in this mode.

Wireless Network Parameters

- Wireless Network Name (SSID) (Default: MangoCube)
- Security Mode (Default: open)
- Encryption Key (Default: none)

TCP/UDP Linking Parameters

- Protocol Type (Default: TCP)
- Link Type (Server or Client) (Default: Server)
- Target Port ID Number (Default: 8899)
- Target Port IP Address (Default: 10.10.100.254)

Serial Port Parameters

- Baud Rate (Default: 115200)
- Data Bit (Default: 8)
- Parity (Check) Bit (Default: None)
- Stop Bit (Default: 1)
- Hardware Flow Control (Default: None)

Configuration/Command Mode:

On power up the WiFi module works in transparent transmission mode by default. To configure it to work in different mode/ function it needs to be entered in configuration/AT command mode.

To get MangoCube WiFi into Configuration/AT command mode:

- Connect the MangoCube WiFi to a PC/Mac via USB
- Select the Board type as ' Leonardo'
- Select COM port
- Upload following sketch:

```
void setup() {
    pinMode(13, OUTPUT);
    digitalWrite(13,LOW);

    // initialize serial communication at 115200 bits per second:

    Serial.begin(115200);
    while (!Serial) {
     ; // wait for serial port to connect. Needed for Leonardo only
    }

    Serial1.begin(115200);
    delay(100);       // delay in between reads for stability
}

void loop() {
    // read from port 1, send to port 0:
    if (Serial1.available()) {
    Serial.write(Serial1.read());
  }

  // read from port 0, send to port 1:
 if (Serial.available()) {
  Serial1.write(Serial.read());
}
}
```

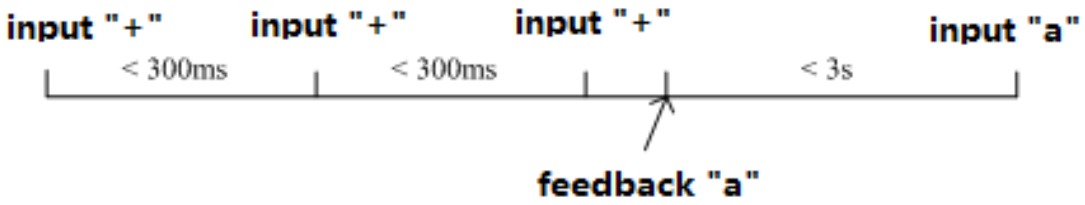
- **Open** Serial Terminal (such as Arduino Serial Monitor)

  Input **+++** via UART

  Module will respond with **a**

- Input **a**

  Module will respond **a+ok**



AT Instruction Set:

Once in Configuration/Command mode user can enter AT command with Carriage Return after each command in Serial Terminal.

Syntax of AT Commands;

'AT + Instruction' is based on the instruction of ASCII command style; the description of syntax format is as follow;

Legend;

< > : Part inside the '<'and '>' is compulsory
[ ] : Part inside the '['and ']' is optional
<CR > : Carriage return, 'Enter' Key, 0x0a or 0x0d in ASCII;

Command Format:

AT+<Command>[Operator][parameter1,parameter2,parameter3,…]**<CR>**

[Operator] could be **'='** to input Parameters and 'Null' for query

Response Format:

+<Response>[operator][parameter1,parameter2,…]**<CR><LF><CR><LF>**

<Response> could be **'ok'** if success and **'ERR'** for failure
[operator] will be **'='**
[Parameter] could be **query command** or **Error code** when error happened;
There are different value of Error Code as described below;

Error Code	Description
-1	Invalid Command Format
-2	Invalid Command
-3	Invalid Operation Symbol
-4	Invalid Parameter
-5	Operation Not Permitted

Once in command mode, try entering AT+H <CR> and you will receive following response.

```
AT+H
+ok
```

```
AT+: NONE command, reply "+ok".
AT+ASWD: Set/Query WiFi configuration code.
AT+E: Echo ON/Off, to turn on/off command line echo function.
AT+ENTM: Goto Through Mode.
AT+NETP: Set/Get the Net Protocol Parameters.
AT+UART: Set/Get the UART Parameters.
AT+UARTF: Enable/disable UART AutoFrame function.
AT+UARTFT: Set/Get time of UART AutoFrame.
AT+UARTFL: Set/Get frame length of UART AutoFrame.
AT+UARTTE: Set/Query UART free-frame triggerf time between two byte.
AT+PING: General PING command.
AT+WAP: Set/Get the AP parameters.
AT+WAKEY: Set/Get the Security Parameters of WIFI AP Mode.
AT+WMODE: Set/Get the WIFI Operation Mode (AP or STA).
AT+WSKEY: Set/Get the Security Parameters of WIFI STA Mode.
AT+WSSSID: Set/Get the AP's SSID of WIFI STA Mode.
AT+WSLK: Get Link Status of the Module (Only for STA Mode).
AT+WSLQ: Get Link Quality of the Module (Only for STA Mode).
AT+WSCAN: Get The AP site Survey (only for STA Mode).
AT+WEBU: Set/Get the Login Parameters of WEB page.
AT+TCPLK: Get The state of TCP link.
AT+TCPTO: Set/Get TCP time out.
AT+TCPDIS: Connect/Dis-connect the TCP Client link
AT+RECV: Recv data from UART
AT+SEND: Send data to UART
AT+WANN: Set/Get The WAN setting if in STA mode.
AT+LANN: Set/Get The LAN setting if in ADHOC mode.
AT+RELD: Reload the default setting and reboot.
AT+RLDEN: Put on/off the GPIO12.
AT+Z: Reset the Module.
AT+MID: Get The Module ID.
AT+VER: Get application version.
AT+H: Help.
```

List of Commands;

AT+ <**enter following instruction**> <CR>

Instruction	Description
<null>	NULL
Network Management Instruction Set	
E	Open/Close show back function
WMODE	Set/Query Wi-Fi work mode (AP/STA/APSTA)
ENTM	Set module into transparent transition mode
TMODE	Set/Query module data transfer mode
Z	Re-start module
H	Help

UART Instruction Set	
UART	Set/Query serial port parameters
UARTFT	Open/Close UART auto-frame function
UARTFT	Set/Query UART auto-frame trigger time
UARTFL	Set/Query UART auto-frame trigger length
UARTTE	Set/Query UART free-frame trigger time between two bytes
Command Mode Instruction Set	
SEND	Send Data at Command Mode
RECV	Receive Data at Command Mode
Network Instruction Set	

PING	Network ”Ping” Instruct i o n
NETP	Set/Query network protocol parameters
MAXSK	Set/Query TCP Client connection number
TCPLK	Query if TCP link already build-up
TCPTO	Set/Query TCP timeout
TCPDIS	Open/Close TCP link
SOCKB	Set/Query SOCKB parameters
TCPDISB	Open/Close SOCKB TCP link
TCPTOB	Set/Query SOCKB TCP timeout
TCPLKB	Query i f SOCKB TCP link already build-up
SNDB	Send data to SOCKB in Command Mode
RCVB	Receive data from SOCKB in Command Mode
Wi-Fi STA Instruction set (Effective when module works as STA)	
WSKEY	Set/Query STA security parameters
WSSSID	Set/Query associated AP SSID parameters
WANN	Set/Query STA’s network parameters
SMAC	Set/Query STA’s MAC address
WSLK	Query STA Wi-Fi link status
WSLQ	Query STA Wi-Fi signal strength
WSCAN	Scan AP
WSDNS	Set/Query STA’s Static DNS server address
Wi-Fi AP Instruction Set (Effective when module works as AP)	
LANN	Set/Query AP’s network parameters
WAP	Set/Query AP Wi-Fi parameters
WAKEY	Set/Query AP security parameters
WAMAC	Set/Query AP MAC address
WADHCP	Set/Query AP DHCP Server status
WADMN	Set/Query AP webpage domain name
WALK	Query MAC address of STA device connecting to module AP

HTTP Instruction Set	
HTTPURL	Set /Query HTTP server IP address and Port Number.
HTTPTP	Set /Query HTTP request type
HTTPPH	Set/Query HTTP protocol header path
HTTPCN	Set/Query Connection of HTTP protocol header
HTTPUA	Set/Query User-Agent of HTTP protocol header
HTTPDT	Send HTTP request or data

Command Description:

Following is the description about how to use each command; **Instructions are in Blue** and Response in **Green colour**.

AT+E

- Function: Enable or disable Echo
- Format:
  - Set Operation:

AT+E=<status><CR>

+ok<CR><LF><CR><LF>

- Parameters:
  - status: Echo status
    - on: Enable echo
    - off: Disable echo

When WiFi Module firstly switches from transparent transmission to configuration mode, Echo is On, input “AT+E” to close Echo, input “AT+E” again to switch Echo On.

AT+WMODE

- Function: Set/Query Wi-Fi work mode. Setting is valid after reset
- Format:
  - Query Operation

AT+WMODE<CR>

+ok=<mode><CR><LF><CR><LF>

  - Set Operation

AT+WMODE=<mode><CR>

+ok<CR><LF><CR><LF>

- Parameters:
  - mode: Wi-Fi work mode
    - AP
    - STA
    - APSTA

AT+ENTM

- Function: Set module into transparent transmission mode
- Format:

AT+ENTM<CR>

+ok<CR><LF><CR><LF>

When operate this command, module switch from configuration mode to transparent transmission mode.

AT+TMODE

- Function: Set/Query data transfer mode. Setting is valid after reset
- Format:
  - Query Operation

    AT+TMODE<CR>

    +ok=<tmode><CR><LF><CR><LF>

  - Set Operation

    AT+TMODE=<tmode><CR>

    +ok<CR><LF><CR><LF>

- Parameters:
  - tmode: data transfer mode, include:
    - throughput : throughput mode
    - cmd : command mode
    - pwm : PWM/GPIO mode

AT+MID

- Function: Query module ID information
- Format:
  - Query Operation

    AT+MID<CR>

    +ok=<module_id><CR><LF><CR><LF>

- Parameters:
  - module_id: Module ID information;
    - Megavizon W1

AT+Z

- Function: Re-start module
- Format:

  AT+Z<CR>

AT+H

- Function: Help;
- Format:
  - Query Operation

AT+H<CR>

+ok=<commandhelp><CR><LF><CR><LF>

- Parameters:
  - command help: command introduction;

AT+UART

- Function: Set/Query serial port parameters. Setting is valid after reset.
- Format:
  - Query Operation

    AT+UART<CR>

    +ok=<baudrate,data_bits,stop_bit,parity><CR><LF><CR><LF>

  - Set Operation

    AT+UART=<baudrate,data_bits,stop_bit,parity><CR>

    +ok<CR><LF><CR><LF>

- Parameters:
  - baudrate:

    600,1200,1800,2400,4800,9600,19200,38400,57600,115200,230400,380400, 460800
  - data_bits:

    8
  - stop_bits:

    1,2
  - parity:
    - NONE
    - EVEN
    - ODD
  - Flowctrl: (CTSRTS)
    - NFC: No hardware flow control
    - FC: hardware flow control

AT+UARTF

- Function: Open/Close UART auto-frame function;
- Format:
  - Query Operation

    AT+UARTF<CR>

    +ok=<para><CR><LF><CR><LF>

  - Set Operation

AT+UARTF=<para><CR>

+ok<CR><LF><CR><LF>

- Parameters:
  - para:
    - disable - Close auto-frame function;
    - enable - Open auto-frame function;

AT+UARTFT

- Function: Set/Query UART auto-frame trigger time;
- Format:
  - Query Operation

AT+UARTFT<CR>

+ok=<time><CR><LF><CR><LF>

  - Set Operation

AT+UARTFT=<time><CR>

+ok<CR><LF><CR><LF>

- Parameters:
  - time: Range 100 ~1000ms

AT+UARTFL

- Function: Set/Query UART auto-frame trigger length;
- Format:
  - Query Operation

AT+UARTFL<CR>

+ok=<len><CR><LF><CR><LF>

  - Set Operation

AT+UARTFL=<len><CR>

+ok<CR><LF><CR><LF>

- Parameters:
  - len: Range 8 ~1000 Byte

AT+UARTTE

- Function: Set/Query UART free-frame trigger time between two bytes;
- Format:
  - Query Operation

AT+UARTTE<CR>

+ok=<mode><CR><LF><CR><LF>

- Set Operation

AT+UARTTE=<mode><CR>

+ok<CR><LF><CR><LF>

- Parameters:
  - mode:
  - ✧ fast: No free-frame trigger time, the uart data may be break into two fragment
  - ✧ normal: free-frame trigger time between two bytes is **50**ms;

AT+SEND

- Function: Send Data to SOCKA at Command Mode.
- Format:

  AT+SEND=<data_lenth><CR>

  +ok<CR><LF><CR><LF>

- Parameters:
  - data_lenth: Length of data. Range: 0~1000 Byte

The UART port will wait 3 seconds for input after this command is sent OK. The data received from UART port is sent to SOCKA. If the interval of two bytes is more than 10ms, the data will be sent instantly.

AT+RECV

- Function: Receive Data from SOCKA at Command Mode.
- Format:

  AT+RECV=<data_length,timeout><CR>

  +ok=<data_length, data_content><CR><LF><CR><LF>

- Parameters:
  - data_length: Length of receive data. Range: 0~1000 Byte
  - timeout: wait for timeout, 0~10 sec
  - data_content: contents of receive data.

If not receive any data in 3 second, then feedback +ok=0.

AT+PING

- Function: Network "PING" Instruction
- Format:
  - Set Operation

AT+PING=<IP_address><CR>

+ok=<sta><CR><LF><CR><LF>

- Parameters:
  - sta: feedback result
    - Success
    - Timeout
    - Unknown host

AT+NETP

- Function: Set/Query network protocol parameters, Setting is valid after reset.
- Format:
  - Query Operation

    AT+NETP<CR>

    +ok=<protocol,CS,port,IP><CR><LF><CR><LF>

  - Set Operation

    AT+NETP=<protocol,CS,port,IP><CR>

    +ok<CR><LF><CR><LF>

- Parameters:
  - protocol:
    - TCP
    - UDP
  - CS: Network mode:
    - SERVER
    - CLIENT
  - Port: protocol port ID: Decimal digit and less than 65535
  - IP: Server's IP address when module set as client

If set as UDP SERVER, the module will save the IP address and port of the latest UDP packet received. The data will be sent to the saved IP address and port. If the module hasn't saved any IP address and port when power up. The data will be sent to the IP address and port which is set by this command.

If set as UDP, CLIENT, the data will always be sent to the IP address and port set by this command.

AT+MAXSK

- Function: Set/ Query TCP Client connection number.
- Format:
  - Query Operation

AT+MAXSK<CR>

+ok=<num><CR><LF><CR><LF>

o Set Operation

AT+MAXSK=<num><CR>

+ok<CR><LF><CR><LF>

- Parameters:
  - o num: TCP Client connection number. Range: 1~5. '5' is the default value it means when the module work in TCP server, it accepts max 5 TCP client connect to it.

AT+TCPLK

- Function: Query if TCP link already build-up;
- Format:

  AT+TCPLK<CR>

  +ok=<sta><CR><LF><CR><LF>

- Parameters:
  - o sta.: if module already setup TCP link;
    - ➢ on: TCP link setup;
    - ➢ off: TCP link not setup;

AT+TCPTO

- Function: Set/Query TCP timeout; Setting is valid after reset.
- Format:
  - o Query Operation

  AT+TCPTO<CR>

  +ok=<time><CR><LF><CR><LF>

  - o Set Operation

  AT+TCPTO=<time><CR>

  +ok<CR><LF><CR><LF>

- Parameters:
  - o time: TCP timeout time.
    - ➢ <= 600, (600s);
    - ➢ >=0, (0 means no timeout);
    - ➢ Default, 300s;

Module begins to count time when TCP channel don't receive any data, clear time counter when TCP channel receive any data. If the t i me

counter reaches the TCPTO, the tcp channel will break. If the module works as TCP Client, it will connect to TCP server instantly and when the module works as TCP Server, the TCP client device should make the connection itself.

AT+TCPDIS

- Function: Open/Close TCP link;
- Format:
  - Query Opera

    AT+TCPDIS<CR>

    +ok=<sta><CR><LF><CR><LF>

  - Set operation

    AT+TCPDIS=<on/off><CR>

    +ok<CR><LF><CR><LF>

- Parameters:

When query, sta.: Feedback if TCP Client can be link,

- ✧ On, TCP link close
- ✧ off，TCP link on

When setting, “off” means close TCP link. After finish this command, module disconnects TCP link and does not connect again. “On” means open TCP link. After finish this command, module re- connect to TCP server right away.

AT+SOCKB

- Function: Set/Query SOCKB parameters. Setting is valid after reset.
- Format:
  - Query Operation

    AT+SOCKB<CR>

    +ok=<protocol,port,IP><CR><LF><CR><LF>

  - Set Operation

    AT+SOCKB=<protocol,port,IP><CR>

    +ok<CR><LF><CR><LF>

- Parameters:
  - Protocol: Protocol type:
    - ➢ TCP: Only for TCP Client
    - ➢ UDP: UDP Client

- UDPS: UDP Server
  - Port: Protocol Port in decimal, less than 65535
  - IP: Destination IP address, domain name is support

If set as UDP SERVER, the module will save the IP address and port of the latest UDP packet received. The data will be sent to the saved IP address and port. If the module hasn't saved any IP address and port when power up. The data will be sent to the IP address and port which is set by this command.

If set as UDP,CLIENT, the data will always be sent to the IP address and port set by this command.

AT+TCPDISB

- Function: Open/Close SOCKB connection
- Format:
  - Query Operation

    AT+TCPDISB<CR>

    +ok=<sta><CR><LF><CR><LF>

  - Set Operation

    AT+TCPDISB=<on/off><CR>

    +ok<CR><LF><CR><LF>

- Parameters:

When setting, "off" means close TCP link. After finish this command, module disconnect TCP link and not co nnect again. "On" means open TCP link. After finish this command, module re- connect TCP server right away.

AT+TCPTOB

- Function: Set/Query Operation SOCKB TCP timeout. Setting is valid after reset.
- Format:
  - Query Operation

    AT+TCPTOB<CR>

    +ok=<time><CR><LF><CR><LF>

  - Set Operation

    AT+TCPTOB=<time><CR>

    +ok<CR><LF><CR><LF>

- Parameters
  - Time: TCP timeout

- <= 600:600s
- >=0:0 means no timeout
- Default:300s

If the SOCKB TCP doesn't receive any data from TCP server for TCP timeout setting, the module will break and reconnect the TCP server. If it receive data from server, the timeout counter will be clear.

AT+TCPLKB

- Function: Query SOCKB connection status
- Format:

  AT+TCPLKB<CR>

  +ok=<sta><CR><LF><CR><LF>

- Parameters:
  - sta.: SOCKB connection status
    - on: TCP connected
    - off: TCP disconnected

AT+SNDB

- Function: Send data to SOCKB at command Mode
- Format:

  AT+SNDB=<data_lenth><CR>

  +ok<CR><LF><CR><LF>

- Parameters:
  - data_lenth: Length of data. Range: 0~1000 Byte

The UART port will wait 3 seconds for input after this command is sent OK. The data received from UART port is sent to SOCKB. If the interval of two bytes is more than 10ms, the data will be sent instantly.

AT+RCVB

- Function: Receive data from SOCKB at Command Mode
- Format:

  AT+RCVB=<data_lenth><CR>

  +ok=<data_lenth,data_content><CR><LF><CR><LF>

- Parameters:
  - data_lenth: Length of received data. Range: 0~1000 Byte
  - data_content: contents of received data.

If not receive any data in 3 second, then feedback +ok=0.

AT+WSSSID

- Function: Set/Query Wi-Fi associated AP SSID parameters. Setting is valid after reset.
- Format:
  - Query Operation

    AT+WSSSID<CR>

    +ok=<ap'sssid><CR><LF><CR><LF>

  - Set Operation

    AT+WSSSID=<ap's ssid ><CR>

    +ok<CR><LF><CR><LF>

- Parameters:
  - ap's ssid: AP's SSID (Within 32 character);

AT+WSKEY

- Function: Set/Query STA security parameters. Setting is valid after reset.
- Format:
  - Query Operation

    AT+WSKEY<CR>

    +ok=<auth,encry,key><CR><LF><CR><LF>

  - Set Operation

    AT+WSKEY=<auth,encry,key><CR>

    +ok<CR><LF><CR><LF>

- Parameters:
  - auth: Authentication mode
    - OPEN
    - SHARED
    - WPAPSK
    - WPA2PSK
  - encry: Encryption algorithm
    - NONE: When "auth=OPEN", effective
    - WEP: When "auth=OPEN" or "SHARED", effective
    - TKIP: When "auth= WPAPSK" or "WPA2PSK", effective
    - AES Whe "auth= WPAPSK" "WPA2PSK", effective
  - key: password, ASCII code, shall less than **64 bit** and greater than **8bit**

AT+WANN

- Function: Set/Quer STA network setting. Setting is valid after reset.
- Format:
  - Query O on

    AT+WANN<CR>

    +ok=<mode,address,mask,gateway><CR><LF><CR><LF>

  - et Operation

    AT+WANN=<mode,address,mask,gateway><CR>

    +ok<CR><LF><CR><LF>

- Parameters:
  - mode: STA's IP network setting
    - static: Static IP
    - DHCP: Dynamic IP
  - address: STA IP address;
  - mask: STA subnet mask;
  - gateway: STA gateway address;

AT+WSMAC

- Function: Set/Query STA MAC address parameters. Setting is valid after reset.
- Format:
  - Query Operation

    AT+WSMAC<CR>

    +ok=<mac_address><CR><LF><CR><LF>

  - Set Operation

    AT+WSMAC=<code,mac_address><CR>

    +ok<CR><LF><CR><LF>

- Parameters:
  - code: security code
    - 8888 (default value)
  - Mac_address: STA MAC address, such as ACCF23FF1234

AT+WSLK

- Function: Query STA WiFi link status
- Format:
  - Query Operation

    AT+WSLK<CR>

    +ok=<ret><CR><LF><CR><LF>

- Parameters:
  - ret
    - ”Disconnected”, if no WiFi connection;
    - ”AP’ SSID (AP’s MAC”), if WiFi c onnection available;

AT+WSLQ

- Function: Query STA WiFi signal strength;
- Format:
  - Query Operation

  AT+WSLQ<CR>

  +ok=<ret><CR><LF><CR><LF>
- Parameters:
  - ret
    - ”Disconnected”, if no WiFi connection;
    - ”AP’s WiFi signal strength” , if WiFi connection available;

AT+WSCAN

- Function: Scan AP;
- Format:

  AT+WSCAN<CR>

  +ok=<ap_site><CR><LF><CR><LF>
- Parameters:
  - ap_site: AP searched;

AT+WSDNS

- Function: Set/Query STA static DNS server address;
- Format:
  - Query Operation

  AT+WSDNS<CR>

  +ok=<address><CR><LF><CR><LF>
  - Set Operation

  AT+WSDNS=<address><CR>

  +ok<CR><LF><CR><LF>
- Parameters:
  - address: STA’s DNS server address; Effective right away.

AT+LANN

- Function: Set/Query AP's network parameters. Setting is valid after reset.
- Format:
  - Query Operation

    AT+LANN<CR>

    +ok=<ipaddress,mask><CR><LF><CR><LF>

  - Set Operation

    AT+LANN=<ipaddress,mask><CR>

    +ok<CR><LF><CR><LF>

- Parameters:
  - ipaddress: AP's IP address;
  - mask: AP's net mask;

AT+WAP

- Function: Set/Query AP Wi-Fi parameters. Setting is valid after reset.
- Format:
  - Query Operation

    AT+WAP<CR>

    +ok=<wifi_mode,ssid,channel><CR><LF><CR><LF>

  - Set Operation

    AT+WAP=<wifi_mode,ssid,channel><CR>

    +ok<CR><LF><CF><LF>

- Parameters:
  - wifi_mode: Wi-Fi mode, include:
    - 11B
    - 11BG
    - 11BGN (Default Value)
  - ssid: SSID at AP mode
  - channel: Wi-Fi channel selection:
    - AUTO;(Default CH1)
    - CH1~CH11;

AT+WAKEY

- Function: Set/Query AP Wi-Fi security parameters. Setting is valid after reset.
- Format:
  - Query Operation

AT+WAKEY<CR>

+ok=<auth,encry,key><CR><LF><CR><LF>

- Set Operation

AT+WAKEY=<auth,encry,key><CR>

+ok<CR><LF><CR><LF>

- Parameters:
  - auth: include
    - OPEN
    - WPA2PSK
  - Encry: include
    - NONE: When "auth=OPEN" available;
    - AES: When "auth=WPA2PSK" available;
  - key: security code, ASCII code, smaller than 64bit and bigger than 8 bit;

AT+WAMAC

- Function: Query AP MAC address parameters;
- Format:
  - Query Operation

AT+WAMAC<CR>

+ok=<mac_address><CR><LF><CR><LF>

- Parameters:
  - mac_address:A 's MAC address;

Note: Module AP mode's MAC address i s related to STA mode's MAC address.

AT+WADHCP

- Function: Set/Query AP DHCP server status; Setting is valid after reset.
- Format:
  - Query Operation

AT+WADHCP<CR>

+ok=<status><CR><LF><CR><LF>

- Set Operation

AT+WADHCP=<status><CR>

+ok<CR><LF><CR><LF>

- Parameters:
  - status: AP's DHCP server function status:

- on: DHCP Server Open;
- off: DHCP Server Close:

AT+WADMN

- Function: Set/Query AP webpage domain name;
- Format:
  - Query Operation

    AT+WADMN<CR>

    +ok=<domain_name><CR><LF><CR><LF>

  - Set Operation

    AT+WADMN=<domain_name><CR>

    +ok<CR><LF><CR><LF>
- Parameters:
  - Domain_name: Webpage domain name (within 20 characters, can't be all numbers)

AT+WALK

- Function: Query MAC address of STA device connecting to module AP
- Format:
  - Query Operation

    AT+WALK<CR>

    +ok=<status><CR><LF><CR><LF>
- Parameters:
  - status: MAC address of STA device connecting to module AP.
    - No Connection: No STA device co nnecting to module AP;

AT+PLANG

- Function: Set/Query webpage language option;
- Format:
  - Query Operation

    AT+PLANG<CR>

    +ok=<language><CR><LF><CR><LF>

  - Set Operation

    AT+PLANG=<language><CR>

    +ok<CR><LF><CR><LF>
- Parameters:
  - language: webpage's language

- CN: Chinese Version (Default);
- EN: English Version;

AT+UPURL

- Function: Set/ Query remote upgrade URL address;
- Format:
  - Query Operation

    AT+UPURL<CR>

    +ok=<url><CR><LF><CR><LF>

  - Set Operation

    AT+UPURL=<url,filename><CR>

    +ok<CR><LF><CR><LF>

- Parameters:
  - url: the upgrade file url address; the last charter shall be "/" (within 20 characters).
  - filename: the upgrade file name, it's optional and not saved parameter. If provide this file name here, the module will start upgrade right away;

AT+UPFILE

- Function: Set/ Query remote upgrade configure file name;
- Format:
  - Query Operation

    AT+UPFILE<CR>

    +ok=<filename><CR><LF><CR><LF>

  - Set Operation

    AT+UPFILE=<filename><CR>

    +ok<CR><LF><CR><LF>

- Parameters:
  - filename: upgrade configure file name (within 20 characters).

AT+ LOGSW

- Function: Open/Close remote upgrade log file
- Format:
  - Query Operation

AT+LOGSW<CR>

+ok=<status><CR><LF><CR><LF>

- Set Operation

AT+LOGSW=<status><CR>

+ok<CR><LF><CR><LF>

- Parameters:
  - status:
    - on: Open. The UART Port will print some upgrade status when upgrading. the log file will be sent to UDP Port after successfully
    - off: Close.

AT+LOGPORT

- Function: Set/Query remote upgrade UDP port of log file.
- Format:
  - Query Operation

AT+LOGPORT<CR>

+ok=<port><CR><LF><CR><LF>

- Set Operation:

AT+LOGPORT =<port><CR>

+ok<CR><LF><CR><LF>

- Parameters:
  - port: The remote upgrade UDP port of log file.

AT+UPST

- Function: Start remote upgrade;
- Format:
  - Query Operation

AT+UPST<CR>

+ok=<log><CR><LF><CR><LF>

- Parameters:
  - log: feedback the status of remote upgrade;

After execute this command; WiFi Module will automatically start upgrading base on the setting of UPURL, UPFILE command contents;

AT+WEBU

- Function: Set/Query webpage user name and password; Setting is valid after reset.
- Format:
  - Query Operation

    AT+WEBU<CR>

    +ok=<username,password><CR><LF><CR><LF>

  - Set Operation

    AT+WEBU=<username,password><CR>

    +ok<CR><LF><CR><LF>

- Parameters:
  - username: User Name, within 15 characters, not support empty.
  - password: password, within 15 characters, support empty.

AT+MSLP

- Function: Set/Query deep sleep/standby mode parameters;
- Format:
  - Query Operation

    AT+MSLP<CR>

    +ok=<ret><CR><LF><CR><LF>

  - Set Operation

    AT+MSLP=<mode><CR><LF><CR><LF>

- Parameters:
  - ret:
    - normal: normal mode (100ms interval)
  - mode:
    - normal: normal mode (100ms interval)
    - standby: WiFi shut down mode

AT+NTPRF

- Function: Set /Query time calibration interval
- Format:
  - Query Operation

    AT+NTPRF<CR>

    +ok=<num><CR><LF><CR><LF>

  - Set Operation

AT+NTPRF=<num><CR>

+ok<CR><LF><CR><LF>

- Parameters:
  - num: Time calibration inverval, range:0~720, default:30 minutes, 10 minutes for each step, set 0 means no time calibration automatically.

AT+NTPEN

- Function: Enable/Disable time calibration function. Setting is valid after reset.
- Format:
  - Query Operation

AT+NTPEN<CR>

+ok=<status><CR><LF><CR><LF>

  - Set Operation

AT+NTPEN=<status><CR>

+ok<CR><LF><CR><LF>

- Parameters:
  - status：Status of time calibration
    - on：Enable time calibration
    - off：Disable time calibration

AT+NTPTM

- Function: Query network time
- Format:
  - Query Operation

AT+NTPTM<CR>

+ok=<time><CR><LF><CR><LF>

- Parameters:
  - time：network time, for example: 2015-02-15 15:10:31 Sun, if it shows 'Not Available' means that the time calibration function is not enabled or the module isn't connect to the internet.

AT+NTPSER

- Function: Set/Query NTP server IP address
- Format:
  - Query Operation

AT+NTPSER<CR>

+ok=<ipaddress><CR><LF><CR><LF>

- Set Operation

AT+NTPSER=<ipaddress><CR>

+ok<CR><LF><CR><LF>

- Parameters:
  - ipaddress: NTP network server IP address

AT+WRMID

- Function: Set module ID;
- Format:
  - Set Operation

AT+WRMID=<wrmid> <CR><LF><CR><LF>

- Parameters:
  - wrmid: set module's ID (within 20 characters).

AT+ASWD

- Function: Set/Query WiFi Configuration Password;
- Format:
  - Query Operation

AT+ASWD<CR>

+ok=<aswd><CR><LF><CR><LF>

  - Set Operation

AT+ASWD=<aswd> <CR><LF><CR><LF>

- Parameters:
  - aswd: WiFi Configuration Password (within 20 characters).

AT+MDCH

- Function: Set Wi-Fi Auto Switch Function. Setting is valid after reset.
- Format:
  - Query Operation

AT+MDCH<CR>

+ok=<mode> <CR><LF><CR><LF>

  - Set Operation

AT+MDCH=<mode> <CR><LF><CR><LF>

- Parameters:
  - mode: Wi-Fi Auto Switch Mode
    - off: Disable Wi-Fi auto switch.

- on: Enable Wi-Fi auto switch. When the module(STA mode) fail to connect to router, it will switch to AP mode itself in one minute.
- auto: Enable Wi-Fi auto detect function. The module will reset itself when encounter any abnormal. The default time interval is 10 minutes. **(default mode)**
- 3-120: unit: minute. S the time interval to reset itself when abnormal.

AT+TXPWR

- Function: Set/Query Wi-Fi Transmit Power, Real Transmit Power=Default Transmit Power (16dBm) – [Setting Value] * 0.5dBm. Setting is valid after reset.
- Format:
  - Query Operation

    AT+TXPWR <CR>

    +ok=<num><CR><LF><CR><LF>

  - Set Operation

    AT+TXPWR=<num><CR>

    +ok<CR><LF><CR><LF>

- Parameters:
  - num: [Setting Value]. The default is 0, it can be sent from 0 ~ 24. If set to 24, the module transmit power will be at a minimum of 4dBm. Reboot to make this setting change valid. It will not restore to default if reload the module.

AT+WPS

- Function: Start WPS function
- Format:
  - Query Operation

    AT+WPS<CR>

    +ok=<status><CR><LF><CR><LF>

- Parameters:
  - status: WPS status. The module will reboot and work in STA mode connecting to specific router when WPS communication is OK.
    - WPS Sp an Failed: WPS communication is failed.

Note: The router WPS function must be open first then enable module WPS Scan function. The module will quit WPS scan status if there is no WPS router in 5 seconds. If the router's WPS is enabled, the mode will reboot and enter WPS mode without reply +ok.

AT+WPSBTNEN

- Function: Enable/Disable WPS function.
- Format:
  - Query Operation

    AT+WPSBTNEN<CR>

    +ok=<status> <CR><LF><CR><LF>

  - Set Operation

    AT+ WPSBTNEN =<status><CR>

    +ok<CR><LF><CR><LF>

- Parameters:
  - status:
    - on: Enable WPS function
    - off: Disable WPS function.

Note: The router WPS function must be open first then enable module WPS Scan function. The module will quit WPS scan status if there is no WPS router in 5 seconds.

AT+WIFI

- Function: Enable/Disable Wi-Fi Command
- Format:
  - Query Operation

    AT+WIFI<CR>

    +ok=<status><CR><LF><CR><LF>

  - Set Operation

    AT+WIFI =<status><CR>

    +ok<CR><LF><CR><LF>

- Parameters:
  - status: Wi-Fi status.
    - UP(boot default status): Enable Wi-Fi Chip
    - DOWN: Disable Wi-Fi Chip

AT+SMEM

- Function: Query the RAM status.
- Format:
  - Query Operation

    AT+SMEM<CR>

    +ok=<status> <CR><LF><CR><LF>

- Parameters:
  - status: The RAM status.

HTTP commands

AT+HTTPURL

- Function: Set /Query HTTP server IP address and Port Number.
- Format:
  - Query Operation

    AT+HTTPURL<CR>

    +ok=<IP,Port><CR><LF><CR><LF>

  - Set Operation

    AT+HTTPURL=<IP,Port><CR>

    +ok<CR><LF><CR><LF>

- Parameters:
  - IP：IP address.
  - Port: Port number.

AT+HTTPTP

- Function: Set /Query HTTP request type
- Format:
  - Query Operation

    AT+HTTPTP<CR>

    +ok=<Type><CR><LF><CR><LF>

  - Set Operation

    AT+HTTPTP=<Type><CR>

    +ok<CR><LF><CR><LF>

- Parameters:
  - Type：GET(default) or POST

AT+HTTPPH

- Function: Set/Query HTTP protocol header path.
- Format:
  - Query Operation

    AT+HTTPPH<CR>

    +ok=<Path><CR><LF><CR><LF>

- Set Operation

AT+HTTPPH=<Path><CR>

+ok<CR><LF><CR><LF>

- Parameters:
  - Path： Max length is 50 bytes.

AT+HTTPCN

- Function: Set/Query Connection of HTTP protocol header
- Format:
  - Query Operation

AT+HTTPCN<CR>

+ok=<Connection><CR><LF><CR><LF>

  - Set Operation

AT+HTTPCN=<Connection><CR>

+ok<CR><LF><CR><LF>

- Parameters:
  - Connection: Max length is 20 bytes.

AT+HTTPUA

- Function: Set/Query User-Agent of HTTP protocol header.
- Format:
  - Query Operation

AT+HTTPUA<CR>

+ok=<Parameter><CR><LF><CR><LF>

  - Set Operation

AT+HTTPUA=<Parameter><CR>

+ok<CR><LF><CR><LF>

- Parameters:
  - Parameter: Max length is 20 bytes.

AT+HTTPDT

- Function: Send HTTP request or data.
- Format:
  - Set Operation

AT+HTTPDT=<Data><CR>

+ok<CR><LF><CR><LF>

- Parameters:
  - Data：HTTP request data, send AT+HTTPDT directly if no data to be sent.

HTTP Example

HTTP parameter settings are as follows：

Set HTTP server address and port	AT+HTTPURL=192.168.1.1,80
(optional)Set HTTP request type	AT+HTTPTP=POST
Set HTTP protocol header path	AT+HTTPPH=/abcd
Set HTTP Connection area	AT+HTTPCN= keep-alive
Set HTTP User-Agent area	AT+HTTPUA= MangoCube

If send "AT+HTTPDT", the data packet will be sent as the following instance including the two new line:

```
POST /abcd HTTP/1.1
Connection:keep-alive
User-Agent: MangoCube
Content-Length:0
Host:192.168.0.127:8999
```

If send AT+HTTPDT=1234, the data packet will be sent as the following instance:

```
POST /abcd HTTP/1.1
Connection:keep-alive
User-Agent: MangoCube
Content-Length:4
Host:192.168.0.127:8999
1234
```

The data received from HTTP server will be output to serial port and end with "+ok".

If the module hasn't received data from HTTP server or 5 second, it will cut the TCP link with HTTP server.

Application:

- Remote control/ monitoring
- Industrial sensors and controls
- Telemetering
- Home automation

- Asset tracking
- Wireless Medical devices

Examples:

Coming soon..