RAK410 Programming Manual

Version 2.1

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1. Overview

1.1 Module Introduction

RAK410 module is a Wi-Fi module that fully supports IEEE 802.11b/g/n wireless standards, with internally integrated TCP/IP protocol stack, supporting numerous protocols such as ARP, IP, ICMP, TCP, UDP, DHCP CLIENT, DHCP SERVER, HTTP, DNS, etc. Host communicates with module by AT commands via UART or SPI interface, facilitating user setting up network and sending/receiving data. Through UART interface, the maximum transmission rate is up to 640kbps. The RAK410 module supports 5 power management modes, with power consumption as low as 0.5uA, completely realizing low-power design for customer.

1.2 Device Features

- Support IEEE 802.11b/g/n protocol
- Support UART / SPI Interface
- Support UART communication with data flow control, with maximum rate of 921600bps
- Support AT commands
- Support Station Mode, Ad-hoc Mode and AP Mode
- Support DHCP SERVER / DHCP CLIENT
- Support OPEN, WEP, WPA-PSK, WPA2-PSK, WPS Encryptions
- Support TCP, UDP protocols, with maximum 8 UDP/TCP connections
- Sending data supports command transfer mode and transparent transmission mode
- Support parameters store; through pin control the module after power on can enter directly into the transparent transmission mode without any command
- Under transparent transmission mode, support TCP automatically reconnection and wireless-disconnected automatically reconnection
- Support webpage-based parameter configuration
- Support parameters store, automatically load parameters after reset
- Support parameters store in Deep Sleep State, with connection time as fastest as 300ms
- 5 kinds power working modes, with minimum power consumption as 0.5 uA

2. UART Interface

2.1. UART Configuration

RAK410 supports the following serial interface rates:

- **9600 bps**
- **19200 bps**
- **38400 bps**
- **57600 bps**
- **115200 bps**
- **200000 bps**
- **230400 bps**
- **460800 bps**
- **921600 bps**

By AT command at+uartconfig, the host can modify UART parameters, including stop bit, data bit, parity check and flow control switch. The module default configuration is as follows:

1)Baud Rate = 115200
2)Data Bit = 8
3)parity check = N/A
4)Stop bit = 1
5)No flow control

Note:

If unable to communicate due to UART parameter configuration error, user can enter BOOT mode by MCU_BOOT pin or by at+del_data command, restore the default baud rate settings.

2.2. Dataflow Control UART_RTS and UART_CTS

RAK410 supports hardware dataflow control

Request to send (RTS) pin ------------------------UART_RTS--------------output
Clear to send (CTS) pin------------------------UART_CTS--------------input

Mode		UART_RTS		UART_CTS	
Command	AP Mode	Vih	AP established, device is not connected or device is disconnected	Vih	Module stops outputting data
		Vil	Device is connected		
	STATION/ADHOC	Vih	Wireless network is disconnected	Vil	Module outputs data

		Vil	Wireless network is connected		normally
Transparent Transmission		Vih	transparent transmission in preparation	Vih	Module stops outputting data
			Module wireless network is disconnected with AP		
			Device wireless network is disconnected with Module		
			TCP is disconnected	Vil	Module outputs data normally
			Data transmission is blocking		
		Vil	Normal data transmission		

If module is working in command mode, UART_RTS is used to tell module network connection status (see above table).

If module is working in transparent mode, UART_RTS is pulled high, the external MCU should immediately stop sending data and wait for UART_RTS getting low.

When UART_CTS pin receives the rising edge, the module stops sending data to the host, and starts data transmission when pin receives the falling edge. If the module is working in Power Mode 3 or Power Mode 4, this pin can also be used to wake the module.

Note: The pin's interval of the rising edge and the falling edge cannot be less than 1us.

If flow control is disabled, any signal from UART_CTS will not affect the module data transmission (wake-up module function remains unchanged), but UART_RTS remains the same function, the user can make the pin left unconnected.

3. Initiate

The initiating time for RAK410 is about 210ms; if abnormal initiating occurs，UART will output the followings:

ASCII------- Welcome to RAK410\r\n

HEX-------- 57 65 6C 63 6F 6D 65 20 74 6F 20 52 41 4B 34 31 30 0D 0A

4. Transparent Transmission Mode

RAK410 supports transparent transmission, allowing users sending and receiving data without any command input, thus reducing the burden on the host. In transparent mode, RAK410 supports TCP reconnection, wireless network reconnection, improving reliability of the transmission.

User can enter into the transparent mode through three ways:

1. After having created or connected TCP/UDP port, enter by sending commands *at + easy_txrx \ r \ n*.
2. After having created or connected TCP/UDP port, save the current configuration parameters to Flash by command *at + storeconfig*, and enable loading parameters after boot via *at + storeenable = 1*, then reset the module, while keep the UART_MODE pin to high, waiting until the module is connected; if UART_RTS goes low, it indicates that the module successfully entered the pass-through mode, If UART_ERROR pulled up, it indicates a failure to enter the pass-through mode.
3. Enter the WEB SERVER, and configure parameters including TCP / UDP connection and network information, then restart the module, while keep the UART_MODE pin to high, waiting until the module is connected; If UART_RTS goes low, it indicate that the module is successfully entered the pass-through mode if UART_ERROR pulled up, it indicates a failure to enter the pass-through mode.

Note:

In pass-through mode, the module can only respond to the first connection, other connection is invalid; however in the ludp mode, multiple connections can respond to several operations for more information, see command *at+ludp*

5. Storing Configuration Parameters

RAK410 supports storing user's parameters to Flash, including scanned information, passwords, IP addresses, and so on. After IP is configured, user can store these configurations by *at + storeconfig*. When *at + storeenable = 1*, these parameters can be automatically loaded after module reboots. If UART_MODE pin is high, the module will automatically create or connect to a TCP or UDP port, and enter the transparent mode.

Note:

If abnormal initiating occurs caused by parameter store error, user can enter BOOT mode by MCU_BOOT pin or by at+del_data command , then delete all parameters via command.

6. Power Management

6.1 Power Mode

RAK410 supports 5 power modes through configuring *at+pwrmode=<mode>* as below:

Mode	Command	Para	Control	Wireless		Min Power

		meter	part	part	Wake-Up Type	Consumption (AP)
0	at+pwrmode=	0	Normal_Mode	Max_Perf	No need	100mA
1	at+pwrmode=	1	Sleep_Mode	Power_Save	No need	20mA
2	at+pwrmode=	2	Sleep_Mode	Shut_down	Command=at+ wake_up	2mA
3	at+pwrmode=	3	Deep_Sleep	Power_Save	Interrupt	3mA
4	at+pwrmode=	4	Deep_Sleep	Shut_down	Interrupt	0.5uA

0)at+pwrmode=0——————Mode 0

Module works under the maximum performance, control part and wireless part are fully opened.

1)at+pwrmode=1——————Mode 1

Control part and wireless part switch into low consumption mode, module can however still receive and transmit data by command, yet lower module performance.

2)at+pwrmode=2——————Mode 2

In the current mode, module saves connection status to RAM, and shuts down the power of wireless part, then control part switches into low consumption. Module can receive commands, however, only *at+wake_up* is valid, any other command would cause fatal errors. If back to work, simply enters *at+wake_up* command to wake up module, then the module should switch into working mode rapidly.

3)at+pwrmode=3——————Mode 3

Control part enters into deep sleep, cannot respond to any command. However, wireless part keeps current connective status, and the module can be wakened up by either transmitting remote data or external interrupting pin (MCU_WAKE, rising edge is valid), then enters Mode 1, and works normally.

4)at+pwrmode=4——————Mode 4

When enters into this mode, module firstly saves current connective status to RAM, and shuts down the power of wireless part, then control part enters into deep state. In this state, module cannot respond to any command or wireless data, lowering consumption to minimum. The module can be wakened up by external interrupting pin (MCU_WAKE, rising edge is valid), and back to the power mode from sleep mode.

6.2 Power Mode Switch

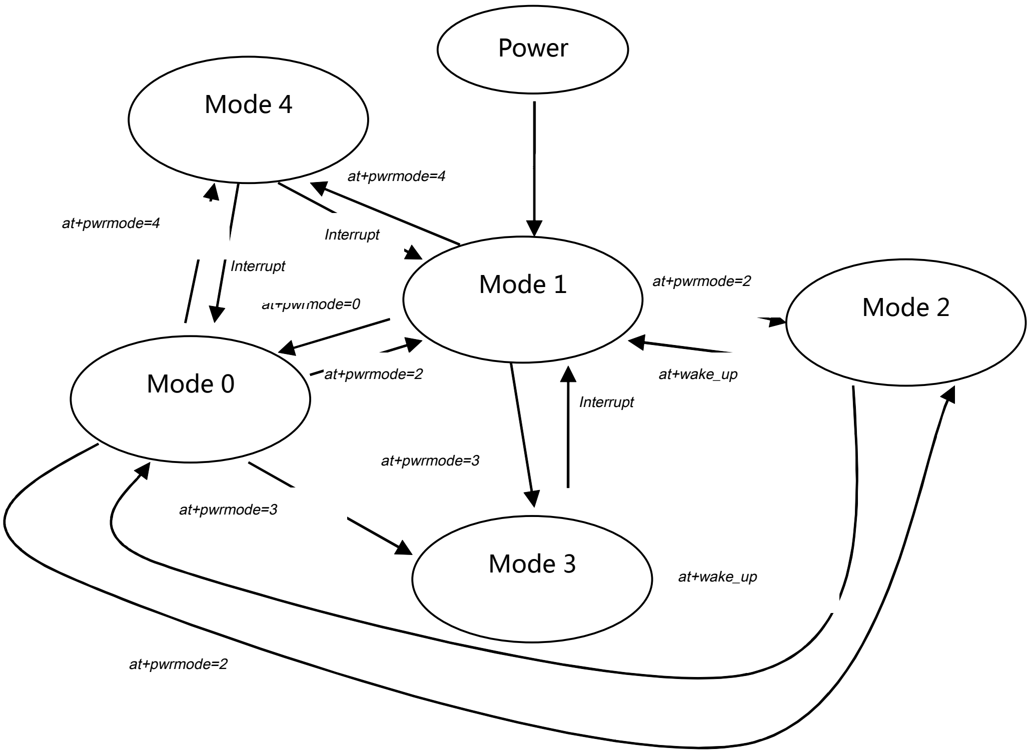
Mode 0---------Switch to any mode by entering corresponding command.

Mode 1---------Switch to any mode by entering corresponding command.

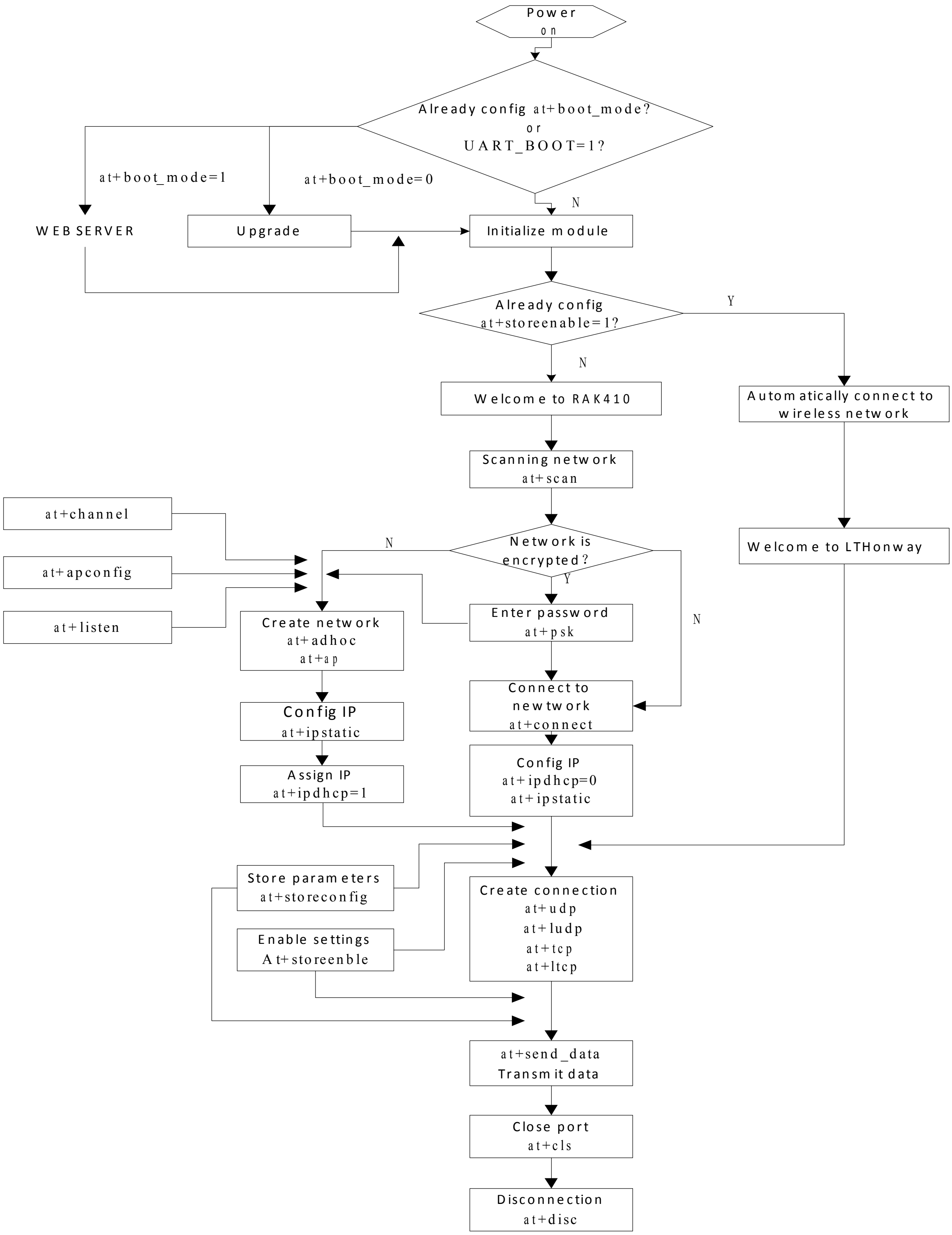
Mode 2---------Only *at+wake_up* command to wake up, then enter into the mode before

Mode 3---------Cannot enter any command, enter into Mode 1 by interrupt-way wakeup

Mode 4-------- Cannot enter any command, enter into the mode before by interrupt-way wakeup


Power
Mode 4
Mode 1
Mode 2
Mode 0
Mode 3
at+pwrmode=4
at+pwrmode=4
Interrupt
Interrupt
at+pwrmode=0
at+pwrmode=2
at+pwrmode=2
at+wake_up
Interrupt
at+pwrmode=3
at+pwrmode=3
at+wake_up
at+pwrmode=2

7. Module Commands Flow Chart


Power on
Already config at+boot_mode? or UART_BOOT=1?
at+boot_mode=1
at+boot_mode=0
N
WEB SERVER
Upgrade
Initialize module
Already config at+storeenable=1?
Y
N
Welcome to RAK410
Automatically connect to wireless network
Scanning network at+scan
at+channel
at+apconfig
at+listen
N
Network is encrypted?
Y
N
Welcome to LTHonway
Create network at+adhoc at+ap
Enter password at+psk
Connect to newtwork at+connect
Config IP at+ipstatic
Config IP at+ipdhcp=0 at+ipstatic
Assign IP at+ipdhcp=1
Store parameters at+storeconfig
Create connection at+udp at+ludp at+tcp at+ltcp
Enable settings At+storeenble
at+send_data Transmit data
Close port at+cls
Disconnection at+disc

8. AT Command

RAK410 communicates with host through AT commands.

8.1. Syntax

Host to Module:

at+<command>=<parameter 1>,<parameter 2>,...........<para n>\r\n

All AT commands from host to module are ASICII, for example:

at+psk=lthonway\r\n

at+connect=LTHonway\r\n

After each command is executed, the module returns value to the host, the third byte of the return value is <code>, shown as below:

1) If executed successfully, return value is:

OK\r\n

or

OK<parameter 1><parameter 2>......................<parameter n>\r\n

Note:

Except for OK, the other parameters are hexadecimal,

```
OK\r\n        HEX=4F 4B 0D 0A-------------------------------No parameter
OK@\r\n       HEX=4F 4B 64 0D 0A---------------------------parameter = 0x64
```

2) If failed to executed, then returns

ERROR<code>

Note:

ERROR is ASCII code, <code> is hexadecimal, for example:

ERROR ?\r\n HEX=45 52 52 4F 52 FE 0D 0A---------------<code>=oxFE

AT Syntax description

AT command begins with "at+" (low case), and ends with "\r\n", maximum length is 80 bytes, any other format is regard as error.

Note:

All the AT syntax above is not applicable to command at+recv_data and at+send_data , for more information please refer to at+recv_data and at+send_data.

8.2. Error Code

Code(HEX)	Description
-1	Input parameter error *(Parameter not recognized/Missing parameter/syntax is long/other illegal parameter)*
-2	Bad command error *(re-enter command)*
-10	System error *(re-enter command or reset module)*
-11	Fatal error *(Must reset module)*

Other	Refer to the specific command

8.3. Command Description

8.3.1. Scanning Wireless Network

Command

at+scan=<channel>,<ssid>\r\n

Description

Scan wireless networks, capturing wireless information, such as encrypted message, channel, signal intensity, BSSID, and so on.

Note:

If the network to be connected is encrypted, this command is mandatory; if the network is public, this command is optional.

Parameter description

The scan command contains two parameter, <channel> is the channel scanned, value range is 1-11, if value is set to 0, all channels are to be scanned, <ssid> is the assigned SSID, optional.

Note:

Specifying certain channel(s) can shorten scan time!

Parameter	Value	Description
<channel>	1-11	Scanning specified channel(s) (1-11), scan all channels if value is 0.
<ssid>	Service name	Specified SSID (optional)

Example:

at+scan=0 \r\n-------------------------Scan all channels
at+scan=0,LTHonway\r\n------------Scan the service named"LTHonway"in all channels
at+scan=8,LTHonway\r\n------------Scan the service named"LTHonway"in channel 8
at+scan=6 \r\n-------------------------Scan all the SSID in channel 6

Return Value Description

If command executed successfully, OK is returned as well as the network number that has been scanned (maximum: 16). Use command at+get_scan to get network information.

Note:

When at+ascii = 1, module returns all information!

Parameter	Format	Length(byte)	Description
Command successful			
OK	ASCII	2	Network is scanned

<SCAN NUM>	HEX	1	Number of network scanned	
\r\n	ASCII	2	End mark	
Command failed				
ERROR	ASCII	5	Error	
<CODE>	HEX	1	0XFE=-2	1. cannot find available SSID 2. cannot find specified SSID
\r\n	ASCII	2	End mark	
Note				

8.3.2. Getting Scanned Information

Command

at+get_scan=<scan_num>\r\n

Description

Get scanned information. Use this command after *at+scan* command.

Note:

1. *If no need to get wireless network information, this command can be omitted!*
2. *After all scanned information is got, if get again, error-2 will be returned ,then command at+scan has to be execute!*
3. *Under* at+ascii=1 *mode, this command is invalid!*

Parameter description

<scan_num> scans the number of information scanned. If the value set is greater than the actual number of scanned information, then the actual number is returned.

Parameter	Value	Description
<scan_num>	> 0	Get the number of scanned information

Example:

at+get_scan=10\r\n-------------------Get 10 wireless network information

Return Value Description

<table>
<tr><th>Parameter</th><th>Format</th><th>Length (byte)</th><th colspan="8">Description</th></tr>
<tr><td colspan="11">Command successful</td></tr>
<tr><td>OK</td><td>ASCII</td><td>2</td><td colspan="8">Get information correctly</td></tr>
<tr><td>&lt;SSID&gt;</td><td>HEX</td><td>33</td><td colspan="8">SSID</td></tr>
<tr><td>&lt;BSSID&gt;</td><td>HEX</td><td>6</td><td colspan="8">BSSID</td></tr>
<tr><td>&lt;CHANNEL&gt;</td><td>HEX</td><td>1</td><td colspan="8">Channel</td></tr>
<tr><td>&lt;RSSI&gt;</td><td>HEX</td><td>1</td><td colspan="8">Channel intensity (negative value)</td></tr>
<tr><td rowspan="2">&lt;Security Mode&gt;</td><td rowspan="2">HEX</td><td rowspan="2">1</td><td colspan="8">Way of encryption</td></tr>
<tr><td>bit7</td><td>bit6</td><td>bit5</td><td>bit4</td><td>bit3</td><td>bit2</td><td>bit1</td><td>bit0</td></tr>
</table>

			WPA2	WPA	WEP	802.1X	PSK	WEP	TKIP	CCMP
\r\n	ASCII	2	End mark							
Command failed										
ERROR	ASCII	5	Error							
<CODE>	HEX	1	0XFE=-2				1. get all scanned information			
\r\n	ASCII	2	End mark							
Note	*For <Security Mode>, bit=1 encryption is valid, bit=0 encryption is invalid. If multiple bits = 1 concurrently, hybrid encryption*									

8.3.3. Setting Password

Command

at+psk=<passphrase>\r\n

Description

1. If module works in station mode, this command is used to enter network password. Module RAK410 supports WEP, WPA-PSK, WPA2-PSK and WPA-PSK+WPA2-PSK encryption methods, whereas WPA2-PSK and WPA2-PSK support TKIP, CCMP and TKIP+CCMP hybrid encryption method.

For WEP encryption, password must be either 5 or 13 ASCIIs, or 10 or 26 hexadecimals (0-9, a-f).

For WPA/WPA2 encryption, module RAK410 supports password types in ASCII with 8-63 characters long or 64 hexadecimals (0-9, a-f).

2. If module works in AP or Ad-hoc mode, this command is used to configure network password.

In AP mode, the encryption method is WAP2-PSK-CCMP by default, no other encryption is supported. Password type must be 8-63 ASCIIs or 64 hexadecimals (0-9, a-f).

In Ad-hoc mode, the encryption method is WEP by default, no other encryption is supported. Password type must be 5 or 13 ASCIIs, or 10 or 26 hexadecimals (0-9, a-f).

Note:

If the network to be connected is OPEN, this command can be omitted!
Module RAK410 does not support comma (,) in the password.

Parameter Description

Parameter	Value	Description
<passphrase>	Password	Enter or set password

Example:

at+psk=lthonway\r\n-------------8-byte character password in WPA2 or WPA mode
at+psk=2a334e5d12\r\n---------10-byte hex password in WEP mode

Return Value Description

Parameter	Format	Length	Description

Command successful			
OK	ASCII	2	Set successfully
\r\n	ASCII	2	End mark
Command failed			
ERROR	ASCII	5	Error
<CODE>	HEX	1	See ERROR list
\r\n	ASCII	2	End mark
Note			

8.3.4. Connecting Wireless Network

Command

at+connect=<ssid>\r\n

Description

This command is used to connect to specified network. If the network password is not blank, only use this command after *at+scan* command and *at+psk* command. If the network password is blank, no *at+scan* command *and at+psk* command are needed.

Parameter Description

Maximum SSID is 32 bytes.

Parameter	Value	Description
<SSID>	SSID	The SSID to be connected is with maximum 32 in length

Example:

at+connect=LTHonway\r\n-------------The network whose SSID is "LTHonway"is connected

Return Value Description

Parameter	Format	Length	Description	
Command successful				
OK	ASCII	2	Connected successfully	
\r\n	ASCII	2	End mark	
Command failed				
ERROR	ASCII	5	Error	
<CODE>	HEX	1	0XFE=-2	No SSID is found
<CODE>	HEX	1	0XFD=-3	Connection is failed
\r\n	ASCII	2	End mark	
Note				

8.3.5. Connecting Network by WPS

Command

at+wps=<mode>,<pin>\r\n

Description

This command is used to enable module WPS function by 3 ways:

1. Through WPS pin; If pin receives the failing edge, the WPS function is enabled, simultaneously the serial port outputs *at+wps=push\r\n* command, waiting module for pushing WPS. The maximum wait timeout is 2 minutes.

2. Enter *at+wps=push\r\n* command, waiting module for pushing WPS. The maximum wait timeout is 2 minutes.

3. Enter *at+wps=pin, <pin code>\r\n* command, enter *<pin code>* in the router configuration page to set connection. The maximum wait timeout is 2 minutes.

Note: it is only effective in Station mode.

Parameter Description

Parameter	Value	Description
<mode>	=push	Connection mode is push
	=pin	Enter PIN code to connect
<pin code>	8 ASCII	PIN code (valid when <mode>=pin)

Return Value Description

<table>
<tr><th>Parameter</th><th>Format</th><th>Length(byte)</th><th colspan="8">Description</th></tr>
<tr><td colspan="11">Command successful</td></tr>
<tr><td>OK</td><td>ASCII</td><td>2</td><td colspan="8">network is connected</td></tr>
<tr><td><SSID></td><td>HEX</td><td>33</td><td colspan="8">SSID</td></tr>
<tr><td rowspan="3"><Security Mode></td><td rowspan="3">HEX</td><td rowspan="3">1</td><td colspan="8">Way of encryption</td></tr>
<tr><td>bit7</td><td>bit6</td><td>bit5</td><td>bit4</td><td>bit3</td><td>bit2</td><td>bit1</td><td>bit0</td></tr>
<tr><td colspan="4"></td><td>WPA2</td><td>WPA</td><td>WEP</td><td>NONE</td></tr>
<tr><td><Password></td><td>HEX</td><td>65</td><td colspan="8">password</td></tr>
<tr><td>\r\n</td><td>ASCII</td><td>2</td><td colspan="8">End mark</td></tr>
<tr><td colspan="11">Command failed</td></tr>
<tr><td>ERROR</td><td>ASCII</td><td>5</td><td colspan="8">Error</td></tr>
<tr><td rowspan="6"><CODE></td><td rowspan="6">HEX</td><td rowspan="6">1</td><td colspan="4">0XFD=-3</td><td colspan="4">1.WPS waiting times out</td></tr>
<tr><td colspan="4">0XFC =-4</td><td colspan="4">2.Invalid information</td></tr>
<tr><td colspan="4">0XFB =-5</td><td colspan="4">3.Multiple PBC sessions</td></tr>
<tr><td colspan="4">0XFA =-6</td><td colspan="4">4.Walktimer Timeout</td></tr>
<tr><td colspan="4">0XF9 =-7</td><td colspan="4">5.M2D RCVD</td></tr>
<tr><td colspan="4">0XF8 =-8</td><td colspan="4">6.Unknown error</td></tr>
<tr><td>\r\n</td><td>ASCII</td><td>2</td><td colspan="8">End mark</td></tr>
<tr><td>Note</td><td colspan="10">For <Security Mode>, bit=1 encryption is valid; bit=0 encryption is invalid.</td></tr>
</table>

8.3.6. Setting Beacon Frame Interval

Command

at+listen=<listen interval>\r\n

Description

This command is used to set beacon frame interval in Station mode.

Note:

> *In power saving mode, module can reduce power consumption by increase parameter value, however, a delay occurs when module receives wireless data!*

Parameter Description

Parameter	Value	Description
<listen interval>	20-1000	For detailed parameters, see wireless router configuration.

Return Value Description

Parameter	Format	Length	Description
Command successful			
OK	ASCII	2	OK
\r\n	ASCII	2	End mark
Command failed			
ERROR	ASCII	5	ERROR
<CODE>	HEX	1	see ERROR list
\r\n	ASCII	2	End mark
Note			

8.3.7. Getting Network Signal Intensity

Command

at+rssi\r\n

Description

This command is used to get network signal intensity.

Parameter Description

N/A

Return Value Description

Parameter	Format	Length	Description
Command successful			

OK	ASCII	2	OK
<RSSI>	HEX	1	Signal intensity (negative value)
\r\n	ASCII	2	End mark
Command failed			
ERROR	ASCII	5	ERROR
<CODE>	HEX	1	0XFE=-2 No wireless network is found
\r\n	ASCII	2	End mark
Note			

8.3.8. Creating Wireless Access Point

Command

at+ap=<ssid>,<hidden>\r\n

Description

This command is used to create a wireless access point, allowing connections from other wireless devices to send/receive data. Before this command, user can configure other wireless parameters by commands *at+apconfig*, *at+channel*. The network default channel is 6 (2437MHZ).

After creation, module can automatically initiate DHCP SERVER. User must configure *at+ipdhcp=1* after static IP is set by command (*at+ipstatic*), then module can automatically configure DHCP SERVER parameters, including IP address range and duration.

Parameter Description

Maximum SSID is 32 bytes.

Parameter	Value	Description
<SSID>	SSID	The SSID to be connected is with maximum 32 in length
<hidden>	0	Set network to be visible (optional)
	1	Set network to be hidden (optional)

Example:

at+ap=LTHonway,1\r\n-------------Create a network whose SSID is "LTHonway"

Return Value Description

Parameter	Format	Length	Description
Command successful			
OK	ASCII	2	Connected successfully
\r\n	ASCII	2	End mark
Command failed			
ERROR	ASCII	5	Error

<CODE>	HEX	1	0XFE=-2	Failed to set up
<CODE>	HEX	1	0XFD=-3	Failed to create
\r\n	ASCII	2	End mark	
Note				

8.3.9. Configuring Parameter of Wireless Access Point

Command

at+apconfig=<contry code>,<inact time>,< beacon>,< dtim>\r\n

Description

This command is used to configure parameters of wireless access point, including country code, inactive time, beacon frame intervals and DTIM threshold.

Parameter Description

Parameter	Value	Description
<contry code >	Country code	Country code, e.g. China (CN)
<inact time>	>0	Inactive time
< beacon>	100~1000	Configure beacon frame intervals, available value: 100 ~ 1000 (ms), default: 100ms (optional)
< dtim>	1~255	Value range: 1 ~25, specifying the interval for delivery traffic indication message (DTIM). The unit is beacon interval, default is 1, meaning the interval of DTIM is same as that of beacon frame (optional).

Return Value Description

Parameter	Format	Length	Description
Command successful			
OK	ASCII	2	Set successfully
\r\n	ASCII	2	End mark
Command failed			
ERROR	ASCII	5	
<CODE>	HEX	1	see ERROR list
\r\n	ASCII	2	End mark
Note			

8.3.10. Creating/Adding Ad-hoc Network

Command

at+adhoc=<ssid>\r\n

Description

This command is used to create and/or add point-to-point network (Ad-hoc). For creating a network, firstly set/enter password and channel by commands *at+psk*, *at+channel* before using this command. In Ad-hoc mode, the network encryption is WEP by default, no other encryption is supported. The default network channel is 10 (2457MHZ).

Parameter Description

Parameter	Value	Description
<ssid>	ssid	Network identifier

Note:

In Ad-hoc mode, DHCP SERVER is not available.

Return Value Description

Parameter	Format	Length	Description
Command successful			
OK	ASCII	2	OK
\r\n	ASCII	2	End mark
Command failed			
ERROR	ASCII	5	ERROR
<CODE>	HEX	1	0XFE=-2 creating/connecting failed
\r\n	ASCII	2	End mark
Note			

8.3.11. Setting Channel

Command

at+channel=< channel >\r\n

Description

It is used to set network channels in Ad-hoc, AP modes. This parameter must be used before setting channel.

Parameter Description

Parameter	Value	Description
<channel>	0-11	Set channel

Return Value Description

Parameter	Format	Length	Description
Command successful			
OK	ASCII	2	OK

\r\n	ASCII	2	End mark
Command failed			
ERROR	ASCII	5	ERROR
<CODE>	HEX	1	see ERROR list
\r\n	ASCII	2	End mark
Note			

8.3.12. Getting Wireless Network Connection Status

Command

at+con_status\r\n

Description

If the module is working in Station mode, this command is used to get its wireless connection status.

If the module is working in AP mode, this command is used to tell device connection status.

Parameter Description

N/A

Return Value Description

Parameter	Format	Length	Description	
Command successful				
OK	ASCII	2	Wireless network/device is connected	
\r\n	ASCII	2	End mark	
Command failed				
ERROR	ASCII	5	Error	
<CODE>	HEX	1	0XFE=-2	No network connection
\r\n	ASCII	2	End mark	
Note				

8.3.13. Setting DHCP Mode

Command

at+ipdhcp=<mode>\r\n

Description

This command is used to set DHCP working mode.

Parameter Description

If <mode>=0, module works in DHCP CLIENT mode, and the module gets data (IP address, etc.) from DHCP SERVER.
If <mode>=1, module automatically configures parameters for DHCP SERVER, including IP address range and duration. This parameter must be effective after command at+ipstatic, in AP mode.

Parameter	Value	Description
< mode >	0	=0 DHCP CLIENT
	1	=1 DHCP SERVER

Example:

at+ipdhcp=0\r\n ---------------------------module works in DHCP CLIENT mode

at+ipdhcp=1\r\n ---------------------------module works in DHCP SERVER mode

Return Value Description

Parameter	Format	Length	Description
Command successful			
OK	ASCII	2	Command successful
<IP>	HEX	4	Module IP address (<mode>=0 valid)
<NETMASK>	HEX	4	Module subnet mask (<mode>=0 valid)
<GATEWAY>	HEX	4	Gateway (<mode>=0 valid)
<DNS1>	HEX	4	DNS Server 1 (<mode>=0 valid)
<DNS2>	HEX	4	DNS Server 2 (<mode>=0 valid)
\r\n	ASCII	2	End mark
Command failed			
ERROR	ASCII	5	Error
<CODE>	HEX	1	0XFE=-2 Getting address is timeout (<mode>=0 valid)
\r\n	ASCII	2	End mark
Note			

8.3.14. Configuring Static IP Address

Command

at+ipstatic=<ip>,<mask>,<gateway>,<dns server1 >,< dns server2>\r\n

Description

This command is used to assign static IP address for module.

Parameter Description

Parameter	Value	Description
<IP>	0.0.0.0-255.255.255.255	Configure IP address
<NETMASK>	0.0.0.0-255.255.255.255	Configure subnet mask

<GATEWAY>	0.0.0.0-255.255.255.255	Configure gateway
<DNS SERVER1>	0.0.0.0-255.255.255.255 (0 is valid)	Configure DNS Server 1
<DNS SERVER2>	0.0.0.0-255.255.255.255 (0 is valid)	Configure DNS Server 2

Example:

at+ipstatic=192.168.9.5,255.255.255.0,192.168.9.1,0,0\r\n----------------Module IP=192.168.9.5

Subnet mask=255.255.255.0

Gateway=192.168.9.1
DNS Server 1=0
DNS Server 2=0

Return Value Description

Parameter	Format	Length	Description	
Command successful				
OK	ASCII	2	Configure IP address successfully	
\r\n	ASCII	2	End mark	
Command failed				
ERROR	ASCII	5	error	
<CODE>	HEX	1	0XFE=-2	IP address error
\r\n	ASCII	2	End mark	
Note				

8.3.15. Getting IP Address

Command

at+ipconfig\r\n

Description

This command is used to get the current IP address of the module, including MAC address, IP address, subnet address, gateway and DNS.

Parameter Description

N/A

Return Value Description

Parameter	Format	Length	Description
Command successful			
OK	ASCII	2	Got IP address successfully
<MAC>	HEX	6	Module MAC address
<IP>	HEX	4	Module IP address
<NETMASK>	HEX	4	Module subnet mask

<GATEWAY>	HEX	4	Gateway
<DNS SERVER1>	HEX	4	DNS Server 1
<DNS SERVER2>	HEX	4	DNS Server 2
\r\n	ASCII	2	Module MAC address
Command failed			
ERROR	ASCII	5	Error
<CODE>	HEX	1	0XFE=-2 Failed to get IP address
\r\n	ASCII	2	End mark
Note			

8.3.16. DNS

Command

at+dns=< domain > \r\n

Description

This command is used to convert domain name into the corresponding IP address with available DNS server address.

Parameter Description

N/A

Return Value Description

Parameter	Format	Length	Description
Command successful			
OK	ASCII	2	Query successfully
<IP>	HEX	4	IP address
\r\n	ASCII	2	End mark
Command failed			
ERROR	ASCII	5	Error
<CODE>	HEX	1	0XFE=-2 DNS send error
<CODE>	HEX	1	0XFD=-3 DNS receive error
<CODE>	HEX	1	0XFC=-4 DNS request failed
\r\n	ASCII	2	End mark
note			

8.3.17. HTTP GET

Command

at+http_get=<ip/domain>:<port>/<url>\r\n

Description

Using *http get* command to request a web page, the request frame format is as follows:

```
GET /<url>    HTTP/1.1\r\n
Host: <ip/domain>:<port>\r\n
Accept: text/plain, text/html\r\n
Accept-Language: zh-cn\r\n
User-Agent: Mozilla/4.0 (compatible; MSIE 5.01; Windows NT 5.0)\r\n
Connection: close\r\n
\r\n
```

Parameter Description

Parameter	Value	Description
<IP>	0.0.0.0-255.255.255.255	Host IP address
<port>	1-65535	Host server port (optional)
<url>	Webpage (max length: 80byte)	Webpage (optional)

Example:

at+http_get=192.168.9.1:8080/index.html\r\n

at+http_get=www.baidu.com\r\n

Return Value Description

Parameter	Format	Length	Description	
Command successful				
OK	ASCII	2	Request successfully	
<status_code>	HEX	2	Status code	
<page_len>	HEX	2	Webpage length	
<data>	HEX		Webpage data	
Command failed				
ERROR	ASCII	5	Error	
<CODE>	HEX	1	0XFE=-2	Request error
\r\n	ASCII	2	End mark	
Note				

8.3.18. HTTP POST

Command

at+http_post=<ip/domain>:<port>/<url>,<data>\r\n

Description

Using *http post* command to submit web content, the request frame format is as follows:

```
POST /<url>    HTTP/1.1\r\n
Host: <ip/domain>:<port>\r\n
Accept: */*\r\n
```

```
Accept-Language: zh-cn\r\n
User-Agent: Mozilla/4.0 (compatible; MSIE 5.01; Windows NT 5.0)\r\n
Content-Length:XXX \r\n
Connection: close\r\n
\r\n
<data>
```

Parameter Description

Parameter	Value	Description
<IP>	0.0.0.0-255.255.255.255	Host IP address
<port>	1-65535	Host server port (optional)
<url>	webpage	webpage (optional)
<data>	Data	Data (optional)

Example:

at+http_post=192.168.9.1:8080/index.html , 123456\r\n

Return Value Description

Parameter	Format	Length	Description	
Command successful				
OK	ASCII	2	Submit successfully	
<status_code>	HEX	2	Status code	
<page_len>	HEX	2	Webpage length	
<data>	HEX		Webpage data	
Command failed				
ERROR	ASCII	5	Error	
<CODE>	HEX	1	0XFE=-2	Request error
\r\n	ASCII	2	End mark	
Note				

8.3.19. Open HTTPD Port

Command

at+httpd_open\r\n

Description

This command is to establish 80 listening port, and wait for the browser connection; the module does not return any data whether the connection is created or disconnected.

Parameter Description

N/A

Return Value Description

Parameter	Format	Length	Description	
Command successful				
OK	ASCII	2	Close successfully	
<FLAG>	HEX	1	=0x0C port identifier for port management	
\r\n	ASCII	2	End mark	
Command failed				
ERROR	ASCII	5	Error	
<CODE>	HEX	1	0XFE= -2	Creating local port error
			0XFD= -3	Binding local port error
			0XFB= -5	Listen error
\r\n	ASCII	2	End mark	
Note				

8.3.20. Sending REPONSE HEAD Data

Command

at+httpd_send=<flag>,<status_code>,<page_len>\r\n

Description

This command is used to send response messages data.

Parameter Description

Parameter	Value	Description
< *flag* >	0-7	Receiving port descriptor
< *status_code* >	Status-Code	Webpage status code
< *page_len* >	1-1024	Webpage length

Return Value Description

Parameter	Format	Length	Description	
Command successful				
OK	ASCII	2	Sent successfully	
\r\n	ASCII	2	End mark	
Command failed				
ERROR	ASCII	5	Error	
<CODE>	HEX	1	0XFE= -2	No available SOCKET found
			0XFD= -3	Send data error
\r\n	ASCII	2	End mark	
Note				

8.3.21. HEX-ASCII Conversion Display

Command

at+ascii=<mode>\r\n

Description

This command is used to convert all command return values to ASCII display, facilitating user for error correction.

Parameter Description

Parameter	Value	Description
<mode>	0	Disable conversion
	1	Enable conversion

Return Value Description

Parameter	Format	Length	Description
Command successful			
OK	ASCII	2	Convert successfully
\r\n	ASCII	2	End mark
Command failed			
ERROR	ASCII	5	Error
<CODE>	HEX	1	See ERROR list
\r\n	ASCII	2	End mark
Note			

8.3.22. PING

Command

at+ping=<host>, <count>, <size>\r\n

Description

This command is used to test network connection status by ping command.

Parameter Description

Parameter	Description
<HOST>	Specify a host
<COUNT>	Number of data package, default is 1 (optional).
<SIZE>	Size of data package, maximum is 1400bytes, default is 64bytes (optional).

Example:

at+ping =192.168.9.5\r\n--------------------------------execute ping command

Return Value Description

Parameter	Format	Length	Description	
Command successful				
OK	ASCII	2	Network is connected	
\r\n	ASCII	2	End mark	
Command failed				
ERROR	ASCII	5	Error	
<CODE>	HEX	1	0XFE =-2	Unable to access destination host
\r\n	ASCII	2	End mark	
Note				

8.3.23. Setting up UDP Connection

at+udp=<dest_ip>,<dest_port>,<local_port>\r\n

Description

This command is used to create a UDP port and configure remote IP address as well as port number. If created successfully, a hexadecimal value is returned for connection management. Maximum 8 connections can be created.

Parameter Description

Parameter	Value	Description
<dest ip>	0.0.0.0-255.255.255.255	Destination IP address
<dest port>	1-65535	Destination port
<local port>	1-65535	Local port

Example:

at+udp=192.168.9.5,25000,25001\r\n-----------connect to destination port

Return Value Description

Parameter	Format	Length	Description
Command successful			
OK	ASCII	2	Setting up successfully
<FLAG>	HEX	1	=0x00~0x07 port identifier for port management
\r\n	ASCII	2	End mark
Command failed			
ERROR	ASCII	5	Error

<CODE>	HEX	1	0XFE= -2	Creating local port error
<CODE>	HEX	1	0XFD= -3	Binding local pot error
<CODE>	HEX	1	0XFC= -4	Connecting destination port error
\r\n	ASCII	2	End mark	
Note				

8.3.24. Setting up UDP SERVER

Command

at+ludp=<local port>\r\n

Description

This command is used to create a local port and wait data from remote port. If the remote port wants to connect to the local port, then the remote port sends data to the local port. However, the module just keeps the last connection of data transmitting, the other connections are invalid. If local port is created successfully, a hexadecimal value is returned for connection management. Maximum 8 connections can be created.

Parameter Description

Parameter	Value	Description
<local port>	1-65535	Creating local port

Example:

at+ludp =25000\r\n--------------------creating local port 25000

Return Value Description

Parameter	Format	Length	Description	
Command successful				
OK	ASCII	2	Setting up successfully	
<FLAG>	HEX	1	=0x00~0x07 port identifier for port management	
\r\n	ASCII	2	End mark	
Command failed				
ERROR	ASCII	5	Error	
<CODE>	HEX	1	0XFE= -2	Creating local port error
<CODE>	HEX	1	0XFD= -3	Binding local pot error
\r\n	ASCII	2	End mark	
Note				

8.3.25. Creating TCP CLIENT

Command

at+tcp=<dest_ip>,<dest_port>,<module_port>\r\n

Description

This command is used to create TCP CLIENT and connect the remote TCP SERVER. If create successfully, a hexadecimal value is returned for connection management. Maximum 8 connections can be created.

Parameter Description

Parameter	Value	Description
<dest ip>	0.0.0.-255.255.255.255	Destination IP address
<dest port>	1-65535	Destination port
<local port>	1-65535	Local port

Example:

at+tcp=192.168.9.5,25000,25001\r\n-----------connect to destination port

Return Value Description

<table>
<tr><th>Parameter</th><th>Format</th><th>Length</th><th colspan="2">Description</th></tr>
<tr><td colspan="5">Command successful</td></tr>
<tr><td>OK</td><td>ASCII</td><td>2</td><td colspan="2">Connected successfully</td></tr>
<tr><td><FLAG></td><td>HEX</td><td>1</td><td colspan="2">=0x00~0x07 port identifier for port management</td></tr>
<tr><td>\r\n</td><td>ASCII</td><td>2</td><td colspan="2">End mark</td></tr>
<tr><td colspan="5">Command failed</td></tr>
<tr><td>ERROR</td><td>ASCII</td><td>5</td><td colspan="2">Error</td></tr>
<tr><td rowspan="3"><CODE></td><td rowspan="3">HEX</td><td rowspan="3">1</td><td>0XFE= -2</td><td>Creating local port error</td></tr>
<tr><td>0XFD= -3</td><td>Binding local pot error</td></tr>
<tr><td>0XFC= -4</td><td>TCP SERVER connection error</td></tr>
<tr><td>\r\n</td><td>ASCII</td><td>2</td><td colspan="2">End mark</td></tr>
<tr><td>Note</td><td colspan="4"></td></tr>
</table>

8.3.26. Creating TCP SERVER

Command

at+ltcp=<local_port>\r\n

Description

The module works as TCP server and creates listening port. If created successfully, a hexadecimal value is returned for connection management. Maximum 4 connections can be created.

Parameter Description

Parameter	Value	Description

<local_port>	1-65535	Creating local listening port

Example:

at+ltcp=25000 \r\n----------creating TCP SERVER

Return Value Description

Parameter	Format	Length	Description	
Command successful				
OK	ASCII	2	Created successfully	
<FLAG>	HEX	1	=0x08~0x0B port identifier for port management	
\r\n	ASCII	2	End mark	
Command failed				
ERROR	ASCII	5	error	
<CODE>	HEX	1	0XFE= -2	Creating local port error
			0XFD= -3	Binding local pot error
			0XFB= -5	Monitoring error
\r\n	ASCII	2	End mark	
Note				

8.3.27. Closing Created Port

Command

at+cls=< flag> \r\n

Description

This command is used to close up connection by its corresponding port identifier.

Parameter Description

Parameter	Value	Description
< flag >	0-11	close corresponding port

Example:

at+cls=0\r\n-----------close up the connection whose identifier is 0

Return Value Description

Parameter	Format	Length	Description	
Command successful				
OK	ASCII	2	Closed successfully	
\r\n	ASCII	2	End mark	
Command failed				
ERROR	ASCII	5	Error	
<CODE>	HEX	1	0XFE= -2	Specified port does not exist

<CODE>	HEX	1	0XFD= -3	Close failed
\r\n	ASCII	2	End mark	
Note				

8.3.28. Sending Data

Command

at+send_data=< flag>,<data_length> ,<data_stream>\r\n

Description

This command is used to send data to target connection (port identifier) with maximum data length as 1400. Whereas, <data_stream> can be any format, meaning the module keeps the original data format without converting.

Parameter Description

Parameter	Value	Description
< flag>	0-11	Connection identifier (ASCII)
<data_length>	1-1400	Data length, maximum is 1400 (ASCII)
<data_stream>	data	Data to be sent (HEX)

Example:

at+send_data=0,4,ABCD\ r\n----------- Sending 4 bytes data to the connection with identifier as 0; the data content is "ABCD".

Return Value Description

Parameter	Format	Length	Description	
Command successful				
OK	ASCII	2	Data sent successfully	
\r\n	ASCII	2	End mark	
Command failed				
ERROR	ASCII	5	Data sent failed	
<CODE>	HEX	1	0XFE=-2	Specified port does not exist
			0XFD=-3	Data send error
\r\n	ASCII	2	End mark	
Note				

8.3.29. Receiving Data

Command

at+recv_data=<flag><dest_port><dest_ip><data_length><data_stream>\r\n

or

at+recv_data=< socket_status><flag><dest_port><dest_ip>\r\n

Description

This command is used for module to send data to the host, including destination port, destination IP, port identifier, data length, and data. This command can also be used to receive information of TCP connection and disconnection.

Parameter Description

N/A

Return Value Description

1. Receiving Data

Parameter	Format	Length	Description
Data Received Successfully			
<CMD>	ASCII	13	Command header
< flag>	HEX	1	=0X00-0X07 Port identifier
<dest_port>	HEX	2	Destination port
<dest_ip>	HEX	4	Destination IP
<data_length>	HEX	2	Data length
<data_stream>	HEX	<data_length>	Data
\r\n	ASCII	2	End mark
Data received Failed			
<CMD>	ASCII	13	Command header
<CODE>	HEX	1	=0XFF Data received Failed
\r\n	ASCII	2	End mark
Note			

2. TCP Connection Status

Parameter	Format	Length	Description
TCP Connected			
<CMD>	ASCII	13	Command header
< socket_status >	HEX	1	=0X80 TCP client connected
< flag>	HEX	1	=0X00-0X07 Port identifier
<dest_port>	HEX	2	Destination port
<dest_ip>	HEX	4	Destination IP
\r\n	ASCII	2	End mark
TCP Disconnected			
<CMD>	ASCII	13	Command header
< socket_status >	HEX	1	=0X81 TCP Client disconnected
< flag>	HEX	1	=0X00-0X07 Port identifier

<dest_port>	HEX	2	Destination port
<dest_ip>	HEX	4	Destination IP
\r\n	ASCII	2	End mark
Note			

8.3.30. Transparent Transmission Mode

Command

at+easy_txrx\r\n

Description

By sending this command module enters into transparent mode; without any command, the host can send and receive data. Once the module has entered the transparent mode, the host cannot be able to return to the command-line mode; this command can only be executed after a TCP/ UDP connection has been established.

Parameter Description

N/A

Return Value Description

Parameter	Format	Length	Description	
Command successful				
OK	ASCII	2	Entered transparent mode successfully	
\r\n	ASCII	2	End mark	
Command failed				
ERROR	ASCII	5	Entered transparent mode failed	
<CODE>	HEX	1	0XFE=-2	No network available
CODE>	HEX	1	0XFE=-3	No available TCP/UDP connection
<CODE>	HEX	1	See ERROR list	
\r\n	ASCII	2	End mark	
Note				

8.3.31. Disconnecting Current Wireless

Command

at+disc\r\n

Description

This command is used to disconnect current wireless connection.

Parameter Description

N/A

Return Value Description

Parameter	Format	Length	Description	
Command successful				
OK	ASCII	2	Disconnected successfully	
\r\n	ASCII	2	End mark	
Command failed				
ERROR	ASCII	5	Error	
<CODE>	HEX	1	0XFE=-2	The current network is disconnected
\r\n	ASCII	2	End mark	
Note				

8.3.32. Setting Power Working Mode

Command

at+pwrmode=<mode>\r\n

Description

This command is used to set power working mode for module.

Parameter Description

Parameter	Value	Description
< mode>	0	Set mode to 0
	1	Set mode to 1
	2	Set mode to 2
	3	Set mode to 3
	4	Set mode to 4

Return Value Description

Parameter	Format	Length	Description
Command successful			
OK	ASCII	2	Set successfully
\r\n	ASCII	2	End mark
Command failed			
ERROR	ASCII	5	Error
<CODE>	HEX	1	See ERROR list
\r\n	ASCII	2	End mark
Note			

8.3.33. Waking Up

Command

at+wake_up\r\n

Description

If module is working in power mode 2, then wake up module by this command. Note that this command is used after at+pwrmode=2。

Parameter Description

N/A

Return Value Description

Parameter	Format	Length	Description
Command successful			
OK	ASCII	2	Processed successfully
\r\n	ASCII	2	End mark
Command failed			
ERROR	ASCII	5	Error
<CODE>	HEX	1	See ERROR list
\r\n	ASCII	2	End mark
Note			

8.3.34. Configuring UART Parameter

Command

at+uartconfig=<baud rate>,<data bits>,<stop bits>,<parity>,<flow ctrol>\r\n

Description

This command is used to configure UART parameters, effective after reboot.

Parameter Description

This command contains five parameters, including baud rate, data bit, stop bit, parity check and flow control switch.

Parameter	Value	Description
<baud rate>	See 2.1	baud rate
<data bits>	4	4 bits data
	5	5 bits data
	6	6 bits data
	7	7 bits data
	8	8 bits data

<stop bits>	1	1 bit stop
	1.5	1.5 bits stop
	2	2 bits stop
<parity>	0	No parity check
	1	Odd Parity Check
	2	Even Parity Check
<flow ctrol>	0	Off
	1	On

Example:

at+uartconfig=115200,8,1,0,1\r\n-------configure UART parameter to

baud rate *=115200*
data bit =8bits
stop bit =1 bit
parity check = No parity check
flow control=on

Return Value Description

Parameter	Format	Length(byte)	Description
Command successful			
OK	ASCII	2	Set successfully
\r\n	ASCII	2	End mark
Command failed			
ERROR	ASCII	5	Error
<CODE>	HEX	1	See ERROR list
\r\n	ASCII	2	End mark
Note			

8.3.35. Storing Parameter When Initiate

Command

at+storeenable=<mode>\r\n

Description

This command is used to choose whether store parameter or not when initiate.

Parameter Description

If *at+storeenable=0*, after reboot module, enter into normal working mode

If *at+storeenable=1*, module stores parameter after reboot, and automatically create or set up connection with stored password and IP. If UART_MODE is high, module will load connection parameters, including connection protocol, port number, destination IP), and enter the transparent mode.

This command is must following *at+storeconfig* command.

Parameter	Description
< mode >	= 0 do not store parameter after reboot
	= 1 store parameter after reboot

Return Value Description

Parameter	Format	Length(byte)	Description
Command successful			
OK	ASCII	2	Set successfully
\r\n	ASCII	2	End mark
Command failed			
ERROR	ASCII	5	Error
<CODE>	HEX	1	See ERROR list
\r\n	ASCII	2	End mark
Note			

8.3.36. Storing Configuration Parameter

Command

at+storeconfig\r\n

Description

This command is used to store user data, including password, SSID, IP address, power mode and scanned information, etc. It must be used after getting IP address, otherwise, connection cannot be automatically set up after reboot.

Parameter Description

N/A

Return Value Description

Parameter	Format	Length	Description
Command successful			
OK	ASCII	2	Set successfully
\r\n	ASCII	2	End mark
Command failed			
ERROR	ASCII	5	Error
<CODE>	HEX	1	0XFE=-2 the store parameter is already 1
\r\n	ASCII	2	End mark
Note	If the boot loading parameter is 1, use the command at + storeenable = 0 to set to 0.		

8.3.37. Boot Mode

Command

at+boot_mode=<mode>\r\n

Description

Configure module to enter into boot mode, and performs upgrade.
Configure module enter into WEB SERVER, and configures parameters.

Parameter Description

Parameter	Description
< mode >	= 0 enter into boot loader
	= 1 enter into web server

Return Value Description

N/A

8.3.38. Deleting Data

Command

at+del_data\r\n

Description

This command is used to delete all the stored parameters.

Parameter Description

N/A

Return Value Description

Parameter	Format	Length	Description
Command successful			
OK	ASCII	2	Delete successfully
\r\n	ASCII	2	End mark
Command failed			
ERROR	ASCII	5	Error
<CODE>	HEX	1	See ERROR list
\r\n	ASCII	2	End mark
Note			

8.3.39. Reset

Command

at+reset =<mode>\r\n

Description

This command is used to reset the entire module or reset wireless module only.

Parameter Description

Parameter	Description
< mode >	= 0 reset the entire module
	= 1 just reset the wireless part, the control part remains working

Return Value Description

Parameter	Format	Length	Description
Command successful			
OK	ASCII	2	Reset successfully (< mode >=1 valid)
\r\n	ASCII	2	End mark
Command failed			
ERROR	ASCII	5	Error
<CODE>	HEX	1	See ERROR list
\r\n	ASCII	2	End mark
Note			

8.3.40. Get Version Information

Command

at+version\r\n

Description

This command is used to query module version, including host version and WLAN version.

Parameter Description

N/A

Return Value Description

Parameter	Format	Length	Description
Command successful			
OK	ASCII	2	OK
HOST VERSION	ASCII	1	host version
	ASCII	1	0X2E= .
	ASCII	1	host version
	ASCII	1	0X2E= .
	ASCII	1	host version

	HEX	1	0X00
WLAN VERSION	ASCII	1	wlan version
	ASCII	1	0X2E= .
	ASCII	1	wlan version
	ASCII	1	0X2E= .
	ASCII	1	wlan version
	HEX	1	0X00
Command failed			
ERROR	ASCII	5	ERROR
<CODE>	HEX	1	See ERROR list
\r\n	ASCII	2	End mark
Note			

9. Revision History

Version	Date	Description
V1.0	2012/9/1	Initial Draft
V1.1	2012/11/3	Revised AT Command Flow Chart
V2.0	2012/11/26	*1.* Added commands: *at+rssi, at+dns, at+httpget, at+httppost, at+ap,* *at+apconfig, at+wps, at+del_data* Deleted commands: *at+get_ltcp, at+upgrade* Refined commands: *at+ltcp, at+ipdhcp, at+reset, at+recv_data,* *at+storeenable, at+storeconfig*
		2. Revised AT Command Flow Chart
V2.1	2013/1/4	Modified part of the documentation errors, increased a detailed description of the flow control section