




Taixin **AH** module **AT** command development guide



Confidentiality level	A	Taixin AH module AT command development guide	File No	
Release date	2023-5-23		file version	V4.3

Revision history

date	Version	describe	Revised by
2023-5-23	V4.3	Modify the description of JOINGROUP;	WE
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2021-4-29	V1.10	Added instructions for using AT+DSLEEP command	YOU

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2021-4-19	V1.9	Add instructions for using broadcast mode: at+mode=group at+joingroup V1.7	YOU
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2020-9-22		V1.1 adds AT+KEYMGMT/AT+AGGCNT commands	YOU
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Confidentiality level	A	Taixin AH module AT command development guide	File No	
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Table

of Contents Taixin AH Module AT Command Development Guide.....	1
1 Overview	1 2
Interface description.....	1 2.1
Serial port settings.....	1 2.2
Network port.....	2
2.2.1 Netat.exe	2
2.2.2 Netlog.exe	3
3 AT command usage instructions.....	3
3.1 Basic networking commands.	3 3.1.1
AT+MODE: Set working mode.....	3 3.1.2 AT+SSID:
Set SSID..	4 3.1.3 AT+KEYMGMT: Set
encryption mode.....	4 3.1.4 AT+PSK: Set encryption
password.....	4 3.1.5 AT+PAIR: Pairing
control.....	4 3.1.6 AT+BSS_BW: Set BSS
bandwidth... ..	5 3.1.7 AT+FREQ_RANGE: Set the
working frequency Point range.....	5 3.1.8 AT+CHAN_LIST: Set the working frequency
list.....	6 3.2 Status Query
Command.....	6 3.2.1 AT+RSSI:
Check the device signal quality RSSI.....	6 3.2.2 AT+CONN_STATE:
View connection status.....	7 3.2.3 AT+WNBCFG: View device parameter
information.....	7 3.2.4 AT+STA_INFO: View STA
information.....	7 3.3 Advanced networking
commands.. ..	8 3.3.1 AT+TXPOWER:
Set the maximum transmit power.....	8 3.3.2 AT+ACKTMO: Set ACK
TIMEOUT time.....	8 3.3.3 AT+TX_MCS: Set tx
mcs.....	9 3.3.4 AT+HEART_INT: Set the heartbeat packet
interval.....	9 3.3.5 AT+UNPAIR: Set to unpair the specified
STA.....	9 3.4 Debugging
commands	10 3.4.1
AT+FWUPG: Serial port firmware upgrade.. ..	10 3.4.2
AT+LOADDEF: Recovery Factory settings.....	10 3.4.3 AT+SYSDBG: Set
printing Debugging information.....	10 3.5 Multicast related
commands.....	11 3.5.1
AT+JOINGROUP: Join the multicast network.....	11 3.6 Relay related
setting commands.....	12 3.6.1 AT+ R_SSID: Set
the SSID of the relay.....	12 3.6.2 AT +R_PSK: Set the encryption password of the
relay.....	12 3.7 Roaming related setting
commands.. ..	13 3.7.1 AT+ROAM: Set
roaming enablement.....	13 3.8 Sleep related
commands	13



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Confidentiality level	A	Taixin AH module AT command development guide	File No	
Release date	2023-5-23		file version	V4.3

3.8.1 AT+PS_MODE: Set STA sleep mode.....13

3.8.2 AT+DTIM: Settings Sleep DTIM time.....14

3.8.3 AT+DSLEEP: Set to enter sleep mode. 14

3.8.4 AT+WAKEUP: Settings Remote wake up..... 15

3.8.5 AT+PS_CONNECT: Setting PS Connect behavior.....15

3.9 Other commands.....15

3.9.1 AT+TXDATA: Send data command..... 16

4 AT command usage examples19

4.1 Basic instructions for module establishment connection.....19

4.2 Configure relay network instructions20

4.2.1 AP module.....20

4.2.2 Relay module....20

4.2.3 STA module..... 20

Taixin confidential documents

1 Overview

Taixin AH module supports AT command working mode. AT commands can be sent through uart or network port, and parameters can be

Digital settings, data communications.

2 Interface description

2.1 Serial port settings

Serial port configuration is as shown below.

端口(O):

COM7

波特率(B):

115200

数据位(D):

8

奇偶校验(A):

None

停止位(S):

1

流控

☐ DTR/DSR

☐ RTS/CTS

☐ XON/XOFF

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Figure 2-1 Serial port parameter configuration

In addition, please pay attention to selecting the new line mode, taking SecureCRT as an example:

会话选项 - serial-com7

类别(C):

连接

登陆动作

串行

SSH2

高级

终端

仿真

模式

Emacs

映射键

高级

外观

窗口

日志文件

打印

X/Y/Zmodem

文件传输

FTP/SFTP

仿真模式

初始模式(I)

☐ 光标键模式(C)

☒ 换行(L)

☒ 新行模式(N)

☒ 数字小键盘(U)

☐ 应用程序键区(A)

当前模式(R)

☐ 光标键模式(S)

☒ 换行(E)

☒ 新行模式(W)

☒ 数字小键盘(M)

☐ 应用程序键区(P)

模式转换(O)

☒ 启用 80/132 列转换(B)

☒ 启用光标键模式转换(K)

☒ 启用小键盘模式转换(Y)

☒ 启用换行模式转换(D)

Figure 2-2 Select New Line Mode

To test whether the serial port is normal, enter AT+, and it will print as shown below:

```
valid cmds:
0. AT+REG_RD
1. AT+REG_WT
2. AT+TEST_START
3. AT+TX_FC
4. AT+TX_FLAGS
5. AT+TX_DST_ADDR
6. AT+TX_LEN
7. AT+TX_TYPE
8. AT+TX_PHA_AMP
9. AT+TX_STEP
10. AT+TX_CONT
11. AT+TX_START
12. AT+TX_TRIG
13. AT+TX_MCS
14. AT+TX_MCS_MAX
15. AT+TX_BW
16. AT+TX_PWR_AUTO
```

Figure 2-3 Echo of inputting AT+

If there is no such print, it means that the serial port input is incorrect and you need to contact our FAE.

2.2 network port

For scenarios where the serial port is inconvenient to use, Taixin provides two network port-based tools to facilitate customers to configure parameters.

Setup (netat.exe) and view log (netlog.exe). Note that both tools require bridge firmware version 12954 or later to work. Instructions for use are introduced below.

2.2.1 Netat.exe

When you need to use AT+ commands to configure network bridge parameters, you can use netat.exe. Connect the

bridge device and PC with a network cable. Double-click to run, enter the IP address of the pc, and the mac of the connected device will be displayed.

If only one

device is connected, device 1 will be auto selected.

```
select ipaddr for bind:10.10.10.151
----- Discover 1 Device -----
1: fa-de-09-8a-9b-38
>:auto select device 1
```

Figure 2-4 Netat selects only one device

If several devices are connected through the switch, you can select the device by entering a number



Figure 2-5 Netat selects multiple devices

After selecting the device, enter the AT command to execute the AT command. The usage is the same as the serial port.

2.2.2 Netlog.exe

When you need to use a network cable to view the debugging log of the network bridge, you can use netlog.exe. Connect the bridge device and PC with a network cable. Double-click to run netlog.exe, enter the IP address of the pc, and the log will be printed automatically. Only the log of the device connected to the network cable will be displayed. When using, be careful not to use a switch to connect multiple devices.

3 AT command usage instructions

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3.1 Basic networking commands

3.1.1AT+MODE: Set working mode

Execute instructions	Query: AT+MODE?	Setting:AT+MODE=ap/sta
response	+MODE:ap/sta OK	Success: OK Failure: ERROR
Parameter Description		Support ap/sta/group/apsta 4 modes
Example		ŷ at+mode=ap: ap mode ŷ at+mode=staŷsta model ŷ at+mode=group: broadcast mode ŷ at+mode=apsta: relay mode, relay mode setting The device not only serves as a sta to connect to the upper-level AP, but also serves as an ap. Provide connection services for other sta. Use at+r_ssid and at+r_psk set the connection parameters of the upper level AP.

3.1.2AT+SSID: Set SSID

Execute instructions	Query: AT+SSID?	Setting: AT+SSID=ssid_char
response	+SSID:hgic_ah_test OK	Success: OK Failure: ERROR
Parameter Description		ssid_char length is less than 32 characters
Example		at+ssid=hgic_ah_test

3.1.3AT+KEYMGMT: Set encryption mode

Execute instructions	Query: AT+KEYMGMT?	Setting: AT+KEYMGMT=WPA-PSK/NONE
response	+KEYMGMT:WPA-PSK OK	Success: OK Failure: ERROR
Parameter Description		WPA-PSK: Turn on encryption NONE: Turn off encryption
Example		at+keymgmt=WPA-PSK at+keymgmt=NONE

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3.1.4AT+PSK: Set encryption password

Execute instructions	Query: AT+PSK?	Setting: AT+PSK=psk_char
response	+PSK:baa58569a9edd7c3a55e4 46bc658ef76a7173d023d25678 6832474d737756a82 OK	Success: OK Failure: ERROR
Parameter Description		psk_char must be 64 hex characters.
Example		at+psk=baa58569a9edd7c3a55e446bc6 58ef76a7173d023d256786832474d7377 56a82

3.1.5AT+PAIR: pairing control

Execute instructions	Query: AT+PAIR=0/1
----------------------	--------------------

response	OK
Parameter Description	<p>This command can achieve fast pairing networking when the SSID is not set. When initiating pairing:</p> <ol style="list-style-type: none"> 1. AP is configured with SSID and password, but STA is not configured: STA will obtain the SSID and password during the pairing process. <p>AP's SSID and password.</p> <ol style="list-style-type: none"> 2. Neither the AP nor the STA has configured SSID and password: During the pairing process, the AP will <p>Generate random passwords.</p> <p>After the pairing is successful, a PAIR SUCCESS message will be generated, but the pairing will not be automatically exited and needs to be executed.</p> <p>Line AT+PAIR=0 to stop pairing.</p> <p>The connection is automatically established after pairing is stopped.</p> <p>If both AP and STA have set SSID and other parameters, there is no need to start PAIR, and they will rely on SSID.</p> <p>The parameters are automatically connected.</p>
Example	<p>AT+PAIR=1 //Start pairing</p> <p>AT+PAIR=0 //Stop pairing</p>

3.1.6AT+BSS_BW: Set BSS bandwidth

Execute instructions	Query: AT+BSS_BW?	Setting: AT+BSS_BW=bss_bw
response	+BSS_BW:8MHz OK	Success: OK Failure: ERROR
Parameter Description		<p>bss_bw only selects the following 4 values:</p> <p>1 : 1MHz</p> <p>2: 2MHz</p> <p>4 : 4MHz</p> <p>8 : 8MHz</p>
Example		at+bss_bw=4

3.1.7AT+FREQ_RANGE: Set the working frequency range

Execute instructions	Query: AT+FREQ_RANGE?	Setting: AT+FREQ_RANGE=start,end
response	+FREQ_RANGE:9080-9240 OK	Success: OK Failure: ERROR
Parameter Description		<p>⚠ This command is used to set the frequency point for continuous use</p> <p>Range, specify the starting center frequency point and ending center frequency</p> <p>Heart frequency point, the AH module will automatically calculate the frequency point sequence</p>

		<p>surface.</p> <p>• The value of start and end is the center frequency point*10.</p>
Example		<p>at+freq_range=9080,9240</p> <p>set up</p> <p>start freq=908MHz</p> <p>end freq=924MHz</p> <p>The generated channel list is 908M,</p> <p>916M,924M</p> <p>Note that if AT+CHAN_LIST is set at the same time,</p> <p>The parameters take priority with the set CHAN_LIST.</p>

3.1.8AT+CHAN_LIST: Set the working frequency list

Execute instructions	Query: AT+CHAN_LIST?	Setting: AT+CHAN_LIST=freq1,freq2
response	+CHAN_LIST:9080,9240 OK	Success: OK Failure: ERROR
Parameter Description		<p>• This command is used to set non-continuous frequency point columns</p> <p>surface.</p> <p>• The specified frequency point value is the center frequency point*10.</p> <p>• Supports up to 16 frequency points, separated by commas</p>
Example		<p>at+chan_list=9080,9240</p> <p>Set 2 frequency points, namely: 908MHz, 924MHz</p>

3.2 Status query command

3.2.1AT+RSSI: Check the device signal quality RSSI

Execute instructions	Query: AT+RSSI?
response	+RSSI:-30 OK
Parameter Description	AT+RSSI=index/mac_addr

	<p>index: Specifies the device index to be queried, starting from 1.</p> <p>mac_addr: Specifies the mac address of the device to be queried.</p>
Example	<p>AT+RSSI //If no parameters are specified, query the RSSI of the first device</p> <p>AT+RSSI=1 //Specify to query the rssi of the first device</p> <p>AT+RSSI=f4:de:09:68:6c:20 //Specify to query RSSI based on MAC address</p>

3.2.2AT+CONN_STATE: View connection status

Execute instructions	Query: AT+CONN_STATE
response	<p>+CONNECTED //Connected</p> <p>+DISCONNECT //Not connected</p>
Parameter Description	
Example	AT+CONN_STATE

3.2.3AT+WNBCFG: View device parameter information

Execute instructions	AT+WNBCFG
response	
illustrate	View device parameter information

3.2.4AT+STA_INFO: View STA information

Execute instructions	AT+STA_INFO=ID
response	<pre>STA1: f6:de:09:79:6c:50 tx1: mcs=0 bw=2MHz snr=86 cnt=7 agg=1 data=0kB(0kbps) dur=4ms dut=32% txq=0 cca=28 ack=0kB(7) drop=0kB(0) per= 0% est_rate=450kbps rx1: mcs=0 bw=2MHz evm(avg:std)=0:0 rssi=0 agc=0 cnt=10 agg=1 data=0kB(2kbps) dur=9ms dut=67% fcserr=0, freqdev =595Hz adv_bw=0:0:0:0 sta_cnt=1</pre>
illustrate	<p>View the LMAC statistics of the STA corresponding to the ID, including RSSI, EVM and other information;</p> <p>AP can use this command, STA does not need this command;</p> <p>ID is the serial number of STA, counting from 1;</p> <p>When using this command, you can first turn off the printing of the default LMAC: AT+SYSDBG=LMAC,0</p>

3.2.5AT+SCAN_AP: Scan surrounding AP information

Execute instructions	AT+SCAN_AP
response	OK
illustrate	Execute this command in STA mode to scan surrounding AP information.

3.2.6AT+BSSLIST: Get the scanned AP list

Execute instructions	Query: AT+BSSLIST
response	[508727]BSS List: [508727]ah_1, freq:7720, signal:-14, en:0, bssid:fa:de:09:83:84:38, repeater:0 [508734]ah_2, freq:7800, signal:-17, en:0, bssid:f6:de:09:6e:5a:50, repeater:0
illustrate	After executing the scan_ap command, you can use this command to obtain the scanned AP list (ap settings ssid can be scanned)

3.3 Advanced networking commands

3.3.1AT+TXPOWER: Set the maximum transmit power

Execute instructions	Query: AT+TXPOWER?	Setting:AT+TXPOWER=txpower
response	+TXPOWER:20dbm OK	Success: OK Failure: ERROR
Parameter Description		This command is used to manually set the maximum transmit power. The range is 6~20, 1db step.
Example		at+txpower=20 Set the maximum transmit power to 20dbm

3.3.2AT+ACKTMO: Set ACK TIMEOUT time

Execute instructions	Query: AT+ACKTMO?	Setting:AT+ACKTMO=0
response	+ACKTMO:0 OK	Success: OK Failure: ERROR
Parameter Description	Default value, no additional ACK timeout is added time;	Set and add AH module WiFi protocol parameter ack timeout value, unit is microsecond, default is 0. Setting is only required when communicating over 1km this parameter. The calculation formula is 10*(distance in kilometers -1), for example 2km set acktmo=10. <small>Modified values are saved when power is turned off;</small>
Example		AT+ACKTMO=100 Add 100us ACK packet timeout

3.3.3AT+TX_MCS: Set tx mcs

Execute instructions	Query: AT+TX_MCS?	Setting: AT+TX_MCS=255
response	+TX_MCS:255 OK	Success: OK Failure: ERROR
Parameter Description		Set tx mcs, the range is 0~7 or 1M mode When 10, it means fixed to a certain mcs, other values mean mcs automatic adjustment; This command will be saved after power off;
Example		AT+TX_MCS=2 Fixed transmission MCS is 2

3.3.4AT+HEART_INT: Set heartbeat packet interval

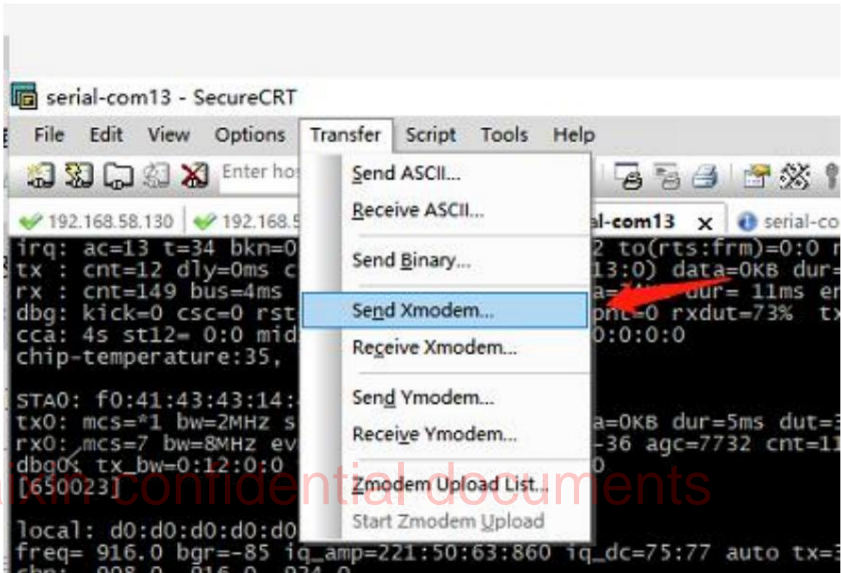
Execute instructions	Query: AT+HEART_INT?	Setting: AT+HEART_INT=500
response	+HEART_INT:500 OK	Success: OK Failure: ERROR
Parameter Description		Set heartbeat packet interval, unit mS, minimum setting is 500; the greater the number of STAs, the recommended setting is The larger the packet hop interval, the approximate appropriate length of the heartbeat packet. The length is STA_count*50; Older software versions require AP and STA settings to match The same heartbeat packet interval, otherwise there will be problems with the connection; This command will be saved after power off; starting from V1.6.2 version, only Just set the heartbeat packet interval of the AP, and the AP will automatically Automatically synchronize to STA. This command is invalid for STA. .
Example		AT+HEART_INT=2000 Set the heartbeat packet interval to 2S

3.3.5AT+UNPAIR: Set to unpair the specified STA

Execute instructions	Query: AT+UNPAIR?	Setting: AT+UNPAIR=mac_addr
response	No response	Success: unpair sta:mac_addr Failure: sta:mac_addr is not exist
Parameter Description		mac_addr is the mac address of the other party
Example		at+unpair=f6:de:09:75:a3:61

3.4 Debugging commands

3.4.1AT+FWUPG: Serial port firmware upgrade

Execute instructions	AT+FWUPG
response	<p>After successful execution, the serial port prints: CCCCCCCCC</p> <p>Indicates that the module has entered upgrade mode and the firmware can be downloaded using the xmodem protocol.</p>
illustrate	<p>Serial port tools that support xmodem protocol include: secureCRT, xshell</p> 

3.4.2AT+LOADDEF: Restore factory settings

Execute instructions	AT+LOADDEF=1
response	
illustrate	reset

3.4.3AT+SYSDBG: Set printing debugging information

Execute instructions	Query: Not supported	Setting:AT+SYSDBG=XXX,VALE
response		Success: OK
Parameter Description		<p>XXX can choose LMAC (air interface statistics),</p> <p>WNB (network layer statistics);</p> <p>VALE=0 means closing the corresponding printing, =1 means printing</p>

		<p>Turn on the corresponding printing.</p> <p>LMAC statistics are turned on by default and many, such as</p> <p>Can be closed if necessary;</p> <p>WNB statistics are not enabled by default.</p>
Example		<p>AT+SYSDBG=LMAC,0</p> <p>Turn off LMAC printing</p>

3.4.4AT+BAUDRATE: Set the baud rate of UART-BUS

Execute instructions	Query: AT+BAUDRATE=?	Setting:AT+BAUDRATE=VALUE
response	VALUE	Success: OK
Parameter Description		<p>Note that this command selects UART BUS</p> <p>When setting the firmware, set UART0 (A10/A11)</p> <p>baud rate, via UART1 (A12/A13)</p> <p>to set;</p> <p>The range of VALUE is 9600-400K, which exceeds the range.</p> <p>The UART-BUS may not work properly;</p>
Example		AT+BAUDRATE=115200

3.5 Multicast related commands

3.5.1AT+JOINGROUP: Join the multicast network

After setting the working mode of the WiFi module to group, you can use this command to set the WiFi module to join a multicast network. network. After joining a multicast network, the WiFi module will only receive data in that multicast network. All data communications are multicast address for communication. If the working mode is set to group, but no multicast network is added, all data communications All are sent and received in the form of broadcast.

Note that the JOINGROUP command can only be set after setting the GROUP mode.

Execute instructions	AT+JOINGROUP=ÿ	Setting:AT+JOINGROUP=11:22:33:44:55:66,3
response	fail: ERROR	Success: OK Failure: ERROR
Parameter Description	Does not support checking Inquire	<p>AT+JOINGROUP=group_addr,AID</p> <p>group_addr: The address of the multicast network to be joined</p> <p>AID: The AID of the device in the multicast network. Valid AID values: 1-N (N is a solid</p>

		<p>The maximum number of STAs supported by the software). The AID of each device in the network should be kept unique one.</p> <p>ÿ Set effective AID: The WiFi module will send heartbeats in the multicast network regularly.</p> <p>Jump to announce your presence to other WiFi modules.</p> <p>ÿ Set invalid AID: The WiFi module will not send heartbeats and will not notify other WiFi module. If all devices set AID to 0, they are not affected by</p> <p>The firmware supports a limit on the maximum number of STAs.</p>
Example		<p>AT+JOINGROUP=11:22:33:44:55:66,3</p> <p>Join multicast address:11:22:33:44:55:66</p> <p>AID is set to 3</p>

3.6 Relay related setting commands

3.6.1AT+R_SSID: Set the SSID of the relay

Execute instructions	Query:AT+R_SSID?	Setting:AT+R_SSID=repeater_ssid
response	+R_SSID:repeater_ssid OK	Success: OK Failure: ERROR
Parameter Description		Set the SSID of the upper level AP that the relay connects to.
Example		

3.6.2AT+R_PSK: Set the encryption password of the relay

Execute instructions	Query: AT+R_PSK?	Setting:AT+R_PSK=psk_char
response	+R_PSK:baa58569a9edd7c3a55 e446bc658ef76a7173d023d256 786832474d737756a82 OK	Success: OK Failure: ERROR
Parameter Description		The password for the relay to connect to the upper level AP. psk_char Must be 64 hex characters.
Example		

3.7 Roaming related setting commands

3.7.1AT+ROAM: Set roaming enablement

Execute instructions	Query: AT+ROAM?	Setting:AT+ROAM=0/1
response	OK	Success: OK Failure: ERROR
Parameter Description	<p>Roaming enablement only needs to be set on the STA side.</p> <p>The SSID of the AP in the roaming network can be set by full word matching or fuzzy matching.</p> <p>Whole-word matching: The SSIDs of all APs are set to the same SSID. The length of the SSID is not limited and does not exceed More than 32 characters are enough. STA is also set to this SSID.</p> <p>Fuzzy matching: The last three characters of SSID of different APs are different. The total length of SSID must be greater than 8 characters, consisting of a common string (at the beginning of the SSID) and a 3-character ID (at the end of the string) to compose. For example, the common string is HUGE_IC_AH, then the SSID of AP1 can be set to HUGE_IC_AH001, the SSID of AP2 is HUGE_IC_AH002, and so on. SSID of STA It should be set to be consistent with the SSID of one of the APs.</p>	
Example		AT+ROAM=1

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3.8 Sleep related commands

3.8.1AT+PS_MODE: Set STA sleep mode

Execute instructions	Query: AT+PS_MODE?	Setting:AT+PS_MODE=0/1/2/3/4
response	+PS_MODE:0 OK	Success: OK Failure: ERROR
Parameter Description		<p>PS_MODE can choose from the following values:</p> <p>0: Sleep mode is not set, the effect is the same as mode 3 Same.</p> <p>1: When the module enters sleep, there is no connection between the module and the server. alive (the module itself and the server are kept alive).</p> <p>2: When the module enters sleep, there is no guarantee between the module and the server. alive (AP replaces the module and server to keep alive, the power consumption is the lowest Low).</p> <p>3: When the module enters sleep, it only maintains communication with the AP.</p>

		<p>connection, any unicast packet can wake up the module.</p> <p>4: The module enters sleep and only keeps alive with the AP.</p> <p>It can only be called through AP by entering: at+wakeup</p> <p>Awake.</p>
Example		AT+PS_MODE=4

3.8.2 AT+DTIM: Set the sleep DTIM time

Execute instructions	Query: AT+DTIM?	Setting: AT+DTIM=1000/2000/3000 etc.
response	+DTIM:1000 OK	<p>Success: OK</p> <p>Failure: ERROR</p>
Parameter Description		<p>The following values can be selected for DTIM:</p> <p>1000: 1S wake up to receive DTIM packet</p> <p>2000: 2S gets up to receive DTIM packets</p> <p>3000: 3S gets up to receive DTIM packets</p> <p>...</p>
Example		AT+DTIM=1000

3.8.3 AT+DSLEEP: Set to sleep

Execute instructions	Query: AT+DSLEEP?	Setting: AT+DSLEEP=1/120 or other value
response	+DSLEEP:awake OK	<p>Success: OK</p> <p>Failure: undef DEEP_SLEEP</p>
Parameter Description	Cannot read after sleeping	<p>In the connected state, set =1 to make the device enter hibernation.</p> <p>sleep-alive state;</p> <p>In the non-connected state, set a non-zero value X to indicate that the device</p> <p>Wake up after entering sleep for X seconds.</p> <p>If the STA retains the AP connection information, wake up</p> <p>The STA will then connect back to the AP. If the connection times out, it will reconnect.</p> <p>Newly enters sleep, then wakes up regularly and then connects again.</p> <p>sleep again (ps-connectnt state).</p> <p>If you want the unconnected device to wake up without</p> <p>To sleep again, you need to change ps-mode to 0;</p>
Example		AT+DSLEEP=1

3.8.4AT+WAKEUP: Set up remote wake-up

Execute instructions	Query: AT+WAKEUP?	Setting: AT+WAKEUP=mac_addr
response	invalid	Success: OK Failure: ERROR
Parameter Description		Enter this command on the AP to wake up the dormant STA.
Example		AT+WAKEUP=11:22:33:44:55:66

3.8.5AT+PS_CONNECT: Set PS Connect behavior

Execute instructions	Query: AT+PS_CONNECT?	AT+PS_CONNECT=60,3
response	+PS_CONNECT=60,3 OK	Success: OK Failure: ERROR
Parameter Description	<p>Set the sleep interval of ps connect (unit S), and the maximum number of increments.</p> <p>STA's WiFi module is in sleep state</p> <p>After being disconnected, it will wake up and reconnect.</p> <p>AP: If the connection fails the WiFi module will</p> <p>Will enter PS Connect mode: loop</p> <p>sleep/wake/reconnect. middle</p> <p>Sleep is to prevent continuous reconnection</p> <p>It consumes too much.</p> <p>If the maximum number of increments is set to 1 then</p> <p>Indicates no incrementing.</p>	<p>The first connection failed sleep for 1 minute, the second time</p> <p>The connection failed, sleep for 2 minutes, the third connection</p> <p>Failed to sleep for 3 minutes. sleep time increments by 3</p> <p>After the first time, wrap around to the interval of the first time, and follow the rules cycle.</p>
Example		AT+PS_CONNECT=60,3

3.9 IoT engineering related commands

3.9.1AT+TCPTEST: hit tcp traffic

Execute instructions	AT+TCPTEST=ip_addr,port,tcpmode
response	
Parameter Description	<p>ip_addr: the other party's IP address</p> <p>port: port number</p>

	tcpmode: The default is for the client to send, and "s" is for the server to receive.
Example	Be the sender: AT+TCPTEST=10.10.10.3,5002 Be the receiving end: AT+TCPTEST=10.10.10.3,5002,s

3.9.2AT+IP: Query or set ip address

Execute instructions	Query: AT+IP=?	Setting: AT+IP=ip_addr
response	+IP:10.10.10.3 (successfully assigned to ip) +IP:0.0.0.0 (not successfully assigned to ip)	Success: OK Failure: ERROR
Parameter Description		Enter this command to set the IP address
Example		AT+IP=10.10.10.3

3.9.3AT+PING: ping function

Execute instructions	AT+PING=ip_domain,send_times,pktsize	
response	<pre> Pinging 10.10.10.201 with 1024 bytes of data: [57969]qs_end [57981]Reply from 10.10.10.201: bytes=1024 time:13ms TTL=255 [58977][02:40:49:81:69:70] is expired, del it (1000) [58996]Reply from 10.10.10.201: bytes=1024 time:11ms TTL=255 [60008]Reply from 10.10.10.201: bytes=1024 time:8ms TTL=255 </pre>	
Parameter Description	<p>"ip_domain" can be an IP address or domain name;</p> <p>pktsize: The data size of the ping packet, the default is 32byte;</p> <p>Note that you cannot enter other at commands while pinging.</p>	
Example	AT+PING=10.10.10.201,5,1024	

3.10 Other commands

3.10.1 AT+TXDATA: Send data command

Execute instructions	Query: Unsupported setting: AT+TXDATA=length,txbw,txmcs,priority	
response		Success: OK Failure: ERROR
Parameter Description		This command is used to send data through the serial port when the UART is in non-transparent transmission mode.

Deliver.

Steps:

1. First execute the AT+TXDATA command to set the parameters for data transmission, such as:
 - length: the length of data to be sent [required]
 - txbw: Specify the tx bandwidth of the data [optional]
 - txmcs: Specify the tx mcs of the data [optional]
 - priority: Specify the priority of the data, 0~7 [optional]
2. After executing the at+txdata command and returning OK, start sending data.

The length of the sent data must meet the length specified by the parameter.

 - In 1-to-1 mode, AT+TXDATA can directly send the original data

according to.
 - In 1-to-many mode, AT+TXDATA cannot send original data directly.

It needs to be sent before the original data +14Byte Ethernet frame header.

Setting length should also include the Ethernet frame header length.

The 1-to-1 mode or 1-to-many mode is set when the firmware is compiled.

Determined by MAX_STA, MAX_STA=1 is 1 to 1 mode.

MAX_STA>1, which is 1 to many mode, can be based on actual application requirements

Make settings. The default firmware is 1 to many mode.

• 1 to 1 mode:

at+txdata=10 //10byte data needs to be sent

OK

1234567890 //10byte original data is sent directly

• 1 to many mode:

at+txdata=24 //Need to send 10byte data

OK

22222222222288888888888899991234567890 _____

The first 14 bytes are the filled Ethernet frame header (written in hexadecimal),

The last 10 bytes are original data (written in the form of visible characters, in fact it should be

This is written uniformly in hexadecimal form).

• 222222222222: is the Ethernet destination address

• 888888888888: is the Ethernet source address

	<div>ÿ 9999: Ethernet protocol type</div> <div>Ethernet frame header filling instructions:</div> <div>ÿ Source address: You can fill in all 0s</div> <div>ÿ Protocol type: You can fill in all 0's</div> <div>ÿ Destination address: The filling rules for ap and sta are as follows:</div> <div><div>ÿ The AP end uart master needs to manage the sta device, remember</div><div>Record the mac address of each sta device, maintain the device ID and</div><div>Mac address mapping table, check before sending data</div><div>table, data can only be sent after finding the MAC address of the device.</div><div>deliver. If it is a broadcast transmission, the destination address is filled with all</div><div>0xFFÿ</div><div>ÿ The uart master on the sta side does not need to maintain the mapping table.</div><div>Just fill in all 1.</div><div>If you use SecureCrt to test this serial port command, you need to note</div><div>Note that the first 14 bytes of the Ethernet frame header are in hexadecimal format.</div><div>It cannot be entered arbitrarily. The destination address can use visible characters.</div><div>111111, the source address can use visible characters 000000, Ethernet protocol</div><div>The type can use the visible character 00, and the final input becomes:</div><div>111111000000001234567890. At this time, the source address displayed by the receiving end</div><div>and Ethernet protocol types are garbled because the sender automatically replaces them</div><div>The device source address and protocol type are in hexadecimal, which is generally not available.</div><div>The characters cannot be seen, so they become garbled characters.</div><div>If you use other serial port tools that support hexadecimal input, you can set</div><div>Any MAC address, please note that all characters including payload are</div><div>Hexadecimal input.</div><div>The AP side mapping representation is as follows:</div><table><tr><th>Device ID</th><th>MAC address</th></tr><tr><td>1001</td><td>00:1A:2B:3C:4D:5</td></tr><tr><td></td><td>AND</td></tr><tr><td></td><td></td></tr></table><div>ÿ Receive data:</div><div>After receiving the data, the AH module will output the data on the serial port with the following format:</div><div>1. 1 to 1:</div></div>	Device ID	MAC address	1001	00:1A:2B:3C:4D:5		AND		
Device ID	MAC address								
1001	00:1A:2B:3C:4D:5								
	AND								

		<pre>+RXDATA:10\r\n 1234567890 Received 10byte data. 2. 1 to many: +RXDATA:24\r\n 222222222228888888888899991234567890 Received 24byte data, of which the first 14byte is the Ethernet frame header Data (written in hexadecimal character form), starting from the 15th byte Real data (written in visible character form, in fact it should be written uniformly as 16 base characters). ÿ The uart master on the AP side can save the source address of the Ethernet frame header. Associate with the device ID and update the mapping table. ÿ The uart master on the sta side does not need to maintain the mapping table and ignores the Ethernet Network frame header, just receive the real data. After the uart master receives +RXDATA, please parse it according to the above format. Receive data.</pre>
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Taixin confidential documents

4 AT command usage examples

4.1 Basic instructions for module establishment of connection

When using the AT command to initialize the AH module, it mainly sets the frequency, bandwidth, SSID and password.

code and other parameters. The simple initialization AT command list is as follows:

```
AT+CHAN_LIST=9080,9160,9240 #Set 3 frequency points#Set 8M bandwidth
AT+BSS_BW=8 #Set
AT+SSID=hgic_ah_test$SSID
AT+KEYMGMT=WPA-PSK #Enable encryption
AT+PSK=baa58569a9edd7c3a55e446bc658ef76a7173d023d256786832474d737756a82
AT+MODE=ap #Set to AP mode
```


4.2 Configure relay network instructions

4.2.1 AP module

1. Configure the ssid of the AP. Each AP should be configured differently. You can consider ssid1 and ssid2 increasing in this way, for example:

`at+ssid=ssid1`

2. Configure without encryption (in order to simplify the configuration, we will use non-encryption as an

example for now) `at+keymgmt=none`

4.2.2 Relay module

1. Configure the relay role

`at+mode=apsta` 2.

Configure no encryption

`at+keymgmt=none` 3. Configure

the `r_ssid` of the relay, which is used to connect the relay to the ap. It should be consistent with the ssid of the ap you want to connect to, for example:

`at+r_ssid=ssid1`

4. Configure the ssid of the relay, which is used to connect the relay to the sta. In order to facilitate management, you can consider the ssid of the ap to be consistent with the ssid of the ap, and add a suffix at the end, such as `ssid1_r1`, `ssid1_r2`, `ssid2_r1`, etc., for example:

`at+ssid=ssid1_r1`

4.2.3 STA module

1. Configure the SSID of the STA to allow the STA to connect to the relay. It should be consistent with the SSID of the relay you want to connect to, for example:

`at+ssid=ssid1_r1` 2,

configure no encryption

`at+keymgmt=none`