



# RS232 to Wlan Module MT7681

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## Technical Informations:

This product is an embedded module based on the universal serial interface network standard, built-in TCP / IP protocol stack, enabling the user serial port, wireless network (wifi) interface between the conversions.

Through the RS232 to Wlan Module, the traditional serial devices do not need to change any configuration, data can be transmitted through the network.

## Features:

- ✓ Low power consumption; Quick start;;network connect quickly
- ✓ Perfect support 802.11b/g/n
- ✓ Support all wifi encryption:WEP/WPA-TKIP/WPA-AES/WPA2-TKIP/WPA2-AES
- ✓ No driver need serial port configuration
- ✓ Support STA/AP mode
- ✓ Support TCP Server/TCP Client/UDP Server/UDP Client
- ✓ Support DHCP DNS HTTP
- ✓ Support serial at command also network at command
- ✓ Support search module in LAN
- ✓ Support SmartLink function,use app to config the module connect the wireless router
- ✓ CE/FCC support,ROHS standard support

## Module Parameters:

| Parameter           | Description / Values                                         |
|---------------------|--------------------------------------------------------------|
| Wireless            | IEEE 802.11n、 IEEE 802.11g、 IEEE 802.11b                     |
| Wireless Rate       | 11n: up to 150Mbps<br>11g: up to 54Mbps<br>11b: up to 11Mbps |
| Channel             | 1-14                                                         |
| Frequency range     | 2.4-2.4835G                                                  |
| Send Power          | 15-18 DBM                                                    |
| Antenna             |                                                              |
| Antenna Type        | External antenna I-PEX connector<br>PCB internal antenna     |
| WiFi                |                                                              |
| WiFi mode           | Sta/soft ap                                                  |
| Encryption          | 64/128/WEK encryption<br>WPA-PSK/WPA2-PSK、 WPA/WPA2          |
| RS232 to TCP / IP   |                                                              |
| Max Serial rate     | 115200 bps                                                   |
| TCP max. connection | 4                                                            |
| UDP max. connection | 4                                                            |

RS232 to Wlan Module Pinout:



| Pin Number | Description |
|------------|-------------|
| 1          | 3.3V        |
| 2          | GND         |
| 3          | Reset       |
| 4          | RX          |
| 5          | TX          |
| 6          | WIFI        |
| 7          | ES/DF       |
| 8          | GPIO2       |
| 9          | GPIO1       |

## General Functions:

### WIRELESS

RS232 to Wlan Module can be configured STA or AP mode. So, there are two serial to wifi mode: serial to WIFI (STA mode) and serial to WiFi (SoftAp mode)

Note:

AP: The center of a wireless network node. Commonly was a wireless router.

STA: Wireless node, a end device, like notebook, PDA are both STA device.

### TRANSPARENT TRANSMISSION MODE

The RS232 to Wlan Module supports serial transparent transmission mode. This has the advantage of plug and play serial, to reduce the user's complexity. Module in transparent transmission mode, the user only need to configure the necessary parameters. After power on, module automatically connect to the default wireless network and server.

Because in this mode, the module serial port always work in transparent transmission mode, so the user just use it as a virtual serial port.

In view words, the module is a wireless serial port, without any change, the user's equipment can be easily add wireless data transceiver.

Transparent transmission mode is fully compatible with the user's own software platform, reduce integration of wireless data transmission software development.

For enable Transparent Transmission Mode parameters as follows required:

- Wireless Parameters
  - Target AP's SSID and SSID'S length.
  - Target AP's encryption
  - Target AP's key and key's length
- TCP/UDP parameters
  - Network Protocol
  - Remote IP
  - Port
- Serial Parameters
  - Baudrate
  - Byte / Data length
  - Checksum bit
  - Stop bit

### AT COMMAND MODE

During start AT Command Mode is disabled. For enable AT Command Mode

**lower ES/DF for 1 - 5 seconds (ES/DF Pin to GND).**

## Factory default configuration:

During first start RS232 to Wlan Module default configuration is STA Mode as follow:

| Parameter       | Value        |
|-----------------|--------------|
| SSID            | NONE         |
| Encryption Type | NONE         |
| SSID Password   | NONE         |
| IP Address      | 192.168.0.99 |
| Gateway         | 192.168.0.1  |
| DNS             | 192.168.0.1  |
| Port            | 8080         |
| Baudrate        | 115200       |
| Byte Length     | 8            |
| Parity          | 0 (none)     |
| Stopbits        | 1            |

## HLK-M30 Configuration Tool:

For Windows OS a configuration tool can be downloaded as Zip File here:

[RS232 to Wlan Module Configuration Tool HLK-M30 Download](#)

Parameters of HLK-M30 Configuration Tool are described in next Section AT Commands.

## Serial Configuration

### CONTROL CHARACTER

AT Commands are based on control characters as end of line signal also executing command line. The RS232 to Wlan Module control character is a CR (carriage return). Usual Terminal Programs are use ↵ (Enter Key) for setting end of line command based on formats as follows:

| CR Carriage Return Type / Format | Value         |
|----------------------------------|---------------|
| Decimal                          | 13            |
| Hexadecimal                      | 0x0D          |
| Keyboard Shortcut                | ^M (ctrl + M) |
| C                                | \r            |
| ISO                              | CR            |

### PORT SETTINGS

The RS232 to Wlan Module RS232 Interface is based on UART (Universal Asynchronous Receiver/Transmitter serial communication. Therefore serial communication must be configured as follows:

| Parameter   | Value      |
|-------------|------------|
| Baudrate    | 115200 b/s |
| Parity      | none       |
| Byte length | 8          |
| Stopbits    | 1          |

## A T C o m m a n d s

### AT COMMAND SYNTAX

AT Commands are based on 2 types

- query actual parameter
- set parameter

In general every command is based on

- **at+command**

To query actual parameter

- **at+command=?**

will return actual value of requested parameter

To set a parameter

- **at+command=value**

will return OK or if command fail ERROR

**Every command is case sensitiv!**

### AT COMMAND EXAMPLES:

| Function                               | at command                  | Return       |
|----------------------------------------|-----------------------------|--------------|
| query actual remote IP address         | <b>at+UIp=?</b>             | 192.168.0.90 |
| set remote IP address to 192.168.0.100 | <b>at+UIp=192.168.0.100</b> | OK           |

## WA FUNCTION / WIFI NETWORK MODE

| Function      | at command     | Return                         | Value               |
|---------------|----------------|--------------------------------|---------------------|
| query WA Mode | <b>at+WA=?</b> | 1 = AP Mode<br>!= 1 = STA Mode | AP Mode<br>STA Mode |
|               |                | Description                    |                     |
| set AP Mode   | <b>at+WA=1</b> | AP Mode configuration          |                     |
| set STA Mode  | <b>at+WA=0</b> | STA Mode configuration         |                     |

## WM FUNCTION / WIFI STA WORK METHOD

| Function           | at command     | Return                                           | Value               |
|--------------------|----------------|--------------------------------------------------|---------------------|
| query WM Mode      | <b>at+WM=?</b> | 1 = AP Mode<br>!= 1 = STA Mode                   | AP Mode<br>STA Mode |
|                    |                | Description                                      |                     |
| set auto WM Mode   | <b>at+WM=0</b> | Auto, manual wait for 3 times than smart connect |                     |
| set smart WM Mode  | <b>at+WM=1</b> | Smart connect                                    |                     |
| set manual WM Mode | <b>at+WM=2</b> | manual                                           |                     |

## SBSSID FUNCTION / SET TARGET AP BSSID

| Function    | at command              | Return                                                           | Value              |
|-------------|-------------------------|------------------------------------------------------------------|--------------------|
| query bssid | <b>at+Sbssid=?</b>      | xx:xx:xx:xx:xx:xx                                                | Router MAC Address |
|             |                         | Description                                                      |                    |
| set bssid   | <b>at+Sbssid=sbssid</b> | bssid usually refer to the wireless router broadcast MAC address |                    |

## SSID FUNCTION / SET TARGET AP SSID

| Function   | at command           | Return                                             | Value                 |
|------------|----------------------|----------------------------------------------------|-----------------------|
| query ssid | <b>at+Sssid=?</b>    | SSID NAME                                          | Router broadcast name |
|            |                      | Description                                        |                       |
| set ssid   | <b>at+Sssid=ssid</b> | usually SSID is the wireless router broadcast name |                       |

## SSSIDL FUNCTION / SET THE LENGTH OF THE TARGET SSID

| Function    | at command            | Return                                                                                                                                                                                                              | Value            |
|-------------|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| query ssidl | <b>at+Ssidl=?</b>     | SSID Length                                                                                                                                                                                                         | SSID Name length |
|             |                       | Description                                                                                                                                                                                                         |                  |
| set ssidl   | <b>at+Ssidl=ssidl</b> | Length of ssid as a integer number. When use at command to config the module, this parameter should be configured. If Ssidl and SSID's real length do not match, the module can not connect to the wireless router. |                  |

## SAM FUNCTION / SET TARGET AP ENCRYPTION METHOD

| Function  | at command                                                                                                     | Return                                                                                  | Value                             |
|-----------|----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-----------------------------------|
| query Sam | <b>at+Sam=?</b>                                                                                                | 0,1,2,4,7,9                                                                             | encryption method (refer set Sam) |
|           |                                                                                                                | Description                                                                             |                                   |
| set Sam   | <b>at+Sam=0</b><br><b>at+Sam=1</b><br><b>at+Sam=2</b><br><b>at+Sam=4</b><br><b>at+Sam=7</b><br><b>at+Sam=9</b> | none<br>wep_share<br>wep_open<br>wpa_aes/wpa_tkip<br>wpa2_aes/wpa2_tkip<br>wpa/wpa2_aes |                                   |

## SPW FUNCTION / SET TARGET AP'S KEY

| Function  | at command        | Return                                                                                         | Value         |
|-----------|-------------------|------------------------------------------------------------------------------------------------|---------------|
| query Spw | <b>at+Spw=?</b>   | ap key                                                                                         | target ap key |
|           |                   | Description                                                                                    |               |
| set Spw   | <b>at+Spw=Spw</b> | The most commonly used encryption method is wpa2-aes, which is the most secure encryption mode |               |

## SPWL FUNCTION / SET THE LENGTH OF TARGET AP'S KEY

| Function   | at command          | Return                                                                                            | Value                |
|------------|---------------------|---------------------------------------------------------------------------------------------------|----------------------|
| query Spwl | <b>at+Spwl=?</b>    | ap key length                                                                                     | target ap key length |
|            |                     | Description                                                                                       |                      |
| set Spwl   | <b>at+Spwl=Spwl</b> | If Spwl and the key's real length do not match, the module can not connect to the wireless router |                      |

## WC FUNCTION / CALCULATE PMK

| Function      | at command     | Description                                                                                                                                                                                                                |
|---------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| calculate PMK | <b>at+WC=1</b> | When set the sta wifi Parameter,this instruction should be executed at the end,this instruction is to calculate the PMK. It takes about 6 seconds.if the encryption is open or wep,this at command do not need to execute. |

## DHCP FUNCTION / SET STATIC DYNAMIC IP ADDRESS MODE

| Function   | at command                           | Return                                            | Value                          |
|------------|--------------------------------------|---------------------------------------------------|--------------------------------|
| query dhcp | <b>at+dhcp=?</b>                     | 0,1                                               | IP Address Mode (refer to set) |
|            |                                      | Description                                       |                                |
| set dhcp   | <b>at+dhcp=0</b><br><b>at+dhcp=1</b> | IP Address Mode static<br>IP Address Mode dynamic |                                |

## STATIC IP FUNCTION / STATIC IP ADDRESS

| Function        | at command              | Return                                                                                                                                               | Value             |
|-----------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| query static ip | <b>at+ip=?</b>          | static IP                                                                                                                                            | static IP Address |
|                 |                         | Description                                                                                                                                          |                   |
| set static ip   | <b>at+ip=ip address</b> | ip address,format:192,168,1,22 separated by a comma.This command is valid when dhcp is disabled (0). If dhcp is enabled (1) this command is invalid. |                   |

## STATIC MASK FUNCTION / STATIC NET MASK

| Function          | at command          | Return                                                                                                                                               | Value           |
|-------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| query static mask | <b>at+mask=?</b>    | static mask                                                                                                                                          | static net mask |
|                   |                     | Description                                                                                                                                          |                 |
| set static mask   | <b>at+mask=mask</b> | net mask format: 255,255,255,0 separated by a comma.This command is valid when dhcp is disabled (0). If dhcp is enabled (1) this command is invalid. |                 |

## STATIC DNS FUNCTION / STATIC DNS

| Function         | at command                | Return                                                                                                                                               | Value                 |
|------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| query static DNS | <b>at+dns=?</b>           | static dns                                                                                                                                           | static dns IP address |
|                  |                           | Description                                                                                                                                          |                       |
| set static DNS   | <b>at+dns=dns address</b> | dns address format:192,168,1,1 separated by a comma.This command is valid when dhcp is disabled (0). If dhcp is enabled (1) this command is invalid. |                       |

## STATIC GW FUNCTION / STATIC GATEWAY

| Function             | at command              | Return                                                                                                                                                   | Value                  |
|----------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| query static gateway | <b>at+gw=?</b>          | static gw                                                                                                                                                | static gateway address |
|                      |                         | Description                                                                                                                                              |                        |
| set static gateway   | <b>at+gw=gw address</b> | gateway address format:192,168,1,1 separated by a comma.This command is valid when dhcp is disabled (0). If dhcp is enabled (1) this command is invalid. |                        |

## UB FUNCTION / UART INTERFACE BAUDRATE

| Function            | at command            | Return                                                                                         | Value                 |
|---------------------|-----------------------|------------------------------------------------------------------------------------------------|-----------------------|
| query UART baudrate | <b>at+Ub=?</b>        | bits/sec.                                                                                      | Baudrate in bits/sec. |
|                     |                       | Description                                                                                    |                       |
| set UART baudrate   | <b>at+Ub=baudrate</b> | UART baudrates:<br>1200<br>2400<br>4800<br>9600<br>19200<br>38400<br>57600<br>115200<br>230400 |                       |

## UD FUNCTION / UART INTERFACE BYTE DATA LENGTH

| Function                    | at command               | Return                           | Value               |
|-----------------------------|--------------------------|----------------------------------|---------------------|
| query UART byte data length | <b>at+Ud=?</b>           | byte length                      | UART length of byte |
|                             |                          | Description                      |                     |
| set UART byte data length   | <b>at+Ud=byte length</b> | UART byte data length:<br>7<br>8 |                     |

## UP FUNCTION / UART INTERFACE PARITY

| Function          | at command                             | Return              | Value                      |
|-------------------|----------------------------------------|---------------------|----------------------------|
| query UART parity | <b>at+Up=?</b>                         | parity              | UART parity (refer set Up) |
|                   |                                        | Description         |                            |
| set UART parity   | <b>at+Up=0</b><br><b>1</b><br><b>2</b> | none<br>odd<br>even |                            |

## US FUNCTION / UART INTERFACE STOPBIT

| Function           | at command                 | Return                                     | Value                              |
|--------------------|----------------------------|--------------------------------------------|------------------------------------|
| query UART stopbit | <b>at+Us=?</b>             | stopbit                                    | UART stopbit length (refer set Up) |
|                    |                            | Description                                |                                    |
| set UART stopbit   | <b>at+Us=1</b><br><b>2</b> | length of stopbit 1<br>length of stopbit 2 |                                    |

## UTYPE FUNCTION / UART NETWORK PROTOCOL TYPE

| Function                | at command                                                        | Return                                                       | Value                            |
|-------------------------|-------------------------------------------------------------------|--------------------------------------------------------------|----------------------------------|
| query UART network type | <b>at+UType=?</b>                                                 | stopbit                                                      | UART network type (refer set Up) |
|                         |                                                                   | Description                                                  |                                  |
| set UART network type   | <b>at+UType=0</b><br><b>1</b><br><b>2</b><br><b>3</b><br><b>4</b> | none<br>TCP Server<br>TCP Client<br>UDP Server<br>UDP Client |                                  |

## UIP FUNCTION / UART REMOTE IP OR DOMAIN

| Function             | at command              | Return                                                                                                                           | Value          |
|----------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------|
| query UART remote IP | <b>at+UIp=?</b>         | stopbit                                                                                                                          | UART remote IP |
|                      |                         | Description                                                                                                                      |                |
| set UART remote IP   | <b>at+UIp=remote IP</b> | Remote IP address or domain, Format: 192.168.1.22 or <a href="http://www.androegg.com">www.androegg.com</a> (separated by a dot) |                |

## URPORT FUNCTION / UART PORT OF REMOTE IP OR DOMAIN

| Function                  | at command                | Return                                                                                                   | Value               |
|---------------------------|---------------------------|----------------------------------------------------------------------------------------------------------|---------------------|
| query UART remote IP Port | <b>at+URPort=?</b>        | port number                                                                                              | UART remote IP port |
|                           |                           | Description                                                                                              |                     |
| set UART remote IP Port   | <b>at+URPort=port no.</b> | Remote IP port number. This at command only valid when the module work at TCP client or UDP client mode. |                     |

## ULPORT FUNCTION / UART LOCAL SERVER PORT

| Function                     | at command                | Return                                                                                               | Value                  |
|------------------------------|---------------------------|------------------------------------------------------------------------------------------------------|------------------------|
| query UART local server Port | <b>at+ULPort=?</b>        | port number                                                                                          | UART local server port |
|                              |                           | Description                                                                                          |                        |
| set UART local server Port   | <b>at+ULPort=port no.</b> | Local port number. This at command only valid when the module work at TCP Server or UDP Server mode. |                        |

## UPL FUNCTION / UART DATA FRAME LENGTH

| Function                     | at command                 | Return                                                                                                                                                               | Value                  |
|------------------------------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| query UART data frame length | <b>at+UPL=?</b>            | frame length                                                                                                                                                         | UART data frame length |
|                              |                            | Description                                                                                                                                                          |                        |
| set UART data frame length   | <b>at+UPL=frame length</b> | data length of automatic framing.This parameter is only effective when serial is in transparent transmission mode. Auto framing length, its range is 64 ~ 512 bytes. |                        |

## UPT FUNCTION / UART PERIODIC AUTO FRAMING

| Function                | at command               | Return                                                                                                                                               | Value                     |
|-------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| query UART auto framing | <b>at+UPT=?</b>          | frame interval                                                                                                                                       | time of UART auto framing |
|                         |                          | Description                                                                                                                                          |                           |
| set UART auto framing   | <b>at+UPT=frame time</b> | Interval of automatic framing.This parameter is only effective when serial is in transparent transmission mode. Auto framing interval 100 ~ 10000ms. |                           |

## DP FUNCTION / ACTIVATE UDP PORT 988 PREFIX

| Function                | at command               | Description                                                                                                                                                                                                                                                                                                                         |
|-------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| set UDP Prefix port 988 | <b>at+DP=port prefix</b> | During connection the RS232 to Wlan Module establish a ump client connection at port 988. For wireless command this parameter must be set in front of the at command.<br>As example UDP Prefix is set to <b>anEGGAT</b> , for setting baudrate<br>Send: <b>anEGGAT</b> at+Ub=115200 over UDP<br>it will set UART baudrate to 115200 |

## DE FUNCTION / ENABLE DISABLE UDP

| Function           | at command           | Return                      | Value        |
|--------------------|----------------------|-----------------------------|--------------|
| query state of UDP | <b>at+DE=?</b>       | 0,1                         | state of UDP |
|                    |                      | Description                 |              |
| set state of UDP   | <b>at+DE=0<br/>1</b> | UDP enabled<br>UDP disabled |              |

## RB FUNCTION / REBOOT RS232 TO WLAN MODULE

| Function                    | at command     | Description                    |
|-----------------------------|----------------|--------------------------------|
| reboot RS232 to Wlan Module | <b>at+Rb=1</b> | Reboot of RS232 to Wlan Module |

## VER FUNCTION / QUERY FIRMWARE VERSION

| Function         | at command      | Description                     |
|------------------|-----------------|---------------------------------|
| Firmware version | <b>at+ver=?</b> | Returns actual Firmware version |

## DF FUNCTION / RESET TO FACTORY DEFAULT

| Function                 | at command     | Description                        |
|--------------------------|----------------|------------------------------------|
| Reset to factory default | <b>at+Df=1</b> | Reset to factory default parameter |

## SO FUNCTION / UART SOCKET PASSTHROUGH SETTING

| Function               | at command                                                                                                                                                                                                                                                            | Return                                                                                          | Value                       |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------|
| Socket Setting         | <b>at+SO=?</b>                                                                                                                                                                                                                                                        | Socket Index                                                                                    | Index of Socket passthrough |
|                        |                                                                                                                                                                                                                                                                       | Description                                                                                     |                             |
| set Socket passthrough | <b>at+SO=0,remote IP, Remote Port, Local Port</b><br><b>at+SO=1,remote IP, Remote Port, Local Port</b><br><b>at+SO=2,remote IP, Remote Port, Local Port</b><br><b>at+SO=3,remote IP, Remote Port, Local Port</b><br><b>at+SO=4,remote IP, Remote Port, Local Port</b> | none<br>TCP Server<br>TCP Client<br>UDP Server<br>UDP Client                                    |                             |
| example                | <b>at+SO=1,192.168.0.100,8080,8080</b>                                                                                                                                                                                                                                | sets TCP Server passthrough from local port 8080 to remote port 8080 of remote IP 192.168.0.100 |                             |

## SC FUNCTION / CLOSE SOCKET

| Function     | at command                | Description                                      |
|--------------|---------------------------|--------------------------------------------------|
| close socket | <b>at+SC=socket index</b> | disable socket passthrough based on socket index |

## SL FUNCTION / QUERY SOCKET INDEX LIST

| Function     | at command     | Description                                        |
|--------------|----------------|----------------------------------------------------|
| close socket | <b>at+SL=?</b> | returns a index list (max. 4) of sockets and state |

## SW FUNCTION / WRITE TO SOCKET

| Function        | at command                                                             | Description                                              |
|-----------------|------------------------------------------------------------------------|----------------------------------------------------------|
| write to socket | <b>at+SW=socket,,data</b><br><b>at+SW=socket,b,len</b><br><b>data2</b> | writes data into designated socket (index / passthrough) |

## SR FUNCTION / READ FROM SOCKET

| Function        | at command              | Description                                             |
|-----------------|-------------------------|---------------------------------------------------------|
| write to socket | <b>at+SR=socket,len</b> | reads data from designated socket (index / passthrough) |

## DR FUNCTION / DOMAIN NAME RESOLUTION

| Function               | at command                                                 | Description                                                                                                                                     |
|------------------------|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| domain name resolution | <b>at+DR=Domain</b><br><b>at+DR=Domain</b>                 | return: error -2<br>return: IP Address                                                                                                          |
| Example                | <b>at+DR=www.google.com</b><br><b>at+DR=www.google.com</b> | error-2<br>173.194.127.84<br>AT Command must be set twice,<br>first AT Command stores Domain Name<br>second command stores IP Address to Domain |

## GW FUNCTION / GPIO WRITE

| Function        | at command                           | Description                             |
|-----------------|--------------------------------------|-----------------------------------------|
| write to GPIO 0 | <b>at+GW=0,0</b><br><b>at+GW=0,1</b> | set GPIO 0 to LOW<br>set GPIO 0 to HIGH |
| write to GPIO 1 | <b>at+GW=1,0</b><br><b>at+GW=1,1</b> | set GPIO 1 to LOW<br>set GPIO 1 to HIGH |
| write to GPIO 2 | <b>at+GW=2,0</b><br><b>at+GW=2,1</b> | set GPIO 2 to LOW<br>set GPIO 2 to HIGH |

## GR FUNCTION / GPIO READ

| Function    | at command     | Description                             |
|-------------|----------------|-----------------------------------------|
| read GPIO 0 | <b>at+GR=0</b> | 0 = GPIO 0 is LOW<br>1 = GPIO 0 is HIGH |
| read GPIO 1 | <b>at+GR=1</b> | 0 = GPIO 1 is LOW<br>1 = GPIO 1 is HIGH |
| read GPIO 2 | <b>at+GR=2</b> | 0 = GPIO 2 is LOW<br>1 = GPIO 2 is HIGH |

## TS FUNCTION / ENABLE DISABLE TRANSPARENT TRANSMISSION MODE

| Function                          | at command                       | Description                                                                                           |
|-----------------------------------|----------------------------------|-------------------------------------------------------------------------------------------------------|
| set transparent transmission mode | <b>at+TS=0</b><br><b>at+TS=1</b> | disable transparent transmission mode (requires UDP/988 mode)<br>enable transparent transmission mode |

## MAC FUNCTION / QUERY MAC ADDRESS

| Function          | at command      | Description         |
|-------------------|-----------------|---------------------|
| query MAC address | <b>at+mac=?</b> | returns MAC address |

## ASSID FUNCTION / SSID SOFT AP NAME

| Function              | at command                   | Return                                        | Value                      |
|-----------------------|------------------------------|-----------------------------------------------|----------------------------|
| query soft AP SSID    | <b>at+Assid=?</b>            | SSID Name                                     | soft AP wireless SSID Name |
|                       |                              | Description                                   |                            |
| set soft AP SSID Name | <b>at+Assid=soft AP SSID</b> | configures soft AP SSID wireless network name |                            |

## ASSIDL FUNCTION / SSID SOFT AP NAME LENGTH

| Function                     | at command                   | Return                                               | Value                       |
|------------------------------|------------------------------|------------------------------------------------------|-----------------------------|
| query soft AP SSIDL          | <b>at+Assidl=?</b>           | integer                                              | length of soft AP SSID Name |
|                              |                              | Description                                          |                             |
| set soft AP SSID Name length | <b>at+Assidl=SSID length</b> | configures soft AP SSID wireless network name length |                             |

## ACHAN FUNCTION / SOFT AP WIRELESS CHANNEL

| Function                       | at command              | Return                                                | Value                 |
|--------------------------------|-------------------------|-------------------------------------------------------|-----------------------|
| query soft AP wireless channel | <b>at+Achan=?</b>       | integer                                               | wireless channel 1-13 |
|                                |                         | Description                                           |                       |
| set soft AP wireless channel   | <b>at+Achan=channel</b> | configures soft AP wireless network channel from 1-13 |                       |

## AAM FUNCTION / SOFT AP ENCRYPTION METHOD

| Function                                 | at command                  | Return                                                                                  | Value                            |
|------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------------|----------------------------------|
| query soft AP wireless encryption method | <b>at+Aam=?</b>             | integer                                                                                 | wireless channel 4-7 (refer set) |
|                                          |                             | Description                                                                             |                                  |
| set soft AP wireless encryption method   | <b>at+Aam=4<br/>7<br/>9</b> | WPA_AES/WPA_TKIP encryption<br>WPA2_AES/WPA2_tkip encryption<br>WPA/WPA2_AES encryption |                                  |

## APW FUNCTION / SOFT AP WPA2-AES PASSWORD KEY

| Function                            | at command             | Return                    | Value                 |
|-------------------------------------|------------------------|---------------------------|-----------------------|
| query soft AP WPA2-AES Password key | <b>at+Apw=?</b>        | string                    | WPA2-AES Password key |
|                                     |                        | Description               |                       |
| set soft AP WPA2-AES Password key   | <b>at+Apw=password</b> | set WPA2-AES Password key |                       |

## APWL FUNCTION / SOFT AP WPA2-AES PASSWORD KEY LENGTH

| Function                                   | at command                     | Return Value                     |                              |
|--------------------------------------------|--------------------------------|----------------------------------|------------------------------|
| query soft AP WPA2-AES Password key length | <b>at+Apwl=?</b>               | string                           | WPA2-AES Password key length |
|                                            |                                | Description                      |                              |
| set soft AP WPA2-AES Password key length   | <b>at+Apwl=password length</b> | set WPA2-AES Password key length |                              |

## AIP FUNCTION / SOFT AP IP ADDRESS

| Function               | at command               | Return Value               |                              |
|------------------------|--------------------------|----------------------------|------------------------------|
| query soft IP Address  | <b>at+Aip=?</b>          | string                     | WPA2-AES Password key length |
|                        |                          | Description                |                              |
| set soft AP IP Address | <b>at+Aip=IP Address</b> | set IP Address Ipv4 Format |                              |