GigaDevice Semiconductor Inc.

GD32W51x AT Command User Guide

Application Note
AN080

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1. AT Command Format

1.1. Command types

Table 1-1. Command Types

Type	Format	Description
Help command	AT+<x>=?	View the command parameters and value range
Query command	AT+<x>?	Query the current parameter values of a specified target
Execute command	AT+<x> or AT+<x>=<…>	Run command Set the specified target parameter value.

1.2. Command format

Table 1-2. Command format

Field	Introduction
AT	Command prefixes
<CMD>	Command string
[ ]	Optional part
<>	The mandatory part, where some parameters are mandatory for a particular command.
[p1],[p2],[p3],…	Parameter, the parameter can be a string or number. The IP address is in the format of “x.x.x.x”. String: Must be enclosed in double quotation marks Number: Support decimal and hexadecimal

Note:AT [+<CMD>] [=] [p1],[p2],[p3],…

1.3. Response format

Table 1-3. Response format

Output type	Introduction
[+<CMD>:<MSG>]	Output results or error prompts
<RSP>	OK: Represent success ERROR: Represent failure

2. The list of AT commands

Table 2-1. AT Commands

Command	Description
AT	Enter the AT command mode
ATQ	Exit the AT command mode
AT+HELP	Query all AT commands
AT+RST	Module reset
AT+GMR	Query version information
AT+TASK	Query all tasks of the current operating system
AT+HEAP	Query the free HEAP of the current operating system
AT+SYSRAM	Query the current free SRAM space
AT+SYSSTATUS	Query the current system status stored in the FLASH memory
AT+UART	Set LOG UART parameters or read current parameters
AT+CWMODE_CUR	Query or set the current working mode of WiFi: SoftAP or STA.
AT+CWJAP_CUR	Connect the AP
AT+CWLAP	Scan and list the information of AP
AT+CWSTATUS	Query the current WiFi working mode and status
AT+CWQAP	Disconnect from the AP
AT+CWSAP_CUR	Start the SoftAP mode
AT+CWLIF	Query information about all STAs connected to SoftAP
AT+CWAUTOCONN	Set whether to automatically connect to the AP during power-on
AT+PING	The function of Ping
AT+CIPSTA	Query or set the IP address of the local STA
AT+CIPSTART	Establish TCP connection or UDP transmission
AT+CIPSEND	Send data
AT+CIPSERVER	Start the TCP Server
AT+CIPCLOSE	Disable the TCP connection or UDP transmission
AT+CIPSTATUS	Query network connection information
AT+CIFSR	Query the local IP address

3. AT base command set

3.1. AT

Table 3-1. Enter the AT command mode

Command	Parameter	The correct response
Execute command AT		OK
For example: AT		

3.2. ATQ

Table 3-2. Exit the AT command mode

Command	Parameter	The correct response
Execute command ATQ		OK
For example: ATQ		

3.3. AT+HELP

Table 3-3. Query all AT commands

Command	Parameter	The correct response
Execute command AT+HELP		AT COMMAND LIST: ATQ AT+HELP …… OK
For example: AT+HELP		

3.4. AT+RST

Table 3-4. Module reset command

Command	Parameter	The correct response
Execute command AT+RST		Restart message
For example:		

AT+RST

3.5. AT+GMR

Table 3-5. Query version information

Command	Parameter	The correct response(Similar format information)
Execute command AT+GMR		SDK version: v1.0.0 SDK build revision: 96cce83437b6ca29 SDK build date: 2021/11/23 10:17:20 OK
For example: AT+GMR		

3.6. AT+TASK

Table 3-6. Query all tasks of the current operating system

Command	Parameter	The correct response(Similar format information)
Execute command AT+TASK		console X 19 342 9 IDLE R 0 214 2 Tmr Svc B 20 204 3 tcpip_thread B 17 464 4 wifi_mgmt B 18 434 8 WLAN_WLAN B 17 940 7 WLAN_RECV B 16 1070 5 WLAN_XMIT B 17 218 6 OK
For example: AT+TASK		

3.7. AT+HEAP

Table 3-7. Query the free HEAP of the current operating system

Command	Parameters	The correct response(Similar format information)
Execute command AT+HEAP		Total free heap size = 113784 Total min free heap size = 109480 OK
For example:		

AT+HEAP

3.8. AT+SYSRAM

Table 3-8. Query the current free SRAM space

Command	Parameter	The correct response(Similar format information)
Execute command AT+SYSRAM		Data limit = 0x20037d58 Free SRAM size = -536640856 OK
For example: AT+SYSRAM		

3.9. AT+SYSSTATUS

Table 3-9. Query the current system status stored in the FLASH memory

Command	Parameter	The correct response(Similar format information)
Execute command AT+SYSSTATUS		System Status: Ping Total Length: 0x1c (28) Active Counter: 05 Checksum: 0x1832274d T L V 7 4 04-00-00-01 3 1 03 5 1 00 OK
For example: AT+SYSSTATUS		

3.10. AT+UART

Table 3-10. Set LOG UART parameters or read current parameters

Command	Parameter	The correct response
Help command AT+UART=?		+UART:<baudrate>, <databits>,<stopbits>,<parity>,<flow control> OK
Query command AT+UART?		+UART: 115200, 8, 1, 0, 0 OK
Execute command	<baudrate>: UART baudrate	OK

Command	Parameter	The correct response
AT+UART=<baudrate>,<databits>,<stopbits>,<parity>,<flow control>	<databits>: Databits 8:8 bit <stopbits>: Stopbits 1:1 bit 2:1.5 bit 3:2 bit <parity>: Parity 0: None 1: Odd 2: Even <flow control>: Flow control 0: Disable control 1: Enable RTS 2: Enable CTS 3:Both enable RTS and CTS	
For example: AT+UART=115200,8,1,0,0		

4. AT WIFI command set

4.1. AT+CWMODE_CUR

Table 4-1. Query or set the current working mode of WiFi: SoftAP or STA

Command	Parameter	The correct response
Help command AT+CWMODE_CUR=?		+CWMODE_CUR: <mode:1-2> OK
Query command AT+CWMODE_CUR?		+CWMODE_CUR: <mode> OK
Execute command AT+CWMODE_CUR=<mode>	<mode>: 1: STA mode 2: Soft AP mode	OK
For example: AT+CWMODE_CUR=2		

4.2. AT+CWJAP_CUR

Table 4-2. Query the information about connected AP or connect AP

Command	Parameter	The correct response
Help command AT+CWJAP_CUR=?		+CWJAP_CUR=<ssid>, <pwd> OK
Query command AT+CWJAP_CUR?		+CWJAP_CUR: <ssid>,<mac>,<channel>,<rssi> OK
Execute command AT+CWJAP_CUR=<ssid>,<pwd>	<ssid>: String parameters <pwd>: String parameters	OK
For example: AT+CWJAP_CUR="totolink","12345678" AT+CWJAP_CUR="tplink","""		

4.3. AT+CWLAP

Table 4-3. Scan and display the list of AP

Command	Parameter	The correct response
Help command AT+CWLAP=?		+CWLAP: [ssid] OK
Execute command AT+ CWLAP[=<ssid>]	<ssid>:String parameters	+CWLAP: <ssid>,<rssi>,<mac>,<channel>,<encr

		ypt> +CWLAP: <ssid>,<rssi>,<mac>,<channel>,<encr ypt> …… OK
For example: AT+CWLAP AT+CWLAP="tplink"		

Note: If the <ssid> parameter is used, only the specified AP information is listed.

4.4. AT+CWSTATUS

Table 4-4. Query WiFi status, STA or SoftAP

Command	Parameter	The correct response
Execute command AT+CWSTATUS		+CWSTATUS: STA, connected, <ssid>,<channel>,<mac>, OK or +CWSTATUS: STA, disconnected OK or +CWSTATUS: SoftAP, <ssid>,<password>, <channel> OK
For example: AT+CWSTATUS		

4.5. AT+CWQAP

Table 4-5. Disconnect from the AP

Command	Parameter	The correct response
Execute command AT+CWQAP		OK
For example: AT+CWQAP		

4.6. AT+CWSAP_CUR

Table 4-6. Start SoftAP mode

Command	Parameter	The correct response

Help command AT+CWSAP_CUR=?		+CWSAP_CUR: <ssid>,<pwd>,<chl:1-13>,<hidden:0-1> OK
Execute command AT+CWSAP_CUR=<ssid>,<pwd>,<chl>,<hidden>	<ssid>: String parameters <pwd>: String parameters <chl>:1, 13 <hidden>: 0: SSID Broadcast 1: Hidden SSID	OK
For example: AT+CWSAP_CUR="test_ap","12345678",6,0		

4.7. AT+CWLIF

Table 4-7. View the client connected to SoftAP

Command	Parameter	The correct response
Execute command AT+CWLIF		+CWLIF: [0] <mac1> +CWLIF: [1] <mac2> …… OK
For example: AT+CWLIF		

4.8. AT+CWAUTOCONN

Table 4-8. Set whether to automatically connect to the AP during power-on

Command	Parameter	The correct response
Help command AT+CWAUTOCONN=?		+CWAUTOCONN:(0-1) OK
Query command AT+CWAUTOCONN?		+CWAUTOCONN: <enable> OK
Execute command AT+CWAUTOCONN=<enable>	<enable>: 0~1 0: Disable auto connect 1: Enable auto connect	OK
For example: AT+CWAUTOCONN=1		
Additional Remarks: If +CWAUTOCONN is set to 1, the AP information is saved to the FLASH after the AP connection succeeds. After the AP restarts, the AP is automatically connected based on the AP information stored in the FLASH.		

5. AT TCPIP command set

5.1. AT+PING

Table 5-1. The function of Ping

Command	Parameter	The correct response
Help command AT+PING=?		+PING: <ip or domain name> OK
Execute command AT+PING=<ip or domain>	<ip>:String parameters, it can be an IP address or domain name	+<delay_time> +<delay_time> …… OK
For example: AT+PING="192.168.0.1" AT+PING="www.baidu.com" **Note**: When using the domain name, it is necessary to connect to the Internet, otherwise, the PING operation fails.		

5.2. AT+CIPSTA

Table 5-2. Query or set the IP address of the local STA

Command	Parameter	The correct response
Help command AT+CIPSTA=?		+CIPSTA: <ip>, <mask>,<gw> OK
Query command AT+CIPSTA?		+CIPSTA:<ip> +CIPSTA:<mask> +CIPSTA:<gw> OK
Execute command AT+CIPSTA=<ip>,<netmask>,<gw>	<ip>: String parameters <netmask>: String parameters <gw>:String parameters	OK
For example: AT+CIPSTA? AT+CIPSTA="192.168.0.10","255.255.255.0","192.168.0.1"		

5.3. AT+CIPSTART

Table 5-3. Establish TCP connection or UDP transmission

Command	Parameter	The correct response
Help command AT+CIPSTART=?		+CIPSTART: <type:"TCP" or "UDP">,<remote ip>, <remote

		port>,[tcp keep alive:0-1] OK
Execute command AT+CIPSTART=<type>,<remote ip>,<remote port>,[tcp keep alive]	<type>: ”TCP” or “UDP”, String parameters <remote ip>: Server IP, string parameters <remote port>: Server Port, integer [tcp keep alive]:0 or 1,integer	OK
For example: AT+CIPSTART= “TCP”,”192.168.0.2”,2001,1 AT+CIPSTART= “UDP”,”192.168.0.2”,5001,0 Note: Testing this AT command requires the cooperation of a network assistant in the host computer.		

5.4. AT+CIPSEND

Table 5-4. Send data

Command	Parameter	The correct response
Help command AT+CIPSEND=?		+CIPSEND: <fd:0-4>, <len>,[remote ip],[remote port] OK
Execute command AT+CIPSEND=<fd>,<len>,[remote ip], [remote port]	<fd>: 0~4, ID of the network connection, integer <len>: < =2048, Length of data to be sent, integer [remote ip]: Remote IP, string parameters [remote port]: Remote port, integer	><input from keyboard> SEND OK
For example: AT+CIPSEND=0,10 AT+CIPSEND=1,20,”192.168.0.2”,5001		

5.5. AT+CIPSERVER

Table 5-5. Start the TCP Server

Command	Parameter	The correct response
Help command AT+CIPSERVER=?		+CIPSERVER:<mode:0-1>, [port] OK
Execute command	<mode>:	OK

AT+CIPSERVER=<mode>, [port]	0: Shut down the server 1: Establish the server [port]: Optional parameters, integer	
For example: AT+CIPSERVER=1,3001		

5.6. AT+CIPCLOSE

Table 5-6. Disable the TCP connection or UDP transmission

Command	Parameter	The correct response
Help command AT+CIPCLOSE=?		+CIPCLOSE: <fd> OK
Execute command AT+CIPCLOSE=<fd>	<fd>: 0-4,ID of the network connection, integer	close <fd> OK
For example: AT+CIPCLOSE=1		

5.7. AT+CIPSTATUS

Table 5-7. Query network connection information

Command	Parameter	The correct response
Execute command AT+CIPSTATUS		STATUS: 5 OK
For example: AT+CIPSTATUS		
Additional Remarks: STATUS 2: The STA has connected to the AP and obtained the IP address 3: The STA has established a TCP connection or UDP transmission 4: The STA disconnects from the network 5: The STA is not connected to the AP		

5.8. AT+CIFSR

Table 5-8. Query the local IP address

Command	Parameter	The correct response
Execute command AT+CIFSR		+CIFSR: APIP, <ip> +CIFSR: APMAC, <mac> OK Or +CIFSR: STAIP,<ip> +CIFSR: STAMAC,<mac> OK

For example: AT+CIFSR

6. Revision history

Table 6-1. Revision history

Revision No.	Description	Date
1.0	Initial Release	Nov.23, 2021

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