MuYu

MY-BT40X Commands Guide

Version 1.2

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Revision History

Version	Date	Notes	Author
1.0	2024/03/01	First Release	Richard
1.1	2024/05/15	1.Add Multi-Connection Functionality 2. Add Command AT+MULEN\AT+RSSI\AT+DBGMODE	Richard
1.2	2024/05/20	1.Add Command AT+ANCSCFG\AT+ANSWERCALL\ AT+HANDUPCALL	Richard

Content

1. Introduction

This document provides a simple performance introduction and detailed explanation of AT commands of the MY-BT40X module, aiming to guide users to quickly become familiar with the development of the MY-BT40X module.

1.1 Overview

MY-BT40X module supports the 2.4GHz BLE (Bluetooth Low Energy) 5.2 protocol, supports master-slave integration and HID functions, and the transparent transmission rate can reach 40kBytes/s. Supports multiple connections, supports up to 9 connections, and supports iOS system ANCS service.

Support Profile:

GATT Server (slave)

GATT Client (master)

1.2 Default Setting:

Bluetooth Name	**MY-BT40X**
Broadcast Interval	**152ms**
Transmitter	**0DBm**
Serial Port Baud rate	**115200bps/8/N/1**
Service UUID	**FFF0**
Notify UUID	**FFF1**
Write or write without response UUID	**FFF2**
The default is slave mode. It starts broadcasting after powering on. If the slave device is connected using the **AT+CONN** command, it will automatically switch to the host mode.	

2. Command

2.1 AT command format

1. All command start with “AT”, end with <CR><LF>
2. <CR> stand for “carriage return”, corresponding hex is 0x0D
3. <LF> stands for “line feed”, corresponding hex is 0x0A
4. If command has parameter, parameter keep behind “=”
5. If command has multiple parameter, parameter must be separated by “,”

6. Module will always report command's execution result using "**OK**" for success or "**ERROR**" for failure
7. In this document, << represents command input, >> represents command reply, and the content inside { } is optional.

AT+ Command {=Param1{, Param2{, Param3...}}} <CR><LF>

For example:

1. Read the version number

<< AT+VER

>> +VER=1.0.0,MY-BT502

>> OK

2. Change the illegal baud rate

<< AT+BAUD=1234

>>ERROR

2.2 General Command

2.2.1 UART Communication Test

Description: UART communication testing between HOST and Module
Format: AT
Response: OK
Eg: << AT >> OK

2.2.2 AT+CMDLIST

Description: AT command list, print and display all AT commands available in the current version
Format: AT+CMDLIST
Response: +CMDLIST=params

Eg:

<< *AT+CMDLIST*

>> *+CMDLIST=*

{

AT+NAME

AT+VER

...

}

>>

OK

2.2.3 AT+VER

Description: Read Firmware version
Format: AT+VER
Response: +VER=param
Eg: << *AT+VER* >> *+VER=1.0.0,MY-BT502* >> *OK*

2.2.4 AT+LEADDR

Description: Read module MAC address
Format: AT+LEADDR
Response: +LEADDR=param
Eg: << *AT+LEADDR* >> *+LEADDR=112233445566* >> *OK*

2.2.5 AT+LENAME

Description: Read, Setting Bluetooth Name Default name:**MY-BT401**
Format: AT+LENAME {=param1{, param2}}
param1: Device Name (Length1~25 Bytes ASCII) param2:(0~2) (0) Disable MAC address suffix (1) Device name + last 4 digits of MAC address (2) Device name + last 6 digits of MAC address
Response: +LENAME=param
Eg1. Read Bluetooth Name << *AT+LENAME* >> *+NAME=MY-BT401* >> *OK*

Eg2: Setting Bluetooth Name: AABBCCDDEEFF (Changes take effect immediately) << *AT+LENAME=AABBCCDDEEFF* >> *OK*
Eg3: Device name + last 4 digits of MAC address (Changes take effect immediately) << *AT+LENAME=AABBCCDDEEFF,1* >> *OK*
Eg4: Device name + last 6 digits of MAC address (Changes take effect immediately) << *AT+LENAME=AABBCCDDEEFF,2* >> *OK*

2.2.6 AT+BAUD

Description: Read, Setting Bluetooth UART Baud rate, default: 115200
Format: AT+BAUD {=param}
param: Baud rate, support: 1200/2400/4800/9600/14400/19200/38400/57600/115200/230400/460800/921600
Response: +BAUD=param
Eg1: Read << *AT+BAUD* >> *+BAUD=115200* >> *OK*
Eg2: Setting Baud rate: 9600 (Changes take effect immediately) << *AT+BAUD=9600*

>> *OK*

2.2.7 AT+TPMODE

Description: Read / Setting Command and Throughput mode; Default: 1 (GATT Throughput Mode)
Format: AT+TPMODE {=param}
param:(0~1) (0) It is command mode in any state, including Bluetooth connection and Bluetooth disconnection. In command mode, any data received by UART will be analyzed for commands. In connection state, data can only be sent to the remote device through the AT+GATTSEND command. (1) GATT transparent transmission. When Bluetooth is disconnected, it is in command mode. You can use AT commands to change relevant parameters. When Bluetooth is connected, it is in GATT transparent transmission mode. AT commands are disabled. Any data received by UART will be sent to remote device
Response: +TPMODE=param
Eg1: Read Mode << *AT+TPMODE* >> *+TPMODE=1* >> *OK*
Eg2: Setting Command Mode (Changes take effect immediately) << *AT+TPMODE=0* >> *OK*

2.2.8 AT+LPM

Description: Read/Setting Low Energy Mode;

Default: 0
Format: AT+LPM {=param}
param:(0~1) (0) Turn off low energy mode (1) Turn on low energy mode. After entering low-power mode, Bluetooth can broadcast and be connected. There are two ways to wake up. 1. The serial port sends the first packet of data to wake up. After waking up, the serial port starts to work. If no serial port data or APP data is received within 10 seconds, it will automatically Close the serial port and enter low power consumption again. 2. The APP sends data to wake up. Under low power consumption conditions, receiving APP data will wake up the serial port and output data. If no serial port or APP data is received within 10s, the serial port will automatically close and enter low power consumption mode. The time (10s) can be changed through the **AT+LPDLY** command
Response: +LPM=param
Eg1: Read Bluetooth status << *AT+LPM* >> *+LPM=0* >> *OK*
Eg2: Setting Low Energy Mode (Changes take effect immediately) << *AT+LPM=1* >> *OK*

2.2.9 AT+REBOOT

Description: Software reset, system restart
Format: AT+REBOOT
Response: OK

Eg: << *AT+REBOOT* >> *OK*

2.2.10 AT+RESTORE

Description: All Bluetooth parameters are restored to factory settings and the system is restarted.
Format: AT+RESTORE
Response: OK
Eg: << *AT+RESTORE* >> *OK*

2.2.11 AT+TXPOWER

Description: Read/ Setting Bluetooth module Transmitter Power, default: 2(0DBm)
Format: AT+TXPOWER{=param}
Param (0~6)
Response: +TXPOWER=param
Eg1: Read << *AT+TXPOWER* >> *+TXPOWER=2*

>> OK
Eg2: Setting 5DBm transmitter power (Changes take effect immediately) << AT+TXPOWER=4 >> OK

2.2.12 AT+PIN

Description: Read/Setting Connection PIN Code
Format: AT+PIN{=param}
param: Pin code (6 Bytes ASCII)
Response: +PIN=param
Eg1: Read << AT+PIN >> +PIN=000000 >> OK
Eg2: Setting PIN Code: 123456 (Changes take effect immediately) << AT+PIN=123456 >> OK

2.2.13 AT+CLOSEAC

Description: Close AirCommand Mode (Only for AirCommand Mode)
Format: AT+CLOSEAC

Response: AirCommandClosed
Eg: << *AT+CLOSEAC* >> *AirCommandClosed*

2.2.14 AT+GPIOCFG

Description: Control the input function switch of two IOs, default (0,0)
Format: AT+GPIOCFG{=param1{,param2}}
param1:(0~1) (0) Disable command/transparent transmission mode switching function (1) Enable command/transparent transmission mode switching function param2:(0~1) (0) Disable Bluetooth disconnect function (1) Enable Bluetooth disconnect function
Response: +GPIOCFG=param
Eg1: Read IO Status << *AT+GPIOCFG* >> *+GPIOCFG=0,0* >> *OK*
Eg2: Enable command/transparent transmission mode switching function; disable Bluetooth disconnect function (Changes take effect immediately) >> *AT+GPIOCFG=1,0* >> *OK*
Eg3: Disable the command/transparent transmission mode switching function and enable the Bluetooth disconnection function. (Changes take effect immediately) >> *AT+GPIOCFG=0,1* >> *OK*

2.2.15 AT+DISC

Description: Disconnect Bluetooth (Only be used in command mode)
Format: AT+DISC{=param}
Response: OK
param: Without parameters, disconnect all connections; with parameters, disconnect the specified channel.
Eg1: Disconnect all connections << *AT+DISC* >> *OK* **Eg2:** Disconnect devices of Channel 0 << *AT+DISC=0* >> *OK*

2.3 GATT

2.3.1 AT+GATTSTATE

Description: Check Bluetooth connection State
Format: AT+GATTSTATE
Response: +GATTSTATE=param1,param2

param1(0~8): Connection Channel param2(1~3):1. Not connected, 2 Connecting, 3 Connected
Eg: Check Bluetooth connection State << *AT+GATTSTATE* >> *+GATTSTATE=0,3* >> *OK*

2.3.2 AT+GATTINFO

Description: Read Bluetooth connection State
Format: AT+GATTINFO
Response: +GATTINFO=param1,param2,param3,param4,param5
param1(0~8)： Connection Channel param2(1~3)： 1. Not connected, 2 Connecting, 3 Connected param3(0~1)： Connection master-slave mode, 0 master mode, 1 slave mode param4： MAC address of the connected remote device param5： Connection MTU size
Eg: Read Bluetooth connection State << *AT+GATTINFO* >> *+GETINFO=0,1,0,000000000000,23* *OK*

2.3.3 AT+IBEACON

Description: Read/ Setting iBeacon broadcasting function, default: 1
Format: AT+IBEACON {=param}
param:(0~2) (0) Turn off iBeacon (1) Turn on iBeacon, set the iBeacon content through the command AT+ADVDATA
Response: +IBEACON=param
Eg: Read << *AT+IBEACON* >> *+IBEACON=1* >> *OK*
Eg2: turn off iBeacon broadcast (Changes take effect immediately) << *AT+IBEACON=0* >> *OK*

2.3.4 AT+ADVDATA

Description: Read, Setting iBeacon broadcast content
Format: AT+ADVDATA{=param}
param: iBeacon data (2~56 Bytes ASCII)

Response: +ADVDATA=param
Eg1: Read << *AT+ADVDATA* >> *+ADVDATA=4C0002155B198FF269A011EE8C990242AC12000200000000B5* >> *OK*
Eg2: Setting iBeacon broadcast data: 0x4C 0x00 0x02 0x15 0x5B 0x19 0x8F 0xF2 0x69 0xA0 0x11 0xEE 0x8C 0x99 0x02 0x42 0xAC 0x12 0x00 0x02 0x00 0x00 0x00 0x00 0xB6(Changes take effect immediately) << *AT+ADVDATA=4C0002155B198FF269A011EE8C990242AC12000200000000B6* >> *OK*

2.3.5 AT+ADVADDR

Description: Broadcast Bluetooth MAC address, default: 1
Format: AT+ADVADDR{=param}
param:(0~1) (0) Turn off broadcast MAC address function. (1) Turn on broadcast MAC address function
Response: +ADVADDR=param
Eg1: Read Broadcast Bluetooth MAC address << *AT+ADVADDR* >> *+ADVADDR=1* >> *OK*

Eg2: Turn off the broadcasting of MAC address (Changes take effect immediately) << *AT+ADVADDR=0* >> *OK*

2.3.6 AT+ADVIN

Description: Read/Setting Broadcast interval, default: 152s
Format: AT+ADVIN {=param}
param:(25~10000), unit: ms
Response: +ADVIN=param
Eg1: Read << *AT+ADVIN* >> *+ADVIN=152* >> *OK*
Eg2: Setting broadcast interval is 1000s (Changes take effect immediately) << *AT+ADVIN=1000* >> *OK*

2.3.7 AT+GATTSEND

Description: Send data to remote device (Only on Command mode using)
Format: AT+GATTSEND =param1,param2,param3

param1: Connection channel number (0~8) Param2: Data length (1~244) Param3: Data（1~244Bytes）
Response: OK
Eg: Send the data “0123456789” to remote device << *AT+GATTSEND=0,10,0123456789* >> *OK*

2.4 Host Command

2.4.1 AT+SCAN

Description: Scan as a host to obtain the broadcast information of the slave
Format: AT+SCAN=param1{,param2{,param3}}
param1(0~2) (0) Stop scanning (1) (1) Scan the surrounding BLE devices to obtain MAC type, MAC, rssi, name len, name and other information. Use the default time scan of 10 seconds to automatically end the scan. By default, only 7 pieces of information of different BLE devices can be stored and printed. (2) param2:(100~10000, unit: ms), scanning time param3: Scan for devices with specified Bluetooth names
Response: +SCAN=param1,param2,param3,param4,param5,param6 Param(1): param1: serial number, Param2: MAC address type, param3: MAC address, param4: RSSI signal value, param5: length of device name, param6: device name

Param(2): Param1: MAC address type, param2: MAC address, param3: RSSI signal value, param4: broadcast type, param5: broadcast length, param6: broadcast content
Eg1: Scan device name using default time << *AT+SCAN=1*
Eg2: Scan the device name and set the scan time to 1000ms. << *AT+SCAN=1,1000*
Eg3: Scan the device name, and set the scan time to 1000ms, and only scan the device named MY-BT502 << *AT+SCAN=1,1000,MY-BT502*
Eg4: Scan and print all broadcast information << *AT+SCAN=2*

2.4.2 AT+UUID

Description: When connected as a host, it will look for the UUID of the slave communication. Before establishing a Bluetooth connection, the slave communication UUID needs to be registered in the host. The default is FFF0, FFF1, FFF2
Format: AT+UUID{=param1,param2,param3}
param1: service uuid param2: notify uuid Param3: write uuid
Response: +GUUID=param1,param2,param3

Eg1: Check the info << *AT+UUID* >> *+UUID=FFF0,FFF1,FFF2* >> *OK*
Eg2: The slave UUID is service FFF0, notify FFF1, write FFF2, and the registration instructions are as follows (Changes take effect immediately) << *AT+UUID=FFF0,FFF1,FFF2* >> *OK*

2.4.3 AT+CONN

Description: Connecting slave devices as a master
Format: AT+CONN=param1param2
param1: Device MAC address param2: Device MAC address type
Response: OK
Eg1: The master initiates the connection (specifies the MAC address and address type) << *AT+CONN=1122334455660* >> *OK*

2.4.4 AT+AUTOCFG

Description: Turn on or off the host mode automatic connection function. The default value is 0. After setting it to 1, the module will record the information of the host's last connection to the device, and

will automatically reconnect when the host is restarted or disconnected abnormally.
Format: AT+AUTOCFG{=param}
Param (0~1): (0) Disable the master mode auto-connect function (1) Enable the master mode auto-connect function
Response: OK
Eg1: Read host mode automatic connection function << *AT+AUTOCFG* >> *+AUTOCFG=0* >> *OK*
Eg2: Turn on host mode automatic connection function (Changes take effect immediately) << *AT+AUTOCFG=1* >> *OK*

2.5 HID Command

2.5.1 AT+HIDEN

Description: Turn on/off HID, default: Turn off (0)
Format: AT+HIDEN{=Param}
Param (0~1): (0) Turn off HID

(1) Turn on HID
Eg: Trurn on HID (reset and restart to take effect)， note that HID function must be used in command mode **+TPMODE=0** << *AT+HIDEN=1* >> *OK*

2.5.2 AT+LAYOUT

Description： iOS device keyboard pop-up, shrink
Format: AT+LAYOUT
Response: OK
Eg: << *AT+LAYOUT* >> *OK*

2.5.3 AT+LANGUE

Description: HID keyboard language setting, the keyboard uses the specified language to send, the remote device please set the keyboard to the same language mode, default: 1 English
Format: AT+LANGUE{=param}
Param:(0~10) (0) HID standard keyboard value, please refer to the USB hid table.pdf guide document (1) English

(2) American English (3) Turkish (4) Spanish (5) Portuguese (6) French (7) German (8) Italian (9) Czech (10) Japanese
Response: +LANGUE=param
Eg1*:* Read HID language << *AT+LANGUE* >> *+LANGUE=1* >> *OK*
Eg2*:* Setting Japanese << *AT+LANGUE=10* >> *OK*

2.5.4 AT+VOLSUM

Description: Volume up
Format： AT+VOLSUM
Response： OK
Eg:

<< *AT+VOLSUM* >> *OK*

2.5.5 AT+VOLSUB

Description: Volume Down
Format： AT+VOLSUB
Response： OK
Eg: << *AT+VOLSUB* >> *OK*

2.5.6 AT+PICTURE

Description: Mobile phone photo taking
Format： AT+PICTURE
Response： OK
Eg: << *AT+PICTURE* >> *OK*

2.5.7 AT+FORWARD

Description: Play the next music
Format: AT+FORWARD
Response: OK
Eg: << *AT+FORWARD* >> *OK*

2.5.8 AT+BACKWARD

Description： Play previous music
Format： AT+BACKWARD
Response： OK
Eg: << *AT+BACKWARD* >> *OK*

2.5.9 AT+PLAYPAUSE

Description: Play and pause music
Format： AT+PLAYPAUSE

Response: OK
Eg: << *AT+PLAYPAUSE* >> *OK*

2.5.10 AT+HIDDLY

Description: Query and set the interval (speed) of HID sending, default: 10
Format: AT+HIDDLY{=param}
Param:(10~500)， unit: ms
Response: +HIDDLY=param
Eg1*:* Read the interval of HID sending << *AT+HIDDLY* >> *+HIDDLY=10* >> *OK*
Eg2: Setting the interval of HID sending in 20ms << *AT+HIDDLY=20* >> *OK*

2.5.11 AT+HIDSEND

Description: Sending HID data to other BT devices

Format: AT+HIDSEND=param1,param2
Param1:data length（1~244） Param2:HID data（1~244 bytes）
Response：+HIDSEND
Eg: Sending 0123456789 to remote device << *AT+HIDSEND=10,0123456789* >> *OK* >> *+HIDSEND*

2.6 Multiple connection commands

2.6.1 AT+MULEN

Description： Enable and disable the multi-connection function. The default value is disabled (0).
Format: AT+MULEN{=Param}
Param (0~1): (0) disable the multi-connection function (1) Enable the multi-connection function, supporting up to 9 connections
Eg: Enable the multi-connection function (reset and restart take effect). Note that the communication channel numbers of multiple connections are different. If you want to send data to the remote end through the module, you need to set **+TPMODE=0**. Refer to **AT+GATTSEND** command to send data. << *AT+MULEN=1* >> *OK*

2.6.2 AT+RSSI

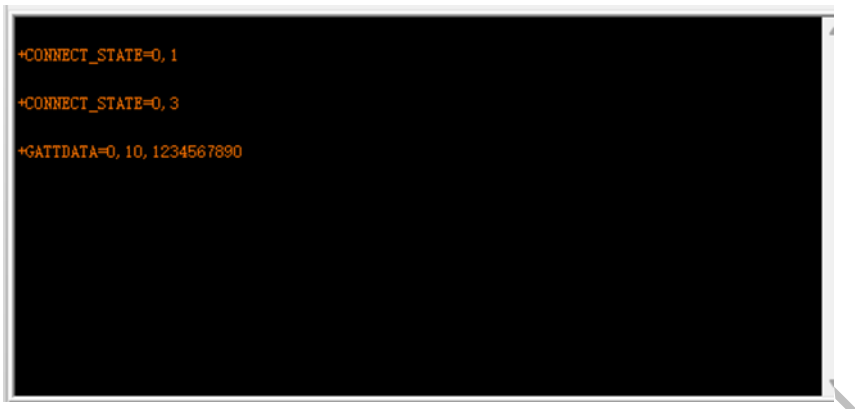
Description: Get the RSSI signal value of the connection channel
Format: AT+RSSI
Eg: Get RSSI. The first parameter is the connection channel number (0~8), and the second parameter is the signal value. Returning 0 means that the channel is not connected. << *AT+RSSI* >> *+RSSI=0,0* >> *OK*

2.6.3 AT+DBGMODE

Description: Turn on and off the serial port printing connection status and add headers and tails to the received remote transparent data. The default value is 0.
Format: AT+DBGMODE{=Param}
Param (0~1): (0) Disable DBG mode (1) Enable DBG mode
Eg: Turn DBG mode << *AT+DBGMODE=1* >> *OK*

After enabling DBGMODE, when Bluetooth is connected or disconnected, the serial port will print the connection status "\r\n+CONNECT_STATE=param1,param2\r\n", param1: channel number (0~8), param2: connection status, 3 connected, 1 disconnected.

When receiving remote data, add header and tail, "\r\n+GATTDATA=param1,param2,data\r\n", param1: connection channel number (0~8), param2: received data length, data: received data, tail: "\r\n"



2.7 ANCS Service Command

2.7.1 AT+ANCSCFG

Description: Enable and disable the ANCS service of the iOS system. The default setting is disable (0).
Format: AT+ANCSCFG{=Param}
Param (0~1): (0) Disable ANCS service (1) Enable ANCS service
Eg: enable ANCS service， After starting the ANCS service, the iOS system has a call reminder function “\r\n+INCOMINGCALL\r\n” << *AT+ANCSCFG=1* >> *OK*

2.7.2 AT+ANSWERCALL

Description: Answer the call
Format: AT+ANSWERCALL

Eg: Answer the call << *AT+ANSWERCALL* >> *OK*

2.7.3 AT+HANDUPCALL

Description： Reject call
Format: AT+HANDUPCALL
Eg: Reject call << *AT+HANDUPCALL* >> *OK*

3. Notes

1. Throughput mode: any data received by UART will be sent to the remote device through the GATT protocol.
2. Command mode: any data received by UART in any state will be parsed and processed, and will not be sent directly to the remote device.