
BT-102

Programming User Guide

version 1.0

Revision history

Version	date	Record	author
1.0	2020/06/01	initial version	GATT

FCC :

FEDERAL COMMUNICATIONS COMMISSION INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/ TV technician for help.

CAUTION:

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

This module is intended for OEM integrator. The OEM integrator is responsible for the compliance to all the rules that apply to the product into which this certified RF module is integrated. Additional testing and certification may be necessary when multiple modules are used.

USERS MANUAL OF THE END PRODUCT

In the users manual of the end product, the end user has to be informed to keep at least 20 cm separation with the antenna while this end product is installed and operated.

The end user has to be informed that the FCC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied.

The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

LABEL OF THE END PRODUCT

The final end product must be labeled in a visible area with the following **Contains FCC ID: YKH319-BT10200**

This radio transmitter **FCC ID: YKH319-BT10200** has been approved by FCC to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

NCC 警語

取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。低功率射頻器材之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前述合法通信，指依電信管理法規定作業之無線電通信。低功率射頻器材須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。本模組於取得認證後將依規定於模組本體標示審驗合格標籤，並要求最終產品平台廠商(OEM Integrator)於最終產品平台(End Product)上標示:本產品內含射頻模組，其 NCC 型式認證號碼為: CCAH23Y10110T0

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introduce

overview

BT-102 serial port communication command is the communication protocol between the Bluetooth module and the MCU , which includes all protocols included in the Bluetooth function such as data commands, audio commands, control commands, and transmission commands, so these commands are not necessarily in line with the requirements. The instructions of the Bluetooth module are the same, but there is a relationship of being included. When using it, you only need to find out the corresponding demand instruction. If there is no response to the sent instruction or "ERROR" is returned, it is a normal phenomenon. Use the corresponding firmware . The command is enough, the default serial transmission rate of the Bluetooth serial port is 115200 .

1. instruction description

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

- All directives begin with " AT " , and end with <CR><LF>
- <CR> represents "carriage return" , and the corresponding HEX is 0x0D
- <LF> stands for "carriage return" , and the corresponding HEX is 0x0A
- If the command has parameters to be set , add " = " before the parameters
- If the command has multiple parameters , each parameter must be separated by " , "
- If the command has a feedback response , the beginning of the feedback is <CR><LF>, and the end is <CR><LF>
- Mod Feedback " OK " Indicates success / " ERROR " failed
- Module UART preset serial transmission rate 115200
- All commands of the module are capital letters
- Data: 8
- Parity: None
- Stop: 1
- C->S : Represents the MCU to send instructions to the module
- C<-S : indicates that the module sends instructions to the MCU
- R : stands for read data
- W : stands for writing data

2. List of Common Data Foundation Instructions

3.1 Test command AT

instruction description
Format : AT Response : OK Description : UART communication test
example
C->S AT C<-S OK

3.2 Query the version number command AT+VER

instruction description
Format : AT+VER Response : +VER=Param OK Description : Param= Bluetooth firmware version number
example
C->S AT+VER C<-S +VER=1.0.0, MY-BT401 C<-S OK

3.3 Read Bluetooth MAC address

3.3.1 Read BLE MAC address AT+LEADDR

instruction description
Format : AT+LEADDR Response : +LEADDR= Param OK Description : Param= BLE MAC Bluetooth address
example
C->S AT+LEADDR C<-S +LEADDR=DD0D305AF262 C<-S OK

3.3.2 Read BR/EDR MAC address AT+ADDR

instruction description
Format : AT+ADDR Response : +ADDR=Param OK Description : Param= BR/EDR MAC Bluetooth address
example
C->S AT+ADDR C<-S +ADDR=DD0D305AF263 C<-S OK

3.4 Query / modify Bluetooth name

3.4.1 Query BR/EDR MAC Bluetooth name AT+NAME

instruction description

Format : AT+NAME Response : +NAME=Param OK Description : Param= 1~31 Bytes ASII Bluetooth name
example
C->S AT+NAME C<-S +NAME=MY-102 C<-S OK

3.4.2 Modify BR/EDR Bluetooth name AT+NAME=Param1,Param2

instruction description
Format : AT+NAME=Param1,Param2 Response : OK Description : Param1: 1~31 Bytes ASII Bluetooth name Param2: Add the last four digits of the Bluetooth MAC address, 0 means not added, 1 means added
example
C->S AT+NAME=MY-401,1 C<-S OK

3.3.3 Query BLE bluetooth name AT+LENAM

instruction description
Format : AT+LENAM Response : +LENAM=Param OK Description : Param= 1~31 Bytes ASII Bluetooth name
example
C->S AT+LENAM C<-S +LENAM=MY-BT401LE C<-S OK

3.3.4 Modify BLE bluetooth name AT+LENAM=Param1,Param2

instruction description
Format : AT+LENAM=Param1,Param2 Response : OK Description : Param1: 1~31 Bytes ASII Bluetooth name Param2: Add the last four digits of the Bluetooth MAC address, 0 means not added, 1 means added
example
C->S AT+LENAM=MY-BT401LE,1 C<-S OK

3.4 Query / modify PIN code

3.4.1 Query PIN code AT+PIN

instruction description
Format : AT+PIN Response : +PIN=Param OK Description : Param= 4~15 Bytes ASII PIN code, the default PIN code is 0000
example
C->S AT+PIN C<-S +PIN=0000 C<-S OK

3.4.2 Modify PIN code AT+PIN=Param

instruction description
Format : AT+PIN=Param Response : +PIN=Param OK Description : Param= 4~15 Bytes ASCII PIN code
example
C->S AT+PIN=1234 C<-S OK

3.5 Easy pairing settings

3.5.1 Query the simple pairing status AT+SSP

instruction description
Format : AT+SSP Response : +SSP=Param OK Description : Param= 0 means turn off easy pairing, 1 means turn on easy pairing
example
C->S AT+SSP C<-S +SSP=0 C<-S OK

3.5.2 Modify the simple pairing state AT+SSP=Param

instruction description
Format : AT+SSP=Param Response : +SSP=Param OK Description : Param= 0 means close, 1 means open simple pairing
example
C->S AT+SSP=1 C<-S OK

3.6 UART serial transmission rate setting

3.6.1 Query serial transmission rate AT+BAUD

instruction description
Format : AT+BAUD Response : +BAUD=Param OK Description : Param= The current serial transmission rate of the module
example
C->S AT+BAUD C<-S +BAUD=115200 C<-S OK

3.6.2 Modify serial transmission rate AT+BAUD=Param

instruction description
Format : AT+BAUD=Param Response : +BAUD=Param OK Description : Param= The serial transmission rate you want to set (1200-921600)
example

C->S AT+BUAD=115200 C<-S +BUAD=115200 C<-S OK

3.7 Bluetooth icon settings

3.7.1 Query the bluetooth icon AT+COD

instruction description
Format : AT+COD Response : +COD=Param OK Description : Param= Bluetooth identification code, used to display on the device, such as headset form, keyboard form, mouse form, etc.
example
C->S AT+COD C<-S +COD=240404 C<-S OK

3.7.2 Modify the bluetooth icon AT+COD=Param

instruction description
Format : AT+COD=Param Response : +COD=Param OK Description : Param= Bluetooth identification code, used to display on the device, such as headset form, keyboard form, mouse form, etc.
example
C->S AT+COD=240204 C<-S +COD=240404 C<-S OK

3.8 Working mode switching

3.8.1 Query working mode AT+MODE

instruction description
Format : AT+MODE Response : +MODE=Param OK Description : Param=1~4 (1=SPP, 2=BLE, 3=HID, 4=SPP+BLE)
example
C->S AT+MODE C<-S +MODE=3 C<-S OK

3.8.2 Set working mode AT+MODE=Param

instruction description
Format : AT+MODE=Param Response : +MODE=Param OK Description : Param=1~4 (1=SPP, 2=BLE, 3=HID, 4=SPP+BLE)
example
C->S AT+MODE=3 C<-S +MODE=3 C<-S OK

3.9 Query / Delete Pairing Records

3.9.1 Query pairing record AT+PLIST

instruction description
Format : AT+PLIST Response : +PLIST={ +PLIST=Param1,Param2 +PLIST=} OK Description : Param1= number of paired records and sorting (1~4) Param2= Bluetooth address code
example
C->S AT+PLIST C<-S +PLIST={ +PLIST=1,D89B3B9EAE9F +PLIST=} C<-S OK

3.9.2 Delete pairing record AT+PLIST=Param

instruction description
Format : AT+PLIST=Param Response : OK Description : Param=0 delete all pairing records Param=1~4, clear the corresponding pairing record according to the index of 1~4 Param=MAC address, clear the corresponding pairing record according to the index of the MAC address
example
C->S AT+PLIST=0 C<-S OK

3.10 Transparent transmission / command mode setting

3.10.1 Transparent transmission mode query AT+TPMODE

instruction description
Format : AT+TPMODE Response : +TPMODE=Param OK Description : Param=0 or 1 , 0 means close transparent transmission, 1 means open transparent transmission
example
C->S AT+TPMODE C<-S +TPMODE=1 C<-S OK

3.10.2 Transparent transmission mode query AT+TPMODE=Param

instruction description
Format : AT+TPMODE=Param Response : +TPMODE=Param OK Description : Param=0 or 1 , 0 means close transparent transmission, 1 means open transparent transmission
example
C->S AT+TPMODE=1

C<-S +TPMODE=1 C<-S OK

3.11 Low Power Settings

3.11.1 Low power mode query AT+LPW

instruction description
Format : AT+LPW Response : +LPW=Param OK Description : Param=0 or 1 , 0 means turn off low power consumption, 1 means turn on low power consumption
example
C->S AT+LPW C<-S +LPW=1 C<-S OK

3.11.2 Low power mode setting AT+LPW=Param

instruction description
Format : AT+LPW=Param Response : +LPW=Param OK Description : Param=0 or 1 , 0 means turn off low power consumption, 1 means turn on low power consumption
example
C->S AT+LPW=1 C<-S +LPW=1 C<-S OK

3.12 Hardware flow control settings

3.12.1 Hardware flow control query AT+FLOWCTL

instruction description
Format : AT+FLOWCTL Response : +FLOWCTL=Param OK Description : Param=0 or 1 , 0 means turn off hardware flow control, 1 means turn on hardware flow control
example
C->S AT+FLOWCTL C<-S +FLOWCTL=1 C<-S OK

3.12.2 Hardware flow control setting AT+FLOWCTL=Param

instruction description
Format : AT+FLOWCTL=Param Response : +FLOWCTL=Param OK Description : Param=0 or 1 , 0 means turn off hardware flow control, 1 means turn on hardware flow control
example
C->S AT+FLOWCTL=1 C<-S +FLOWCTL=1

C<-S OK

3.13 Power-on automatic connection setting

3.13.1 Power-on automatic connection query AT+AUTOCOON

instruction description
Format : AT+AUTOCOON Response : +AUTOCOON=Param OK Description : Param=0 or 1 , 0 means turn off automatic reconnection after power-on, 1 means enable automatic reconnection after power-on
example
C->S AT+AUTOCOON C<-S +AUTOCOON=1 C<-S OK

3.13.2 Power-on automatic connection setting AT+AUTOCOON=Param

instruction description
Format : AT+AUTOCOON=Param Response : +AUTOCOON=Param OK Description : Param=0 or 1 , 0 means turn off automatic reconnection after power-on, 1 means enable automatic reconnection after power-on
example
C->S AT+AUTOCOON=1 C<-S +AUTOCOON=1 C<-S OK

3.14 Disconnect all connected devices AT+DISC

instruction description
Format : AT+DISC Response : OK Description : Disconnect says there is a connected device
example
C->S AT+DISC C<-S OK

3.15 Restart the device AT+REBOOT

instruction description
Format : AT+REBOOT Response : OK Description : Reboot device
example
C->S AT+REBOOT C<-S OK

3.16 Restore factory settings AT+RESTORE

instruction description

Format : AT+RESTORE
Response : OK
Description : The settings are restored to the original state
example
C->S AT+RESTOER
C<-S OK

3.17.1 BLE query master-slave mode AT+ROLE

instruction description
Format : AT+ROLE
Response : +ROLE=0
OK
Description : ROLE=0 means slave mode, ROLE=1 means master mode
example
C->S AT+ROLE
C<-S +ROLE=0
C<-S OK

3.17.2 BLE switching master-slave mode AT+ROLE=Param

instruction description
Format : AT+ROLE=1
Response : +ROLE=1
OK
Description : ROLE=0 means slave mode, ROLE=1 means master mode
example
C->S AT+ROLE
C<-S +ROLE=1
C<-S OK

3.18 Search all bluetooth devices AT+SCAN

instruction description
Format : AT+SCAN
Response : +SCAN=Param1,Param2,Param3,Param4,Param5,Param6
OK
Description : Param1 represents the search list sequence, Param2 represents the Bluetooth URL type (0 represents a fixed Bluetooth address, 1 represents a random address), Param3 represents the Bluetooth model strength, Param4 represents the Bluetooth address code, Param5 represents the length of the Bluetooth name, and Param6 represents the Bluetooth name
example
C->S AT+SCAN
C<-S +SCAN=1,0,3C610529F63E,-80,9,MY-BT
C<-S +SCAN=2,1,3C610529FFFE,-10,8,MY-BT
C<-S OK

3.18 Stop searching for Bluetooth devices AT+SCAN=0

instruction description
Format : AT+SCAN=0
Response : OK
Description :
example
C->S AT+SCAN=0
C<-S OK

3.19 Search classic bluetooth devices AT+SCAN=1

instruction description
Format : AT+SCAN=1 Response : +SCAN=Param1,Param2,Param3,Param4,Param5,Param6 OK Description : Param1 represents the search list sequence, Param2 represents the Bluetooth URL type (0 represents a fixed Bluetooth address, 1 represents a random address), Param3 represents the Bluetooth model strength, Param4 represents the Bluetooth address code, Param5 represents the length of the Bluetooth name, and Param6 represents the Bluetooth name
example
C->S AT+SCAN=1 C<-S +SCAN=1,0,3C610529F63E,-80,9,MY-BT C<-S +SCAN=2,1,3C610529FFFE,-10,8,MY-BT C<-S OK

3.19 Search for BLE Bluetooth devices AT+SCAN=2

instruction description
Format : AT+SCAN=2 Response : +SCAN=Param1,Param2,Param3,Param4,Param5,Param6 OK Description : Param1 represents the search list sequence, Param2 represents the Bluetooth URL type (0 represents a fixed Bluetooth address, 1 represents a random address), Param3 represents the Bluetooth model strength, Param4 represents the Bluetooth address code, Param5 represents the length of the Bluetooth name, and Param6 represents the Bluetooth name
example
C->S AT+SCAN=2 C<-S +SCAN=1,0,3C610529F63E,-80,9,MY-BT C<-S +SCAN=2,1,3C610529FFFE,-10,8,MY-BT C<-S OK

3.19 BLE connect Bluetooth device AT+LECONN

instruction description
Format : AT+LECONN=Param1,Param2,Param3,Param4 Response : +SCAN=Param1,Param2,Param3,Param4 OK Description : Param1 stands for Bluetooth address code, Param2 stands for Service-UUID , Param3 stands for Wire-UUID , Param4 stands for Notify-UUID
example
C->S AT+LECONN=3C610529F63E,FFF0,FFF2,FFFF1 C<-S OK

3.20 BLE send data AT+LESEND

instruction description
Format : AT+LESEND=Param1,Param2 Response : OK Description : Param1 represents the length of the data to be sent, Param2 represents the data to be sent
example
C->S AT+LESEND=10,1234567890 C<-S OK

3.21 BLE receiving data + GATTDATA

instruction description
Format : +GATTDATA=Param1,Param2 Description : Param1 represents the length of received data, Param2 represents the received data
example
C<-S +GATTDATA=10,1234567890

3.22 BLE UUID modification AT+SETUUID

instruction description
Format : AT+SETUUID=Param1 , Param2 , Param3 Description : Param1 stands for Service-UUID , Param2 stands for Wire-UUID , Param3 stands for Notify-UUID
example
C->S AT+SETUUID=FFF0,FFF2,FFFF1 C<-S +UUID=FFF0,FFF2,FFFF1 C<-S OK

3.23 Query BLE status AT+LECFG

instruction description
Format : AT+LECFG Response: +LECFG=Param Description : Param=0 means turn off BLE , Param=1 means turn on BLE
example
C->S AT+LECFG C<-S +LECFG=1 C<-S OK

3.24 Open and close BLE AT+LECFG=Param

instruction description
Format : AT+LECFG=Param Description : Param=0 means turn off BLE , Param=1 means turn on BLE
example
D->S AT+LECFG=1 C<-S +LECFG=1 C<-S OK