

EH-MC16

Command Interface User Guide

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VERSION HISTORY

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1. Introduction

The command interface is a set of ASCII commands and indicators with which the user can send command to the Bluetooth module via UART interface from host (PC, MCU, etc.).

The commands are used to send to Bluetooth module from host. The indicators are output from the Bluetooth module to the host for indicating the status of the module.

In addition, there are some IO indicators available when the UART is used to transfer raw data. As a complement of ASCII commands and indicators, the IO indicators are also a part of AT COMMAND.

1.1. Default UART Configuration

The default configuration of UART is given below:

baud rate: 9600

Data bits: 8

Stop bits: 1 parity: None

Flow command: None

The default UUID of service is given below:

Service UUID : 11223344-5566-7788-99AA-BBCCDDEEFF00

2. Command and Indicator Syntax

2.2. General Syntax

The general syntax of AT command is shown as below:

→AT+CMD[=Para1][,Para2][, RawData] <CR><LF>

The general syntax of AT indicator is shown as below:

←IDC[=Para1]<CR><LF>

Note: 1. For the examples in this document, the command sent to the Bluetooth module will be shown with “→” at the beginning of the line, while the indicator output by Bluetooth module will be shown with “←” at the beginning of the line.

2.2. Description of each field

“AT+” : command line prefix.

“CMD”: command. All of the commands are listed in section 5.

“IDC” : indicator. All of the indicators are listed in section 4.

“= ” : separator between command/indicator and parameter. It's only needed if a parameter is presented. Para1 is the first parameter. Not all of the commands have a parameter.

“, ” : separator between parameters. It's only needed if subsequent parameter is presented. Para2 is the second parameter if available. RawData is the raw data which will be sent by the command. Only parts of the commands have this field.

<CR><LF>: terminator of the command, hex: 0x0d 0x0a

Notes:

1. All of the parameters are composed of ASCII characters while the RawData field can composed of any data contents.
2. In indicators, the module prints hex values in low case. For other places in the document we always use upper case characters for hex values.

2.3. Description of each field

Here is some examples show how to use the AT commands and indicators.

→AT+NM=EH-LINK<CR><LF> configure the GAP device name characteristic. The newname is “EH-LINK”.

←OK<CR><LF> response from the module to indicate the command is adopted.

Notes:For the examples in this document, the command sent to the Bluetooth Module will be shown with “→” at the beginning of the line, while the indicator output by Bluetooth Module will be shown with “←” at the beginning of the line. “→”and“←” not send with the ascii data.

3. Command List

All the available AT commands are listed and briefly described in the tables below. The detailed description of each command is given in chapter 5.
description of each command is given in chapter 5.

Command	Short Description
RESET	The module is reset.
VERSION	Query firmware version.
NAME	Query or configure the module name.
LADDR	Query module address.
PIN	Query or configure the Pairing code.
BAUD	Query or configure the baud.
ADVMOD	Query or configure the Broadcasting mode.
ADVEN	Turn the broadcast on or off.
ADVINT	Query or configure the Broadcast interval.
POWER	Query or configure the transmitted power.
ADVDAT	Query or configure the Broadcast data.
SCANRSP	Query or configure the SCAN Response data.
ROLE	Query or configure the master/slave mode .
PHY2M	Query or configure the 2M.
SLEEP	In DLPS.
PAIR	Query or configure the pairable mode.
INQ	Search for bluetooth devices.
SINQ	Stop searching for bluetooth devices.
SCANRLT	Search for bluetooth address by number.
CONN	Connect the remote device.
FC	Query or configure the UART control current.
BTFC	Query or configure the BT control current.
DEFAULT	Software reset.

4. Indicator List

All the available AT command indicators are listed and briefly described in the tables below. The detailed description of each indicator is given in chapter 5 and chapter 6.

Indicator	Short Description
OK	Indicate successful after command was adopted.
ER	Indicates error after give a command.
BD	Reports current UART baud rate.

5.General Information Commands

5.1. RESET—The module is reset

5.1.1.Description:

This command resets the bluetooth module.

5.1.2. Syntax:

Synopsis:

→AT+RESET<CR><LF>

←OK<CR><LF>

5.1.3. Parameter Description:

none

5.1.4. Examples:

Ex. 1. Reset bluetooth module:

→AT+ RESET <CR><LF> Reset bluetooth module.
 ←OK<CR><LF> Reset the success.

5.2. VERSION—Query firmware version.

5.2.1. Description:

This command retrieves the bluetooth firmware version

5.2.2. Syntax:

Synopsis:

→AT+VERSION<CR><LF>
 ←+VERSION =<Param><CR><LF>

5.2.3. Parameter Description:

Parameter	Description	Nvram	Comments
	Param: patch Version (8 characters)+app Version (8 characters) Both Patch and app version are 32-bit, and the response of version is in the form of string.	NO	

5.2.4. Examples:

Ex. Query the firmware version of the module:

→AT+ VERSION <CR><LF> Query the firmware version of the module.
 ←+VERSION =<Param><CR><LF> response from the module to indicate the command is adopted.

5.3. NAME—Query or Configure Module’s Name

5.3.1. Description:

This command can query or configure the BLE Module’s name. It will take effect next power on.

5.3.2. Syntax:

Synopsis:

→AT+NAME[=Name]<CR><LF>
 ←+NAME=Name<CR><LF>

5.3.3. Parameter Description:

Parameter	Description	Nvram	Comments
[Name] will display in advertising data.	Query or configure the BLEModule’s name.	YES	The length of the name can’t over 18 bytes.

5.3.4. Examples:

Ex.a. To query the name of module:

→AT+NAME<CR><LF> Query the name of module.
 ←+NAME=EH-MC17<CR><LF> response the name of the module.

Ex.b. Configure the name of the module:

→AT+NAME=TEST123<CR><LF> Configure the name of module as “TEST123”.
 ←OK<CR><LF> response from the module to indicate the command is adopted.

5.4. LADDR — Query or Configure Advertise Type

5.4.1. Description:

This command gets the bluetooth module address.

5.4.2. Syntax:

Synopsis:

→AT+LADDR[=Type]<CR><LF>
 ←+LADDR=<Param><CR><LF>

5.4.3. Parameter Description:

Parameter	Description	Nvram	Comments
[address]	Module's local mac address	NC	The address format is: UAP,NAP,LAP

5.4.4. Examples:

Ex. To query the module's address:

→AT+ LADDR <CR><LF> query the module advertising type.

←+LADDR =<Param><CR><LF> response the module's address.

5.5. PIN—Query the module pairing code

5.5.1. Description:

This command queries the module pairing code.

5.5.2. Syntax:

Synopsis:

→AT+PIN<CR><LF>

←+PIN=<Param><CR><LF>

5.5.3. Parameter Description:

Parameter	Description	Nvram	Comments
The pairing code for the module	module's pairing code	NC	6 digit pairing code(Windows:123456)

5.5.4. Examples:

Ex. To reset the module:

→AT+PIN <CR><LF> query the module's address.

←+PIN=<Param><CR><LF> response from the module to indicate the command is adopted.

5.6. BAUD—Query or Configure UART's Baud Rate

5.6.1. Description:

This command can query or configure the UART baud rate of Bluetooth Module. Once changed, the new baud rate will take effect next power on. The Bluetooth module stores the value in its non-volatile memory so the value won't change until be set again. If the command without parameter, the Bluetooth Module will report current baud rate by indicator BD.

5.6.2. Syntax:

Synopsis:

→AT+ BAUD <CR><LF>

←+BAUD =<Param><CR><LF>

5.6.3. Parameter Description:

Parameter	Description	Nvram	Comments
[baudrate] Range: 2400-921600	Module's baudrate of UART speed. 2400 bps 9600 bps 19200 bps 38400 bps 57600 bps 115200 bps 230400 bps 460800 bps 921600 bps	YES	Default: 115200

5.6.4. Examples:

Ex.a. To query the baud rate of Bluetooth Module:

→AT+BAUD<CR><LF> query the baud rate.

←+BAUD=9600<CR><LF> report the baud rate, it's 9600.

Ex.b. To change the baud rate of Bluetooth Module:

→AT+BAUD=115200<CR><LF> change the baud rate to 115200.

←OK response from the module to indicate the command is adopted.

5.7. ADVMOD—Query or configure the Broadcasting mode

5.7.1. Description:

This command can query and set broadcast mode.

5.7.2. Syntax:

Synopsis:

→AT+ ADVMOD <CR><LF>

←+ADVMOD =<Param><CR><LF>

→AT+ ADVMOD=<Param> <CR><LF>

←OK<CR><LF>

5.1.7.3. Parameter Description:

Parameter	Description	Nvram	Comments
	Param (0, 1) 0: Manual radio 1: Automatic radio	YES	Default: 1

5.7.4. Examples:

Ex. Query module broadcast mode:

→AT+ ADVMOD <CR><LF> Query module broadcast mode.

←+ADVMOD =<Param><CR><LF> response from the module to indicate the command is adopted.

Ex. Configure module broadcast mode:

→AT+ ADVMOD =0<CR><LF> Configure module broadcast mode.

←OK<CR><LF> response from the module to indicate the command is adopted.

5.8. POWER—Query or Configure the TX Power level

5.8.1. Description:

This command can query or configure the TX power value.

5.8.2. Syntax:

Synopsis:

→AT+POWER[=Power]<CR><LF>

←+POWER=Power<CR><LF>

5.8.3. Parameter Description:

Parameter	Description	Nvram	Comments
[Power] Range: -20,0,3,4,8	Param (-20,0,3,4,8) : -20: -20dBm 0: 0dBm 3: 3dBm 4: 4dBm 8: 8dBm 1: Automatic radio	YES	Default: 0

5.8.4. Examples:

Ex. To query the module's TX power level:

AT+POWER<CR><LF> query the module's power value.

+POWER=04<CR><LF> response the module's TX power value, level: 4.

AT+POWER=01<CR><LF> configure the module's TX power value.

OK<CR><LF> response from the module to indicate the command is adopted.

he module to indicate the command is adopted.

5.9. ADVDAT—Query or Configure Module's Broadcast data (Beacon)

5.9.1. Description:

This command can query or set the broadcast data of the module.

5.9.2. Syntax:

Synopsis:

→AT+ ADVDAT <CR><LF>

←+ADVDAT = <Param> <CR><LF>

5.9.3. Examples:

Parameter	Description	Nvram	Comments
Query or Configure Module's Broadcast data	<Param>less than or equal to31*2	NC	Only valid in beacon mode

5.9.4. Examples:

Ex. a.To Query the module' broadcast data:

→AT+ ADVDAT <CR><LF> Query the module's broadcast data.

←+ADVDAT = <Param><CR><LF> response the module's state is fast advertising.

Ex. b.To Configure the module' broadcast data:

→AT+ ADVDAT =<Param><CR><LF> Configure the module's broadcast data.

←OK<CR><LF> response the module's state is fast advertising.

5.10. SCANRSP—Query or Configure Module's response data (Beacon)

5.10.1. Description:

This command can query or set the response data of the module.

5.10.2. Syntax:

Synopsis:

→AT+ SCANRSP <CR><LF>

←+SCANRSP =<Param><CR><LF>

5.10.3. Examples:

Parameter	Description	Nvram	Comments
Query or Configure Module's response data	<Param>less than or equal to31*2	NC	Only valid in beacon mode

5.10.4. Examples:

Ex. a.To Query the module' response data:

→AT+ SCANRSP <CR><LF> Query the module's response data.

←+SCANRSP = <Param><CR><LF> response the module's state is fast advertising.

Ex. b.To Configure the module' response data:

→AT+ SCANRSP =<Param><CR><LF> Configure the module's response data.

←OK<CR><LF> response the module's state is fast advertising.

5.11. ROLE — Query or Configure Module's master/slave mode

5.11.1. Description:

This command can query or configure the module's master/slave mode.

5.11.2. Syntax:

Synopsis:

→AT+ ROLE<CR><LF>

←+ROLE =<Param><CR><LF>

5.11.3. Parameter Description:

Parameter	Description	Nvram	Comments
	Param (0, 1) : 0: slave 1: master 2: beacon		Default: 0

5.11.4. Examples:

Ex. Query or configure the module's master/slave mode:

→AT+ ROLE <CR><LF> query the module's master/slave mode:

←+ROLE =<Param><CR><LF> response from the module to indicate the command is adopted.

5.12. PHY2M—Query or Configure Module's 2M schema

5.12.1. Description:

This command can query or Configure Module's 2M schema.

5.12.2. Syntax:

Synopsis:

→AT+ PHY2M <CR><LF>

←+PHY2M =<Param><CR><LF>

5.12.3. Parameter Description:

Parameter	Description	Nvram	Comments
	Param (0, 1) : 0: 1M 1: 2M	NC	Default: 0

5.12.4. Examples:

Ex. Query the module's 2M schema:

→AT+ PHY2M <CR><LF> query the module's 2M schema.

←+PHY2M =<Param><CR><LF> response the module's connection parameter.

Ex. Configure the module's connection parameter:

→AT+ PHY2M =1<CR><LF> configure the Module's 2M schema.

←OK<CR><LF> response from the module to indicate the command is adopted.

5.13. SLEEP—Enter into DLPS

5.13.1. Description:

This command can enter disconnected mode.

5.13.2. Syntax:

Synopsis:

→AT+ SLEEP <CR><LF>

←OK<CR><LF>

5.13.3. Parameter Descri

Parameter	Description	Nvram	Comments
	Enter disconnected mode	NC	Wake up by arbitrary command

5.13.4. Examples:

Ex. Enter disconnected mode:

→AT+ SLEEP<CR><LF>

←OK<CR><LF> response from the module to indicate the command is adopted.

5.14. PAIR—Query or Configure Module's pairing mode

5.14.1. Description:

This command can query the module's pairing mode .

5.14.2. Syntax:

Synopsis:

→AT+PAIR<CR><LF>

←+PAIR=<Param><CR><LF>

5.14.3. Parameter Description:

Parameter	Description	Nvram	Comments
NC	Param (0, 1, 2, 3) : 0: NO PASS WORD 1: JUST WORK 2: PASS_WORD 3: PASS_WORD_BOND	NC	Default: 0

5.14.4. Examples:

Ex.To query the module's pairing mode:

AT+ PAIR <CR><LF> query the module's firmware version.

+PAIR =<Param><CR><LF> response from the module to indicate the command is adopted.

5.15.FC—Query or Configure UART flow control

5.15.1. Description:

This command can query or Configure UART flow control.

5.15.2. Syntax:

Synopsis:

→AT+FC<CR><LF>

←+FC=<Param><CR><LF>

5.15.3. Parameter Description:

Parameter	Description	Nvram	Comments
	Param (0, 1) : 0: Forbid UART flow control 1: Enabled UART flow control		Default: 0

5.15.4. Examples:

Ex. To Query or Configure UART flow control:

AT+ FC <CR><LF> Query UART flow control.

+FC =<Param><CR><LF> Response from the module to indicate the command is adopted.

5.16. BTFC—Query or Configure BTFC flow control

5.16.1. Description:

This command can query or Configure BTFC flow control.

5.15.2. Syntax:

Synopsis:

→AT+BTFC<CR><LF>

←+BFFC=<Param><CR><LF>

5.15.3. Parameter Description:

Parameter	Description	Nvram	Comments
	Param (0, 1) : 0: Forbid BTFC flow control 1: Enabled BTFC flow control		Default: 0 Command from the machine

5.15.4. Examples:

Ex. To query or configure BTFC flow control:

AT+ BTFC <CR><LF> Query BTFC flow control.

+BTFC =<Param><CR><LF> Response from the module to indicate the command is adopted.

5.17. DEFAULT—Oftware reset(Restore the default Settings and restart after 500ms)

5.17.1 Description:

This command can oftware reset,restore the default settings and restart after 500ms.

5.17.2. Syntax:

→AT+ DEFAULT<CR><LF>

←OK<CR><LF>

5.17.3. Parameter Description:

Parameter	Description	Nvram	Comments
	Restoring default Settings includes: 1.Module name: "Realtek" 2. Pairing code:"123456" 3.Master-slave mode: slave/pass-through mode 4. Broadcast mode: auto 5.Baud rate:4(9600) 6. Power on whether to enter low power consumption:1(Power on does not enter low power consumption)	NC	

5.17.4. Examples:

Ex. Oftware reset:

AT+ DEFAULT <CR><LF> Oftware reset.

OK<CR><LF> Response from the module to indicate the command is adopted.

5.18. INQ—Search for bluetooth devices (Master commands)

5.18.1. Description:

This command can search for bluetooth devices.

5.18.2. Syntax:

Synopsis:

→AT+INQ<CR><LF>

←OK<CR><LF>

←+INQS<CR><LF>

←0:Realtek 0x888888777777<CR><LF>

←1:Realtek 0x333333444444<CR><LF>

5.18.3. Parameter Description:

Parameter	Description	Nvram	Comments
	0:<NAME> <MAC> 1:<NAME> <MAC> 2:<NAME> <MAC> ...		NAME: The name of the passthrough module found MAC: MAC address of the passthrough module searched

5.18.4. Examples:

Ex. To Search for bluetooth devices:

AT+INQ<CR><LF> Search for bluetooth devices.

OK<CR><LF> response from the module to indicate the command is adopted.

0:Realtek 0x888888777777<CR><LF> Bluetooth devices 0

1:Realtek 0x333333444444<CR><LF> Bluetooth devices 1

5.19. SINQ—Stop searching for bluetooth devices

5.19.1. Description:

This command can stop searching for bluetooth devices.

5.19.2. Syntax:

Synopsis:

→AT+ SING<CR><LF>

←OK<CR><LF>

5.19.3. Parameter Description:

none

5.19.4. Examples:

Ex. To query stop searching for bluetooth devices:

AT+ SING <CR><LF> Query the stop searching for bluetooth devices .

OK<CR><LF> Response from the module to indicate the command is adopted.

5.20. SCANRLT—Search the bluetooth address according to the number query

5.20.1 Description:

This command can search the bluetooth address according to the number query.

5.20.2. Syntax:

Synopsis:

→AT+ SCANRLT=<Param><CR><LF>

←+SCANRLT=<Param>:<MAC><CR><LF>

5.20.3. Parameter Description:

Parameter	Description	Nvram	Comments
	Param: The serial number of the passthrough module found MAC: MAC address of the passthrough module searched	NC	Master mode command

5.20.4. Examples:

Ex. Search the bluetooth address according to the number query:

AT+ SCANRLT <CR><LF> Query the module's firmware version.

+SCANRLT=<Param>:<MAC><CR><LF> Response from the module to indicate the command is adopted.

5.21. CONN—Connect the remote device

5.21.1 Description:

This command can connect the remote device.

5.21.2. Syntax:

→AT+CONN=<Param><CR><LF>

←OK<CR><LF>

←+CONNS+CONNECTED>> <MAC><CR><LF>

5.21.3. Parameter Description:

Parameter	Description	Nvram	Comments
	Param: The device number of the passthrough module found (0 - 9) MAC: Establishes the MAC address of the connected bluetooth device	NC	Master mode command

5.21.4. Examples:

Ex.If device 0 is found(0: 0x888888777777):

→AT+ CONN=0<CR><LF>

←OK<CR><LF>

←+CONNS<CR><LF>

←+CONNECTED>>0x888888777777<CR><LF>Connection established successfully

←+CONNECTION TIME OUT<CR><LF>The connection has not been successfully established for more than 10 seconds

Notice: If you send "AT+CONN<Param>" again before returning "+CONNECTED>> <MAC>" (connection successfully established) or "+CONNECTION TIME OUT ", it will be considered invalid and return "INVALID CONNECTION COMMAND".

5.22. RF—Radio frequency test

5.22.1 Description:

This command allows the module to enter rf test mode.

5.22.2. Syntax:

→AT+RF=<Param><CR><LF>
←OK<CR><LF>

5.22.3. Parameter Description:

Parameter	Description	Nvram	Comments
	Param: 0,1 0:Use mode single tone(Frequency offset and 2402M output power, sensitivity cannot be tested) 1:Use mode HCI(HC lmode can use the RTL8762C_RFTTestTool.exe)	NC	

5.22.4. Examples:

Ex.Set RF test mode:

→AT+ RF=0<CR><LF> Use mode single tone
←OK<CR><LF> Response from the module to indicate the command is adopted.
→AT+ RF=1<CR><LF> Use mode HCI.
←OK<CR><LF> Response from the module to indicate the command is adopted.

6. Description of ASCII Commands

6.1. OK—Command is Adopted by the Bluetooth Module

6.1.1. Description:

This indicator indicates a command was adopted by the module successfully.

6.1.2. Syntax:

Synopsis:

←OK<CR><LF>

6.1.3. Examples:

Ex. To make Bluetooth Module discoverable:

→AT+AD=01<CR><LF> Make Bluetooth Module discoverable.
←OK<CR><LF> Response from the module to indicate the command is adopted.

6.2. ER—Error

6.2.1. Description:

This indicator indicates there is an error detected in the command sent by the host.

6.2.2. Syntax:

Synopsis:

←ER=Code<CR><LF>

6.2.3. Parameter Description:

Parameter	Description	Comments
	The error code to give the reason 01: The command is not support 02: The command Parameter is not right 03: The command is not allowed in current state. 04: The AT+DA command, less '=' 05: The command is a master command, and now,device role is slave. 06: The command valid in connected state.	

6.2.4. Examples:

Ex. To make Bluetooth Module discoverable:

→AT+AD=06<CR><LF> 06 is not a allowed parameter.

←ER=02<CR><LF> response from the module to indicate the command take a wrong parameter.