

BoT-CLE310

User Manual

Operation Description

BoT-CLE310 BLE wireless Module transmits and receives 2.4GHz frequency

The default operating voltage is 3.3 V, and the BLE transmission / reception data is processed by the main processor

[BoT-CLE310](#) wireless transmit / receive data operates with AT + Command stored in main processor.

BoT-CLE310 Protocol (AT-COMMAND)

OVERVIEW

This document defines a communications protocol through UART (serial port) between customers' MCU (hereinafter referred to as "HOST") connected with "Chipsen [BoT-CLE310](#) ~~BoT-CLE1X0~~-Module" (hereinafter referred to as "BT") and UART interface.

1.1. Basic Protocol Rule

- The transmission and receipt of data between the HOST and the BT is based on the UART(serial port) interface.
- Default setting values of UART (serial port)
 - Baud rate : 9600bps
 - Data bit : 8
 - Parity bit : none
 - Stop bit : 1
 - Flow Control : None
 - The aforementioned matters are default setting values, and if you want to change such values, please request a modification thereto when preparing the BT firmware or modify them using the applicable AT command (AT + UART = BaudRate).
- Communication direction
 - REQUEST (HOST → BT): generated from the HOST and transmitted to the BT
 - NOTIFY (BT → HOST): notify the basic state of the BT, as a message that is generated from the BT and transmitted to the HOST
 - RESPONSE (BT → HOST): a response to the REQUEST, as a message that is generated from the BT and transmitted to the HOST
- Communication rule

All protocols consist of a combination of ASCII values and notify the end of Command through <Carriage Return>.

E.g.) REQUEST - the mode state of the current device: AT+VER?

Command	AT+VER?
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Command set	A	T	+	V	E	R	?	CR
Ascii set	0x41	0x54	0x2B	0x56	0x45	0x52	0x3F	0x0D

E.g.) NOTIFY - when the preparation is completed after the application of the power:
+READY

Command	+READY						
Command set	+	R	E	A	D	Y	CR
ASCII set	0x2B	0x52	0x45	0x41	0x44	0x59	0x0D

E.g.) RESPONSE – Requested operation failed: +ERROR

Command	+ERROR						
Command set	+	E	R	R	O	R	CR
ASCII set	0x2B	0x45	0x52	0x52	0x4F	0x52	0x0D

1.2. Default Protocol Operation

- The BT transmits a corresponding RESPONSE after receiving a REQUEST from the HOST. The HOST may basically expect RESPONSE to +OK or +ERROR and receive a specific RESPONSE corresponding to REQUEST.

1.3. Description of UART operation modes

- With respect to the DATA of the HOST transmitted to UART, the BT supports two modes of the AT-COMMAND mode, when connection is not made with remote device, and the BYPASS mode, when connection is made with the remote device.

1.3.1 AT-COMMAND mode

There is a situation where an order can be given to change the device settings of the BT or make the BT perform a specific operation in the HOST, which is called the AT- COMMAND mode.

The BT always maintains the AT-COMMAND mode if connection is not made with Remote device.

Most of this document is to describe commands available in the AT-COMMAND mode.

1.3.2 BYPASS mode

The BT is capable of transmitting to the Remote device DATA generated in the HOST by being connected with Remote device. This state is called the BYPASS mode.

In the BYPASS mode, it is not possible to change the settings of the the BT device or perform a specific operation.

1.4. Description of the BT State

- The BT state is divided into Advertising, Connected, and Scanning on the basis of the state of connection with the Remote device and the UART operation mode (see "the **UART operation mode** ").

1.4.1 ADVERTISING

It comes under ADVERTISING in the BLE Server mode and under ADVERTISING in all cases not connected with the Remote Client device.

In case of the Advertising state, the UART operation mode always operates in the AT-COMMAND mode.

1.4.2 CONNECTED

It comes under CONNECTED when already connected with the Remote device. In this case, the data generated from the HOST is all sent to the Remote device.

1.4.3 SCANNING

It comes under SCANNING in the BLE Server mode and under SCANNING in all cases not connected with the Remote device.

1.5. Description of the BT GPIO

- Three GPIOs are allocated separately in order to make easy the state or control of the the BT in the HOST.

1.5.1. Indication of Server/Client Connection State (GPIO3)

GPIO3 is high when Server or Client is connected.

GPIO3 is low when Server or Client is disconnected.

1.5.2. Low-power operation (GPIO4)

The BT always enters the low-power mode in a situation where it is available.

In the low-power mode, there may occur an omission of data transmitted using UART in the HOST.

When data to be transmitted in AT command or with the Remote devices is sent to UART, be sure that a low-power GPIO4 must be kept high.

While GPIO is kept HIGH, The BT will not enter the low-power mode. If GPIO is kept LOW, the BT will immediately enter the low-power mode, but this case may cause problems in the UART communication.

1.5.3. Initialization to Factory Settings and Disconnection (GPIO9)

GPIO9 port has a default setting input in advance. When high values are kept more than 4 seconds, make a + OK response before returning them to the factory setting state. Also, when HIGH values are input during the connection, disconnection is possible.

2. REQUEST (HOST → BT) Protocol Summary

Protocol	Description	Remark
AT	+OK request	<Server/Client Role>
ATZ	Module reset	<Server/Client Role>
AT&F	Initialize values to be changed in the current module to factory settings before resetting them	<Server/Client Role>
AT+VER?	Request the version of the firmware applied to the current module.	<Server/Client Role>
AT+INFO?	Request the Bluetooth address, Device Name and Role information of the current module. e.g.) 74:F0:7D:B0:12:12,BoT,SERVER[PERIPHERAL]	<Server/Client Role>
AT+UART=xxxx	Used when the UART Baudrate is changed 2400, 9600, 19200, 38400, 57600, 115200, 230400	<Server/Client Role>
AT+ROLECHANGE	Change the role of the current device.	<Server/Client Role>
AT+SERVER=role	If the device operates in the Server mode, the operation will be decided depending on the role. : role=B – Broadcaster : role=P - Peripheral	<Server Role>

AT+MANUF=xxxxxxxx	Used when the name of Manufacturer is changed In case of Manufacturer using this command, device manufacturer information will be changed in the Discoverable mode. MAX 8byte	<Server Role>
AT+MANUF?	Request the Manufacturer	<Server Role>
AT+TXPWR=x	Used to adjust the TX power level of the BT; the power level will be automatically applied after the use of this command. Input range values: 0 ~ 7 (-18 ~ 8dBm)	<Server Role>
AT+TXPWR?	Request the TX power level of the BT	<Server Role>
AT+ADVDATA=xxxx	User data area to be set when the remote device is searched for while the device operates in the Server mode(MAX 11byte)	<Server Role>
AT+ADVDATA?	Requested to know the data of the User data	<Server Role>
AT+ADVINTERVAL=xxxxx	Used to change Advertising Interval Range: 20 ~ 10240 (ms)	<Server Role>
AT+ADVINTERVAL?	Requested to know the value of the Advertising Interval	<Server Role>
AT+CONNINTERVAL=xxxx	Used to change the value of the Connection Interval	<Server Role>
AT+CONNINTERVAL?	Requested to know the value of the Connection Interval	<Server Role>
AT+CLIENT=role	If the device operates in the Client mode, the operation will be decided depending on the role. : role=C- Central : role=O - Observer	<Client Role>
AT+SCAN	Search for peripherals Default Scan Time : 15 Second	<Client Role>
AT+SCAN=xxx	Search for peripherals for a specified period of time Range : 0~999 <Second> If "AT + SCAN = 0," unlimited	<Client Role>
AT+STOPSCAN	Request for stopping device searches	<Client Role>
AT+SCANINTERVAL=xxxx	Used to change Scan Interval Range : 12~2560 <ms>	<Client Role>
AT+SCANINTERVAL?	Used to know Scan Interval	<Client Role>
AT+SCANWINDOW=xxxx	Used to change Scan Window Size Range : 11~2560 <ms> Window Size is to be less than or equal to the Interval.	<Client Role>
AT+SCANWINDOW?	Used to know Scan Window Size	<Client Role>

AT+CONNECT=xxxxxxxxxxx	Request connection when you know the Bluetooth Address intended to be connected to. E.g.) AT+CONNECT=74F07DB00001	<Client Role>
AT+RECONNECT	Request connection to the device which was last connected to.	<Client Role>
AT+AUTOCONNECT?	Request automatic connection configure	<Client Role>
AT+AUTOCONNECT=ON	Set Enable automatic connection to the device which was last connected to.	<Client Role>
AT+AUTOCONNECT=OFF	Set Disable automatic connection to the device which was last connected to.	<Client Role>

3. NOTIFY (BT→HOST) Protocol Summary

Protocol	Description	Remark
+READY	The state where the power is turned on and Server or Client operation is possible	
+ADVERTISING	The state where search and connection are possible in the remote device	
+BROADCASTING	The state where only search is possible in the remote device	
+SCANNING	The state that allows for search for the remote device	
+CONNECTED[xx:xx:xx:xx:xx:xx]	If connection is made to the remote device	[xx:xx:xx:xx:xx:xx] Connected Target BT Device
+DISCONNECTED	If disconnection is made to the remote device	

4. Advertising (Discoverable) Data format

Advertising Data refers to data where the device is in the Server mode and which can be identified during search even when there is no connection.

4.1. Format

- A total of 31 bytes in Advertising data include changeable 22-byte data areas.
- The data included in the Advertising data is composed of the reserved data area where users cannot change and the data area where users can change via UART.
- FIELD in yellow block within 4.1.1 Structure is the area where users can change in the AT Command mode.

4.1.1 Structure

Packet types are as follows, and the Index position of the packet may be variable depending on the data length.

index	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Data	GAP Reserved			TX power Reserved		TX level User Data	Device name Reserved		Device Name User Data							

index	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Data	User data Reserved		Factory Reserved		Undefined User Data										

General RESPONSE (BT→HOST) Protocol Summary

Protocol	Description	Remark
+OK	When REQUEST is made normally	
+ERROR	To be sent to the HOST when REQUEST is not made normally	

5. REQUEST Protocol Detail

5.1. Server / Client Common AT Command

5.1.1 AT

Operation	Request +OK from the BT from the HOST
Response	+OK
Description	If the BT receives the Request and performs the command normally, respond with "+OK."
Usage example	(HOST→ BT) : AT (BT→HOST) : +OK

5.1.2 ATZ

Operation	Request the BT reset from the HOST
Response	+OK

Description	If the device receives the Request and performs the command normally, respond with "+OK" and then reset it in 2 seconds.
Usage example	(HOST→BT) : ATZ (BT→HOST) : +OK (BT→HOST) : +READY ➔ The reset can be identified with the reset performance and + READY response.

5.1.1 AT&F

Operation	If changeable values of the BT from the HOST are initialized to factory settings
Response	+OK
Description	If the device receives the Request and performs the command normally, respond with "+OK," initialize settings and then reset it in 2 seconds.
Usage example	(HOST→BT) : AT&F (BT→HOST) : +OK (BT→HOST) : +READY ➔ The reset can be identified with the reset performance and +READY response after the initialization of changeable values

5.1.2 AT+VER?

Operation	If you want to know the Firmware version of the BT from the HOST
Response	+OK
Description	If the device receives the Request and performs the command normally, respond with "+OK" and display the firmware version.
Usage example	(HOST→BT) : AT+VER? (BT→HOST) : +OK (BT→HOST) : v1.0.0 ➔ You can know obtain information about the BT firmware version 1.0.0 from the Host device

5.1.3 AT+INFO?

Operation	If you want to know the address, Device Name, and Role state of the BT from the HOST
Response	+OK

Description	If the device receives the Request and performs the command normally, respond with "+OK" and display the address, device name, and role.
Usage example	(HOST→BT) : AT+INFO? (BT→HOST) : +OK (BT→HOST) : 74:F0:7D:B0:10:00, BoT,SERVER[PERIPHERAL] ➔ You can know obtain information about the address of the BT, the name of BoT, and the Server Role from the Host device

5.1.1 AT+UART=xxxx

Operation	If you change the communication speed with the BT from the HOST
Response	+OK or +ERROR
Description	If the BT receives the Request and performs the command normally, respond with "+OK," and reset it in 2 seconds; otherwise, respond with "+ERROR." Communication speeds that can be supported are 2400, 9600, 19200, 38400, 57600, 115200, 230400, etc.
Usage example	(HOST→BT) : AT+UART=9600 (BT→HOST) : +OK

5.1.2 AT+ROLECHANGE

Operation	When you want to change the current BT Role from the HOST
Response	+OK or +ERROR
Description	If the device receives the Request and performs the command normally, respond with "+OK" and the current operation state, and change it to the Client mode and the Server mode respectively when the current mode is the other, before resetting. Otherwise, respond with "+ERROR."
Usage example	(HOST→BT) : AT+ROLECHANGE (BT→HOST) : +OK ➔ If the current operating state of the BT is the Server mode and the the Client mode respectively, change it to the Client mode and the Server mode correspondingly and reset after 2 seconds.

5.2. Server AT Command

5.2.1. AT+SERVER=ROLE

Operation	Used to change the role of the BT in the HOST when the BT is in the SERVER mode
Response	+OK or +ERROR
Description	If the device receives the Request and performs the command normally, respond with "+OK" and then reset it. Otherwise, respond with "+ERROR."
Usage example	(HOST→BT) : AT+SERVER=P (BT→HOST) : +OK ➔ The BT begins operating as the Peripheral device

5.2.2. AT+MANUF=xxxx

Operation	If you change the Manufacturer of the BT in the HOST
Response	+OK or +ERROR
Description	If the device receives the Request and performs the command normally, respond with "+OK"; otherwise, do with "+ERROR." Up to 8 digits.
Usage example	(HOST→BT) : AT+MANUF= BoT (BT→HOST) : +OK ➔ Set device name of the BT on BoT in the Host device. Information about BoT is available from Advertising Data during the search for Client

5.2.3. AT+TXPWR=xx

Operation	If you change the TX Power of the BT in the HOST
Response	+OK or +ERROR
Description	If the device receives the Request and performs the command normally, respond with "+OK"; otherwise, respond with "+ERROR." If currently in the Advertising state, stop the Advertising and apply the TX Power before beginning the Advertising again.
Usage example	(HOST→BT) : AT+TXPWR=xx (BT→HOST) : +OK The range of xx parameter can be changed to 0-7.

	0(-18dBm), 1(-14dBm), 2(-10dBm), 3(-6dBm), 4(-2dBm), 5(2dBm), 6(6dBm), 7(8dBm)
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5.2.1. AT+TXPWR?

Operation	If you want to know BT TX Power
Response	+OK or +ERROR
Description	If the device receives the Request and performs the command normally, respond with "+OK" and then display the value of the TX Power.
Usage example	(HOST→BT) : AT+TXPWR? (BT→HOST) : +OK (BT→HOST) : 4 ➔ You can know obtain from the Host device information that the TX Power of the BT is 4(-2dBm)

5.2.2. AT+ADVDATA=xxxx

Operation	Used to change the Advertising User Data of the BT in the HOST when the BT is in the SERVER mode
Response	+OK or +ERROR
Description	If the device receives the Request and performs the command normally, respond with "+OK"; otherwise, respond with "+ERROR." If currently in the Advertising state, stop the Advertising and apply the Advertising User Data before beginning the Advertising again.
Usage example	(HOST→BT) : AT+ADVDATA=Data12 (BT→HOST) : +OK ➔ User Data(Data12) is available in the Advertising Data User entry during the search for the BT in the Remote device.

5.2.3. AT+ADVDATA?

Operation	If you want to know the Advertising User Data of the BT in the HOST
Response	+OK
Description	If the device receives the Request and performs the command normally, respond with "+OK" and then display the Advertising User Data.
Usage	(HOST→BT) : AT+ADVDATA?

example	(BT→HOST) : +OK (BT→HOST) : Data12 ➔ You can know obtain from the Host device the information that the Advertising User Data of the BT is Data12.
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5.2.1. AT+ADVINTERVAL=xxxx

Operation	If you want to change the Advertising Interval of the BT in the HOST
Response	+OK or +ERROR
Description	If the device receives the Request and performs the command normally, respond with "+OK"; otherwise, respond with "+ERROR." Advertising Interval Range : 12~2560(ms)
Usage example	(HOST→BT) : AT+ADVINTERVAL=800 (BT→HOST) : +OK ➔ Set the Advertising Interval of the BT on 800ms in the Host Device.

5.2.2. AT+ADVINTERVAL?

Operation	If you want to know the Advertising Interval of the BT in the HOST
Response	+OK
Description	If the device receives the Request and performs the command normally, respond with "+OK" and display the Advertising Interval.
Usage example	(HOST→BT) : AT+ADVINTERVAL? (BT→HOST) : +OK (BT→HOST) : 800 ➔ You can know obtain from the Host device the information that the Advertising Interval of the BT is 800ms.

5.2.3. AT+CONNINTERVAL=xxxx

Operation	If you want to change the Connection Interval of the BT in the HOST
Response	+OK or +ERROR
Description	If the device receives the Request and performs the command normally, respond with "+OK"; otherwise, respond with "+ERROR." Input values can get input up to four digits, the value of (input * 1.25ms) is the value of the Connection Interval actually requested. If the requested value is more than that of the

	current Connection Interval (current Connection Interval with the remote device), request the change of the Connection Interval after 30 seconds the connection (The Default Connection Interval immediately after the connection is about 30ms). Actually updated connection values are negotiated ones and equal to or less than the requested values, depending on the remote devices. Requested values should not exceed 4 seconds suggested in the specifications.
Usage example	(HOST→BT) : AT+CONNINTERVAL=70 (BT→HOST) : +OK ➔ Request 87.5ms as the Connection Interval (70*1.25ms)

5.2.4. AT+CONNINTERVAL?

Operation	If you want to know the set values of the Connection Interval of the BT in the HOST
Response	+OK
Description	If the device receives the Request and performs the command normally, respond with "+OK" and display the Connection Interval.
Usage example	(HOST→BT) : AT+CONNINTERVAL? (BT→HOST) : +OK (BT→HOST) : 30 ➔ You can know obtain from the Host device the information that the Connection Interval of the BT is 37.5ms (30*1.25)

5.3. Client AT Command

5.3.1 AT+CLIENT=ROLE

Operation	Used to change the role of the BT in the HOST when the BT is in the CLIENT mode
Response	+OK or +ERROR
Description	If the device receives the Request and performs the command normally, respond with "+OK" and then reset it. Otherwise, respond with "+ERROR." The Observer mode outputs +SCANNING after the booting and Advertising Data after the response, in real-time manner.
Usage	(HOST→BT) : AT+CLIENT=C

example	(BT→HOST) : +OK ➔ The BT is rebooted in 2 seconds and operates with the Central device.
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5.3.1 AT+SCAN

Operation	Search for the SERVER device in CLIENT
Response	+OK or +ERROR
Description	If the device enters the SCAN state normally, respond with "+SCANNING" and then do with +OK after a 15-second Scan. Otherwise, respond with "+ERROR."
Usage example	(HOST→BT) : AT+SCAN (BT→HOST) : +SCANNING (BT→HOST) : BT_ADDR[74:F0:7D:B0:00:01], TX_PWR=[-2], RSSI=[-50], MANUF=[Beacon],... (BT→HOST) : +OK ➔ SCAN the BT device in the Remote device for 15 seconds and output information about devices that are searched for.

5.3.2 AT+SCAN=xxx

Operation	Search for the SERVER device in CLIENT for a set period of time.
Response	+OK or +ERROR
Description	If the device enters the SCAN state normally, respond with "+SCANNING." Otherwise, respond with "+ERROR." Scan for a set period of time and then respond with +OK.
Usage example	(HOST→BT) : AT+SCAN=80 (BT→HOST) : +SCANNING (BT→HOST) : +OK ➔ SCAN the BT device for 80 seconds.

5.3.3 AT+STOPSCAN

Operation	Stop searching for the SERVER device in CLIENT
Response	+OK or +ERROR
Description	If the device stops SCAN normally, respond with "+OK." Otherwise, respond with "+ERROR."
Usage	(HOST→BT) : AT+STOPSCAN

example	(BT→HOST) : +OK è Stop scanning the BT device in the Host device.
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5.3.1 AT+SCANINTERVAL=xxxx

Operation	If you want to change the Advertising Interval of CLIENT
Response	+OK or +ERROR
Description	If the value of the Scan Interval is changed normally, respond with "+OK." Otherwise, respond with "+ERROR." The value of SCAN Interval ranges from 12 to 2560 (ms). Default Scan Interval : 400ms
Usage example	(HOST→BT) : AT+SCAN=80 (B→HOST) : +SCANNING (BT→HOST) : +OK ➔ Set the SCAN Interval of the BT on 80ms in the Host Device.

5.3.2 AT+SCANINTERVAL?

Operation	If you want to know the SCAN Interval of CLIENT in the HOST
Response	+OK or +ERROR
Description	If the device reads the value of the SCAN Interval normally, respond with "+OK" and then display the value of the SCAN Interval. Otherwise, respond with "+ERROR."
Usage example	(HOST→BT) : AT+SCANINTERVAL? (BT→HOST) : +OK (BT→HOST) : 80 ➔ You can know the information that the value of BT SCAN Interval in the Host device is 80ms.

5.3.3 AT+SCANWINDOW=xxxx

Operation	If you want to change the size of SCAN window of CLIENT
Response	+OK or +ERROR
Description	If the value of the Scan Window is changed normally, respond with "+OK." Otherwise, respond with "+ERROR." The value of the SCAN Window should be equal to or less than that of the SCAN Interval and ranges from 11 to 2560 (ms). Default Windows Size : 400ms

Usage example	(HOST→BT) : AT+SCANWINDOW=60 (BT→HOST) : +OK ➔ Set the BT SCAN Window in the Host device on 60ms.
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5.3.1 AT+SCANWINDOW?

Operation	If you want to know the size of the SCAN Window of CLIENT in the HOST
Response	+OK or +ERROR
Description	If the value of the Scan Window is read normally, display the size of the SCAN Window and then respond with "+OK." Otherwise, respond with "+ERROR."
Usage example	(HOST→BT) : AT+SCANWINDOW? (BT→HOST) : +OK (BT→HOST) : 60 ➔ You can know the information that the value of BT SCAN Window in the Host device is 60ms.

5.3.2 AT+CONNECT=xxxxxxxxxxxx

Operation	Used to try to make connection with a specific SEVER by entering the Bluetooth address in CLIENT
Response	+OK, +CONNECTED[xx:xx:xx:xx:xx:xx] or +FAILED
Description	If Request is made normally, respond with "+OK," and in case of a connection failure for 15 seconds, respond with "+FAILED."
Usage example	(HOST→BT) : AT+CONNECT=74F07DB00001 (BT→HOST) : +OK (BT→HOST) : +CONNECTED[xx:xx:xx:xx:xx:xx] ➔ Try to connect to the Server device with the value of NAP:74F0 UAP:7D LAP:B00001 in the Host device and then get connected. *Client's BT Connection only support BoT BT Server.

5.3.3 AT+RECONNECT

Operation	Used to try to make connection with the device recently connected in CLIENT
Response	+OK, +CONNECTED[xx:xx:xx:xx:xx:xx] or +FAILED
Description	If Request is made normally, respond with "+OK," and in case of a connection failure for 15 seconds, respond with "+FAILED."

Usage example	(HOST→BT) : AT+RECONNECT (BT→HOST) : +OK (BT→HOST) : +CONNECTED[xx:xx:xx:xx:xx:xx] ➔ Request connection with the SERVER recently connected to the BT in the Host device and get connected
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5.3.1 AT+AUTOCONNECT?

Operation	Request the setting status of AUTOCONNECTION with the SERVER recently connected in CLIENT
Response	+OK
Description	If Request is made normally, respond with "+OK." If AUTOCONNECTION is set, respond with "ON." Otherwise, respond with "OFF."
Usage example	(HOST→BT) : AT+AUTOCONNECT? (BT→HOST) : +OK (BT→HOST) : ON ➔ You can know that the setting of AUTOCONNECT to the BT is requested and the same is currently set in the Host device.

5.3.2 AT+AUTOCONNECT=ON

Operation	Set AUTOCONNECTION to the SERVER recently connected in CLIENT
Response	+OK
Description	If Request is made normally, respond with "+OK." If Booting or Connection state is disabled after the setting, try to make Auto Connection.
Usage example	(HOST→BT) : AT+AUTOCONNECT=ON (BT→HOST) : +OK ➔ Set Auto Connection with the SERVER recently connected to the BT in the Host device.

5.3.3 AT+AUTOCONNECT=OFF

Operation	Disable the setting of AUTOCONNECTION to the SERVER recently connected in CLIENT.
Response	+OK
Description	If Request is made normally, respond with "+OK." Apply immediately after disabling the setting.

6. General Data transmission

The data that receives UART after the SERVER is connected with the CLIENT BLE device or the data that is transmitted through the BLE link from the remote device is automatically transmitted without transformation.

State	The state where SERVER and CLIENT are connected to each other
Usage example	(HOST→BT) : ABCD<CR> (Remote device) : ABCD<CR>

7. Service UUID Classification

The SERVER based on the firmware provides Data Service, and UUID is as shown in the table below. The Service is accessible through the following UUIDs via a smartphone or other devices.

Service	UUID	Properties
Data Service (Primary)	0xFFFF0	N/A
Read/Notification	0xFFFF1	Read/Notification
Write(No response)	0xFFFF2	Write without Response

8. PIO Classification

PIO Index	Function	Description
PIO 3	Connection State	Display the Connection state of the Server/Client Connected : HIGH, Disconnected : LOW
PIO 4	UART ON/OFF	Used for an ON/OFF switch of the UART Enable the UART when high and disable it when low, and enter the Deep Sleep mode when conditions are met.
PIO 9	Factory Reset & Disconnecting	Initialize an applicable port to factory settings when it is kept high for 4 seconds or longer. Disconnect during connection(Rising Edge)

Certificate Statement

FCC Statement

This Bluetooth BLE Module has been granted modular approval for mobile applications. OEM integrators for host products may use the module in their final products without additional FCC certification if they meet the following conditions. Otherwise, additional FCC approvals must be obtained.

- The host product with the module installed must be evaluated for simultaneous transmission requirements.
- The user's manual for the host product must clearly indicate the operating requirements and conditions that must be observed to ensure compliance with current FCC RF exposure guidelines.
- To comply with FCC regulations limiting both maximum RF output power and human exposure to RF radiation, use this module only with the included onboard antenna.
- A label must be affixed to the outside of the host product with the following statements:

Product Name : Bluetooth BLE Module

Contains FCC ID: **2AUUG-BOT-CLE310**

The final host / module combination may also need to be evaluated against the FCC Part 15B criteria for unintentional radiators in order to be properly authorized for operation as a Part 15 digital device.

This equipment has been tested and found to comply within 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 different circuit from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help.

Device Classifications

Since host devices vary widely with design features and configurations module integrators shall follow the guidelines below regarding device classification and simultaneous transmission, and seek guidance from their preferred regulatory test lab to determine how regulatory guidelines will impact the device compliance. Proactive management of the regulatory process will minimize unexpected schedule delays and costs due to unplanned testing activities.

The module integrator must determine the minimum distance required between their host device and the user's body. The FCC provides device classification definitions to assist in making the correct determination. Note that these classifications are guidelines only; strict adherence to a device classification may not satisfy the regulatory requirement as near-body device design details may vary widely. Your preferred test lab will be able to assist in determining the appropriate device category for your host product and if a KDB or PBA must be submitted to the FCC.

Note, the module you are using has been granted modular approval for mobile applications. Portable applications may require further RF exposure (SAR) evaluations. It is also likely that the host / module combination will need to undergo testing for FCC Part 15 regardless of the device classification. Your preferred test lab will be able to assist in determining the exact tests which are required on the host / module combination.

FCC Definitions

Portable: (§2.1093) — A portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is / are within 20 centimeters of the body of the user.

Mobile: (§2.1091) (b) — A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. Per §2.1091d(d)(4) In some cases (for example, modular or desktop transmitters), the potential conditions of use of a device may not allow easy classification of that device as either Mobile or Portable. In these cases, applicants are responsible for determining minimum distances for compliance for the intended use and installation of the device based on evaluation of either specific absorption rate (SAR), field strength, or power density, whichever is most appropriate.

Simultaneous Transmission Evaluation

This module has **not** been evaluated or approved for simultaneous transmission as it is impossible to determine the exact multi-transmission scenario that a host manufacturer may choose. Any simultaneous transmission condition established through module integration into a host product **must** be evaluated per the requirements in KDB447498D01(8) and KDB616217D01,D03 (for laptop, notebook, netbook, and tablet applications).

These requirements include, but are not limited to:

- Transmitters and modules certified for mobile or portable exposure conditions can be incorporated in mobile host devices without further testing or certification when:

- The closest separation among all simultaneous transmitting antennas is >20 cm,

Or

- Antenna separation distance and MPE compliance requirements for **ALL** simultaneous transmitting antennas have been specified in the application filing of at least one of the certified transmitters within the host device.

In addition, when transmitters certified for portable use are incorporated in a mobile host device, the antenna(s) must be >5 cm from all other simultaneous transmitting antennas.

- All antennas in the final product must be at least 20 cm from users and nearby persons.

OEM Instruction Manual Content

Consistent with §2.909(a), the following text must be included within the user's manual or operator instruction guide for the final commercial product (*OEM-specific content is displayed in italics.*)

Operating Requirements and Conditions:

The design of **BoT-CLE310** complies with U.S. Federal Communications Commission (FCC) guidelines respecting safety levels of radio frequency (RF) exposure for Mobile devices.

Note: In the case where the Host / Module combination has been re-certified the FCCID shall appear in the product manual as follows:

FCCID: **2AUUG-BOT-CLE310**

Mobile Device RF Exposure Statement (If Applicable):

RF Exposure - This device is only authorized for use in a mobile application. At least 20 cm of separation distance between the transmitting antenna device and the user's body must be maintained at all times.

Caution Statement for Modifications:

Caution: Any changes or modifications to the equipment not expressly approved by the party responsible for compliance could void user's authority to operate the equipment.

FCC Part 15 Statement (Only Include if FCC Part 15 is Required on the End Product):

Note: 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. (*OEM must follow Part 15 guidelines (§15.105 and §15.19) to determine additional statements required in this section for their device class*)

Note 2 : This device complies with part 15 of the FCC Rules.

Operation is subject to the following two conditions.

- 1) This device may not cause harmful interference, and
 - 2) This device must accept any interference, including interference that may cause undesired operation of the device.
- a. That module is limited to OEM installation ONLY.
 - b. That OEM integrators are responsible for ensuring that the end-user has no manual instructions to remove or install module.
 - c. That module is limited to installation in mobile or fixed applications, according to Part 2.1091(b).
 - d. That separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and different antenna configurations.
 - e. That grantee shall provide guidance to the host manufacturer for compliance with Part 15 subpart B requirements.

CE Statement

Hereby, AutoBizSystems Inc. declares that the radio equipment type Bluetooth BLE Module is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the providing datasheet or approval sheet.

The antenna(s) must be installed such that a minimum separation distance of at least 20 cm is maintained between the radiator (antenna) and all persons at all times. This device must not be collocated or operating in conjunction with any other antenna or transmitter.

SIMPLIFIED EU DECLARATION OF CONFIRMITY

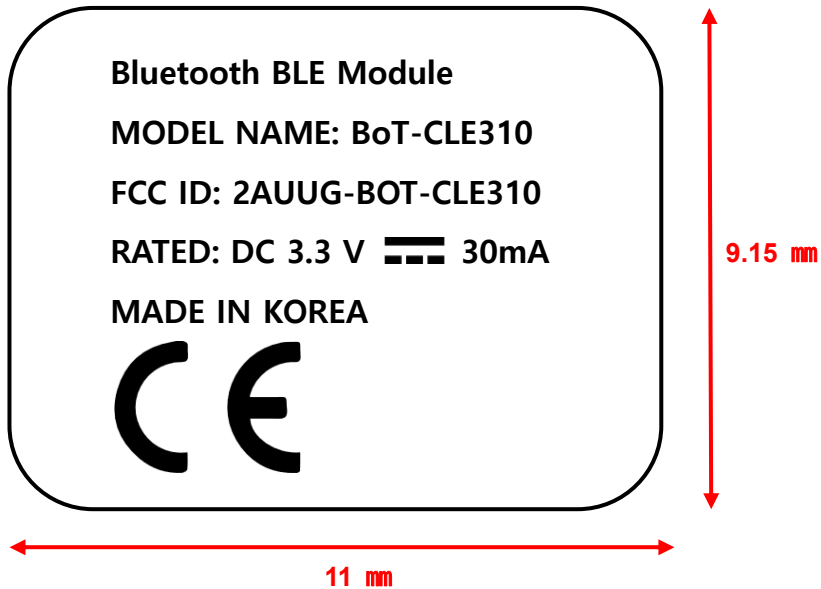
The simplified EU declaration of conformity referred to in Article 10(9) shall be provided as follows:

Hereby, AutoBizSystems Inc. declares that the radio equipment type Bluetooth BLE Module is in compliance with Directive 2014/53/EU.



Frequency Range	2402 MHz - 2480 MHz
Maximum EIRP	3.483 dBm

Label Specification



Label Location

