ROBOTIS

OEM Integrator manual

[**BT-210**]

㈜로보티즈 대표이사 : 김병수 사업자등록번호: 209-81-22390 통신판매번호 : 제 19-3380호
위치안내 서울시 금천구 가산동 371-50 에이스 하이엔드 타워 3차 1506호 고객센터 TEL : 070-8671-2600 FAX : 070-8230-1336

Purpose

The BT-210 is an UART serial module implementing Bluetooth communications standards. The module can connect to the following devices.

(please refer to each controller on how to mount the BT-210.)

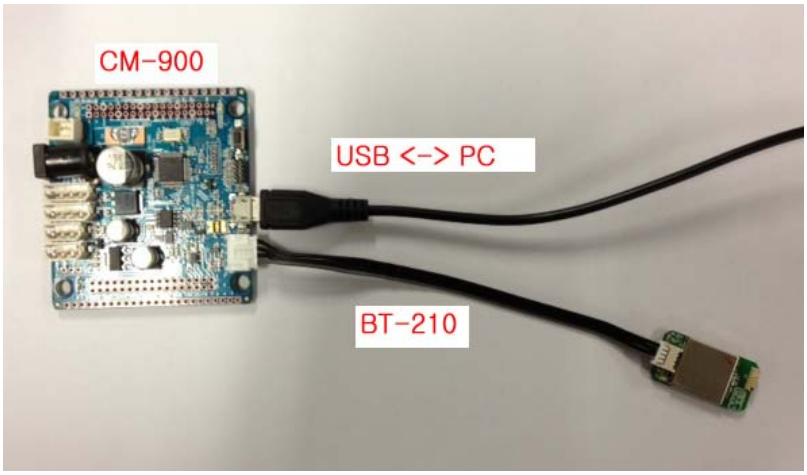
- BT-210 : CM-100, CM-510, CM-530, CM-700, CM-900

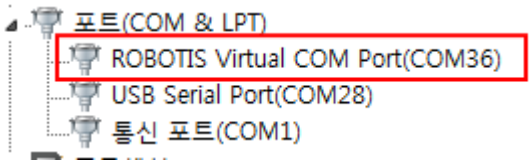
[examples of use]

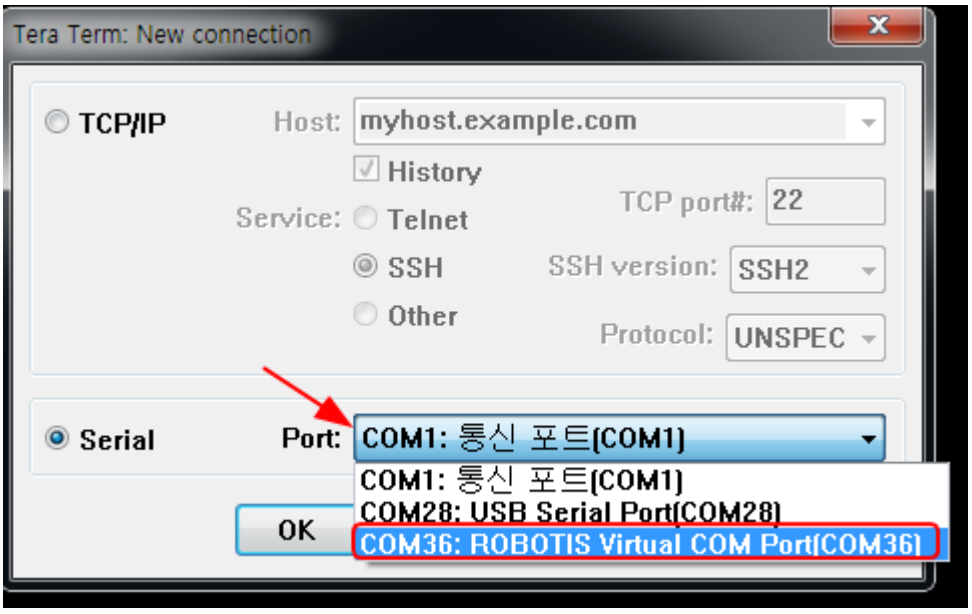
- Ollo Bug control via Bluetooth communications
    - Mount the BT-210 to the Bug's controller (CM-100)
    - Connect a smartphone to the BT-210 and control the Bug
- Control Bioloid Premium from a PC via Bluetooth
    - Mount a BT-210 to the CM-900 then connect to PC serially
    - Mount the BT-210 to Bioloid Premium's controller (CM-510).

Set-up

- Connect the BT-210 to the CM-900 then run Tera Term.
- Connect the CM-900 to the PC via US; install drivers; Tera Term terminal uses the actual COM port to connect (pick any baud rate).

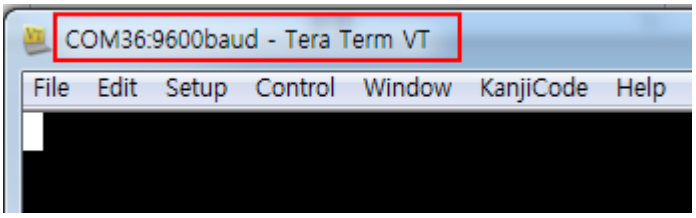




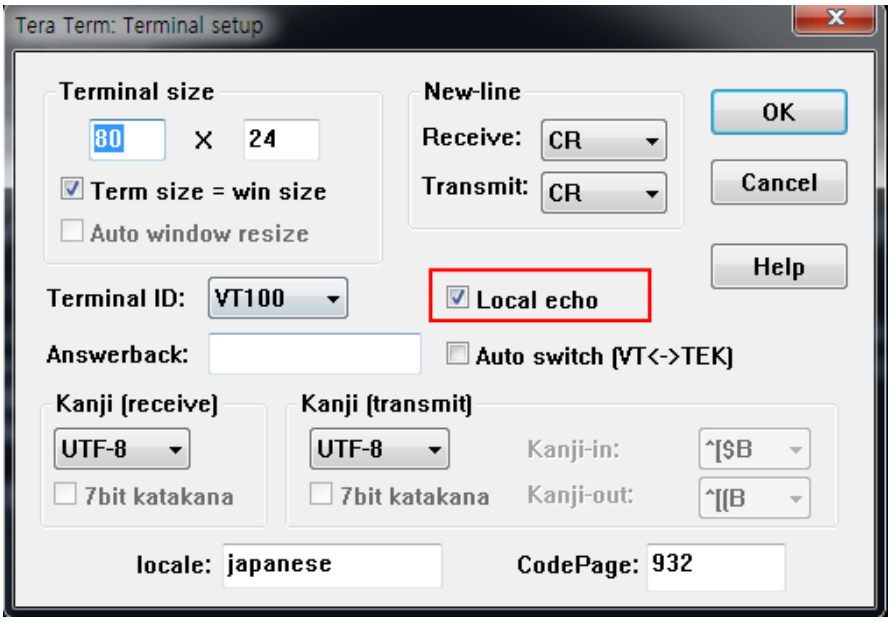


Setup is now complete. baud rate can be of any value.

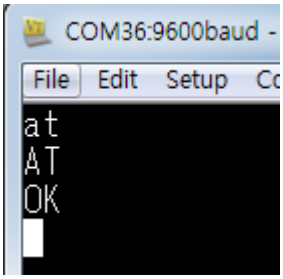
<consult CM900_USB_드라이버설치.pdf for driver setup>



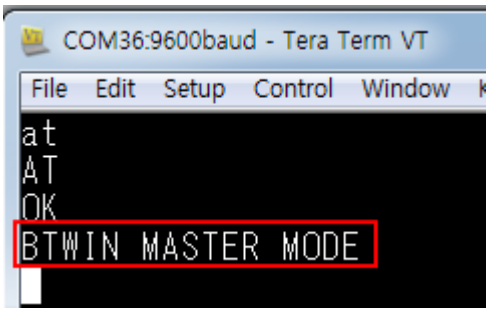
- Go to Setup -> Terminal check Local echo.



- From the terminal after AT input press the Enter key. With OK display then connection to BT-210 is successful.



- The BT-210 and CM-900 will connect in a SLAVE/MASTER configuration. The following diagram is MASTER mode.

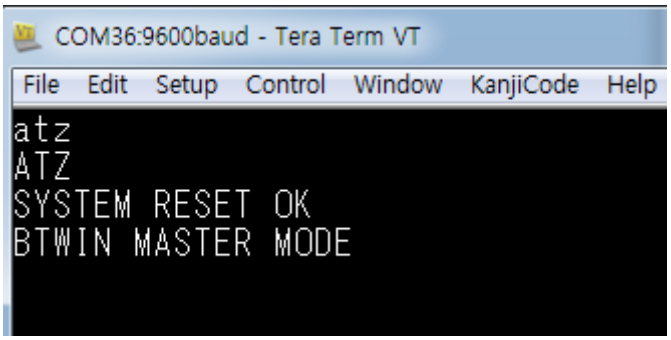


- **Instructions types**

From the terminal it is possible to change setup of the BT-210 via AT commands.

① System reset

ATZ resets the BT-210. Any changes made the command will reset to the change(s) made.



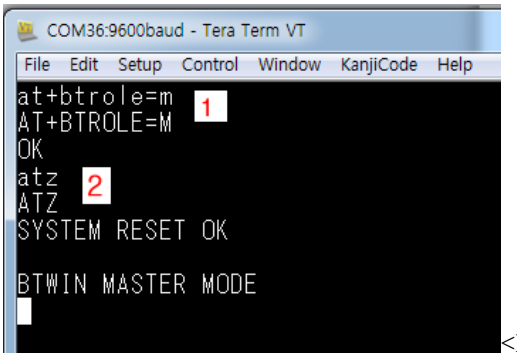
② Mode change

Use the command below to change the mode of the BT-210 (Slave/Master).

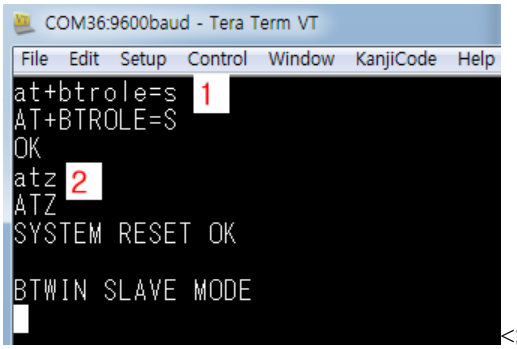
AT+BTROLE=M -> Master mode

AT+BTROLE=S -> Slave mode

Then after ATZ command the system reset and mode change takes effect.



<MASTER mode>

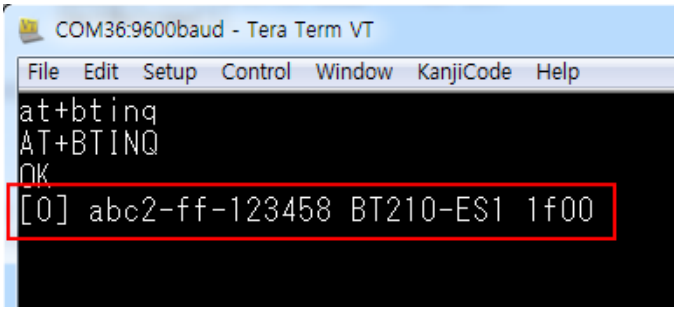


<SLAVE mode>

③ Peripherals search

Peripherals search is possible only in Master mode. Enter the command AT+BTINQ

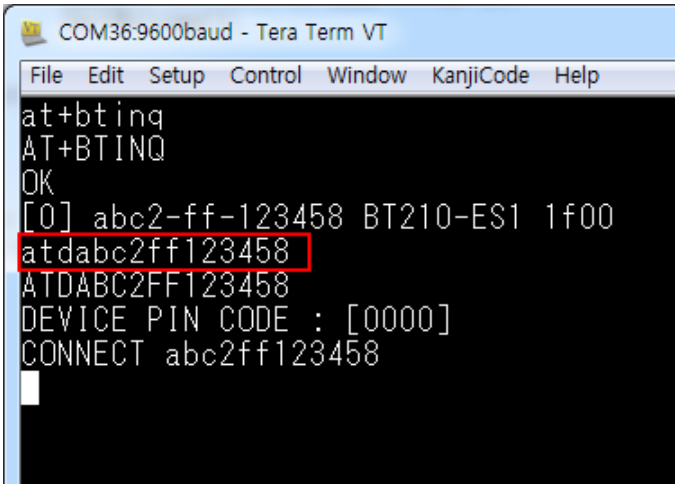
and Device Class 0x1F00(SPP) device peripheral will appear.



④ Connecting devices (pairing)

Enter the command AT+BTINQ to search for peripherals and the MAC address will display (12-digit hexadecimal) then it can connect.

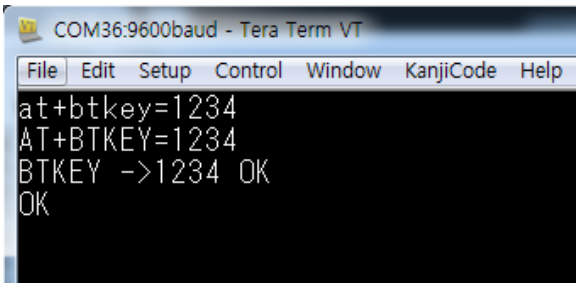
For example MAC address abc2-ff-123458appears on the terminal; enter the command ATDabc2ff123458 and pairing will be attempted with the device with said device. Look for the device pin code (default is 0000.).



⑤ Pin Code change

AT+BTKEY= 4-digit pin code

The illustration below shows how to change the pairing pin code.



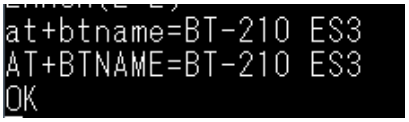
Simply enter the command AT+BTKEY (the = sign is unnecessary)

⑥ Current Device Class output

This is possible when the BT-210 is in SPP(Serial Port Profile) mode(0x1f00).

⑦ Bluetooth device name change

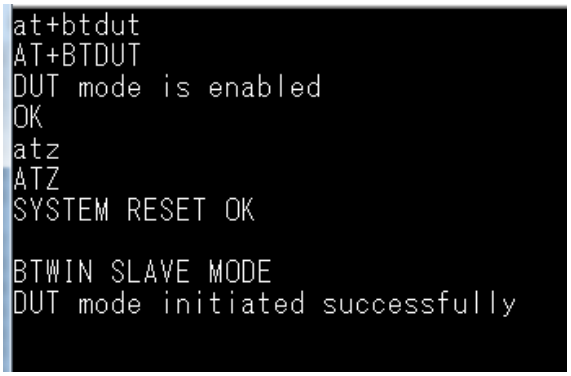
Enter AT+BTNAME = to change name



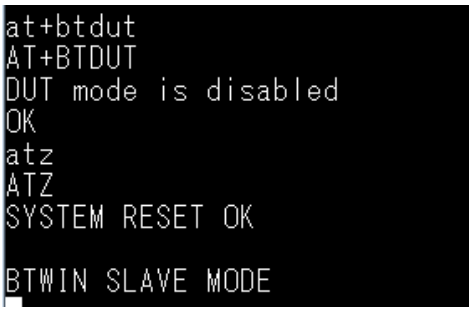
⑧ Device Under Test mode (DUT)

Bluetooth device performance can be measured in DUT mode.

Enter the command AT+BTDUT; the current mode will toggle. Enter ATZ and the mode during toggle will be selected after a reset (note: this can only be done under SLAVE mode only).



To exit DUT mode enter the command AT+BTDUT and DUT mode is disabled will display; enter ATZ to reset.



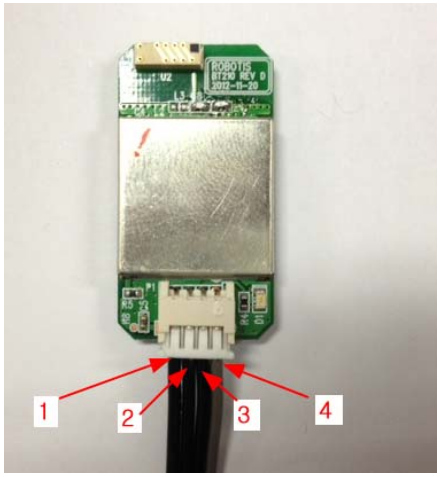
Communications mode

Besides pairing with the BT-210 1:1 communications is also reliable.

[1:1 communications]

- Pair 2 Bluetooth devices (1 being the BT-210); one in MASTER mode (the other device) and the other in SLAVE mode (BT-210).
- When powered on the LED will blink; after successful pairing the LED will remain constantly on.

Pin layout information



1. RXD : Bluetooth Module Receive Signal terminal
2. TXD : Bluetooth Module Transmit Signal terminal
3. VCC : Bluetooth Module Supply Voltage (3.3V)
4. GND : Bluetooth Module Ground Level (0v)

Hardware characteristics

- weight
    - BT-210 : 5.7g
- size
    - BT-210: 18mm * 30mm * 9.1mm
- Bandwidth: MAX 250kbps
- Operating voltage: 3.3V
- Current consumption: 48mA (MAX)
- Spectrum band frequency: 2.45Ghz ISM Band
- Transmission power: -6~4dBm(Class 2)
- Symbol/label:

ROBOTIS
FCC ID: SOD-BT-210
Model No.: BT-210
Rating: 3.3V ⎓ , 0.2A

KCC-CRM-R0B-BT-210

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITION ; (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDERSIRED OPERATION.

Made In Korea

FCC Certification Requirements

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 received, including interference that may cause undesired operation.

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. 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:

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

FCC Certification Guidelines for End Products Using the BT-210

This module is limited to OEM Installation only.

1 Introduction

The BT-210 is a modular transmitter. Therefore, customers who wish to use the BT-210 Bluetooth in their end product must follow region-specific regulations.
This application note provides guidelines for the specific United States of America Federal Communications Commission (FCC) that pertain to the BT-210. End products may be subject to additional regulations, and it is the responsibility of the end-product manufacturer to determine and comply with those regulations.

OEM integrators must be instructed to ensure that the end-user has no manual instructions to remove or install the module.

This device complies with Part 15 of the FCC Rules. And FCC notice that grantee need to provide guidance to the host manufacturer for compliance with the Part 15B requirements.

The end product with an embedded FCC ID:SOD-BT-210 Module may also need to pass the FCC Part 15 unintentional emission testing requirements and be properly authorized per FCC Part 15.

If need more information, please contact ROBOTIS .

2 Certification Overview

2.1 Unintentional vs. Intentional Radiation

The FCC require end products to comply with both unintentional and intentional radiation regulations.
Unintentional radiation occurs from a product that inherently or unwillingly transmits RF signals.
Intentional radiation occurs from a product that is designed to radiate or transmit RF signals for the purpose of wireless communication. The BT-210 is an intentional radiation emitter.

2.2 Modular Transmitter Approval

A modular transmitter is an intentional radiator device, such as the BT-210, that is designed to be installed in a host device. Obtaining modular transmitter approval allows the modular transmitter to be integrated into an end product without the need for additional intentional radiation testing of the final end-product assembly, as long as the modular transmitter is installed and operated in accordance with certain guidelines.

NOTE: Unintentional conducted and radiated emissions testing of the end product is still required to ensure compliance with the rules governing unintentional radiators. It is the responsibility of the end-product manufacturer to verify the end product meets these regulations. Additionally, the customer is responsible for any and all tests and/or certifications pertaining to their end product. This may include but is not limited to Specific Absorption Rate (SAR) compliance and potential recertification as an intentional radiation emitter if the BT-210 is installed or operated in a manner that differs from the instructions herein.

3. Compliance Guidelines

3.1 Overview

Modular approval permits the BT-210 to be integrated into an end product without the need to recertify the end product as long as the following guidelines are followed by the module integrator.

3.2 Integration Requirements

3.2.1 Antenna Systems

The BT-210 has been approved using the antenna and coaxial cable specified. Use of this antenna and cable will satisfy FCC modular transmitter requirements. Substituting a different antenna of the same type with a peak gain of 2.69 dBi or less at 2.4 GHz is permitted.

3.2.2 Substitute Antennas/Cables

If an antenna with a higher gain, of a different type, or with a shorter MCD/W.FL to MCB/U.FL coaxial cable is used, the end product must be put through intentional radiation testing at a qualified test lab.

Please refer to FCC rules 47 CFR § 15.204 for more information.

If a different is antenna is desired, please contact ROBOTIS for assistance with certification.

3.2.3 FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance.

Note1 : This module certificated that complies with RF exposure requirement under mobile or fixed condition, this module is to be installed only in mobile or fixed applications.

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. In this context, the term “fixed location” means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

A fixed device is defined as a device is physically secured at on location and is not able to be easily moved to another location.

Note2 : Any modifications made to the module will void the Grant of Certification, this module is limited to OEM installation only and must not be sold to end-users, end-user has no manual instructions to remove or install the device, only software or operating procedure shall be placed in the end-user operating manual of final products.

Note 3 : The device must not transmit simultaneously with any other antenna or transmitter.

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 received, including interference that may cause undesired operation.

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

IMPORTANT NOTE: In the event that these conditions cannot be met (for certain configurations or because of co-location with another transmitter), the FCC authorizations are no longer considered valid and the FCC ID certification number cannot be used on the final product.
In these circumstances, the OEM integrator will be responsible for re-evaluating the end product, including the transmitter, and obtaining a separate FCC authorization.

3.3 Labeling Requirements for End-Product

The BT-210 has been certified by the FCC as a modular transmitter. As such, it has been assigned an FCC ID that is printed on a label permanently affixed to the BT-210.
If the FCC ID label is not visible when the BT-210 is installed in the end product, this FCC ID must be located on the exterior surface of the end product where users can easily access it.
The end product's exterior label or etching should use wording similar to one of the examples below.

- **Contains FCC ID: SOD-BT-210**
- **Contains Transmitter Module FCC ID: SOD-BT-210**

Please refer to FCC rules 47 CFR § 15.212(vi)(A) for additional information.

3.4 End-Product User Manual Statements

The following section outlines statements that are required to appear in the end product's user manual in order to maintain modular transmitter approval.

■ FCC User Manual Guidelines

For products marketed and used in the United States, the end-product user manual must include the following caution statement in a prominent location:
To satisfy FCC RF exposure requirements for mobile and base station transmission devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during operation. To ensure compliance, operation at closer than this distance is not recommended. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.