1. Introduction

WCS-232 v4.0 converts RS-232 serial signals to Bluetooth RF signals.

Product box contains
- Bluetooth to Serial Converter 2EA
- User Manual

2. Specifications

- Blutooth to Serial Converter 2EA
- User Manual

3. Architecture

1) External View

2) Mode Switch

3) LED

4) Connector

3. Installation Procedures

1) Connection

There is no need to install additional programs in your computer or communication device to use the WCS-232 v4.0. Connect the WCS-232 v4.0 to a serial port at your computer or communication device and supply it with power. Then you can connect the WCS-232 v4.0 to your PC or communication devices to use the WCS-232 v4.0.

2) Environment Setting

Once WCS-232 v4.0 are connected onto the serial port of your PC or communication device, you should specify the serial port environment information (Baud rate, data bits, parity bit, stop bit, flow control, etc.) and the RF connection (device name, operating mode, target address, etc.) for mutual communication.

RF connection setting is required only if you communicate with other manufacturer’s Bluetooth device instead of the WCS-232 v4.0 or if you change the initial settings.

For environment setting, please use “hyper terminal” included in your Windows’ operating system.

4. Operating Environment Setting

1) Procedures

WCS-232 v4.0 can set baud rate, parity, stop bit, device name, target address and operating mode using Hyper Terminal.

- Connect one WCS-232 v4.0 to the PC serial port and power on it.
- Run Windows’ Hyper Terminal program.
- Whenever you change environment setting, you must Set the baud rate, data bits, parity bit and stop bit to 9600-N-O-1 (Initial Factory Setting) at Hyper Terminal.
- Select setup mode at the WCS-232 v4.0 mode switch. Then all setup information will be displayed.

2) Serial Settings

- Example of Baud Rate Setting (9600 bps → 115200 bps)

- Example of Flow Control Setting (None → CTS/RTS)

- Example of Device Name Setting (WCS-232 v4.0 → WCS-232)

3) RF Connection Settings

This is necessary only if you communicate with other manufacturer’s Bluetooth device instead of the WCS-232 v4.0 or if you change the initial settings.

- Example of Target Address Setting (00:02:78:01:EF:BC)

- Example of Stop Bit Setting (1 bit → 2 bits)

- Example of Parity Bit Setting (None → Even)

- Example of Connection Mode Setting (WAIT COMMAND → INACT)

4) Connector

- RxD: Turns red when data is receiving
- TxD: Turns green when data is transmitting (turns on faintly only if linked)
- DTR/DSR/DCD Loop Back connected

5. Operating Environment Setting

1) External View

2) Setup RF connection. < Refer to 3) RF Connection Setting >

3) Set up serial port. < Refer to 2) Serial Settings >

4) Select setup mode at the WCS-232 v4.0 mode switch. Whenever you change environment setting, you must Set the baud rate, data bits, parity bit and stop bit to 9600-N-O-1 (Initial Factory Setting) at Hyper Terminal.

- Select setup mode at the WCS-232 v4.0 mode switch. When all setup information will be displayed.

6. Reference

If you enter ‘Y’, the list for all commands is displayed, and if ‘COMMAND’, how to use the requested command is displayed. All commands and setting values are case-sensitive.

- Example of Stop Bit Setting (1 bit → 2 bits)

- Example of Parity Bit Setting (None → Even)

- Example of Connection Mode Setting (WAIT COMMAND → INACT)

- Example of Device Name Setting (WCS-232 v4.0 → WCS-232)

- Example of Connection Mode Setting (WAIT COMMAND → INACT)

- Example of Target Address Setting (00:02:78:01:EF:BC)

- Example of Flow Control Setting (None → Hardware)
The following example showing how to set up the destination WCS-232 v4.0 always perform 1:1 communication in pairs.

**WCS-232 v4.0 Pair Setting**

① Example of Setting Low Power Mode

It searches Bluetooth devices connected and serviced in the same coverage.

② Example of Setting PIN

Apply stage after execution of the command, the adapter address is ended and the communication is enabled in Active Mode.

**Appendix-A : Wait for user command mode**

The Wait Mode that waits for a command by a user performs search and connection of accessories. The correspondent adapter shall be set up in Wait Mode.

- Search: searches Bluetooth devices connected and serviced in the same coverage.
- Connection: Connection to a specific device after execution of the command.
- Save: Save the setting using 'X' command and then put the 'Mode Switch' to Setup Mode.
- Setting for factory reset

**Appendix-B : Command**

- **C-1. No Data Transmission**
  - Check whether the Baud rate of WCS-232 v4.0 matches that of the host equipment.
  - Check whether the host equipment has a Data bit setting of 8.
  - WCS-232 v4.0 supports only 8 Data bit settings. If your host equipment uses 7 Data bit and even or odd parity, it may work with 8 Data and No parity setting. This is valid only when both DCE devices are the WCS-232 v4.0. In this case, both WCS-232 v4.0 use 8 Data bit and No parity. If one of DCE devices is another Bluetooth device such as Bluetooth USB dongle, all data configurations will not work.

- **C-2. Data Loss or Malfunctioning**
  - Check whether the Parity and Stop bit of WCS-232 v4.0 match those of your host equipment. WCS-232 v4.0 supports No parity, Even parity and Odd parity, 1 and 2 Stop bit configurations.
  - Check whether the host equipment of WCS-232 v4.0 uses Hardware Flow Control. WCS-232 v4.0 is initially set to Use Hardware Flow Control. If your host equipment does not use Hardware Flow Control, please disable the Hardware flow control option by referring to 5. Operating environment setting. WCS-232 v4.0 does not support RS-232 break signal.

- **C-3. Transmission Delay**
  - It takes 30msec approximately for a WCS-232 v4.0 to complete a data transmission to the other Bluetooth device. This time delay cannot be reduced and may enlarge as the RF transmission environment becomes worse. Do not use WCS-232 v4.0 if your applications cannot allow for this time delay.

- **C-4. RF Processing Delay**
  - If there are many Bluetooth devices working in a small area and/or the RF communication distance is too great and/or there are some obstacles affecting RF performance, the WCS-232 v4.0 repeats the transmission packet by packet due to interferences and/or low RF performance. This may lead to increased data transmission time delays.

- **C-5. Pin Assignment**
  - WCS-232 v4.0 does not support RS-232 cable. If your host equipment is DCE, plug WCS-232 v4.0 directly to the host equipment or use straight RS-232 cable. If your host equipment is DTE, plug WCS-232 v4.0 directly to the host equipment.

- **C-6. Data Loss or Malfunctioning**
  - Check whether the Baud rate of WCS-232 v4.0 matches that of the host equipment.

- **Appendix-C : Trouble Shooting**