# Serial Bluetooth Smart® Adapter - RS232, Low Energy 4.1 BLE
# Datasheet and Quick Reference for BLE232V2

**Package content:**

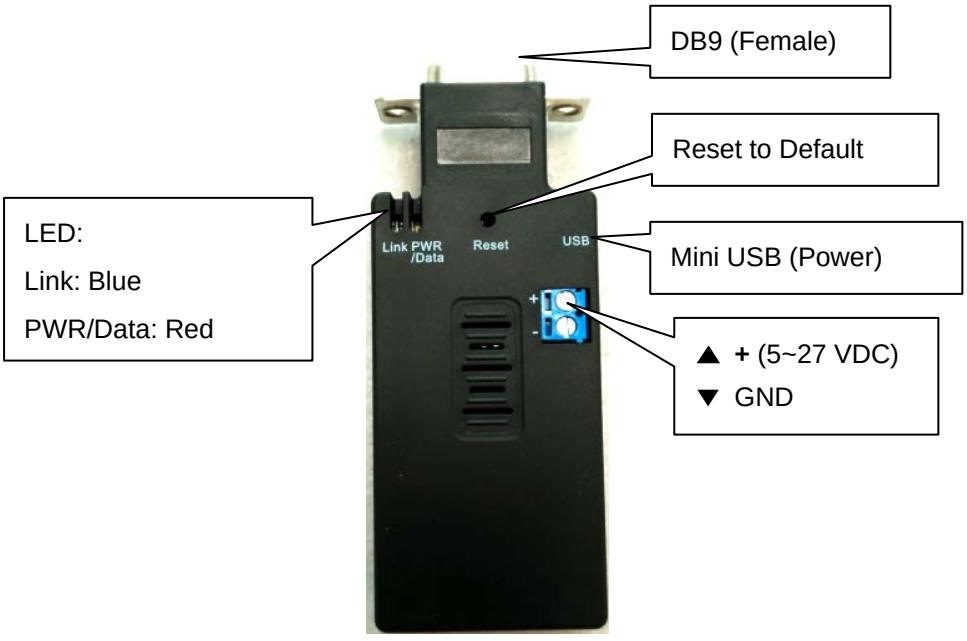
BLE RS-232 adapter x 1

Screws for DB9 connector x 2

Nuts for DB9 connector x 2

User manual x 1

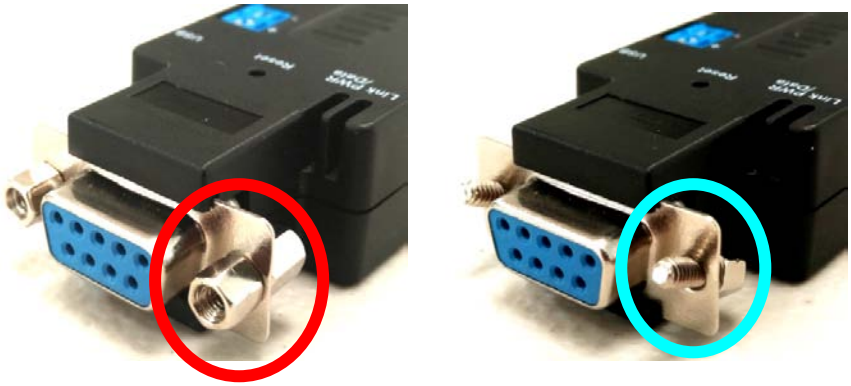
Mini USB Cable x 1



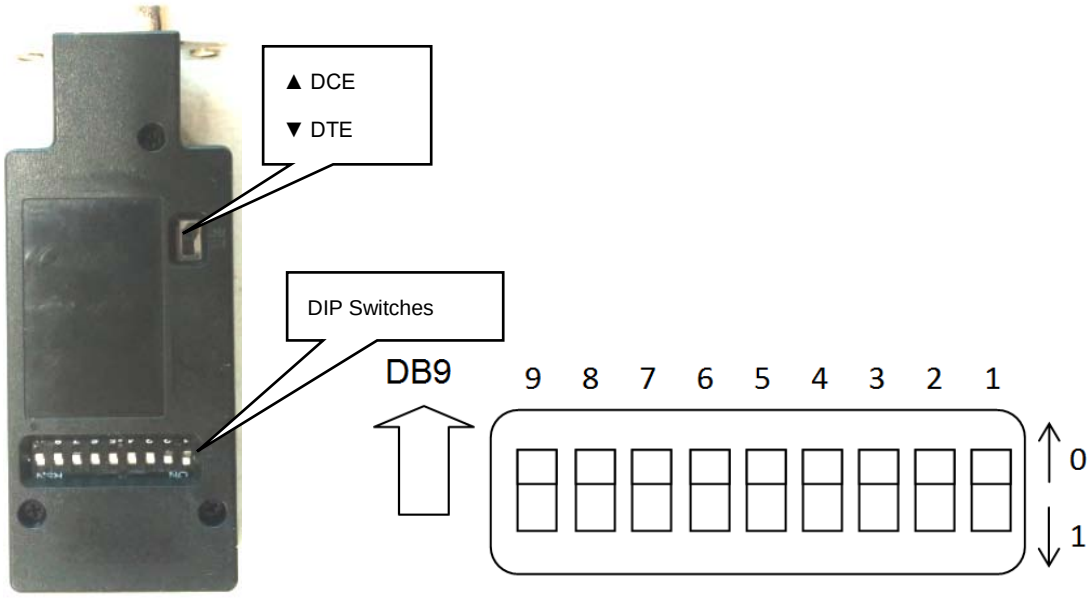
| SPECIFICATIONS | |
|---|---|
| Part number | BLE232V2 |
| Operating systems | iOS 5 and later, Windows Phone 8.1, Windows 8 and later, Android 4.3 and later, BlackBerry 10, Linux 3.4 and later through BlueZ 5.0. |
| Processor | Cypress CYBLE-012012-10 |
| Application | Short data transmission |
| Data payload | 27 bytes |
| Interface type | RS232 |
| Mode | Central or Peripheral (Master or Slave) |
| Works with iPad/iPod? | Yes |
| Baud Rate | 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800, 921600 |
| Parity | None, even, odd |
| Stop bits | 1, 1,5, 2 |
| Data bits | 7, 8 |
| Flow control | None, CTS/RTS |
| Operating distance | Up to 160 feet (50m) in open space |
| LED lights | TX, RX, Bluetooth and Power |
| DEC/DTE | Manual switch |
| Parameters configurable by | - Over the air by iOS and Android app<br>- Via COM port by AT commands<br>- DIP switches |
| RS232 Signals | TX, RX, CTS, RTS, GND |
| Serial port | 1-port female D-sub 9-pin |
| Bluetooth version | V4.1 |
| Programming interfaces | GATT / UUID |
| Frequency range | 2.4GHz ISM ( 2.40000 – 2.4835GHz) |
| TX Power | Max. 3 dBm |
| RX Sensitivity | -89 dBm typical |
| TX current consumption | 15.6 mA (radio only, 0 dbm) |
| Antenna | Internal |
| Antenna Gain | max. 2 dB |
| Power supply | Mini USB, screw terminals or DB9 pin 9: 5 - 27VDC |
| Operating temp. | -40C to 70C |
| Dimensions | 81.6mm x 31.75mm x 17mm mm |
| Certifications | CE, FCC |

**DB9 connector:**

The converter's DB9 connector can be secured with either screws or nuts (both are included).



**Rear Side:**



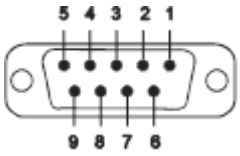

**Switch configuration:**

| Configuration by | CTS/RTS | Stop Bit | Parity | Role | Baud Rate |
|---|---|---|---|---|---|
| 9 | 8 | 7 | 6-5 | 4 | 3-2-1 |
| **0: DIP Switches**<br>1: AT commands or app. | **0: Disable**<br>1: Enable | **0: 1**<br>1: 2 | **00: None**<br>01: Odd<br>10: Odd<br>11: Even | **0:Slave**<br>1:Master | 110:2400<br>111:4800<br>**000:9600**<br>001:19200<br>010:38400<br>011:57600<br>100:115200<br>101:230400 |

Default values are in bold **red** color.

The GATT service / tablet apps and AT commands will support more settings than the DIP switches.

## RS232 Interface (Female)




| Pin | Signal | DTE Direction | DCE Direction | Description |
|---|---|---|---|---|
| 1 | N/A | | | |
| 2 | TxD | Output | Input | Transmitted data |
| 3 | RxD | Input | Output | Received data |
| 4 | N/A | | | |
| 5 | GND | | | Ground |
| 6 | N/A | | | |
| 7 | CTS | Input | Output | Clear to send |
| 8 | RTS | Output | Input | Request to send (Default) |
| 9 | VCC | | | Power Input (5~27 VDC) |

| LED Status | Description |
|---|---|
| Data LED flash | Data transmission |
| Data LED solid on | No data transmission |
| Link LED solid on | BLE Link |
| Link LED flash | No Link |
| Data & Link LED solid on | DFU/OTA Mode |

## Power supply:

Voltage: 5 - 27 VDC, **Do NOT exceed 27VDC!**

The BLE232V2 can be powered by: Mini USB, screw terminals or pin9 in the DB9 connector.

**Do NOT power the adapter by more than two sources.**

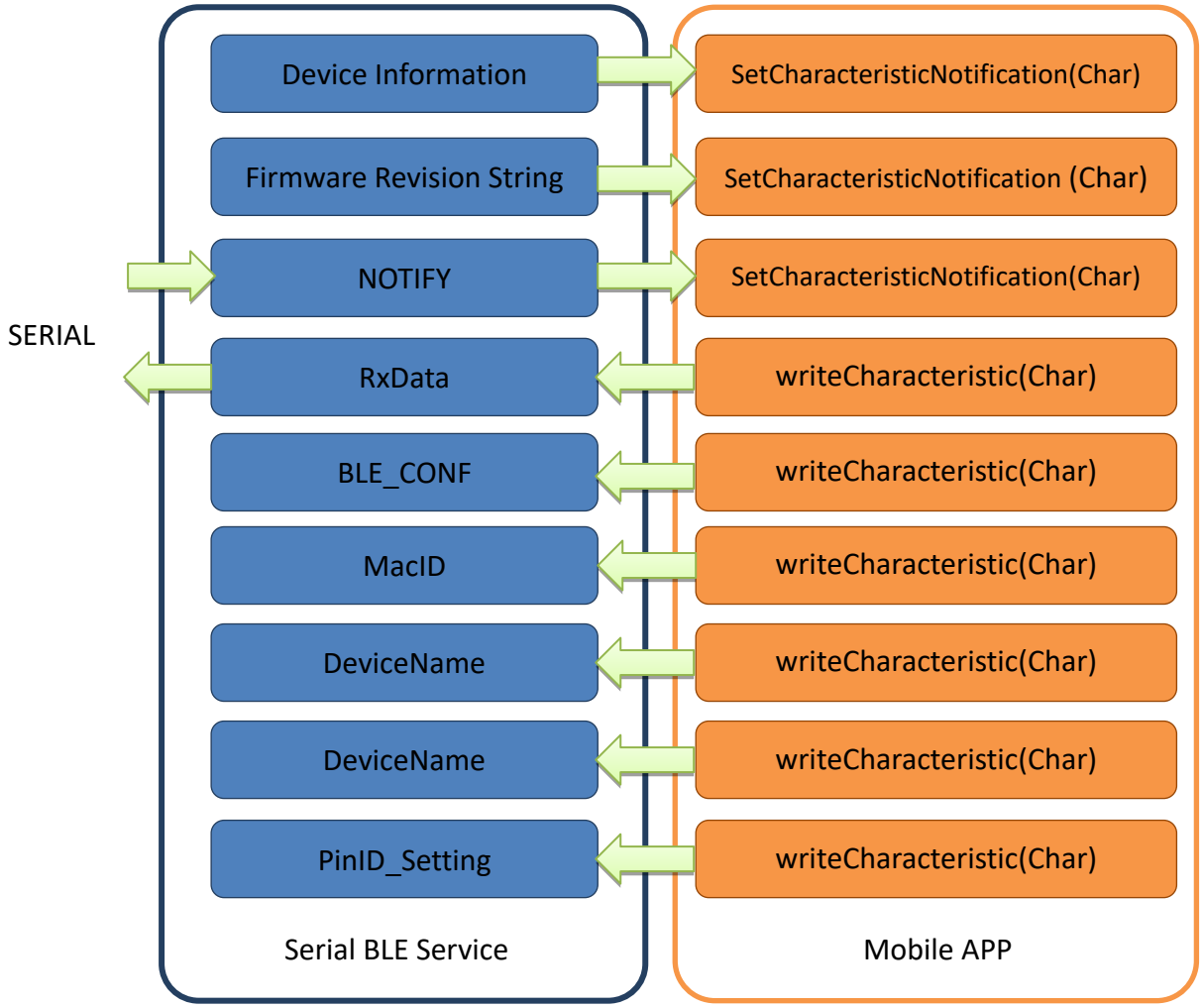
## Default values:

- Baud rate: 9600 bps
- Data bit: 8
- Parity: none
- Stop bit: 1
- Flow control: none
- Device Name: BLE Serial
- Pin code: disabled on adapters with serial number 1743006 to 1743010, otherwise the code is 123456.

**Reset button:**

Press the reset button for about 5 seconds and the adapter will reset to factory settings. A power cycle is recommended after reset.

**GATT Service:**




Programming Interfaces:

| GATT | UUID |
|---|---|
| UUID_Device Information | 0000180A-0000-1000-8000-00805F9B34FB |
| UUID_Firmware Revision String | 00002A26-0000-1000-8000-00805F9B34FB |
| UUID_NOTIFY (~20 bytes) | 00031234-0000-1000-8000-00805F9B0130 |
| UUID_RxData (~20 bytes) | 00031234-0000-1000-8000-00805F9B0131 |
| UUID_MacID (6 bytes) | 00031234-0000-1000-8000-00805F9B0133 |
| UUID_DeviceName (15 bytes) | 00031234-0000-1000-8000-00805F9B0134 |
| UUID_Reboot (1 bytes) | 00031234-0000-1000-8000-00805F9B0135 |

| | |
|---|---|
| UUID_PinID_Setting (6 bytes) | 00031234-0000-1000-8000-00805F9B0136 |
| UUID_BLE_CONF (7 bytes) | 00031234-0000-1000-8000-00805F9B0132 |

| Byte0 | Byte1 | Byte2 | Byte3 |
|---|---|---|---|
| Data bit | Hwfc | Stop Bit | Parity Bit |
| 7,8 | 0x01:on<br>0x00:off | 2:1<br>3:1.5<br>4:2 | 0x02 : No Parity<br>0x01 : Odd Parity<br>0x00 : Even Parity |

| Byte4 | Byte5 | Byte6 |
|---|---|---|
| Baud Rate | Device Mode | Reset To Default |
| 00:9600<br>01:19200<br>02:38400<br>03:57600<br>04:115200<br>05:230400<br>06:2400<br>07:4800<br>08:1200<br>09：460800<br>10：921600 | 0x01:on<br>0x00:off | 0x01: Reset |

**Command set via COM port:**

| Command | Value | Description |
|---|---|---|
| AT | | Check the connection status between control terminal and the RS-232 adapter. Response: “OK” when the connection is ok. Response: “ERROR” when the connection is not ok. |
| AT | | Test the RS-232 status when first connect the adapter with the controller. |
| AUTO= | | This command is used to enable/disable auto-connection feature. It is available only when the adaptor is in the Central (master) role. |
| | Y | The Central role adapter will connect the neighboring BLE peripheral adapter automatically. |
| (Default) | N | The command will disable the auto link function. |
| | ? | Inquire the current setting. |
| BAUD= | | This command is used to specify the baud rate of COM port. The command will need 200 ms delay. |
| | 1200 | 1200 bps |
| | 2400 | 2400 bps |
| | 4800 | 4800 bps |
| | 9600 | 9600 bps |
| (Default) | 19200 | 19200 bps |

| | | |
|---|---|---|
| | 38400 | 38400 bps |
| | 57600 | 57600 bps |
| | 115200 | 115200 bps |
| | 230400 | 230400 bps |
| | 460800 | 460800 bps |
| | 921600 | 921600 bps |
| | ? | Inquire the current baud rate. |
| BIT= | | |
| | 7 | 7 data bit |
| | 8 | 8 data bit |
| | ? | Inquire the current data bit |
| DEFAULT= | | This command is used to restore the default settings and originate a warm start. |
| | Y | Restore the default settings.<br>The command will re-start the system for 1 second. |
| DFU= | | Device Firmware Upgrade via PC software. OTA (Over the air) is available to upgrade the firmware by APP |
| | Y | |
| ECHO= | | This command is used to specify whether the adaptor echoes characters received from the UART back to the DTE/DCE. |
| | N | Command characters received from the UART are not echoed back to the DTE/DCE. |
| (Default) | Y | Command characters received from the UART are echoed back to the DTE/DCE. |
| | ? | Inquire the current setting. |
| FLOW= | | This command enable or disable flow control signals (CTS/RTS) of the UART port. Note, the setting is not affected by DEFAULT.<br>The command will need 1 second delay. |
| (Default) | N | Disable flow control. |
| | Y | Enable flow control. |
| | ? | Inquire the current setting |
| NAME= | | This command is used to specify a device name for the adaptor.<br>You can specify a friendly name using 0 to 9, A to Z, a to z, space and –, which are all valid characters. Note that “first space or -, last space or – isn’t permitted”. |
| (Default) | BLE Serial | Default device name |
| | xx….xx | “xx….xx” is a character string with the length from 2 to 30. |
| | R | Restore the default name |
| | ? | Inquire the name of the local adaptor. |
| PARITY= | | This command is used to specify parity bit setting of COM port.<br>The command will need 200 ms delay. |
| (Default) | N | None parity bit |
| | O | Odd parity |
| | E | Even parity |
| | ? | Inquire the current setting. |
| PIN= | | This command is used to specify a PIN code. The PIN code is disabled on adapters with serial number 1743006 to 17430105 otherwise the default pin |

| | | |
|---|---|---|
| | | code is 123456. Paired adaptors should have the same PIN. |
| (Default) | 123456 | |
| | xx….xx | “xx….xx” is a 4~16 digit string or English character (in capital or lower case) |
| | N | Cancel authentication by PIN. |
| | R | Restore the default pin code |
| | ? | Inquire the current PIN. |
| PROMPT= | | The command is used to decide whether result messages are prompted when Setup commands are executed. The result messages are: OK/ERROR for command execution. |
| (Default) | Y | Prompt result messages. |
| | N | Not prompt result messages. |
| | ? | Inquire the current setting. |
| ROLE= | | This command is used to specify whether the adaptor is in the central or peripheral role. If the device role is changed, the adaptor will reboot and all paired addresses will be cleared. |
| | C | Set the adaptor to the central role. |
| (Default) | P | Set the adaptor to the peripheral role. |
| | ? | Inquire the current role of the adaptor. |
| STATUS= | | Inquire all the current setting of the adapter. |
| | T | Inquire the inner temperature of the IC in centigrade |
| | ? | Display the current setting of the adapter |
| STOP= | | This command is used to specify one or two stop bits of COM port.<br>The command will need 200ms delay. |
| (Default) | 1 | One stop bit. |
| | 2 | Two stop bits. |
| | ? | Inquire the current setting. |
| VERSION= | | This command is used to inquiry the firmware version. |
| | ? | Inquire the version codes. |

### Configuring Central and Peripheral: (Similar to Master and Slave roles)

By DIP switches: The central will pair the slave automatically.

- Switch DIP-9 to 0 (Switch)
- Switch DIP-4 to 1 (Master)
- The central will link with the neighboring peripheral automatically. The blue LED will be solid on. The central will link with the paired peripheral next time when powered on.
- Please reset to default and follow above procedure if you want to link with other BLE devices.

By AT command:

- Set “role=c” or “ROLE=C” in one adapter.
- Set “auto=y” or “AUTO=Y” to enable the auto link
- The central will link with the neighboring peripheral automatically. The blue LED will be solid on. The central will link with the paired peripheral next time when powered on.
- Please reset to default and follow above procedure if you want to link with other BLE devices.

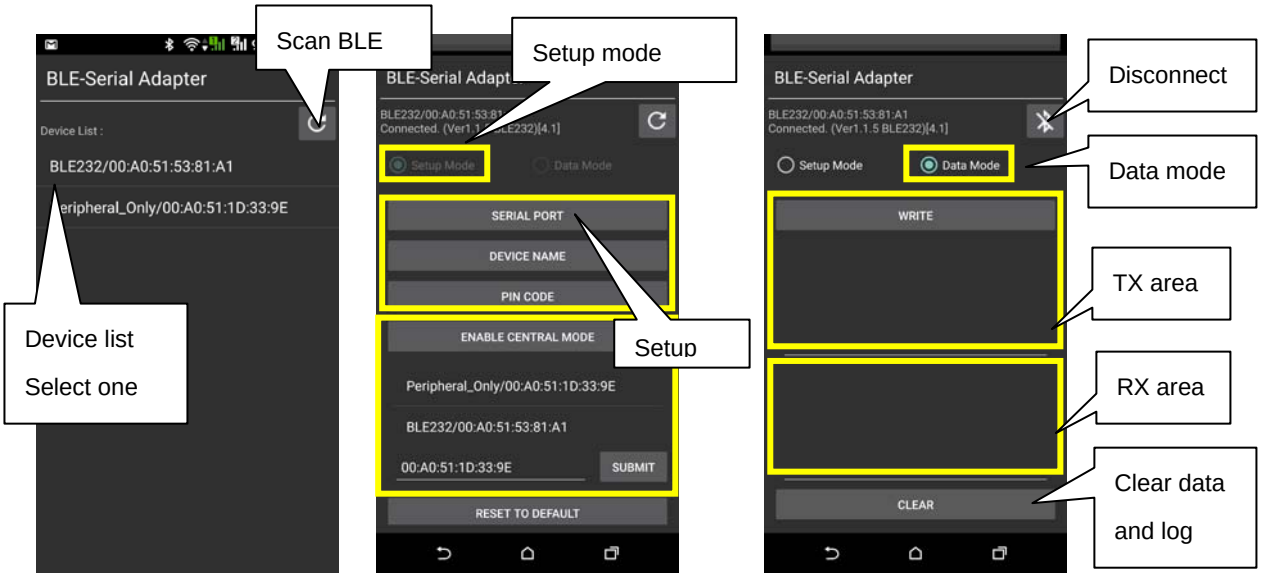
By APP setup (apps can be downloaded from www.usconverters.com, Google Play or Apple Store):

- The APP will search the BLE and select one as the central.
- Then select the other one as the peripheral and link.
- The central will link with the neighboring peripheral automatically. The blue LED will be solid on. The central will link with the paired peripheral on next time when power on.
- Please reset to the default and follow the above procedures if you want to link with other BLE devices.

The APP is used for configuring the parameters and can also be used for data transmission tests.

**Android:** The Android app can be downloaded from the Google Play Store:
https://play.google.com/store/apps/details?id=tw.com.uconnect.ble232

Or you can scan the QR code below:




Scan and select one. Connect and configure Data transmission test.

**iOS**: The same configuration procedure as the Android version. The app for iOS can be downloaded from the Apple Play Store:
https://itunes.apple.com/us/app/ble-to-serial-terminal/id1238004134?l=zh&ls=1&mt=8

Or you can scan the QR code below: