Serial RS232 Bluetooth v2.1 Adapter
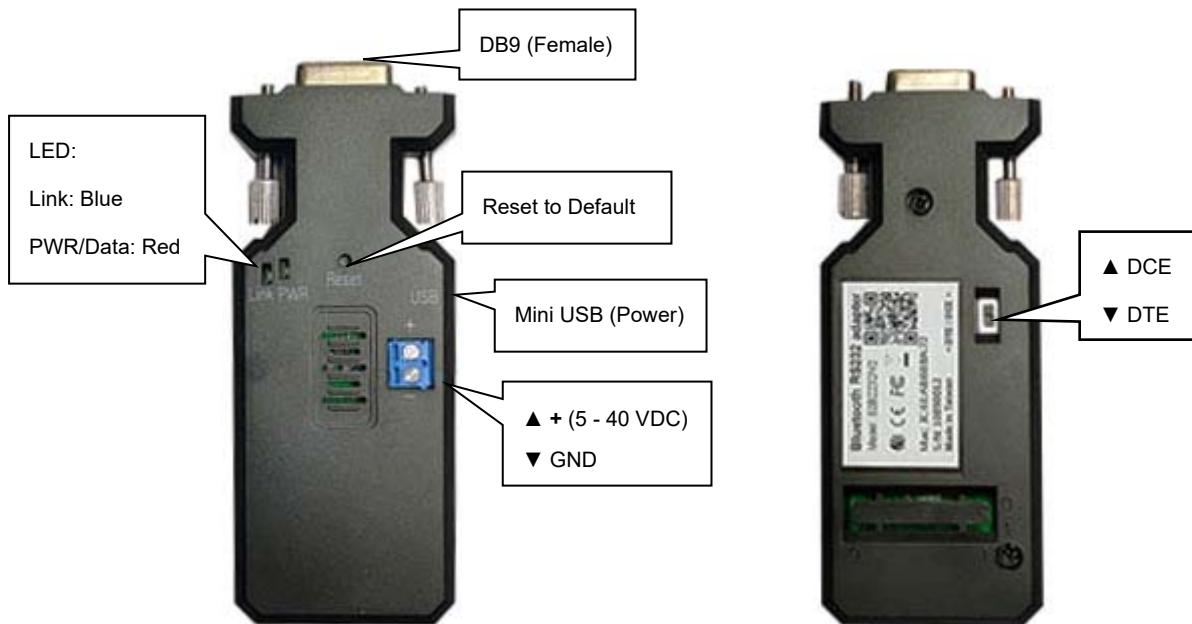
Datasheet & Quick Reference for S2B2232FIV2 / S2B2232FEV2

S2B2232FIV2
Internal chip antenna

S2B2232FEV2
External di-pole antenna

DB9 (Female)

LED:

Link: Blue

PWR/Data: Red

Reset to Default

Mini USB (Power)

▲ **+** (5 - 40 VDC)

▼ GND

▲ DCE

▼ DTE

Package Contents:
- RS-232 adapter x 1
- User manual x 1
- USB Cable x 1
- Di-pole antenna (S2B2232FEV2 only)

SPECIFICATIONS	
Part number	S2B2232FIV2 (internal chip antenna) S2B2232FEV2 (external di-pole antenna)
Operating systems	Windows 11, Windows 10, Windows 8.1, Windows 8, Windows 7, Vista, XP, 2000, ME, 98, Linux, Mac, Android
Interface type	RS232
Chipset	ESP32-D0WDQ6-V3 with External 4M flash
Baud Rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400 bps
Data bits	5, 6, 7, 8
Stop bits	1, 1.5, 2
Parity	None, odd, even
Data buffer size	RX buffer: 2048 bytes TX buffer: 8192 bytes Queue buffer size: 30 bytes
Operating distance	Up to 330 feet (100 meters) in open space
LED lights	Power, Link status
Bluetooth stack	Serial Port Profile (SPP)
PIN	PIN code available for pairing
Connection type	Point-to-point
Flow control	CTS/RTS
DEC/DTE	Manual switch
Parameters configurable by	• Over serial port (with AT commands/terminal software) • Over BLE Bluetooth using iOS / Android app (firmware V7.14-17 and V7.28 or higher)
RS232 Signals	TX, RX, CTS, RTS, GND
Echo	Configurable by software (on/off)
NMEA 183 compatible	Yes
Works with Cisco products	Yes, routers and switches (tested with Cisco Catalyst 3560)
Works with Windows 2008/20012 Server?	No, Windows Server does not have built-in Bluetooth drivers
Can pair while serial interface receives data	Yes limited
Full duplex RS232	Yes, can send and receive simultaneously both when connected over Bluetooth and when used in pairs.
Works with iPad/iPod?	No, it will not work with iPads/iPods due to the restrictions Apple put on their Bluetooth chipset, however it does work with most other Bluetooth enabled smartphones, tablets and devices
Number of slaves per master	7
Serial port	1-port female D-sub 9-pin
Bluetooth version	V2.1 Class 1 (for serial port communication) BLE V4.2 (for parameter configuration)
Frequency range	2.4GHz – 2.4835 GHz ISM Band
Hopping	1.600/sec, 1MHz channel space
Modulation	GFSK-1, DQPSK-2, 8-DPSK-3 Mbps
Tx power	Max. 18dBm (class 1)
Rx sensivity	-86 dBm typical
	S2B2232FIV2: Internal dipole

Antenna	S2B2232FEV2: External 2dBi di-pole, Reverse Polarity SMA male (inside threads / center receptacle)
Antenna connector on adapter (S2B2232FEV2)	Reverse Polarity SMA female (outside threads / center pin)
Power options	• Mini USB cable (5VDC) • DB9 connector Pin 9 (5 - 40VDC) • Screw terminals (5 - 40VDC)
Current consumption	Max 100mA
Operating temp.	-13°F to 185°F (-25°C to 85°C)
Dimensions	89 x 39 x 17.5 mm
Adapter weight	34g
Certifications	CE, FCC, RoHS

Default factory settings:

- Baud rate: 9600 bps

- Data bit: 8

- Parity: none

- Stop bit: 1

- Flow control: none

- Mode: Slave / Peripheral

- Device name: Serial Adapter

- Bluetooth PIN code: 'disabled' (Windows may require 0000 to pair)

These settings can be configured through the serial port using any terminal software such as TeraTerm, Putty or Hyper Terminal. Please see the 'Setup Guide' and below parameter table for details.

Reset Button:
Press and hold the reset button using a paper clip or similar for more than 5 seconds and the adapter will reset and reboot to factory defaults.

DTE/DCE switch
Use the slide switch to change between DTE and DCE.

Power
The adapter can be powered by 5 – 40VDC via mini USB, pin 9 in the DB9 connector or the screw terminals. **ONLY POWER THE ADAPTER BY ONE OF THESE OPTIONS, OTHERWISE THE ADAPTER MAY GET DAMAGED.**

LED Status

Status	Description
Red power LED on	Power is ON
Blue Link LED fast flashing (2 blink/sec)	Adapter in slave mode. Bluetooth ready.
Blue Link LED slow flashing (1 blink/sec)	Adapter in master mode (waiting for slave to connect)
Blue Link LED steady on	Master mode: Slave and Master is linked Slave mode: Bluetooth linked **and** COM port open (when paired with a PC)
Both blue and red LEDs off	Firmware upgrade mode

Parameters

The parameters can be configured via the DB9 RS232 serial port using a standard terminal program such as Putty or Tera Term, or over BLE Bluetooth using an app. Please see the 'Setup Guide' for details.

Note 2: Commands cannot be received by the adapter if it is paired/linked.

Command	Value	Description
+++		Change the adapter from the data mode into command mode locally. The command is available only when the adapter is in master mode. The time delay between each "+" sign is between 0.3 to 1.5 sec.
?		List all commands
ADDRESS=		This command is used to display the Bluetooth address of the local adapter.
	?	Inquire the Bluetooth address of the local adapter.
AT		Checks the connection status between control terminal and the RS-232 adapter. Response: "OK" when the connection is ok. "ERROR" when the connection is unsuccessful.
AUTO=		This command is used to enable/disable the auto-connection feature. It is available only when the adapter is in Master mode. All slaves with the head of the mac. 0012, 0019 or 3C61 will be connected w/o authenticating the pin value. The system will not re-start after changing this parameter.
	Y	Master and Slave will connect automatically.
(Default)	N	Master and Slave will need to be connected manually with the 'CONNECT' command.
	?	Inquire the current setting.
BAUD=		This command is used to specify the baud rate of the COM port. The command will need 200 ms delay.
	1200	1200 bps
	2400	2400 bps
	4800	4800 bps
*Default	9600	9600 bps
	19200	19200 bps
	38400	38400 bps
	57600	57600 bps
	115200	115200 bps
	230400	230400 bps
	?	Inquire the current baud rate.
BIT=		Data bit
	5	5 data bits
	6	6 data bits
	7	7 data bits
(Default)	8	8 data bits
	?	Inquire the data bit setting.
CONNECT=		This command is used to establish a connection manually. It is available only when the adapter is in the Master role.
	1~8	Connect the adapter to a Bluetooth device in the neighborhood found through "SEARCH=?"
	xxxxxxxxxxxx	Connect the remote adapter by typing the MAC address directly without searching.
	?	Display the MAC address of the latest paired device.
DEFAULT=		This command is used to restore the default settings and originate a warm start.

	Y	Restore the default settings (e.g. 9600 bps). The command will re-start the system for 1 second.
DEVICE=	xxxxxxxxxxx	Pre-set the adapter's mac address. This command is used with the "connect=device".
DFU=		Device Firmware Upgrade
	Y	
ECHO=		This command is used to specify whether the adapter 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. The command will need 1 second delay.
(Default)	N	Disable flow control.
	Y	Enable flow control.
	?	Inquire the current setting
KEY=		The key value will be created by the smart phone or Win10 devices when pairing with the slave adapter. Please type the same 6 numbers shown on the smart phone or Win10 devices within 15 seconds.
(Default)	N	
	Y	
MAC=		The mac. Address will be customized by the user. The master will connect the 2nd slave with the same mac. address if the 1st slave damaged.
	xxxxxxxxxxxx	The head of the address 0012, 0018, 0019 is available only.
NAME=		This command is used to specify a name for the adapter. 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". The default name is "Serial Adapter".
(Default)	Serial Adapter	Default device name
	xx….xx	"xx….xx" is a character string with the length from 5 to 32.
	R	Restore the default settings name="Serial Adapter".
	?	Inquire the name of the local adapter.
ONE=		The master will link with one paired or any nearby slave automatically. All the slaves with the same pin code will be connected. Once connected, the master will not change the paired slave until reset to default from the slave. The command is available under the command "auto=y".
(Default)	N	The master will link with any nearby slave automatically.
	Y	The master will link with the paired slave which is linked by the master before automatically.
	?	Inquire the current setting
PARITY=		This command is used to specify parity bit setting of COM port. 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. Paired adapters should have a same PIN. The length must be 4 – 16 alphanumeric characters. The master will connect the slave first

		and check the pin value sent from the slave. The master will connect the slave if the pin value is the same between both. The command is available for the S2B2232FE(I)V2 only.
(Default)	"none"	
	xx….xx	"xx….xx" is a 4 - 32 digit string of alphanumeric characters (in capital or lower case)
	?	Inquire the current PIN.
PROMPT=		This command is used to decide whether status messages are prompted when Setup commands are executed. The status messages are: OK/ERROR for command execution, or CONNECT/DISCONNECT/Try Connect Device for connection status.
(Default)	Y	Prompt result messages.
	N	Not prompt result messages.
	?	Inquire the current setting.
ROLE=		This command is used to specify whether the adapter is in the master or slave mode. If the device mode is changed, the adapter will reboot and all paired addresses will be cleared. The command will need 1 second delay.
	M	Set the adapter to the master mode.
(Default)	S	Set the adapter to the slave mode.
	?	Inquire the current mode of the adapter.
SEARCH=		This command is used to search for any Bluetooth device in the neighborhood within one minute. If any device is found, its name and its 12-digit-address will be listed. The search ends with a message "Inquiry ends. xx device(s) found." This command is available only when the adapter is in the master role by manual.
	?	Inquire Bluetooth devices in the neighborhood, listing 8 devices the maximum
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. The command will need 200ms delay.
(Default)	1	Stop bit
	1.5	Stop bit
	2	Stop bit
	?	Inquire the current setting.
VERSION=	?	Inquire firmware version.

Pin configuration

Pin	Signal	DTE Direction	DCE Direction	Description
1	CD	Input	Output	Not connected
2	TxD	Output	Input	Transmit
3	RxD	Input	Output	Receive
4	DSR	Input	Output	Not connected
5	GND	N/A	N/A	Signal ground (and power GND if powered by pin 9)
6	DTR	Output	Input	Not connected
7	CTS	Input	Output	Clear to send
8	RTS	Output	Input	Request to send (Default)
9	Vcc	Input	Input	Power supply (5 - 40VDC)

BLE GATT Service

1. UUID_1800_SERV = ("00001800-0000-1000-8000-00805F9B34FB")

  ● UUID = 2A00, Device name, Default: BLE232

2. UUID_180A_SERV = ("0000180A-0000-1000-8000-00805F9B34FB")

  ● UUID= 2A26,Firmware version,Format: x.x.x, ASCII/read only

  ● UUID=2A24,BLE version,Format: x.x, ASCII/read only, Value: 4.2 or 5.0

3. UUID_BLE_SERV = ("0003ABCD-0000-1000-8000-00805F9B0131") (Self defined UUID)

  ● UUID_BLE5DATA = ("00031201-0000-1000-8000-00805f9b0130"),Data from BLE232_TxData(Notification)

  ● UUID_BLE5SENT = ("00031202-0000-1000-8000-00805f9b0130"),//Data to BLE232_RxData

    max244bytes/package(write only)

  ● UUID_BLE5CONF = ("00031203-0000-1000-8000-00805f9b0130"), Configuration, 4bytes, (read/write)

UUID_BLE_Config (4 bytes): 00031203-0000-1000-8000-00805F9B0130			
Byte0 (ReadOnly)	Byte1	Byte2	Byte3
Product model	Baud Rate	Data and Stop bit	Port setting
0xAA: RS232	0x00: 1200 bps	Data bit	bit 0: Parity (0: NONE 1: EVEN)
0xAF: RS485/422	0x01: 2400 bps	bit 7: 8 bit	bit 1: Flow control (0: Disabled 1:
	0x02: 4800 bps	bit 6: 7 bit	Enabled) (for RS232 model Only)
	0x03: 9600 bps	bit 5: 6 bit	bit 2: Parity(1:ODD, bit 0 must be 0)
	0x04: 19200 bps	bit 4: 5 bit	bit 3: Port Type (0: RS485 1: RS422)
	0x05: 38400 bps		(Available on RS485 model only)
	0x06: 57600 bps	Stop bit	bit 4: BLE Role (0: Peripheral 1: Central)
	0x07: 115200 bps	bit 3: 1-bit	(indication Only)
	0x08: 230400 bps	bit 2: 1.5-bit	bit 5:ControlSet (0: set by APP or
		bit 1: 2-bit	command 1: set by 9P switch)
		bit 0: N/A	(indication Only)

  ● UUID_BLE5ADDR = ("00031204-0000-1000-8000-00805f9b0130"), Target Peripheral Mac. Address,

    6bytes,(read/write)

  ● UUID_BLE5NAME = ("00031205-0000-1000-8000-00805f9b0130"), Device name, Max. 15bytes,UTF-8,(read/write)

- UUID_BLE5PIN = ("00031206-0000-1000-8000-00805f9b0130"), Pin code, 6bytes, (read/write)

- UUID_BLE5RBT = ("00031210-0000-1000-8000-00805f9b0130");Reboot, 2bytes, (read/write)

4. BLE Central command set: Used to connect BLE peripheral device. Available on ROLE=C.

BLE-NOTIFY=	NOTIFY characteristic's UUID string w/o space or symbol. Case-sensitive.
BLE-RX=	Read characteristic's UUID string w/o space or symbol. Case-sensitive.
BLE-PRISVC=	BLE primary service UUID string w/o space or symbol. Case-sensitive.
BLE-CONNECT=	Mac. address of the BLE peripheral device. EX:00A05152911C, Not Case-sensitive.

EX: Link with BLE peripheral S2B5232E. Please follow the procedures to set the UUID.

ROLE=C

BLE-NOTIFY=000312010000100080000805F9B0130

BLE-RX=000312020000100080000805F9B0130

BLE-PRISVC=0003ABCD0000100080000805F9B0131

BLE-CONNECT=00A05152911C

Parameter configuration.

The adapter has built-in BLE Bluetooth v4.2 which can be used for configuring the parameters. It cannot be used for communicating with a serial device, it can ONLY be used to configure the parameters.

App configuration is available for firmware versions V7.14-17 and V7.28 or higher.

iOS

https://apps.apple.com/us/app/id6449416841

Android

https://play.google.com/store/apps/details?id=com.uconnect.sppsetup

1. Download and install the app on your phone/device.

2. Open the app.

3. Connect the adapter to a power source and turn it on.

4. Press and hold the reset button on the adapter for about 5 seconds.

   The app should now automatically scan and find the adapter.

   Select "Setup Mode"'. You can now select which parameter you want to configure.

<u>Federal Communications Commission (FCC) Statement</u>

RADIO FREQUENCY INTERFERENCE STATEMENT

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 correcting the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into and outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.
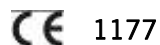-

Warning: A shielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

The information contained in this document is subject to change without notice.

FCC ID: XJ8-BT-232B   CCAB09LP2610T2   CE 1177