

Class 2 RS232 Bluetooth serial adapter Manual

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1. Brief introduction

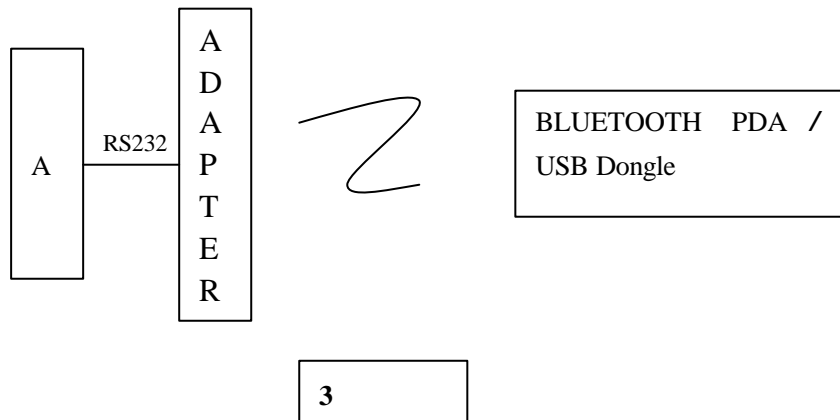
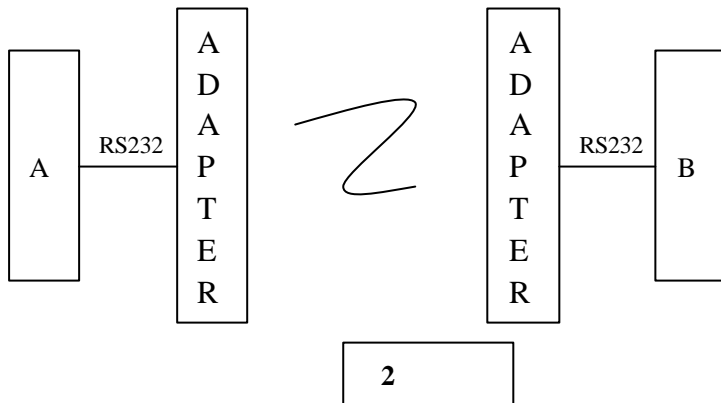
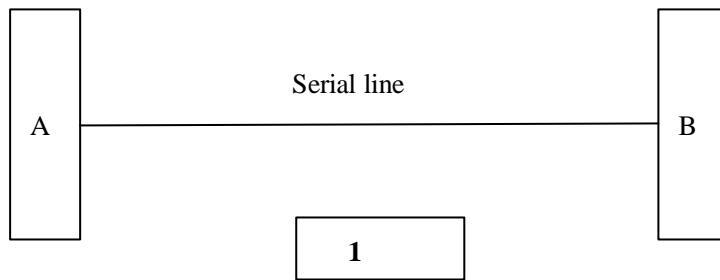
Bluetooth RS232 adapter can be applied to all kinds of home appliances, equipment (such as medical treatment equipment) and other electronic information products. As a cable replacement program, it can connect the single-chip processor or processor directly via using PnP mode to achieve the wireless data transmission among equipments transparently. Bluetooth RS232 adapter has the discrimination of principal and subordinate, which can be matched as one set. The principal and subordinate equipment can establish connection, identify and memorize the opposite equipments automatically when hardware circuit of Bluetooth RS232 adapter connects correctly with electricity supply. The equipments of user can use RS232 Bluetooth adapter as the same as serial wires.

Bluetooth RS232 adapter can be used independently as well, excluding using by match. When user's equipment equipped with a RS232 Bluetooth adapter of one subordinate equipment, other Bluetooth devices, such as Bluetooth PDA can search out adapter of this RS232, and find out the services provided, then establish links and communication with this adapter through these services as well. This module can still be used as the same as the serial wires for the communications of users' equipments.

RS232 Bluetooth adapter provides a safety identification function. When users use safety identification, the equipments' connects must be authenticated, and only the authenticated equipment can realize communication. However this process could be automatically finished among a matched Bluetooth adapter (acquiescence code: 1234).

In figure 1, users' equipments between A and B connect by a serial wire; as shown in Figure 2, users' equipments between A and B connect by Bluetooth RS232 adapters. For equipments of users, these two types could be considered to be connected with a serial wire. Figure 3 shows the connecting situation between Bluetooth RS232 adapter and other Bluetooth equipment (shown here is the Bluetooth PDA). Under such circumstances, for the user's equipment, it is still the same as indicated in Figure 1 and Figure 2_just like to be connected with a serial line..

3. Chart



2. Features :

Compatible Bluetooth 1.2 Specification

Class 2 Standard

Effective distance 10 M

SPP Service

Multiple Baud Rates are supported (9.6k and 19.2k, 38.4k and 57.6k, 115.2k)

Automatic energy-saving mode

Low -power -wasted mode support & high-speed working mode support

4 Technical specification

Name	10M RS232 Bluetooth serial adapter (Female or male)						
Criterion	Compatible for Bluetooth 1.2 criterion						
RF output power	CLASS 2 Standard						
Working frequency range	ISMF Frequency range 2.400 ~ 2.483MHz						
Spectrum range	FHSS						
Antenna	External antenna						
Sensitive tolerance	<-88dBm at < 0.1% BER						
Implement protocol	LM、LC、L2cap、SDP、RFCOMM						
Support service	(Bluetooth Serial Port Profile)						
Power supply	Electrical plug power supply and DB9 power supply, 5 ~ 9V 100mA Rate current						
Power	State	Mode	Wait	Connect	Communication	The state of parameter set	
	Average Current MA	Slave	13	8	DANGLE send to Serial adapter	29	14
					Serial adapter send to DANGLE	34	
	Master	53	8	DANGLE send to Serial adapter	10	14	
Serial adapter send to DANGLE				26			
Interface	Standard RS232 five wire system mode						
Connecter	DB9 FEMALE						
PIN	RxD, TxD, RTS, CTS, GND						
Saving power	Automatic saving power mode, support low-power working mode/high speed working mode						
Security	Safe authentication, data encryption.						
Baud rate	1.2K ~ 1382.4Kbps						
LED indicator light	Power supply indicator, connecting state, working mode.						
Application	PC						
Work distance	Open zone 10M						

Work circumstance	Running temperature	0 ~ +60
	Storage temperature	-10 ~ +70
	Humidity	5% ~ 90% None coagulate
Box size	10.6cm(L) × 3.6cm(W) × 1.4cm(H)	
Antenna dimension	Length : 8.7cm(Antenna can circumrotate 360 degree or upright 90 degree)	
Weight	25g	

5 Indicator light and button explain

There are three LED to indicate serial adapter's power state, connecting state and master/slave mode. Use Cmd button to change adapter working mode (data mode or command mode).

Indicator light : Adapter indicator lights include red light, green LED light, power state (red light), Master/slave mode indicator (red light), connecting state indicator(green light).

After electrify serial adapter, power supply state indicator light (red light) keeps bright.

If master/slave mode indicator (red light) winks every several seconds, that means serial adapter works in gear. We can estimate the device if it is master or slave by the interval time of light sparkle. If winks once every 2 seconds, it is slave. If winks once every 5 seconds, it is master.

If connecting state indicator (green light) extinguishes, that shows it have established link with other Bluetooth devices; If winks, that shows it didn't establish links. When there isn't any established connect, through green lights flashing speed, we can determine whether the equipment has memorized address or not, that is to say, we can determine weather it pairs other Bluetooth equipments or not, if it twinkles fast (2 twinkles per second), it has memorized address; if it twinkle slowly (1 twinkle per second), it means it have not memorized address. For the master, it is normal that every 2 seconds winks once while consulting, and 4 fast twinkles per second while pairing, the light extinguishes after connecting.

Master/slave mode indicator and connecting state indicator light extinguish while RS232 serial adapter is in the state of parameter setting.

Cmd Button : In the estate of data mode, press Cmd button, the two of working state indicator lights are extinguished. This time serial adapter is in the state of parameter setting, and return to "+OPEN : 0" from serial interface. In the state of parameter setting, serial adapter stops working that you can set serial adapter parameter. While Pressing Cmd, RS232 serial adapter quits the state of parameters setting, and begins to work (search, match, link, transfer data, etc.) this time, but you can not install parameters of the RS232 adapter. Electrifies it and default enters into the state of data mode.

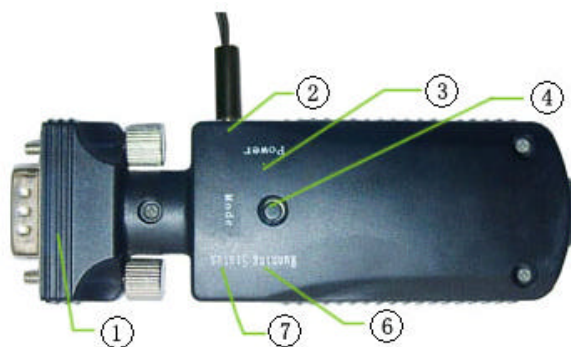
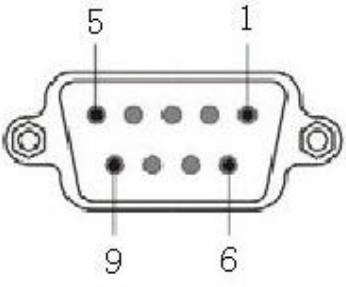


Chart 4: Indicator light and button

- RS232 interface
- DC Power supply interface
- Power supply indicator light (Red)
- CMD Button
- Antenna
- Master/Slave mode indicator light (Red)
- Connection mode indicator light (Green)

6 Standard RS232(Female) PIN Define

 <p>DB9 Female</p>	Pin No	Signal
	1	VCC
	2	TXD
	3	RXD
	4	Nc
	5	GND
	6	Nc
	7	CTS
	8	RTS
9	VCC	

7 Power supply Explanation

There are 2 ways to supply power, one is supplying power by power plug of the adapter, which connect to PC.

Standard of Serial adapter power supply: 5~9V DC , 100mA Rating current



The other is supplying power by DB9, which is available for the device developed by user's own self. It supplies power just through the way of inserting serial interface.

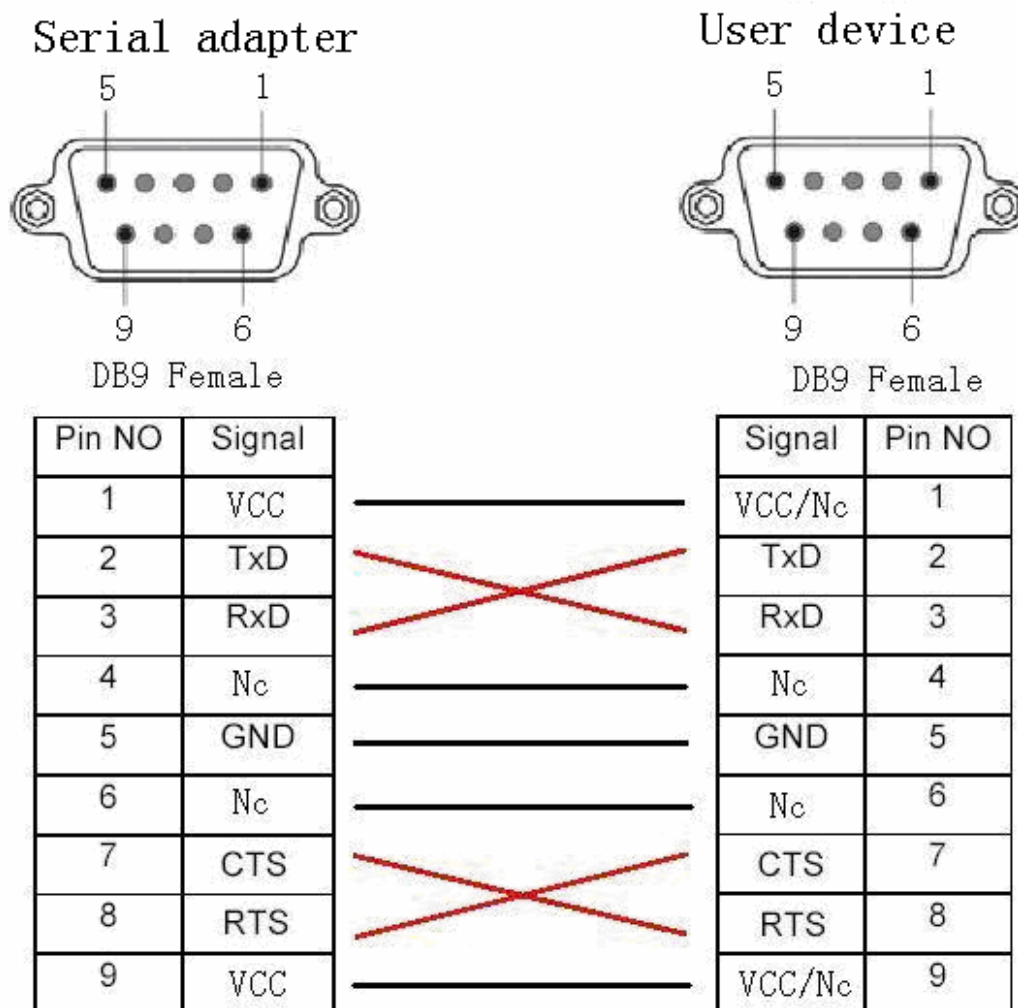
DB9-1、DB9-9 VCC、DB9-5 GND , 5~9V 100mA Rating current.

8 Original parameter setting explanation

Originally, Setting Serial adapter parameter is SLAVE (It needs to be searched and connected by the other Bluetooth device.), Device name JINO3264 Baud rate: 9600kbps , Pairing password 1234

Use AT Command or parameter setting tool changing proper value based on circs variety.

9 Serial interface joined each other Explanation



Note : VCC/Nc Shows the time of supplying power by power supply plug, PIN 1、 9 means Nc ;
 Supplying power by PIN 1, 9 connecting VCC power with DB9 Plug.

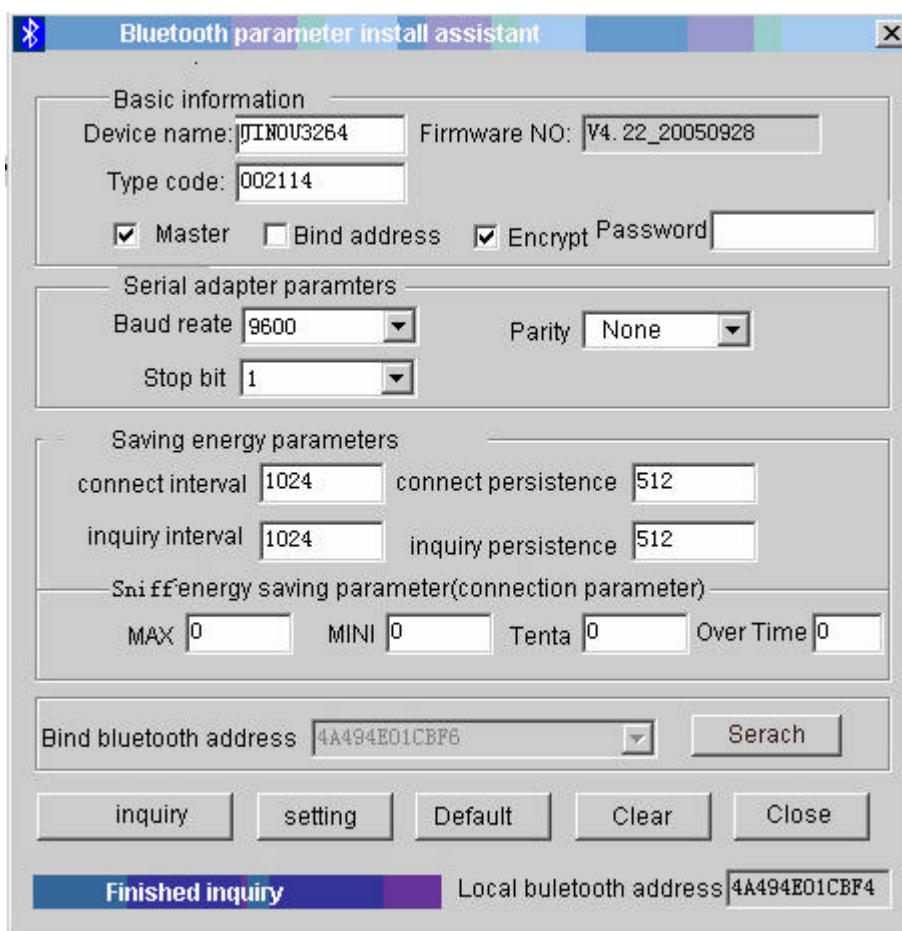
10. Usage

If amendment of the parameters are needed, please move Cmd Data Switch to Cmd side until the completion of parameter setting, and install related parameters via the "AT command" or "parameter setting tool", such as parameters for principle/subordinate equipment, baud rate, authentication and address binding. If the communication is between two RS232 adapters, you should make an equipment the principle one, and another one subordinate. Please move the Cmd Data to the Date side after finished.

After starting the equipment up, if no memorized addresses are saved, search nearby Bluetooth equipment first. If searching out, the principle equipment would enter into matching state. If authenticating right, the principle equipment would memorize (save) the address, and establish links with the equipment. If linking success, LINK light twinkles one time every five seconds; if having memorized addresses yet, the principle equipment connects directly with the memorized equipment without inquiries and matching. The memorized address could be deleted by using the AT command and parameters setting tool.

As for subordinate equipment, which wait for being connected and searched by other equipment, its Indicator light extinguishes, if connecting successfully.

11 Parameter installing assistant



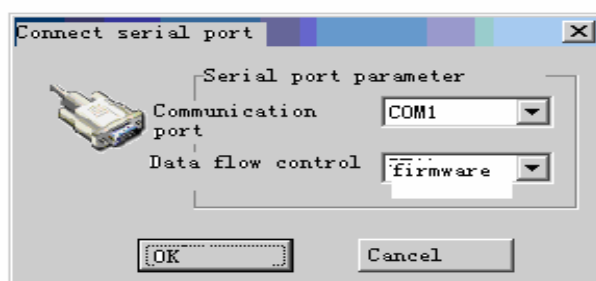
The screenshot shows a window titled "Bluetooth parameter install assistant" with a Bluetooth icon in the title bar. The window is divided into several sections:

- Basic information:**
 - Device name: JINOU3264
 - Firmware NO: V4. 22_20050928
 - Type code: 002114
 - Master Bind address Encrypt Password: []
- Serial adapter parameters:**
 - Baud rate: 9600
 - Parity: None
 - Stop bit: 1
- Saving energy parameters:**
 - connect interval: 1024
 - connect persistence: 512
 - inquiry interval: 1024
 - inquiry persistence: 512
- Save energy saving parameter(connection parameter):**
 - MAX: 0
 - MINI: 0
 - Tenta: 0
 - Over Time: 0
- Bind bluetooth address:** 4A494E01CBF6 [Search]
- Buttons:** inquiry, setting, Default, Clear, Close
- Status bar:** Finished inquiry | Local bluetooth address: 4A494E01CBF4

Note :When using parameter installing internet assistant, press Cmd button let serial adapter get into parameter installing mode, make sure the board connect PC serial interface correctly and this serial interface dose not be occupied by other software. After finishing parameter installing, press Cmd button again, let serial adapter get into data mode and make parameter modified become effective.

Serial adapter installing assistant includes start-up page and primary page. Primary page is above.

11.1 Start-up Page

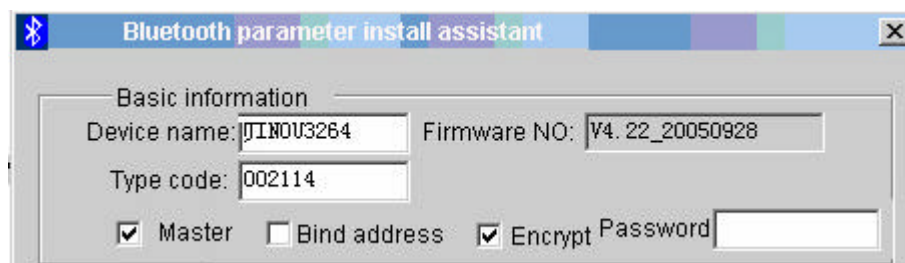


Open *SetParam4.25.exe* file, enter into start-up page , then you can setup communication parameters between serial adapter and computer serial interface.

Communication port : Select communication port between computer and serial adapter such as COM1, COM2.

Data flow control : Select Flow control mode.

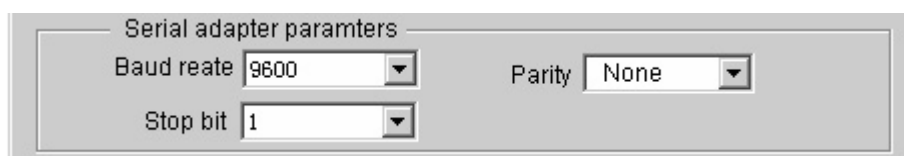
11.2 Basic setting



- Equipment name
Set serial adapter name, only support English name.
- Firmware Version
Current version of the serial adapter.
- Type code
Equipment type, Master's type must be same as slaves or master make use of **0x000000** , as for slaves you can make it at random. Know more please check *Addenda*.
- Master
Set Serial adapter as master, if not, as slaves. When both sides use serial adapter, it is indispensable that you set one module as master and another one is slave. In this way it can be used for the project of RS232 cable substitute.
- Bind address
If bind the other device address or not.
The one ticked off means it can not connect with other devices but can connect this device address restrictedly. Contrarily, it can be permitted connecting any devices.

- If be authorized and encrypted or not
As if it was chosen, the other device must authorize right by inputting password before connecting, data transmitted would be encrypted.
- Password
Make use of password when authorizing right.

11.3 Serial interface parameter



Serial adapter parameters

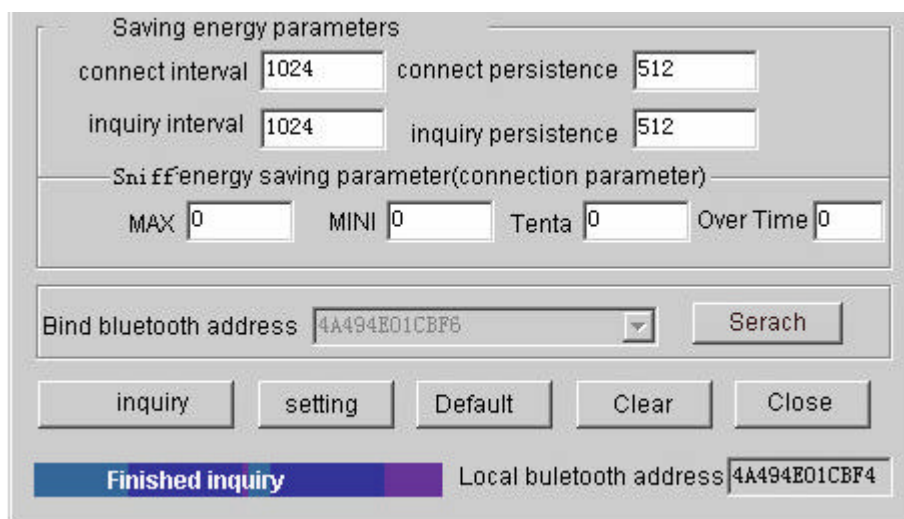
Baud rate: 9600

Parity: None

Stop bit: 1

- Baud rate
Set serial adapter baud rate when it communicates with device next time. This baud rate is serial adapter baud rate.
- Parity bit
Support none parity bit, odd parity, and even parity.
- Stop bit
Support stop bit for 1 bit, stop bit for 2 bit.

11.4 Saving power parameter and command



Saving energy parameters

connect interval: 1024

connect persistence: 512

inquiry interval: 1024

inquiry persistence: 512

Efficiency saving parameter(connection parameter)

MAX: 0

MINI: 0

Tenta: 0

Over Time: 0

Bind bluetooth address: 4A494E01CBF6

Search

inquiry

setting

Default

Clear

Close

Finished inquiry

Local bluetooth address: 4A494E01CBF4

- Connecting interval
Interval time of every time connecting scan, it means every other how long it would be allowed to connect. Interval time =setting value \times 625us
- Connecting persistence
Duration of every time connecting scan, it means the time keeping connect condition. Duration =setting value \times 625us
Note : connecting duration can not be longer than connecting interval time.
- Inquire interval

Interval time of every time inquiry scan, it means every other how long it would be allowed to inquire about. Interval time = setting value \times 625us

- Inquire persistence

Duration of every time inquire scan, it means the time keeping scan condition. Duration = setting value \times 625us

Note : Inquire about duration can not be longer than inquiring interval time.

- Sniff saving-power parameter

There are 4 parameters about Sniff : Maximum , Minimum , tentative , overtime.

Parameter value = setting value \times 625us. When the four parameters are all set as 0, forbid Sniff saving-power, serial adapter runs completely, the speed of data transfers reaches to maximum, but power consume is also maximum. We suggest you use this when data flow is larger. If permit Sniff saving-power, serial adapter power consume would reduce, we suggest permit Sniff saving-power when data flow is smaller, which can reduce power consume. For example: maximum = 800, minimum = 80, tentative = 8 , overtime = 8.

- Bind Bluetooth address

Inquire Bluetooth device address which paired with this module.

- Inquiry

Inquire about serial adapter current settings.

- Setting

You should set parameters into serial adapter, but it will be available after restart it.

- Default

Renews serial adapter setting as default, but it will be available after restart it.

- Clear up address

Clear up the other side Bluetooth device address which stored in serial adapter. Once serial adapter establishes connect with some Bluetooth devices, it will keep its address. In the next time of communication, Bluetooth module only can communicate with this Bluetooth device, but can not accept other addresses. Through the way of clear up Bluetooth address by this parameter set assistant, you can communicate with other devices.

11.5 Setting

After all is set, select appropriate parameters in the connect setting box of parameter installing assistant, such as communication port, flow control mode, clicks connecting button and establishes connect with serial adapter.

After connect successfully, system would inquired about RS232 serial adapter current settings parameter and showed on screen.

If user needs to amend some parameters, for example baud rate, you can select corresponding parameter, after input appropriate parameters, click setting button and start to set. After finished setting, you can carry out inquiry command and check up it is correct about parameter setting.



After finished parameters setting, you must move Cmd Data switch to Data side , parameters just are available, this time you can use RS232 serial adapter in gear.

Note : To avoid of damaging chipset, do not ser parameter frequently.

OEM Bluetooth serial adapter for you!

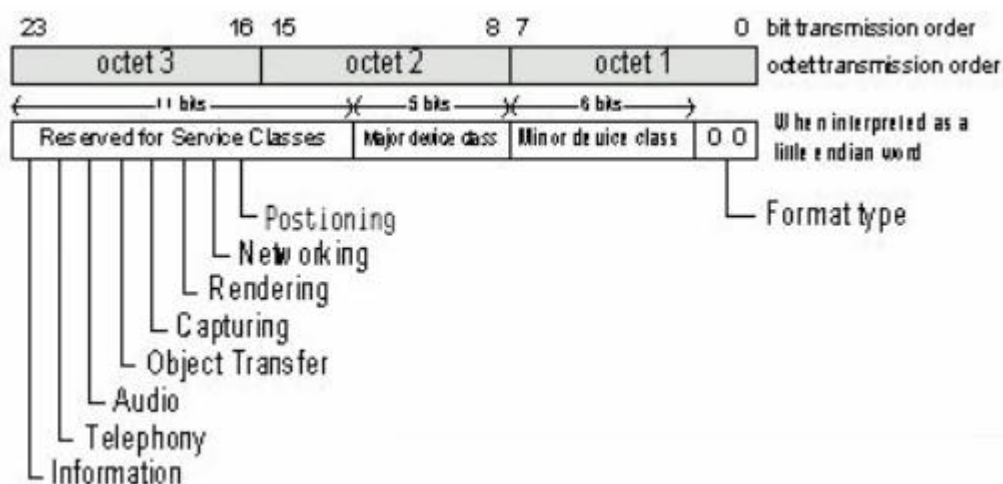
Addenda

1 Device type No.

The Class of Device/Service (CoD) field has a variable format. The format is indicated using the 'Format Type field' within the CoD. The length of the Format Type field is variable and ends with two bits different from '11'. The version field starts at the least significant bit of the CoD and may extend upwards.

In the 'format #1' of the CoD (Format Type field = 00), 11 bits are assigned as a bit-mask (multiple bits can be set) each bit corresponding to a high level generic category of service class. Currently 7 categories are defined. These are primarily of a 'public service' nature. The remaining 11 bits are used to indicate device type category and other device-specific characteristics.

Any reserved but otherwise unassigned bits, such as in the Major Service Class field, should be set to 0.



Any reserved but otherwise unassigned bits, such as in the Major Service Class field, should be set to 0.

Figure 1.2: The Class of Device/Service field (first format type). Please note the order in which the octets are sent on the air and stored in memory. Bit number 0 is sent first on the air.

2 MAJOR SERVICE CLASSES

Bit no	Major Service Class
13	Limited Discoverable Mode [Ref #1]
14	(reserved)
15	(reserved)
16	Positioning (Location identification)
17	Networking (LAN, Ad hoc, ...)
18	Rendering (Printing, Speaker, ...)
19	Capturing (Scanner, Microphone, ...)

20	Object Transfer (v-Inbox, v-Folder, ...)
21	Audio (Speaker, Microphone, Headset service, ...)
22	Telephony (Cordless telephony, Modem, Headset service, ...)
23	Information (WEB-server, WAP-server, ...)

TABLE 1.2: MAJOR SERVICE CLASSES

[Ref #1 As defined in See Generic Access Profile, Bluetooth SIG]

3 MAJOR DEVICE CLASSES

The Major Class segment is the highest level of granularity for defining a Bluetooth Device. The main function of a device is used to determine the major class grouping. There are 32 different possible major classes. The assignment of this Major Class field is defined in Table 1.3.

12	11	10	9	8	Major Device Class
0	0	0	0	0	Miscellaneous [Ref #2]
0	0	0	0	1	Computer (desktop,notebook, PDA, organizers,)
0	0	0	1	0	Phone (cellular, cordless, payphone, modem, ...)
0	0	0	1	1	LAN /Network Access point
0	0	1	0	0	Audio/Video (headset,speaker,stereo, video display, vcr.....
0	0	1	0	1	Peripheral (mouse, joystick, keyboards,)
0	0	1	1	0	Imaging (printing, scanner, camera, display, ...)
1	1	1	1	1	Uncategorized, specific device code not specified
X	X	X	X	X	All other values reserved

TABLE 1.3: MAJOR DEVICE CLASSES

[Ref #2: Used where a more specific Major Device Class code is not suited (but only as specified in this document). Devices that do not have a major class code assigned can use the all-1 code until 'classified']

4 THE MINOR DEVICE CLASS FIELD

The 'Minor Device Class field' (bits 7 to 2 in the CoD), are to be interpreted only in the context of the Major Device Class (but independent of the Service Class field). Thus the meaning of the bits may change, depending on the value of the 'Major Device Class field'. When the Minor Device Class field indicates a device class, then the primary device class should be reported, e.g. a cellular phone that can also work as a cordless handset should use 'Cellular' in the minor device class field.

5 MINOR DEVICE CLASS FIELD - COMPUTER MAJOR CLASS

7	6	5	4	3	2	Minor Device Class
bit no of CoD						
0	0	0	0	0	0	Uncategorized, code for device not assigned



Minor Device Class						
7	6	5	4	3	2	bit no of CoD
0	0	0	0	0	1	Desktop workstation
0	0	0	0	1	0	Server-class computer
0	0	0	0	1	1	Laptop
0	0	0	1	0	0	Handheld PC/PDA (clam shell)
0	0	0	1	0	1	Palm sized PC/PDA
0	0	0	1	1	0	Wearable computer (Watch sized)
X	X	X	X	X	X	All other values reserved

TABLE 1.4: SUB DEVICE CLASS FIELD FOR THE 'COMPUTER' MAJOR CLASS

6 MINOR DEVICE CLASS FIELD - PHONE MAJOR CLASS

Minor Device Class						
7	6	5	4	3	2	bit no of CoD
0	0	0	0	0	0	Uncategorized, code for device not assigned
0	0	0	0	0	1	Cellular
0	0	0	0	1	0	Cordless
0	0	0	0	1	1	Smart phone
0	0	0	1	0	0	Wired modem or voice gateway
0	0	0	1	0	1	Common ISDN Access
0	0	0	1	1	0	Sim Card Reader
X	X	X	X	X	X	All other values reserved

TABLE 1.5: SUB DEVICE CLASSES FOR THE 'PHONE' MAJOR CLASS

7 MINOR DEVICE CLASS FIELD - LAN/NETWORK ACCESS POINT MAJOR CLASS

Minor Device Class			
7	6	5	bit no of CoD
0	0	0	Fully available
0	0	1	1 - 17% utilized
0	1	0	17 - 33% utilized
0	1	1	33 - 50% utilized
1	0	0	50 - 67% utilized
1	0	1	67 - 83% utilized
1	1	0	83 - 99% utilized
1	1	1	No service available [REF #3]
X	X	X	All other values reserved

TABLE 1.6: THE LAN/NETWORK ACCESS POINT LOAD FACTOR FIELD

[Ref #3: "Device is fully utilized and cannot accept additional connections at this time, please retry later"]

The exact loading formula is not standardized. It is up to each LAN/Network Access Point implementation to determine what internal conditions to report as a utilization percentage. The only requirement is that the number reflects an ever-increasing utilization of communication resources within the box. As a recommendation, a client that locates multiple LAN/Network Access Points should attempt to connect to the one reporting the lowest load.

Minor Device Class			
4	3	2	bit no of CoD
0	0	0	Uncategorized (use this value if no other apply)
X	X	X	All other values reserved

TABLE 1.7: RESERVED SUB-FIELD FOR THE LAN/NETWORK ACCESS POINT

8 MINOR DEVICE CLASS FIELD - AUDIO/VIDEO MAJOR CLASS

Minor Device Class							
7	6	5	4	3	2	bit no of CoD	
0	0	0	0	0	0	Uncategorized, code not assigned	
0	0	0	0	0	1	Device conforms to the Headset profile	
0	0	0	0	1	0	Hands-free	
0	0	0	0	1	1	(Reserved)	
0	0	0	1	0	0	Microphone	
0	0	0	1	0	1	Loudspeaker	
0	0	0	1	1	0	Headphones	
0	0	0	1	1	1	Portable Audio	
0	0	1	0	0	0	Car audio	
0	0	1	0	0	1	Set-top box	
0	0	1	0	1	0	HiFi Audio Device	
0	0	1	0	1	1	VCR	
0	0	1	1	0	0	Video Camera	
0	0	1	1	0	1	Camcorder	
0	0	1	1	1	0	Video Monitor	
0	0	1	1	1	1	Video Display and Loudspeaker	
0	1	0	0	0	0	Video Conferencing	
0	1	0	0	0	1	(Reserved)	
0	1	0	0	1	0	Gaming/Toy [Ref #4]	
X	X	X	X	X	X	All other values reserved	

[Ref #4: Only to be used with a Gaming/Toy device that makes audio/video capabilities available via Bluetooth]

TABLE 1.8: SUB DEVICE CLASSES FOR THE 'AUDIO/VIDEO' MAJOR CLASS

9 MINOR DEVICE CLASS FIELD - PERIPHERAL MAJOR CLASS

Minor Device Class	
7 6	bit no of CoD
0 1	Keyboard
1 0	Pointing device
1 1	Combo keyboard/pointing device
X X	All other values reserved

TABLE 1.9: THE PERIPHERAL MAJOR CLASS KEYBOARD/POINTING DEVICE FIELD

Bits 6 and 7 independantly specify mouse,keyboard or combo mouse/keyboard devices. These may be combined with the lower bits in a multifunctional device.

Minor Device Class			
5 4 3 2	bit no of CoD		
0 0 0 0	Uncategorized device		
0 0 0 1	Joystick		
0 0 1 0	Gamepad		
0 0 1 1	Remote control		
0 1 0 0	Sensing device		
0 1 0 1	Digitizer tablet		
X X X X	All other values reserved		

TABLE 1.10: RESERVED SUB-FIELD FOR THE DEVICE TYPE

10 MINOR DEVICE CLASS FIELD - IMAGING MAJOR CLASS

Minor Device Class			
7 6 5 4	bit no of CoD		
X X X 1	Display		
X X 1 X	Camera		
X 1 X X	Scanner		
1 X X X	Printer		
X X X X	All other values reserved		

TABLE 1.11: THE IMAGING MAJOR CLASS BITS 4 TO 7

Bits 4 to 7 independantly specify display, camera, scanner or printer. These may be combined in a multifunctional device.

Minor Device Class	
3 2	bit no of CoD
0 0	Uncategorized, default



X X All other values reserved

TABLE 1.12: THE IMAGING MAJOR CLASS BITS 2 AND 3
Bits 2 and 3 are reserved

Example:

PC : 0x120104

NOTEBOOK : 0x12010C

Headphones : 0x200404

OEM Bluetooth serial adapter for you!

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