

BLK-MD-BC04-B BLUETOOTH MODULE

AT COMMANDS

Users can through a serial interface and BLK-MD-BC04-B chips for communication, serial interface use Tx, Rx two root signal lines, baud rate support 1200 ,2400,48000,38400,57600,115200,230400,460800 and 921600 bps. The default of baud rate is 9600 bps.

BLK-MD-BC04-B bluetooth serial interface module (hereinafter referred to as the module) has two kinds of work modes: Master, Slave mode. Configure the method is as follows:

PIO (4)--soft/hardware master-slave set port: set low (or impending) for hardware Settings master-slave mode, set 3.3 V high level for software installed master-slave mode; If choose hardware Settings master-slave mode, can use the PIO (5) to set; If choose software installed master-slave mode, can use AT commands inquires and set (AT + ROLE).

PIO (5)--hardware master-slave set port: 3.3 V high level setting Master mode, grounding (or impending) Settings for Slave mode.

AT COMMANDS INSTRUCTIONS

BLK-MD-BC04-B Bluetooth serial interface module have two kinds of commands: commands and indications.(note this: AT commands all case, all with command carriage returns, line feeds character end: \ r \ n) .

I. Commands

Command 1: Test connection commands

command	answer	parameter
AT	OK	none

Command 2: Inquires Program Version

command	answer	parameter
AT+VERSION	+VERSION=< Para1>	<Para1>: Firmware version, bluetooth version number, local HCI version, HCI revision, LMP version number, son LMP version number

Example:

AT+VERSION\r\n

+BOLUTEK Firmware V2.2, Bluetooth V2.1, HCI V2.1, HCI Rev37, LMP V4, LMP SubV37

Command 3: Inquires the help informations

command	answer	parameter
AT+HELP	Command Description ----- AT Check if the command terminal work normally AT+RESET Software reboot	none

Command 4: Inquires/set——Name

command	answer	parameter
AT+NAME	+NAME=<Para1>	<Para1>: the name of device default: BOLUTEK
AT+NAME< Para1>	1.+NAME=<Para1> OK——succeeded 2.ERROR=<Error_Code>—— failed*	

*< Error_Code > for the error code, please see appendix 1

Command 5: Restore default Settings

command	answer	parameter
AT+DEFAULT	OK	none

Command 6: Software reset/restart

command	answer	parameter
AT+ RESET	OK	none

Command 7: Inquires/set——PIN

command	answer	parameter
AT+PIN	+PIN=<Para1>	<Para1>: pin default: 1234
AT+PIN< Para1>	1.+PIN=<Para1> OK——succeeded 2.ERROR=<Error_Code>——failed	

Command 8: Inquires/set——Baud Rate

command	answer	parameter
AT+BAUD	+BAUD=<Para1>	<Para1>: baud rate
AT+BAUD< Para1>	1.+BAUD=<Para1> OK——succeeded 2.ERROR=<Error_Code>—— failed	1---1200 2---2400 3---4800 4---9600 5---19200 6---38400 7---57600 8---115200 9---230400 A---460800 B---921600 C---1382400 default: 4---9600

Note: baud rate after change, if not the default 9600, if set parameters or data communication in the later, need to use the set baud rate.

Command 9: Inquires/set——Equipment type

command	answer	parameter
AT+COD	+COD=<Para1>,<Para2>	< Para1 > : local equipment types (length must for six byte), in effect from the model, is to end retrieval
AT+COD< Para1>,<Para2>	1.+COD=<Para1>,<Para2> OK——succeeded 2.ERROR=<Error_Code>—— failed	< Para2 > : filter equipment types, in the master mode to take effect, used for filtering to equipment (if set 000000 return all search to equipment) The default: 001 f00, 000000

In order to effectively around to many bluetooth implementation filtering, and rapid inquiry or be inquires the custom bluetooth device, the user can set the standard for the module bluetooth device types, such as 001 f00 (hex).

Command 10: Inquires/set——Module SPP master-slave mode

command	answer	parameter
AT+ROLE	+ROLE=<Para1>	<Para1>:

AT+ROLE< Para1>	1.+ROLE=<Para1> OK——succeeded 2.ERROR=<Error_Code>—— failed	0---slave 1---master The default:0 slave
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Note: in hardware Settings master-slave mode condition, can use AT + ROLE inquiry, set command can't change a master-slave mode. In the software installed master-slave mode condition, this command mode in the next set master-slave on effective when electricity.

Command 11: Inquires/set——Inquires the access code

command	answer	parameter
AT+IAC	+IAC=<Para1>	<Para1>: Inquires the access code The default: 9e8b33 Set specific see appendix 2: inquires introductions
AT+IAC< Para1>	1.+ IAC =<Para1> OK——succeeded 2.ERROR=<Error_Code>—— failed	

Access Code set to GIAC (General Inquire Access Code: 0 x9e8b33) General inquires the Access Code, can be used to find or be found all around the bluetooth device; In order to effectively in many bluetooth devices around the rapid inquires custom or be inquires bluetooth devices, users can access the module inquires into GIAC and LIAC code set outside of the Numbers, such as e8b3f 9.

Command 12: Inquires the distal bluetooth device name

command	answer	parameter
AT+RNAME< Para1>	1.OK——succeeded 2.ERROR=<Error_Code>—— failed	< Para1>: Remote bluetooth device address

Example:

Bluetooth device address: 00:11:22:33:44:55, Device name: BOLUTEK

AT+RNAME00,11,22,33,44,55\r\n

OK

+RNAME=BOLUTEK

Command 13: Inquires/set——Inquires the access mode

command	answer	parameter
AT+INQM	+INQM=<Para1>,<Para2>,<Para3> >	<Para1>: inquiry mode 0: inquiry_mode_standard

AT+INQM< Para1>,<Para2>,<Para3>	1.+INQM=<Para1>,<Para2>,<Para3> OK——succeeded 2.ERROR=<Error_Code> —— failed	1: inquiry_mode_rssi 2: inquiry_mode_eir Length: 1 byte < Para2 > : most bluetooth device response number length: 2 bytes < Para3 > : the biggest inquires the overtime Overtime scope: 1-30 (converted into time: 1.28-61.44 seconds) Length: 2 bytes The default value: 1,9,30 (hex)
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RSSI access mode: according to receiving signal strength around a visit default access the strongest signal bluetooth devices.

Example:

AT + INQM1, 5, 12-set inquires the access mode: according to the RSSI pattern search, more than five bluetooth device response is terminated inquiry, set for overtime $48 * 1.28 = 61.44$ seconds

+ INQM = 1,5,30

OK

Command 14: Inquires/set——Connection modes

command	answer	parameter
AT+CMODE	+CMODE=<Para1>	< Para1 > : 0: designated bluetooth address connection modes (designated by the BIND command bluetooth address set) 1: any bluetooth address connection modes (from BIND the constraints of the command set address) The default: 1
AT+CMODE< Para1>	1.+CMODE=<Para1> OK——succeeded 2.ERROR=<Error_Code>—— failed	

Binding address: for from equipment, if has the memory address, it can't be matched with inquires, can only be it memory device to connect; On the equipment, if has the memory address, is always try to connect it to the memory of the equipment; So when binding address, once a device memory address, the connection is only in it and it is established between the memory of the equipment, and will not establish a connection with other equipment. So, in the binding address, if hope to establish a connection with other equipment, it must be clear memory address.

Don't binding address: from the devices can be matched with inquires; The equipment will have been connected to the memory devices, until clear memory address, the main equipment began to search and matching new equipment.

Command 15: Inquires/set——Binding bluetooth address

command	answer	parameter
AT+BIND	+BIND=<Para1>	<Para1>: Set bingding Bluetooth address: 11,22,33,44,55,66 Reply bluetooth address format: 11:22:33:44:55:66 The default: 00:00:00:00:00:00
AT+BIND<Para1>	+BIND=<Para1> OK——succeeded 2.ERROR=<Error_Code> — —failed	

When using this command to set up each other's bluetooth address, unless through the key or remove address command (AT + CLEAR) to remove address, as the main equipment bluetooth module will have been trying to connect the address until success. As the bluetooth module from equipment if not binding address, can be any other main equipment link; If need to bind the address, use the command set the binding of address.

Example:

In the designated bluetooth address connection mode, binding bluetooth device address:
15:51:35: ef: CD: ab

Command and response as follows:

AT+BIND11,22,33,44,55,66\r\n

+BIND=11:22:33:44:55:66

OK

Command 16: Clear memory address

command	answer	parameter
AT+CLEAR	OK	none

The module will remember the address of the other after paring succeeded, this command can be used to clear the memory address (not binding mode) or the binding address(binding mode).

Command 17: Inquires/set——Serial interface communication mode

command	answer	parameter
AT+UARTMODE	+UARTMODE=<Para1>,<Para2>	< Para1 > : stop bits 0:1 stop bits 1:2 stop bits < Para2 > : parity 0: no calibration 1: strange calibration
AT+ UARTMODE<Para1>,<Para2>	1. + UARTMODE=<Para1>,<Para2> OK ——succeeded 2.ERROR=<Error_Code> — —	

	failed	2: parity checking The default: 0, 0
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Command 18: Inquires——Local Bluetooth address

command	answer	parameter
AT+LADDR	+LADDR=<Para1>	<Para1> : local Bluetooth address Example: 11:22:33:44:55:66

Command 19: Inquires——Bluetooth module working state

command	answer	parameter
AT+STATE	+STATE=<Para1>	<Para1>: Bluetooth module working state Return values: 0: INITIALIZING 1: READY 2: INQUIRING 3: PAIRABLE 4: CONNECTING 5: CONNECTED

Command 20: Search distal bluetooth devices

command	answer	parameter
AT+INQ	OK	none

Note: after the beginning of inquires, equipment for the meeting for bluetooth address. Specific format see instructions 8(INQS, INQ: bluetooth address, equipment type, RSSI instructions, INQE), RSSI whether to return to the command ,can use AT + INQM to be set.

Example:

AT+IAC9e8b33\r\n ——Set any access code Bluetooth devices

+ IAC=9e8b33

OK

AT+COD001f00\r\n ——Set Bluetooth device type

+COD=001f00

OK

AT+INQM1,9,30\r\n ——Mode Settings: Take RSSI signal strength instructions, more than nine Bluetooth device response is terminated inquiry, set overtime for 61.44 seconds

AT+INQ ——search Bluetooth devices

OK
+INQS
+INQ: 11:22:33:44:55:66,001f00,-90 ———Return to search to bluetooth address equipment information
+INQ: aa:bb:cc:dd:ee:ff,001f00,-71 ———Return to search to bluetooth address equipment information
+INQE

Command 21: Inquires/set——Whether to be automatic search distal bluetooth devices

command	answer	parameter
AT+AUTOINQ	+AUTOINQ=<Para1>	<Para1>: 0: Not automatic search 1: Automatic search The default: 1
AT+ AUTOINQ<Para1>	+ AUTOINQ=<Para1> OK——succeeded 2.ERROR=<Error_Code> — — — failed	

Example:

AT+AUTOINQ1\r\n ———Set up automatic search distal bluetooth devices
+AUTOINQ=1
OK
AT+INQ\r\n ———Search distal bluetooth devices
+INQS
+INQ: 11:22:33:44:55:66,001f00,-90 ———Return to search to bluetooth address equipment information
+INQ: aa:bb:cc:dd:ee:ff,001f00,-71 ———Return to search to bluetooth address equipment information
.....
+INQE
+INQS
+INQ: 11:22:33:44:55:66,001f00,-90
+INQ: aa:bb:cc:dd:ee:ff,001f00,-71
.....
+INQE

Command 22: Cancel inquires——Distal bluetooth equipment

command	answer	parameter
AT+INQC	OK	none

Note: the command only in the Lord shall state model inquires, stop the current query

Command 23: Inquires/set——Whether to connect remote bluetooth devices

command	answer	parameter
AT+AUTOCONN	+AUTOCONN=<Para1>	<Para1>: 0: No auto connect 1: Auto connect default: 1
AT+ AUTOCONN<Para1>	+ AUTOCONN=<Para1> OK——succeeded 2.ERROR=<Error_Code> — — failed	

Command 24: Connect remote bluetooth devices

command	answer	parameter
AT+CONNECT<Para1>	1.OK——succeeded 2. ERROR=<Error_Code> — —failed	<Para1>: Set remote Bluetooth address format: 11,22,33,44,55,66 Reply bluetooth address format: 11:22:33:44:55:66

Note: this command only can be used when it is in “ready”.

Example:

AT+CONNECT11,22,33,44,55,66 ——connect remote Bluetooth devices

OK

+CONNECTING>>11:22:33:44:55:66 ——Active connection distal bluetooth equipment in the process (Master)

+CONNECTED

Command 25 : Inquires/set —— Paging scanning, inquires the scanning parameters

command	answer	parameter
AT+IPSCAN	+IPSCAN=<Para1>,<Para2> ,<Para3>,<Para4>	< Para1 > : inquires the time interval < Para2 > : inquires the duration < Para3 > : paging time interval < Para4 > : paging duration The above parameters are a decimal number. The default: 400,200,400,200
AT+IPSCAN<Para1>,<Para2>,<Para3>,<Para4> >	1.+IPSCAN=<Para1>,<Para2>,<Para3>,<Para4> OK——succeeded 2.ERROR=<Error_Code> — —failed	

Command 26: Inquires/set——Security and encryption mode

command	answer	parameter
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AT+SENM	+SENM=<Para1>,<Para2>	<Para1>: security mode, Value as follows (1 byte): 0—sec_mode0_off 1—sec_mode1_non_secure 2—sec_mode2_service 3—sec_mode3_link 4—sec_mode4_ssp <Para2>: encryption, Value as follows (1 byte): 0—hci_enc_mode_off 1—hci_enc_mode_pt_to_pt 2—hci_enc_mode_pt_to_pt_and_bcast The default: 0,0
AT+SENM<Para1>,<Para2>	1.+SENM=<Para1>,<Para2> OK——succeeded 2.ERROR=<Error_Code>——failed	

Command 27: Inquires/set——Lowpower

command	answer	parameter
AT+LOWPOWER	+LOWPOWER=<Para1>	<Para1>: 0: no support lowpower 1: support lowpower The default: 1
AT+ LOWPOWER<Para1>	1. +LOWPOWER=<Para1> OK——succeeded 2.ERROR=<Error_Code>——failed	

Command 28: Inquires/set——Sniff energy-saving way

command	answer	parameter
AT+SNIFF	+SNIFF=<Para1>,<Para2>,<Para3>,<Para4>	< Para1 > : maximum time < Para2 > : minimum time < Para3 > : try to time < Para4 > : overtime time The default: 20,40,1,5
AT+SNIFF<Para1>,<Para2>,<Para3>,<Para4>	1.+SNIFF=<Para1>,<Para2>,<Para3>,<Para4> OK——succeeded 2.ERROR=<Error_Code>——failed	

Command 29: Inquires/set——Indication command

command	answer	parameter
AT+ENABLEIND	+ ENABLEIND=<Para1>	<Para1>: 0: close Indication command 1: open Indication command The default: 1
AT+ENABLEIND<Para1>	1.+ENABLEIND=<Para1> OK——succeeded 2.ERROR=<Error_Code>——failed	

Command 30: Inquires——Bluetooth pairing list

command	answer	parameter
AT+LSP	LSP=<Para1>,<Para2>,<Para3> LSP=E	< Para1 > : serial number (0-7) < Para2 > : bluetooth address < Para3 > : name the default feedback: LSP = E

Bluetooth equipment most record 8 pairs of bluetooth address , and after no power will also retain.

Command 31: clear Bluetooth pairing list

command	answer	parameter
AT+RESETPDL	OK	none

Command 32: Remove designated bluetooth pairing record

command	answer	parameter
AT+REMOVEPDL<Para1>	OK	<Para1>: serial number (0-7)

Command 33: Inquires/set——Break time monitoring

command	answer	parameter
AT+SUPERVISION	+SUPERVISION=<Para1>	<Para1>: Response time, unit seconds (hex) The default: 5
AT+SUPERVISION<Para1>	1.+SUPERVISION=<Para1> OK——succeeded 2.ERROR=<Error_Code>—— failed	

After the other party break line, Linkloss report time. Within the duration in, even if the other party break line, it will still keep the connection.

II. Indications

Indication 1: READY STATE

Indication	parameter
+READY	none

Indication 2: INQUIRING STATE

Indication	parameter
+INQUIRING	none

Just only the master has it, active inquiry

Indication 3: PAIRABLE STATE

Indication	parameter
+PAIRABLE	none

Just only the slave has it, to be search

Indication 4: CONNECTING

Indication	parameter
+CONNECTING<Para1>	<Para1>: bluetooth address Format as follows: >>aa:bb:cc:dd:ee:ff (master) <<aa:bb:cc:dd:ee:ff (slave)

Indication 5: CONNECTED

Indication	parameter
+CONNECTED	none

Indication 6: CONNECTION FAILED

Indication	parameter
+CONNECTION FAILED	none

Indication 7: CONNECTION BROKEN

Indication	parameter
+DISC:<Para1>	< Para1 > : connection broken reasons SUCCESS: normal disconnect LINKLOSS: link disconnect lost NO_SLC: no SLC connection broken TIMEOUT: overtime disconnect ERROR: for other errors disconnect

Indication 8: REPORT THE REMOTE BLUETOOTH DEVICE NAME

Indication	parameter
+RNAME=<Para1>	<Para1>: the remote Bluetooth device name Example: BOLUTЕК

Note: if the bluetooth found a new device, it will report the name of this device.

Indication 9: REPORT QUERY RESULT

Indication	parameter
+INQS Query beginning	<Para1>: Bluetooth address
+INQ=<Para1>,<Para2>,<Para3>	Format: 11:22:33:44:55:66
..... Found information about the device	<Para2>: device type
+INQE Inquires complete	<Para3>: RSSI signal strength (normal for 10 into the system, failed to return to 7 FFF)

Appendix 1: AT command the error code instructions

The error code to return to form——ERROR=<Error_Code>

Error_code (Decimal)	Comment
101	More than 40 bytes device name length
102	Pairing code length more than 16 bytes
103	Baud rate more than 1 byte length
104	Equipment types (COD) length of more than 6 bytes
105	For the remote device name address length error
106	Taken longer than 1 byte mode Settings
107	More than 1 byte connection modes length
108	Setting binding address length error
109	More than six byte IAC set length
110	Set INQM length error
111	Set up automatic inquires the length of more than 1 byte
112	Set up automatic connection length of more than 1 byte
113	Set SENM length error
114	Set IPSCAN length error
115	SNIFF set length error
116	Set LOWPOWER length error
117	CONNECT the command input connection address length error
118	Set UARTMODE length error
119	Set ENABLEIND length error

121	Set REMOVEPDL length error
201	Set REMOVEPDL length error
202	Baud rate parameters beyond the range (1-C)
203	Take the remote device name address value error
204	Master-slave mode setting error
205	Connection mode setting error
206	Take the remote device name address value error
207	Setting binding address value error
208	Set IAC value input errors
209	Set INQM value input errors
210	Set up automatic inquires error value
211	Set up automatic connection error value
212	Set SENM value input errors
213	Set IPSCAN value input errors
214	Set SNIFF value input errors
215	Set LOWPOWER value input errors
216	CONNECT the command input connection address value error
217	Set UARTMODE value error
218	Set ENABLEIND value error
220	Set SUPERVISION value error
301	IAC value is not in the normal range (0 x9e8b00-0 x9e8b33)
302	The command only support Lord mode
303	Inquiry command can only be effective Ready state
304	Cancel the Inquiry ordered only in Inquiring state effective
305	CONNECT connection only in Ready state command effectively

Appendix 2: inquires intrductions

The General- and Device-Specific Inquiry Access Codes (DIACs)

The Inquiry Access Code is the first level of filtering when finding *Bluetooth* devices and services. The main purpose of defining multiple IACs is to limit the number of responses that are received when scanning devices within range.

#	LAP value	Usage
0	0x9E8B33	General/Unlimited Inquiry Access Code (GIAC)
1	0x9E8B00	Limited Dedicated Inquiry Access Code (LIAC)

Table 1: *The Inquiry Access Codes*

The Limited Inquiry Access Code (LIAC) is only intended to be used for limited time periods in scenarios where both sides have been explicitly caused to enter this state, usually by user action. For further explanation of the use of the LIAC, please refer to the [Generic Access Profile](#).

In contrast it is allowed to be continuously scanning for the General Inquiry Access Code (GIAC) and respond whenever inquired.

The Class of Device/Service field

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.

Figure 1: *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.*

Major Service Classes

The Major and Minor classes are intended to define a general family of devices with which any particular implementation wishes to be associated. No assumptions should be made about specific functionality or characteristics of any application based solely on the assignment of the Major or Minor device class.

Bit no	Major Service Class
13	Limited Discoverable Mode
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 2: *Major Service Classes*

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,sterео, video display, vcr....
0	0	1	0	1	Peripheral (mouse, joystick, keyboards,)
0	0	1	1	0	Imaging (printing, scanner, camera, display, ...)
0	0	1	1	1	Wearable
0	1	0	0	0	Toy
0	1	0	0	1	Health
1	1	1	1	1	Uncategorized, specific device code not specified
X	X	X	X	X	All other values reserved

Table 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']

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.

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
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 4: Sub Device Class field for the 'Computer' Major Class

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
X	X	X	X	X	X	All other values reserved

Table 5: Sub Device Classes for the 'Phone' Major Class

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
X	X	X	All other values reserved

Table 6: The LAN/Network Access Point Load Factor field

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 7: Reserved sub-field for the LAN/Network Access Point

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	Wearable Headset Device
0 0 0 0 1 0	Hands-free Device
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
X X X X X X	All other values reserved

Table 8: *Sub Device Classes for the 'Audio/Video' Major Class*

Minor Device Class field - Peripheral Major Class

7 6	Minor Device Class bit no of CoD
0 0	Not Keyboard / Not Pointing Device
0 1	Keyboard
1 0	Pointing device
1 1	Combo keyboard/pointing device

Table 9: *The Peripheral Major Class keyboard/pointing device field*

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

5 4 3 2	Minor Device Class 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

0 1 1 0	Card Reader (e.g. SIM Card Reader)
0 1 1 1	Digital Pen
1 0 0 0	Handheld scanner for bar-codes, RFID, etc.
1 0 0 1	Handheld gestural input device (e.g., "wand" form factor)
X X X X	All other values reserved

Table 10: *Minor Class bits 2 to 5 for Peripheral Major Class*

Minor Device Class field - Imaging Major Class

7 6 5 4	Minor Device Class 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 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.

3 2	Minor Device Class bit no of CoD
0 0	Uncategorized, default
X X	All other values reserved

Table 12: *The Imaging Major Class bits 2 and 3*

Bits 2 and 3 are reserved

Minor Device Class field - Wearable Major Class

The Minor Class segment is the lowest level of granularity for defining a *Bluetooth* Device. There are 64 different possible minor classes.

7 6 5 4 3 2	Minor Device Class bit no of CoD
0 0 0 0 0 1	Wrist Watch
0 0 0 0 1 0	Pager
0 0 0 0 1 1	Jacket
0 0 0 1 0 0	Helmet
0 0 0 1 0 1	Glasses
X X X X X X	All other values reserved

Minor Device Class field - Toy Major Class

7 6 5 4 3 2	Minor Device Class bit no of CoD
0 0 0 0 0 1	Robot
0 0 0 0 1 0	Vehicle
0 0 0 0 1 1	Doll / Action Figure
0 0 0 1 0 0	Controller
0 0 0 1 0 1	Game
X X X X X X	All other values reserved

Minor Device Class field - Health

7 6 5 4 3 2	Minor Device Class bit no of CoD
0 0 0 0 0 0	Undefined
0 0 0 0 0 1	Blood Pressure Monitor
0 0 0 0 1 0	Thermometer
0 0 0 0 1 1	Weighing Scale
0 0 0 1 0 0	Glucose Meter
0 0 0 1 0 1	Pulse Oximeter
0 0 0 1 1 0	Heart/Pulse Rate Monitor
0 0 0 1 1 1	Health Data Display
0 0 1 0 0 0	Step Counter
0 0 1 0 0 1	Body Composition Analyzer
0 0 1 0 1 0	Peak Flow Monitor
0 0 1 0 1 1	Medication Monitor
0 0 1 1 0 0	Knee Prosthesis
0 0 1 1 0 1	Ankle Prosthesis
0 0 1 1 1 0	Generic Health Manager
X X X X X X	All other values reserved