Specific Bluetooth AT Commands Interface Guide

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Specific Bluetooth
AT Commands Interface Guide

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Contents

Overview

The aim of this document is to provide WAVECOM customers with a full description of the specific Bluetooth AT commands. This description is valid from software release X55.

Abbreviations

BT   Bluetooth
GAP   Generic Access Profile
SDAP   Service Discovery Application Profile
SAP   SIM Access Profile

1 Generic Access Profile features

The GAP is used to define generic procedures for Bluetooth devices discovery, security management and link establishment.

1.1 Set Local device administration +WBTADM

1.1.1 Description

This feature is used to permit at the application to set-up the name of the local Bluetooth device.

1.1.2 Syntax

Command syntax : AT+WBTADM=<DeviceName>

Command	Possible responses
AT+WBTADM="DeviceName" *Note*	OK *Note : Command valid*
AT+WBTADM?	+WBTADM : "DeviceName", "DeviceClass"[,"Device Address"] OK *Note : Command valid, local device address is returned when BT stack is started*
AT+WBTADM=?	+WBTADM: (248) OK Notes: indicates the max_length for DeviceName.

1.1.3 Defined values:

<DeviceName> :

alphanumeric string which contains the name of the device.

The string is coded in UTF8 (extended ascii characters) and the maximum length is 248 characters. But if the string is shorter, it is terminated by the NULL character. In a case of a limited user interface capabilities, we need to manage at least the 20 firsts characters. Initialized value : "Wavecom Device"

<DeviceClass> : ASCII string which indicates class of the device .its value is set to "Cellular".

<DeviceAddress> specify the address of the local device which must be retrieved when the BT module is started and the command AT+WBTADM? Is proceeded. This string is made of 6 groups of 2 hexadecimal characters separated by':' (ie : "xx:xx:xx:xx:xx:xx) .

1.2 Set PIN +WBTPIN

1.2.1   Description

This feature allows the setting of the PIN type on the local device. Possible values are:

- **Fixed PIN**: the PIN value is contained into the local device and can't be changed by the end user. This is useful when the local device don't have any peripheral to enter the PIN value.

- **Variable PIN**: the PIN value must be enter by the user with any peripheral.

1.2.2   Syntax

Command syntax : AT+WBTPIN=<type>

Command	Possible responses
AT+WBTPIN=<type> *Note : write the pin type*	OK *Note : Command valid*
AT+WBTPIN? *Note : read the pin type*	+WBTPIN: <type > OK *Note : Command valid*
AT+WBTPIN=?	+WBTPIN: (0,1) OK
AT+WBTPIN?	+WBTPIN: 0 OK

1.2.3   Defined values:

<type>

   0   variable PIN

   1   Fixed PIN

1.3 Start/Stop BT stack +WBTM

1.3.1 Description

This feature is used to start or to stop the BT application, and to configure the serial port used for BT module.

By default , the BT module is stopped.

After starting the BT module the configuration is available for all connections to Bluetooth service.

1.3.2 Syntax

Command syntax :

AT+WBTM=<mode>[,<speed>,<format>,<FlowControlIn>,<FlowControlOut> [,parity]]

Command	Possible responses
AT+ WBTM = <mode>[,<speed>,<format>,<FlowControlIn>, <FlowControlOut> [,parity]]	OK
AT+WBTM? Initial serial port configuration to be used with HCI Bluetooth module	+WBTM: 1, Speed, Format, FlowControlIn, FlowControlOut, Parity OK *Note : if the Bluetooth stack is started* +WBTM: 0 OK *Note: if the Bluetooth stack is stopped*
AT+WBTM=?	+WBTM: (0,1),(0-9),(0-5),(0,1),(0,1),(0-4) OK

1.3.3 Defined values:

<mode>

0 Disabled

1 Enabled

Values when mode =0 (Stop the BT module)

Input parameters:

None

Output parameters:

None

Values when mode =1 (Start the BT module)

Input parameters:

<speed> : baud rates that can be used by the DCE

0	300
1	600
2	1200
3	2400
4	4800
5	9600
6	19200
7	38400
8	57600
9	115200

<format>

0 : 8 Data 2 Stop *(supported)*

    <parity> *parameter is ignored, default value (4) is effective.*

1 : 8 Data 1 Parity 1 Stop *(supported)*

    *if no **<parity>** provided, 4 is used by default as **<parity>** value.*

2 : 8 Data 1 Stop *(supported)*

    <parity> *parameter is ignored, default value (4) is effective.*

3 : 7 Data 2 Stop *(supported)*

    <parity> *parameter is ignored, default value (4) is effective.*

4 : 7 Data 1 Parity 1 Stop *(supported)*

    *if no **<parity>** provided, 4 is used by default as **<parity>** value.*

5 : 7 Data 1 Stop *(supported)*

    <parity> *parameter is ignored, default value (4) is effective.*

<parity>

0 : Odd

1 : Even

2 : Mark

3 : Space

4 : None

flow control

<FlowControlIn >   :

0 : none

1 : RTS

<FlowControlOut >

0 : none

1 : CTS

Output parameters:

None

1.4 Set device mode configuration +WBTCONF

1.4.1   Description

This feature is used to permit at the application to set-up the discoverability mode, the encryption mode, the security level, the pairing mode, and to use Bluetooth capability

1.4.2   Syntax

Command syntax :

AT+WBTCONF=<discoverMode>,<PairingMode>, <connectableMode>,<SecuLevel>,<encryption>

Command	Possible responses
AT+WBTCONF=<discoverMode>, <PairingMode>, <connectableMode>,<SecuLevel>,<encryption>	OK *Note : Command valid*
AT+WBTCONF?	+WBTCONF: <discoverMode>, <PairingMode>, <connectableMode>,<SecuLevel>,<encryption> OK *Note : Command valid*
AT+WBTCONF=2,1,1,0	OK
AT+WBTCONF?	+WBTCONF: 2,1,1,0,0 OK
AT+WBTCONF=?	+WBTCONF: (0-2),(0-1),(0-1),(0-2),(0-2) OK

1.4.3   Defined values:

< discoverMode >

> 0 : Non discoverable

> 1 : Limited Discoverable

> 2 : General discoverable

<encryption>

> 0 : No encryption

> 1 : Encryption only for pear-to-pear packets

> 2 : Encryption for pear-to-pear and broadcast packets

< SecuLevel >

0 No security

1 Link level security; authentication is required for each connection.

2 service level security: accept connection only from paired device

<PairingMode> :

    0 : Non-pairable

    1 : Pairable

<connectableMode>

    0 : non-connectable

    1 : connectable

1.5 Set device mode configuration BT 1.2 +WBTSC

1.5.1   Description

This command is used to set specific modes used with BT 1.2.

1.5.2   Syntax

<u>Command syntax</u> :

AT+WBTSC=<InqScanMode>,<PagScanMode>,<AFHMode>,<RSSIMode>

Command	Possible responses
AT+WBTSC=<InqScanMode>,<PagScanMode>,<AFHMode>,<RSSIMode>	OK *Note : Command valid*
AT+WBTSC?	+WBTSC: <InqScanMode>,<PagScanMode>,<AFHMode>,<RSSIMode> OK *Note : Command valid*
AT+WBTSC=0,1,1,0	OK
AT+WBTSC?	+WBTSC: 0,1,1,0 OK
AT+WBTSC=?	+WBTSC: (0-1),(0-1),(0-1),(0-1) OK

1.5.3   Defined values:

< InqScanMode >

This parameter allows to configure the inquiry scan type for the local device.

    0 : Normal
    1 : Interlaced

< PagScanMode >

This parameter allows to configure the page scan type for the local device

    0 : Normal
    1 : Interlaced

<AFHMode>

This parameter allows to enable or not the controller's channel assessment scheme for the local device

    0 : Disable

    1 : Enable

<RSSIMode>

    0 : Standard

the inquiry result doesn't contain any value for the remote RSSI value

    1 : With RSSI level

the inquiry result contains the value of the remote RSSI level.

1.6 Searching for new Bluetooth devices in the range : +WBTSD

1.6.1   Description :

This command allows to perform 3 actions:

- Search for remote Bluetooth devices in the range by sending its address.

- Search for Bluetooth devices name in the above results.

- Abort research

1.6.2   Syntax :

Command syntax : AT+WBTSD=<CmdType>[,<Timeout>[,<Max number of devices>[,<Class of device>[,<DeviceAddress>[,<DiscoverableMode>]]]]]

Command	Possible responses
AT+WBTSD= <CmdType>[,<Timeout>[,<Max number of devices>[,<Class of device> [,<DeviceAddress>] [,<DiscoverableMode>]]]]]	OK +CME ERROR <err>
AT+WBTSD?	OK
AT+WBTSD=?	+WBTSD: (0-3),(2-120),(1-15),(50),(XX:XX:XX:XX:XX:XX),(0-1) OK

1.6.3   Defined values :

<CmdType>

0 : Abort search

1 : search for device addresses which are in <DiscoverableMode>

2 : Device discovery: get the address and the name

3 : Device name discovery.

<Timeout> is the time of research (in seconds); if timeout is not specified, the value will be 20. The range of values for Timeout depends on the mode:

if mode=1 or 3, timeout can be set between 2s to 60s.

if mode=2, timeout can be set between 4s to 120s.

<Max number of devices> is the maximum number of Bluetooth units to search; Maximum value is 15. if not specified that means no limitation.

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Page : **16 / 53**

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<Class of device> string which indicated the class of Bluetooth device if the research has to be done only for a particular class of device ("cellular phone").

<DiscoverableMode>

0 : general discoverable mode

1: limited discoverable mode

if not specified , a general inquiry is made

<DeviceAddress> specify the address of the device which name must be retrieved. This string is made of 6 groups of 2 hexadecimal characters separated by':' (ie : "xx:xx:xx:xx:xx:xx) .

Input Values when CmdType=0 (Abort search)

None

Input Values when CmdType=1 (search for device addresses which are in <DiscoverableMode>)

Every parameter is optional:

<Timeout>

<Max number of devices>

<Class of device>

<DiscoverableMode>

if not specified , a general inquiry is made

Input Values when CmdType=2 (Device discovery: get the address and the name)

Every parameter is optional:

<Timeout>

<Max number of devices>

<Class of device>

Note: inquiry is made on the device in general discoverable mode, the parameter <DiscoverableMode> is not taken into account.

Input Values when CmdType=3 (Device name discovery)

<Timeout> (optional)

 <DeviceAddress>(mandatory)

Note: discoverable device must be in connectable mode to be discover by other devices ,especially in case when CmdType = 2 or 3 .

1.7 Bonding +WBTB

This command performs the following actions (depending on CmdType):

- Initializes Bluetooth bonding procedure (to pair Bluetooth devices): creation of the key, sending it to Bluetooth device, waiting for response, and memorizing it if it is correct.

- Unpairs bonded device

- Lists of paired devices

1.7.1   Syntax

Command syntax :

AT+WBTB=<CmdType>[,<Device address> [,<PIN code>]]

Command	Possible responses
AT+WBTB= <CmdType>[,<Device address> [,<PIN code>]]	OK See table 1 +CME ERROR: <Error code>
AT+WBTB?	OK
AT+WBTB=?	+WBTB: (0-2),(XX:XX:XX:XX:XX:XX),(1-16) OK *Note: indicate the range of CmdType, the format of Device Adress and the length min and max for PIN code.*

table 1

Cmd Type	Description	Possible responses
0	Initialise Bluetooth bonding procedure	OK
1	Unpair bonded device	OK
2	List of paired devices	+WBTB: <Index of found service>,<Device address > OK

1.7.2   Defined values

<u>Values when CmdType=0 (Initialize Bluetooth bonding procedure)</u>

<Device address> : address of Bluetooth unit; this string is made of 6 groups of 2 hexadecimal characters separated by '**:**' (i.e : "xx:xx:xx:xx:xx:xx")

<PIN code> string in Alphanumeric format which contains the PIN code of Bluetooth device to pair, the string is less than 16 characters.

PIN code is used to calculate a key number which enable the authentication of the device between them.

During the bonding phase between two devices, the same PIN code is entered on both sides.

Note: devices to pair must be discoverable & connectable, to be paired.

When a device has been paired once, it is not necessary to proceed the command anymore, until the device is unpaired with CmdType=1.

<u>Values when CmdType=1 (Unpaired bonded device)</u>

<Device address> : address of Bluetooth unit; this string is made of 6 group of 2 hexadecimal characters separated by '**:**' (i.e. : "xx:xx:xx:xx:xx:xx").

If no address is specified the command unpaires all bonded devices.

<u>Values when CmdType=2 (List of paired devices)</u>

None

1.8 Service Connection / disconnection management : +WBTCM

1.8.1   Description

This command permits the connection or disconnection (depending on CmdType) to a Bluetooth service. It also provides the name of connected services

1.8.2   Syntax

Command syntax : AT+WBTCM=<CmdType>[,<Device address>,<Class of service>,<Name of service>]

Command	Possible responses
AT+WBTCM=<CmdType>[,<Device address>,<Class of service >,<Name of service>]	OK +CME ERROR: <error>
AT+WBTCM?	OK
AT+WBTCM=?	+WBTCM: (0-2),(XX:XX:XX:XX:XX:XX),(50),(50) OK
AT+WBTCM=2	+WBTCM: 1,"00:60:57:27:3D:6B", "SIM Access","SIM ACCESS" OK
AT+WBTCM=2	+WBTCM: 0 OK *Note: No connected device*

1.8.3   Defined values

<CmdType>

0 : connect to service

1 : disconnect to service

2 : show connected services

<Device address> : address of Bluetooth unit; this string is made of 6 groups of 2 hexadecimal characters separated by ':' (i.e.: "xx:xx:xx:xx:xx:xx")

<Name of service> name of service to connect to (This character string has a maximum length of 50).

<class of service> class of service to connect to (This character string has a maximum length of 50).

Input Values when CmdType=0 (connect to service)

<Device address>

<Name of service>

<class of service>

Input Values when CmdType=1 (disconnect to service)

<Device address>

<Name of service>

<class of service>

Input Values when CmdType=2 (show connected services

None

1.9 Retrieve RSSI remote signal level +WBTRSSI

This feature allows the local device to retrieve the RSSI level of the remote device, already connected.

1.9.1   Syntax

Command syntax : AT+WBTRSSI=<Device address>

Command	Possible responses
AT+WBTRSSI=<Device address>	+WBTRSSI: < Device address >,<RSSI Level> OK +CME ERROR: <Error code>
AT+WBTRSSI?	OK
AT+WBTRSSI=?	+WBTRSSI: (XX:XX:XX:XX:XX:XX) OK Note : indicate the format of the address in hexadecimal characters.

1.9.2   Defined values

<Device address> : address of luetooth unit; this string is made of 6 groups of 2 hexadecimal characters separated by ':' (i.e : "xx:xx:xx:xx:xx:xx")

In the response:

<RSSI level> : indicates the level in dB of the signal , it is an integer between – 127 and 128 .

1.10 Unsolicited request and unsolicited information: +WBTUM

1.10.1 Description

This command permits to accept / reject unsolicited request or information coming from a Bluetooth unit, send unsolicited request.

So AT+WBTUM is entered as a response to a +WBTUM unsolicited message.

1.10.2 Syntax

Command syntax : AT+WBTUM=<CmdType>,<Device   address>,<Type   of request / information>,<precision>[,<data1>[,<data2>]]

Command	Possible responses
AT+WBTUM=<CmdType>,<Device address>,<Type of request / information>,<precision>[,<data1>[,<data2>]]	OK +CME ERROR: 3
AT+WBTUM?	OK
AT+WBTUM=?	OK

1.10.3 Defined values

<CmdType>

0 accept unsolicited request

1 reject unsolicited request

2   Send data request

<Device address> : address of Bluetooth unit; this string is made of 6 groups of 2 hexadecimal characters separated by ':' (i.e.: "xx:xx:xx:xx:xx:xx")

<Type of request / information>

Request Type	Meaning
0	Not specified
1	Connection
2	PIN_CODE
3	Disconnection (information)
4	Receive Data*
5	Send Data*
6..255	Reserved

Note: * not used .

\<precision\>

precision	Meaning for CmdType = 0	Meaning for CmdType = 1
0	None	Not specified
1	String (\0 terminated)	Security reason
2	U32 /hexa data?	Limited resources
3..255	Reserved	Reserved

\<data1\>

if CmdType = 0 (unsolicited request was accepted) CmdType=2 (send an unsolicited request) this optional field can be used to send data. This data type is specified by \<precision\>

\<data1\> indicate the class of service when **\<Type of request / information\>**=1 or 3 connection/disconnection.

\<data2\> indicate the name of service when **\<Type of request / information\>\>**=1 or 3 connection/disconnection.

If Request Type :

1 or 3-> \<data1\>= class of service and \<data2\>= name of service

2-> \<data1\>= PIN code , \<data2\> not used.

1.11 Bluetooth configuration +WBTCNF

1.11.1 Description

First, this command allows to configure the timing of the reset sequence of the Bluetooth external chip, and to set the device class.

This command has to be sent once in the lifetime of a product, BEFORE ANY OTHER BLUETOOTH COMMAND!

Parameters are stored in E2P and remains valid as long as the Bluetooth chip is not changed.

A reset is necessary to take into account a new configuration.

This command also allows to use the activated TEST mode for the Bluetooth certification.

1.11.2 Syntax

Command syntax:

For Mode = 0:

AT+WBTCNF=<Mode>,<ResetPolarity>,<ActiveResetDuration>,<ReleaseResetDuration>[,<DeviceClass>]

For Mode = 1:

AT+WBTCNF=<Mode>

For Mode = 2:

AT+WBTCNF=<Mode>,<TestingMode>,<LoopbackMode>

Response syntax:

For Mode = 1:

+WBTCNF:<ResetPolarity>,<ActiveResetDuration>,<ReleaseResetDuration>,<DeviceClass>,<resetFlag>

For Mode = 2 and TestingMode = 1:

+WBTCNF: <LoopbackMode>

Command	Possible responses
AT+WBTCNF=0,1,20,1000,"Cellular" *Note: Write BT Reset parameter*	OK
AT+WBTCNF=1 *Note: Read BT Reset parameter*	+WBTCNF: 1,20,1000,"Cellular",1 OK *Note : A reset must be performed to take the modifications into account.*
AT+WBTCNF=2,0,1 *Note: Local LoopbackMode*	OK
AT+WBTCNF= 2,1 *Note: Read current LoopbackMode*	+WBTCNF: 1 OK
AT+WBTCNF= 2,2 *Note: Activate DUT mode*	OK
AT+WBTCNF?	OK
AT+WBTCNF=?	OK

1.11.3   Defined values

<Mode>

> **0:** Write BT Reset parameter

> **1:** Read BT Reset parameter

> **2:** Bluetooth Testing Command

For Mode = 0

<ResetPolarity> :

The Trigger state of this signal is configurable :

> **0**: Low level

> **1**: High level

<ActiveResetDuration>:
Duration of the active level of the reset signal.
Range of values: 20 to 255 ms

< ReleaseResetDuration >:
Duration of the release level of the reset signal.
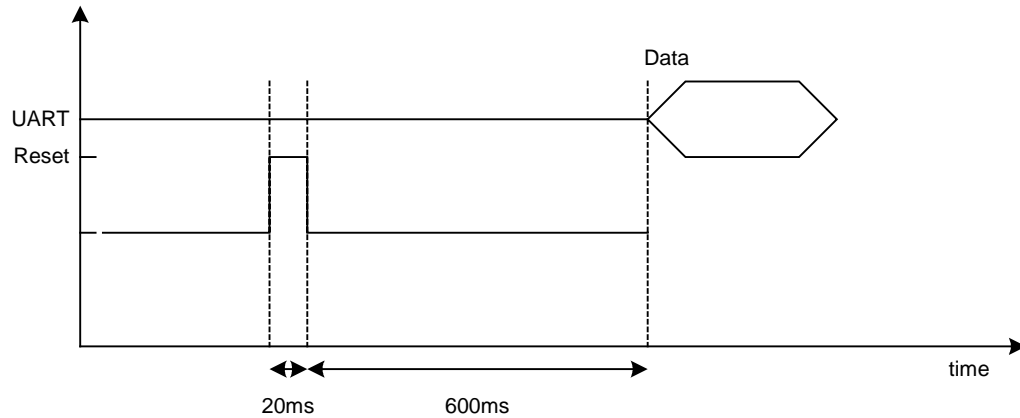Range of values: 20 to 65535 ms
<DeviceClass>:

String identifying the class of the device,(50 characters max). This parameter is optional, and has to be used if the default value ("Cellular") isn't appropriate.
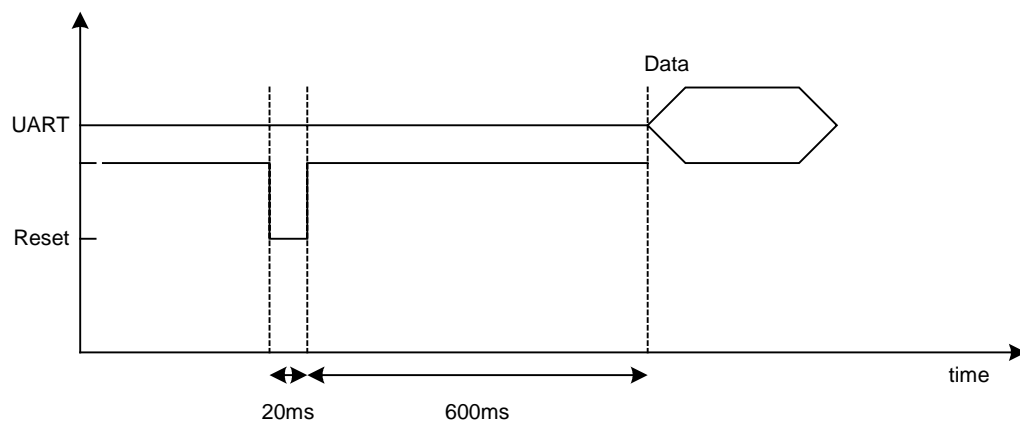
Example :

Reset signal with the configuration: AT+WBTCNF=0,1,20,600

Reset signal with the configuration: AT+WBTCNF=0,0,20,600

<u>For Mode = 1</u>

<resetFlag>

> **0:** the feature has not been modified since the last boot of the product.

> **1:** the feature has been modified since the last boot of the product; a reset must be performed to take the modifications into account.

<u>Notes</u>: *If a feature is reset to its initial value after a modification, the <resetFlag> parameter will be reset to 0.*

For Mode = 2

<TestingMode> :

> **0:** Write Loopback mode

> **1:** Read Loopback mode

> **2:** Enable DUT mode

Notes: *It is impossible to disable the DUT mode without a Bluetooth stack and chip reset.*

<LoopbackMode> :

> **0:** None

> **1:** Local Loopback

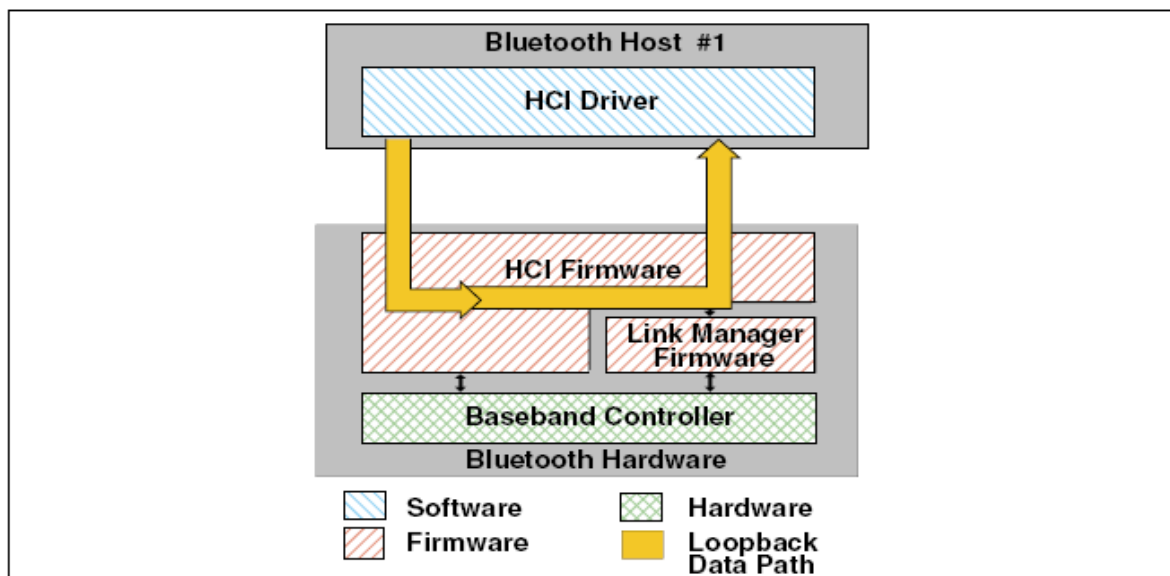> **2:** Remote Loopback

Notes: *Direct transition 1->2 or 2->1 are forbidden without explicite transition by LoopbackMode None (So, transition 1->0->2 or 2->0->1 are accepted).*
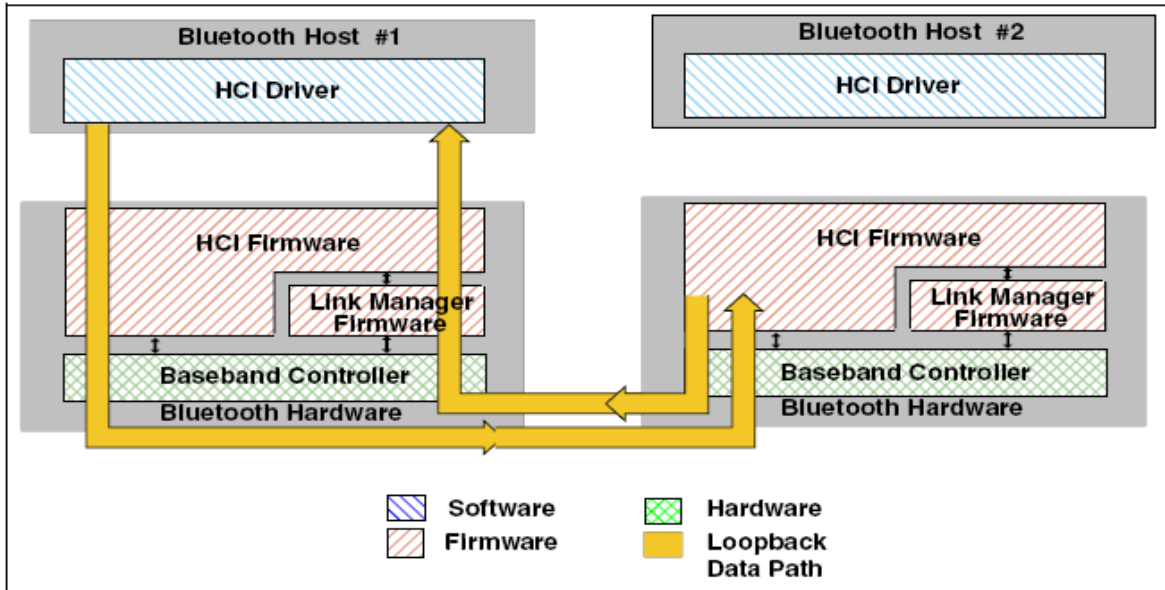
Example:

Enable Local Loopback: AT+WBTCNF=2,0,1

Enable Remote Loopback: AT+WBTCNF=2,0,2

2 Service Discovery Application Profile features

The SDAP is used to retrieve services that are available in a Bluetooth device.

2.1 Searching for activated services: +WBTSS

2.1.1   Description :

This command starts (or stops depending on CmdType) the search of Bluetooth activated services.

Note: "activated service" means all the services which are available (or registered) in a BT module (local or remote depending on CmdType).

2.1.2   Syntax :

Command syntax : AT+WBTSS=<CmdType>[,<Device   address>[,<class   of service>[,<timeout>]]]

Command	Possible responses
AT+WBTSS=<CmdType>[,<Device address> [,<class of service>[,<timeout>]]]	OK +CME ERROR: <err>
AT+WBTSS?	OK
AT+WBTSS=?	+WBTSS: (0-2),(XX:XX:XX:XX:XX:XX),(50), (0-255) OK

2.1.3   Defined values :

Values when CmdType=0 (Abort search)

None

Values when CmdType=1 (search for services)

Every parameter is optional:

<Device address> : address of Bluetooth unit; this string is made of 6 groups of 2 hexadecimal characters separated by ':' (i.e.: "xx:xx:xx:xx:xx:xx")

.

If no address is set, activated services will be listed from all the detected BT devices (present in the local WISMO area).

<Class of services> class of Bluetooth service if the research of services has to be done only for a particular class of service. (This character string has a maximum length of 50).

<Timeout> is the time of research (in seconds); if timeout is not specified, default value will be 20. Maximum value is 255.

When timeout is equal to 0, it means there is no timeout.

Remark:

The timeout is the duration of the effective research of the service, the response to the command (OK) can be delayed (few seconds).

Values when CmdType=2 (Search local activated supported service)

Every parameter is optional:

<Class of services> class of Bluetooth service if the research of services has to be done only for a particular class of service. (This character string has a maximum length of 50).

<Timeout> is the time of research (in seconds); if timeout is not specified, default value will be 20. Maximum value is 255.

3 SIM ACCESS PROFILE

In the following part, Server is used to identify the device which has physical links with the SIM, and client the device which access to the SIM with a Bluetooth link.

Fixed passkey shall not be used. If the passkey is not correct, the error code is remote dependent.

3.1 Mode LOCAL/CLIENT +WBTSM

3.1.1   Description

This command permits to indicate to the local device the access mode to the SIM: a Client mode for SAP , or local mode (nominal mode).

3.1.2   Syntax

Command syntax : AT+WBTSM=<Mode>

Command	Possible responses
AT+WBTSM=<Mode>	OK
AT+WBTSM?	+WBTSM: <Mode> OK
AT+WBTSM=?	+WBTSM: (0-1) OK

3.1.3   Defined values

<Mode> :

0 : mode local

1 : mode client

by default the mode local is set.

4 Appendixes to Specific Bluetooth AT Commands Interface Guide

4.1 Class of device, Class of service

4.1.1 CLASS OF DEVICE

"Uncategorized"

"Desktop Workstation"

"Server-class Workstation"

"Laptop"

"Handheld PC/PDA (Clam Shell)"

"Palm Sized PC/PDA"

"Wearable Computer (Watch Sized)"

"Uncategorized"

"Cellular"

"Cordless"

"Smart Phone"

"Wired Modem or Voice Gateway"

"Common ISDN Access"

"Fully available"

" 1 - 17% utilized"

"17 - 33% utilized"

"33 - 50% utilized"

"50 - 67% utilized"

"67 - 83% utilized"

"83 - 99% utilized"

"No service available"

"Uncategorized"

"Wearable Headset Device"

"Hands-free Device"

"(Reserved)"

"Microphone"

"Loudspeaker"

"Headphones"

"Portable Audio"

"Car Audio"

"Set-top Box"

"HiFi Audio Device"

"VCR"

"Video Camera"

"Camcorder"

"Video Monitor"

"Video Display and Loudspeaker"

"Video Conferencing"

"(Reserved)"

"Gaming/Toy"

"Uncategorized"

"Joystick"

"Gamepad"

"Remote Control"

"Sensing Device"

"Digitizer Tablet"

"Card Reader"

"Uncategorized"

"Display"

"Camera"

"Display - Camera"

"Scanner"

"Display - Scanner"

"Camera - Scanner"

"Display - Camera - Scanner"

"Printer"

"Display - Printer"

"Camera - Printer"

"Display - Camera - Printer"

"Scanner - Printer"

"Display - Scanner - Printer"

"Camera - Scanner - Printer"

"Display - Camera - Scanner - Printer"

4.1.2   CLASS OF SERVICE

"SDP"

"UDP"

"RFCOMM"

"TCP"

"TCS_BIN"

"TCS_AT"

"OBEX"

"IP"

"FTP"

"HTTP"

"WSP"

"BNE"

"UPNP"

"HIDP"

"HCRP Control Channel"

"HCRP Data Channel"

"HCRP Notification"

"AVCTP"

"AVDTP"

"CMPT"

"L2CAP"

"ServiceDiscoveryServerServiceClassID"

"BrowseGroupDescriptorServiceClassID"

"PublicBrowseGroup"

"SerialPort"

"LANAccessUsingPPP"

"DialupNetworking"

"IrMCSync"

"OBEXObjectPush"

"OBEXFileTransfer"

"IrMCSyncCommand"

"Headset"

"CordlessTelephony"

"AudioSource"

"AudioSink"

"A/V_RemoteControlTarget"

"AdvancedAudioDistribution"

"A/V_RemoteControl"

"VideoConferencing"

"Intercom"

"Fax"

"HeadsetAudioGateway"

"WAP"

"WAP_CLIENT"

"PAN User"

"Network Access Point"

"Group Ad-hoc Network"

"DirectPrinting"

"ReferencePrinting"

"Imaging"

"ImagingResponder"

"ImagingAutomaticArchive"

"ImagingReferencedObjects"

"Handsfree"

"HandsfreeAudioGateway"

"DirectPrintingReferenceObjectsService"

"ReflectedUI"

"BasicPrinting"

"PrintingStatus"

"HumanInterfaceDeviceService"

"HardcopyCableReplacement"

"HardcopyCableReplacementPrint"

"HardcopyCableReplacementScan"

"Common_ISDN_Access"

"VideoConferencingGW"

"SIM_Access"

"PnPInformation"

"GenericNetworking"

"GenericFileTransfer"

"GenericAudio"

"GenericTelephony"

4.2 List of BT error code

<error>	Meaning	Usual cases	Resulting from the following commands
3	Operation not available		all command
515	Please wait, init or command processing in progress		WBTM, WBTSD, WBTSS
601	Not specified		all command
602	Timeout : no response	No response is received from the remote device	WBTB, WBTCM
603	Security reason	The security level or the encryption mode between the devices don't match	WBTB, WBTCM
604	Configuration failed	Parameter linked to the at command is not correct, or parameter does not match the configuration	WBTB, WBTCM,WBTCONF
605	Limited resources	Internal error due to a lack of memory, or memory error from the remote	WBTB, WBTCM
606	Other end refused	Remote device refused the connection	WBTCM
607	Pin code refused	Value , size of PIN code is wrong	WBTB
608	Pairing not allowed	Configuration not allow the pairing	WBTB
609	Already used	The service is already connected	WBTCM, WBTUM
610	Service , or class or device name not available	One parameter at least (Service , or class or device name) is not available in the command	WBTCM,WBTSD,WBTSS, WBTUM,

611	Service not connected	*The specified service, to use or to disconnect is not (or no more) connected	WBTCM, all command used depending on an connection with a service
612	card (already) powered off	External SIM is power off	WBTSM
613	Card removed	External SIM has been removed	WBTSM
614	card (already) powered on	External SIM is power on	WBTSM
615	card not accessible	External SIM is not accessible	WBTSM
616	data not available	Data received is not available	WBTRSSI,WBTSM
619	Bonding error	Bonding operation has failed (connection or disconnection)	WBTB
623	Hardware error	Hardware error	WBTM, all command
627	Connection error	Error occurred when establishing a connection	WBTCM, WBTUM
628	BT module Stopped		All at bt command
629	Device out of range	The device specified In the command is no more accessible	WBTSD,WBTSS, WBTCM, WBTUM, WBTRSSI,
630	Already started	The bt module has been already started, impossible to do it again without stopping it before	WBTM
631	Command disallowed	The command cannot be executed because the BT module is in a state where it cannot process this command at this time	All command
632	Search list error	The remote device address list built during the inquiry is inconsistent	WBTSD
633	Service class unknown/not supported		WBTSS, WBTCM, WBTUM

| 634 | Unsupported feature | BT module 1.1 instead of 1.2 | WBTSC |

*connection can be lost because of a low signal from the remote device, or because remote device for internal problem ended the connection, in that case when using a service , the error 611 is returned to the next at command.

4.3 Alphabetical Index for AT commands and responses

AT command / response	Type of Command	Paragraph Nb
+WBTADM	Generic Access Profile	1.1
+WBTB	Generic Access Profile	1.7
+WBTCM	Generic Access Profile	1.8
+WBTCONF	Generic Access Profile	1.4
+WBTM	Generic Access Profile	1.3
+WBTPIN	Generic Access Profile	1.2
+WBTRSSI	Generic Access Profile	1.9
+WBTSC	Generic Access Profile	1.5
+WBTSD	Generic Access Profile	1.6
+WBTSM	SIM Access Profile	3.1
+WBTSS	Service Discovery Application Profile	2.1
+WBTUM	Generic Access Profile	1.10

4.4 Execution conditions

AT commands	Conditions	SIM dependence	Intermediate
AT+WBTADM	None	N	N
AT+WBTPIN	BT module started	N	N
AT+WBTM	None	N	N
AT+WBTCONF	BT module started	N	N
AT+WBTSC	BT module started	N	N
AT+WBTSD	BT module started	N	N
AT+WBTB	BT module Started	N	N
AT+WBTCM	BT module started	N	N
AT+WBTRSSI	BT module Started	N	N
AT+WBTUM	BT module Started	N	N
AT+WBTSS	BT module started	N	N
AT+WBTSM	None	N	N
AT+WBTCNF	None	N	N

4.5 Parameters storage

Command	AT&W (E2P)	Command (E2P)	AT+CSAS (SIM, E2P)	AT&F (SIM, E2P)	Default values
Specific Bluetooth command					
AT+WBTADM					
AT+WBTPIN		X		X	0 (variable)
AT+ WBTM					none
AT+WBTCONF		X		X	2,1,1,0,0
AT+WBTSC		X		X	0,0,0,0
AT+WBTSD					
AT+WBTB					
AT+WBTCM					
AT+WBTRSSI					
AT+WBTUM					
AT+WBTSS					
AT+WBTSM					
AT+WBTCNF		X			ResetPolarity : 1 ActiveResetDuration : 20 ReleaseResetDuration : 1000 DeviceClass : Cellular

4.6 Intermediate results codes

Verbose result code	Numeric (V0 set)	Description
+WBTSD		
+WBTB		Use to indicate the list of the bonded devices
+ WBTCM		
+WBTRSSI		Indicate the RSSI level of remote device
+WBTUM		
+WBTSS		
+ WBTSM		

4.7 Examples

4.7.1   Example of Start/Stop BT stark

AT+WBTM=1,1,0,0,0

OK

AT+WBTM?

+WBTM: 1,1,0,0,0,3

OK

Note : the last parameter parity is set to 3 by default.

4.7.2   Example of Set device mode configuration

AT+WBTCONF=1,1,2,1

OK

AT+WBTCONF?

+WBTCONF: 1,1,2,1,0

OK

4.7.3   Example of Set device mode configuration BT 1.2

AT+WBTSC=1,1,0,0

OK

AT+WBTSC?

+WBTSC: 1,1,0,0

OK

Note: for BT 1.1, the default configuration is used.

4.7.4   Example of Searching for new Bluetooth devices in the range

<u>Samples for CmdType = 1</u>

AT+WBTSD=1

+WBTSD: 1,"b7:1a:5e:62:2e:f0","Desktop computer"

+WBTSD: 2,"65:d8:9b:0a:14:78","Cellular phone"

OK

Note: 2 units found

<u>Samples for CmdType = 2</u>

AT+WBTSD=2

+WBTSD: 0

OK

Note: No unit found

AT+WBTSD=2,,,"Cellular phone"

+WBTSD: 1,"65:d8:9b:0a:14:78","Cellular phone","TOTO phone"

OK

Note: 1 unit found

AT+WBTSD=2,,2

+WBTSD: 1,"65:d8:9b:0a:14:89","Desktop   computer","TITI   Desktop Computer"

+WBTSD: 2,"65:d8:9b:0a:14:78","Cellular phone","Toto Phone"

OK

Note: 2 units max were found

AT+WBTSD=2

+WBTSD: 1,"0a:0b:0c:0d:0e:01","Desktop computer",""

+WBTSD: 2,"65:d8:9b:0a:14:78","Cellular phone","Toto Phone"

OK

Note: 2 units found : the first has no name so we get back its address.

AT+WBTSD=2

+WBTSD: 1,"0a:0b:0c:0d:0e:01","",""

OK

Note:1 unit found : no name and no class specified.

Samples for CmdType = 3

AT+WBTSD=3,,,,"0a:0b:0c:0d:0e:01"

OK

Note: No unit found

AT+WBTSD=3,,,,"0a:0b:0c:0d:0e:01"

+WBTSD: 1,"0a:0b:0c:0d:0e:01","","TOTO phone"

OK

Note: 1 unit found

Note: with CmdType=3, as no inquiry is made, the string **<Class of device>** is empty (example :+WBTSD: 1, "xx:xx:xx:xx:xx:xx","","Device Name").

4.7.5   Example of bonding

Samples when CmdType=2:

AT+WBTB=2

+WBTB: 0

OK

Note: No Paired Device

AT+WBTB=2

+WBTB: 1,"00:60:57:27:DD:36"

+WBTB: 2,"00:60:57:27:D4:6B"

OK

Note: 2 Paired Devices

Samples when CmdType=1:

Device 1	Device 2
at+wbtb=0,"00:02:C7:52:EE:E6","1234"	+WBTUM: 0,"00:02:C7:52:EE:E3",2,0
	at+wbtum=1,"00:02:C7:52:EE:E3",2,0 *notes: device 2 reject the request*
+CME ERROR: 608	OK

4.7.6   Example of Service connection / disconnection management

Samples when CmdType=2:

AT+WBTCM=2

+WBTCM: 0

OK

Note: No connected device

AT+WBTCM=2

+WBTCM: 1,"00:60:57:27:3D:6B","SAP","SIM Access"

OK

Note: 1 connected device of "SAP" service class

4.7.7   Example of Retrieve RSSI remote signal level

AT+WBTRSSI="00:60:57:27:DD:36"

+WBTRSSI : "00:60:57:27:DD:36",25

OK

4.7.8   Example of Unsolicited request and unsolicited information

Samples of unsolicited requests and information :

Connection indication from remote Bluetooth device with answer Request whom Bluetooth device address is 0x00 0x60 0x57 0x27 0xDD 0x36:

+WBTUM: 0,"00:60:57:27:DD:36",1,1,"SAP","SIM Access"

Accept the connection:

AT+WBTUM=0,"00:60:57:27:DD:36",1,1,"SAP","SIM Access"

+WBTUM: 41,"00:60:57:27:DD:36","SAP","SIM Access"

OK

Note: potID=41

Reject the connection:

AT+WBTUM=1,"00:60:57:27:DD:36",1,1,"SAP","SIM Access"

OK

Disconnection indication from remote Bluetooth device without answer Request whom Bluetooth device address is 0x00 0x60 0x57 0x27 0xDD 0x36:

+WBTUM: 1,"00:60:57:27:DD:36",3,1,"SAP","SIM Access"

The disconnection is made from the class of service SAP", the name of which is .

Most complex request and response associated :

Pin Code request from remote Bluetooth device whom Address is "00:60:57:27:DD:36"

+WBTUM: 0,"00:60:57:27:DD:36",2,0

Accept the request:

AT+WBTUM= 0,"00:60:57:27:DD:36",2,1,"1234"

OK

Reject the request:

AT+WBTUM= 1,"00:60:57:27:DD:36",2,0

OK

4.7.9   Example of Searching for activated services

Samples when CmdType=1 or CmdType=2

AT+ WBTSS=1

+WBTSS: 0

OK

Note: No Service found

AT+WBTSS=1

+WBTSS: 1,"00:60:57:27:DD:36","SAP","SIM Access"

OK

Note: 1 Service found

"AT+WBTSS=1
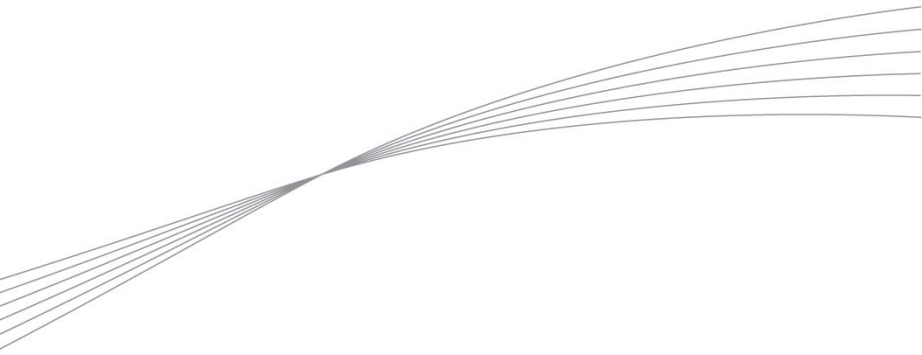+WBTSS: 1,"00:60:57:27:3D:6B","SAP","SIM Access"
OK
Note: 1 Service found

at+wbtss=2,,"SAP"

+WBTSS: 1,"00:02:C7:1D:C7:C3", "SAP","SIM Access"
OK
Note: 1 Service found

End of the document

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