EGBT-045MS
EGBT-046S

Bluetooth Modules

Wireless UART Cable Replacement

Hardware Manual &
AT Commands Reference Manual Rev. 1r0

EGBT-045MS and EGBT-046S Bluetooth Module are low cost replacements of our now retired EGBC-04 Bluetooth Module. EGBC-04 is an excellent Bluetooth Module, it is fully certified to Bluetooth standards, and is loaded with programmable features users had come to love. There is just one thing that went against it- it is expensive.

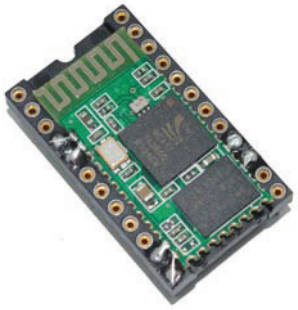
It is easy to see why the EGBC-04 cost so much. Firstly, the manufacturer produced these specialty modules in relatively small volume; hence, there is no economy of the scale to speak of. Secondly, certification costs a lot of money; and this cost will have to be added on top of the manufacturing cost. Hence, EGBC-04 ended up costing about 10 times more expensive than its garden variety USB-type Bluetooth dongles cousins.

Fortunately, at least one volume manufacturer have came up with an idea of producing a generic Bluetooth module in large quantity, for sale and distribution to developers who now have to put only the firmware functionalities. This resulted in a huge drop in prices of these specialty Bluetooth modules, benefiting us experimenters and hobbyists.

EGBT-045MS and EGBT-046S are generic Bluetooth Modules loaded with SPP firmware for UART wireless cable replacement functions. The EGBT-045MS can be configured by the user to work either as a master or slave Bluetooth device using a set of AT commands.

EGBT-046S, on the other hand, is permanently programmed as Bluetooth slave device. EGBT-046S, because of its simpler function, is a lot easier to use, and of course, costs less than EGBT-045MS. You can use it straight out of the box as a UART wireless cable replacement, without any need to add set-up codes in your microcontroller application firmware.

The new EGBT-04 Bluetooth module comes in two flavors. The EGBT-046S is permanently configured as a slave device. EGBT-045MS, on the other hand, can be configured by the user to work as a master or slave Bluetooth device.



EGBT-04 modules can be soldered directly on a hi-rel type IC socket to make it easier to work with prototyping platforms, such as breadboards and perforated prototyping boards.

Use the cheaper EGBT-046S if your application will connect to a master Bluetooth device, such as PC or laptops. Use the EGBT-045MS if your application must connect to a slave Bluetooth device, such as with EGBT-046S. Note that EGBT-045MS will work as well as a slave Bluetooth device.

COMMON SPECIFICATIONS

Radio Chip: CSR BC417
Memory: External 8Mbit Flash
Output Power: -4 to +6dbm Class 2
Sensitivity: -80dbm Typical
Bit Rate: EDR, up to 3Mbps
Interface: UART
Antenna: Built-in
Dimension: 27W x 13H mm

Voltage: 3.1 to 4.2VDC
Current: 40mA max

COMMON HARDWARE INTERFACING CONSIDERATIONS

The EGBT-04 module will work with supply voltage of 3.1VDC to 4.2VDC. When supplied with 3.3VDC, it will interface directly with the UART port of any microcontroller chip running at 3.3VDC.

When used with 5V microcontrollers, The TXD output logic swing of the EGBT-04 still falls within the valid 5V TTL range, hence, can be connected directly to the UART RXD of the 5V microcontroller host. EGBT RXD and inputs, however, are not 5V tolerant, and can be damaged by 5V level logic going in. Some level translation circuit must be added to protect the inputs.

A simple diode level translator circuit like the ones shown in Figure 3 and 7 will suffice in most applications. A better alternative is with the use of 5V input tolerant tiny logic chips such as 74LVC1G125 – a single buffer chip housed in smd sot23-5 package.

EGBT-046S PIN CONFIGURATION

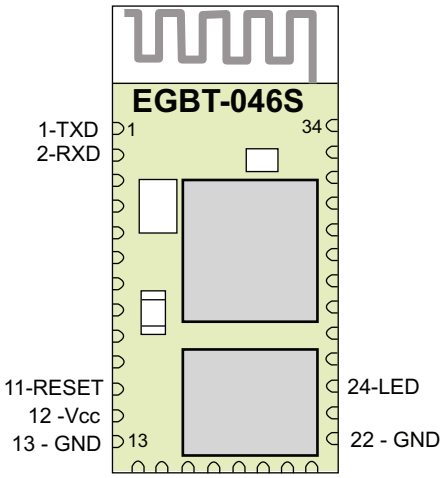


Figure 1. *EGBT-046S Pin Layout*

Table 1. EGBT-046S Pin Description

PIN	ID	DESCRIPTION
1	TXD	UART TXD Output
2	RXD	UART RXD Input
11	RESET	RESET Input
12	Vcc	+3.1 to 4.2VDC Power Input
13	GND	Common Ground
22	GND	Common Ground
24	LED	LED Status Indicator Flashing - Waiting to Connect/Pair Steady ON - Connected/Paired

Note:
All unassigned pins must be left unconnected.

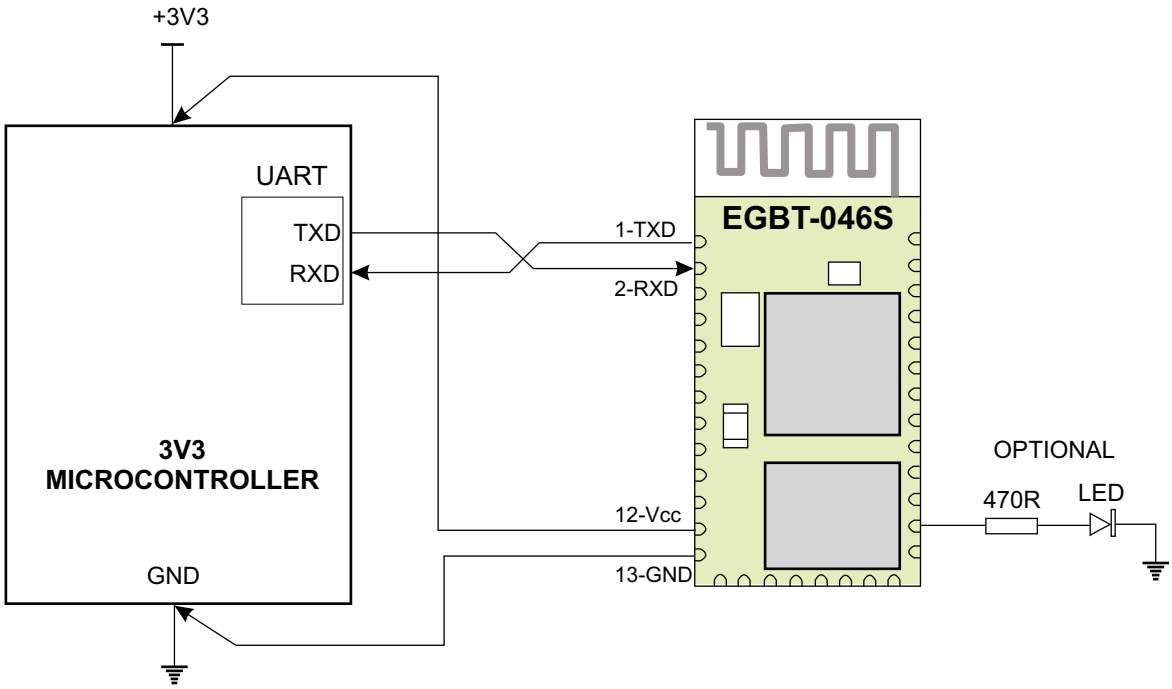


Figure 2. *EGBT-046S wiring example with a 3v3 host microcontroller. The 470R resistor and LED are for status indication, and may be omitted if not needed.*

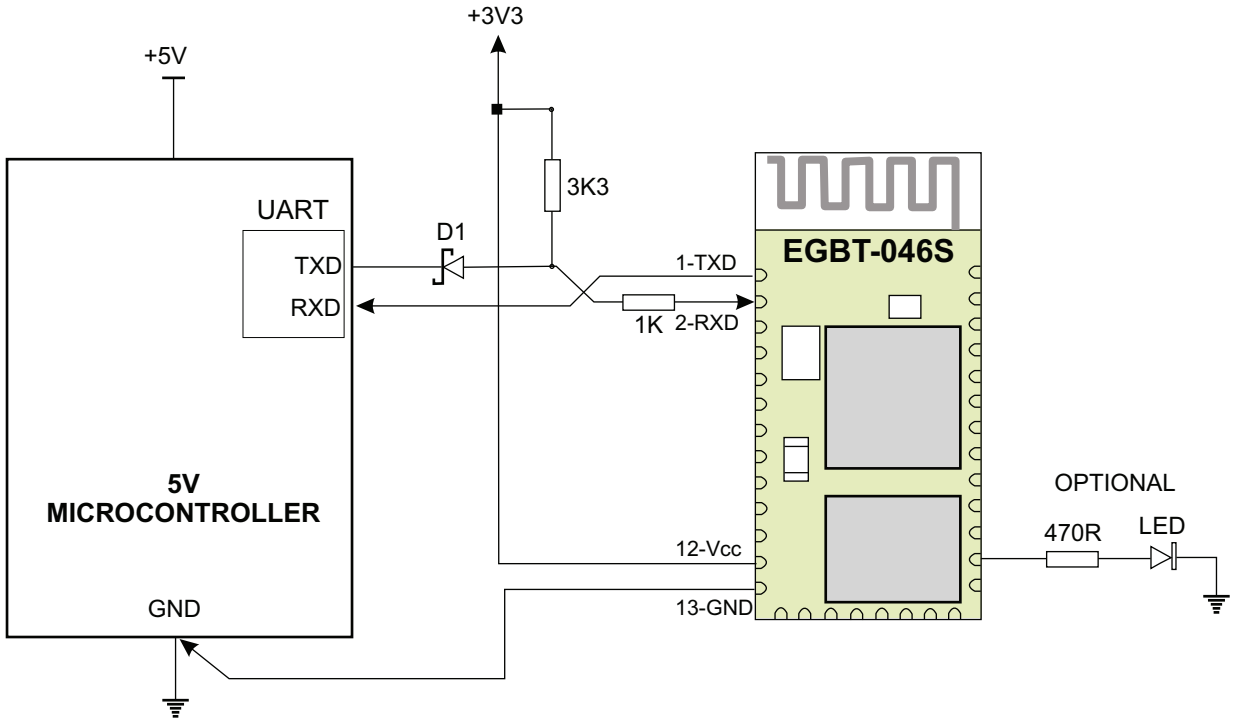


Figure 3. *EGBT-046S RX input is not 5V tolerant. A schottky diode connected as shown will keep 5V voltages out of the Bluetooth module when operated with a 5V host microcontroller.*

PREPARATION FOR USE

The EGBT-046S is permanently configured as a slave Bluetooth device. It works under the following default configuration:

Baud Rate: 9600 bps
Data : 8 bits
Stop Bits: 1 bit
Parity : None
Handshake: None

Passkey: 1234
Device Name: linvor

If the default configuration suits your application, then you can use EGBT-046S immediately. Once it is paired to a master Bluetooth device, its operation becomes transparent to the user. No user code specific to the Bluetooth module is needed at all in the user microcontroller program.

The EGBT-046S automatically sets itself up in Command Mode when it is not remotely connected (paired) to any other Bluetooth device. You can change the Passkey, Device Name, and Baud Rate while the EGBT-046S is in Command Mode by entering a small subset of AT style commands. Any changes made will be retained even after power is removed from the EGBT-046S, hence device configuration setup must not be repeated unless new changes need to be made.

You can do configuration setup using the host controller itself (the microcontroller in your own circuit), or a PC running a terminal software using a serial to TTL (or USB to Serial TTL) converter. See Figure 4 for connection details.

It is important to note that EGBT-046S does not wait for any termination character for each AT command entry. Instead, it acts to whatever character you entered after one second. Hence, if you are not able to complete a command entry within a second, it will be ignored. Because of this behavior, it may be extremely difficult to do manual entry configuration using Windows Hyperterminal software. Terminal software that allows batch sending of multiple characters must be used.

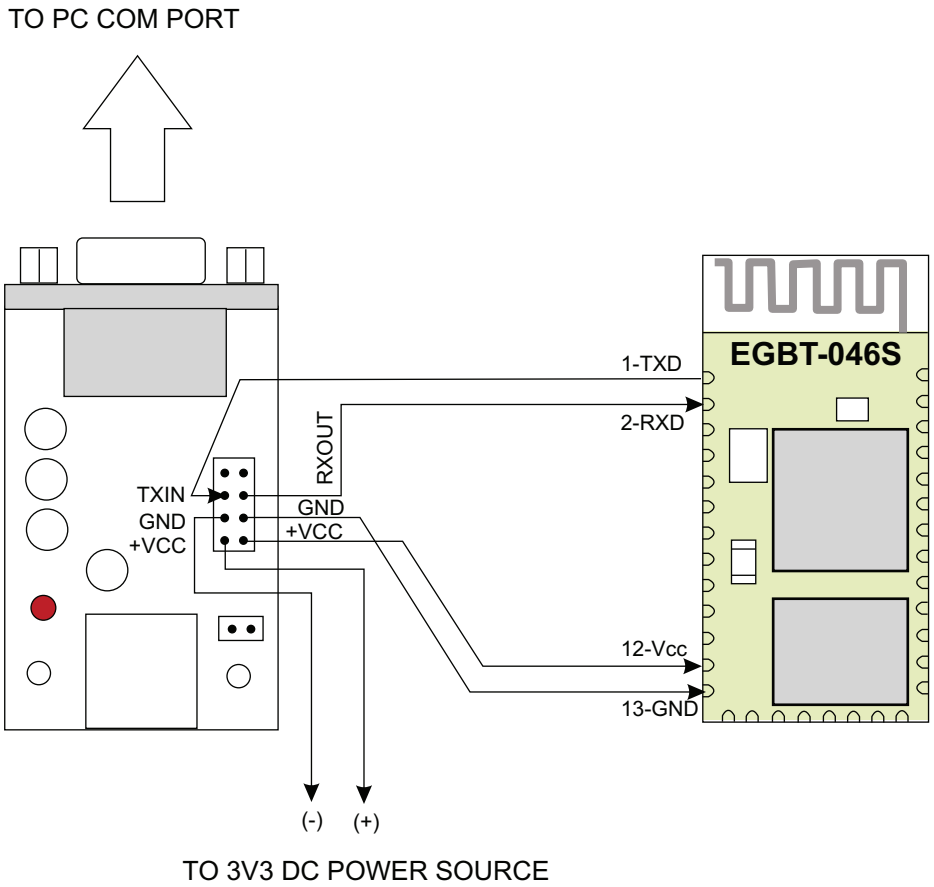


Figure 4. *A PC may be used to configure the EGBT-04. To connect to a PC COM port, a RS-232C to TTL converter is needed. This figure shows a wiring example using e-Gizmo RS-232 to TTL converter kit.*

EGBT-046S AT Command Set

1. TEST

Used to test the UART connection between the host controller and Bluetooth Module.

COMMAND	RESPONSE
AT	OK

2. Change Baud Rate

COMMAND	RESPONSE
AT+BAUD<p>	OK<r>

where:

<p> Paramater
<r> Response, set to nnnn bps

<p>	<r>	Remarks
1	1200	set to 1200bps
2	2400	set to 2400bps
3	4800	set to 4800bps
4	9600	set to 9600bps (Default)
5	19200	set to 19200bps
6	38400	set to 38400bps
7	57600	set to 57600bps
8	115200	set to 115200bps
9	230400	set to 230400bps
A	460800	set to 460800bps
B	921600	set to 921600bps
C	1382400	set to 1382400bps

Caution:
PC standard COM port hardware does not support baud rates in excess of 115200bps. If you are using a PC to configure EGBT-046S and accidentally set baud rate to these values, connection to a PC COM port will no longer be possible. Use of USB to Serial converter cable that can work at higher bauds may be necessary to re-establish a connection. Prolific PL-2303 based USB to Serial converter cables are known to work up to 921600bps.

Example1: Set baud rate to 57600bps

From Host controller:
AT+BAUD7
EGBT-046S Response
OK57600

Example2: Set baud rate to 4800bps

From Host controller:
AT+BAUD3
EGBT-046S Response
OK4800

3. Change Device Name

The EGBT-046S can be assigned a readable name of up to 20 characters in lenght.

COMMAND	RESPONSE
AT+NAME<name>	OK<name>

Example1: Set device name as EGBT-04

From Host controller:
AT+NAMEEGBT-04
EGBT-046S Response
OKEGBT-04

4. Change PASSKEY(PIN code)

Passkey (PIN Code) is a 4-digit code shared with a master Bluetooth Device (e.g. PC) to prevent unauthorized pairing.

COMMAND	RESPONSE
AT+PIN<nnnn>	OK<nnnn>

Where:
<nnnn> 4-digit passkey

Example1: Set PASSKEY to 5995

From Host controller:
AT+PIN5995
EGBT-046S Response
OK5995

EGBT-045MS PIN CONFIGURATION

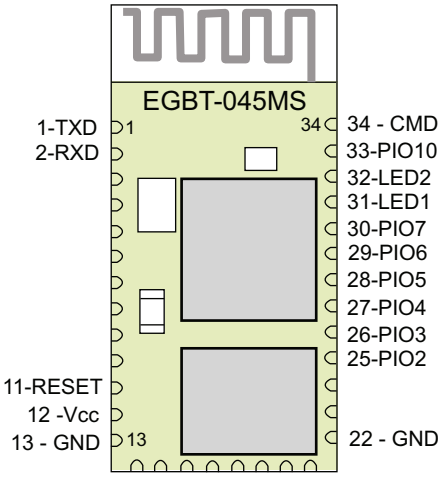


Figure 5. *EGBT-045MS pin layout*

Table 1. EGBT-045MS Pin Description

PIN	ID	DESCRIPTION
1	TXD	UART TXD Output
2	RXD	UART RXD Input
11	RESET	RESET Input
12	Vcc	+3.1 to 4.2VDC Power Input
13	GND	Common Ground
22	GND	Common Ground
25	PIO2	User programmable I/O
26	PIO3	User programmable I/O
27	PIO4	User programmable I/O
28	PIO5	User programmable I/O
29	PIO6	User programmable I/O
30	PIO7	User programmable I/O
33	PIO10	User programmable I/O
31	LED1	LED Status Indicator
32	LED2	LED Status Indicator
34	CMD	Command Mode

Note:
All unassigned pins must be left unconnected.

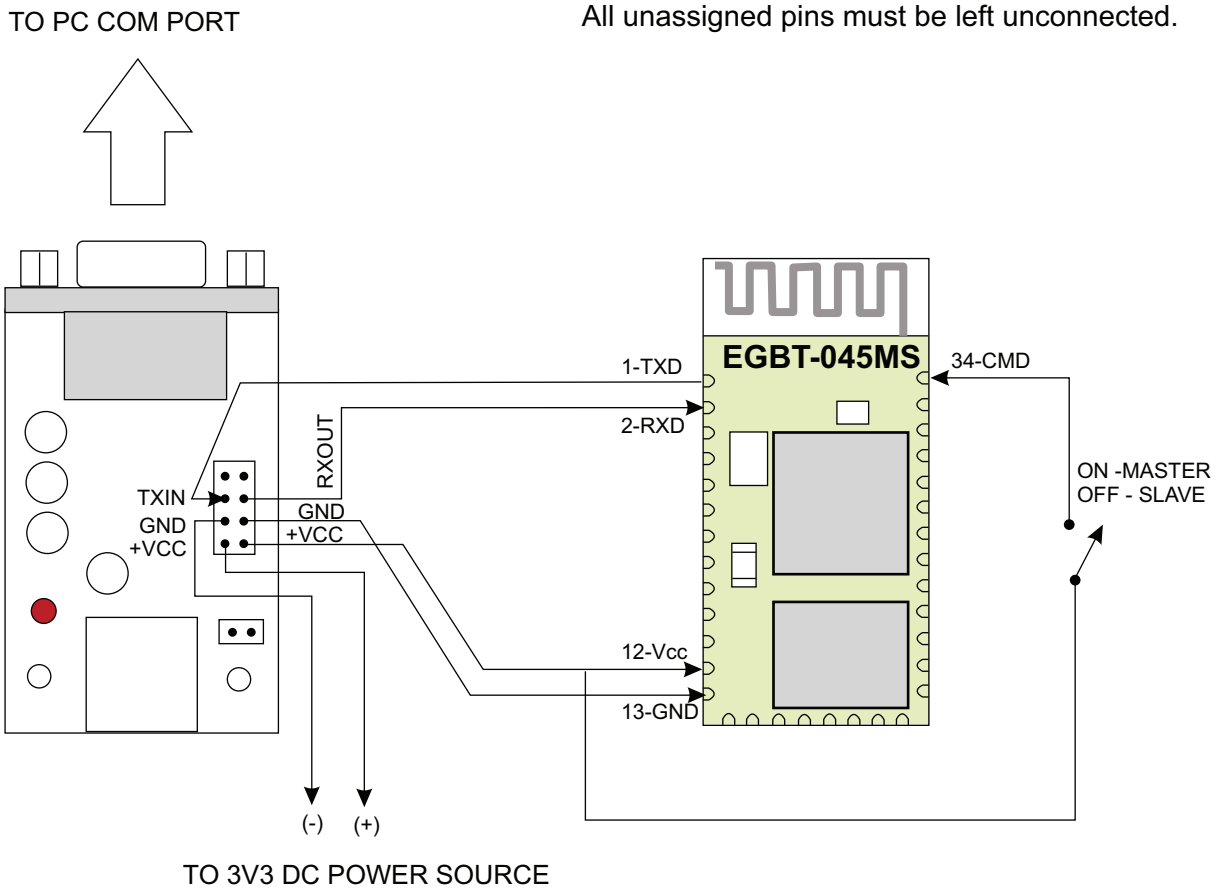


Figure 6. *Connecting the EGBT-045MS to a PC for test and configuration. To connect to a PC COM port, a RS-232C to TTL converter is needed. This figure shows a wiring example using e-Gizmo RS-232 to TTL converter kit.*

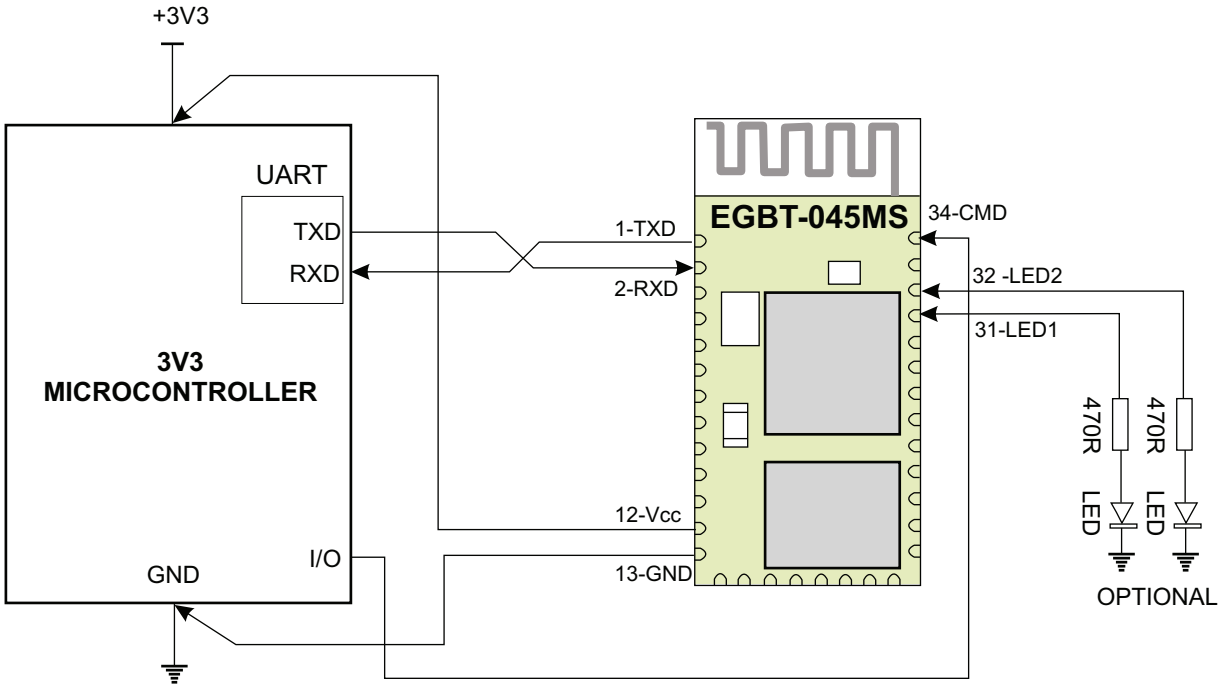


Figure 7. *EGBT-045MS wiring example with a 3v3 host microcontroller. The 470R resistors and LEDs are for status indication, and may be omitted if not needed. The microcontroller can switch the EGBT-045MS between command mode and data mode at any time by setting the CMD pin accordingly.*

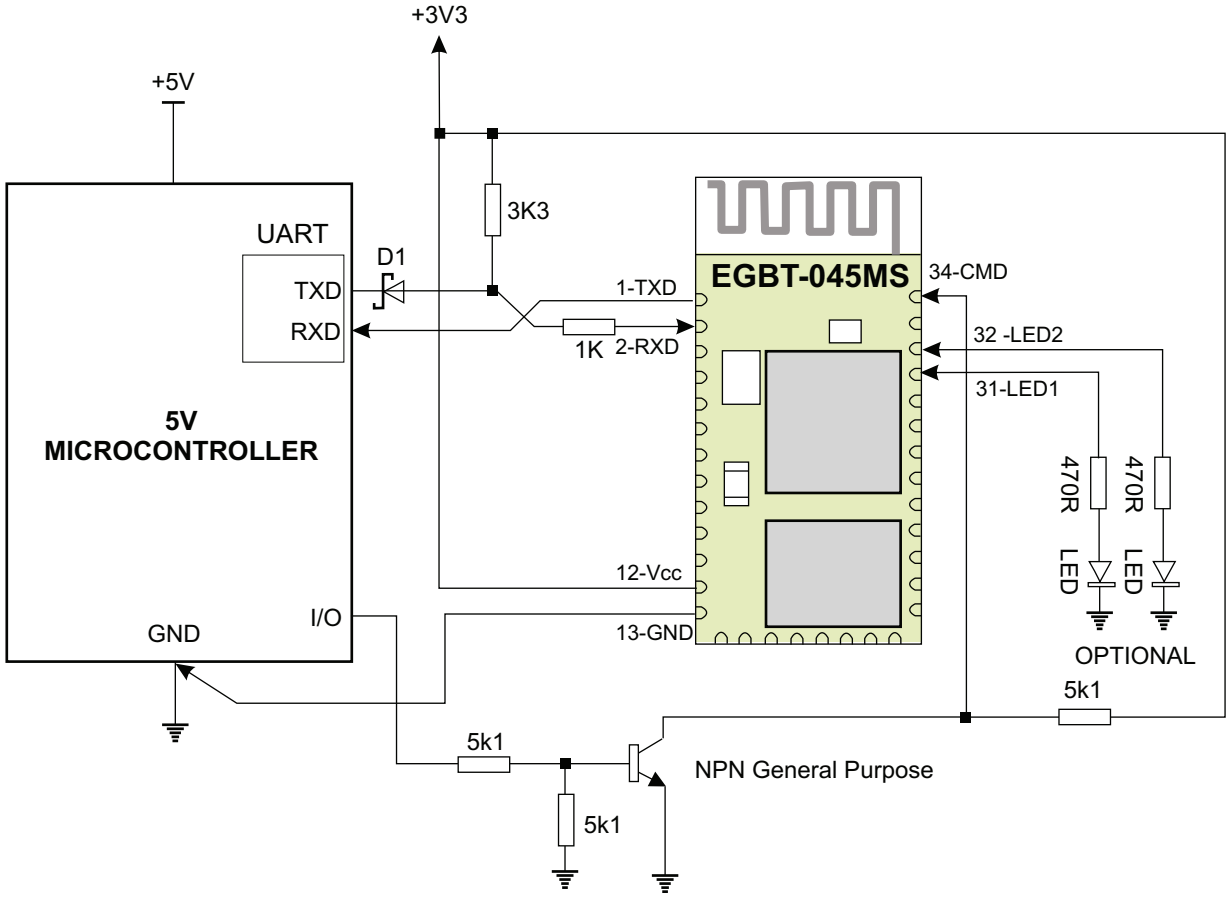


Figure 8. *EGBT-045MS RX input is not 5V tolerant. A schottky diode connected as shown will keep 5V voltages out of the Bluetooth module when operated with a 5V host microcontroller. The transistor circuit takes on a similar function for the CMD pin.*

PREPARATION FOR USE

The EGBT-045MS is pre-configured as a slave Bluetooth device. As shipped, it works under the following data mode default configuration:

Baud Rate: 38400/9600 bps – see “Entering Command Mode” section for details
Data : 8 bits
Stop Bits: 1 bit
Parity : None
Handshake: None

Passkey: 1234
Device Name: HC-05

If the default configuration suits your application, then you can use EGBT-045MS immediately. Once it is paired to a master Bluetooth device, its operation becomes transparent to the user. No user code specific to the Bluetooth module is needed at all in the user microcontroller program.

The EGBT-045MS works in Data Mode when the CMD pin (pin 34) is pulled to logic 0 level or is left unconnected. Transparent UART data transfer with a connected remote device occurs only while in Data Mode. The EGBT-045MS switches to Command Mode if CMD pin is set to logic HIGH. Command mode must be invoked to setup and configure EGBT-045MS. Pairing and connection to a remote Bluetooth slave device can be initiated only while the EGBT-045MS is in command mode (and configured in role as a Master) by entering a string of AT style commands. Any changes made to system parameters (e.g. password, baud rate, etc) will be retained even after power is removed, hence device configuration setup must not be repeated unless new changes need to be made.

Entering Command Mode

EGBT-045MS is put in Command Mode by setting the CMD pin to logic High. There is one important point the user should be aware of when setting the device in Command Mode – the baud rate may assume a different value depending on the instance the CMD pin is switched to high:

• If EGBT-045MS is powered ON with CMD pin to +Vcc, the UART is set to 38400bps, 8 data bits, 1 stop bit, no parity, no handshake.

• If the EGBT-045MS is powered ON with the CMD pin at logic low (or open circuit), and then pulled High a moment later, the UART parameters assumes a set of values that was previously fixed using the AT+UART command, with 9600bps, 8 data bits, 1 stop bit, no parity, and no handshake as default parameter values.

You can do configuration setup using the host controller itself (the microcontroller in your own circuit), or a PC running a terminal software using a serial to TTL (or USB to Serial TTL) converter. See Figure 6 for connection details.

EGBT-045MS AT COMMAND REFERENCE

Symbols and Nomenclatures.

<xxxx> Descriptive ID of parameters that must be entered by the user or reported back by the EGBT-045MS.

Example:
AT+INQM=<inq1>,<inq2>,<inq3>
May in actual use appear as
AT+INQM=0,1,15
When <inq1> =0, <inq2>=1, and <inq3>=15

↵ = Carriage Return followed by Line Feed character<CR><LF>

Example:

OK↵ = OK<CR><LF>

Important note: All commands must be terminated by <CR><LF>. If the host controller send a <CR> only, EGBT-045MS will repeatedly send a respond that will stop only when <LF> is issued by the host controller

AT COMMAND LISTING

	COMMAND	FUNCTION
1	AT	Test UART Connection
2	AT+RESET	Reset Device
3	AT+VERSION	Querry firmware version
4	AT+ORGL	Restore settings to Factory Defaults
5	AT+ADDR	Query Device Bluetooth Address
6	AT+NAME	Query/Set Device Name
7	AT+RNAME	Query Remote Bluetooth Device's Name
8	AT+ROLE	Query/Set Device Role
9	AT+CLASS	Query/Set Class of Device CoD
10	AT+IAC	Query/Set Inquire Access Code
11	AT+INQM	Query/Set Inquire Access Mode
12	AT+PSWD	Query/Set Pairing Passkey
13	AT+UART	Query/Set UART parameter
14	AT+CMODE	Query/Set Connection Mode
15	AT+BIND	Query/Set Binding Bluetooth Address
16	AT+POLAR	Query/Set LED Output Polarity
17	AT+PIO	Set/Reset a User I/O pin
18	AT+MPIO	Set/Reset multiple User I/O pin
19	AT+MPIO?	Query User I/O pin
20	AT+IPSCAN	Query/Set Scanning Parameters
21	AT+SNIFF	Query/Set SNIFF Energy Savings Parameters
22	AT+SENM	Query/Set Security & Encryption Modes
23	AT+RMSAD	Delete Authenticated Device from List
24	AT+FSAD	Find Device from Authenticated Device List
25	AT+ADCN	Query Total Number of Device from Authenticated Device List
26	AT+MRAD	Query Most Recently Used Authenticated Device
27	AT+STATE	Query Current Status of the Device
28	AT+INIT	Initialize SPP Profile
29	AT+INQ	Query Nearby Discoverable Devices
30	AT+INQC	Cancel Search for Discoverable Devices
31	AT+PAIR	Device Pairing
32	AT+LINK	Connect to a Remote Device
33	AT+DISC	Disconnect from a Remote Device
34	AT+ENSNIFF	Enter Energy Saving mode
35	AT+EXSNIFF	Exit Energy Saving mode

ERROR CODES

ERROR CODE	VERBOSE
0	Command Error/Invalid Command
1	Results in default value
2	PSKEY write error
3	Device name is too long (>32 characters)
4	No device name specified (0 lenght)
5	Bluetooth address NAP is too long
6	Bluetooth address UAP is too long
7	Bluetooth address LAP is too long
8	PIO map not specified (0 lenght)
9	Invalid PIO port Number entered
A	Device Class not specified (0 lenght)
B	Device Class too long
C	Inquire Access Code not Specified (0 lenght)
D	Inquire Access Code too long
E	Invalid Iquire Access Code entered
F	Pairing Password not specified (0 lenght)
10	Pairing Password too long (> 16 characters)
11	Invalid Role entered
12	Invalid Baud Rate entered
13	Invalid Stop Bit entered
14	Invalid Parity Bit entered
15	No device in the Pairing List
16	SPP not initialized
17	SPP already initialized
18	Invalid Inquiry Mode
19	Inquiry Timeout occured
1A	Invalid/zero lenght address entered
1B	Invalid Security Mode entered
1C	Invalid Encryption Mode entered

1. Test UART connection

COMMAND	RESPONSE
AT↵	OK↵

2. Reset Device

COMMAND	RESPONSE
AT+RESET↵	OK↵

3. Querry firmware version

COMMAND	RESPONSE
AT+VERSION?↵	+VERSION:<VER>↵ OK↵

where <VER> = Version Number

4. Restore settings to Factory Defaults

COMMAND	RESPONSE
AT+ORGL↵	OK↵

Restore to the following settings:
Device Class: 0
Inquiry Code: 0x009e8b33
Device Mode: Slave
Binding Mode: SPP
UART: 38400bps, 8 bit, 1 stop bit, no parity
Pairing Code: 1234
Device Name: H-C-2010-06-01

5. Query EGBT-045MS Bluetooth Address

COMMAND	RESPONSE
AT+ADDR?↵	+ADDR:nn:uu:ll↵ OK↵

Bluetooth Address Format:
nn - NAP (16 bit Non-significant Address Portion)
uu - UAP (8 bit Upper Address Portion)
ll - LAP (24 bit Lower Address Portion)
Returned bluetooth address

Example: Querry EGBT-045MS Bluetooth Address

From Host controller:
AT+ADDR?↵
EGBT-045MS Response
+ADDR:11:6:230154↵
OK↵

Bluetooth Address is 11:06:23:01:54

6. Query/Set Device Name

COMMAND	RESPONSE
AT+NAME?↵	+NAME:<name>↵ OK↵
AT+NAME=<name>↵	OK↵

where <name> = Device Name (31 characters max.)

Example: Query device name

From Host controller:
AT+NAME?↵
EGBT-045MS Response
+NAME:HC-05↵
OK↵

Example: Set device name to “e-Gizmo”

From Host controller:
AT+NAME=e-Gizmo↵
EGBT-045MS Response
OK↵

Example: Set device name to “supercalifragilisticexpialidocious”

From Host controller:
AT+NAME=supercalifragilisticexpialidocious↵
EGBT-045MS Response
ERROR:(3)↵ *name too long (>31 characters)*

7. Query Remote Bluetooth Device’s Name

COMMAND	RESPONSE
AT+RNAME?<addr>↵	+NAME:<name>↵ OK↵

where <name> = Device name
<addr> = 48 bit bluetooth address
in NAP,UAP,LAP format

Example: Query remote Bluetooth device having address = 00:02:72:0A:3C:7F

Bluetooth address in NA:UAP:LAP format = 0002:72:0A3C7F

From Host controller:
AT+RNAME?0002,72,0A3C7F↵
EGBT-045MS response if remote device name is “HC-05”
+NAME:HC-05↵
OK↵
EGBT-045MS response if remote device name is unresolved
FAIL↵

8. Query/Set Device Role

COMMAND	RESPONSE
AT+ROLE?↵	+ROLE:<role>↵ OK↵
AT+ROLE=<role>↵	OK↵

where <role>
0 - Slave (default)
1 - Master
2 - Slave-Loop

Slave - EGBT-045MS acts as discoverable wireless UART device ready for transparent data exchange.
Master - Scans for a remote bluetooth (slave) device, pairs, and setup connection for a transparent data exchange detween devices
Slave-Loop - Data loop-back Rx-Tx. Used mainly for testing.

Example: Set EGBT-045MS in master role

Bluetooth address in NA:UAP:LAP format = 0002:72:0A3C7F

From Host controller:
AT+ROLE=1↵
EGBT-045MS response
+ROLE:1↵
OK↵

9. Query/Set Class of Device CoD

COMMAND	RESPONSE
AT+CLASS?↵	+CLASS:<class>↵ OK↵
AT+CLASS=<class>↵	OK↵

where <class>
0 - (default)

The Class of Device identifier. For more info, see the Bluetooth_Code_Definition.pdf file included with the product documentation of this kit.

10. Query/Set Inquire Access Code

COMMAND	RESPONSE
AT+IAC?↵	+IAC:<iac>↵ OK↵
AT+IAC=<iac>	OK↵ / FAIL↵

where <iac> = Inquire Access Code
9e8b33 - default value

11. Query/Set Inquire Access Mode

COMMAND	RESPONSE
AT+INQM?↵	+INQM:<inq1>,<inq2>,<inq3>↵ OK↵
AT+INQM=<inq1>,<inq2>,<inq3>↵	OK↵ / FAIL↵

where <inq1> Inquire Access Mode
0 - standard
1 - rssi (default)

<inq2> Maximum number of devices response
0 to 32000
1 (default)

<inq3> Inquire timeout
1 to 48
48 (default)

Maximum number of devices response - EGBT-045MS will stop inquiring once the number of devices that responded reaches this value.
Inquire Timeout - Multiply this number by 1.28 to get the maximum time in seconds the EGBT-045MS will wait for a respond to an inquiry call.

Example: Set EGBT-045MS Inquire Access Mode at
Inquire access mode - 1 (rssi)
Number of devices - 3
Timeout - 10 (10*1.28 = 12.8 seconds)

Bluetooth address in NA:UAP:LAP format = 0002:72:0A3C7F

From Host controller:
AT+INQM=1,3,10↵
EGBT-045MS response
OK↵

12. Query/Set Pairing Passkey

COMMAND	RESPONSE
AT+PSWD?↵	+PSWD:<password>↵ OK↵
AT+PWSD=<password>↵	OK↵

where <password> = Alphanumeric password 16 characters max.
1234 - (default)

Example: Set EGBT-045MS Password to “e-Gizmo”

From Host controller:
AT+PSWD=e-Gizmo↵
EGBT-045MS response
OK↵

13. Query/Set UART parameter

COMMAND	RESPONSE
AT+UART?↵	+UART:<baud>,<stop>,<parity>↵ OK↵
AT+UART=<baud>,<stop>,<parity>↵	OK↵

where <baud> =baud rate, any one of the following
4800
9600 (default)
19200
38400
57600
115200
234000
460800
921600
1382400

<stop> = number of stop bits
0 - 1 bit (default)
1 - 2 bits

<parity> = Parity bit
0 - None (default)
1 - Odd parity
2 - Even Parity

Example: Set EGBT-045MS UART parameter to 115200bps, 2 stop bits, even parity

From Host controller:
AT+UART=115200,1,2↵
EGBT-045MS response
OK↵

14. Query/Set Connection Mode

COMMAND	RESPONSE
AT+CMODE?↵	+CMODE:<mode>↵ OK↵
AT+CMODE=<mode>↵	OK↵

where <mode>
0 - Connect to a specified Bluetooth device only (default). See related command Command 15.
1 - Can connect with any other Bluetooth device.
2 - Test mode

15. Query/Set Binding Bluetooth Address

COMMAND	RESPONSE
AT+BIND?↵	+BIND:<addr>↵ OK↵
AT+BIND=<addr>↵	OK↵

where <addr> = 48 bit bluetooth address in NAP,UAP,LAP format

Example: Bind with Bluetooth device having address = 00:02:72:0A:3C:7F

Bluetooth address in NA,UAP,LAP format = 0002,72,0A3C7F

From Host controller:
AT+BIND=0002,72,0A3C7F↵
EGBT-045MS response
OK↵

16. Query/Set LED Output Polarity

COMMAND	RESPONSE
AT+POLAR?↵	+POLAR:<led1>,<led2>↵ OK↵
AT+POLAR=<led1>,<led2>↵	OK↵

where <led1> = LED1 (pin 31) Polarity
0 - LED1 output active low
1 - LED1 output active high (default)

<led2> = LED2 (pin 32) Polarity
0 - LED2 output active low
1 - LED2 output active high (default)

LED 1
Flashes once each seconds to indicate EGBT-045MS is in Command Mode. Flashes two times per second when EGBT-045MS is in data mode.

LED2
Turns ON when EGBT-045MS remote connection is successfuly opened.

17. Set/Reset a User I/O pin

COMMAND	RESPONSE
AT+PIO=<pn>,<value>↵	OK↵

where <pn> = port number. Available port are as follows
2 - PIO2
3 - PIO3
4 - PIO4
5 - PIO5
6 - PIO6
7 - PIO7
10 - PIO10

<value>
0 - Logic Low
1 - Logic High

Example: Set PIO2 to logic High

From Host controller:
AT+PIO=2,1↵
EGBT-045MS response
OK↵

18. Set/Reset multiple User I/O pin

COMMAND	RESPONSE
AT+MPIO=<iomap>↵	OK↵

where
<iomap> =12-bit I/O map presented in hexadecimal

x	PIO10	X	X	PIO7	PIO6	PIO5	PIO4	PIO3	PIO2	x	x

x - don't care/reserved

Example:
Set PIO2 and PIO6 to logic High, all others to logic 0

Bit pattern is 0000 0100 0100 = 44 hexadecimal

From Host controller:
AT+MPIO=44↵
EGBT-045MS response
OK↵

19. Query User I/O pin

COMMAND	RESPONSE
AT+MPIO?↵	+MPIO:<iomap>↵ OK↵

where
<iomap> =12-bit I/O map presented in hexadecimal

x	PIO10	X	X	PIO7	PIO6	PIO5	PIO4	PIO3	PIO2	x	x

x - reserved -used by system, may assume any values

Example:
Read PIO inputs

From Host controller:
AT+MPIO?↵
EGBT-045MS response
+MPIO:944↵
OK↵
Returned value in binary: 1001 0100 0100

In this example, the PIO are previously set in command 18 with PIO2 and PIO6 set. The returned value also shows reserved bits 11 and 8 set by the system.

20. Query/Set Scanning Parameters

COMMAND	RESPONSE
AT+IPSCAN?↵	+IPSCAN:<int>,<dur>,<pint>,<pdur>↵ OK↵
AT+IPSCAN=<int>,<dur>,<pint>,<pdur>↵	OK↵

where <int> = inquire scan time interval
1024 - default
<dur> = inquire scan time duration
512 - default
<pint> = page scan time interval
1024 - default
<pdur> = page scan time duration
512 - default

All parameters must be represented with decimal integer value.

21. Query/Set SNIFF Energy Savings Parameters

COMMAND	RESPONSE
AT+SNIFF?↵	+SNIFF:<tmax>,<tmin>,<retry>,<timeout>↵ OK↵
AT+SNIFF=<tmax>,<tmin>,<retry>,<timeout>↵	OK↵

where <tmax> = maximum time
0 - default
<tmin> = minimum time
0 - default
<retry> = retry time
0 - default
<timeout> = timeout
0 - default

All parameters must be represented with decimal integer value.

22. Query/Set Security & Encryption Modes

COMMAND	RESPONSE
AT+SENM?↵	+SENM:<mode>,<encrypt>↵ OK↵
AT+SENM=<mode>,<encrypt>↵	OK↵

where <mode> = Security Mode
0 - sec_mode_off (default)
1 - sec_mode1_non-secure
2 - sec_mode2-service
3 - sec_mode3_link
4 - sec_mode_unknown

<encrypt> = encryption mode
0 - hci_enc_mode_off (default)
1 - hci_enc_mode_pt_to_pt
2 - hci_enc_mode_pt_to_pt_and_bcast

23. Delete Authenticated Device from List

COMMAND	RESPONSE
AT+RMSAD=<addr>↵	OK↵

where <addr> = 48 bit bluetooth address
in NAP,UAP,LAP format

Example: Remove from Authenticated Device list a Bluetooth device having address = 00:02:72:0A:3C:7F

Bluetooth address in NA,UAP,LAP format = 0002,72,0A3C7F

From Host controller:
AT+RMASD=0002,72,0A3C7F↵
EGBT-045MS response if deletion is successful
OK↵
EGBT-045MS response if remote device address is not in the list
ERROR(15)↵

Caution:

Entering
AT+RMASD↵
will delete ALL authenticated device from the list!

24. Find Device from Authenticated Device List

COMMAND	RESPONSE
AT+FSAD=<addr>↵	OK↵

where <addr> = 48 bit bluetooth address
in NAP,UAP,LAP format

Note: AT+FSAD returns a FAIL response if device is not in the authenticated list

25. Query Total Number of Device from Authenticated Device List

COMMAND	RESPONSE
AT+ADCN?↵	+ADCN:<total>↵ OK↵

where
<total> = total number of devices in the authenticated device list

26. Query Most Recently Used Authenticated Device

COMMAND	RESPONSE
AT+MRAD?↵	+MRAD:<addr>↵ OK↵

where <addr> = 48 bit bluetooth address
in NAP:UAP:LAP format

27. Query Current Status of the Device

COMMAND	RESPONSE
AT+STATE?↵	+STATE:<stat>↵ OK↵

where
<stat> = Current Status, any one of the following:

INITIALIZED
READY
PAIRABLE
PAIRED
INQUIRING
CONNECTING
CONNECTED
DISCONNECTED
UNKNOWN

28. Initialize SPP Profile

COMMAND	RESPONSE
AT+INIT↵	OK↵ / FAIL↵

29. Query Nearby Discoverable Devices

COMMAND	RESPONSE
AT+INQ↵	+INQ: <addr>,<class>,>rssi>↵ OK↵

where <addr> = 48 bit bluetooth address
in NAP:UAP:LAP format
<class> = Device Class
<rssi> = RSSI

This command will scan and report all nearby dicoverable Bluetooth devices. The same device may be reported more than once.

This command will work only if EGBT-045MS is set to work as a master device, i.e. AT+ROLE=1, and after AT+INIT is executed.

Example: Discover nearby devices

From Host controller: Set device role as master

AT+ROLE=1↵

EGBT-045MS response

OK↵

From Host controller: Initialize SPP

AT+INIT↵

EGBT-045MS response

OK↵

From Host controller: Set inquire mode as RSSI, look for 9 devices, and 48 as timeout

AT+INQM=1,9,48↵

EGBT-045MS response

OK↵

From Host controller: Start Device Discovery

AT+INQ↵

EGBT-045MS response (sample only, actual report will vary)

+INQ:101D:C0:2E7B54,5A0204,7FFF↵

+INQ:25:48:21AD1A,5A020C,7FFF↵

OK↵

In this example, EGBT-045MS found only two discoverable devices. It will quit searching after the timeout time specified by the AT+INQM command or if the number of discovered devices equals the number of specified devices.

30. Cancel Search for Discoverable Devices

COMMAND	RESPONSE
AT+INQC↵	OK↵

AT+INQ can be stopped at anytime by executing this command.

31. Device Pairing

COMMAND	RESPONSE
AT+PAIR=<addr>,<timeout>↵	OK↵ / FAIL↵

where <addr> = 48 bit bluetooth address in NAP,UAP,LAP format

<timeout> = Timeout time in sec

32. Connect to a Remote Device

COMMAND	RESPONSE
AT+LINK=<addr>↵	OK↵ / FAIL↵

where <addr> = 48 bit bluetooth address in NAP,UAP,LAP format

33. Disconnect from a Remote Device

COMMAND	RESPONSE
AT+DISC↵	+DISC:<results>↵

where

<results> = Disconnection results, any one of the following:

SUCCESS
LINK_LOSS
NO_SLC
TIMEOUT
ERROR

34. Enter Energy Saving mode

COMMAND	RESPONSE
AT+ENSNIFF=<addr>↵	OK ↵

where <addr> = 48 bit bluetooth address in NAP,UAP,LAP format

35. Exit Energy Saving mode

COMMAND	RESPONSE
AT+EXSNIFF=<addr>↵	OK↵

where <addr> = 48 bit bluetooth address in NAP,UAP,LAP format