

Bluetooth Module Description and User Manual
June 1, 2008
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The BT Module is designed to be used as a common BT element in Metrologic products. The Class 2 BlueTooth module is designed to provide Class 2 BlueTooth performance for our Smartdongle product as a master BlueTooth unit and for integration into the scanners as slave BlueTooth unit. The BlueTooth module has been tested to meet FCC rules and regulation for the ISM band of 2.4Ghz to 4.48Ghz. The unit can not be modified without retesting All units that use this module must contain the language “ Contains FCC ID LW5BT010M” for this module.

The Module supports Bluetooth Serial Port Profile (SPP) control application based on this BlueLab software stack. The BlueTooth module must be tested in the final product to meet applicable FCC regulations for units that contain a limited module approval. Our application implement a UART command set (AT command set) to control the SPP together with I/O control and indicator. The HOST MCU uses these commands and I/O to control the Bluetooth.

Bluetooth Features supported:

Besides making connection and data transmission, the module will provide following Bluetooth features.

Item	Features	Fucntions	Default	Remark
1	Configurable Device name	The name of the dongle when searched by other Bluetooth devices.	"MetroBT Module"	The Bluetooth address should be printed on the scanner label.
2	Configurable Pin code	The pin code when other devices connect to the dongle.	"0000"	
3	Configurable Page scan mode	Whether other Bluetooth device can found the Module during inquiry.	Discoverable and connectable	
4	Configurable security mode	Whether pin code is necessary when other device connect to our module for the first time.	Security mode off	
5	Configurable Encryption mode	Whether the Bluetooth encryption will be used or not.	No encryption	
6	Configurable Device class	Device classes.	"080640", image capture devices	
7	Inquiry Bluetooth device	Found Bluetooth devices around		

I/O Pin on Bluetooth Module

I/O Pin	Direction	Functions
RESET	in	Host Reset the Bluetooth module
READY	out	Indicate the BT Module is ready or not: low means the chip is ready
CONNECTED	out	Indicate the connection status: high means the chip is connected
DATA/CMD	in	The incoming data to BT module is command or data.
WAKE UP HOST	out	Wake up the scanner when data come in and scanner in sleep mode
HOST SLEEP	in	Reserved

Implement the module in scanner:

1. On power up, Host reset the BT Module, and wait the BT Module self test by checking the READY PIN status, The Module will be ready less than 1 second.
2. Host switch to CMD mode by set the DATA/CMD pin to HIGH.
3. Host configure the module:
 - Change the communication baudrate if necessary.
 - Read the BT module address.
 - Set the BT Module device name.
 - Set the class if needed.
 - Set the security mode if necessary.
Host set the security mode with ATC command:
e.g. "ATC=3000" + 0x0D,
The Module will reply a '0' + 0x0D after it configure correctly.
4. Host initiate the connection by the ATD command:
e.g. "ATD=00046184FB71"
The Module will reply a '0' + 0x0D after it received correctly.

The host only needs to send this connect command for one time, the BT Module will try the connection until it connected or it receives an "ATH" command. Once send the connect command, the host only need to monitor the CONNECTED pin status, once the connection is established, the CONNECTED pin will be HIGH.

5. After the connection established, the BT Module will pull up the CONNECTED pin and then present UART information “Y” + 0x0D if the UART connection indicator is enabled.
6. The Host switch to the DATA mode by set the DATA/CMD pin to LOW. Then it can send barcodes through the Bluetooth interface.
7. During the connection:

When the connection broken, the BT module will pull down the CONNECTED pin and present a UART information “Z” + 0x0D, if the UART connection indicator is enabled.

If the connection lost automatically such as the scanner is out of range, then the CONNECT pin will be LOW, the Module will try reconnection by itself.

If the HOST switch to the command mode and send the “ATH” command to disconnect the connection, the Module will not try reconnection by itself. The HOST should send the ATD + ADDRESS + 0x0D command to restart the connection process.

If the HOST need to switch to a new Bluetooth device, then it should send the “ATH” command first, and then send the ATD + ADDRESS + 0x0D, the Module will retry the connection with the new address.

b. Implement the module in cradle/dongle:

1. On power up, Host reset the BT Module, and wait the BT Module self test by checking the READY PIN status, The Module will be ready less than 1 second.
2. Host switch to CMD mode by set the DATA/CMD pin to HIGH.
3. Host configure the module:
 - Change the communication baudrate if necessary.
 - Read the BT module address.
 - Set the BT Module device name.
 - Set the class if needed.
 - Set the security mode if necessary.
Host set the security mode with ATC command:
e.g. “ATC=3000” + 0x0D,
The Module will reply a ‘0’ + 0x0D after it configure correctly.
4. Host monitor the CONNECT pin status, once the pin is HIGH, the MCU could switch to the data mode and ready to receive the data.

Implement the module in cradle/dongle:

1. On power up, Host reset the BT Module, and wait the BT Module self test by checking the READY PIN status, The Module will be ready less than 1 second.
2. Host switch to CMD mode by set the DATA/CMD pin to HIGH.
3. Host configure the module:
 - Change the communication baudrate if necessary.
 - Read the BT module address.
 - Set the BT Module device name.
 - Set the class if needed.
 - Set the security mode if necessary.
Host set the security mode with ATC command:
e.g. "ATC=3000" + 0x0D,
The Module will reply a '0' + 0x0D after it configure correctly.
4. Host monitor the CONNECT pin status, once the pin is HIGH, the MCU could switch to the data mode and ready to receive the data.

Integrators Responsibility

- 1) The BT Module has a limited module approval and should not be changed without recertification.
- 2) The MPE calculations need to be checked based on the location of the unit with reference to the user. See applicable FCC guidelines governing MPE and SAR testing.
- 3) The end product needs to include " This product contains FCC ID LW5BT010M"
- 4) All applicable FCC warnings need to be in the end users manual.

FCC RF Radiation Exposure Statement for both module and OEM integrator:

1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

FCC Information

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This Device may not cause harmful interface, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for CLASS B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try correct the interference by one or more of the following measures:

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

WARNING

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.