Configuring JY-MCU Bluetooth module using AT (Attention) commands

1. About JY-MCU Bluetooth module:

(a) Introduction:

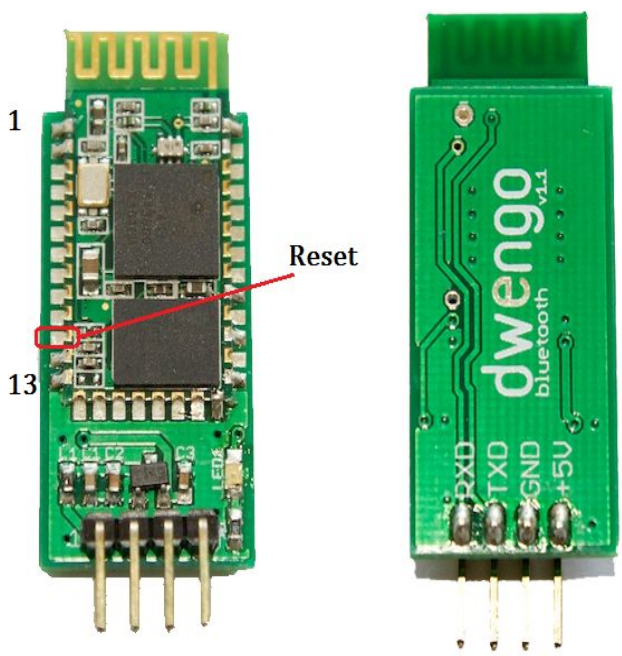
This is a Bluetooth Wireless module that provides a simple interface for connecting to Arduino, AVR, Firewing, USB to serial converter and other microcontroller applications.

The module provides a method to connect wirelessly with a PC or Bluetooth phone to transmit/receive embedded data such as GPS data, ADC voltage reading and other parameters.

(b) Technical Specification:

- JY-MCU Bluetooth Wireless Serial Port Module with free extension cable designed for easy use with Arduino boards,Atmega boards and Firewing boards.
- Supply voltage can be between 3.6 to 6V DC. IOs are 5V tolerant.
- Bluetooth V2.0+EDR (Enhanced Data Rate) 3Mbps
- Bluetooth SPP (Serial Port Protocol)
- Easy to connect this module with any standard Bluetooth device, just search and key "1234" passcode.
- Baud rate: 38400 bps, 9600 bps default
- Module requires no setup.
- Dimensions: 1.73 in x 0.63 in x 0.28 in (4.4 cm x 1.6 cm x 0.7 cm)

Fig 1: JY-MCU Bluetooth module



(c) **Application circuit:**

JY-MCU Bluetooth Module Pinouts	
Pin No.	**Signal Description**
1	Key (No pin)
2	VCC +3.6v to +6v DC
3	GND- Ground Connection
4	TXd -Tx from module
5	RXD- Rx for the module

(d) **1.4. Pairing your Bluetooth module with your Computer/Laptop:**

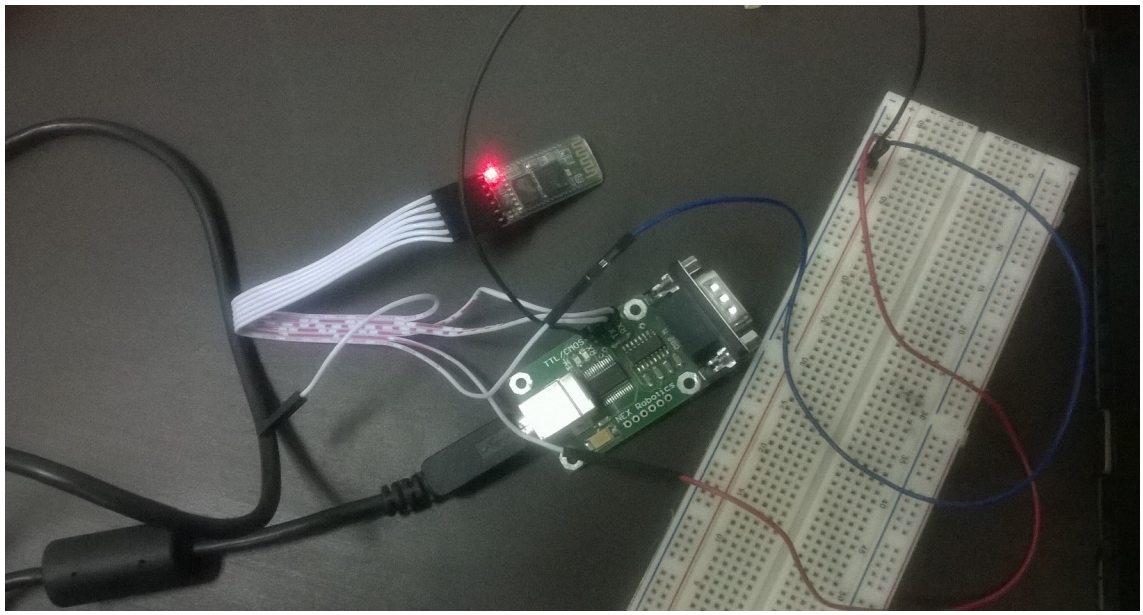
- Turn on your laptop Bluetooth Wireless or plug the Bluetooth USB module into your desktop PC. .
- Task bar will show the connected status of the blue tooth device.
- Add Device by right click on the Bluetooth task bar icon.
- You will find a device named Linvor. Choose this and complete the installation until your board blue tooth module is paired with computer Bluetooth.
- Use the pass code or pin is 1234 for this connection if prompted.

2. AT commands:

(a) **Connections of JY-MCU with USB to seriat converler:**

- Use USB to serial converter for configuration of Bluetooth module.
- Connect RXD pin of converter to TXD pin of JY-MCU and TXD pin of converter to RXD pin of JY-MCU.
- To configure bluetooth we have to bring the module in AT(Attention) mode. To do this, connect Key pin of module to Vcc of converter.
- Connect Vcc and GND of converter to Vcc and GND of module.
- Use Flash Magic or Bray's Terminal software to configure bluetooth.
- Connect the circuit to laptop or PC.
- If LED on JY-MCU blinks for 2 seconds continuously then it indicates that it has entered in AT mode and it is ready to accept AT commands.

Fig 2: Connection of JY-MCU with USB to serial converter



(b) **Various AT commands given:**

i. **AT**
This command is to test the operation. If Response is 'OK' then it is working properly.

ii. **AT+NAME**
This command responds the name of the bluetooth module. Initially the name was Linvor. We can change the name of the bluetooth module by the command, AT+NAME=EEG. This command changed the name of bluetooth module with response OK. To confirm the name, now again give command AT+NAME.

iii. **AT+PSWD**
This command responds with its initial password set (1234 —¿ Default password). We have to change the pass code of bluetooth module according to the pass code of the Neurosky EEG sensor as we have to bind it with it. The default password of EEG sensor is 0000. Set the password using command AT+PSWD=0000. Verify the same with AT+PSWD.

iv. **AT+CMODE=<paratemer>**
0—-connect the module to the specified Bluetooth address. (Bluetooth address can be specified by the binding command)
1—-connect the module to any address (The specifying address has no effect for this mode.)
2—-Slave-Loop
Default connection mode: 0
We have to connect the bluetooth module only to Neurosky sensor so we

give AT command AT+CMODE=0. To connect mobile or PC/laptop to the bluetooth module we have to change this parameter to 1.

v. **AT+UART=<param1>,<param2>,<param3>**
Param1: baud rate(bits/s). The value (Decimal) should be one of the following:
4800, 9600, 19200, 38400, 57600, 115200, 23400, 460800, 921600, 1382400
Param2:stop bit:
0—-1 bit
1—-2 bits
Param3: parity bit
We have to give the command as AT+UART=9600,0,0 as the inbuilt baud rate of the sensor is set to 9600 with 1 stop bit and no parity bit.

vi. **AT+ROLE=<parameter>**
parameter:
0—- Slave role
1—- Master role
2—- Slave-Loop role
Defaule: 0
We have to set the bluetooth module as a master so wealve to give the command as 'AT+ROLE=1', wherein it responds as 'OK'.

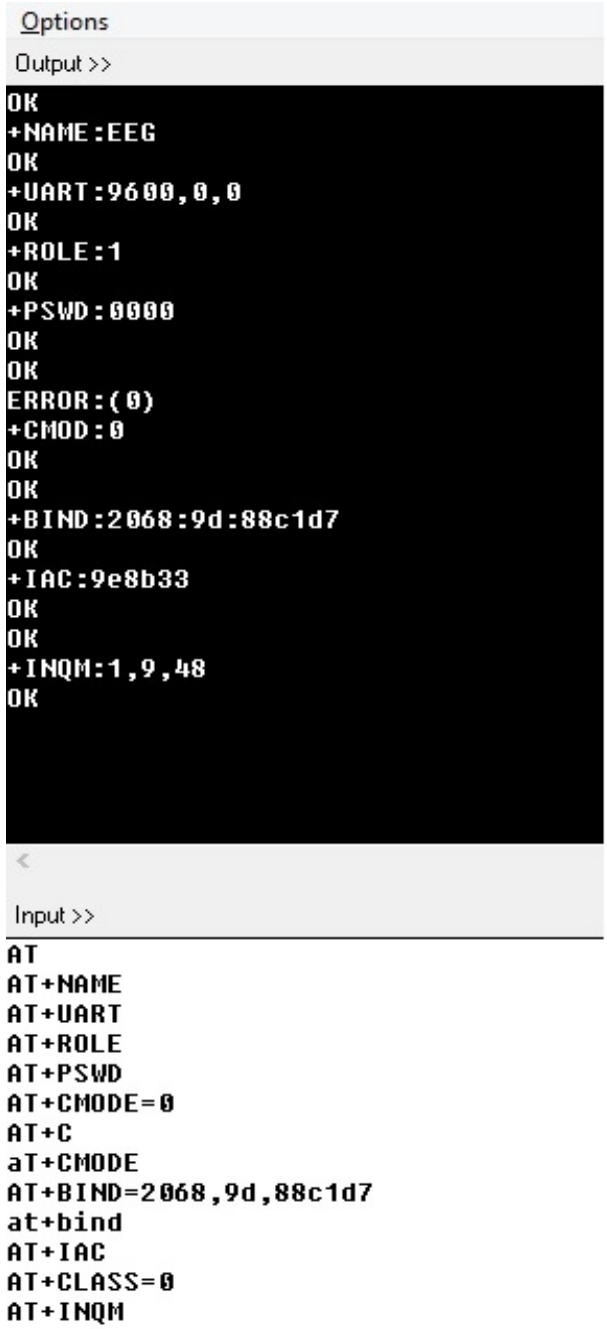
vii. **AT+BIND=<parameter>**
We need to bind the bluetooth module to the sensor so that it doesnt get distracted by other bluetooth devices. So we have to configure and bind it using unique ID number of the sensor. The default bind number is 00:00:00:00:00:00. Mindwave Unique Number is given in datasheet as 20:68:9d:88:c1:d7. So we need to give command as AT+BIND=2068,9d,88c1d7.

viii. **AT+IAC=9E8B33**
This is inquiry access code and is used to seek information about all the bluetooth devices around.

ix. **AT+CLASS=<parameter>**
Param: device type
Bluetooth device type is a 32-bit parameter indicates the device type and what typ can be supported.
Default: 0

x. **AT+INQM=<Param1>,<Param2>,<Param3>** Param1: Inquire access mode
0—-inquiry mode standard
1—-inquiry mode rssi
Param2: the maximum of Bluetooth devices response
Param3:The maximum of limited inquiring time
The range of limited time: 1 48

(Corresponding time:1.28s 61.44s)
Default: 1, 1, 48
We should give the command as, AT+INQM=1,9,48.



xi. There are many more AT commands that can be given to change its configuration. But the above given AT commands are sufficient for configuring, binding and interfacing with EEG sensor and Firebird V.

References:

- HC-05 bluetooth module datasheet (uploaded in github link in datasheets folder)
- http://upcommons.upc.edu/pfc/bitstream/2099.1/23666/7/Annex3Datasheet%20mdul%20Bluet MCU.pdf
- http://www.instructables.com/id/Success-Using-the-JY-MCU-linvor-Bluetooth-Module/step3/T Correct-Library-Connections/
- http://hobbycomponents.com/wireless/64-jy-mcu-bluetooth-wireless-serial-port-module- slav
- https://github.com/rwaldron/johnny-five/wiki/Getting-Started-with-Johnny-Five- and-JY-MCU-Bluetooth-Serial-Port-Module