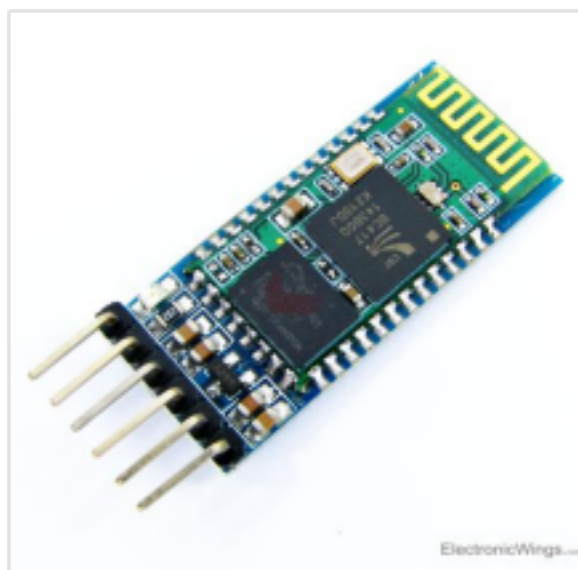# BLUETOOTH MODULE

INTRODUCTION

• It is used for many applications like wireless headset, game controllers, wireless mouse, wireless keyboard and many more consumer applications.

• It has range up to <100m which depends upon transmitter and receiver, atmosphere, geographic & urban conditions.

• It is IEEE 802.15.1 standardized protocol, through which one can build wireless Personal Area Network (PAN). It uses frequency-hopping spread spectrum (FHSS) radio technology to send data over air.

• It uses serial communication to communicate with devices. It communicates with microcontroller using serial port (USART).

HC-05 BLUETOOTH MODULE

• HC-05 is a Bluetooth module which is designed for wireless communication. This module can be used in a master or slave configuration.

PIN DESCRIPTION

Bluetooth serial modules allow all serial enabled devices to communicate with each other using Bluetooth.

It has 6 pins,

1. Key/EN: It is used to bring Bluetooth module in AT commands mode. If Key/EN pin is set to high, then this module will work in command mode. Otherwise by default it is in data mode. The default baud rate of HC-05 in command mode is 38400bps and 9600 in data mode.

HC-05 module has two modes,

    1. Data mode: Exchange of data between devices.

    2. Command mode: It uses AT commands which are used to change setting of HC-05. To send these commands to module serial (USART) port is used.

2. VCC: Connect 5 V or 3.3 V to this Pin.

3. GND: Ground Pin of module.

4. TXD: Transmit Serial data (wirelessly received data by Bluetooth module transmitted out serially on TXD pin)

5. RXD: Receive data serially (received data will be transmitted wirelessly by Bluetooth module).

6. State: It tells whether module is connected or not.

HC-05 module Information

• HC-05 has red LED which indicates connection status, whether the Bluetooth is connected or not. Before connecting to HC-05 module this red LED blinks continuously in a periodic manner. When it gets connected to any other Bluetooth device, its blinking slows down to two seconds.

• This module works on 3.3 V. We can connect 5V supply voltage as well since the module has on board 5 to 3.3 V regulator.

• As HC-05 Bluetooth module has 3.3 V level for RX/TX and microcontroller can detect 3.3 V level, so, no need to shift transmit level of HC-05 module. But we need to shift the transmit voltage level from microcontroller to RX of HC-05 module.
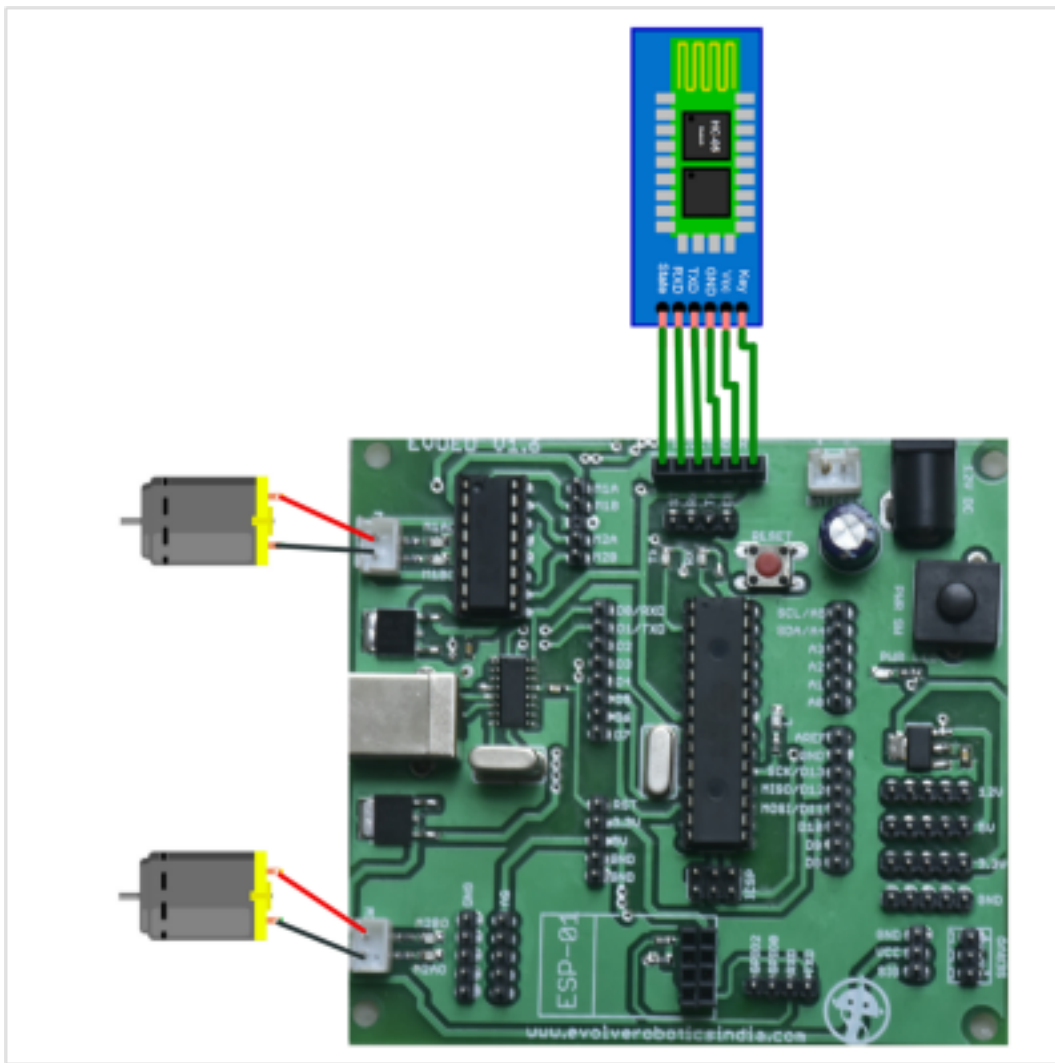
PROJECT: BLUETOOTH CONTROLLED

CAR AIM:

CREATE AN WIRELESS CONTROLLED MOTOR CAR USING

BLUETOOTH. COMPONENTS REQUIRED:

EVOED BOARD, HC-O5, DC MOTOR, MOTOR CHASIS.

CIRCUIT DIAGRAM:

![evolve ROBOTICS simply evolved]

PROJECT: BLUETOOTH CONTROLLED CAR

PROGRAM:

```
int m1a=3;
int m1b=4;
int m2a=5;
int m2b=6;

void setup() {
pinMode(m1a,OUTPUT);
pinMode(m1b,OUTPUT);
pinMode(m2a,OUTPUT);
pinMode(m2b,OUTPUT);
Serial.begin(9600);
```

```
}

void loop() {
if(Serial.available()>0){
  char x=Serial.read();
  Serial.println(x);
  if(x=='F')
  {
        digitalWrite(m1a,HIGH);
        digitalWrite(m1b,LOW);
        digitalWrite(m2a,HIGH);
        digitalWrite(m2b,LOW);
        delay(2000);
  }
if(x=='B')
{
digitalWrite(m1a,LOW);
digitalWrite(m1b,HIGH);
digitalWrite(m2a,LOW);
digitalWrite(m2b,HIGH);
delay(2000);
}
```

```
if(x=='L')
{
digitalWrite(m1a,LOW);
digitalWrite(m1b,LOW);
digitalWrite(m2a,HIGH);
digitalWrite(m2b,LOW);
delay(2000);
}
if(x=='R')
```

```
{
digitalWrite(m1a,HIGH);
digitalWrite(m1b,LOW);
digitalWrite(m2a,LOW);
digitalWrite(m2b,LOW);
delay(2000);
}
if(x=='S')
{
digitalWrite(m1a,LOW);
digitalWrite(m1b,LOW);
digitalWrite(m2a,LOW);
digitalWrite(m2b,LOW);
delay(2000);
}
}
}
```