SNS COLLEGE OF TECHNOLOGY

Coimbatore-35

An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A++' Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

19ECT213- IoT SYSTEM ARCHITECTURE

II ECE / IV SEMESTER

UNIT 3 – ACTUATORS AND IOT NETWORKING DEVICES

TOPIC 6 –HC05 Bluetooth Transceiver

HC05 Bluetooth Transceiver

- The HC-05 is a very cool module which can add two-way (full-duplex) wireless functionality to projects.
- This module is used to communicate between two microcontrollers like Arduino or communicate with any device with Bluetooth functionality like a Phone or Laptop.
- The module communicates with the help of USART at 9600 baud rate hence it is easy to interface with any microcontroller that supports USART.
- The default values of the module also configured by using the command mode.
- It transfer data from your computer or mobile phone to microcontroller or vice versa

HC05 Bluetooth Transceiver

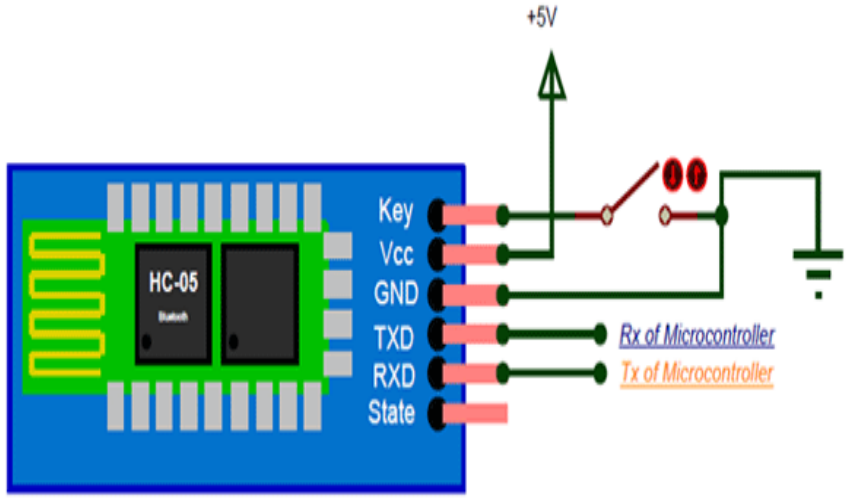
- Operating Voltage : 4 V to 6V (have internal 3.3V regulator).
- Operating Current : 30mA
- Integrated antenna and an edge connector.
- Range about 10 meters.
- Configurable in both master and slave modes.
- Pins : STATE, RXD, TXD, GND, VCC, KEY/ENABLE

HC-05 module has two modes,

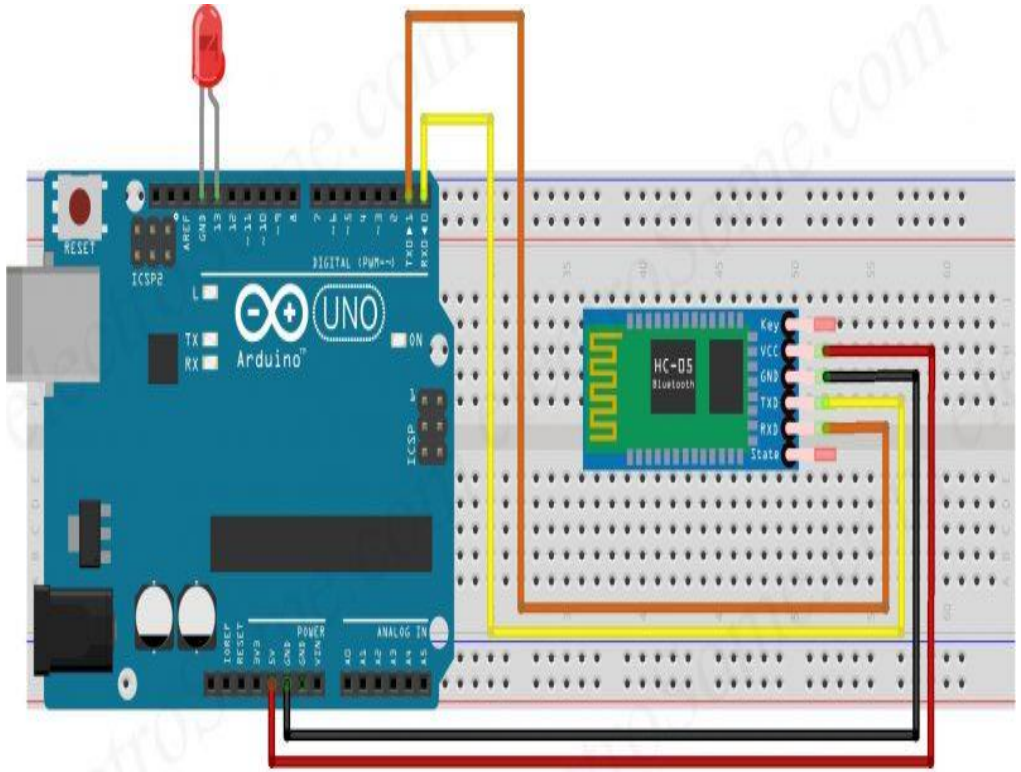
1. **Data mode:** Exchange of data between devices.
2. **Command mode:** It uses AT commands which are used to change setting of HC-05. To send these commands to module serial (USART) port is used.

HC05 Bluetooth Transceiver

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.
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



HC05 Bluetooth Transceiver



Description

- RXD pin of HC-05 Bluetooth – TXD pin of Arduino Uno
- TXD pin of HC-05 Bluetooth – RXD pin of Arduino Uno
- GND pin of HC-05 Bluetooth – GND pin of Arduino Uno
- VCC pin of HC-05 Bluetooth – 5V output pin of Arduino Uno
- Positive pin of LED – Pin 13 of Arduino Uno
- Negative pin of LED – GND pin of Arduino Uno

HC05 Bluetooth Transceiver

```
char data = 0;        //Variable for storing received data
 void setup()
{
   Serial.begin(9600);  //Sets the data rate in bits per second (baud) for serial data transmission
   pinMode(13, OUTPUT); //Sets digital pin 13 as output pin
}
 void loop()
{
   if(Serial.available() > 0)      // Send data only when you receive data:
   {
      data = Serial.read();       //Read the incoming data and store it into variable data
      Serial.print(data);         //Print Value inside data in Serial monitor
      Serial.print("\n");         //New line
      if(data == '1')            //Checks whether value of data is equal to 1
         digitalWrite(13, HIGH);  //If value is 1 then LED turns ON
      else if(data == '0')        //Checks whether value of data is equal to 0
         digitalWrite(13, LOW);   //If value is 0 then LED turns OFF
   }
}
```

HC05 Bluetooth Transceiver

- Initialize the serial port (UART) with the default baudrate of HC-05 Bluetooth module.
- Initialize Pin 13 as output pin.
- In the loop() we keep checking any data is available to read from the serial port.
- If data is available to read, store it to the variable named “data”.
- If the data read is ‘1’ then the LED is turned ON, else LED will be turned OFF