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 5 –IoT Networking devices Programming and Interfacing: HC05 Bluetooth Tranceiver

HC05 Bluetooth Tranceiver

- The HC-05 is a very cool module which can add two-way (full-duplex) wireless functionality to your projects. You can use this module to communicate between two microcontrollers like Arduino or communicate with any device with Bluetooth functionality like a Phone or Laptop.

HC05 Bluetooth Tranceiver

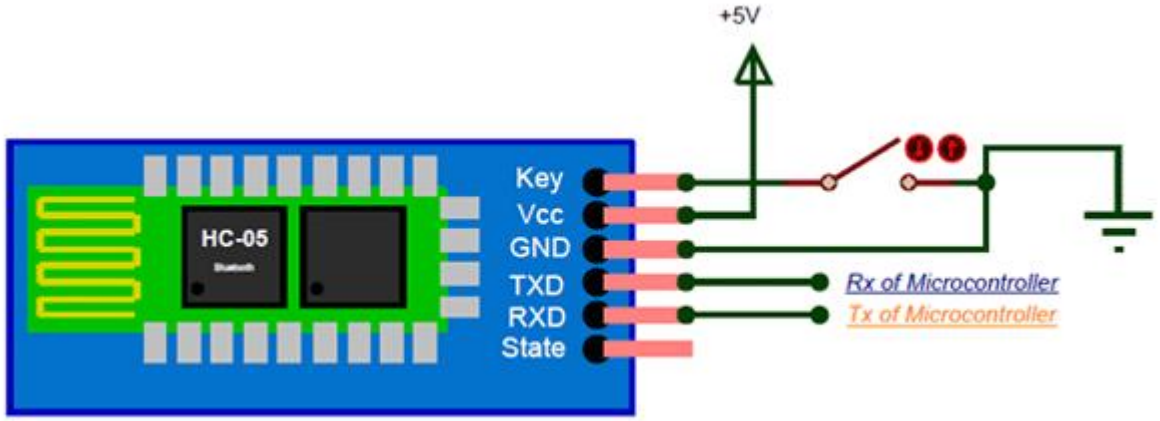
The module communicates with the help of USART at 9600 baud rate hence it is easy to interface with any microcontroller that supports USART. We can also configure the default values of the module by using the command mode.

It transfer data from your computer or mobile phone to microcontroller or vice versa

HC05 Bluetooth Tranceiver

- The HC-05 has two operating modes, one is the Data mode in which it can send and receive data from other Bluetooth devices and the other is the AT Command mode where the default device settings can be changed. We can operate the device in either of these two modes by using the key pin as explained in the pin description.

HC05 Bluetooth Tranceiver



HC05 Bluetooth Tranceiver

- 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
- GND : Power supply -ive.
- VCC : Power supply +ive.
- EN/KEY : This input is used to switch between command and data mode. If this pin is set HIGH, the module will be in command mode. Similarly if this pin is set LOW, the module will be in data mode.

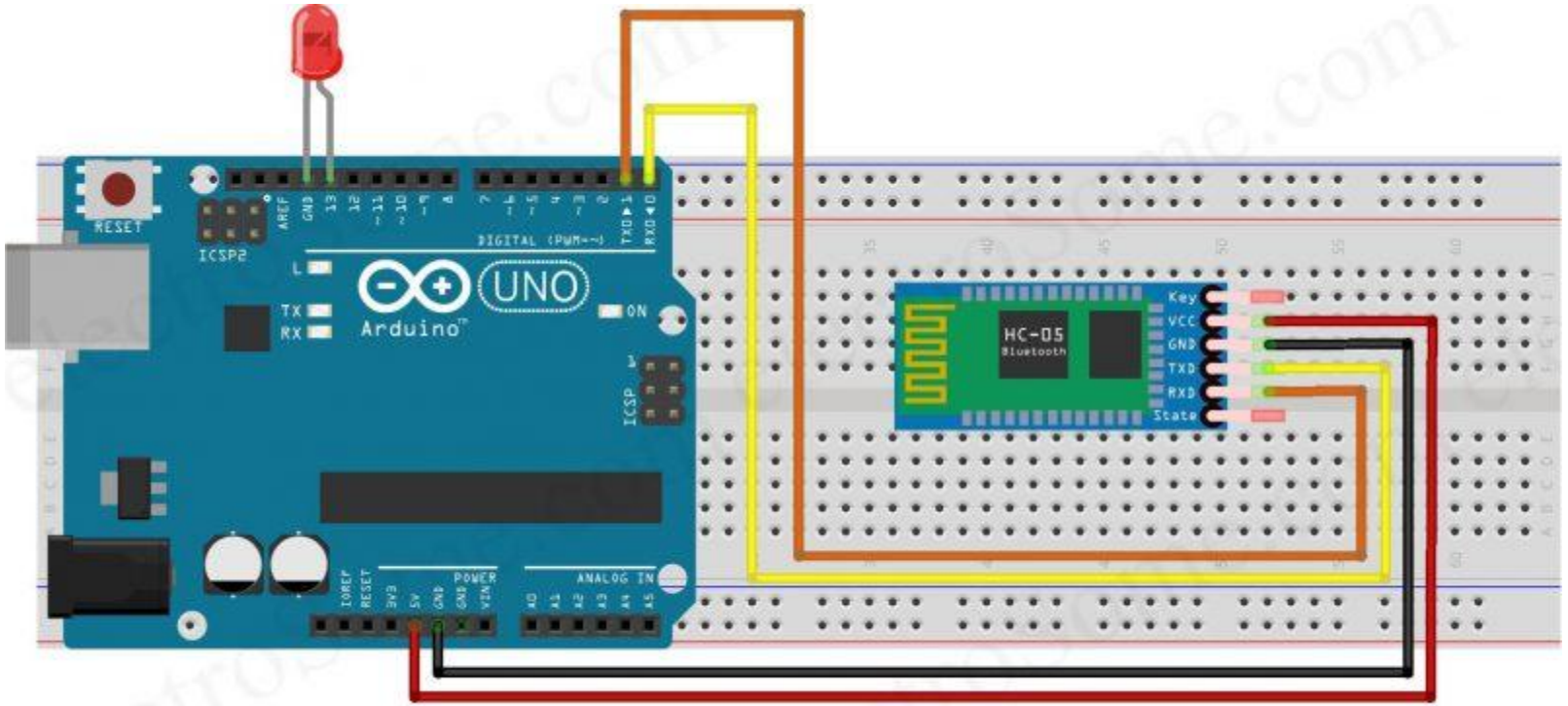
HC05 Bluetooth Tranceiver

- STATE : State pin indicates whether the module is connected or paired with a device. When the module is not connected, this pin will be in LOW state and the on-board LED will be flashing fast. But when the module is paired or connected to a device, the state pin will be in HIGH state and the on-board LED will be flashing with a delay.

- RXD : This is UART RX pin. This pin is used to send AT command when the module is in command mode. And it is used to send data to the connected device when the module is in data mode.

- TXD : This is UART TX pin. This pin is used push out responses to AT command when the module is in command mode. And it is used push out data send by the connected device when the module is in data mode.

Interfacing HC-05 Bluetooth Module with Arduino Uno



Interfacing HC-05 Bluetooth Module with Arduino Uno

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

Interfacing HC-05 Bluetooth Module with Arduino Uno

- Arduino Bluetooth Controller
- Hope you installed this app from Google Play Store. This app will act as a Bluetooth remote controller for Arduino. It is very easy to use this app. Open the app and connect to the HC-05 device. Then select the option as switch mode. Now you can control the LED using the app.

Interfacing HC-05 Bluetooth Module with Arduino Uno

```
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:
    {
```

Interfacing HC-05 Bluetooth Module with Arduino Uno

```
    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
 }
}
```

Interfacing HC-05 Bluetooth Module with Arduino Uno

Description

- 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