**BLUETOOTH MODULE**

Bluetooth Communication is a 2.4GHz frequency-based RF Communication with a range of approximately 10 meters. It is one of the most popular and most frequently used low range communication for data transfer, audio systems, handsfree, computer peripherals etc.

**HC-05 BLUETOOTH MODULE**This module is based on BC417 Single Chip Bluetooth IC that is compliant with Bluetooth v2.0 standard and with support for both UART and USB interfaces.

Generally, the HC-05 Bluetooth Module, or the HC-05 Sub Module, to be precise, comes with the BC417 IC along with a flash memory. Such Modules come as surface mount board and several third-party manufacturers use these board to build a more complete system with necessary pins and components.

The HC-05 Module supports for UART, USB as well as SPI communication and depending on the application, necessary pins can be used.

An important point to remember is the HC-05 Bluetooth Module works on a logic level of 3.3V. Hence, a 3.3V Regulator is used on the board.

**Pin Description**

* **EN/KEY:** It is the enable pin. When this pin is floating or connected to 3.3V, the module is enabled. If this pin is connected to GND, the module is disabled.
* **+5V:** This is the supply pin for connecting +5V. As the Module has on-board 3.3V regulator, you can provide +5V supply.
* **GND:** It is the ground pin.
* **TX:** It is the Transmitter pin of the UART Communication.
* **RX:** It is the Receive Pin of UART.
* **STATE:** This is a status indicator pin. This pin goes LOW when the module is not connected to any device. When the module is paired with any device, this pin goes HIGH.

#### Purpose of STATE Pin on HC-05 Bluetooth Module

The STATE pin of the HC-05 Bluetooth module is connected to the onboard LED. The STATE pin is also terminated on the connector.

The STATE pin tells you whether there is a Bluetooth connection present or not.

By looking at the LED, you can know whether the connection is active or not. If there is an active connection, the LED will be ON. The LED will be off if there is no connection.

You can connect the STATE pin to any Arduino GPIO pin. The STATE helps you read the connection status in your code later.

If you read a logic HIGH, there is an active connection. If there is no active connection, you will read logic zero.

Connecting the STATE pin to the Arduino is not mandatory but helps provide more debugging data for the user.

#### Purpose of the KEY Pin on HC-05 Bluetooth Module

The purpose of the KEY pin is to toggle the HC-05 Bluetooth module from **Data mode** to **command mode** and vice versa.

If no connections are made, the HC-05 module will be in data mode by default.

If you want to put the module into command mode, use an Arduino GPIO pin to drive the KEY pin to logic High.

#### MODES OF OPERATION

The HC-05 Bluetooth Module can be configured in two modes of operation: Command Mode and Data Mode.

In Command Mode, you can communicate with the Bluetooth module through AT Commands for configuring various settings and parameters of the Module like get the firmware information, change UART Baud Rate, change module name, set it as either Master or slave etc.

An important point about HC-05 Module is that it can be configured as Master or Slave in a communication pair. In order to select either of the modes, you need to activate the Command Mode and sent appropriate AT Commands.

Coming to the Data Mode, in this mode, the module is used for communicating with other Bluetooth device i.e., data transfer happens in this mode.