

ARDUINO BLUETOOTH MODULE HC05 DIP

The HC-05 is a popular Bluetooth module used with Arduino and other microcontrollers for wireless communication. It is a versatile module that supports both master and slave modes, making it suitable for a wide range of applications. The "DIP" version of the HC-05 refers to the Dual In-line Package, which is a common form factor for electronic components.

Key Features of HC-05 Bluetooth Module:

- **Bluetooth Version:** 2.0 + EDR (Enhanced Data Rate)
- **Operating Voltage:** 3.3V to 5V
- **Communication:** Serial communication (UART)
- **Range:** Typically up to 10 meters (depending on the environment)
- **Modes:** Can operate in both Master and Slave modes
- **Pinout:** Typically includes VCC, GND, TXD, RXD, EN, and STATE pins

Pinout Description:

- **VCC:** Power supply (3.3V to 5V)
- **GND:** Ground
- **TXD:** Transmit Data (connects to RX pin of Arduino)
- **RXD:** Receive Data (connects to TX pin of Arduino)
- **EN:** Enable pin (used to enter AT command mode)
- **STATE:** Connection status indicator

Wiring HC-05 to Arduino:

1. **VCC** to **5V** on Arduino (or 3.3V if your module is 3.3V logic)
2. **GND** to **GND** on Arduino
3. **TXD** to **RX** on Arduino (via a voltage divider if using 5V logic)
4. **RXD** to **TX** on Arduino (via a voltage divider if using 5V logic)
5. **EN** and **STATE** pins are optional and can be left unconnected for basic operation.

Voltage Divider (if needed):

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If your Arduino operates at 5V and the HC-05 is 3.3V logic, you should use a voltage divider on the TXD line (Arduino TX to HC-05 RX) to avoid damaging the module. A common resistor combination is 1k Ω and 2k Ω .

Example Code for Arduino:

Here's a simple example to send and receive data via the HC-05 module:

```
cpp
Copy
#include <SoftwareSerial.h>

SoftwareSerial BTSerial(10, 11); // RX, TX

void setup() {
  Serial.begin(9600);
  BTSerial.begin(38400); // Default baud rate for HC-05
  Serial.println("Bluetooth module is ready!");
}

void loop() {
  // Send data from Arduino to Bluetooth module
  if (Serial.available()) {
    BTSerial.write(Serial.read());
  }

  // Receive data from Bluetooth module to Arduino
  if (BTSerial.available()) {
    Serial.write(BTSerial.read());
  }
}
```

AT Commands:

To configure the HC-05 module, you can use AT commands. To enter AT command mode:

1. Connect the **EN** pin to 3.3V.
2. Power cycle the module.
3. Send AT commands at 38400 baud rate.

Example AT commands:

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- **AT** - Check if the module is responding.
- **AT+VERSION** - Get the firmware version.
- **AT+ROLE=0** - Set the module to Slave mode.
- **AT+ROLE=1** - Set the module to Master mode.
- **AT+UART=9600,1,0** - Change the baud rate to 9600.

Applications:

- Wireless communication between devices
- Remote control of robots or other devices
- Data logging and monitoring
- Home automation

Troubleshooting:

- **No Response:** Ensure the wiring is correct and the module is powered properly.
- **Baud Rate Mismatch:** Make sure the baud rate in your code matches the module's baud rate.
- **AT Command Mode:** Ensure the EN pin is correctly toggled to enter AT command mode.

