ACEIRMC HC-05

ACEIRMC HC-05 Bluetooth Module User Manual

Model: HC-05 | Brand: ACEIRMC

1. Introduction

This manual provides comprehensive instructions for the ACEIRMC HC-05 Bluetooth Module. The HC-05 is a versatile wireless serial port communication module designed for integration into various electronic projects, particularly with Arduino platforms. It supports the Bluetooth V2.0 SPP protocol and can operate in both master and slave modes, allowing for flexible connectivity options.

Please read this manual thoroughly before operating the module to ensure proper setup and functionality.

2. Product Overview

2.1 Key Features

- Utilizes the CSR BC417 mainstream Bluetooth chip, adhering to Bluetooth V2.0 SPP protocol standards.
- Module operating voltage range: 3.6V to 6V.
- Enables quick addition of Bluetooth functionality to Arduino projects, allowing control via Android devices (e.g., switches, LEDs).
- Includes 6-pin Dupont cables for easy connection to Arduino boards.
- Configurable via AT commands for both master and slave modes, facilitating connections to specified Bluetooth devices.

2.2 Package Contents

- HC-05 Bluetooth Module (quantity as purchased, e.g., 3pcs)
- 6-pin Dupont Cable (if included with specific package)

3. Setup and Wiring

The HC-05 Bluetooth module is designed for easy integration into electronic projects. It requires a supply voltage

between 3.6V and 6V DC. The module features an LED indicator to show its status (on/in use) and is breadboard compatible for convenient prototyping.

3.1 Pinout Diagram

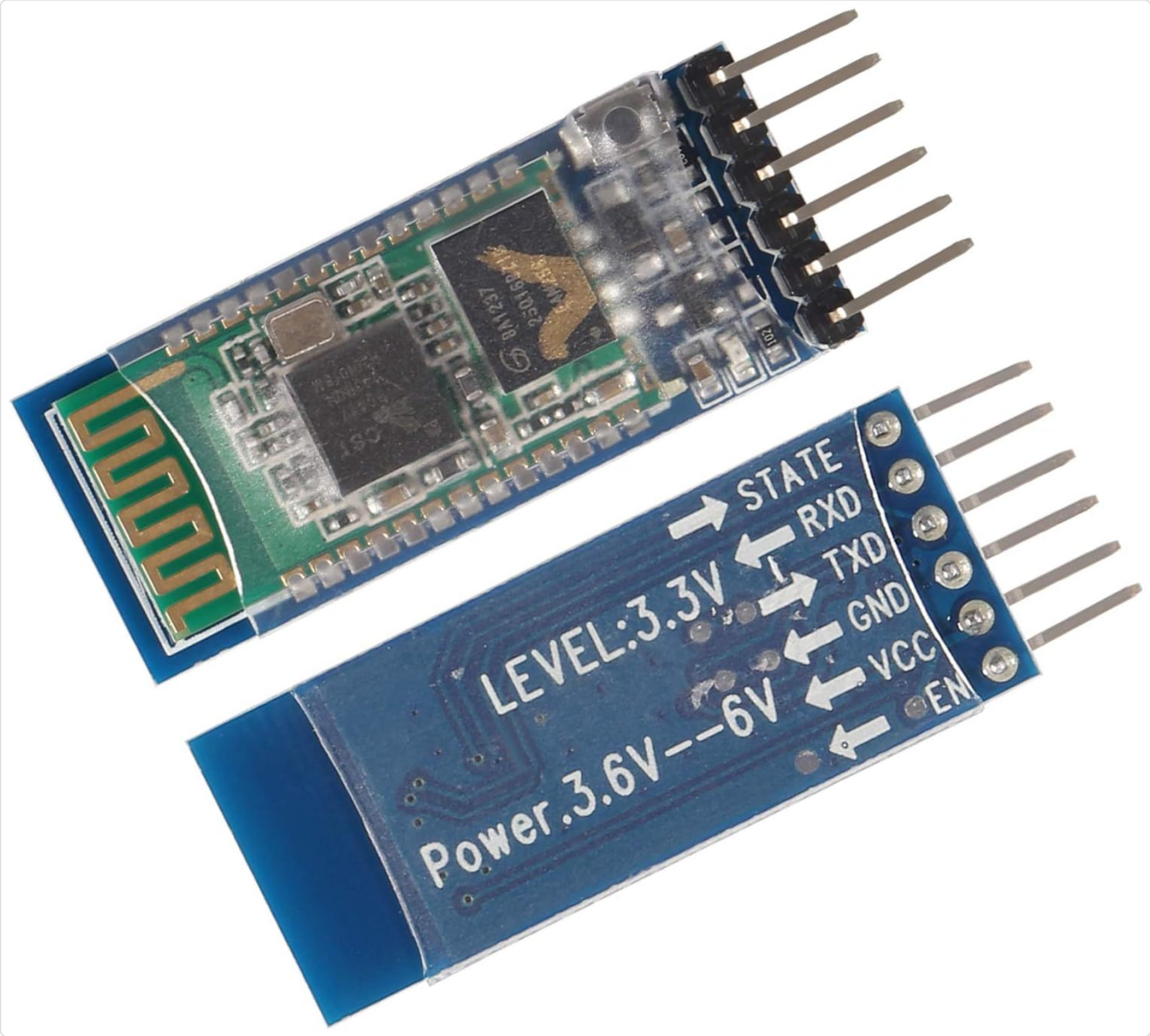

Figure 1: HC-05 Bluetooth Module with labeled pins (STATE, RXD, TXD, GND, VCC, EN).

The module typically has the following pins:

- **STATE:** Status indicator pin.
- **RXD:** Receive Data pin. Connects to the TX pin of your microcontroller.
- **TXD:** Transmit Data pin. Connects to the RX pin of your microcontroller.
- **GND:** Ground connection.
- **VCC:** Power supply input (3.6V - 6V).
- **EN:** Enable pin (often used for AT command mode).

3.2 Connecting to Arduino

When connecting the HC-05 module to an Arduino board, a minimum of four wires are typically used: VCC, GND, TXD, and RXD. It is crucial to note the voltage levels:

- The HC-05 module's RXD pin operates at 3.3V. If your Arduino's TX pin outputs 5V, a voltage divider (e.g., using a 1kΩ resistor) is required between the Arduino's TX pin and the HC-05's RXD pin to prevent damage to

the module.

- The HC-05's TXD pin outputs 3.3V, which is generally safe to connect directly to a 5V Arduino's RX pin.

For initial setup or configuration using AT commands, the module can be put into command mode by holding down the small button on the board while applying power. The LED will then blink at a 2-second interval, indicating AT command mode.

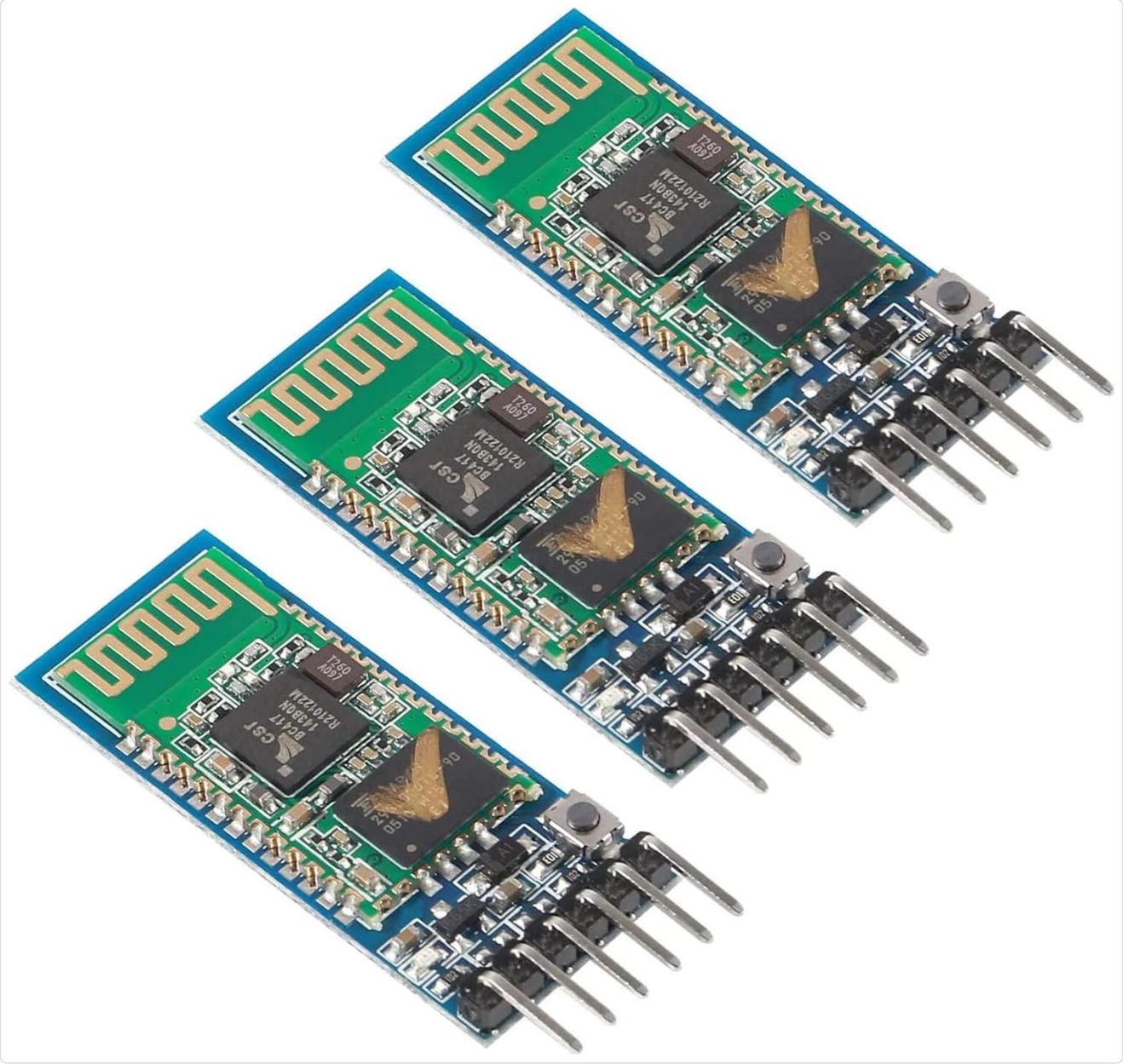

Figure 2: Multiple HC-05 Bluetooth modules, ready for integration.

4. Operating the Module

4.1 Master and Slave Modes

The HC-05 module can be configured to operate as either a master or a slave device. In slave mode (default factory setting), the module waits for a connection from another Bluetooth device. In master mode, it can initiate a connection to another Bluetooth device (e.g., another HC-05 module).

Switching between master and slave modes, as well as other advanced configurations, is performed using AT commands. Extensive documentation and tutorials for AT commands are available online for specific use cases.

4.2 Serial Communication

Once connected, the HC-05 module facilitates serial data transmission. Data sent to the module's RXD pin is transmitted wirelessly, and data received wirelessly is output through the TXD pin. This allows for wireless control and data exchange between your microcontroller and a Bluetooth-enabled device.

The module's approximate range is 10 meters in open air conditions.

5. Device Connectivity

The HC-05 module is primarily designed for communication with Android devices and Windows laptops. Please note that this is a classic Bluetooth 2.0 module and is generally **not compatible with iOS (iPhone/iPad) devices**. For iOS compatibility, a Bluetooth 4.0 BLE module (e.g., SH-HC-08) would typically be required.

5.1 Connecting to Windows

1. Ensure your HC-05 module is powered on and in pairing mode (blinking LED).
2. On your Windows computer, navigate to "Bluetooth & devices" settings.
3. Change the "Bluetooth devices discovery" option to "Advanced" (if not already set).
4. Click "Add device" and select "Bluetooth".
5. The HC-05 module should appear in the list. Select it to connect.
6. When prompted, enter the default PIN: **1234**.
7. To verify the connection, open Device Manager and check under "Ports (COM & LPT)". You should see a "Standard Serial over Bluetooth link (COMx)" entry for the connected module.

5.2 Connecting to Android Devices

1. Ensure your HC-05 module is powered on and in pairing mode.
2. Download a suitable serial Bluetooth terminal application from the Google Play Store (e.g., "DSD TECH Bluetooth" or similar).
3. Open the application and allow it to communicate via Bluetooth.
4. Scan for available devices. Your HC-05 module should appear.
5. Select the module to pair and connect. You may be prompted for the default PIN (**1234**).
6. Once connected, the communication LED on the HC-05 module should become solid, indicating an active connection. You can then send and receive serial commands through the app.

6. Troubleshooting

- **Module not powering on:** Verify VCC and GND connections and ensure the power supply is within the 3.6V-6V range.
- **Module not discoverable:** Ensure the module is powered on and its LED is blinking, indicating it's in pairing mode. Check Bluetooth settings on your host device.
- **Connection issues (Windows):** Ensure Bluetooth device discovery is set to "Advanced" in Windows settings. Confirm the correct COM port is selected in your Arduino IDE or serial terminal.
- **Connection issues (Android):** Ensure Bluetooth is enabled on your Android device and the correct app is being used.
- **Data transmission errors:** Double-check TXD and RXD connections. Remember to use a voltage divider for

the HC-05 RXD pin if connecting to a 5V Arduino TX pin. Verify baud rates match between the module and your microcontroller/software.

- **Module not responding to AT commands:** Ensure the module is correctly put into AT command mode (hold button while powering on, LED blinks slowly). Verify serial connection and baud rate for AT commands (often 38400 or 9600).
- **Intermittent connection:** Check for interference from other 2.4GHz devices. Ensure the module is within its 10-meter range.

7. Technical Specifications

Feature	Specification
Brand	ACEIRMC
Model	HC-05
Bluetooth Protocol	V2.0 SPP
Operating Voltage	3.6V - 6V DC
Communication Range	Approximately 10 meters (open air)
Operating Modes	Master, Slave (configurable via AT commands)
Interface	Serial (TXD, RXD)
Dimensions	2.44 x 1.77 x 0.47 inches (approximate package dimensions)
Item Weight	0.317 ounces / 0.01 Kilograms
UPC	701715445918

8. Maintenance

The HC-05 Bluetooth module is a low-maintenance electronic component. To ensure its longevity and reliable operation:

- Keep the module clean and free from dust and moisture.
- Avoid exposing the module to extreme temperatures or direct sunlight.
- Handle with care to prevent physical damage to the pins or circuit board.
- Ensure proper voltage supply to prevent overheating or damage to components.

9. Warranty and Support

For warranty information and technical support, please refer to the retailer or manufacturer's official website. Keep your purchase receipt for any warranty claims.