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QIACHIP WL101/WL102-341

QIACHIP WL101 Receiver and WL102 Transmitter 433MHz RF Wireless Module Kit Instruction Manual

INTRODUCTION

This manual provides detailed instructions for the QIACHIP WL101 Superheterodyne Receiver and WL102 Transmitter 433MHz RF Wireless Module Kit. This kit is designed for various DIY projects, including remote control applications with platforms like Arduino UNO. It operates on the 433MHz frequency band and supports ASK/OOK modulation.

Package Contents:

- 1 x WL101 Superheterodyne Receiver Module
- 1 x WL102 Transmitter Module
- 2 x Antennas (for receiver and transmitter)

SAFETY INFORMATION

Handle batteries with care. Avoid extreme temperatures. Do not interfere with other wireless devices.

PRODUCT FEATURES

- **Frequency:** 433MHz RF
- **Modulation Mode:** Supports ASK/OOK modulation
- **Transmit Power:** Greater than 11dBm (for WL102 Transmitter)
- **Receiver Type:** Superheterodyne (for WL101 Receiver)
- **Application:** Suitable for motorcycles, automobile anti-theft products, home security systems, electric doors, remote control sockets, LED lighting, garage door openers, and various remote control applications.

SPECIFICATIONS

WL101 Receiver Module

- **Model:** WL101
- **Operating Voltage:** Typically 3.3V - 5V (refer to specific datasheet for exact range)
- **Operating Current:** Low power consumption

- **Frequency:** 433MHz
- **Dimensions:** Approximately 1.18 inches x 0.35 inches (30mm x 9mm)

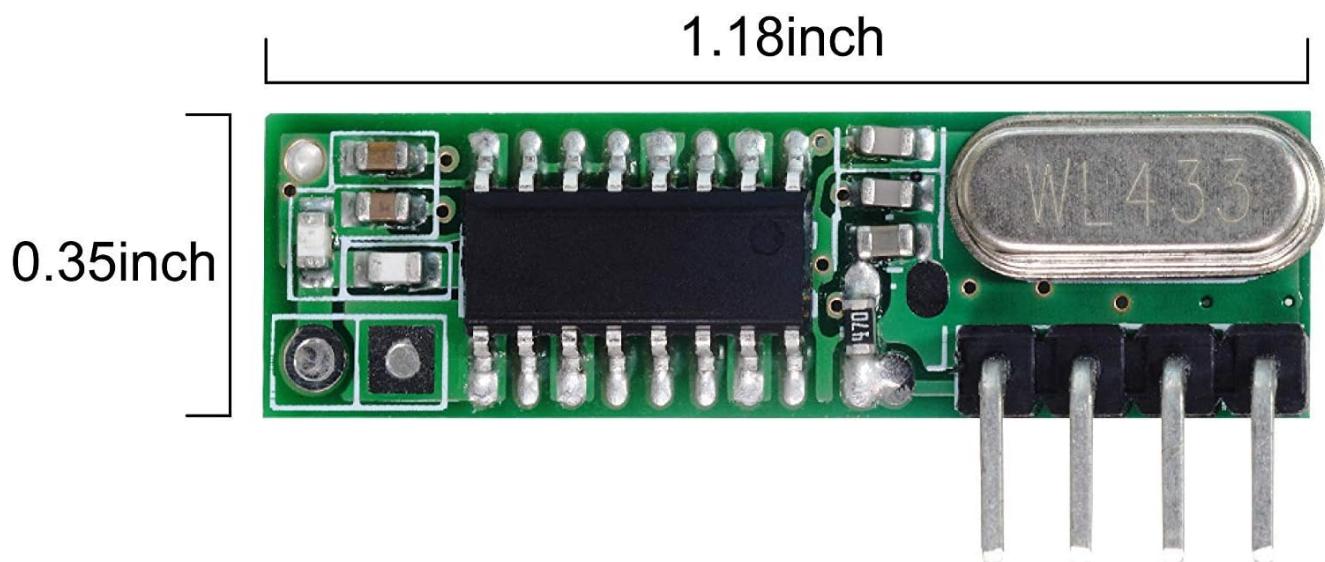


Image Description: A green circuit board showing the WL101 receiver module with dimensions indicated. The length is approximately 1.18 inches and the width is 0.35 inches.

WL102 Transmitter Module

- **Model:** WL102
- **Operating Voltage:** Typically 3.3V - 12V (refer to specific datasheet for exact range)
- **Operating Current:** Varies with transmit power
- **Frequency:** 433MHz
- **Transmit Power:** >11dBm
- **Dimensions:** Approximately 13mm x 13mm

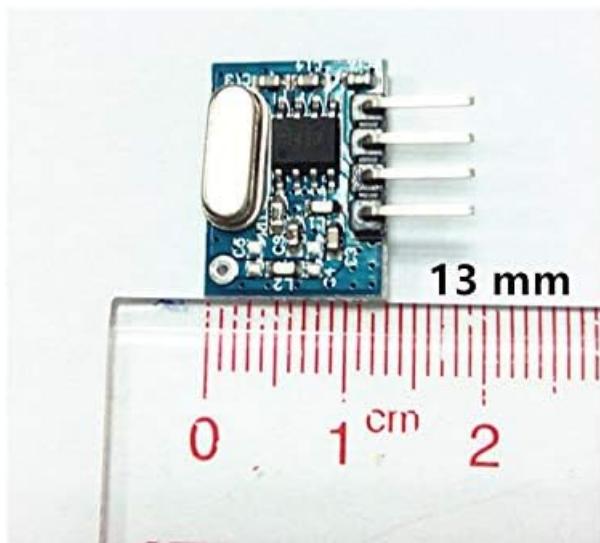
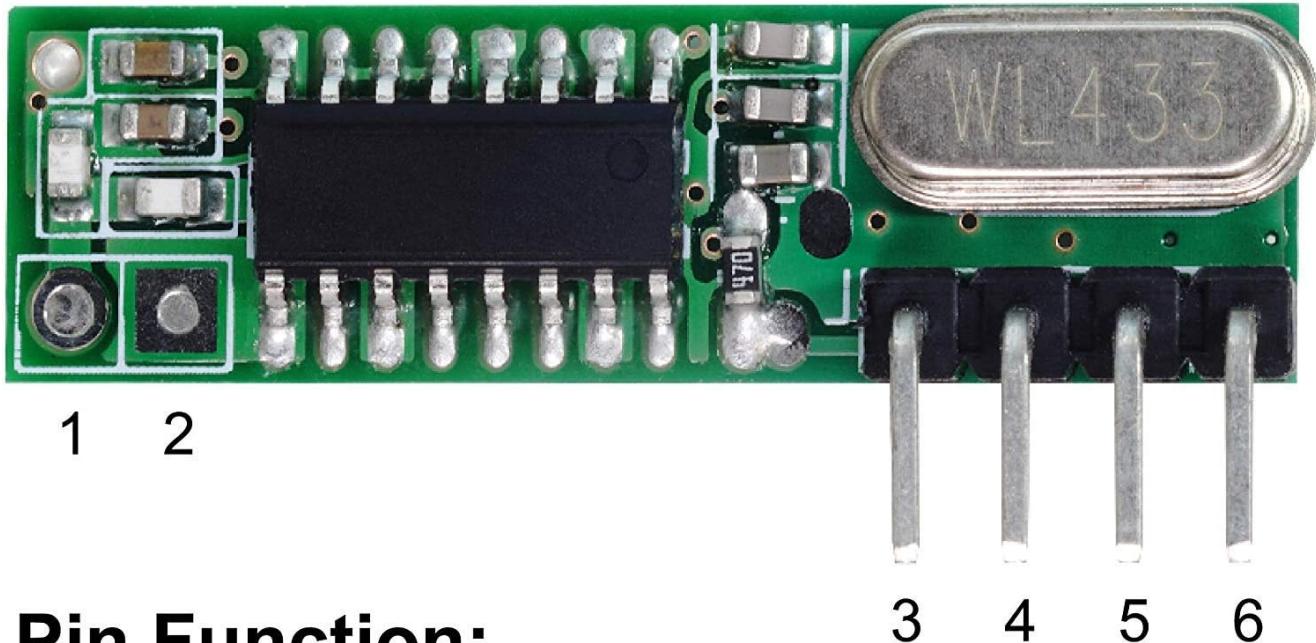


Image Description: A small blue circuit board showing the WL102 transmitter module with a ruler indicating its size, approximately 13 mm.

PINOUT AND CONNECTIONS

WL101 Superheterodyne Receiver Pinout

The WL101 receiver module features six pins for power, ground, data output, and antenna connection. Refer to the diagram below for pin identification.



Pin Function:

1.ANT
2.GND
3.VIN(VDD)
4.DO(DATA)
5.DO(DATA)
GND

Antenna pin
Power ground pin
Power input pin
Data output pin
Data output pin
Power ground pin

Image Description: A green circuit board showing the WL101 receiver module. Six pins are labeled 1 through 6. Pin 1 is ANT (Antenna), Pin 2 is GND (Power ground), Pin 3 is VIN(VDD) (Power input), Pin 4 is DO(DATA) (Data output), Pin 5 is DO(DATA) (Data output), and Pin 6 is GND (Power ground).

WL101 Receiver Pin Functions

Pin No.	Label	Function
1	ANT	Antenna pin
2	GND	Power ground pin
3	VIN(VDD)	Power input pin
4	DO(DATA)	Data output pin
5	DO(DATA)	Data output pin
6	GND	Power ground pin

WL102 Transmitter Pinout

The WL102 transmitter module has pins for power, ground, data input, and antenna. Note that the EN (Enable) pin

is internally connected to the power supply and has no external function.

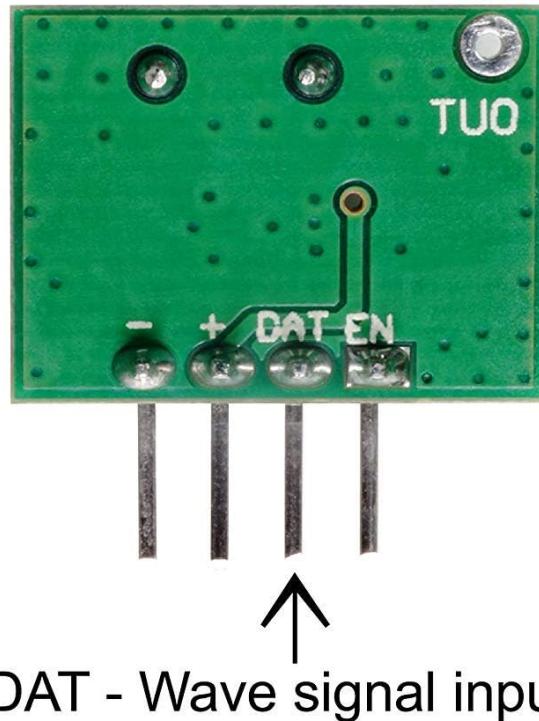
DAT - Wave signal input

OUT - Antenna pin. RF signal output, can directly connect to the antenna.

EN - Enable Pin. **But this product EN pin is connected to the power supply, no function**

- - Power- ground Pin. The ground wire connects power supply.

+ - power supply pin. Power Input



Supporting ASK/OOK Modulation Mode, transmit power is greater than 11dBm

Image Description: A small green circuit board showing the WL102 transmitter module. It has four pins at the bottom. The text indicates 'DAT - Wave signal input', 'OUT - Antenna pin', 'EN - Enable Pin (connected to power supply, no function)', '-' Power ground Pin, '+' Power supply pin.

WL102 Transmitter Pin Functions

Label	Function
DAT	Wave signal input
OUT	Antenna pin (RF signal output)
EN	Enable Pin (internally connected to power, no external function)
- (GND)	Power ground pin
+ (VCC)	Power supply pin

Example Connection to Arduino UNO (WL101 Receiver)

This diagram illustrates a typical connection of the WL101 receiver module to an Arduino UNO board. Ensure correct voltage and data pin connections.

Superheterodyne 433Mhz Receiver

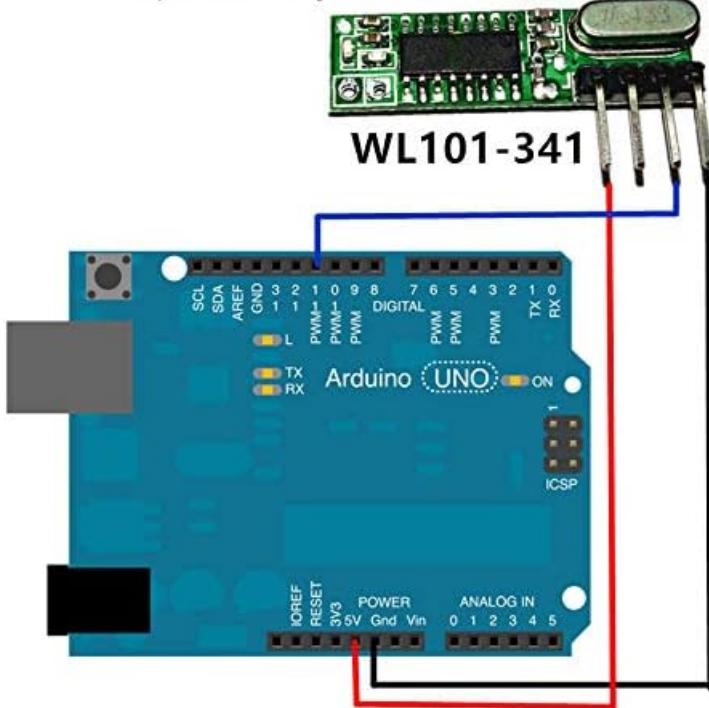


Image Description: A circuit diagram showing a QIACHIP WL101-341 Superheterodyne 433MHz Receiver connected to an Arduino UNO board. The receiver's VDD pin is connected to Arduino's 5V, GND to GND, and one of the DO(DATA) pins to a digital input pin (e.g., D2) on the Arduino. The antenna is shown connected to the ANT pin.

SETUP

Antenna Connection

For optimal performance, connect the supplied helical antenna to the ANT pin of the WL101 receiver and the OUT pin of the WL102 transmitter. The length of the antenna is critical for 433MHz operation; a quarter-wavelength antenna (approximately 17.3 cm or 6.8 inches for 433MHz) is recommended for best range, though the provided coiled antennas are suitable for shorter distances.

Power Supply

- **WL101 Receiver:** Connect the VIN(VDD) pin to a stable power source (e.g., 5V from Arduino) and GND to ground.
- **WL102 Transmitter:** Connect the '+' pin to a stable power source (e.g., 3.3V to 12V, depending on desired range and power) and '-' to ground.

Data Connection

- **WL101 Receiver:** Connect one of the DO(DATA) pins to a digital input pin on your microcontroller (e.g., Arduino).
- **WL102 Transmitter:** Connect the DAT pin to a digital output pin on your microcontroller.

OPERATING INSTRUCTIONS

Basic Operation Principle

The WL102 transmitter sends data using Amplitude Shift Keying (ASK) or On-Off Keying (OOK) modulation at 433MHz. The WL101 superheterodyne receiver is designed to efficiently detect and demodulate these signals.

Microcontroller Programming (e.g., Arduino)

1. **Transmitter (WL102):** Program your microcontroller to send digital data (e.g., ON/OFF pulses) to the DAT pin of the WL102. Libraries like "RCSwitch" or "VirtualWire" are commonly used for encoding and transmitting data.
2. **Receiver (WL101):** Program your microcontroller to read digital data from the DO(DATA) pin of the WL101. The same libraries (e.g., "RCSwitch", "VirtualWire") can be used to decode the received signals.
3. **Data Protocol:** Ensure that the data encoding and decoding protocols used by the transmitter and receiver microcontrollers are compatible.

Range Considerations

The effective range of the modules depends on several factors, including antenna quality, power supply voltage (for transmitter), environmental interference, and line of sight. Optimal antenna tuning and clear line of sight will maximize range.

MAINTENANCE

- **Keep Dry:** Protect the modules from moisture and humidity to prevent corrosion and damage.
- **Clean Connections:** Ensure all pin connections are clean and secure.
- **Avoid Physical Stress:** Handle the modules carefully to prevent bending pins or damaging components.
- **Antenna Care:** Ensure antennas are not bent or damaged, as this can significantly impact performance.

TROUBLESHOOTING

- **No Signal Reception:**
 - Verify power connections to both modules.
 - Check antenna connections and ensure they are properly sized for 433MHz.
 - Confirm that the transmitter and receiver are operating on the same frequency (433MHz).
 - Ensure the data encoding/decoding libraries and protocols are correctly implemented.
 - Reduce distance between modules and check for obstructions or sources of interference.
- **Short Range:**
 - Improve antenna quality (e.g., use a proper quarter-wavelength wire antenna).
 - Increase transmitter power supply voltage (within specified limits).
 - Minimize environmental interference (e.g., other 433MHz devices, Wi-Fi routers).
 - Ensure clear line of sight between transmitter and receiver.
- **Intermittent Operation:**
 - Check for loose connections or cold solder joints.
 - Ensure stable power supply to both modules.
 - Consider adding decoupling capacitors near power pins if experiencing noise issues.
- **Module Appears Damaged:**
 - Inspect for visible signs of corrosion or physical damage. If found, replacement may be necessary.

WARRANTY AND SUPPORT

QIACHIP products are designed for reliability. For technical support or inquiries regarding your WL101/WL102

module kit, please refer to the seller's support channels or the QIACHIP official website. Specific warranty details may vary by region and retailer.