

RF Wireless Transmitter and Receiver Kit (433 MHz)



The RF modules are 433 MHz RF transmitter and receiver modules. This transmitter/receiver module is good use for your wireless application project that wants to use the free band 433MHz. These modules can be fully used by interfacing it to any microcontroller like and Arduino microcontroller.



HARDWARE SPECIFICATIONS

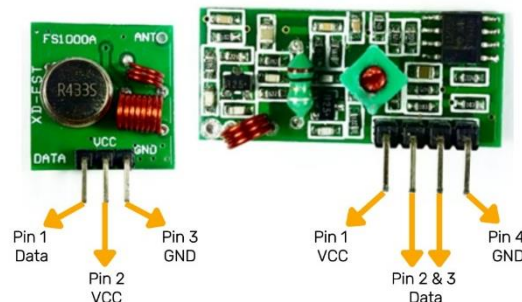
- Receiver frequency 433MHz
- Receiver typical frequency 105Dbm
- Receiver supply current 3.5mA
- Low power consumption
- Receiver operating voltage 5v
- Transmitter frequency range 433.92MHz
- Transmitter supply voltage 3v~6v
- Transmitter output power 4v~12v

HARDWARE OVERVIEW

The kit consists of Receiver and Transmitter. The receiver is on the left side as depicted from the figure below while the transmitter is on the right side.









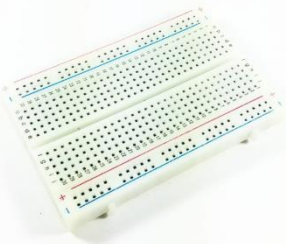


Receiver Module		
Pin	Input	Description
3	VCC	To be connected to the GND pin in a microcontroller.
2	GND	Supplies power to the module. Could be connected to a +5V pin or +3.3V pin.
	Output	
1	Data	Data can be transmitted from this pin.
Transmitter Module		
Pin	Input	Description
1	VCC	To be connected to the GND pin in a microcontroller.
4	GND	Supplies power to the module. Could be connected to a +5V pin or +3.3V pin.
	Output	
2	Data	Data received can be obtained from this pin.
3	Data	Data received can be obtained from this pin.



To give you a sample of the RF Transmitter/Receiver Kit (433 MHz) working principle, let us delve into its most common and basic application using the Arduino Uno microcontroller. This will serve as the QuickStart Guide for this kit.

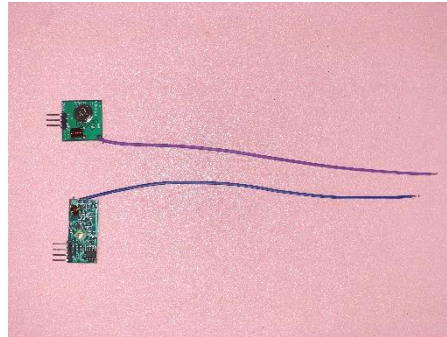
PARTS LIST

For this QuickStart guide, we will need the following materials:

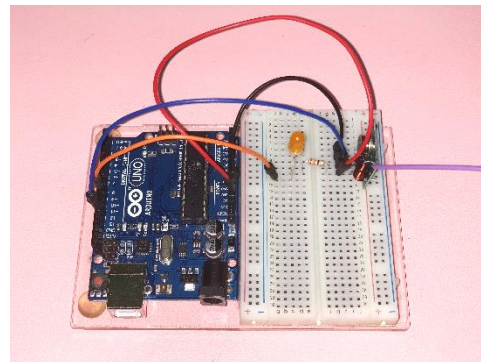
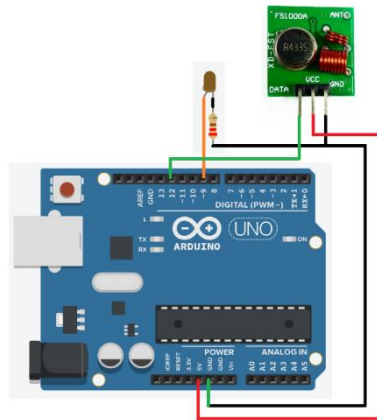
 <p>RF Wireless Transmitter (433 MHz) – 1 piece</p>	 <p>RF Wireless Receiver (433 MHz) – 1 piece</p>	 <p>LED – 2 pieces</p>
 <p>Buzzer – 1 piece</p>	 <p>Battery – 2 pieces</p>	 <p>Arduino Uno – 2 pieces</p>
 <p>Breadboard – 2 pieces</p>	 <p>Connecting Wires (Male-to-Male)</p>	 <p>¼Watt, 220Ω Resistor – 2 pieces</p>

WIRING CONNECTION

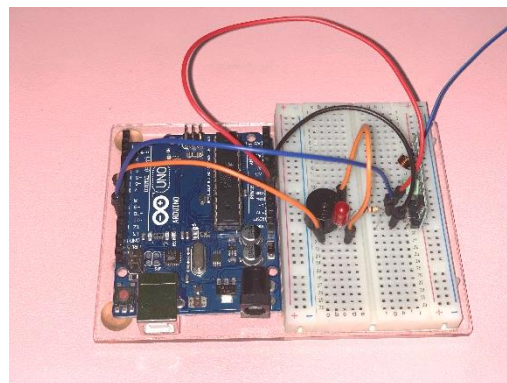
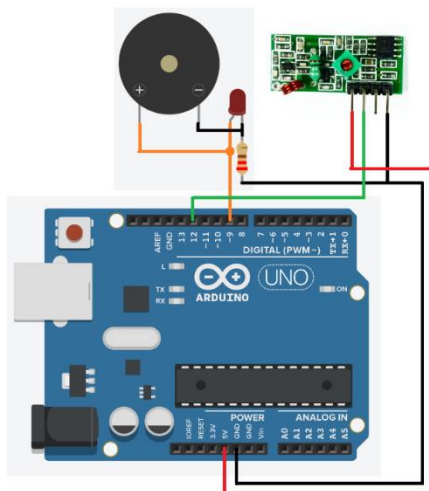
Before setting up the hardware for the transmitter and receiver circuits, make sure to solder an antenna to both of the modules to enable wireless communication. Approximately 17cm antennas can be placed on the modules as follows:



Setup the hardware for TRANSMITTER as shown below:



Setup the hardware for RECEIVER as shown below:



ARDUINO CODE

A library is required to run the code for the transmitter and receiver. It is called VirtualWire and it can be downloaded through the GitHub link: <https://github.com/m0/Updated-Arduino-VirtualWire-Library>.

It is assumed that you already tried adding library to Arduino IDE. Otherwise, you can check this link: <https://docs.arduino.cc/software/ide-v1/tutorials/installing-libraries>.

Open Arduino IDE. Copy the code for the TRANSMITTER below into the programmer:

```
#include <VirtualWire.h>
const int ledPin = 9;
char *data;
void setup()
{
  pinMode(ledPin,OUTPUT);
  vw_set_ptt_inverted(true);
  vw_set_tx_pin(12);
  vw_setup(4000);
}
void loop()
{
  data="0";
  vw_send((uint8_t *)data, strlen(data));
  vw_wait_tx();
  digitalWrite(ledPin,HIGH);
  delay(500);
  data="1";
  vw_send((uint8_t *)data, strlen(data));
  vw_wait_tx();
  digitalWrite(ledPin,LOW);
  delay(500);
}
```

Upload the code to the Arduino board used for the TRANSMITTER circuit.

Open another sketch. Copy the code for the RECEIVER below into the programmer:

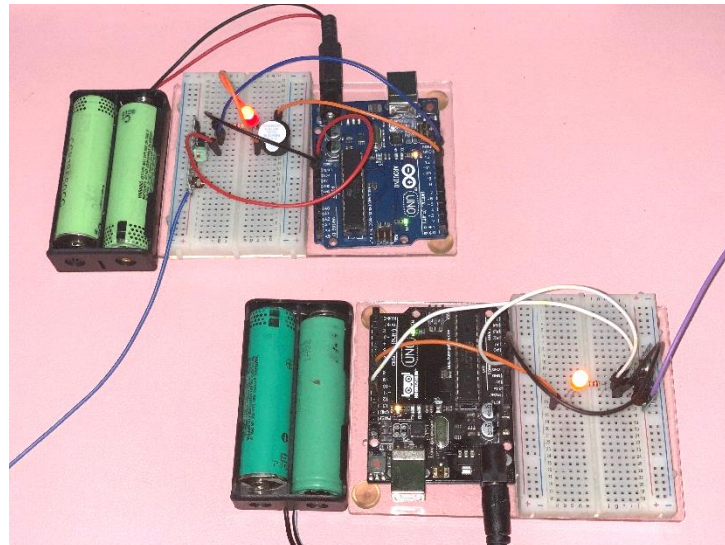
```
#include <VirtualWire.h>
void setup()
{
  vw_set_ptt_inverted(true); // Required for DR3100
  vw_set_rx_pin(12);
  vw_setup(4000); // Bits per sec
  Serial.begin(9600);
  pinMode(9, OUTPUT);
  vw_rx_start(); // Start the receiver PLL running
}
void loop()
{
  uint8_t buf[VW_MAX_MESSAGE_LEN];
  uint8_t buflen = VW_MAX_MESSAGE_LEN;
  Serial.println();
  if (vw_get_message(buf, &buflen) // Non-blocking
```

```
{
if(buf[0]=='0')
{
digitalWrite(9, HIGH);
}
else
{
digitalWrite(9, LOW);
}
}
}
```

Upload the code to the Arduino board used for the RECEIVER circuit.

OUTPUT

The output will show that the two circuits (transmitter and receiver) communicate wirelessly. It is evident by looking at the receiver where the RED LED blinks and the Buzzer makes sound according to how the ORANGE LED from the transmitter blinks.



REFERENCES

Complete Guide for RF 433MHz Transmitter/Receiver Module with Arduino, January 2019
<https://randomnerdtutorials.com/rf-433mhz-transmitter-receiver-module-with-arduino/>

RF Communication | RF transmitter and Receiver with Arduino by Techatronic
<https://techatronic.com/rf-transmitter-and-receiver-with-arduino/>

TUTORIAL: How to set up wireless RF (433Mhz) Transmitter Receiver Module - Arduino Quick Simple, by Antony Cartwright
https://www.youtube.com/watch?v=KA_YE7AvFn0