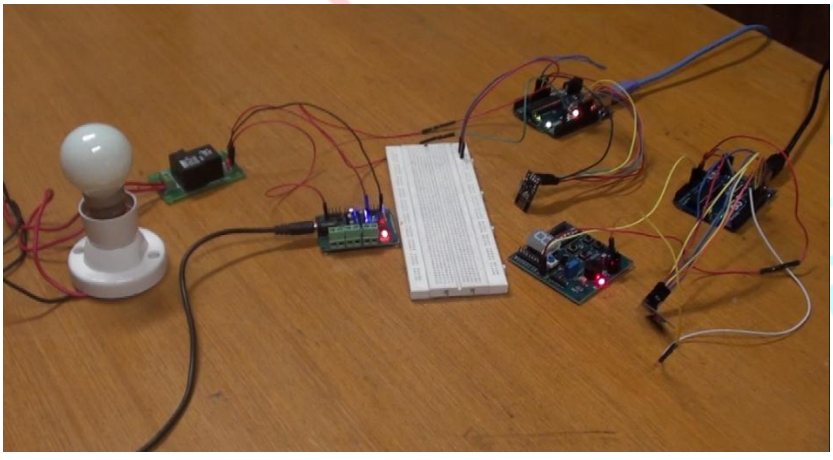
TENET TECHNETRONICS

2015

Interfacing NRF24L01 Transceiver with Arduino UNO



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Transmitting data through wireless can be done by various hardware modules like XBEE, HC-05 Bluetooth module, RF ASK module etc. These modules operate on different frequency band and they are very much costlier, if you are looking out for a wireless transceiver device which uses ultralow power and with less cost and it can also transmit and receive data up to 1Km range NRF24L01 is the device.

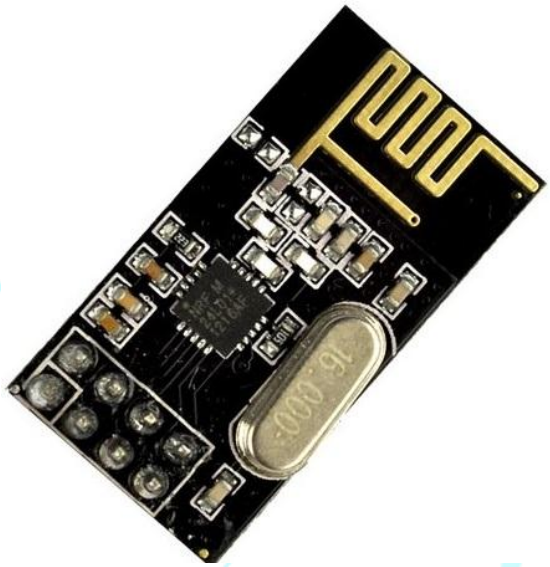

Figure 1 - nRF24L01 module

The nRF24L01+ is a single chip 2.4GHz transceiver with an Enhanced shock burst protocol embedded in it, which operates on a very low power (i.e. 3.3V). In this application note we are interfacing nRF24L01+ module with Arduino UNO to turn ON an LED, whenever the LDR value reaches certain limit on the transmitter end a LED on the receiver side will glow.

PIN Configuration:

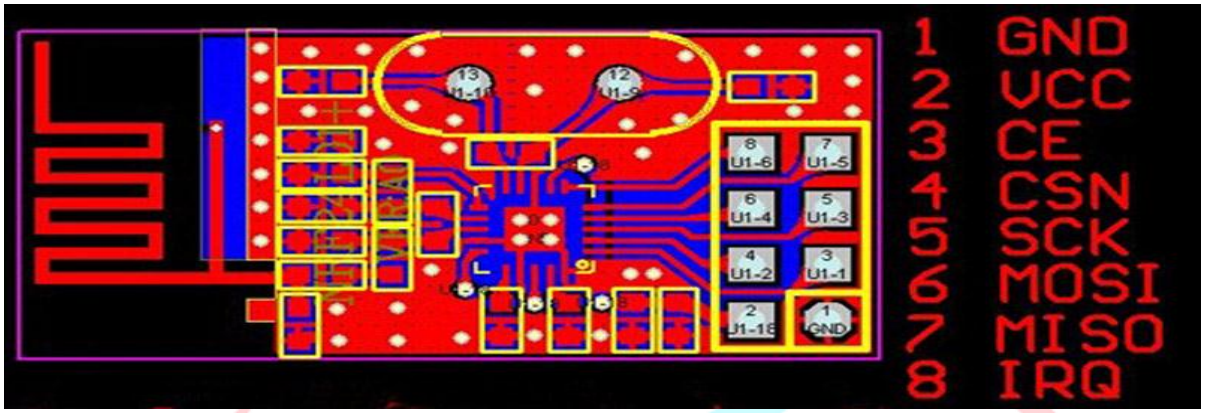

Figure 2 – nRF24L01 pin outs

Pin Description:

GND	Connects to System Ground
IRQ	Maskable interrupt pin. Active Low
MISO	SPI Slave Data Output
MOSI	SPI Slave Data Input
SCK	SPI Slave Data Input
CSN	SPI Chip Select
CE	Chip Enable Activates RX or TX mode. CE = 0 makes the chip to go into Stand-by
VCC	Connects to Power Supply (3.3V).

Pin connections:

Arduino UNO	**nRF24L01**
GND	GND
3.3V	VCC
Pin-9	CE
Pin-10	CSN
Pin-13	SCK
Pin-11	MOSI
Pin-12	MISO
No connection	IRQ

Interfacing nRF24L01+ module with Arduino UNO

Transmitter Block diagram

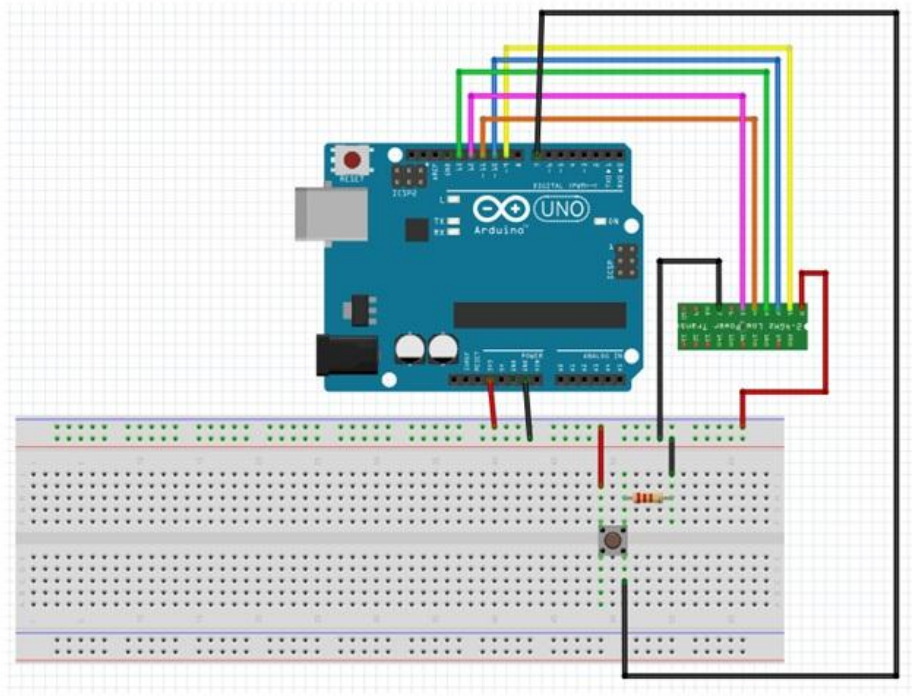

Figure 3 – Transmitter circuit diagram

Receiver:

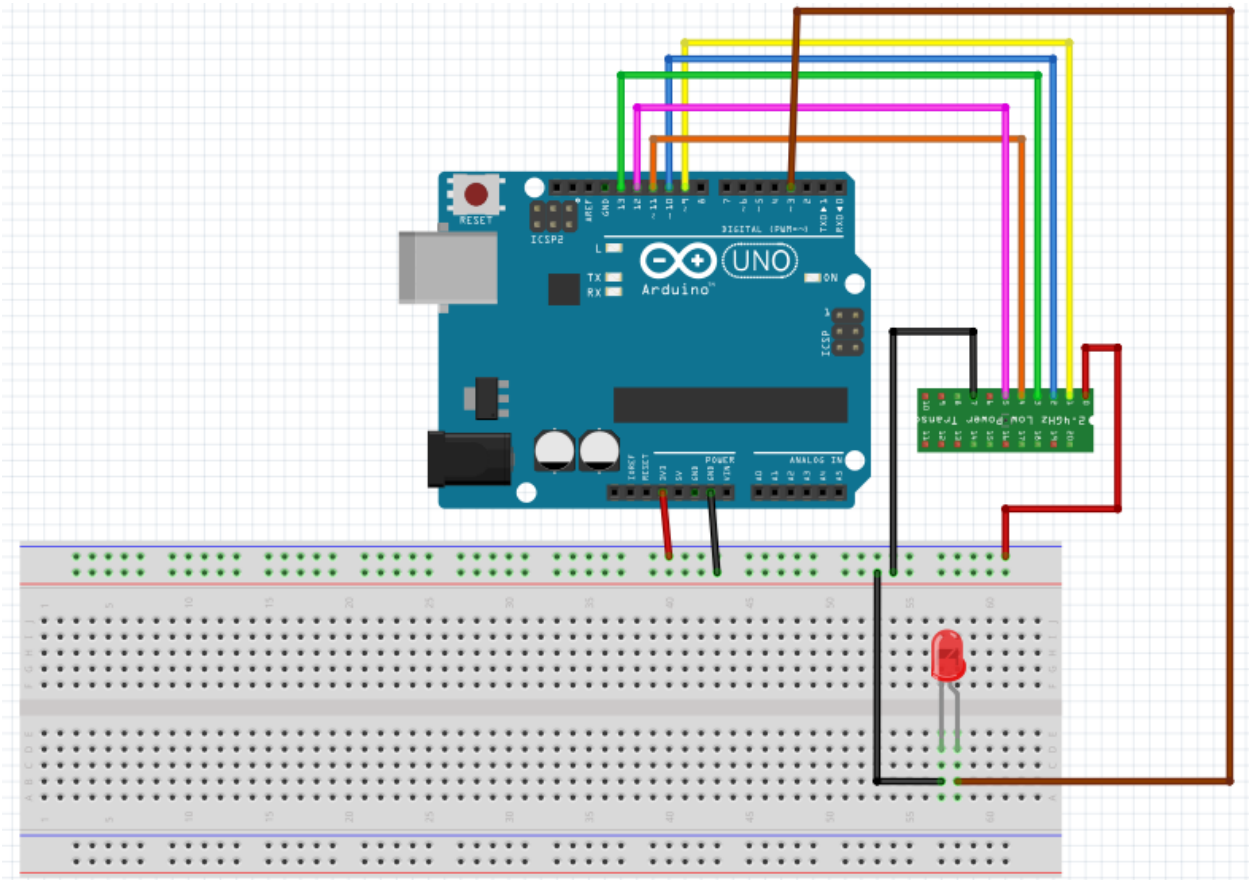

Figure 4 – Receiver circuit diagram

Code:

Transmitter:

```
#include  <SPI.h>
#include "nRF24L01.h"
#include "RF24.h"
int msg[1];
RF24 radio(9,10);
const uint64_t pipe = 0xE8E8F0F0E1LL;
```

```
int SW1 = 7;


void setup(void){
 Serial.begin(9600);
 radio.begin();
 radio.openWritingPipe(pipe);}


void loop(void){
 if (digitalRead(SW1) == HIGH){
 msg[0] = 111;
 radio.write(msg, 1);}}
```

Receiver:

```
#include <SPI.h>
#include "nRF24L01.h"
#include "RF24.h"
int msg[1];
RF24 radio(9,10);
const uint64_t pipe = 0xE8E8F0F0E1LL;
int LED1 = 7;


void setup(void){
 Serial.begin(9600);
 radio.begin();
```

```
 radio.openReadingPipe(1,pipe);
 radio.startListening();
 pinMode(LED1, OUTPUT);}

void loop(void){
 if (radio.available()){
   bool done = false;
   while (!done){
     done = radio.read(msg, 1);
     Serial.println(msg[0]);
     if (msg[0] == 111){
delay(10);
digitalWrite(LED1, HIGH);}
     else {
      digitalWrite(LED1, LOW);}
     delay(10);}}
 else{Serial.println("No radio available");
}
}
```

Libraries to be included:

https://github.com/maniacbug/RF24

Result:

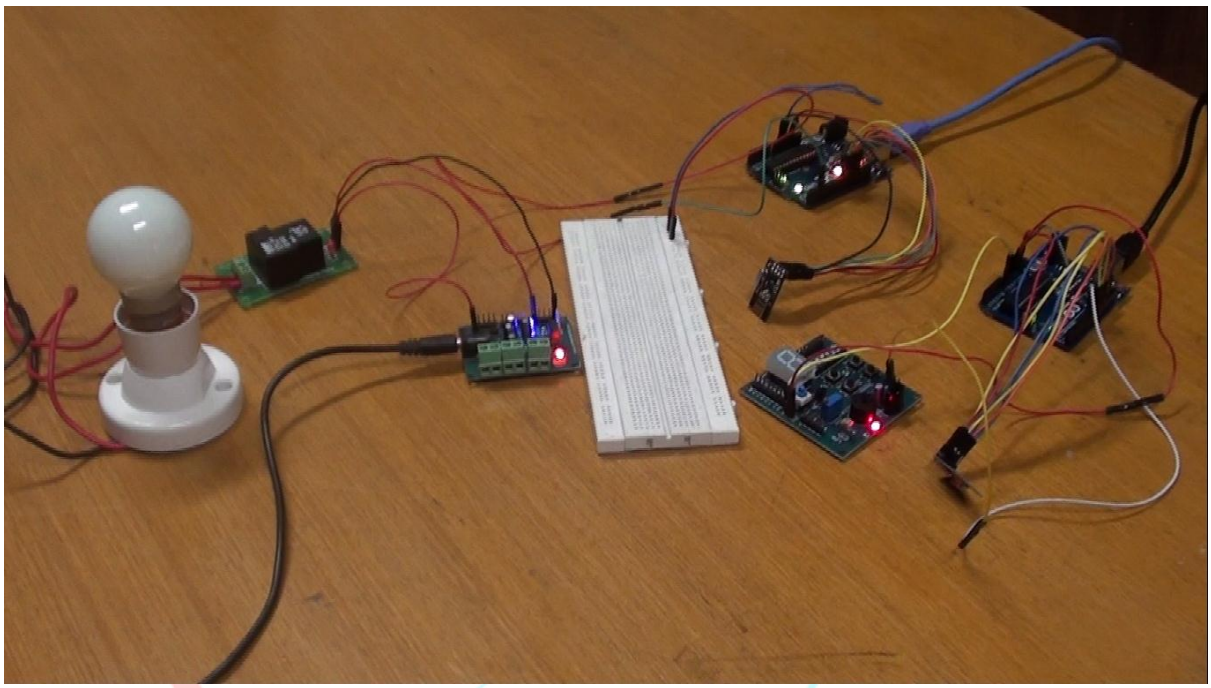

Figure 3 – No button pressed

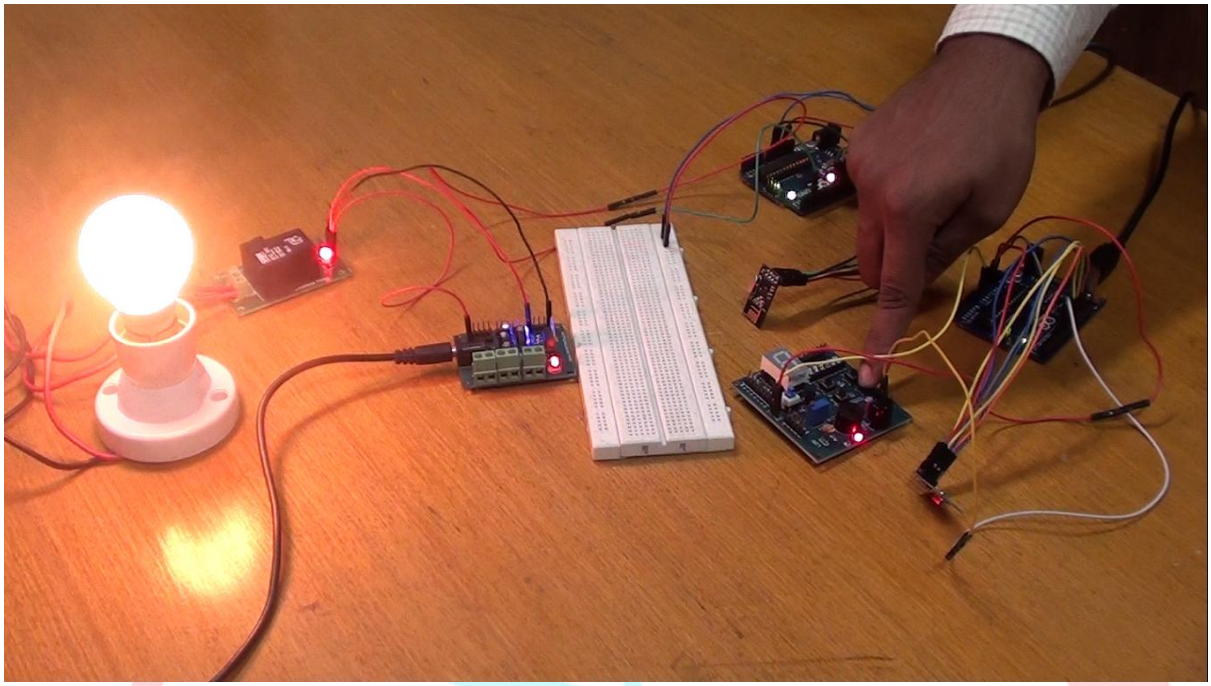

Figure 4 – Button is pressed

For product information:

1. http://www.tenettech.com/product/5294/nrf24l01module
2. HTTP://WWW.TENETTECH.COM/PRODUCT/202/ARDUINO-UNO-ARDUINO-UNO-R3
3. HTTP://WWW.TENETTECH.COM/PRODUCT/2609/BASIC-BREADBOARD

For more information please visit: www.tenettech.com

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