TA0034 Instructions for RF Transceiver Module (nRF24L01)

**1.Introduction**

These are a series of 2.4 GHz Radio modules that are all based on the Nordic Semiconductor nRF24L01+ chip. The Nordic nRF24L01+ integrates a complete 2.4GHz RF transceiver, RF synthesizer, and baseband logic including the Enhanced ShockBurst™ hardware protocol accelerator supporting a high-speed SPI interface for the application controller. The low-power short-range (200 feet or so) Transceiver is available on a board with Arduino interface and built-in Antenna.

**2. Pin Instructions**

|  |  |  |
| --- | --- | --- |
| nRF24L01 Pin name | Arduino pin (RF24 Library) | Pin Description |
| VCC | 3.3V | Power(3.3V) |
| CE | 9 | Chip (RX/TX) Enable, high active. If high, module is either sending or listening |
| CSN | 10 | Chip Select Not, low active. If low, the chip responds to SPI commands. This is actually the ‘real’ chip select signal, and is easily confusing with CE which enables/disables the transceiver radio part. |
| SCK | 13 | SPI Shift Clock, up to 10 MHz |
| MOSI | 6 | Master-Out-Slave-In, used to shift data from the microcontroller to the device |
| MISO | 7 | Master-In-Slave-Out, used to shift data from the device to the microcontroller. |
| IRQ | 2 | Optional Interrupt Request pin. Signals RX/TX status like packet sent or received. |
| GND | GND | Ground |

**3. Example**

There are two sketches that you can cut and paste into a blank Arduino IDE windows and then save. Upload one to the Arduino that has an nRF24L01 connected, and the joystick or Potentiometers connected. Upload the other into an Arduino with an nRf24L01.

Example 1: nRF24L01\_Transmit\_JoyStick

\*\*\*\*\*\*\*\*\*\*Code Begin\*\*\*\*\*\*\*\*\*

/\* YourDuinoStarter Example: nRF24L01 Transmit Joystick values

- WHAT IT DOES: Reads Analog values on A0, A1 and transmits

them over a nRF24L01 Radio Link to another transceiver.

- SEE the comments after "//" on each line below

- CONNECTIONS: nRF24L01 Modules See:

http://arduino-info.wikispaces.com/Nrf24L01-2.4GHz-HowTo

1 - GND

2 - VCC 3.3V !!! NOT 5V

3 - CE to Arduino pin 9

4 - CSN to Arduino pin 10

5 - SCK to Arduino pin 13

6 - MOSI to Arduino pin 11

7 - MISO to Arduino pin 12

8 - UNUSED

-

Analog Joystick or two 10K potentiometers:

GND to Arduino GND

VCC to Arduino +5V

X Pot to Arduino A0

Y Pot to Arduino A1

- V1.00 11/26/13

Based on examples at http://www.bajdi.com/

Questions: terry@yourduino.com \*/

/\*-----( Import needed libraries )-----\*/

#include <SPI.h>

#include <nRF24L01.h>

#include <RF24.h>

/\*-----( Declare Constants and Pin Numbers )-----\*/

#define CE\_PIN 9

#define CSN\_PIN 10

#define JOYSTICK\_X A0

#define JOYSTICK\_Y A1

// NOTE: the "LL" at the end of the constant is "LongLong" type

const uint64\_t pipe = 0xE8E8F0F0E1LL; // Define the transmit pipe

/\*-----( Declare objects )-----\*/

RF24 radio(CE\_PIN, CSN\_PIN); // Create a Radio

/\*-----( Declare Variables )-----\*/

int joystick[2]; // 2 element array holding Joystick readings

void setup() /\*\*\*\*\*\* SETUP: RUNS ONCE \*\*\*\*\*\*/

{

Serial.begin(9600);

radio.begin();

radio.openWritingPipe(pipe);

}//--(end setup )---

void loop() /\*\*\*\*\*\* LOOP: RUNS CONSTANTLY \*\*\*\*\*\*/

{

joystick[0] = analogRead(JOYSTICK\_X);

joystick[1] = analogRead(JOYSTICK\_Y);

radio.write( joystick, sizeof(joystick) );

}//--(end main loop )---

/\*-----( Declare User-written Functions )-----\*/

//NONE

\*\*\*\*\*\*\*\*Code End\*\*\*\*\*\*\*

Example 2: nRF24L01\_Receive\_JoyStick

\*\*\*\*\*\*\*\*\*\*\*\*code Begin\*\*\*\*\*\*\*\*\*

/\* YourDuinoStarter Example: nRF24L01 Receive Joystick values

- WHAT IT DOES: Receives data from another transceiver with

2 Analog values from a Joystick or 2 Potentiometers

Displays received values on Serial Monitor

- SEE the comments after "//" on each line below

- CONNECTIONS: nRF24L01 Modules See:

http://arduino-info.wikispaces.com/Nrf24L01-2.4GHz-HowTo

1 - GND

2 - VCC 3.3V !!! NOT 5V

3 - CE to Arduino pin 9

4 - CSN to Arduino pin 10

5 - SCK to Arduino pin 13

6 - MOSI to Arduino pin 11

7 - MISO to Arduino pin 12

8 - UNUSED

- V1.00 11/26/13

Based on examples at http://www.bajdi.com/

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/\*-----( Import needed libraries )-----\*/

#include <SPI.h>

#include <nRF24L01.h>

#include <RF24.h>

/\*-----( Declare Constants and Pin Numbers )-----\*/

#define CE\_PIN 9

#define CSN\_PIN 10

// NOTE: the "LL" at the end of the constant is "LongLong" type

const uint64\_t pipe = 0xE8E8F0F0E1LL; // Define the transmit pipe

/\*-----( Declare objects )-----\*/

RF24 radio(CE\_PIN, CSN\_PIN); // Create a Radio

/\*-----( Declare Variables )-----\*/

int joystick[2]; // 2 element array holding Joystick readings

void setup() /\*\*\*\*\*\* SETUP: RUNS ONCE \*\*\*\*\*\*/

{

Serial.begin(9600);

delay(1000);

Serial.println("Nrf24L01 Receiver Starting");

radio.begin();

radio.openReadingPipe(1,pipe);

radio.startListening();;

}//--(end setup )---

void loop() /\*\*\*\*\*\* LOOP: RUNS CONSTANTLY \*\*\*\*\*\*/

{

if ( radio.available() )

{

// Read the data payload until we've received everything

bool done = false;

while (!done)

{

// Fetch the data payload

done = radio.read( joystick, sizeof(joystick) );

Serial.print("X = ");

Serial.print(joystick[0]);

Serial.print(" Y = ");

Serial.println(joystick[1]);

}

}

else

{

Serial.println("No radio available");

}

}//--(end main loop )---

/\*-----( Declare User-written Functions )-----\*/

//NONE

\*\*\*\*\*\*\*Code End\*\*\*\*\*\*\*\*