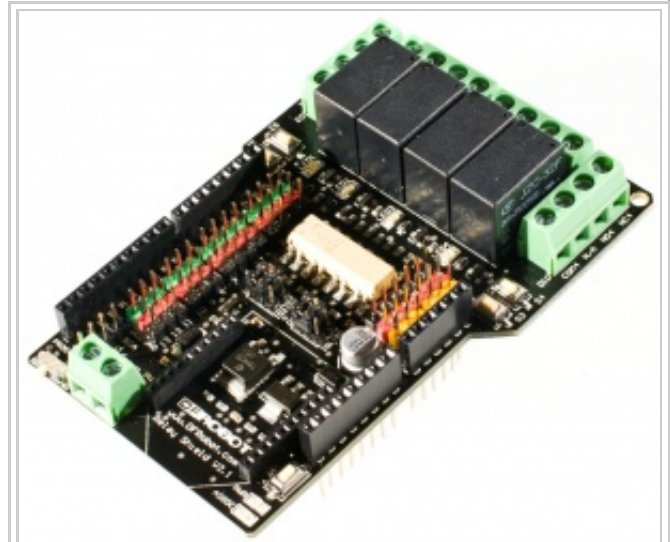


Relay Shield for Arduino V2.1 (SKU:DFR0144)

From Robot Wiki

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Relay Shield for Arduino V2.1

Introduction

The DFRobot Relay shield V2.1 is capable of controlling 4 relays. The max switching power is DC 90W or AC 360VA. It is possible to control the Relay shield through Arduino/DFRduino using digital IOs with external 7 to 12V supply. With the built in xbee socket, it can be wirelessly controlled via Xbee/bluetooth/WPM. This makes it an ideal solution for automation and robotics.

NOTE:It needs an external powered to use an xbee module

Specification

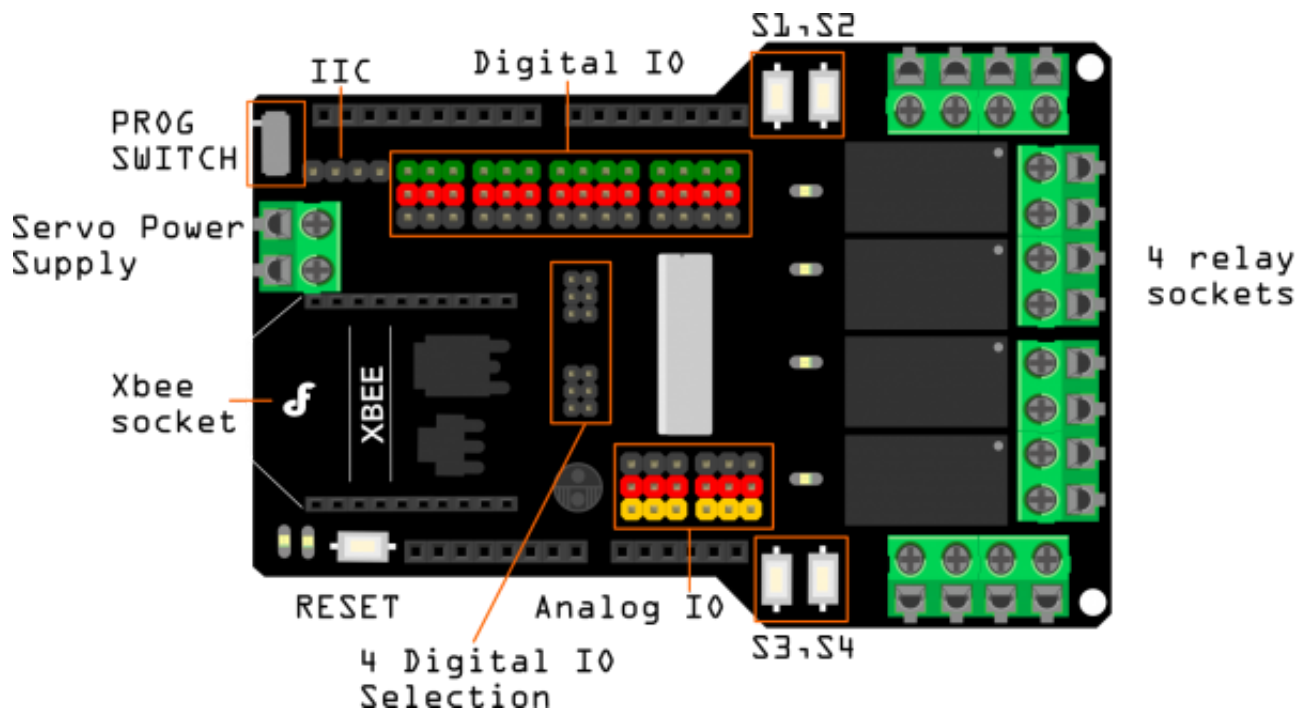
- Compatible with Arduino Rev3
- 4 buttons to test module
- LED status indicator of relay
- Support Xbee IO directly control
- Xbee socket for wireless communication
- Selectable digital IO pin for control(Default digital 2,7,8,10)
- 6 channels Analog IO & 13 channels Digital IO
- Up to 4 Relay with photo-coupled circuit
- Relay information:
 - Contact Rating 3A AC 120V / DC 24V
 - Max Switching Voltage AC 240V / DC 60V
 - Max Switching Current 5A
 - Max Switching Power AC 360VA / DC 90W

- Electrical Life (Min) 100,000 Operations
- Mechanical Life (Min) 10,000,000 Operations
- Safety Standard(relay) UL cUL TUV CQC
- Coil Working Voltage 9VDC
- Working temperature -30°C to +85°C
- Working temperature 40% - 85%
- Size:95x65mm

Documents

- Schematic
(<http://www.dfrobot.com/image/data/DFR0144/V2.1/Relay%20shield%20Schematic%20V2.1.pdf>)
- HJR4102 datasheet (<http://www.dfrobot.com/image/data/DFR0144/V2.1/HJR-4102-L-05V.pdf>)

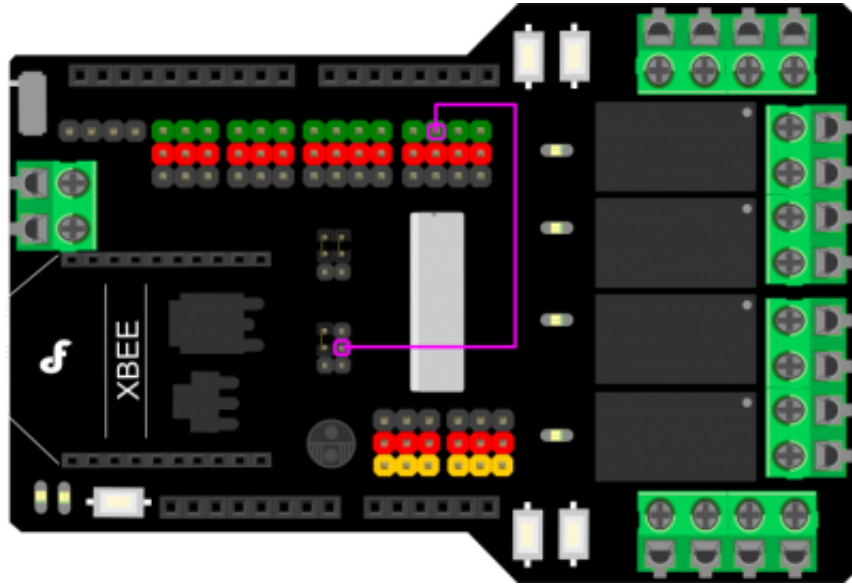
Pin Out



More details:

- **PROG SWITCH:**
 - PROG:When programming or download the code if you plug the Xbee/bluetooth on the module
 - RGN: Run the module after finishing downloading the code
- S1,S2,S3,S4:4 Buttons to test the module that you needn't program,S1- S4 correspond to relay1-relay4
- Servo Power Supply:Just can supply power to the digital IO pins
- 4 Digital IO selection headers for the Relays:
 - D2,D7,D8,D10: Default,connect to Arduino digital 2,7,8,10 to drive the relays

- IO0,IO1,IO2,IO3:Connect to XBee's IO pins
- **You can connect the middle pin header after you unplug the jumper, to Arduino digital IO with jumper cables depend on your needed pin mapping to drive relays.For example,when you use the board with an Arduino Ethernet board.They will conflict the digital 10,so you should do like the following picture.**



Technical Information

Pin Mapping (default)

D2 -> COM1

D7 -> COM2

D8 -> COM3

D10 -> COM4

NC Normally Closed - NC1 is connected with COM1 when control port D2 is set low and disconnected when D2 is set high

NO Normally Open - NO1 is disconnected from COM1 when control port D2 is set low and connected when D2 is set high

XBee interface

The XBee module supports Xbee radios, Bluetooth Bee, and the Wireless programming module. This gives the project a versatile wireless communications capability.

Connection Diagram

In this sample connection diagram it shows how LED can be controlled via relays, while this is a bit of overkill for controlling LEDs its only meant to be an example. These relays can be used to control lamps, or some other mid-voltage range appliances.

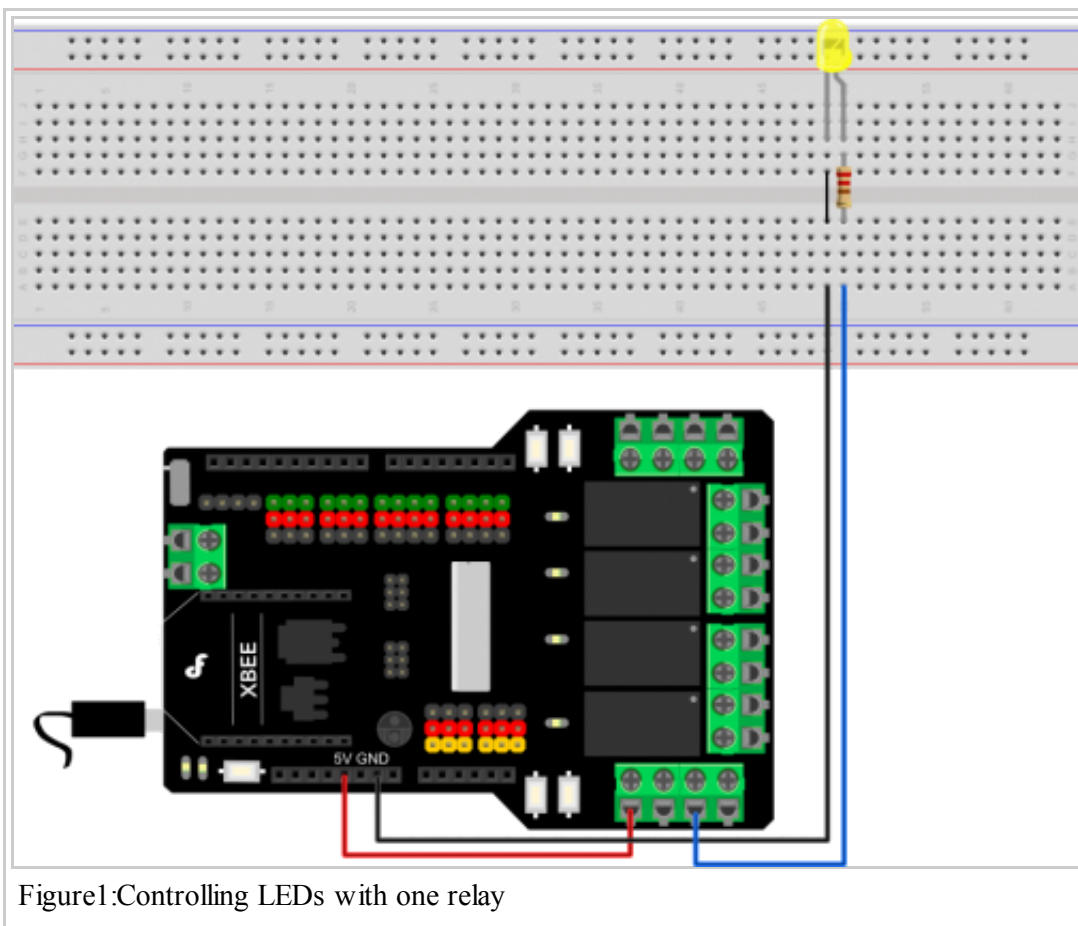


Figure1:Controlling LEDs with one relay

Plugging in an appliance

We will use "NO" for our example, using "NC" will simply reverse the logic, as explained above.

We recommend using a swappable cable to do this with, as using a relay requires you to perform some minor surgery on the appliance's cable. To plug in an appliance such as a lamp: Cut and strip a portion of the positive wire so that you end up with two ends of the wire as shown in Figure 2.

The relay should have the positive wire of the device being used connected to "COM" and to "NO" as shown in figure 2, and any digital signal pin on the arduino end (For example pin 13). Sending a digital high or a "1" will trigger the relay. Sending a digital low or "0" will disable the relay.


```
15
16 int i;
17 for(i = 0; i < 4; i++) digitalWrite(relayPin[i],HIGH);
18 delay(1000);
19 for(i = 0; i < 4; i++) digitalWrite(relayPin[i],LOW);
20 delay(1000);
21
22}
```

A more elaborate sample code

```
?
1 /*
2  # This Sample code is for testing the Relay shield V2.1 for Arduino.
3
4  # Editor : Phoebe
5  # Date   : 2013.2.28
6  # Ver    : 0.1
7  # Product: Relay shield for Arduino
8  # SKU    : DRI0144
9
10 # Hardwares:
11 1. Arduino UNO
12 2. Relay Shield For Arduino V2.1
13 3 Power Supply:7~ 12V
14 */
15
16byte relayPin[4] = {
17 2,7,8,10};
18//D2 -> RELAY1
19//D7 -> RELAY2
20//D8 -> RELAY3
21//D10 -> RELAY
22char input=0;
23int val;
24
25void setup() {
26 for(int i = 0; i < 4; i++) pinMode(relayPin[i],OUTPUT);
27 Serial.begin(57600);
28 delay(100);
29 Serial.println("Press 1-4 to control the state of the relay");
30 Serial.println("waiting for input:");
31 for(int j = 0; j < 4; j++) digitalWrite(relayPin[j],LOW);
32}
33
```

```
34void loop() {
35  if (Serial.available())
36  {
37    char input= Serial.read();
38    if(input != -1)
39    {
40      switch(input)
41      {
42
43        case '1':
44          Serial.println("Relay1");
45          val=digitalRead(relayPin[0]);
46          val=!val;
47          digitalWrite(relayPin[0],val);
48          break;
49        case '2':
50          Serial.println("Relay2");
51          val=digitalRead(relayPin[1]);
52          val=!val;
53          digitalWrite(relayPin[1],val);
54          break;
55        case '3':
56          Serial.println("Relay3");
57          val=digitalRead(relayPin[2]);
58          val=!val;
59          digitalWrite(relayPin[2],val);
60          break;
61        case '4':
62          Serial.println("Relay4");
63          val=digitalRead(relayPin[3]);
64          val=!val;
65          digitalWrite(relayPin[3],val);
66          break;
67
68        default:
69          if(input != '\r' && input != '\n')
70            Serial.println("invalid entry");
71          break;
72      }
73    }
74    // else unablerelay();
75  }
76}
```

Resources

- Xbee tutorial (<http://www.dfrobot.com/wiki/index.php/Xbee%7C>)

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