SIS-2 (Rev 5)

2 Output, Universal IR Remote Control Receiver Switch
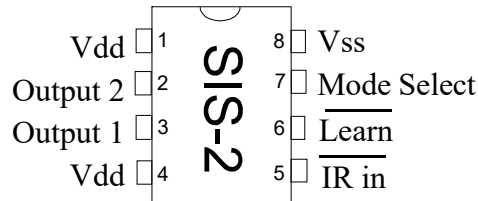
General Description:

The SIS-2 makes it simple to implement an infrared (IR) remote controllable switching solution for a wide variety of applications. When used with an inexpensive IR receiver module, the SIS-2 recognizes IR signals from 2 independent IR remote control sources, and provides 2 modes of switching for your application. The IR sources can be from the same or multiple remotes.

Works with over 99% of IR remotes, both universal and dedicated types.
IR code is easily "taught" by user with a few simple button presses on the IR remote.
IR code is stored in non-volatile, re-programmable memory.
Applications include switching and on/off control of two soures, volume control, digital pots, and servos.

```
         Vdd ┌1      8┐ Vss
    Output 2 ┌2   S   7┐ Mode Select
    Output 1 ┌3   I   6┐ Learn
         Vdd ┌4   S   5┐ IR in
                 -2
```

Vdd (with respect to Vss): 2-5.5V
Max current on I/O pins: 25 ma
Package: 300mil wide Plastic DIP
Current consumption (Vdd=5V): < 2mA

IR in from IR module: No signal = Vdd, Pulses = Vss
IR code is stored in non-volatile, re-programmable memory.
Logic levels of Outputs 1, 2 on power up: Vss (low)

Normal Operation of the SIS-2

After the SIS-2 has been programmed to recognize 2 IR codes, there are two modes of normal operation:

Mode 1 -- Mode Select pin = Vss (pin7=low):

Output 1 (pin 3) will toggle (change to the opposite logic level) each time its corresponding IR code is received.
Output 2 (pin 2) will toggle (change to the opposite logic level) each time its corresponding IR code is received.

Mode 2 -- Mode Select pin = Vdd (pin7=high):

Output 1 (pin 3) is normally low, but goes to Vdd (high) when its corresponding IR code is received.
Output 2 (pin 2) is normally low, but goes to Vdd (high) when its corresponding IR code is received.

(In Mode 2, the output pin will stay continuously high (Vdd) for as long as the IR code is being received. As long as you hold down on the properly aimed IR remote button, the output pin will stay high.)

Discrete Button Mode

Discrete button mode allows the SIS-2 to switch Output 2 (pin 2) to a logic high state when IR code 1 is received and switch Output 2 to a logic low when IR code 2 is received. In other words, one button of the IR remote turns Output 2 "on", and another button of the IR remote turns Output 2 "off".

Discrete button mode is active when pins 4 and 7 of the SIS-2 are connected to ground.

In discrete button mode, after programming is complete, Output 1 (pin 3) is not used.

Programming the SIS-2

Output 1 (pin 3) is controlled by the first IR code that is learned during the programming process.
Output 2 (pin 2) is controlled by the second IR code that is learned during the programming process.

So that the IR codes are properly learned by the SIS-2 during the programming process, you will press each of the two buttons on your IR remote(s) 4 times per button.
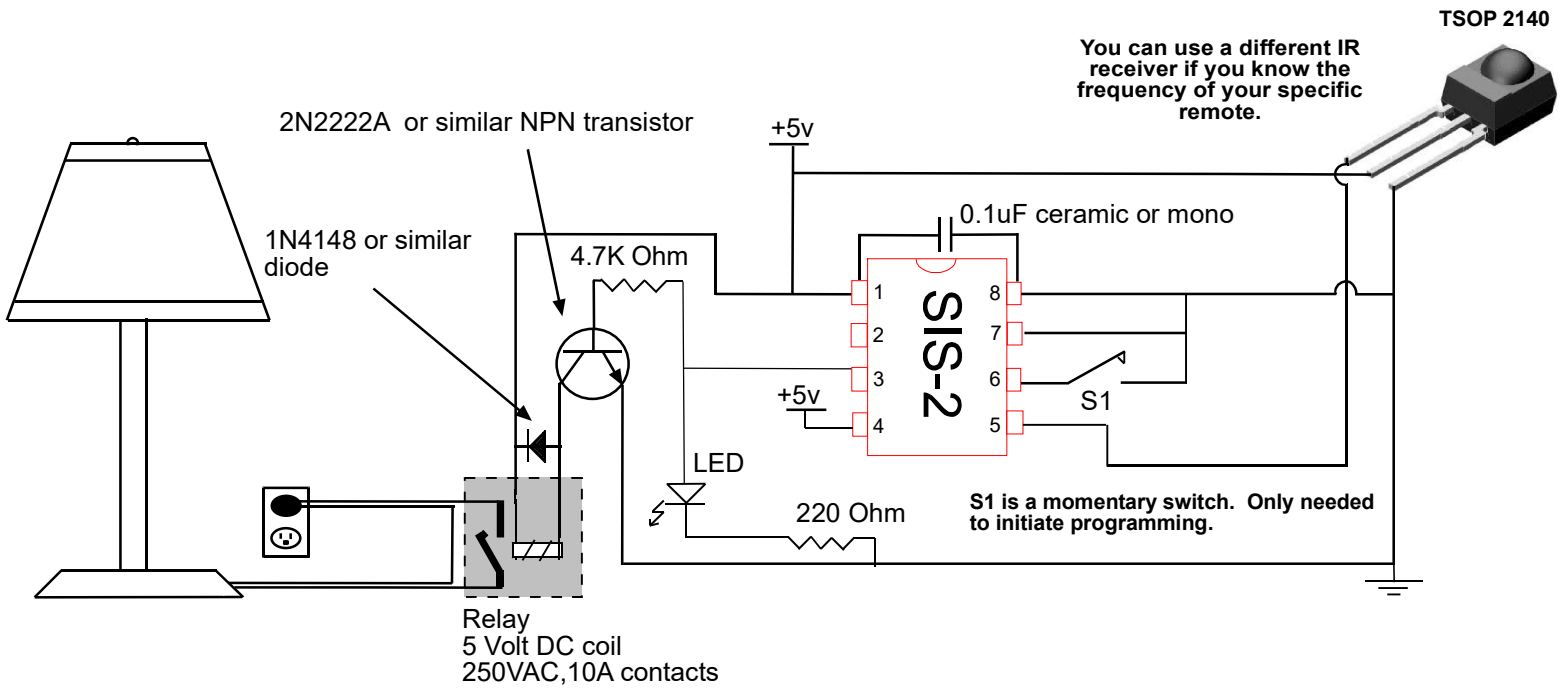
To program the SIS-2:

1. Select the two buttons from your IR remote(s) that you want the SIS-2 to recognize. For the remaining steps below, the first button will be referred to as "button 1", the second button as "button 2", and your IR remote as "the remote."

2. Momentarily pull pin 6 low until pin 3 goes high, indicating that learning mode is active.

3. Aim the remote at the IR receiver and press button 1. When pin 3 goes low, release button 1.

4. Pin 3 will go back high after about 2 seconds. Repeat step 3 three more times.

5. After the above steps are completed, pin three will pulse several times, then remain high. This indicates that the SIS-2 has learned the IR code for button 1, and is now ready to learn the IR code for button 2.

The steps for programming button 2 are identical to button 1, specifically:

6. Aim the remote at the IR receiver and press button 2. When pin 3 goes low, release button 2.

7. Pin 3 will go back high after about 2 seconds. Repeat step 3 three more times.

8. After the above steps are completed, pin 3 will pulse several times then go low. This indicates that programming is complete.

The SIS-2 is now ready for normal use.

Application Example

TSOP 2140

You can use a different IR receiver if you know the frequency of your specific remote.

2N2222A or similar NPN transistor

+5v

1N4148 or similar diode

0.1uF ceramic or mono

4.7K Ohm

SIS-2

1 8
2 7
3 6
4 5

+5v

S1

LED

220 Ohm

S1 is a momentary switch. Only needed to initiate programming.

Relay
5 Volt DC coil
250VAC,10A contacts

Considerations Using the SIS-2

Delay Between Repeated IR Remote Button Presses

In Mode 1 (toggle mode), there is a minimum of a 250ms delay between consecutive IR code recognition. This is designed to prevent unwanted toggling of the output if the user presses the IR remote button a little too long.

Incompatible IR Remotes

The SIS-2 is known to work with over 99% of existing IR remotes. However, it has not been tested with Bang & Olufsen, high-frequency remotes, and is assumed not to work.

IR Receiver Modules

The vast majority of IR receiver modules are use negative logic -- the output from the receiver is high when no IR signal is being detected. The SIS-2 requires a negative logic signal on pin 5. If you choose to use a positive logic IR receiver module, simply use an inverter between the receiver's output and pin 5 of the SIS-2.

If you have questions regarding the SIS-2, contact us: SUPPORT@SIMEREC.com