

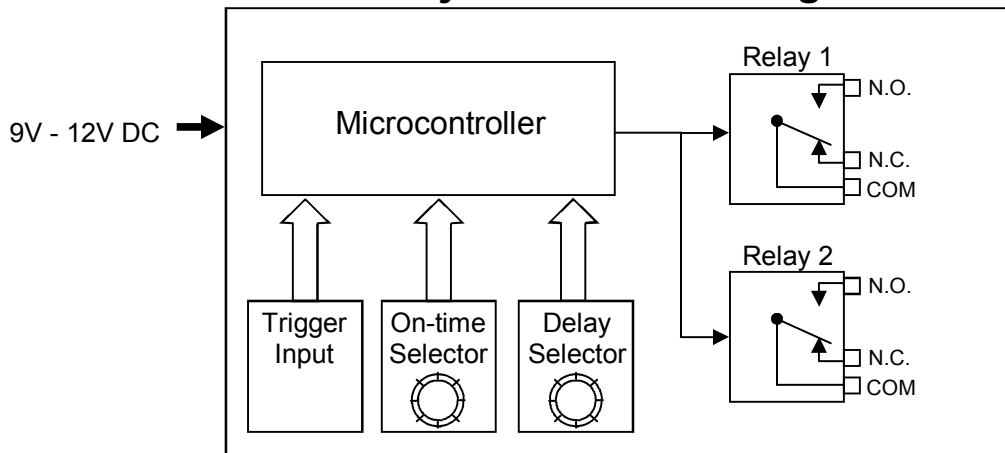
User's Guide for the RT1 Relay Timer

Thank for your purchase of the RT1 Relay Timer. This unit is designed to accept a 5V trigger input and when triggered will turn on 2 relays. The amount of time the relays stay on and the amount of time before another trigger is recognized are both adjustable.

System Features

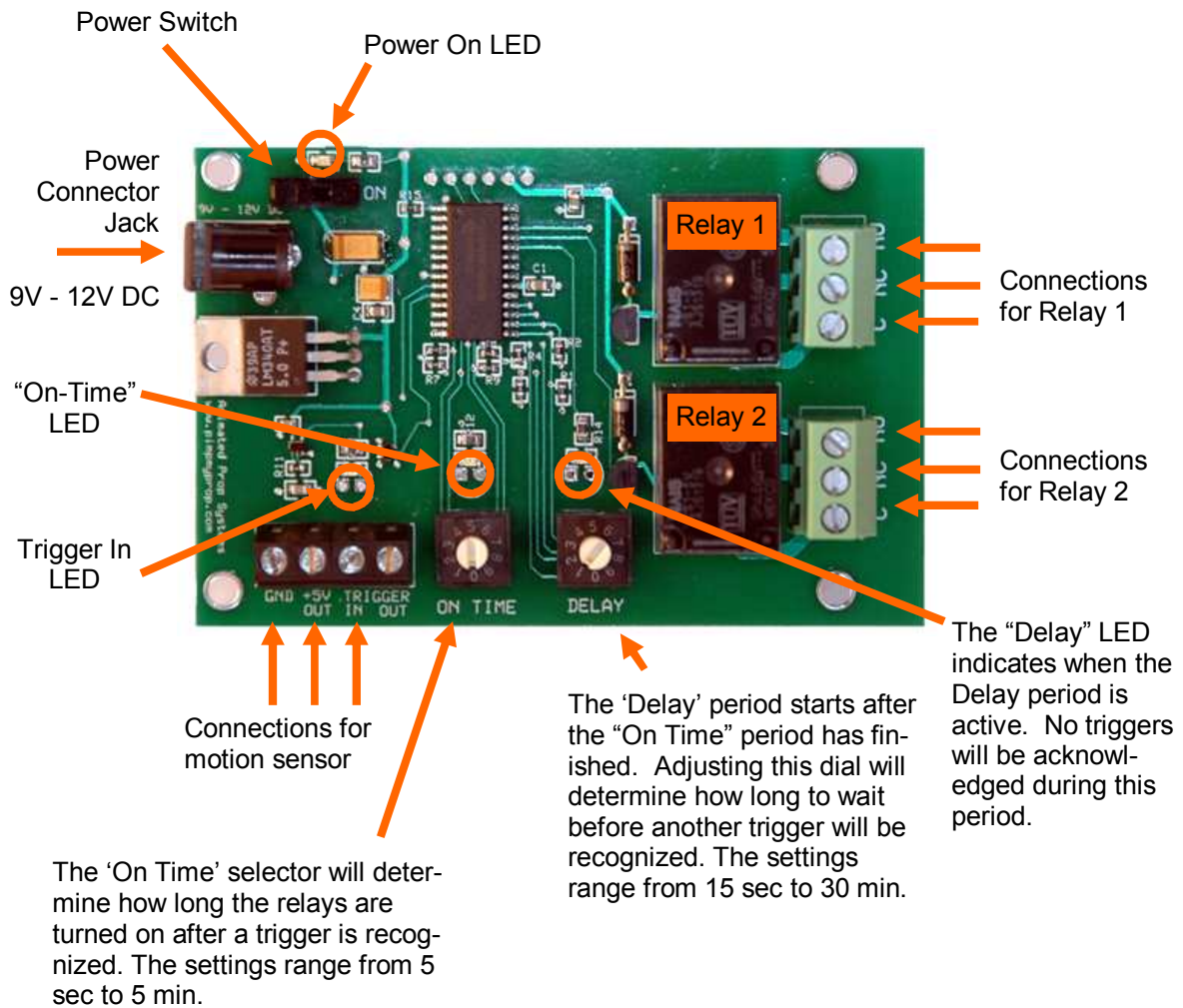
- Relays have normally open (N.O.) and normally closed (N.C.) connections
- Triggered from any 3.3V - 5V input signal
- Selectable On time from 5 sec to 5 min
- Selectable Delay time from 15 sec to 30 min before another trigger is recognized
- 5V "trigger out" signal for controlling other devices
- Indicator LEDs to show trigger in, trigger out and delay

Relay Timer Block Diagram



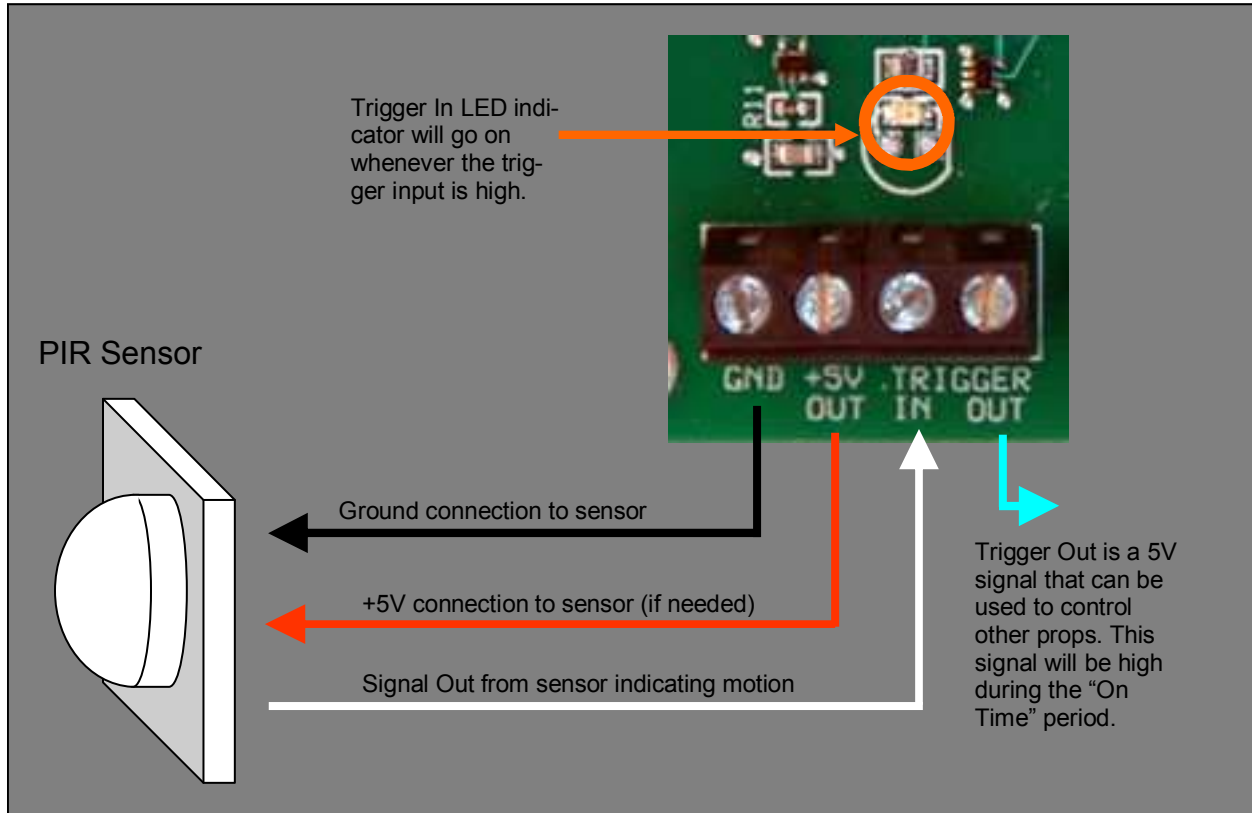
Caution! Working with electrical devices such as this can be inherently dangerous. Using this device without a thorough understanding of the operational principles is considered unsafe and misuse can cause injury AND DEATH. The user assumes all liability when using this device.

RT1 Relay Timer Board layout and basic functions



Trigger Section

The trigger section of the RT1 Relay timer is shown in the photo below. This is where you will connect a sensor or switch to the board that will determine when the relays are turned on.



The 4-position connector in the diagram is where you will connect your motion sensor or switch. The **GND** position on the left is for the ground connection to a sensor. The **+5V OUT** position is a 5V output to power your sensor if needed.

The **TRIGGER IN** position on the connector is for the trigger input signal from the motion sensor. A voltage of 3.3V to 5V on this terminal will 'trigger' the board. The **Trigger In Indicator LED** will light up anytime the trigger signal is above this threshold. It should be noted here that if the board is in the "Delay" period (see section on setting the Delay Time Period) then even though a trigger signal is present and this light is on, the trigger will not be accepted.

The **TRIGGER OUT connection** provides a +5V output signal whenever the "On-Time" period is active. This output is provided for use as a control signal to other devices such as other relays or controller boards. This signal can drive a maximum of 30mA which in most cases is NOT enough to directly drive the coil of a relay.

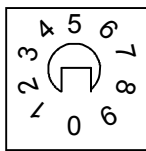
Setting the "On Time" Period

The "On-Time" setting will determine how long the relays are turned on after a trigger is recognized. The On-Time period can be set in increments from 5 sec to 5 min as shown in the table below.

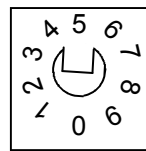
The LED indicator above the switch will go on after a trigger has been accepted and the On-Time period has begun and will stay on as long as the On-time period is in effect.

Make sure you read the next section on adjusting the Delay time.

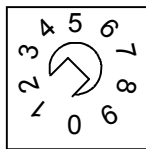
On-Time indicator LED



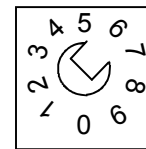
On time indicator = 0
On time = 5 sec



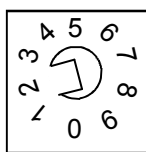
On time indicator = 5
On time = 60 sec



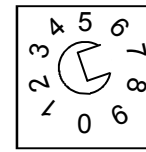
On time indicator = 1
On time = 10 sec



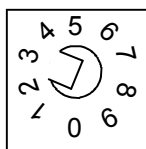
On time indicator = 6
On time = 90 sec



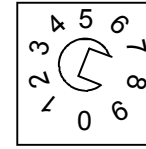
On time indicator = 2
On time = 15 sec



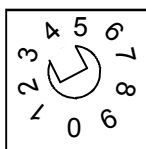
On time indicator = 7
On time = 2 min



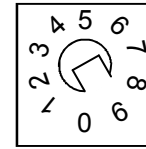
On time indicator = 3
On time = 30 sec



On time indicator = 8
On time = 3 min



On time indicator = 4
On time = 45 sec



On time indicator = 9
On time = 5 min

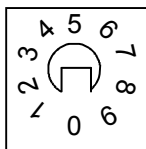
Setting the "Delay Time" Period

The delay feature allows you to set the delay period after the "On time" has completed before another trigger is accepted. The delay time can be changed from 15 sec to 30 min in increments shown in the diagram below. The longer delay times are typically used in situations where multiple triggers are occurring in a short period of time (such as people continuously walking past the sensor) and you want the relay timer to wait a certain amount of time before the relays are activated again. Once some people realize that a sensor has caused something to happen they may be compelled to attempt to make the trigger go off multiple times - which you (or your neighbors) may find annoying. Using a post cycle delay of a few minutes or more usually takes care of this issue.

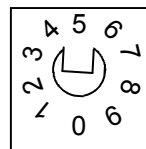
The delay time is set using the rotary dip switch on the board as shown in photo on the right. The switch can be turned to one of 10 positions to adjust the delay as shown below.

The yellow LED indicator above the switch will go on as soon as the "On time" period has finished and will stay on as long as the delay period is in effect. During this delay period, any triggers will be ignored.

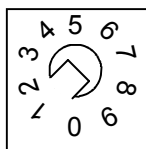
Delay indicator LED



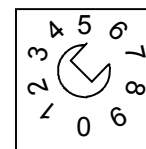
Delay indicator = 0
Delay time = 15 sec



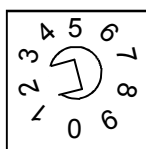
Delay indicator = 5
Delay time = 3 min



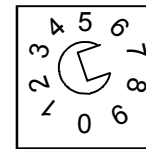
Delay indicator = 1
Delay time = 30 sec



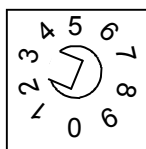
Delay indicator = 6
Delay time = 5 min



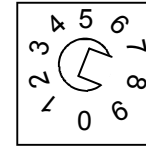
Delay indicator = 2
Delay time = 60 sec



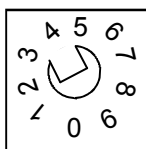
Delay indicator = 7
Delay time = 10 min



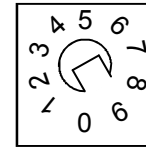
Delay indicator = 3
Delay time = 90 sec



Delay indicator = 8
Delay time = 15 min



Delay indicator = 4
Delay time = 2 min



Delay indicator = 9
Delay time = 30 min

Relay connections

The relays on the RT1 Relay timer can be used to control both AC and DC devices. If you are planning on using AC devices such as lights, be aware that the maximum current that the relays can handle is 10A for both 120V AC or 240V AC. For DC applications such as DC motors, the maximum specification is 100V and 5A.

The relays act as switches that are turned on when a trigger is recognized by the board. The Normally Open connection will act as an open switch until a valid trigger and then the switch is closed. In the example below a light bulb is being controlled by the relay. Until a trigger is received the light bulb will be off and when a trigger is received the light will be turned on for the amount of time indicated by the "On Time" selector dial on the board. After the "On Time" period has finished, another trigger will not be accepted until the "Delay Time" period has expired.

A device connected to the Common and "Normally Closed" terminals will operate in the opposite way, ie., the device will be on until a valid trigger is received and then turn off when the trigger is received.

Example: Typical configuration for controlling a standard AC light bulb.

