

Animated Prop Systems

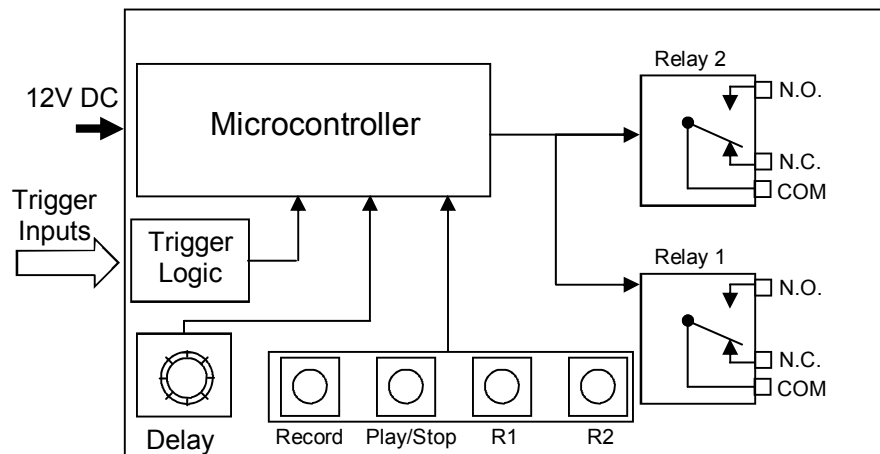
User's Guide for the PC1 Prop Controller

The PC1 unit is designed to record up to 13 minutes of button press sequences related to each of the two relays. When triggered, the recorded sequence will be played back.

System Features

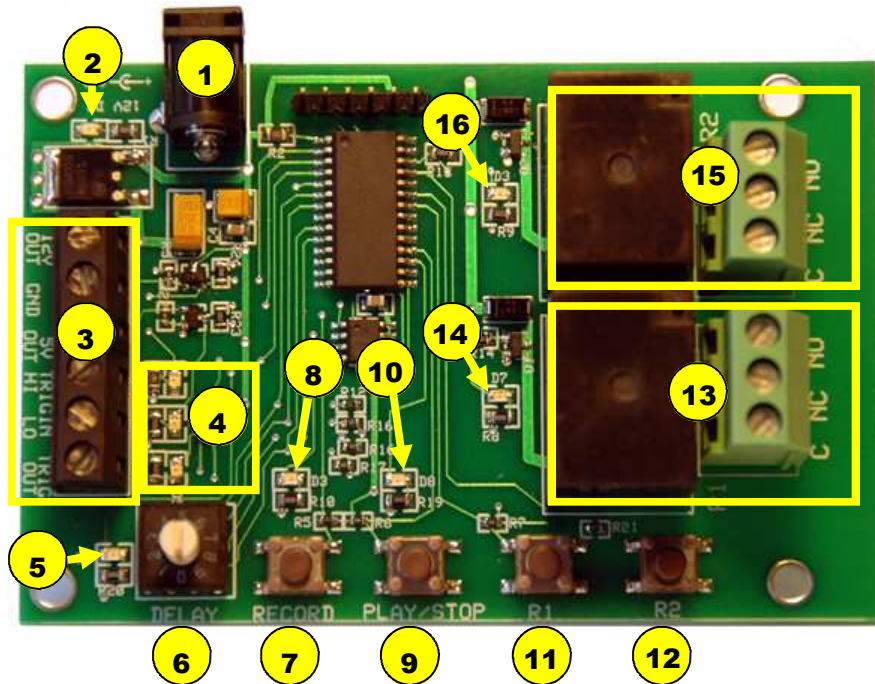
- Records up to 13 minutes of relay actions in a single program
- Plays back recorded program when trigger signal is detected
- Relays have normally open (N.O.) and normally closed (N.C.) connections
- Both high-active and low-active trigger inputs
- Accepts trigger signals from 3.3V - 12V
- Selectable delay time from 15 sec to 30 min before another trigger is recognized
- Always plays full sequence before another trigger is recognized
- 5V "trigger out" signal for controlling other devices
- Indicator LEDs to show trigger in, trigger out, delay period and relay on

PC1 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 *SERIOUS INJURY OR DEATH*. The user assumes all liability when using this device.

PC1 Relay Timer Board layout and basic functions



- 1) Power Connector Jack (12V DC center positive)
- 2) Power on indicator LED (green)
- 3) Sensor/Switch connections (see 'Trigger Section' on page 4)
- 4) Trigger in/out indicator LEDs
- 5) Indicator LED for Delay period (yellow)
- 6) Delay period selection switch - sets delay between 5 sec and 30 min.
- 7) Record start/stop switch used to record the relay sequence
- 8) Record mode indicator LED (red)
- 9) Play/Stop switch used to play the recorded sequence
- 10) Play mode indicator LED (green)
- 11) Relay 1 switch used when recording sequence
- 12) Relay 2 switch used when recording sequence
- 13) Relay 1 and connector for relay
- 14) Indicator LED for Relay 1 (red)
- 15) Relay 2 and connector for relay
- 16) Indicator LED for Relay 2 (red)

Recording a sequence

The purpose of the PC1 board is to record a sequence for the 2 relays and then play that same sequence back when the board is triggered. Below are the steps to follow to record and test your sequence.

Once you complete this sequence your board is ready to go once a trigger is detected. Go to the next section to read details on how to trigger your board and play the recorded sequence.

Step 1

Press the RECORD button. The Record mode LED will go on to indicate you are recording.

Step 2

Press R1 and R2 buttons to turn on and turn off Relay 1 and Relay 2 in whatever sequence you want for your prop. You can record for up to 13 minutes.

Step 3

Press the RECORD button again to stop recording.

Step 4

Press the PLAY button again to test your sequence. The Play mode indicator LED will go on to indicate that the sequence is playing.

Trigger Section

The trigger section of the PC1 Relay timer is shown in the photo to the right. This is where you will connect a sensor or switch to the board which will then determine when the sequence that you have recorded begins to play.

The trigger section consists of a 6-position connector as shown in the diagram.

- 1** The leftmost position (**12V OUT**) provides a 12V signal out for use with a switch or a sensor that requires 12V to operate.
- 2** The second position is Ground (**GND**). This connection is necessary if you are powering a sensor from the PC1 board using either the 5V or 12V signal.
- 3** The third position (**+5V OUT**) provides a 5V signal out for use with a switch or a sensor that requires 5V to operate..

The PC1 has both high-active and a low active trigger inputs to help make connecting to different sensors and switches as easy as possible. Depending on your system, you might use one of these inputs or the other - or possibly even both.

- 4** The high-active trigger input (**TRIGIN HI**) will trigger the board if any voltage from 3V up to 12V is detected on the input.
- 5** The low-active trigger input (**TRIGIN LO**) will trigger the board if this connection is connected to Ground (0V)

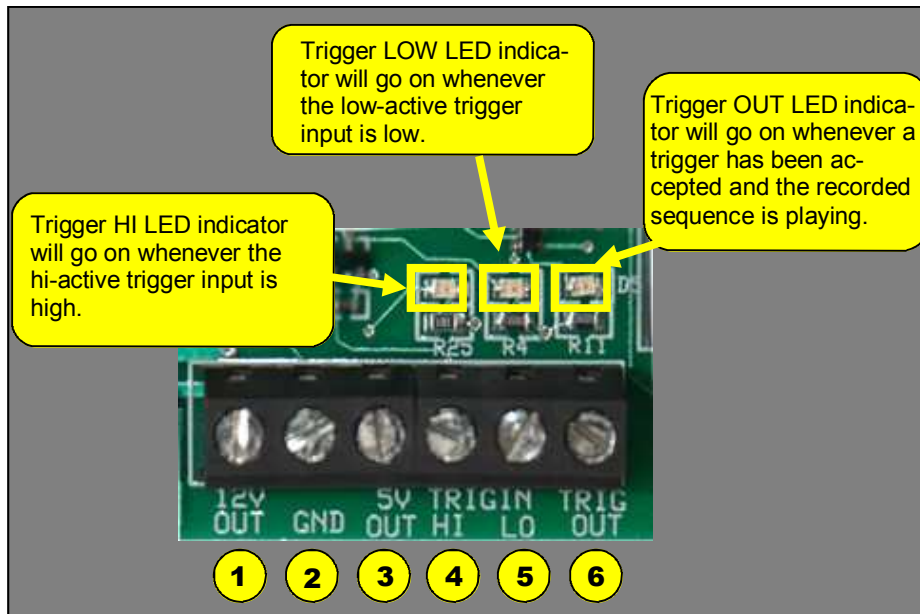
Each of the trigger inputs has a **Trigger Indicator LED** above the connector that will light up anytime a trigger signal is detected on that connector. Note that if the board is playing the recorded sequence or in the "Delay" period (see section on setting the Delay Time Period) then even though a trigger signal is present and this light is on, the trigger will not be accepted until the current sequence has finished playing and the delay period has completed.

- 6** The **Trigger Out connection** provides the means of controlling other devices or acting as the trigger signal for other controllers. The **Trigger Out** connection provides a +5V output signal whenever the player has been triggered by the trigger input and the recorded sequence is playing. This connection will remain high as long as the sequence plays and will go low as soon as the sequence completes. This output will be low during the post cycle delay period. Whenever the Trigger Out connection is high, the red **Trigger Out Indicator LED** will turn on as well.

The Trigger Out signal will only drive about 25mA so it is NOT suitable for directly driving relays or motor - you will need to use a suitable drive circuit for an application such as this. Please see the section in this manual "[How to drive a relay with the Trigger Out pin](#)" for details on a suitable driver circuit.

For more details on how to use the Trigger Out pin to activate other controllers, see the section "[How to use the Trigger Out pin to trigger another controller](#)"

Trigger Input/Output Diagram



Connecting a switch to the trigger inputs

Note that in this example, you could just as easily have connected the switch to the 12V connector instead of the 5V connector.



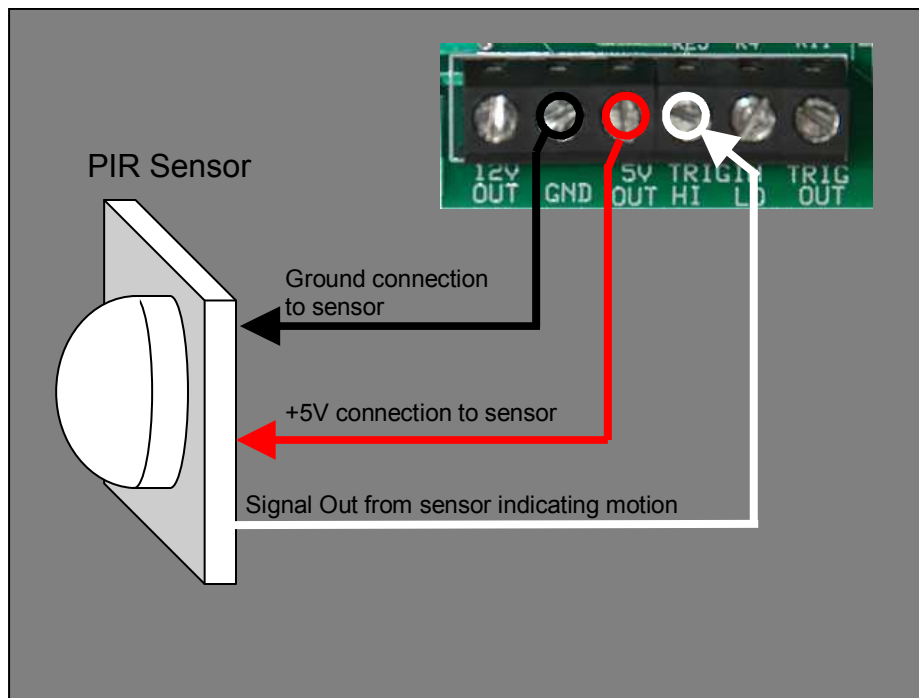
This could be a simple push-button switch or something like a pressure mat.

OR



Connecting a sensor to the inputs

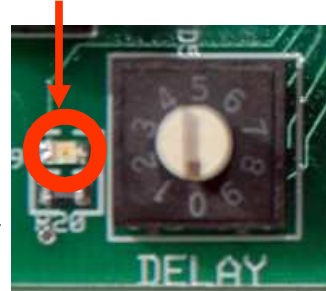
There are many different kinds of motion sensors and therefore the diagram below is just one configuration and the sensor you use may be different. In the example below, we are showing the connections for a simple PIR sensor available from many sources including Parallax. The Parallax sensor requires 5V to operate and provides a 3.3V output when motion is detected. To provide the operating voltage to the sensor we connect the power connection on the sensor (red wire) to the 5V OUT connector on the board and the ground connection on the sensor (black wire) to the GND connector on the board. The output from the sensor (white wire) is connected to the TRIGIN HI connector on the board. When the sensor detects motion the output from the sensor will rise to 3.3V and this will trigger the PC1 to play the recorded relay sequence.



Setting the "Delay Time" Period

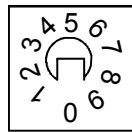
The delay feature allows you to set the delay period after the recorded sequence has finished playing before another trigger is accepted. The delay time can be changed from 15 sec to 30 min in increments shown in the diagram below. The longer delay times are typically used in situations where multiple triggers are occurring in a short period of time (such as people continuously walking past the sensor). 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.

Delay indicator LED

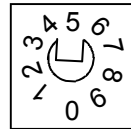


The delay time is set using the rotary dip switch on the board as shown in photo on the right. The switch can be turned to one of 10 positions to adjust the delay as shown below.

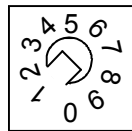
The yellow LED indicator next to the switch will go on as soon as the recorded sequence has finished and will stay on as long as the delay period is in effect. During this delay period, any triggers will be ignored.



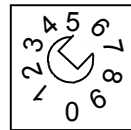
Delay indicator = 0
Delay time = 15 sec



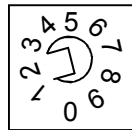
Delay indicator = 5
Delay time = 3 min



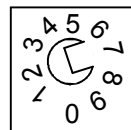
Delay indicator = 1
Delay time = 30 sec



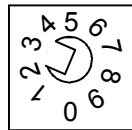
Delay indicator = 6
Delay time = 5 min



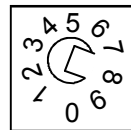
Delay indicator = 2
Delay time = 60 sec



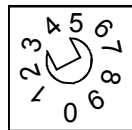
Delay indicator = 7
Delay time = 10 min



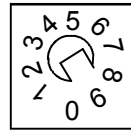
Delay indicator = 3
Delay time = 90 sec



Delay indicator = 8
Delay time = 15 min



Delay indicator = 4
Delay time = 2 min



Delay indicator = 9
Delay time = 30 min

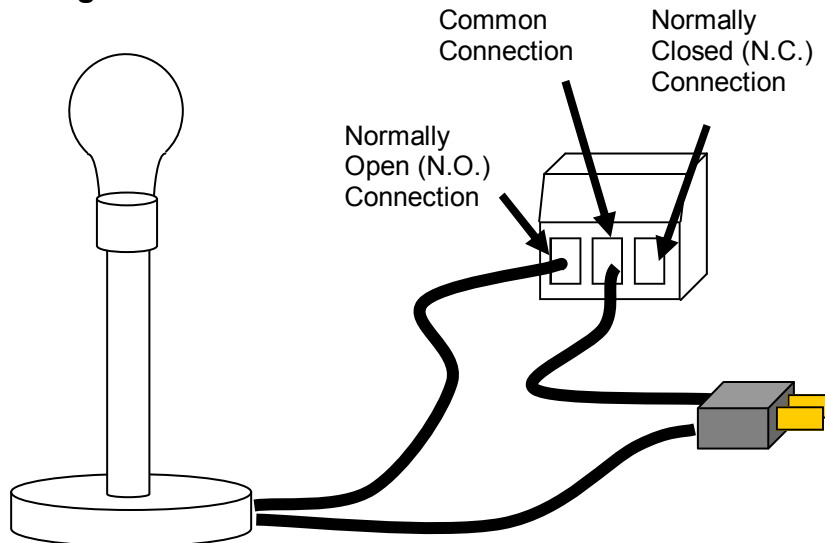
Relay connections

The relays on the PC1 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 according to the sequence that you record for your prop. The **Normally Open (NO)** connection will act as an open switch until the relay is turned on and then the switch is closed. In the example below a light bulb is being controlled by the relay. Until the relay is activated the light bulb will be off and when the relay is turned on the light will be turned on for the amount of time that you recorded in your sequence.

A device connected to the Common and **Normally Closed (NC)** terminals will operate in the opposite way, ie., the device will be on until the relay is activated and then turn off when the relay is turned on.

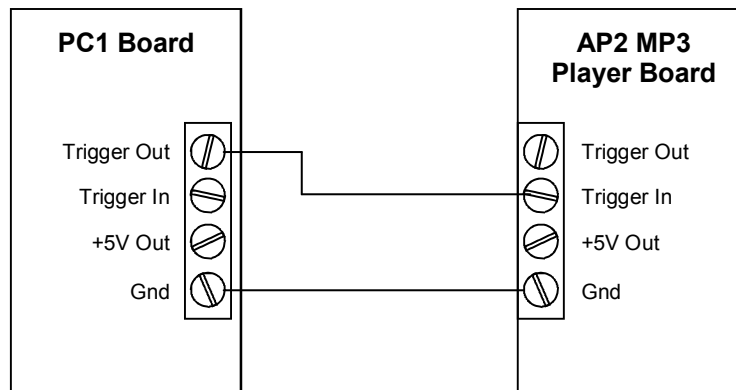
Example: Typical configuration for controlling a standard AC light bulb.



Caution! When working with mains voltages (120V or 240V AC) you must take precautions to prevent electric shock. Working with electrical devices such as this can be inherently dangerous and 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.

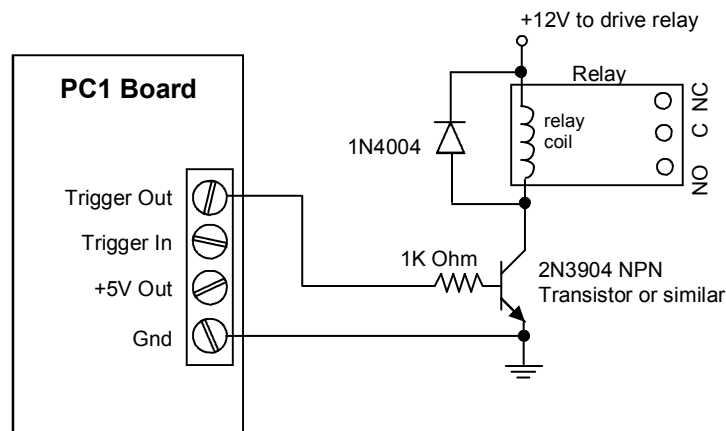
How to use the Trigger Out pin to trigger another controller

If you have other props or controllers in your system, the Trigger Out pin provides a means for the PC1 to activate other controllers or devices. The Trigger Out pin provides a 5V output signal that can be tied directly to other suitable controllers such as our AP2 MP3 Audio Player board. In the configuration shown below, the Trigger out pin from the PC1 board is used as the trigger input to the audio player board. This means that as soon as the PC1 receives a valid trigger, it will also trigger the audio player to begin playing an audio track.



How to drive a relay with the Trigger Out pin

If you want to drive a relay with the Trigger Out pin, you must use a suitable driver circuit. A relay typically requires 100mA to drive the coil in the relay and the Trigger Out pin does not have the ability to drive this much current by itself. The diagram below shows a simple circuit that will allow the Trigger Out pin to drive a relay. In the diagram



***Animated Prop Systems
9003 Deer Shadow Pass
Austin, TX 78733***

sales@pimpmyprop.com