The CVM-60 is a general purpose multifunction timer capable of timing from 1 second to 4 hours in 4 selectable ranges. The unit provides the ability to trip from power-up, or from a normally open or normally closed contact with positive or negative trip The CVM-60 provides one single pole double throw (SPDT - Form C) dry contact output. The timer may be powered from 12 or 24V DC or AC (limited functionality when powered by AC) - selectable by cutting jumpers.
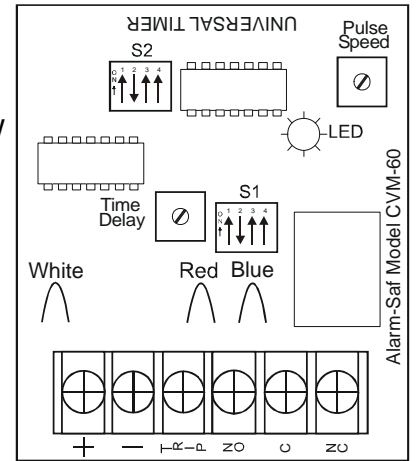
Terminal Usage
Terminals 1 (+) and 2 (-) are the power input to the timer and may be connected to a voltage source of 12V or 24V DC or AC after cutting the proper jumpers.
Terminal 3 is used to start (trip) or restart the timer
Terminals 4, 5, and 6 are the dry relay contacts and are rated for 3 amps @ 30VDC or 120VAC resistive.

Jumper Usage

For Use With:	Cut:		
	White	Blue (If Present)	Red
10-16 VDC		√	
17-24 VDC		√	√
10-16 VAC	√	√	
17-24 VAC	√	√	√

Switch Usage

S1-1 and S1-2 are used to select the start (trip) mode of the timer	
↑↓|| To activate the timer by connecting TRIP terminal to (-).	
↓↑|| To activate the timer by connecting TRIP terminal to (+).	

S1-3 enables the pulse mode of the timer, causing the output relay to alternately transfer for the duration of the time delay.

||↓ On	||↑ Off

S1-4 is used to select either a momentary or maintained trip as a condition for starting the time delay.

|||↓ Momentary	|||↑ Maintained

S2-1 and S2-2 are used to select the desired timing range.

↑↓|| Range 1	↓↑|| Range 2	↑↑|| Range 3	↓↓|| Range 4

S2-3 used to select single cycle or recycle mode.

||↑ Single	||↓ Recycle

S2-4 is used to determine whether the relay is pulled in or dropped out during the time delay.

|||↓ Relay In	|||↑ Relay Out

Potentiometer Usage
Turn the *Time Delay potentiometer* clockwise to increase the time delay. Turn the *Pulse Speed potentiometer* counterclockwise to increase pulse speed when in Pulse Mode (S1-3).

Switch Function Descriptions
S1-1 and **S1-2** are to select positive or negative trip to activate the timer
   Positive Trip - A signal which in standby, sits at zero volts (ground or floating), then rises above 3 volts to trip the timer
   Negative Trip - A signal which in standby, sits at a positive voltage greater than 3 volts or is left floating, then brought to ground potential to trip the timer

S1-3 is to select pulse mode. Pulse mode will transfer the relay on and off during the time delay selected. The duty cycle of the pulsing is 50% (i.e. 1 second on, 1 second off). The Pulse Speed potentiometer controls the speed of the pulsing. The Time Delay potentiometer and Range Selection switches control the amount of time the relay pulses for. *Note that recycle mode and pulse mode are not the same - pulse mode gives a timed series of pulses, while recycle mode pulses the entire time power is present.*

S1-4 selects momentary or maintained trip. The relay activates immediately in either mode, but the setting of this switch will determine when the unit begins timing.
   Momentary Trip - The CVM-60 begins timing when the trip signal is *first* applied. The unit will time out, even if the trip signal remains or is reapplied.
   Maintained Trip - The CVM-60 begins timing when the trip signal is *removed*. The unit will remain active for the entire time the trip signal is present *plus* the time delay. If the trip signal is removed, then reapplied before the unit times out, the timing will restart after the removal of the last trip signal.

S2-1 and **S2-2** set the timing range for the CVM-60. Use the chart below and find the closest time to what is required. Look across to the left column (Range 1) of the chart and find the corresponding time. Set the timer for Range 1 and use the Time Delay potentiometer to set the time indicated in the Range 1 column. To do this, trip the timer and adjust the potentiometer - repeat this process until the desired time (from the Range 1 column) is achieved. When the Range 1 time is set, set the timer for the correct range for the time desired.

   Example:
   1. One and a half hours is required. The closest time is 1.56 hours in Range 4. Looking across to Range 1, the corresponding time is 22.00 seconds.
   2. Set the CVM-60 to Range 1. Trip the timer and time the pulse. Adjust the Time Delay potentiometer in the appropriate direction and re-trip the timer. Repeat this process until 22.00 seconds is achieved.
   3. Set the timer for Range 4. The timer should now be set for 1.56 hours. The Time Delay potentiometer can now be "fine-tuned" to achieve exactly 1.50 hours if desired.

Range 1	Range 2	Range 3	Range 4
1.00 Sec	4.00 Sec	32.00 Sec	4.27 Min
2.00 Sec	8.00 Sec	1.07 Min	8.53 Min
3.00 Sec	12.00 Sec	1.60 Min	12.80 Min
4.00 Sec	16.00 Sec	2.13 Min	17.07 Min
5.00 Sec	20.00 Sec	2.67 Min	21.33 Min
6.00 Sec	24.00 Sec	3.20 Min	25.60 Min
7.00 Sec	28.00 Sec	3.73 Min	29.87 Min
8.00 Sec	32.00 Sec	4.27 Min	34.13 Min
9.00 Sec	36.00 Sec	4.80 Min	38.40 Min
10.00 Sec	40.00 Sec	5.33 Min	42.67 Min
12.00 Sec	48.00 Sec	6.40 Min	51.20 Min
14.00 Sec	56.00 Sec	7.47 Min	59.73 Min
16.00 Sec	1.07 Min	8.53 Min	1.14 Hrs
18.00 Sec	1.20 Min	9.60 Min	1.28 Hrs
20.00 Sec	1.33 Min	10.67 Min	1.42 Hrs
22.00 Sec	1.47 Min	11.73 Min	1.56 Hrs
24.00 Sec	1.60 Min	12.80 Min	1.71 Hrs
26.00 Sec	1.73 Min	13.87 Min	1.85 Hrs
28.00 Sec	1.87 Min	14.93 Min	1.99 Hrs
30.00 Sec	2.00 Min	16.00 Min	2.13 Hrs
32.00 Sec	2.13 Min	17.07 Min	2.28 Hrs
34.00 Sec	2.27 Min	18.13 Min	2.42 Hrs
36.00 Sec	2.40 Min	19.20 Min	2.56 Hrs
38.00 Sec	2.53 Min	20.27 Min	2.70 Hrs
40.00 Sec	2.67 Min	21.33 Min	2.84 Hrs
42.00 Sec	2.80 Min	22.40 Min	2.99 Hrs
44.00 Sec	2.93 Min	23.47 Min	3.13 Hrs
46.00 Sec	3.07 Min	24.53 Min	3.27 Hrs
48.00 Sec	3.20 Min	25.60 Min	3.41 Hrs
50.00 Sec	3.33 Min	26.67 Min	3.56 Hrs
55.00 Sec	3.67 Min	29.33 Min	3.91 Hrs
1.00 Min	4.00 Min	32.00 Min	4.27 Hrs

S2-3 sets Single Cycle or Recycle Mode

> *Single Cycle* mode is the most common mode. When power is applied to the timer, it goes through the power-up trip, then waits for a valid signal on the trip terminal

> *Recycle* mode allows for a continuous pulsing of the relay. It begins as soon as power is applied to the timer, and continues until power is removed. The duty cycle of the pulsing is 50% (i.e. 1 second on, one second off). *Note that recycle mode and pulse mode are not the same - pulse mode gives a timed series of pulses, while recycle mode pulses the entire time power is present.*

S2-4 sets the normal state of the output relay.

> *Relay In* - Relay activates during time delay
> *Relay Out* - Relay drops out during time delay

Miscellaneous Notes

1. The momentary trip mode *does not* work when the CVM-60 is being powered/tripped with AC power.
2. Power-up trip *can not* be disabled. The timer *will* activate when power is first applied - wait for it to time out before attempting to trip the timer. If it is necessary for the application to use the trip terminal of the CVM-60, you must keep power applied to the timer. If this is not possible, consider the AlarmSaf UT-10 or UT-20 timers, which do not have the power-up trip function.
3. Some applications may require multiple timers. For example, use an Alarm Verifier to trip a One Shot timer to give a 5 second pulse after a 30 second delay. Through combinations of timers (CVM-60, UT-10, UT-20, FT-100/200/247) and relays, most applications can be solved.
4. The CVM-60 has no provisions for resetting during the time delay. If a reset feature is required, consider the AlarmSaf UT-10 or UT-20, which have a reset terminal.
5. The voltage being used to trip the timer *MUST* be common grounded with the voltage powering the CVM-60
6. The CVM-60 has no built-in method for delaying its output. It can be "tricked" into delaying by reversing the relay (S2-4), and holding the timer tripped normally, removing or overriding the trip signal to start the delay. The trip must be removed for the entire length of the delay, at which time the relay will activate and remain active until the trip is reapplied. See the Delay on Operate (Alarm Verifier) applications for examples.
7. The CVM-60 provides a *DRY-CONTACT* output. No voltage is supplied from the CVM-60.

Applications

Alarm Verification

Timers may be used in conjunction with two or more detector types in order to minimize or eliminate the possibility of false alarms due to the relationship of the detector type chosen to the environment.

For example, proximity detectors tend to be false alarm prone; however by using a PIR in conjunction with a proximity detector, the combination may be made essentially foolproof.

The accepted method is to utilize the most unstable detector to initiate a "time window" during which the second detector "looks" for a disturbance upon which an alarm may be initiated.

It is possible to use the CVM-60 timer as an alarm verifier to eliminate "swingers" by forcing the alarm detector to hold in the alarm mode for a specific time frame.

Delay on Operate - N.O. Contact (Alarm Verifier For N.O. Loop)

For this application, the timer is set for a negative maintained trip. The resistor (*must be between 1K and 100K at ¼ Watt*) from minus to trip holds the timer tripped. S2-4 sets the relay so that it is not active during the time delay. When the N.O. contact closes, it applies a positive voltage to the trip terminal, overriding the trip through the resistor, "untripping" the timer. After the delay set by the range switches and Time Delay

potentiometer, the relay activates and remains active until the N.O. contact is opened, at which time, the relay immediately drops out. If the N.O. contact is re-opened before the end of the time delay, the relay never activates, the timer resets and awaits the next contact closure.
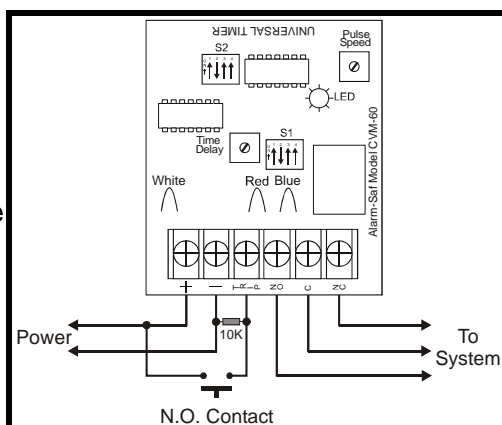
Delay on Operate - N.C. Contact (Alarm Verifier For N.C. Loop)

For this application, the timer is set for a negative maintained trip. The N.C. contact from minus to trip holds the timer tripped. S2-4 sets the relay so that it is not active during the time delay. When the N.C. contact opens, it "untrips" the timer. After the delay set by the range switches and Time Delay potentiometer, the relay activates and remains active until the N.C. contact is closed,

at which time, the relay immediately drops out. If the N.C. contact is re-closed before the end of the time delay, the relay never activates, the timer resets and awaits the next contact closure.
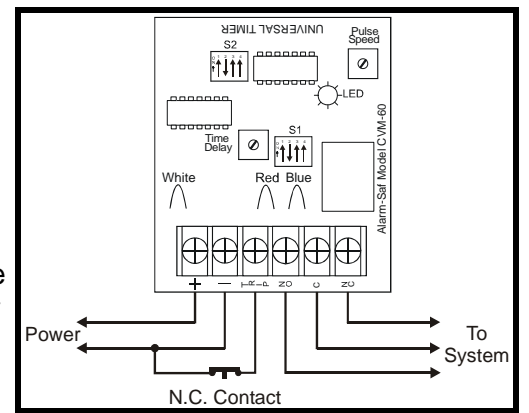
### One Shot Timer Tripped from N.O. Contact

Momentary closure of N.O. Contacts connected between positive and trip will initiate timer operation.

Relay contacts will transfer at the closure of the N.O. Trip contacts and remain until the end of the time delay selected by S2-1, S2-2, and the Time Delay potentiometer. Holding the N.O. Switch closed or opening then reclosing the N.O. Switch during the time delay will not affect the timeout of the CVM-60.
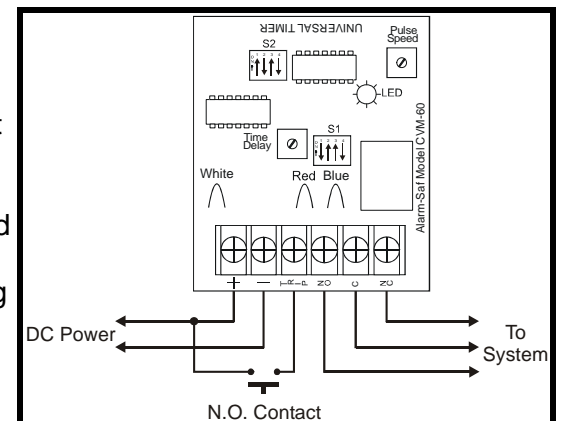
Note: The application is for use with DC power only. It WILL NOT work with AC powering and/or tripping the CVM-60.

One Shot Timer Tripped from N.C. Contact

Momentary opening of N.C. Contacts connected between positive and trip will initiate timer operation.

Relay contacts will transfer at the opening of the N.C. Trip contacts and remain until the end of the time delay selected by S2-1, S2-2, and the Time Delay potentiometer. Holding the N.C. Switch open or closing then reopening the N.C. Switch during the time delay will not affect the timeout of the CVM-60.
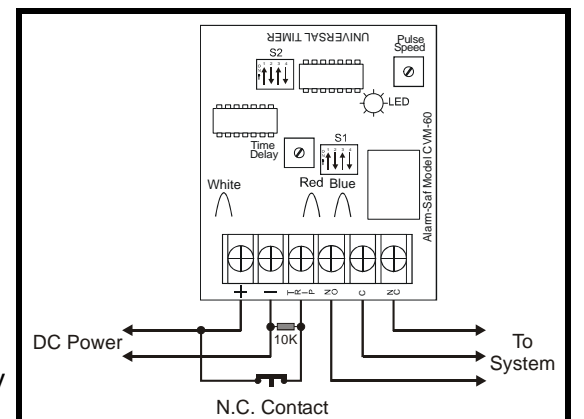
Note: The application is for use with DC power only. It WILL NOT work with AC powering and/or tripping the CVM-60.

Combination Applications

Timers may be combined to achieve functions that a single timer cannot perform on its own. For example, the application below combines a Delay on Operate timer with a One Shot timer, to give a 5 second pulse after a 30 second delay.