



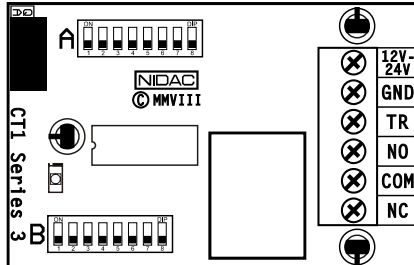
# CT1

“Series 3”

## General Purpose Timer

Installation Manual 1<sup>st</sup> Edition

Ⓢ N761



### FEATURES

- 12-24 volt D.C. operation.
- 4 Timing Ranges:
  - 1 to 255 seconds in 1 second increments.
  - 10 to 2550 seconds (42½ minutes) in 10 second increments.
  - 1 to 255 minutes (4 hours, 15 minutes) in 1 minute increments.
  - 1 to 255 hours (10 days, 15 hours) in 1 hour increments.
- Accurate DIP switch selection (no pots).
- Selectable Positive, Negative or Dual Edge trigger.
- 13 operating modes:
  - Single shot.
  - Single shot retriggerable.
  - Dual edge triggered single shot.
  - Dual edge triggered single shot retriggerable.
  - Bistable (clutch / toggle) operation.
  - Trigger Extension.
  - Maximum Pulse.
  - Minimum Pulse (retriggerable).
  - Hold off (Door open too long).
  - Multivibrator (strobe) with 1 second on time, selectable off time.
  - Multivibrator (strobe) with equal on/off times.
  - Delay on.
  - Delay on retriggerable (no activity timer).
- Heavy duty 5 amp. change over relay.
- Fail Safe or Fail Secure relay operation.
- LED indication of relay operation.
- 36 month manufacturer's warranty.

### SPECIFICATIONS

Size: 45mm x 70mm x 19.5mm (without feet)  
57mm x 70mm x 23.5mm (with feet)

Operating Voltage: 10.5 - 28 Volts D.C.

Quiescent Current: 10 mA. @ 12 Volts D.C. (40 mA. with relay on).  
11 mA. @ 24 Volts D.C. (45 mA. with relay on).

High Trigger Voltage: > 2 Volts D.C.

Low Trigger Voltage: < 1.5 Volts D.C.

Trigger Current: -0.03 mA. @ 0 Volts D.C.  
0.9 mA. @ 12 Volts D.C.  
2.1 mA. @ 24 Volts D.C.

#### Relay

Maximum Switching Current: 5 Amps.

Maximum Switching Voltage: 30 VDC, 125 VAC.

**WARNING: DO NOT USE 240V ON THE RELAY CONTACTS!**

### SETTING UP THE CT1

The CT1 is set up using two banks of 8 Dip Switches, labelled A and B.

The red LED, near Dip Switch bank B, indicates when the relay is active (i.e. energised in Fail Secure mode, de-energised in Fail Safe mode).

### SETTING THE TIME

(applies for all operating modes except Delay On)

Dip switch bank A is used to set the CT1 timing period. The function of each of these 8 dip switches is explained below.

	Dip switch A1 ON adds 1 time interval to the time.
	Dip switch A2 ON adds 2 time intervals to the time.
	Dip switch A3 ON adds 4 time intervals to the time.
	Dip switch A4 ON adds 8 time intervals to the time.
	Dip switch A5 ON adds 16 time intervals to the time.
	Dip switch A6 ON adds 32 time intervals to the time.
	Dip switch A7 ON adds 64 time intervals to the time.
	Dip switch A8 ON adds 128 time intervals to the time.

### TIME INTERVALS

The time intervals mentioned above are set by dip switches 3 and 4 on bank B:

	Dip switch B3 & B4 OFF time interval = 1 second.
	Dip switch B3 OFF, B4 ON time interval = 10 seconds.
	Dip switch B3 ON, B4 OFF time interval = 1 minute.
	Dip switch B3 & B4 ON time interval = 1 hour.

### Time Setting Examples:

	Sets the time for 45 seconds $1 + 4 + 8 + 32 = 45$ seconds
	Sets the time for 3 minutes and 10 seconds $(1 + 2 + 16) \times 10 = 190$ secs
	Sets the time for 1½ hours (90 minutes) $2 + 8 + 16 + 64 = 90$ minutes
	Sets the time for 1 week (168 hours) $8 + 32 + 128 = 168$ hours

### TRIGGER POLARITY

Dip switch 1 on bank B is used to select between a positive or negative voltage for the trigger input.

	The CT1 is triggered when a positive voltage (greater than 2V D.C.) is applied to the trigger input.
	The CT1 is triggered when zero volts (less than 1.5V D.C.) is applied to the trigger input.

**Note:** If Dual Edge mode is selected by using dip switches 12, 13 and 14 and the CT1 is NOT in bistable mode, the CT1 will trigger each time the trigger voltage selected above is either applied OR removed.

### USING A NORMALLY CLOSED TRIGGER CONTACT

When a Normally Closed contact is used on the TR input a 10K resistor is required to correctly bias the TR input for when the contact opens.

If the NC contact is wired between TR and GND, wire the 10K resistor between TR and 12V-24V and set switch B1 off.

If the NC contact is wired between TR and 12V-24V, wire the 10K resistor between TR and GND and set switch B1 on.

### FAIL SAFE/SECURE

Dip switch 2 on bank B is used to select between fail safe and fail secure relay operation. When fail safe mode is selected, the relay is energised (NC contacts open, NO contacts shorted, LED ON) when the timer is not timing and de-energised when timing is started. If power is removed from the CT1, the relay will de-energise (NC contacts shorted, NO contacts open).

When fail secure is selected, the relay is only energised (NC contacts shorted, NO contacts open) when timing has commenced.

	CT1 relay state is Fail Secure.
	CT1 relay state is Fail Safe.

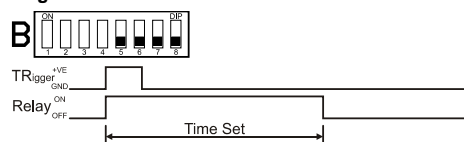
### MODE SELECTION SWITCHES

Dip switches 5, 6, 7 and 8 on bank B select the operating mode of the CT1.

	Single Shot
	Bistable (clutch/toggle)
	Single Shot Retriggerable
	Dual Edge
	Dual Edge Retriggerable
	Minimum Pulse
	Maximum Pulse
	Trigger Extension
	Hold Off Timer (door open too long)
	Multivibrator (strobe) with 1 second on time
	Multivibrator (strobe) with equal on/off time
	Single Shot Cancellable
	DO NOT USE Reserved for future use
	Delay On
	Delay On Retriggerable (no activity timer)

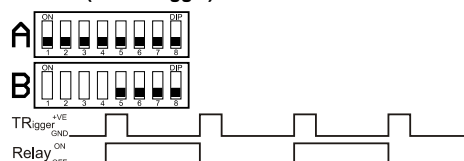
**Note:** All the timing diagrams shown are for a positive trigger and fail secure relay (Dip switches 1 and 2 on bank B are off).

### Single Shot



In single shot timing mode the CT1 turns the relay ON when triggered and turns it OFF after the set time has elapsed. If any further triggers that occur while the relay is ON are ignored.

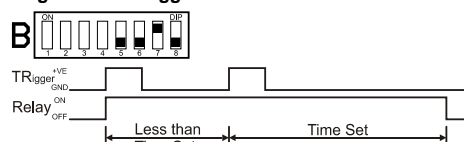
### Bistable (clutch/toggle) Mode



When dip switches 1 to 8 on bank A and switches 5 to 8 on bank B are all OFF the timer is placed in bistable mode. Each time the CT1 is triggered the relay will change state.

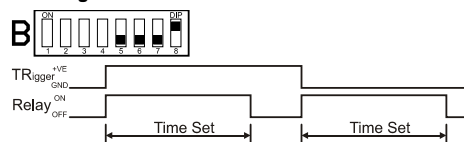
**Note:** In bistable mode, no timing function is performed and the two time interval selection switches (dip switches 3 and 4 on bank B) have no effect.

### Single Shot Retriggerable



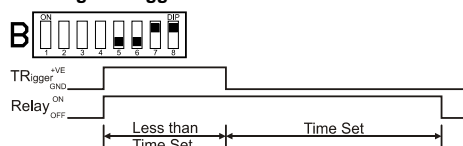
When triggered the CT1 relay will turn ON and turn OFF after the time set. If another trigger occurs while the relay is ON, timing is restarted and the relay remains ON for the time interval set from the start of the last trigger.

### Dual Edge



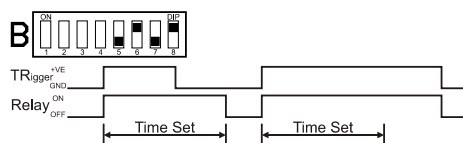
The CT1 performs the same as in Single Shot mode but will activate when the trigger is either applied or removed from the trigger input.

### Dual Edge Retriggerable



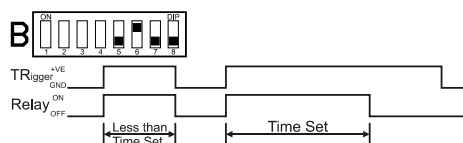
The CT1 performs the same as in Single Shot Retriggerable mode but will activate when the trigger is either applied or removed from the trigger input.

### Minimum Pulse



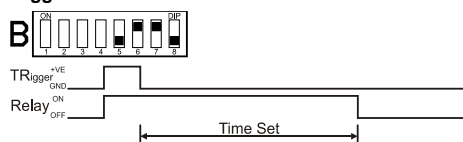
When Minimum Pulse is selected and the CT1 is triggered, the relay will turn ON. It will remain on until either the time set expires or the trigger is removed, whichever event occurs last.

### Maximum Pulse



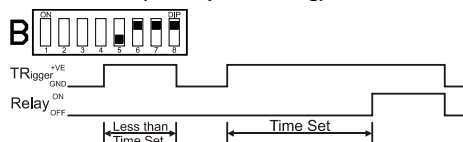
When Maximum Pulse is selected and the CT1 is triggered, the relay will turn ON. It will remain on until either the time set expires or the trigger is removed, whichever event occurs first.

### Trigger Extension



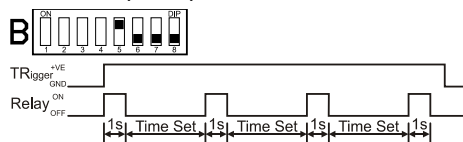
When Trigger Extension is selected and the CT1 is triggered, the relay will turn ON and stay ON while the trigger remains at the trigger voltage (zero volts for a negative trigger, a positive voltage for a positive trigger). When the trigger is removed, the relay remains ON for the time set.

### Hold Off Timer (Door open too long)



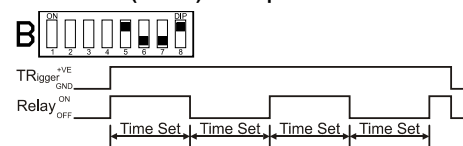
When Hold Off Timer is selected and the CT1 is triggered, the relay will remain OFF until the trigger has remained active for the time set, the relay will then turn ON and remain ON until the trigger is removed. If the trigger is active for less than the time set, the relay will not turn ON.

### Multivibrator (Strobe) with 1 second on time



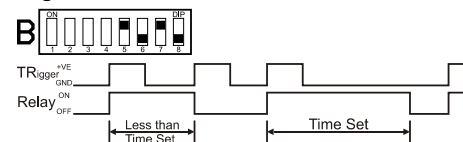
When Multivibrator with 1 second on time is selected and the CT1 is triggered and remains triggered the relay will turn ON for 1 second then turn OFF for the time set before turning ON again for 1 second then OFF for the time set. This pattern will repeat until the trigger is removed, at which time the relay will turn OFF and timing will stop.

### Multivibrator (Strobe) with equal on/off time



When Multivibrator with equal on/off time is selected and the CT1 is triggered and remains triggered the relay will turn ON for the time set then turn OFF for the time set before turning ON again for the time set then OFF for the time set. This pattern will repeat until the trigger is removed, at which time the relay will turn OFF and timing will stop.

### Single Shot Cancellable



When triggered the CT1 relay will turn ON and turn OFF after the time set. If another trigger occurs while the relay is ON, timing is stopped and the relay turns OFF, the next trigger will start the timing again.

### Delay On Modes

The two delay on modes require 2 separate times to set up how it works. The first time is the Delay Time and it determines how long the unit waits after the trigger occurs before operating the relay. The second time, On Time, determines how long the relay remains activated for once the Delay Time has expired.

**Delay Time** is determined by Dip switches 1 to 6 on bank A. These switches have the same value as stated on page 3. **Note** that if all 6 switches are left off the Delay Time becomes 64 time intervals.

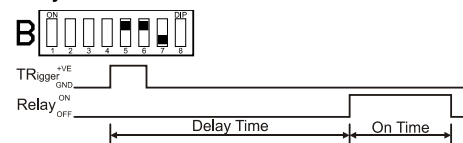
**On Time** is determined by Dip switches 7 & 8 on bank A and switch 8 on bank B as shown below.

	Dip switch A7 ON adds 2 time intervals to the On Time.
	Dip switch A8 ON adds 4 time intervals to the On Time.
	Dip switch B8 ON adds 8 time intervals to the On Time.

**Note** that if all three switches are left off the On Time becomes 1 time interval.

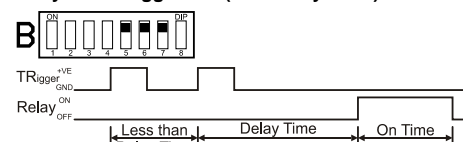
Both **Delay Time** and **On Time** use the time period base set by Dip switches 3 & 4 on bank B as described on page 3.

### Delay On



When triggered in Delay On mode, the CT1 relay will remain OFF for the time set and turn ON for 1 second after the time set has elapsed. If any further triggers occur while the CT1 is timing, they are ignored.

### Delay On Retriggerable (no activity timer)



When triggered in Delay On Retriggerable mode, the CT1 relay remains OFF for the Delay Time set and turns ON for On Time provided no further triggers occur. If another trigger occurs while the relay is OFF timing is restarted.



**NIDAC SECURITY PTY. LTD.**  
 MANUFACTURERS OF SECURITY EQUIPMENT  
 A.B.N. 49 004 933 242

2 CROMWELL STREET  
 BURWOOD, VICTORIA  
 AUSTRALIA 3125

TEL: +61 3 9808 6244  
 FAX: +61 3 9808 9335  
 WEB: www.nidac.com  
 EMAIL: sales@nidac.com