FORGE™

CT1

"Series 4"

General Purpose Timer

Installation Manual 2nd Edition

FEATURES

- 12-24 Volt D.C. operation.
- 4 Selectable 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 time selection (no pots).
- Selectable Positive, Negative or Dual Edge trigger.
- 14 Operating Modes:
  - Single shot.
  - Single shot retriggerable.
  - Single shot cancellable.
  - 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.
- Accepts Normally Open or Normally Closed trigger without requiring external resistors.
- LED indication of relay operation.
- New CT1 size now suits Ritec/Hammond enclosure RL6105-F, NIDAC part number HO-RL6105-F
- 5 year manufacturer's warranty.

SPECIFICATIONS

Dimensions:	38mm x 72mm x 19.5mm (without feet) 50mm x 84mm x 23.5mm (with feet)
Operating Voltage:	10.5 - 28 Volts D.C.
Quiescent Current:	8 mA. @ 12 Volts D.C. (45 mA. with relay on). 10 mA. @ 24 Volts D.C. (55 mA. with relay on).
High Trigger Voltage:	> 3 Volts D.C.
Low Trigger Voltage:	< 2 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 Max. Switching Current:	5 Amps.
Relay Max. 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, located below Dip Switches 5 & 6 on bank A, indicates when the relay is active.

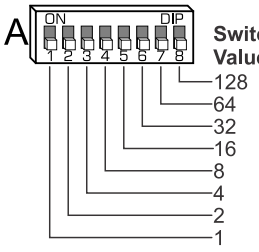
The switch settings shown in this manual use the following notation:

ON = Dip switch ON	ON = Dip switch OFF

SETTING THE TIME

(applies for all operating modes except Delay On)

Dip switch bank A is used to set the total time. Each dip switch has a value assigned to it as shown below.

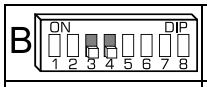
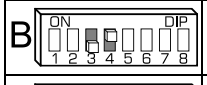
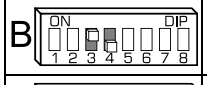
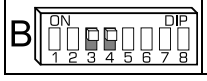


To calculate the total time simply add all the values for the dip switches on bank A that are ON.

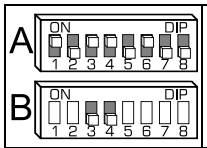
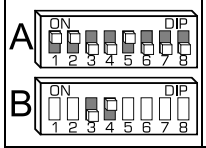
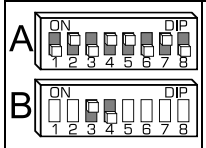
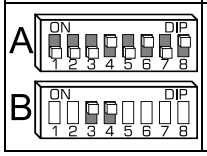
If no dip switches on bank A are ON the total time selected = 0. For most operating modes this value is not allowed and the CT1 will use a total time of 1 or operate in bistable mode, except where otherwise noted.

TIME BASE

The total time value of the switches on bank A that are ON is multiplied by the time base set by dip switches 3 and 4 on bank B to give the total time set.

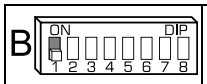
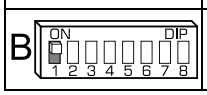
	Dip switch B3 & B4 OFF time base = 1 second.
	Dip switch B3 OFF, B4 ON time base = 10 seconds.
	Dip switch B3 ON, B4 OFF time base = 1 minute.
	Dip switch B3 & B4 ON time base = 1 hour.

Time Setting Examples:

	A1, A3, A4 & A6 are ON 1 + 4 + 8 + 32 = 45 B3 & B4 are OFF = seconds **Time Set = 45 seconds**
	A1, A2 & A6 are ON 1 + 2 + 16 = 19 B3 OFF & B4 ON = 10 secs **Time set = 190 seconds (3 minutes & 10 seconds)**
	A2, A4, A5 & A7 are ON 2 + 8 + 16 + 64 = 90 B3 ON & B4 OFF = minutes **Time set = 90 minutes (1½ hours)**
	A4, A6 & A8 are ON 8 + 32 + 128 = 168 B3 & B4 are ON = hours **Time set = 168 hours (1 week)**

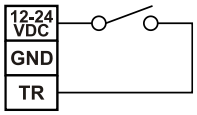
TRIGGER INPUT POLARITY

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

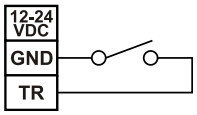
	The CT1 requires a positive voltage (greater than 3V D.C.) on the trigger input.
	The CT1 requires zero volts (less than 2V D.C.) on the trigger input.

Note: If Dual Edge mode is selected (see MODE SELECTION SWITCHES section) the CT1 will trigger each time the selected trigger voltage is either applied OR removed.

Trigger Wiring Examples



Positive Trigger
(Dip switch B1 OFF)



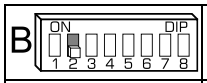
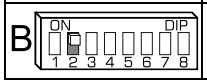
Negative Trigger
(Dip switch B1 ON)

NORMALLY OPEN/CLOSED TRIGGER

Dip switch 2 on bank B is used to select between a Normally Open and Normally Closed trigger input.

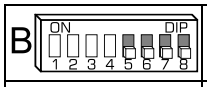
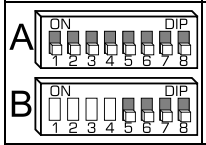
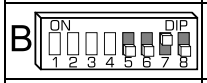
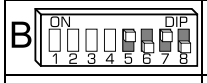
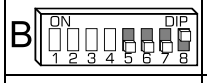
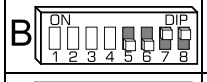
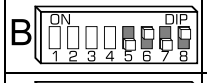
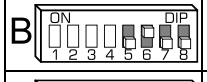
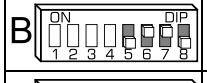
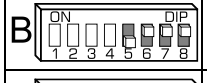
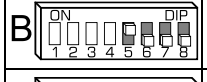
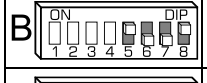
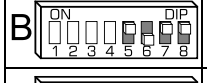
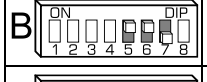
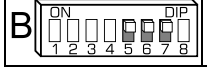
When a Normally Open trigger is selected, the CT1 is triggered when selected trigger input voltage is applied to the trigger input.

When a Normally Closed trigger is selected, the CT1 is triggered when selected trigger input voltage is removed from the trigger input.

	CT1 is set for a Normally Open trigger input.
	CT1 is set for a Normally Closed trigger input.

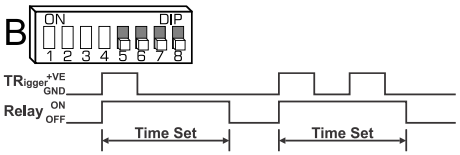
MODE SELECTION SWITCHES

Dip switches 5, 6, 7 and 8 on bank B select the operating mode of the CT1 as shown in the summary table below. An explanation of each mode is given on the following page.

	Single Shot
	Bistable (clutch/toggle)
	Single Shot Retriggerable
	Single Shot Cancellable
	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
	DO NOT USE Reserved for future use
	Delay On
	Delay On Retriggerable (no activity timer)

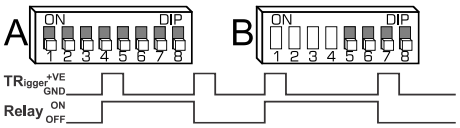
Note: All the timing diagrams shown are for a positive normally open trigger setting (Dip switches 1 and 2 on bank B are off).

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. Any further triggers that occur while the relay is ON are ignored.

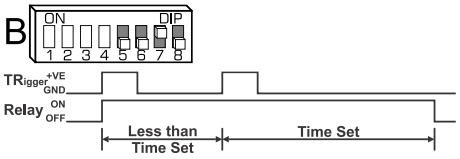
Bistable (clutch/toggle) Mode



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.

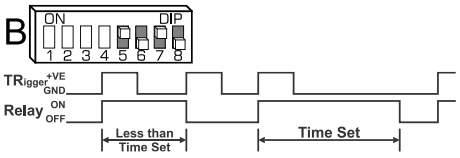
Note: In bistable mode no timing function is performed and the two time base selection switches (dip switches 3 & 4 on bank B) have no effect.

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 timing period set from the start of the last trigger.

Single Shot Cancellable



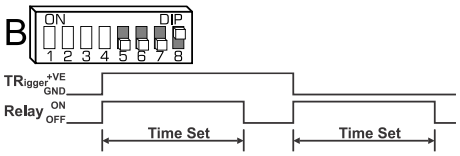
When triggered the CT1 relay will turn ON and turn OFF after the time set. If another trigger occurs while the relay is ON timing is immediately stopped and the relay turns OFF, the next trigger will turn the relay ON and start the timing again.

Designed and manufactured by

NIDAC Pty Ltd
2 Cromwell Street
Burwood Victoria
Australia 3125

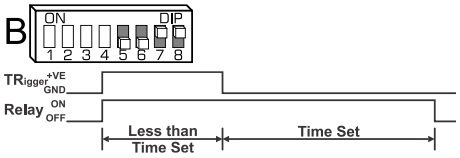
+61 3 9808 6244
www.nidac.com
sales@nidac.com

Dual Edge



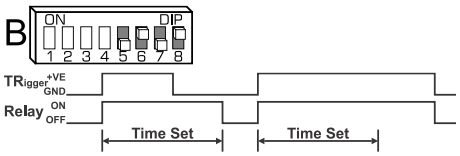
The CT1 performs the same as in Single Shot mode but will activate when the trigger is either applied or removed from the trigger input.

Dual Edge Retriggerable



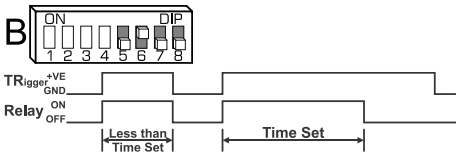
The CT1 performs the same as in Single Shot Retriggerable mode but will activate when the trigger is either applied or removed from the trigger input.

Minimum Pulse



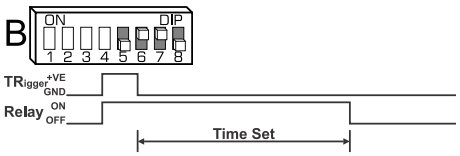
When Minimum Pulse is selected and the CT1 is triggered, the relay will turn ON. It will remain on until either the time set expires or the trigger is removed, whichever event occurs last.

Maximum Pulse



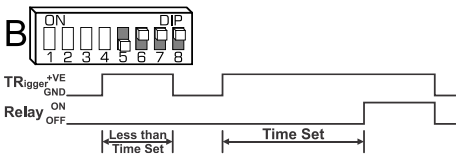
When Maximum Pulse is selected and the CT1 is triggered, the relay will turn ON. It will remain on until either the time set expires or the trigger is removed, whichever event occurs first.

Trigger Extension



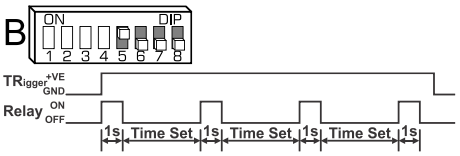
When Trigger Extension is selected and the CT1 is triggered, the relay will turn ON and stay ON while the trigger remains at the trigger voltage (zero volts for a negative trigger, a positive voltage for a positive trigger). When the trigger is removed, the relay remains ON for the time set.

Hold Off Timer (Door open too long)



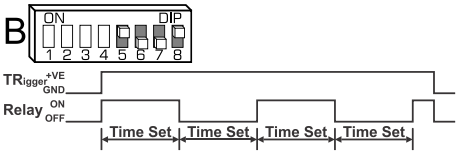
When Hold Off Timer is selected and the CT1 is triggered, the relay will remain OFF until the trigger has remained active for the time set, the relay will then turn ON and remain ON until the trigger is removed. If the trigger is active for less than the time set, the relay will not turn ON.

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



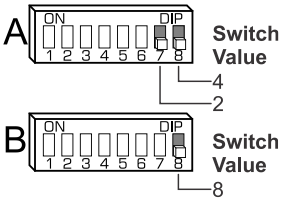
When Multivibrator with equal on/off time is selected and the CT1 is triggered and remains triggered the relay will turn ON for the time set then turn OFF for the time set before turning ON again for the time set then OFF for the time set. This pattern will repeat until the trigger is removed, at which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

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 values as described in the SETTING THE TIME section. **Note** however that if all 6 switches are left off the Delay Time becomes 64 instead of 0.

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

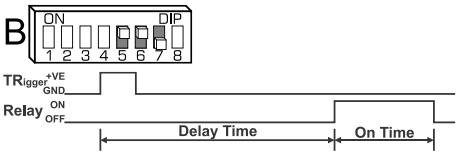


To calculate the On Time simply add all the values for the dip switches of A7, A8 & B8 that are ON.

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

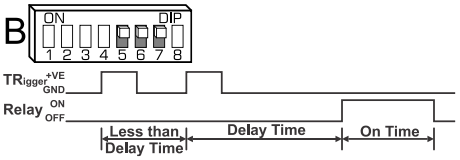
Both **Delay Time** and **On Time** use the time base set by dip switches 3 & 4 on bank B as described in the TIME BASE section.

Delay On



When triggered in Delay On mode, the CT1 relay will remain OFF for the Delay Time set and then turn ON for the duration of the On Time. Any further triggers that occur whilst the CT1 is timing will be 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.