

DualTimer as a Specialised Triggerable Relay

For "Dirty" Electronic Environments, or if Trigger on Broken Circuit is Needed

1. DIRTY ELECTRONIC ENVIRONMENT

1.1 Background

By "dirty" electronic environments we mean an environment where there is significant noise on a circuit created by such things as:

- "bounce" of mechanical switches (including push-button switches, limit switches, and relay switch contacts)
- Electro-magnetic radiation (EMR) from electrical devices in the local area (ranging from such things as internal sparking of some electric motors to some digital circuits with in-built oscillators).

1.2 Why is this a problem for a Triggerable Relay?

Triggerable relay modules are designed to require a much lower voltage to activate their relay than is required by a "standard" relay module.

A problem arises if a triggerable relay module is too sensitive for "dirty" electronic environments.

Such a relay module is able to be triggered (or de-triggered) by the electronic "noise", not just by the intended signal to its trigger.

1.3 Debouncing — the Solution

The DualTimer is designed to handle dirty electronic environments. Its trigger has debouncing built into it. The DualTimer's trigger has an hysteresis time of about 0.05 seconds—which means that it will continue to stay in its current state (either OFF, or ON) unless a detected changed state signal continues for more than 0.05 seconds.

1.4 Delay Mode Provides Additional Debouncing of the DualTimer's Trigger — on Application

The minimum timer setting is 0.25 seconds. This provides *additional* debouncing, but only for application of the trigger.

This additional debouncing can be very handy if the dirty electronic environment is causing incorrect triggering even with the in-built debouncing.

2. IF TRIGGER ON BROKEN CIRCUIT IS NEEDED

Many triggerable relays have the ability to trigger on positive or negative trigger as the DualTimer has. (Refer to Item 2 *Trigger on Positive or Negative Trigger* of the DualTimer's manual.)

But the DualTimer can also trigger on broken circuit ie trigger on LOSS of a trigger voltage. (Refer manual *Trigger on Broken Circuit*.)

3. TIMER SETUP IN DELAY MODE, MINIMUM TIME

To behave similarly to a triggerable relay module, the DualTimer needs to be set up in Delay Mode, probably with the minimum time setting of 0.25 seconds.

This means that when the DualTimer detects a trigger, it will count down the 0.25 seconds before activating the relay. The relay is released when the trigger is released.

A typical triggerable relay will normally not have this 0.25 sec delay on application of the trigger, but for many applications such a short delay may not be noticeable or even a problem.

Notes:

1. Refer to the Disclaimer to the right.
2. Refer also to Manual: *DualTimer12*.
3. Use the relay within OMRON's specifications. A copy can be found on the ULTRAsmart web site.

"TRIGGERABLE RELAY" TIMER SETUP

- 1 Check the relay coil voltage. It should read 12VDC on the DualTimer12 if you are using the model that uses 12 volt DC supply.
- 2 Set up for either a positive or negative Trigger. (See Item 2, *Positive or Negative Trigger* on the unit's manual, or for *Trigger on Broken Circuit* on Manual with the same title.)
- 3 Set the Timer Mode to Delay (See Item 3, *Timer Modes* on the unit's manual, and Item 3 to the left.)
- 4 Set the Timing DIP switches 3 and 4 to OFF to select the range 0.25 sec to 15 sec. (See *TIMING SETTINGS* below.)
- 5 Set the Time Adjust knob. In the case of the example we want 0.25 seconds which is fully anti-clockwise.
- 6 Connect the correct wires to the relevant terminals.
 - Relay outputs are via Relay Switch N/C, N/O and C
 - Power is via POS + and NEG -.
 - The Trigger is via TRG +/-.

TIMING SETTINGS

Time Adjust Knob		DIP Switches	
Fully Anti-clockwise	Fully Clockwise	3	4
0.25 sec	15 sec	OFF	OFF
15 sec	1 min	OFF	ON
1 min	5 min	ON	OFF
5 min	30 min	ON	ON

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