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## Installation & Wiring Instructions TM-180DL Timer Module

The TM-180DL is a full-functioned microprocessor-controlled timer, combining the best features of more expensive models into a single unit suitable for AC or DC operation. AC capability allows elimination of separate power supply in many applications.

A timing cycle, programmable between 1 second and 60 minutes, begins when a trigger is applied to the trigger terminal (TRI). During the timing cycle, the TM-180DL's relay will change state until the end of the programmed delay period. If the relay is normally de-energized (JP2 OFF), it will be energized for this period. Conversely, if the relay is normally energized (JP2 ON), it will be de-energized for this period. If DIP switch 2 is set to ON, the relay will change states *after* the delay period has expired and remain active as long as an input trigger is present.

### A. JUMPER PROGRAMMING

There are 2 jumpers on the board, JP1 and JP2.

**JP1: TRIGGER VOLTAGE SELECTION.** Place on the left two pins if a negative (active low) trigger voltage is to be applied. Place on the right 2 pins for a positive trigger voltage. A positive trigger can be any DC voltage between 2 and 28 Volts.

**JP2: RELAY IDLE STATE.** This jumper is used to the normal "idle" state of the relay. If set to OFF, the relay is activated for the programmed delay time when a trigger is applied to the trigger terminal (TRI). If set to ON, the relay stays activated and will de-energize for the programmed delay time when a trigger is applied to the trigger terminal.

### B. DIP SWITCH PROGRAMMING

#### 1. Seconds or Minutes

Set DIP switch #1 for the required operating time range

When OFF (seconds mode), delays of 1 second to 60 seconds can be achieved.

When ON (minutes mode), delays of 01 minute to 60 minutes can be achieved.

*Set-up hint: For a 5 minute timer, set SW1 to OFF and adjust the potentiometer for 5 seconds, then turn SW-1 to ON. The unit is now programmed for 5 minutes.*

#### 2. Relay Active During Delay / Relay Active After Delay

Set DIP switch #2 to determine whether the output relay will be active *during* the programmed delay period or *after* the delay period.

ON (UP) = Relay will activate *after* the programmed delay expires and remain active until the input trigger is removed.

OFF (DOWN) = Relay will activate *during* the programmed delay and restore to the idle state once the delay period expires.

#### 3. Single Shot / Repeat

Set DIP switch #3 to program the Repeat Mode.

ON (UP) = Delay cycle will repeat as long as the trigger is present. E.g. if the potentiometer is set for 5 seconds, the cycle will repeat 5 seconds on, 5 seconds off. This feature may be combined with SW4 Auto Trigger in order to endlessly repeat the cycles, regardless of the Trigger Input state.

OFF (DOWN) = One delay cycle per each NEW trigger event. No further cycles will occur even if trigger remains on.

#### 4. Auto Trigger

Set DIP switch #4 to enable Auto Trigger.

SW4 provides a simple method for triggering the delay cycle without connecting a wire to the trigger inputs. This feature is useful for setup testing on the bench (Turn switch ON to simulate a trigger) or for providing a constant trigger for the Repeat mode (SW4=ON; SW3=ON)

### C. TRIGGERING

The timing cycle is begun by application of a signal to the trigger (TRI) terminal. This can be a positive signal between 2 and 28 Volts. The timing cycle may also be triggered by setting DIP switch #4 to ON. **Note: Auto Trigger ignores any signal on the trigger (TRI) terminal.**

### D. LED INDICATION

The red LED illuminates when the relay is energized and goes out when the relay is de-energized.

### SPECIFICATIONS

Power input: 8 – 28V AC or DC.

Trigger input: 2 – 28V DC (+ Trig); 1.3 – 0V (- Trig)

Current Draw- Standby: 11mA; Energized: 90mA max.

Relay Output: Form C, rated 5A at 28 Volts DC or 120 Volts AC.

Board Dimensions: 2.5 x 3.0 x 0.8 inches.