# T5 TIMER MODES  rev. 5.10

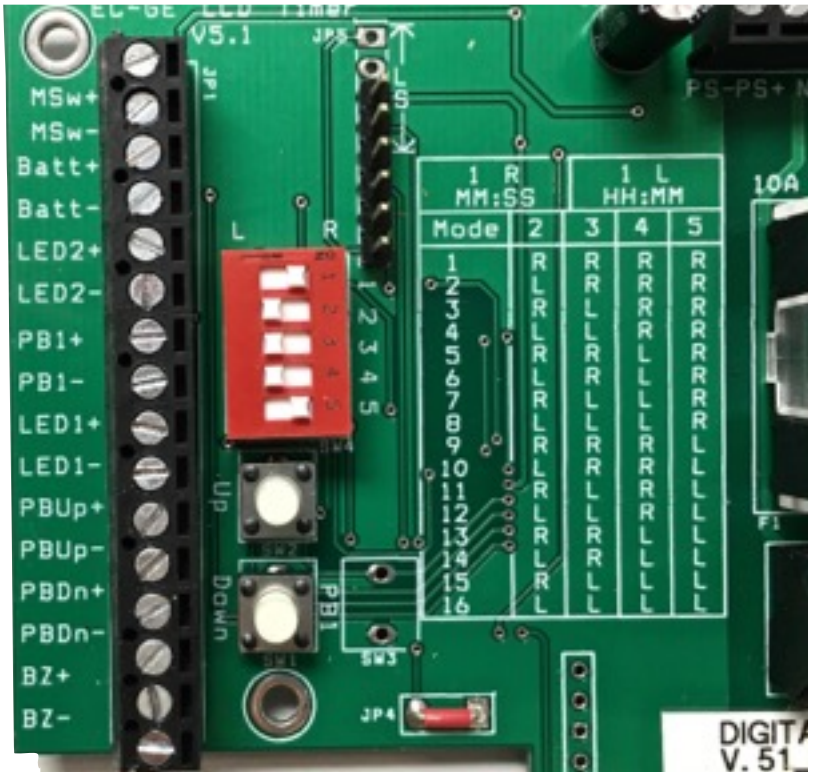
### 1. Display Logic

A. When displaying in HH:MM, it will not be obvious from the display that the timer is counting, the four dots at the bottom of the display “chase” from left to right to indicate its counting down.

### 2. PB2 and PB3 - Setting time

A. The two digits left of the colon are incremented by PB2 and decremented by PB3. (regardless if display is indicating HH:MM or MM:SS) Holding PB1 down while simultaneously pressing PB2 or PB3 will change the digits *right* of the colon instead. In any case if PB1 or PB2 is held down, the digits race forward quickly. (increment to the next higher number every 100ms)

B. Depressing PB2 and PB3 together will clear the display to zero.




## 6. MODES

**For all modes, switch position 1** determines hours or minutes.  The default position is the the right which gives minutes/seconds.
The other switch positions 2,3,4,5 determine the other behaviours as in chart below.

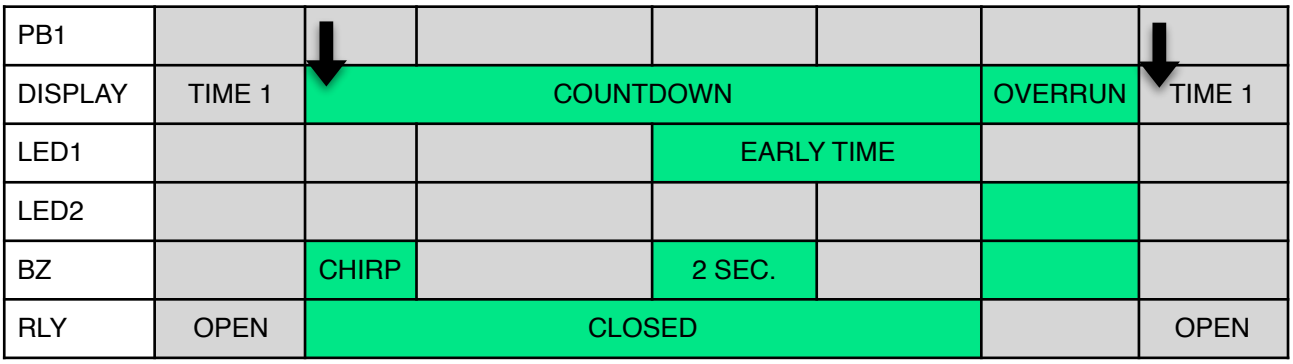
# T5 TIMER MODES rev. 5.10

| MODE | SWITCH POSITION | | | | | DESCRIPTION |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | |
| 1 | L / R | R | R | R | R | EARLY WARNING ON LED1 |
| 2 | L / R | L | R | R | R | MANUAL STOP - CANNOT CANCEL |
| 3 | L / R | R | L | R | R | PROXIMITY SWITCH WITH EARLY WARNING |
| 4 | L / R | L | L | R | R | PAUSING |
| 5 | L / R | R | R | L | R | AUTOMATIC STOP - WITH CANCEL |
| 6 | L / R | L | R | L | R | EARLY WARNING ON LED2 |
| 7 | L / R | R | L | L | R | GUARD DUTY |
| 8 | L / R | L | L | L | R | PROXIMITY SWITCH / SPRAY RINSE |
| 9 | L / R | R | R | R | L | MACHINE RUN TIME |
| 10 | L / R | L | R | R | L | ON DELAY |
| 11 | L / R | R | L | R | L | REPEAT CYCLE |
| 12 | L / R | L | L | R | L | FUTURE USE |
| 13 | L / R | R | R | L | L | FUTURE USE |
| 14 | L / R | L | R | L | L | FUTURE USE |
| 15 | L / R | R | L | L | L | FUTURE USE |
| 16 | L / R | L | L | L | L | FUTURE USE |

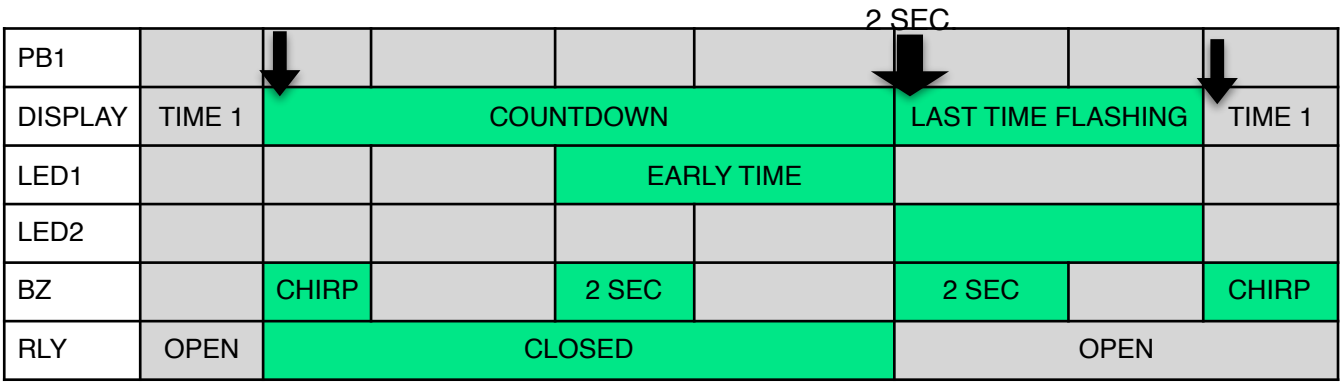
1. **Mode 1 - EARLY LED1**
   LED1 activates before the end of a cycle. to give an early warning to an operator. The amount of “early warning” time is settable as follows: holding all three buttons simultaneously for 5 seconds; then when the 3 buttons are released, the timer is in a state to set the “early” time. (indicated by the display blinking) The “early” time is set in the same way as the time is normally set with PB1,PB2, PB3.. After the “early” time is set, the display flashes this time for 5 seconds and then after that the time becomes “locked in” and the flashing stops.

   For example:all 3 buttons are depressed for 5 seconds, then released. Using PB1 and PB2 a time is set for 40 seconds. This time blinks for 5 seconds and then displays steadily. Operator must now set the desired countdown time again if it is to be different from the “early” time of 40 sec.. When the next cycle runs, PB1 illuminates 40 seconds before the end of the cycle. At the end off the cycle, BZ/ LED2/relay activate as usual. This “early time” is erased (set to zero) by holding all 3 buttons down for 5 seconds.

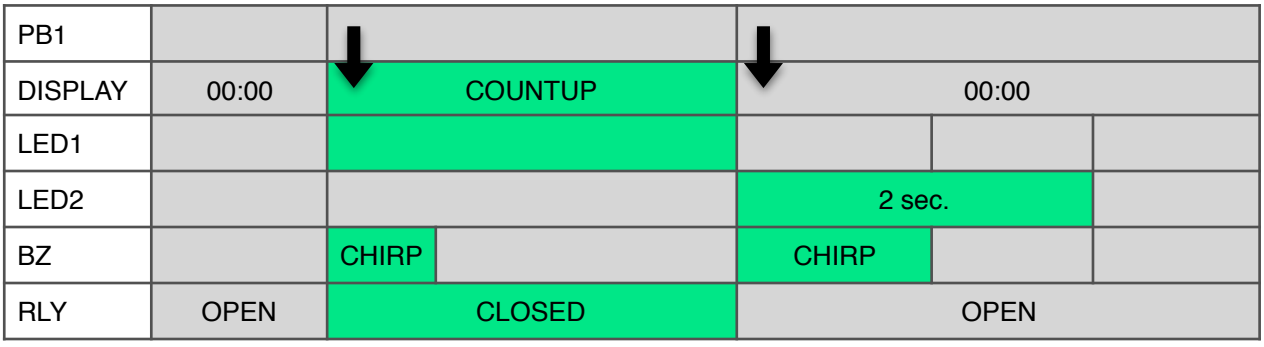
# T5 TIMER MODES rev. 5.10




MODE 1 - CHART 1 — EARLY LED1



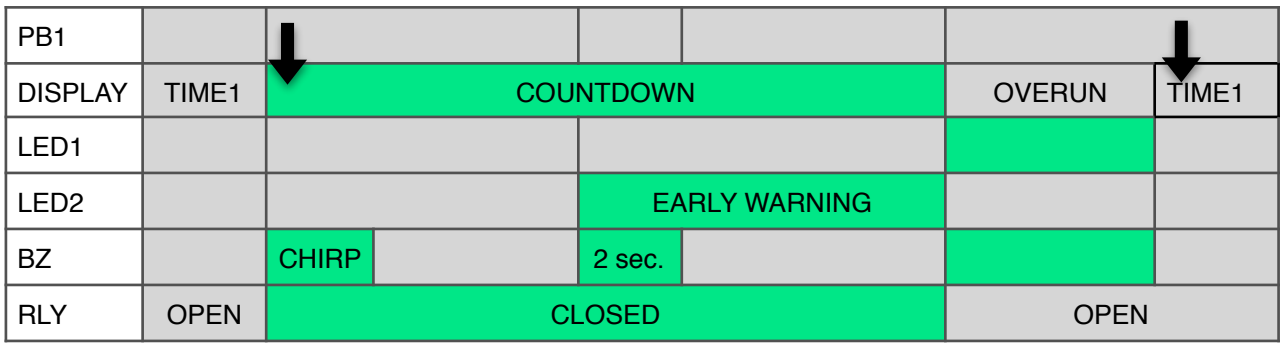

MODE 1 - CHART 2 — EARLY LED1 WITH CANCELLATION




MODE 1 - CHART 3 — COUNT UP

**2. Mode 2 - MANUAL STOP, CANNOT CANCEL**

- Same as cycle 1 but cycle cannot be cancelled.
- Setting “early warning” is the same as other modes. See mode 1 for details.

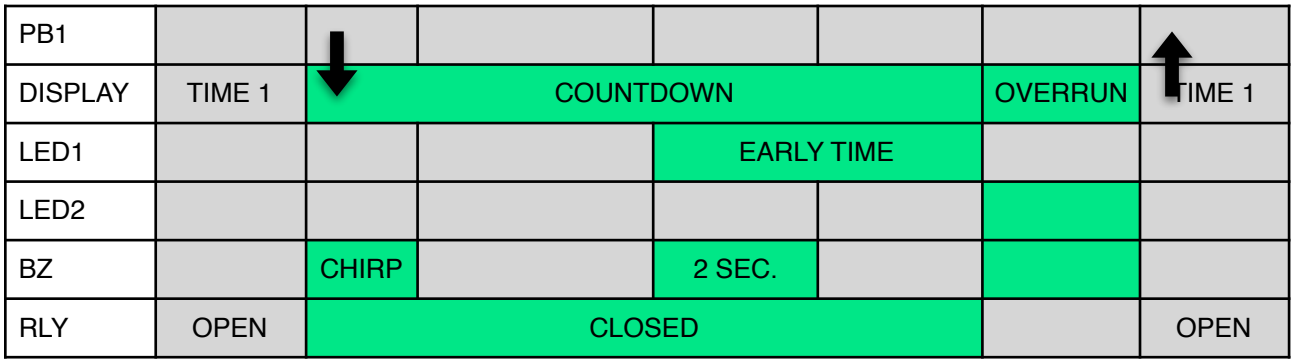



MODE 2 - CANNOT CANCEL

# T5 TIMER MODES rev. 5.10

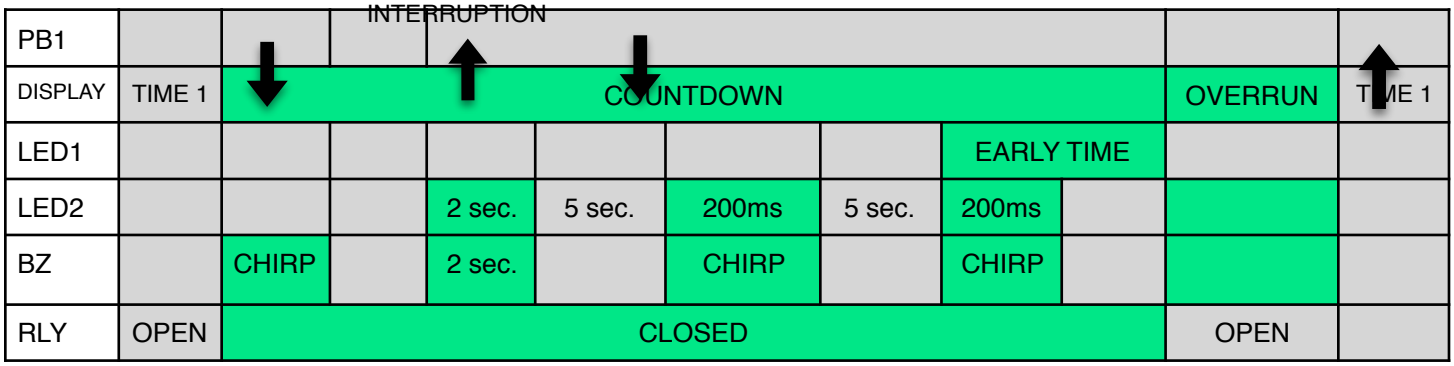
### 3. Mode 3 - MECHANICAL TRIGGER

For applications where PB1 is closed for the entire cycle by a mechanical switch. The cycle cannot be cancelled during timing. If the mechanical switch is interrupted, a warning is given. LED2 and BZ activate for 5 seconds initially, then chirp for short duration ~200ms every 3 seconds, for the remainder of the cycle.




MODE 3 - CHART 1 — EARLY LED1 (NORMAL OPERATION)

.




MODE 3 - CHART 2 — EARLY LED1 (WITH AN INTERRUPTION)

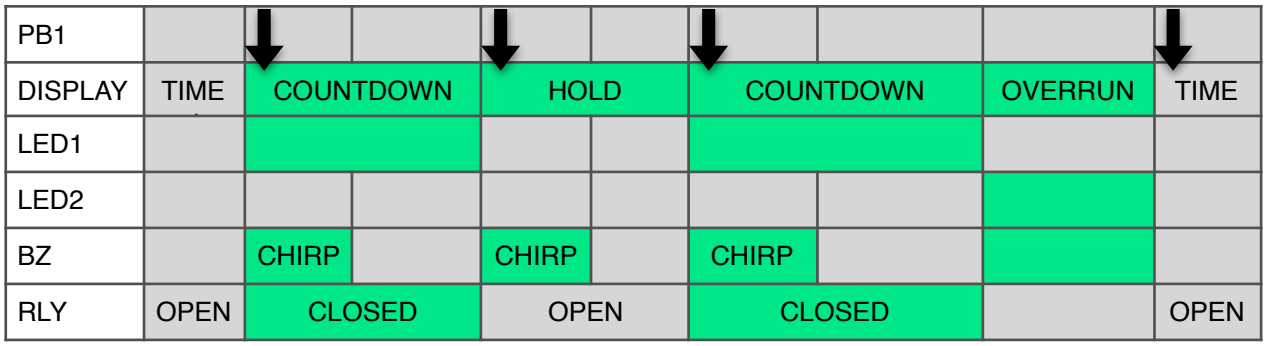
** An interruption starts a pattern where BZ and LED2 chirps a warning.

**4. Mode 4 - PAUSING**

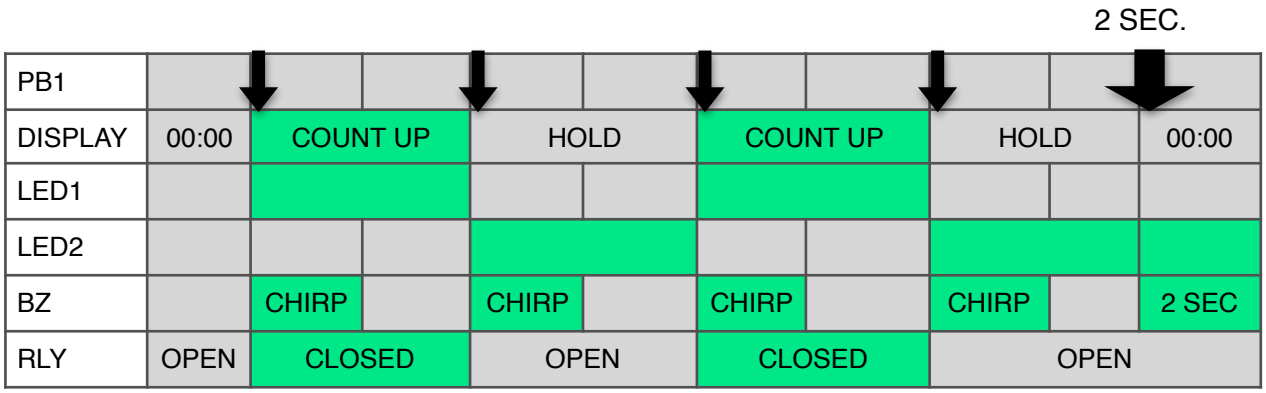
A. Counts down from a set value but time can be paused by pressing PB1. When paused, the display flashes the time.

B. If PB1 is pressed again the countdown resumes. (and display stops flashing) PB1 can be pressed to pause the timing an unlimited number of times. After the set time has elapsed, BZ/LED1/LED2/relay act as usual.

C. If set time starts is zero then it counts *up* and can be paused/resumed in the same way. Count-up can be terminated when by holding PB1 for 2 seconds. In this case BZ sounds to indicate the cycle is cancelled.




MODE 4 - CHART 1 — PAUSING COUNT DOWN




MODE 4 - CHART 2 — PAUSING COUNT UP

**5. Mode 5 -AUTO STOP WITH CANCEL**

Buzzer does not sound at the end of a cycle that runs to completion - it only sounds if the cycle is cancelled. (as shown)

| | | | | |
|---|---|---|---|---|
| PB1 | ↓ | | | |
| DISPLAY | TIME | COUNTDOWN | | TIME |
| LED1 | | | | |
| LED2 | | | | 2 SEC |
| BZ | | CHIRP | | |
| RLY | OPEN | CLOSED | | OPEN |

MODE 5 - CHART 1 — AUTO STOP WITH NO CANCELLATION

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 2 SEC. | | | |
| PB1 | ↓ | | ↓ | | ↓ | |
| DISPLAY | TIME | COUNTDOWN | | LAST TIME FLASHING | | TIME |
| LED1 | | | | | | |
| LED2 | | | | | | |
| BZ | | CHIRP | | 2 sec. | | CHIRP †† |
| RLY | OPEN | CLOSED | | OPEN | | |

MODE 5 - CHART 2 — AUTO STOP WITH A CANCELLATION

**6. EARLY LED2**

Identical to mode 1 except the behaviors of LED1 and LED2 are reversed from mode 1. See mode 1 for written description.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| PB1 | | ↓ | | | | ↓ | |
| DISPLAY | TIME 1 | COUNTDOWN | | | | OVERRUN | TIME 1 |
| LED1 | | | | | | | |
| LED2 | | | | EARLY TIME | | | |
| BZ | | CHIRP | | 2 SEC. | | | |
| RLY | OPEN | CLOSED | | | | OPEN | |

MODE 6 - CHART 1 - EARLY LED2

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 SEC. | | | |
| PB1 | | ↓ | | | ↓ | | ↓ | |
| DISPLAY | TIME 1 | COUNTDOWN | | | | LAST TIME FLASHING | | TIME 1 |
| LED1 | | | | | | | | |
| LED2 | | | | EARLY TIME | | | | |
| BZ | | CHIRP | | 2 SEC | | 2 SEC | | CHIRP |
| RLY | OPEN | CLOSED | | | | OPEN | | |

MODE 6 - CHART 2 - EARLY LED2 WITH CANCELLATION

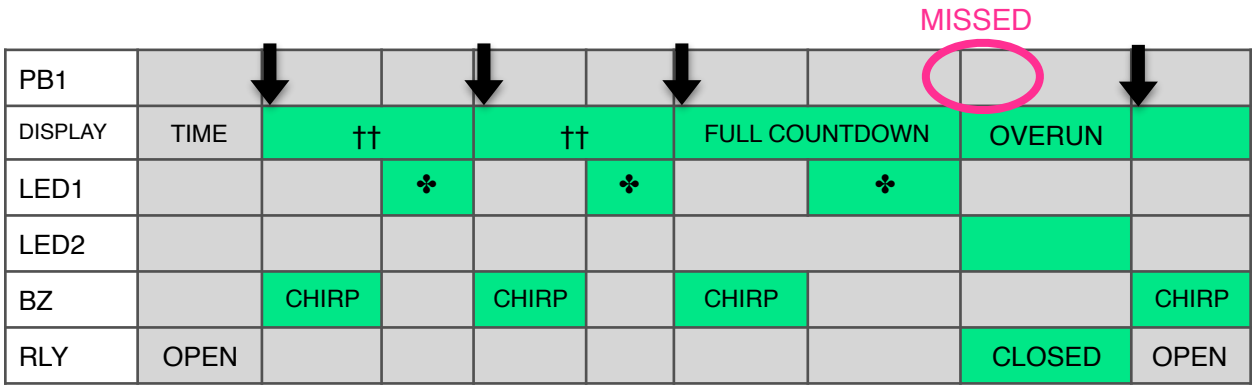
| | | | | | |
|---|---|---|---|---|---|
| PB1 | | ↓ | | ↓ | |
| DISPLAY | 00:00 | COUNTUP | | 00:00 | |
| LED1 | | | | | |
| LED2 | | | | | |
| BZ | | CHIRP | | CHIRP | |
| RLY | OPEN | CLOSED | | OPEN | |

MODE 6- CHART 3 — COUNT UP

# T5 TIMER MODES rev. 5.10

## 7. Mode7 - GUARD DUTY

- Counts down but the time is reset to the starting value if PB1 is pressed anytime before the end of a cycle. If time elapses then LED2 and relay activate. (this is like the doomsday counter on the TV show “Lost”) Cycle cannot be stopped except by disconnecting power.
- Setting “early warning” is the same as other modes. See mode 1 for details.




MODE 7 - GUARD DUTY

†† PARTIAL COUNTDOWN

✤ EARLY WARNING

## 8. Mode 8 - SPRAY RINSE

- Designed to activate a spray rinse at the end of a cycle. If contact with a N.O proximity sensor is closed the cycle starts. The sensors will be connected to PB input.

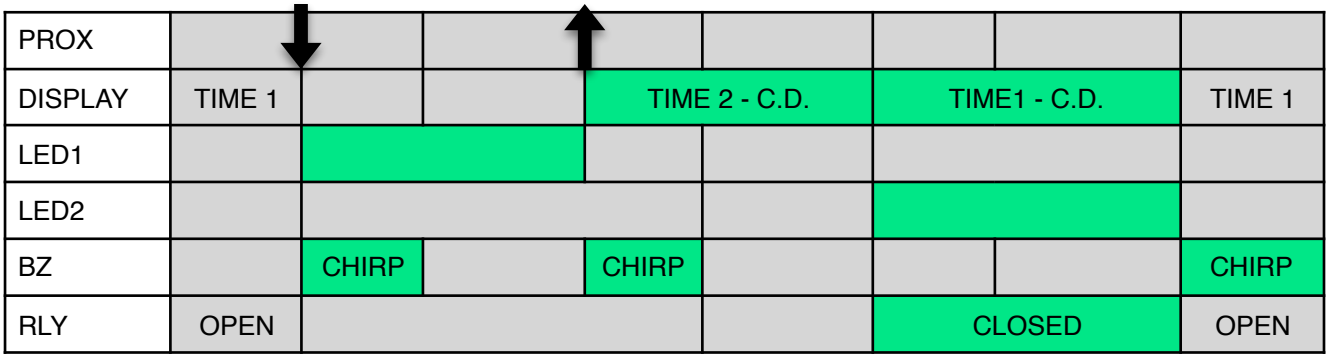
- When a time cycle is activated, the relay close is delayed by TIME2, then relay closes for TIME1.

- TIME2 is set in the same way as the “early warning” in mode 1. (Hold down all three buttons etc.)

- Display should be in seconds:hundredths (so the maximum time possible is 99:99 sec.)

- After programming, the default times should be TIME2= 1.00 seconds, TIME1= 5.00 seconds.

- There is no need to change to another resolution other than seconds/hundredths such as hours/mins by removing jumper A from the pins. Therefore there is a vacant mode 9 if jumper A is off the pins for future use.




MODE 8 - CHART 1

# T5 TIMER MODES rev. 5.10

## 9. Mode 9 - MACHINE RUN TIME

- Purpose: to track running hours on a machine.
- Counting starts when triggered by MSw, stops when MSw is off. (chart 9.1)
- Counting can also be controlled by presence/absence of power. (chart 9.2)
- PB1 immediately resets time. (like guard duty cycle #7)
- If time starts at zero, then it counts up with no alarm. In this case there is no alarm to silence, so PB1 resets time only.
- Time can be also reset *before* the countdown has elapsed.
- This will only be used with line power. (not 9V battery)

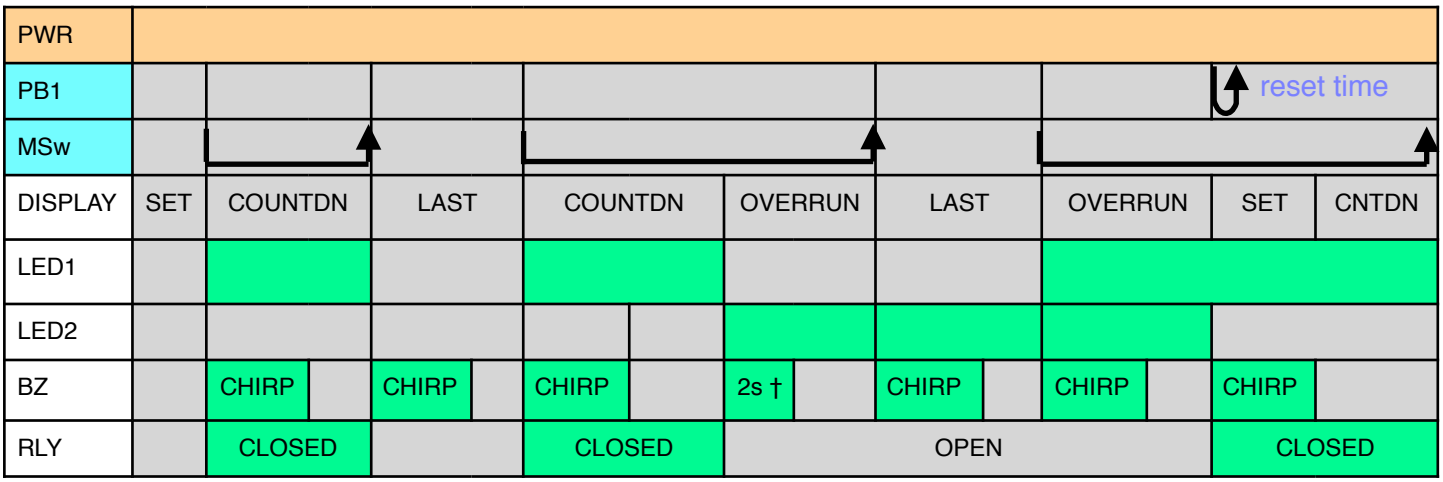



CHART 9.1 - Machine runtime.

*† 500ms BZ chirp every 5 minutes after countdown is complete, while unit is counting. (not while idle)*

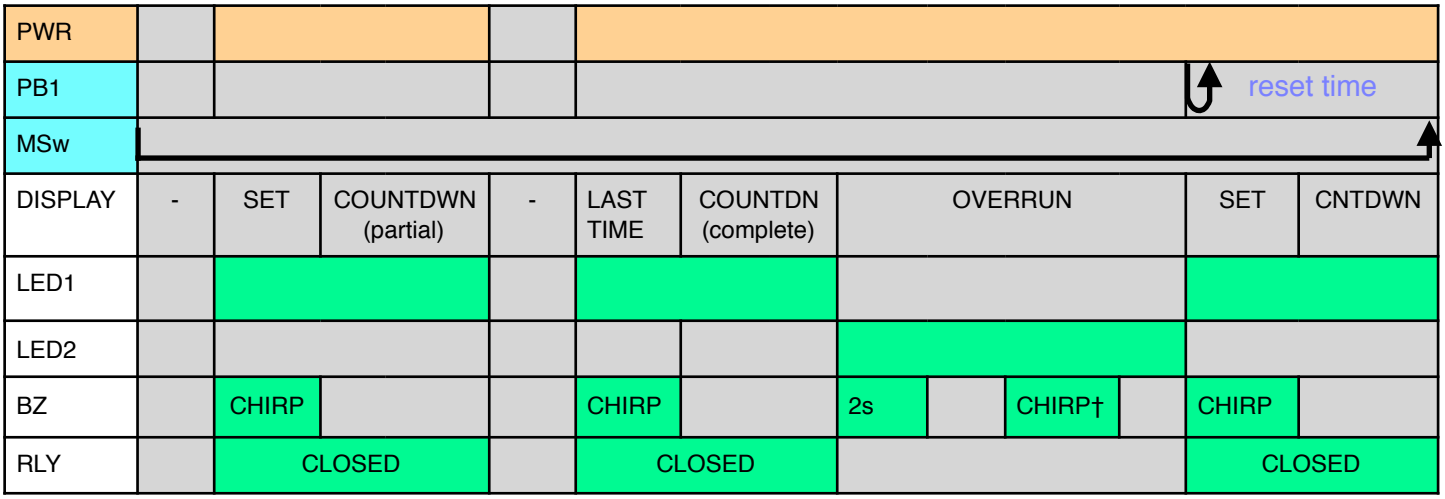



CHART 9.2 - Machine runtime - intermittent power

*† 500ms BZ chirp every 5 minutes after countdown is complete, while unit is counting. (not while idle)*

## 10.Mode 10 ON-DELAY

- Ability to set a delay time before countdown cycle begins.
- Delay is programed by holding down 3 buttons (PB1, PB2, PB3) for 5 seconds. (like programming the “early warning” in mode 1 and 6.
- When cycle starts, set time displays, and the “chaser dots” on the bottom of the screen activate (left to right) until the programmed delay is over, then countdown begins as normal.
- Cancel cycle by holding PB1 down 2s..
- MSw not used.

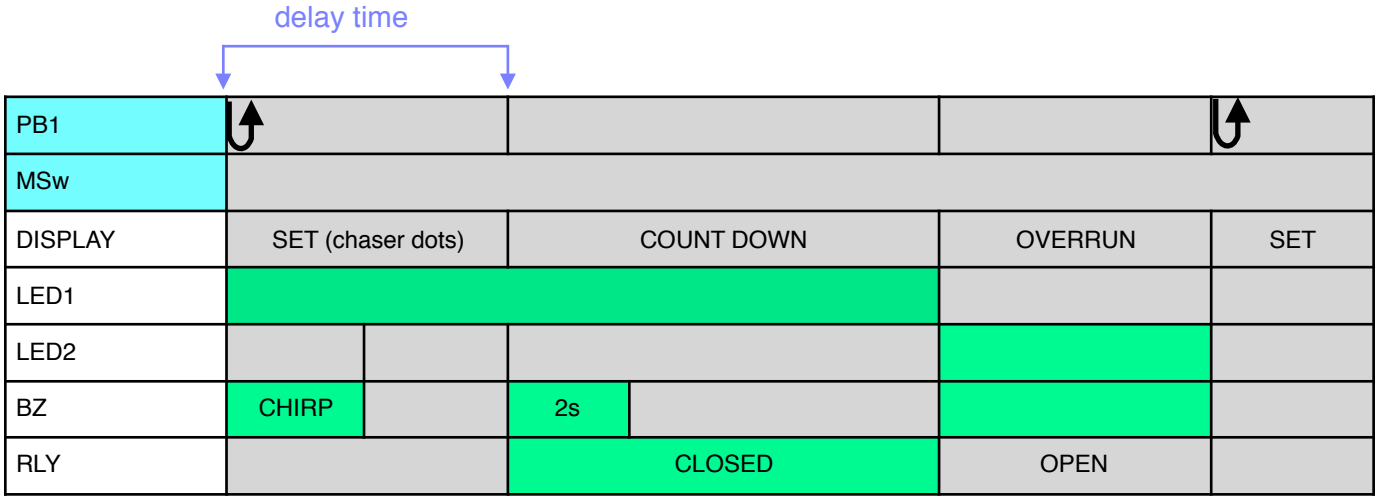



CHART 10.1 - CYCLE 10 COMPLETE CYCLE

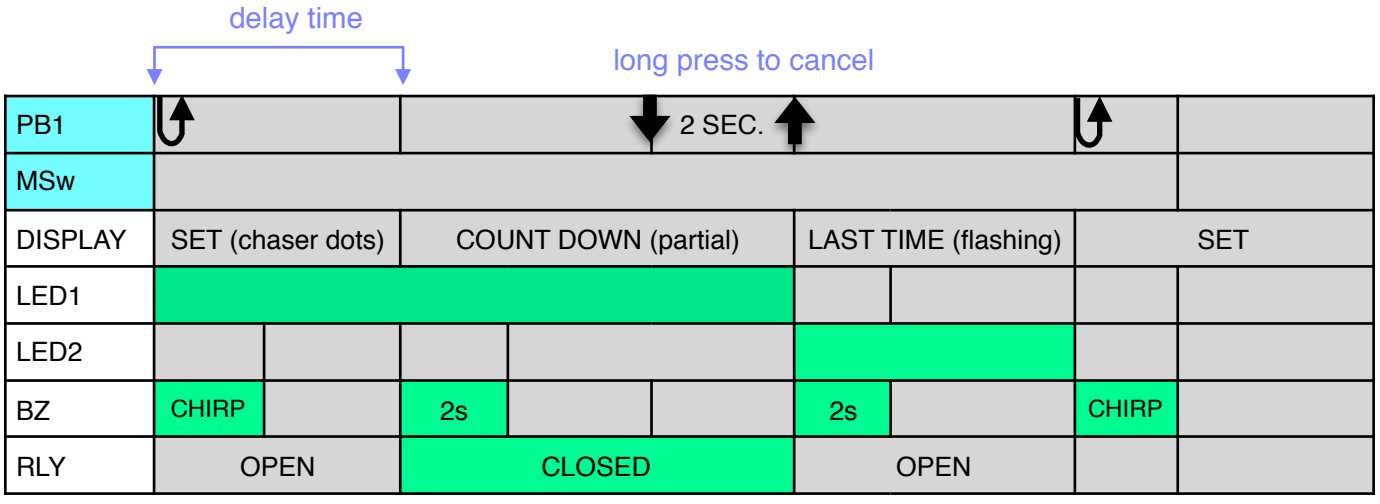
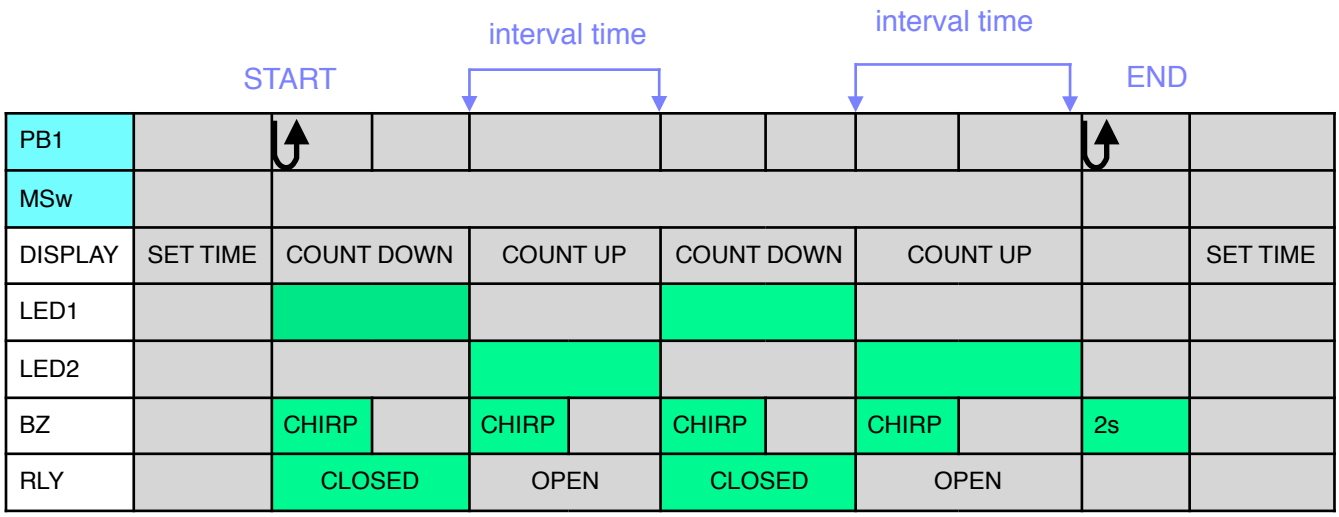



CHART 10.2 - CYCLE 10 WITH CANCELLATION

# T5 TIMER MODES rev. 5.10

## 11.Mode 10 REPEAT

- Once the pushbutton is pressed, the timer will have a repeating behavior until pushbuttons held.
- The “interval time” is set by holding down all three buttons like the “early warning” time in other mode




CYCLE 11 COMPLETE CYCLE