1 YEAR
WARRANTY

OMEGA™

User's Guide

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PTC-13-LV-A & PTC-13-A Multifunction Digital Timer

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Please read this document carefully before using this product. The product guarantee will become invalidated by any damage to the timer caused by not following the instructions in the user manual. Tempatron do not accept any liability for personal injury, material damage or capital losses which may arise by not following the instructions in the user manual.

- 48 x 48mm size
- Two line 4 digit display
- 9 selectable time ranges from 0-99.99sec to 0-9999 hours
- Selectable PNP or NPN sensor type
- Selectable up or down counting direction
- Adjustable input signal pulse and void duration
- Selectable memory option
- 13 different timing modes
- Two relay outputs (1 changeover output and 1 normally open output)
- Two NPN 100mA SSR outputs with current limiting
- Adjustable display brightness
- Security for adjustment of parameters
- Easy installation with plug-in terminal connections

RoHS Compliant

TECHNICAL SPECIFICATION

ENVIRONMENTAL CONDITIONS

Operating/Storage Temperature:	0°C to +50°C / -25°C to +70°C
Relative Humidity:	Maximum humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C
Protection Class:	According to EN60529, front: IP65, rear: IP20
Installation Height:	Maximum 2000m

Do not use this timer in locations where corrosive or flammable gases could be present.

ELECTRICAL

Power Supply Voltage:	PTC-13-LV-A 9-30Vdc/7-24Vac (±10%) PTC-13-A 90-250Vac 50/60Hz (±10%)
Power Consumption (Burden):	<5VA
Wiring:	2.5mm^2 screw type terminals for power supply connection 1.5mm^2 plug-in terminals for signal connnection
Data Retention:	EEPROM (minimum 10 years)
EMC:	EN 61326-1:2013 (performance criterion B is satisfied for EN 61000-4-3)
Safety Requirements:	EN61010-1:2010 (pollution degree 2, overvoltage category II)

INPUTS

Start, Gate, Reset Inputs:	Input types can be set to PNP or NPN in programming mode Minimum pulse and void duration times can be set between 5ms and 100ms For PNP input the activation level is a 5 to 30V pulse For NPN input the activation level is a 0 to 2V pulse

OUTPUTS

Control Outputs (OUT1 & OUT2):	OUT1: Single pole changeover contact 10A rated at 250Vac (resistive load) OUT2: Single pole N/O contact 5A rated at 250Vac (resistive load)
SSR1 & SSR2 Outputs:	Open collector output, maximum 30Vdc, 100mA
Auxiliary Power Supply:	12Vdc, maximum 50mA (un-regulated)
Relay Contact Life:	Mechanical 5,000,000 operations Electrical 200,000 operations
Accuracy:	±0.01% ±1ms

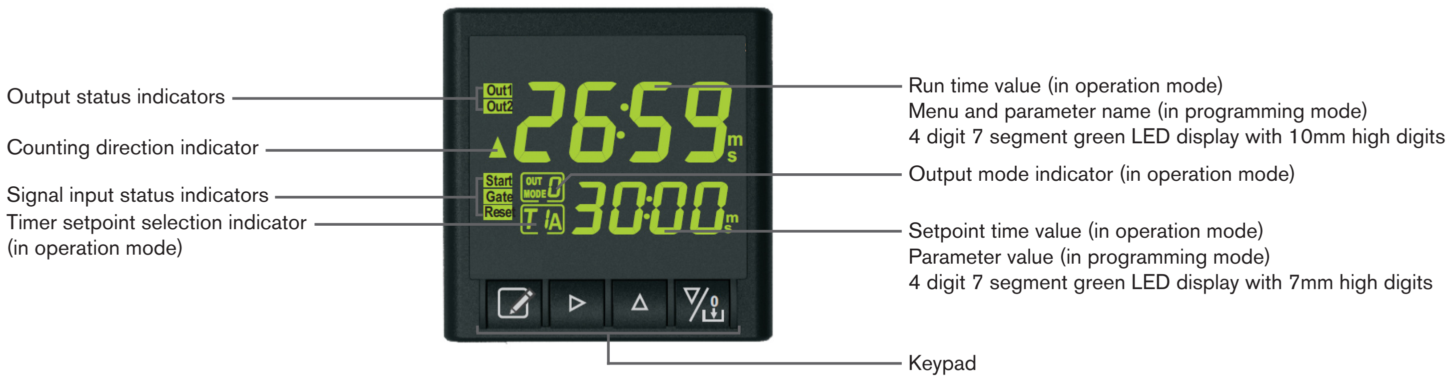
Note: Relay and SSR outputs are synchronised so if OUT1 is on then SSR1 output is on and if OUT2 is on then SSR2 output is on.

HOUSING

Housing Type:	Suitable for flush-panel mounting according to DIN 43700
Dimensions:	48mm wide x 48mm high x 87mm deep
Weight:	Approximately 230g (without packaging)
Enclosure Materials:	Self extinguishing plastics

When cleaning the timer, solvents (thinners, gasoline, acid etc.) or corrosive materials must not be used.

FRONT PANEL DISPLAY FUNCTIONS



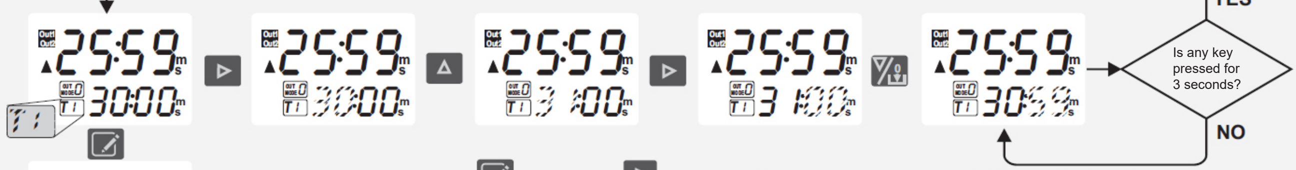
ADJUSTING THE SET TIMES

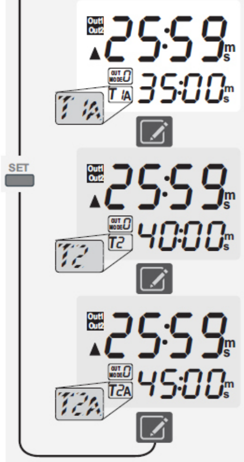
OPERATION MODE

In Operation mode press the key to display the T1, T1A, T2 and T2A setpoints respectively in sequence.
The selected value flashes on the lower display. If no key is pressed for 3 seconds the timer returns to operation mode.

⚠ The T2 and T2A setpoints are only displayed if the parameter o.2.cn is set to t2.on , t2.oF or if 'Out Mode b' is selected.

PROGRAMMING THE SET TIMES





With the T1 time selected with the key, press the ▷ key to select the first digit which will flash.
Press the △ key or key to adjust the value to the desired value. Press the ▷ key to select the second digit which will then flash. Press the △ key or key to adjust the value to the desired value. Continue until all the digits are set to the desired values.

Use the key to select the T1A, T2, T2A set values and adjust them as required following the same procedure as above.
If no key is pressed for 3 seconds the timer will return to operation mode.

⚠ The T1A setpoint is only displayed if timing mode 9, A or b is selected.

⚠ The T2 setpoint is only displayed if the o.2.cn parameter is set to t2.on , t2.oF or 'Out Mode b' is selected.

⚠ The T2A setpoint is only displayed if the o.2.cn parameter is set to t2.on , t2.oF or 'Out Mode 9', 'Out Mode A' or 'Out Mode b is selected.

⚠ If changes are made to parameters t1.r , t1.L or t1.H and the T1 setpoint is then not within these parameter limits the T1 setpoint will be automatically adjusted to fall within these parameter limits.

⚠ If changes are made to parameters t1A.r , t1A.L or t1A.H and the T1A setpoint is then not within these parameter limits the T1A setpoint will be automatically adjusted to fall within these parameter limits.

⚠ If changes are made to parameters t2.r , t2.L or t2.H and the T2 setpoint is then not within these parameter limits the T2 setpoint will be automatically adjusted to fall within these parameter limits.

⚠ If changes are made to parameters t2A.r , t2A.L or t2A.H and the T2A setpoint is then not within these parameter limits the T2A setpoint will be automatically adjusted to fall within these parameter limits.

PROGRAMMING MODE

Press the [PRG] key together with the [▶] key to enter the programming menu.

To Exit Programming Mode

When in programming mode if no key is pressed for 20 seconds, the parameter settings are stored and the timer reverts to operation mode.

Alternatively to exit programming mode press the [PRG] key and [▶] key together, the parameter settings are stored and the timer reverts to operation mode.

[PRG] [▶] Stores the parameter settings and the timer reverts to operation mode

Timer1 Configuration Menu

t1.cn

t1 r 99.99 — **T1 Scale Selection**
9 different time periods can be selected (see Table 1). If this parameter is changed, t1L and t1H are changed automatically.

t1Ar 99.99 — **T1A Scale Selection**
9 different time periods can be selected (see Table 1). If this parameter is changed, t1A.L and t1A.H are changed automatically.

t1 L 0.00 — **T1 Lower Limit Value**
Timer 1 setpoint lower limit can be adjusted between 0 and the t1.H parameter value.

t1AL 0.00 — **T1A Lower Limit Value**
Timer 1A setpoint lower limit can be adjusted between 0 and the t1.A parameter value.

t1 H 99.99 — **T1 Upper Limit Value**
Timer 1 setpoint upper limit can be adjusted between the t1L and t1r parameter values.

t1AH 99.99 — **T1A Upper Limit Value**
Timer 1A setpoint upper limit can be adjusted between the t1AL and t1Ar parameter values.

Timer2 Configuration Menu

t2.cn

This menu is displayed only if parameter o2.cn is set to t2on, t2oF or 'Out Mode b' is selected.

t2 r 99.99 — **T2 Scale Selction**
9 different time periods can be selected (see Table 1). If this parameter is changed, t2L and t2H are changed automatically.

t2Ar 99.99 — **T2A Scale Selction**
9 different time periods can be selected (see Table 1). If this parameter is changed, t2A.L and t2A.H are changed automatically.

t2 L 0.00 — **T2 Lower Limit Value**
Timer 2 setpoint lower limit can be adjusted between 0 and the t2.H parameter value.

t2AL 0.00 — **T2A Lower Limit Value**
Timer 1A setpoint lower limit can be adjusted between 0 and the t2.A parameter value.

t2 H 99.99 — **T2 Upper Limit Value**
Timer 2 setpoint upper limit can be adjusted between the t2.L and t2.r parameter values.

t2AH 99.99 — **T2A Upper Limit Value**
Timer 2A setpoint upper limit can be adjusted between the t2AL and t2Ar parameter values.

Output Configuration Menu

o.cnF

outn 0 — **Out mode Selection**
13 different timing output modes can be selected (see timing mode diagrams on pages 5-7 for details).

o.1cn t1on — **Out1 Settings**
Set output 1 to either t1on or t1oF (for output 1 setting requirements see timing mode diagrams on pages 5-7 for details).

o2cn oFF — **Out2 Settings**
Set output 2 to oFF, t1on, t1oF, t2on, t2oF or Pon (for output 2 setting requirements see timing mode diagrams on pages 5-7 for details).

o.1ot HoLd — **Out1 ON, timer settings**
Set to HoLd for output to be continuously activated. Alternatively set between 0.01 and 99.99 seconds (for output 1 setting requirements see timing mode diagrams on pages 5-7 for details).

o2ot HoLd — **Out2 ON, Timer Settings**
Set to HoLd for output to be continuously activated. Alternatively set between 0.01 and 99.99 seconds (for output 2 setting requirements see timing mode diagrams on pages 5-7 for details).

SnEn no — **Permanent Memory Parameters**
If set to no the timer count position and output contact status will not be retained upon loss of power to the timer. If set to YES the timer count position will be retained upon loss of power to the timer and the timer will continue from where it stopped once power is restored.

Device Configuration Menu

d.cnF

t.dir uP — **Timer Counting Direction**
Set to uP for the timer to count upwards or set to dn for the timer to count downwards.

iFLt 0.001s — **Input Filter**
0.001, 0.020, 0.050 and 0.100 second values can be selected. Pulse and void durations for the start, gate and reset inputs must be greater that the set iFLt value.

itYP nPn — **Input Type Selection**
Set the input type for the Start, Gate and Input to either nPn or PnP.

dLth 10 — **Display Brightness Selection**
The display brightness can be set between 1 and 20.

dnod t1-1 — **Indicator Format**
Set which parameters are to be displayed on the top and bottom displays (see Table 2 for options). Note: This setting resets to t1-1 when outn, o.1cn and o2cn parameters are changed so will need re-adjusting if necessary.

PrCo oFF — **Panel Reset Control**
If set to oFF the reset key will not function. If set to on the timer can be reset by pressing the reset key for 1 second.

Security Configuration Menu

S.cnF

SCod 0 — **Security Menu**
To access this menu enter the security code 4400.

To Fully Reset The Timer
Press the [PRG] key together with the [▼] key for 4 seconds. dEF.P is displayed and the timer is returned to factory default settings.

t1cS PYES — **T1 (Timer1) Menu, Security Access Level**
If nonE Parameter menus not accessible
If PYES Parameters can be modified
If P. no Parameters can be viewed only

t2cS PYES — **T2 (Timer2) Menu, Security Access Level**
If nonE Parameter menus not accessible
If PYES Parameters can be modified
If P. no Parameters can be viewed only

ocnS PYES — **ocnF Menu, Security Access Level**
If nonE Parameter menus not accessible
If PYES Parameters can be modified
If P. no Parameters can be viewed only

dcnS PYES — **dcnF Menu, Security Access Level**
If nonE Parameter menus not accessible
If PYES Parameters can be modified
If P. no Parameters can be viewed only

ATTENTION!
Depending on how parameters outn and o2cn are set some display modes may not be displayed.

Table 1
Time Range Selection

Parameter	Adjustable Value
99.99s	Between 0.01 sec and 99.99 sec
999.9s	Between 0.1 sec and 999.9 sec
9999s	Between 1 sec and 9999 sec
99.59m s	Between 0 min 1 sec and 99 min 59 sec
999.9m	Between 0.1 min and 999.9 min
9999m	Between 1 min and 9999 min
99.59h m	Between 0 hours 1 min and 99 hours 59 min
999.9h	Between 0.1 hour and 999.9 hours
9999h	Between 1 hour and 9999 hours

Table 2
Display Parameter Selection

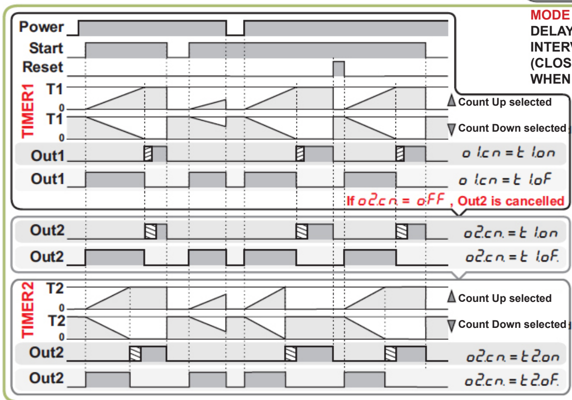
Parameter	TOP Display	BOTTOM Display
t1-1	Timer 1	T1 set
t1.1A	Timer 1	T1A set
t1-2	Timer 1	T2 set
t1.2A	Timer 1	T2A set
t2-2	Timer 2	T2 set
t2.2A	Timer 2	T2A set
t1.t2	Timer 1	Timer 2

How to Adjust a Parameter

t1AL 15.00 → t1AL 15.00 → t1AL 15.00 → t1AL 16.00 → t1AL 16.55

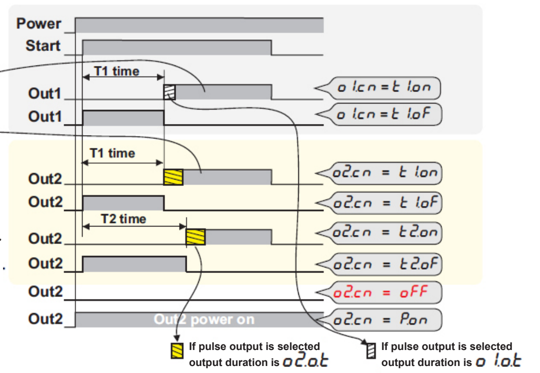
To set a parameter value hold down the [PRG] key and the whole or part of the selected parameter will flash. Adjust the value using the [▲] or [▼] keys until the desired value is reached. Hold the [PRG] key and then press the [▶] key and the next part of the selected parameter will now flash and can be adjusted in the same way.
If the [▲] or [▼] key is held for more than 1 second the value of the selected digits changes more rapidly.

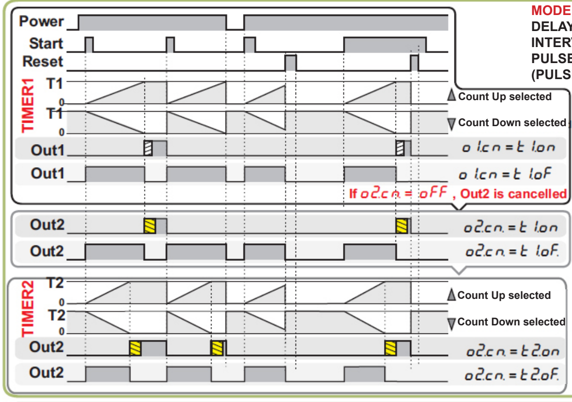
DETAILED EXPLANATION | **TIMING MODES** | **QUICK EXPLANATION**



MODE 0
DELAY ON ENERGISE, INTERVAL or DELAYED PULSE (CLOSE TO START, RESET WHEN START OPENS)

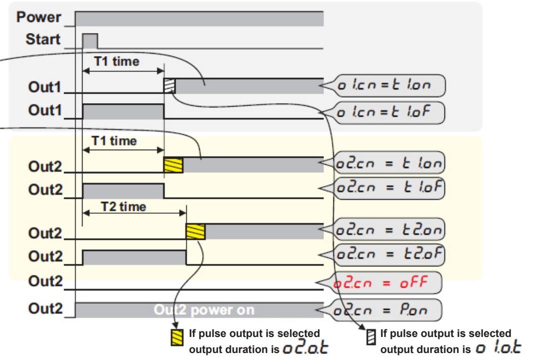
If o1.o.t or o2.o.t is set to HOLD, the output is continuous until the power is removed from the timer or the START input or RESET input is switched.

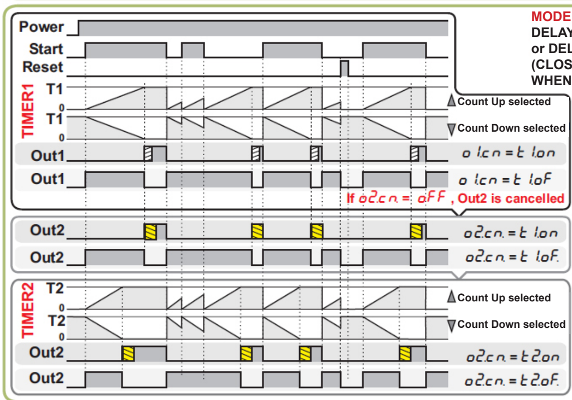




MODE 1
DELAY ON ENERGISE, INTERVAL or DELAYED PULSE
(PULSE TO START)

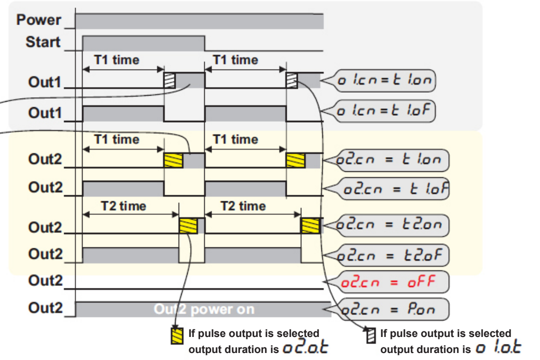
If o1.o.t or o2.o.t is set to HOLD, the output is continuous until the power is removed from the timer or the START input or RESET input is switched.

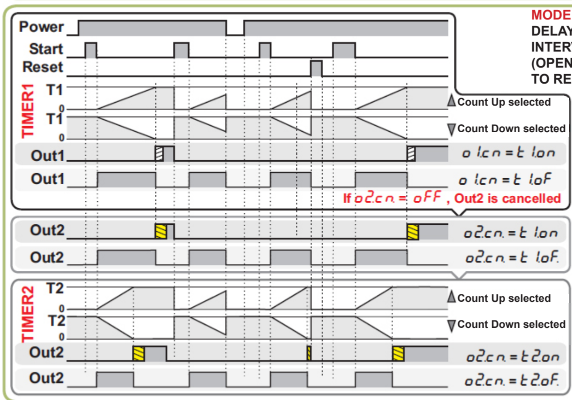




MODE 2
DELAY ON ENERGISE, INTERVAL or DELAYED PULSE
(CLOSE TO START, RESTARTS WHEN START OPENS)

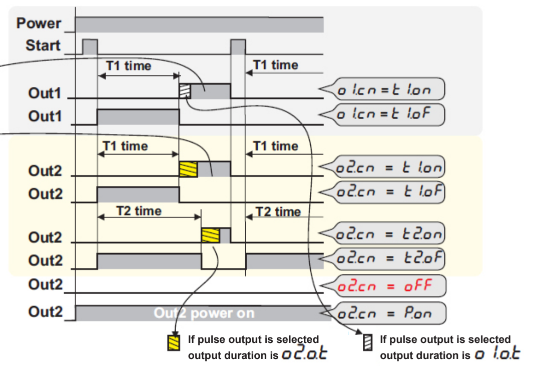
If o1.o.t or o2.o.t is set to HOLD, the output is continuous until the power is removed from the timer or the START input or RESET input is switched.

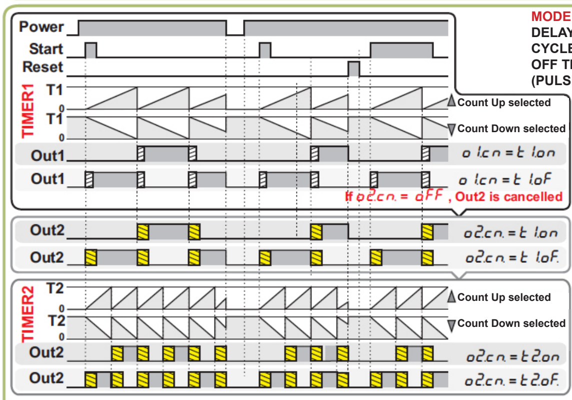




MODE 3
DELAY ON ENERGISE, INTERVAL or DELAYED PULSE
(OPEN TO START, CLOSE START TO RESET)

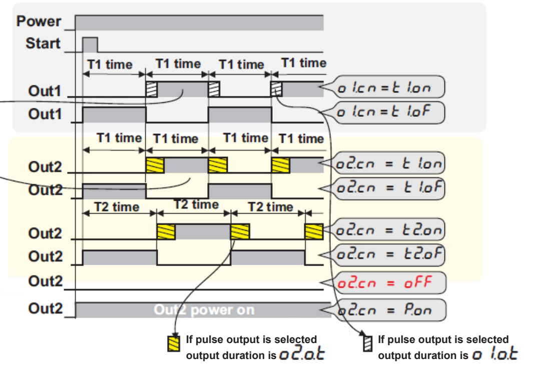
If o1.o.t or o2.o.t is set to HOLD, the output is continuous until the power is removed from the timer or the START input or RESET input is switched.





MODE 4
DELAYED CYCLE or IMMEDIATE CYCLE WITH EQUAL ON AND OFF TIME
(PULSE TO START)

If o1.o.t or o2.o.t is set to HOLD, output 1 cycles off/on for T1 and output 2 cycles off/on for T2 until the power is removed from the timer or the START input is switched.

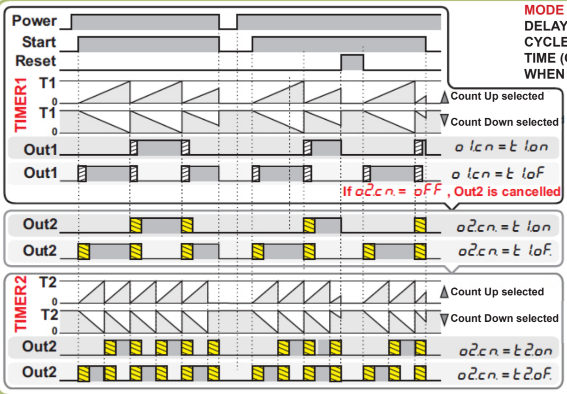


NOTE: If the Gate input is activated the timer enters standby mode with any timing mode selected.

DETAILED EXPLANATION

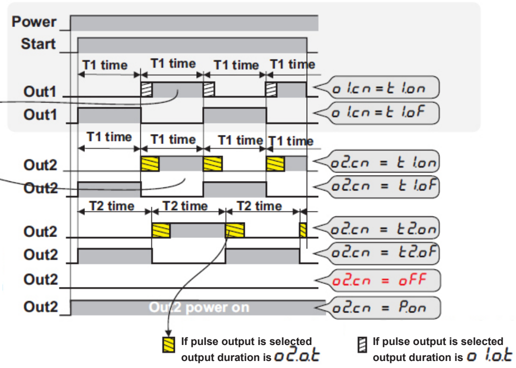
TIMING MODES

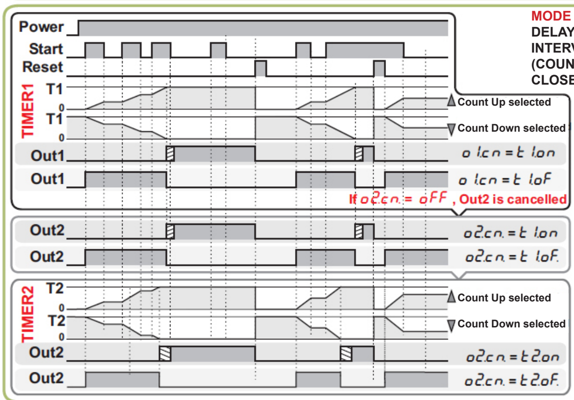
QUICK EXPLANATION



MODE 5
DELAYED CYCLE or IMMEDIATE CYCLE WITH EQUAL ON AND OFF TIME (CLOSE TO START, RESET WHEN START OPENS)

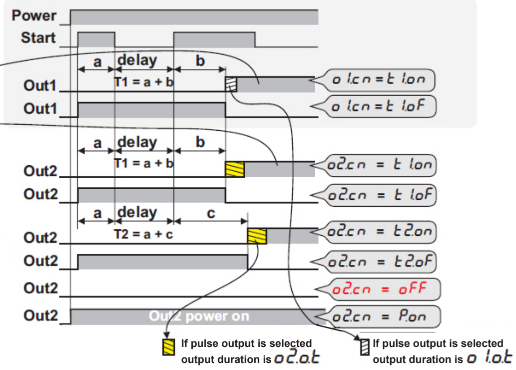
If o1o.t or o2o.t is set to HOLD, output 1 cycles off/on for T1 and output 2 cycles off/on for T2 while the START input is closed and until the power is removed from the timer.

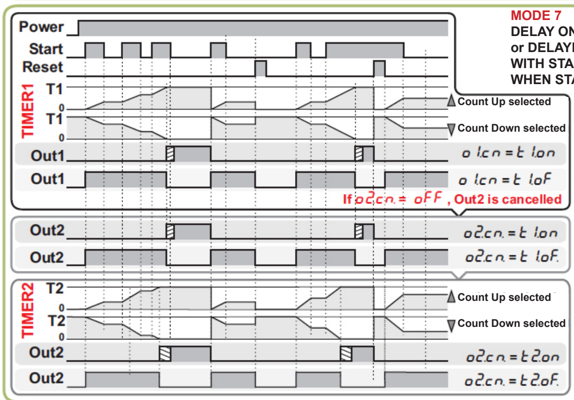




MODE 6
DELAY ON ENERGISE, INTERVAL or DELAYED PULSE (COUNT ONLY WITH START CLOSED)

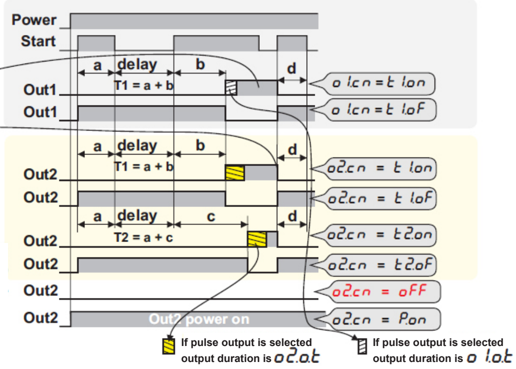
If o1o.t or o2o.t is set to HOLD, the output is continuous until the power is removed from the timer or the RESET input is switched.

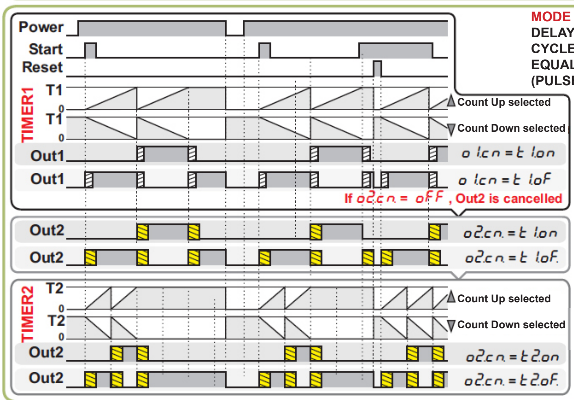




MODE 7
DELAY ON ENERGISE, INTERVAL or DELAYED PULSE (COUNT ONLY WITH START CLOSED, RESTARTS WHEN START CLOSED AGAIN)

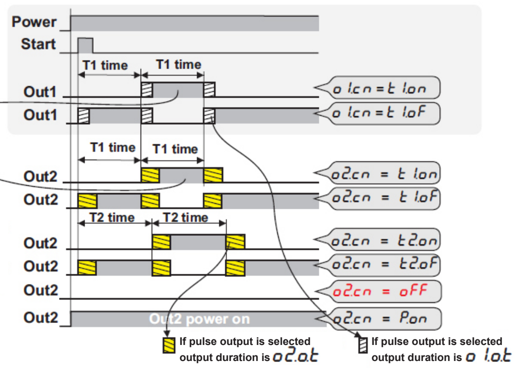
If o1o.t or o2o.t is set to HOLD, the output is continuous until the power is removed from the timer or the START input or RESET input is switched.

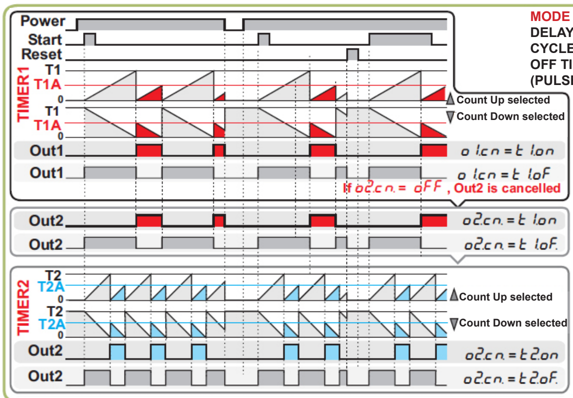




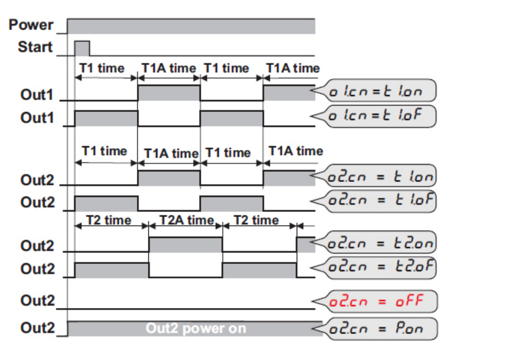
MODE 8
DELAYED CYCLE or IMMEDIATE CYCLE WITH SINGLE CYCLE AND EQUAL ON AND OFF TIME (PULSE TO START)

If o1o.t or o2o.t is set to HOLD, output 1 is off/on for T1 and output 2 is off/on for T2 until the power is removed from the timer or the START input is switched.





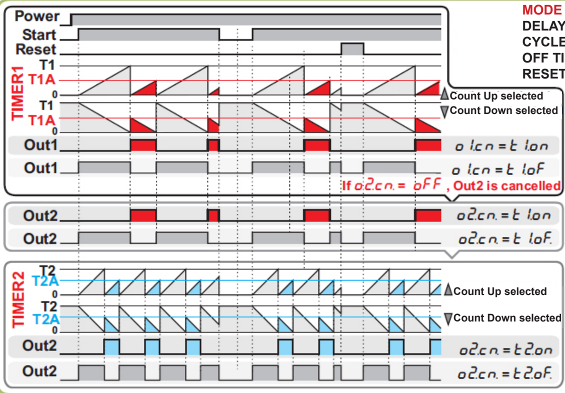
MODE 9
DELAYED CYCLE or IMMEDIATE CYCLE WITH VARIABLE ON AND OFF TIMES (PULSE TO START)

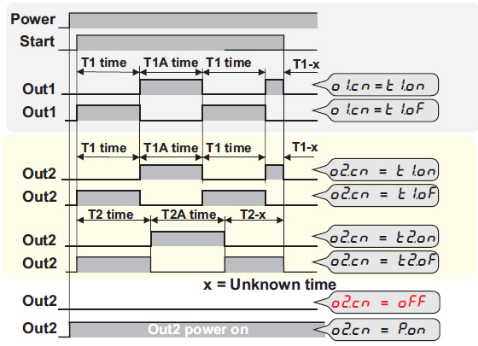


NOTE: If the Gate input is activated the timer enters standby mode with any timing mode selected.

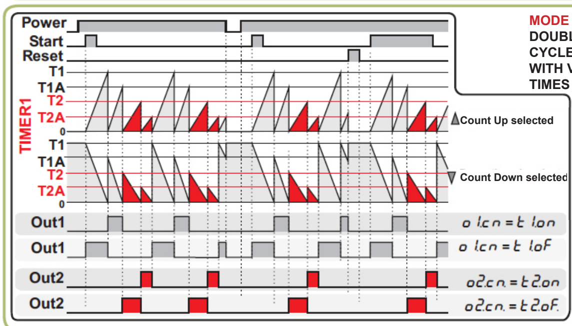
DETAILED EXPLANATION — TIMING MODES — QUICK EXPLANATION

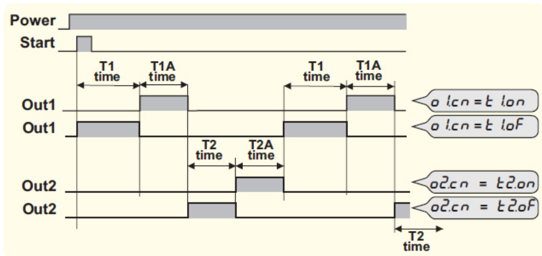
MODE A
DELAYED CYCLE or IMMEDIATE CYCLE WITH VARIABLE ON AND OFF TIMES (CLOSE TO START, RESET WHEN START OPENS)





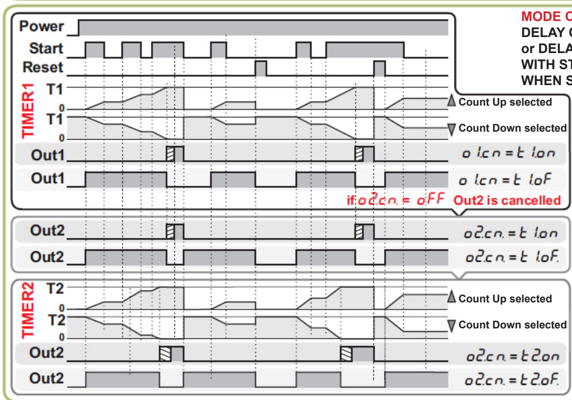
MODE b
DOUBLE OUTPUT DELAYED CYCLE or IMMEDIATE CYCLE WITH VARIABLE ON AND OFF TIMES (PULSE TO START)



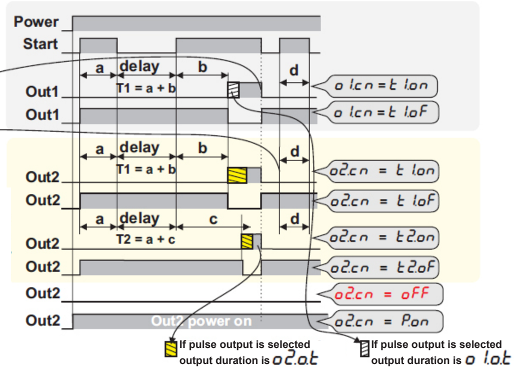


ATTENTION! In order to choose this mode, o2cn parameter must be set to t2on or t2oF .

MODE C
DELAY ON ENERGISE, INTERVAL or DELAYED PULSE (COUNT ONLY WITH START CLOSED, RESTARTS WHEN START OPENS)

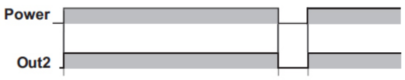


If o1.o.t or o2.o.t is set to HOLD, the output is continuous until the power is removed from the timer or the START input or RESET input is switched.



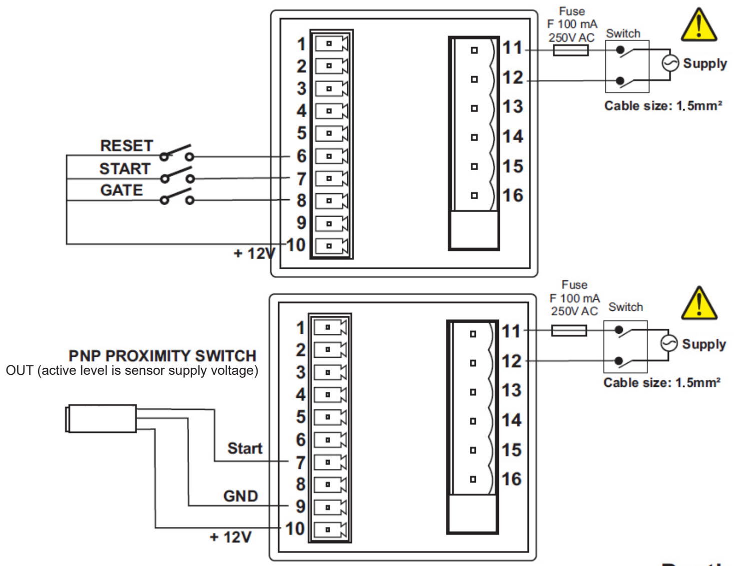
NOTE 1: If the Gate input is activated the timer enters standby mode with any timing mode selected.

NOTE 2: If the o2.cn parameter is set to P.on then output Out2 is continuously activated whilst the timer is powered and only deactivates when power is removed from the timer. In this setup, output Out2 is used to confirm that the timer is powered and all other Out2 output functions cannot be used.

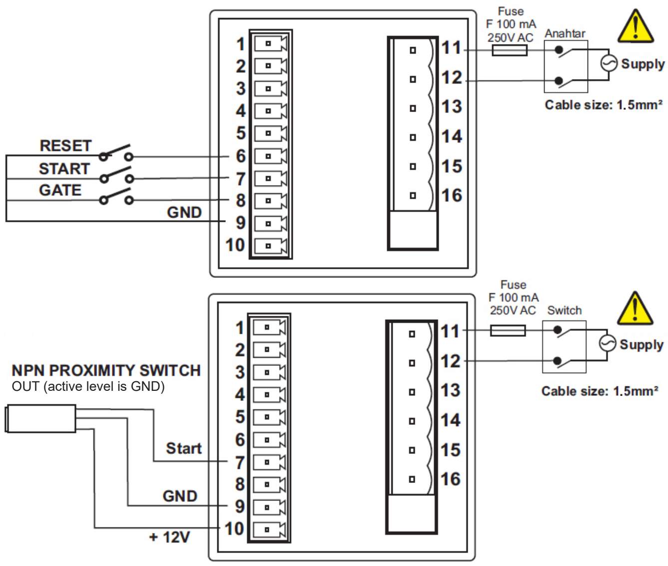


SENSOR CONNECTIONS

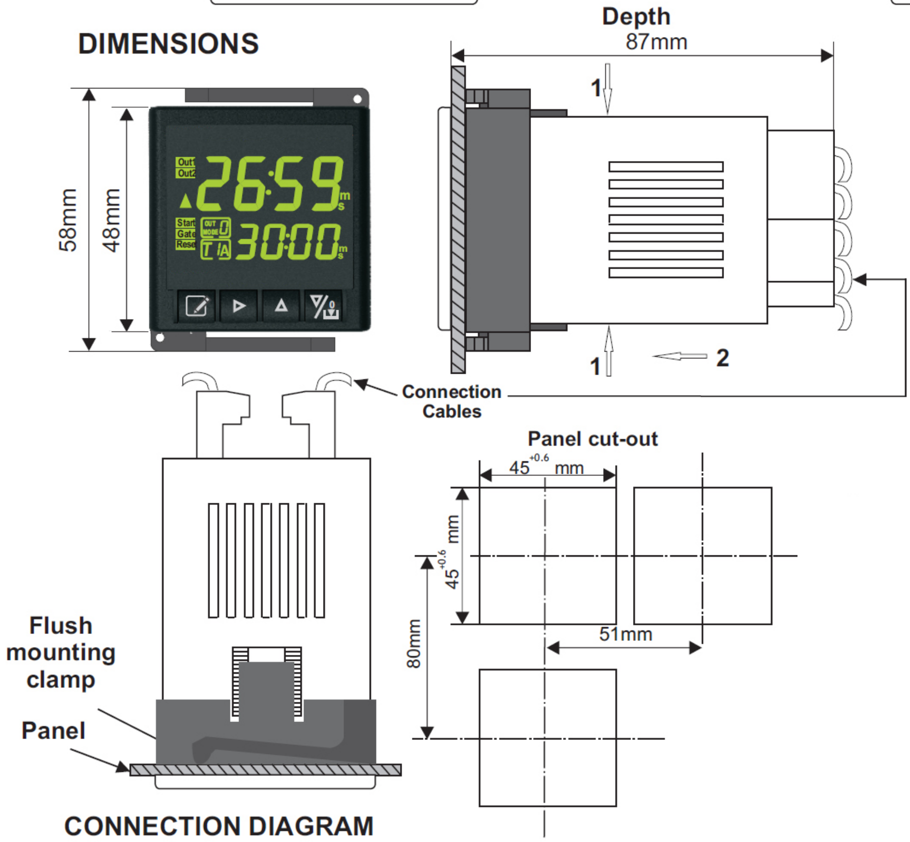
Typical connections for PNP sensor type



Typical connections for NPN sensor type



DIMENSIONS



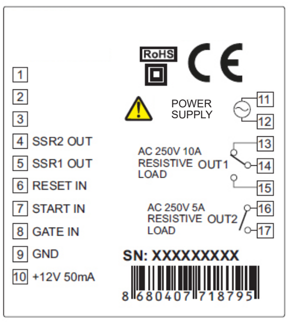
To Remove The Mounting Clamp

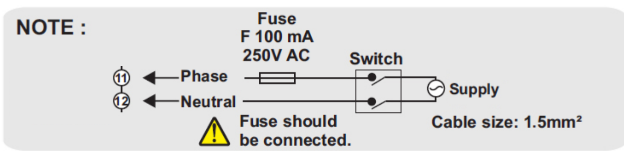
1. Squeeze the timer as shown by the arrows marked 1.
2. Then pull the timer in the direction as shown by arrow 2.

Notes

1. When panel mounting the timer sufficient additional space should be allowed for the connecting cables and to facilitate any possible removal of the timer from the panel.
2. The maximum panel thickness should be 9mm.

CONNECTION DIAGRAM





WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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