

Autonics

# TIMER LE4S SERIES

M A N U A L



Thank you very much for selecting Autonics products.  
For your safety, please read the following before using.

## Caution for your safety

- Please keep these instructions and review them before using this unit.
- Please observe the cautions that follow:
  - Warning** Serious injury may result if instructions are not followed.
  - Caution** Product may be damaged, or injury may result if instructions are not followed.
- The following is an explanation of the symbols used in the operation manual.
  - Warning**: Injury or danger may occur under special conditions.

## Warning

- In case of using this unit with machineries (Nuclear power control, medical equipment, vehicle, train, airplane, combustion apparatus, entertainment or safety device etc), it requires installing fail-safe device, or contact us for information on type required. It may result in serious damage, fire or human injury.
- This unit must be mounted on panel. It may give an electric shock.
- Do not repair or checkup when power on. It may give an electric shock.
- Do not disassemble and modify this unit, when it requires. If needs, please contact us. It may give an electric shock and cause a fire.
- Lithium battery is used for memory retention in this product, therefore do not disassemble or burn up. Please contact Autonics to replace battery. It may cause explosion.

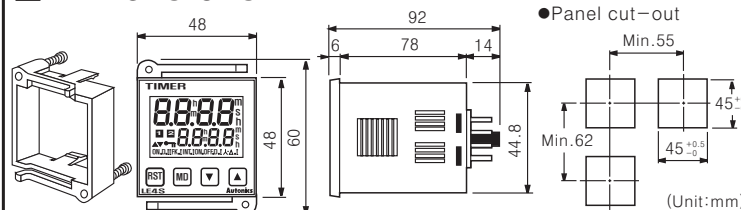
## Caution

- This unit shall not be used outdoors. It might shorten the life cycle of the product or give an electric shock.
- When wire connection, No.20AWG(0.50mm<sup>2</sup>) should be used and screw bolt on terminal block with 0.74N·m to 0.90N·m strength. It may result in malfunction or fire due to contact failure.
- Please observe specification rating. It might shorten the life cycle of the product and cause a fire.
- Do not use the load beyond rated switching capacity of Relay contact. It may cause insulation failure, contact melt, contact failure, relay broken, fire etc.
- In cleaning the unit, do not use water or an oil-based detergent. It might cause an electric shock or a fire.
- Do not use this unit at place where there are flammable or explosive gas, humidity, direct ray of the sun, radiant heat, vibration, impact etc. It may cause explosion or a fire.
- Do not inflow dust or wire dregs into inside of this unit. It may cause a fire or mechanical trouble.

## Ordering information

L	E	4	S	
Time limit 1c				
A	Time limit 2c, Instantaneous 1c+Time limit 1c(Selectable)			
S DIN Size W48×H48mm				
4	9999(Digit)			
E Timer				
L LCD Display(Backlight)				

## Dimensions

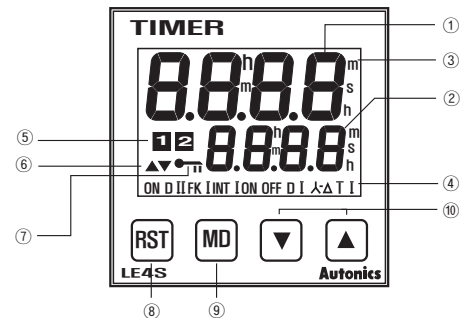


\*The above specification are changeable without notice anytime.

## Specifications

Model	LE4S	LE4SA
Power supply	100-240VAC 50/60Hz, 24-240VDC	
Display method	LCD Display(Backlight)	
Allowable voltage range	90 to 110% of rated voltage	
Power consumption	Max. 5VA(240VAC 50/60Hz), Max. 3W(240VDC)	
Return time	Max. 200ms	
Min. START input signal	Min. 20ms	
Input	START input: No-voltage input RESET input: Short-circuit impedance:Max. 1kΩ, Residual voltage:Max. 1V INHIBIT input: Open-circuit impedance:Min. 100kΩ	
Con-trol output	Type: Time limit SPDT(1c) Capacity: NO : 250VAC 3A, NC : 250VAC 2A resistive load	
Output mode	13 kinds of operating mode(See operation mode)	
Ambient temperature	-10 to 55°C (at non-freezing status)	
Storage temperature	-25 to 65°C (at non-freezing status)	
Ambient humidity	35 to 85%RH	
Repeat error	Power Start : Max. ±0.01% ±0.05sec	
Setting error	Signal Start : Max. ±0.005% ±0.03sec	
Voltage error		
Temperature error		
Memory retention	10 years at 25°C and when LCD and input key turns OFF, 40 days at 25°C and when LCD and input key turns ON continually	
Insulation resistance	Min. 100MΩ (at 500VDC)	
Dielectric strength	2000VAC 50/60Hz for 1 minute	
Noise strength	±2kV the square wave noise(pulse width:1μs) by the noise simulator	
Vibra-tion	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 1hour
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 10 minutes
Shock	Mechanical	300m/s <sup>2</sup> (30G) in X, Y, Z directions for 3 times
	Malfunction	100m/s <sup>2</sup> (10G) in X, Y, Z directions for 3 times
Relay life cycle	Mechanical	Min. 10,000,000 times
Weight	Electrical	Min. 100,000 times(NO:250VAC 3A, NC:250VAC 2A resistive load)
		Approx. 126g
		Approx. 130g

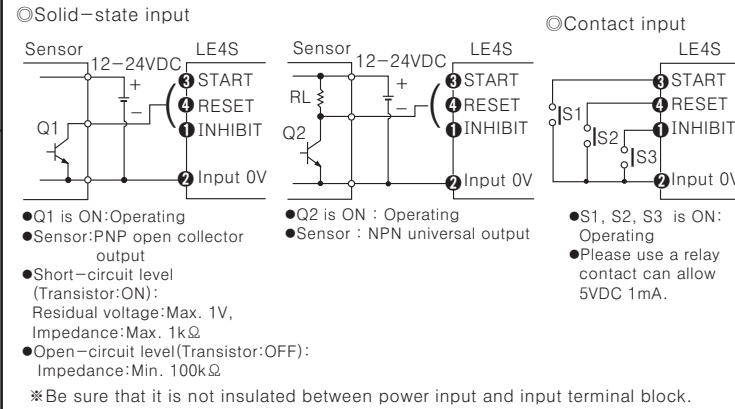
## Front panel identification



- Time progressing display : It displays the current time.
- Time setting display : It displays the setting time.
- Time unit : It displays the time unit. (h:hour) (m:min) (s:sec)  
\*When the time is progressing, it is flickering by turn (0.5sec).
- Operation mode: It displays the current operation mode. (Ex:ON D=ON delay)
- Output display: It displays the status of output contact.
- UP/DOWN : It displays time progressing UP(▲), DOWN(▼).
- Key lock display : It displays the status of key lock.
- RESET key : Used for initializing time progressing and output return.
- MODE key : Used for time setting and function setting.
- DOWN(▼)key, UP(▲)key: Used for changing time and mode move.

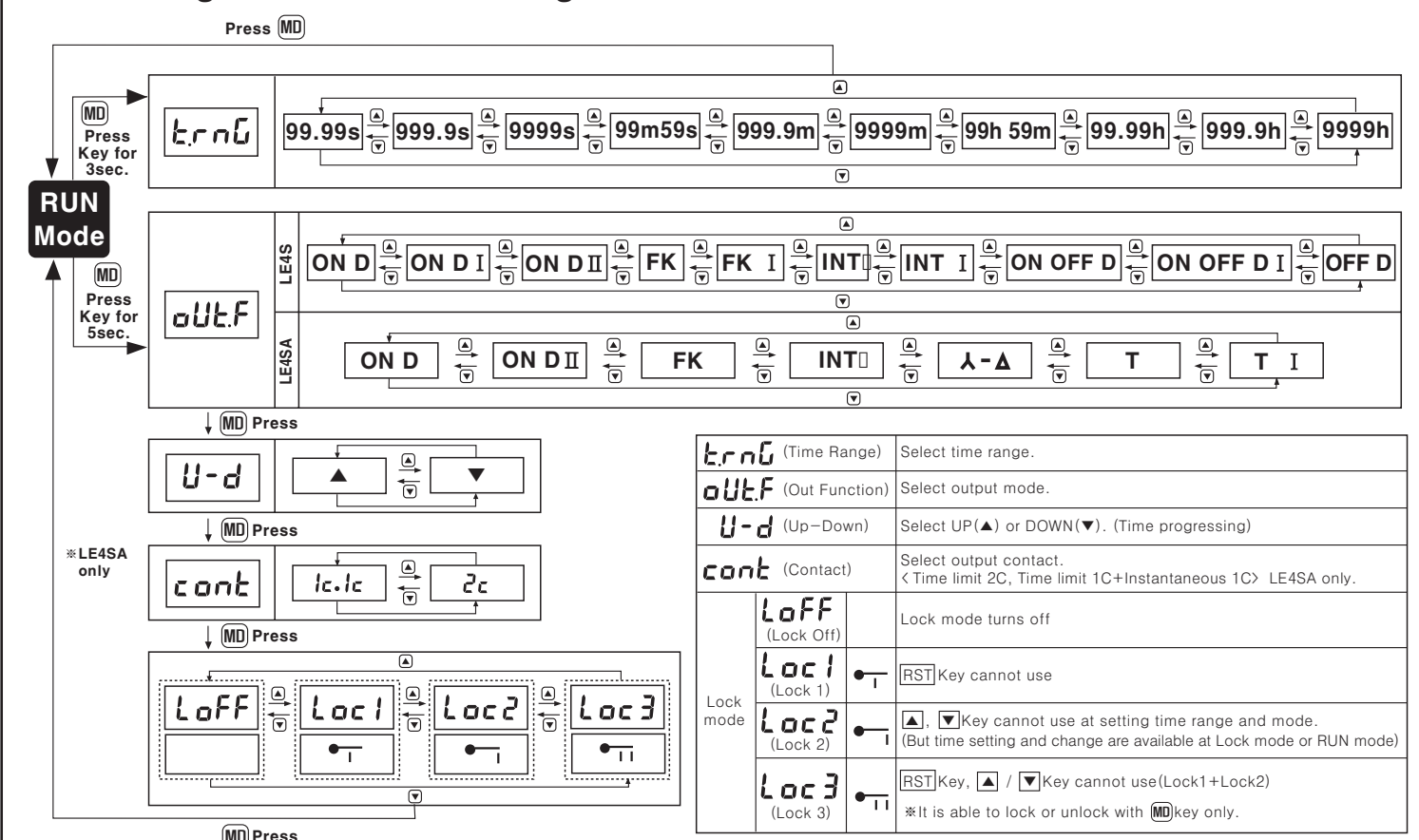
## Input connection

LE4S is No-voltage input(Short-circuit and open) type.



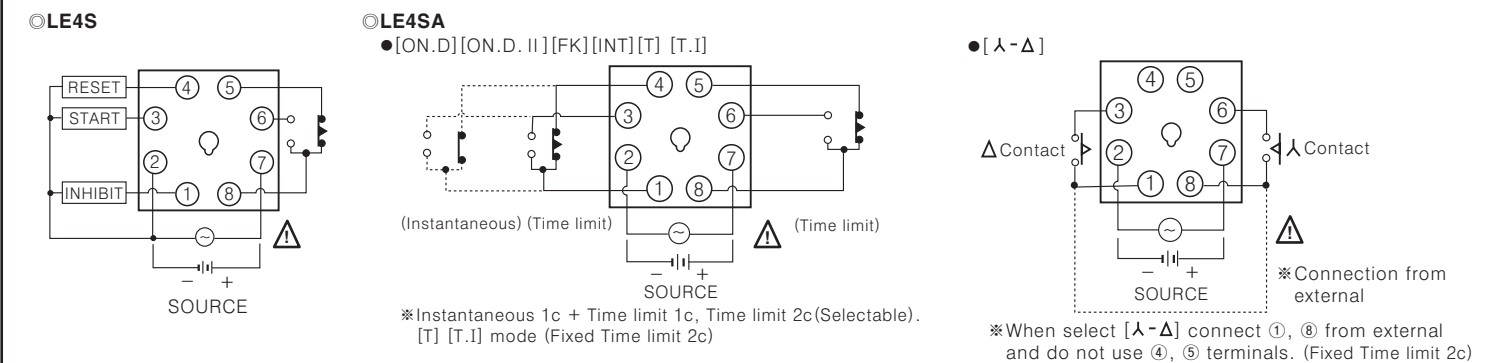
\*Be sure that it is not insulated between power input and input terminal block.

## Time range and function setting



Time Range	Select time range.
Out Function	Select output mode.
U-d (Up-Down)	Select UP(▲) or DOWN(▼). (Time progressing)
Contact	Select output contact. < Time limit 2C, Time limit 1C+Instantaneous 1C > LE4SA only.
Lock mode	Lock mode turns off
Loc1 (Lock 1)	[RST] Key cannot use
Loc2 (Lock 2)	[▲], [▼] Key cannot use at setting time range and mode. (But time setting and change are available at Lock mode or RUN mode)
Loc3 (Lock 3)	[RST] Key, [▲] / [▼] Key cannot use (Lock1+Lock2) *It is able to lock or unlock with MD key only.

## Connections



## Time Range

●If press MD key for 3sec, it is moved to the time range mode.

TIME RANGE specification	
99.99s	0.01sec. to 99.99sec.
999.9s	0.1sec. to 999.9sec.
9999s	1sec. to 9999sec.
99m59s	1min. 01sec. to 99min. 59sec.
999.9m	0.1min. to 999.9min.
9999m	1min. to 9999min.
99h59m	1hour 01min to 99hour 59min.
99.99h	0.01hour to 99.99hour
999.9h	0.1hour to 999.9hour
9999h	1hour to 9999hour

## The setting and status when cut power off

- LCD display and output will be OFF when power off.
- If press any keys in front, previous setting mode and setting time will be displayed.  
\*After LCD is ON, if no key touched for 30sec., then LCD will be OFF.
- Enable to set each mode and setting time of each mode in above status. (But LCD backlight and external signal input, relay output are disable)
- When supply power again, the mode and setting value changed in above status will be saved, the time progressing value will be initialized.

## Operation mode

● If press MD key for 5sec, it is moved to output mode.

NO	Indication	LE4S	LE4SA
1	ON D	ON DELAY	
2	ON D I	ON DELAY1	Non function
3	ON D II (*1)	ON DELAY2(One shot out)	
4	FK (*2)	FLICKER	
5	FK I (*2)	FLICKER1	Non function
6	INT	INTERVAL-DELAY	
7	INT I	INTERVAL-DELAY1	Non function
8	ON OFF D	ON-OFF DELAY	Non function
9	ON OFF D I	ON-OFF DELAY1	Non function
10	OFF D	OFF DELAY	Non function
11	▲-Δ	▲-Δ TIMER	
12	T	Non function	TWIN TIMER
13	T I	Non function	TWIN TIMER

(\*1)One-shot output is fixed as 0.5sec. (ON D II mode)  
(\*2)When selected [FK] [FK I], T-ON and T-OFF time can be set separately.

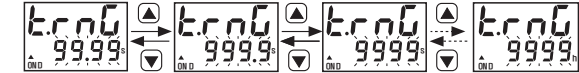
## Factory specification

LE4S	LE4SA
●OUT MODE : ON delay	●OUT MODE : ON delay
●UP/DOWN MODE : UP	●UP/DOWN MODE : UP
●Output contact : Time limit 1c	●Output contact : Time limit 1c+Instantaneous 1c
●Timer Range : 99.99sec	●Timer Range : 99.99sec
●Lock key : LoFF (Lock mode turns off)	●Lock key : Loc1 ([RST] key cannot use)

## Mode setting

### [brnG] : Time Range setting(LE4S, LE4SA)

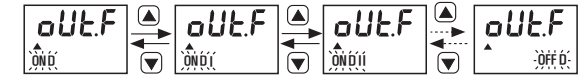
Press MD key for 3sec at RUN status



\*If press MD key in the desire time range, the range will be set then return to RUN mode.

### [outF] : Operation mode setting(LE4S)

Press MD key for 5sec at RUN status



\*If press MD key in the desire operation mode, the operation mode will be set then enter into UP-DOWN mode.

\*LE4SA can select 7 kinds of mode from ON D mode to T I mode. (See operation mode)

### [U-d] : UP-DOWN mode setting(LE4S, LE4SA)



\*If press MD key in the desire specification, UP or DOWN mode will be set then(LE4S:Enter in to the key lock mode, LE4SA:Enter in to the output contact selection mode)

### [cont] : Output contact setting(LE4SA only)

Time limit 2c, Instantaneous limit 1c + Time limit 1c selectable.  
Instantaneous limit 1c + Time limit 1c are factory specification.  
[Instantaneous : 1 (6-8), Time limit : 2 (1-3)]



Instantaneous 1c + Time limit 1c

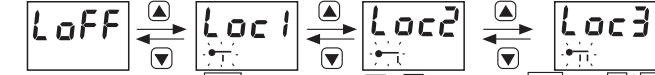
\*If press MD key in desire specification, output contact will be selected then enter into key lock mode.

\*cont mode is not displayed in LE4S.

\*If press MD at RUN mode, setting mode of output contact displayed.

(If press MD key for 3sec, [brnG] mode displayed.)

### [Loc] : Lock mode setting and unlock(LE4S, LE4SA)



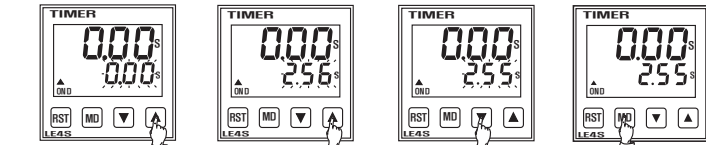
Lock mode turns off. RST key cannot use. Key can not use. RST key, / key cannot use.

\*If press MD key in desire specification, key lock will be selected then return to RUN mode.

\*Release key lock:After pressing MD key at RUN mode for 5sec. select LoFF at Lock selection mode and key lock will be released by pressing MD key and return to RUN mode.

## The time setting

### Output operation mode : [ON D], [ON D I], [ON D II], [INT], [INT I], [ON OFF D], [ON OFF D I], [OFF D]



(Picture 1) (Picture 2) (Picture 3) (Picture 4)

1. Display of setting time will be flickering when press / or Key at RUN mode.(Picture 1)  
2. And then set the setting time with / or Key. If press / Key once, it will increase as number of pressing, but if keep pressing more than 2sec., it will increase faster.(Picture 2)  
If press / key once, it will decrease as number of pressing, but if keep pressing more than 2sec., it will decrease faster.(Picture 3)

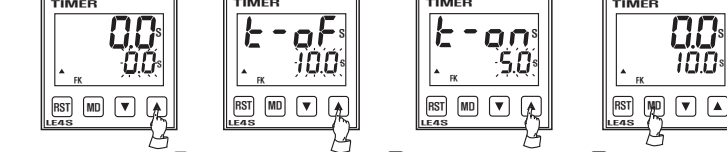
3. When complete the setting, it will be saved and return by pressing MD key.(Picture 4)

\*It is able to change the setting time during the time progressing, but be sure about the time progressing while changing of the time.

\*If set the value is 0, "Err" will be displayed. ("Err" will be removed by pressing /, Key)

\*If no key touched for 30sec., it will return to RUN mode.

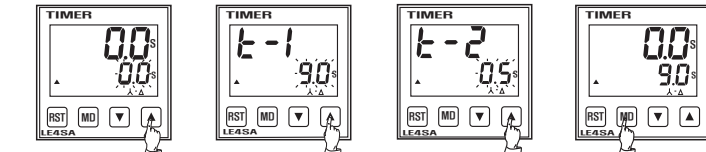
### Output operation mode : [FK], [FK I] (There is no [FK I] in LE4SA)



(RUN mode) (T-OFF Time setting) (T-ON Time setting) (RUN mode)  
Set by / Key Set by / Key

\*It is able to change the setting time during the time progressing, but be sure about the time progressing while changing of the time.

### Output operation mode : STAR-DELTA[λ-Δ] (LE4SA only)

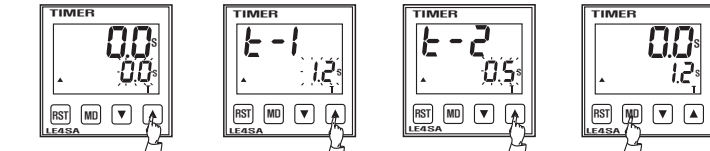


(RUN mode) (T1 Time setting) (T2 Time setting) (RUN mode)  
Set by / Key Set by / Key

\*It is able to change the setting time during the time progressing, but be sure about the time progressing while changing of the time.

\*T1 : Setting time, T2 : λ-Δ switching time

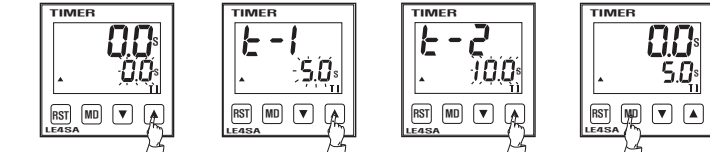
### Output operation mode : TWIN TIMER[T] (LE4SA only)



(RUN mode) (T1 Time setting) (T2 Time setting) (RUN mode)  
Set by / Key Set by / Key

\*It is able to change the setting time during the time progressing, but be sure about the time progressing while changing of the time.

### Output operation mode : TWIN TIMER[T I] (LE4SA only)



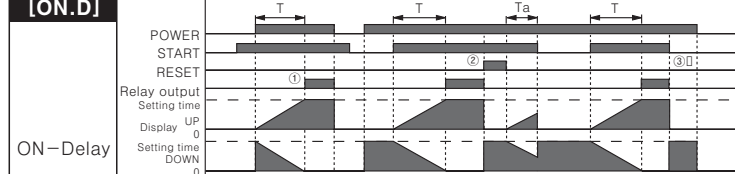
(RUN mode) (T1 Time setting) (T2 Time setting) (RUN mode)  
Set by / Key Set by / Key

\*It is able to change the setting time during the time progressing, but be sure about the time progressing while changing of the time.

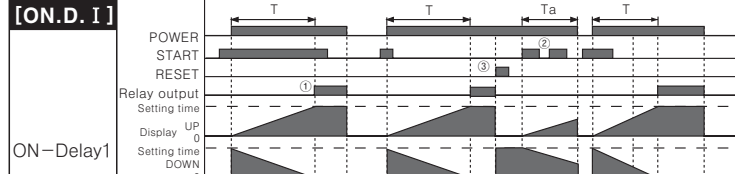
## Output operation in each mode(Output mode)

### LE4S

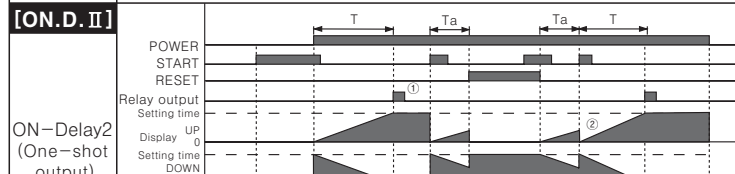
Mode Time-chart (T:Setting time)



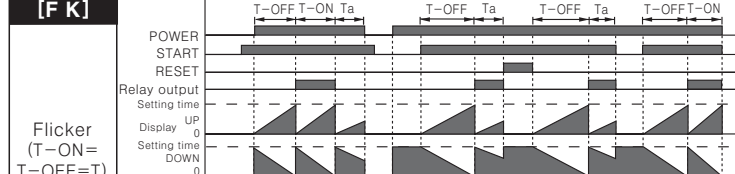
1. The time progress when START signal is ON at status of power on.  
2. Output(Relay output) turns on at setting time. (1 Position)  
3. Output and display value will be initialized when RESET signal is applied.  
(But in case of applying START signal, time progress again when RESET signal is OFF.) (2 Position)  
4. When START signal is OFF, time progressing will be initialized and output is returned. (3 Position)



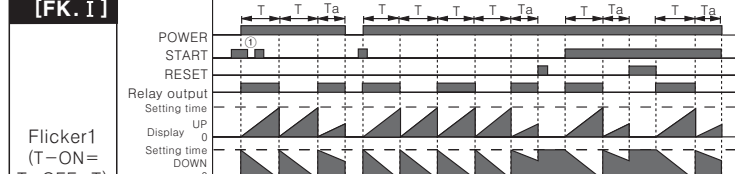
1. Time progress when START signal is ON, output will be ON at setting time. (1 Position)  
2. Even though the START signal is applied repeatedly, it does not detect from the second START signal. (2 Position)  
3. Output and display value will be initialized when RESET signal is applied. (3 Position)  
4. When power on again after power off, then it will be operating as "1".



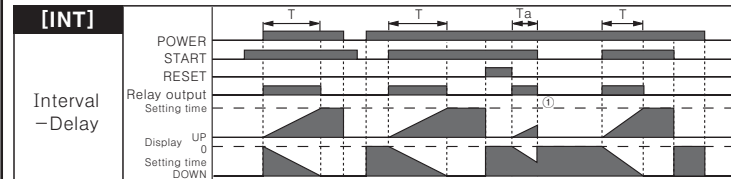
1. The time progress when START signal is ON at status of power on.  
2. Output will be ON for 0.5sec(One shot output) at setting time and then OFF. (1 Position)  
3. If START signal is ON again during time is progressing, the time progressing will be initialized there progress again. (2 Position)



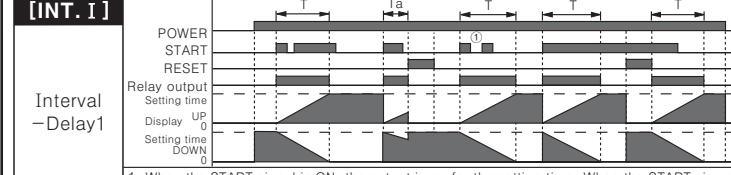
1. Output will be OFF for T-OFF time when START signal is ON and then ON status will be held for T-ON time and then OFF again.  
2. T-ON is the time while output is ON, T-OFF is the time while output is OFF.  
3. T-ON & T-OFF can be set individually.  
4. T-OFF time start in [FK I] mode firstly.  
5. Please set min. 100ms as the setting time.



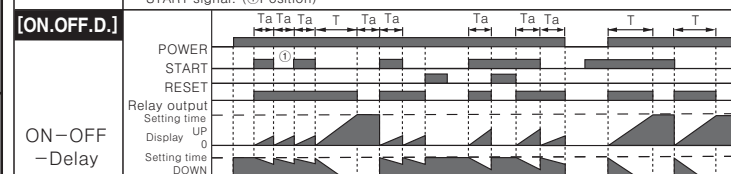
1. Output is ON and OFF repeatedly at setting time when START signal is ON.  
2. Even though the START signal is applied repeatedly, it does not detect from the second START signal. (1 Position)  
3. Output and display value return to initial status when RESET signal is applied.  
4. T-OFF time start in [FK I] mode firstly.  
5. When power on again after power off, then it will be operating as "1".  
6. Please set min. 100ms as the setting time.



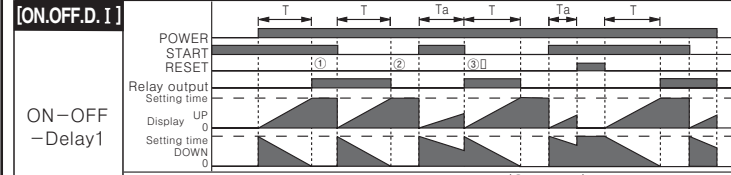
1. Output is ON when START signal is ON, output will be OFF at setting time and display is held. 2. Output and the time return to initial status when START signal is OFF. (1 Position)



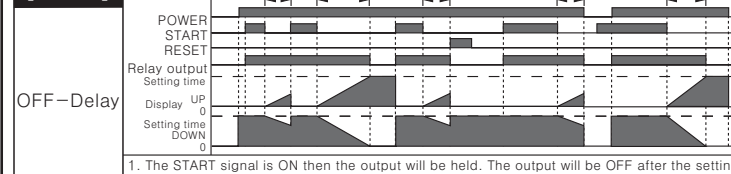
1. When the START signal is ON, the output is on for the setting time. When the START signal turns off, the output is ON again for the setting time.  
2. Even though the START signal is applied repeatedly, it does not detect from the second START signal. (1 Position)



1. If the START signal is applied repeatedly, the output keeps ON status, progressing time will return to initial status. (1 Position)  
2. When the START signal is ON, the output will be ON at the same time. The setting value = display value, the output will be returned. When the START signal is OFF, the output will be ON at the same time. The setting value = display value, the output will be returned.



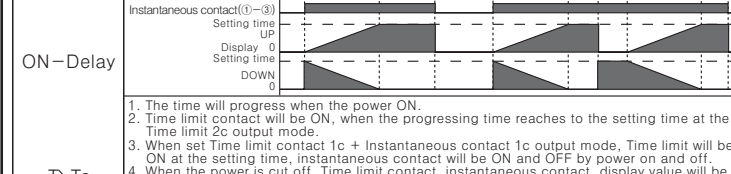
1. After the START signal is applied, the output will be ON (1 Position). When the START signal becomes OFF, the output will be OFF after setting time. (2 Position)  
2. When the START signal under the setting time is applied, the output will be ON at START signal becomes OFF then the output will be OFF after the setting time. (3 Position)  
3. RESET signal is applied, the progressing time and output will return to the initial status.



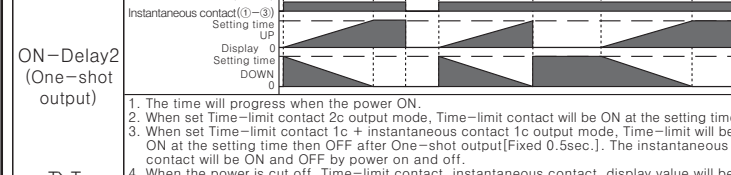
1. The START signal is ON then the output will be held. The output will be OFF after the setting time at the START signal is OFF.  
2. RESET signal is applied, the progressing time and output will return to the initial status.  
\*Initial status : The output is "OFF", the display value is "0". (At up down)

### LE4SA

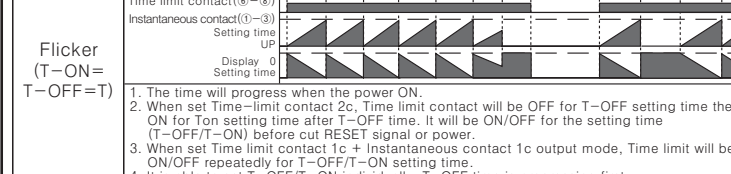
Mode Time-chart \*Rt=Over than return time(200ms), T:Setting time



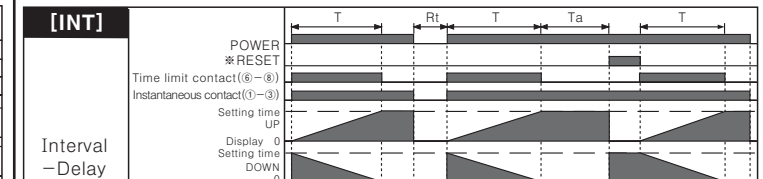
1. The time will progress when the power ON.  
2. Time limit contact will be ON, when the progressing time reaches to the setting time at the Time limit 2c output mode.  
3. When set Time-limit contact 1c + Instantaneous contact 1c output mode, Time limit will be ON at the setting time, instantaneous contact will be ON and OFF by power on and off.  
4. When the power is cut off, Time limit contact, instantaneous contact, display value will be initialized. When apply the RESET signal, Time limit and display value will be initialized only.



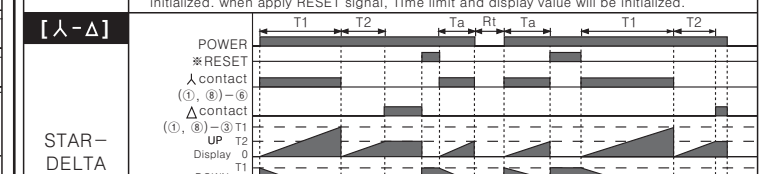
1. The time will progress when the power ON.  
2. When set Time-limit contact 2c, Time limit contact will be ON at the setting time.  
3. When set Time-limit contact 1c + Instantaneous contact 1c output mode, Time-limit will be ON at the setting time then OFF after One-shot output(Fixed 0.5sec.). The instantaneous contact will be ON and OFF by power on and off.  
4. When the power is cut off, Time-limit contact, instantaneous contact, display value will be initialized. When apply the RESET signal, Time-limit and display value will be initialized only.



1. The time will progress when the power ON.  
2. When set Time-limit contact 2c, Time limit contact will be OFF for T-OFF setting time then ON for Ton setting time after T-OFF time. It will be ON/OFF for the setting time (T-OFF/T-ON) before cut RESET signal or power.  
3. When set Time limit contact 1c + Instantaneous contact 1c output mode, Time limit will be ON/OFF repeatedly for T-OFF/T-ON setting time.  
4. It is able to set T-OFF/T-ON individually, T-OFF time is progressing first.  
5. Please set the setting time min. 100ms.

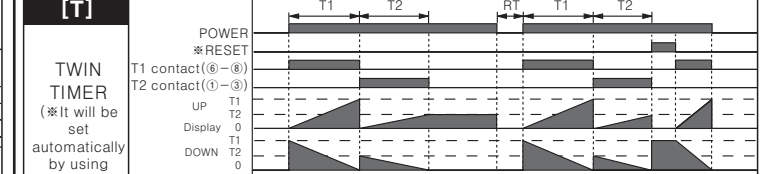


1. The time will progress when the power ON.  
2. When set Time limit contact 2c, Time limit contact will be ON at the power on. Then it will be OFF after the setting time.  
3. When set Time limit contact 1c + instantaneous contact 1c output mode, Time limit will be ON at the power on, the output will be OFF after setting time and the output will be ON during instantaneous contact is ON to OFF.  
4. When the power is cut off, Time limit contact, instantaneous contact, display value will be initialized. When apply RESET signal, Time limit and display value will be initialized.

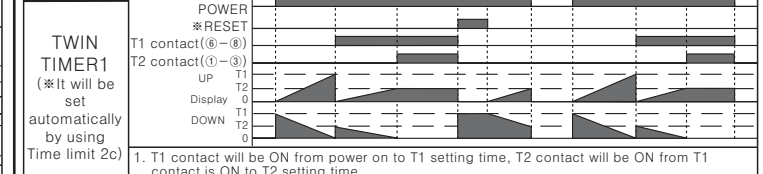


1. When the power on, λ contact will be ON then OFF at the setting time(T1). And Δ contact will be ON after switching time(T2).  
2. When cut the power off or apply the RESET signal, Δ contact will be OFF then display value will be initialized. And it will be run again when the power on or RESET signal is OFF.  
3. If set T2(λ-Δ changeover time) less than 0.05sec., "Err" will be displayed.

\*T1:Setting time, T2: λ-Δ Switching time  
\*Please connect 1 terminal and 2 terminal in external.



1. T1 contact will be ON at the power on, then OFF after T1 setting time. T2 contact will be ON at T1 contact is OFF, then T2 contact will be ON after T2 setting time.  
2. T1 contact, T2 contact and the progressing time will be initialized during apply power again or RESET signal is ON to OFF.



1. T1 contact will be ON from power on to T1 setting time, T2 contact will be ON from T1 contact is ON to T2 setting time.  
2. T1 contact, T2 contact and the progressing time will be initialized during apply power again or RESET signal is ON to OFF.

\*Initial : The output is "OFF", the display value is "0". (At UP mode)  
\*Front reset key can be used at LoFF, Loc2 only of LOCK mode.

## Caution for using

1. Power connection  
①AC Power : It is able to connect power to the terminals(2 to 7) without distinguish the polarity.  
DC Power : Be sure the polarity of ②-<->, ①-<->

②LE4S can be operating stably due to free power voltage type. (Please connect the power line separate from high voltage line in order to avoid inductive noise)

2. Input signal line  
①Shorten the cable distance between the sensor and this product.  
②Please shielded wire for input signal needed to be long.  
③Please wire input signal line separated from power line.

3. When test dielectric voltage and insulation resistance of the control panel with this unit installed.  
①Please isolate this unit from the circuit of control panel.  
②Please make all terminals of this unit short-circuited.

4. Do not use this unit at below places because of product damage  
①Place where there are severe vibration or impact.  
②Place where strong alkalis or acids are used.  
③Place where there are direct ray of the sun  
④Place where strong magnetic field or electric noise are generated.

5. Installation environment  
①It shall be used indoor  
②Altitude Max. 2000m  
③Pollution Degree 2  
④Installation Category II.

\*It may cause malfunction if above instructions are not followed.

## Main products

- COUNTER
- TIMER
- TEMPERATURE CONTROLLER
- PANEL METER
- TACHO/LINE SPEED/PULSE METER
- DISPLAY UNIT
- PROXIMITY SENSOR
- PHOTOELECTRIC SENSOR
- FIBER OPTIC SENSOR
- PRESSURE SENSOR
- ROTARY ENCODER
- SENSOR CONTROLLER
- POWER CONTROLLER
- STEPPING MOTOR & DRIVER & CONTROLLER
- LASER MARKING SYSTEM(CO<sub>2</sub>, Nd:YAG)

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