

Timer / Counter

# LT1 / LC1 Series

## INSTRUCTION MANUAL

Thank you for purchasing HANYOUNG NUX Co.,Ltd. product.  
Please check whether the product you purchased is the exactly same as you ordered. Before using this product, please read instruction manual carefully.



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## Safety information

Before you use, read safety precautions carefully, and use this product properly. The precautions described in this manual contain important contents related with safety, therefore, please follow the instructions accordingly. The precautions are composed of DANGER, WARNING and CAUTION.



### DANGER

- Do not decompose, modify, revise or repair this product. This may cause malfunction, electric shock or fire.
- If you use the product with methods other than specified by the manufacturer, there may be bodily injuries or property damages.
- Because this product uses the Lithium battery as the internal power, please do not disassemble or burn the product.



### WARNING

- The contents of this manual may be changed without prior notification.
- Before using the product you have purchased, check to make sure that it is exactly what you ordered.
- Check to make sure that there is no damage or abnormality of the product during delivery.
- Do not use this product at any place with corrosive (especially noxious gas or ammonia) or flammable gas.
- Do not use this product at any place with direct vibration or impact.
- Do not use this product at any place with liquid, oil, medical substances, dust, salt or ion contents (Pollution level 1 or 2).
- Do not polish this product with substances such as alcohol or benzene.
- Do not use this product at any place with excessive induction trouble, static electricity or magnetic noise.
- Do not use this product at any place with possible thermal accumulation due to direct sunlight or heat radiation.
- Install this product at place under 2,000m in altitude.
- When the product gets wet, the inspection is essential because there is danger of an electric leakage or fire.
- Install the circuit breaker or switch at near place for convenient use.
- For the continuous and safe use of this product, the periodical maintenance is recommended.
- Some parts of this product have limited life span, and others are changed by their usage.
- The warranty period for this product including parts is one year if this product is properly used.



### THINGS TO CONSIDER WHEN HANDLING THE BATTERY

- Because Lithium battery is built in, please avoid the places such as the explosive place or flammable place when scraping the product.
- Please do not charge, short, disassemble, modify and heat the product. Also, please do not through into the fire and etc.
- Pay attention to the + polarity and - polarity of lithium battery.
- Please do not solder battery.
- When disuse battery, please insulate it with the tape or etc.
- Please avoid direct sun light, high temperature and high humidity places when keep it.
- When you change lithium battery, please do not mingle new one with used or other type.

## Suffix code

Model	Code	Information
L	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	LCD Display
Function	T	Timer
	C	Counter
Dimension	1	DIN Size : 48 (W) X 24 (H) mm
Input type		non-voltage input
	F	voltage input (free voltage)

## Specialty

- Mini LCD timer/counter
- Run by battery so external power is not required
- Reusing possible by replacing with new battery
- Long term usage of battery due to the low power consumption
- Non-voltage input or free voltage input
- IP66 protective structure (front side)
- Compact size so able to apply within the packed or narrow place.
- Attached the terminal protective cover

## Specification

### LT1 / LT1-F (TIMER)

Model	LT1	LT1-F
Input type	non-voltage input	voltage input (free voltage)
Power	No (run by battery, replacing possible)	
Size	48 (W) X 24 (H) mm	
Operation type	Up only	
Time range	9999 h 59 m 59 s / 9999 h 59.9 m / 99999 h 59 m / 999999.9 h	
Time error	±0.01 %	
Input	Condition	Remaining voltage when disconnected : Max 0.7 V Max impedance when disconnected : Max 10 kΩ Min impedance when connected : Min 1 MΩ High : 24 - 240 Vac / 6 - 240 V d.c. Low : 0 - 2 V a.c / 0 - 2.4 V d.c.
	Min signal width	Min. 20 ms
RESET	Input type	non-voltage input
	Min signal width	Min. 20 ms
Battery life	more than 10 years (approx 25 °C)	
External setting switch	※ ① SW1, ※ ② SW2	
External connection	terminal block (4 pin)	
Displaying type	LCD 7 segment reflection type, alphabet height 8.7mm black	
Displaying digits	8 digits	
Insulation resistance	Min 100 MΩ (500 V d.c mega standard, between the electric conduction terminal and exposed non-charging metal part)	
Dielectric strength	2000 V a.c (50 / 60 Hz for 1 min, between the electric conduction terminal and exposed non-charging metal part)	
Vibration	Durability	10 - 55 Hz double amplitude, each direction of x, y, z for 2 hour
	Malfunction	10 - 55 Hz double amplitude, each direction of x, y, z for 10 min
Shock	Durability	300 % (approx 30G) each direction of x, y, z 3 times
	Malfunction	100 % (approx 10G) each direction of x, y, z 3 times
Ambient temperature	-10 ~ 55 °C (no dew condensation, no icing)	
Storage temperature	-25 ~ 65 °C (no dew condensation, no icing)	
Ambient humidity	35 ~ 85 % R.H.	
Protective structure	IP66 (front side)	
Weight	approx 58 g (excluded the weight of box)	

- ※ ① SW1 : Setting switch of internal battery and front side reset key  
 ※ ② SW2 : Time range setting switch

### LC1 / LC1-F (COUNTER)

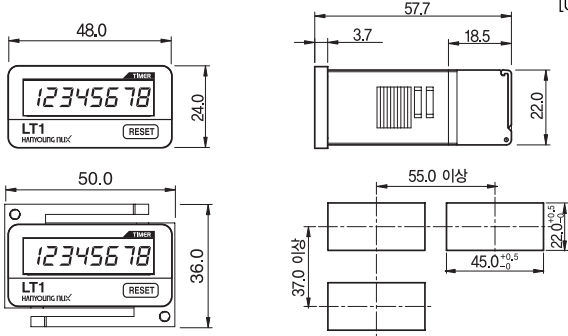
Model	LC1	LC1-F
Input type	non-voltage input	voltage input (free voltage)
Power	No (run by battery, replacing possible)	
Size	48 (W) X 24 (H) mm	
Operation type	Up only	
Computation speed	1 cps / 30 cps / 100 cps / 1 kcps	20 cps (fixed)
Input condition	Remaining voltage when disconnected : Max. 0.7 V Max impedance when disconnected : Max. 10 kΩ Min impedance when connected : Min. 1 MΩ High : 24 - 240 Vac / 6 - 240 V d.c. Low : 0 - 2 V a.c / 0 - 2.4 V d.c.	
	Min signal width	Min. 20 ns
RESET	Input type	non-voltage input
	Min signal width	Min. 20 ns
Battery life	more than 7 years (approx 25 °C)	
External setting switch	※ ① SW1, ※ ② SW2	※ ① SW1
External connection	terminal block (4 pin)	
Displaying type	LCD 7 segment reflection type, alphabet height 8.7mm black	
Displaying digits	8 digits	
Insulation resistance	Min. 100 MΩ (500 V d.c mega standard, between the electric conduction terminal and exposed non-charging metal part)	
Dielectric strength	2000 V a.c (50 / 60 Hz for 1 min, between the electric conduction terminal and exposed non-charging metal part)	
Vibration	Durability	10 - 55 Hz double amplitude 0.5 mm each direction of X · Y · Z for 2 hour
	Malfunction	10 - 55 Hz double amplitude 0.5 mm each direction of X · Y · Z for 10 min
Shock	Durability	300 % (approx 30G) each direction of X · Y · Z 3 times
	Malfunction	100 % (approx 10G) each direction of X · Y · Z 3 times

Ambient temperature	-10 ~ 55 °C (no dew condensation, no icing)
Storage temperature	-25 ~ 65 °C (no dew condensation, no icing)
Ambient humidity	35 ~ 85 % RH
Protective structure	IP66 (front side)
Weight	approx 58.g (excluded the weight of box)

- \* ① SW1 : Setting switch of internal battery and front side reset key
- \* ② SW2 : Computation speed setting switch

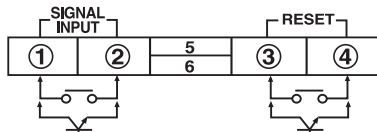
### Dimension and panel cutout

[Unit : mm]

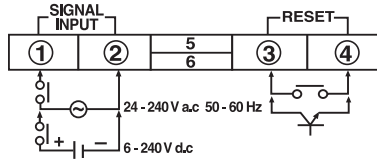


### Connection diagram

#### ■ Non-voltage input (LT1 / LC1)

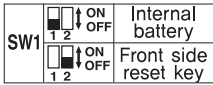


#### ■ Free power input (LT1-F / LC1-F)



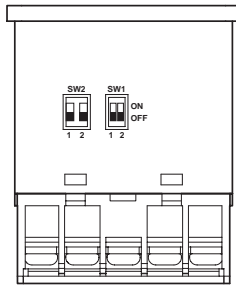
### Setting specification

#### ■ Internal battery and front side reset key setting



- Internal battery ON/OFF selection.
  - Setting the SW1 to the ON direction will turn ON the internal power (battery)
  - Setting the SW1 to the OFF direction will turn OFF the internal power (battery)
  - When not using the device for a long time period, please turn OFF the power in order to extend life of the battery.

- Selection of whether to use the front reset key or not.
  - Setting the SW1 to the ON direction makes the usage of front reset key possible
  - Setting the SW1 to the OFF direction makes the usage of front reset key impossible
  - When setting of the front reset key is in OFF state, switch is in lock state so resetting cannot be performed.



#### ■ Time range setting (Timer)

Time range	
SW2 1 2 ON/OFF	9999 h 59 m 59 s
SW2 1 2 ON/OFF	99999 h 59.9 m
SW2 1 2 ON/OFF	999999 h 59 m
SW2 1 2 ON/OFF	9999999.9 h

- Select the time range that users want to use and set by using switch.

#### ■ Counting speed setting (Counter)

Max. counting speed	
SW2 1 2 ON/OFF	1 cps
SW2 1 2 ON/OFF	30 cps
SW2 1 2 ON/OFF	100 cps
SW2 1 2 ON/OFF	1 kcps

- Select the counting speed that users want to use and set by using switch.
- Counting speed of Model LC1-F is fixed with 20cps.

\* After changing the time range and counting speed, please press RESET key in the front panel or terminal.

#### ■ Things to consider when setting the counting speed

Counting speed	1 cps / 20 cps / 30 cps	100 cps / 1 kcps
Input type	1 cps / 20 cps / 30 cps	100 cps / 1 kcps
Contact	input directly by using relay, switch and etc and when bounce effect	It counts the bounce effect (chattering) so contact cannot be used.
Non-contact	when inputting as transistor	when inputting as transistor

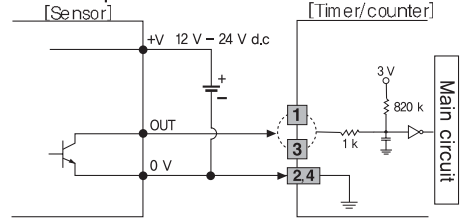
### ■ Default setting

Switch	Model	LT1 / LT1-F (Timer)	LC1 (Counter)	LC1-F (Counter)
SW1 1 2 ON/OFF		Internal battery OFF Usage of the front reset key : OFF	Internal battery OFF Usage of the front reset key : OFF	Internal battery OFF Usage of the front reset key : OFF
SW2 1 2 ON/OFF		9999 h 59 m 59 s (Time range)	1 cps (Counting speed)	20 cps fixed (counting speed) No switch

### Input connection diagram

#### ■ Non-voltage input

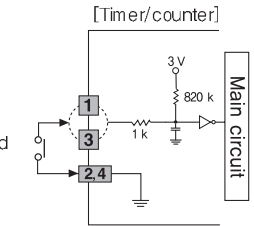
##### 1. Non-connect input



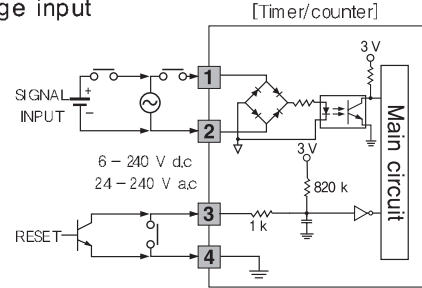
- Please use NPN open collector output type for the sensor and supply power from the outside.
- Do not supply voltage to the terminal 1 and 3. It may cause mal function or destroy the device.

##### 2. contact voltage input

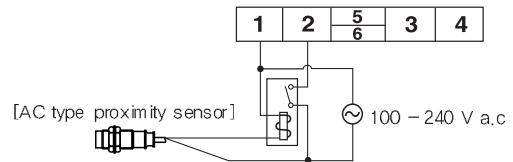
- Contact input (relay, switch) must withstand 3V d.c 5uA without any problem.
- GND terminal 2 and 4 are connected internally.



#### ■ Voltage input

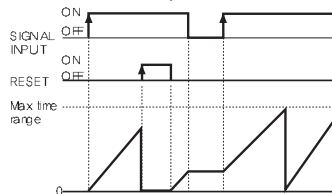


- Users must use voltage input with the input 1 and 2. For the input 3 and 4, please use non-contact input (NPN transistor) or contact input (relay, switch).
- Terminal 1, 2 and 3, 4 are insulated internally.
- Contact input (relay, switch) must withstand 3V d.c 5uA without any problem.
- When using AC 2 wire type proximity sensor, do not connect directly. When using AC proximity sensor, computation does not work properly due to the leakage current so when users want to compute, please operate the relay in the middle just like an image below.

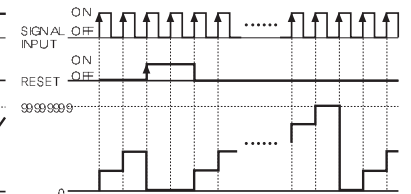


### Operation chart

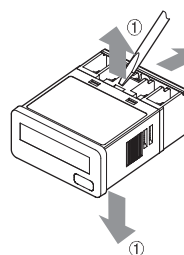
#### ■ Timer operation mode



#### ■ Counter operation mode



### Things to consider when replacing batteries



- Please disconnect wires when replacing the batteries.
- There is possibility that you get electric shock if you touch the part where high voltage had been supplied.
- When replacing the batteries please perform with static electricity not charged on to the body.
- Order for replacing batteries
  - Please separate the upper and lower part of case Lock by using tools.
  - Please pull the body part of case.
  - After case being separated, replace the batteries. (cautious for the polarity)