LCD Counter & Timer

LC series

USER'S MANUAL

Thank you for purchasing Hanyoung Nux products. Please read the instruction manual carefully before using this product, and use the product correctly. Also, please keep this manual where you can view it any time.

HANYOUNG NUX

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Safety information

Please read the safety information carefully before the use, and use the product correctly. The alerts declared in the manual are classified into Danger, Warning and Caution according to their importance

⚠ DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury
⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor injury or property damage

⚠ DANGER

- The input/output terminals are subject to electric shock risk. Never let the input/output terminals come in contact with your body or conductive substances.

⚠ WARNING

- Any use of the product other than those specified by the manufacturer may result in personal injury or property damage.
- If there is a possibility that a malfunction or abnormality of this product may lead to a serious accident to the system, install an appropriate protection circuit on the outside.
- Since this product is not equipped with a power switch and fuse, install them separately on the outside (fuse rating: 250 V a.c. 0.5 A).
- Please supply the rated power voltage, in order to prevent product breakdowns or malfunctions.
- To prevent electric shocks and malfunctions, do not supply the power until the wiring is completed.
- The product does not have an explosion-proof structure, so avoid using it in places with flammable or explosive gases.
- Never disassemble, modify, process, improve or repair this product, as it may cause abnormal operations, electric shocks or fires.
- Please disassemble the product after turning OFF the power. Failure to do so may result in electric shocks, product abnormal operations or malfunctions.
- Please use this product after installing it to a panel, because there is a risk of electric shock.

⚠ CAUTION

- The contents of this manual may be changed without prior notification.
- Please make sure that the product specifications are the same as you ordered.
- Please make sure that there are no damages or product abnormalities occurred during shipment.
- Please use the product in places where corrosive gases (especially harmful gases, ammonia, etc.) and flammable gases are not generated.
- Please use the product in places where vibrations and impacts are not applied directly.
- Please use the product in places without liquids, oils, chemicals, steam, dust, salt, iron, etc.
- Please do not wipe the product with organic solvents such as alcohol, benzene, etc. (use neutral detergents).
- Please avoid places where large inductive interference, static electricity, magnetic noise are generated.
- Please avoid places with heat accumulation caused by direct sunlight, radiations, etc.
- Please use the product in places with elevation below 2000 m.
- When water enters, short circuit or fire may occur, so please inspect the product carefully.
- When there is a lot of noise from the power, we recommend to use insulation transformer and noise filter. Please install the noise filter to a grounded panel, etc. and make the wiring of noise filter output and power supply terminal as short as possible.
- Tightly twisting the power cables is effective against noise.
- Do not wire anything to unused terminals.
- Please wire correctly, after checking the polarity of the terminals.
- When you install this product to a panel, please use switches or circuit breakers compliant with IEC60947-1 or IEC60947-3.
- Please install switches or circuit breakers at close distance for user convenience.
- We recommend regular maintenance for the continuous safe use of this product.
- Some components of this product may have a lifespan or deteriorate over time.
- The warranty period of this product, is 1 year, including its accessories, under normal conditions of use.
- The preparation period of the contact output is required during power supply. If used as a signal to external interlock circuit, etc. please use a delay relay together.

Suffix code

Model	Code							Content
LC	□-	□	□	□	□			LCD Counter & Timer
Dimensions	3							96(W) × 48(H) ㎜
	4							48(W) × 48(H) ㎜
	6							72(W) × 36(H) ㎜
	7							72(W) × 72(H) ㎜
Settings		P						Preset Counter & Timer
Display digits			4					4 digits (9999) ※LC4 only
			6					6 digits (999999)
Control output				1				1-stage output
				2				2-stage output
Sub output					N			No sub output
					C			RS485 (MODBUS-RTU)
Power voltage						A		100 – 240 V a.c. 50/60 Hz

Specification

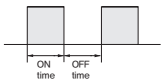
Model			LC3	LC4	LC6	LC7
Power voltage			100–240 V a.c. 50/60 Hz (voltage fluctuation rate: ±10%)			
Power Consumption			■ 2-stage setting type: max. 12 VA ■ 1-stage setting type: max. 11 VA			
Character height			Counting unit (14.5 mm), Setting unit (10 mm)	■ 6-digit: Counting unit (10.8 mm), Setting unit (8 mm) ■ 4-digit: Counting unit (14 mm), Setting unit (8.5 mm)	Counting unit (10.5 mm), Setting unit (6.7 mm)	Counting unit (17.2 mm), Setting unit (12.5 mm)
Max counting speed			1 cps / 30 cps / 1 Kcps / 10 Kcps			
Power outage compensation			10 years (using non-volatile memory)			
Input			■ Selection of input method by external switch (voltage input / non-voltage input) ■ Counter: composed of CP1, CP2, RESET, BATCH -RESET ■ Timer: composed of START, INHIBIT, RESET ■ Voltage input: HIGH level (5 V – 30 V d.c.), LOW level (0 V – 2 V d.c.),input resistance (about 4.5 KΩ) ■ Non-voltage input: impedance during short-circuit (max. 1 KΩ), residual voltage during short-circuit (max. 2 V d.c.)			
Minimum input signal time			1 ms / 20 ms (START, INHIBIT, RESET inputs)			
External power supply			Max. 12 V d.c. 100 ㎃			
ONE SHOT output			0.01 ~ 99.99 sec.			
Control output	contact output	1-stage	OUT (SPDT, 1c)		OUT (SPST, 1a)	OUT (SPDT, 1c)
		2-stage	OUT1 (SPST, 1a), OUT2 (SPDT, 1c) * OUT2 of LC6-P62C: SPST configuration			
		capacity	■ SPDT: NC (250 V a.c. 5A), NO (250 V a.c. 2A), resistive load ■ SPST: 250 V a.c. 5A, resistive load			
	contactless output	1-stage	NPN 2 circuits (OUT, BAT.O), * LC4-P61C / P41C models NPN 1 circuit configuration			
		2-stage	NPN 2 circuits (OUT1, OUT2)	–		NPN 2 circuits (OUT1, OUT2)
		capacity	Open collector, max. 30 V d.c. 100 ㎃			
Timer operation error			Power start: max. ±0.01 % ±0.05 sec Reset start: max. ±0.01 % ±0.03 sec			
Communication	protocol		Modbus RTU			
	method		RS485 (2-wire half-duplex)			
	synchronism		Asynchronous			
	speed		2,400 / 4,800 / 9,600 / 19,200 / 38,400 bps			
	effective distance		Max. within 800 m			
	maximum connections		31 (address : 1 ~ 127)			
	response waiting time		5 ~ 99 ms			
	START BIT		1 bit (fixed)			
	STOP BIT		1 bit (fixed)			
	DATA BIT		8 bit			
	PARITY BIT		None / Odd / Even			
Insulation resistance			Min. 100 ㏁ (500 V d.c.) conductive part terminal – unfilled metal			
Dielectric strength			2000 V a.c. 60 Hz for 1 minute (different live part terminals)			
Noise immunity			Square-wave noise by noise simulator (1 ㎲ pulse every 16 ㎳) ±2000 V (pulse width 1 ㎲)			
Vibration durability			10–55 Hz, single amplitude 0.5 ㎜, 3-axis each direction, 2 h			
Relay life	electrical		Min. 50,000 times			
	mechanical		Min. 10,000,000 times			
Degree of protection			IP66 (product front)			
Approval			CE KC			
Storage temperature			-20 ~ 65 ℃			
Ambient temperature & humidity			-10 ~ 55 ℃, 35 ~ 85 % RH			
Weight			196 g	140 g	143 g	222 g

Maximum counting speed

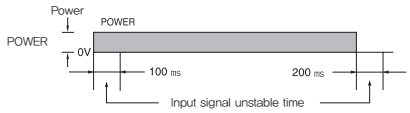
The maximum counting speed is the maximum response speed when you input the duty ratio (ON / OFF ratio) of the count input signal as 1: 1.
① Even when the input signal is below the maximum counting speed, it may not be counted if the ON and OFF times are less than the specified minimum signal width.
② Minimum signal time.

Counting speed	Minimum signal time
1 cps	500 ㎳
30 cps	16.7 ㎳
1 Kcps	0.5 ㎳
10 Kcps	0.05 ㎳

※ The minimum signal time refers to ON and OFF times.



Power supply

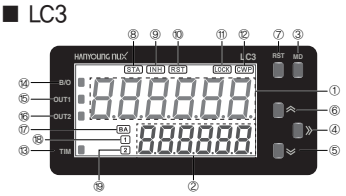


Since the rise and fall time of internal power and external output power is 100 ms after power on and 200 ms after power off, it does not not operate in unstable time to prevent malfunction due to unsafe output operation of external sensor

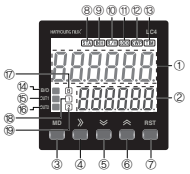
- Apply the signal 100 ms after power on.
- Apply power 200 ms after power off.

Part name and functions

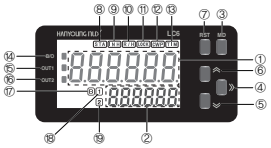
■ LC3



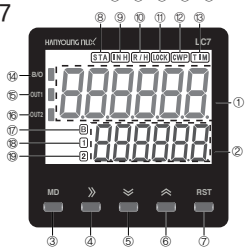
■ LC4



■ LC6



■ LC7



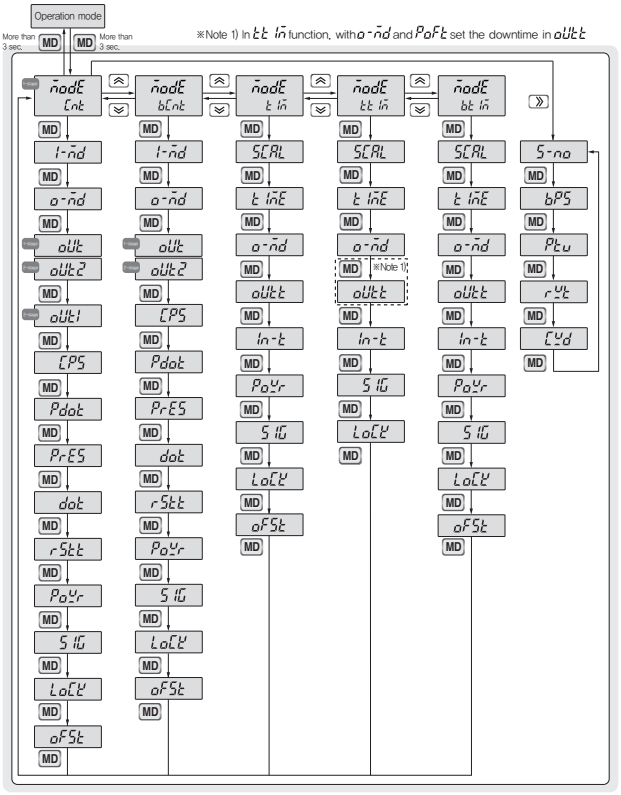
① PV display: displays count value, time value, batch count value, setting item
② SV display: displays counter / timer / batch set value
③ MODE KEY: enters and quits function mode (auto save function set value during termination)
: used to switch the SV display in operation mode (1–stage/2–stage set values/batch set value)
④ SHIFT KEY: enters set value change mode and shifts the set value digits
: enters communication setting mode in function mode
⑤ DOWN KEY: reduces set value in function mode and set value change mode
⑥ UP KEY: increases set value in function mode and set value change mode
⑦ RESET KEY: resets count value, time value and output status
⑧ START input indicator: illuminates when external START signal is applied in timer operation mode
⑨ INHIBIT input indicator: illuminates when external INHIBIT signal is applied in timer operation mode
⑩ RESET input indicator: illuminates when external RESET signal is applied
⑪ LOCK set indicator: illuminates when LOCK is set
⑫ Communication write inhibit indicator: illuminates when communication write inhibit is set
⑬ Timer setting indicator: illuminates when TIM/TTIM/BTIM operation mode is set, flashes during timing operation
⑭ BATCH output indicator: illuminates during BATCH output operation
⑮ OUT1 output indicator: illuminates during OUT1 output operation
⑯ OUT2 output indicator: illuminates during OUT2 output operation
⑰ BATCH setting indicator: illuminates when switching SV display to BATCH set value
⑱ OUT1 setting indicator: illuminates when switching SV display to 1–stage set value
⑲ OUT2 setting indicator: illuminates when switching SV display to 2–stage set value

Operation mode

Display	Operation mode	Description
CNT	Preset counter	According to input mode, it adds, subtracts, add/subtracts and counts the pulses applied to external input CP1 /CP2. When the count value reaches the 1– and 2–stage set values, the OUT1 and OUT2 are operated according to the selected output mode.
bCNT	Batch counter	The batch output is activated when the batch count value reaches the batch set value, after counting the count–ups of the counter.
t1n	Timer	When a signal is applied to the external input START / INHIBIT / RESET, the operation time is displayed according to time range. OUT1 and OUT2 outputs are operated according to the selected output mode when the time value reaches the 1– and 2– stage set values.
tt1n	Twin timer	OUT1 and OUT2 outputs are turned ON / OFF according to ON and OFF set times. (OUT output is operated in 1–stage model, OUT1 and OUT2 outputs are operated in 2–stage model simultaneously).
bt1n	Batch timer	The batch output is activated when the batch count value reaches the batch set value, after counting the time–ups of the timer.

* The batch count value can be initialized by pressing the front reset button in the batch count value display mode or by applying a signal to the batch reset terminal.

Function mode configuration

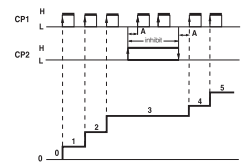
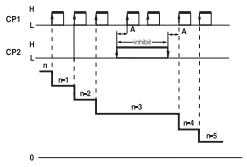
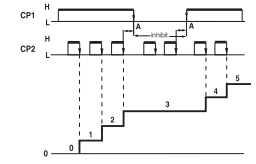
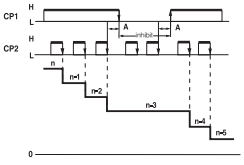
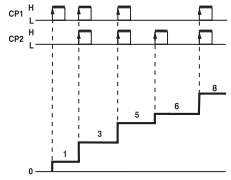
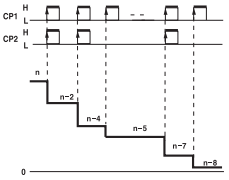
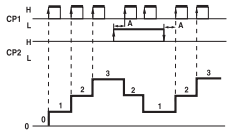
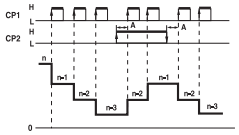
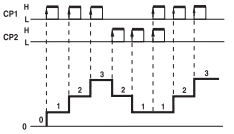
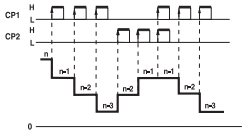
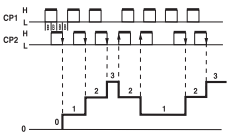
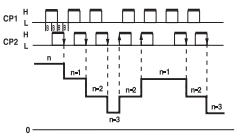


Counter function mode

Display	Name	Settings	Display condition	Initial value
nodE CNt	Operation mode	CNt ⟷ bCNt ⟷ t1 n ⟷ tt1 n ⟷ bt1 n Preset counter / Batch counter / Timer / Twin timer / Batch timer * In operation mode setting, you can set the communication function by pressing » key	Counter	CNt
1-nd U-A	Input mode	U-A ⟷ U-b ⟷ U-Ab ⟷ d-A ⟷ d-b ⟷ d-Ab ⟷ UP-A / UP-B / UP-AB / DOWN-A / DOWN-B / DOWN-AB Ud-F ⟷ Ud-E ⟷ Ud-d ⟷ Ud-C ⟷ Ud-b ⟷ Ud-A UP/DOWN –F / UP/DOWN –E / UP/DOWN –D / UP/DOWN –C / UP/DOWN –B / UP/DOWN –A	Counter	U-A
o-nd F	Output mode	n ⟷ F ⟷ C ⟷ r ⟷ K ⟷ P ⟷ Q ⟷ R N / F / C / R / K / P / Q / A	Counter	F
oUt2 0000	OUT2/ OUT output time	• Sets OUT2 or OUT output time • You cannot set to 00.00 in some output modes 00.00 ~ 99.99 00.00 99.99	2–stage setting	0000
oUt 0000			1–stage setting	
oUt1 HoLd	OUT1 output time	• Sets OUT1 output time HoLd ~ 99.99 HOLD 99.99	2–stage setting	HoLd
CPS 30	Counting speed	• Sets max counting speed (when duty ratio is 1:1) 1 ⟷ 30 ⟷ 1K ⟷ 10K 1 30 1K 10K	Counter	30
Pdot 000000	Pre–scale decimal point	• Up to 5 decimal places can be set 0.00000 ⟷ 00.0000 ⟷ 000.000 ⟷ 0000.00 ⟷ 00000.0 0.00000 00.0000 000.000 0000.00 00000.0	Counter	000000
PrES 00.0001	Pre–scale	0.00001 ~ 999999 0.00001 999999	Counter	00.0001
dot 000000	Decimal point	※ Decimal point display cannot be more than prescale one 0.00000 ⟷ 00.0000 ⟷ 000.000 ⟷ 0000.00 ⟷ 00000.0 ⟷ 000000 0.00000 00.0000 000.000 0000.00 00000.0 000000	Counter	000000
rStt 20mS	Reset time	1mS ⟷ 20mS 1 ㎳ 20 ㎳	Counter	20mS
PoYr SAvE	Power outage memory	• SAVE (saves count value), CLEAR (resets count value SAvE ⟷ CLEr SAVE CLEAR	Counter	CLEr
SiG nPn	Show input logic	• Shows NPN/PNP input selection status of side dip swtch nPn ⟷ PnP NPN PNP	Counter	nPn
LoCY LoFF	Key lock	LoFF ⟷ Lon ⟷ LSEt ⟷ LrSt LOCK OFF / LOCK ON / LOCK SET / LOCK RESET	Counter	LoFF
oFSt 000000	Offset	• Available only in UP mode, it counts from the set offset value ※ It cannot be used with the twin timer. 000000 ~ 999999 000000 999999	Counter	000000

Counter input action

A shall be above the minimum signal width, and B above 1/2 of the minimum signal width

U-A	Up – A inhibit input	d-A	Down – A inhibit input
			
U-b	Up – B inhibit input	d-b	Down – B inhibit input
			
U-Ab	Up–AB individual input	d-Ab	Down – AB individual input
			
Ud-A	Up/Down – A command input	Ud-d	Up/Down – D command input
			
Ud-b	Up/Down – B individual input	Ud-E	Up/Down – E individual input
			
Ud-C	Up/Down – C phase difference input	Ud-F	Up/Down – F phase difference input
			

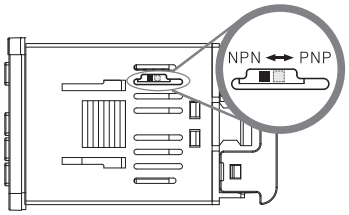
• Use Ud-C , Ud-F with an incremental encoder.

Note) The timing diagram above is for when the input logic is set to 'PNP' mode.

Input/output connection

■ Input logic selection (voltage / non–voltage)

1. After turning off the power, check the NPN / PNP display on case top and operate the transfer switch.
2. You can check the input logic setting status in the function setting mode.



● Non–voltage input (NPN)

NPN PNP

● Voltage input (PNP)

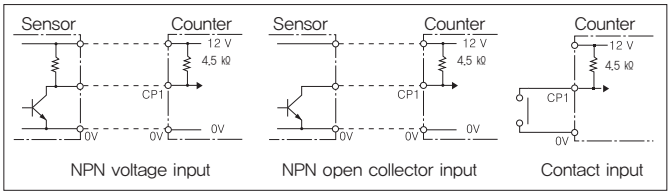
NPN PNP

(Shipping specification)

■ Input connection

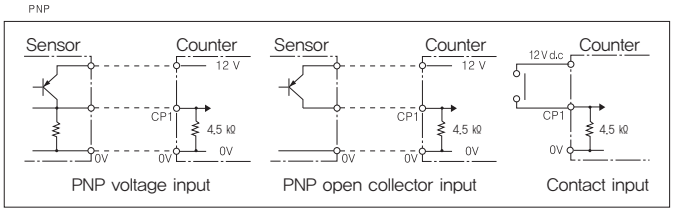
● When non–voltage input (NPN) is selected

NPN

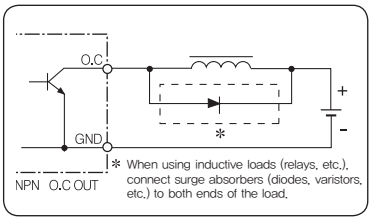


● When voltage input (PNP) is selected

PNP

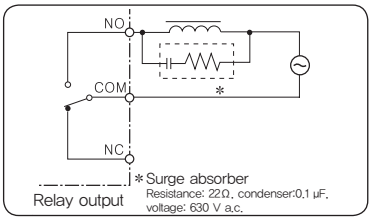


■ Output connection



● Example of contactless (transistor) output

• Since internal circuit and contactless output are isolated, please use same as GND.
For the contactless output, select the power supply for the load and the load, in order not to exceed the maximum of 30 V 100 mA.



● Example of contact output

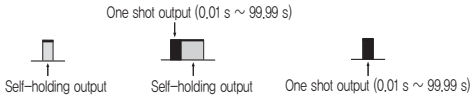
• Because the contact capacity is 250 V a.c. NO 3 A, NC 2 A (load resistance) make sure that the transient current does not flow at the contact. The wiring follows the normal wiring method.

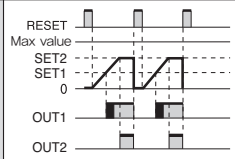
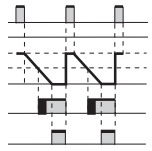
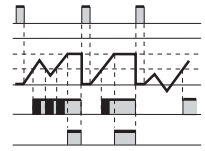
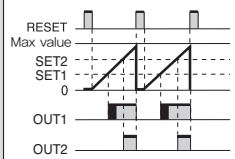
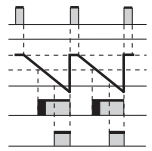
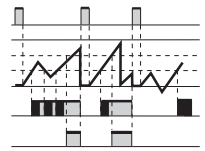
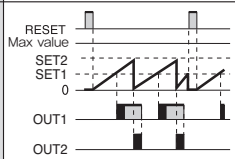
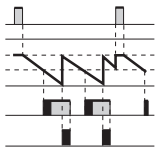
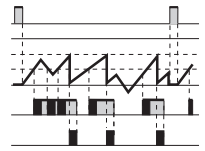
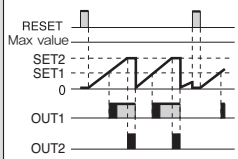
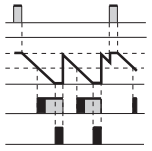
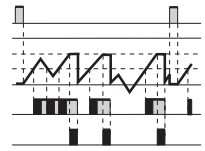
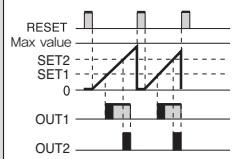
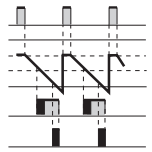
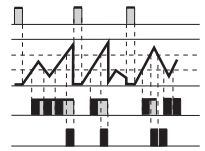
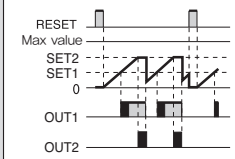
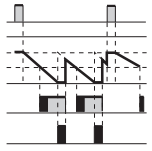
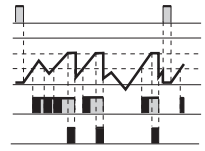
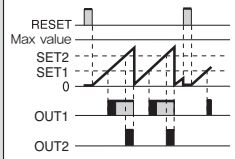
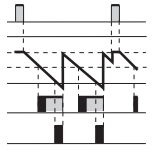
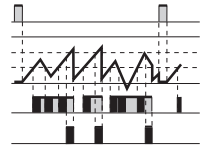
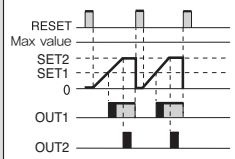
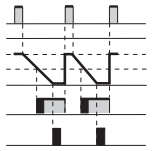
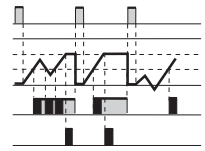
■ Key lock level selection (LoCK)

Key lock level selection	Description
LoFF	Unlocks all keys
Lon	Locks all keys {except MODE key}
LSEt	Locks set value input (SHIFT) key
LrSt	Locks reset (RST) key

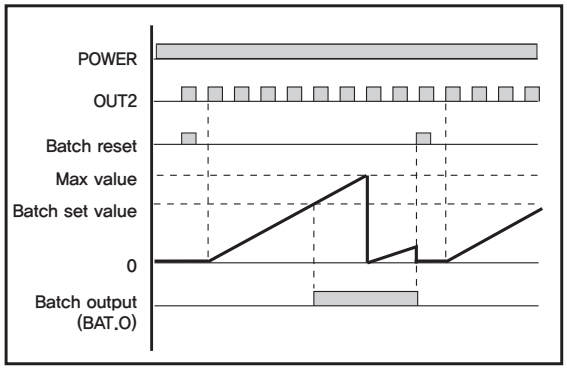
Counter output mode

※ In case of 1-stage model, it is operated as SET2 and OUT2.
※ Apply a reset signal to the front reset (RST) key or external RESET terminal.



Output mode	Input mode			Operation
	UP	DOWN	UP/DOWN/A, B, C	
n				When the count reaches the set value, the count stops and the displayed value is held. OUT2 output is held. Count value, display value and output are initialized during reset input.
F				Even when the count value reaches the set value, the count is displayed continuously increasing or decreasing. OUT2 output is maintained. Count value, display value and output are initialized during reset input.
C				When the count value reaches the set value, the count is idisplayed continuously increasing or decreasing after initialization. OUT2 output turns off after one-shot output during the set time. The self-holding output of OUT1 turns off together with OUT2 output. The one-shot output of OUT1 turns off after the OUT1 output setting time, regardless of OUT2 output. Count value, display value and output are initialized during reset input.
r				When the count value reaches the set value, the count is displayed after stop during the OUT2 output setting time. After the OUT2 output setting time, it is displayed incrementally or decrementally after initialization. OUT2 output turns off after one-shot output during the set time. The self-holding output of OUT1 turns off together with OUT2 output. The one-shot output of OUT1 turns off after the OUT1 output setting time, regardless of OUT2 output. Count value, display value and output are initialized during reset input.
U				When the count value reaches the set value, the count is displayed incrementally or decrementally. OUT2 output turns off after one-shot output during the set time. The self-holding output of OUT1 turns off together with OUT2 output. The one-shot output of OUT1 turns off after the OUT1 output setting time, regardless of OUT2 output. Count value, display value and output are initialized during reset input.
P				When the count value reaches the set value, the count is displayed incrementally or decrementally after initialization. The count value display stops during OUT2 output setting time, and the increased or decreased count value is displayed after the OUT2 output setting time. OUT2 output turns off after one-shot output during the set time. The self-holding output of OUT1 turns turns off together with OUT2 output. The one-shot output of OUT1 turns off after the OUT1 output setting time, regardless of OUT2 output. Count value, display value and output are initialized during reset input.
q				When the count value reaches the set value, after OUT2 output setting time, the count is displayed incrementally or decrementally after initialization. OUT2 output turns off after one-shot output during the set time. The self-holding output of OUT1 turns off together with OUT2 output. The one-shot output of OUT1 turns off after the OUT1 output setting time, regardless of OUT2 output. Count value, display value and output are initialized during reset input.
A				When the count value reaches the set value, the count stops and the display value is held. OUT2 output turns off after one-shot output during the set time. The self-holding output of OUT1 turns off together with OUT2 output. The one-shot output of OUT1 turns off after the OUT1 output setting time, regardless of OUT2 output. Count value, display value and output are initialized during reset input.

Batch counter



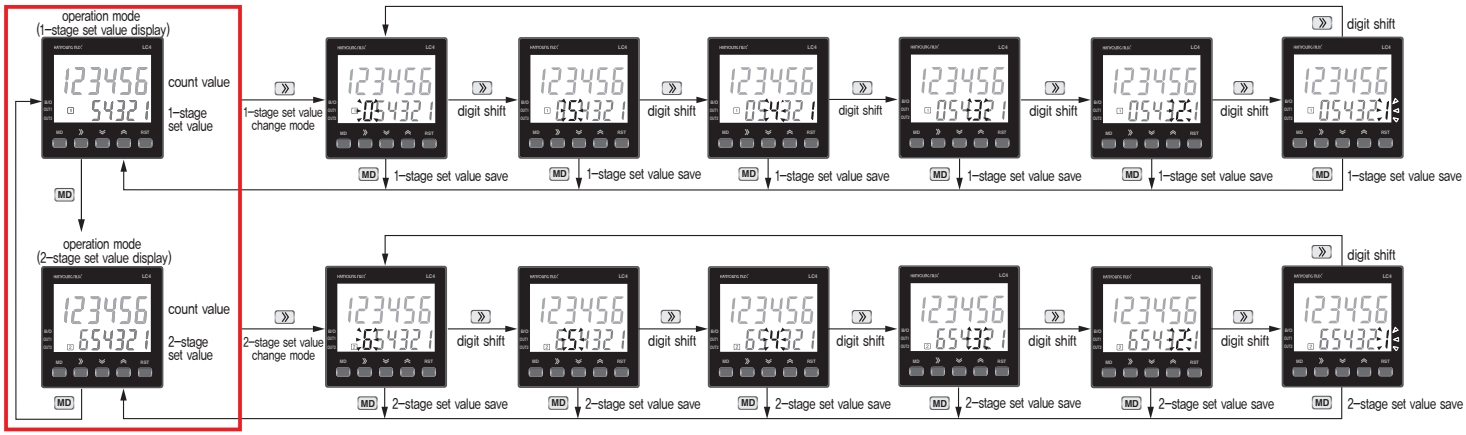
■ Batch counter operation

- The batch count value increases during OUT2 output operation (increase during OUT output operation in 1-stage model)
- Batch output (B/O) is operated when the batch count value is greater than the batch set value.
- Batch count values and batch outputs are initialized by pressing the front RST key in batch display mode or by applying a signal to the external BRST terminal.
- Even in batch display mode, the counting operation continues.
- If the batch count value is ' 999999 or more, it is initialized to '0' and counted.

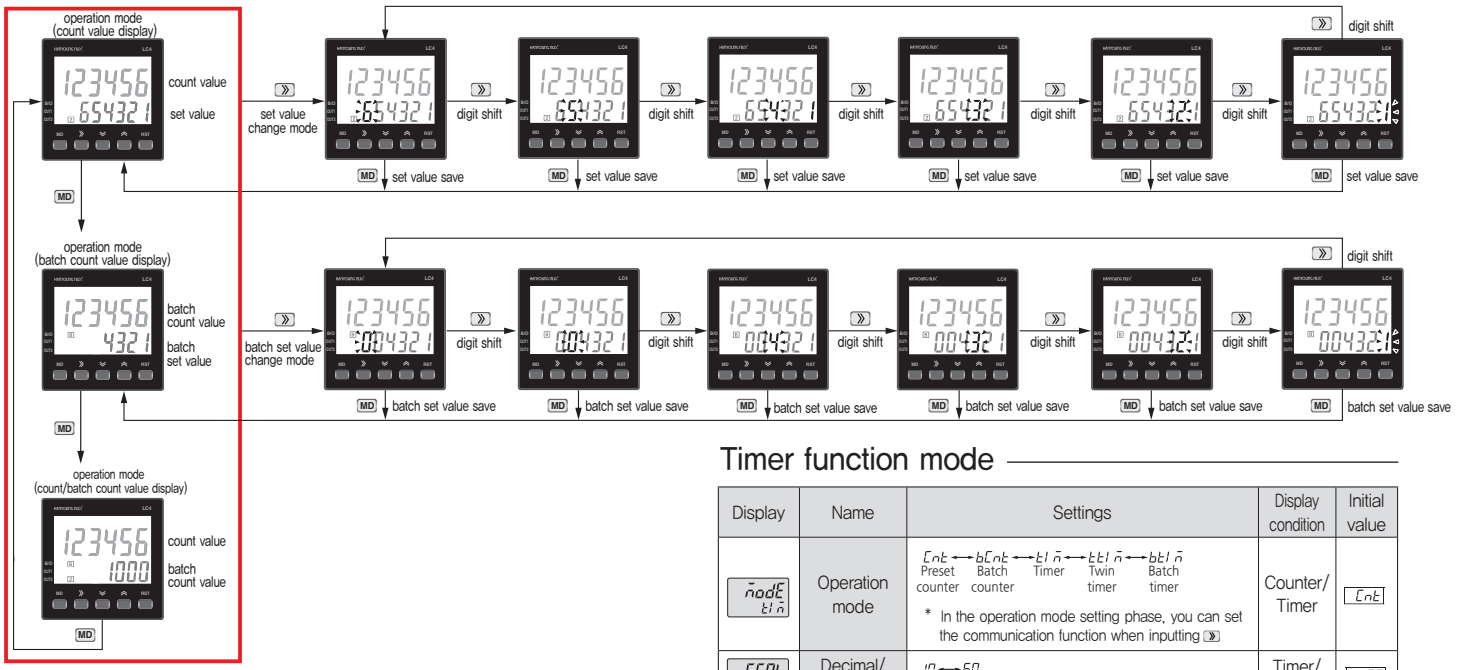
View and change counter set value

- If you press [MD] in counter operation mode, SET1 or SET2 set value is displayed in SV display sequentially.
- To change the set value, select the SET1 or SET2 set value to change with [MD], then press [»] to enter set value change mode.
- If you enter the set value change mode, the set value will flash and you can change the set value with [»] / [»] / [»]
- After changing the set value, use [MD] to save the changed set value.
- Without key inputs for 1 minute in set value change mode, it returns to operation mode with the value set before change, without saving.
- For 1-stage models, the set value is not changed. (It is fixed as [2] on the display part.)

■ Counter set value change (2-stage output model)



■ Batch counter set value and batch set value change



■ Batch set value change

1. In operation mode, use [MD] to switch to batch count value display mode.
2. In batch count value display mode, use [»] to switch to batch set value change mode.
3. In batch set value input mode, use [»] , [»] , [»] to change the batch set value to "4321" (when setting the batch set value to "4321")
4. After changing the batch set value, press [MD] to save the changed batch set value.
5. In the count value / batch count value display modes, you can change the set value and batch set value.

Time range

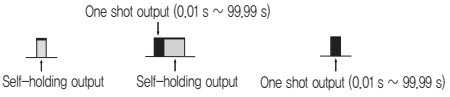
Range selection display		4-digit time range		6-digit time range	
UP	DOWN	Decimal notation	Sexagesimal notation	Decimal notation	Sexagesimal notation
0.01S	d.01S	99.99 s	59.99 s	9999.99 s	59 m 59.99 s
0.1S	d.1S	999.9 s	9 m 59.9 s	99999.9 s	9 h 59 m 59.9 s
1S	d.1S	9999 s	59 m 59 s	999999 s	99 h 59 m 59 s
1M	d.1M	9999 m	99 h 59 m	999999 m	9999 h 59 m
1H	d.1H	9999 h	99 d 23 h	999999 h	9999 d 23 h

※ s : seconds m : minutes h : hours d : days

Timer function mode

Display	Name	Settings	Display condition	Initial value
mode / tim	Operation mode	CNt ⟷ bCNt ⟷ tim ⟷ ttim ⟷ btim Preset counter / Batch counter / Timer / Twin timer / Batch timer * In the operation mode setting phase, you can set the communication function when inputting [»]	Counter/ Timer	CNt
SCAL / 60	Decimal/ sexagesimal	10 ⟷ 60 10 60	Timer/ twin timer	60
tim / U1S	Time range	U0.1S ⟷ U1S ⟷ U10S ⟷ U1M ⟷ U1H ⟷ U0.1s / U1s / U10s / U1m / U1h d1H ⟷ d1M ⟷ d10S ⟷ d1S ⟷ d0.1S D1h / D1m / D10s / D1s / D0.1s	Timer/ twin timer	U1S
o-md / Pond	Output mode	Pond ⟷ Sond ⟷ SoFd ⟷ SINT ⟷ SRdd ⟷ SF-P POND / SOND / SOFD / SINT / SADD / S.F-P Sond ⟷ Son1 ⟷ SINT ⟷ SFLK ⟷ SF-R ⟷ SF-Q S.OND / S.ON1 / S.INT / S.FLK / S.F-R / S.F-Q	Timer	Pond
		Pond ⟷ PoFd ⟷ PoFt ⟷ Sond ⟷ SoFd POND / POFD / POFT / S.OND / S.OFD	Twin timer	
outt / Hold	Output time	• Not displayed in some twin timer operation modes Hold ~ 99.99 HOLD / 99.99	Timer	Hold
in-t / 1MS	Minimum input signal time	• Select input terminal min input time(START,INHIBIT,RESET) 1MS ⟷ 20MS 1 ms / 20 ms	Timer/ twin timer	20MS
Pour / SAVE	Power outage memory	• SAVE (save time value), CLEAR (reset time value) SAVE ⟷ CLEr SAVE / CLEAR	Timer	CLEr
SIO / nPn	Input logic display	nPn ⟷ PnP NPN / PNP	Timer/ twin timer	nPn
Lock / LOFF	Key lock	LOFF ⟷ LON ⟷ LSET ⟷ LrSt LOCK OFF / LOCK ON / LOCK SET / LOCK RESET	Twin timer	LOFF
oFSt / 000000	Offset	• Only in UP mode,display from set offset value 000000 ~ 999999 (000000 / 999999) Note) Can not be used with twin timer.	Timer	000000

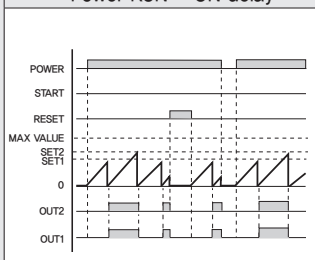
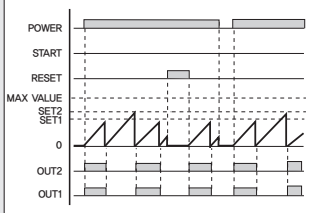
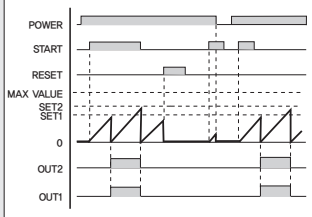
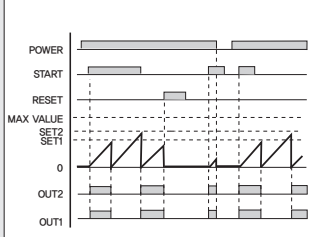
Timer output mode

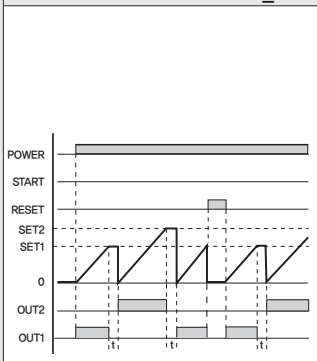


Output mode		Operation description
Pond	Power RUN – ON delay	• Time is displayed at the same time as power is on • During time-up, OUT2 output turns ON and the time value is held • Time value and output are initialized during reset input
Sond	Signal RUN – ON delay	• Time is displayed at the same time as external START signal is applied • During time-up, OUT2 output turns ON and the time value is held • Time value and output are initialized when external START signal is OFF • Time value and output initialized during reset input
SoFd	Signal RUN – OFF delay	• OUT2 output ON at the same time as external START signal is applied • Time is displayed when external START signal is OFF • During time-up, time value and OUT2 output are initialized • Time value and output initialized during reset input
SInt	Signal RUN – Interval	• OUT2 output turns ON and time is displayed at the same time as external START signal is applied • During time-up, time value and OUT2 output are initialized • Time value and output are initialized when external START signal is OFF • Time value and output initialized during reset input
SAdd	Signal RUN – Addition	• Time is displayed only while external START signal is applied • During time-up, OUT2 output turns ON and the time value is held • It maintains time value until reset input • Time value and output initialized during reset input
Sond	Signal START – ON delay	• Time is displayed at the same time as external START signal is applied • During time-up, OUT2 output turns ON and the time value is held • Time value and output initialized during reset input

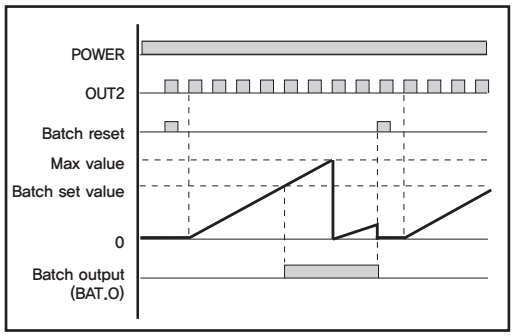
Output mode		Operation description
Son1	Signal START – ON delay1	• Time is displayed at the same time as external START signal is applied • During time-up, OUT2 output turns ON and the time value is held • Time value and output initialized during reset input
SInt	Signal START – Interval	• OUT2 output turns ON and time is displayed at the same time as external START signal is applied • During time-up, time value and OUT2 output are initialized • Time value and output are initialized when external START signal is OFF • Time value and output initialized during reset input
SFLt	Signal START – Flicker	• Time is displayed at the same time as external START signal is applied • During time-up, the time is displayed continuously after OUT2 output turns ON, and the time value is initialized • After the external START signal is applied it shows the time according to SET2 set time and repeats the OUT2 output ON/OFF operation • If OUT2 output is one-shot, OUT2 output turns OFF after OUT2 output set time • Time value and output are initialized during reset input
SF-r	Signal START – Flicker_R	• Time is displayed at the same time as external START signal is applied • During time-up, OUT2 output turns ON and the time value is held • Time value initializes and OUT2 output turns OFF after OUT2 output set time • After the external START signal is applied it shows the time according to SET2 set time and repeats the OUT2 output ON/OFF operation • Time value and output are initialized during reset input
SF-P	Signal START – Flicker_P	• Time is displayed at the same time as external START signal is applied • During time-up, OUT2 output ON and time value is initialized (however, the time display value is held) • Time value is displayed and OUT2 output turns OFF after OUT2 output set time • After the external START signal is applied it shows the time according to SET2 set time and repeats the OUT2 output ON/OFF operation • Time value and output are initialized during reset input
SF-Q	Signal START – Flicker_Q	• Time is displayed at the same time as external START signal is applied • During time-up, OUT2 output ON and displayed continuously • Time value is initialized and OUT2 output turns OFF after OUT2 output set time • After the external START signal is applied it shows the time according to SET2 set time and repeats the OUT2 output ON/OFF operation • Time value and output are initialized during reset input

Twin timer output mode

Output mode		Operation description
PonD	Power RUN – ON delay 	• OFF time (SET1) is displayed at the same time as power is on • During OFF time (SET1) time–up, OUT1 and OUT2 outputs turn ON, and ON time (SET2) is displayed after time value initialization • During ON time (SET2) time–up, OUT1 and OUT2 outputs turn OFF, and OFF time (SET1) is displayed after time value initialization • After supplying the power OUT1 and OUT2 outputs repeat ON/OFF operation according to SET1 and SET2 set times • Time value and output initialized during reset input
PoFd	Power RUN – OFF delay 	• OUT1 and OUT2 outputs turn on and ON time (SET1) is displayed at the same time as power is on • During ON time (SET1) time–up, OUT1 and OUT2 outputs turn OFF, and OFF time (SET2) is displayed after time value initialization • During OFF time (SET2) time–up, OUT1 and OUT2 outputs turn ON, and ON time (SET1) is displayed after time value initialization • After supplying the power OUT1 and OUT2 outputs repeat ON/OFF operation according to SET1 and SET2 set times • Time value and output initialized during reset input
SonD	Signal START – ON delay 	• OFF time (SET1) is displayed at the same time as external START signal is applied • During OFF time (SET1) time–up, OUT1 and OUT2 outputs turn ON, and ON time (SET2) is displayed after time value initialization • During ON time (SET2) time–up, OUT1 and OUT2 outputs turn OFF, and OFF time (SET1) is displayed after time value initialization • After the external START signal is applied, OUT1 and OUT2 outputs repeat ON/OFF operation according to SET1 and SET2 set times • Time value and output are initialized during reset input
SoFd	Signal START – OFF delay 	• OUT1 and OUT2 outputs turn ON and ON time (SET1) is displayed at the same time as external START signal is applied • During ON time (SET1) time–up, OUT1 and OUT2 outputs turn OFF, OFF time (SET2) displayed after time valueMinitialization • During OFF time (SET2) time–up, OUT1 and OUT2 outputs turn ON, and ON time (SET1) is displayed after time value initialization • After the external START signal is applied, OUT1 and OUT2 outputs repeat ON/OFF operation according to SET1 and SET2 set times • Time value and output are initialized during reset input

Output mode		Operation description
PoFt	Power RUN – Flicker_P 	• While power is on, OUT1 output is ON and OUT1 ON time (SET1) is displayed • During OUT1 ON time (SET1) time–up, OUT1 output is OFF and and downtime (t) is displayed after time value initialization • OUT2 output turns on after the downtime (t), and OUT2 ON (SET2) time is displayed after time value initialization • OUT2 output turns off ON during OUT2 ON time (SET2) time–up, and the downtime (t) is displayed after time value initialization • After power–on, OUT1 and OUT2 output repeat ON / OFF operations according to SET1 and SET2, t set time • Time value and output initialization during reset input • Available in 2–stage models

Batch timer



■ Batch timer operation

- The batch count value increases during OUT2 output operation.
- Batch output (B/O) is operated when the batch count value is greater than the batch set value.
- Batch count value and batch output are initialized by pressing the front RST key in batch display mode or by applying a signal to the external BRST terminal.
- Even in batch display mode, counting operation continues.
- If the batch count value is ' 999999 or more, it is initialized to '0' and counted.

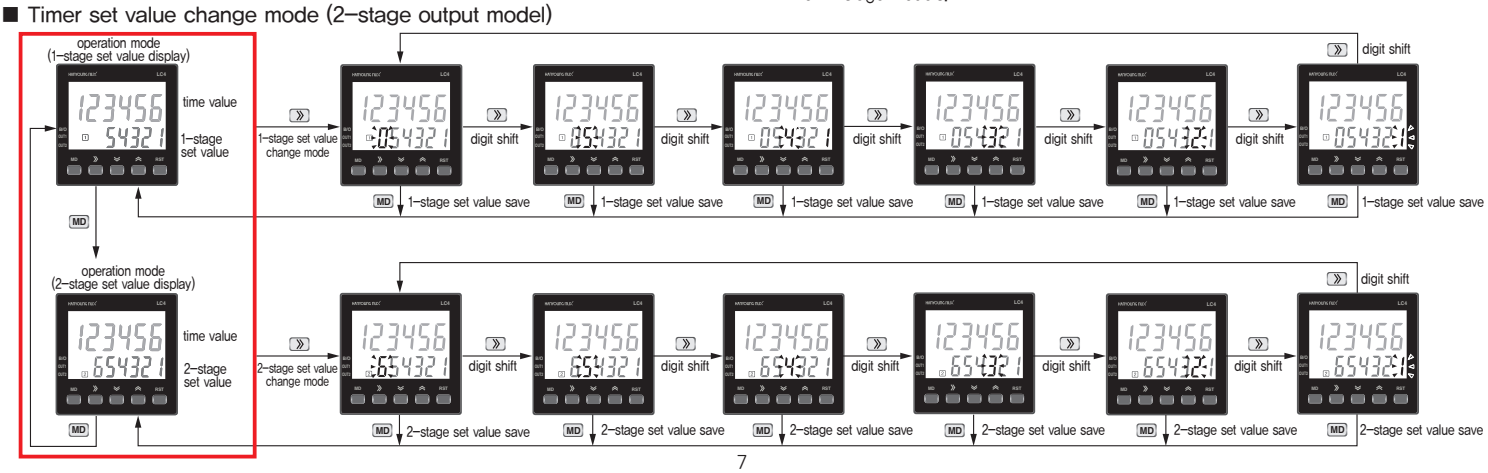
■ Instantaneous output operation

- When batch set value is set to '0', batch output (BAT.O) is operated as instantaneous output (BAT.O LED illuminates)

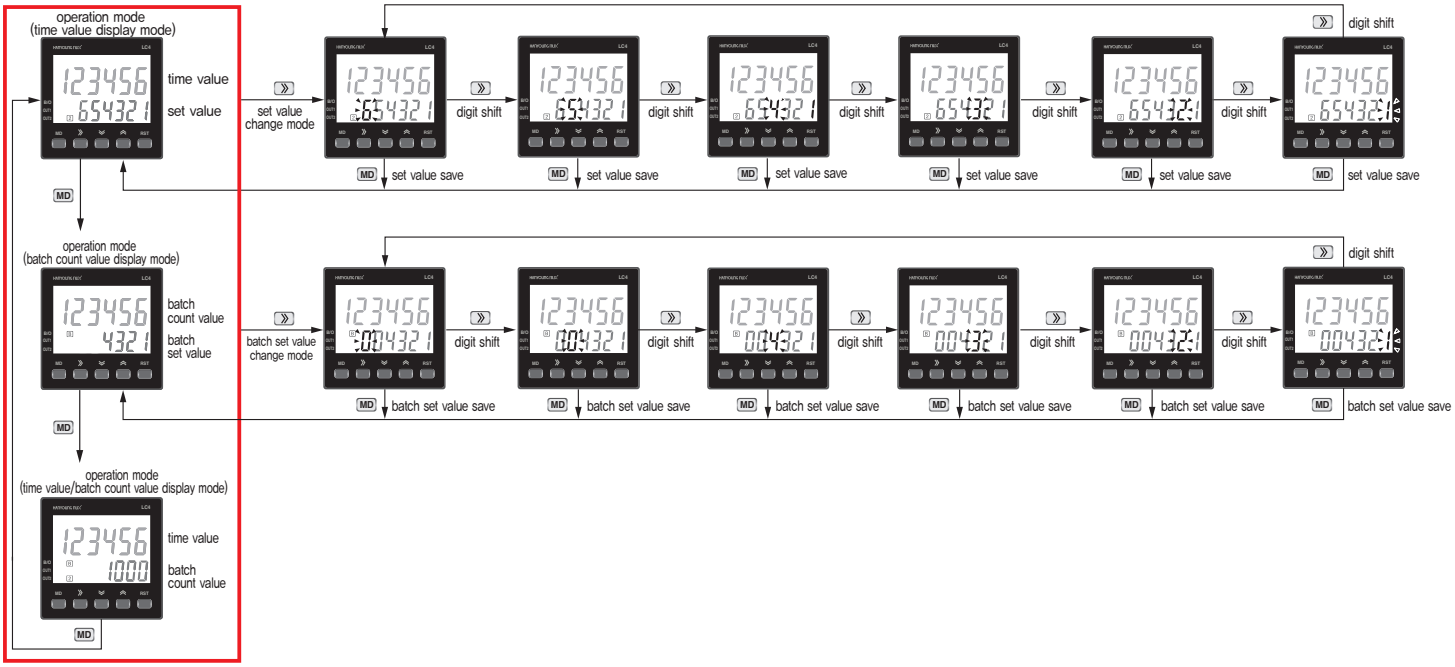
View and change timer set value

- If you press MD in timer operation mode, SET1 or SET2 set value will be displayed in SV display sequentially.
- If you want to change the set value, select SET1 or SET2 set value to change with MD and press » to enter set value change mode.
- If you enter the set value change mode, the set value will flash, and you can change the set value using » / ≪ / ≪.
- After changing the set value, use MD to save the changed set value.
- If there is no key input for 1 minute in set value change mode, it returns to operation mode with the value set before change, without saving.
- In case of 1–stage model, set value does not change (it is fixed as 2 on the display part).
- In the twin timer, the ON and OFF times must be set together regardless of 1 or 2–stage models.

■ Timer set value change mode (2–stage output model)



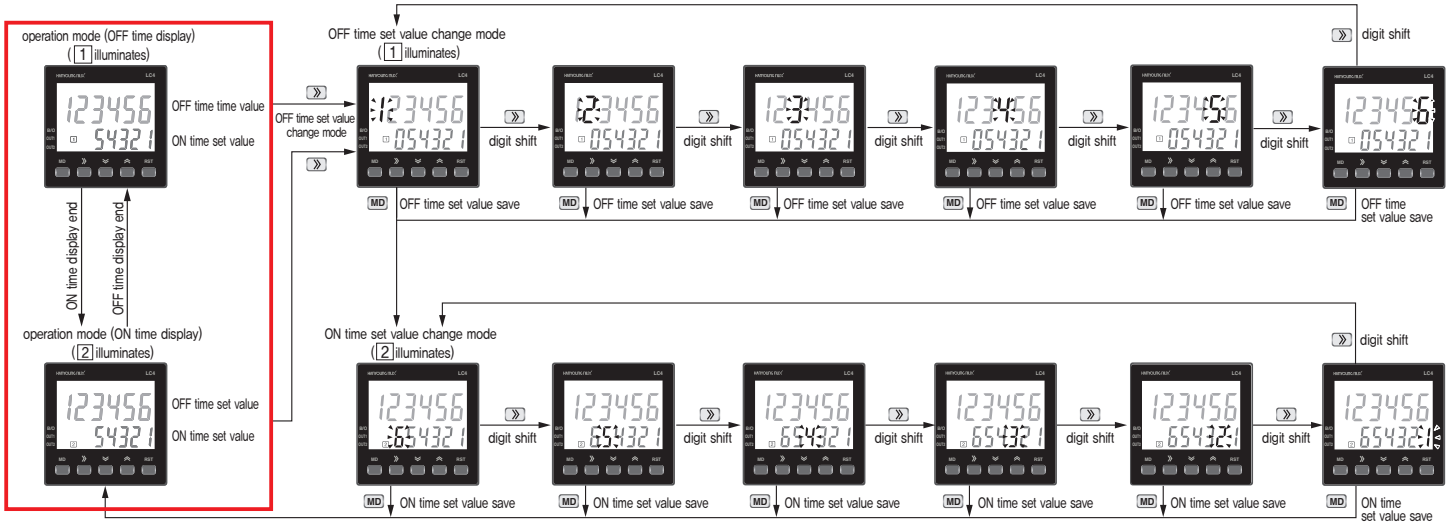
■ Batch timer set value and batch set value change



※ Batch set value change

1. In operation mode, use MD to switch to batch count value display mode.
2. In batch count value display mode, use » to switch to batch set value change mode.
3. In batch set value change mode, use », ≪, ≫ to change the batch set value to '4321' (when setting the batch set value to '4321')
4. After changing the batch set value, press MD to save the changed batch set value.

■ Twin timer ON time and OFF time set value change mode

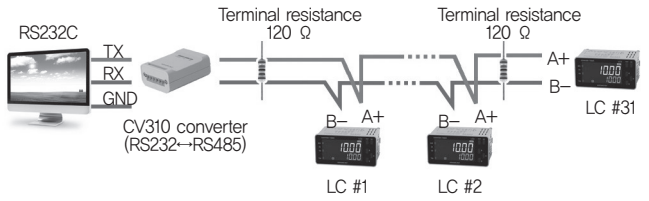


■ View and change twin timer ON / OFF time set value

1. SET1 set value is displayed on PV display, SET2 set value is displayed on SV display.
2. During Pond / Sond output mode, OFF time is set on PV display, and ON time is set on SV display.
3. During PoFd / SoFd output mode, ON time is set on PV display, and OFF time is set on SV display.
4. During PoFt output mode, OUT1–ON time is set on PV display, and OUT2–ON time is set on SV display.

※ When entering the twin timer ON / OFF time set value change mode, the timer stops, and when disabling the set value change mode, the timer displays from the stopped time.

Communication configuration

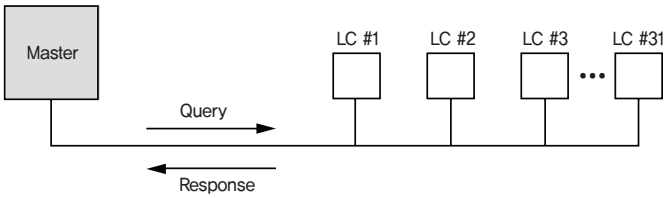


- The communication cable uses twisted-pair cable to connect several LCs.
- Connect twisted-pair cable among LCs by Daisy chain method, the terminal has resistances of around 120 Ω at both ends with communication line.
- Set the parameter values related to LC communication as Master (make sure that the address is not set as duplicate)
- You can connect up to 31 LCs.

※ RS232↔RS485 converter CV310 is sold separately.

Communication control method

- The Modbus communication starts by transmitting a query from the Master to the counter
- The counter monitors the query and sends a response to the master, if the address is confirmed.



1. Query

Query (Master)				
Address	Command	Start address	Number of data	CRC16
← CRC16 →				

Address	LC address (1~127)
Command	Function Code (01H~06H, 10H)
Start address	Register start address for transfer request
Number of data	Number of data for transfer request
CRC16	Checksum from address to number of data

2. Response

Response (counter)				
Address	Command	Number of data	Data	CRC16
← CRC16 →				

Address	LC address (1~127)
Command	Requested function code (01H~06H, 10H)
Number of data	Number of data to transfer
Data	Data to transfer
CRC16	Checksum from address to data

Communication function mode

Display	Name	Settings	Display condition	Initial value
S-no 001	Communication address	001↔127 1 127 • A communication error will occur if you use the same address in LC during multi-communication • You can connect 31 units during multi communication	Communication model	001
bPS 9600	Communication speed	24↔48↔96↔192↔384 2400 4800 9600 19200 38400	Communication model	9600
PtY nonE	Communication parity bit	nonE↔EuEn↔odd none even odd	Communication model	nonE
rUt 20	Communication response waiting time	05↔99 5 ms 99 ms	Communication model	20
LUP on	Communication write inhibit	oFF↔on OFF ON • If communication write inhibit is set to ON, it is not possible to set data by communication.	Communication model	on

Communication speed	Setting range of communication response waiting time
2400 bps	16 ms ~ 99 ms
4800 bps	8 ms ~ 99 ms
9600 bps	5 ms ~ 99 ms
19200 bps	5 ms ~ 99 ms
38400 bps	5 ms ~ 99 ms

COMMAND

1. Func 01H (Read Coil Status)

Query (Master)							
Slave Addr	Func	Start Addr		No. of Points		CRC16	
		High	Low	High	Low	Low	High
1byte	1byte	1byte	1byte	1byte	1byte	1byte	1byte

Response (Slave)					
Slave Addr	Func	Data Byte Count	Data	CRC16	
				Low	High
1byte	1byte	1byte	1byte	1byte	1byte

※ Func 01H usage example
(LC address 01 current status: RST KEY = OFF, BAT RST KEY = OFF, OUT1 = ON, OUT2 = ON, BOUT = OFF)

Query (Master)							
Slave Addr	Func	Start Addr		No. of Points		CRC16	
		High	Low	High	Low	Low	High
01	01	00	00	00	05	FC	09

Response (Slave)					
Slave Addr	Func	Data Byte Count	Data	CRC16	
				Low	High
01	01	01	0C	51	8D

2. Func 02H (Read Input Status)

Query (Master)							
Slave Addr	Func	Start Addr		No. of Points		CRC16	
		High	Low	High	Low	Low	High
1byte	1byte	1byte	1byte	1byte	1byte	1byte	1byte

Response (Slave)					
Slave Addr	Func	Data Byte Count	Data	CRC16	
				Low	High
1byte	1byte	1byte	1byte	1byte	1byte

※ Func 02H usage example
(LC address 01 current status :external RST = ON, external BRST = OFF, CP1 = OFF, CP2 = OFF)

Query (Master)							
Slave Addr	Func	Start Addr		No. of Points		CRC16	
		High	Low	High	Low	Low	High
01	02	00	00	00	05	B8	09

Response (Slave)					
Slave Addr	Func	Data Byte Count	Data	CRC16	
				Low	High
01	02	01	01	60	48

3. Func 03H (Read Holding Registers)

Query (Master)							
Slave Addr	Func	Start Addr		No. of Points		CRC16	
		High	Low	High	Low	Low	High
1byte	1byte	1byte	1byte	1byte	1byte	1byte	1byte

Response (Slave)						
Slave Addr	Func	Data Byte Count	Data (n = 1~16)		CRC16	
			High	Low	Low	High
1byte	1byte	1byte	n-byte	n-byte	1byte	1byte

4. Func 04H (Read Input Registers)

Query (Master)							
Slave Addr	Func	Start Addr		No. of Points		CRC16	
		High	Low	High	Low	Low	High
1byte	1byte	1byte	1byte	1byte	1byte	1byte	1byte

Response (Slave)						
Slave Addr	Func	Data Byte Count	Data (n = 1~13)		CRC16	
			High	Low	Low	High
1byte	1byte	1byte	n-byte	n-byte	1byte	1byte

5. Func 05H (Force Single Coil)

Query (Master)							
Slave Addr	Func	Coil Addr		Force Data		CRC16	
		High	Low	High	Low	Low	High
1byte	1byte	1byte	1byte	1byte	1byte	1byte	1byte

Response (Slave)							
Slave Addr	Func	Coil Addr		Force Data		CRC16	
		High	Low	High	Low	Low	High
1byte	1byte	1byte	1byte	1byte	1byte	1byte	1byte

6. Func 06H (Preset Single Register)

Query (Master)							
Slave Addr	Func	Register Addr		Preset Data		CRC16	
		High	Low	High	Low	Low	High
1byte	1byte	1byte	1byte	1byte	1byte	1byte	1byte

Response (Slave)							
Slave Addr	Func	Register Addr		Preset Data		CRC16	
		High	Low	High	Low	Low	High
1byte	1byte	1byte	1byte	1byte	1byte	1byte	1byte

7. Func 10H (Preset Multiple Registers)

Query (Master)										
Slave Addr	Func	Start Addr		No. of Register		Data Byte Count	Data (n = 1~16)		CRC16	
		High	Low	High	Low		High	Low	Low	High
1byte	1byte	1byte	1byte	1byte	1byte	1byte	n-byte	n-byte	1byte	1byte

Response (Slave)							
Slave Addr	Func	Start Addr		No. of Register		CRC16	
		High	Low	High	Low	Low	High
1byte	1byte	1byte	1byte	1byte	1byte	1byte	1byte

8. Exception (Exception code transmission in case of communication error)

Response (Slave)				
Slave Addr	Func + 80H	Exception code	CRC16	
			Low	High
1byte	1byte	1byte	1byte	1byte

Exception	Description
1	Commands not supported
2	Start address of the requested not matching the address that can be sent by the device
3	Number of requested data not matching the number that can be sent by the device
4	The requested command cannot be processed normally
5	If communication write inhibit is ON, Exception code 4 sent during communication write request

※ Exception usage example (If the Start Addr of the requested data is an error)

Query (Master)							
Slave Addr	Func	Start Addr		No. of Points		CRC16	
		High	Low	High	Low	Low	High
01	03	00	95	00	07	14	24

Response (Slave)				
Slave Addr	Func + 80H	Exception code	CRC16	
			Low	High
01	83	02	C0	F1

MAPPING TABLE

1. Func 01H/05H Mapping Table (output status / reset)

Output status / reset						
ADDR	FUNC	Function	Setting range			
00001 (0000)	01/05	Reset terminal input	0	off	1	on
00002 (0001)	01/05	Batch-Reset terminal input	0	off	1	on
00003 (0002)	01	OUT1 output	0	off	1	on
00004 (0003)	01	OUT2 output	0	off	1	on
00005 (0004)	01	Batch output	0	off	1	on

2. Func 02H Mapping Table (input status)

Input status						
ADDR	FUNC	Function	Setting range			
10001 (0000)	02	Reset terminal input	0	off	1	on
10002 (0001)	02	Batch-reset terminal input	0	off	1	on
10003 (0002)	02	CP1 input	0	off	1	on
10004 (0003)	02	CP2 input	0	off	1	on
10005 (0004)	02	RESERVED	20H			

3. Func 04H Mapping Table (product information / product monitoring)

Product information			
ADDR	FUNC	Function	Setting range
30101 (0064)	04	Product no. Low	0
30102 (0065)	04	Product no. High	0
30103 (0066)	04	Hardware version	0
30104 (0067)	04	Firmware version	0
30105 (0068)	04	Model name	"LC"
30106 (0069)	04	Product model	"62" / "61" / "42" / "41" * Depending on the product model, displays one of four product models
30107 (006A)	04	RESERVED	20h
30108 (006B)	04	RESERVED	20h

Product monitoring			
ADDR	FUNC	Function	Setting range
31001 (03E8)	04	LED display status	0 off 1 on bit14 TIM LED / bit8 OUT2 LED bit13 SET2 LED / bit7 BATCH OUT LED bit12 SET1 LED / bit6 STA LED bit11 LOCK LED / bit5 INH LED bit10 BATCH LED / bit4 RST LED bit9 OUT1 LED / bit3 CWP LED
31002 (03E9) ~ 31003(03EA)	04	Batch PV	6 digits (0~999999), 4 digits (0~9999)
31004 (03EB) ~ 31005(03EC)	04	PV	※ Counter 6 digits (-99999~999999),4 digits (-999~9999) ※ Timer -. refer to SV settings (ADDR 40001)
31006 (03ED)	04	Dot Point	※ Counter 0 6 digits (000000), 4 digits (0000) 1 6 digits (000000), 4 digits (0000) 2 6 digits (0000.00),4 digits (00.00) 3 6 digits (000.000),4 digits (0.000) 4 6 digits (00.0000), 4 digits (x) 5 6 digits (0.00000), 4 digits (x) ※Timer -. Set dot position by time range 0 u.01s 5 d.01s 1 u.1s 6 d.1s 2 u1s 7 d1s 3 u1m 8 d1m 4 u1h 9 d1h
31007 (03EE) ~31008(03EF)	04	SV2	※ Counter 6 digits (0~999999),4 digits (0~9999) ※ Timer -. Refer to SV settings (ADDR 40001)

Product monitoring			
ADDR	FUNC	Function	Setting range
31009 (03F0) ~31010(03F1)	04	SV1	※ Counter 6 digits (0~999999),4 digits (0~9999) ※ Timer -. Refer to SV settings (ADDR 40001)
31011 (03F2) ~31012(03F3)	04	Batch SV	6 digits (0~999999) 4 digits (0~9999)
31013 (03F4)	04	Input logic	0 NPN 1 PNP

4. Func 03H/06H/10H Mapping Table (SV / counter / timer / communication settings)

SV settings			
ADDR	FUNC	Function	Setting range
40001 (0000) ~40002 (0001)	03/06/16	SV2	※ Counter 6 digits (0~999999), 4 digits (0~9999) ※ Timer (decimal) 6 digits (0~999999), 4 digits (0~9999) ※ Timer (sexagesimal)
40003 (0002) ~40004 (0003)	03/06/16	SV1	u.01s 6 digits (0~595999),4 digits (0~5999) u.1s 6 digits (0~959599),4 digits (0~9599) u1s 6 digits (0~995959),4 digits (0~5959) u1m 6 digits (0~999959),4 digits (0~9959) u1h 6 digits (0~999923),4 digits (0~9923)
40005 (0004) ~40006 (0005)	03/06/16	Batch SV	※ 6 digits: 0 ~ 999999 ※ 4 digits: 0 ~ 9999

Counter settings			
ADDR	FUNC	Function	Setting range
40051 (0032)	03/06/16	Operation mode	0 counter 3 twin timer 1 batch-counter 4 batch-timer 2 timer
40052 (0033)	03/06/16	Input mode	0 U-A 6 UD-A 1 U-B 7 UD-B 2 U-AB 8 UD-C 3 D-A 9 UD-D 4 D-B A UD-E 5 D-AB B UD-F
40053 (0034)	03/06/16	RESERVED	20h
40054 (0035)	03/06/16	Output mode	0 N 4 K 1 F 5 P 2 C 6 Q 3 R 7 A
40055 (0036)	03/06/16	Max. counting speed	0 1 cps 2 1 Kcps 1 30 cps 3 10 cps
40056 (0037)	03/06/16	OUT2 output time	0000 ~ 9999 (0 ~ 99.99 sec)
40057 (0038)	03/06/16	OUT1 output time	0000 ~ 9999 (Hold ~ 99.99 sec)
40058 (0039)	03/06/16	Dot Point	0 6 digits (000000), 4 digits (0000) 1 6 digits (00000.0), 4 digits (000.0) 2 6 digits (0000.00), 4 digits (00.00) 3 6 digits (000.000), 4 digits (0.000) 4 6 digits (00.0000), 4 digits (x) 5 6 digits (0.00000), 4 digits (x)
40059 (003A)	03/06/16	Min. input signal time	0 1 ms FF 20 ms
40060 (003B)	03/06/16	Prescale Dot Point	1 6 digits (00000.0), 4 digits (000.0) 2 6 digits (0000.00), 4 digits (00.00) 3 6 digits (000.000), 4 digits (0.000) 4 6 digits (00.0000), 4 digits (x) 5 6 digits (0.00000), 4 digits (x)
40061 (003C)	03/06/16	Prescale	6 digits (0.00001~999999), 4 digits (0.001~9999)
40062 (003D)	03/06/16		
40063 (003E)	03/06/16	RESERVED	20h
40064 (003F)	03/06/16		20h
40065 (0040)	03/06/16	Backup	0 clear 1 save
40066 (0041)	03/06/16	Lock	0 Lock-off 2 Lock-set 1 Lock-on 3 Lock-reset

Timer settings							
ADDR	FUNC	Function	Setting range				
40101 (0064)	03/06/16	Operation mode	0	counter	3	twin timer	
			1	batch-counter	4	batch-timer	
			2	timer			
40102 (0065)	03/06/16	Range	0	u.01s	5	d.01s	
			1	u.1s	6	d.1s	
			2	u1s	7	d1s	
			3	u1m	8	d1m	
			4	u1h	9	d1h	
40103 (0066)	03/06/16	Scale	0	Decimal	1	Sexagesimal	
40104 (0067)	03/06/16	Output mode	※ Timer				
			0	pond	6	s.on1	
			1	sond	7	s.int	
			2	sofd	8	s.flk	
			3	sint	9	s.fr	
			4	sadd	A	s.fp	
			5	s.ond	B	s.fq	
			※ Twin timer				
			C	tw-pond	F	tw-s.ond	
			D	tw-pofd	10	tw-s.ofd	
			E	tw-poft			
40105 (0068)	03/06/16	RESERVED	20h				
40106 (0069)			20h				
40107 (006A)	03/06/16	OUT output time	0000 (Hold) ~ 9999 (99.99 sec)				
40108 (006B)	03/06/16	RESERVED	20h				
40109 (006C)	03/06/16	Min. input signal time	0	1 ms	FF	20 ms	
40110 (006D)	03/06/16	RESERVED	20h				
40111 (006E)			20h				
40112 (006F)			20h				
40113 (0070)			20h				
40114 (0071)			20h				
40115 (0072)	03/06/16	Backup	0	clear	1	save	
40116 (0073)	03/06/16	Lock	0	lock-off	2	lock-set	
			1	lock-on	3	lock-rst	

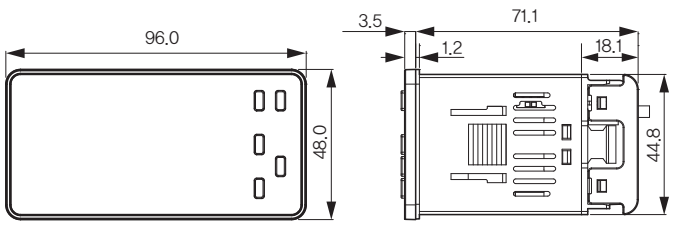
Communication settings							
ADDR	FUNC	Function	Setting range				
40151 (0096)	03/06/16	ADDR	1 ~ 7F				
40152 (0097)	03/06/16	BPS	0	2400	3	19200	
			1	4800	4	38400	
			2	9600			
40153 (0098)	03/06/16	Parity	0	none			
			1	odd			
			2	even			
40154 (0099)	03/06/16	Stop	0	1–stop (fixed)			
40155 (009A)	03/06/16	Response wait time	5 ~ 99 (5ms ~ 99ms)				
40156 (009B)	03/06/16	Communication write inhibit	0	off	FF	on	

Dimension and panel cutout

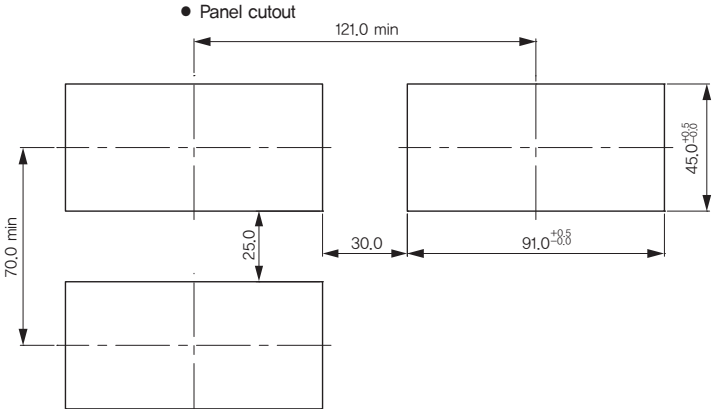
[Unit: mm]

■ LC3

● Dimension

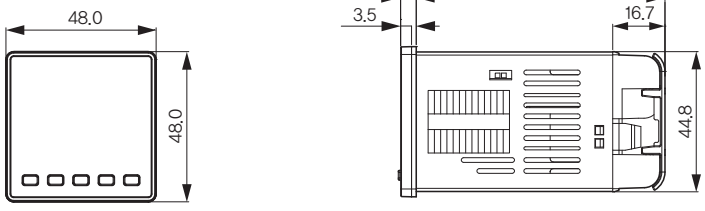


● Panel cutout

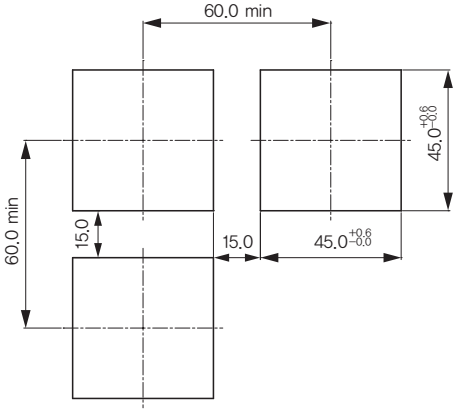


■ LC4

● Dimension

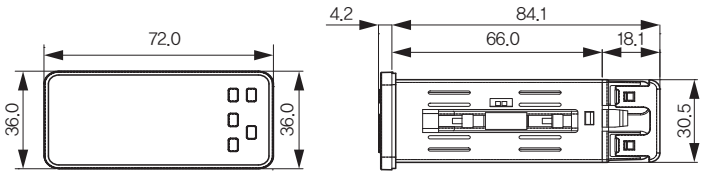


● Panel cutout

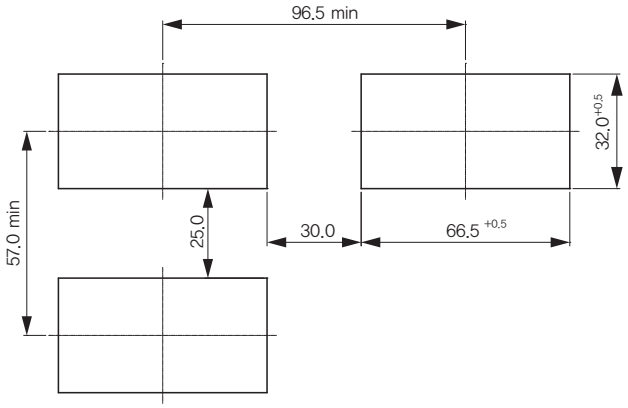


■ LC6

● Dimension

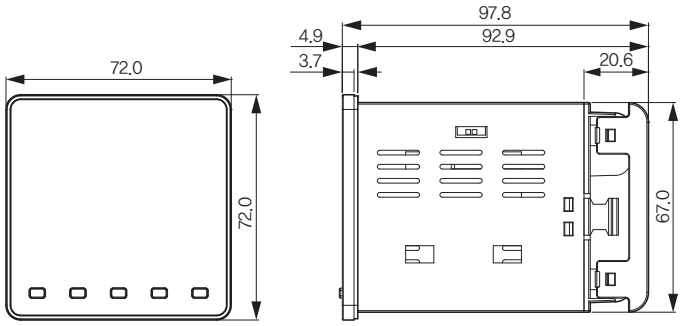


● Panel cutout

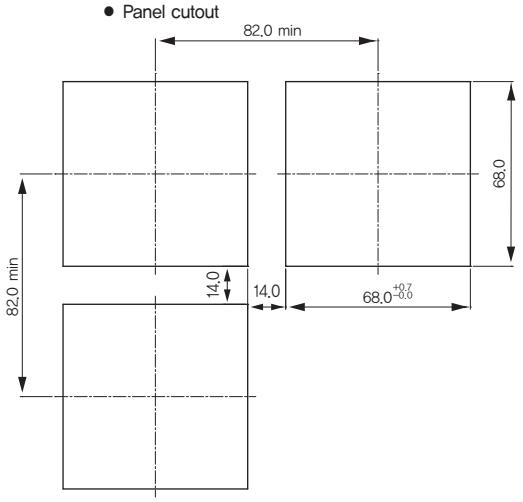


■ LC7

● Dimension

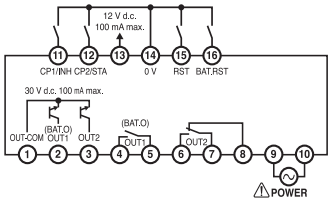


● Panel cutout

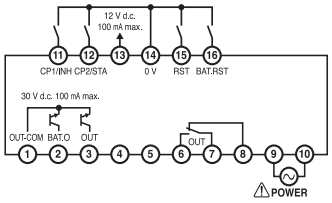


Connection diagram

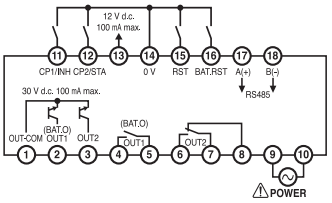
● LC3–P62N



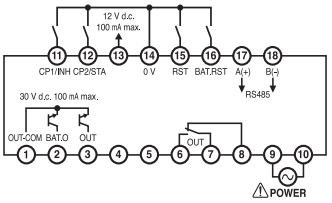
● LC3–P61N



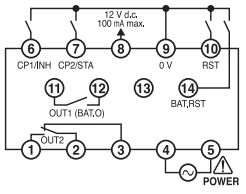
● LC3–P62C



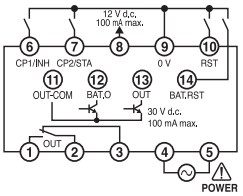
● LC3–P61C



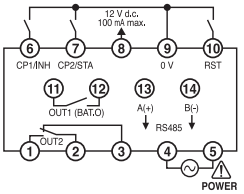
● LC4–P62N/P42N



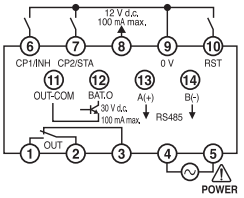
● LC4–P61N/P41N



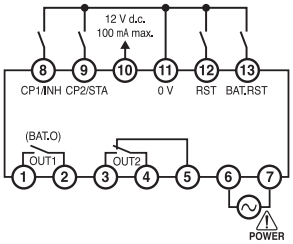
● LC4–P62C/P42C



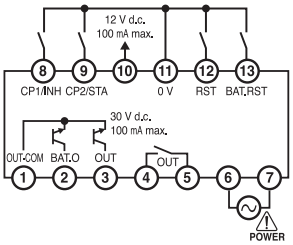
● LC4–P61C/P41C



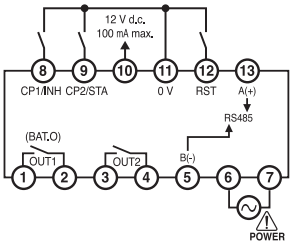
● LC6–P62N



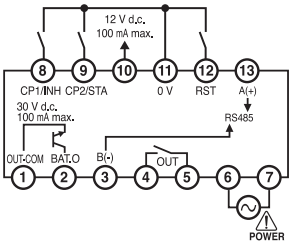
● LC6–P61N



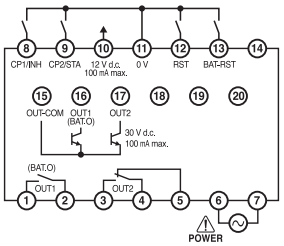
● LC6–P62C



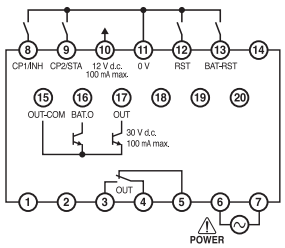
● LC6–P61C



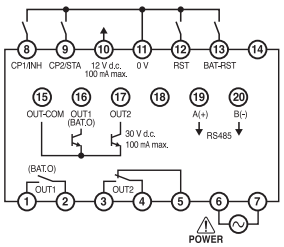
● LC7–P62N



● LC7–P61N



● LC7–P62C



● LC7–P61C