

LCD Counter / Timer

LC series

INSTRUCTION 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 instruction manual where you can view it any time.

HANYOUNG NUX

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Safety information

	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 ecified 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. 0.5A).
 - Please replace 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.
 - Never let the input/output terminals come in contact with your body or conductive substances.
 - 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.

Model code

Model	Code	Content
LC	☐ ☐ ☐ ☐ ☐ ☐	LCD Counter / Timer
	3	96(W) × 48(H) mm
Dimensions	4	48(W) × 48(H) mm
	6	72(W) × 36(H) mm
	7	72(W) × 72(H) mm
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
	D	24 - 48 V a.c. 50/60 Hz or 24 - 48 V d.c.

Specifications

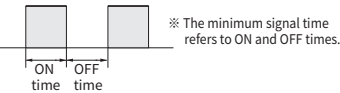
Model	LC3	LC4	LC6	LC7
Power voltage	100 - 240 V a.c. 50/60 Hz, 24 - 48 V a.c. 50/60 Hz or 24 - 48 V d.c. (Voltage fluctuation rate: ±10%)			
Power consumption	AC	• 2-stage setting type: max. 12 VA • 1-stage setting type: max. 11 VA		
	DC	• 2-stage setting type: max. 6 W • 1-stage setting type: max. 5 W		
Character height	Counting unit (14.5 mm), Setting unit (10 mm)	• 6-digit : Counting unit (10.8 mm), Setting unit (8.5 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 - 30 V d.c.), LOW level (0 - 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 mA			
ONE SHOT output	0.01 - 99.99 sec			
Control output	1-stage	OUT (SPDT, 1c)		OUT (SPDT, 1c)
	2-stage	OUT1 (SPST, 1a), OUT2 (SPDT, 1c) * OUT2 of LC6-P62C: SPST configuration		
	capacity	• SPDT: NC (250 V a.c. 2 A), NO (250 V a.c. 5 A), resistive load • SPST: 250 V a.c. 5 A, 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 mA		
Communication	Timer operation error	Power start: max. ±0.01 % ±0.05 sec Reset start: max. ±0.01 % ±0.03 sec		
	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		
	max. connections	31 (address : 1 ~ 127)		
	response waiting time	5 - 99 ms		
	START BIT	1 bit (fixed)		
	STOP BIT	1 bit (fixed)		
Relay	electrical	None / Odd / Even		
	mechanical	Min. 50,000 times		
Life		Min. 10,000,000 times		
Degree of protection		IP66 (product front)		
Storage temperature		-25 ~ 65 °C (without condensation)		
Ambient temperature & humidity		-10 ~ 55 °C, 35 ~ 85 % RH (without condensation)		
Weight(g)	196	140	143	222

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.

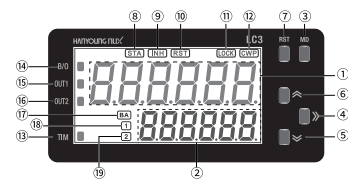
- Even when the input signal is below the maximum counting speed, it may not be counted if the ON and OFF times are less than the specified minimum signal width.
- Minimum signal time.

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

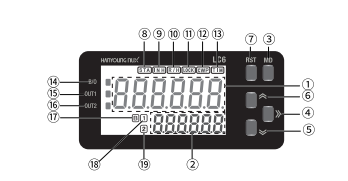


Part names and functions

LC3

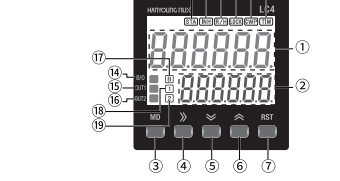


LC6

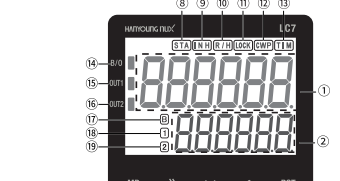


- PV display:** displays count value, time value, batch count value, setting item
- SV display:** displays counter / timer / batch set value
- MODE KEY:** enters and quits function mode (auto save function set value during termination) : used to switch the SV display in operation mode (1-stage/2-stage set values/batch set value)
- SHIFT KEY**
 - enters set value change mode and shifts the set value digits
 - enters communication setting mode in function mode
- DOWN KEY:** reduces set value in function mode and set value change mode
- UP KEY:** increases set value in function mode and set value change mode
- RESET KEY:** resets count value, time value and output status
- START input indicator:** illuminates when external START signal is applied in timer operation mode

LC4



LC7



- INHIBIT input indicator:** illuminates when external INHIBIT signal is applied in timer operation mode
- RESET input indicator:** illuminates when external RESET signal is applied
- LOCK set indicator:** illuminates when LOCK is set
- Communication write inhibit indicator:** illuminates when communication write inhibit is set
- Timer setting indicator:** illuminates when TIM/TIMM/BTMM operation mode is set, flashes during timing operation
- BATCH output indicator:** illuminates during BATCH output operation
- OUT1 output indicator:** illuminates during OUT1 output operation
- OUT2 output indicator:** illuminates during OUT2 output operation
- BATCH setting indicator:** illuminates when switching SV display to BATCH set value
- SV1 setting indicator:** illuminates when switching SV display to 1-stage set value
- SV2 setting indicator:** illuminates when switching SV display to 2-stage set value

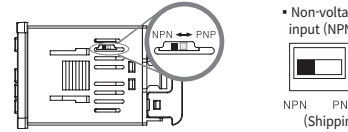
Operation modes

Display	Operation mode	Description
	Preset counter	According to input mode, 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.
	Batch counter	Batch output activated when batch count value reaches the batch set value, after counting the count-ups of the counter.
	Timer	When a signal is applied to external input START / INHIBIT / RESET, operation time is displayed according to time range. OUT1 and OUT2 outputs operated according to selected output mode when the time value reaches the 1- and 2- stage set values.
	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).
	Batch timer	Batch output activated when the batch count value reaches batch set value, after counting the time-ups of the timer.

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

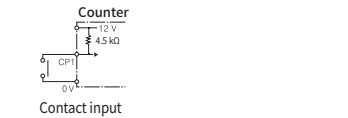
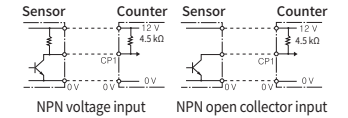
Input/output connection

Input logic selection (voltage / non-voltage)

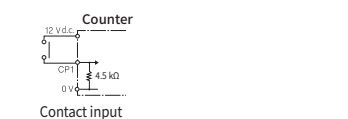
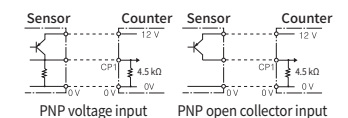


Input connection

- When non-voltage input (NPN) is selected



- When voltage input (PNP) is selected



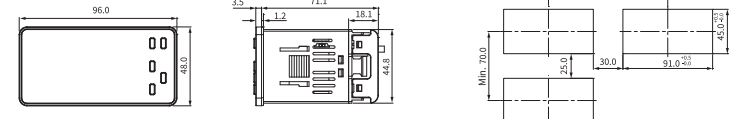
Counter function modes

Display	Name	Settings	Display condition	Initial value
	Operation mode	$Lnk \rightarrow bLnk \rightarrow t \ln \rightarrow t \ln \rightarrow b \ln$ Preset Batch Twin Batch counter counter timer timer timer	Counter	
* In the operation mode setting phase, you can set the communication function when inputting				
	Input mode	$U-R \rightarrow U-b \rightarrow U-Rb \rightarrow d-R \rightarrow d-b \rightarrow d-Rb$ UP-A UP-B UP-AB DOWN-A DOWN-B DOWN-AB $Ud-R \rightarrow Ud-b \rightarrow Ud-C \rightarrow Ud-d \rightarrow Ud-E \rightarrow Ud-F$ UP/DOWN UP/DOWN UP/DOWN UP/DOWN UP/DOWN UP/DOWN -A -B -C -D -E -F	Counter	
	Output mode	$n \rightarrow F \rightarrow C \rightarrow R \rightarrow K \rightarrow P \rightarrow Q \rightarrow A$ N F C R K P Q A	Counter	
	OUT2/OUT output time	• Sets OUT2 or OUT output time • You cannot set to 00.00 in some output modes $0000 \sim 9999$ 00.00 99.99	2-stage setting	
	OUT1 output time	• Sets OUT1 output time $HoLd \sim 9999$ HOLD 99.99	2-stage setting	
	Counting speed	• Sets max counting speed (when duty ratio is 1:1) $1 \rightarrow 30 \rightarrow 1K \rightarrow 10K$ 1 30 1K 10K	Counter	
	Pre-scale decimal point	• Up to 5 decimal places can be set $000000 \rightarrow 000000 \rightarrow 000000 \rightarrow 000000 \rightarrow 000000$ 0.00000 00.0000 000.000 0000.00 00000.0	Counter	
	Pre-scale	$00000 \sim 999999$ 0.00001 999999	Counter	
	Decimal point	※ Decimal point display cannot be more than prescale one $000000 \rightarrow 000000 \rightarrow 000000 \rightarrow 000000 \rightarrow 000000$ 0.00000 00.0000 000.000 0000.00 00000.0	Counter	
	Reset time	$ln5 \rightarrow 20n5$ 1 ms 20 ms	Counter	
	Power outage memory	•SAVE (saves count value), CLEAR (resets count value) $SRuE \rightarrow CLr$ SAVE CLEAR	Counter	
	Show input logic	•Shows NPN/PNP input selection status of side dip switch $nPn \rightarrow nPn$ NPN PNP	Counter	
	Key lock	$LoFF \rightarrow Lon \rightarrow LSEt \rightarrow Lr5t$ LOCK OFF LOCK ON LOCK SET LOCK RESET	Counter	
	Offset	•Available only in UP mode, it counts from the set offset value ※ It cannot be used with the twin timer. $000000 \sim 999999$ 000000 999999	Counter	

Dimensions and panel cutouts

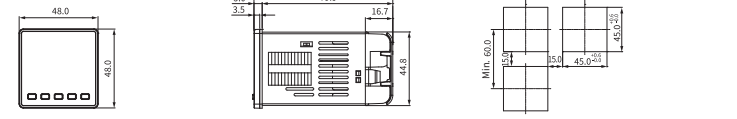
LC3

- Dimensions



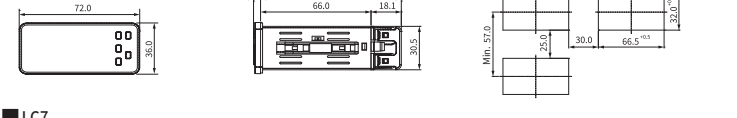
LC4

- Dimensions



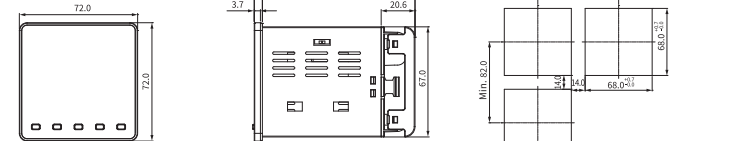
LC6

- Dimensions



LC7

- Dimensions

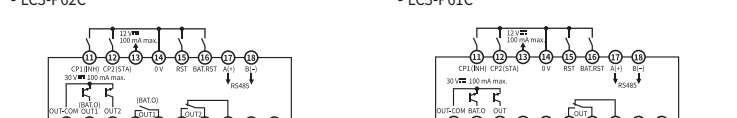


Connection diagrams

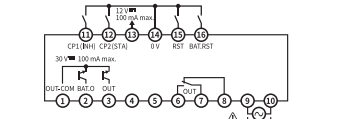
LC3-P62N



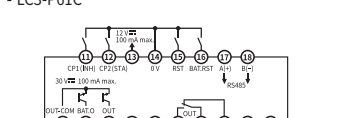
LC3-P62C



LC3-P61N



LC3-P61C



Timer function modes

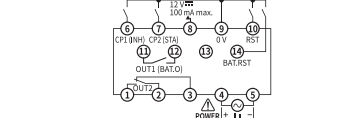
Display	Name	Settings	Display condition	Initial value
	Operation mode	• In the operation mode setting phase, you can set the communication function when inputting	Counter/Timer	
	Decimal/sexagesimal	$Lnk \rightarrow bLnk \rightarrow t \ln \rightarrow t \ln \rightarrow b \ln$ Preset Batch Twin Batch counter counter timer timer timer	Timer/TwinTimer	
	Time range	$U0 \ln5 \rightarrow U \ln5 \rightarrow U \ln5 \rightarrow U \ln \rightarrow U \ln$ U.01s U.1s U.1s U.1m U.1h $d \ln \rightarrow d \ln \rightarrow d \ln5 \rightarrow d \ln5 \rightarrow d0 \ln5$ D1h D1m D1s D.1s D.01s	Timer/TwinTimer	
	Output mode	$Pond \rightarrow Pond \rightarrow Pond \rightarrow 5 lnk \rightarrow 5Add \rightarrow 5ond$ POND SOND SOFD SINT SADD SOND $5on l \rightarrow 5 lnk \rightarrow 5FLK \rightarrow 5F-r \rightarrow 5F-P \rightarrow 5F-Q$ S.ON1 S.INT S.FLK S.F-R S.F-P S.F-Q	Timer	
		$Pond \rightarrow PoFd \rightarrow PoFt \rightarrow 5ond \rightarrow 5oFd$ POND POFD POFT S.OND S.OFD	TwinTimer	
	Output time	•Not displayed in some twin timer operation modes $HoLd \sim 9999$ HOLD 99.99	Timer	
	Minimum input signal time	• Select input terminal min input time (START,INHIBIT,RESET) $ln5 \rightarrow 20n5$ 1 ms 20 ms	Timer/TwinTimer	
	Power outage memory	•SAVE (save time value), CLEAR (reset time value) $SRuE \rightarrow CLr$ SAVE CLEAR	Timer	
	Input logic display	$nPn \rightarrow nPn$ NPN PNP	Timer/TwinTimer	
	Key lock	$LoFF \rightarrow Lon \rightarrow LSEt \rightarrow Lr5t$ LOCK OFF LOCK ON LOCK SET LOCK RESET	Timer/TwinTimer	
	Offset	• Only in UP mode, display from set offset value $000000 \sim 999999$ 000000 999999 Note) Can not be used with twin timer.	Timer	

Time ranges

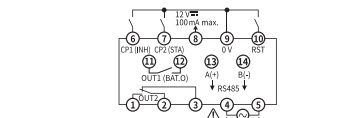
Range selection display		4-digit time range		6-digit time range	
UP	DOWN	Decimal notation	Sexagesimal notation	Decimal notation	Sexagesimal notation
$U0 \ln5$	$d0 \ln5$	99.99 s	59.99 s	9999.99 s	59 m 59.99 s
$U \ln5$	$d \ln5$	999.9 s	9 m 59.9 s	9999.9 s	9 h 59 m 59.9 s
$U \ln5$	$d \ln5$	9999 s	59 m 59 s	999999 s	99 h 59 m 59 s
$U \ln$	$d \ln$	9999 m	99 h 59 m	999999 m	9999 h 59 m
$U \ln$	$d \ln$	9999 h	99 d 23 h	999999 h	9999 d 23 h

Connection diagrams

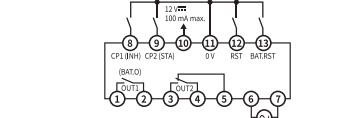
LC4-P62N/P42N



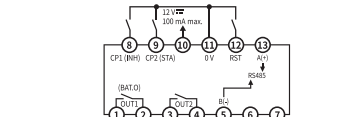
LC4-P62C/P42C



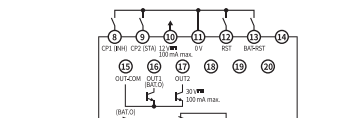
LC6-P62N



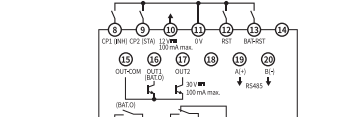
LC6-P62C



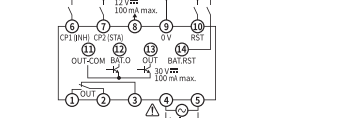
LC7-P62N



LC7-P62C



LC4-P61N/P41N



LC4-P61C/P41C