

H5CX-A□-N/-L□-N

Digital Timer

EN INSTRUCTION MANUAL

Thank you for purchasing the OMRON Product. To ensure the safe application of the Product, read this manual carefully before using the Product and always keep it close at hand when the Product is in use.

OMRON Corporation
©All Rights Reserved

1148541-8B

For details, refer to the latest datasheet (Cat. No. L111).

Suitability for Use

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of the products in the customer's application or use of the product. Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used. Know and observe all prohibitions of use applicable to this product. NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM. See also product catalog for Warranty and Limitation of Liability.

SAFETY PRECAUTIONS

Keys to Warning Symbols

CAUTION Indicates a potentially hazardous situation which, if not avoided, is likely to result in minor or moderate injury or in property damage.

CAUTION

- Do not allow pieces of metal, wire clippings, or fine metallic shavings or fillings from installation to enter the product. Doing so may occasionally result in electric shock, fire, or malfunction.
- Minor injury due to explosion may occasionally occur. Do not use the Timer where subject to flammable or explosive gases.
- Fire may occasionally occur. Tighten the terminal screws to the rated torque.
H5CX terminals: 6.55 to 7.97 lb-in (0.74 to 0.90 N-m)
P2CF socket terminals: 4.4 lb-in (0.5 N-m)
- Minor injury due to electric shock may occasionally occur. Do not touch any of the terminals while power is being supplied. Be sure to mount the terminal cover after wiring.
- The life expectancy of the output relay varies considerably according to its usage. Use the output relay within its rated load and electrical life expectancy. If the output relay is used beyond its life expectancy, its contacts may become fused or there may be a risk of fire. Also, be sure that the load current does not exceed the rated load current and when using a heater, be sure to use a thermal switch in the load circuit.
- Minor electric shock, fire, or malfunction may occasionally occur. Do not disassemble, modify, or repair the Timer or touch internal components.

Precautions for Safe Use

- When mounting the Timer to a panel, tighten the two mounting screws alternately, a little at a time, so as to keep them at an equal tightness. If the panel screws are tightened unequally, water may enter the panel.
- Store the Timer at the specified temperature. If the Timer has been stored at a temperature of less than -10°C, allow the Timer to stand at room temperature for at least 3 hours before use.
- Mounting the Timer side-by-side may reduce the life expectancies of internal components.
- Use the Timer within the specified ranges for the ambient operating temperature and humidity.

- Do not use in the following locations:
 - Locations subject to sudden or extreme changes in temperature.
 - Locations where high humidity may result in condensation.
 - Locations with excessive vibration or shock.
 - Locations subject to water.
 - Locations where the Timer is used in dusty environments, in locations where corrosive gases are present, or in locations subject to direct sunlight.
- Do not connect more than two crimp terminals to the same terminal.
- Use two wires of the same size and type can be inserted into a single terminal.
- Use the specified wires for wiring. Applicable Wires: AWG 18 to AWG 22, solid or twisted, copper. Install a switch or circuit breaker that allows the operator to immediately turn OFF the power, and label it to clearly identify its function.
- When the Timer is operated with no-voltage input (NPN input), approximately 14 V is output from the input terminals. Use a sensor that contains a diode.
- Use a switch, relay, or other contact so that the rated power supply voltage will be reached within 0.1 seconds. If the power supply voltage is not reached quickly enough, the Timer may malfunction or outputs may be unstable.
- Use a switch, relay, or other contact to turn the power supply OFF instantaneously. Outputs may malfunction and memory errors may occur if the power supply voltage is decreased gradually.
- Install a switch or circuit breaker that allows the operator to immediately turn ON the power if the set value is changed as follows because of the use of a constant read-in system:
 - Elapsed time (UP) mode: Present value > Set value
 - Remaining time (DOWN) mode: Elapsed time > Set value (The present value is set to 0).
 When in the remaining time mode, the amount the set value is changed is added to or subtracted from the present value. When the set value is 0, the output turns ON the moment the signal is input. The reset operation turns OFF the output.
- Do not use organic solvents (such as paint thinners or benzene), strong alkali, or strong acids. They will damage the external finish.
- Confirm that indicators are working normally, including the backlight LED and LCD. The indicator LEDs, LCD, and resin parts may deteriorate more quickly depending on the application environment, preventing normal indications. Periodic inspection and replacement are required.
- The waterproof packing may deteriorate, shrink, or harden depending on the application environment. Periodic inspection and replacement are required.

Precautions for Correct Use

- H5CX models with a 24-VAC/12 to 24-VDC power supply use a transformer-free power supply method in which the power supply terminals are not isolated from the signal input terminals. If a non-isolating DC power supply is used, unwanted current paths may occasionally burn or destroy internal components depending on the wiring. Always check the wiring sufficiently before use.
- An inrush current of approx. 10 A will flow for a short time when the power supply is turned ON. If the capacity of the power supply is not sufficient, the Timer may not start. Be sure to use a power supply with sufficient capacity.
- Maintain voltage fluctuations in the power supply within the specified operating voltage range.
 - 4) To allow for the startup time of peripheral devices (sensors, etc.), the Timer starts timing operation between 200 to 250 ms after power is turned ON. For this reason, in operations where timing starts from power ON, the time display will actually start from 249 ms. If the set value is 249 ms or less, the time until output turns ON will be a fixed value between 200 and 250 ms. The present value display will start from 250 ms. (Normal operation is possible for set values of 250 ms or more.) In applications where a set value of 249 ms or less is required, use start timing with signal input.

Rated Specifications

Power supply voltage	100 to 240 VAC, 50/60 Hz (Other than H5CX-□D) 12 to 24 VDC/24 VAC, 50/60 Hz (H5CX-□D)
Allowable voltage fluctuation range	85% to 110% of rated supply voltage (12 to 24 VDC: 90% to 110%)
Power consumption	Approx. 6.2 VA at 100 to 240 VAC Approx. 5.1 VA/2.4 W at 24 VDC/12 to 24 VDC
Operating temperature range	-10 to 55°C (-10 to 130°F) if Timers are mounted side by side (with no icing or condensation) -25 to 70°C (-13 to 158°F) (with no icing or condensation)
Storage temperature range	25% to 85%
Operating humidity range	2,000 m max.
Altitude	T2A, 250 VAC, time-lag, low-breaking capacity
Recommended fuse	Approx. 115 g (main unit only)
Weight	Installation environment Installation method
No-voltage Input	ON impedance: 1 kΩ max. (Leakage current: 12 mA when 0 V) OFF impedance: 100 kΩ min.
Voltage Input	High (logic) level: 4.5 to 30 VDC Low (logic) level: 0 to 2 VDC (Input resistance: approx. 4.7 kΩ)
No-voltage (NPN) input/voltage (PNP) input (switchable)	Control output
Contact output	250 V AC, 5A (resistive load) 30 V DC, 5A (resistive load) Open collector, 30 VDC max., 100 mA max. Residual voltage: 1.5 VDC max. (Effective voltage: Approx. 1 VDC)
Solid state output	Leakage current: 0.1 mA max. 100,000 operations (at an ambient temperature of 23°C) 10,000,000 operations (at an ambient temperature of 23°C) Degree of protection
Electrical life of relay	100,000 operations (at an ambient temperature of 23°C)
Mechanical life of relay	10,000,000 operations (at an ambient temperature of 23°C)
Degree of protection	IEC IP66, UL508 Type 4X*

* Individual mounting: Degree of protection on the front panel of the Timer conforms to UL 508 Type 4X when all of the following conditions are satisfied:
 • The Y92S-29 waterproof packing and Y92F-30 mounting adapter are used with the Timer.
 • Use only these parts for replacement.
 • The Timer is mounted on the flat surface of an enclosure that is rated and marked *Type 4X for Indoor Use Only.*

Conformance to EN/IEC Standards

When conforming to EMC standards, refer to the information provided in this Instruction Manual for cable selection and other conditions. This is a class A product. In residential areas it may cause radio interference, in which case the user may be required to take adequate measures to reduce interference. Basic insulation is provided between the power supply and input terminals. (No insulation is provided between the power supply and input terminals for the H5CX-□D-N.) Basic insulation is provided between power supply and output terminals, and between input and output terminals. When double insulation or reinforced insulation is required, apply double insulation or reinforced insulation as defined in IEC 60664 that is suitable for the maximum operating voltage with clearances or solid insulation.

- The input signal will not be accepted after 5 to 505 ms has elapsed from when the power supply is turned OFF.
- Inrush current generated by turning ON or OFF the power supply may deteriorate contacts on the power supply circuit. Turn ON or OFF to a device with the rated current of more than 10 A.
- Make sure that all settings are appropriate for the application. Unexpected operation resulting in property damage or accidents may occur if the settings are not appropriate.
- Do not leave the Timer for long periods of time at a high temperature with output current in the ON state. Doing so may result in the premature deterioration of internal components (e.g., electrolytic capacitors).
- EPEPROM is used as memory when the power is interrupted. The write life of the EPEPROM is 100,000 writes. The EPEPROM is written when the power is turned OFF or when switching from function setting mode or Timer/Twin Timer selection mode to run mode.
- Dispose of the product according to local ordinances as they apply.
- Attach the front panel when using the Timer. The latches in the middle of each of four sides secure the front panel to the main body. To remove the panel, widen the four latches and pull the panel toward you. To mount the panel, fit all four latches correctly into the slots on the main body.

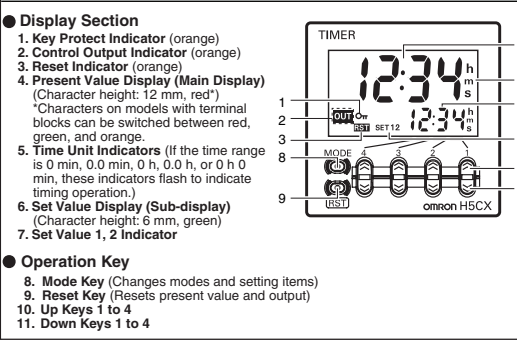
Precautions for Compliance with UL Standards and CSA Standards

Notice to Users of the H5CX in the USA and Canada
 Please use the following installation information instead of the general information in the instruction manual in order to use the product under certified conditions of UL and CSA when the product is installed in the USA or Canada. (UL 508 and 508A are the requirements for the product.) National Electrical Code in the USA and the Canadian Electrical Code, Part I in Canada and may vary from information given in the product manuals or safety precautions.

- Installation in a Panel: H5CX is normally installed on a flat surface in an operation panel. Use a Type 1 Enclosure for the operation panel.
- Use an isolated source for power input for the H5CX-□D.
- Use the isolated source for inputs and for Solid State Output.
- Environment:
 - Surrounding Air Temperature: -10 to 40°C
 - Power supply: The inputs are non-isolated. (Applicable to H5CX-□D only)
 - The same power supply as the main power source should be used for that input.

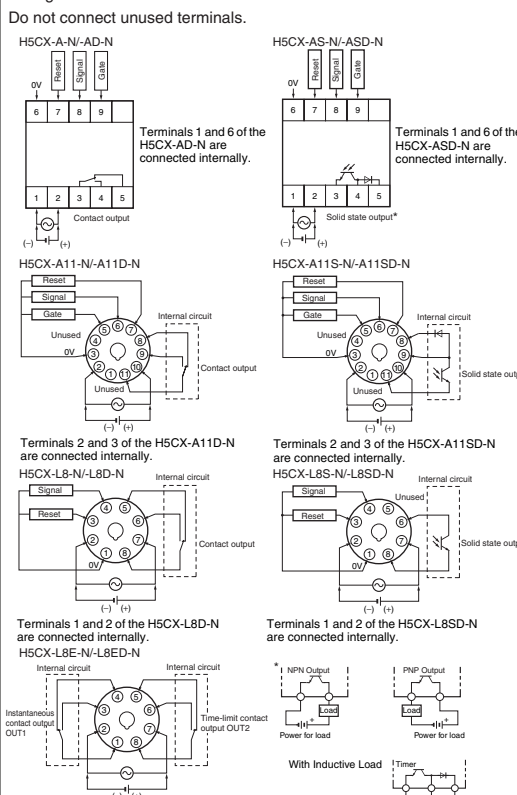
Track Mounting/Front Connecting Socket	11-pin	P2CF-11
	11-pin, finger-safe type	P2CF-11-E
	8-pin	P2CF-08
	8-pin, finger-safe type	P2CF-08-E
Flush Mounting Adapter	---	Y92F-30
Waterproof Packing	---	Y92S-29
Front Panel (4 digits)	Light gray (Munsell 5Y7/1)	Y92P-CXT4D
	White	Y92P-CXT4S
	Black	Y92P-CXT4B

Nomenclature



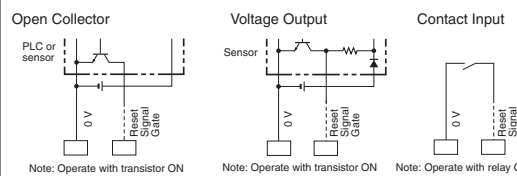
Terminal Arrangement

Wire properly after checking the specifications of the power supply voltage. Do not connect unused terminals.

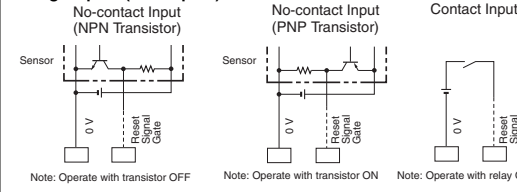


Input Connections

No-voltage Inputs (NPN Inputs)



Voltage Inputs (PNP Inputs)



Key-protect Switch Settings

When the key-protect switch is ON, individual key operations can be disabled to prevent setting errors according to the key protect levels (KP-1 to KP-7) shown in the following table.
 * Key protect levels are set in function setting mode.

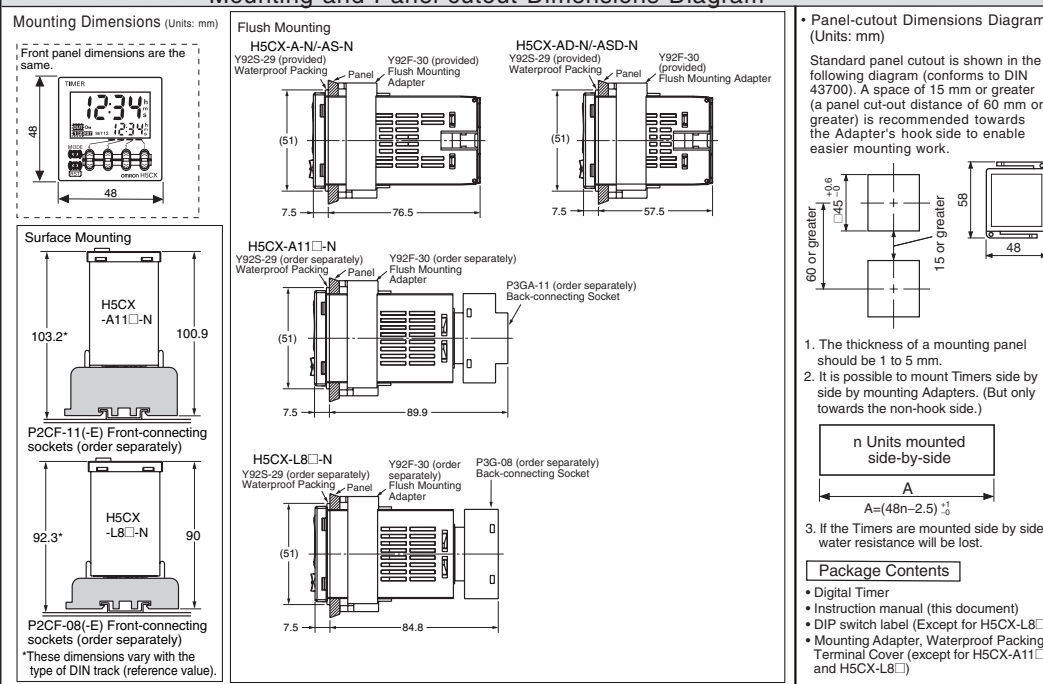
Level	Mode change*	Display switch in the run mode	Reset Key	Up/Down Key
KP-1 (default setting)	Invalid	Valid	Valid	Valid
KP-2	Invalid	Valid	Invalid	Valid
KP-3	Invalid	Valid	Valid	Invalid
KP-4	Invalid	Valid	Invalid	Invalid
KP-5	Invalid	Invalid	Invalid	Valid
KP-6	Invalid	Invalid	Invalid	Invalid
KP-7	Invalid	Invalid	Invalid	Invalid

Self-diagnostic Functions

Main display	Sub-display	Error	Output status	Correction method	Set value after reset
E1	Not lit	CPU error	OFF	Either press the Reset Key or reset the power supply.	No change
E2	Not lit	Memory error (RAM)	OFF	Reset the power supply.	No change
E3	SuA	Memory error (EEPROM)	OFF	Reset Key	Factory setting
E3:2	No change	Output ON count alarm set value exceeded	No change	Reset Key	No change

*1 This includes times when the life of the EEPROM has expired.
 *2 The normal display and E3 will appear alternately. When the Reset Key is pressed, E3 will no longer be displayed even if the alarm set value is exceeded. (Monitoring is possible, however, because the counter will continue without clearing the output ON count.)

Mounting and Panel-cutout Dimensions Diagram



Application as a Timer

Step 1 Basic settings can be done only with the DIP switch. Note: H5CX-L8□-N has no DIP switch, so go to Step 2.

Key-protect switch: ON (enable), OFF (disable).

Item	OFF	ON
1 DIP switch setting	Disable	Enable
2 Time range	Refer to the table on the right.	
3 Output mode	Refer to the table on the right.	
4 UP/DOWN mode	UP	DOWN
5 Input signal width	20 ms	1 ms

Pin 2	Pin 3	Pin 4	Time range
ON	ON	ON	0.001 s to 9.999 s
OFF	OFF	OFF	0.01 s to 99.99 s
ON	OFF	OFF	0.1 s to 999.9 s
OFF	ON	OFF	1 s to 9999 s
ON	ON	OFF	0 min 01 s to 99 min 59 s
OFF	OFF	ON	0.1 min to 999.9 min
ON	OFF	ON	0 h 01 min to 99 h 59 min
OFF	ON	ON	0.1 h to 999.9 h

Pin 5	Pin 6	Output mode
OFF	OFF	A Mode (Signal-ON delay (I): Power recycle)
ON	OFF	A-2 Mode (Power-ON delay (I): Power recycle)
OFF	ON	E Mode (Interval: Power recycle)
ON	ON	F Mode (Cumulative: Power retain)

Application as a Twin Timer

Step 1 First, switch to a Twin Timer. Display in RUN mode.

Power ON → MODE + [] 1 s → Function setting mode → [] 1 s → Twin Timer → [] 1 s → DIP switch monitor.

Item	OFF	ON
1 DIP switch setting	Disable	Enable
2 OFF-time range	Refer to the table on the right.	
3 ON-time range	Refer to the table on the right.	
4 Output mode	Repeat cycle-OFF start	Repeat cycle-ON start
5 UP/DOWN mode	UP	DOWN
6 Input signal width	20 ms	1 ms

Pin 2	Pin 3	OFF-time range
OFF	OFF	0.01 s to 99.99 s
ON	OFF	0.1 s to 999.9 s
OFF	ON	1 s to 9999 s
ON	ON	0 min 01 s to 99 min 59 s

Pin 4	Pin 5	ON-time range
OFF	OFF	0.01 s to 99.99 s
ON	OFF	0.1 s to 999.9 s
OFF	ON	1 s to 9999 s
ON	ON	0 min 01 s to 99 min 59 s

Step 2

Parameters that cannot be set with the DIP switch are set with the operation keys on the front panel. Note: Refer to the datasheet (Cat. No. L111) for detailed parameter settings.

Display	Parameter name	Set value	Comments
---	Time range	---	---
---	UP/DOWN mode	UP, DOWN *2	---
---	Output mode	A, A-2, R-1, R-2, R-3, b, b-1, d, E, F, z, z *2	Only modes A, A-2, R-1, R-2, R-3, b, b-1 and z can be selected for H5CX-L8E□.
---	Output time	0.001 to 9999	(If the output time is set to 0.00, Hold is displayed.) Displayed for modes A, A-2, R-1, R-2, R-3, b, b-1 and z only. Unit: second
---	Input signal width	20ms, 1ms *2	Displayed only for models other than H5CX-L8E□.
---	NPN/PNP input	NPN, PNP *2	Only displayed for the H5CX-A□ and H5CX-A11□.
---	Display color	Red, Green, Blue, Yellow, White, Black	Displayed only for models with terminal blocks.
---	Instantaneous/time-limit	Instant, Time *2	Displayed only for the H5CX-L8E□.
---	Set value upper limit	1 to 9999	---
---	Key protect level	KP-1, KP-2, KP-3, KP-4, KP-5, KP-6, KP-7 *2	---

Step 3

Parameters that cannot be set with the DIP switch are set with the operation keys on the front panel. Note: Refer to the datasheet (Cat. No. L111) for detailed parameter settings.

Change from RUN Mode to Function Setting Mode.

Set the parameters using the [] Keys. The characters displayed in reverse video are the default settings. When performing settings with operation keys only, set pin 1 of the DIP switch to OFF (factory setting). If pin 1 of the DIP switch is set to ON, the setting items indicated in [] will not be displayed.

Display	Parameter name	Set value	Comments
---	Instantaneous output 1 (OUT1) ON count alarm set value	1 to 9999	× 1,000
---	Time-limit output 2 (OUT2) ON count alarm set value	1 to 9999	× 1,000
---	Instantaneous output 1 (OUT1) ON count monitor value	---	The monitor value is only displayed. It cannot be set. × 1,000
---	Time-limit output 2 (OUT2) ON count monitor value	---	The monitor value is only displayed. It cannot be set. × 1,000

*1 The set values for the time range are as follows:
 --- s: 0.01 s to 99.99 s (default setting)
 --- s: 0.1 s to 999.9 s
 --- s: 1 s to 9999 s
 --- ms: 0 min 01 s to 99 min 59 s
 --- m: 0.1 min to 999.9 min
 --- m: 1 min to 9999 min
 --- hm: 0 h 01 min to 99 h 59 min
 --- h: 0.1 h to 999.9 h
 --- h: 1 h to 9999 h
 --- s: 0.001 s to 9.999 s
 *2 After reaching the last set value, the [] Keys will return to the first set value.

Application as a Twin Timer

Step 1 First, switch to a Twin Timer. Display in RUN mode.

Power ON → MODE + [] 1 s → Function setting mode → [] 1 s → Twin Timer → [] 1 s → DIP switch monitor.

Item	OFF	ON
1 DIP switch setting	Disable	Enable
2 OFF-time range	Refer to the table on the right.	
3 ON-time range	Refer to the table on the right.	
4 Output mode	Repeat cycle-OFF start	Repeat cycle-ON start
5 UP/DOWN mode	UP	DOWN
6 Input signal width	20 ms	1 ms

Pin 2	Pin 3	OFF-time range
OFF	OFF	0.01 s to 99.99 s
ON	OFF	0.1 s to 999.9 s
OFF	ON	1 s to 9999 s
ON	ON	0 min 01 s to 99 min 59 s

Pin 4	Pin 5	ON-time range
OFF	OFF	0.01 s to 99.99 s
ON	OFF	0.1 s to 999.9 s
OFF	ON	1 s to 9999 s
ON	ON	0 min 01 s to 99 min 59 s

Step 2

Parameters that cannot be set with the DIP switch are set with the operation keys on the front panel. Note: Refer to the datasheet (Cat. No. L111) for detailed parameter settings.

Display	Parameter name	Set value	Comments
---	OFF time range	---	---
---	ON time range	---	---
---	UP/DOWN mode	UP, DOWN *2	---
---	Twin Timer Output mode	OFF, ON, OFF/ON, ON/OFF	Only modes OFF and ON can be selected for H5CX-L8E□.
---	Input signal width	20ms, 1ms *2	Displayed only for models other than H5CX-L8E□.
---	NPN/PNP input	NPN, PNP *2	Displayed only for the H5CX-A□ and H5CX-A11□.
---	Display color	Red, Green, Blue, Yellow, White, Black	Displayed only for models with terminal blocks.
---	Instantaneous/time-limit	Instant, Time *2	Displayed only for H5CX-L8E□.

Step 3

Parameters that cannot be set with the DIP switch are set with the operation keys on the front panel. Note: Refer to the datasheet (Cat. No. L111) for detailed parameter settings.

Change from RUN Mode to Function Setting Mode.

Set the parameters using the [] Keys. The characters displayed in reverse video are the default settings. When performing settings with operation keys only, set pin 1 of the DIP switch to OFF (factory setting). If pin 1 of the DIP switch is set to ON, the setting items indicated in [] will not be displayed.

Display	Parameter name	Set value	Comments
---	Instantaneous output 1 (OUT1) ON count alarm set value	1 to 9999	× 1,000
---	Time-limit output 2 (OUT2) ON count alarm set value	1 to 9999	× 1,000
---	Instantaneous output 1 (OUT1) ON count monitor value	---	The monitor value is only displayed. It cannot be set. × 1,000
---	Time-limit output 2 (OUT2) ON count monitor value	---	The monitor value is only displayed. It cannot be set. × 1,000