

World's Smallest Compact Preset Counter/Timer

1/32-mm DIN with Communications

- Only 48 x 24 x 83 mm (W x H x D)
- Switch between 4-digit preset counter and 4-digit timer operation.
- While using the preset counter, it is possible to switch the display to monitor the totalizing count value (8 digits).
- Built-in prescaling for counter operation.
- ON/OFF-duty adjustable flicker mode that can be used to perform cyclic control is available for timer operation.
- Four preset values that can be changed by the front panel key (SV-bank).
- Finger protection terminal block to meet VDE0106/P100.
- Panel surface compatible with NEMA4X/IP66.
- Conforms to UL, CSA, and IEC safety standards as well as CE Marking.
- Six-language instruction manual provided.



Ordering Information

Supply voltage	Output	Communications	
		No communications	RS-485
24 VDC	Contact output (SPDT)	H8GN-AD	H8GN-AD-FLK

Model Number Legend:

H8GN-AD-

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1 2

1. **Supply Voltage**
D: 24 VDC

2. **Communications Output Type**
None: Communications not supported
FLK: RS-485

Specifications

■ Ratings

Rated supply voltage		24 VDC
Operating voltage range		85% to 110% of rated supply voltage
Power consumption		1.5 W max. (for max. DC load) (Inrush current: 15 A max.)
Mounting method		Flush mounting
External connections		Screw terminals (M3 screws)
Terminal screw tightening torque		0.5 N·m max.
Attachment		Waterproof packing, flush mounting bracket
Display		7-segment, negative transmissive LCD; time display (h, min, s); CMW, OUT, RST, TOTAL Present value (red, 7-mm-high characters); Set value (green, 3.4-mm-high characters)
Digits		PV: 4 digits SV: 4 digits When total count value is displayed: 8 digits (Zeros suppressed)
Memory backup		EEPROM (non-volatile memory) (number of writes: 100,000 times)
Counter	Maximum counting speed	30 Hz or 5 kHz (See note.)
	Counting range	–999 to 9,999
	Input modes	Increment, decrement, individual, quadrature inputs
	Output modes	N, F, C, or K
Timer	Time ranges	0.000 to 9.999 s, 0.00 to 99.99 s, 0.0 to 999.9 s, 0 to 9999 s, 0 min 00 s to 99 min 59 s, 0.0 to 999.9 min, 0 h 00 min to 99 h 59 min, 0.0 h to 999.9 h, 0 h to 9999 h
	Timer modes	Elapsed time (Up), remaining time (Down)
	Output modes	A, B, D, E, F, or Z
Inputs	Input signals	For Counter: CP1, CP2, and reset For Timer: Start, gate, and reset
	Input method	No-voltage input (contact short-circuit and open input) Short-circuit (ON) impedance: 1 K Ω max. (Approx. 2 mA runoff current at 0 Ω) Short-circuit (ON) residual voltage: 2 VDC max. Open (OFF) impedance: 100 k Ω min. Applied voltage: 30 VDC max.
	Start, reset, gate	Minimum input signal width: 1 or 20 ms (selectable)
	Power reset	Minimum power-opening time: 0.5 s
Control output		SPDT contact output: 3 A at 250 VAC/30 VDC, resistive load ($\cos \phi = 1$)
Minimum applied load		10 mA at 5 VDC (failure level: P, reference value)
Reset system		External, manual, and power supply resets (for timer in A, B, D, E, or Z modes)
Sensor waiting time		260 ms max. (Inputs cannot be received during sensor wait time if control outputs are turned OFF.)

Note: The figures given for maximum counting speed are for incrementing or decrementing operation with a prescale value of $\times 1$. If prescaling is used and 5 kHz is set, the maximum counting speed will be reduced to about half. The maximum counting speed will also be reduced to about half when the up/down mode is selected.

■ Characteristics

Timer function	Accuracy of operating time and setting error (including temperature and voltage effects)	Signal start: $\pm 0.03\% \pm 30$ ms max. Power-ON start: $\pm 0.03\% \pm 50$ ms max.
Insulation resistance		100 M Ω min. (at 500 VDC)
Dielectric strength		1,500 VAC, 50/60 Hz for 1 min between output terminals and non-current-carrying metal parts 510 VAC, 50/60 Hz for 1 min between current-carrying terminals (except output terminals) and non-current-carrying metal parts 1,500 VAC, 50/60 Hz for 1 min between output terminals and current-carrying terminals (except output terminals) 500 VAC, 50/60 Hz for 1 min between communications terminals and current-carrying terminals (except output terminals) 1,000 VAC, 50/60 Hz for 1 min between contacts not located next to each other
Noise immunity		Square-wave noise by noise simulator; ± 480 V (between power terminals), ± 600 V (between input terminals)
Static immunity		± 8 kV (malfunction), ± 15 kV (destruction)
Vibration resistance	Malfunction	10 to 55 Hz with 0.35-mm single amplitude each in three directions for 10 min
	Destruction	10 to 55 Hz with 0.75-mm single amplitude each in three directions for 2 h
Shock resistance	Malfunction	100 m/s ² , 3 times each in six directions
	Destruction	300 m/s ² , 3 times each in six directions
Life expectancy	Mechanical	10 million operations
	Electrical	100,000 operations min. (3 A at 250 VAC, resistive load)
Ambient temperature	Operating	-10°C to 55°C (with no icing or condensation)
	Storage	-25°C to 65°C (with no icing or condensation)
Ambient humidity		25% to 85%
EMC		(EMI): Emission Enclosure: EN61326 Class A EN61326 (EMS): Immunity ESD: EN61000-4-2: 4 kV contact discharge (level 2) 8 kV air discharge (level 3) Immunity RF-interference: EN61000-4-3: 10 V/m (Amplitude-modulated, 80 MHz to 1 GHz) (level 3); 10 V/m (Pulse-modulated, 900 MHz \pm 5 MHz) (level 3) Immunity Conducted Disturbance: EN61000-4-6: 3 V (0.15 to 80 MHz) (level 2) Immunity Burst: EN61000-4-4: 2 kV power-line (level 3); 1 kV I/O signal-line (level 4); 1 kV communications-line (level 3) Immunity Surge: EN61000-4-5: 1 kV between lines (power and output lines) (level 3); 2 kV between grounds (power and output lines) (level 3)
Approved standards		UL508, CSA C22.2 No.14 Conforms to EN61010-1/IEC61010-1 (Pollution degree 2/overvoltage category II) Conforms to VDE0106/P 100 (Finger Protection)
Case color		Rear section: Gray smoke; Front section: N1.5 (black)
Enclosure ratings		Panel surface: IP66 and NEMA Type 4X (indoors) Rear case: IP20 Terminal block: IP20
Weight		Approx. 80 g

■ Communications Specifications

Transmission path connections	Multidrop
Communications method	RS-485 (two-wire, half duplex)
Synchronization method	Start-stop synchronization
Baud rate (See note.)	1,200/2,400/4,800/9,600 bit/s
Transmission code	ASCII
Data bit length (See note.)	7 or 8 bits
Stop bit length (See note.)	1 or 2 bits
Error detection (See note.)	Vertical parity (none, even, or odd) (See note.) Block check character (BCC)
Flow control	Not supported.
Interface	RS-485
Retry function	Not supported.
Communications buffer	40 bytes
Reading and writing from H8GN	Reading present value and totalizing count value; reading/writing preset and set values; switching between SV-banks; switching between communications write-enabled/write-prohibited; reading/writing other initial and advanced function setting parameters

Note: The baud rate, data bit length, stop bit length, and vertical parity can be individually set using the communications setting level.

Nomenclature

No. 1 Display

Displays the present value or parameter type. When totalizing count is displayed, the leftmost 4 digits of the 8-digit totalizing count will be displayed. (Zeros suppressed)

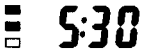
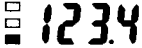
Operation display 2

Indicator	Meaning
CMW	Lit when communications writing is enabled.
RST	Lit during reset using reset input or Reset Key.
OUT	Lit when control output is ON.
TOTAL	Lit when totalizing count value is displayed.

Operation display 1

Displays the time unit when the timer function has been selected.

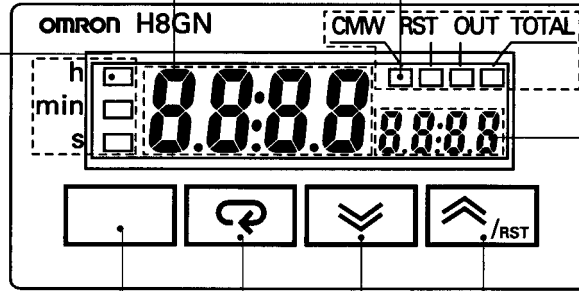
Example

5 h 30 min 
 123.4 s 

Flashes while timer is on 0.0 min, 0 h 00 min, 0.0 h, or 0 h.

No. 2 Display

Displays set value or set value of the parameter. Displays the rightmost 4 digits of the count value (8 digits) when the H8GN is used as a totalizing counter. (Zeros suppressed)



Level Key

Press this key to select the setup level. The setup level is selected in order "operation level" ↔ "adjustment level", "initial setting level" ↔ "communications setting level".

Mode Key

Press this key to select parameters within each level.

Down Key

Each press of this key decreases values displayed on the No. 2 display. Hold down this key continuously to decrease values quickly. Also returns setting items.

Up/Reset Key

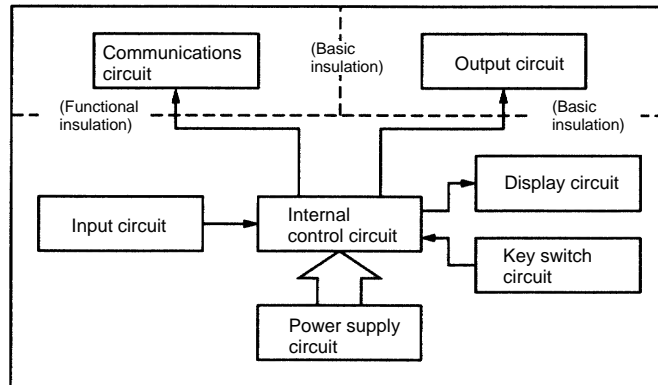
Each press of this key increases values displayed on the No. 2 display. Hold down this key continuously to increase values quickly. Also advances setting items.

Reset Function

To reset the present value, press this key while the present value is displayed. If this key is pressed while the totalizing count value is displayed, the totalizing count value and the present value will be reset.

Operation



■ Block Diagram



■ I/O Functions

Inputs	Counter inputs	CP1/CP2	<ul style="list-style-type: none"> Receive count signals. Receive increment, decrement, individual, and quadrature inputs. In increment mode and decrement mode, CP1 is used for the count input and CP2 is used for count prohibit input.
		Reset	<ul style="list-style-type: none"> Resets the present value. (Totalizing count value is not reset.) (In increment mode or increment/decrement mode, the present value returns to 0; in Decrement Mode the present value returns to the set value.) The count input is not received during resetting. The RST indicator is lit during resetting.
	Timer inputs	Start	<ul style="list-style-type: none"> Starts timing.
		Reset	<ul style="list-style-type: none"> Resets the timer. (In elapsed time mode the time returns to 0; in remaining time mode, the time returns to the set value.) During resetting, timing stops and the control output turns OFF. The RST indicator is lit during resetting.
		Gate	<ul style="list-style-type: none"> Prohibits timing operation.
	Outputs	OUT	<ul style="list-style-type: none"> Output made according to the output mode setting when the set value is reached.

Initial Setup

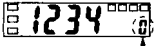
The  and  Keys are used to switch between setup menus, and the amount of time that you hold the keys down for determines which setup menu you move to. This section describes two typical examples.



Note: In the following sections, "PV" is used to indicate a present value and "SV" to indicate a set value.

1. Using the H8GN as a Counter

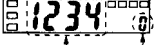
Typical Application Examples • Setup Procedure

1. Changing Set Values



Set value and selections in each display can be changed by pressing the  and  Keys.

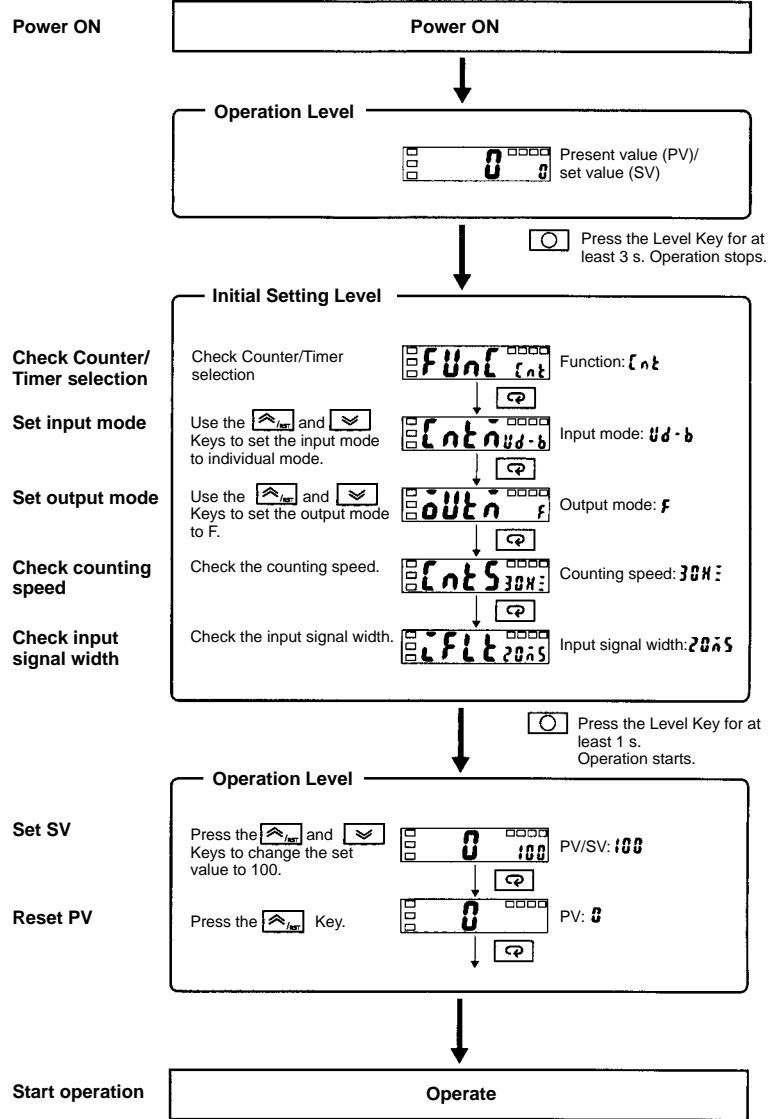
2. Displays





No. 1 display No. 2 display

Typical Application

Input mode	Individual input
Output mode	F (overcount)
Counting speed	30 Hz
Input signal width	20 ms
Decimal point	None
Prescale	None



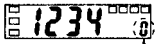
• Confirming Set Values

Set values are effective two seconds after key operation is stopped or when the  or  Key is pressed.

2. Using the H8GN as a Timer

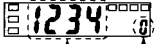
Typical Application Examples

1. Changing Set Values



Set value and selections in each display can be changed by pressing the and Keys.

2. Display

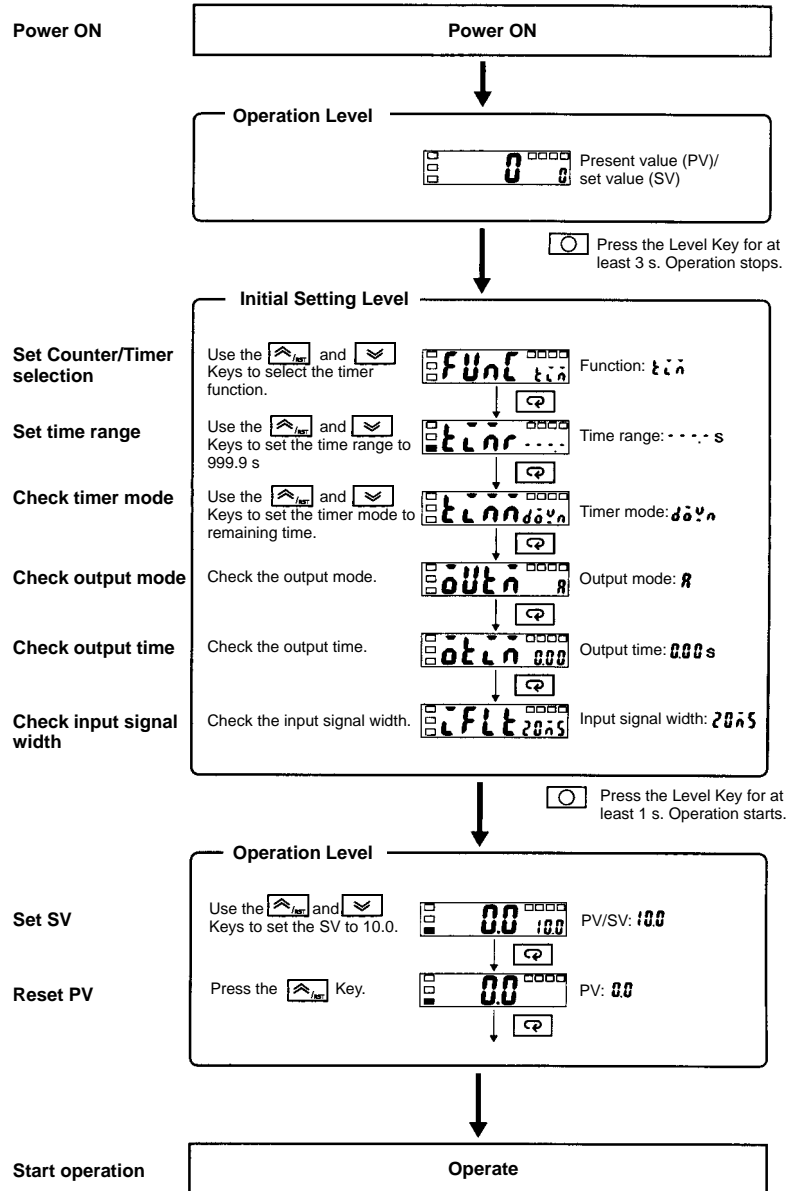


No. 1 Display No. 2 Display

Typical Application Examples

Time range	0.0 to 999.9 s
Timer mode	DOWN (remaining time)
Output mode	A mode
Output time	Hold
Input signal width	20 ms

• Setup Procedure



• Confirming Set Values

Set values are effective two seconds after key operation is stopped or when the or Key is pressed.