

# G48 Series

**P R E S E T   C O U N T E R**



- **DIN 48 × 48 PRESET COUNTER**
- **EASY EDITING (INDIVIDUAL DIGIT KEYS)**
- **LCD DISPLAY WITH BACKLIGHT**
- **PRESCALE**
- **KEY LOCK**
- **FREE WRITE**

## MODELS

Model	Digit	Preset	Power source	Input	Body length
G48-305	6	1 level preset	AC100~240V	Contact / Open collector Voltage input (SELECTABLE)	100 mm
G48-306			DC12~24V		64 mm
G48-315		2 level preset	AC100~240V		100 mm
G48-316		1 level preset + prewarn			

## FRONT PANEL FEATURES

① Count display	④ Output indicator
② Preset/Programming Setting display	⑤ External reset input indicator
③ Program item display	⑥ External key lock indicator
IN Hz      count speed	⑦ Individual digit setting keys (Key 1 ... Key 6)
IN          input mode / count mode	⑧ Reset key
OUT        output mode	⑨ Mode key
OUT ms    output time	⑩ Display key
PS         prescale	
DP         decimal point position	
W          freewrite	
RST ms    reset time	
KEY/P     key lock protection	
SET        preset value setting	
PW         prewarn value setting	

## PROGRAMMING

- **Count Speed**      30Hz, 1000Hz, or 5000Hz can be selected. Default setting is 30Hz.
- **Input Mode**        Contact / Open collector or Voltage input modes can be selected. Default setting is Contact/Open Collector.
- **Count Mode**        One of the following 5 count modes can be selected. Default setting is  $UP$ :

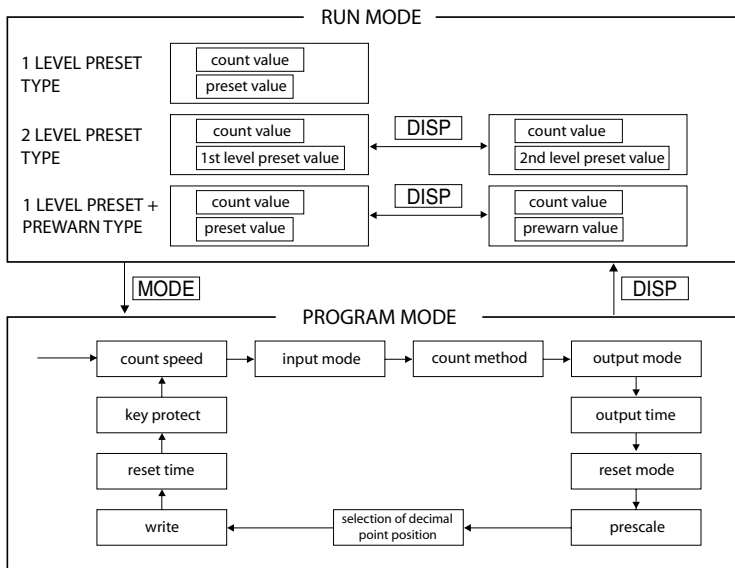
<p><b>ADD INPUT (<math>UP</math>)</b> (6 Digit) <math>0 \rightarrow 99999</math></p> <p>Input A: count input Input B: count prohibit Freewrite value: 0</p> <p>Count value 0 1 2 3 4 5</p> <p>※ The example shown is open collector input mode.</p>	<p><b>QUADRATURE INPUT (<math>QUAD</math>)</b> (6 Digit) <math>-9999 \leftrightarrow 0 \leftrightarrow 99999</math></p> <p>Count value 0 1 2 3</p> <p>※ The example shown is open collector input mode.</p>
<p><b>SUBTRACT INPUT (<math>DOWN</math>)</b> (6 Digit) Write in value <math>0 \rightarrow -99999</math></p> <p>Input A: count input Input B: count prohibit Freewrite value: 0</p> <p>Subtracts from freewrite value and outputs at preset value.</p> <p>Count value 10 9 8 7 6 5</p> <p>※ The example shown is open collector input mode.</p>	<p><b>DIRECTION INPUT (<math>DIR</math>)</b> (6 Digit) <math>-9999 \leftrightarrow 0 \leftrightarrow 99999</math></p> <p>Count value 0 1 2 3</p> <p>※ The example shown is open collector input mode.</p>
<p><b>ADD SUBTRACT INPUT (<math>ADD SUB</math>)</b> (6 Digit) <math>-99999 \leftrightarrow 0 \leftrightarrow 99999</math></p> <p>Count value 0 1 2 3</p> <p>※ The example shown is open collector input mode.</p>	

- **OUTPUT MODE**      One of the following 6 output modes can be selected. Default setting is  $Std$ .

Output Type	Display	Description	Applicable Models
Standard Output	$Std$	Output occurs when count value reaches preset value. Different output conditions can be set. (One-Shot (10~9990ms), Hold, Hold1, Hold2)	1 Level Preset 2 Level Preset Prewarn + 1 Level Preset
Equal Output	$EQUAL$	Output occurs only when and continues as long as count value is equal to preset value.	1 Level Preset 2 Level Preset Prewarn + 1 Level Preset
Lower Limit Output	$LL$	Output occurs when count value reaches below the set value.	1 Level Preset
Upper Limit Output	$UL$	Output occurs when count value reaches above the set value.	1 Level Preset
Upper - Lower Limit Output	$LL-UL$	Output occurs when count value reaches below (Lower) or above (Upper) the set value.	2 Level Preset
Upper 1 - Upper 2 Limit Output	$UL-HULL$	Output occurs when count value reaches above the set value.	2 Level Preset

## BASIC OPERATION

The G48 has 2 operation modes. Settings such as selection of input modes and count modes are done in the Program Mode. Counting and Preset Values setting are done in the Run Mode. Use the **[MODE]** key to enter the Program Mode and the **[DISP]** key to return to the Run Mode.



## PROGRAM MODE SETTINGS

### ● Output Mode

Output Type	Display	Description	Applicable Models
Hold	<i>Hold</i>	Output is Latched until a Reset signal is sent.	1 Level Preset, OUT2 of 2 Level Preset, OUT2 of Prewarn + 1 Level Preset
Hold 1	<i>Hold-1</i>	Output is Latched until Output 2 goes away.	OUT1 of 2 Level Preset, PW of Prewarn + 1 Level Preset
Hold 2	<i>Hold-2</i>	Output is Latched until a Reset signal is sent, independent from Output 2.	OUT1 of 2 Level Preset, PW of Prewarn + 1 Level Preset
One Shot	<i>10~9990ms</i>	Output time can be set from 10 ~ 9990ms (at 10ms steps).	All Models

### ● Reset Mode

The output below refers to the 1 Level Preset model, OUT2 of 2 Level Preset Model and to the OUT2 in the Prewarn + 1 Level Preset Model. Default setting is Mode A.

Mode A	<i>A</i>	Unit counts during output signal duration.	Overrun (Without Auto-Reset)
Mode B	<i>b</i>	Unit does not count during output signal duration.	
Mode C	<i>c</i>	Unit does not count during and after output signal duration.	
Mode D	<i>d</i>	Unit resets at rising edge of output signal.	Auto-Reset
Mode E	<i>E</i>	Unit resets at falling edge of output signal. (For One-Shot Output time only)	
Mode F	<i>F</i>	Unit resets at rising edge of output signal, unit display frozen during output signal duration. (For One-Shot Output time only)	
Mode G	<i>G</i>	Unit resets at falling edge of output signal, unit display frozen during output signal duration. (For One-Shot Output time only)	

### ● Prescale

Incoming pulses can be prescaled to display the desired measuring unit. The prescale can be set at any value within the range of 0.001 ~ 99.999. Default setting is 1.000.

Prescale Formula: 
$$PS = \frac{\text{Desired Display Value (per unit)}}{\text{Pulse Number (per unit)}}$$

<Examples>

- To display 1 count per 10 pulses : PS value = 0.1
- To display 1 count per 5 pulses : PS value = 0.2
- To display 2 counts per 1 pulse : PS value = 2

### ● Decimal Point Position

Decimal point position can be selected from the following settings: 0,0.0,0.00,0.000. Default setting is 0.

### ● Free Write

Any desired value can be set on the unit as the starting count value of the counter. The counter will add to or subtract from the set value. Upon reset, the set value will be displayed. Default setting is 0.

### ● Reset Time

Reset time sets minimum pulse time of remote reset signal. Reset time can be set to 2ms or 20ms. Default setting is 20ms.

### ● Key Protect

There are 4 protection levels. Default setting is Level 1.

Level 1	<i>L1</i>	Lock program	Protection level can be selected in the Program Mode.
Level 2	<i>L2</i>	Lock program & front key reset	
Level 3	<i>L3</i>	Lock program & preset	
Level 4	<i>L4</i>	Lock program, front key reset & preset	

**PROGRAM MODE OPERATION**

Press **MODE** to select program menu items. Press individual digit setting keys to change setting values.

Program Item	Program Item Display	Setting Values	Setting Key	Default Value
	IN Hz	30 → 1000 → 5000	Key 1 will select the desired value	30 (Hz)
	IN	n → P n is contact/open collector input mode. P is voltage input mode.	Key 1 will select the desired value	n (contact / open collector)
	IN	UP → d0 → AdSw → 9wAd → d1 r	Key 1 will select the desired value	UP (Add)
	OUT (1 level preset)	Std → E9wAL → LL → UL	Key 1 will select the desired value	Std
	(2 level preset)	Std → E9wAL → LL-UL → UL-HUL	Key 1 will select the desired value	
	(1 level preset + prewarn)	Std → E9wAL	Key 1 will select the desired value	Std
	OUT ms (1 level preset output)	0 → 1 → 2 ..... 8 → 9 1230 → Hold	Keys 2 ~ 4 will change digits Key 1 will select the desired value	Hold
	OUT1 ms (1st preset of 2 level preset model) (prewarn output)	0 → 1 → 2 ..... 8 → 9 1230 → Hold-1 → Hold-2	Keys 2 ~ 4 will change digits Key 1 will select the desired value	Hold-1
	OUT2 ms (2nd preset of 2 level preset model) (main output of 1P+1PW model)	0 → 1 → 2 ..... 8 → 9 1230 → Hold	Keys 2 ~ 4 will change digits Key 1 will select the desired value	Hold
	Reset Mode	LP Only mode A can be set if the output mode is different than Std Mode E, F, G, can only be set if OUT or OUT 2 is programmed to one shot output.	Key 1 will select the desired value	LP_A (Mode A)
	PS	0 → 1 → 2 ..... 8 → 9 Prescaler setting range : 0.001 ~ 99.999	Keys 1 ~ 5 will change the corresponding digits	1.000
DP	0 → 0.0 → 0.00 → 0.000	Key 1 will select decimal point position	0	
W	0 → 1 → 2 ..... 8 → 9	Press corresponding numeric keys	0	
RST ms	2 → 20	Key 1 will select the desired value	20 (ms)	
KEY/P	11 → 12 → 13 → 14	Key 1 will select the desired protection level	11 (Level 1)	



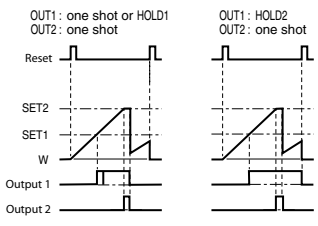


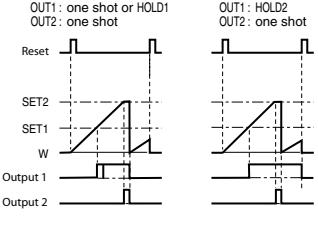


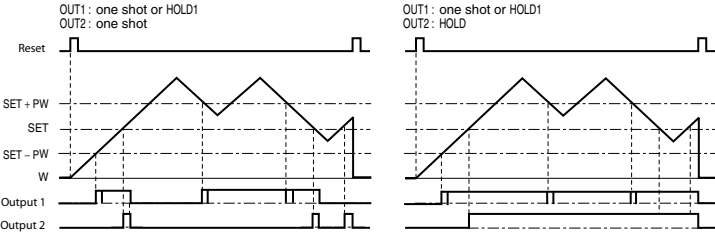

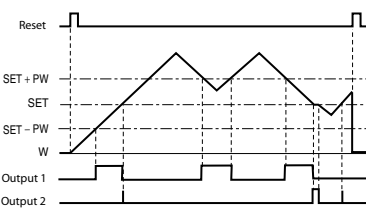


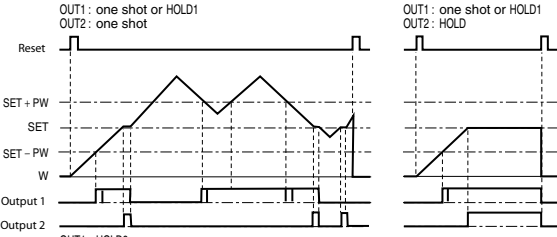


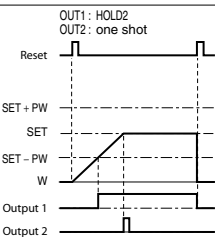
# WIRING AND REAR TERMINALS

MODELS	G48-305	G48-315	G48-325	G48-306
PRESET LEVELS	1 level	2 levels	1 level + prewarn	1 level
REAR TERMINALS				
POWER SOURCE	Supply AC100~240V to terminals 9 & 10.			Supply DC12~24V to terminals 9 & 10.
INPUT	<p>Depending on the status of input B (ON/OFF), pulses at input A will be added to or subtracted from pulse register. Counter will add pulses while terminals 2 and 4 are disconnected, and subtract pulses while shorted.</p> <p><b>Add/Sub Direction Input (1 input)</b></p> <p><b>Contact Input</b></p> <p><b>Open collector Input</b></p> <p><b>Voltage Input</b></p> <p><b>Add or Subtract Input (1 input)</b></p> <p><b>Contact Input</b></p> <p><b>Open collector Input</b></p> <p><b>Voltage Input</b></p> <p><b>Individual Add and Subtract Input (2 inputs)</b></p> <p><b>Contact Input</b></p> <p><b>Open collector Input</b></p> <p><b>Voltage Input</b></p> <p><b>90° Quadrature Input (2 inputs)</b></p> <p><b>Double Pulse Sensor</b></p> <p>※ For DC Powered model, use terminal <b>9</b> instead of terminal <b>3</b></p>			
OUTPUT				
RESET	<p>To reset remotely, short terminals 4 and 5 with a relay, microswitch, etc. (The unit does not count while shorted)</p>			
KEY PROTECT	<p>To disable keys at any of the 4 protection levels short terminals 4 and 12. (See Program Mode).</p>			
COUNT DISABLED	<p>In case of Add or Subtract input (1 input), Terminal 1 is a count input terminal and terminal 2 is a count disable terminal. To disable counting, short the indicated terminals in the wiring diagrams below. Pulses will be ignored while these terminals remain shorted.</p> <p><b>Contact/Open Collector input mode [2] and [4].</b></p> <p>※ For Voltage input mode, [2] and [3].</p> <p><b>For Contact/Open Collector, [2] and [4].</b></p> <p>※ For Voltage input mode, [2] and [9].</p>			

# OPERATION MODE AND OUTPUT MODE

One of the following Operation mode  $\frac{t}{P}$  and output mode OUT can be selected.

Type	Operation Mode	Output Mode	Operation Example	
2 level (or 1 level) preset	Mode A $\frac{t}{P}.A$  [ counts during output in overrun ]	Standard Output $Std$		[ In case of 1 level preset models operation is the same as OUT 2 operation. ]
		Equal Output $Equal$		[ In case of 1 level preset models operation is the same as OUT 2 operation. ]
		Upper and lower limit outputs $LL-UL$ (LL)		[ In case of 1 level preset models operation is the same as OUT 1 operation. ]
		Upper limit outputs 1 & 2 $UL-HUL$ (UL)		[ In case of 1 level preset models operation is the same as OUT 1 operation. ]
	Mode B $\frac{t}{P}.b$  [ does not count during output in overrun ]	Standard Output $Std$		[ In case of 1 level preset models operation is the same as OUT 2 operation. ]
	Mode C $\frac{t}{P}.c$  [ does not count during and after output in overrun ]	Standard Output $Std$		[ In case of 1 level preset models operation is the same as OUT 2 operation. ]
	Mode D $\frac{t}{P}.d$  [ auto-reset at rising edge of output ]	Standard Output $Std$		[ In case of 1 level preset models operation is the same as OUT 2 operation. ]
	Mode E $\frac{t}{P}.e$  [ auto-reset at falling edge of output ]	Standard Output $Std$		[ In case of 1 level preset models operation is the same as OUT 2 operation. ]

Type	Operation Mode	Output Mode	Operation Example	
2 level (or 1 level) preset	<b>Mode F</b>  auto-reset at rising edge of output, display "frozen" during output	Standard Output 		In case of 1 level preset models operation is the same as OUT 2 operation.
	<b>Mode G</b>  auto-reset at falling edge of output, display "frozen" during output	Standard Output 		
1 level preset + prewarn	<b>Mode A</b>  counts during output in overrun	Standard Output 		
		Equal Output 		
	<b>Mode B</b>  does not count during output in overrun	Standard Output 		
<b>Mode C</b>  does not count during and after output in overrun	Standard Output 			

Modes D, E, F, & G in 1 level preset + prewarn models are similar to those in 2 preset level ones: the main output in these models corresponds to SET 2 and the prewarn corresponds to SET 1.

Latched (HOLD) output returns to the initial status of power interruption when the power is recovered after power interruption.

## ■ SPECIFICATIONS

MODEL	G48-305	G48-315	G48-325	G48-306
DISPLAY	LCD display with backlight ; Digit Size : 10mm × 5mm			
NO. OF DIGITS	6			
NO. OF DIGIT SETTING KEYS	6			
PRESET LEVEL	1	2	1 level preset + prewarn	1
SETTING RANGE	-99999 999999			
PREWARN FEATURE	—		0 999999	—
INPUT MODE	Contact / Open Collector / Voltage (selectable)			
INPUT SIGNAL	Open Collector (Sink current 10mA, DC power model: power supply volt / 1.2KΩ) L : 0 ~ 4V Voltage (Input impedance 7KΩ) L : 0 ~ 4V H: 6 ~ 30V (Available to duplex wire DC sensor)			
COUNT SPEED	30Hz, 1kHz, 5kHz (selectable)			
COUNT MODE	Add, Subtract, Add/Subtract (Add/Subtract individual input, Add/Subtract direction, 90 quadrature input)			
COUNT RANGE	-99999 999999			
INPUT INHIBITION	Incoming pulses in either add or subtract mode can be inhibited at input B only.			
PRESCALE	0.001 99.999 (0 setting is not available)			
DECIMAL POINT POSITION	0.0, 0.00, 0.000, No decimal point			
WRITE	-99999 999999			
RESET	Front panel reset, Remote reset, Auto-reset			
REMOTE RESET TIME	2msec or 20msec (selectable)			
RESET MODE	Modes A, B, C, D, E, F, G can be selected. Except for standard output, Mode A only is available for other output modes.			
MEMORY	E <sup>2</sup> PROM (10 years, can be used 10000 times)			
OUTPUT	Relay output (1a) : load of AC250V 5A / DC30V 5A maximum			
OUTPUT DELAY	30Hz : 20msec, 1kHz & 5kHz : 7msec.			
TYPE OF OUTPUT	1 Level Preset: Standard, Equal, Lower Limit, Upper Limit 2 Level Preset: Standard, Equal, Upper-Lower Limit, Upper-Upper Limit 1 Level Preset + Prewarn: Standard, Equal			
OUTPUT TIME	Standard output : one shot (10 ~ 9990msec) or HOLD or HOLD 1 or HOLD 2 Equal, Upper, Lower output : Latched only when requirements are full			
KEY LOCK	Key operation can be disabled at 4 protection levels (L1, L2, L3, L4) by selecting in Program Mode and shorting key lock terminals.			
ERROR DISPLAY	In Add/subtract mode, error message will be displayed on the LCD if the count range is exceeded (overflow error : $\overline{O-Er}$ underflow error : $\underline{U-Er}$ )			
POWER SUPPLY	AC100 240V -15%, 10%		DC12 24V -15%, 10%	
SENSOR POWER SOURCE	DC12V 100mA		—	
POWER CONSUMPTION	Approx. 7VA for AC240V		Approx. 1.2W for DC24V	
OPERATING TEMPERATURE	-10 C 50 C (non-freezing, non-condensing)		45 85%RH (non-freezing, non-condensing)	
FRONT PANEL	IP54 (panel surface)			
WEIGHT	Approx. 170g		Approx. 110g	

## ■ DIMENSIONS

