No. 99MBC088B10

User's Manual

Linear Gage Counter EG-101P/EG-101Z/EG-101D

Safety Precautions

Use this product in conformance with the specifications, functions, and precautions for use described in this document. Failure to do so may impair your safety.

Foreword

To obtain the highest performance and the longest service life from this product, carefully read this document thoroughly prior to setup and operation. After reading, retain it close at hand for future reference. Be sure to follow the precautions below.

Export Control Compliance

This product is subject to the "Foreign Exchange and Foreign Trade Act" of Japan. Contact Mitutoyo for re-export and re-sale of the product, or re-provisioning of the technology.

Electromagnetic Compatibility (EMC)

This product complies with the EMC Directive. Note that, in environments where electromagnetic interference exceeds the EMC requirements defined in this directive, appropriate countermeasures are required to ensure product performance.

Disposal of Old Electrical & Electronic Equipment (Applicable in the European Union and Other European Countries with Separate Collection Systems)

This symbol on the product or on its packaging is based on WEEE Directive (Directive on Waste Electrical and Electronic Equipment), which is a regulation in EU member countries, and this symbol indicates that this product shall not be treated as household waste.

To reduce the environmental impact and minimize the volume of landfills, please cooperate in reuse and recycle.

For how to dispose of the product, please contact your dealer or the nearest Mitutoyo sales office.

China RoHS Compliance Information

产品中有害物质的名称及含量

部件名称	有害物质					
	铅	汞	镉	六价铬	多溴联苯	多溴二苯醚
	(Pb)	(Hg)	(Cd)	(Cr(VI))	(PBB)	(PBDE)
本体	×	○	○	○	○	○
配件	○	○	○	○	○	○

本表格依据 SJ/T 11364 的规定编制。

○：表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。

×：表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。

环保使用期限标识是根据《电器电子产品有害物质限制使用管理办法》以及《电子电气产品有害物质限制使用标识要求(SJ/T11364–2014)》制定的，适用于中国境内销售的电子电气产品的标识。
电器电子产品只要按照安全及使用说明内容在正常使用情况下，从生产日期算起，在此期限内产品中含有的有毒有害物质不致发生外泄或突变，不致对环境造成严重污染或对其人身、财产造成严重损害。
产品使用后，要废弃在环保使用年限内或者刚到年限的产品，请根据国家标准采取适当的方法进行处置。
另外，此期限不同于质量／功能的保证期限。

CONVENTIONS USED IN THIS DOCUMENT

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death.
NOTICE	Indicates a potentially hazardous situation which, if not avoided, may result in property damage.
⏚	Indicates that grounding needs to be implemented.

Precautions for Use

⚠ WARNING

Do not remove the cover or disassemble the product. Otherwise you may be subject to electric shock, and there is a risk of breakage or fire due to a short circuit caused by metallic powders that have gotten inside the product.

- This product is precision equipment. Be careful not to apply excessive shock or force to any of the parts.
- Use this product in an environment where the temperature is between 0 °C and 40 °C and where it will be subject to minimal temperature change without condensation.
- Avoid using this product in the following places:
  – Places exposed to chips, machining oil, dust, and vibration.
  – Places subject to direct sunlight.
  – Around devices that use high voltage or current.

Warranty

In the event that this product should prove defective as a result of workmanship, material or transportation, within 1 year from the date of original purchase, it will be repaired free of charge. Contact your dealer or the nearest Mitutoyo sales office/service center for repair.

1 Overview

1.1 Major Functions

This product is a Counter that displays the counter values from connected Mitutoyo Linear Gages. The following main functions are available.

- Preset, Tolerance Judgment
- Communication with a PC or external devices via the I/O connector

1.2 Supported Linear Gages

The following table shows the Linear Gages supported by this product and their features:

Model No.	Supported Linear Gages	Feature
EG-101P	LGF-L-B, LGK, LGB, LGB2, LG, etc.	• Differential square-wave output type • High resolution down to 0.1 µm • High-speed response of 1.5 m/s (LGF)
EG-101Z	LGF-ZL-B, etc.	• Scale reference-point signal output type (The origin can be restored even if the power is turned off)
EG-101D	LGD, LGS, etc. (ID and SD are also supported)	• Digimatic output type • ABS function (no need for master setting)

Tips

Counter values will not be displayed correctly on the Counter in the following cases.

- If the gage that is connected displays a counter value that is more than 6 digits (whole-number digits + fractional digits).
- If the resolution (minimum reading) is 0.1 mm or more and less than 1 mm.

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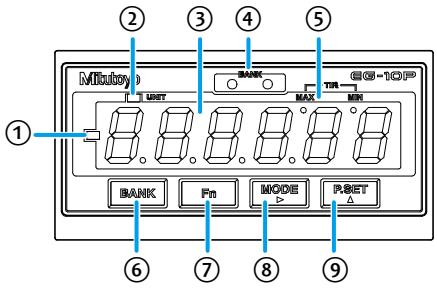
1.3 Part Names and Functions

■ Front side of the main body

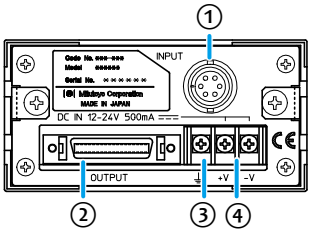
Common to all 3 models



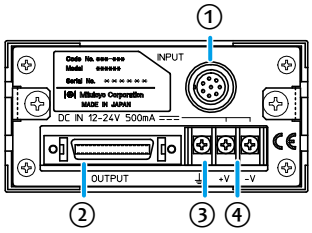
Symbol	Name	Description
①	Sign indicator	Indicates the sign of a counter value or a setting value. Lights when the displayed value fills all available digits and the value is also negative.
②	UNIT indicator	• Blinks while a HOLD signal is being input when the I/O connector is connected. • Lights when an E unit has been selected for the corresponding parameter.
③	Display	Displays the counter value from the connected Linear Gage.
④	BANK indicator	Indicates the currently selected Tolerance Bank. Also, indicates the tolerance judgment result by color. For details about the Tolerance Bank, see "4.3 Switching the Tolerance Bank" (page 5).
⑤	Peak mode indicator	Indicates the Peak-mode type.
⑥	[BANK] key	Switches the Tolerance Bank. For details about switching the Tolerance Bank, see "4.3 Switching the Tolerance Bank" (page 5).
⑦	[Fn] key	Switches to setup mode where you can set tolerance values or the Preset value. **Tips** • When setting parameters, this advances the parameter number. • When setting tolerance values or the Preset value, this cancels the setting.
⑧	[MODE] key	Sets Peak mode. **Tips** When setting the tolerance, Preset, or optional constant value, this moves the current input digit from left to right.
⑨	[P.SET] key	• Displays the Preset value. • Cancels an error. **Tips** • When setting a parameter, this advances the set value. • When setting the tolerance, Preset, or optional constant value, this increases the value of the selected digit.

■ Rear side of the main body

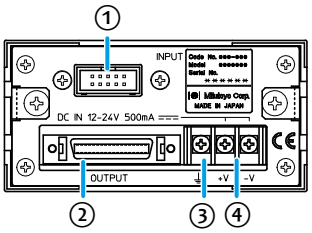
EG-101P



EG-101Z



EG-101D



Symbol	Name	Description
①	Linear Gage input connector	For connecting a Linear Gage.
②	OUTPUT connector (I/O connector)	For connecting an I/O connecting cable.
③	Grounding terminal	For connecting a grounding wire.
④	Power terminal block	For connecting the Terminal strip connecting cable or a DC power cable.

2 Setup

2.1 Unpacking

When unpacking for the first time, check that the following components are contained in the box.

Name	Q'ty
Linear Gage Counter (this product)	1
Washer (plain washer round, nominal diameter: 4)	6
User's Manual (this document)	1
Supplemental operation manual	1
Warranty	1

2.2 Mounting on a Panel

■ Dimensions for the mounting holes in the panel

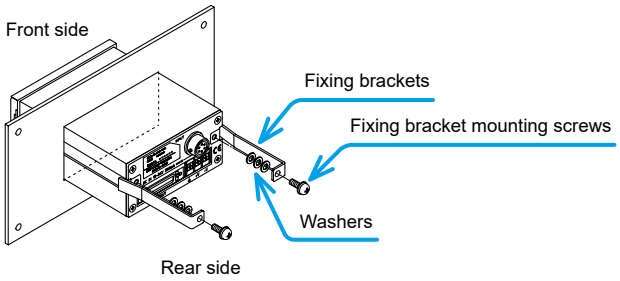
Width (mm)	Height (mm)	Panel thickness (mm)
92.0 to 92.8	45.0 to 45.8	1.0 to 3.2

■ Panel mounting procedure

1 Loosen the fixing bracket mounting screws (see the following figure), and then remove the fixing brackets.

2 Insert the Counter main body from the front side of the panel.

3 From the back of the panel, reattach the fixing brackets that you removed in step 1 to the Counter and secure them.



Tips

Refer to the following table and select the number of washers to use according to the thickness of the panel.

Panel thickness (mm)	1.0 to 1.3	1.4 to 1.7	1.8 to 2.5	2.5 to 3.2
Number of washers	0	1	2	3

2.3 Connections

■ Power source

Prepare a DC power source (voltage: 12 V to 24 V, output current: 1 A or more) for each Counter. An AC adapter is available as an option. To use the AC adapter, connect an AC cable and the Terminal strip connecting cable to the AC adapter.

NOTICE

Never use this power source with other electric equipment that runs at a high voltage and/or large current.

Tips

If you use a commercial power source, use a power cable with a length of 30 m or shorter. Avoid outdoor wiring.

■ Connecting cables for external equipment

You must supply an I/O connector connecting cable for connecting external equipment.

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Tips

For details about I/O connecting cables, see "5 External Input/Output Function" (page 6).

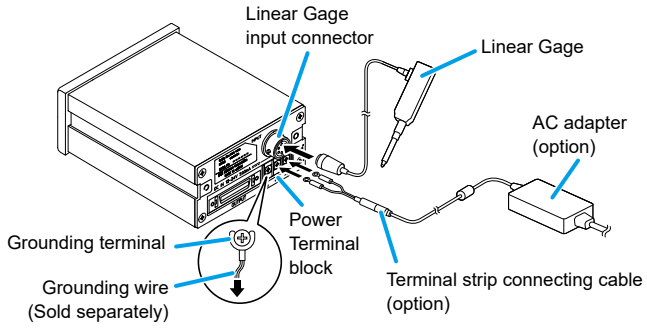
■ Connection procedure

NOTICE

- When making connections, connect the power cable last.
- Do not run the power cable and Linear Gage connecting cable through a cable duct together with other power lines.
- Secure the power cable and connecting cables for external equipment to your equipment with a cable tie, cable holder, etc.

Be sure to connect this product to ground. If this product is not grounded, it will be more susceptible to electrical noise.

Make connections as shown in the figure below.



2.4 Operation Check

Check the cable connections with the following procedure to confirm that the connections are correct.

1 Connect the power.

» The Counter enters the stand-by state.

2 Press [P.SET].

» The Counter changes to the Counter display.

Tips

EG-101Z will enter the origin-detection waiting state. To change to the Counter display, push in the contact point of the Linear Gage to make it pass over the origin.

3 Check that the counter value is shown on the Display.

4 Check that the counter value on the Counter changes by moving the contact point of the Linear Gage up and down.

3 Parameter setting

The settings of the Linear Gage that you will use, the display of the Counter, and external output are specified by setting parameters. Set parameters before you begin measuring.

3.1 Procedure for Setting Parameters

Parameters are set in Parameter mode. As an example, the procedure for using the Linear Gage with a resolution of 5 µm for EG-101P is explained.

1 Connect the power.

» The Counter enters the stand-by state.

2 Press and hold [Fn], and then press [P.SET].

» The Counter enters Parameter mode. (The set value of parameter number 00 will blink.)

3 Press [P.SET] once to set the value to 1 (parameter setting).

» Parameters can now be modified. (The set value remains blinking.)

Tips

If the setting value is 0, you can view the parameter values, but you cannot change them.

4 Repeatedly press [Fn] to advance the parameter number to 12.

» The current value of parameter number 12 will blink. (Parameter number 12 sets the resolution.)

5 Repeatedly press [P.SET] to set the set value to 1 (resolution: 5 µm).

» The value will be set to 1. (The Linear Gage resolution will be set to 5 µm.)

6 Press and hold [Fn], and then press [P.SET].

» The Counter will return to the stand-by state.

3.2 Basic Parameters

This section explains the basic parameters related to measuring. Be sure to set these settings before measuring.

Tips

Correct measurement results may not be obtained if the settings are incorrect.

[Parameter number] /Setting item	Description (the values in bold indicate the default value)
[00] Parameter mode	Used to view or modify parameters. **0: View parameters** 1: Set parameters 2: Set an optional constant value*1
[05] Origin detection function*2 (EG-101Z only)	Selects whether the origin is restored when a Linear Gage with an origin point mark is connected. For EG-101P, this is not available. **0: Disabled** 1: Enabled
[11] Counter direction	Sets whether the numeral will increase or decrease when the spindle of the Linear Gage is pushed in. **0: + direction** 1: - direction
[12] Linear Gage resolution*3	Sets the resolution or the type of the Linear Gage to be connected. EG-101P/EG-101Z: 0: 10 µm; 1: 5 µm; **2: 1 µm**; 3: 0.5 µm; 4: 0.1 µm; 5: 0.1 µm (exclusive for 542-711-1 and 542-712-1) EG-101D*4: 0: INC; **1: ABS**
[15] Unit system selection*3	The unit for displayed values can be set to "mm" or "E units". E=1/25.4 mm. After the unit is set, the default value will not be restored even if the parameters are re-initialized. **0: mm** 1: E 5/100,000 reading 2: E 1/10,000 reading 3: mm (when connecting an E gage, 1/10,000 reading. EG-101D only)

*1 The optional constant value setting is available only when the value of parameter number 16 is set to 3. For details, see "4.5 Optional Constant Value Setting" (page 6).

*2 To use the origin detection function with EG-101Z, set the value to 1. When using EG-101P, set the value to 0.

*3 The Preset value and tolerance value that had been set will be cleared if the setting is changed.

*4 An ABS type gage stores the origin even when the power is off. Set this according to the Linear Gage type. To match the display of the Counter and Linear Gages such as ID or SD, specify INC mode.

3.3 Advanced Parameters

This section explains the parameters related to the display, functions, and external output of the Counter. Configure the settings appropriate to your application.

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[Parameter number] /Setting item	Description (the values in bold indicate the default value)
[10] Parameter initialization*1	If you set the value of this parameter to 1, the set values for all parameters, except for the unit setting, can be reset to their default values (initialized). Once this setting has been enabled, this parameter is reset so its set value is 0 (do not initialize). **0: Do not initialize** 1: Initialize
[14] Display at startup	Selects stand-by state or Counter display (origin detection wait state for EG-101Z) to display at startup. EG-101P/EG-101D EG-101Z **0: [------] display** **0: [------] display** 1: 0.000 1: Origin detection wait state
[16] Calculation with a constant	Sets whether to multiply the counter value by a predetermined value, by an arbitrary value, or to not multiply it. The value obtained by multiplying the counter value by the set constant value will be displayed as the measurement result. For details about optional constant value setting, see "4.5 Optional Constant Value Setting" (page 6). **0: Do not calculate** 1: 2 times 2: 10 times 3: Arbitrary value
[17] Hide the lowest-order digit*2	Hides the lowest-order digit. However, the lowest-order digit will be included in printouts. **0: Display all digits** 1: Hide the lowest-order digit
[18] Smoothing (EG-101P/EG-101Z only)	Averages the counter value and then displays it. (This reduces fluctuation of the lowest-order digit.) You can specify the number of measurements to average. For EG-101D, this is not available. **0: None** 1: Display the average of 8 measurements 2: Display the average of 16 measurements
[20] Tolerance judgment/ BCD output switchover	Switches between tolerance judgment result output and BCD output. **0: Tolerance judgment result output** 1: BCD output
[21] Tolerance mode*1	Selects the tolerance mode. **0: 3-step tolerance** 1: 5-step tolerance
[22] BCD output mode	Sets the output timing of BCD. 0: Command mode (sync control) **1: Interval mode**
[23] BCD output speed	Selects the speed of BCD. **0: 5 ms** 1: 15 ms 2: 20 ms 3: 40 ms
[24] BCD output logic	Selects the output logic of BCD. **0: DATA [H] (sign H)** 1: DATA [L] (sign L) 2: DATA [H] (sign L) 3: DATA [L] (sign H)
[29] Digimatic input WAIT*3*4 (EG-101D only)	Sets the wait time for the Digimatic input signal. Change this when the Counter cannot read the input signals from a Digimatic device. 0: No wait **1: 100 ms WAIT** 2: 200 ms WAIT
[35] Key protect	Key operations can be disabled to prevent operation errors. **0: Key operation enabled** 1: Key operation disabled
[41] Origin detection direction (EG-101Z only)	When a Linear Gage with an origin mark is connected, selects the direction of the spindle of the Linear Gage for origin detection. For EG-101P, this is not available. **0: + direction** 1: - direction
[42] Origin re-detection*5 (EG-101Z only)	When a Linear Gage with an origin mark is connected, sets whether to wait for the origin to be detected without turning off the power in the case of an abnormal stop. For EG-101P, this is not available. **0: Disabled** 1: Enabled
[43] Origin initialization (when the power is turned on) (EG-101Z only)	When a Linear Gage with an origin mark is connected, initializes the origin when the power is on. After the initialization, the set value will be returned to 0 (do not initialize). For EG-101P, this is not available. **0: Do not initialize** 1: Initialize

*1 The Preset value and tolerance value that had been set will be cleared if the setting is changed.

*2 When this parameter is set to 1 "Hide the lowest-order digit", the "MIN" display of the Peak mode indicator also becomes hidden. Set up the Peak mode while selecting 0 "Display all digits" for this parameter. Even if it is set to "Hide the lowest-order digit" later, the mode setting for the Peak mode continues to be valid.

*3 The display speed can be changed.

*4 When using EG-101D, an error may occur when a special gage is connected. In that case, set the value to 1 or 2. When using EG-101P, set the value to 0.

*5 When the setting is enabled, the Counter will wait for the origin re-detection either after the Preset value or tolerance value is set, or when the HOLD signal is raised. If the HOLD signal is input again during origin re-detection, the origin re-detection function will be canceled (except during error detection).

4 Basic Operations

4.1 Preset

The current value of the Counter can be set to an arbitrary value at any point within the Linear Gage measuring range.

Tips

- Switch the current Peak mode setting to the normal measurement in advance. For details, see "4.2 Peak Mode Setting" (page 5).
- The factory default setting of the Preset value is 0.
- To set the current value of the Counter to 0 after you have modified the Preset value, set the Preset value to 0. The maximum value, minimum value, and TIR value that have been set in Peak mode will be set to 0 at this time.
- For the EG-101D (gage type is set to "ABS") and EG-101Z (origin detection function is enabled) Counters, the effective Preset count is one million times.

As an example, the procedure for presetting the datum to 10.005 mm is explained.

1 Repeatedly press [BANK] to select BANK 0.

» The BANK indicator turns off.

Tips While [BANK] is pressed down, the currently selected BANK number is displayed. When the key is released, the Counter will return to the Counter display.

2 Press [Fn] to switch to setup mode.

» The previous Preset value will be displayed. (The example on the right shows the previous value as 10.000.)

3 Press [MODE].

» The input digit will shift to the right. (The currently selected digit will blink.)

4 Press [P.SET].

» The Preset value will be modified.

Tips

- The ± sign is also set at the most significant digit. To set the Preset value to a negative value, repeatedly press [P.SET] until the Sign indicator lights.
- To cancel the input, press [Fn]. The Counter will return to the Counter display.

5 Repeat step **3** and step **4** until the least significant digit has been set.

» The least significant digit will blink.

6 Press [MODE].

» The Preset value will be applied (the least significant digit stops blinking).

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7 Press [Fn].

» The Counter will return to the Counter display.

8 Press [P.SET].

» The current value will be changed to the Preset value that was set.

4.2 Peak Mode Setting

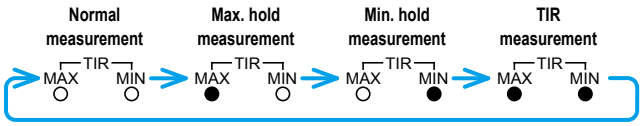
The maximum value, the minimum value, and TIR value are constantly calculated in the Counter. By switching the mode, you can display the counter value according to the intended application.

Mode	Description
Normal measurement	Counts the movement (displacement) of the contact point of the Linear Gage, and then displays the value successively.
Max. hold measurement	Displays the maximum value (MAX) measured during the measurement. The display will not change until a new maximum value is measured.
Min. hold measurement	Displays the minimum value (MIN) measured during the measurement. The display will not change until a new minimum value is measured.
TIR measurement	Displays TIR value during the measurement = TIR (maximum value - minimum value). The display will not change until either a new maximum value or minimum value is measured.

■ Procedure for switching Peak mode

1 Repeatedly press [MODE] until the desired mode is displayed.

» The mode will switch as follows:



■ Procedure for clearing the peak value

1 Press [MODE].

» Peak mode will be set.

2 Press [P.SET].

» The peak value will be cleared (MAX = MIN = current value, TIR = 0).

4.3 Switching the Tolerance Bank

When setting 3-step or 5-step tolerance values, 3 sets of tolerance value settings can be saved in internal counter memory called a BANK. You can recall the saved tolerance value settings by switching the BANK.

Tips

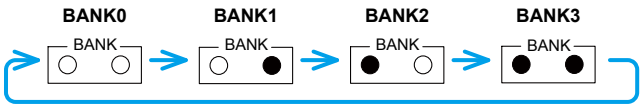
- For details about tolerance value settings, see "4.4 Tolerance Value Setting" (page 5).
- The BANK can also be switched by an external signal.

This section explains how to switch the BANK.

1 Press [BANK].

» The BANK number will be switched.

» The BANK indicator will switch according to the selected BANK number as shown in the figure below.



Tips

- The BANK indicator will switch in order from BANK0 through BANK3 each time you press [BANK].
- While [BANK] is pressed down, the currently selected BANK number is displayed. When the key is released, the Counter will return to the Counter display.
- The tolerance judgment function is disabled when BANK0 is selected.

4.4 Tolerance Value Setting

There are 2 settings for the tolerance value: 3-step and 5-step.

Tips

- Set the value of parameter number 21 to 0 (3-step tolerance) or 1 (5-step tolerance) in advance.
- For details about I/O output, see "5 External Input/Output Function" (page 6).

■ 3-step tolerance value setting (3-step tolerance zone selection)

With S1 and S4 set as the tolerance values, the 3-step tolerance judgment will be performed as follows:

Judgment conditions	BANK indicator	I/O output (PIN number)
Measurement result < S1	Amber indicator on	L1 (3)
S1 ≤ measurement result ≤ S4	Green indicator on	L3 (5)
S4 < measurement result	Red indicator on	L5 (7)

This section explains how to set the 3-step tolerance value.

1 Press [BANK] to select the BANK number that you want to set.

» The BANK indicator corresponding to the selected BANK number will light.

Tips

Select a BANK number from BANK1 through 3. Tolerance values cannot be set if BANK0 is selected.

2 Press [Fn] to switch to setup mode.

» The BANK indicator will light in amber. (Tolerance value S1 will be selected.)

3 Press [MODE].

» The input digit will shift to the right. (The currently selected digit will blink.)

4 Press [P.SET].

» The tolerance value will be modified.

Tips

The ± sign is also set at the most significant digit. To set the tolerance value to a negative value, repeatedly press [P.SET] until the Sign indicator lights.

5 Repeat step **3** and step **4** until the least significant digit has been set.

» The least significant digit will blink.

6 Press [MODE].

» Tolerance value S1 will be applied. (The least significant digit stops blinking.)

7 Press [Fn].

» The BANK indicator will light in red. (Tolerance value S4 will be selected.)

8 Set the tolerance value S4 in the same steps as in **3** to **5**.

9 Press [MODE].

» Tolerance value S4 will be applied. (The least significant digit stops blinking.)

10 Press [Fn].

» The Counter will return to the Counter display.

Tips

An error will occur unless S1 ≤ S4. Press [P.SET] to redo the input from S1.

■ 5-step tolerance value setting (5-step tolerance zone selection)

With S1 to S4 set as the tolerance values, the 5-step tolerance judgment will be performed as follows:

Judgment conditions	BANK indicator	I/O output (PIN number)
Measurement result < S1	Amber indicator on	L1 (3)
S1 ≤ measurement result < S2	Amber indicator blinks	L2 (4)
S2 ≤ measurement result ≤ S3	Green indicator on	L3 (5)
S3 < measurement result ≤ S4	Red indicator blinks	L4 (6)
S4 < measurement result	Red indicator on	L5 (7)

This section explains how to set the 5-step tolerance value.

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1 Press [BANK] to select the BANK number that you want to set.

» The BANK indicator corresponding to the selected BANK number will light.

Tips

Select a BANK number from BANK1 through 3. Tolerance values cannot be set if BANK0 is selected.

2 Press [Fn].

» The BANK indicator will light in amber. (Tolerance value S1 will be selected.)

Tips

Tolerance values are set in the order S1, S2, S3, S4. The Tolerance judgment indicator displays as shown in the following table. (The tolerance value to be set will be selected.)

Tolerance value	BANK indicator
S1	Amber indicator on
S2	Amber indicator blinks
S3	Red indicator blinks
S4	Red indicator on

3 Set the tolerance values using the same procedure as for setting the 3-step tolerance values.

» The values will be applied in the order S1, S2, S3, S4, and then the Counter will return to the Counter display.

Tips

- For details about setting the 3-step tolerance values, see "3-step tolerance value setting (3-step tolerance zone selection)" (page 5).
- An error will occur unless S1 < S2 < S3 < S4 or S1 = S2 = S3 = S4.

4.5 Optional Constant Value Setting

You can set an arbitrary multiplication factor for the counter value. If this function is used, the accuracy cannot be guaranteed.

Tips

- Set the value of parameter number 16 to 3 (arbitrary value) in advance.
- When an arbitrary constant is set, the decimal point will blink.

This section explains how to set an arbitrary multiplication factor.

1 Press and hold [Fn], and then press [P.SET].

» The Counter enters Parameter mode. (The set value of parameter number 00 will blink.)

2 Press [P.SET] twice to set the value to 2.

» The display appears as to the right.

3 Press [Fn].

» The previous multiplication factor will be displayed. (The example on the right shows the previous value as 1.0000.)

4 Press [MODE].

» The input digit will shift to the right. (The currently selected digit will blink.)

5 Press [P.SET].

» The multiplication factor will be modified.

6 Repeat step **4** and step **5** until the least significant digit has been set.

» The least significant digit will blink.

Tips

The setting range is ±9.9999.

7 Press [MODE].

» The multiplication factor will be applied. (The least significant digit stops blinking.)

8 Press and hold [Fn], and then press [P.SET].

» The Counter will return to the Counter display.

5 External Input/Output Function

This product has an I/O connector that enables data communication with external equipment. There are 2 types of external output modes: "Tolerance judgment output mode", which outputs the tolerance judgment result, and "BCD output mode", which outputs the counter data with BCD. Also, you can activate the Preset function and activate HOLD on the counter value through external signal input.

5.1 Connections

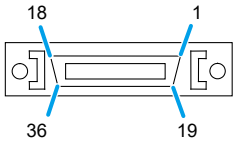
■ Compatible plug and connecting cable

Compatible plug:

- Option No. 02ADB440 (plug and cover set)
- Commercial plug 10136-3000PE (3M), cover 10336-52A0-008 (3M)
- Commercial plug DX40M-36P (HIROSE), cover DX30M-36-CV (HIROSE)

Cable: Use shielded wires and limit the connecting cable length to 3 m or less.

■ Pin assignment



Tips

- External input is valid when input voltage is "L". (External input is negative logic.)
- "I/O" in the following table refers to the first letters of "Input/Output" respectively. Refer to the input circuit for "I", and the output circuit for "O".
- In BCD output mode, it is possible to invert the output logic of pin numbers 3 through 26 and pin number 31 by setting parameter number 24 (BCD output logic).

● Tolerance judgment output mode

Pin number	I/O	Name	Functions
1, 2	-	COM	Internally connected to GND
3	O	L1	Tolerance judgment result output • Relevant output terminal: "L" • Output on error: both L1 and L5 are "L"
4	O	L2	
5	O	L3	
6	O	L4	
7	O	L5	
10	O	NOM	Normal output Normal: "L"
27	I	SET1	Setting BANK, Peak mode: Input the set value with SET in advance, then assign with MODE, BANK.
28	I	SET2	
29	I	MODE	Switching Peak: Input in combination with SET.
34	I	HOLD	HOLD input
35	I	P.SET	Normal measurement: Preset Peak mode measurement: Peak clear
36	I	BANK	Switching BANK: Input in combination with SET.
-	-	NC	No connection should be made other than those shown above.

● BCD output mode

Pin number	I/O	Name	Pin number	I/O	Name	Pin number	I/O	Name
1	-	COM	13	O	4×10^{2}	25	O	4×10^{5}
2	-	COM	14	O	8×10^{2}	26	O	8×10^{5}
3	O	1×10^{0}	15	O	1×10^{3}	27	I	SET1
4	O	2×10^{0}	16	O	2×10^{3}	28	I	SET2
5	O	4×10^{0}	17	O	4×10^{3}	29	I	MODE
6	O	8×10^{0}	18	O	8×10^{3}	30	-	NC
7	O	1×10^{1}	19	O	1×10^{4}	31	O	SGN
8	O	2×10^{1}	20	O	2×10^{4}	32	O	NOM*1
9	O	4×10^{1}	21	O	4×10^{4}	33	O	READY*2
10	O	8×10^{1}	22	O	8×10^{4}	34	I	HOLD*1
11	O	1×10^{2}	23	O	1×10^{5}	35	I	PSET*1
12	O	2×10^{2}	24	O	2×10^{5}	36	I	INH*3

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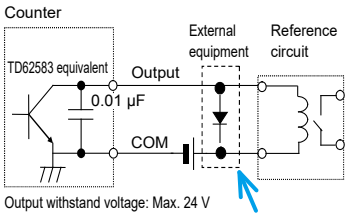
*1 The same function as in tolerance judgment output mode.

*2 "L" when output data is fixed.

*3 During input, the output of pin numbers 3 through 26 and pin number 31 is "H".

■ Output circuit

Transistor is on when the output is "L" (open collector).



Output withstand voltage: Max. 24 V
Output current: Max. 10 mA
Output saturation voltage: Max. 0.7 V

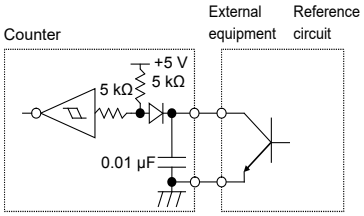
Surge-current-absorbing diode
60 V 100 mA or more

NOTICE

- When using relays, incorporate a surge-current-absorbing diode or a protective circuit. If no protection is incorporated, the IC in the Counter may be damaged.
- The output current when the tolerance judgment result is output is 20 mA at maximum.

■ Input circuit

Input is valid when the input voltage is "L".

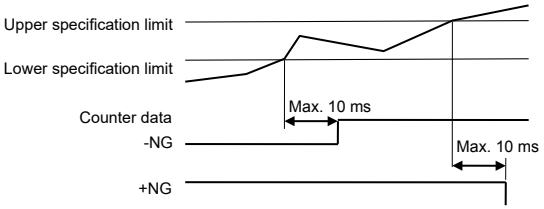


Input current: Max. 1 mA
Input voltage: H = 4 to 24 V
L = Max. 1 V

Use open-collector output or relay output, etc.

5.2 Timing Chart

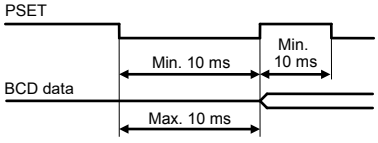
● Tolerance judgment result output



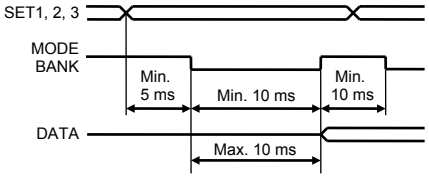
Tips

- After acquiring the counter data, there is a maximum 10 ms delay before the tolerance judgment result is output.
- For EG-101D, the length of time until the tolerance judgment result is output after the counter data enters in the Specification range depends on the connected equipment, such as the Linear Gage.

● Preset, Peak clear



● Peak mode/BANK specification



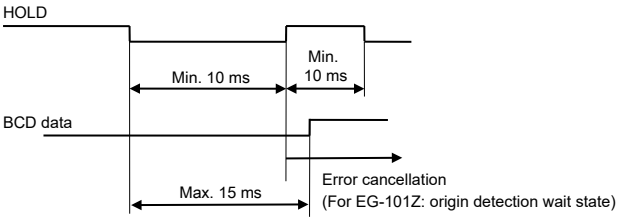
BANK (pin number 36):
BANK switchover

	SET2	SET1
BANK0	H	H
BANK1	H	L
BANK2	L	H
BANK3	L	L

MODE (pin number 29):
Peak switchover

	SET2	SET1
NOMAL	H	H
MAX	H	L
MIN	L	H
TIR	L	L

● HOLD

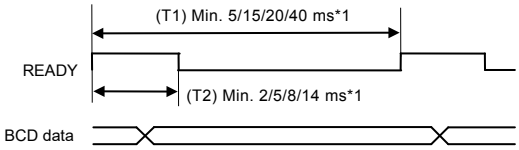


Tips

During HOLD input, the UNIT indicator will blink.

● Interval mode

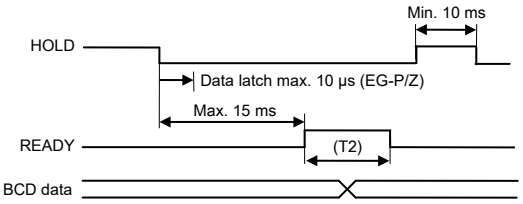
Continuously outputs data using the Counter's internal timing.



*1 Depends on the setting of Parameter number 23

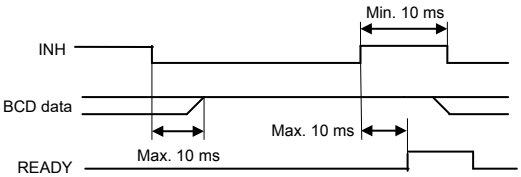
● Command mode

Outputs data using sync control via HOLD and READY.



● INH input

BCD data output is switched off during INH input.



6 Troubleshooting

6.1 Troubleshooting

When the Counter does not operate as expected, refer to the cause of the trouble and the solutions shown below:

Cause	Solution
Symptom 1: The counter value is incorrect (not counting).	
Parameters are not correctly set for the type of the Linear Gage, etc.	Set correct parameters. For details, see "3.2 Basic Parameters" (page 3).
Peak mode (MAX or MIN is lit) is active.	Cancel Peak mode. For details, see "4.2 Peak Mode Setting" (page 5).
The HOLD signal (UNIT is blinking) is being input.	Check the external input.
Calculation with a constant function is set.	Cancel calculation with a constant function. (Set parameter number 16 to 0.)
Symptom 2: Cannot execute Zero setting.	
Peak mode is active.	Cancel Peak mode. For details, see "4.2 Peak Mode Setting" (page 5).
The Preset value is a value other than 0.	Set the Preset value to 0. For details, see "4.1 Preset" (page 4).

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Cause	Solution
Symptom 3: The Counter executes Zero setting unexpectedly.	
A power interruption (sudden drop in power voltage) has occurred.	Check the power supply. For details about how to cancel the error, see [------] in the List of Error Codes. "6.2 List of Error Codes" (page 8)
Symptom 4: BCD output is not working.	
BCD output is not enabled.	Enable BCD output. (Set the value of parameter number 20 to 1.)
Output logic is not correct.	Select the output logic that is appropriate for your application by setting parameter number 24.
Command mode is active.	Enable interval mode. (Set the value of parameter number 22 to 1.)
Symptom 5: Cannot modify the parameter settings.	
"Set parameters" (set value 1) has not been set for Parameter mode.	Set the value for parameter number 00 to 1. For details, see "3.1 Procedure for Setting Parameters" (page 3).

6.2 List of Error Codes

Display	NOM signal	BCD output	Cause	Solution/ Error cancellation method
Err 10	H	FFFF10	Abnormal power voltage	Connect to the specified power.
				Automatic cancellation
[------]	H	FFFF15	In stand-by state after power-on or a power interruption	Re-check the power if a power interruption has occurred.
				• Press [P.SET]. • Input an external HOLD signal.
Err 20	H	FFFF20	Excess speed	Revise the measurement conditions.
				• Press [P.SET]. • Input an external HOLD signal.
Err 30	H	FFFF30	Counter value is 8 digits or more	Modify the Preset value.
				• Press [P.SET]. • Input an external HOLD signal.
Err 40	H	FFFF40	Linear Gage malfunction or excess speed	• Check the Linear Gage connection. • Revise the measurement conditions.
				• Press [P.SET]. • Input an external HOLD signal.
F*****	L	F*****	Counter value is 6 digits or more	Return the counter value to within 6 digits.
All decimal points blinking	L	Counter value status	The origin is not detected yet (EG-101Z only)	Pass the spindle of the Linear Gage through the origin.
				Automatic cancellation
Err 90	L	Counter value status	Tolerance value setting error	Input the tolerance value again.
				Press [P.SET].
Err 95	L	Counter value status	Key protect	Cancel the key protection parameter. (Set parameter number 35 to 0.)
				Automatic cancellation

Tips

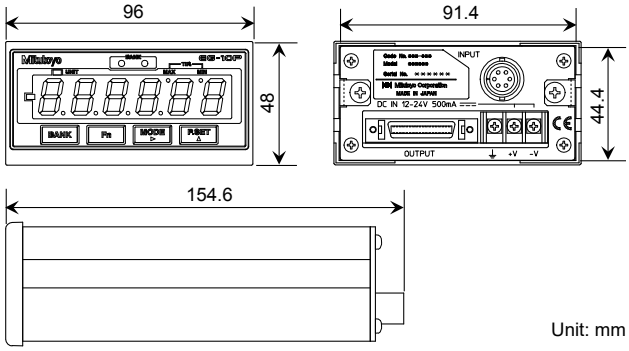
- If the NOM signal is "H": When an error occurs in 3-step or 5-step tolerance judgment output (the value for parameter number 20 is 0), both pin numbers 3 (L1) and 7 (L5) will be "L".
- If an error occurs while you are setting parameters, the Preset value, or the tolerance value, the error will be displayed after you return to the counter state. However, the error signal will be output immediately to any external output.
- Errors can also be canceled with an external PSET signal.
- For EG-101D, all decimal points blink for about 8 seconds when an error is canceled.

7 Specifications

■ Basic specifications

Code No.	542-015	542-017	542-016
Model No.	EG-101P	EG-101Z	EG-101D
Number of display axis	1 axis		
Display	Minus (–) sign and 6 numeric digits (green LED)		
Minimum reading (Count display range)	Selected by parameter		Set automatically according to the gage
	0.01 (±9999.99) mm 0.005 (±999.995) mm 0.001 (±999.999) mm 0.0005 (±99.9995) mm 0.0001 (±99.9999) mm		
Maximum input frequency	1.25 MHz (2-phase square wave)		
Maximum count speed	5 MHz		
Power source voltage	DC +12 V to 24 V		
Power consumption	Max. 6 W (Max. 500 mA)		
Operating temperature (humidity) range	0 °C to 40 °C (20 % RH to 80 % RH, without condensation)		
Storage temperature (humidity) range	-10 °C to 50 °C (20 % RH to 80 % RH, without condensation)		
External dimensions	96 (W) × 48 (H) × 155 (D) mm		
Mass	Approx. 400 g		
CE marking	EMC directive: EN 61326-1 Immunity test requirement: Clause 6.2 Table 2 Emission limit: Class B RoHS directive: EN IEC 63000		
Interface	**I/O**		

■ External dimensions drawing (for all models)



Unit: mm

■ Options

Part No.	Name
02ADB440	I/O output connector (with cover)
02ADD930	Terminal strip connecting cable*1
357651	AC adapter
02ZAA000	AC cable*1

*1 Required if using the AC adapter.

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