Mitutoyo

Linear Gage Counter EB Series

EB-11P
EB-11Z
EB-11D

User's Manual

- Instructions for use -

Read this document thoroughly before operating the instrument.
After reading, retain it close at hand for future reference.

No. 99MBC058B10
Date of publication: December 1, 2020（1）

■ Product names and model numbers

● EB-11P

● EB-11Z

● EB-11D

■ Notice regarding this document

- Mitutoyo Corporation assumes no responsibilities for any damage to the instrument, caused by its use not conforming to the procedure described in this document.
- Upon loan or transfer of this instrument, be sure to attach this document to the product.
- In the event of loss or damage to this document, immediately contact a Mitutoyo sales office or your dealer.
- Before operation of the product, thoroughly read this document to comprehend its contents.
- Particularly, for full understanding of information, carefully read "Safety Precautions" and "Precautions for Use" at the outset of this manual before using the product.
- The contents in this document are based on the information current as of December, 2020.
- No part or whole of this document may be transmitted or reproduced by any means without prior written permission of Mitutoyo Corporation.
- Some screen displays in this document may be highlighted, simplified or partially omitted for convenience of explanation. In addition, some of them may differ from actual ones to the extent that no user will misunderstand the functions and operations.
- The corporation, organization and product names that appear in this manual are their trademarks or registered trademarks.

No. 99MBC058B

CONVENTIONS USED IN THIS DOCUMENT

Conventions used in this document are roughly divided into 3 types (safety reminders, prohibited actions and mandatory actions). Moreover, these safety symbols include general warnings and specific warnings. Specific warning symbols are provided with concrete pictograms inside of them.

■ Safety reminder conventions and wording warning against potential hazards

General	 DANGER	Indicates an immediately hazardous situation which, if not avoided, will result in serious injury or death.
	 WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death.
	 CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor injury.
	NOTICE	Indicates a potentially hazardous situation which, if not avoided, may result in property damage.
Specific		Alerts the user to a specific hazardous situation that means "Caution, risk of electric shock".

■ Conventions and wording indicating prohibited actions and mandatory actions

General	 Mandatory	Indicates concrete information about mandatory actions.
Specific		Indicates that grounding needs to be implemented.

■ Conventions and wording indicating referential information or referential locations

Tips Indicates referential information such as that for when the operating methods and procedures which are printed in these sentences are to be applied to specific conditions.

Indicates referential locations if there is information that should be referred to in this document or an extraneous manual.

Example: For details about xxx, see "1.3 Part Names and Functions" (page 2).

Safety Precautions

Read these Safety Precautions thoroughly before operating the system to use it properly.

These safety precautions include such information as to prevent an injury to the operator and other persons or damage to property. Be sure to observe the precautions.

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.

Precautions for Use

■ Product applications and handling

● This product is a Counter.

Do not use this product for any purposes other than as a Counter.

● This is an industrial product.

Do not use this product for any purposes other than industrial applications.

● This product is precision equipment.

Handle this product with care. Be careful not to apply excessive shock or force to any of the parts during operation.

■ Installation environment

This product is designed for indoor use. To ensure optimal performance for this precision equipment, take the following conditions into account when installing this product.

- Vibration
  Install this product in an environment where it will be subject to minimal vibration. Using this product in a place with significant vibration for an extended period of time may result in malfunction of the precision components. If using this product in a place with significant vibration is unavoidable, lay a vibration-proof rubber sheet, etc., under this product in order to reduce the vibration.
- Dust
  Dust in the installation site negatively affects the electrical components in the Display. Install this product in an environment where it will be subject to minimal dust.
- Sunlight
  If this product is exposed to direct sunlight, the heat will cause deformations in the main body, negatively affecting its operation. If installing this product in an environment that is exposed to direct sunlight, such as near a window, is unavoidable, protect it from the sunlight by curtaining it off, etc.
- Ambient temperature, humidity
  Use this product in a place where the ambient temperature is within the range of 0°C to 40°C. Avoid using it in a place that is subject to sudden changes in temperature or humidity.

When using this product in the following environments, take necessary shielding measures.

- In locations subject to electric noise, such as from static electricity
- In locations subject to strong electric fields
- In locations near power supply lines/power lines
- In locations where it may directly exposed to chips, cutting fluids, water, etc.
- In locations that may be exposed to radiation
- In locations that may be exposed to corrosive gas

■ Maintenance

Gently wipe dirt off of the product with a soft, tightly woven cloth. If dirt is difficult to remove, wipe the dirt off with a cloth soaked in a neutral detergent, and then gently wipe the product with a dry cloth or a cloth that is tightly wrung after being soaked in water. Do not use organic solvents such as thinner or benzine.

■ Power source

- Turn off the power after use.
- Use only a power source for this product that is rated at 12 V to 24 V and an output current of 1 A or more. Never use this power source with other electric equipment that runs at a high voltage and/or large current.
- Do not connect the AC adapter to a high-current power used by machine tools or large CNC measuring instrument.

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.

Export Control Compliance

This product falls into the Catch-All-Controlled Goods and/or Catch-All-Controlled Technologies (including Programs) under Category 16 of Appended Table 1 of the Export Trade Control Order or under Category 16 of the Appended Table of Foreign Exchange Control Order, based on the Foreign Exchange and Foreign Trade Act of Japan.

If you intend re-export of the product from a country other than Japan, re-sale of the product in a country other than Japan, or re-provision of the technology (including program), you are obligated to observe the regulations of your country.

Also, if an option is added or modified to add a function to this product, this product may fall under the category of List-Control Goods and/or List-Control Technology (including Programs) under Category 1 - 15 of Appended Table 1 of the Export Trade Control Order or under Category 1 - 15 of the Appended Table of Foreign Exchange Control Order, based on Foreign Exchange and Foreign Trade Act of Japan. In that case, if you intend re-export of the product from a country other than Japan, re-sale of the product in a country other than Japan, or re-provision of the technology (including program), you are obligated to observe the regulations of your country. Please contact Mitutoyo in advance.

Notes on Export to EU Member Countries

When you intend export of this product to any of the EU member countries, you may be required to provide Instruction Manual in English and EU Declaration of Conformity in English (under certain circumstances, Instruction Manual in the destination country's official language and EU Declaration of Conformity in the destination country's official language). For detailed information, please contact Mitutoyo in advance.

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

To reduce environmental impact and minimize the volume of landfill, please cooperate in reuse and recycling.

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

Warranty

In the event that this product should prove defective in workmanship or material, within one year from the date of original purchase for use, it will be repaired or replaced free of charge. Please contact your dealer or the nearest Mitutoyo sales office.

If this product fails or is damaged for any of the following reasons, it will be subject to a repair charge even if it is still under warranty.

- Failure or damage owing to fair wear and tear.
- Failure or damage owing to inappropriate handling, maintenance, or repair, or to unauthorized modification.
- Failure or damage owing to transport, dropping, or relocation of the product after purchase.
- Failure or damage owing to fire, salt, gas, abnormal voltage, lightning surge, or natural disaster.
- Failure or damage owing to use in combination with hardware or software other than that designated or permitted by Mitutoyo.
- Failure or damage owing to use in ultra-hazardous activities.

This warranty is effective only where the instrument is properly installed and operated in conformance with the instructions in this document within the original country of the installation.

EXCEPT AS SPECIFIED IN THIS WARRANTY, ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS, AND WARRANTIES OF ANY NATURE WHATSOEVER INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NONINFRINGEMENT OR WARRANTY ARISING FROM A COURSE OF DEALING, USAGE, OR TRADE PRACTICE, ARE HEREBY EXCLUDED TO THE MAXIMUM EXTENT ALLOWED BY APPLICABLE LAW.

You assume all responsibility for all results arising out of the selection of this product to achieve your intended results.

Disclaimer

IN NO EVENT WILL MITUTOYO, ITS AFFILIATED AND RELATED COMPANIES AND SUPPLIERS BE LIABLE FOR ANY LOST REVENUE, PROFIT, OR DATA, OR FOR SPECIAL, DIRECT, INDIRECT, CONSEQUENTIAL, INCIDENTAL, OR PUNITIVE DAMAGES HOWEVER CAUSED AND REGARDLESS OF THE THEORY OF LIABILITY ARISING OUT OF THE USE OF OR INABILITY TO USE THIS PRODUCT EVEN IF MITUTOYO OR ITS AFFILIATED AND RELATED COMPANIES AND/OR SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

If, notwithstanding the foregoing, Mitutoyo is found to be liable to you for any damage or loss which arises out of or is in any way connected with use of this product by you, in no event shall Mitutoyo's and/or its affiliated and related companies' and suppliers' liability to you, whether in contract, tort (including negligence), or otherwise, exceed the price paid by you for the product only.

BECAUSE SOME COUNTRIES, STATES OR JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR THE LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, IN SUCH COUNTRIES, STATES OR JURISDICTIONS, MITUTOYO'S LIABILITY SHALL BE LIMITED TO THE EXTENT PERMITTED BY LAW.

About This Document

■ Positioning of this document in document map

In addition to this document, a User's Manual for each Linear Gage and other products that may be connected to and used with this product is available.

● Manuals for Counters

- EB Counter User's Manual (this document)
- External Switch Box User's Manual
- DP-1VR Digimatic Mini-Processor User's Manual
- USB Input Tool User's Manual

● Manuals for Linear Gages

- LGK User's Manual
- LGF (Standard) User's Manual
- LGF (Origin mark) User's Manual
- LGB User's Manual
- LGB2 User's Manual
- LG-1100 User's Manual
- LGM User's Manual
- LGS User's Manual
- LGD User's Manual

■ Intended readers and purpose of this document

● Intended readers

This manual is intended for beginners of the EB-series counters.

They are also assumed to be able to understand instructions by reading technical drawings.

● Purpose

To use this product safely and correctly, read this document thoroughly. After reading, keep it in a safe place close to the product.

The purpose of this document is to help you understand how to use EB-series counters.

■ How to read this document

● When you do not know the appropriate operation while using this product

Look for the page with the desired operation in the table of contents.

● To measure

The setup of this product and the settings of parameters are required in advance.

See the following pages for basic measurements, such as height measurement.

"1 Overview" (page 1) to "3.2 Basic Parameters" (page 10)

In addition to the pages above, see the following pages for how to connect to external equipment.

"3.3 Advanced Parameters" (page 11)

● Terms and definitions

BANK: Memory in the Counter for saving tolerance value settings. For 3-step and 5-step tolerance value settings, up to 7 tolerance value settings can be saved; for independent tolerance settings, up to 2 tolerance value settings can be saved in BANKs.

Contents

1 Overview

This section describes the features and part names of this product.

1.1 Major Functions

This product is a Counter that displays the counter values from connected Mitutoyo Linear Gages.

In addition, the following functions are available.

- Preset, Tolerance Judgment, Multi-sorting by independent tolerance
- Communication with a PC or external devices via the I/O connector
- Simple printing by connecting to a Mitutoyo Digimatic Mini-Processor
- Simple input of tolerance values or the Preset value by connecting to a Mitutoyo external switch box

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
EB-11P	LGF-L-B, LGK, LGB, LGB2, LG, LGM, etc.	• Differential square-wave output type • High resolution down to 0.1 µm • High-speed response of 1.5 m/s (LGF)
EB-11Z	LGF-ZL-B, etc.	• Scale reference-point signal output type (The origin can be restored even if the power is turned off)
EB-11D	LGD, LGS-1012P, etc. (ID and SD are also supported)	• Digimatic output type • ABS function (no need for master setting)

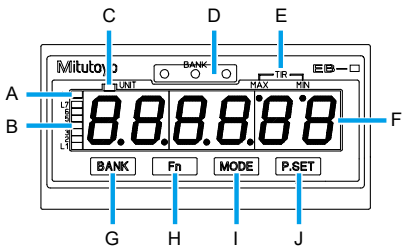
Tips

- If LG-01100 or LGM-01100 is connected to this Counter, the maximum display range will be ±99.9999.
- EB-11D will not display correct counter values 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.

1.3 Part Names and Functions

1.3.1 Front Side of the Main Body

All models

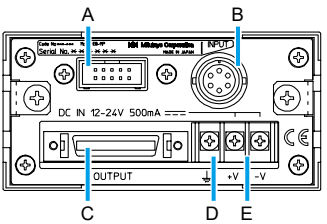


Symbol	Name	Description
A	Sign indicator	Indicates the sign of a counter value or a setting value. Lights when the displayed value fills all available digits and the value is also negative.
B	LIMIT indicator	Indicates the tolerance range within which the measurement falls with 7 indicators, L1 to L7.
C	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.
D	Tolerance BANK indicator	Indicates the currently selected Tolerance Bank. For details about the Tolerance Bank, see "4.3 Switching the Tolerance Bank" (page 18).
E	Peak mode indicator	Indicates the Peak-mode type.
F	Display	Displays the counter value from the connected Linear Gage.
G	[BANK] key	Switches the Tolerance Bank. For details about switching the Tolerance Bank, see "4.3 Switching the Tolerance Bank" (page 18).

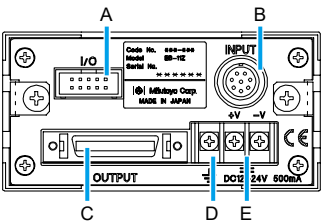
Symbol	Name	Description
H	[Fn] key	Switches to setup mode where you can set tolerance values or the Preset value. **Tips** • When setting parameters, this advances the parameter number. • When setting tolerance values or the Preset value, this cancels the setting.
I	[MODE] key	Sets Peak mode. **Tips** When setting tolerance values or the Preset value, this moves the current input digit from left to right.
J	[P.SET] key	• Displays the Preset value. • Cancels an error. **Tips** • When setting a parameter, this advances the set value. • When setting tolerance values or the Preset value, this increases the value of the selected digit.

1.3.2 Rear Side of the Main Body

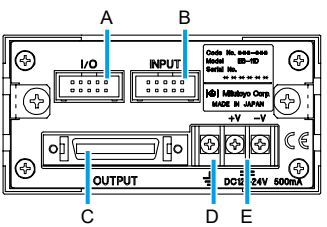
EB-11P



EB-11Z



EB-11D

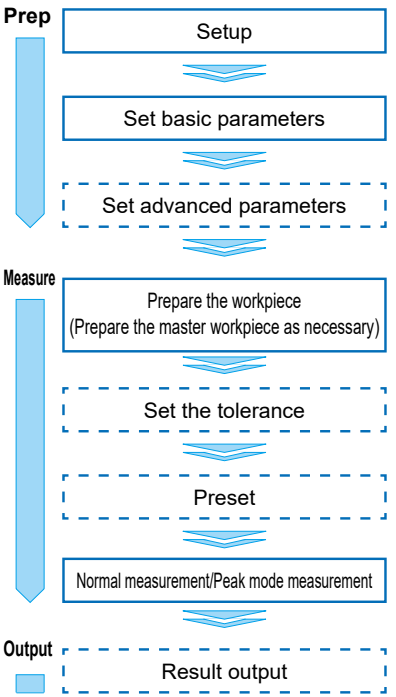


Symbol	Name	Description
A	Digimatic I/O connector	For connecting Digimatic input equipment or Digimatic output equipment.
B	Linear Gage input connector	For connecting a Linear Gage.
C	OUTPUT connector (I/O connector)	For connecting an I/O connecting cable.
D	Grounding terminal	For connecting a grounding wire.
E	Power terminal block	For connecting the Terminal strip connecting cable or a DC power cable.

1.4 Operation Flow

The basic operation flow is explained below.

Do not omit the operations enclosed with a solid line. Perform the operations enclosed with a dashed line as necessary.



"2 Setup" (page 6)

"3.2 Basic Parameters" (page 10)

"3.3 Advanced Parameters" (page 11)

"4.4 Tolerance Value Setting" (page 19)

"4.1 Preset" (page 15)

"4.2 Peak Mode Setting" (page 17)

"5 External Input/Output Function" (page 25)

2 Setup

2.1 Unpacking

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

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

2.2 Mounting

2.2.1 Mounting on a Panel

■ Dimensions for the mounting holes in the panel

Width (mm)	Height (mm)	Panel thickness (mm)
92 to 92.8	45 to 45.8	1.0 to 3.2

■ Panel mounting procedure

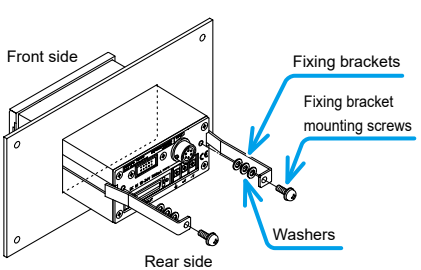
1 Loosen the fixing bracket mounting screws (see the following figure), and then remove the fixing brackets.

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

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



2.3 Connections

2.3.1 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.

2.3.2 Connecting Cables for External Equipment

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

Tips For details about I/O connecting cables, see "5.2 I/O Connector Terminal Function" (page 26).

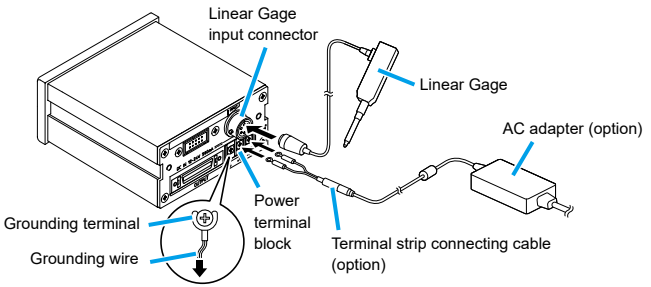
2.3.3 Connection Procedure

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 EB-11Z 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 Setting Parameters

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 EB-11P 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.)

Parameter number Set value

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

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

Parameter number Set value

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

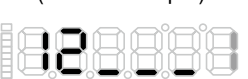
4 Repeatedly press [Fn] to advance the parameter number to 12.

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

Parameter number Set value

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.)



Parameter number Set value

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.
- The circles in the Counter model columns in the following table indicate whether a parameter number that is displayed on the Counter is valid or invalid (● : valid, ○ : invalid).

No.	Setting item	Description/Allowable values (the values in bold indicate the default value)	Counter model		
			P	Z	D
00	Parameter mode	Used to view or modify parameters. You can only set the value to 0 or 1. **0: View parameters** 1: Set parameters	●	●	●
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*1	Sets the resolution of the Linear Gage that is to be connected to. EB-11P/EB-11Z: 0: 10 µm; 1: 5 µm; **2: 1 µm**; 3: 0.5 µm; 4: 0.1 µm EB-11D*2: 0: INC; **1: ABS**; 2: ABS_ORG	●	●	●
15	Unit system selection*1	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	●	●	●

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

*2 Select "0: INC" when the gage that is to be connected to is an INC model. "0: INC", "1: ABS", or "2: ABS_ORG" can be selected when the gage is an ABS model.
When "0: INC" is selected: Match the counter value of both the gage and the Counter when starting up the Counter. Perform Zero setting, etc., on the gage side when performing measurement with the values matched.

When "1: ABS" is selected: The first time the Counter starts up it will read the origin of the gage and set its origin to that value. The origin of the Counter will be overwritten if the Preset value is set. Also, the origin of the Counter will remain valid even if the Counter is re-started.
When "2: ABS_ORG" is selected: The origin of the gage can be changed from the Counter. If the origin of the gage has been changed, it will remain valid even if the power is turned off. Therefore, even if you use a different Counter, the origin of the gage that was used before the change can be read by the Counter when it first starts up.

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.

Tips The circles in the Counter model columns in the following table indicate whether a parameter number that is displayed on the Counter is valid or invalid (● : valid, ○ : invalid).

No.	Setting item	Description/Allowable values (the values in bold indicate the default value)	Counter model		
			P	Z	D
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 EB-11Z) to display at startup. EB-11P/EB-11D: **0: [------] display**, 1: 0.000 EB-11Z: **0: [------] display**, 1: Origin detection wait state	●	●	●
20	Serial BCD output timing	Sets the output timing of serial BCD. 0: Command (output by HOLD signal input) **1: Interval (continuous output)**	●	●	●
21	Serial BCD speed	Selects the speed of serial BCD. 0: 1.6 ms, 1: 3.2 ms 2: 8 ms, **3: 18 ms** 4: 28 ms, 5: External clock	●	●	●
22	Tolerance output method*1	Selects the tolerance judgment result output method. **0: 3-step tolerance** 1: 5-step tolerance 2: Independent tolerance	●	●	●

No.	Setting item	Description/Allowable values (the values in bold indicate the default value)	Counter model		
			P	Z	D
30	Analog output range	Selects the measurement range (resolution range) of the analog output when the power is turned on. 0: 99 to -99 **1: 999 to -999** 2: 9990 to -9990 3: 99900 to -99900 4: 999000 to -999000	●	●	●
31	Analog offset	You can adjust the offset for analog output. For details about adjusting the offset, see  "5.2.2 Output Function" (page 29). **0: No offset** 1: Adjust offset	●	●	●
35	Key protect	Key operations can be disabled to prevent operation errors. **0: Key operation enabled** 1: Key operation disabled	●	●	●
41	Origin detection direction	When a Linear Gage with an origin mark is connected, selects the direction of the spindle of the Linear Gage for origin detection. **0: + direction** 1: - direction	○	●	
42	Origin re-detection*2	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. **0: Disabled** 1: Enabled	○	●	
43	Origin initialization (when the power is turned on)	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). **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.

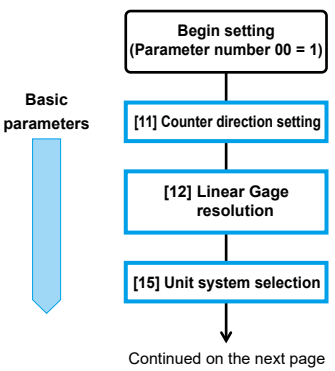
*2 When the setting is enabled, the Counter will wait for the origin re-detection when the HOLD signal is raised. If the HOLD signal is input again during origin re-detection, the origin re-detection function will be canceled (except during error detection).

3.4 Overview of Setting Parameters

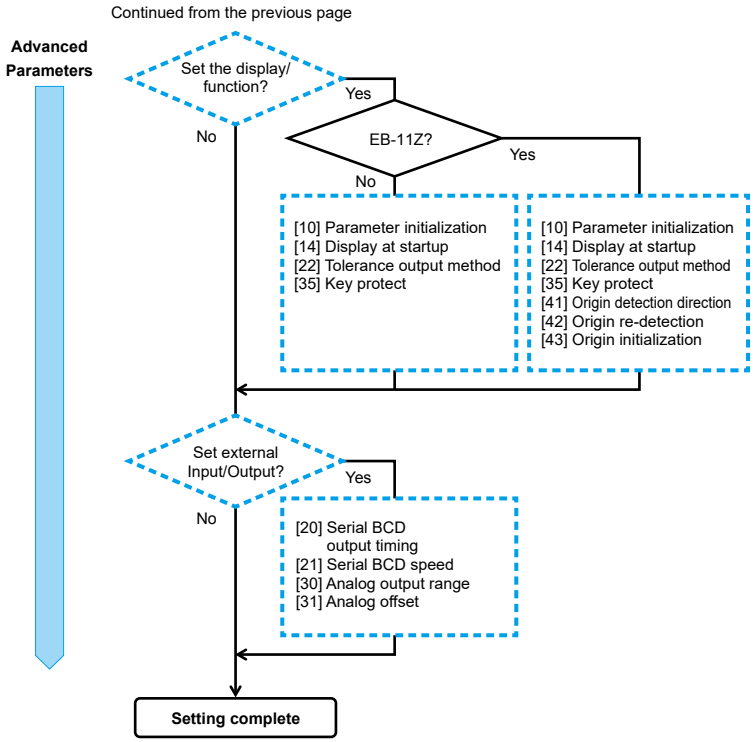
This section gives an overview of setting parameters.

Tips

- The following figure does not show the steps for setting parameters.
- When setting parameters, each time you press [Fn], the parameter number will advance from 10. When the number advances to the last number, it then returns to 10.
- Be sure to set the parameters enclosed within a solid line. Perform the parameter settings enclosed with a dashed line as necessary.



For details about basic parameters, see "3.2 Basic Parameters" (page 10).



For details about advanced parameters, see "3.3 Advanced Parameters" (page 11).

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 "4.2.1 Procedure for Switching Peak Mode" (page 17).
- 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 EB-11D (gage type is set to "ABS" or "ABS_ORG") and EB-11Z 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 BANK0.

» 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.)

» The LIMIT indicator L1 will blink.

Tips For EB-11D, if the gage type is set to "ABS_ORG", it takes about 4 seconds to recall the Preset value. At this time all decimal points will blink. Do not move the spindle during this time.

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 tolerance 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).

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.

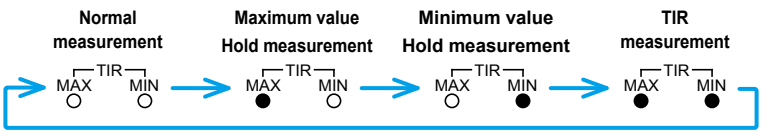
Mode	Description
Normal measurement	Counts the movement (displacement) of the contact point of the Linear Gage, and then displays the counter value successively.
Max. hold measurement	Displays the maximum value (MAX) measured during the measurement. The display will not change until a new maximum value 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.

4.2.1 Procedure for Switching Peak Mode

This section explains how to switch Peak mode.

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

» The mode will switch as follows:



4.2.2 Procedure for Clearing the Peak Value

This section explains how to clear the peak value in Peak mode.

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

This product saves multiple tolerance value settings in memory in the Counter that is referred to as a BANK. For 3-step and 5-step tolerance value settings, up to 7 tolerance value settings can be saved; for independent tolerance settings, up to 2 tolerance value settings can be saved.

You can recall the saved tolerance value settings by switching the BANK.

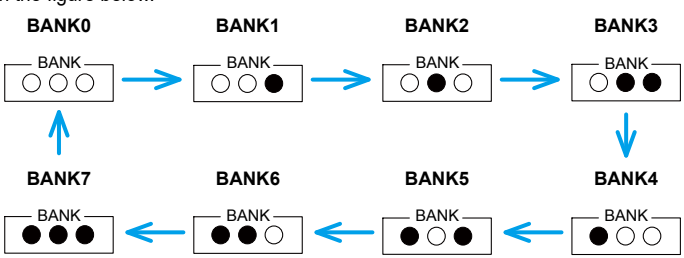
Tips
- For details about tolerance value settings, see "4.4 Tolerance Value Setting" (page 19).
- The BANK can also be switched by an external signal.

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
- For 3-step and 5-step tolerance value settings, each time you press [BANK], the BANK indicator will switch in order from BANK0 through BANK7.
- For the independent tolerance settings, each time you press [BANK], the BANK indicator will switch in order from BANK0 through BANK2.
- 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 3 types of tolerance value setting: 3-step tolerance, 5-step tolerance, and independent tolerance. This section explains the details of each setting.

Tips
- With parameter number 22, select the tolerance output method that you want to set.
- For details about I/O output, see "5.2 I/O Connector Terminal Function" (page 26).

4.4.1 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	LIMIT indicator	I/O output (PIN number)
Measurement result < S1	Amber indicator on	L1 indicator on	L1 (3)
S1 ≤ measurement result ≤ S4	Green indicator on	L3 indicator on	L3 (5)
S4 < measurement result	Red indicator on	L5 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 will light corresponding to the selected BANK number.

Tips Select a BANK number from BANK1 through 7. 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.)

» The LIMIT indicator for L1 will blink.

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.
- 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].

» 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.)

» The LIMIT indicator for L2 will blink.

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.

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

This section explains how to set the 5-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 7. 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.)

» The LIMIT indicator for L1 will blink.

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

Tolerance value	BANK indicator	LIMIT indicator
S1	Amber indicator on	L1 blinks
S2	Amber indicator blinks	L2 blinks
S3	Red indicator blinks	L3 blinks
S4	Red indicator on	L4 blinks

3 Press [MODE].

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

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.
- To cancel the input, press [Fn]. The Counter will return to the Counter display.

4 Press [P.SET].

» The tolerance value will be modified.

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 changes to the color for the tolerance value that is to be set next.

» The LIMIT indicator for the tolerance value that is to be set next will blink.

8 Set the tolerance value in order for S2, S3, and S4 as explained in steps **3** to **7**.

» The tolerance values S2, S3, and S4 will be applied, and the Counter will return to the Counter display.

Tips An error will occur unless S1 < S2 < S3 < S4 or S1 = S2 = S3 = S4.

4.4.3 Independent Tolerance Value Setting

Up to 7 3-step tolerance value settings can be set independently to L1 through L7. Also, the Counter output conditions (for turning the LIMIT indicator on or off) for each tolerance value can be set separately for L1 through L7. The output conditions that can be set for L1 through L7 are shown in the following table.

Output pattern	⊔	⌝	∩	⌟
Measurement < S1	H	H	L	L
S1 ≤ Measurement < S4	L	L	H	H
S4 ≤ Measurement	H	L	L	H

H: LIMIT indicator turns off (tolerance judgment result output off)
L: LIMIT indicator turns on (tolerance judgment result output on)

This section explains how to set the independent 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 BANK1 or BANK2. Tolerance values cannot be set if BANK0 is selected.

2 Press [Fn] to switch to setup mode.

» The current output pattern for L1 will be displayed.

» The LIMIT indicator for L1 will blink.

Output pattern

3 Repeatedly press [BANK] until the LIMIT number that you want to set is displayed.

4 Press [MODE].

» The output pattern will blink.

Output pattern

5 Repeatedly press [P.SET] until the desired output condition is set.

» The output conditions will switch as shown below.

6 Press [Fn].

» The output condition will be applied.

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

7 Press [MODE].

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

8 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.

9 Repeat step **7** and step **8** until the least significant digit has been set.

» The least significant digit will blink.

10 Press [MODE].

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

11 Press [Fn].

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

12 Set the tolerance value S4 in the same steps as in **7** to **9**.

13 Press [MODE].

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

14 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 External Input/Output Function

This product is equipped with the following interfaces that enable the connection of external equipment.

Interface	Connectable equipment	Functions
Digimatic I/O connector	• Digimatic Mini-Processor (DP-1VR) • External control box • Communication equipment such as USB Input Tool	• Printing the measurement data, statistical calculation results, etc. • Simple input of tolerance values or the Preset value
I/O connector	Equipment such as a switch or control unit	• Data output to PLC • External control of Counter

Tips PLC: programmable logic controller

5.1 Digimatic Input/Output Function

5.1.1 Printing by Digimatic Mini-Processor

You can print the measurement data by connecting to a Digimatic Mini-Processor (DP-1VR), which is sold separately. Connect the DP-1VR to the Digimatic I/O connector of the Counter with the optional connection cable (RS LINK/Digimatic).

Tips A maximum of 6 digits can be printed. If a Counter display overflow occurs, the correct value will not be printed. If an overflow occurs, "F" will be displayed in the most significant digit, e.g., "F0.0005". Modify the Preset value to output the measurement with the most significant digit displayed correctly.

5.1.2 Extending the Number of Tolerance Steps with the EB-11D Counter

The number of tolerance steps can be extended by connecting an EB-11D Counter as a second or subsequent Counter.

With the optional connection cable (RS LINK/Digimatic), connect the Digimatic I/O connector of the EB Counter that is used as the first Counter to the linear gage input connector of the EB-11D Counter to be used as the second Counter.

Tips Tolerance judgment result output by the second or subsequent EB-11D Counters is delayed by approximately 100 ms for each Counter. Use this function for static measurement in normal measurement mode.

5.1.3 Data Output by USB Input Tool

Measurement data can be output to a PC by connecting to USB Input Tool.

Tips For details, see the User's Manual for USB Input Tool.

5.1.4 External Switch Box

This is an optional input tool that can perform simple input operation of tolerance values and the Preset value. Connect the connection cable of the external switch box to the Digimatic I/O connector of the Counter.

Tips For details about the setting method and operations, see the User's Manual for the external switch box.

5.2 I/O Connector Terminal Function

Through the I/O connector, the signal of tolerance judgment results, measurement data, etc., can be output to an external device. You can also switch the Tolerance Bank, switch Peak mode, activate the Preset function, clear the peak value, etc., by an external signal input.

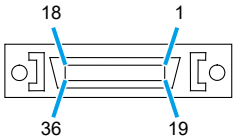
5.2.1 Connections

■ Compatible plug and pin assignment

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 number	I/O	Name	Functions
1, 2	-	COM	Internally connected to GND
3	O	L1	Tolerance judgment result output • Relevant terminal output: "L" • Output on error: L1, L5: "L" (3-step or 5-step tolerance) L1 to L7: "H" (Independent tolerance)
4	O	L2	
5	O	L3	
6	O	L4	
7	O	L5	
8	O	L6	
9	O	L7	
10	O	NOM	Normal output Normal: "L"
21	I/O	BCD_CK	BCD output signal I/O: This changes to the input terminal when the set value of parameter number 21 is set to 5 (external clock).
22	I/O	BCD_ST	
23	O	BCD_DT	
24	O	ANALG	Analog output
25	O	ANGND	GND for analog
26	I	AREG	Switching the analog range: Input in combination with SET.
27	I	SET1	BANK, Peak, Analog range set: Input the set value with SET in advance, then assign with AREG, MODE, BANK.
28	I	SET2	
29	I	SET3	
30	I	MODE	Switching Peak: Input in combination with SET.
31	-	NC	Not connected
32	I	BANK	Switching BANK: Input in combination with SET.
33	-	NC	Not connected
34	I	HOLD	HOLD/Error cancel input
35	I	P.SET	Normal measurement: Preset Peak mode measurement: Peak clear
36	-	NC	Not connected

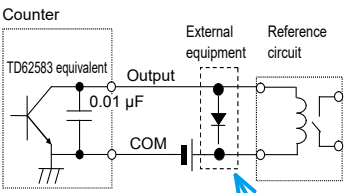
Tips

- External input is valid when input voltage is "L". (External input is negative logic.)
- "I/O" refers to the first letters of "Input/Output" respectively. Refer to the input circuit for "I", and the output circuit for "O".
- For details about setting the MODE signal (for switching Peak) and the BANK signal (for switching BANK), see "5.2.4 Timing Chart" (page 31).

■ Input/Output circuit

Output circuit

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

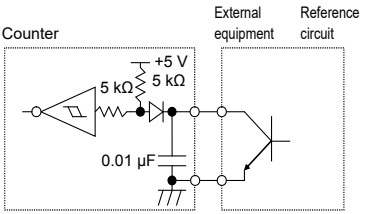


Output withstand voltage: Max. 24 V
Output current: Max. 10 mA
Output saturation voltage: Max. 0.7 V

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

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.

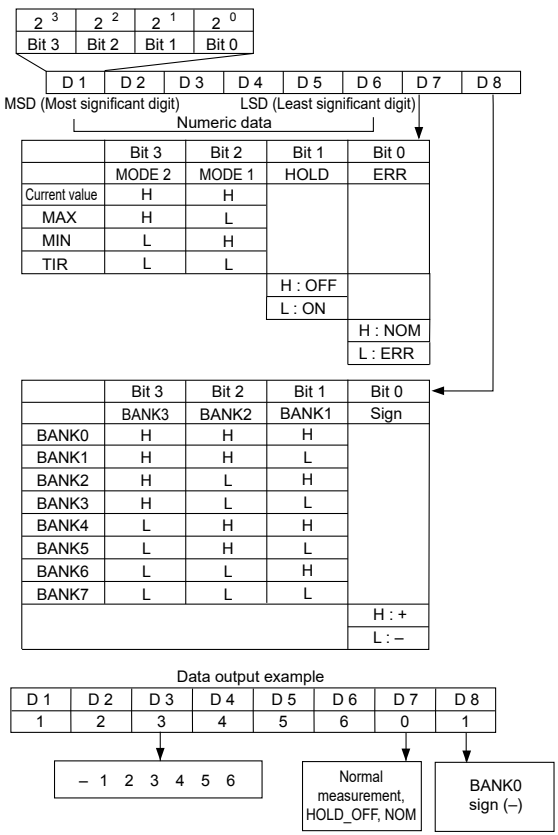
NOTICE When using relays, incorporate a surge-current-absorbing diode or a protective circuit. If no protection is incorporated, the IC in the Counter may be damaged.

5.2.2 Output Function

■ Serial BCD output

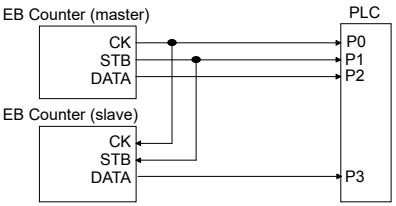
Because BCD output is performed with serial data, a PLC can be connected using a minimum of connecting lines. If two or more EB Counters will be connected, the second and subsequent Counters can be connected to a PLC with a single data line.

● Data format



Tips For details about the timing chart, see "5.2.4 Timing Chart" (page 31).

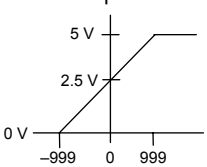
● Example of multiple Counter connection



Tips Set the set value of parameter number 21 (serial BCD speed) to 5 (external clock) for the second and subsequent Counters.

■ Analog output

Movement of the spindle of a Linear Gage can be monitored as linear voltage by measuring the voltage between terminals (pin no. 24–25) with a pen recorder or oscilloscope.



Output voltage = 2.5 V + counter value × voltage resolution (25 mV/2.5 mV) (full-scale: 0 to 5 V)
Response speed: 10 Hz (update time: 5 ms)
Accuracy: ±5% (0 to 5 V)
±0.5% (2.5 V ±200 mV, after offset adjustment) (accuracy is rated at full-scale 5 V)
Load resistance: 300 kΩ or more

● Measurement range setting

The measurement range can be set using parameters. Details about the parameters are as follows:

SET			Parameter number 30	Measurement range (mm) (range resolution [mm])					Voltage resolution
3	2	1		10 µm gage	5 µm gage	1 µm gage	0.5 µm gage	0.1 µm gage	
H	H	H	0	±0.99 (0.01)	±0.095 (0.005)	±0.099 (0.001)	±0.0095 (0.0005)	±0.0099 (0.0001)	25 mV
H	H	L	1	±9.99 (0.01)	±0.995 (0.005)	±0.999 (0.001)	±0.0995 (0.0005)	±0.0999 (0.0001)	2.5 mV
H	L	H	2	±99.90 (0.1)	±9.950 (0.05)	±9.990 (0.01)	±0.9950 (0.005)	±0.9990 (0.001)	2.5 mV
H	L	L	3	±999.00 (1)	±99.500 (0.5)	±99.900 (0.1)	±9.9500 (0.05)	±9.9900 (0.01)	2.5 mV
L	H	H	4	±9990.00 (10)	±995.000 (5)	±999.000 (1)	±99.5000 (0.5)	±99.9000 (0.1)	2.5 mV

Tips The measurement range can also be set by an external signal. For information about the setting procedure, refer to the timing chart. For details about the timing chart, see "5.2.4 Timing Chart" (page 31).

● Offset adjustment

To perform offset adjustment for the output value, set parameter number 31 to 1 (offset available). When it is set to 1, "counter value – tolerance value" is output in analog.

Tips
- The tolerance value is S1 (for 3-step tolerance value) or S2 (for 5-step tolerance value).
- Offset adjustment cannot be performed if the independent tolerance is set.

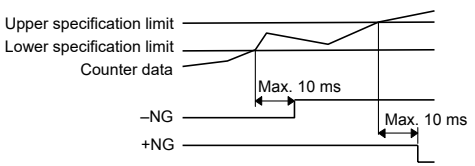
5.2.3 Input Function

With an external signal input, you can switch the BANK, switch the Peak mode, activate the Preset function, and clear the peak value. You can hold counter values as well.

Tips For details about the timing chart, see "5.2.4 Timing Chart" (page 31).

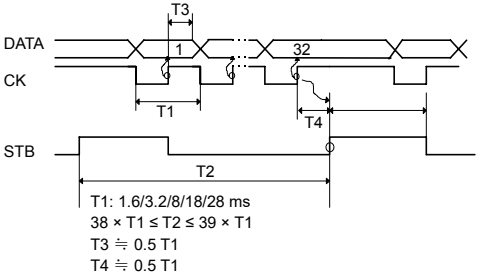
5.2.4 Timing Chart

■ 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 EB-11D, 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.

■ BCD output



Details about BCD output timing are as follows:

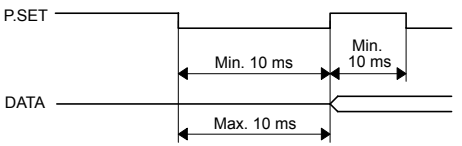
- DATA is loaded at the rising of CK.
- All data is transferred in 32 bits.
- Data transfer is completed while STB is "H", and then the result is stored.
- The BCD transmission speed (T1) is set by parameter number 21.

Parameter number 21	BCD transmission speed	Total transmission time
0	1.6 ms	62.4 ms
1	3.2 ms	124.8 ms
2	8 ms	312 ms
3	18 ms	702 ms
4	28 ms	1092 ms

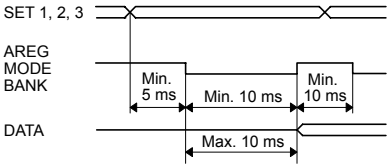
Tips If a transmission speed of 3.2 ms or less is used, use a device with a response time of 1 ms or less.

■ External signal input

● Preset, Peak clear



● Peak mode, BANK, analog range specification



Refer to the following table to set the SET signal.

After setting, leave a gap of 5 ms or more, and then input the input signal of the function to change for at least 10 ms.

The data will be modified within 10 ms after the fall of the input is confirmed.

MODE (pin number 30): Switching Peak

	SET3	SET2	SET1
Current value	H	H	H
MAX	H	H	L
MIN	H	L	H
TIR	H	L	L

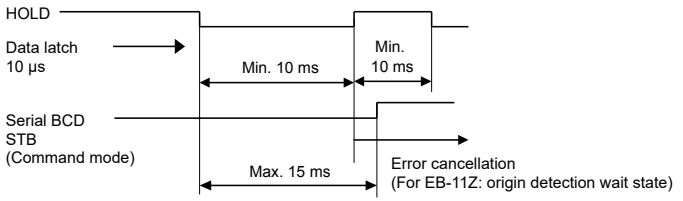
BANK (pin number 32): Switching BANK

	SET3	SET2	SET1
BANK0	H	H	H
BANK1	H	H	L
BANK2	H	L	H
BANK3	H	L	L
BANK4	L	H	H
BANK5	L	H	L
BANK6	L	L	H
BANK7	L	L	L

Tips

- BANK3 to BANK7 are disabled if independent tolerance is set.
- For information about AREG (analog range), refer to measurement range setting for the analog output. "Measurement range setting" (page 30)

■ HOLD/Error reset



Tips

- The data latch function will be executed 10 µs after the fall of the HOLD signal. The error cancellation will be executed with the rising HOLD signal.
- When outputting BCD data, start the data output within 15 ms after the data latch.
- For EB-101D, the length of time until the data latch depends on the connected equipment, such as a Linear Gage.
- During HOLD input, the UNIT indicator will blink.

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:

Problem	Cause	Solution
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 10).
	Peak mode (MAX or MIN is lit) is active.	Cancel Peak mode. For details, see "4.2.1 Procedure for Switching Peak Mode" (page 17).
	The HOLD signal (UNIT is blinking) is being input.	Check the external input.
Cannot execute Zero setting.	Peak mode is active.	Cancel Peak mode. For details, see "4.2.1 Procedure for Switching Peak Mode" (page 17).

6.2 Error Messages

6.2.1 List of Error Codes

Display	NOM signal	BCD output	Cause	Solution/ Error cancellation method
[------]	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 10	H	FFFF10	Abnormal power voltage	Connect to the specified power.
				Automatic cancellation
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.

Display	NOM signal	BCD output	Cause	Solution/ Error cancellation method
F*****	L	F*****	Counter value is 6 digits or more	• Return the counter value to within 6 digits. • Modify the Preset value.
				Automatic cancellation
All decimal points will blink	H	Counter value status	The origin is not detected yet (EB-11Z 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", the tolerance judgment result output will be "L" for L1 and L5 for 3-step or 5-step tolerance and "H" for L1 to L7 for independent tolerance.
- "Err 40" (Linear Gage malfunction) is displayed even when no Linear Gage is connected.
- "Err 90" and "Err 95" are displayed when a tolerance value setting error occurs due to a key operation.
- 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.

6.2.2 Error Cancellation Method

The 3 main error cancellation methods are explained below, but the appropriate method differs depending on the cause.

- Automatic cancellation
- Press [P.SET].
- Input an external HOLD signal.

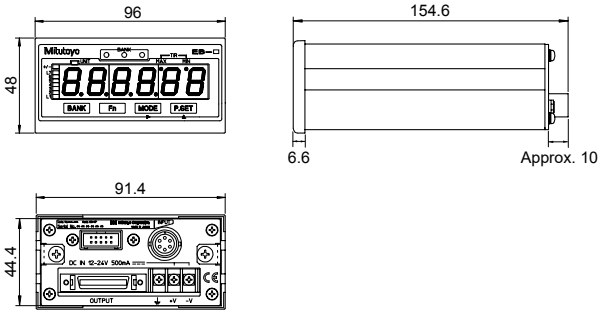
Tips For details about error messages, see "6.2.1 List of Error Codes" (page 35).

7 Specifications

7.1 Basic Specifications

Code No.	542-092-2	542-094-2	542-093-2
Model No.	EB-11P	EB-11Z	EB-11D
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) Guarantee a minimum power supply of 1 A per unit.		
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) × 156 (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		
Functions	Preset, Measurement mode switching (maximum value, minimum value, TIR value), Tolerance judgment output (3-step/5-step/independent tolerance value)		
Interface	Digimatic I/O		

7.2 External Dimensions Drawing (For All Models)



Unit: mm

7.3 Option

Part No.	Name
02ADB440	I/O output connector (with cover)
02ADF180	External switch box (with connecting cable)
02ADD950	Connection cable (RS LINK/Digimatic) (0.5 m)*1
936937	Connection cable (RS LINK/Digimatic) (1 m)*1
965014	Connection cable (RS LINK/Digimatic) (2 m)*1
02ADD930	Terminal strip connecting cable*2
357651	AC adapter
02ZAA000	AC cable*2

*1 Required if using DP-1VR or USB Input Tool.

*2 Required if using the AC adapter.

SERVICE NETWORK

*As of October 2020

Europe

Mitutoyo Europe GmbH

Borsigstrasse 8-10, 41469 Neuss, GERMANY

TEL: 49 (0)2137 102-0 FAX: 49 (0)2137 102-351

Mitutoyo CTL Germany GmbH

Von-Gunzert-Strasse 17, 78727 Oberndorf, GERMANY

TEL: 49 (0)7423 8776-0 FAX: 49 (0)7423 8776-99

KOMEG Industrielle Messtechnik GmbH

Zum Wasserwerk 3, 66333 Völklingen, GERMANY

TEL: 49 (0)6898 91110 FAX: 49 (0)6898 9111100

Germany

Mitutoyo Deutschland GmbH

Borsigstrasse 8-10, 41469 Neuss, GERMANY

TEL: 49 (0)2137 102-0 FAX: 49 (0)2137 86 85

M³ Solution Center Hamburg

Tempowerkring 9·im HIT-Technologiepark 21079 Hamburg, GERMANY

TEL: 49 (0)40 791894-0 FAX: 49 (0)40 791894-50

M³ Solution Center Berlin

Ernst-Lau-Straße 6, 12489 Berlin, GERMANY

TEL:49(0)30 2611 267 FAX: 49 30 67988729

M³ Solution Center Eisenach

Neue Wiese 4, 99817 Eisenach, GERMANY

TEL: 49 (0)3691 88909-0 FAX: 49 (0)3691 88909-9

M³ Solution Center Ingolstadt

Marie-Curie-Strasse 1A, 85055 Ingolstadt, GERMANY

TEL: 49 (0)841 954920 FAX: 49 (0)841 9549250

M³ Solution Center Leonberg

Steinbeisstrasse 2, 71229 Leonberg, GERMANY

TEL: 49 (0)7152 6080-0 FAX: 49 (0)7152 608060

Mitutoyo-Messgeräte Leonberg GmbH

Heidenheimer Strasse 14, 71229 Leonberg, GERMANY

TEL: 49 (0)7152 9237-0 FAX: 49 (0)7152 9237-29

U.K.

Mitutoyo (UK) Ltd.

Joule Road, West Point Business Park, Andover, Hampshire SP10 3UX, UNITED KINGDOM

TEL: 44 (0)1264 353 123 FAX: 44 (0)1264 354883

M³ Solution Center Coventry

Unit6, Banner Park, Wickmans Drive, Coventry, Warwickshire CV4 9XA, UNITED KINGDOM

TEL: 44 (0)2476 426300 FAX: 44 (0)2476 426339

M³ Solution Center Halifax

Lowfields Business Park, Navigation Close, Elland, West Yorkshire HX5 9HB, UNITED KINGDOM

TEL: 44 (0)1422 375566 FAX: 44 (0)1422 328025

M³ Solution Center East Kilbride

The Baird Building, Rankine Avenue, Scottish Enterprise Technology Park, East Killbride G75 0QF, UNITED KINGDOM

TEL: 44 (0)1355 581170 FAX: 44 (0)1355 581171

France

Mitutoyo France

Paris Nord 2-123 rue de la Belle Etoile, BP 59267 ROISSY EN FRANCE 95957 ROISSY CDG CEDEX, FRANCE

TEL: 33 (0)149 38 35 00

M³ Solution Center LYON

Parc Mail 523, cours du 3ème millénaire, 69791 Saint-Priest, FRANCE

TEL: 33 (0)149 38 35 70

M³ Solution Center STRASBOURG

Parc de la porte Sud, Rue du pont du péage, 67118 Geispolsheim, FRANCE

TEL: 33 (0)149 38 35 80

M³ Solution Center CLUSES

Espace Scionzier 480 Avenue des Lacs, 74950 Scionzier, FRANCE

TEL: 33 (0)1 49 38 35 90

M³ Solution Center TOULOUSE

Aeroparc Saint Martin Cellule B08 ZAC de Saint Martin du Touch 12 rue de Caulet 31300 Toulouse, FRANCE

TEL: 33 (0)1 49 38 42 90

M³ Solution Center RENNES

2, rue Claude Chappe, PA le Vallon - ZAC Mivoie, 35230 Noyal-Châtillon-sur-Seiche, FRANCE

TEL: 33 (0)1 49 38 42 10

Italy

MITUTOYO ITALIANA S.r.l.

Corso Europa, 7 - 20045 Lainate (MI), ITALY

TEL: 39 02 935781

FAX: 39 02 93578255

M³ Solution Center BOLOGNA

Via dei Carpini1/A - 40011 Anzola Emilia (BO), ITALY

TEL: 39 02 93578215 FAX: 39 02 93578255

M³ Solution Center CHIETI

Contrada Santa Calcagna - 66020 Rocca S. Giovanni (CH), ITALY

TEL: 39 02 93578280 FAX: 39 02 93578255

M³ Solution Center PADOVA

Via G. Galilei 21/F - 35035 Mestrino (PD), ITALY

TEL: 39 02 93578268 FAX: 39 02 93578255

Netherlands

Mitutoyo Nederland B.V.

Wiltonstraat 25, 3905 KW Veenendaal,

THE NETHERLANDS

TEL: 31(0)318-534911

Mitutoyo Nederland B.V. / M³ Solution Center Enschede

Institutenweg 50, 7521 PK Enschede,

THE NETHERLANDS

TEL: 31(0)318-534911

Mitutoyo Nederland B.V. / M³ Solution Center Eindhoven

De Run 1115, 5503 LB Veldhoven,

THE NETHERLANDS

TEL: 31(0)318-534911

Mitutoyo Research Center Europe B.V.

De Rijn 18, 5684 PJ Best, THE NETHERLANDS

TEL:31(0)499-320200 FAX:31(0)499-320299

Belgium

Mitutoyo Belgium N.V. / M³ Solution Center Melsele

Schaarbeekstraat 20, B-9120 Melsele, BELGIUM

TEL: 32 (0)3-2540444

Sweden

Mitutoyo Scandinavia AB

Släntvägen 6, 194 61 Upplands Väsby, SWEDEN

TEL: 46 (0)8 594 109 50 FAX: 46 (0)8 590 924 10

M³ Solution Center Alingsås

Ängsvaktaregatan 3A, 441 38 Alingsås, SWEDEN

TEL: 46 (0)8 594 109 50 FAX: 46 (0)322 63 31 62

M³ Solution Center Värnamo

Storgatsbacken 1, 331 30 Värnamo, SWEDEN

TEL: 46 (0)8 594 109 50 FAX: 46 (0)370 463 34

Switzerland

Mitutoyo (Schweiz) AG

Steinackerstrasse 35, 8902 Urdorf, SWITZERLAND

TEL: 41 (0)447361150 FAX: 41(0)447361151

Mitutoyo (Suisse) SA

Rue Galilée 4, 1400 Yverdon-les Bains, SWITZERLAND

TEL: 41 (0)244259422 FAX: 41 (0)447361151

Poland

Mitutoyo Polska Sp.z o.o.

Ul.Graniczna 8A, 54-610 Wroclaw, POLAND

TEL: 48 (0)71354 83 50 FAX: 48 (0)71354 83 55

Czech Republic

Mitutoyo Česko s.r.o.

Dubská 1626, 415 01 Teplice, CZECH REPUBLIC

TEL: 420 417-514-011 FAX: 420 417-579-867

Mitutoyo Česko s.r.o. M³ Solution Center Ivančice

Ke Karlovu 62/10, 664 91 Ivančice, CZECH REPUBLIC

TEL: 420 417-514-011 FAX: 420 417-579-867

Mitutoyo Česko s.r.o. M³ Solution Center Ostrava Mošnov

Mošnov 314, 742 51 Mošnov, CZECH REPUBLIC

TEL: 420 417-514-050 FAX: 420 417-579-867

Mitutoyo Česko s.r.o. Slovakia Branch

Hviezdoslavova 124, 017 01 Považská Bystrica, SLOVAKIA

TEL: 421 948-595-590

Hungary

Mitutoyo Hungária Kft.

Záhony utca 7, D-épület / fsz, 1031 Budapest, HUNGARY

TEL: 36 (0)1 2141447 FAX: 36 (0)1 2141448

Romania

Mitutoyo Romania SRL

1A Drumul Garii Odai Street, showroom, Ground Floor, 075100 OTOPENI-ILFOV, ROMANIA

TEL: 40 (0)311012088 FAX: +40 (0)311012089

Showroom in Brasov

Strada Ionescu Crum Nr.1, Brasov Business Park Turnul 1, Mezanin, 500446 Brasov-Judetul Brasov, ROMANIA

TEL/FAX: 40 (0)371020017

Russian Federation

Mitutoyo RUS LLC

13 Sharikopodshipnikovskaya, bld.2, 115088 Moscow, RUSSIAN FEDERATION

TEL: 7 495 7450 752

Finland

Mitutoyo Scandinavia AB Finnish Branch

Viherkiitäjä 2A, 33960, Pirkkala, FINLAND

TEL: 358 (0)40 355 8498

Austria

Mitutoyo Austria GmbH

Salzburger Straße 260 / 3 A-4600 Wels, AUSTRIA

TEL: 43 (0)7242 219 998

Mitutoyo Austria GmbH Goetzis Regional showroom

Lastenstrasse 48a 6840 Götzis AUSTRIA

Singapore

Mitutoyo Asia Pacific Pte. Ltd.

Head office / M³ Solution Center

24 Kallang Avenue, Mitutoyo Building, SINGAPORE 339415

TEL: (65)62942211 FAX: (65)62996666

Malaysia

Mitutoyo (Malaysia) Sdn. Bhd.

Kuala Lumpur Head Office / M³ Solution Center

Mah Sing Integrated Industrial Park, 4, Jalan Utarid U5/14, Section U5, 40150 Shah Alam, Selangor, MALAYSIA

TEL: (60)3-78459318 FAX: (60)3-78459346

Penang Branch office / M³ Solution Center

30, Persiaran Mahsuri 1/2, Sunway Tunas, 11900 Bayan Lepas, Penang, MALAYSIA

TEL: (60)4-6411998 FAX: (60)4-6412998

Johor Branch office / M³ Solution Center

70 (Ground Floor), Jalan Molek 1/28, Taman Molek, 81100 Johor Bahru, Johor, MALAYSIA

TEL: (60)7-3521626 FAX: (60)7-3521628

Thailand

Mitutoyo(Thailand)Co., Ltd.

Bangkok Head Office / M3 Solution Center

76/3-5, Chaengwattana Road, Kwaeng Anusaowaree, Khet Bangkaen, Bangkok 10220, THAILAND

TEL: (66)2080 3500 FAX:(66)2521 6136

Chonburi Branch / M³ Solution Center

7/1, Moo 3, Tambon Bowin, Amphur Sriracha, Chonburi 20230, THAILAND

TEL: (66)2080 3563 FAX:(66)3834 5788

ACC Branch / M³ Solution Center

122/8, 122/9, Moo 6, Tambon Donhuaroh, Amphur Muangchonburi, Chonburi 20000, THAILAND

TEL: (66)2080 3565

Indonesia

PT. Mitutoyo Indonesia

Head Office / M³ Solution Center

Jalan Sriwijaya No.26 Desa cibatu Kec. Cikarang Selatan Kab. Bekasi 17530, INDONESIA

TEL: (62)21-2962 8600 FAX: (62)21-2962 8604

Vietnam

Mitutoyo Vietnam Co., Ltd

Hanoi Head Office / M³ Solution Center

1st & 2nd floor, MHDI Building, No. 60 Hoang Quoc Viet Road, Nghia Do Ward, Cau Giay District, Hanoi, VIETNAM

TEL: (84)24-3768-8963 FAX: (84)24-3768-8960

Ho Chi Minh City Branch Office / M³ Solution Center

123 Dien Bien Phu Street,Ward 15,Binh Thanh District, Ho Chi Minh City, VIETNAM

TEL: (84)28-3840-3489 FAX: (84)28-3840-3498

Philippines

Mitutoyo Philippines, Inc.

Head Office / M³ Solution Center

Unit 1B & 2B LTI, Administration Building 1, Annex 1, North Main Avenue, Laguna Technopark, Binan Laguna 4024, PHILIPPINES

TEL: (63)49 544 0272 FAX: (63)49 544 0272

India

Mitutoyo South Asia Pvt. Ltd. Head Office

C-122, Okhla Industrial Area, Phase-I, New Delhi-110 020, INDIA

TEL: (91) 11-26372090 FAX: (91) 11-26372636

MSA Technical Center

Plot no. 65, Ground Floor, Udyog Vihar, Phase-4 Gurgaon, Haryana - 122016, INDIA

TEL: (91) 124–2340286/287

Mumbai Region Head office

303, Sentinel Hiranandani Business Park Powai, Mumbai-400 076, INDIA

TEL: (91) 22-25700684/837/839
FAX: (91) 22-25700685

Pune Office / M³ Solution Center

G4/G5, Pride Kumar Senate, Off. Senapati Bapat Road, Pune-411 016, INDIA

TEL: (91) 20-25660043/44/45
FAX: (91) 20-66033644

Bengaluru Region Head office / M³ Solution Center

No. 5, 100 Ft. Road, 17th Main, Koramangala, 4th Block, Bengaluru-560 034, INDIA

TEL: (91) 80-25630946/47/48
FAX: (91) 80-25630949

Chennai Office / M³ Solution Center

No. 624, Anna Salai Teynampet, Chennai-600 018, INDIA

TEL: (91) 44-24328823/24 FAX: (91) 44-24328825

Kolkata Office

Unit No. 1208,Om Tower, 32,J.L..Nehru Road, Kolkata-700 071, INDIA

TEL: 91 33-22267088/40060635

FAX: (91) 33-22266817

Ahmedabad Office/M³ Solution Center (Ahmedabad)

A-104 & A-105, First Floor, Solitaire Corporate Park, Near Divya Bhaskar Press, S.G. Road, Ahmedabad - 380 015, INDIA

TEL: (91) 079 - 29704902/903

Coimbatore Office

Regus, Srivari Srimath, 3rd Floor, Door No:1045, Avinashi Road, Coimbatore - 641 018,INDIA

TEL: (91) 9345005663

Taiwan

Mitutoyo Taiwan Co., Ltd. / M³ Solution Center Taipei

4F., No.71, Zhouzi St., Neihu Dist.,Taipei City 114, TAIWAN (R.O.C.)

TEL: 886(2)5573-5900 FAX: 886(2)8752-3267

Taichung Branch / M³ Solution Center Taichung

1F., No. 299, Gaotie 1st Rd., Wuri Dist., Taichung City 414, TAIWAN (R.O.C.)

TEL:886(4)2338-6822 FAX:886(4)2338-6722

Kaohsiung Branch / M³ Solution Center Kaohsiung

1F., No.31-1, Haibian Rd., Lingya Dist., Kaohsiung City 802, TAIWAN (R.O.C.)

TEL: 886(7)334-6168 FAX: 886(7)334-6160

South Korea

Mitutoyo Korea Corporation

Head Office / M³ Solution Center

(Sanbon-Dong, Geumjeong High View Build.), 6F, 153-8, Ls-Ro, Gunpo-Si, Gyeonggi-Do, 15808 KOREA

TEL: 82(31)361-4200 FAX: 82(31)361-4201

Busan Office / M³ Solution Center

(3150-3, Daejeo 2-dong) 8,Yutongdanji 1-ro 49beon-gil, Gangseo-gu, Busan, 46721 KOREA

TEL: 82(51)324-0103 FAX: 82(51)324-0104

Daegu Office / M³ Solution Center

(Galsan-dong, Daegu Business Center), 301-Ho, 217, Seongseogongdan-ro, Dalseo-gu, Daegu 42704 KOREA

TEL: 82(53)593-5602 FAX: 82(53)593-5603

China

Mitutoyo Measuring Instruments (Shanghai) Co., Ltd.

8th Floor, Tower 1 Lujiazui Jinkong Square No.1788/1800 Century Ave., Pudong New District, Shanghai 200122, CHINA

TEL: 86(21)5836-0718 FAX: 86(21)5836-0717

Suzhou Office / M³ Solution Center (Suzhou)

No. 46 Baiyu Road, Suzhou 215021, CHINA

TEL: 86(512)6522-1790 FAX: 86(512)6251-3420

Wuhan Office / M³ Solution Corner

Room 1701, Wuhan Wanda Center, No. 96, Linjiang Road, Wuchang District, Wuhan Hubei 430060, CHINA

TEL: 86(27)8544-8631 FAX: 86(27)8544-6227

Chengdu Office

1-701, New Angle Plaza, 668# Jindong Road, Jinjiang District, Chengdu, Sichuan 610066,CHINA

TEL: 86(28)8671-8936 FAX: 86(28)8671-9086

Hangzhou Office

Room 804, Eastern International Business Center Building 1, No.600 Jinsha Road of Hangzhou Economic and Technological Development Zone, 310018, CHINA

TEL: 86(571)8288-0319 FAX: 86(571)8288-0320

Tianjin Office / M³ Solution Center China (Tianjin)

Room D 12/F, TEDA Building, No.256 Jie-fang Nan Road Hexi District,Tianjin 300042, CHINA

TEL: 86(22)5888-1700 FAX: 86(22)5888-1701

Changchun Office

Room 815, 8F, Building A1, Upper East

International No.3000 Dongsheng Street, Erdao

District, Changchun, Jilin, 130031, CHINA

TEL: 86(431)8192-6998 FAX: 86(431)8192-6998

Chongqing Office

Room 1312, Building 3, Zhongyu Plaza, No.86, Hongjin Avenue, Longxi Street, Yubei District, Chongqing, 400000, CHINA

TEL: 86(23)6595-9950 FAX: 86(23)6595-9950

Qingdao Office

Room 638, 6F, No.192 Zhengyang Road, Chengyang District, Qingdao, Shandong, 266109, CHINA

TEL: 86(532)8096-1936 FAX: 86(532)8096-1937

Xi'an Office

Room 805, Xi'an International Trade Center, No. 196 Xiaozhai East Road, Xi'an, 710061, CHINA

TEL: 86(29)8538-1380 FAX: 86(29)8538-1381

Dalian Office / M³ Solution Center China (Dalian)

Room A-106 Shuijing SOHO, No.16 Harbin Road,Economic Development Zone,Dalian, 116600 CHINA

TEL: 86(411)8718 1212 FAX: 86(411)8754-7587

Zhengzhou Office

Room1801,18/F,Unit1,Building No.23, Shangwu Inner Ring Road, Zhengdong New District,Zhengzhou City, Henan 450018, CHINA

TEL: 86(371)6097-6436 FAX: 86(371)6097-6981

Dongguan Office / M³ Solution Center China (Dongguan)

No.26, Chang'an Section Guanchang Road, Chang'an Town, Dongguan City, Guangdong 523855, CHINA

TEL: 86(769)8541 7715 FAX: 86(769)-8541 7745

Fuzhou Office

Room 2104, City Commercial Centre, No.129 Wu Yi Road N., Fuzhou City, Fujian 350005, CHINA

TEL: 86 (591) 8761 8095 FAX: 86 (591) 8761 8096

Changsha Office

Room 2207, Building 1, Shiner International Plaza, No. 88, Kaiyuan Middle Road, Changsha City, Hunan 410100, CHINA

TEL: 86 (731) 8401 9276 FAX: 86 (731) 8401 9376

Mitutoyo Leeport Metrology (Hong Kong) Limited

Room 818, 8/F, Vanta Industrial Centre, No.21-33, Tai Lin Pai Road, Kwai Chung, NT, HONG KONG

TEL: (852)2992-2088 FAX: (852)2670-2488

Mitutoyo Measuring Instruments (Suzhou) Co., Ltd.

No. 46 Baiyu Road, Suzhou 215021, CHINA

TEL: 86(512)6252-2660 FAX: 86(512)6252-2580

U.S.A.

Mitutoyo America Corporation

965 Corporate Blvd., Aurora, IL 60502, U.S.A.

TEL: 1-(630)820-9666
Toll Free No. 1-888-648-8869

FAX: 1-(630)978-3501

M³ Solution Center-Illinois

965 Corporate Blvd., Aurora, IL 60502, U.S.A.

M³ Solution Center-Ohio

6220 Hi-Tek Ct., Mason, OH 45040, U.S.A.

TEL: 1-(888)-648-8869 FAX: 1-(513)754-0718

M³ Solution Center-Michigan

46850 Magellan Drive, Suite 100 Novi, MI 48377, U.S.A.

TEL: 1-(888)-648-8869 FAX: 1-(248)-926-0928

M³ Solution Center-California

16925 E. Gale Ave., City of Industry, CA 91745, U.S.A.

TEL: 1-(888)-648-8869 FAX: 1-(626)369-3352

M³ Solution Center-North Carolina

11515 Vanstory Dr., Suite 140, Huntersville, NC 28078, U.S.A.

TEL: 1-(888)-648-8869 FAX: 1-(704)875-9273

M³ Solution Center-Alabama

2100 Riverchase Center Suite 106, Birmingharm, AL 35244, U.S.A

TEL: 1-(888)-648-8869 FAX: 1-(205)-988-3423

M³ Solution Center-Washington

1000 SW 34th St. Suite G, Renton, WA 98057 U.S.A.

TEL: 1-(888)-648-8869

M³ Solution Center-Texas

4560 Kendrick Plaza Drive Suite 120 Houston, TX 77032, U.S.A.

TEL: 1-(888)-648-8869 FAX: 1-(281)227-0937

M³ Solution Center-Massachusetts

753 Forest Street, Suite 110, Marlborough,MA 01752, U.S.A.

TEL: 1-(888)648-8869 FAX: 1-(508)485-0782

Mitutoyo America Corporation Calibration Lab

965 Corporate Blvd., Aurora, IL 60502, U.S.A.

TEL: 1-(888)-648-8869 FAX: 1-(630)978-6477

Micro Encoder, Inc.

11533 NE 118th St., Kirkland, WA 98034-7111, U.S.A.

TEL: 1-(425)821-3906 FAX: 1-(425)821-3228

Micro Encoder Los Angeles, Inc.

16925 Gale Ave. City of Industry, CA 91745-1806 U.S.A.

TEL: 1-626-961-9661 FAX:1-626-333-8019

Mituotyo America Corporation CT-Lab Chicago

965 Corporate Blvd., Aurora, IL 60502, U.S.A.

TEL: 1-(888)-648-8869 FAX: 1-(630)-820-3418

Canada

Mitutoyo Canada Inc.

2121 Meadowvale Blvd., Mississauga, Ont. L5N 5N1., CANADA

TEL: 1-(905)821-1261 FAX: 1-(905)821-4968

Montreal Office

7075 Place Robert-Joncas Suite 129, Montreal, Quebec H4M 2Z2, CANADA

TEL: 1-(514)337-5994 FAX: 1-(514)337-4498

Brazil

Mitutoyo Sul Americana Ltda.

Head office / M³ Solution Center / Factory

Rodovia Índio Tibiriçá 1555, CEP 08655-000 - Vila Sol Nascente - Suzano - SP - BRASIL

TEL: 55 (11)5643-0040

Argentina

Mitutoyo Sul Americana Ltda.

Argentina Branch / M³ Solution Center

Av. B. Mitre 891/899 – C.P. (B1603CQI) Vicente López –Pcia. Buenos Aires – ARGENTINA

TEL: 54(11)4730-1433 FAX: 54(11)4730-1411

Sucursal Cordoba / M³ Solution Center

Av. Amadeo Sabattini, 1296, esq. Madrid Bº Crisol Sur – CP 5000, Cordoba, ARGENTINA

TEL/FAX: 54 (351) 456-6251

Mexico

Mitutoyo Mexicana, S.A. de C.V.

Industria Elēctrica No.15, Parque Industrial, Naucalpan de Juārez, Estado de Mēxico C.P.53370, MÉXICO

TEL: 52 (01-55) 5312-5612
FAX: 52 (01-55) 5312-3380

Monterrey Office/ M³ Solution Center

Blv. Interamericana No. 103, Parque Industrial FINSA, C.P. 66636 Apodaca, N.L., MÉXICO

TEL: 52(01-81) 8398-8227/8228/8242/8244

FAX: 52(01-81) 8398-8226

Tijuana Office/ M³ Solution Center

Calle José María Velazco 10501-C, Col. Cd. Industrial Nueva Tijuana, C.P. 22500 Tijuana, B.C., MÉXICO

TEL: 52 (01-664) 647-5024

Querétaro Office / M³ Solution Center

Av. Cerro Blanco No.500-1, Colonia Centro Sur, Querétaro, Querétaro, C.P. 76090, MÉXICO

TEL: 52 (01-442) 340-8018, 340-8019 and 340-8020

FAX: 52 (01-442) 340-8017

Mitutoyo Mexicana, S.A. de C.V. Querétaro Calibration Laboratory

Av. Cerro Blanco 500 30 Centro Sur, Querétaro, Querétaro, C.P. 76090, MÉXICO

TEL: 52 (01-442) 340-8018, 340-8019 and 340-8020

FAX: 52 (01-442) 340-8017

Aguascalientes Office / M³ Solution Center

Av. Aguascalientes No. 622, Local 15 Centro Comercial El Cilindro Fracc. Pulgas Pandas Norte, C.P. 20138, Aguascalientes, Ags. MÉXICO

TEL: 52 (01-449) 174-4140 and 174-4143

Irapuato Office / M³ Solution Center

Boulevard a Villas de Irapuato No. 1460 L.1 Col. Ejido Irapuato C.P. 36643 Irapuato, Gto., MÉXICO

TEL: 52 (01-462) 144-1200 and 144-1400

Revision History

Date of publication	No. of revisions	Revision details
July 1, 2017	Ninth edition	Completely revised
December 1, 2020	Tenth edition	Revision due to changes of the harmonized European standards, etc.

Mitutoyo Corporation

20-1, Sakado, 1-Chome, Takatsu-ku, Kawasaki-shi, Kanagawa 213-8533, Japan
Home page: http://www.mitutoyo.co.jp/global.html

Printed in Japan

No. 99MBC058B