



Compact Display Unit for Linear Gage EJ Counter

EJ-102N

EJ-102NE



User's Manual - Instructions for use -

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

This English language version of the document contains the original instructions.

No. 99MBC139A

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■ Product names and model numbers covered in this document

Product name	Model number
Compact Display Unit for Linear Gage EJ Counter	EJ-102N
	EJ-102NE


■ Notice regarding this document

- Mitutoyo Corporation assumes no responsibilities for any damage to the product, caused by its use not conforming to the procedure described in this document.
- In the event of loss or damage to this document, immediately contact a Mitutoyo sales office or your dealer.
- Read this document thoroughly before operating the product. In particular, be sure to fully understand "Safety Precautions" and "Precautions for Use" in the preface.
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Conventions and Wording Used in This Document

■ Safety reminder conventions and wording warning against potential hazards

 WARNING	Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
NOTICE	Indicates a potentially hazardous situation which, if not avoided, may result in property damage.

■ Conventions indicating prohibited and mandatory actions


	Indicates concrete information about prohibited actions.
	Indicates concrete information about mandatory actions.
	Indicates that grounding needs to be implemented.

■ Conventions and wording indicating referential information or reference location

Tips Indicates further information and details relevant for the operating methods and procedures that are explained in that section.



Indicates reference location if there is information that should be referred to in this document or an extraneous User's Manual.

E.g.: For details about XX, see  "1.4 Part Names" on page 5.

Safety Precautions

Read these “Safety Precautions” thoroughly before operating the product to use it properly. These safety precautions include such information as to prevent injury to the operator and other persons, damage to property and product defects. Be sure to observe these precautions carefully.

■ Precautions for this product

WARNING



Do not 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

■ Use and handling of the product

- This product is a measuring instrument.



Do not use it for any purposes other than measuring.

- This product is for industrial usage.



Do not use this product for purposes other than for industrial usage.

- The product is a precision instrument.



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

■ Environment for placement



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.
- **Dust**
Dust in the installation site negatively affects the electrical components. 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 unit, 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 and humidity**
Avoid using the product in any place that is subject to sudden changes in temperature or humidity.

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

- Where noise is generated due to static electricity
- Where the electric field strength is high
- Where power wires and motor lines pass nearby
- Where there is risk of direct contact with materials such as chips, cutting fluids or water
- Where there is risk of exposure to radiation
- Where there is the risk of exposure to corrosive gas

■ Maintenance



Do not use organic solvents such as thinner or benzene. Gently wipe dirt off of the product with a soft, tightly woven cloth.

■ Power supply



- When using the optional AC adapter, do not connect it to any power line that carries high current, such as lines used with machine tools or large CNC measuring instruments; use a separate power line instead.
- When using a commercial power source, use a power cable with a length of less than 30 m, and make a one-to-one connection between the instrument and the power source.



- Use a power source that is rated for 10 V–27 V and an output current of 3 A or greater. Never use this power source with other electric equipment that runs at a high voltage and/or large current.
- Avoid outdoor wiring.



- Be sure to connect this product to ground.
- Connect the AC adapter to a grounded three-slot outlet.

Electromagnetic Compatibility (EMC)

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

This product is an industrial product, and is not intended to be used in residential environment. If this product is used in residential environment, this product may cause electromagnetic interference with other instruments. In such a case, it is required to take appropriate measures for preventing such electromagnetic interference.

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 Export Trade Control Order or under Category 16 of Appended Table of Foreign Exchange Control Order, based on 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-providing of the technology (including Programs), you shall 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, List-Control Technology (including Programs) under Category 1 - 15 of Appended Table 1 of Export Trade Control Order or under Category 1 - 15 of 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-providing of the technology (including Programs), you shall observe the regulations of your country. Please contact Mitutoyo in advance.

Notes on Export to EU Member Countries

When you intend exporting this product to any of the EU member countries, it may be required to provide User's Manual(s) in English and EU Declaration of Conformity in English (under certain circumstances, User's Manual(s) 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 Products outside the European Union and Other European Countries

Please follow the official instruction in each community and country.

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

This product meets China RoHS requirements. See the table below.

产品中有害物质的名称及含量

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




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另外,此期限不同于质量/功能的保证期限。

Warranty

This product has been manufactured under strict quality management, but should it develop problems within one year of the date of purchase in normal use, repair shall be performed free of charge. Please contact the agent where you purchased the product or Mitutoyo sales representative ( "SERVICE NETWORK" on page App-1).

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 those designated or permitted by Mitutoyo
- Failure or damage owing to use in ultra-hazardous activities

This warranty is effective only where the product 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 responsibility for all results due to the selection of this product to achieve your intended results.

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The foregoing limitations shall apply even if the above-stated warranty fails of its essential purpose. 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, document map

The position of this document and its relationship to other product documentation are as follows.

● Counter manual

EJ Counter User's Manual
(Simplified Version)

This is the simplified version of the EJ Counter User's Manual.

EJ Counter User's Manual
(This Document)

Covers EJ Counter topics such as handling precautions, operating procedures, specifications and troubleshooting.

● Interface Unit manual

Interface Unit User's Manual
(Simplified Version)

This is the simplified version of the Interface Unit User's Manual.

Interface Unit USB
User's Manual

Covers handling precautions, operating procedures, specifications, troubleshooting and so forth for Interface Unit which is connected to the EJ Counter for use.

Interface Unit CC-Link
User's Manual

(Not included with product. Please download the manual from Mitutoyo website.)

● Linear Gage manual

LG100
User's Manual

Covers installation procedures, specifications, maintenance and so forth for Linear Gages that can be connected to EJ Counters.

LGK
User's Manual

Select and purchase Linear Gages according to your application.

LGB
User's Manual

LG
User's Manual

■ Intended readers and purpose of this document

● Intended readers

This document is intended for first-time users of EJ Counters.

● Purpose

The purpose of this document is to help you understand operation, functions, procedures for use and care of the product.

■ How to read this document

2 Setup

2.1.2 Linking Multiple EJ Counters

Up to eight EJ Counters can be linked together.
The optional interface units can also be linked together.

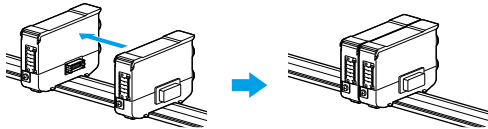
1 Attach EJ Counters to the DIN rail one at a time.

Tips
For details, see ["2.1.1 DIN Rail Attachment / Removal"](#) on page 9.

2 Remove the protective cover from the counter linkage connectors of EJ Counters to be linked together.

NOTICE
Leave the protective covers in place on EJ Counters that are not to be linked. Leaving the connectors uncovered could result in introduction of noise, accumulation of contaminants on the terminals, or damage to the product.

3 Link EJ Counters together.
Slide the EJ Counter to be connected along the rail so that the counter linkage connector (female) is firmly mated with the counter linkage connector (male) on the other counter.



NOTICE
Do not link more than eight EJ Counters together. Failure to observe this precaution may result in damage.

Tips
When sliding EJ Counters along the DIN rail, move them slowly.

10 No. 99MBC139A

Indicates an operating procedure to be performed or its outline.

Indicates reference to some other document or section.

Indicates safety information.

Indicates supplementary information.

■ Brackets, quotation marks and numbers (1)

The meanings of brackets, quotation marks and numbers to be used in this document are as follows.

(): Round brackets	Represent a paraphrase of an immediately preceding phrase or a supplementary explanation.
" ": Double quotation marks	Represent a highlighted phrase. They also indicate an index where information to be referenced is described.
[]: Square brackets	Indicates the name of an operation key.
1, 2, 3 ...	Indicates the order and the contents of tasks.

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1 Overview

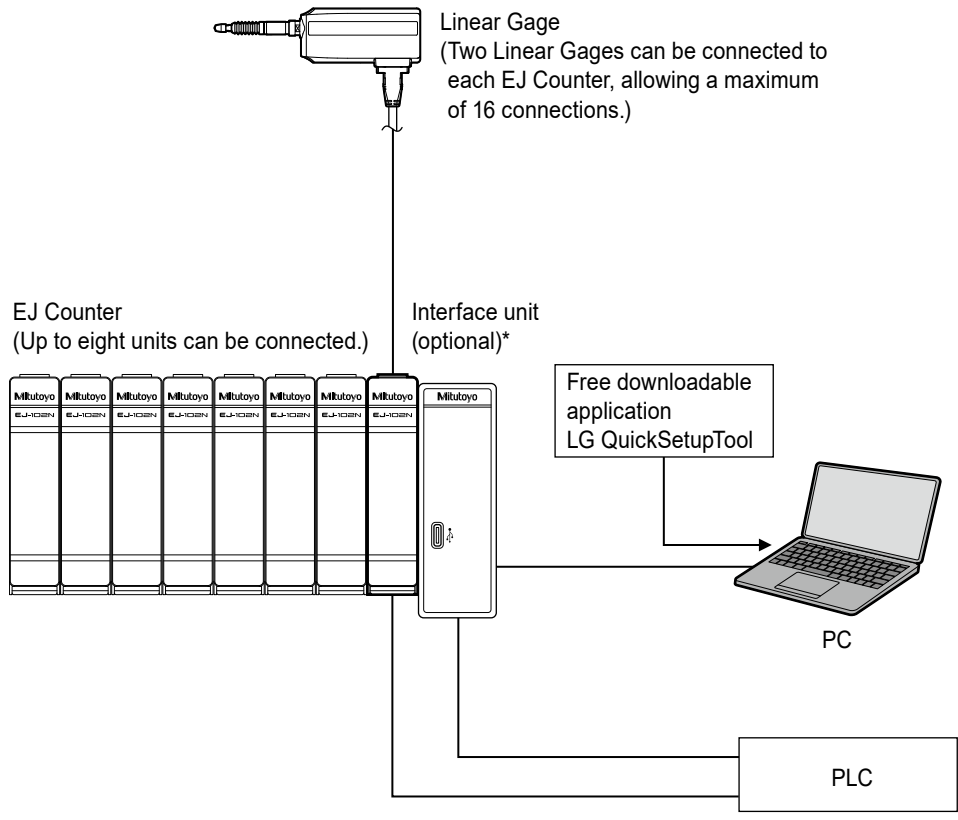
This section describes the features and part names of the EJ Counter.

1.1 Main Functions and Features

EJ Counter is a compact display unit for use with Linear Gages.

- It can be connected to the Linear Gages which support the differential square wave output (regardless of whether such gages have an origin point mark).
- Compact in size, the counter is attached by DIN rails, helping to conserve space.
- A single counter can be connected to two Linear Gages. Further, up to eight EJ Counters can be linked together, allowing connection to up to 16 Linear Gages.
- The counter provides functions such as tolerance judgment, peak hold, and display of 2-axes sum/difference calculation between two of the same connected counters I/O output of tolerance judgment is also possible.
- The counter can be connected to a PC or PLC (programmable logic controller) through the optional interface unit, allowing output of measurement results. The interface unit also makes it possible to make various EJ Counter settings from a PC.

1.2 System Configuration



* Any of the following interface units can be connected.
USB Interface Unit (Part No. 21HZA149)
CC-Link Interface Unit (Part No. 21HZA186)

- Tips**
- For details on Linear Gages that can be connected to this product, see "1.3 Supported Linear Gages" on page 3.
 - Select and purchase Linear Gages according to your application.
 - The interface unit is optional.
 - PCs and/or PLCs must be provided by the customer.

1.3 Supported Linear Gages


Linear Gages compatible with EJ Counter are as follows.

■ Linear Gages with 10-pin connector

Code No.	Model No.	Specifications		
		Type	Resolution	Stroke
542-190	LG100-110	Standard/with origin	0.001 mm (1 μm)	10 mm
542-191	LG100-0510		0.0005 mm (0.5 μm)	
542-192	LG100-0110		0.0001 mm (0.1 μm)	
542-193	LG100-125		0.001 mm (1 μm)	25 mm
542-194	LG100-0525		0.0005 mm (0.5 μm)	
542-195	LG100-0125		0.0001 mm (0.1 μm)	
542-196	LG100-150		0.001 mm (1 μm)	50 mm
542-197	LG100-0550		0.0005 mm (0.5 μm)	

■ Linear Gages with 8-pin connector



Tips

- An optional adapter cable (Part No. 21HZA194) is required for connection. For adapter cable external dimensions, see  "6.3 Options" on page 58.
- Connection to Linear Gages other than those listed below is possible as long as they support differential square wave output (optional adapter cable required).

Code No.	Model No.	Specifications		
		Type	Resolution	Stroke
542-164	LGF-110ZL-B	Standard/with origin	0.001 mm (1 μm)	10 mm
542-165	LGF-125ZL-B			25 mm
542-166	LGF-150ZL-B			50 mm
542-174	LGF-0510ZL-B		0.0005 mm (0.5 μm)	10 mm
542-175	LGF-0525ZL-B			25 mm
542-176	LGF-0550ZL-B			50 mm

■ Linear Gages with 6-pin connector

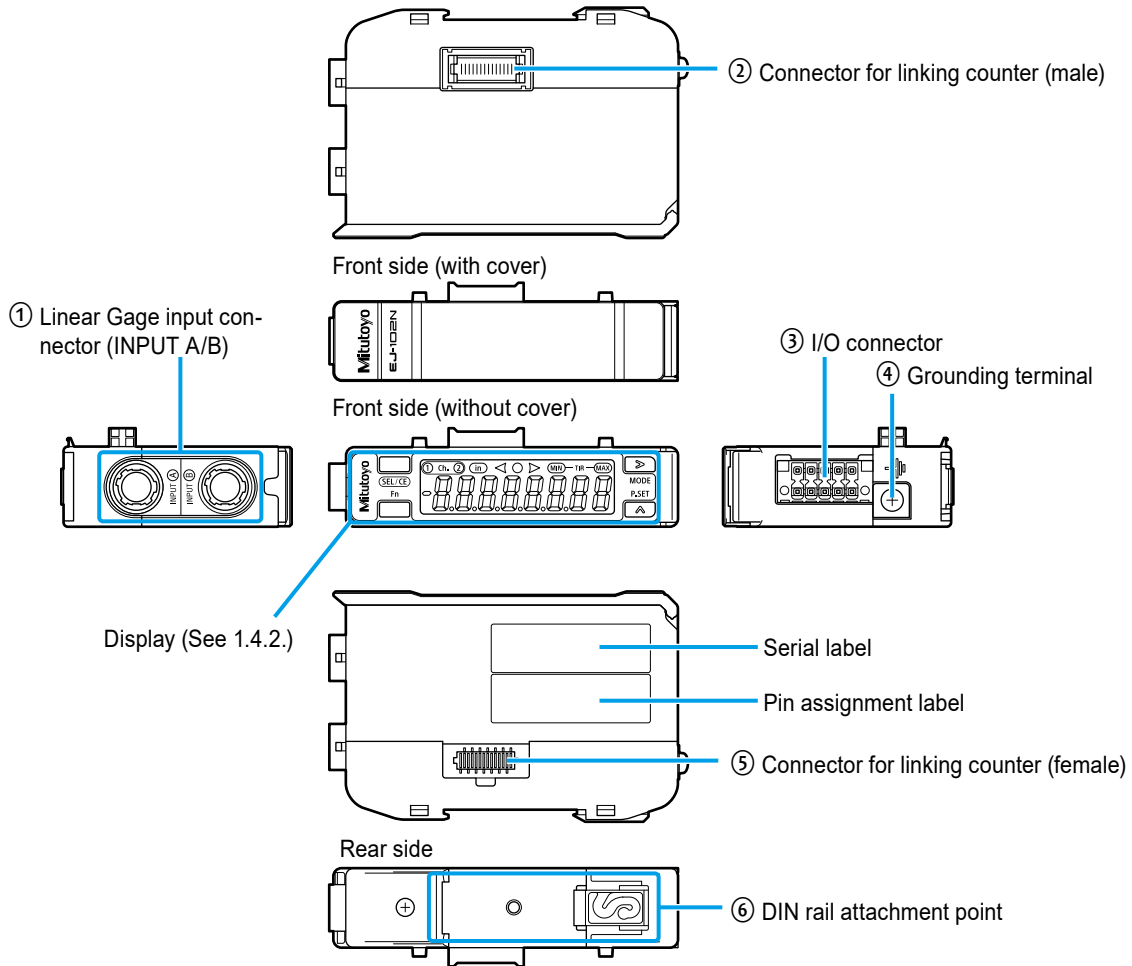
Tips

- An optional adapter cable (Part No. 21HZA193) is required for connection. For adapter cable external dimensions, see  "6.3 Options" on page 58.
- Connection to Linear Gages other than those listed below is possible as long as they support differential square wave output (optional adapter cable required).
- When using this product, please use with a DC power noise filter. For details, see  "2.3.2 DC Power Supply Connection" on page 16.

Code No.	Model No.	Specifications			
		Type	Resolution	Stroke	Notes
542-161	LGF-110L-B	Standard	0.001 mm (1 μm)	10 mm	
542-162	LGF-125L-B			25 mm	
542-163	LGF-150L-B			50 mm	
542-171	LGF-0510L-B		0.0005 mm (0.5 μm)	10 mm	
542-172	LGF-0525L-B			25 mm	
542-173	LGF-0550L-B			50 mm	
542-181	LGF-0110L-B		0.0001 mm (0.1 μm)	10 mm	Must be connected through a DC power noise filter.
542-182	LGF-0125L-B			25 mm	
542-156	LGK-110		Slim (ø12)	0.001 mm (1 μm)	10 mm
542-157	LGK-0510	0.0005 mm (0.5 μm)			
542-158	LGK-0110	0.0001 mm (0.1 μm)			
542-204	LGB-105L	Slim (ø8)	0.001 mm (1 μm)	5 mm	
542-222	LGB-110			10 mm	High precision
542-222H	LGB-110H				Low measuring force
542-224	LGB-110-1				Air driven
542-230	LGB-110AR				
542-246	LGB2-0105L	Slim (ø9.52/8)	0.0001 mm (0.1 μm)	5 mm	
542-244	LGB2-105L		0.001 mm (1 μm)	10 mm	High precision
542-262	LGB2-110				Low measuring force
542-262H	LGB2-110H				Air driven
542-264	LGB2-110-1				
542-270	LGB2-110AR				
542-312	LG-01100	Long stroke	0.0001 mm (0.1 μm)	100 mm	Low measuring force
542-316	LG-01100C				With rubber cap
542-314	LG-01100P				
542-332	LG-1100		0.001 mm (1 μm)	Low measuring force	
542-336	LG-1100C			With rubber cap	
542-334	LG-1100P				

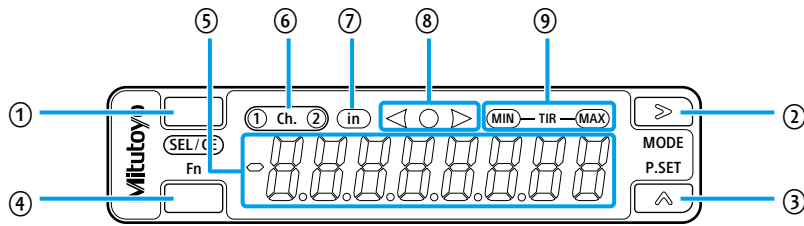
1.4 Part Names

1.4.1 Main Unit



No.	Name	Description
①	Linear Gage input connector (INPUT A/B)	Linear Gages can be connected to each of inputs A and B. The Linear Gage connected to INPUT A is referred to as the A-axis, and that connected to INPUT B as the B-axis.
②	Connector for linking counter (male)	Allows connection to another EJ Counter or optional interface unit.
③	I/O connector	For connection to the power supply or external equipment using the provided connector plug.
④	Grounding terminal	For connection to ground using the provided ground lead and ground plate.
⑤	Connector for linking counter (female)	Allows connection to another EJ Counter or terminal resistance unit. Tips A terminal resistance unit is provided with the optional interface unit.
⑥	DIN rail attachment point	Used for attaching the counter to a DIN rail.

1.4.2 Display



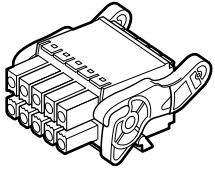

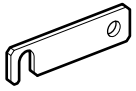

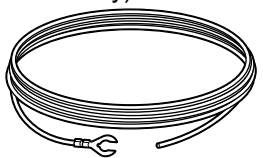

■ Operation key

No.	Name	Description
①	[SEL/CE] key	Used for switching channels and moving between items when making various settings. Cancels errors when pressed together with the [Fn] key. Tips For details about the A-axis, B-axis and channels, see "■ Advanced parameters" on page 34.
②	[MODE] (>) key	Used for peak mode selection and for moving between digits when making various settings. When pressed together with the [Fn] key, enters the parameter setting screen.
③	[P.SET] (^) key	Used for setting preset values. Clears preset or peak values when pressed together with the [Fn] key. When setting preset / tolerance or parameter values, increases the value of the selected digit.
④	[Fn] key	Used to start and end setting of preset/tolerance values.


■ Numeric and indicator display screen

No.	Name	Description
⑤	Numeric display	Displays numeric values.
⑥	Displays the channel (Ch.).	The selected channel (Ch.) lights. Content of individual channel (Ch.) display varies according to the setting of Parameter Number 03. Tips For details about Parameter Number 03, see "■ Advanced parameters" on page 34.
⑦	Unit display (EJ-102NE only)	The LED lights when display in inches is selected. The LED goes out when display in mm is selected.
⑧	Tolerance indicator	Indicates the result of tolerance judgment. is displayed when an error occurs. Tips For details about the tolerance judgment display, see "3.2.4 Tolerance Judgment" on page 26.
⑨	Peak indicators	The LEDs go on or off according to the peak mode selected. When off: The current value is displayed. When only MAX is lit: The maximum value is displayed. When only MIN is lit: The minimum value is displayed. When both MAX and MIN are lit: The run-out width (maximum value - minimum value) is displayed.

1.5 Standard Accessories

Name	Quantity	Description
Connector plug (Phoenix Contact connector DFMC 1,5/ 5-ST-3,5-LR - 1790519) 	1	Power supply and I/O signal lines are wired to this plug, which is plugged into the connector on the main unit. Tips For details, see  "2.3.3 Connecting the AC Adapter (Optional)" on page 18.
Ground plate 	1	When linking EJ counters together, use this plate to make connection between ground terminals of adjacent EJ counter and reduce ground lead wiring. Tips For details, see  "2.3.1 Ground Connection" on page 14.
Ground Lead (Wire number: AWG18 x 4 m, Sheath: Gray) 	1	Use this wire to connect the EJ Counter to customer-provided ground. Cut to required length for use. Tips For details, see  "2.3.1 Ground Connection" on page 14.
User's Manual	1	99MBC140B
WEEE User's Manual	1	
Warranty	1	

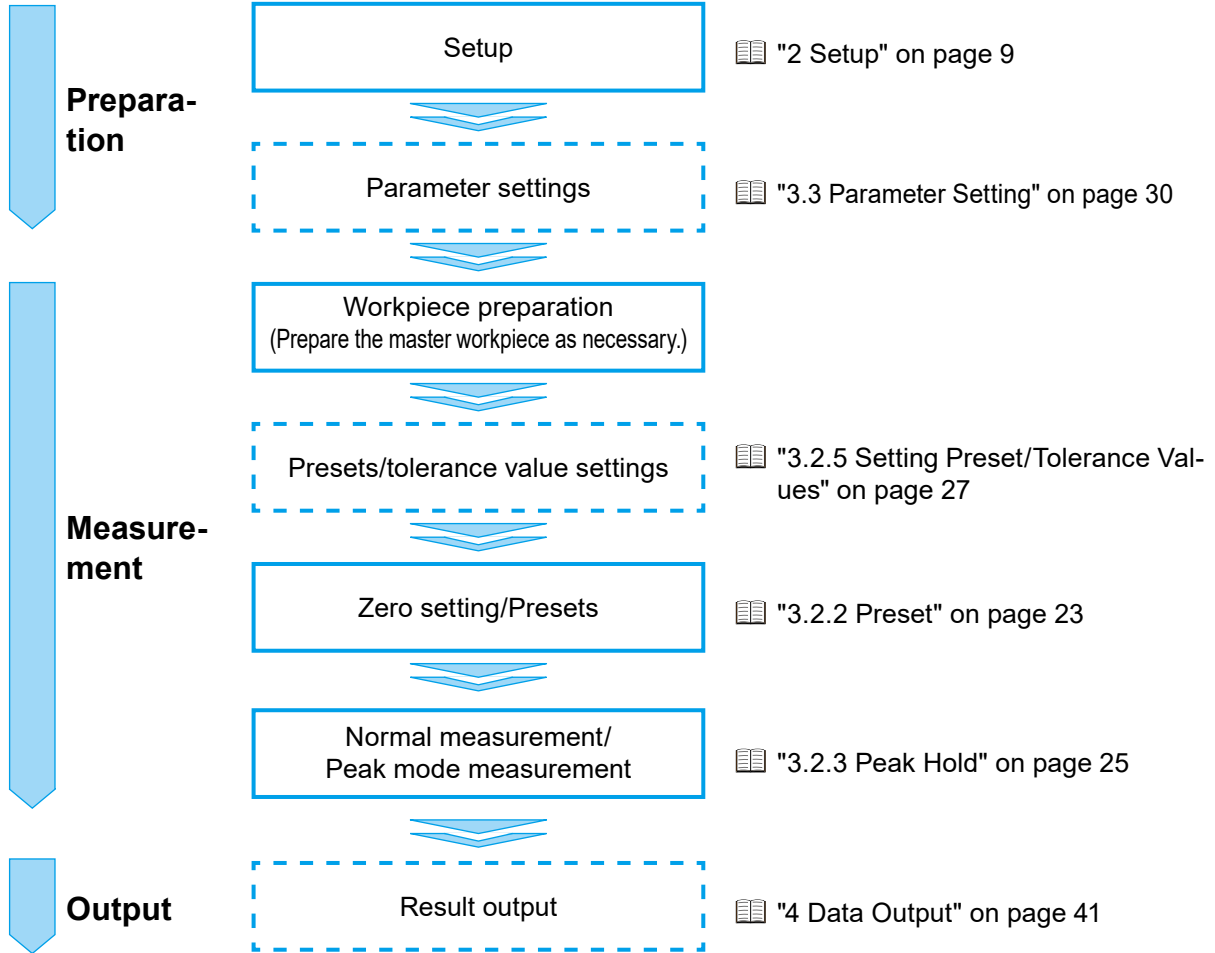
Tips

- The AC adapter, AC cable and DC plug are optional.
- For details about options, see  "6.3 Options" on page 58.

1.6 Operation Flow

The basic flow of operation is explained below.

Be sure to perform operations enclosed by solid lines. Perform operations enclosed by dashed lines as necessary.



2 Setup

2.1 Mounting

2.1.1 DIN Rail Attachment / Removal

The EJ Counter is attached to a DIN rail for use.



After first removing Linear Gages and connector plugs, the EJ Counter is attached to or removed from the DIN rail a unit at a time.

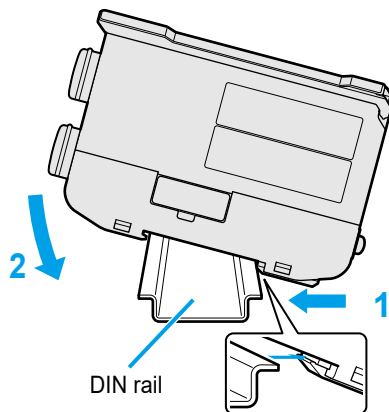
Tips

A DIN rail must be provided by the customer.

Suitable DIN rail type names (IEC 60715): TH35-7.5Al, TH35-7.5Fe, TH35-15Fe

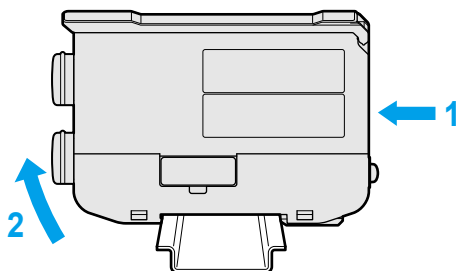
■ Attachment

Press the clip (gray) on the rear side of the EJ Counter onto the DIN rail, and then hook the clip on the opposite side onto the DIN rail.



■ Removal

Pressing the EJ Counter in the direction indicated by arrow 1, raise the clip on the opposite side so that it comes clear of the rail.



2.1.2 Linking Multiple EJ Counters

Up to eight EJ Counters can be linked together.
The optional interface units can also be linked together.


- 1 Remove the protective cover from the counter linkage connectors of EJ Counters to be linked together.**

NOTICE

Leave the protective covers in place on EJ Counters that are not to be linked. Leaving the connectors uncovered could result in introduction of noise, accumulation of contaminants on the terminals, or damage to the product.

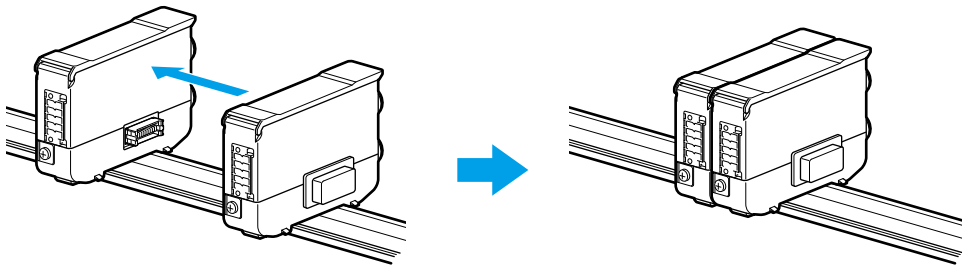
- 2 Attach EJ Counters to the DIN rail one at a time.**

Tips

For details, see  "2.1.1 DIN Rail Attachment / Removal" on page 9.

- 3 Link EJ Counters together.**

Slide the EJ Counter to be connected along the rail so that the counter linkage connector (female) is firmly mated with the counter linkage connector (male) on the other counter.



NOTICE

Do not link more than eight EJ Counters together. Failure to observe this precaution may result in damage.

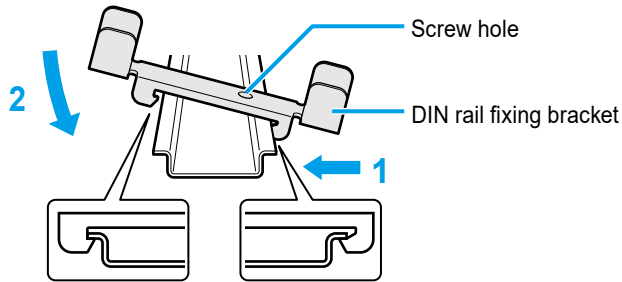
Tips

When sliding EJ Counters along the DIN rail, move them slowly.

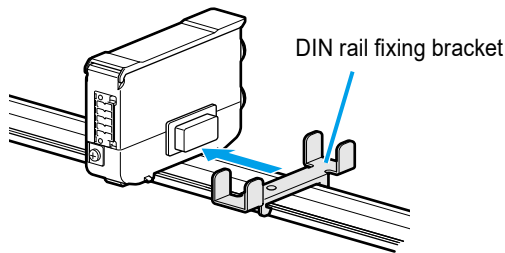
2.1.3 Attaching the DIN Rail Fixing Bracket

EJ Counters attached to the DIN rail can be fastened in place using the optional DIN rail fixing bracket (Part No. 21HZA157).

- 1** Hook the clip that is closer to the screw hole in the fixing bracket onto the DIN rail, then press toward the opposite side and hook the other clip onto the rail.



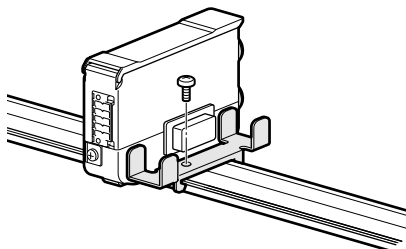
- 2** Slide the fixing bracket along the DIN rail to where it comes in contact with the EJ Counter.



- 3** Fasten the fixing bracket in place by threading the screw provided with the fixing bracket into the screw hole in the bracket, and then tightening the screw so that it presses against the DIN rail, immobilizing the fixing bracket.

Tips

The screw provided with the bracket is suitable for fastening to a TH35-7.5 rail. A different screw (M4) must be used for fastening to a TH35-15 rail.



- 4** Repeat steps **1** through **3** to attach a fixing bracket to the opposite side of the EJ Counter.

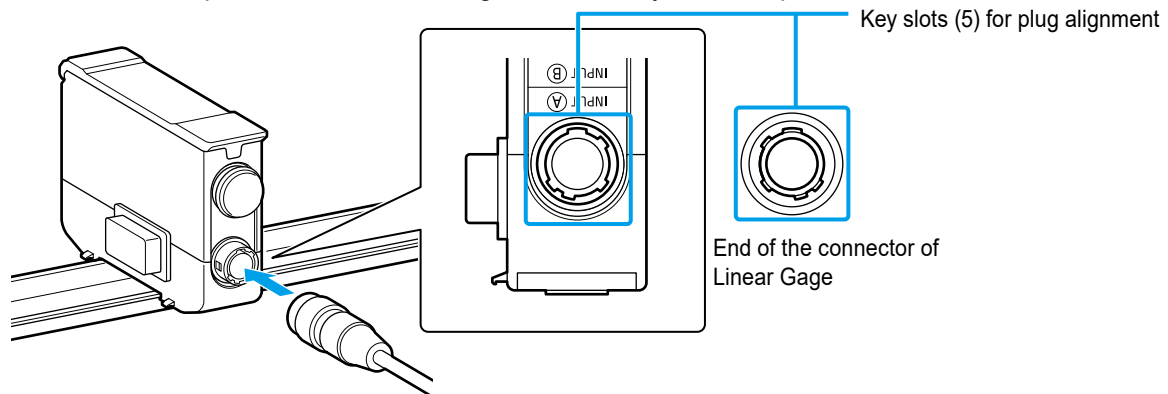
2.2 Linear Gage Connection

Connecting a Linear Gage to the EJ Counter.

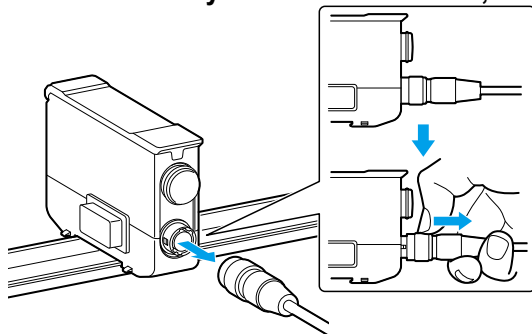
1 Remove the protective cover from the EJ Counter's Linear Gage connector.

2 Plug the connector on the Linear Gage into the Linear Gage connector on the EJ Counter.

Align the key on the connector of the Linear Gage with the slot in the Linear Gage connector on the EJ Counter, and then press the connectors together until they click into place.



3 When disconnecting a Linear Gage, slide the lock cover on the connector of the Linear Gage in the direction away from the EJ Counter, and then pull to disconnect the connectors.



NOTICE

- Do not forcibly pull the connectors apart, as doing so could destroy the Linear Gage.
- When connecting only a single Linear Gage, leave the protective cover in place on the connector that is not used. Leaving the connectors uncovered could result in introduction of noise, accumulation of contaminants on the terminals, or damage to the EJ Counter.
- Before connecting or disconnecting the Linear Gage, be sure to shut off the power. Failure to observe this precaution may result in damage.
- Fasten the Linear Gage so that it does not put any strain on the EJ Counter. See the Linear Gage User's Manual for the connection procedure.

Tips

- When connecting only a single Linear Gage, set Parameter Number 03 to 6 or 7. For details about Parameter Number 03, see "■ Advanced parameters" on page 34.
- For details on Linear Gages that can be connected to this product, see "1.3 Supported Linear Gages" on page 3.

2.3 Power Supply Connection

This section describes the power supply connection procedure.

NOTICE



Never use a power source that is shared with other equipment that draws high power. Incorrect operation or damage may result.

Tips

When using multiple EJ Counters linked together, connection of power to one EJ Counter also supplies power to the other linked counters.

2.3.1 Ground Connection

This section describes the procedure for making ground connections using the provided ground lead and ground plate.

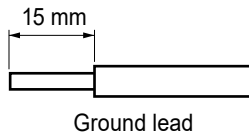


Be sure to connect this product to ground before connecting it to the power supply. Failure to ground the product will make it susceptible to electrical noise.

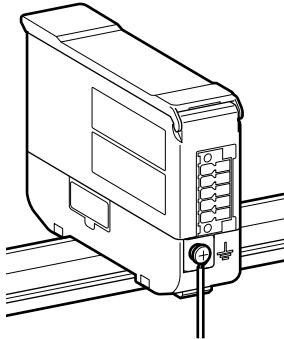
Tips

When using multiple EJ Counters that are linked together, connect the ground lead to just one EJ Counter, then share the ground with other EJ Counters using ground plates.

- 1 Strip about 15 mm of the sheath from the end of the ground lead opposite from the end with the Y lug.



- 2 Loosen the ground terminal screw on the counter and wrap the stripped end of the ground lead around the screw.
- 3 Tighten the ground terminal screw to secure the ground lead.



- 4 Connect the Y lug on the other end of the ground lead to a suitable ground.

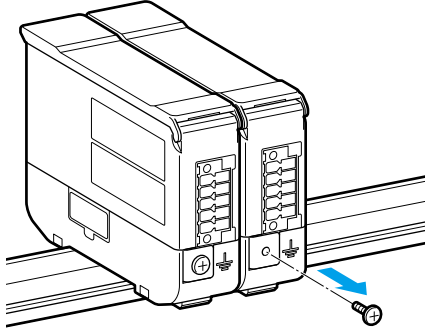
Tips

- The Y lug can be fastened with screw of about M5 size.
- If the ground lead is too long, it may be shorted to a length that suits the customer's circumstances.

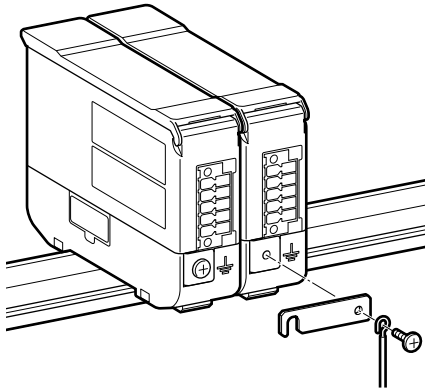
■ When linking multiple EJ Counters together

When using multiple EJ Counters that are linked together, use ground plates to allow them to share a common grounding.

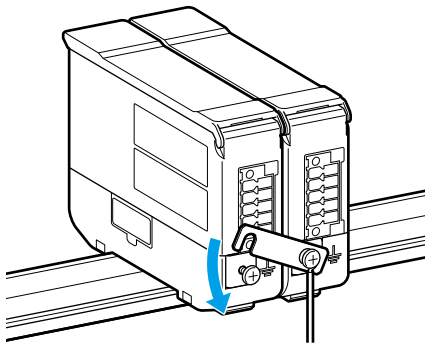
- 1** Remove the ground terminal screw.



- 2** Put the removed screw through the hole in the ground plate and loosely attach the ground plate to the ground terminal.



- 3** Loosen the ground terminal screw on the adjacent EJ Counter and hook the notch at the end of the ground plate over the screw.




- 4** Repeat steps **1** through **3** to attach ground plates to other linked EJ Counters.

- 5** Tighten the ground terminal screws on all of the EJ Counters.

2.3.2 DC Power Supply Connection

This section describes the procedure for DC power supply connection.

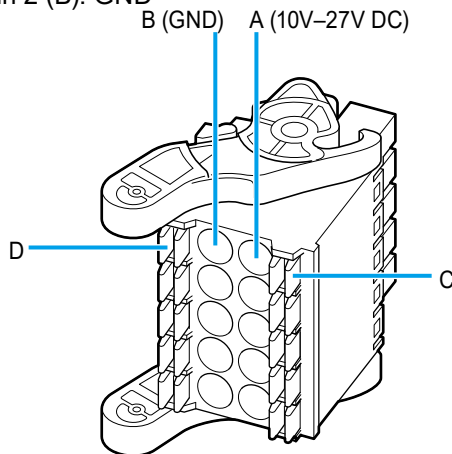
Tips

- Prepare a power supply capable of supplying 10 V DC–27 V DC (30 W).
- Never use a power source that is shared with other equipment that draws high power.
- When using this product connected to an LGF-series Linear Gage with resolution of 0.0001 mm (0.1 μm), please use with a DC power noise filter. (The noise filter used for testing by Mitutoyo is the Cosel ESP-06-472-D.) For applicable Linear Gages, see  "■ Linear Gages with 6-pin connector" on page 4.

1 Connect the power cable to the provided connector plug.

Pin 1 (A): 10 V–27 V DC

Pin 2 (B): GND



● When the cable is fitted with pin terminals

Push the pins all the way in to terminals A and B.

Tips

- Compatible pin terminals are those with conductive ferrule sleeves that are 10 mm in length. Recommended part: Phoenix Contact part number 3241129 AI 0,34-10 TQ
- Use a power cable with a length of less than 30 m, and make a one-to-one connection between the EJ Counter and an insulated power supply.
- The EJ Counter internal ground is connected to ground internally.

● When the cable ends in stranded wire

Slip the wire tips all the way into terminals A and B while using a tool such as a flat-head precision screwdriver to press connector plug buttons C and D, and then release the buttons.

Tug on the cable to make sure that the stranded wires are securely fastened to the connector plug.

● Disconnecting the cable

To disconnect the cable from the plug, pull out while pressing the buttons with a flat-head precision screwdriver or the like.

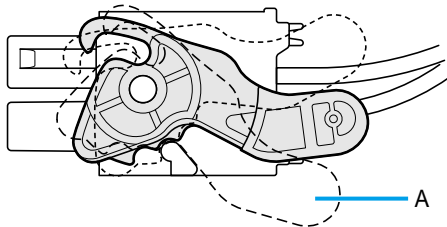
NOTICE

Forcibly pulling the connector plug out will result in damage to the connector or discontinuities in the cable.

2 Center the levers on both sides of the connector plug.

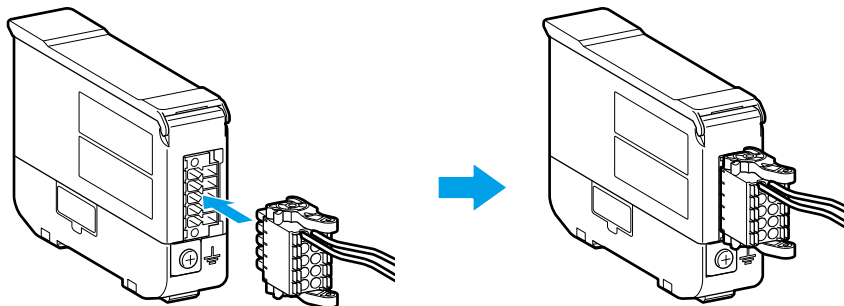
Tips

The levers have three discrete positions. If the levers are in the bottom-most position (A), it will be hard to plug the connector plug into the EJ Counter.



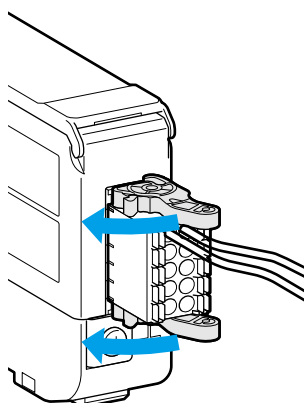
3 Plug the connector plug into the I/O connector on the EJ Counter.

Align the claws on the levers on the side of the connector plug with the holes on both sides of the I/O connector, and then plug the connector plug into the I/O connector on the EJ Counter. Push the connector plug in to where its claws engage with the holes on both sides of the I/O connector and the lever won't go any further.




NOTICE

When you need to unplug the connector plug, do so by operating the levers on both sides so that the claws disengage from the EJ Counter connector and then pulling the plug out of the connector on the EJ Counter (to the left as indicated in the figure below). Forcibly pulling the connector plug out may result in damage.



2.3.3 Connecting the AC Adapter (Optional)

This section describes the procedure for DC power supply connection using the following options.

- DC jack with pin terminals (Part No. 21HZA209)
- AC adapter (Part No. 357651)
- AC cable (Part Number varies according to destination country or region.)
For details, see  "6.3 Options" on page 58

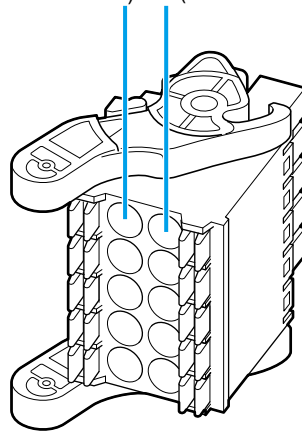
1 Connect the DC jack with pin terminals to the provided connector plug.

Push the pin terminal attached to the DC jack's red cable all the way in to terminal A, and the pin terminal connected to the black cable all the way into terminal B.

Tips

With the DC jack that is equipped with pin terminals, press the terminals directly into the holes.

B (Connect the terminal of the black cable.) A (Connect the terminal of the red cable.)



● Disconnecting the cable

To disconnect the cable from the plug, pull out while pressing the buttons with a flat-head precision screwdriver or the like.

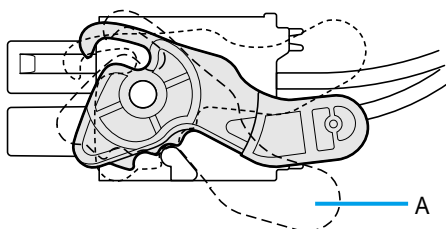
NOTICE

Forcibly pulling the connector plug out will result in damage to the connector or discontinuities in the cable.

2 Center the levers on both sides of the connector plug.

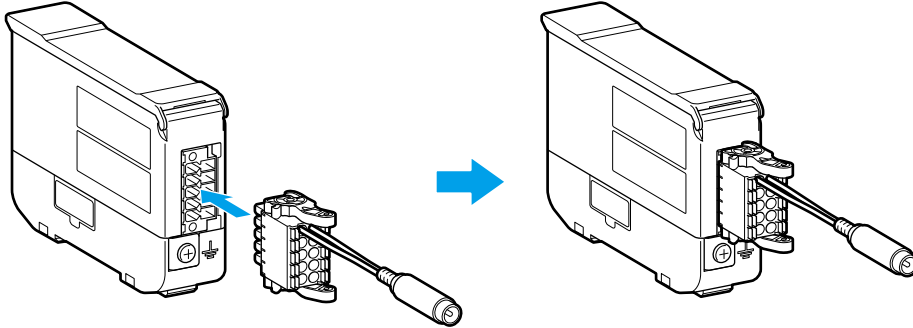
Tips

The levers have three discrete positions. If the levers are in the bottom-most position (A), it will be hard to plug the connector plug into the EJ Counter.



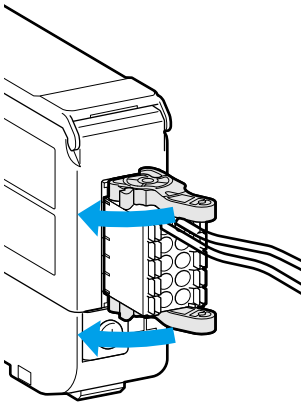
3 Plug the connector plug into the I/O connector on the EJ Counter.

Align the claws on the levers on the side of the connector plug with the holes on both sides of the I/O connector, and then plug the connector plug into the I/O connector on the EJ Counter. Push the connector plug in to where its claws engage with the holes on both sides of the I/O connector and the lever won't go any further.



NOTICE

When you need to unplug the connector plug, do so by operating the levers on both sides so that the claws disengage from the EJ Counter connector and then pulling the plug out of the connector on the EJ Counter (to the left as indicated in the figure below). Forcibly pulling the connector plug out will result in damage.

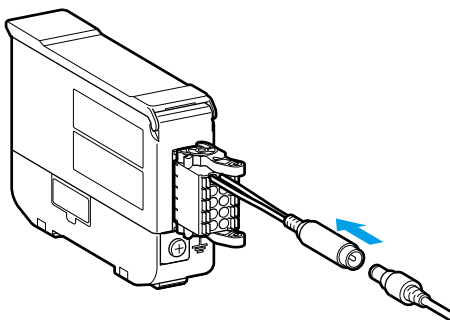


4 Connect the power cable to the AC adapter, and then plug the power plug into the outlet.

5 Connect the AC adapter to the DC jack with pin terminals.

Tips

Make sure that the AC adapter does not come loose from the DC jack with pin terminals during measurement.



MEMO

3 Operation Procedure

3.1 Power ON/OFF

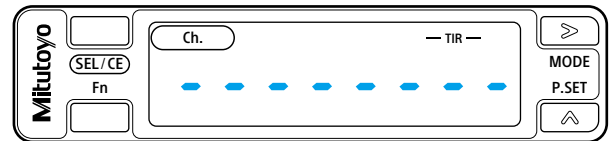
This product is not equipped with a power switch.

To power the product ON/OFF, either switch the power supply itself on/off, or connect/disconnect the power cable.

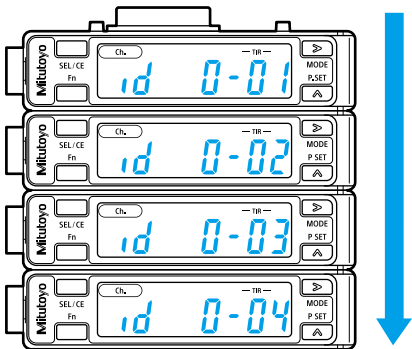
When the power goes on, an ID number is automatically assigned, and then the product enters the stand-by state.

Counting begins when the [SEL/CE] key is pressed while the product is in the stand-by state.

Counter stand-by state



Furthermore, when using multiple EJ Counters that are linked together, ID numbers are assigned in sequence from the EJ Counter that is at the top when counter displays are viewed with the characters oriented upright.



ID numbers are assigned sequentially (figure shows automatic ID number assignments).

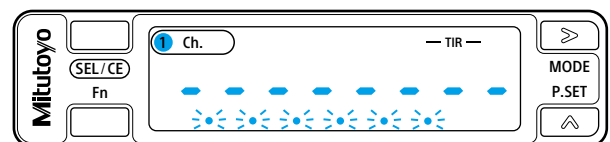
Tips

- ID numbers from 01 to 08 are assigned automatically. If arbitrary ID numbers (50 to 99) were set for Parameter Number 19 when the product was last powered on, those values are assigned instead.
- If numeric display is selected for Parameter Number 09 when the product was last powered on, counting starts immediately upon connection of INC model Linear Gages.

When Linear Gages with origin mark are connected, whether counting begins immediately at power-on or or is deferred pending origin detection depends on the setting made for Parameter Number 05.

- For details, see "3.3.2 List of Parameters" on page 32.

Origin detection wait state




3.2 Measurement Functions

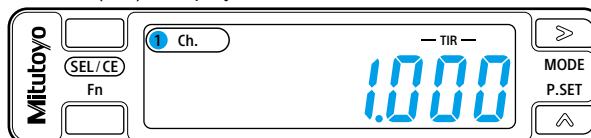
3.2.1 Switching the Display Channel (Ch.)

During count display screen display, the displayed channel (Ch.) changes each time the [SEL/CE] key is pressed.

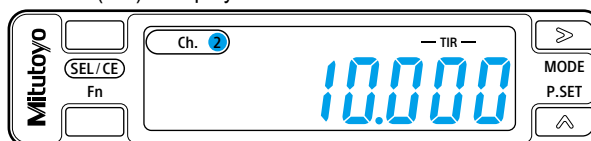
Tips

- The factory default is to display the A-axis count on Ch. 1 and the B-axis count on Ch. 2.
 - Content of individual channel (Ch.) displays can be changed by the setting of Parameter Number 03.
- For details about Parameter Number 03, see  "■ Advanced parameters" on page 34.

Channel (Ch.) 1 display




Channel (Ch.) 2 display



3.2.2 Preset


Preset replaces the current value with an arbitrary value (preset value).

Tips

- The factory default preset value is 0.
For details, see  "3.2.5 Setting Preset/Tolerance Values" on page 27.
- When making zero settings, do so after setting the preset value to 0.

■ Setting preset values

Tips


For details, see  "3.2.1 Switching the Display Channel (Ch.)" on page 22.

1 Display the channel for which you wish to set the preset value.

2 Set the peak mode to current value display.

Press the [MODE] (>) key so that the peak indicator (MIN/MAX) goes out.

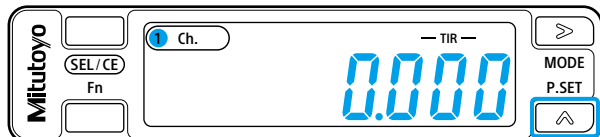
Tips

For details, see  "3.2.3 Peak Hold" on page 25.



3 Press the [P.SET] (^) key.


- » The current value is replaced with the preset value.
- » This clears the maximum and minimum values and the run-out width.



■ Returning to the count value that preceded preset


Tips

Return to the count value that preceded preset is only possible for the currently value display. When the maximum, minimum and run-out (difference between maximum and minimum) values are displayed, first return display to the current value display.

For details, see  "3.2.3 Peak Hold" on page 25.

1 Display the channel for which you wish to restore the count value that preceded preset.

Tips

For details, see  "3.2.1 Switching the Display Channel (Ch.)" on page 22.

2 Press and hold the [Fn] key, and then press the [P.SET] (^) key.

- » The preset is canceled and the preceding count value is restored.
- » This clears the maximum and minimum values and the run-out width.




3.2.3 Peak Hold

In addition to display of the current value, maximum/minimum values and run-out width (the difference between the maximum and minimum values) can be detected and displayed.

■ Switching the peak mode

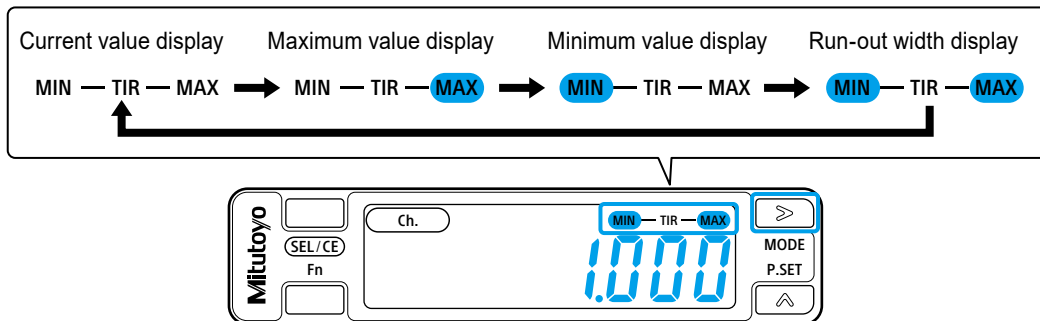
1 Display the channel for which you wish to switch the peak mode.

Tips

For details, see  "3.2.1 Switching the Display Channel (Ch.)" on page 22.

2 Switch the peak mode.


The peak mode changes each time you press the [MODE] (>) key.



■ Clearing the peak values

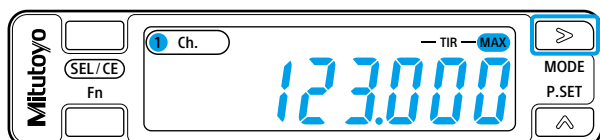
1 Display the channel for which you wish to clear the peak values.

Tips

For details, see  "3.2.1 Switching the Display Channel (Ch.)" on page 22.

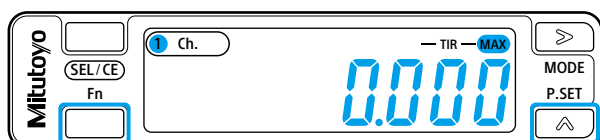
2 Switch the peak mode to maximum, minimum or run-out value display.

The peak mode changes each time you press the [MODE] (>) key.



3 Press and hold the [Fn] key, and then press the [P.SET] (^) key.

- » This clears the maximum and minimum values and the run-out width.



3.2.4 Tolerance Judgment

Tolerance judgment is performed when it is enabled in the parameter settings.

There are two types of tolerance judgment: 3-step tolerance judgment and 5-step tolerance judgment.

Tips

To perform tolerance judgment, first set Parameter Number 08 to 0 (for 3-step parameter judgment) or 1 (for 5-step parameter judgment), and then set the tolerance values.

For details, see "3.3 Parameter Setting" on page 30, "3.2.5 Setting Preset/Tolerance Values" on page 27

■ **3-step tolerance**

When S1 and S4 are set as tolerance values, 3-step tolerance judgment is performed as follows:

Judgment conditions	Tolerance indicator
Measurement result < S1	(L1)
S1 ≤ measurement result ≤ S4	(L3)
S4 < measurement result	(L5)
Error resulting in no measurement	

■ **5-step tolerance**

When S1, S2, S3 and S4 are set as tolerance values, 5-step tolerance judgment is performed as follows:

Judgment conditions	Tolerance indicator
Measurement result < S1	(L1)
S1 ≤ measurement result < S2	(L2)
S2 ≤ measurement result ≤ S3	(L3)
S3 < measurement result ≤ S4	(L4)
S4 < measurement result	(L5)
Error resulting in no measurement	

■ **Target of tolerance judgment**

The target of tolerance judgment differs according to peak mode.

Peak mode	Target of tolerance judgment
Current value display	Current value
Maximum value display	Maximum value
Minimum value display	Minimum value
Run-out width display	Run-out width

3.2.5 Setting Preset/Tolerance Values

Preset and tolerance values can be set for each channel.

Tips

- Preset value setting is not possible if speed display is set as the display mode by parameter setting.
- Tolerance value setting is not possible if no tolerance is set by parameter setting. The tolerance value settings are different for 3- and 5-step tolerance judgment. First you must select 3- or 5-step tolerance judgment in the parameter settings.

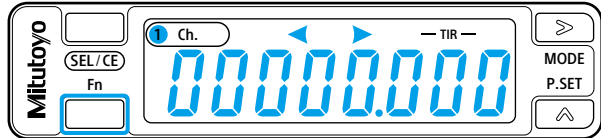
1 Display the channel for which you wish to set the preset and tolerance values.

Tips

For details, see "3.2.1 Switching the Display Channel (Ch.)" on page 22.

2 Press the [Fn] key.

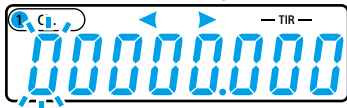
» Display enters the preset value setting screen.



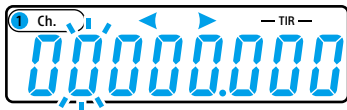
3 Set the preset value.

Using the [MODE] (>) key to move between digits, change the digit values using the [P.SET] (^) key. The current digit flashes to show that it is selected.

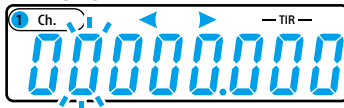
Movement between digits



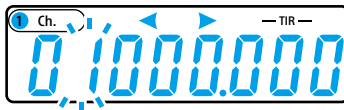
[MODE]
(>) key



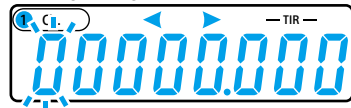
Changing numeric values



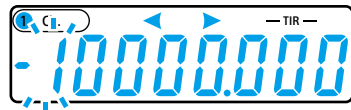
[P.SET]
(^) key



Setting a negative value



[P.SET]
(^) key



Tips

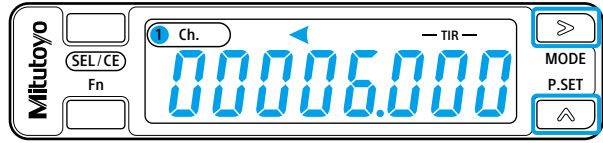
- While setting the preset values, is displayed by the tolerance indicator.
- If you wish to set a negative preset value, you can change the highest-order digit to a value with a minus sign. The peak mode changes in the sequence shown below each time you press the [P.SET] (^) key.
0→1→2→.....→9→-0→-1→-2→.....→-9→0
- The direction in which digit selection and number setting proceeds can be reversed by pressing the [MODE] (>) or [P.SET] (^) key together with the [Fn] key.
- You can omit steps **4** – **7** if you wish to finish after setting only the preset values.

4 Press the [SEL/CE] key.

» The preset value settings are applied.
» Display enters the tolerance value S1 setting screen.

5 Set tolerance value S1 (tolerance indicator display: ◀ ○ ▶).

Using the [MODE] (>) key to move between digits, change the digit values using the [P.SET] (^) key.



Tips

- If you wish to set a negative tolerance value, you can change the highest-order digit to a minus sign.
- The direction in which digit selection and number setting proceeds can be reversed by pressing the [MODE] (>) or [P.SET] (^) key together with the [Fn] key.

6 Press the [SEL/CE] key.

» Tolerance value S1 will be applied.

Setting 3-step tolerance



Setting 5-step tolerance



- » When setting 3-step tolerance values, display enters the tolerance value S4 (tolerance indicator display: ◀ ○ ▶) setting screen.
- » When setting 5-step tolerance values, display enters the tolerance value S2 (tolerance indicator display: ◀ ● ▶) setting screen.

Tips

The state of the tolerance indicator changes in the following sequence according to the tolerance value settings (S1, S2, S3 and S4).

Tolerance value		Tolerance indicator
3-step tolerance value setting	5-step tolerance value setting	
S1	S1	◀ ○ ▶
—	S2	◀ ● ▶
—	S3	◀ ● ▶
S4	S4	◀ ○ ▶

7 Repeat steps 5 to 6 to set tolerance value S4 (tolerance values S2, S3 and S4 when setting 5-step tolerance values).

Tips

Display returns to the preset value setting screen of step 2 when you press the [SEL/CE] key while in the tolerance value S4 setting screen.

8 Press the [Fn] key when done making settings.


» Display returns to the counter display screen.

Tips

- An error (Error 90) will occur if settings are made as follows:
With 3-step tolerance value settings: In any case other than $S1 \leq S4$
With 5-step tolerance value settings: In any case other than $S1 \leq S2 \leq S3 \leq S4$
- If this error occurs, press the [SEL/CE] key together with the [Fn] key to return to the preset value setting of step 2, and then do the setting over again.

9 Make new preset value settings as necessary.

Tips

For details, see  "3.2.2 Preset" on page 23.

3.3 Parameter Setting

You can set parameters to specify criteria such as the counter direction, display, and external output. Configure the settings as appropriate to your requirements.

Tips

- For details about basic parameters, see "■ Basic parameters" on page 32.
- For details about advanced parameters, see "■ Advanced parameters" on page 34.

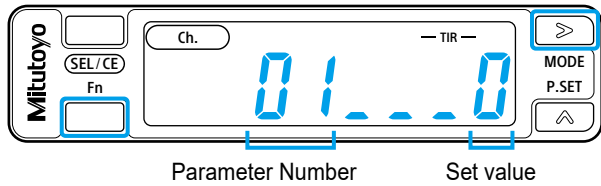
3.3.1 Setting Procedure

Parameter settings can be made either by operating the keys on the counter, or externally through the optional interface unit.

■ Setting parameters by key operation

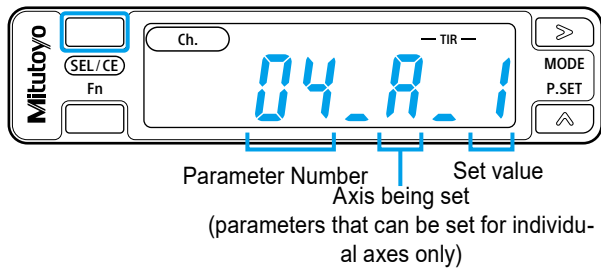
1 Press and hold the [Fn] key, and then press the [MODE] (>) key.

» Display enters the parameter setting screen.



2 Display the Parameter Number of the parameter to be set.

The Parameter Number changes each time you press the [SEL/CE] key.

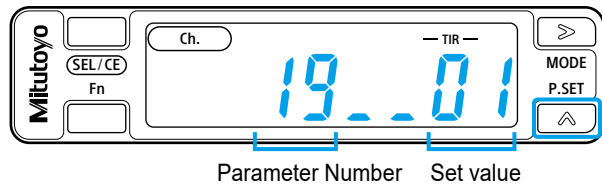


Tips

- With some parameters, values are set separately for the A-axis and B-axis. For parameters that are set separately for the A-axis and B-axis, the setting screen for the A-axis is displayed first, and then the setting screen for the B-axis appears upon pressing the [SEL/CE] key.
- You can cycle through the Parameter Numbers in reverse order by pressing the [SEL/CE] key together with the [Fn] key.

3 Change the set value.

The set value of the displayed Parameter Number changes each time you press the [P.SET] (^) key.

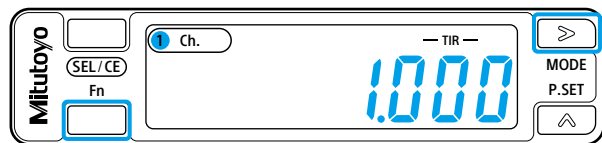


Tips

- For settings that have two digits, you can move between digits by pressing the [MODE] (>) key.
- The set value can be decreased by pressing the [P.SET] (^) key together with the [Fn] key.

4 Press and hold the [Fn] key, and then press the [MODE] (>) key.


- » The setting is applied.
- » Display enters the counter display screen.



■ Setting parameters by external input


The EJ Counter's parameters can also be changed by external input through the optional interface unit.

Tips

For details, see  the separate "Interface Unit User's Manual".

3.3.2 List of Parameters

Tips

- Entry of incorrect parameter settings will prevent correct measurement results or result in display of an error.
- In case operation fails or an error is displayed, see  "5 Troubleshooting" on page 51 to check setting contents and make the correct settings.

■ Basic parameters

Basic measurement parameters

Be sure to make these settings before starting measurement.

No.	Set value	Per-axis setting	Set value: Operation	Default value	Description
04	Linear Gage resolution (minimum reading)	✓	0: 0.005 mm (5 μ m), 0.0002 in 1: 0.001 mm (1 μ m), 0.00005 in 2: 0.0005 mm (0.5 μ m), 0.00002 in 3: 0.0001 mm (0.1 μ m), 0.000005 in	1	Set the minimum reading according to the resolution of the connected Linear Gage. Make settings individually for the A-axis and B-axis. Tips <ul style="list-style-type: none"> • Correct values will not be displayed if the settings do not match the resolution of the connected Linear Gage. • The unit for minimum reading is "in" when Parameter Number 22 is set to "1".
05	Origin detection function	N/A	0: Disabled 1: Enabled	0	Selects whether the origin function is enabled or disabled when a Linear Gage with an origin point mark is connected.
06	Counter direction	✓	0: + direction 1: - direction	0	Sets the relationship between the direction in which the numeric value changes and the direction of movement of the Linear Gage spindle. When 0 is set, the numeric value increases as the spindle moves toward top dead center. When 1 is set, the numeric value increases as the spindle moves toward bottom dead center. Make settings individually for the A-axis and B-axis.
07	Origin detection direction	✓	0: + direction 1: - direction	0	When a Linear Gage with an origin mark is connected, selects the direction of the spindle of the Linear Gage for origin detection. Make settings individually for the A-axis and B-axis.


3 Operation Procedure

No.	Set value	Per-axis setting	Set value: Operation	Default value	Description
22	Unit selection (EJ-102NE only)	N/A	0: mm (mm/s) 1: in (in/s)	0	<p>The unit for displayed values can be set to "mm" or "in".</p> <p>Tips</p> <ul style="list-style-type: none">• Changing this setting clears the preset and tolerance values.• The default value is not restored even if the parameters are re-initialized.• The resolution of the Linear Gage is fixed to "in".

■ Advanced parameters

The advanced parameters increase the scope of utility of the product. These parameters make it possible to make settings such as selection of the tolerance judgment function and I/O-related settings.

No.	Set value	Per-axis setting	Set value: Operation	Default value	Description																											
01	Key protect	N/A	0: No key protect 1: Key protect	0	Operation of keys other than those used for setting parameters can be disabled to prevent operation errors. Tips Operation by external input cannot be disabled.																											
02	Origin initialization (Origin clear)	N/A	0: Do not initialize 1: Initialize	0	When a Linear Gage with origin mark is connected, the origin can be initialized without cycling on the power.																											
03	Display mode selection	N/A	<table border="1"> <thead> <tr> <th>Set value</th> <th>Ch. 1</th> <th>Ch. 2</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>A-axis counter</td> <td>B-axis counter</td> </tr> <tr> <td>1</td> <td>Sum (A+B)</td> <td>B-axis counter</td> </tr> <tr> <td>2</td> <td>Difference (A-B)</td> <td>B-axis counter</td> </tr> <tr> <td>3</td> <td>A-axis counter</td> <td>Sum (A+ B)</td> </tr> <tr> <td>4</td> <td>A-axis counter</td> <td>Difference (A-B)</td> </tr> <tr> <td>5</td> <td>A-axis speed</td> <td>B-axis speed</td> </tr> <tr> <td>6</td> <td>A-axis counter</td> <td>A-axis speed</td> </tr> <tr> <td>7</td> <td>B-axis counter</td> <td>B-axis speed</td> </tr> </tbody> </table>	Set value	Ch. 1	Ch. 2	0	A-axis counter	B-axis counter	1	Sum (A+B)	B-axis counter	2	Difference (A-B)	B-axis counter	3	A-axis counter	Sum (A+ B)	4	A-axis counter	Difference (A-B)	5	A-axis speed	B-axis speed	6	A-axis counter	A-axis speed	7	B-axis counter	B-axis speed	0	Selects the values to be displayed on Ch. 1 and Ch. 2. Tips <ul style="list-style-type: none"> When using only the A-axis or the B-axis, set 6 or 7. If the displayed content is the same both before and after changing the setting, the tolerance value, preset value and preset state settings are maintained. In order to set the speed display, set the speed sampling cycle with Parameter Number 17. The speed display unit is mm/s (or in/s). The display of the lower 1 or 2 digits may be fixed depending on the speed sampling cycle. When the minimum value (MIN) is selected for Peak mode, the speed display indicates the maximum speed in the reverse direction. Because speed display is simplified, it is not suitable for feedback control.
Set value	Ch. 1	Ch. 2																														
0	A-axis counter	B-axis counter																														
1	Sum (A+B)	B-axis counter																														
2	Difference (A-B)	B-axis counter																														
3	A-axis counter	Sum (A+ B)																														
4	A-axis counter	Difference (A-B)																														
5	A-axis speed	B-axis speed																														
6	A-axis counter	A-axis speed																														
7	B-axis counter	B-axis speed																														

No.	Set value	Per-axis setting	Set value: Operation	Default value	Description
08	Tolerance judgment setting	N/A	0: 3-step tolerance judgment 1: 5-step tolerance judgment 2: No tolerance judgment	0	<p>Selects whether or not the tolerance judgment function is used.</p> <p>When the tolerance judgment is used, selects the number of steps of tolerance judgment.</p> <p>Tips Changing the settings does not clear tolerance values S1 to S4, which are maintained. However, the following adjustments may be made in the event that the following inconsistencies occur. When the setting is changed from "3-step tolerance" or "No tolerance" to "5-step tolerance": When $S2 < S1$ or $S4 < S2$, S2 is replaced with the value of S1. When $S3 < S1$ or $S4 < S3$, S3 is replaced with the value of S4.</p>
09	Display at startup	N/A	0: Counter stand-by 1: Counter displayed	0	<p>Selects whether to display the standby state or the counter display at startup.</p> <p>If you want to prevent counter error, set 1.</p> <p>Tips For details about screen display in the counter stand-by state, see  "3.1 Power ON/OFF" on page 21.</p>
10	ERR/ALLGO selection (I/O input/output setting)	N/A	0: Used as ERR 1: Used as ALLGO	0	<p>Selects whether to use the ERR or ALLGO signal as the external output function.</p> <p>Tips When multiple EJ Counters are linked together, all of them must have the same setting. Correct output will not be obtained if any of the EJ Counters has a different setting.</p>
11	Channel coupling selection (I/O input/output setting)	N/A	0: Do not couple channels 1: Couple channels	0	<p>Selects whether to couple the 1 or 2 SEL external input signal to the EJ Counter's display channel.</p> <p>Tips The [SEL/CE] key also works to couple the signal.</p>

No.	Set value	Per-axis setting	Set value: Operation	Default value	Description
12	Origin re-detection (I/O input/output setting)	N/A	0: Disabled 1: Only effective for the axis that is dependent on the channel selected by 1/2 SEL. 2: Axis dependent on Ch. 1 and axis dependent on Ch. 2.	0	When setting is enabled, origin re-detection goes on stand-by when the HOLD signal (I/O input) rises. If the HOLD signal rises again while original detection is on stand-by, origin re-detection is canceled. Tips This setting affects all axes related to the specified channel. However, this does not include the axis whose channel is displaying speed. Example: <ul style="list-style-type: none"> • If the channel displaying the sum (A+B) and difference (A-B) is selected, the A-axis and B-axis are affected. • If the channel displaying the B-axis coordinates is selected, the B-axis is affected
13	Preset by I/O input (I/O input setting)	N/A	0: Executed only for the channel selected by 1/2 SEL. 1: Executed for both channels.	0	Selects whether preset processing by external input is to be applied to just one channel or both channels.
14	Ch affected by the CLEAR signal (I/O input/output setting)	N/A	0: Executed only for the channel selected by 1/2 SEL. 1: Executed for both channels.	0	Selects whether peak clear and error clear are to be applied to just the specified channel or to both channels.
15	Peak value preset	N/A	0: Disabled 1: Enabled	0	Sets whether the peak value is to be set as the standard during peak mode maximum value display or minimum value display. Tips Peak value preset cannot be set during run-out display.
16	Smoothing	N/A	0: No smoothing (update at 5 ms intervals). 1: The average of 16 measurements is displayed (update at 80 ms intervals). 2: The average of 32 measurements is displayed (update at 160 ms intervals).	0	Counter values are averaged to minimize flicker of the lowest-order digit.
17	Speed sampling cycle	N/A	0: 10 ms 1: 50 ms 2: 100 ms	0	Selects the sampling interval for speed calculation.

No.	Set value	Per-axis setting	Set value: Operation	Default value	Description
18	Hide the lowest-order digit.	N/A	0: Display all digits. 1: Hide the lowest-order digit.	0	Hides the lowest-order digit. However, data output to the optional interface unit includes the lowest-order digit.
19	Arbitrary ID specification	N/A	00 to 49: ID numbers assigned automatically. 50 to 99: Arbitrary ID numbers assigned (ID numbers specified).	01	<p>Set the ID number required when an optional interface unit is connected. When arbitrary ID numbers are set in the range 50 to 99, the ID numbers set are assigned the next time the power is turned on.</p> <p>Tips</p> <ul style="list-style-type: none"> When 00 to 49 is set, the ID numbers can be used until the power is turned off, but are automatically assigned in the range from 01 to 08 the next time the power is turned on again. An error does not result if the same arbitrary ID is set for multiple EJ Counters that are linked together. If ID numbers are duplicated during use of the optional interface unit, a communications error results.
20	Power saving function	N/A	00: Display always lit 01 to 99: Display goes out after the specified interval passes (specify the interval length in minutes).	00	<p>Turning off display minimizes power consumption. Specify the time that elapses between when the last key is pressed until the display goes out (01 to 99 minutes). When display is turned off, press any key to turn it on again.</p> <p>Tips</p> <p>Counter operation for the axes, I/O input and output, and data communication through the optional interface unit continue even when the display is off.</p>
21	Parameter initialization	N/A	0: Do not initialize. 1: Initialize.	0	<p>When this parameter is set to 1, the settings for all parameters other than number 19 (the arbitrary ID) and number 22 (the unit setting) are reset to their default values. Further, the tolerance and preset values are cleared.</p> <p>Tips</p> <p>When you set 1 and press the [SEL/CE] key, "cLEAR" is displayed and the settings are initialized.</p>

3.3.3 Effect of Parameter Changes on the A-axis and B-axis

Changing the basic parameters initializes the settings and dependent channels of the associated axes.

Parameter changed		Setting initialized			
		Axis-related		Channel-related	
Number display	Meaning	Counter IC	Origin	Preset state, peak value	Preset value, tolerance value
04 A	Resolution (A-axis)	✓ (A-axis only)		✓ (channels dependent on A-axis only)	
04 B	Resolution (B-axis)	✓ (B-axis only)		✓ (channels dependent on B-axis only)	
05	Origin function selection	✓		✓	
06 A	Counter direction (A-axis)	✓ (A-axis only)		✓ (channels dependent on A-axis only)	
06 B	Counter direction (B-axis)	✓ (B-axis only)		✓ (channels dependent on B-axis only)	
07 A	Origin detection direction (A-axis)	✓ (A-axis only)		✓ (channels dependent on A-axis only)	
07 B	Origin detection direction (B-axis)	✓ (B-axis only)		✓ (channels dependent on B-axis only)	
22	Unit	✓		✓	

Tips

- Channels displaying sum and difference (A+B and A-B) are dependent on both the A-axis and B-axis.
- Since preset is not possible for the channel displaying speed, preset clear is not performed.

3.3.4 Effect of Changing the Display Mode

When display mode selection is changed with Parameter Number 03 and displayed content is the same before and after changing the setting, the tolerance value, preset value and preset state settings are maintained.

If the displayed content differs after the setting is changed, the tolerance, preset value, and preset state settings are re-initialized.

Tips

Settings are also maintained if the same content is displayed between different channels before and after setting changes. For example, if the display mode is changed from 1 to 3, the setting of display mode 1 for Ch. 1 is passed to display mode 3 for Ch. 2.

			Display mode after change																	
			0		1		2		3		4		5		6		7			
			Ch. 1	Ch. 2	Ch. 1	Ch. 2	Ch. 1	Ch. 2	Ch. 1	Ch. 2	Ch. 1	Ch. 2	Ch. 1	Ch. 2	Ch. 1	Ch. 2	Ch. 1	Ch. 2		
			A-axis coordinates	B-axis coordinates	Sum (A+B)	B-axis coordinates	Difference (A-B)	B-axis coordinates	A-axis coordinates	Sum (A+B)	A-axis coordinates	Difference (A-B)	A-axis speed	B-axis speed	A-axis coordinates	A-axis speed	B-axis coordinates	B-axis speed		
Display mode before change	0	Ch. 1	A-axis coordinates						✓		✓				✓					
		Ch. 2	B-axis coordinates			✓	✓											✓		
	1	Ch. 1	Sum (A+B)						✓											
		Ch. 2	B-axis coordinates		✓		✓												✓	
	2	Ch. 1	Difference (A-B)								✓									
		Ch. 2	B-axis coordinates		✓	✓													✓	
	3	Ch. 1	A-axis coordinates	✓							✓				✓					
		Ch. 2	Sum (A+B)			✓														
	4	Ch. 1	A-axis coordinates	✓					✓						✓					
		Ch. 2	Difference (A-B)				✓													
	5	Ch. 1	A-axis speed													✓				
		Ch. 2	B-axis speed																	✓
	6	Ch. 1	A-axis coordinates	✓					✓		✓									
		Ch. 2	A-axis speed										✓							
7	Ch. 1	B-axis coordinates		✓	✓	✓														
	Ch. 2	B-axis speed											✓							

MEMO

4 Data Output

4.1 I/O Function

By using the I/O connector, results of tolerance judgment can be output as signals, and settings of the EJ Counter can be made by external control signals.

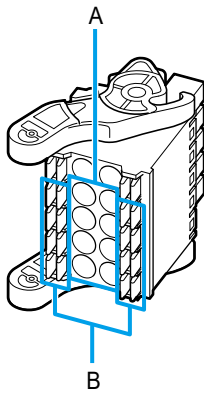
4.1.1 Connector Plug

Recommended connector plug:

- Phoenix Contact connector DFMC 1,5/ 5-ST-3,5-LR - 1790519 (with lock levers, standard accessory)
- Phoenix Contact connector DFMC 1,5/ 5-STF-3,5 - 1790328 (with screw lock)

4.1.2 Wiring Procedure

1 Connect the cable to the connector plug.



● When the cable is fitted with pin terminals

Push the pins all the way in to terminals A.

Tips

- Compatible pin terminals are those with conductive ferrule sleeves that are 10 mm in length.
Recommended part: Phoenix Contact part number 3241129 AI 0,34-10 TQ
- Use an input/output cable with a length of less than 30 m for I/O input/output.

● When the cable ends in stranded wire

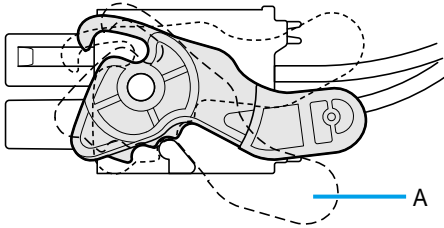
Slip the wire ends all the way into terminals B while pressing the connector plug buttons, and then release the buttons.

Tug on the cable to make sure that the stranded wires are securely fastened to the connector plug.

2 Center the levers on both sides of the connector plug.

Tips

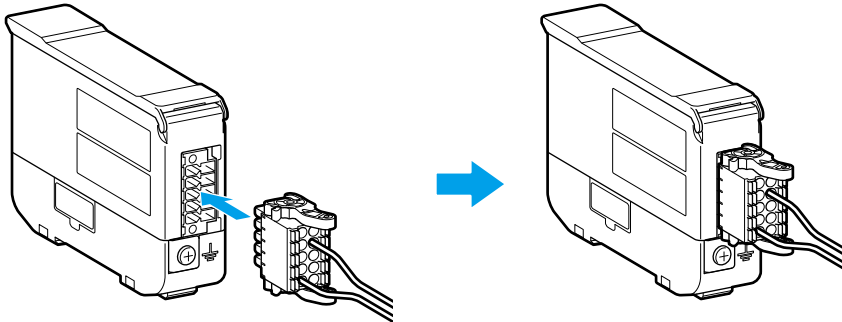
The levers have three discrete positions. If the levers are in the bottom-most position, it will be hard to plug the connector plug into the EJ Counter.



3 Plug the connector plug into the I/O connector on the EJ Counter.

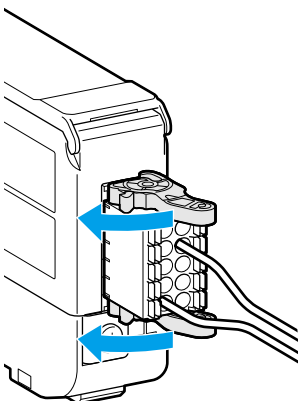
Align the claws on the levers on the side of the connector plug with the holes on both sides of the I/O connector, and then plug the connector plug into the I/O connector on the EJ Counter.

Push the connector plug in to where its claws engage with the holes on both sides of the I/O connector and the lever won't go any further.



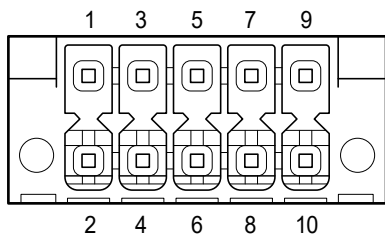
NOTICE

When you need to unplug the connector plug, you can do so by manipulating the levers on both sides so that the claws disengage from the EJ Counter connector and pulling it out of the connector on the EJ Counter (to the left as shown in the figure below). Forcibly pulling the connector plug out will result in damage.



4.1.3 Pin Assignments

Pin arrangement (connector built into EJ Counter)



Tips

For details on the input/output circuit, see "4.1.4 Input/Output Circuits" on page 45.

■ **Input**

Photo coupler input (negative logic)

■ **Output**

Photo coupler collector output (negative logic)

Tips


Output is in the error state while setting the preset and tolerance values and while setting parameters.

Pin number	Signal name	Signal level
7	ALLGO (when Parameter Number 10 is set to 1)	H
	ERR (when Parameter Number 10 is set to 0)	L
8	LT1	L
9	LT2	H
10	LT3	L

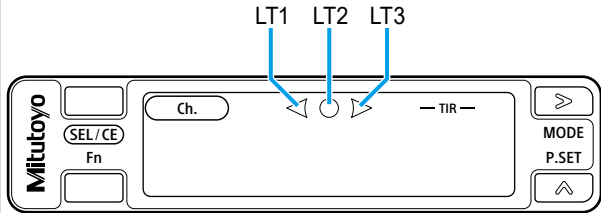
■ **Signal**

Pin number	Signal name	IN/OUT	Functions
1	10-27V DC	IN	Power source (supplied to EJ Counter from an external source) Input power: 10 V–27 V, 3 A
2	GND	IN	
3	1/2 SEL	IN	Specifies the channel for input/output signals. H: Ch. 1 L: Ch. 2 Tips <ul style="list-style-type: none"> When Parameter Number 11 is set to 1, the display channel can be changed by switching between H and L. When disconnected (open), the signal level goes H.

4 Data Output

Pin number	Signal name	IN/OUT	Functions
4	$\overline{\text{CLEAR}}$	IN	<p>Peak value is cleared when the signal falls. If an error has occurred, the error is cleared at the same time.</p> <p>Tips</p> <ul style="list-style-type: none"> • The setting of Parameter Number 14 determines whether the function is applied to the channel specified by 1/2 SEL, or to both channels. • Peak value is cleared even during peak mode value display. • When disconnected (open), the signal level goes H.
5	$\overline{\text{HOLD}}$	IN	<p>When the signal falls, HOLD is applied to all channels.</p> <p>When the signal rises, origin detection wait is switched between ON and OFF.</p> <p>Tips</p> <ul style="list-style-type: none"> • The HOLD signal is shared by all EJ Counters that are linked together. • When disconnected (open), the signal level goes H.
6	$\overline{\text{PRESET}}$	IN	<p>Preset is performed when the signal falls.</p> <p>Tips</p> <ul style="list-style-type: none"> • The setting of Parameter Number 13 determines whether the function is applied to the channel specified by 1/2 SEL, or to both channels. • Preset is effective even during peak mode value display. • When disconnected (open), the signal level goes H.
7	$\overline{\text{ERR/ALLGO}}$	OUT	<ul style="list-style-type: none"> ●When ERR output is selected L: There is an error on at least one channel. H: There are no errors on any channel. ●When ALLGO output is selected L: All channels are GO or without errors. H: At least one channel is NG or has an error. <p>Tips</p> <ul style="list-style-type: none"> • The setting of Parameter Number 10 determines whether ERR or ALLGO is output. • When multiple EJ Counters are linked together, the setting of Parameter Number 10 must be the same for all of them. Correct output will not be obtained if even one EJ Counter has a different setting. • The range in which channels are GO is "S1 ≤ measurement result ≤ S4" for both 3-step tolerance judgment and 5-step tolerance judgment. When "measurement result < S1" or "S4 < measurement result", ERR is displayed. For details, see  "■ Output signals" on page 48.

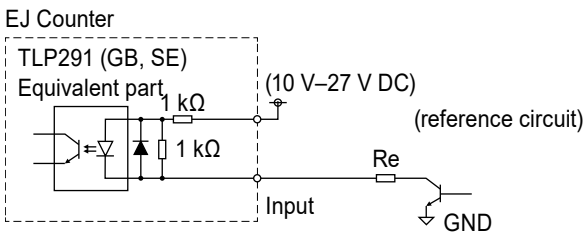
Pin number	Signal name	IN/OUT	Functions
8	$\overline{LT1}$	OUT	Outputs the tolerance judgment result for the channel specified by 1/2 SEL. Output of the various signals corresponds to the on or off state of the tolerance indicator. H: The corresponding tolerance indicator is off. L: The corresponding tolerance indicator in on.
9	$\overline{LT2}$	OUT	●Correspondence between signals and tolerance indicators
10	$\overline{LT3}$	OUT	



4.1.4 Input/Output Circuits

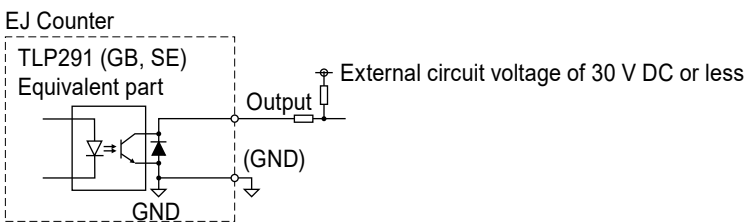
Input circuit

Connect external resistance (Re) as needed to bring input current into the range from 5 mA to 15 mA.



Output circuit

Adjust the output circuit current to 20 mA for use.

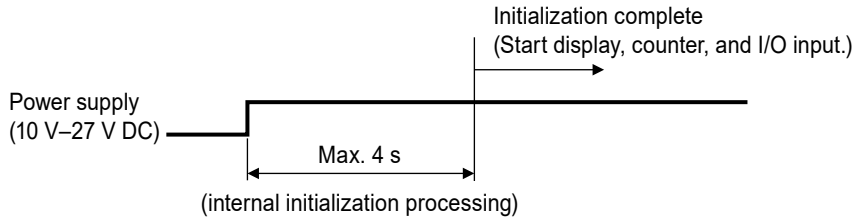


NOTICE

- Use shielded conductors as signal lines and connect the cable shield to frame ground. This will help minimize electromagnetic interference that could affect the product and prevent erroneous operation and possible damage.
- To protect the product from damage by inductive loads, such as relays, use protective devices such as reverse voltage prevention diodes.

4.1.5 Timing Chart

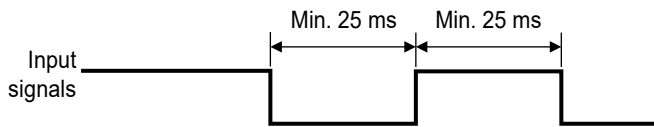
■ When power is ON



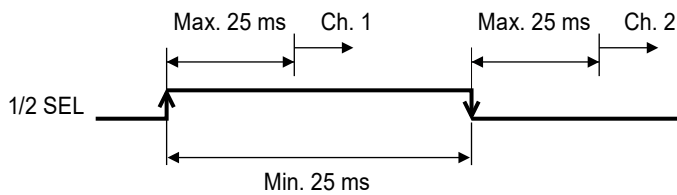
■ Regarding input signals (1/2 SEL, CLEAR, HOLD and PRESET)

Ensure the duration of input signals is at least 25 ms.

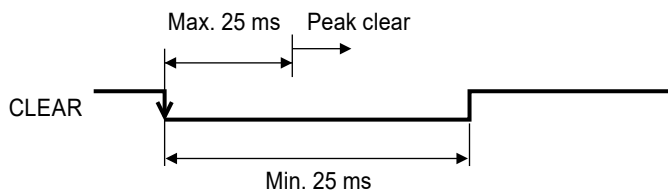
When inputting input signals in succession, ensure at least a 25-ms interval between one input signal and the next.



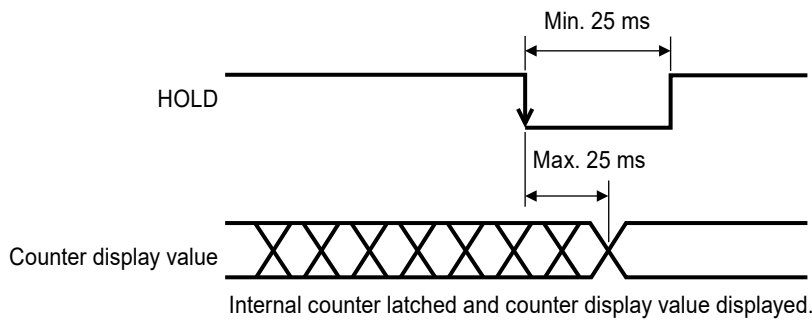
● 1/2 SEL



● CLEAR

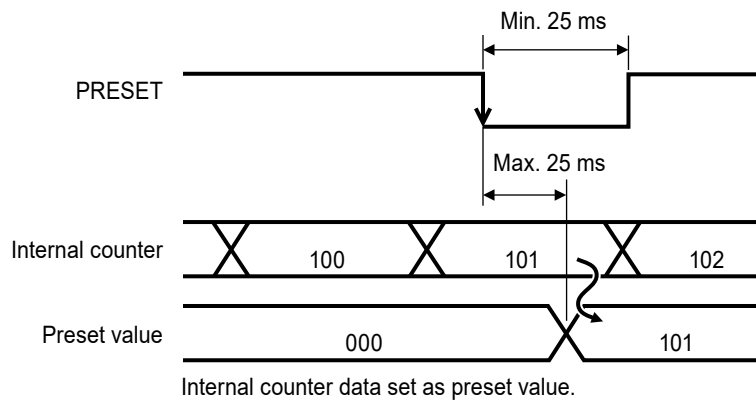


● HOLD



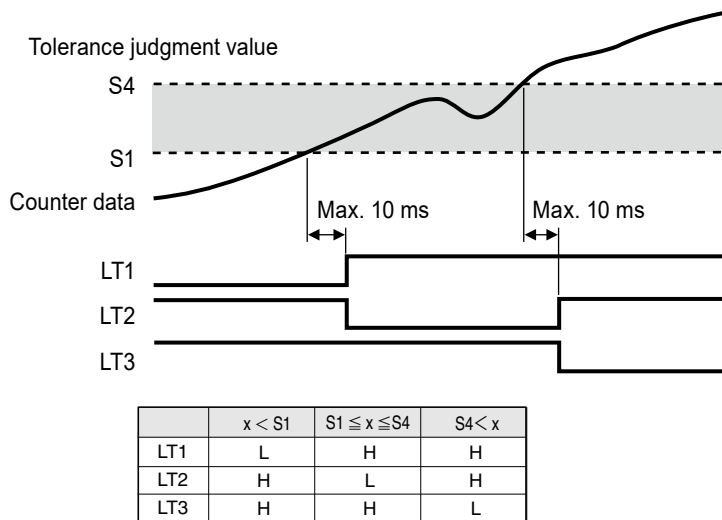
4 Data Output

● PRESET

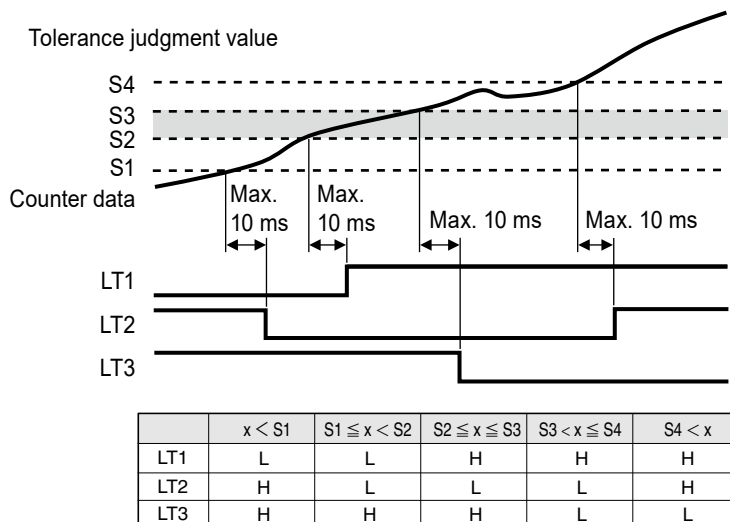


■ Tolerance judgment output

● 3-step tolerance



● 5-step tolerance

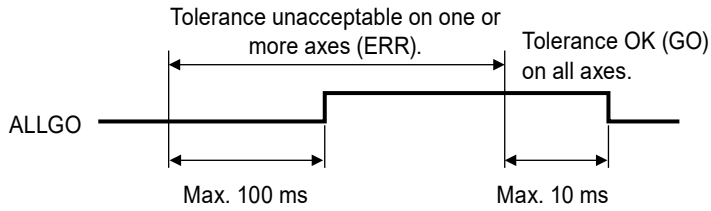


■ Output signals

● ALLGO

Tips

- When both 3-step tolerance judgment and 5-step tolerance are selected, the range in which channels are GO is "S1 ≤ measurement result ≤ S4".
- When using multiple EJ Counters that are linked together, the tolerance judgment will be handled as "GO" for any EJ Counter for which tolerance judgment is set to "None" (Parameter Number 8 is set to 2).



3-step tolerance value setting

Judgment conditions	ERR/GO Judgment
Measurement result < S1	ERR
S1 ≤ measurement result ≤ S4	GO
S4 < measurement result	ERR

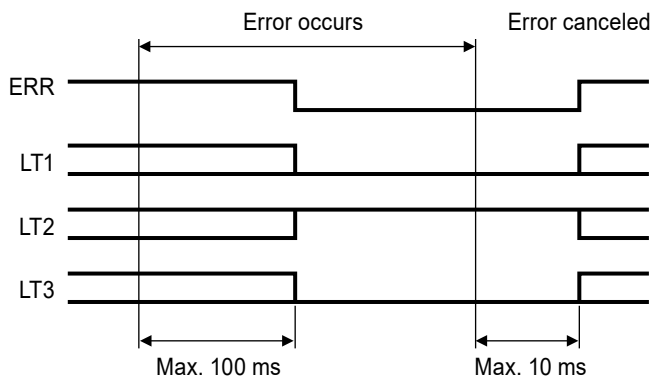
5-step tolerance value setting

Judgment conditions	ERR/GO Judgment
Measurement result < S1	ERR
S1 ≤ measurement result < S2	GO
S2 ≤ measurement result ≤ S3	GO
S3 < measurement result ≤ S4	GO
S4 < measurement result	ERR

● Error output

Tips

For details about error message contents, see 📖 "5.2 Error Messages" on page 52.




4.2 Data Input/Output

External data input/output is possible through the optional interface unit.

Data that can be input/output through interface units are as follows.

Interface unit	Format	Possible data I/O	
		Output	Input
USB (Part No. 21HZA149)	USB2.0 FS (12 Mbps)	Current value (by channel) Preset value (by channel) Tolerance value (by channel) Errors (by channel and by counter) Parameter setting values (by counter) Number of counters connected Counter ID	Preset value (by channel) Tolerance value (by channel) Peak mode selection (by channel) Preset and zero set (by channel) HOLD set/clear (by counter) Peak clear (by counter) Error clear (by counter) Parameter settings (by counter)
CC-Link (Part No. 21HZA186)	CC-Link V1.10	Tolerance judgment result (by channel, All) Gage connection status	
	CC-Link V2.00	Current value data (by channel) Tolerance judgment result (by channel, All) Gage connection status	
	USB2.0 FS (12 Mbps)	Current value (by channel) Preset value (by channel) Tolerance value (by channel) Errors (by channel and by counter) Parameter setting values (by counter) Number of counters connected Counter ID	Preset value (by channel) Tolerance value (by channel) Peak mode selection (by channel) Preset and zero set (by channel) HOLD set/clear (by counter) Peak clear (by counter) Error clear (by counter) Parameter settings (by counter)

Tips

For details, see  the separate "Interface Unit User's Manual".

MEMO

5 Troubleshooting

5.1 Troubleshooting

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

Problem	Cause	Solution
Power does not go on	Connector plug is improperly connected.	Power is not supplied to the correct pins. Tips For details, see "2.3.2 DC Power Supply Connection" on page 16 and "2.3.3 Connecting the AC Adapter (Optional)" on page 18.
The counter value is incorrect (not counting).	Parameters are not correctly set for the type of the Linear Gage, etc.	Set correct parameters. Tips For details, see "3.3 Parameter Setting" on page 30.
	Peak mode is set to maximum value, minimum value or run-out width.	Set the peak mode to current value display. Tips For details, see "3.2.3 Peak Hold" on page 25.
	The HOLD signal is being input.	Check the external input.
Cannot execute Zero setting.	The preset value is set to something other than 0.	Do preset with the preset value set to 0. Tips For details, see "3.2.2 Preset" on page 23.
Linear Gage cannot be connected.	You are trying to connect a Linear Gage with 6-pin or 8-pin connector.	Use the optional adapter cable. Tips For details, see "6.3 Options" on page 58.
	You are trying to connect a Linear Gage that does not support differential square wave output.	The EJ Counter can only be connected to a Linear Gage that provides differential square wave output. Other Linear Gages can be used in combination with the EC Counter or EH Counter.
The tolerance indicator display continues showing .	An error has occurred.	Change the display channel and clear the error. Tips For details, see "5.2.1 Error State Indication" on page 52 and "5.2.2 How to Clear Errors" on page 52.
The numeric display shows "-.-.- .-.-.-" (the periods are flashing) uninterruptedly.	The Linear Gage is in origin detection mode.	Indicates the origin detection wait state. When the connected Linear Gage with origin mark is operated, the origin is acquired and then display switches to counter display.

5.2 Error Messages

5.2.1 Error State Indication

Regardless of the tolerance judgment setting, if an error occurs, the left and right tolerance indicators light and the center indicator goes off (◀ ○ ▶).


The numeric display shows the error number related to the selected channel.

5.2.2 How to Clear Errors

To clear the error, use either of the following methods.



- Press the product's [Fn] key together with the [SEL/CE] key.
- Input the CLEAR signal (I/O input).
- Clear the error by external input through the interface unit (optional).

Tips

- In case of error on the channel not selected, the tolerance indicator indicates the error.
- In case of multiple errors, clearing the one that is displayed will cause the uncleared error to be displayed instead.
- Errors can only be cleared by key operation for the channel that is currently displayed. Errors on channels that are not displayed cannot be cleared.
If the tolerance indicator continues displaying errors even though errors have been cleared for the displayed channel, check by changing the display channel.
For details on changing display channels, see  "3.2.1 Switching the Display Channel (Ch.)" on page 22.
- Errors can only be cleared by I/O input for the channel specified by the 1/2 SEL signal. Errors on channels that are not specified by the 1/2 SEL signal cannot be cleared.
If the tolerance indicator continues displaying errors even though errors have been cleared for the specified channel, check by changing the specified channel.
- All errors can be cleared with error clear operation by external input through the interface unit.
- Display of errors on by the numeric display is dependent on the Ch. 1 and Ch. 2 display content specified by the display mode selected for Parameter Number 03.
When a channel is displaying the coordinates and speed of the A-axis, only A-axis errors are displayed; B-axis errors are not displayed.
When a channel is displaying the coordinates and speed of the B-axis, only B-axis errors are displayed; A-axis errors are not displayed.
For a channel displaying sum/difference of the A-axis and B-axis, errors of both axes are displayed.


5.2.3 Error List

Display	Interface unit output	I/O output	Cause	Solution
Error 10	Yes	Yes	Abnormal power voltage (Voltage is outside of the range from 10 V through 27 V.)	Make connection to a power supply of suitable voltage, and then do the error clear operation.
Error 12	Yes	Yes	Internal memory abnormality (data abnormality)	Do the error clear operation. Tips If the error cannot be cleared, there may be an internal malfunction. Please contact the nearest Mitutoyo sales representative.
Error 13	Yes	Yes	Internal memory abnormality (access abnormality)	Do the error clear operation. If the error cannot be cleared, cycle the power off and on. Tips If the error cannot be cleared, there may be an internal malfunction. Please contact the nearest Mitutoyo sales representative.
-----	Yes (Error15)	Yes	Counter stand-by state after power-on	Change to the counter display screen with the [SEL/CE] key. Tips When Parameter Number 09 is set to 1 (counter display), this error is not displayed.
			Origin not acquired	Do the error clear operation.
			Power supply interruption	Verify power supply connection, and then do the error clear operation.
Error 20	Yes	Yes	Excess speed	Verify measurement conditions (such as spindle movement speed), and then do the error clear operation.
Error 30	Yes	Yes	Counter value overflow	After doing error clear operation, check positioning of the measurement work and spindle, verify the preset values of the product, and then set presets again. Tips <ul style="list-style-type: none"> • Presets are cleared automatically. • The origin is not acquired.
Error 40	Yes	Yes	Linear Gage disconnection detected (other than origin signal), or excess speed	Verify connection of the Linear Gage. After making proper connection, do the error clear operation. Verify measurement conditions (such as spindle movement speed). If the error cannot be cleared, there may be a discontinuity in the cable. Please contact the nearest Mitutoyo sales representative.

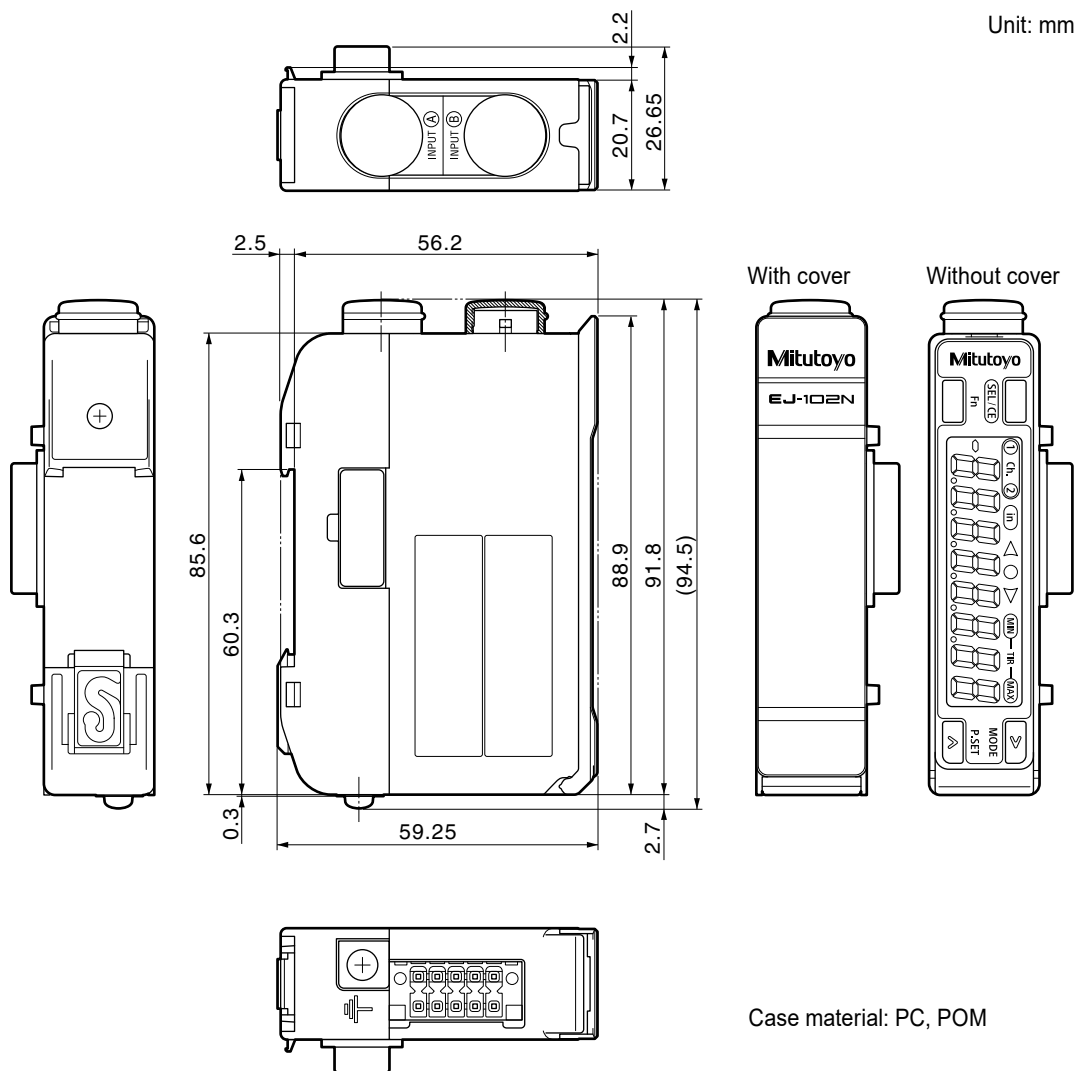
Display	Interface unit output	I/O output	Cause	Solution
Error 41	Yes	Yes	No origin signal	<p>When using a Linear Gage with origin mark, check whether the origin signal is disconnected.</p> <p>When using a Linear Gage without origin mark, such as an INC model, set Parameter Number 05 to 0.</p> <p>Tips For details about Parameter Number 05, see  "3.3.2 List of Parameters" on page 32.</p>
Error 60	Yes	Yes	More than eight EJ Counters are linked together.	<p>Turn the power back on after reducing the number of linked EJ Counters to no more than eight.</p> <p>Tips When multiple counters are linked together, errors are displayed by the two end counters.</p>
Error 80	Yes	Yes	Peak detection error	<p>Verify measurement conditions (such as spindle movement speed), and then do the error clear operation.</p>
Error 81	Yes	Yes	Counter IC reset error	<p>Occurred because a Linear Gage was connected or removed during operation.</p> <p>Do the error clear operation.</p>
Error 85	Yes	Yes	Counter IC overflow	<p>Electrical noise could be a problem.</p> <p>Do the error clear operation.</p>
Error 90	Yes	Yes	Tolerance value setting error	<p>The tolerance value is not set correctly.</p> <p>With 3-step tolerance judgment: The condition $S1 \leq S4$ is not satisfied.</p> <p>With 5-step tolerance judgment: The condition $S1 \leq S2 \leq S3 \leq S4$ is not satisfied.</p> <p>Press the [SEL/CE] key together with the [Fn] key to return to preset/tolerance value setting and reset the tolerance value.</p>
Error 95	No	No	A key was operated with key protect enabled.	<p>Set Parameter Number 01 to 0 (no key protect).</p> <p>Tips For details about Parameter Number 01, see  "3.3.2 List of Parameters" on page 32.</p>

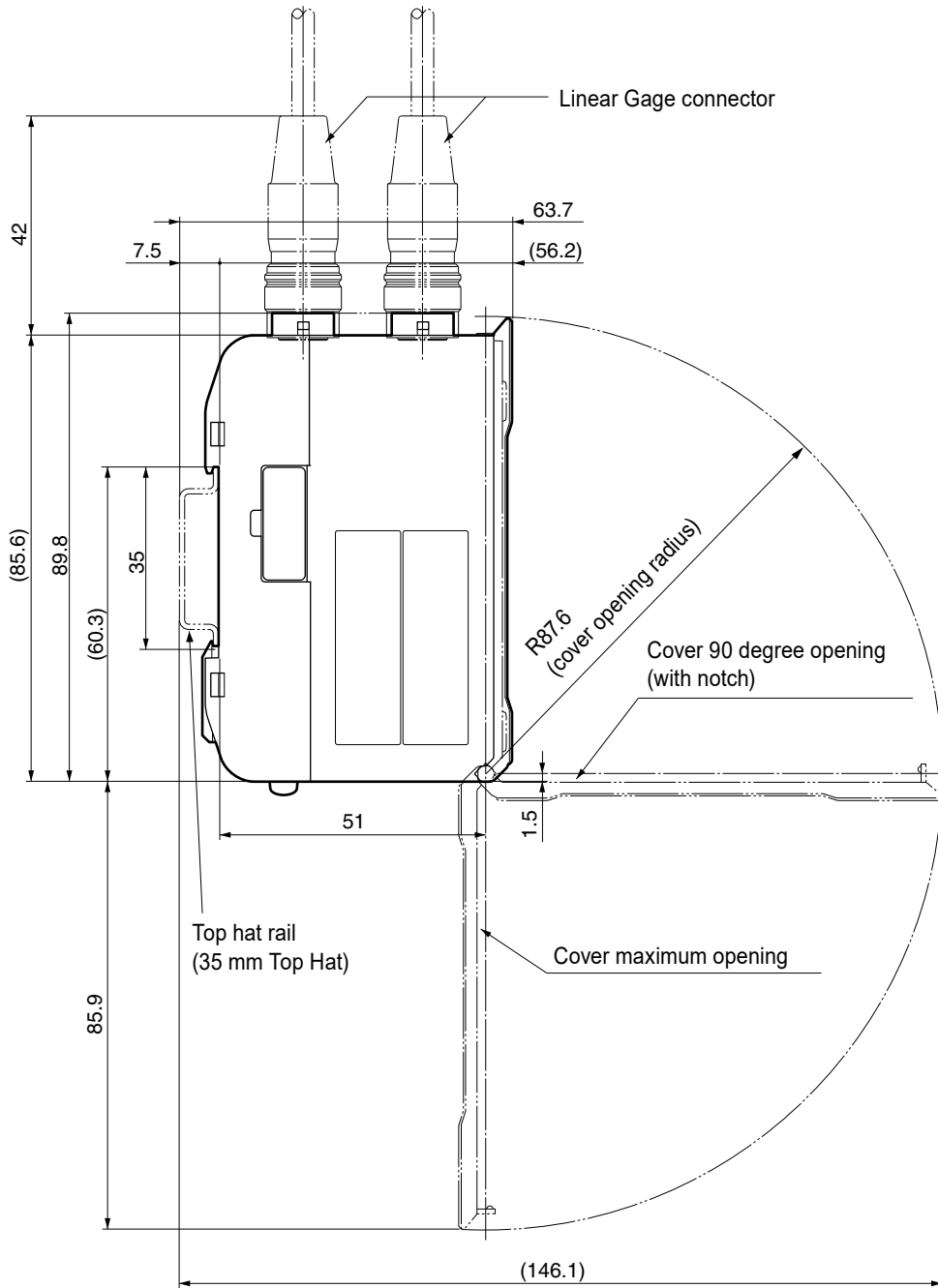
6 Specifications

6.1 Basic Specifications

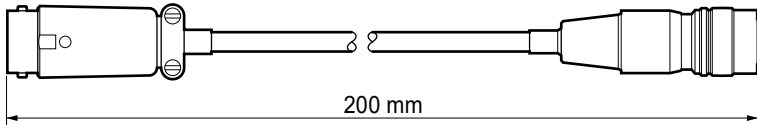
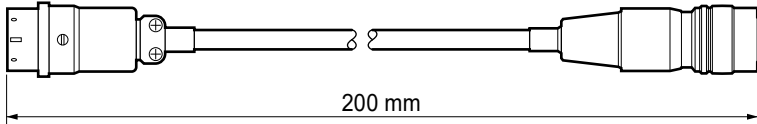
Code No.	542-080	542-081	
Model No.	EJ-102N	EJ-102NE	
Unit of display	mm	mm/in	
Display resolution (varies according to connect- ed Linear Gage) *1: Display range	0.005 mm (5 μ m) $\pm 19999.995^{*1}$	0.005 mm (5 μ m) $\pm 19999.995^{*1}$	0.0002 in $\pm 199.9998^{*1}$
	0.001 mm (1 μ m) $\pm 19999.999^{*1}$	0.001 mm (1 μ m) $\pm 19999.999^{*1}$	0.00005 in $\pm 199.99995^{*1}$
	0.0005 mm (0.5 μ m) $\pm 9999.9995^{*1}$	0.0005 mm (0.5 μ m) $\pm 9999.9995^{*1}$	0.00002 in $\pm 199.99998^{*1}$
	0.0001 mm (0.1 μ m) $\pm 9999.9999^{*1}$	0.0001 mm (0.1 μ m) $\pm 9999.9999^{*1}$	0.000005 in $\pm 99.999995^{*1}$
Number of Linear Gage con- nection ports	2		
Supported gage signals	Differential square wave, differential square wave with origin		
Input response frequency	5 MHz		
Supported Linear Gages	For details, see  "1.3 Supported Linear Gages" on page 3 (optional adapter cable required depending on Linear Gage type)		
User inter- face	Display	Minus sign + 8 digits and indicators (displays one axis, manually selectable)	
	Number of keys	4	
External in- put/output	Number of I/O ports	Input ports: 4 Output ports: 4	
	Applicable communica- tions standards	CC-Link, USB (supported by optional interface unit)	
Maximum number of units linked together	Eight EJ Counters + one interface unit (optional) (maximum number of Linear Gages that can be connected: 16)		
Power supply specifica- tions	Input voltage	10 V–27 V DC	
	Maximum pow- er consumption	Single EJ Counter: 3 W or less (including two Linear Gages) With maximum number of linked EJ Counters: 30 W or less (in- cluding interface unit and 16 Linear Gages)	
Operating temperature (hu- midity) range	0 °C–50 °C (20% RH–80% RH, without condensation)		
Storage temperature (humidity) range	-10 °C–60 °C (20% RH–80% RH, without condensation)		
Unit mass	Approx. 120 g (0.26 lb)		
CE marking	EMC directive: EN 61326-1 Immunity test requirement: Clause 6.2 Table 2 Emission limit: Class A RoHS directive: EN IEC 63000		

6.2 Outline Dimensional Drawing





6.3 Options

Part No.	Name
21HZA157	DIN rail fixing bracket
21HZA186	CC-Link Interface Unit
21HZA149	USB Interface Unit
21HZA193	Connector adapter cable (for P gages) (for Linear Gages with 6-pin connector)
	 <p>The diagram shows a cable with a 6-pin connector on the left and a larger connector on the right. A dimension line below the cable indicates a length of 200 mm.</p>
21HZA194	Connector adapter cable (for Z gages) (for Linear Gages with 8-pin connector)
	 <p>The diagram shows a cable with an 8-pin connector on the left and a larger connector on the right. A dimension line below the cable indicates a length of 200 mm.</p>
21HZA209	DC jack with pin terminals
357651	AC adapter (12 V DC, 4.1 A)
02ZAA000	AC cable (Japanese type)
02ZAA010	AC cable (UL, CSA, US type)
02ZAA020	AC cable (CEE, European type)
02ZAA030	AC cable (BS, UK type)
02ZAA040	AC cable (CCC compliant: S type, Chinese type)
02ZAA050	AC cable (P-023+IS14, Korean type)

SERVICE NETWORK

*As of May 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 911100

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 - 20020 Lainate (MI), ITALY
TEL: 39 02 935781 FAX: 39 02 9373290•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 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 Gallée 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 Povážská 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)2-080-3500 FAX:(66)2-521-6136

Chonburi Branch / M³ Solution Center

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

TEL:(66)2-080-3563 FAX:(66)3-834-5788

ACC Branch / M³ Solution Center

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

TEL:(66)2-080-3565

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 Gurgaon technical center

Plot no. 65, Ground Floor, Udyog Vihar, Phase-4 Gurga-
on, Haryana - 122016

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

Room 1701, Wuhan Wanda Center, No. 96, Linji-

ang Road, Wuchang District, Wuhan

Hubei 430060, CHINA

TEL:86(027)8544-8631 FAX:86(027)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

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 Province, 450018,CHINA

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

Mitutoyo Leepport 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 Leepport Metrology (Dongguan) Limited / M³ Solution Center Dongguan

No.26, Guan Chang Road, Chong Tou Zone,
Chang An Town, Dong Guan, 523855 CHINA
TEL:86(769)8541 7715 FAX:86(769)-8541 7745

Mitutoyo Leepport Metrology (Dongguan) Limited – Fuzhou office

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

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

Mitutoyo Leepport Metrology (Dongguan) Limited – Changsha office

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

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

Mitutoyo Leepport Metrology (Dongguan) Limited -Guangzhou Office

Room 605, Tower A, No. 264 Xing Tai Road, Shi Qiao Street, Pan Yu District, Guangzhou, Guangdong Province, 511400 CHINA

TEL:(86) 20-8466 1987 FAX:(86) 20-8466 1897

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, Birmingham, 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

Mitutoyo 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 B°
Crisol Sur – CP 5000, Cordoba, ARGENTINA
TEL/FAX:54 (351) 456-6251

Mexico

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

Industria Eléctrica No.15, Parque Industrial, Nau-
calpan de Juárez, Estado de México 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 Comer-
cial 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

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Mitutoyo Corporation

20-1, Sakado 1-Chome, Takatsu-ku, Kawasaki-shi, Kanagawa 213-8533, Japan
Tel: +81 (0)44 813-8230 Fax: +81 (0)44 813-8231
Home page: <http://www.mitutoyo.co.jp/global.html>

For the EU Directive, Authorized representative and importer in the EU:
Mitutoyo Europe GmbH
Borsigstrasse 8-10, 41469 Neuss, Germany

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