

WIRELESS MEASUREMENT DATA COMMUNICATION SYSTEM U-WAVE®

New wireless system improves efficiency by eliminating the need for data cables when sending measurements to a PC.

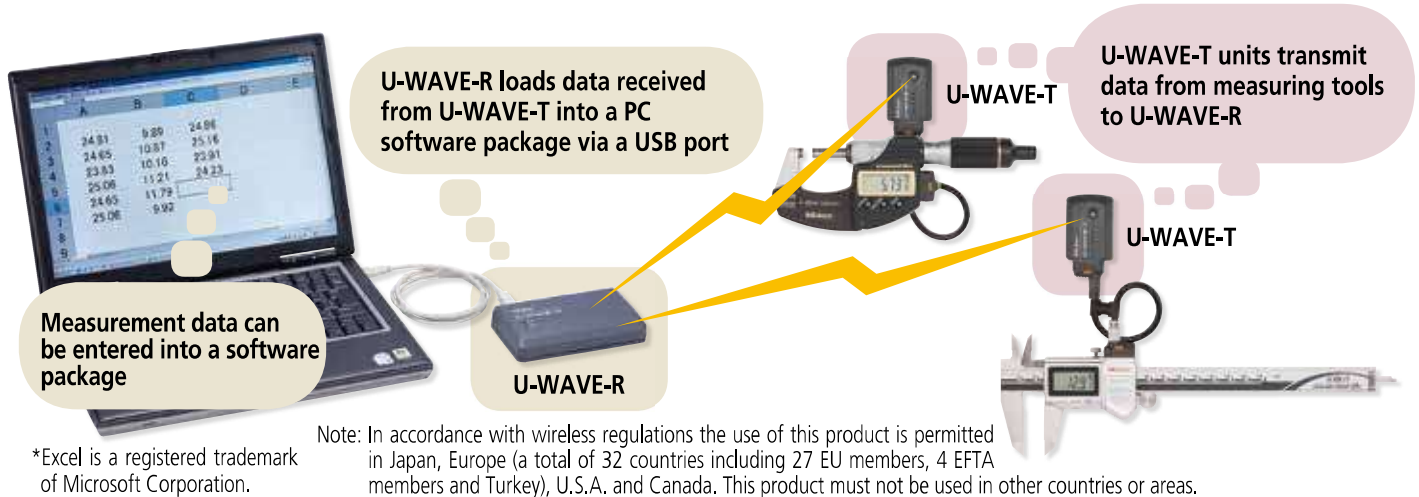
SMALL TOOL INSTRUMENTS
AND DATA MANAGEMENT



U-WAVE®

MeasurLink® ENABLED
Data Management Software by Mitutoyo

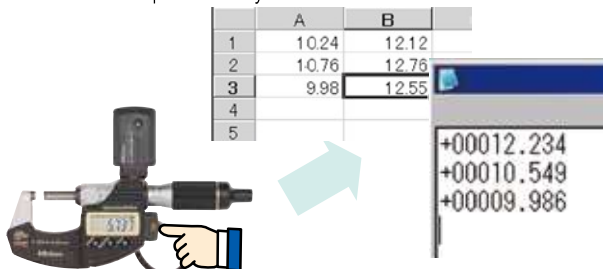
The **U-WAVE** system enables easy wireless data communication from a measuring tool to a PC using the Digimatic protocol. Measurement efficiency is improved by eliminating the long and cumbersome data cables. The user-friendly interface allows data to be loaded into any software product that accepts keyboard input, such as Excel* or Notepad.



*Excel is a registered trademark of Microsoft Corporation.

Keyboard emulation or VCP

The **U-WAVEPAK**, **U-WAVE-R** standard package features a keyboard interface function. This allows measurement data to be easily entered into in Excel, Notepad or other format that accepts numeric value input via a keyboard.



In addition, a virtual COM driver allows measurement data to be input to a program that supports **RS-232C** serial communication. The communication speed (baud rate) is fixed to 57,600 bps.

Dustproof and water resistant IP67 model

IP67-type **U-WAVE-T** (No.02AZD730C) has an **IP67**-level dust/water-proof function. This model can be used in combination with, devices such as a coolant-proof caliper, micrometer or indicator.



IP67

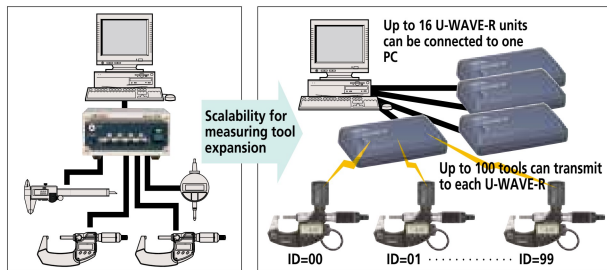
Installation Bracket Kit Order No. 02AZE200



Wireless Measurement Data Communication System

Up to 100 measuring tools can be connected to one U-WAVE-R unit

Up to 100 **U-WAVE-T** units can be registered with one **U-WAVE-R** unit, and up to 16 **U-WAVE-R** units can be connected via a commercially available USB hub.



MUX-10F

(up to 4 wired channels)

U-WAVE

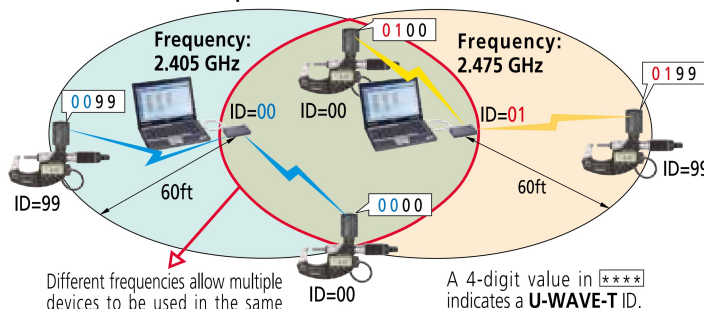
(up to 100 wireless channels)

Data communication range up to 60ft possible

The maximum reliable communication range is approximately 60ft*. Even when multiple **U-WAVE-R** units are used within the range of 60ft, interference does not occur since an ID (00 to 99) is assigned to each unit. Radio interference between **U-WAVE-R** units can also be avoided by setting different frequencies (selected from 15 bands).

*Actual range depends on the local radio transmission characteristics.

Different frequencies ensure no radio interference



Different frequencies allow multiple devices to be used in the same communication range.

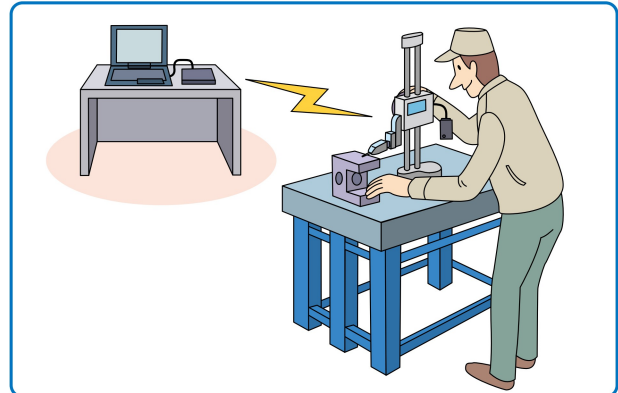
Approximately 400,000 Data Transmissions

One commercially available CR2032 lithium battery will support about 400,000 data transmissions. Assuming that the device is used 20 days a month, sending data 2,000 times a day, one battery will last for about 10 months.

Wireless operation improves efficiency in measurement data recording

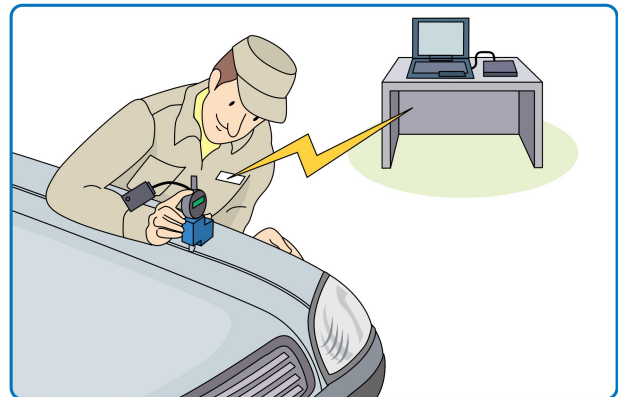
Measurement on surface plate

With a wireless device, the surface plate and PC desk no longer need to be adjacent, allowing flexible layout in the inspection room.



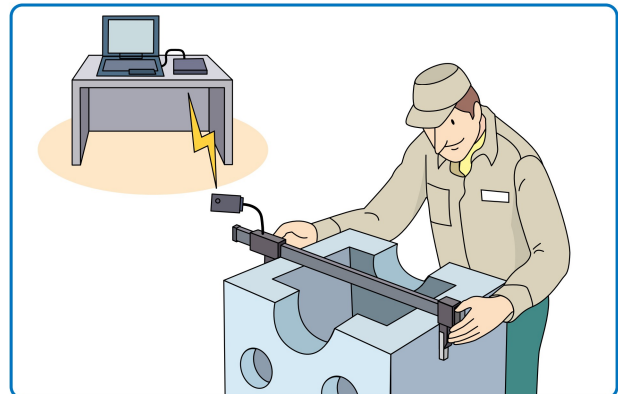
Measurement of large workpieces

With **U-WAVE**, operators can perform measurement freely around the workpiece with no cable constraints.



Measurement using long measuring tools

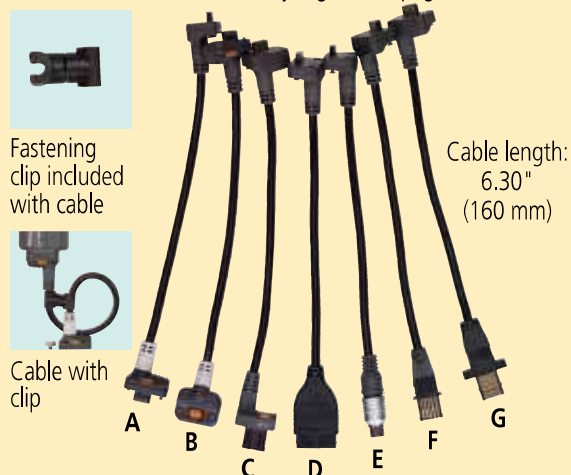
U-WAVE eliminates cable constraints, making the use of hard-to-handle, long measuring tools easier.



Purchase the following four products (**1** to **4**) to send data to your PC.

3 U-WAVE-T/tool connection

A short cable is used to connect a measuring tool to its **U-WAVE-T** unit. Select the appropriate cable from **A** to **G** below (7 types) to suit the measuring tool. Detailed information on cable suitability is given on page 7.



	Type	Order No.
A	Water-proof model with output button	02AZD790A
B	Water-proof model with output button	02AZD790B
C	With data-out button type	02AZD790C
D	10-pin plain type	02AZD790D
E	6-pin round	02AZD790E
F	Plain type straight	02AZD790F
G	Plain type straight water-proof model	02AZD790G

2 U-WAVE-T · Registered Design (Japan)

Inch/(Metric)

U-WAVE-T sends measurement data to **U-WAVE-R**.

Actual size



Buzzer Model

The buzzer model has a speaker so the operator can hear the sound.

Major specifications of U-WAVE-T

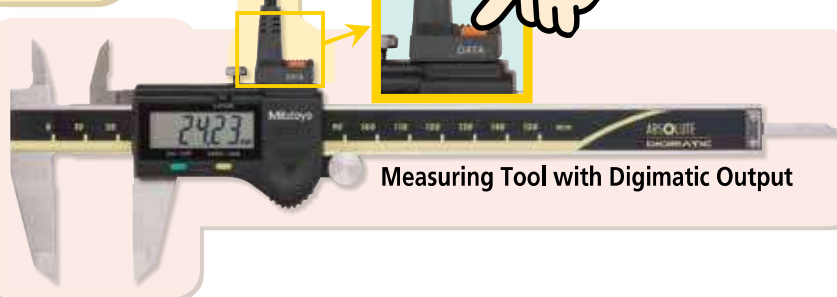
Model	U-WAVE-T (IP67 model)	U-WAVE-T (Buzzer model)
Order No.	02AZD730D*	02AZD880D*
Protection Rating	IP67	—
Data reception indication	LEDs	Buzzer and LEDs
Power supply	Lithium battery CR2032 x 1	
Battery life	Approx. 400,000 transmissions	
External dimensions	1.73" x 1.17" x .73" (44 x 29.6 x 18.5 mm)	
Mass	.05 lb (23g)	



Standard accessory: screwdriver

U-WAVE-T connecting cable

U-WAVE-T



4 Mitutoyo Measuring Tool with Digimatic Output

This product can be connected to a measuring tool that provides Digimatic data output. Digimatic output is Mitutoyo's proprietary output format. The Digimatic specifications have remained unchanged since the first Digimatic measuring tool was released. Therefore, any tool having a Digimatic port can be used, regardless of model. Connectors on some older instruments are not compatible with connectors used on the above-listed cables. See cable list on page 7.

Example Digimatic measuring tools pictured with connecting cables. Instrument models/cable product numbers are listed below.



Super Caliper
CD67-S15PM
No.02AZD790A



QuantuMike
MDE-25MJ
No.02AZD790B

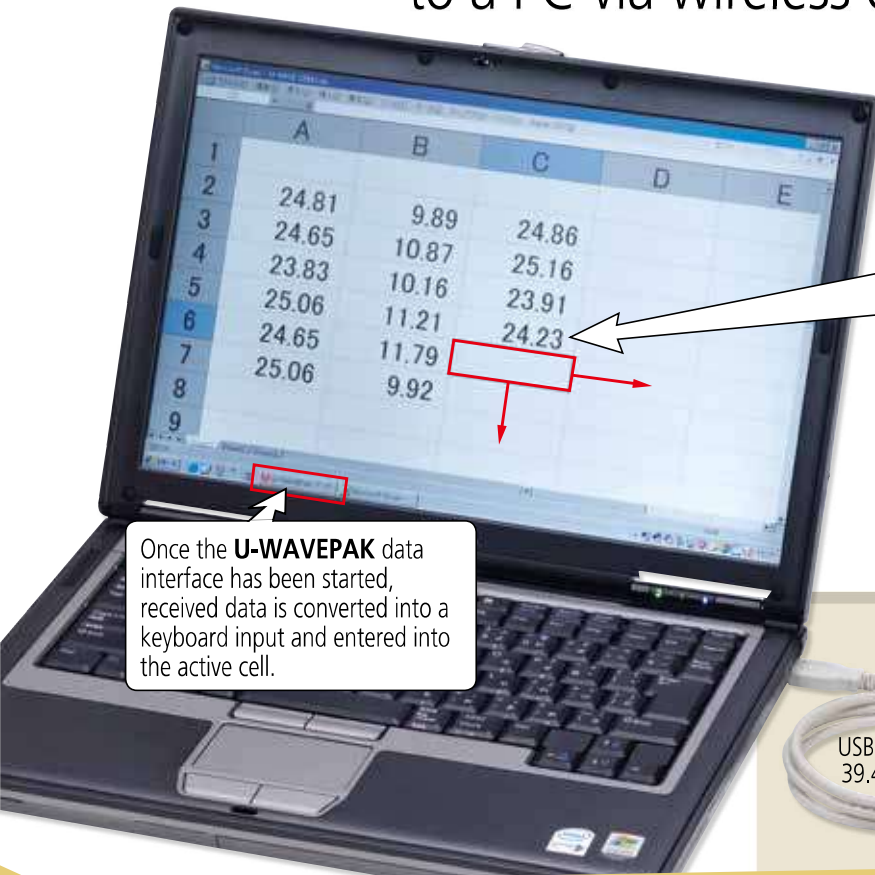


ABS Digimatic Caliper
CD-15CX
No.02AZD790C



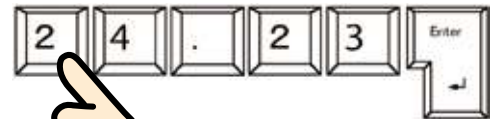
Digimatic Indicator
ID-H0530
No.02AZD790D

Press a button to send measurements to a PC via wireless communication.



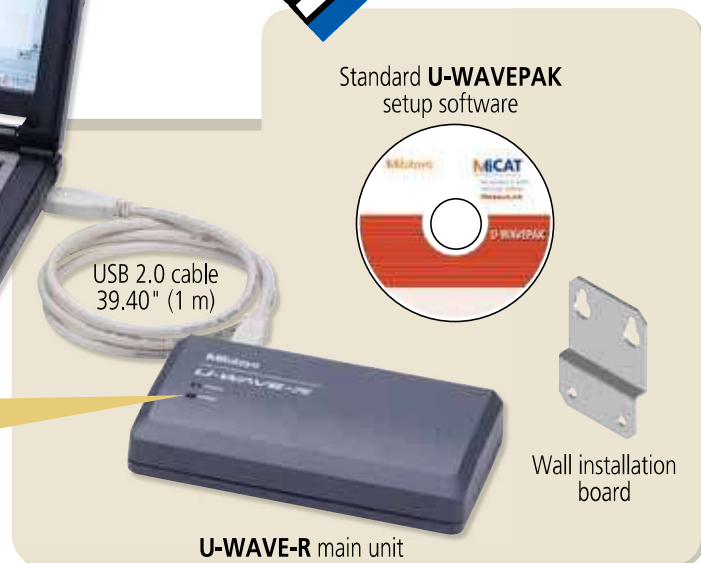
Once the **U-WAVEPAK** data interface has been started, received data is converted into a keyboard input and entered into the active cell.

When the data input button is pressed, the value displayed on the measuring tool is entered into the active cell of Excel followed by "Enter" key input. The cursor movement direction after input (up, down, left or right) can be set in Excel.



Communication distance of approximately 60ft
(in a good transmission/reception location)

*Refer to page 6 for wireless communication specification



1 U-WAVE-R · Registered Design (Japan)

Inch/(Metric)

Major Specifications of U-WAVE-R

Model	U-WAVE-R
Order No.	02AZD810D*
Power supply	USB bus power system
Number of U-WAVE-R units that can be connected to one PC	Up to 16
Number of U-WAVE-T units that can be connected	Up to 100
External dimensions	5.51" x 3.15" x 1.24" (140 x 80 x 31.6mm)
Mass	.29 lbs (130g)



*Detailed information on conformity standards of wireless communication specification is given on page 6.

*Refer to page 6 for specification of **U-WAVEPAK** (setup software).



Quick Micro MDQ-30M
No.02AZD790E



Digimatic Height Gauge HD-30AX
No.02AZD790F



ABS Digimatic Indicator ID-N112
No.02AZD790G

Specifications of wireless communication

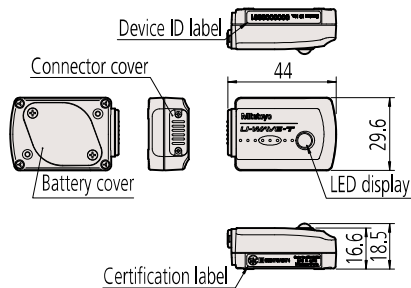
Wireless standards	Conform to IEEE802.15.4	Wireless communication distance	Approx. 20 m (within visible range)
Wireless communication speed	250 kbps	Transmission output	1 mW (0 dBm) or less
Modulation method	DS-SS (direct sequence spread spectrum) Resistant to interfering signal or noise.		
Communication frequency	2.4 GHz band (ISM band: universal frequency)		
Used band	15 channels (2.405 to 2.475GHz at intervals of 5MHz) The noise search function can avoid interference with other communication devices.		

Note: This is not compatible with the conventional Mu-WAVE, for which communication specifications are different.

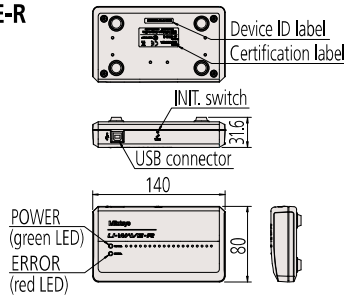
Name and Dimensions of Each Part

U-WAVE-T

Unit: Inch/(mm)



U-WAVE-R



Conformity standards	
· Japanese conformity standards	ARIB STD-T66
· European conformity standards	R&TTE Directive
· U.S.A. conformity standards	47 CFR Part 15.247:(Subpart :C)
	47 CFR Part 15,(Subpart :B)
· Canada conformity standards	RSS-210 (Issue 7)
	RSS-Gen (Issue 2)
	ICES 003 (Issue 4)
· Mexican conformity standards	Homologation Certificate No. NOM-121-SCT1-2009
· Brazilian conformity standards	Resolution 442 and Resolution 506
· Indian conformity standards	SD/RAD-01/01.SEP 2005USB-FSW
· Korean conformity standards	KN22, KN301 489-1/17, KN61000-4-2 and KN61000-4-3

Note: According to the Radio Regulations the use of this product is permitted in the above countries or areas. This product must not be used in other countries or areas.

Order No.	Countries or areas
02AZD810D, 02AZD730D, 02AZD880D	Japan, Indonesia, Thailand, Vietnam, Malaysia, Philippines and India, Europe (a total of 32 countries including 27 EU members, 4 EFTA members and Turkey), U.S.A. and Canada
02AZD810E, 02AZD730E, 02AZD880E	Mexico and Costa Rica (Available for only products labeled with a wireless accreditation label for Mexico)
02AZD810F, 02AZD730F, 02AZD880F	Brazil
	South Korea

U-WAVEPAK

Specifications of U-WAVEPAK (setup software)

Before using **U-WAVEPAK** for the first time after purchase, IDs, frequencies, and other settings must be made. The data interface function allows measurement data to be loaded into a PC in Excel, Notepad or other software file that accepts keyboard input. Data can also be input to a program that supports **RS-232C** serial communication using the virtual COM driver.

1) Operating environment

Supported OS: Windows 2000 Professional (SP4 or higher)
Windows XP Home Edition (SP2 or higher)
Windows XP Professional (SP2 or higher)
Windows Vista
Windows 7
Windows 8*
Windows 8.1*
* 32-bit/64-bit operating systems are supported.

Other information: USB port needed

2) Initial setup procedure

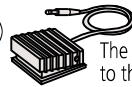
- (1) Install the **U-WAVEPAK** (setup software).
- (2) Connect the **U-WAVE-R** main unit to the PC with a USB 2.0 cable.
- (3) Install the dedicated USB driver and virtual COM driver.
- (4) Set IDs and frequencies for **U-WAVE-R** and **U-WAVE-T** with **U-WAVEPAK**.
- (5) Press the DATA button of **U-WAVE-T** once to write settings into **U-WAVE-T**. Once this procedure has been performed when using **U-WAVE-T** for the first time, settings are then stored in the main unit memory.

Connecting Cables

Two Types of Connecting Cable

A much-needed foot-switch type connecting cable (lower drawing at right) has been provided in addition to the conventional type (upper drawing at right) of connecting cable between the **U-WAVE-T** unit and a measuring tool. Identify the connector type compatible with your measuring tool in the following table listing 7 types (**A** to **G**), and select either the standard type or foot-switch type cable according to the purpose. The table also lists wired-type connecting cables with the same connector as those 7 types on each measuring tool. Specify those cables as required.

Foot-switch (Optional)
Order No. **937179T**



The foot switch is connected to this connector.

Measuring tool end

U-WAVE-T unit end

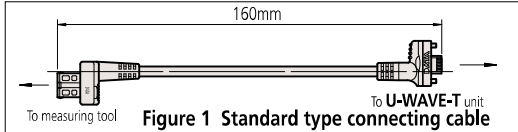


Figure 1 Standard type connecting cable

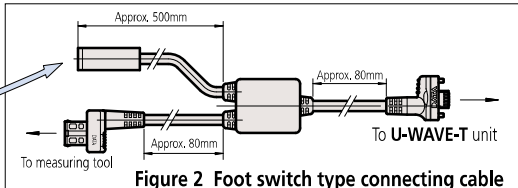
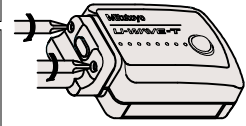


Figure 2 Foot switch type connecting cable



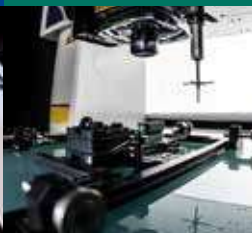
Fasten the connector to U-WAVE-T with two screws.

Cable type	A Water-proof with switch	B Water-proof with switch	C With switch	D 10-pin plain	E 6-pin round	F straight type	G Water-proof straight type
Standard type	Order No. 02AZD790A	Order No. 02AZD790B	Order No. 02AZD790C	Order No. 02AZD790D	Order No. 02AZD790E	Order No. 02AZD790F	Order No. 02AZD790G
Foot switch type	Order No. 02AZE140A	Order No. 02AZE140B	Order No. 02AZE140C	Order No. 02AZE140D	Order No. 02AZE140E	Order No. 02AZE140F	Order No. 02AZE140G
Plug that connects to the measuring instrument							
Socket type on the measuring instrument							
Major compatible measuring instruments	• Digimatic caliper 500-776/500-777, etc. 500-712-10/500-713-10, etc. 500-712/500-612, etc. 550-301-10/550-331-10, etc. 551-301-10/551-331-10, etc. 552-302-10/552-303-10, etc. 552-150-10/552-151-10, etc. 552-155-10/552-156-10, etc. 552-181-10/552-182-10, etc. • Digimatic special application caliper 573-601/573-602, etc. • Digimatic depth gage 571-251-10/571-252-10, etc. • Digimatic scale unit 572-600, 572-601, etc.	• Digimatic micrometer 293-100/293-130 293-140/293-141, etc. 293-230-30/293-240-30, etc. 340-251-10/340-252-10 • Dedicated micrometers for Digimatic 422-230-30/422-231-30, etc. 406-250-30/406-251-30, etc. 343-250-30/343-251-30, etc. 369-250-30/369-251-30, etc. 345-250-30/345-251-30, etc. 314-251-30/314-252-30, etc. • Digimatic micrometer head 350-251-30/350-261-30, etc. • Digimatic holtest 468-161/468-162, etc. • Digimatic depth gage 329-250-30/329-251-30, etc.	• Digimatic caliper 500-150-30/500-151-30, etc. 500-500-10/500-501-10, etc. 500-443/500-453, etc. • Digimatic special application caliper 573-118-10/573-119-10, etc. 573-116-10/573-117-10, etc. 573-191-30/573-291-30 573-181-30/573-182-30, etc. • Digimatic depth gage 571-201-30/571-202-30, etc. • Digimatic micrometer head 164-163/164-164 • Digimatic scale unit 572-203-10/572-213-10 572-300-10/572-301-10, etc.	[Surface Roughness Tester] -178 series SJ-210/310/410 [Height Gage] -518 series QM-Height [Reference Gage] -515 series Digital Height Master [Digimatic Indicator] 515-341/515-342 ID-H/F [Laser Scan Micrometer] -544 series LSM-9506 [μ-checker] Digital μ-checker (Using the foot switch) [Linear Gage/Counter] -542 series EB, EC-101D [Hardness testing machines] HM-210/220	• Digimatic micrometer 293-666/293-667, etc. 227-201/227-221, etc. 369-411/369-412, etc. • Digital height master 515-374/515-376, etc. • Hardness testing machines HM-100 HM-200 HV-100 HR-300/400/500 HH-411	• Digimatic indicator ID-CX, ID-C (Peak Value Hold Type), ID-C (Calculation type), ID-C (Bore Gage Type), ID-U, ID-SS, ID-SX, ID-C_RB, ID-C_GB • Digimatic height gage 192-663-10/192-613-10 / 570-322 / 570-227/574-112-1, etc. (Flat L-shape, cable outlet is right) • ABS Borematic 568-361/568-362, etc. • Scale unit 572-460/572-560/ 572-480-10/572-580-10, etc. • Digimatic Bore gage 511-501/511-502, etc. • Hardness testing machines HH-300 • Digimatic depth gage Digimatic type (ID-CX)	[Digimatic Indicator] -543 series ID-N ID-B
Measuring instruments that cannot be connected				[Surface Roughness Tester] -178 series SJ-500/SV-2100 [Linear Gage/Counter] -542 series EF-PRH/ZR, EH-P/Z/S/D EB-P/Z/D EC-D [Litematic] -318 series VL-A/AS/AH			
Reference: Order No. of wired-type connecting cable	1m 05CZA624 2m 05CZA625	05CZA662 05CZA663	959149 959150	936937 965014	937387 965013	905338 905409	21EAA194 21EAA190

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Form Measurement



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Sensor Systems

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Digital Scale and DRO Systems

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Apart from the basics of calibration and repair, Mitutoyo offers product and metrology training, as well as IT support for the sophisticated software used in modern measuring technology. We can also design, build, test and deliver measuring solutions and even, if deemed cost-effective, take your critical measurement challenges in-house on a sub-contract basis.



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