Mitutoyo

Mitutoyo Quality

Measurement Data Wireless Communication System
U-WAVE

Small Tool Instruments and Data Management

Catalog No. E12000(5)

Mitutoyo

Promotes Smart Factory by Collecting and Managing Measurement Data

"U-WAVE", the measurement data wireless communication system, collects data in the inspection process swiftly and accurately, and increases a company's competitiveness based on detailed data analysis.
In addition, together with MeasurLink, "IoT of Quality Control envisioned by Mitutoyo" can be achieved.

Advantages of Introducing U-WAVE

Higher Efficiency
Data can be input by single button operation! Since there is no need for manual input misinput does not occur. Efficiency is greatly improved!

Centralized Data Management
Measurement data can be managed centrally! "Visualization of quality" helps prevent the generation of defective products!

Cost Reduction Effect
Easily connected to the Digimatic gage* currently in use! A system configuration reducing the initial and running cost is possible.
* Some models of U-WAVE-TM/TC are not applicable.

Achieve Smart Measurement

Measurement Data Wireless Communication System

U-WAVE

This is a system that transmits data from Mitutoyo Digimatic gages to software such as Excel or Notepad via wireless communication. It saves time and eliminates misinput, helps achieve cost reductions and better efficiency while maintaining excellent operability.

U-WAVE fit
Compared to U-WAVE-T, compact and thin design provides a better fit to the Digimatic gage and better operability.

From a Digimatic gage connected with U-WAVE

Data is obtained via wireless communication and sent to commercial software such as Excel

U-WAVE resolves measuring process issues!

Issue
Manual input of measurement data is inefficient and frequently generates misinput.

Solution
U-WAVE immediately transmits the measurement data to your PC. Misinput due to manual input can be eliminated, and therefore data reliability and operational efficiency is improved.

Issue
Loading measurement data via wireless is seen as desirable but justifying any high initial investment is difficult.

Solution
No high initial investment required because U-WAVE can be inexpensively connected to your existing Digimatic gages. No need to purchase replacements.

Issue
Since multiple operators use Digimatic gages, it takes a long time for data collection and Pass/fail judgment.

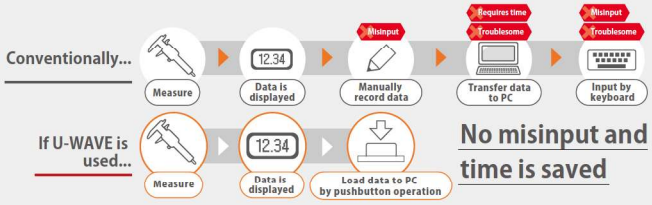
Solution
Up to 100 Digimatic gages can be registered to a single U-WAVE receiver on the PC side. The data is automatically entered separately in the Excel sheet. Therefore, data collection and Pass/fail judgment are easily performed.

See video from here

Mitutoyo

Speedy and Reliable Data Collection and Pass/fail Judgment Improves Manufacturing Competitiveness

Higher Efficiency



LED or a buzzer notifies data reception

Patented in Japan

Confirmation that data was successfully received.

Note: The buzzer sound is only available with the buzzer equipped model.

- Normally received: green LED blinks
- Buzzer sounds twice briefly

- Reception failed: red LED blinks
- Buzzer sounds once

Dustproof and water resistant IP67 model

The water-proofed transmitter is resistant to water and dust.

IP67

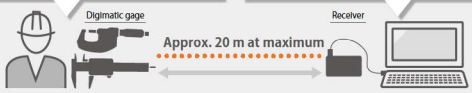
Cordless enables freedom of movement

No cord allows easy operation.

Wireless communication range up to 20 m* (line of sight)

The measurement site can be layout freely.

* May be less according to the operating environment.
* May be less, if the Digimatic gage is used while covered by hand.



Misinput generated by manual input is eliminated

The measurement data can be directly input by a single button operation.

Stable wireless communication

Mitutoyo's original wireless communication based on IEEE802.15.4 (2.4 GHz) has been adopted.

Centralized Data Management

Operation in an Excel sheet

The data can be directly read into an Excel sheet.

Digitalization enables easy data collection and analysis

The measurement data from each process can be stored and managed centrally.

Up to 100 Digimatic gages can be registered

Using USB-ITPAK V2.1, data can be laid out for each Digimatic gage based on the data identification ID.

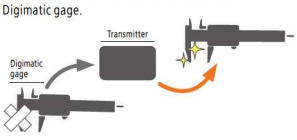
Up to 15 units can be connected to a PC

Data can be collected from any measuring instrument equipped with the Digimatic output function.

Cost Reduction Effect

Point If a Digimatic gage is damaged, operation can be continued using a different gage

The transmitter can be reconnected to a different Digimatic gage.



Point Connectable to any of your existing Digimatic gages

No need to buy a replacement if your tool is equipped with the Digimatic function.

Point Approximately 400,000 continuous data transmissions are possible

Just one CR2032 lithium battery provides power for about 400,000 data transmissions.

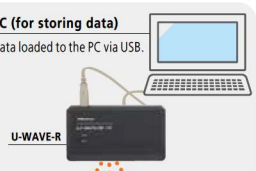
Product Configuration

(Refer to pages 8 and 9 for details.)

Receiver

U-WAVE-R

- Receives measurement data and transmits to the PC via USB.
- Since USB bus power system is used, a battery or adapter is not required.
- The identification ID and frequency to be used can be set using supplied software U-WAVEPAK.
- The data load function to Excel, etc. is supplied as a standard accessory.



Transmitters

U-WAVE-TM/TC/T

- Transmits the measurement data displayed on the gage to U-WAVE-R.
- Compact, cable-less design provides a better fit with the Digimatic gage and better operability.

U-WAVE fit

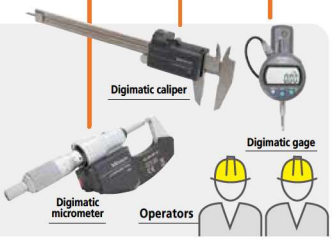
Connecting unit/connecting cable

- A compact connecting unit connects the U-WAVE-TM/TC/T transmitter to the Digimatic gage.
- A dedicated cable connects the U-WAVE-T transmitter to the Digimatic gage.

Digimatic gages

Compatibility

- U-WAVE-TM/TC can be used with most of the calipers and micrometers equipped with the Digimatic output function.
- U-WAVE-T can be used with all the Digimatic gages equipped with the Digimatic output function.



U-WAVE fit U-WAVE-TM/TC compatible Digimatic gages (reference)

For details, refer to a separate sheet "U-WAVE-TM/TC Compatible Devices" or our web site.

Digimatic micrometer	Digimatic caliper
	
	
	
	
	

Transmitters

Type of Transmission Unit

U-WAVE-TM/TC

Patent applied for in Japan, U.S., China, and Germany
Design registered in Japan, U.S., EU, and China

With functions and performance inherited from U-WAVE-T, a compact and thinner design provides a neater solution by eliminating cabling around the Digimatic gage and thus better operability!

U-WAVE fit

U-WAVE-TM for micrometers and U-WAVE-TC for calipers are available, both the buzzer type and IP67 type. The buzzer type notifies the normal reception of data by LED and buzzer sound. The dust/water-proof IP67 type is designed for a harsh environment and as such is only equipped with LED notification of data reception.

U-WAVE-T

Design registered in Japan

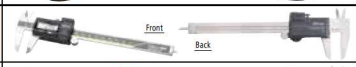
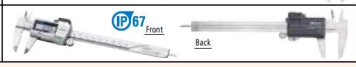
This product successfully introduced U-WAVE to the market.

For digimatic micrometers, calipers, indicators and micrometer heads

U-WAVE-T is connected to a Digimatic gage with a dedicated cable that mates with the data connector on that particular gage.

The buzzer type and IP67 type are available. The buzzer type notifies the normal reception of data by LED and buzzer sound. The IP67 type is designed for a harsh environment and as such is only equipped with LED notification of data reception.

Connecting compatible micrometers, calipers and other Digimatic gages to U-WAVE

Gage		Assembled appearance	Connecting unit/connecting cable	Transmitter	Receiver
For micrometers	Standard		 02AZF310	U-WAVE-TM With buzzer 264-623 U-WAVE fit	 U-WAVE-R 02AZD810D Design registered in Japan
	Dust/water-proof			IP67 U-WAVE-TM Dust/water-proof 264-622 U-WAVE fit	
For calipers	Standard		 02AZF300	U-WAVE-TC With buzzer 264-621 U-WAVE fit	
	Dust/water-proof		 02AZF310	IP67 U-WAVE-TC Dust/water-proof 264-620 U-WAVE fit	
Digimatic gages			 Connecting cable*	U-WAVE-T With buzzer 02AZD880G	
				IP67 U-WAVE-T Dust/water-proof 02AZD730G	

* Select according to the Digimatic gage to be connected. Refer to pages 16 and 17 for connecting cables.

Typical Measuring Issues Solved

In combination with application software USB-ITPAK V2.1,
better efficiency in quality assurance can be achieved.

Case Study

Case 1 — Standard sequential measurement input

Issue To record the measurement results, on a chart, from three points on a mass-produced product measured using two gages.

Solution If you set the procedure of inputting data to the Excel sheet with USB-ITPAK V2.1, the measurement data is automatically entered.

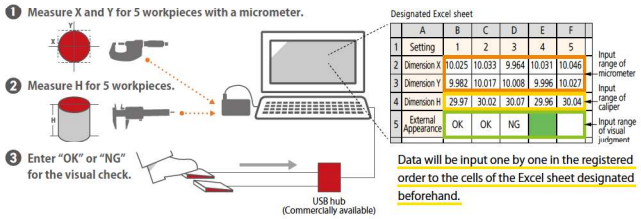
■ Measure the workpiece dimensions, X and Y, with a micrometer. Then, measure H with a caliper. Finally, visually check the appearance and judge OK or NG. Perform the above for 5 workpieces consecutively.

Point **Measurements in order**

The designated table will be created by measuring and transmitting data for X and Y of 5 workpieces, measuring and transmitting data of H, and then entering the result of visual check.

Point **Set the sequential measurement input order**

Designate the Excel sheet, select the data loading range, loading order, and allocate the ID for each cell.



Designated Excel sheet

	A	B	C	D	E	F	
1	Setting	1	2	3	4	5	
2	Dimension X	10.025	10.033	9.964	10.031	10.046	Input range of micrometer
3	Dimension Y	9.982	10.017	10.008	9.996	10.027	
4	Dimension H	29.97	30.02	30.07	29.96	30.04	Input range of caliper
5	External Appearance	OK	OK	NG			Input range of visual judgment

Data will be input one by one in the registered order to the cells of the Excel sheet designated beforehand.

Case 2 — Data input by multiple operators

Issue To sort data into separate Excel sheets per Digimatic gage in the inspection process.

Solution The data collected by multiple operators can be individually set to be input to the designated cells in the Excel sheet.

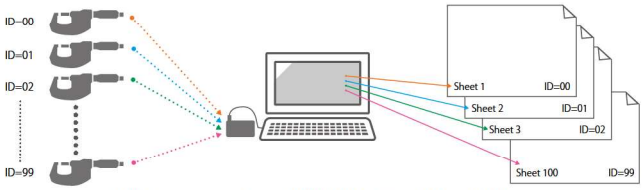
■ Input data of each Digimatic gage in order into the designated cells of the separate Excel sheet.

Point **Up to 100 Digimatic gages can be registered**

100 Digimatic gages at maximum can be registered to a receiver and the same number of Excel sheets can be designated.

Point **Designate the Excel sheet per Digimatic gage**

Using USB-ITPAK, designate the Excel sheet per Digimatic gage. Then, same as the sequential measurement, select the data loading range, loading order, and allocate the IDs.



Multiple measurement data (via U-WAVE-TM/TC/T) can be sorted into the separate Excel sheets without requiring you to program macros.

Option

USB-ITPAK V2.1

A USB dongle must be connected to the PC running the software.

USB dongle

Measurement Data Collection Software

USB-ITPAK V2.1

USB-ITPAK V2.1 is optional software to be installed in the PC connected with U-WAVE-R. It enables setting up the procedure to input the measurement data received from U-WAVE-R to the Excel sheet and to achieve greater inspection efficiency and enhanced credibility.

The combined use with U-WAVE will improve the operational efficiency of the inspection work.

Best suited for recording data in mass-production inspections where the procedure is repeated every day.

Features of USB-ITPAK V2.1

- The measuring methods can be configured, such as sequential measurement, batch measurement, individual measurement and more.
- Data can be canceled by a single operation of the foot switch or function key.
- Input range can be specified per Digimatic gage, which reduces the chance of a misinput.
- Data input or cancellation can be instructed globally in multiple-point simultaneous measurement.
- The Excel sheet can be automatically called for data input.
- The cursor movement after data input can be set to enable automatic input.

Case Study

Case 3

Batch measurement using timer

Issue To measure displacement using multiple Digimatic gages and automatically obtain data in a certain input interval.

Solution Batch timer input is available using the USB-ITPAK batch measurement function and the optional timer input function.

■ Specify the interval for measuring the displacement of the workpiece and collect data at once.

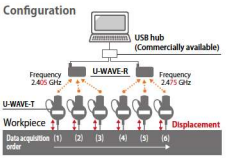
Point **Batch measurement with all the Digimatic gages**
Data can be obtained globally by a foot switch operation.

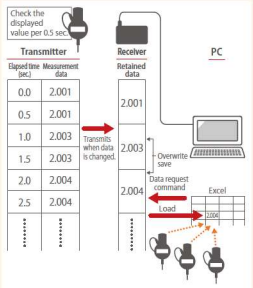
Point **Timer input option**
Using USB-ITPAK, the data request interval can be set by hours, minutes, and seconds (0.0 sec. to 24 hrs.).

Point **Batch timer input**
Data can be obtained at the desired interval using the timer input function in batch measurement.

	A	B	C	D	E	F	G
1	Displacement (1)	Displacement (2)	Displacement (3)	Displacement (4)	Displacement (5)	Displacement (6)	Measurement date/ time
2	0.281	0.162	0.121	0.051	0.011	−0.001	2013/4/1 7 30 00
3	0.270	0.152	0.133	0.064	0.018	−0.003	2013/4/1 7 30 05
4	0.265	0.149	0.142	0.080	0.021	−0.007	2013/4/1 7 30 10
5							
6							

After 5 sec.
After 5 sec.
After 5 sec.





Responds to data request from PC

U-WAVEPAK (event drive)

Using event drive mode

1) For configuration, software U-WAVEPAK (event drive) is used.
2) The data request command can be sent to U-WAVE-R at an arbitrary timing.

Responds to data request command

1) U-WAVE-TM/TC/T checks the displayed value of the Digimatic gage in the 0.5 sec. interval, and transfers data if the value is changed.
2) U-WAVE-R overwrites data in the storage.
3) Sends data responding to the data request command.

Enables automatic data load

Without operating the send button of the Digimatic gage, data can be obtained automatically from multiple Digimatic gages.

● The battery life of the U-WAVE-TM/TC/T is shortened (20 days in continuous operation). ● U-WAVE is equipped with a function to avoid radio wave interference, and enables successful simultaneous data transmission of three U-WAVE-T units per U-WAVE-R. To perform simultaneous data transmission with more than three units of U-WAVE-T, add U-WAVE-R and set different frequencies (15 channels) to assure reliable wireless communication.

Achieve "Visualization of Quality"

Collecting the measurement data
Measurement Data Wireless Communication System
U-WAVE

IoT of Quality Control
Measurement Data Network System
MeasurLink

Configure the measurement network system MeasurLink using U-WAVE as a base

What is MeasurLink®?

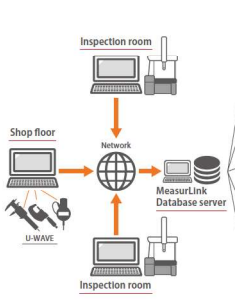
MeasurLink is an IoT platform for quality management that realizes "Visualization of Quality" by enabling real-time data collection from the networked Digimatic gages and global control and analysis. U-WAVE supports MeasurLink as an infrastructure that collects and controls data.

Preventing defectives
Collects data from the Digimatic gages on the network and performs statistical process control (SPC) to warn of possible generation of defectives.

Diagnosis by data analysis
Checking measurement results by accessing the data base and performing various analyses helps investigate and resolve process performance concerns.

Simply start achieving IoT
In addition to conventional data storage, the network can be configured in steps to simply start IoT of Quality Control.

Linkage between U-WAVE and MeasurLink



Data Collection Software MeasurLink Real-Time
This SPC software allows data collection from each tool and instrument and still allows realtime display of statistical processing data such as control charts, histograms and process capability indexes.

Process Management for Administrators MeasurLink Process Manager
This administrative software enables centralized monitoring of information from all MeasurLink data collection terminals networked together on the shop floor.

Process Analysis module for Administrators MeasurLink Process Analyzer
This administrative software allows confirmation of measurement results and various statistical analyses by access to the database where the measurement data collected with MeasurLink Real-Time is stored.

Gage Management Software MeasurLink Gage Management
This software plans and implements a complete calibration schedule and incorporates a powerful retrieval function in addition to recording and managing the operational status of gages.

Evaluation / Analysis Software for Measurement System Analysis (MSA) MeasurLink Gage R&R
This is evaluation and analysis software compliant with the MSA* required in ISO/TS 16949. * Measurement System Analysis

Measurement data ▶ Collect data ▶ Unify ▶ Analyze ▶ Visualize

Mitutoyo

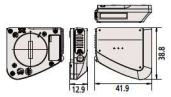
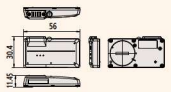
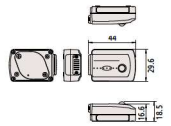
Specifications

Wireless Communication Specifications

Wireless communication	Wireless communication distance	Wireless communication speed	Transmission output	Modulation method	Communication frequency	Used band
Original (based on IEEE802.15.4 (2.4 GHz))	Approx. 20 m (line of sight)	250 kbps	U-WAVE-T: 1 mW (0 dBm) or less U-WAVE-TC/TM: 2.5 mW (4 dBm) or less	DS-SS (Direct Sequence - Spread Spectrum) Resistant to interfering signals and noise	2.4 GHz band (ISM band: Universal frequency)	15 channels (2.405 to 2.475 GHz at intervals of 5 MHz) The noise search function avoids interference with other communication devices.

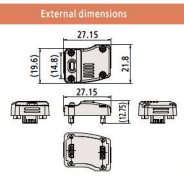
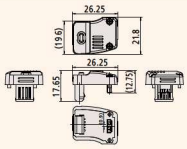
Note 1: This product is a radio equipment classified in the 2.4 GHz Wide-band Low Power Data Communication System.
To use this product, conformity to the radio law of each country is required. Please contact your dealer or nearest Mitutoyo sales office.
Note 2: Not compatible with the conventional Mu-WAVE, for which communication specifications are different.

Transmitter (Refer to pages 8 and 9 for combinations.)

Product name	Model	Order No.	Protection level	Data reception indication	Power supply	Battery life	Mass	Appearance	External dimensions
U-WAVE-TM (for micrometers)	IP67 type dust/water-proof	264-622	IP67	LED	Lithium battery CR2032×1	Approximately 400,000 transmissions	18 g		Unit: mm 
	Buzzer type	264-623	N/A	LED, buzzer			18 g		
U-WAVE-TC (for calipers)	IP67 type dust/water-proof	264-620	IP67	LED			18 g		Unit: mm 
	Buzzer type	264-621	N/A	LED, buzzer			18 g		
U-WAVE-T	IP67 type dust/water-proof	02AZD730G	IP67	LED			23 g		Unit: mm 
	Buzzer type	02AZD880G	N/A	LED, buzzer			23 g		

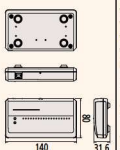
Compatible OS: Windows 2000 Professional (SP2 or later)/Windows XP/Home Edition (SP2 or later)/Windows XP Professional (SP2 or later)*/Windows Vista*/Windows7*/Windows 8*/Windows 8.1*/Windows 10* (* compatible with 32/64-bit OS)

Connecting unit (Refer to pages 8 and 9 for combinations.)

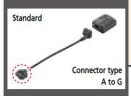
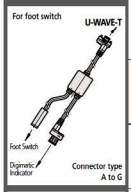
Product name	Model	Order No.	Protection level	Mass	Appearance	External dimensions
Connecting unit	For dust/water-proof type	02AZF310	IP67	6 g		Unit: mm 
	For standard type	02AZF300	N/A	6 g		Unit: mm 

Mitutoyo

Receiver (Refer to pages 8 and 9 for combinations.)

Product name	Model	Order No.	Power supply	Connectable U-WAVE-R units (per PC)	Connectable U-WAVE-T units	Mass	Appearance	External dimensions	Standard accessory: U-WAVEPAK software		
									System Environment: Compatible OS	Main specifications	Data format
U-WAVE-R	U-WAVE-R	02AZD810D	USB bus power system	Up to 15	Up to 100	130 g		Unit: mm 	Windows 2000 Professional (SP4 or later)* Windows XP Home Edition (SP2 or later)* Windows XP Professional (SP2 or later)* Windows Vista* Windows 7* Windows 8/8.1* Windows 10* Note: Windows 10 Mobile is not supported. * 32-bit, 64-bit OS supported <Versions confirmed operational on Windows 10> • U-WAVEPAK Ver.1.020 or later <Connectability confirmed for tablet PC> • Microsoft Surface Pro 6 (the version whose operation on Windows10 Professional is confirmed) • Required environment: DVD drive (required for installation), USB port ×2 ports or more	• Setup of dedicated driver software (USB and virtual COM port) • Initial setting of ID number and frequency selection (required only once for the first time) • Load data to Microsoft Excel or Notepad through the data interface function	**Example of format when the Digimatic gage displays 12.34** **DT1 01 02 +00000012.34 M** Header DT1: Measurement data ST1: **Status code**☆ Digimatic gage display value*1 Unit M: mm U-WAVE-TC/TM/T ID: 00 to 99 U-WAVE-R ID: 00 to 99 *1 Data interface function is switchable to "Measurement value only" ☆**Example of status code format** **ST1 01 02 0999999073 99** Header Status code U-WAVE-R ID U-WAVE-TC/TM/T ID Device ID*2 **Status code** 99: Data cancellation 01: No response from Digimatic gage 03: Measurement data missing, others *2 Unique number assigned to U-WAVE at shipment

Dedicated cable for U-WAVE-T (Refer to pages 8 and 9 for combinations.)

Product name	Connecting cable			Gage connectors on data cable		Digimatic ports on gage		
	Connector type	Order No.		Picture of gage connector	Data switch	Picture of Digimatic port	Applicable models	
		Standard	For foot switch					
Dedicated cable for U-WAVE-T	A Water-proof type with output button	02AZD790A	02AZE140A		Available		[**Digimatic caliper**] 500-712-20/500-713-20, etc. 550-301-20/550-331-20, etc. 551-301-20/551-331-20, 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**] 573-601-20/573-602-20, etc. [**Digimatic depth gage**] 571-251-20/571-252-20, etc. [**Digimatic scale unit**] 572-600, 572-601, etc.
Standard 	B Water-proof type with output button	02AZD790B	02AZE140B		Available		[**Digimatic micrometer**] 293-140-30/293-141-30, etc. 293-230-30 etc. 340-251-30/340-252-30 293-666-20/293-667-20, etc. 227-201-20/227-203-20, etc. 227-205-20/227-206-20, etc. 227-221-20 etc. 227-223-20 etc. [**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.
For foot switch 	C Straight type with output button	02AZD790C	02AZE140C		Available		[**Digimatic caliper**] 500-150-30/500-151-30, etc. 500-500-10/500-501-10, etc. 500-443 etc. [**Digimatic special application caliper**] 573-718-20/573-719-20, etc. 573-716-20/573-717-20, 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.
	D Flat 10-pin type	02AZD790D	02AZE140D		N/A		[**Digimatic indicator**] ID-H ID-F (Note)	[**High-precision height gage**] QM-Height
	E Round 6-pin type	02AZD790E	02AZE140E		N/A		[**Hardness testing machines**] HM-100, HM-200, HV-100, HR-300/400/500, HH-411	
Foot Switch (optional)  Order No.937179T	F Flat straight type	02AZD790F	02AZE140F		N/A		[**Digimatic indicator**] ID-CX, ID-C (Peak-Value Hold Type), ID-C (Calculation type), ID-C (Bore Gage Type), ID-U (Note), ID-SS (Note), ID-SX (Note) [**Digimatic height gage**] 192-663-10/192-613-10/570-322/570-227, etc. (Flat L-shape, cable outlet is right) [**ABS boremattic**] 568-361/568-362, etc. [**Digimatic bore gage**] 511-501/511-502, etc.	[**Scale unit**] 572-460/572-560/572-480-10/572-580-10, etc. [**Hardness testing machines**] HH-300 [**Digimatic depth gage**] Digimatic type (ID-CX)
	G Flat straight water-proof type	02AZD790G	02AZE140G		N/A		[**Digimatic indicator**] ID-N, ID-B	

Note: ID-F, ID-U, ID-SS, ID-SX are required to use with the USB-ITN.

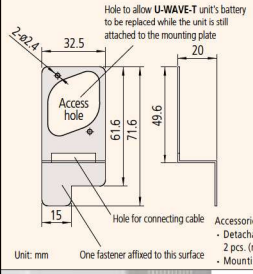
Optional Products

Application system

Product name	Model	Compatible OS: Windows*1	Compatible Excel version*2	Order No.
USB-ITPAK	USB-ITPAK V2.1	2000 SP4 XP SP2 or later Vista 7 8 8.1 10	2002 2003 2007 2010 2013 2016 365	06AFM386

*1 32-bit, 64-bit OS supported Windows 10 Mobile is not supported. *2 The operation with Excel for MAC OS is not guaranteed.

Accessories for U-WAVE-T

Product name	Appearance	Dimensions and fixing example	Order No.
U-WAVE-T Installation Bracket Kit		 Accessories • Detachable fastener, 2 pcs. (mirror-imaged) • Mounting screws, 2 pcs.	02AZE200
		 Accessories • Detachable fastener, 2 pcs. (mirror-imaged) • Mounting screws, 2 pcs.	02AZE990

Application examples of the mounting plate (02AZE200)

Digimatic indicator ID-C112XB

Image of fastener attachment to main gage

In the case of an indicator

ID-C112XB

A back plate without a center lug is recommended. If a lug is present, attach fastener after cutting away material to clear the lug.

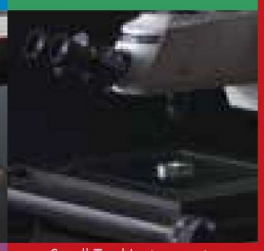
509 2110 (5)a-(CH)NE (JP12), Printed in Japan

Coordinate Measuring Machines

Vision Measuring Systems

Form Measurement

Optical Measuring

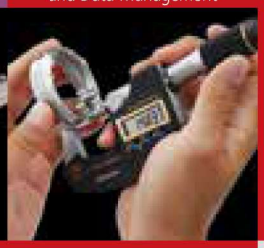


Sensor Systems

Test Equipment and Seismometers

Digital Scale and DRO Systems

Small Tool Instruments and Data Management



Whatever your challenges are, Mitutoyo supports you from start to finish.

Mitutoyo is not only a manufacturer of top quality measuring products but one that also offers qualified support for the lifetime of the equipment, backed up by comprehensive services that ensure your staff can make the very best use of the investment.

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 bespoke measuring solutions and even, if deemed cost-effective, take your critical measurement challenges in-house on a sub-contract basis.

Find additional product literature and our product catalogue

https://www.mitutoyo.co.jp/global.html

Our products are classified as regulated items under Japanese Foreign Exchange and Foreign Trade Law.
Please consult us in advance if you wish to export our products to any other country.
If the purchased product is exported, even though it is not a regulated item (Catch-All controls item), the customer service available for that product may be affected. If you have any questions, please consult your local Mitutoyo sales office.

Mitutoyo

Mitutoyo Corporation
20-1, Sakado 1-Chome,
Takatsu-ku, Kawasaki-shi,
Kanagawa 213-8533, Japan
T +81 (0) 44 813-8230
F +81 (0) 44 813-8231
https://www.mitutoyo.co.jp

Catalog No. E12048

Mitutoyo

Measurement Data Wireless Communication System

Mitutoyo *Bluetooth*® U-WAVE

Mitutoyo Quality

U-WAVE now available with Bluetooth® wireless technology

Small Tool Instruments and Data Management

NEW Products

Mitutoyo

Easy to Connect

U-WAVE fit

Receiver-less Measurement Data Wireless Communication System

Allows direct measurement data transmission to smartphones, tablets and PCs.

U-WAVE fit

Bluetooth®

U-WAVEPAK-BM (English version only), the communication software for transferring measurement data to smartphones and tablets is available at app stores for free download.

Get from Google Play — Available for free from the middle of June 2020

Download from App Store — Available for free from the middle of June 2020

U-WAVEPAK-BW, the computer communication software for transferring measurement data to computer software, is available for download from our company's website.

Available for download from April 2020
https://www.mitutoyo.co.jp/contact/products/u-wave/

Google Play and the Google Play logo are trademarks of Google LLC. Apple and the Apple logo are trademarks of Apple Inc.

Note1: This application operates with Windows Terminal for Windows 10 equipped with the Bluetooth wireless technology function. If your Windows Terminal does not have this function, please purchase a commercially available Bluetooth® receiver.
Note2: We cannot guarantee the operation of this application and U-WAVE TCB/TMB with all Bluetooth equipped devices.

Manage Measurement Data Centrally and Wirelessly on a Smartphone, Tablet or PC

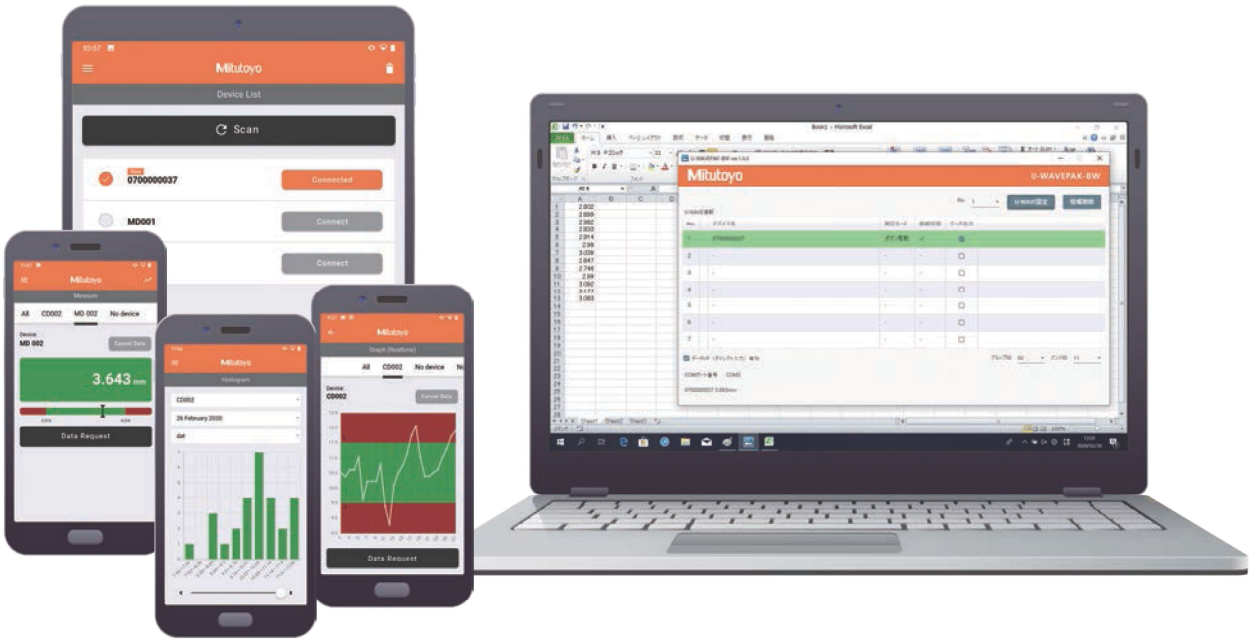
Mitutoyo *Bluetooth*® U-WAVE

U-WAVE-TMB / TCB

NEW Products

More compact and thinner for a better fit with Digimatic gages, and featuring improved operability and performance inherited from its predecessor, U-WAVE-TMB / TCB is now available with Bluetooth® wireless technology. No receiver is required, and one PC can conect up to seven units of Mitutoyo *Bluetooth*® U-WAVE. Dust/water-proof models are also available for arduous shop floor usage.

IP67



For Digimatic micrometers

U-WAVE-TMB

For Digimatic calipers

U-WAVE-TCB

Major Advantages of Introducing U-WAVE incorporating Bluetooth® wireless technology

Does Not Require a Receiver

Measurement data can be transmitted to PCs, tablets and smartphones without a receiver if they are equipped with Bluetooth® wireless technology!

Cost Reduction Effect

System can be configured at reduced cost, just by connecting to an existing Digimatic gage!

Higher Efficiency

Data can be input by single button operation! Since there is no need for manual input misinput does not occur. Efficiency is greatly improved!

Centralized Data Management

Measurement data can be managed centrally! "Visualization of quality" helps prevent the generation of defective products!

Easy Data Saving

Measurement data can be saved to smartphones and tablets independently of the measurement site!

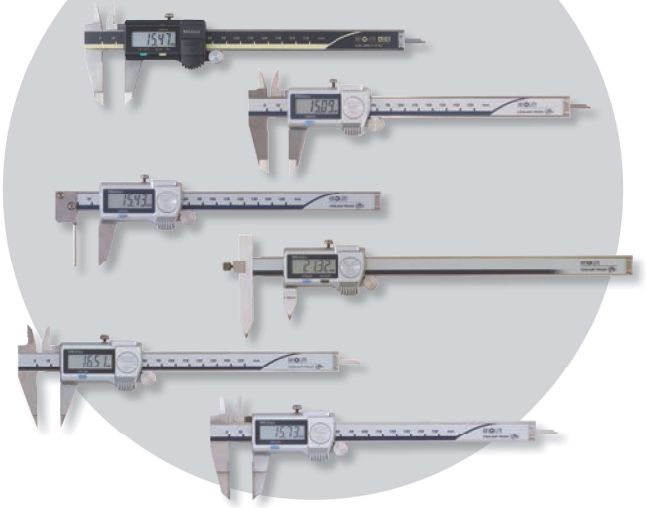
You can use with confidence since it is labeled with the wireless certification number acquired in the country of purchase.

With Bluetooth® wireless technology for Easy Pairing with Your Digimatic Micrometer or Caliper

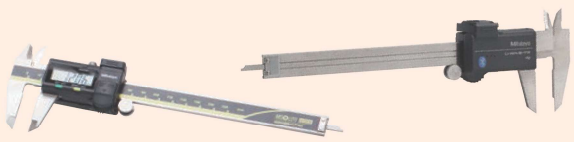
U-WAVE-TMB/TCB is compatible with most Digimatic micrometers and calipers.
Refer to our company's website for details on product compatibility.
https://www.mitutoyo.co.jp/eng/support/service/catalog/10/E12000_appendix.pdf

Digimatic micrometers

Digimatic calipers

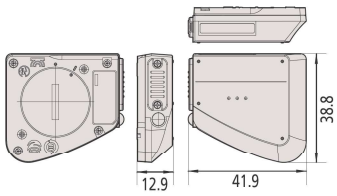
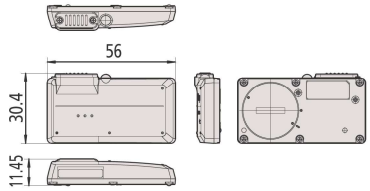


Digimatic gage, connecting unit and transmitter combinations

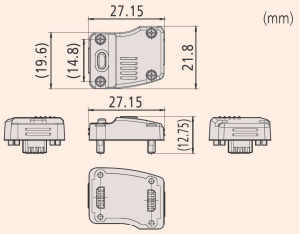
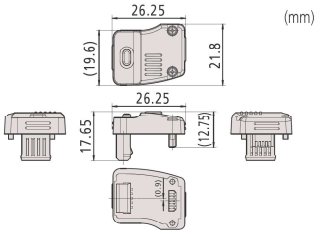
		Assembled appearance	Connecting unit	Transmitter
For micrometers	Standard		02AZF310 	U-WAVE-TMB buzzer type 264-627 
	Water-proof type			U-WAVE-TMB IP67 type dust/water-proof 264-626 IP67 
For calipers	Standard		02AZF300 	U-WAVE-TCB buzzer type 264-625 
	Coolant-proof type		02AZF310 	U-WAVE-TCB IP67 type dust/water-proof 264-624 IP67 

Specifications

Transmitter (Refer to page 5 for combinations.)

Product name	U-WAVE-TMB (for Digimatic micrometers)		U-WAVE-TCB (for Digimatic calipers)	
Model	U-WAVE-TMB (IP67 type dust/water-proof)	U-WAVE-TMB (buzzer type)	U-WAVE-TCB (IP67 type dust/water-proof)	U-WAVE-TCB (buzzer type)
Order No.	**264-626**	**264-627**	**264-624**	**264-625**
Protection level	IP67	N/A	IP67	N/A
Data reception indication	LED	LED, buzzer	LED	LED, buzzer
Power supply	Lithium battery CR2032×1			
Battery life	Approx. 1 year under normal conditions of use, but varies according to usage.			
Mass	18 g			
Appearance				
External dimensions	 (mm)		 (mm)	

Connecting unit (Refer to page 5 for combinations.)

Product name	Order No.	Protection level	Mass	Appearance	External dimensions
Connecting unit (for dust/water-proof type)	**02AZF310**	IP67	6 g		 (mm)
Connecting unit (for standard type)	**02AZF300**	N/A	6 g		 (mm)

Wireless Communication Specifications

Wireless communication	Bluetooth 4.2 Low Energy
Wireless communication distance	Approx. 16 m (line of sight) Approx. 10 m (in a factory environment)
Transmission output	3.2 mW (5 dBm) or less (Class2)
Modulation method	FH-SS (Frequency-hopping spread spectrum)
Communication frequency	2.4 GHz band

Note 1: To use U-WAVE-TMB/TCB, conformity to the radio law of each country is required. Please contact your dealer or nearest Mitutoyo sales office.
Note 2: U-WAVE-TMB/TCB is not compatible with U-WAVE fit, for which communication specifications are different.

Refer to the U-WAVE fit Brochure (No. E12000) for more details.
https://www.mitutoyo.co.jp/eng/support/service/catalog/10/E12000.pdf

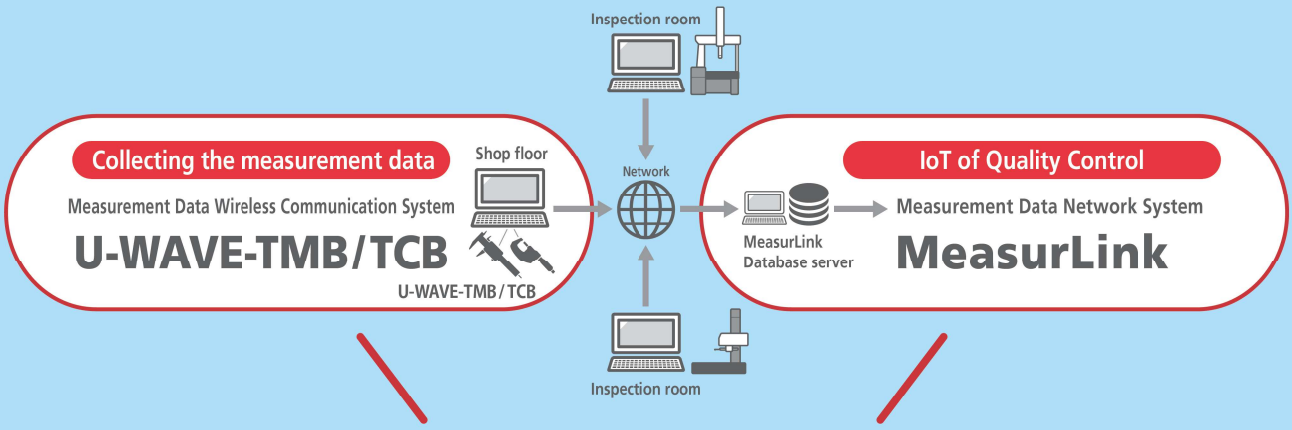
Optional Products

Application system for a PC

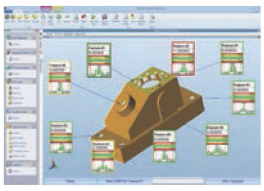
Product name	Model No.	Compatible OS: Windows	Compatible Excel version	Part No.	Appearance
USB-ITPAK	USB-ITPAK V2.1	10 (64 bit)	2016 (The operation with Excel for MAC OS is not guaranteed.)	06AFM386	

A USB dongle must be connected to the PC running the software.

Configuring the measurement network system MeasurLink based on U-WAVE-TMB/TCB



Achieve "Visualization of Quality"



With MeasurLink®

MeasurLink is an IoT platform for quality management that realizes "Visualization of Quality" by enabling real-time data collection from networked Digimatic gages and global control and analysis. U-WAVE supports MeasurLink as an infrastructure that collects and controls data.

Preventing defectives

Collects data from Digimatic gages on the network and performs statistical process control (SPC) to warn of possible generation of defectives.

Diagnosis by data analysis

Checking measuremen: results by accessing the data base and performing various analyses helps investigate and resolve process performance concerns.

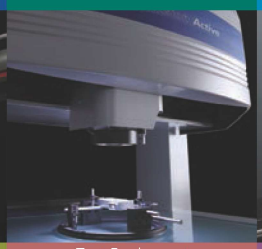
Simply start achieving IoT

In addition to conventional data storage, the network can be configured in steps to simply start IoT of Quality Control.

64 2005(1)e(DS)HS(JP1), Printed in Japan

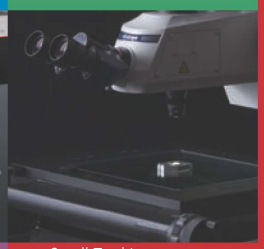
Coordinate Measuring Machines

Vision Measuring Systems



Form Measurement

Optical Measuring

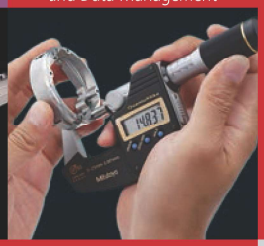


Sensor Systems

Test Equipment and Seismometers

Digital Scale and DRO Systems

Small Tool Instruments and Data Management



Whatever your challenges are, Mitutoyo supports you from start to finish.

Mitutoyo is not only a manufacturer of top quality measuring products but one that also offers qualified support for the lifetime of the equipment, backed up by comprehensive services that ensure your staff can make the very best use of the investment.

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 bespoke measuring solutions and even, if deemed cost-effective, take your critical measurement challenges in-house on a sub-contract basis.

Find additional product literature and our product catalogue

https://www.mitutoyo.co.jp/global.html

Our products are classified as regulated items under Japanese Foreign Exchange and Foreign Trade Law.
Please consult us in advance if you wish to export our products to any other country.
If the purchased product is exported, even though it is not a regulated item (Catch-All controls item), the customer service available for that product may be affected. If you have any questions, please consult your local Mitutoyo sales office.

Mitutoyo

Mitutoyo Corporation
20-1, Sakado 1-Chome,
Takatsu-ku, Kawasaki-shi,
Kanagawa 213-8533, Japan
T +81 (0) 44 813-8230
F +81 (0) 44 813-8231
https://www.mitutoyo.co.jp