

# Measurement Data Wireless Communication System U-WAVE

Catalog No. E12000(2)

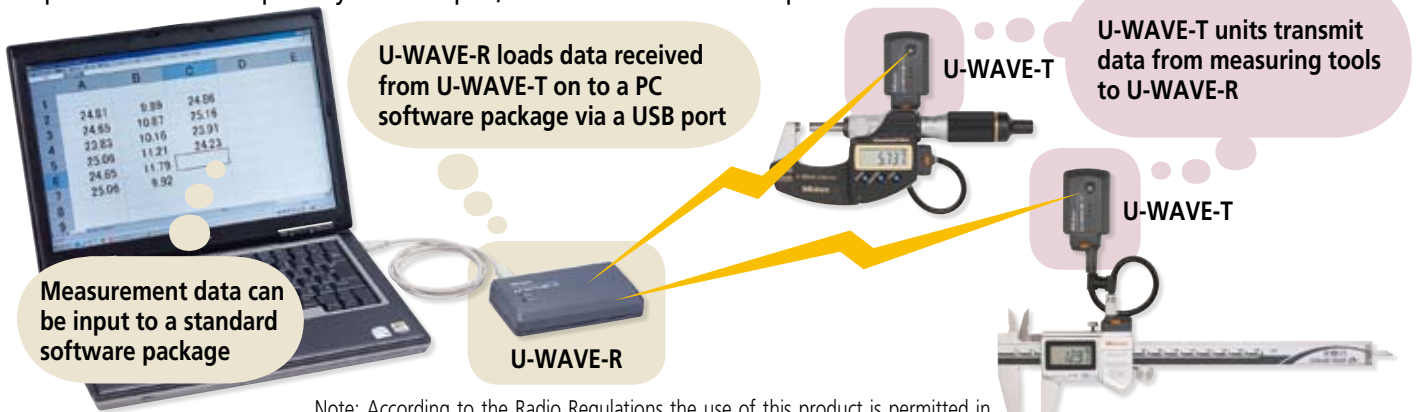


New system improves workability by eliminating long and cumbersome cables when communicating data to a PC

**Mitutoyo**

# Measurement Data Wireless Communication System U-WAVE

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

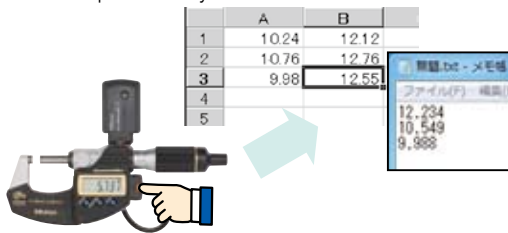


\*Excel is a registered trademark of Microsoft Corporation.

Note: According to the Radio Regulations the use of this product is permitted in the specified countries and regions. (Details on page 6) This product must not be used in other countries or areas.

## Easy loading in Excel format

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



## Dustproof and water resistant IP67 model

**IP67**-type **U-WAVE-T** (No.02AZD730D) has an **IP67**-level dust/water-proof function. This model can be used in combination with, for example, a coolant-proof caliper, micrometer or indicator.



**IP67**

## Combination with optional accessories

The combined use with **USB-ITPAK V2.0** will improve the operational efficiency of repetition inspection work. Best suited for keeping track of inspection data of mass-produced products. Refer to page 10 and 11 for details.



## Reception is reported by LEDs (and a beep sound).

· Patent pending (Japan)

The **U-WAVE-T** main unit has two LEDs and a buzzer\* that can be used to check if sent data was successfully received.

\*Beep indication is supported by the buzzer type **No.02AZD880D** only.

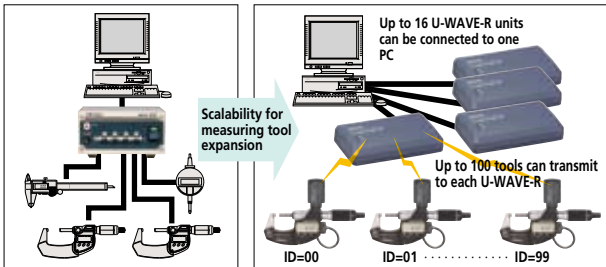


**Mitutoyo**

# U-WAVE

## 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**

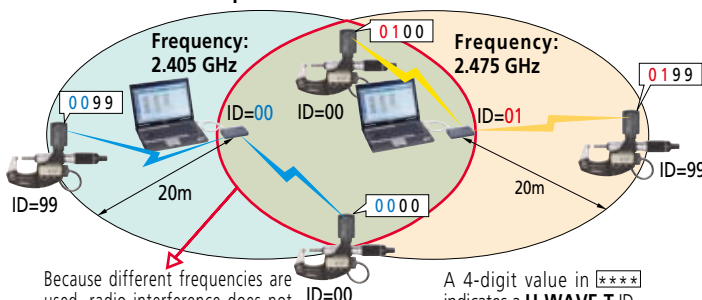
(up to 100 wireless channels)

## Data communication range up to 20 m possible

The maximum reliable communication range is approximately 20 m\*. Even when multiple **U-WAVE-R** units are used within the range of 20 m, 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).

\*The range achievable depends on the local radio transmission characteristics.

### Different frequencies ensure no radio interference



Because different frequencies are used, radio interference does not occur even when multiple devices are used in the same communication range.

## Approximately 400,000 Data Transmissions

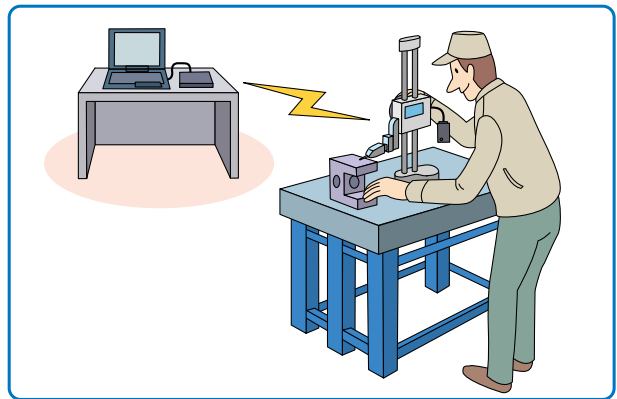
One commercially available CR2032 lithium battery can be used for about 400,000 data transmissions.

Assuming that the device is used twenty days a month, sending data 2,000 times a day, one battery would last for about ten months.

## Cordless operation improves workability in measurement data recording

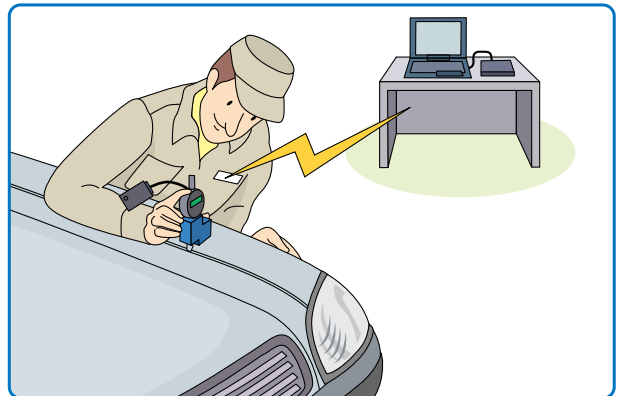
### Measurement on surface plate

With a cordless device, the surface plate and PC desk no longer need to be adjacent, enabling freer layout in the inspection room.



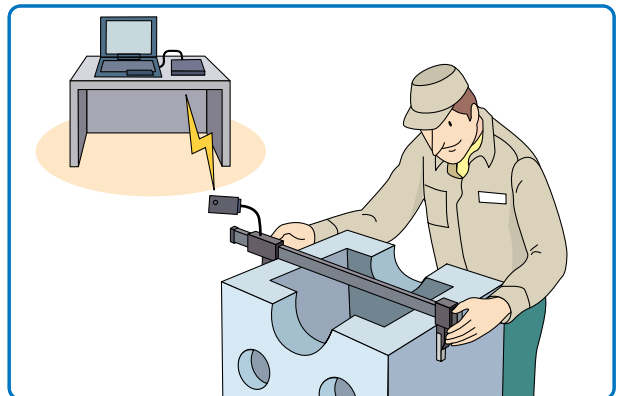
### Measurement of large workpieces

With **U-WAVE** operators can perform measurement freely walking around the workpiece. There are no cable constraints.



### Measurement using long measuring tools

Long measuring tools are hard to handle, but **U-WAVE** eliminates cable constraints and improves workability.



# Just pressing a switch loads measured data

Purchase the following four products (1 to 4) to enable data loading onto your PC.

## 3 U-WAVE-T/tool connection

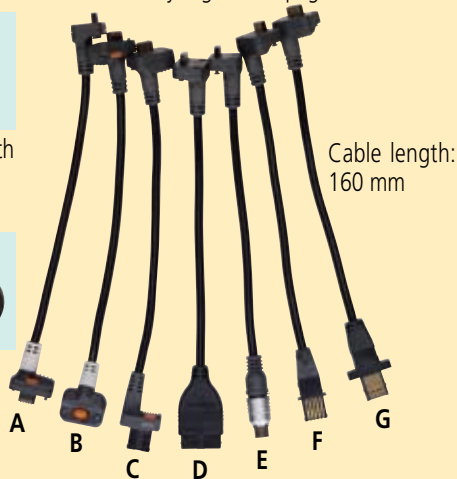
A short cable is used to connect a measuring tool to its **U-WAVE-T** unit. Select the appropriate cable from **A** to **G** below (7 types) to suit the measuring tool. Detailed information on cable suitability is given on page 10.



Shipped with a clip for cable fixing



Clip use example



	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)

**U-WAVE-T** sends measurement data to **U-WAVE-R**. Select IP67 or buzzer model, according to your application.

### Major specifications of U-WAVE-T

Model	U-WAVE-T (IP67 model)	U-WAVE-T (buzzer model)
Order No.	02AZD730*	02AZD880*
Protection Rating	IP67	-
Data reception indication	LEDs	Buzzer and LEDs
Power supply	Lithium battery CR2032x1	
Battery life	Approx. 400,000 transmissions	
External dimensions	44x29.6x18.5 mm	
Mass	23g	



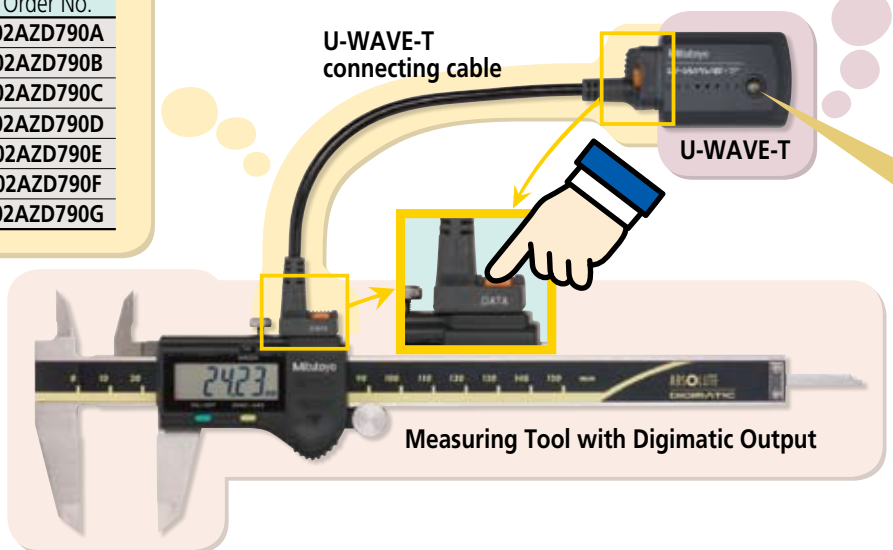
The buzzer model has a hole so that you can hear the sound.

\*Detailed information on order No. and conformity standards of wireless communication specification is given on page 6.

Standard accessory: driver

U-WAVE-T connecting cable

U-WAVE-T



Measuring Tool with Digimatic Output

## 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 remain unchanged since the first Digimatic measuring tool was released. Therefore any tool having a Digimatic port can be used, regardless of whether the instrument is new or old, although note that the connectors on some older instruments are not compatible with the connectors used on the above-listed cables. Check with the cable list on page 10.

Some Digimatic measuring tools pictured with suitable connecting cables. The product numbers for the cables are shown underneath the instrument descriptions.



Super Caliper  
CD67-S15PM  
No.02AZD790A



QuantuMike  
MDE-25MJ  
No.02AZD790B



ABS Digimatic  
Caliper  
CD-15CX  
No.02AZD790C

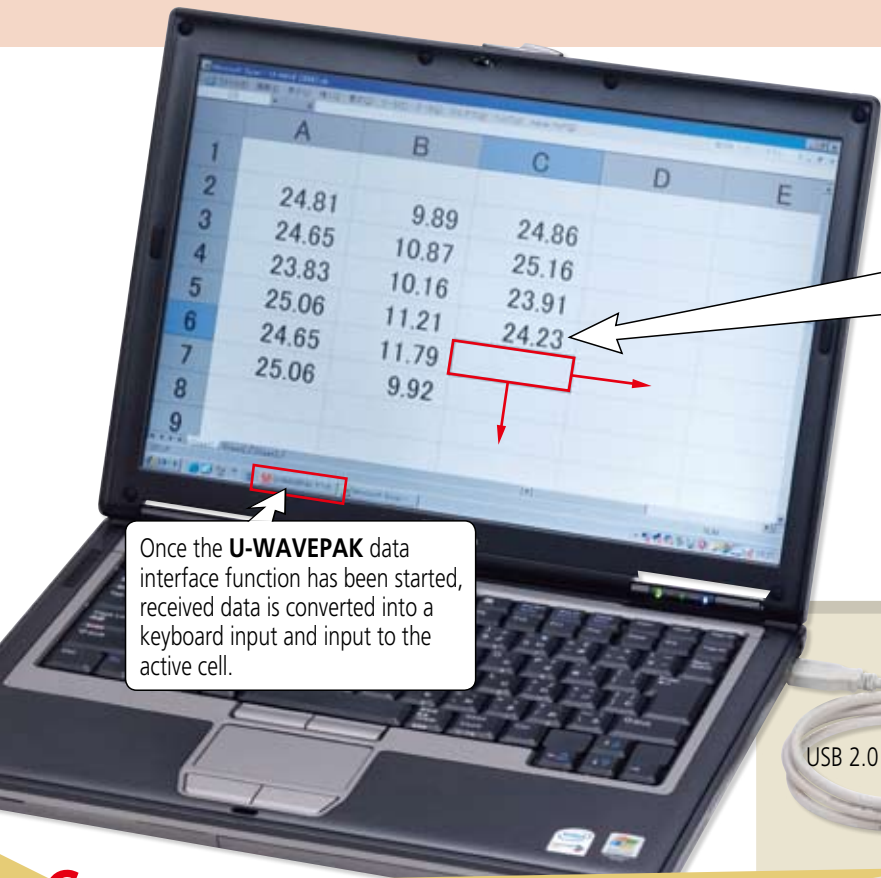


Digimatic  
Indicator  
ID-H0530  
No.02AZD790D

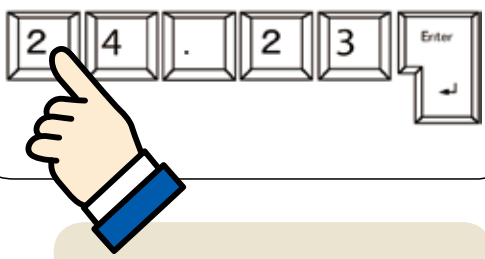
Mitutoyo

# onto a PC through wireless communication.

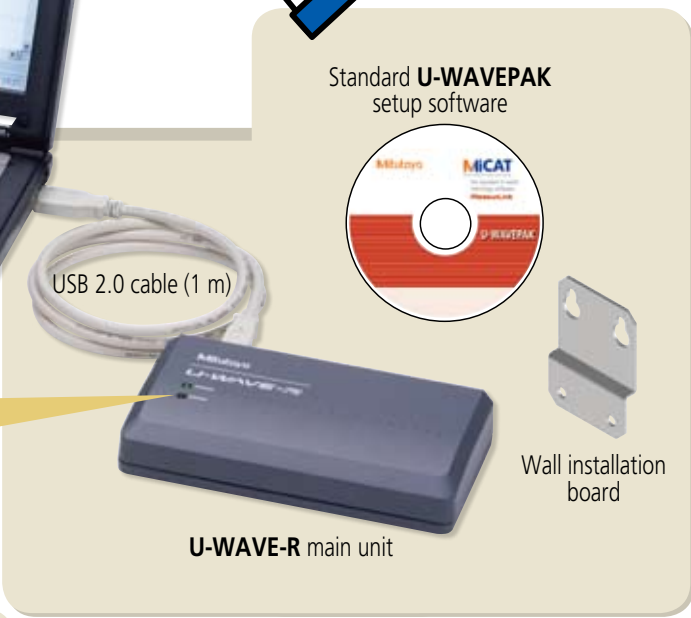
# U-WAVE



When the data input button is pressed, the value displayed by the measuring tool is input to 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.



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



**Communication distance of approximately 20 m (in a good transmission/reception location)**

*\*Refer to page 6 for wireless communication specification*

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

### Major Specifications of U-WAVE-R

Model Order No.	U-WAVE-R 02AZD810*
Power supply	USB bus power system
Number of <b>U-WAVE-R</b> units that can be connected to one PC	Up to 16
Number of <b>U-WAVE-T</b> units that can be connected	Up to 100
External dimensions	140x80x31.6mm
Mass	130g



\*Detailed information on order No. and 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 product is not compatible with the conventional Mu-WAVE, for which communication specifications are different.

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 following 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 Mexico and Costa Rica (Available for only products labeled with a wireless accreditation label for Mexico)
02AZD810E, 02AZD730E, 02AZD880E	Brazil
02AZD810F, 02AZD730F, 02AZD880F	South Korea

## 1 U-WAVE-R

### Receives data from U-WAVE-T and loads it onto a PC via a USB connection

#### <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

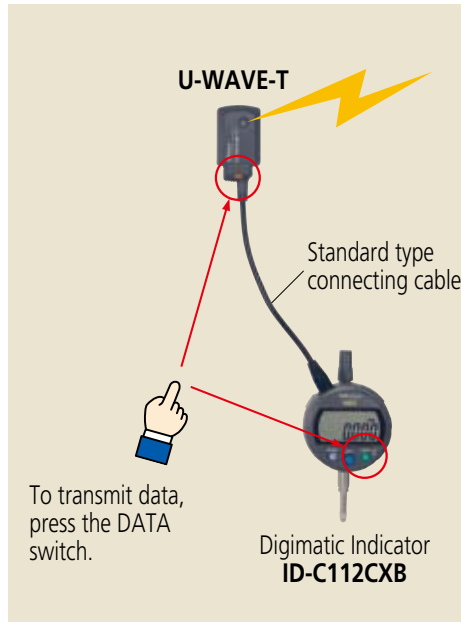
#### 2) Initial setup procedure

- (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.

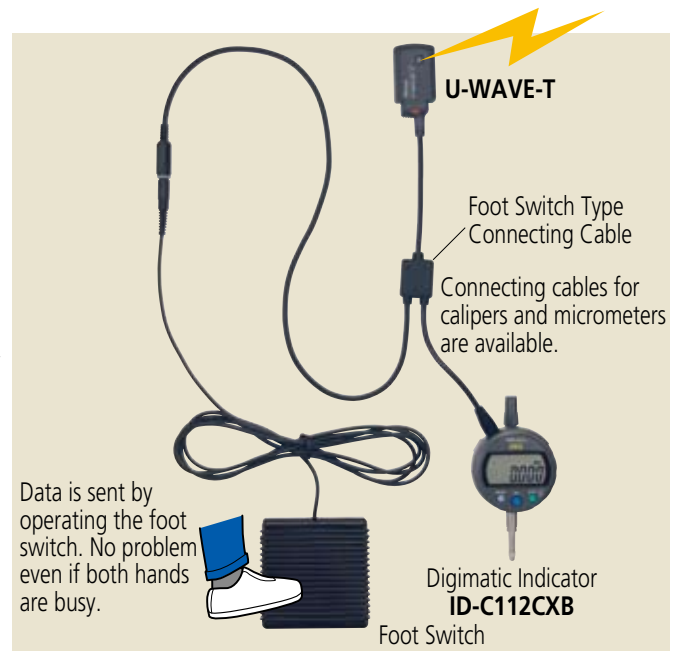
# Accessories (Optional)

## Foot Switch Type Connecting Cable

Connect one of the optional foot switch type connecting cables in place of the standard cable to use the footswitch. Select an appropriate cable that fits the measuring tool to be connected.



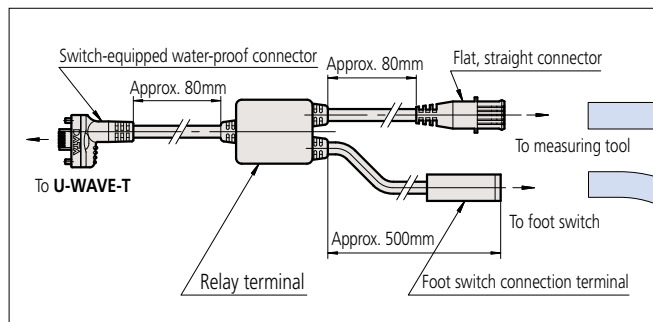
Or use the foot switch to send data



**If the standard connecting cable is connected:**  
Data is sent by one press on the switch on the connecting cable connector (**U-WAVE-T** end).

**If the foot switch is connected:**  
Data is sent by one press on the optional foot switch (**No.937179T**).

### External View and Dimensions Example Order No.02AZE140F



Select a connector type according to the measuring tool to be used.

### Order Numbers

Select a connecting cable from among the following 7 types (**A** to **G**) that fits the measuring tool. For detailed information, refer to the list of connecting cables on page 10.

Connector type	Order No.
<b>A</b> Water-proof with switch	<b>02AZE140A</b>
<b>B</b> Water-proof with switch	<b>02AZE140B</b>
<b>C</b> With switch	<b>02AZE140C</b>
<b>D</b> 10-pin plain	<b>02AZE140D</b>
<b>E</b> 6-pin round	<b>02AZE140E</b>
<b>F</b> Straight type	<b>02AZE140F</b>
<b>G</b> Water-proof straight type	<b>02AZE140G</b>

### Foot Switch (Optional) Order No.937179T

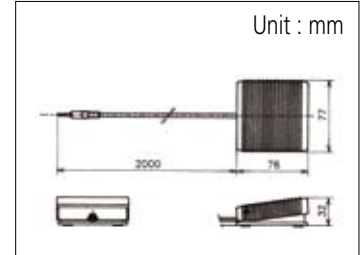
Data is output by a contact signal from the foot switch.



MONO (ø3.5) MINIATURE PLUG US Type

### Dimensions

Unit : mm



**Mitutoyo**

# Accessories (Optional)

## U-WAVE-T Instration Kit

A plastic mounting plate is provided to enable the **U-WAVE-T** unit and measuring tool to be held together by means of adhesive-backed hook and eye fasteners. This method makes attaching/detaching the tool and **U-WAVE-T** unit quick and convenient. Batteries can be replaced without needing to detach the tool.



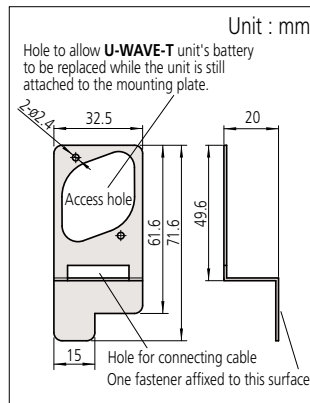
### U-WAVE-T Instration Kit Order No.02AZE200

- Accessories
- Detachable fasteners: 2 pieces (mirror-imaged)
  - Mounting screws: 2 pieces

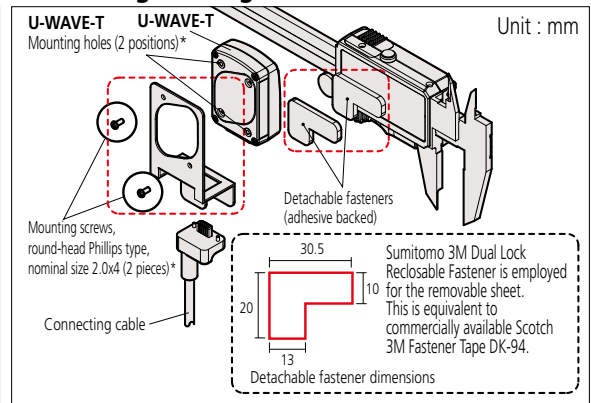
### U-WAVE-T Installation kit for QM-Height Order No.02AZE990

- Accessories
- Detachable fasteners: 2 pieces (mirror-imaged)
  - Mounting screws: 2 pieces

### ■ Dimensions



### ■ Mounting Drawing



### Major measuring tools intended to use the U-WAVE-T mounting plate

Series No.	Product name	
500	ABS Coolant Proof Caliper	CD-PMX/PM/GM
	Super Caliper	CD-SPM
	ABS Digimatic Caliper	CD-CX/C
293	Coolant Proof Micrometer	MDC-MJ/MJT/ MDE-MJ
543	ABS Digimatic Indicator	ID-CXB/ID-SB

Other measuring tools than the above-mentioned can also be used if they have a flat area big enough to accept the detachable fastener (refer to the dimensions on the mounting drawing). However, note that the positional relationship of the connector and **U-WAVE-T** unit needs to be carefully considered when establishing the connecting cable run.

### ■ Typical Fastener Locations on Measuring Tools

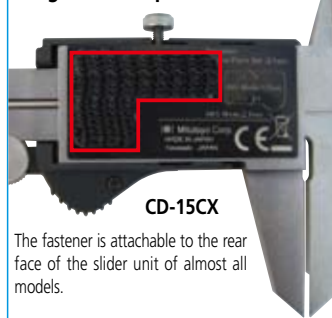
#### Digimatic indicator



ID-C112XB

A flat back type is recommended. The fastener can be affixed to a lug-type backplate if it is positioned to avoid the lug.

#### Digimatic caliper



CD-15CX

The fastener is attachable to the rear face of the slider unit of almost all models.

#### Digital micrometer



MDC-25MJ

The fastener can be affixed to the rear of the body if the battery cover is avoided.



MDC-25M

The fastener will not fit on the **MDC-25M** (old model), **MDQ-30M**, etc., since there is no space on the rear of the body due to connectors.

\* To avoid damaging the threaded holes in the plastic body of the U-WAVE-T unit, the mounting screws should be tightened only just sufficiently to grip. Repeated removal of these screws should also be avoided for the same reason.

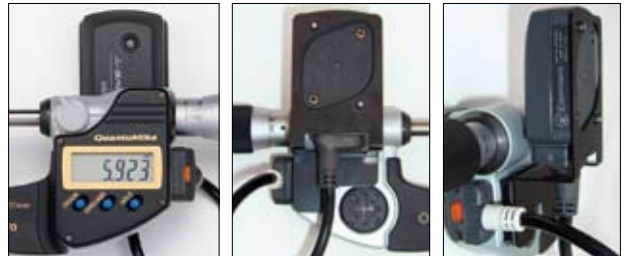
\*\* In order to avoid loss of adhesion, do not allow oil or coolant to come into contact with the bonding surfaces of the detachable fasteners.

### ■ The Mounting Plate in Use

#### SuperCaliper CD67-S15PM



#### QuantuMike MDE-25MJ



#### Digimatic Indicator ID-C112XB



Front view

Rear view

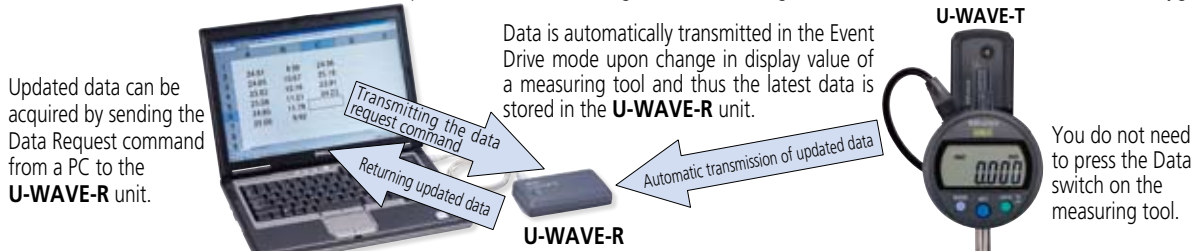
Side view



# Introduction to Custom-order System Example/Dimensions

## Example of a custom-order – Support of data request from a PC (Event Drive mode) For detailed information, contact the nearest Mitutoyo Sales Department.

This custom-ordered Event Drive enables data request from the PC end. This system is effective if no operator is in attendance on a measuring tool or if the tool is installed at an inaccessible site. (Data acquisition from a measuring tool such as a Digimatic indicator mounted on a machine or a jig)



Create a program that supports the data request command as system software by the customer or use Mitutoyo **USB-ITPAK V2.0**.

This system needs the custom-ordered **U-WAVEPAK** that supports the event drive. Purchase the standard models for **U-WAVE-T** and **U-WAVE-R** units.

### Precautions

#### ① About battery life:

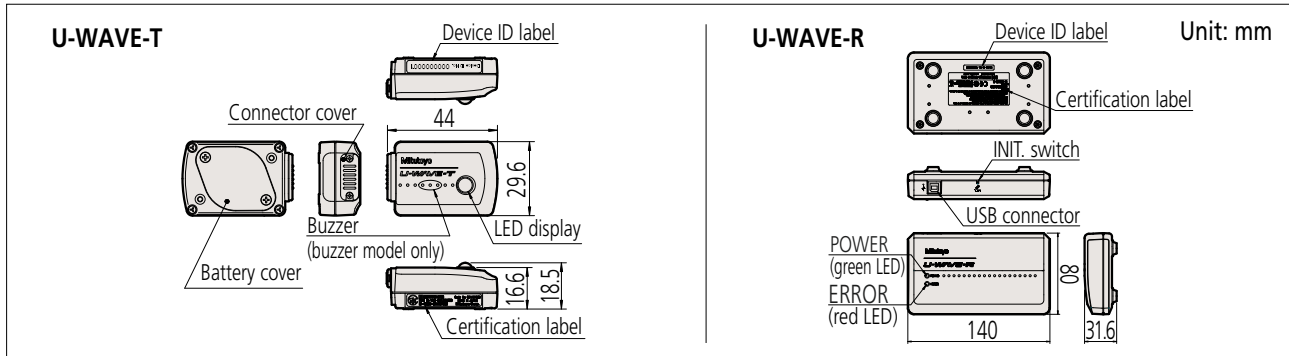
The battery lifespan in the Event Drive mode is shorter than that in the Normal mode (button-drive). Change to the Normal (button-drive) mode after every measurement to extend the battery life span.

#### ② If using multiple measuring tools:

If multiple **U-WAVE-T** units are connected to one **U-WAVE-R** unit in the Event Drive mode, a communication error could result due to conflict between the signals when data is transmitted simultaneously from the **U-WAVE-T** units since they use the same frequency.

To avoid any transmission conflict, shift the timing of each measurement or provide enough **U-WAVE-R** units (a maximum of 16 units are connectable) for each measuring tool and set different frequencies (15 channels).

## Physical Features and Dimensions



## Precautions for use in Radio Communication Environments

The **U-WAVE** communication distance is approximately 20m line-of-sight. The system may not deliver its full performance in an environment detrimental to transmission. (Refer to Table 1.)

### Safety Precautions

Do not use the **U-WAVE-T** and **U-WAVE-R** units near a medical device due to risk of causing a malfunction due to electromagnetic interference. (Refer to Table 2.)

### Radio Law Requirements

These **U-WAVE** units have obtained accreditation as 2.4GHz-band advanced small-power data communication systems in compliance with the Radio Communication Laws in the specified countries and regions. (Details on page 6)

These laws prohibit the disassembly or modification of these units or their use without the accreditation label affixed to the body.

**Table 1 Features that could impair data communication between U-WAVE units**

Feature	Effect
Concrete wall	Disables data communication if any unit is completely enclosed by a concrete wall.
Metallic partition or similar structure	May reduce communication speed or block data transmission.
Communication devices for wireless LAN, ZigBee, Bluetooth, etc., or a microwave oven	May reduce communication speed or block data transmission. A remedy is to separate the communication channel (band ID) and installation site of each device as far as possible from the <b>U-WAVE-R</b> unit.
Machine tools, etc.	May reduce communication speed or block data transmission at worksites where machine tools such as electrical discharge machines, carrier cranes, arc welders, etc., are operating.

**Table 2 Equipment that could be affected by U-WAVE units**

Device	Effect
Medical equipment	Using <b>U-WAVE</b> units near a medical device such as a laser surgical knife or electronic scale may cause that device to malfunction.

# 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. **937197T**



The foot switch is connected to this connector.

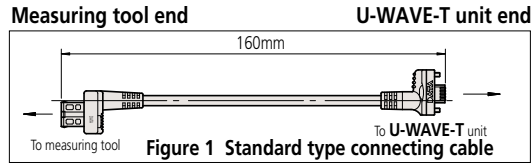


Figure 1 Standard type connecting cable

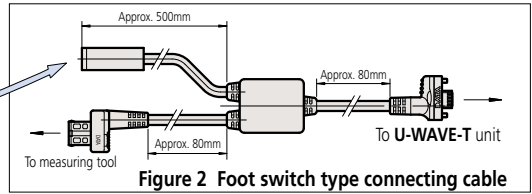
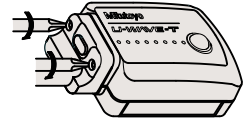


Figure 2 Foot switch type connecting cable



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. <b>02AZD790A</b>	Order No. <b>02AZD790B</b>	Order No. <b>02AZD790C</b>	Order No. <b>02AZD790D</b>	Order No. <b>02AZD790E</b>	Order No. <b>02AZD790F</b>	Order No. <b>02AZD790G</b>
Foot switch type	Order No. <b>02AZE140A</b>	Order No. <b>02AZE140B</b>	Order No. <b>02AZE140C</b>	Order No. <b>02AZE140D</b>	Order No. <b>02AZE140E</b>	Order No. <b>02AZE140F</b>	Order No. <b>02AZE140G</b>
Plug that connects to the measuring instrument	Light gray	Light gray					
Socket type on the measuring instrument							
Major compatible measuring instruments	<ul style="list-style-type: none"> <li>• Digimatic caliper <b>500-776/500-777</b>, etc.</li> <li>• <b>500-712-10/500-713-10</b>, etc.</li> <li>• <b>500-712/500-612</b>, etc.</li> <li>• <b>550-301-10/550-331-10</b>, etc.</li> <li>• <b>551-301-10/551-331-10</b>, etc.</li> <li>• <b>552-302-10/552-303-10</b>, etc.</li> <li>• <b>552-150-10/552-151-10</b>, etc.</li> <li>• <b>552-155-10/552-156-10</b>, etc.</li> <li>• <b>552-181-10/552-182-10</b>, etc.</li> <li>• Digimatic special application caliper <b>573-601/573-602</b>, etc.</li> <li>• Digimatic depth gage <b>571-251-10/571-252-10</b>, etc.</li> <li>• Digimatic scale unit <b>572-600, 572-601</b>, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Digimatic micrometer <b>293-100/293-130</b></li> <li>• <b>293-140/293-141</b>, etc.</li> <li>• <b>293-230-30/293-240-30</b>, etc.</li> <li>• <b>340-251-10/340-252-10</b></li> <li>• Dedicated micrometers for Digimatic <b>422-230-30/422-231-30</b>, etc.</li> <li>• <b>406-250-30/406-251-30</b>, etc.</li> <li>• <b>343-250-30/343-251-30</b>, etc.</li> <li>• <b>369-250-30/369-251-30</b>, etc.</li> <li>• <b>345-250-30/345-251-30</b>, etc.</li> <li>• <b>314-251-30/314-252-30</b>, etc.</li> <li>• Digimatic micrometer head <b>350-251-30/350-261-30</b>, etc.</li> <li>• Digimatic holtest <b>468-161/468-162</b>, etc.</li> <li>• Digimatic depth gage <b>329-250-30/329-251-30</b>, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Digimatic caliper <b>500-150-30/500-151-30</b>, etc.</li> <li>• <b>500-500-10/500-501-10</b>, etc.</li> <li>• <b>500-443/500-453</b>, etc.</li> <li>• Digimatic special application caliper <b>573-118-10/573-119-10</b>, etc.</li> <li>• <b>573-116-10/573-117-10</b>, etc.</li> <li>• <b>573-191-30/573-291-30</b></li> <li>• <b>573-181-30/573-182-30</b>, etc.</li> <li>• Digimatic depth gage <b>571-201-30/571-202-30</b>, etc.</li> <li>• Digimatic micrometer head <b>164-163/164-164</b></li> <li>• Digimatic scale unit <b>572-203-10/572-213-10</b></li> <li>• <b>572-300-10/572-301-10</b>, etc.</li> </ul>	<ul style="list-style-type: none"> <li>[Surface Roughness Tester]</li> <li>-<b>178 series</b></li> <li><b>SJ-210/310/410</b></li> <li>[Height Gage]</li> <li>-<b>518 series</b></li> <li><b>QM-Height</b></li> <li>[Reference Gage]</li> <li>-<b>515 series</b></li> <li><b>Digital Height Master</b></li> <li>[Digimatic Indicator]</li> <li><b>515-341/515-342</b></li> <li><b>ID-H/F</b></li> <li>[Laser Scan Micrometer]</li> <li>-<b>544 series</b></li> <li><b>LSM-9506</b></li> <li>[μ-checker]</li> <li><b>Digital μ-checker</b></li> <li>(Using the foot switch)</li> <li>[Linear Gage Counter]</li> <li>-<b>542 series</b></li> <li><b>EB, EC-101D</b></li> <li>[Hardness testing machines]</li> <li><b>HM-210/220</b></li> </ul>	<ul style="list-style-type: none"> <li>• Digimatic micrometer <b>293-666/293-667</b>, etc.</li> <li>• <b>227-201/227-221</b>, etc.</li> <li>• <b>369-411/369-412</b>, etc.</li> <li>• Digital height master <b>515-374/515-376</b>, etc.</li> <li>• Hardness testing machines <b>HM-100</b></li> <li><b>HM-200</b></li> <li><b>HV-100</b></li> <li><b>HR-300/400/500</b></li> <li><b>HH-411</b></li> </ul>	<ul style="list-style-type: none"> <li>• Digimatic indicator <b>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</b></li> <li>• Digimatic height gage <b>192-663-10/192-613-10 / 570-322 / 570-227/574-112-1</b>, etc. (Flat L-shape, cable outlet is right)</li> <li>• <b>ABS Borematic 568-361/568-362</b>, etc.</li> <li>• Scale unit <b>572-460/572-560/572-480-10/572-580-10</b>, etc.</li> <li>• Digimatic Bore gage <b>511-501/511-502</b>, etc.</li> <li>• Hardness testing machines <b>HH-300</b></li> <li>• Digimatic depth gage <b>Digimatic type (ID-CX)</b></li> </ul>	<ul style="list-style-type: none"> <li>[Digimatic Indicator]</li> <li>-<b>543 series</b></li> <li><b>ID-N</b></li> <li><b>ID-B</b></li> </ul>
Measuring instruments that cannot be connected				<ul style="list-style-type: none"> <li>[Surface Roughness Tester]</li> <li>-<b>178 series</b></li> <li><b>SJ-500/SV-2100</b></li> <li>[Linear Gage/Counter]</li> <li>-<b>542 series</b></li> <li><b>EF-PRH/ZR, EH-P/Z/S/D, EB-P/Z/D, EC-D</b></li> <li>[Litematic]</li> <li>-<b>318 series</b></li> <li><b>VL-A/AS/AH</b></li> </ul>			
Reference: Order No. of wired-type connecting cable	1m <b>05CZA624</b> 2m <b>05CZA625</b>	<b>05CZA662</b> <b>05CZA663</b>	<b>959149</b> <b>959150</b>	<b>936937</b> <b>965014</b>	<b>937387</b> <b>965013</b>	<b>905338</b> <b>905409</b>	<b>21EAA194</b> <b>21EAA190</b>

# Combination with application systems

Combining this product with **USB-ITPAK V2.0**, Excel-based inspection work can be performed more efficiently.

## Measurement data collection software **USB-ITPAK V2.0**

**Upgraded USB-ITPAK V2.0 now supports U-WAVE, a wireless communication system. Both wired connection (IT-016U/USB-ITN) and wireless system (U-WAVE) are supported.**

### New functions of **USB-ITPAK V2.0**

- Supports the U-WAVE wireless communication system
- Timer input function
- Measurement date/time display
- Others: Compatible with Windows 8, 64-bit OS, and Russian included in the operating language selection

**USB-ITPAK V2.0** creates a procedure to input data from gages equipped with Digimatic output to Excel sheets via USB-ITN or U-WAVE. This optional software facilitates the daily inspection work for mass-produced products.

**The combined use with USB-ITPAK V2.0 will improve the operational efficiency of repetition inspection work. Best suited for keeping track of inspection data of mass-produced products.**

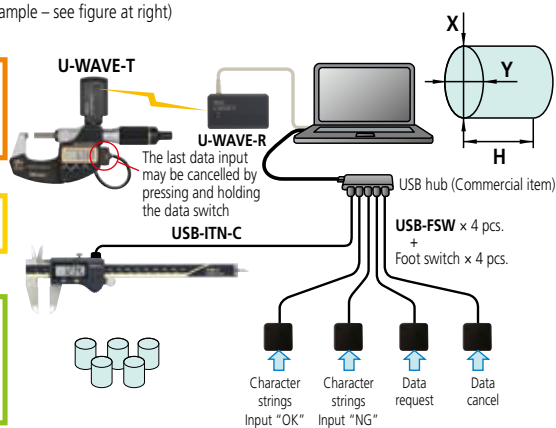
- Automatically calls Excel sheet.
- Cursor moves can be specified.
- Input range can be specified per Digimatic gage, which reduces improper input.
- The last data input can be canceled by a single operation (foot switch, function key etc.)
- Data input or cancellation can be performed at once in multiple-point simultaneous measurement.

## USB-ITPAK V2.0 measurement examples:

**Sequential measurement** Measurement values are input one by one according to a procedure previously defined by using one or more Digimatic gages (via **IT-016U/USB-ITN** or **U-WAVE**).

(Measurement example – see figure at right)

- (1) Measure outside diameter at X and Y of 5 workpieces with a micrometer.
- (2) Measure length H of 5 workpieces.
- (3) Inspect external view to check if there are any scratches or color shading and input "OK" or "NG".



When a measuring procedure is executed, a window (as below) is displayed. "Data request\*", "Data cancel\*", "Data skip\*", "Aborting", "Complete" can be specified. \* These operations can be allocated to the function key or foot switch (via USB-FSW).

	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
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
5	External Appearance	OK	OK	NG		

Cell that will receive next input is highlighted in green

Cell movement direction after inputting data (down and right)  
 Carriage return (Low, column)  
 Microsoft Excel sheet previously specified

## Order No.

Model No.	<b>USB-ITPAK V2.0</b>
Order No.	<b>06AEN846</b>

Upgrade pricing from V1.0 is not available. Please purchase V2.0.

## USB-ITPAK V2.0 USB dongle



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

## Operating environment

Compatible OS *1	Windows 2000 SP4, Windows XP SP2 or later, Windows Vista, Windows7, Windows8
Supported Excel versions *2	Excel 2000, Excel 2002, Excel 2003, Excel 2007, Excel 2010, Excel 2013
Hard disk	Free space of more than 10MB
CD-ROM drive	For program installation
USB port *3	2 ports or more
Monitor resolution	800x600, 256 colors or more

\*1: 32-bit, 64-bit OS supported  
 \*2: Operation with Excel for MAC OS is not guaranteed.  
 \*3: A commercially available hub can be used. (USB certified product is recommended)

## Language support

- Operation language (15 languages)  
 Japanese, English, German, French, Spanish, Italian, Czech, Swedish, Turkish, Polish, Hungarian, Russian, Korean, Chinese (traditional/simplified), and Simplified Chinese
- Operation manual (PDF file)  
 Japanese, English, German

## USB Foot Switch Adapter USB-FSW

This USB adapter for connecting a PC is required when using the Foot Switch (No. 937179T) in **USB-ITN**. A dedicated VCP driver\* for this adapter is included in **USB-ITPAK V2.0**.

### Main specification

- With **USB-ITPAK V2.0**, application of the foot switch can be set.
- Data control: "Data request", "Data cancel", "Data skip"
- Character string input (e.g. GO/NG, etc.)

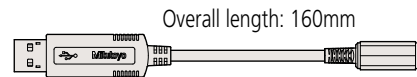
\*USB-FSW is used for installation of the VCP driver.



### Order No. Price

Model No.	<b>USB-FSW</b>
Order No.	<b>06ADV384</b>

### Foot Switch Adapter USB-FSW



The wired interface **USB Input Tools** shown below can also be used with **USB ITPAK V2.0** for data acquisition. Refer to the **USB Input Tool Catalog (E12007)** for details.

### USB Input Tool IT-016U



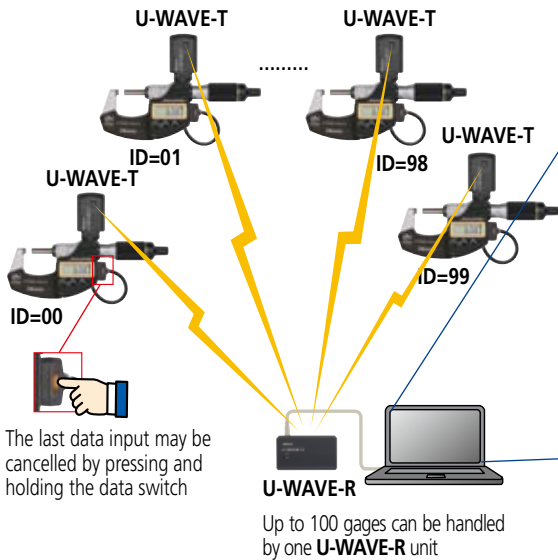
### USB Input Tool Direct USB-ITN



# U-WAVE

## Example of measurement using the U-WAVE wireless communication system — data sorting of individual measurements

### Data from multiple Digimatic gages sent to separate Excel sheets



Loading data from multiple Digimatic gages (**U-WAVE-T**) into separate Excel sheets is now available without the need for macro programming.

**USB-ITPAK V2.0 (Individual measurement)**

	ID=98			ID=99		
	A	B	C	A	B	C
1	2.341	2.274	2.007	2.341	2.274	2.007
2	2.039	1.963	2.274	2.039	1.963	
3	1.996			1.996	2.152	

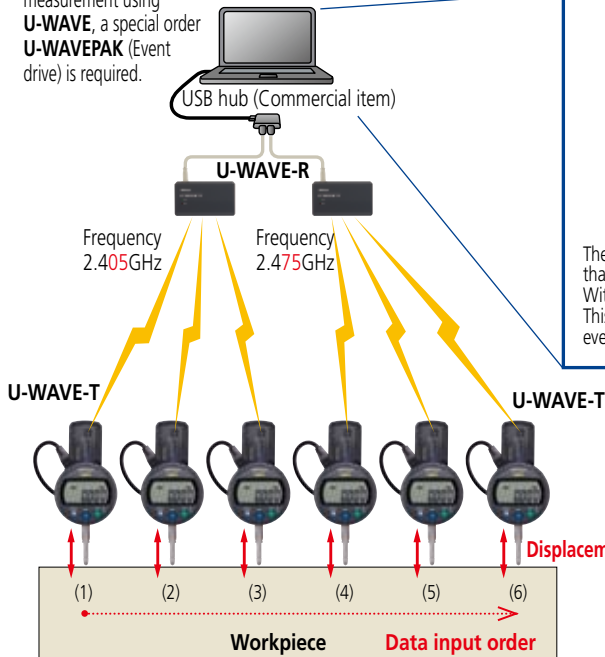
Sheet 98, Sheet 99, Sheet 00, Sheet 01

- Entry point can be specified per gage (by **U-WAVE-T** ID).
- Specifying an Excel file: Excel Book (full path) + sheet name
  - Specifying data input cells (example: A1:C3)
  - Specifying cursor move (right or down)

## Example of measurement using the U-WAVE wireless communication system — timer input + measurement date/time display during simultaneous measurement

### Automatically obtains displacement data in a certain input interval

To perform simultaneous measurement using **U-WAVE**, a special order **U-WAVEPAK** (Event drive) is required.



If using **USB-ITPAK V2.0** supporting **U-WAVE** event drive, arbitrary timer input is allowed without the need for macro programming.

**USB-ITPAK V2.0 simultaneous measurement + timer input (example: 5s interval)**

	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	0.279	0.152	0.133	0.064	0.018	-0.003	2013/4/1 7 30 05
4	0.265	0.149	0.142	0.089	0.021	-0.007	2013/4/1 7 30 10
5							
6							

The input interval can be arbitrarily set by 0.1s intervals up to 24 hours. If a smaller value than the data loading time is set, the actual measurement time will be the input interval. With **U-WAVE**, an error (no data) may occur if less than 0.5s is set for the input interval. This is because the data request signal is issued before the data comes in, based on the event drive data refresh interval that is set to 0.5s (fixed).

### Points to note when performing simultaneous measurement using **U-WAVE** and **USB-ITPAK V2.0**

- Besides **U-WAVE**, a special order **U-WAVEPAK** (Event drive) is required.
  - The battery life of **U-WAVE-T** becomes shorter in the event mode, reducing to approximately 20 days for continuous measurement.
  - When using several Digimatic gages, communication errors may occur because simultaneous transmission from all gages may cause radio interference. With **U-WAVE**, radio wave interference can be mostly avoided if data is transmitted after making sure there is no other radio communication.
- CSMA/CA method: this avoids radio interference and enables successful simultaneous data transmission of three U-WAVE-T units per **U-WAVE-R**.
- To perform simultaneous measurement with more than three units of U-WAVE-T, add U-WAVE-R and set different frequencies (15 ch) to avoid radio interference.



Export permission by the Japanese government may be required for exporting our products according to the Foreign Exchange and Foreign Trade Law. Please consult our sales office near you before you export our products or you offer technical information to a nonresident.

- 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

Complies with	
	[R]005WWCA0166 [R]005WWCA0168 [R]005WWCA0167
U.S.A/ FCC	VXU-02AZD730D, VXU-02AZD880D, VXU-02AZD810D
Canada/IC	4396B-02AZD730D, 4396B-02AZD880D, 4396B-02AZD810D
Mexico	RCPMIUW09-0826
Brazil	Anatel: 0069-1058-15, Anatel: 0068-10-5815
Singapore	IDA standard license No. No. 259-10, Dealer's License No. DA105175
India	NR-ETA/1193, NR-ETA/1191, NR-ETA/1192
Korea	KCC-CRI-MT5-02AZD730F, KCC-CRI-MT5-02AZD880F, KCC-CRI-MT5-02AZD810F

Note: All information regarding our products, and in particular the illustrations, drawings, dimensional and performance data contained in this pamphlet, as well as other technical data are to be regarded as approximate average values. We therefore reserve the right to make changes to the corresponding designs, dimensions and weights. The stated standards, similar technical regulations, descriptions and illustrations of the products were valid at the time of printing. Only quotations submitted by ourselves may be regarded as definitive.

**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  
<http://www.mitutoyo.co.jp>

