Measurement Data Management

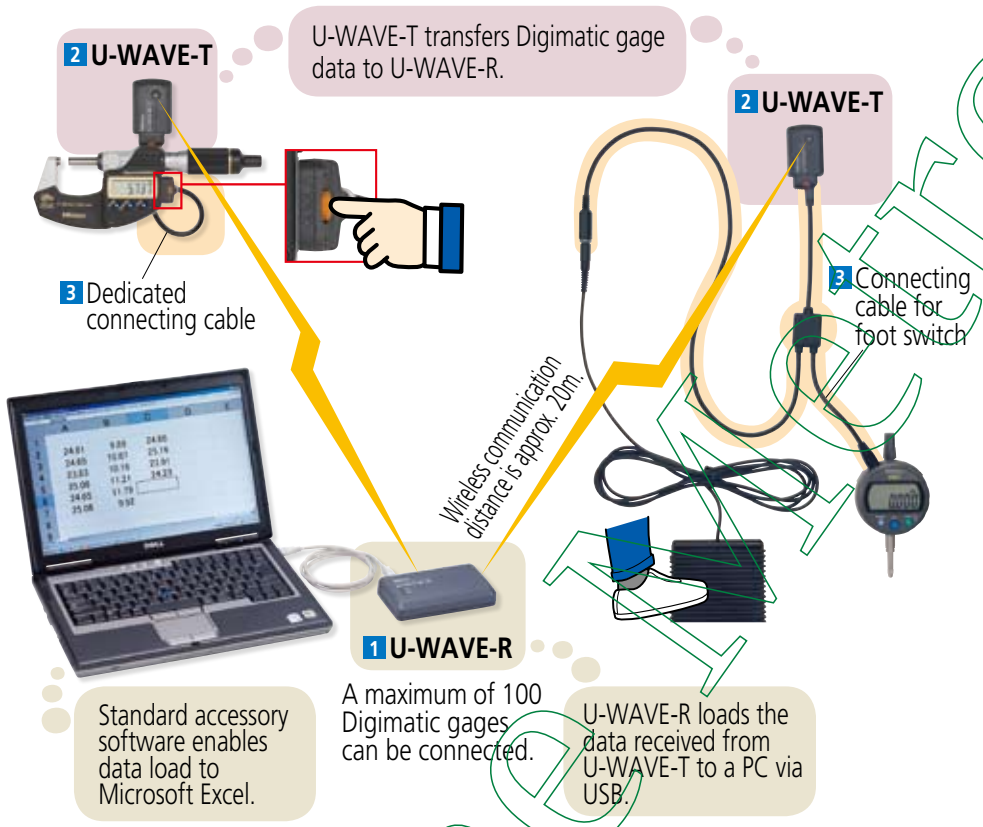
Convenient data collection tool and quality control software

Measurement data wireless communication system U-WAVE

A

- Data from Digimatic gages can be loaded to a PC easily.
- Wireless communication eliminates cabling, improving measuring operability.
- The Data Interface Function of the U-WAVE-R standard accessory software enables data input to commonly available software by keyboard input (Microsoft Excel*, Notepad, etc.).
- USB-ITPAK V2.0 supports U-WAVE
  Loading multiple measurement data into separate Excel sheets, or simultaneous measurement using the special event drive is now available without the need for macro programming.
  (Automatic loading in a certain interval is available with the timer function.)

U-WAVE system configuration



Data from Digimatic gages can be loaded to a PC easily by using items 1 to 3 below.

1 U-WAVE-R

Receives data from U-WAVE-T and loads to a PC via USB.

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	140×80×31.6mm
Mass	130g

U-WAVE-R main unit

USB2.0 cable (1m) attached

U-WAVEPAK

U-WAVEPAK software (standard accessory)

System Environment: Compatible OS
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*

* Revision history (U-WAVEPAK)
Ver1.010 or later is compatible with 32/64-bit OS.
Ver1.020 or later is compatible with Windows 8.
Ver1.021 or later is compatible with Windows 8.1.

Main specifications
- Setup of dedicated driver software (USB and virtual COM port)
- Initial setting of ID number and frequency selection (required only once for first time)
- Load data to Microsoft Excel or Notepad through data interface function
- Note: Cannot be connected to a device other than a PC (such as DP-1VR, PDA, or controller).

U-WAVE system communication specifications

- Wireless communication

Conformity standards	ARIB STD-T66 (Japan)*
Wireless standards	Conform to IEEE802.15.4
Wireless communication distance	Approx. 20m (within visible range)
Wireless communication speed	250 Kbps
Transmission output	1mW (0dBm) or less
Modulation method	DS-SS (Direct Sequence - Spread Spectrum) Resistant to interfering signals and noise
Communication frequency	2.4GHz band (ISM band: Universal frequency)
Used band	15 channels (2.405 to 2.475GHz at intervals of 5MHz) The noise search function avoids interference with other communication devices.

* According to the Radio Regulations, the use of this product is permitted in the countries listed below. This product must not be used in other countries or areas.

Use of U-WAVE is allowed in the following countries:
This product is a radio equipment classified in the 2.4GHz Band Wide-band Low Power Data Communication System. To use this product, conformity to the radio law of each county is required. The use of U-WAVE sold in Japan is permitted in the countries listed below.

Applicable models	• 02AZD810D • 02AZD880D • 02AZD730D
Area	Country
Asia	Japan, Indonesia, Thailand, Vietnam, Malaysia, Philippines, India
North America	US, Canada
Europe	27 EU member nations (UK, France, Germany, Italy, Netherlands, Belgium, Luxembourg, Spain, Portugal, Austria, Sweden, Finland, Denmark, Bulgaria, Cyprus, Czech, Slovakia, Estonia, Greece, Hungary, Ireland, Latvia, Lithuania, Malta, Poland, Romania, Slovenia) 4 EFTA member nations (Norway, Switzerland, Iceland, Liechtenstein) Turkey

Countries, which permit the use of U-WAVE purchased from Mitutoyo Overseas Operations or Agents/Distributors in the intended use destination are listed below.

Area	Country
Asia	Singapore, South Korea
Central and South America	Mexico, Costa Rica, Brazil

U-WAVE cannot be used in countries other than the above.

Refer to the Measurement Data Wireless Communication System leaflet (E12000) for more details.

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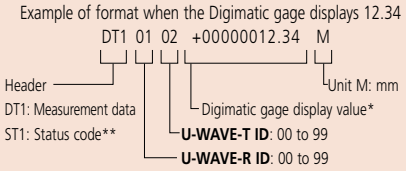
Measurement data wireless communication system U-WAVE

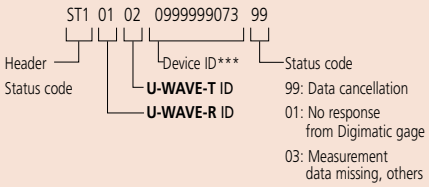
• Data format

Example of format when the Digimatic gage displays 12.34



* Data interface function is switchable to "Measurement value only"
e.g.) +00000012.34

** Example of status code format



*** Unique number assigned to **U-WAVE** at shipment

Notes on identification of measurement data and multiple systems operation

Following the above format, the U-WAVE data format starts with a 4-digit code where the first two digits represent receiver channels and the last two are transmitter channels. The large number of transmitter/receiver combinations possible with this scheme ensures that the receivers in a factory measurement system only accept data from the intended transmitters, even when several receivers are all within communication range of different transmitters using the same channel.
Different frequency bands (up to 15 available) may also be used to further ensure that there are no communication problems between adjacent U-WAVE-R units.

2 U-WAVE-T

Transmits measurement data to U-WAVE-R. Select IP67 or buzzer model, according to your application. U-WAVE-R can be connected to Digimatic gages by dedicated cable for U-WAVE-T (option).

Model	U-WAVE-T (IP67 type)	U-WAVE-T (buzzer type)
Order No.	**02AZD730D**	**02AZD880D**
Protection Rating	IP67	None
Data reception indication	LEDs	Buzzer and LEDs
Power supply	Lithium battery CR2032×1	
Battery life	Approx. 400,000 transmissions	
Dimensions	44×29.6×18.5 mm	
Mass	23 g	

3 U-WAVE-T dedicated connection cable

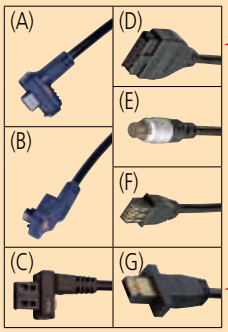
A dedicated cable connects a Digimatic gage to U-WAVE-T. Check the connector (A to G; refer to pages A-21 and A-22 for details) compatible with the Digimatic gage to be used and select either standard type (figure 1) or foot switch type (figure 2) according to your application.

Type	Standard connecting cable Part Nos.	Connecting cable for foot switch Part Nos.
(A) Water-proof model with output button	**02AZD790A**	**02AZE140A**
(B) Water-proof model with output button	**02AZD790B**	**02AZE140B**
(C) With data-out button	**02AZD790C**	**02AZE140C**
(D) 10-pin plain type	**02AZD790D**	**02AZE140D**
(E) 6-pin round type	**02AZD790E**	**02AZE140E**
(F) Plain type straight	**02AZD790F**	**02AZE140F**
(G) Plain type straight water-proof model	**02AZD790G**	**02AZE140G**

Standard accessory
Clip for cable fixing

Application example of the clip

7 types of connector



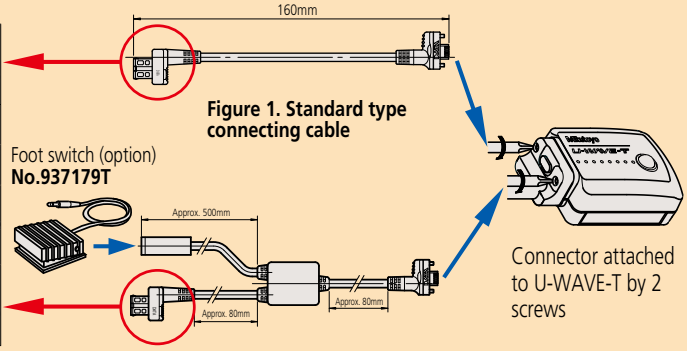


Figure 1. Standard type connecting cable

Figure 2. Connecting cable for foot switch

Daisaqua Metrology

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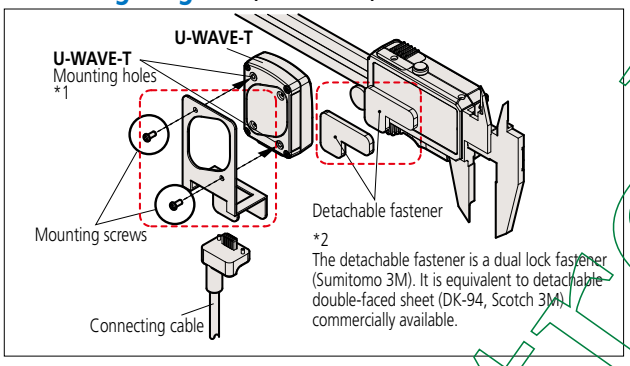
Optional Accessories for U-WAVE-T

U-WAVE-T mounting plate

Since the standard cable clip is not sufficient to support the U-WAVE-T on a Digimatic gage, a mounting plate is provided. The mounting plate can be fixed to the gage by the easily detachable hook-and-eye type fasteners provided. Batteries can be replaced without needing to detach the U-WAVE-T from the gage.

U-WAVE-T mounting plate
Part No.02AZE200
Standard accessories
- Detachable fasteners: 1 set
- Mounting screw 2pcs.

Mounting diagram (No.02AZE200)



*2 The detachable fastener is a dual lock fastener (Sumitomo 3M). It is equivalent to detachable double-faced sheet (DK-94, Scotch 3M) commercially available.

*1 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.

*2 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.

Application examples of the mounting plate

Super Caliper CD67-S15PM

Front view Rear view

QuantuMike MDE-25MJ

Front view Rear view

Digimatic Indicator ID-C112XB

Front view Rear view

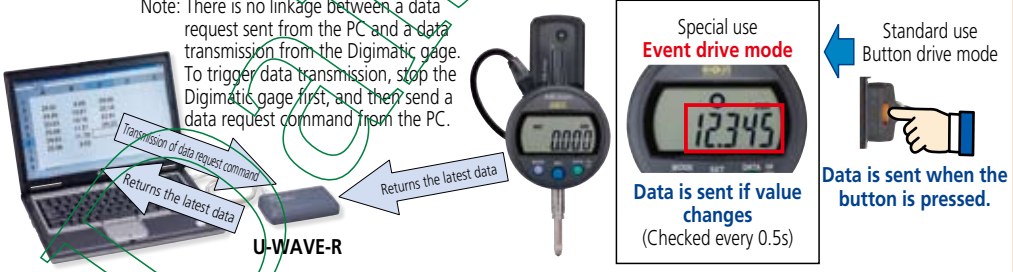
Application example of the 'event drive' mode

Data request support from PC. Special order U-WAVEPAK (Event drive)

For standard type U-WAVE, the currently displayed data can be sent by pressing the data switch.
This is called "button drive mode".
In the "event drive mode", the measurement value is checked every 0.5 seconds and measurement data is automatically sent if there is a change. At this time, the data switch is disabled. The sent data is written in the U-WAVE-R memory, and only the latest data is kept, it is not output to the PC. The data is loaded to the PC from the U-WAVE-R memory when the data request command is sent. The mode switching between "button drive" and "event drive" is enabled by the special order U-WAVEPAK (Event drive).
In the event drive mode, pressing the data switch on the Digimatic gage is not necessary. PC operation enables loading data from multiple gages at once.

To perform simultaneous measurement using USB-ITPAK V2.0, a special order U-WAVEPAK (Event drive) is required.

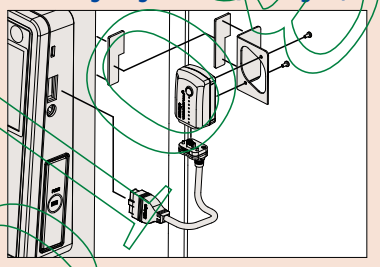
Note: There is no linkage between a data request sent from the PC and a data transmission from the Digimatic gage. To trigger data transmission, stop the Digimatic gage first, and then send a data request command from the PC.

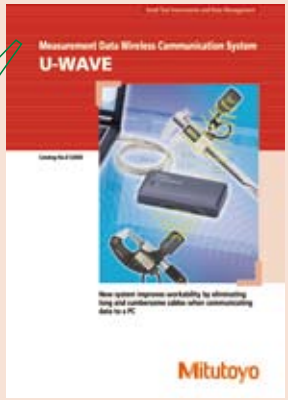


When using the event drive please note:
- The battery life is shorter than in normal mode.
  The battery lasts approximately 20 days with continuous use.
  Switching to the button mode when the battery is not in use extends the battery life.
- When using several Digimatic gages (U-WAVE-T), communication errors may occur because of radio interference in simultaneous measuring. Therefore, it is required to add U-WAVE-R and set different frequencies (15ch) to avoid radio wave interference.

U-WAVE-T mounting plate for OM-Height
Order No.02AZE990
Standard accessories
- Detachable fasteners: 1 set
- Mounting screw: 2 pcs

Mounting diagram for OM-Height (02AZE990)





Refer to the Measurement Data Wireless Communication System leaflet (E12000) for more details.

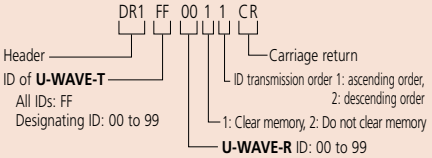
Special order U-WAVEPAK (Event drive)

This is a special order product. For the latest pricing, please contact your dealer or the nearest Mitutoyo Service Center.
Product configuration: Program on CD

For **U-WAVE-R** and **U-WAVE-T**, please purchase the standard model.
Install this special order **U-WAVEPAK** (Event drive) and gain the ability to perform setups without using the standard accessory **U-WAVPAK**.

A program to send a data request command is separately required to load data to a PC.
Event drive supporting software:
- **USB-ITPAK V2.0** (timer input enabled)
- **MeasureReport** (function key operation)

Example of data request command - All Data Output:



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