



## Wireless Communication System for Measurement Data

### U-WAVE-T

Prior to using this product, first read the U-WAVE Setup Manual included with the Mitutoyo U-WAVE-R (option) to install the software and specify the communication settings.

This product connects with the connecting cable (option) to a measuring tool with Digimatic output (including Digimatic 2 compliant models) and sends measurement data wirelessly to a U-WAVE-R device. There are two models: "IP67 type" and "buzzer type". To obtain the highest performance and the longest service life from this product, carefully read this manual thoroughly prior to use. After reading this manual, keep it close at hand for future reference.

#### Tips

To refer to the instructions for use in Chinese, please see our website (<https://manual.mitutoyo.co.jp/manuals/search>).

#### Safety Precautions

To ensure operator safety, use this instrument in accordance with the directions and specifications given in this User's Manual.

Not following the instructions may compromise safety.

This product uses radio waves. Even within the communication range of the radio waves, communication may be interrupted due to factors such as external noise. In this case, take sufficient preventative measures (safety measures).

Take sufficient preventative measures (safety measures) to guard against the possibility of this product malfunctioning.

**WARNING** Shows risks that could result in death or serious injury.

- Always keep batteries out of reach of small children, and if swallowed, consult a physician immediately.

- Batteries should never be short-circuited, disassembled, deformed or come in contact with extreme heat or flames, add excessive force, left in excessive high temperature environment, left in an environment receiving excessive low pressure.

- If battery alkaline liquid comes in contact with the eyes, flush eyes immediately with clean water and consult a physician. If battery alkaline liquid comes in contact with the skin, flush the exposed area thoroughly with clean water.

**CAUTION** Shows risks that could result in minor or moderate injury.

Never attempt to charge the primary battery or reverse the positive-negative terminals when mounting. Improper battery handling or mounting may cause the battery to explode, cause battery leakage and/or serious bodily injury or malfunctioning.

1

#### Precautions regarding Export Regulations

This product is categorized as a good or program that falls into the Catch-All-Controlled Goods regulations under Category 16 of Appended Table 1 of the Export Trade Control Order or under Category 16 of the Appended Table of Foreign Exchange Control Order, based on the Foreign Exchange and Foreign Trade Act of Japan. This User's Manual also falls into technology categorized under the Catch-All-Controlled Goods regulations. Consult with Mitutoyo prior to exporting this product, transferring this product overseas, providing this technology to a non-resident, etc. An export license or written application and certificate for permission for service transactions may be required from the Ministry of Economy, Trade and Industry.

#### Precautions regarding Radio Law

This product can be used only in the countries where the wireless certification is acquired and in the country of purchase.

When using this product outside the country of purchase, please contact Mitutoyo sales representative.

**!** This product uses radio waves. Use this product in accordance with the relevant regulations stipulated in the country of use.

- !** Do not disassemble or modify this product. These actions are prohibited by law.
- !** Do not peel off the certification label affixed to this product. Use of this product without a certification label is prohibited.
- !** Always remove the battery from this product when boarding an aircraft, and never use this product while on board. The use of wireless devices inside of aircrafts is prohibited by law.

#### Precautions regarding Wireless Communication Environments

Be aware that obstructions, etc., in the environment may degrade the performance of this product. Refer to the tables below for a list of potential obstructions.

##### 1) Possibility that this product will not be able to communicate

Item	Description
Concrete walls	Communication is not possible in a completely shielded state.
Metallic partitions, etc.	The communication speed may deteriorate or communication may be blocked.
Wireless LAN, Zigbee, Bluetooth, and other communication devices as well as microwave ovens	The communication speed may deteriorate or communication may be blocked. Use this product by either installing it as far away from these devices as possible or changing the communication channel (band ID).
Machine tools, etc.	The communication speed may deteriorate or communication may be blocked in a workplace where machine tools, such as electrical discharge machines, carrying cranes, and arc welding equipment, are operated.
If this product is held and covered by the hands	The communication speed may deteriorate or the communication distance may be decreased. Use this product as close as possible to the installation location of the U-WAVE-R device.

##### 2) Possibility that this product will affect nearby equipment

Item	Description
Medical devices	Do not use this product near medical equipment that may malfunction due to radio waves, such as laser scalpels and scales.

2

#### Precautions regarding Dust and Water Proofing

Observe the points below to obtain the highest performance from IP67-type U-WAVE-T devices.

- This product is guaranteed to be dustproof and waterproof when the connecting cable and battery cover are mounted correctly. When this product is not in use, mount all the covers to prevent water and oil from getting inside and store this product.
- Fully tighten the battery cover using a size 0 screwdriver when inserting the battery to obtain sufficient protective performance (IP67) against water and dust. In addition, make sure the packing is attached correctly.
- Mounting the connecting cable with the packing removed or caught on something may result in damage, because the water proofing of this product cannot be ensured.
- Be very careful when using this product not to let particles, debris, etc., damage the packing. In the event the packing has been damaged, send this product for replacement or repair immediately because the dust and water proofing will have been lost.
- Materials such as the rubber used in the packing are not impervious to the wide range of coolants, chemicals, etc. Contact the nearest Mitutoyo service center if these materials become significantly deteriorated.
- This product is constructed in a way such that it cannot be disassembled, due to the application of sealing in each area. Therefore, the specified performance cannot be obtained if this product is disassembled.
- Do not use this product submerged in water. This product cannot prevent the penetration of coolant and other chemicals.

#### Tips

Refer to IEC 60529 for more information about the IP67 protection level.

#### China RoHS Compliance Information

产品名称：数据传送单元  
产品中有害物质的名称及含量

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

本表格依据 SJ/T 11364 的规定编制。

○：表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。  
×：表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。

**10** 环保使用期限标识，是根据电器电子产品有害物质限制使用管理办法以及《电子电气产品有害物质限制使用标识要求》(SJ/T11364-2014)，制定的适用于中国境内销售电子电气产品的标识。电子电气产品只要按照安全及使用说明内容，正常使用情况下，从生产日期算起，在此期限内，产品中含有的有毒有害物质不致发生外泄或突变，不致对环境造成严重污染或对其人身、财产造成严重损害。产品正常使用后，要废弃在环保使用年限内或者刚到年限的产品时，请根据国家标准采取适当的方法进行处置。另外，此期限不同于质量/功能的保证期限。

3

### 3. Using This Product

#### 3.1. Operation When Sending Measurement Data

- Types of communication operations
- Use the [DATA] switch on the connecting cable to perform the communication operations below.

Description of communication	Length of time to press the [DATA] switch*1	LED indicator
Transmission of measurement data*2	Less than 2 seconds	Blinks green (operating normally) Blinks red (error)
Notification to the U-WAVE-R device of a cancel request for the previously transmitted measurement data	2 seconds or more and less than 5 seconds	Blinks orange in intervals of 0.1 seconds
Search for a U-WAVE-R device available for communication*3	5 seconds or more and less than 10 seconds	Blinks orange in intervals of 0.3 seconds

\*1 If you pressing this switch for 10 seconds or more, the LED indicator turns off and communication operations are disabled. Perform the operation again.

\*2 This operation can also be performed using the [DATA] switch on a measuring tool that supports data output.

\*3 If the device ID of this product is registered in the U-WAVE-R device to search for, the devices connect automatically.

- Verification of communication results
- The communication results with the U-WAVE-R device can be verified by the operational status of the LED indicator or buzzer on this product.

Communication results	LED indicator	Buzzer*1
- Wireless communication ended normally.	Blinks green	2 short buzzes
- Wireless communication failed.	Blinks red	1 long buzz

\*1 Buzzer type only

#### 3.2. Initializing the Settings

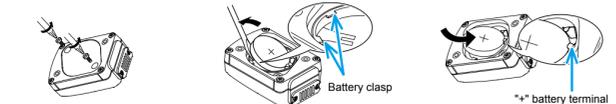
You can reset the settings of this product to the factory default values. If this product stops communicating and communication is not re-established even after performing the countermeasures in [ ] "5. Troubleshooting", initialize the settings with the procedure below.

- 1** Remove the battery from this product. For more information about removing the battery, refer to [ ] "4. Replacing the Battery".
- 2** While pressing and holding the [DATA] switch on the connecting cable, insert the battery, wait 2 seconds or more, and then release the [DATA] switch. >> The settings of this product are initialized.
- 3** Mount the battery cover.

### 4. Replacing the Battery

Replace the battery with the following procedure. Always use the supplied size 0 screwdriver to fasten/remove the screws, and tighten them with a torque of about 5 to 8 cN·m.

- 1** Remove the fastening screws on the back of the main body using the supplied size 0 screwdriver, and then remove the battery cover.
- 2** Insert a tool such as a small flathead screwdriver between the battery and battery clasp, and remove the battery using the tool as lever.
- 3** Insert the new battery into the battery terminal, and then press the opposite side of the battery into the battery clasp.



- 4** Make sure that the packing (circular) is attached.
- 5** Mount the battery cover and tighten the screws using the supplied size 0 screwdriver.



**CAUTION** Shows risks that could result in minor or moderate injury.

Always use a CR2032 battery (lithium battery) for this product. There is a risk of explosion if a different type of battery is used. When disposing of the battery, follow any applicable ordinances and regulations.

**NOTICE** Shows risks that could result in property damage.

- Do not remove the attached packing.
- Be careful not to apply undue force and break or bend the battery terminals when replacing the battery. A fragment of a broken battery terminal in particular can cause damage if the fragment gets inside of this product.

### 5. Troubleshooting

Try the countermeasures included in this section when trouble occurs during use of this product. Contact a Mitutoyo service center listed in the [ ] "U-WAVEPAK User's Manual" if the trouble cannot be resolved.

#### Tips

For more information about the issues and countermeasures of trouble related to the U-WAVE-R device, refer to [ ] "4. Troubleshooting" in the "U-WAVE-R User's Manual".

7



**Disposal of waste batteries and accumulators (applicable in the European Union and other European countries with separate collection systems)**

Batteries and accumulators containing heavy metals such as mercury, lead, and cadmium may contaminate the environment if improperly discarded. When incinerated, certain chemicals are released into the air or concentrated in the ash residue from the combustion process. These may lead to health risks to humans and animals, and also damage the environment in general.

In compliance with legal requirements, the symbol of a "crossed-out wheeled bin" is either applied on the battery or on its packaging. This symbol indicates that disposal of the batteries as household wastes is strictly prohibited. Instead, the batteries must be disposed according to separate collection and recycling rules. Additional marking identifies that heavy metal content (i.e. Cd =cadmium, Hg = mercury, Pb = lead) contained within the battery is over prescribed levels. End users are obliged by law to comply with the discarding procedure for waste batteries. At Mitutoyo facilities, or at its appointed distributors, receptacles will be provided to accept the disposal of previously supplied batteries at no charge.

#### Other Precautions

Be aware that the actions or circumstances below can cause failure or malfunction.

- Do not subject this product to sudden impacts, such as dropping it, nor apply excessive force.
- If this product will not be used for three or more months, remove the battery from it and store it. This product may become damaged by liquid leaking from the battery.
- Avoid using or storing this product in places with direct sunlight or in excessively hot or cold places.
- Avoid using or storing this product in places where it may come into contact with solutions or organic solvents such as acid and alkali.
- Electronic parts may be damaged if a high-voltage device such as an engraving pen is used.
- Be careful not to apply undue force to or excessively bend the connecting cable.
- When the remaining power in the battery becomes low, replace it as soon as possible before operation becomes unreliable.

#### Electromagnetic Compatibility (EMC)

This product complies with the EU EMC Directive. Use of this product in environments with electromagnetic interference exceeding the EMC requirements defined in this directive is outside the scope of the warranty and requires appropriate countermeasures.

#### Disposal of Old Electrical & Electronic Equipment (Applicable in the European Union and Other European Countries with Separate Collection Systems)



This symbol included on the product or the packaging indicates that this product should not be disposed of with general household waste for disposal in EU countries. Please reuse and recycle products to decrease the volume of Waste Electrical and Electronic Equipment (WEEE) in landfills and reduce the environmental impact. For more information about disposal procedures, please contact your dealer or nearest Mitutoyo sales office.

4

#### 3. Check the [S] column and the comment of the [U-WAVEPAK Setup] screen.

If [c] is displayed in the [S] column, communication has been established. If an ID number is displayed in the comment, proceed to **3**.



#### 3. Register the settings again after initializing the settings of this product.

- 1. Initialize the settings of this product.**
  - [ ] "3.2. Initializing the Settings"
- 2. Register the settings of this product.**
  - [ ] "4.3. Registering the Settings" in the "U-WAVE Setup Manual"

### 6. Specifications

#### 6.1. Basic Specifications

Model	U-WAVE-T	
	IP67 type	Buzzer type
Part No.	02AZD730G	02AZD880G
Certification number	005WWCA0166 (Japan) VXU-02AZD730D (U.S.A.) 4396B-02AZD730D (Canada)	005WWCA0168 (Japan) VXU-02AZD880D (U.S.A.) 4396B-02AZD880D (Canada)
Protection level	IP67	None
Equipped with buzzer	No	Yes
Transmission output	1 mW (0 dBm) or less	
Communication range	Approx. 20 m (line of sight distance in an office environment)	
Standards conformance	Japan Europe U.S.A. Canada	ARIB STD-T66 RE Directive - 47 CFR Part 15.247; (Subpart: C) - 47 CFR Part 15; (Subpart: B) - RSS-210 (Issue 7) and RSS-Gen (Issue 2) - ICES 003 (Issue 4)
Wireless specifications	Proprietary (IEEE802.15.4 base)	
Communication frequency	2.405 GHz~2.475 GHz	
Transmission band	15 ch (5 MHz interval)	
Modulation method	Direct-Sequence Spread Spectrum (DSSS)	
Wireless communication speed	250 kbps	
LED display	Green/orange/red three-color display	
Communication with measuring tool	Digimatic (6 digits), Digimatic 2 (8 digits) *Automatic identification	
Battery	CR2032 (3 V): 1 battery	
Battery life	Approx. 400,000 times	
Operating temperature (humidity)	0 °C~40 °C (20 % RH~80 % RH with no condensation)	
Storage temperature (humidity)	-10 °C~60 °C (20 % RH~80 % RH with no condensation)	
External dimensions	44 × 29.6 × 18.5 (mm)	
Mass	Approx. 23 g	

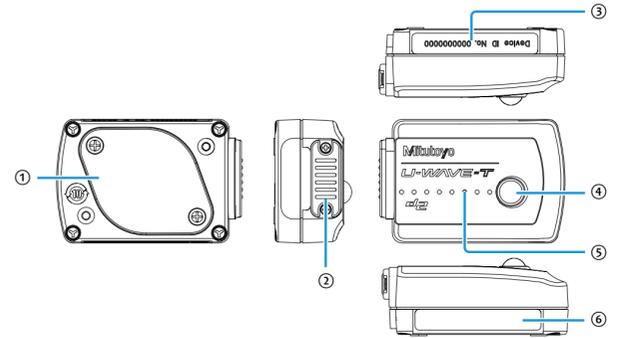
9

### 1. Included Accessories

Size 0 screwdriver  No. 05CZA619	Lithium battery  CR2032	Manual and accessory documentation - U-WAVE-T User's Manual (this document) (No. 99MAL108B) - Warranty card - Declaration of conformity document (copy) (No. 02AZD849A)
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### 2. Name and Function of Each Part

#### - U-WAVE-T



No.	Name	Function
①	Battery cover	Remove the battery cover to replace the battery.
②	Connector cover	Remove this cover to access the connector for connecting the connecting cable.
③	Device ID label	Includes the identification number for this product. The identification number is used when registering the settings of this product to U-WAVEPAK.
④	LED indicator	Blinks or turns off according to the communication status.
⑤	Buzzer holes*1	Buzzes according to the communication status.
⑥	Certification label	Includes the code number and wireless certification number for this product.

\*1 Buzzer type only

#### Tips

The LED indicator blinks red if the battery is out of power, and a warning message is sent to the U-WAVE-R device. Replace the battery immediately. (The buzzer type provides a warning both with a blinking LED and a buzz.)

5

#### 6.2. Connecting Cable (option)

Main Digimatic connecting cables are shown below. For further details on the measuring instruments' specifications, refer to our General Catalog.

Part No. Type	Series No.	Main applicable models	
		Product name/model	Product name/model
02AZD790A Water-proof type with output button Color: Light gray	500	ABS Coolant Proof Caliper	CD-PMX/PM
	500	Sugar Caliper	CD-SPM
	571	ABS Coolant Proof Depth Gage	VDS-PI/PM
	572	ABS Coolant Proof Digimatic Scale Units	SD-G
	573	ABS Coolant Proof special application Caliper	NTD-PMX/PM
02AZD790B Water-proof type with output button Color: Light gray	552	ABS Coolant Proof Carbon Caliper	CF-C-GR/GC/GUMXT
	293	Coolant Proof Micrometer	MDC-MX
	293	Coolant Proof Micrometer	MDE-MX
	---	Coolant Proof special application Micrometer	(The end of the mark is -MX)
	329	Depth Micrometer	DMC-MX
02AZD790C Straight type with output button	350	Coolant Proof Digimatic Micrometer Heads	MHN-AX/MXN
	---	Digimatic special application Micrometer	(The end of the mark is -MX)
	468	Digimatic Hottest	HTD-R
	293	High-Accuracy Digimatic Micrometer	MDH-MB
	337	Extension Rod Type Inside Micrometer	IMZ-MJ
02AZD790D Flat 10-pin type	339	Extension Pipe Type Inside Micrometer	IMJ-MJ
	500	ABS Digimatic Caliper	CD-AX/CSC
	571	ABS Digimatic Depth Gage	VDS-AX/DCX/DC
	572	ABS Digimatic Scale Units	SD-D/SDV-D
	---	ABS Digimatic special application Caliper	(The end of the mark is -AX/C)
02AZD790E Flat straight type	515	Digital Height Master	HME-DMB
	164	Digimatic Micrometer Head	MHD-MB
	293	Digimatic Micrometer	MDC-MB
	178	Portable Surface Roughness Tester Surftest	SJ-210/310/411/412
	518	High Precision Digital Height Gage QM-Height	QM-H-AB
02AZD790F Flat straight waterproof type	519	Digital Mu-Checker	M
	542	Linear gage counter	EB/E-C
	543	Digimatic Indicator	ID-HID-F
	544	Laser Scan Micrometer	LSM-5506
	544	Laser Scan Micrometer	LSM-5500
02AZD790E Round 6-pin type	---	(It applies when using Digimatic Codecut unit (02AGC840))	
	810	Micro Vickers Hardness Testing Machines	HM-210/220
	810	Vickers Hardness Testing Machines	HV-110/120
	227	Soft-Touch Micrometer	CLM
	293	Quickmike	MDQ
02AZD790F Flat straight type	---	Exclusive Quickmike	(The end of the mark is -QM)
	810	Micro Vickers Hardness Testing Machines	HM-100/200
	810	Vickers Hardness Testing Machines	HV-100
	810	Rebound Type Portable Metal Hardness Tester	HR-411
	810	Rockwell Hardness Testing Machines	HR-500
02AZD790E Flat straight type	192	Digimatic Height Gage	HDM-AX/HD-AX
	511	ABS Digimatic Bore Gage	CG-D
	543	ABS Digimatic Indicator	ID-SX/SS
	543	ABS Digimatic Indicator	ID-CX
	570	ABS Digimatic Height Gage	HDS-H/C
02AZD790G Flat straight waterproof type	547	ABS Digimatic Depth Gage	SD-E/SDV-E/SDV-S/SDV-F
	572	ABS Digimatic Scale Units	SD-E/SDV-E/SDV-S/SDV-F
	575	ABS Digimatic Indicator	ID-U
	568	ABS Borematic	SBM-CX
	811	Durometers for Sponge, Rubber, and Plastics	HH-300
02AZD790G Flat straight waterproof type	543	ABS Coolant Proof Digimatic Indicator	ID-NID-B

#### Tips

The designs and specifications of Digimatic connecting cables are subject to partial change without prior notice for product improvement. We appreciate your understanding.