

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.

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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.

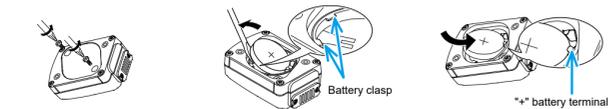
2) Possibility that this product will affect nearby equipment

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.

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.

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



- Make sure that the packing (circular) is attached.
- 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".

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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.

EU 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.

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Issue	
Data transmission fails and the LED indicator blinks red.	
Check point	Countermeasure
Is the LCD of the measuring tool in the counter-display state?	Communication cannot be performed if the display of the measuring tool that is connected is turned off or is in a state for setting a value. Set the LCD to the counter display.
Is the battery out of power?	Measurement data cannot be sent if the battery is out of power. Replace the battery with a new battery.
Is this product correctly attached to the measuring tool?	Make sure that this product and the measuring tool are fully connected with the connecting cable.
Does U-WAVEPAK show that the ID number indicated on the device ID label of this product is connected?	Communication cannot be performed if U-WAVEPAK does not show that the device is connected. Make sure that [c] is displayed in the [S] column on the [U-WAVEPAK Setup] screen of U-WAVEPAK. "4.3.2. U-WAVE-T/TC/TM Settings" in the "U-WAVE Setup Manual"

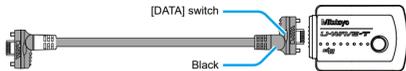
Issue	
Data transmission is not stable and errors occur frequently.	
Check point	Countermeasure
Is this product being used in an environment where communication is obstructed?	Check whether there is a problem with the usage environment. "Precautions regarding Wireless Communication Environments"

Issue	
The settings for this product cannot be completed because this product cannot communicate with the U-WAVE-R device.	
Check point	Countermeasure
Has communication been established between this product and the U-WAVE-R device?	

Establish communication using the procedure below.

1 Make sure that the connecting cable has been attached in the correct direction.

Always connect the black connector side of the connecting cable to the U-WAVE-T device.



(The connecting cable in the diagram is Part No. 02AZD790A.)

2 Execute the search for the U-WAVE-R device.

1. Start U-WAVEPAK, and then display the [U-WAVEPAK Setup] screen.

2. Press and hold the [DATA] switch for 5 to 10 seconds.

The LED indicator of this product will start blinking orange. Release the [DATA] switch after the indicator starts blinking slowly.

Tips

If you press the [DATA] switch for 10 seconds or more, the LED indicator will turn off and the search operation will be disabled. Press and hold the switch again until the LED indicator blinks slowly.

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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.

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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 Step 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)	005WWCA0168 (Japan)
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: ARIB STD-T66 Radio: EN 300 328 V2.1.1 Safety: EN 62368-1:2014+A11 EN IEC 63000	
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(button-driven mode) **1	
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	

*1 The current consumption significantly increases when operating in event-driven mode.

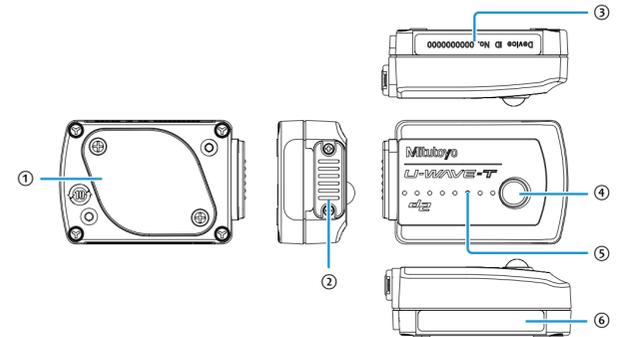
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1. Included Accessories

Size 0 screwdriver No. 05CZA619	Lithium battery CR2032	Manual and accessory documentation - U-WAVE-T User's Manual (this document) (No. 99MAL108B) - Certification and Regulation (No. 99MAL124W) - 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.)

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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	Main applicable models	
	Series No.	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-SFM
	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 CFC-CGI/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
	350	Coolant Proof Digimatic Micrometer Heads MH-N/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
339	Extension Pipe Type Inside Micrometer IMJ-MJ	
02AZD790C Straight type with output button	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)
	515	Digital Height Master HME-OMB
	164	Digimatic Micrometer Head MHD-MB
	293	Digimatic Micrometer MDC-MB
02AZD790D Flat 10-pin type	178	Portable Surface Roughness Tester SurfTest SJ-210/310/411/412
	518	High Precision Digital Height Gage QM-Height QMH-A/B
	519	Digital Mu-Checker M
	542	Linear gage counter EB/EC-D
	543	Digimatic Indicator ID-HID-F
	544	Laser Scan Micrometer LSM-3506
	544	Laser Scan Micrometer LSM-8200
	---	(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
02AZD790E Round 6-pin type	227	Soft-Touch Micrometer CLM
	293	Quickmike MDQ
	---	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 HH-411
	810	Rockwell Hardness Testing Machines HR-500

02AZD790F 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
	547	ABS Digimatic Depth Gage SD-E/SDV-E/SD-V/SDV-F
	572	ABS Digimatic Scale Units SD-E/SDV-E/SD-V/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.

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