LR8512
LR8513
LR8514
LR8515

HIOKI

Measurement Guide

WIRELESS PULSE LOGGER
WIRELESS CLAMP LOGGER
WIRELESS HUMIDITY LOGGER
WIRELESS VOLTAGE/TEMP LOGGER

EN

July 2016 Revised edition 3
LR8512B981-03 16-07H

* 6 0 0 4 4 4 5 9 3 *

Contents

Handling of temperature and humidity sensor

⚠CAUTION

- The temperature and humidity sensor is not dustproof or waterproof. Do not use the sensor in locations where it may be exposed to dust or water. It may cause a malfunction of the instrument.
- The temperature and humidity sensor is not drip-proof. Water that drips onto the connector could cause a malfunction.

- When the sensor is used outside the specified operating (storage) environment, the sensor accuracy may deteriorate even within the 1 year accuracy warranty period and accurate measurement cannot be performed.
- Do not expose the temperature and humidity sensor to any concentrated chemical solvent for an extended period of time while it is used or stored.
- When the temperature and humidity sensor is not used, place it with a drying agent in a plastic bag, seal the bag completely, and store it in a cool, dark place.
- Do not allow any condensation to form. Condensation can form particularly in any environment where the temperature changes drastically.
- This instrument does not come with a guarantee against any problem when the sensor is used outside the specified operating (storage) environment.
- Due to a humidity change (from low to high humidity or high to low humidity), about a 1% change (hysteresis) occurs in the measured humidity value.

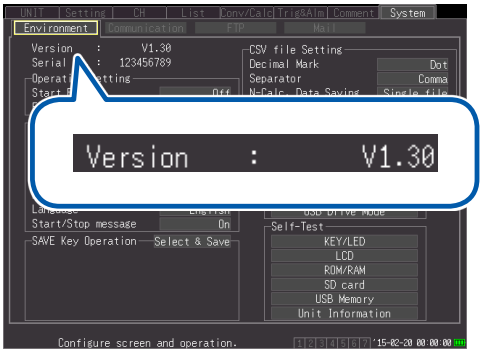
Precautions during shipment

⚠CAUTION

- To avoid damaging the instrument, remove accessories and options from the instrument.
- Avoid any vibration or impact to prevent damage to the instrument, humidity sensor, and clamp sensor during transportation and handling. Be careful especially with impact by a fall.

For customers who are using the LR8410 Wireless Logging Station

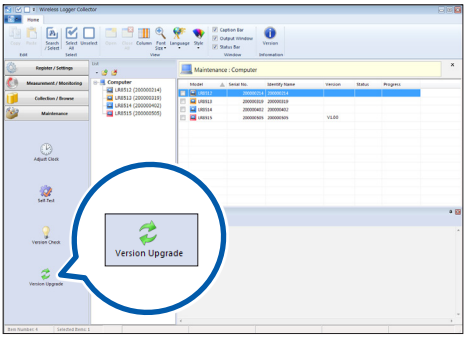
This instrument can be used on the LR8410 firmware version 1.30 or later.
The firmware version for the LR8410 is displayed on the system screen.



The latest version can be downloaded from our website.
For details on how to upgrade the software, see our website or check with your authorized Hioki distributor or reseller.

Instrument Version

The Wireless Logger Collector can be used on the instrument software **version 1.20** or later.
A version older than 1.20 needs to be updated. The software can be updated in Wireless Logger Collector (Windows® PC version).



If the software version is older than 1.20, a communication error (protocol error) occurs in any communications attempted between the instrument and Wireless Logger Collector.

Introduction

Thank you for purchasing the HIOKI LR8512 Wireless Pulse Logger, LR8513 Wireless Clamp Logger, LR8514 Wireless Humidity Logger, or LR8515 Wireless Voltage/Temp Logger. To obtain maximum performance from the product, please read this manual first, and keep it handy for future reference.

In this manual, the name of each instrument is indicated as follows.

Product name	Name indicated in the manual
LR8512 Wireless Pulse Logger LR8513 Wireless Clamp Logger LR8514 Wireless Humidity Logger LR8515 Wireless Voltage/Temp Logger	Instrument

There are the following instruction manuals available for this instrument. Please refer to the appropriate manuals for the intended usage.

Measurement Guide (this manual)	**Read this first.** For customers who use this instrument for the first time, this manual describes the basic operation procedures.
Instruction Manual	Describes details of the functions, operations, and specifications of this instrument.

Registered Trademark

- Microsoft, Windows, Windows Vista, and Excel are either registered trademarks or trademarks of Microsoft Corporation in the United States and other countries.
- Bluetooth® is a registered trademark of Bluetooth SIG, Inc. (USA).
  The trademark is used by HIOKI E.E. CORPORATION under license.
- Adobe and Adobe Reader are trademarks of Adobe Systems Incorporated.
- Android™ and Google Play™ are registered trademarks of Google, Inc.

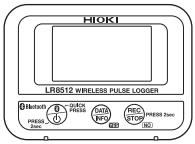
Verifying Package Contents

When you receive the instrument, inspect it carefully to ensure that no damage occurred during shipping. In particular, check the accessories, panel keys, and connectors. If damage is evident, or if it fails to operate according to the specifications, contact your authorized Hioki distributor or reseller.

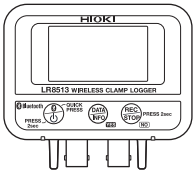
Check the package contents as follows.

Instrument

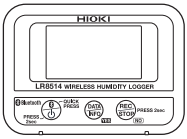
☐ **LR8512 × 1**



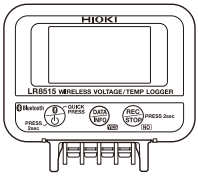
☐ **LR8513 × 1**



☐ **LR8514 × 1**



☐ **LR8515 × 1**



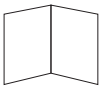
Common accessories

☐ **CD × 1**
[Instruction Manual (PDF), Application Software (Logger Utility, Wireless Logger Collector)]

The latest version of the application software can be downloaded from our website.

☐ **Measurement Guide**

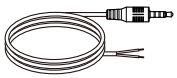
☐ **Precautions Concerning Use of Equipment That Emits Radio Waves**



☐ **LR6 Alkaline battery × 2**

LR8512 Accessory

☐ **L1010 Connection Cable (length approx. 1.5 m) × 2**

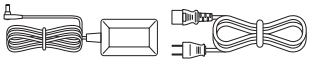


Options

The following options are available for the LR8512, LR8513, LR8514, and LR8515.
Contact your authorized Hioki distributor or reseller when ordering.

Common options

☐ Z2003 AC Adapter (power cord attached)



☐ Z5004 Magnetic Strap
☐ Z5020 Magnetic Strap

LR8512 Option

☐ L1010 Connection Cable (length approx. 1.5 m)

LR8513 Option

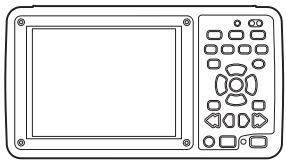
☐ 9669 Clamp On Sensor
☐ 9695-02 Clamp On Sensor
☐ CT6500 Clamp On Sensor
☐ 9657-10 Clamp On Leak Sensor
☐ 9675 Clamp On Leak Sensor
☐ CT9691-90 Clamp On AC/DC Sensor
☐ CT9692-90 Clamp On AC/DC Sensor
☐ CT9693-90 Clamp On AC/DC Sensor
☐ 9219 Connection Cable (for 9695-02 connection)
☐ CT7631 AC/DC Current Sensor
☐ CT7636 AC/DC Current Sensor
☐ CT7642 AC/DC Current Sensor
☐ CT7731 AC/DC Auto-Zero Current Sensor
☐ CT7736 AC/DC Auto-Zero Current Sensor
☐ CT7742 AC/DC Auto-Zero Current Sensor
☐ CT9667-01 AC Flexible Current Sensor
☐ CT9667-02 AC Flexible Current Sensor
☐ CT9667-03 AC Flexible Current Sensor
☐ CT7044 AC Flexible Current Sensor
☐ CT7045 AC Flexible Current Sensor
☐ CT7046 AC Flexible Current Sensor
☐ CM7290 Display Unit
For the CT7631,CT7636,CT7642,CT7731,CT7736,CT7742,CT7044,CT7045,CT7046
☐ CM7291 Display Unit
For the CT7631,CT7636,CT7642,CT7731,CT7736,CT7742,CT7044,CT7045,CT7046
☐ L9095 Output Cord (for CM7290/CM7291 connection)

LR8514 Option

☐ Z2010 Humidity Sensor (Length including the sensor: Approx. 50 mm)
☐ Z2011 Humidity Sensor (Cable length: Approx. 1.5 m)

Supported instrument

☐ LR8410 Wireless Logging Station
(Supported for software version 1.30 and later)



Safety Notes

This instrument is designed to conform to IEC 61010 Safety Standards, and has been thoroughly tested for safety prior to shipment. However, using the instrument in a way not described in this manual may negate the provided safety features.
Before using the instrument, be certain to carefully read the following safety notes.

⚠DANGER

Mishandling during use could result in injury or death, as well as damage to the instrument. Be certain that you understand the instructions and precautions in the manual before use.

⚠WARNING

If you do not have knowledge or experience of electrical measurements, use this instrument under supervision of experienced personnel.

Notation

In this manual, the risk seriousness and the hazard levels are classified as follows.

⚠DANGER	Indicates an imminently hazardous situation that will result in death or serious injury to the operator.
⚠WARNING	Indicates a potentially hazardous situation that may result in death or serious injury to the operator.
⚠CAUTION	Indicates a potentially hazardous situation that may result in minor or moderate injury to the operator or damage to the instrument or malfunction.
IMPORTANT	Indicates information related to the operation of the instrument or maintenance tasks with which the operators must be fully familiar.
	Indicates a strong magnetic-field hazard. The effects of the magnetic force can cause abnormal operation of heart pacemakers and/or medical electronics.
	Indicates prohibited actions.
	Indicates an action that must be performed.
✱	Additional information is presented below.
Windows®	Windows® XP, Windows® Vista, Windows® 7, and Windows® 8 are referred to as "Windows®", otherwise specified.
Dialog	Windows® dialog boxes are referred to as dialogs.
[ ]	The names and keys on the screen including menus, commands, dialogs, dialog button names, etc. are enclosed in brackets **[ ]**.

Symbols affixed to the instrument

	Indicates cautions and hazards. When the symbol is printed on the instrument, refer to a corresponding topic in the Instruction Manual.
	Indicates a grounding terminal.
	Indicates DC (Direct Current).

Symbols for various standards

	Indicates the Waste Electrical and Electronic Equipment Directive (WEEE Directive) in EU member states.
	Indicates that the instrument conforms to regulations set out by the EC Directive.
	Indicates that the product incorporates Bluetooth® wireless technology.
FCC ID	Indicates the ID number of the wireless module certified by the U.S. Federal Communications Commission (FCC).
IC	Indicates the identification number of a wireless module approved by Industry Canada (IC).

Screen display

The instrument screen displays the alphanumeric characters as follows.

Accuracy

We define measurement tolerances in terms of rdg. (reading) and dgt. (digit) values, with the following meanings:

f.s.	(Maximum display value or scale length/range) The maximum displayable value or scale length. This is usually the name of the currently selected range.
rdg.	(Reading or displayed value) The value currently being measured and indicated on the measuring instrument.
dgt.	(Resolution) The smallest displayable unit on a digital measuring instrument, i.e., the input value that causes the digital display to show a “1” as the least-significant digit.

Measurement categories

To ensure safe operation of measuring instruments, IEC 61010 establishes safety standards for various electrical environments, categorized as CAT II to CAT IV, and called measurement categories.

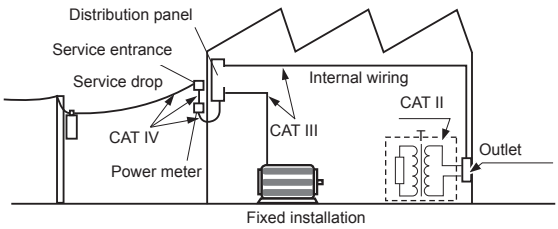
⚠ DANGER

- **Using a measuring instrument in an environment designated with a higher-numbered category than that for which the instrument is rated could result in a severe accident, and must be carefully avoided.**
- **Using a measuring instrument without categories in an environment designated with the CAT II to CAT IV category could result in a severe accident, and must be carefully avoided.**

CAT II: When directly measuring the electrical outlet receptacles of the primary electrical circuits in equipment connected to an AC electrical outlet by a power cord (portable tools, household appliances, etc.)

CAT III: When measuring the primary electrical circuits of heavy equipment (fixed installations) connected directly to the distribution panel, and feeders from the distribution panel to outlets

CAT IV: When measuring the circuit from the service drop to the service entrance, and to the power meter and primary overcurrent protection device (distribution panel)



Usage Notes

Follow these precautions to ensure safe operation and to obtain the full benefits of the various functions.

Bluetooth®

This instrument and the LR8410 use radio waves of a band frequency of 2.4 GHz. No radio station license is required to use this product, however, be aware of the following.

⚠WARNING

- **Do not use this instrument in a system that requires high safety and reliability.**
- **Do not use this instrument near any medical equipment, such as a pacemaker, etc.**
- **Do not modify, disassemble, or repair the instrument.**

⚠CAUTION

- If this instrument is used near any equipment that uses the same frequency band, such as wireless LAN equipment, etc., communications may become unstable or other equipment may be affected.
- The line-of-sight distance between the instrument and the LR8410 is 30 m. If there is an obstacle (wall, metal screen, etc.), communications may become unstable or the communications distance may become shorter.
- Communications between the instrument and the LR8410 are encrypted by SSP, however, the confidentiality of any information is not guaranteed. We are not responsible for any leakage of measurement data by wireless communications.
- This instrument and the LR8410 generate electric waves. Usage of electric waves requires permission and authorization in each country. Using electric waves in any country or region other than the ones listed in the attached document “Precautions Concerning Use of Equipment That Emits Radio Waves” is against the law and may be subject to punishment.

When the instrument is positioned on a stand instead of directly on the floor, communications can become more stable.

Check before use

Verify that it operates normally to ensure that no damage occurred during storage or shipping. If you find any damage, contact your authorized Hioki distributor or reseller.

Installation

⚠WARNING

Installing the instrument in inappropriate locations may cause a malfunction of the instrument or may give rise to an accident. Avoid the following locations.

- **Exposed to direct sunlight or high temperature**
- **Exposed to corrosive or combustible gases**
- **Exposed to water, oil, chemicals, or solvents**
- **Exposed to high humidity or condensation**
- **Exposed to a strong electromagnetic field or electrostatic charge**
- **Exposed to high quantities of dust particles**
- **Near induction heating systems (such as high-frequency induction heating systems and IH cooking equipment)**
- **Susceptible to vibration**

For details on the operating temperature and humidity, see the specifications.

⚠CAUTION

- This instrument is not drip-proof. Water that drips on the connector could cause a malfunction.
- Do not allow any condensation to form. Condensation can form particularly in an environment where the temperature changes drastically.

- Do not allow the instrument to become wet or take measurements with wet hands. Doing so may cause a malfunction.
- Do not position the instrument on an unstable table or inclined surface. When the instrument falls or tips, an injury or malfunction can occur.

Install the LR8515 Wireless Voltage/Temp Logger with attention to the following:

- Take appropriate measures to prevent the ambient temperature near the terminal block from changing. Install the instrument where it is not exposed to direct air from a ventilation fan, air conditioner, etc. A measurement error can occur during thermocouple input.
- When the instrument is moved to a location with a significant temperature change, wait for at least 60 minutes before starting measurement.

Handling of this instrument

⚠CAUTION

Avoid any vibration or impact to prevent damage to the instrument during transportation and handling. Be especially careful regarding the impact by a fall.

This instrument may cause interference if used in residential areas. Such use must be avoided unless the user takes special measures to reduce electromagnetic emissions to prevent interference to the reception of radio and television broadcasts.

Handling of cords and cables

⚠WARNING

Make sure to use the specified power cord when using the instrument. Otherwise, a fire may be caused.

⚠CAUTION

- Avoid stepping on or pinching the cables to prevent damage to the cables. Do not bend or pull the cables.

- To prevent any wires from breaking, pull on the connector end, not the cable, to disconnect the output connector.
- To prevent any wires from breaking, pull on the connector end, not the cord, to disconnect the power cord from the outlet or the instrument.
- The cables become stiff below 0°C. If the cables are bent or pulled in this condition, the cable insulation may be damaged or the wires may be cut.

- When using the instrument, make sure to use the connection cable specified by our company. When any other cable is used, it may not be possible to perform accurate measurement due to a contact failure, etc.
- When a measurement cable that is longer than 3 m is connected, measurement may be affected by factors in the EMC environment, such as exogenous noise.
- Position the measurement cable away from the power line or ground cable.
- When the measurement cable is connected in parallel to other equipment, measurement values may vary. If the measurement cable is to be connected in parallel, make sure to check the operation before use.

Before turning on the power

⚠CAUTION

- When operating the instrument using a UPS (uninterruptible power supply) or DC-AC inverter, do not use any square-wave and pseudo sine-wave UPS or DC-AC inverter. Doing so may damage the instrument.
- Make sure that the power voltage connection is correct. Connection errors could damage the internal circuit.

The instrument and measurement unit will not fail due to a momentary power failure under 40 ms. If the power failure is longer than 40 ms, the power may be shut off temporarily. Install the instrument in consideration of power conditions at the installation location.

Magnet of the optional strap

⚠DANGER

Those with medical electronics such as pacemakers should not use the Z5004 Magnetic Strap. Nor should such persons approach the Z5004. It is extremely dangerous. The electronics may not operate properly and the life of the operator may be put at great risk.

⚠WARNING

Swallowing magnets could be life-threatening. Keep any magnets out of reach, especially of small children. If you accidentally swallow magnets, immediately seek medical attention.

⚠CAUTION

- Do not use the Z5004 in locations where it may be exposed to rainwater, dust, or condensation. In those conditions, the magnet may be decomposed or deteriorated. The magnet adhesion may be diminished. In such case, the instrument may not be hung in place and may fall.
- Do not bring the Z5004 near magnetic media such as floppy disks, magnetic cards, pre-paid cards, or magnetized tickets. Doing so may corrupt and may render them unusable. Furthermore, if the Z5004 is brought near precision electronic equipment such as PCs, TV screens, or electronic wrist watches, they may fail.
- Keep magnets away from any impact by a fall. The magnets may chip or crack due to impact.

AC adapter

⚠WARNING

- **Make sure to use the optional Z2003 AC Adapter. The rated power voltage for the AC adapter is 100 V to 240 V AC and the rated power frequency is 50 Hz/60 Hz. Do not use the AC adapter at any voltage other than the above to avoid damage to the instrument and electrical accidents.**
- **Before turning on the power, make sure that the power voltage indicated on the AC adapter matches the power voltage to be used. Using the AC adapter outside the specified power voltage range could cause damage to the instrument or AC adapter or electrical accidents.**

⚠CAUTION

- Connect the output plug to the instrument and then connect the plug to an outlet. Connecting the energized output plug to the instrument may damage the instrument.
- When connecting an external power supply, connect the output plug to the instrument and then supply external power.

Handling of batteries

⚠WARNING

- **Do not short circuit, disassemble, or incinerate batteries. Do not charge alkaline batteries. Doing so may cause an explosion. Handle and dispose of batteries in accordance with local regulations.**

- **In order to prevent electric shocks, remove measurement cables and then replace the batteries.**
- **After battery replacement, reattach and screw down the battery cover before use.**
- **To prevent damage to the instrument or electric shocks, make sure to use the battery cover screw (screw with a spring) that is attached at the time of shipment. If you lose the screw or spring or find any damage, contact your authorized Hioki distributor or reseller.**

⚠CAUTION

Poor performance or damage from battery leakage could result. Observe the cautions listed below.

- Do not mix new and old batteries, or different types of batteries.
- Be careful to observe the battery polarity during installation. Poor performance or damage from battery leakage could result.
- Do not use batteries after their recommended expiry date.
- Do not allow used batteries to remain in the instrument.

- To avoid corrosion from battery leakage and/or damage to the instrument, remove the batteries from the instrument if it is to be kept in storage for an extended period.

IMPORTANT

The displayed remaining battery level may be different from the actual remaining battery level due to the battery characteristics, settings during use, temperature or consumption level. When a battery is used in a low temperature environment or a weak and deteriorated battery is used, the power may shut off regardless of the battery indicator display.

Batteries

The battery indicator display and battery life are based on the use of a new alkaline battery.

Use of nickel-metal hydride batteries

When nickel-metal hydride batteries are used, the battery indicator display does not operate correctly.
The battery life varies depending on the capacity, charging condition, deterioration due to repeated use, etc. Use batteries in consideration of the factors above.

Use of manganese dioxide batteries

Do not use manganese dioxide batteries as the instrument may not be able to measure or communicate.

Wire connection

⚠DANGER

Do not permanently connect the instrument in an environment where there is a possibility of surges exceeding the dielectric withstand voltage. Doing so may damage the instrument and result in personal injury.

⚠WARNING

- **Do not allow input that exceeds the maximum rating. Doing so may cause heat to generate, which can cause damage to the instrument, short circuits or electric shocks.**
- **Do not connect any equipment other than the specified clamp sensor to the LR8513 Wireless Clamp Logger. Doing so may cause electric shocks or damage to the instrument.**
- **Do not connect any equipment other than the specified temperature and humidity sensor to the LR8514 Wireless Humidity Logger. Doing so may cause electric shocks or damage to the instrument.**
- **A semiconductor relay is used to isolate between the input terminals and channel of the LR8515 Wireless Voltage/Temp Logger. When any voltage that exceeds the specified rating is applied, the semiconductor relay can fail with a short-circuit. Never input any voltage that exceeds the specified rating. Especially be aware of lightning surges. If there is an error in measurement values, send the instrument for repair.**
- **Do not connect the measurement cable to the instrument while it is connected to the object to be measured. Doing so may cause electric shocks.**
- **The analog input terminal maximum input voltage, maximum rated voltage to earth, and maximum rated voltage between the input terminals and channel of each logger is shown in the following table. To avoid electric shocks and damage to the instrument, do not input any voltage over the voltages shown below.**

Model	Maximum input voltage	Maximum rated voltage to earth	Maximum rated voltage between input terminals and channel
LR8512	0 to 50 V DC	33 V AC rms or 70 V DC (between each analog input channel and chassis)	Non-isolated (GND common)
LR8515	±50 V DC	33 V AC rms or 70 V DC (between each analog input channel and chassis)	70 V DC

⚠WARNING

The power supply ground and input terminals (-) are common and not isolated. When using an external power supply, use an isolated external power supply or connect the wires so that there is no potential difference between the ground of the external power supply and the object to be measured to prevent damage to the instrument or electric shocks.

Handling of CD

- Do not allow any dirt or scratches on the disk recording surface. When writing on the label face, use a pen with a soft tip.
- Store the disk in a protective case and do not expose the disk to direct sunlight or high temperatures and humidity.
- We are not responsible for any trouble in the Windows® computer system when this disk is used.

Handling of clamp sensor

⚠CAUTION

- To prevent damage to the BNC connector, make sure to release the lock and then pull on the connector end of the BNC connector.

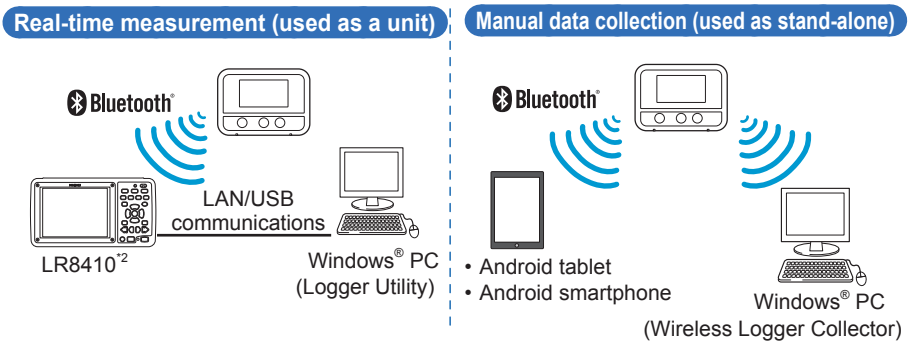
1 Overview

1.1 Overview and Features

This is a compact wireless logger that is capable of measurement, display, and recording.

Model	Description
LR8512 Wireless Pulse Logger	• Counts pulses and records an integrated value. • Measures the revolution and logic ON/OFF signal.
LR8513 Wireless Clamp Logger	• Measures AC/DC current with the optional (sold separately) clamp sensors installed. • Sets the voltage and power factor and measures the power easily.*1
LR8514 Wireless Humidity Logger	• Measures temperature and humidity precisely.
LR8515 Wireless Voltage/Temp Logger	• Measures the voltage of ±50 mV to ±50 V and temperature (thermocouple K, T).

Real-time measurement and manual data collection functions



0.1 sec. high-speed sampling

The data update of the LR8513 and LR8514 is every 0.5 sec.

The memory capacity for each channel is 500,000 data

3-way power supply

You can choose a power supply from LR6 alkaline batteries, AC adapter, and external power supply (5 V to 13.5 V).

Average/Maximum recording mode installed

An average/maximum recording mode is installed on the LR8513 Wireless Clamp Logger. An average/maximum of the effective values measured at intervals of 0.5 seconds is recorded for each recording interval.

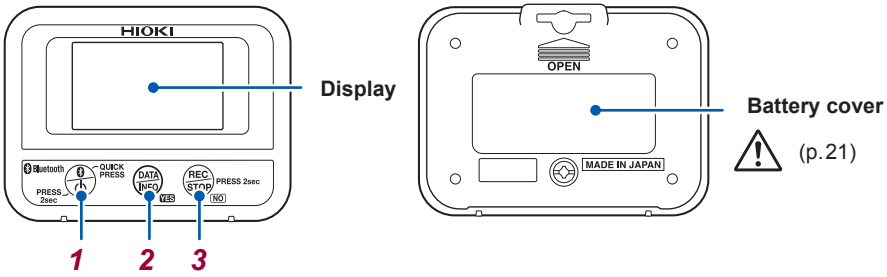
*1 For a single-phase/2-wire, the power value can be directly read on the instrument using the scaling setting.
For a single-phase/3-wire and three-phase/3-wire, a value can be displayed on the LR8410 with the waveform calculations function of the LR8410.

*2 For the procedure for connecting to the LR8410, refer to the LR8410 instruction manual.

1.2 Parts Names and Functions

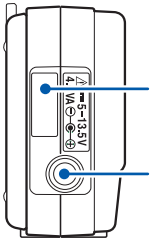
Front **Rear**

(Common areas of each model are described.)



Operation keys	Press briefly	Hold down (for at least 2 seconds)
1 Power	Bluetooth® ON/OFF	Power ON/OFF
2 Display	Display change YES (During operation verification)	—
3 Measurement	NO (During operation verification)	Measurement start/stop

Left side (Common to all models)

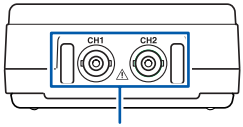


Serial number label
It is necessary for production control requirements such as the product warranty. Do not peel off the label.

AC adapter connection terminal
(p.21)

Bottom side

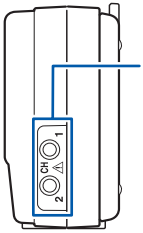
LR8513



Connection terminal
Connect the clamp sensor.
(p.21)

Right side

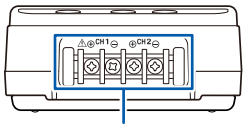
LR8512, LR8514



Connection terminal
For LR8512, connect the L1010 Connection Cable.
For LR8514, connect the temperature and humidity sensor.
(p.21)

Bottom side

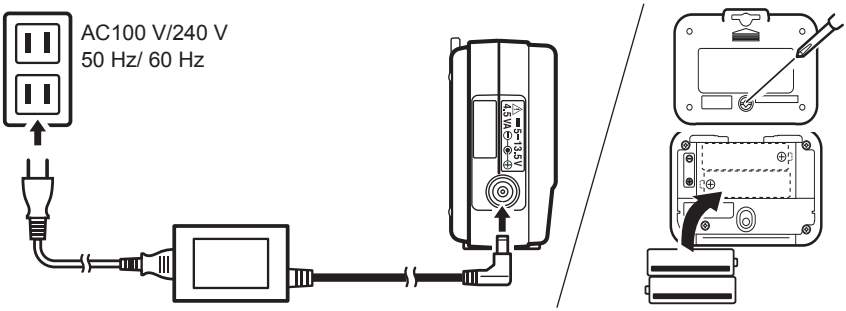
LR8515



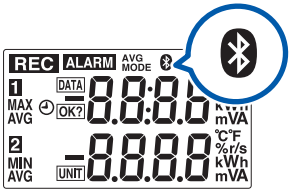
Connection terminal
Connect the input cable or thermocouple.
(p.21)

2 Preparation for Measurements

1 Choose a power supply (AC adapter or battery).



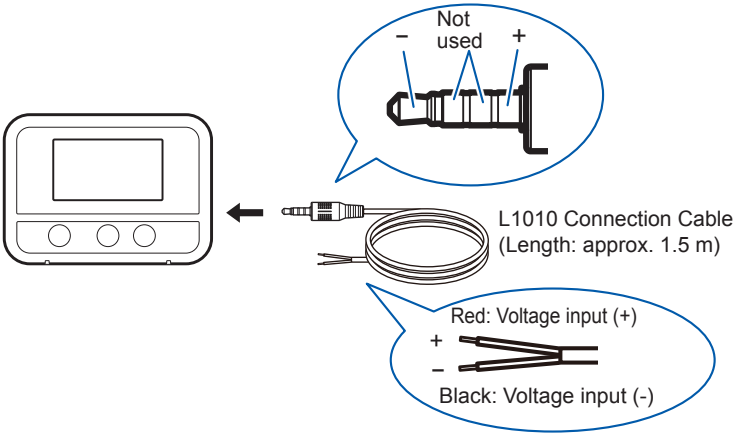
The instrument is automatically powered on.



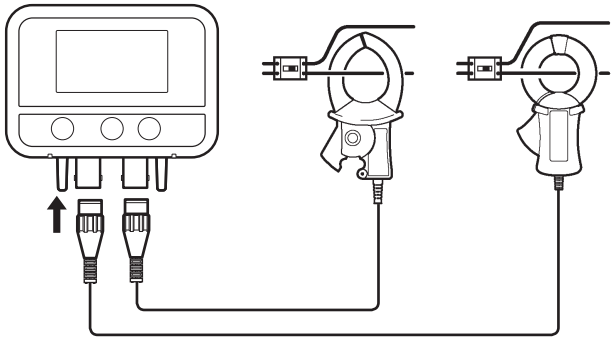
Bluetooth® ON ↔ Bluetooth® OFF

2 Connect measurement cables to the instrument.

LR8512



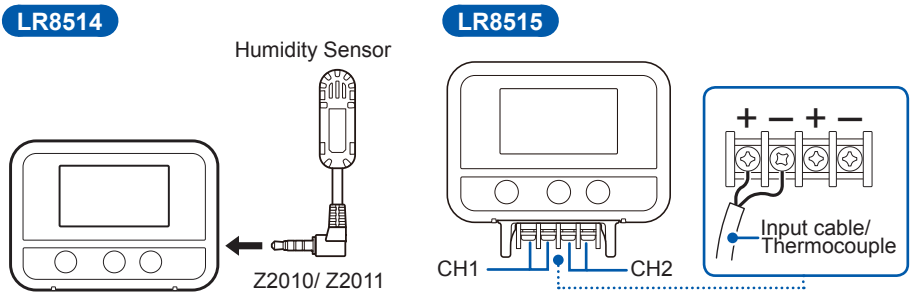
LR8513



Supported clamp sensor

Model	Range	Max. input current	Max. input voltage
9669	1000 A	1000 A	CAT III AC600 V
9695-02	50 A	60 A	CAT III AC300 V
CT6500	500 A	600 A	CAT III AC600 V
9657-10	5 A	30 A	CAT III AC300 V
9675	5 A	10 A	
CT9691-90	100 A	100 A	CAT III AC/DC 600 V
CT9692-90	200 A	200 A	
CT9693-90	2000 A	2000 A	
CT7631	100 A	100 A	CAT IV AC/DC 600 V
CT7636	200 A	600 A	CAT IV AC/DC 600 V CAT III AC/DC 1000 V
CT7642	2000 A	2000 A	
CT7731	100 A	100 A	CAT IV AC/DC 600 V
CT7736	200 A	600 A	CAT IV AC/DC 600 V CAT III AC/DC 1000 V
CT7742	2000 A	2000 A	
CT9667-01	5000 A	10000 A	CAT IV AC 600 V CAT III AC 1000 V
CT9667-02	5000 A	10000 A	
CT9667-03	5000 A	10000 A	
CT7044	5000 A	1000 A (600 A range) 10000 A (6000 A range)	
CT7045	5000 A	1000 A (600 A range) 10000 A (6000 A range	
CT7046	5000 A	1000 A (600 A range) 10000 A (6000 A range	

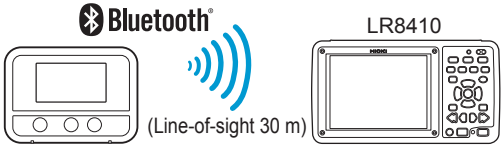
*range changes are controlled from the CM7290/CM7291
For details, refer to the instruction manual attached to each clamp sensor.



3 **Set the measurement condition**
Measurement settings can be changed from supported instrument or Windows® PC/Android application.
The settings can't be changed only by this instrument.

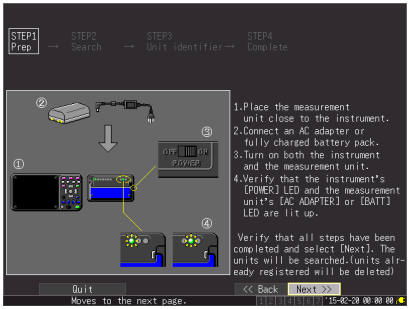
3 Using the LR8410 as a Unit

3.1 Real-time Measurement Using the LR8410



1 **Turn ON the power of the instrument and the LR8410.**

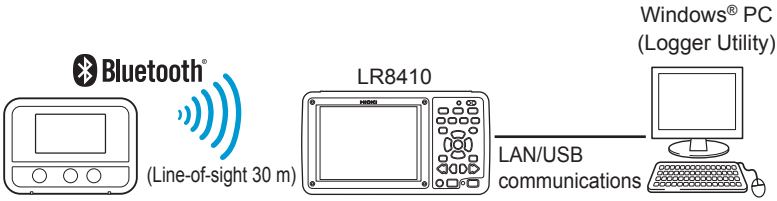
2 **Register the instrument as a unit using the LR8410 Quick Set function (Unit Guide).**



3 **Set the measurement conditions using the Quick Set function (Config Guide) and send the conditions to the instrument.**

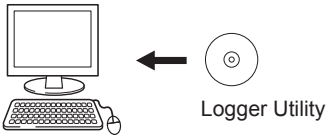
4 **Start measurement.**
For details, refer to the LR8410 measurement guide.

3.2 Performing Real-time Measurement Using a Windows® PC

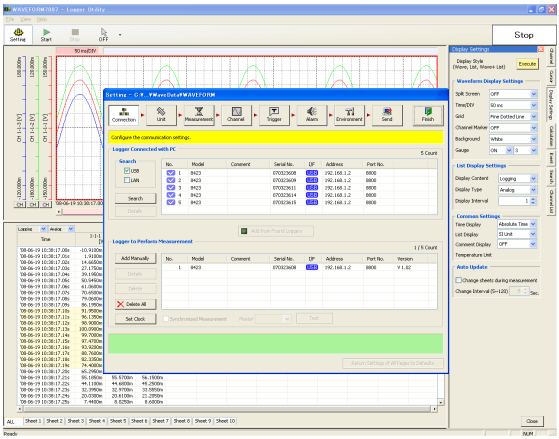


1 **Register the instrument as a unit in the LR8410. (p.25)**

2 **Install Logger Utility on the Windows® PC.**



3 **Start up Logger Utility.**
The main screen is displayed when Logger Utility starts up.
The main screen is the basic screen for Logger Utility.



4 **Set the measurement conditions for the instrument.**

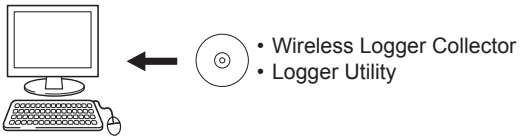
5 **Send the measurement conditions to the instrument.**

6 **Start or stop measurement.**
For details, refer to the Logger Utility instruction manual on the provided CD.

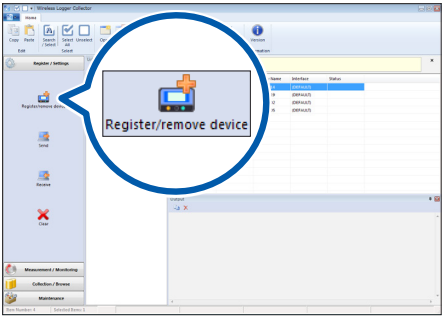
4 Collecting Measurement Data Using a Windows® PC

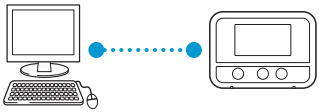
1 **Install the instrument referring to “Preparation for Measurements” (p.21).**

2 **Install the software on the Windows® PC.**



3 **Register the instrument in Wireless Logger Collector (up to 100 units).**

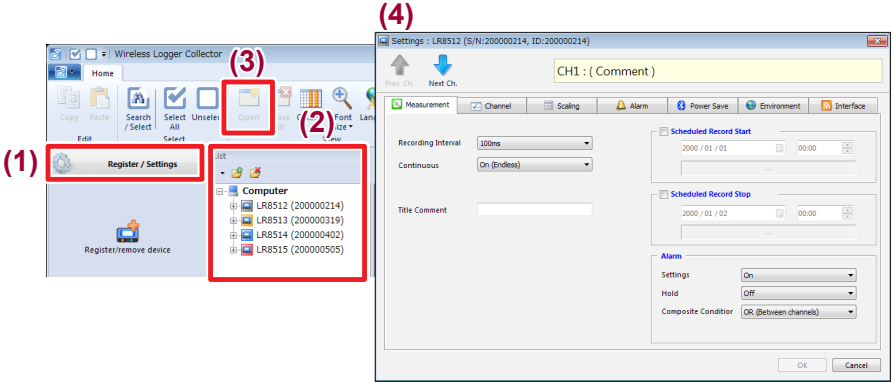




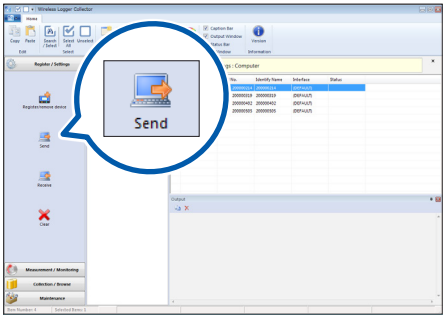
When no wireless logger is found

- When the Bluetooth® symbol in the screen is off, press the power key to turn ON the Bluetooth® function.
- When the signal symbol in the screen is off, a wireless connection is not established. Place the instrument closer to the PC or remove any obstacle and then search for the logger again.

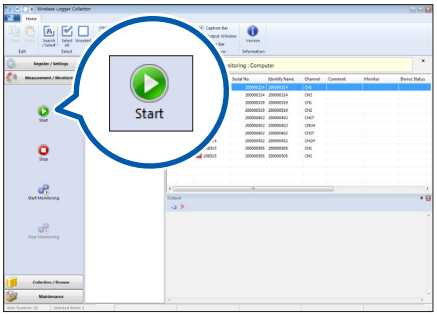
4 **Set the measurement conditions in Wireless Logger Collector.**



5 Send the measurement conditions to the instrument.



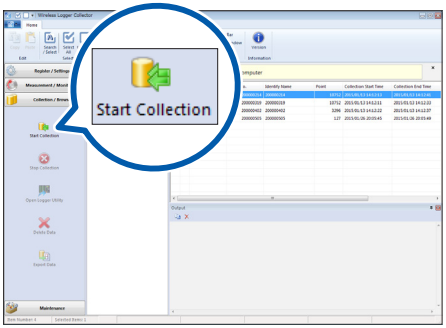
6 Start measurement.



You can also start measurement by holding down this button.

7 Collect measurement data using Wireless Logger Collector.

Measurement data can be collected during measurement and after measurement stop.



8 Analyze the data on the Windows® PC.

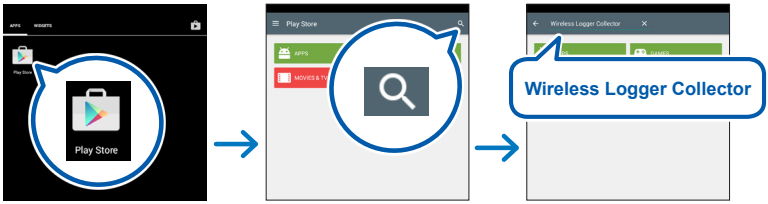
1. **Display measurement data in the Logger Utility:** The data is displayed in a graph and analyzed.

2. **Output the collected data in the CSV file format:** The data is displayed in a graph using a spreadsheet program, such as Microsoft® Excel®.

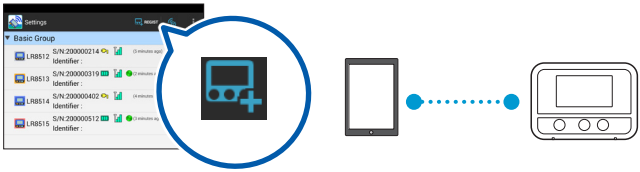
5 Collecting Measurement Data Using an Android Terminal

1 Install the instrument referring to “Preparation for Measurements” (p.21).

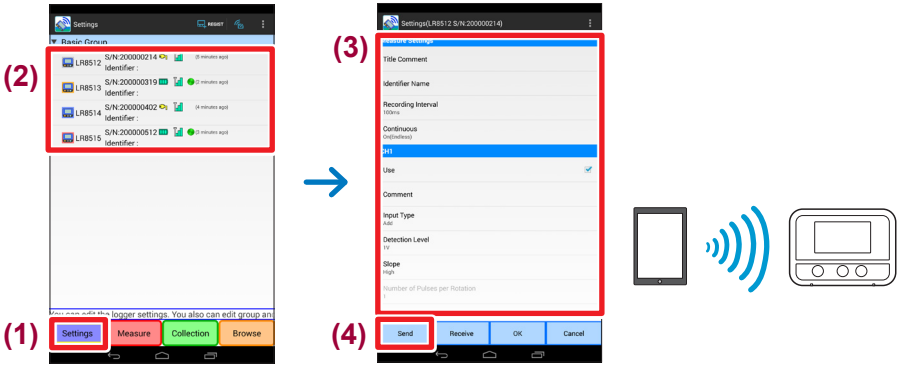
2 Install Wireless Logger Collector on the Android terminal.



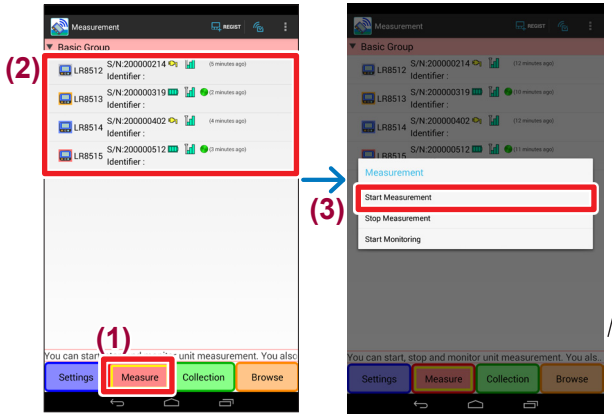
3 Register the instrument in Wireless Logger Collector (up to 100 units).

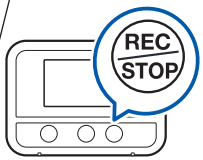


4 Set the measurement conditions in Wireless Logger Collector and send the conditions to the instrument.



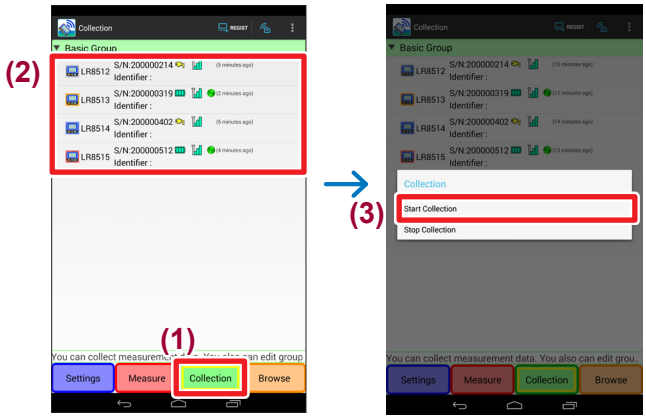
5 Start measurement.



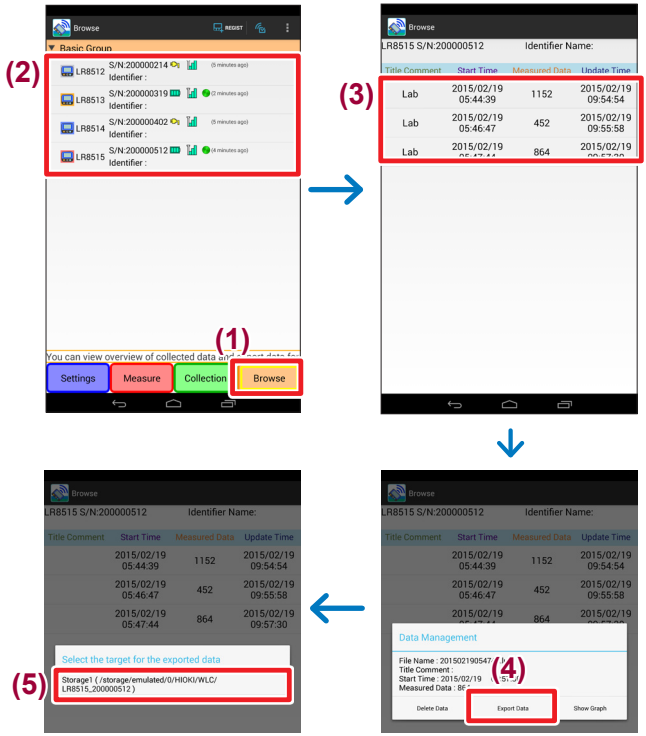


You can also start measurement by holding down this button.

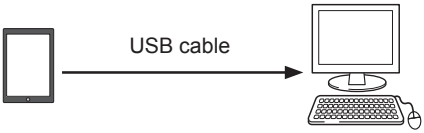
6 Collect measurement data using Wireless Logger Collector.



7 Export the measurement data to a file.



8 Copy the exported file onto the Windows® PC.



9 Analyze the data on the Windows® PC.

6 Maintenance and Service

6.1 Troubleshooting

When a malfunction of the instrument is suspected, check the battery level and connection cable conditions and then, if necessary, contact your authorized Hioki distributor or reseller.

•

Before sending the instrument for repair

When the instrument operation does not seem normal, check the following items.

Symptom	Possible cause	Solution and reference
Nothing appears in the display.	• The power is OFF. • The AC adapter is improperly attached. • The AC adapter is incorrectly connected. • The batteries are exhausted.	• Hold down the power key to turn the power ON. • Check that the AC adapter is connected correctly. • Check to see that the batteries are properly installed. • Use new LR6 alkaline batteries. If the problem persists, the instrument needs to be repaired or inspected. Contact your authorized Hioki distributor or reseller.
When the power is turned ON, the date and time are significantly deviated from the correct values.	The backup lithium battery life has expired.	The replacement cycle for the backup lithium battery is 5 years. Contact your authorized Hioki distributor or reseller.
Measured data cannot be found.	Recording has restarted since measurement stop.	Be aware that data is deleted if recording is started accidentally after measurement stops.
• The wireless logger cannot be found. • A connection to the wireless logger cannot be established.	Are you using the LR8410 to perform real-time measurement?	Data cannot be collected with Wireless Logger Collector during real-time measurement by the LR8410.
	The Bluetooth® module power is OFF (is off or blinking).	Press the power key of the instrument and turn ON the Bluetooth® module power.
	The wireless logger cannot be searched for or connected if another terminal (LR8410, PC, or Android terminal) is connected (is lit).	Cut off the communications of the connected terminal and then search for or connect the wireless logger again.
	Communication with all Bluetooth® compatible instruments is not guaranteed.	Try other terminals.

Symptom	Possible cause	Solution and reference
Communications with the wireless logger cannot be established. An error occurs.	The settings cannot be sent or received or maintenance cannot be performed while the wireless logger is busy (during measurement or monitoring).	Stop measurement or monitoring and then try again.
	As the security settings are enabled, an authentication error occurs.	Enter the correct password.

6.2 Error Display

When there is an error in the instrument, the error is displayed as follows.

Instrument error display

Error display	Meaning	Solution and reference
Err.1	Adjustment data error An error has occurred in the internal adjustment data.	Repair or inspection is required. Contact your authorized Hioki distributor or reseller.
Err.2	Serial number error An error has occurred in the internal memory.	
Err.3	Microcomputer operation error An error has occurred in the program ROM.	
Err.4	Bluetooth® module error An error has occurred in the Bluetooth® module.	• Disconnect the Z2003 adapter and connect it again. • Remove the batteries and place new LR6 alkaline batteries. • If the problem persists, the instrument needs to be repaired or inspected. Contact your authorized Hioki distributor or reseller.
Err.5	Hardware error An error has occurred in the hardware.	
Err.140	Backup battery error An error has occurred during clock backup.	
O.F. **U.F.**	The measurement value is outside of the measurement range or display range.	The measurement value cannot be displayed as it is outside of the measurement range or display range. Check the input signal.
BURN	Disconnection detection A thermocouple disconnection or temperature and humidity sensor error has been detected.	• Check the thermocouple connection. Check to see that the thermocouple is not disconnected. • Completely insert the temperature and humidity sensor.
BATT LO	Power supply error The power voltage drops to the point where the instrument cannot operate properly.	• Remove the Z2003 AC adapter and connect the AC Adapter. • Remove the batteries and place new LR6 alkaline batteries.
----	Not measured A measurement value cannot be displayed as measurement has not been performed.	Start measurement.

Warranty Certificate

HIOKI

Model	Serial No.	Warranty period One (1) year from date of purchase (___ / ___)

This product passed a rigorous inspection process at Hioki before being shipped.

In the unlikely event that you experience an issue during use, please contact the distributor from which you purchased the product, which will be repaired free of charge subject to the provisions of this Warranty Certificate. This warranty is valid for a period of one (1) year from the date of purchase. If the date of purchase is unknown, the warranty is considered valid for a period of one (1) year from the product's date of manufacture. Please present this Warranty Certificate when contacting the distributor.
Accuracy is guaranteed for the duration of the separately indicated guaranteed accuracy period.

1. Malfunctions occurring during the warranty period under conditions of normal use in conformity with the Instruction Manual, product labeling (including stamped markings), and other precautionary information will be repaired free of charge, up to the original purchase price. Hioki reserves the right to decline to offer repair, calibration, and other services for reasons that include, but are not limited to, passage of time since the product's manufacture, discontinuation of production of parts, or unforeseen circumstances.
2. Malfunctions that are determined by Hioki to have occurred under one or more of the following conditions are considered to be outside the scope of warranty coverage, even if the event in question occurs during the warranty period:
   a. Damage to objects under measurement or other secondary or tertiary damage caused by use of the product or its measurement results
   b. Malfunctions caused by improper handling or use of the product in a manner that does not conform with the provisions of the Instruction Manual
   c. Malfunctions or damage caused by repair, adjustment, or modification of the product by a company, organization, or individual not approved by Hioki
   d. Consumption of product parts, including as described in the Instruction Manual
   e. Malfunctions or damage caused by transport, dropping, or other handling of the product after purchase
   f. Changes in the product's appearance (scratches on its enclosure, etc.)
   g. Malfunctions or damage caused by fire, wind or flood damage, earthquakes, lightning, power supply anomalies (including voltage, frequency, etc.), war or civil disturbances, radioactive contamination, or other acts of God
   h. Damage caused by connecting the product to a network
   i. Failure to present this Warranty Certificate
   j. Failure to notify Hioki in advance if used in special embedded applications (space equipment, aviation equipment, nuclear power equipment, life-critical medical equipment or vehicle control equipment, etc.)
   k. Other malfunctions for which Hioki is not deemed to be responsible

*Requests
- Hioki is not able to reissue this Warranty Certificate, so please store it carefully.
- Please fill in the model, serial number, and date of purchase on this form.

16-01 EN

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  - ■ Regional contact information
  - ■ The latest revisions of instruction manuals and manuals in other languages.
  - ■ Declarations of Conformity for instruments that comply with CE mark requirements.
- All reasonable care has been taken in the production of this manual, but if you find any points which are unclear or in error, please contact your supplier or the International Sales and Marketing Department at Hioki headquarters.
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