Wireless data logging at 1 ms

330-channel portable logger available with your choice of plug-in and wireless units

Plug-in units

Wireless units: Q2 2020

- Voltage: 1 ms sampling
- Strain: 1 ms sampling
- Temperature: 10 ms sampling
- Humidity: 10 ms sampling
- Resistance: 10 ms sampling
Two models: basic and wireless

Up to 120 channels

Basic model

**LR8450**

Gain up to 120 channels of input simply by adding a total of four plug-in units

Example unit configuration: 120 channels

**Plug-in units**

VOLTAGE/TEMP UNIT U8552 × 4

Each VOLTAGE/TEMP UNIT U8552 accepts 30 channels of input. Add four units for 120 channels of measurement.
Wireless LAN model
Add channels freely via either plug-in or wireless units

Can also be used exclusively with wireless units.

Maximum 330 channels

Wireless LAN model
LR8450-01

Add a total of up to 7 wireless units for a maximum of 330 channels

Example unit configuration: 330 channels

<table>
<thead>
<tr>
<th>Plug-in units</th>
<th>Wireless units</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLTAGE/TEMP UNIT U8552 × 4</td>
<td>WIRELESS VOLTAGE/TEMP UNIT LR8532 × 7</td>
</tr>
</tbody>
</table>

Mix plug-in and wireless units

Add plug-in units to the LR8450-01 and place wireless units in measurement locations. With four U8552 VOLTAGE/TEMP Units and seven LR8532 WIRELESS VOLTAGE/TEMP Units, you can measure a total of 330 channels.
Applications

Sample output from a variety of sensors, including 1 ms pressure sensors

Voltage measurement Fastest sampling rate of 1 ms
HIGH SPEED VOLTAGE UNIT U8553, LR8533
A 1 ms sampling rate is the best match to measure sensor outputs with a frequency response of under 100 Hz, for example pressure and vibration sensors.

Measure strain with a 1 ms sampling rate

Strain measurement Fastest sampling rate of 1 ms
STRAIN UNIT U8554, LR8534
Connect strain gauges directly and measure at a sampling rate of up to 1 ms. Strain gauges tend to have long, thin wires that are easily broken, but that potential pitfall can be avoided by using wireless units so that wire length is minimized.

Sample input at up to 1 ms, even if you connect additional units
Each unit incorporates its own A/D converter. This design keeps the maximum sampling rate high even when units are added.

Example 1: Use four U8553 High Speed Voltage Units (with 5 channels each) to measure 20 channels at a sampling rate of 1 ms.

Example 2: Use four U8550 Voltage/Temp Units (with 15 channels each) to sample 60 channels at a sampling rate of 10 ms.
Measure temperature near an inverter or battery

**Temperature measurement**

- Fastest sampling rate of 10 ms

**Stable measurement, even at high voltages and frequencies**

**Reduced effects of noise**

Legacy models were incapable of measuring temperature accurately in noisy environments due to the effects of high frequencies, which caused values to shift or fluctuate significantly. The LR8450 uses a revamped design to dramatically reduce the effects of high-frequency noise.

Example: Measure temperature by connecting the tip of a K-type thermocouple to the screw on an inverter’s PWM output terminal (W-phase) when using the Voltage/Temp Unit U8550 (settings: 100 ms sampling in the 100°C f.s. range).

**Consistent noise resistance, even when units are added**

Since adding units doesn’t change the cutoff frequency at a sampling rate of 1 s, power supply noise can be rejected without sacrificing noise resistance.

<table>
<thead>
<tr>
<th>Number of channels</th>
<th>Cutoff frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ch to 15 ch</td>
<td>60 Hz</td>
</tr>
<tr>
<td>16 ch to 30 ch</td>
<td>60 Hz</td>
</tr>
<tr>
<td>31 ch to 45 ch</td>
<td>60 Hz</td>
</tr>
<tr>
<td>46 ch to 60 ch</td>
<td>60 Hz</td>
</tr>
</tbody>
</table>

*When using a power supply frequency of 60 Hz.

**Set filters for each unit**

The cutoff frequency, which varies with the data refresh interval, can be set separately for each unit. You can use long data refresh intervals, which boost filter effectiveness, and short data refresh intervals for different units at the same time.

- Measure control signals at maximum speed: Unit 1 (data refresh interval: 1 ms)
- Measure battery voltage fluctuations: Unit 2 (data refresh interval: 1 ms)
- Measure temperature using thermocouples: Unit 3 (data refresh interval: 1 s) with strong filter

**SiC inverter**

- Carrier frequency: 200 kHz
- Motor speed: 500 r/min

**Recording interval : 1 ms**

Legacy data logger LR8450

Legacy models exhibit significant fluctuations when the inverter is operating, but the LR8450 does not.
Easy-to-understand presentation of measured values

Wide screen for easy viewing of waveforms

The LR8450/LR8450-01 features a 7-inch TFT color LCD that makes it easy to view collected data. Easily switch among four screen layouts: a waveform display, which makes it easy to see changes in characteristics; a waveform + numerical value display, which lets you review numerical values while viewing waveform changes; a numerical value display, which lets you check values such as instantaneous and maximum values on a single screen; and an alarm display, which lets you review the conditions under which alarms have occurred.

Check waveforms on a full-screen display.

Check maximum, minimum, average, and peak values at the same time on a single screen.

Extensive calculation functionality

Numerical calculation

In addition to the maximum and minimum value calculation functions provided by legacy models, the LR8450/LR8450-01 offers an extensive range of calculations, including on/off time, count, and usage ratio.

Waveform calculation

Calculate data while measurement continues and display calculated waveforms in real time. Calculation results are saved on dedicated calculation channels that are distinct from measurement channels.

Check waveforms along with numerical values and comments at the same time on a single screen.

Check alarm status and times.
External control terminals and interfaces to accommodate a broad range of use cases

MEMORY HiLOGGER
LR8450, LR8450-01

Motor speed, flow rate integration, etc.
8-channel pulse measurement

In "Revolve" mode, monitor production equipment by measuring the variations in revolution speed of motors or drills. In "Count" mode, identify operation status by acquiring integrated power or flow rate.

Useful in preventive maintenance
8-channel alarm output

Configure eight channels of alarm output. You can set level, window, slope, and logic pattern alarms for each channel you wish to monitor.

Two voltage output terminals (5, 12, or 24 V)
Sensor power supply functionality

The LR8450/LR8450-01 provides two voltage output terminals, each of which can supply a 100 mA current, eliminating the need for a separate sensor power supply. Select 5, 12, or 24 V for the VOLTOUT1 terminal and 5 or 12 V for the VOLTOUT2 terminal.

External control terminals

<table>
<thead>
<tr>
<th>Pulse/logic input</th>
<th>8 channels</th>
</tr>
</thead>
<tbody>
<tr>
<td>External I/O (4 terminals)</td>
<td>Input terminals</td>
</tr>
<tr>
<td>START, STOP, START/STOP, Trigger input, Event input</td>
<td></td>
</tr>
<tr>
<td>Output terminals</td>
<td>Trigger output</td>
</tr>
<tr>
<td>Alarm output (8 terminals)</td>
<td></td>
</tr>
<tr>
<td>Voltage output</td>
<td>VOLTOUT terminal 1 Select from 5 V, 12 V, or 24 V.</td>
</tr>
<tr>
<td>VOLTOUT terminal 2 Select from 5 V or 12 V.</td>
<td></td>
</tr>
<tr>
<td>GND (10 terminals)</td>
<td></td>
</tr>
</tbody>
</table>

Record data for extended periods of time in construction, agriculture, civil engineering, etc.

Replace media during real-time saving
No need to stop recording

When you eject the storage media device while recording data, data remaining in the internal buffer memory will be written to a different file once another media device has been inserted.

Save automatically to SD Memory Cards
Repeat recording over extended periods of time without interruption

Collect data on storage media (SD Memory Card or USB Drive) while measuring continues. The ability to segment files by hour or day without stopping measurement is convenient when you need to review data later.

Segment time: 12 hours
Data saved in one file

| 12:00 am | 6:00 am | 12:00 pm | 6:00 pm | 12:00 am |
Control the logger remotely and download data files from a computer

HTTP server function
Control the logger remotely
Use a standard browser such as Internet Explorer® to control the LR8450/LR8450-01, start and stop measurement, and enter comments.

FTP server function
Download data files onto a computer
Download files on an SD Memory Card or USB Drive that’s connected to the LR8450/LR8450-01 to a computer.

NTP client function
Set the logger’s clock
Set the time from an NTP server every hour or day.

FTP client
Automatically transfer data files to an FTP server
Automatically upload files that were saved automatically on an SD Memory Card or USB Drive in the LR8450/LR8450-01 to an FTP server.

Collect data in real time on a computer
Record data on a computer in real time using the Logger Utility application, a standard accessory. You can even scroll waveforms backwards (to view older data) while recording is in progress.
* Real-time measurement on the LR8450, LR8450-01 is possible with a recording interval of 100 ms or more.
Wireless data capture for outstanding ease of use

LR8450-01 (wireless LAN model) only

Install in a closed vehicle when you need to separate the internal and external environments

Make measurements in locations where it would be difficult to route wires

With traditional methods, if the testing lab where the object under measurement is located and the monitoring room where data will be reviewed are separated by a door, you’ll need to drill a hole in the wall and connect the two locations with a long wiring run. With the LR8450-01 and a wireless unit, you can streamline setup and minimize wire use by eliminating the need to run multiple long wires from the testing lab.

Collect data from dispersed locations all at the same time

Install wireless units in testing equipment

If you’ve installed multiple legacy data loggers on dispersed testing equipment, measurement results will be collected separately by each logger. With the wireless connectivity of the LR8450-01, you can install a wireless unit on each piece of testing equipment and then collect the data from all the units at once, simultaneously.

Wireless LAN connection to computer

Observe data from remote locations on a computer

The LR8450-01 wireless LAN model can connect to commercially available access points (APs). By activating the LR8450-01’s station (STA) function and connecting to an AP, you can control the logger remotely via its HTTP server and acquire data via its FTP server.
Mix and match an array of measurement units

**VOLTAGE/TEMP UNIT**

**U8550**
- Plug-in units
- Measurement targets: Voltage, Thermocouples, Humidity* (use sensor Z2000) * U8550 only
- Maximum input voltage: ±100 V DC
- Number of input channels: 15 ch
- Fastest sampling: 10 ms
- Input terminals: M3 screw-type terminal block

**LR8530**
- Wireless units

**U8552**
- Plug-in units
- Measurement targets: Voltage, Thermocouples, Humidity* (use sensor Z2000) * U8552 only
- Maximum input voltage: ±100 V DC
- Number of input channels: 30 ch
- Fastest sampling: 20 ms (10 ms if using 15 or fewer channels)
- Input terminals: Push-button type terminal block

**LR8532**
- Wireless units

**UNIVERSAL UNIT**

**U8551**
- Plug-in units
- Measurement targets: Voltage, Thermocouples, Humidity* (use sensor Z2000), Resistance bulb (Pt100, Pt1000, JPt100), Resistor
- Maximum input voltage: ±100 V DC
- Number of input channels: 15 ch
- Fastest sampling: 10 ms
- Input terminals: Push-button type terminal block

**LR8531**
- Wireless units

**HIGH SPEED VOLTAGE UNIT**

**U8553**
- Plug-in units
- Measurement targets: Voltage
- Maximum input voltage: ±100 V DC
- Number of input channels: 5 ch
- Fastest sampling: 1 ms
- Input terminals: M3 screw-type terminal block

**LR8533**
- Wireless units

**STRAIN UNIT**

**U8554**
- Plug-in units
- Measurement targets: Voltage, Strain
- Strain gauge-type converter
- Strain gauge: 1-gauge method (2-wire setup), 1-gauge method (3-wire setup), 2-gauge method (adjacent sides), 4-gauge method
- Adaptive gauge resistance: 1-gauge method, 2-gauge method: 120 Ω (external bridge box required for 350 Ω), 4-gauge method: 120 Ω to 1 kΩ
- Bridge voltage: 2 V ±0.05 V DC
- Number of input channels: 5 ch
- Fastest sampling: 1 ms
- Input terminals: Push-button type terminal block

**LR8534**
- Wireless units

Connect strain gauges directly

The Strain Unit has a built-in bridge box, allowing you to connect strain gauges directly to its input terminals.
Specifications

General specifications

- Product warranty period: 3 years
- Accurate guage period: 1 year
- Maximum number of connectable modules: 14 plug-in modules + 7 wireless modules* (LR8450-01 only)
- Connectable modules (Plug-in modules): U8550 Voltage Temp Unit, U8551 Universal Unit, U8552 Voltage Temp Unit, U8553 High Speed Voltage Unit, U8554 Strian Unit
- Connectable modules (Wireless modules) (LR8450-01 only): LR8530 Wireless Voltage/Temp Unit, LR8531 Wireless Universal Unit, LR8532 Wireless Voltage/Temp Unit, LR8533 Wireless High Speed Voltage Unit, LR8534 Wireless Strian Unit
- * Available at future firmware updates

- Mass: Approx. 1108 g (39.08 oz.) (excluding battery pack)
- Without any modules: 272W × 145H × 43D mm (10.72″W × 5.71″H × 1.69″D) (excluding protrusions)
- Time axis accuracy: ±0.2 s/day (at 23°C)
- Backup battery service life: At least 10 years for clock (reference value at 23°C)
- Clock functionality: Auto-calendar, automatic leap year recognition, 24-hour clock
- Clock precision: ±1.0 s/day (at 23°C)
- Operating environment: Indoors, Pollution Degree 2, altitude up to 2000 m
- Storage temperature and humidity range: −10°C to 50°C (14°F to 122°F), 80% RH or less (non-condensing)
- Dimensions: Without any modules: 272W × 145H × 43D mm (10.72″W × 5.71″H × 1.69″D) (excluding protrusions)
- With 2 modules: 272W × 186H × 63D mm (10.72″W × 7.32″H × 2.48″D) (excluding protrusions)
- With 4 modules: 272W × 252H × 63D mm (10.72″W × 9.92″H × 2.48″D) (excluding protruding parts)
- Mass: Approx. 1108 g (39.08 oz.) (excluding battery pack)
- Standards: Safety: EN61010, EMC: EN61326 Class A

- Vibration resistance: JIS D1601:1995-1996 5.3 (1)
- Class 1: Passenger vehicles; conditions: Class A equivalent (4 h along X-axis and 2 h along Y- and Z-axes at a vibration acceleration of 45 ms²/4.6 G)

- Display

- Display: 7-inch TFT color LCD (WVGA 800 × 480 dots)
- Display resolution (with waveform display selected): Max. 20 divisions (horizontal axis) × 10 divisions (vertical axis) (1 division = 36 dots [horizontal axis] × 36 dots [vertical axis])
- Display language: Japanese and English
- backlight service life: Approx. 100,000 h (Reference value at 23°C)
- Backlight saver: Turns off backlight when no key is operated for a set amount of time.
- Backlight brightness: 5-sever (user-selectable)
- Waveform background color: Dark/light (user-selectable)

- Power supply

- Power supply: AC adapter
- AC adapter: Z1014 AC Adapter (12 V DC ±10%) AC Adapter rated supply voltage: 100 V to 240 V AC (assumed voltage fluctuation of ±10%) AC Adapter rated power supply frequency: 50 Hz/60 Hz
- Battery: LR8450 accommodates 2 batteries Z1007 Battery Pack (When used with AC Adapter, AC Adapter has priority) Li-ion, 7.2 V, 2.170 mA
- External power supply: 10 V to 30 V DC
- Power consumption: Normal power consumption
- Using Z1014 AC Adapter or 12 V DC external power supply
- Maximum rated power: When using the Z1014 AC Adapter 95 VA (including AC Adapter) When using a 30 V DC external power supply 28 VA (while charging battery with LCD at maximum brightness) When using the Z1007 Battery Pack 20 VA (with LCD at maximum brightness)
- Continuous operating time: Battery: With one Z1007 Battery Pack Approx. 2h (reference value at 23°C) With two Z1007 Battery Packs Approx. 4h (reference value at 23°C) Conditions: With one U8551 Universal Unit connected, backlight on, voltage output off, and Z4006 connected
- Charging functionality: Charging is available when the Z1007 Battery Pack is attached and the AC Adapter is connected.
- Charging time: Approx. 7 hours (reference value at 23°C)

Interface specifications

- The LAN interface and USB interface (function) cannot be used at the same time.

Lan interface

- IEEE 802.3 Ethernet, automatic 100Base-TX/1000Base-T detection
- Auto MDI-X, DHCP, DNS support
- Connector: RJ-45
- Maximum cable length: 100 m
- LAN functionality: Data acquisition, condition settings used with the Logger Utility software (supplied as standard)
- Configuring settings and controlling recording using communications commands
- Manually acquiring data using the FTP server (Acquiring files from a connected SD Memory Card or USB Drive)
- Automatically sending data via FTP (FTP client)
- After Record has finished: Waveform files (binary, text)
- Remote operation using the HTTP server
- Remote operation using the HTTP server
- NTP client function
- Time synchronization with an NTP server

USB interface (host)

- Standard compliance: USB 2.0 compliant
- Connectors: Series A receptacle × 2
- Guaranteed-operation options: Z4006 USB Drive (16 GB)
- File system: FAT16, FAT32
- Connectable devices: Keyboard, hub (1 layer), USB Drive

USB interface (function)

- USB standard: USB 2.0 compliant
- Connector: Series mini-B receptacle
- USB functionality: Data acquisition, condition settings used with the Logger Utility software (bundled)
- Configuring settings and controlling recording using communications commands
- USB drive mode: Transferring data from a connected SD Memory Card to a computer

SD card slot

- Standard compliance: SD standard-compliant slot × 1 (with SD Memory Card/SDHC Memory Card support)
- Guaranteed-operation options: Z4001 (2 GB), Z4003 (8 GB)
- File system: FAT16, FAT32

External control terminals

- Terminal block: Push-button type terminal block
- Terminal block
  - Number of terminals: 4, Non-isolated (same GND as instrument)
  - Input voltage: 0 V to 10 V DC
  - Slope: Rising/falling (user-selectable)
  - Response pulse width: High period: 2.5 ms or greater; low period: 2.5 ms or greater
  - Functionality: Choose from off, start, stop, start/stop, trigger input, event input
- Output
  - Output format: Open-drain output (with 5 V voltage output)
  - Maximum switching capacity: 5 V to 10 V DC, 200 mA
  - Output pulse width (Trigger output): 10 ms or greater
  - Functionality: Trigger output
- Alarm output
  - Output format: Open-drain output (with 5 V voltage output)
  - Minimum switching capacity: 5 V to 30 V DC, 200 mA
  - Output pulse width: 10 ms or greater
  - Number of terminals: 8, Non-isolated (same GND as instrument)
- Voltage output
  - Output voltage: Off, 5 V ±10%, 12 V ±10%, 24 V ±10% (user-selectable)
  - Supply current: Max. 100 mA each, 24 V output can be selected for the VOUT/PGU terminal only.
- Number of terminals: 2, 2, Non-isolated (same GND as instrument)
- GND terminal
  - Number of terminals: 10 (common GND)
Recording

Recording mode Normal

Recording intervals
1 ms*, 2 ms*, 5 ms*, 10 ms, 20 ms, 50 ms, 100 ms, 200 ms, 500 ms*, 1 s, 2 s, 5 s, 10 s, 20 s, 30 s, 1 min, 2 min, 5 min, 10 min, 20 min, 30 min, 1 h

Setting time automatically only when a module with data refresh interval that includes 1 ms is used.

Data refresh interval
Automatically or user-selected value per module
Automatically-selected value: Data refresh interval is automatically selected based on recording interval setting. User-selected value: Available settings depend on module specification.

Repeat recording
ON/OFF (user-selectable) ON: Repeat recording at set recording time OFF: Recording is performed once until it stops

Specified time/continuous
Specified time: Recording is set in days, hours, minutes, and seconds.
Continuous: Recording is performed once until it is stopped.
If maximum capacity of internal buffer memory is exceeded, memory will be overwritten.

Waveform recording
Last 256 M data points are saved in internal buffer memory. Scroll through and view data stored in internal buffer memory.
Alarm source data recording can be toggled on and off.

Backup of recorded data
None

Display
Sheet function
Display sheets can be switched between all channels and individual modules.
All-channel display sheet: Maximum 120 analog channels, 30 waveform calculation channels, 8 pulse/logic channels, 8 alarm channels

Waveform display screen
Time-axis waveform display: Simultaneous display of gauges and settings (channel representative settings and display settings) Simultaneous display of time-axis waveforms and values: Instantaneous values, cursor values, or numerical calculation values (user-switchable)
Numerical display: Simultaneous display of instantaneous values and statistical values
Alarm display: Display of alarm status and alarm history

Display format
Time-axis waveform display: 1 screen

Numerical display format
SI units, decimal, or exponent (user-selectable)
When decimal is selected, number of decimal places to display can be set (values will then be rounded to set number of places).

Waveform colors
24 colors

Zooming in and out on the waveform display
Horizontal axis
2 ms to 1 day/division

Vertical axis
Number of divisions per screen: 100
Setting method
Select position or upper and lower limits for each channel. (Waveform calculation channels: upper and lower limits only) When setting by position: Set zoom factor and zero position. Zoom factor: 1/2%, 1%, 2%×5, 10%×20, 50%×100. Zero position: -50% to 150% (with a zoom factor of 1×) When set by upper/lower limit: Set upper and lower limit.

Waveform scrolling
Display can be scrolled left and right during recording and while recording is stopped (during waveform rendering only).

Monitor display
Check instantaneous values and waveforms without recording data to memory (values and waveforms can be displayed while waiting for a trigger).

Files
Save destinations
SD Memory Card/USB Drive (user-selectable)
Only storage media sold by HOKIO are guaranteed for operation

File names
Up to 8 single-byte characters
Automatic numeric/dating (user-selectable)

Auto saving
Waveform data (real-time saving): Off, binary format, or text format (user-selectable)
Numerical calculation results (saved after recording): Off or text format (user-selectable)
When text format is selected, choose whether to save all calculations in one file or to save each calculation in its own file.

Priority save destination
SD Memory Card/USB Drive (user-selectable)
Choose whether to give priority to SD Memory Card or USB Drive for saving data when both are inserted.

Delete and save
On/Off (user-selectable) On: System will stop saving data when SD Memory Card or USB Drive starts to run out of available space.
On: When SD Memory Card or USB Drive starts to run out of available space, system will delete oldest waveform file (binary or text) and then continue saving.
When both an SD Memory Card and USB Drive are inserted, system will perform delete and save on media that has been set as priority save destination only.

Folder segmentation
No segmentation, 1 day, 1 week, or 1 month (user-selectable)

File segmentation
Enable/disable (user-selectable)
Disabled: Data for each recording session is saved in its own file.
Enabled: Data for each set period of time is saved in its own file, starting with the start of measurement. Segmentation time: Day, hour, or minute (user-selectable)

External media eject (SD Memory Card/USB Drive)
External media can be ejected during real-time saving by activating a button on the screen and confirming a message.
When both an SD Memory Card and USB Drive are inserted and media set as priority save destination is ejected, system will continue to save data on other media.
When either an SD Memory Card or a USB Drive is inserted and media set as priority save destination is ejected, system will stop saving data.

Data protection
Yes (valid only when Z1007 Battery Pack is installed)
If remaining battery life declines during real-time saving, system will close file and stop saving data (although measurement operation will continue).

Manual saving
Data is saved when SAVE key is pressed.
Choose either selective save or immediate save as operation to perform when SAVE key is pressed.
Selective save
User will be prompted to choose information to save: settings, waveform data (binary format), waveform data (first format), numerical calculation results (all calculations in one file or each calculation in its own file), display image (PNG format).
Immediate save
Data will be saved immediately when SAVE key is pressed.
Type of data to be saved in set in advance along with format and range.
File names can be entered when saving data.

Declination
(last format only)
Decimate and save
Off or a value from 1/2 to 1/100,000 (user-selectable)

Loading data
Loading saved data
Specify a position and then load up to 256 M data points of previously saved text/format data (when recording 1 analog channel, if recording n channels, 256 Min data points).

Calculations
Numerical calculations
Number of calculations
Up to 10 calculations simultaneously

Calculation content
Average value, peak-to-peak value, maximum value, maximum value time, minimum value, minimum value time, integration, aggregation, moving average, on time*, off time*, on count, off count, Total, positive, negative, or absolute value (user-selectable)

Calculation range
During recording: Calculations performed for all data during recording After recording has stopped: Calculations performed for all data in internal buffer memory, or for data in a calculation range specified by A/B cursors (on vertical axis)

Time segmentation calculations
Enable/disable (user-selectable)
Disabled: Calculations performed for all data during recording Enabled: Data for each segment of time, starting with start of measurement
Segmentation time: Day, hour, or minute (user-selectable)

Waveform calculations
Calculation content
Ability to set the following calculations:
Four arithmetic operations among channels
Moving average, simple moving average, aggregation, and integration of any channel
Calculated values are recorded as data for calculation channels (W1 through W30). (Calculations are performed at same time as measurement. Values cannot be recalculated after measurement.)
Calculation equation
A = CHa + CHb + CHc + CHd
B = CHa - CHb + CHc - CHd
C = CHa + CHb - CHc - CHd
D = CHa - CHb - CHc + CHd
E = CHa + CHb + CHc + CHd

Triggers
Trigger method
Digital comparison method

Trigger timing
Start, stop, or start & stop

Trigger conditions
AND/OR operation performed on trigger source, interval trigger, or external trigger
When triggers are disabled, free run

Trigger sources
Analog, pulse, logic, waveform calculations

Trigger types
Level triggers:
Trigger activated by rising or falling edge at set level
Window triggers: Set by trigger level upper limit and lower limit. Trigger activated when value leaves area or when value enters area

Interval triggers
Trigger activated for set interval after setting days/hours/minutes/seconds

External triggers
Trigger activated by rising or falling edge at set level in external input signal rise/fall

Trigger level resolution
Analog
0.1% f.s. (f.s. = 10 divisions)

Pulse
Count 1c, rotational speed t/n (where n = pulse count per rotation setting)
Jump function
Specify event mark, A/B cursor position, trigger point, or waveform scaling settings can be configured separately for each channel.

Thermocouple burnout
Alarm output when a thermocouple burnout occurs when Tc burnout detection setting is enabled.

Types of alarms
Level: System will output an alarm following a rising or falling edge at set level
Window: Set upper limit and lower limit System will output an alarm when wave value leaves area or when value enters area
Slope: System will output an alarm when rate of change exceeds set value
Logic: System will output an alarm when patterns of 1/0/X match (where “X” indicates either)

Alarm filter
Apply a filter to results of AND/OR operations performed on alarm sources. Set based on sample count (Off, 2 to 1000).

Alarm retention
On/Off (user-selectable)
Clear alarms: When alarm retention is On, alarms will be cleared without stopping recording.

Alarm tone
On/Off (user-selectable)

Even mark function
Number of inputs: Up to 1000 inputs per measurement

Waveform search function
Search waveforms and display target location in center of waveform screen.

Search conditions
Search by choosing level, window, maximum value, minimum value, local maximum value, or local minimum value.

Search range
All data in internal buffer memory or data between A/B cursors (on vertical axis)

Jump function
Specify event mark, A/B cursor position, trigger point, or waveform display position to display in center of waveform screen.

Cursor measurement function
Cursor display: All channels or specified channels (user-selectable)
Cursor movement: A, B, or simultaneous (user-selectable)
Types of cursors: Vertical or horizontal (user-selectable)

Scaling function
Scaling settings can be configured separately for each channel.

Comment entry function
Enter titles and channel-specific comments

Start state retention function
On/Off (user-selectable)

Prevention of inadvertent START/STOP key operation
When START or STOP key is pressed, system will display a message asking if user wishes to start or stop measurement.

Confirmation message: Enable/disable (user-selectable)

Key lock function
Disables operation keys

Beep tone
On/Off (user-selectable)

Self-check function
Can check keys, LCD, ROM/RAM, LAN, media, and modules.

Display of horizontal axis (time values)
Horizontal axis (time value) display can be set to time, date, or data point count. Setting is applied when text data is saved.

Configuration range (Quick Set function)
Connection diagram display (Strain gauge, external terminals)

Power supply frequency filter function
50 Hz/60 Hz selection

Input
Pulse logarithmic input
Number of channels
8 channels (common GND, non-isolated)

Exclusive setting for digital input for individual channels

Terminal block
Push-button type terminal block

Adaptive input format
Non-voltage contact, open collector (PNP open collector requires external resistor), or voltage input

Maximum input voltage
0 V to 42 V DC

Input resistance
1:0 MΩ ±5%

Detection level
2 levels (user-selectable)

High: 1.0 V or greater; Low: 0 to 0.5 V

High: 4.0 V or greater; Low: 0 to 1.5 V

Pulse input
Measurement range, resolution
Measurement target
Range
1000 m pulse/s (s)
1 pulse
0 to 1000 m pulse
0 to 5000 (n/s)

Maximum pulse
50000 (n/s) 1ns
1ns (ns)
0 to 500 (ns)
0 to 5000 (n/s)

Relative position
1000000 (n/m) 1ns
1ns (ns)
0 to 300000 (n/m, s)

Number of pulses per rotation (1 to 100)
With filter off: 200 µs or greater (100 µs or greater during high and low interval)

With filter on: 100 ms or greater (50 µs or greater during high and low interval)

Slope
Set rising/falling for each channel.

Software Logger Utility specifications
Operating Environment
Windows7/32bit/64bit
Windows8/32bit/64bit
Windows10/32bit/64bit

Overview
Control PC-connected logger to receive, display and save measured waveform data sequentially. (Total recording samples: maximum 10 million data. Data exceeding this number will be segmented into separate measurement files while recording continues.)

“*Real-time measurement on the LR8450, LR8450-01 is possible with a recording interval of 100 ms or more.

Function
Controllable loggers: 5
Data Collection System: 1 system
Display Format:
- Waveforms (split time-axis display is possible)
- Numerical values (logging) Numerical display can be enlarged
- Alarms
Above items can be displayed simultaneously

Notification: Display: In a separate window is possible.
Scroll: Waveforms can be scrolled during measurement.

Data Collection
Settings: Data collection settings of logger unit can be configured Monitor function can be checked before measurement.
Save: Save settings from multiple devices supporting real-time measurement (LUS format) and measurement data (LUW format) as one file.

Data Save Destination: Real-time data collection file (LUW format), transfer data in real-time or non-real-time to Microsoft Excel®, Excel® template can be specified

Event Mark: Recording during measurement is possible

Waveform Display
Supported Files: Waveform data file (LUW format, MEM format)
Display Format: Waveforms (split time-axis display available), Simultaneous display of numerical values (logging) available
Maximum Number of Channels: 675 channels (measured) + 60 channels (waveform calculation)

Waveform Display Sheets: Waveforms of each channel can be displayed on any of the ten sheets
Scroll: Available
Event Mark Recording: Available
Cursor: Cursors A and B can be used to display voltage values at cursor positions.
Hard Copy: Hard copy of waveform display available

Data Conversion
Applicable Files: Waveform data file (LUW format, MEM format)
Conversion Section: All data, specified section
Conversion Format: CSV format (comma delimited, space delimited, tab delimited), transfer to Excel® sheet, LR5000 format (hrp2.hrp)

Data Thinning: Simple thinning with any thinning number

Waveform Calculation
Calculation Items: Four arithmetic operations

Numerical Calculations
Applicable Data: Waveform data file (LUW format, MEM format), real-time measurement data, Waveform calculation
Calculation Items: Average value, peak value, maximum value, time to maximum value, minimum value, time to minimum value
On Time, Off Time, On count, Off count, standard deviation, aggregation, area value, and integration
Save calculation: Perform numerical calculation and save to file

Search
Applicable Data: Real-time data collection file (LUW format), Main unit measurement file (MEM format), Waveform calculation data Search Mode: Event mark, date and time, maximum position, minimum position, local maximum position, local minimum position, alarm, position, level, and variation

Print
Applicable printer: Printer compatible to the OS in use
Applicable Data: Waveform data file (LUW format, MEM format)
Print format: Waveform image, Report print, List print (Channel data, Event, Cursor value)
Print area: All area, Specified area by A-B cursor
Print preview: Available
Option specifications (sold separately)

Voltage/Temp Unit U8550, Universal Unit U8551, Voltage/Temp Unit U8552
Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year

General specifications

Number of input channels
U8550: 15 (Set voltage, thermocouple, or humidity for each channel)
U8551: 15 (Set voltage, thermocouple, humidity, RTD, or resistor for each channel)
U8552: 30 (Set voltage, thermocouple, or humidity for each channel)

Input terminals
U8550: M3 screw-type terminal block (2 terminals per channel)
U8551: Push-button type terminal block (4 terminals per channel)
U8552: Push-button type terminal block (2 terminals per channel) outfitted with terminal block cover

Measurement target
U8550, U8552: Voltage, thermocouples, humidity
U8551: Voltage, thermocouples, humidity, RTD, resistor

Input type
Scanning by semiconductor relays
All channels isolated (Not isolated when measuring with thermocouple, resistors or humidity)

A/D resolution
16 bits

Maximum input voltage
±100 V DC (maximum voltage between input terminals without causing damage)

Maximum channel-to-channel voltage
±300 V AC, DC (maximum voltage that can be applied between each input channel without causing damage; not isolated when measuring with RTD, resistance or humidity)

Maximum rated terminal-to-ground voltage
500 V AC, DC (maximum voltage that can be applied on a channel without causing damage; not isolated when measuring humidity)

Input resistance
10 MΩ or greater (10 MΩ or greater between input voltage terminals of temperature sensor, humidity sensor, and transducer. (10 ms interval

Data refresh interval
10 ms to 10 s (10 selectable levels)

Digital filters
Digital filter cutoff frequency is automatically set to data refresh interval, burnout setting, and power supply frequency filter setting

Operating temperature and humidity range
-15°C to 50°C (14°F to 122°F), 80% RH or less (non-condensing)

Dimensions
Approx. 134W × 70H × 63D mm (5.28″W × 2.76″H × 2.48″D)

Mass
U8550: Approx. 345 g (12.2 oz.), U8551: Approx. 318 g (11.2 oz.),
U8552: Approx. 319 g (11.3 oz.)

Accessories
Instruction Manual, Installation screws × 2

Analog input specifications

(23 ± 5°C ± 5°F, 80% rh or less, after 30 minutes of warm-up and zero-adjustment, with the 50 Hz 60 Hz cut-off setting selected)

Voltage

<table>
<thead>
<tr>
<th>Type</th>
<th>Range</th>
<th>Measurable range</th>
<th>Measurable range</th>
<th>Measurement accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 mV f.s.</td>
<td>500 mV</td>
<td>-10 mV to 10 mV</td>
<td>±10 μV</td>
<td></td>
</tr>
<tr>
<td>20 mV f.s.</td>
<td>1 μV</td>
<td>-20 mV to 20 mV</td>
<td>±20 μV</td>
<td></td>
</tr>
<tr>
<td>100 mV f.s.</td>
<td>5 μV</td>
<td>-100 mV to 100 mV</td>
<td>±50 μV</td>
<td></td>
</tr>
<tr>
<td>200 mV f.s.</td>
<td>10 μV</td>
<td>-200 mV to 200 mV</td>
<td>±100 μV</td>
<td></td>
</tr>
<tr>
<td>1 V f.s.</td>
<td>50 μV</td>
<td>-1 V to 1 V</td>
<td>±500 μV</td>
<td></td>
</tr>
<tr>
<td>2 V f.s.</td>
<td>100 μV</td>
<td>-2 V to 2 V</td>
<td>±1 mV</td>
<td></td>
</tr>
<tr>
<td>10 V f.s.</td>
<td>500 μV</td>
<td>-10 V to 10 V</td>
<td>±5 mV</td>
<td></td>
</tr>
<tr>
<td>20 V f.s.</td>
<td>1 mV</td>
<td>-20 V to 20 V</td>
<td>±10 mV</td>
<td></td>
</tr>
<tr>
<td>100 V f.s.</td>
<td>5 mV</td>
<td>-100 V to 100 V</td>
<td>±50 mV</td>
<td></td>
</tr>
<tr>
<td>1-5 V f.s.</td>
<td>500 μV</td>
<td>1 V to 5 V</td>
<td>±5 mV</td>
<td></td>
</tr>
</tbody>
</table>

Temperature
Thermocouple (Not including accuracy of reference junction compensation)
Standards: JS C1402-2015, IEC 61348

<table>
<thead>
<tr>
<th>Type</th>
<th>Range</th>
<th>Measurable range</th>
<th>Measurement accuracy</th>
<th>Measurable range</th>
<th>Measurement accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>K 100°C f.s.</td>
<td>0.01°C</td>
<td>-100°C to less than 0°C</td>
<td>±0.7°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>500°C f.s.</td>
<td>0.05°C</td>
<td>-200°C to less than -100°C</td>
<td>±1.4°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000°C f.s.</td>
<td>0.1°C</td>
<td>-200°C to less than -100°C</td>
<td>±0.7°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J 100°C f.s.</td>
<td>0.01°C</td>
<td>-100°C to less than 0°C</td>
<td>±0.7°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>500°C f.s.</td>
<td>0.05°C</td>
<td>-200°C to less than -100°C</td>
<td>±0.9°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000°C f.s.</td>
<td>0.1°C</td>
<td>-200°C to less than -100°C</td>
<td>±0.7°C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Humidity (use Humidity Sensor Z2000)

<table>
<thead>
<tr>
<th>Range</th>
<th>Maximum resolution</th>
<th>Measurable range</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% rh f.s.</td>
<td>0.1% rh</td>
<td>5.0% rh to 95.0% rh</td>
</tr>
</tbody>
</table>

Humidity sensor Z2000 accuracy

Other specifications about thermocouple measurement

Reference junction compensation: Internal/external
Thermocouple burnout detection: ON/OFF

System will check for burnout at each data refresh interval during thermocouple measurement. (10 ms interval not available)
Universal Unit U8551 Only  Input specifications

<table>
<thead>
<tr>
<th>Temperature RTD</th>
<th>Connection: 3-wire/4-wire, Measurement current: 1 mA (Pt100, Jpt100), 0.1 mA (Pt1000) Standards: P100,P1000; JIS C1604-2013,EC751-JP1001; JIS C1604-1989</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Range</td>
</tr>
<tr>
<td>Pt100</td>
<td>100°C f.s.</td>
</tr>
<tr>
<td></td>
<td>500°C f.s.</td>
</tr>
<tr>
<td>JP100</td>
<td>100°C f.s.</td>
</tr>
<tr>
<td></td>
<td>500°C f.s.</td>
</tr>
<tr>
<td>Pt1000</td>
<td>100°C f.s.</td>
</tr>
<tr>
<td></td>
<td>500°C f.s.</td>
</tr>
</tbody>
</table>

*When using Pt1000, data refresh intervals of 10ms, 20ms, and 50ms are not available.

**Resistance**

<table>
<thead>
<tr>
<th>Range</th>
<th>Maximum resolution</th>
<th>Measurable range</th>
<th>Measurement accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 f.s.</td>
<td>0.5 mΩ</td>
<td>0Ω to 1Ω</td>
<td>±10 mΩ</td>
</tr>
<tr>
<td>200 f.s.</td>
<td>1 mΩ</td>
<td>0Ω to 2Ω</td>
<td>±20 mΩ</td>
</tr>
<tr>
<td>1000 f.s.</td>
<td>5 mΩ</td>
<td>0Ω to 10Ω</td>
<td>±100 mΩ</td>
</tr>
<tr>
<td>2000 f.s.</td>
<td>10 mΩ</td>
<td>0Ω to 20Ω</td>
<td>±200 mΩ</td>
</tr>
</tbody>
</table>

**Universal Unit U8551 Only**

**Input**

<table>
<thead>
<tr>
<th>Range</th>
<th>Maximum resolution</th>
<th>Measurable range</th>
<th>Measurement accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>100 mV f.s.</td>
<td>5 μV</td>
<td>±100 μV</td>
</tr>
<tr>
<td>200 mV f.s.</td>
<td>10 μV</td>
<td>-100 mV to 200 mV</td>
<td>±200 μV</td>
</tr>
<tr>
<td>1 V f.s.</td>
<td>50 μV</td>
<td>-1 V to 1 V</td>
<td>±1 mV</td>
</tr>
<tr>
<td>2 V f.s.</td>
<td>100 μV</td>
<td>-2 V to 2 V</td>
<td>±2 mV</td>
</tr>
<tr>
<td>10 V f.s.</td>
<td>500 μV</td>
<td>-10 V to 10 V</td>
<td>±10 mV</td>
</tr>
<tr>
<td>20 V f.s.</td>
<td>1 mV</td>
<td>-20 V to 20 V</td>
<td>±20 mV</td>
</tr>
<tr>
<td>100 V f.s.</td>
<td>5 mV</td>
<td>-100 V to 100 V</td>
<td>±100 mV</td>
</tr>
<tr>
<td>1-5 V f.s.</td>
<td>500 μV</td>
<td>1 V to 5 V</td>
<td>±10 mV</td>
</tr>
</tbody>
</table>

**Analog input specifications**

<table>
<thead>
<tr>
<th>Measurement target</th>
<th>Range</th>
<th>Maximum resolution</th>
<th>Measurable range</th>
<th>Measurement accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>100 mV f.s.</td>
<td>5 μV</td>
<td>-100 mV to 100 mV</td>
<td>±100 μV</td>
</tr>
<tr>
<td></td>
<td>200 mV f.s.</td>
<td>10 μV</td>
<td>-200 mV to 100 mV</td>
<td>±200 μV</td>
</tr>
<tr>
<td></td>
<td>1 V f.s.</td>
<td>50 μV</td>
<td>-1 V to 1 V</td>
<td>±1 mV</td>
</tr>
<tr>
<td></td>
<td>2 V f.s.</td>
<td>100 μV</td>
<td>-2 V to 2 V</td>
<td>±2 mV</td>
</tr>
<tr>
<td></td>
<td>10 V f.s.</td>
<td>500 μV</td>
<td>-10 V to 10 V</td>
<td>±10 mV</td>
</tr>
<tr>
<td></td>
<td>20 V f.s.</td>
<td>1 mV</td>
<td>-20 V to 20 V</td>
<td>±20 mV</td>
</tr>
<tr>
<td></td>
<td>100 V f.s.</td>
<td>5 mV</td>
<td>-100 V to 100 V</td>
<td>±100 mV</td>
</tr>
<tr>
<td></td>
<td>1-5 V f.s.</td>
<td>500 μV</td>
<td>1 V to 5 V</td>
<td>±10 mV</td>
</tr>
</tbody>
</table>

**Maximum recording time (Rough estimate)**

**Example: Recording 2 units (30 analog) (no alarm output or waveform processing)**

Because header portion of waveform files is not included in capacity calculations, expect actual maximum times to be about 90% of those in table. Maximum recording time is inversely proportional to number of recording channels.

<table>
<thead>
<tr>
<th>Recording intervals</th>
<th>Internal buffer memory (512 MB)</th>
<th>Z4001 (2 GB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 s</td>
<td>10 d 8 h</td>
<td>38 d 18 h</td>
</tr>
<tr>
<td>200 s</td>
<td>20 d 17 h</td>
<td>77 d 12 h</td>
</tr>
<tr>
<td>500 s</td>
<td>51 d 18 h</td>
<td>193 d 19 h</td>
</tr>
<tr>
<td>1 s</td>
<td>103 d 13 h</td>
<td>387 d 15 h</td>
</tr>
<tr>
<td>5 s</td>
<td>500 d</td>
<td>1162 d 21 h</td>
</tr>
<tr>
<td>10 s</td>
<td>500 d</td>
<td>3876 d 8 h</td>
</tr>
</tbody>
</table>

**High Speed Voltage Unit U8553**

(Memory guaranteed for year, Post-adjustment accuracy guaranteed for 1 year)

**General specifications**

- Number of input channels: 5 (voltage only)
- Input terminals: M3 screw-type terminal block (2 terminals per channel), outfitted with terminal block cover
- Measurement target: Voltage
- Input type: Scanning by semiconductor relays, all channels isolated
- A/D resolution: 16 bits
- Maximum input voltage: 100 V DC (maximum voltage between input terminals without causing damage)
- Maximum channel-to-channel voltage: 300 V DC (maximum voltage between input channels without causing damage)
- Maximum input current: 100 μA or less
- Allowable signal source resistance: 100Ω or less
- Data refresh interval: 1 ms to 10 s (13 selectable levels)
- Digital filters: Digital filter cutoff frequency is automatically set to data refresh interval, burnout detection setting, and power supply frequency filter setting.
- Operating temperature and humidity range: -10°C to 50°C (14°F to 122°F), 80% RH or less (non-condensing)
- Dimensions: Approx. 134W × 70H × 63D mm (5.28″W × 2.76″H × 2.48″D) (including cover)
- Accessories: Instruction Manual, Installation screws × 2, Connection confirmation label

**Analog input specifications**

(23 ± 0.5°C ±3°F, 80% RH or less, auto-balance at least 30 minutes after power on, with LPSF set at 4 Hz)

<table>
<thead>
<tr>
<th>Measurement target</th>
<th>Range</th>
<th>Maximum resolution</th>
<th>Measurable range</th>
<th>Measurement accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>1 mV f.s.</td>
<td>10 μV</td>
<td>-1 mV to 1 mV</td>
<td>±9 μV</td>
</tr>
<tr>
<td></td>
<td>2 mV f.s.</td>
<td>50 μV</td>
<td>-2 mV to 2 mV</td>
<td>±10 μV</td>
</tr>
<tr>
<td></td>
<td>5 mV f.s.</td>
<td>250 μV</td>
<td>-5 mV to 5 mV</td>
<td>±25 μV</td>
</tr>
<tr>
<td></td>
<td>10 mV f.s.</td>
<td>500 μV</td>
<td>-10 mV to 10 mV</td>
<td>±50 μV</td>
</tr>
<tr>
<td></td>
<td>20 mV f.s.</td>
<td>1 μV</td>
<td>-20 mV to 20 mV</td>
<td>±100 μV</td>
</tr>
<tr>
<td></td>
<td>50 mV f.s.</td>
<td>2.5 μV</td>
<td>-50 mV to 50 mV</td>
<td>±250 μV</td>
</tr>
<tr>
<td></td>
<td>100 mV f.s.</td>
<td>5 μV</td>
<td>-100 mV to 100 mV</td>
<td>±500 μV</td>
</tr>
<tr>
<td></td>
<td>200 mV f.s.</td>
<td>10 μV</td>
<td>-200 mV to 200 mV</td>
<td>±1 mV</td>
</tr>
<tr>
<td></td>
<td>1,000 μf.s.</td>
<td>0.05 μV</td>
<td>-1,000 μV to 1,000 μV</td>
<td>±9 μV</td>
</tr>
<tr>
<td></td>
<td>2,000 μf.s.</td>
<td>0.1 μV</td>
<td>-2,000 μV to 2,000 μV</td>
<td>±10 μV</td>
</tr>
<tr>
<td></td>
<td>5,000 μf.s.</td>
<td>0.25 μV</td>
<td>-5,000 μV to 5,000 μV</td>
<td>±25 μV</td>
</tr>
<tr>
<td></td>
<td>10,000 μf.s.</td>
<td>0.5 μV</td>
<td>-10,000 μV to 10,000 μV</td>
<td>±50 μV</td>
</tr>
<tr>
<td></td>
<td>20,000 μf.s.</td>
<td>1 μV</td>
<td>-20,000 μV to 20,000 μV</td>
<td>±100 μV</td>
</tr>
<tr>
<td></td>
<td>50,000 μf.s.</td>
<td>2.5 μV</td>
<td>-50,000 μV to 50,000 μV</td>
<td>±250 μV</td>
</tr>
<tr>
<td></td>
<td>100,000 μf.s.</td>
<td>5 μV</td>
<td>-100,000 μV to 100,000 μV</td>
<td>±500 μV</td>
</tr>
<tr>
<td></td>
<td>200,000 μf.s.</td>
<td>10 μV</td>
<td>-200,000 μV to 200,000 μV</td>
<td>±1000 μV</td>
</tr>
</tbody>
</table>

*Internal bridge resistance precision tolerance: ±0.01%; temperature characteristics: ±2 ppm/°C
*Measurement accuracy does not include internal bridge resistance tolerance and temperature characteristics

Detailed specifications for wireless units will be made available when units launch.
### Model: MEMORY HiLOGGER LR8450

![Image of the device]

<table>
<thead>
<tr>
<th>Model No. (Order Code)</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>LR8450</td>
<td>Standard model, main unit only</td>
</tr>
<tr>
<td>LR8450-01</td>
<td>Wireless LAN equipped model, main unit only</td>
</tr>
</tbody>
</table>

Note: The LR8450 and LR8450-01 cannot perform measurement on their own. One or more plug-in units or wireless units are required (sold separately).

Note: The LR8450-01 and each wireless unit emit radio waves. Use of radio waves is subject to licensing requirements in certain countries. Using it in a country or region other than those indicated may violate the law and may result in legal penalties for the operator.

Note: Wireless certification countries: Japan, United States, Canada, and European Union. *For the latest information about countries and regions where wireless operation is currently supported, please visit the Hioki website.

### Option

#### Plug-in units
- VOLTAGE/TEMP UNIT U8550
- UNIVERSAL UNIT U8551
- VOLTAGE/TEMP UNIT U8552
- HIGH SPEED VOLTAGE UNIT U8553
- STRAIN UNIT U8554

#### Wireless units (Q2 2020)
- WIRELESS VOLTAGE/TEMP UNIT LR8530
- WIRELESS UNIVERSAL UNIT LR8531
- WIRELESS VOLTAGE/TEMP UNIT LR8532
- WIRELESS HIGH SPEED VOLTAGE UNIT LR8533
- WIRELESS STRAIN UNIT LR8534

#### Power supply
- BATTERY PACK Z1007
- AC ADAPTER Z1014

#### Fixed Stand
- FIXED STAND Z5040
  - For installing logger on wall

#### CASE
- CARRYING CASE C1012
  - Optional storage possible

#### Cables, sensors, etc.
- LAN CABLE 9642
  - Straight Ethernet cable, supplied with straight to cross conversion adapter, 5 m (16.41 ft) length

- HUMIDITY SENSOR Z2000
  - (Analog output), 3 m (9.84 ft) length

- Thermocouple
  - For reference only. Please purchase locally.

### Storage media
- SD MEMORY CARD Z4001
  - 2 GB capacity

- SD MEMORY CARD Z4003
  - 8 GB capacity

- USB DRIVE Z4006
  - 16 GB, Long-life, High-reliability SLC Flash Memory

*Always use HIOKI optional storage media. Proper operation is not guaranteed when using storage media from other manufacturers, and may prevent the product from saving and loading data properly.

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