HIOKI

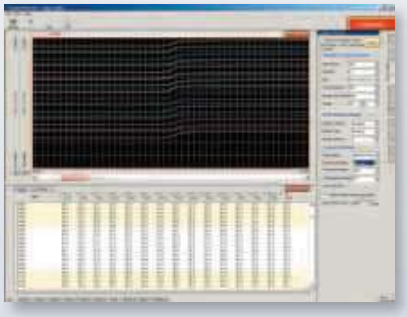
MEMORY HiLOGGER LR8431

Featuring USB flash drive support and improved accuracy

Your Personal 10-channel Logger

Real-time recording of up to 10ms/ sample data to USB or CF memory devices

Small and light enough for the palm of your hand - yet completely isolated



Logger Utility program supports multi-channel measurements via PC

CALRIGHT INSTRUMENTS

The Right Source For Your Test & Measurement Needs

8715 Mesa Point Terrace San Diego, CA 92154
Toll Free: 1.866.363.6634 Tel: 1.619.429.4545 Fax: 1.619.374.7012
Email: sales@calright.com http://www.calright.com

Lightest weight in its class and Easy Operation

Featuring USB flash drive support, faster performance, and more accurate thermocouple measurement

Redesigned to be even more capable, Hioki's 10-channel logger still fits in the palm of your hand.

Ultra-compact for convenient portability
Dimensions and mass (HiLOGGER only) :
Approx. 176 mm (6.93 in) W × 101 mm (3.98 in) H × 41 mm (1.61 in) D, 550 g (19.4 oz)

Provides ten electrically isolated analog input channels for measuring voltage and temperature, plus four pulse-counting input channels.
The isolated inputs alleviate constraints while minimizing interchannel interference.

10 ms scanning of all channels provides rapid sampling capabilities
Track waveforms to meet demands for measuring sudden changes in loads

Widescreen, bright LCD gives excellent viewability
The beautiful, wide QVGA-TFT display is ideal for waveform monitoring.

Featuring USB flash drive support

The LR8431-20 can record measurement data on a USB flash drive for easy transfer to a computer. In long-term measurement applications, it can also record to reliable Compact Flash cards for increased peace of mind.

1 **Replace storage media during real-time recording**
Switch out fully loaded storage media with new ones while recording without stopping the measurement so that you can analyze any data recorded so far.
Note: During high-speed recording, be sure to insert the new storage media within 2 minutes of removing the former.

2 **Display remaining recording time**
The LR8431-20 lets you check the remaining recording time based on the available capacity on your CF card or USB flash drive.

Setting screen

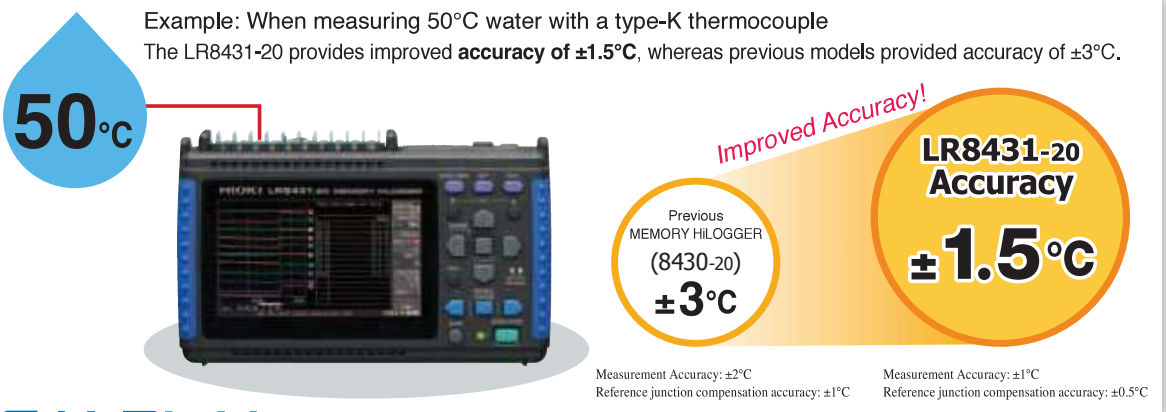
3 **Load data from previous MEMORY HiLOGGER 8430-20 models**
The LR8431-20 can also load waveform and settings data from previous MEMORY HiLOGGER 8430-20 models, allowing it to make measurements using the same settings and display past data.

4 **Copy data between storage media**
The LR8431-20 can copy recorded data between the CF card and USB flash drive.

Use only HIOKI CF cards, which are manufactured to strict industrial standards, for long-term storage of important data. Operation of non-HIOKI CF cards is not guaranteed.

The LR8431-20 delivers improved thermocouple measurement accuracy and reference junction compensation accuracy.

Example: When measuring 50°C water with a type-K thermocouple
The LR8431-20 provides improved **accuracy of ±1.5°C**, whereas previous models provided accuracy of ±3°C.



Evaluating motors and inverters used in electric and hybrid vehicles

The LR8431-20 enables stable, low-noise measurement of high-speed, high-resistance targets.

Efficiency measurement and performance evaluation of air conditioning equipment

The LR8431-20 supports simultaneous, multi-point measurement, for example of input and output at multiple air conditioning registers or the temperature of internal components.

Temperature measurement and performance evaluation of internal components in electronic equipment

Used with a wind velocity converter, the LR8431-20 can measure cooling efficiency inside equipment enclosures.

Isolated 10ms 10ch

This compact logger excels in a broad range of settings, from production lines to research and development.

Key Point

Ten Isolated Analog Input Channels

There's no need to worry about differing potentials of measurement objects when measuring temperature and voltage. All ten analog channels are isolated. Even when measuring temperature and voltage at the same time, interchannel interference and electric shock hazards are eliminated. The four pulse channels are ideal for counting revolution pulses to measure rotation speed. (Pulse inputs share common ground.)

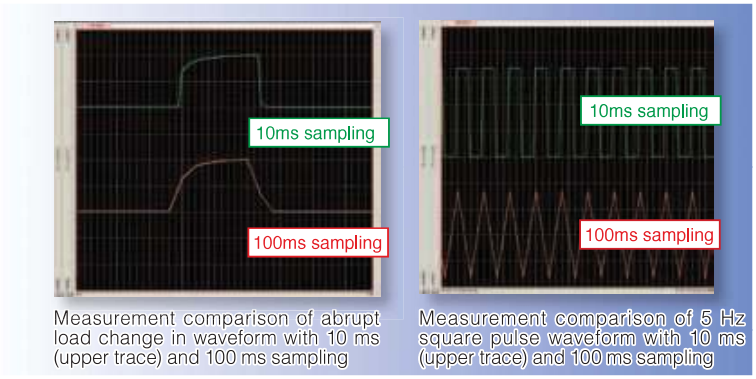
Note: Isolation between channels is possible through the use of semi-conductor relays. Voltage exceeding the product specifications, such as that originating from lightning surges or other sources, should never be applied between each channel; otherwise the relays will short and the recorder will be damaged.

Key Point

High-Speed Sampling

10 ms Sampling and Recording Across All Channels

Abrupt changes in load need to be measured during development of EV・HV・PHV, for which multi-channel, 10 ms sampling is essential. This HiLOGGER can track waveforms that could not be followed with the 100 ms sampling interval previously available.



Measurement comparison of abrupt load change in waveform with 10 ms (upper trace) and 100 ms sampling

Measurement comparison of 5 Hz square pulse waveform with 10 ms (upper trace) and 100 ms sampling

(using the supplied Logger Utility program)

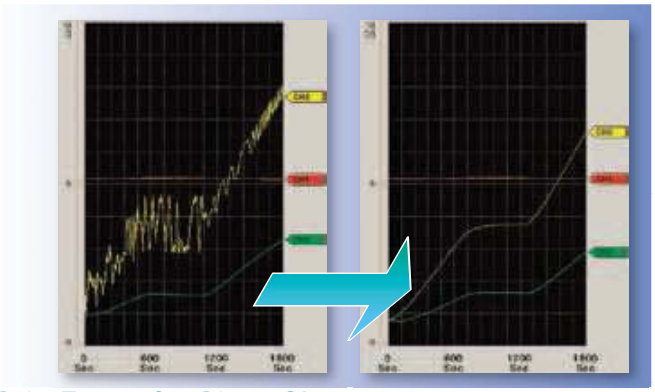
Key Point

Enhanced Noise Suppression

Noise-resistant measurement circuitry for improved readings

Measurement involves the deployment of a delta-sigma type A/D converter. Suppress inverter switching noise and line-frequency hum by digital filtering with the HiLOGGER's proprietary oversampling technology.

Note: Optimum noise suppression is obtained for recordings at least two seconds long.



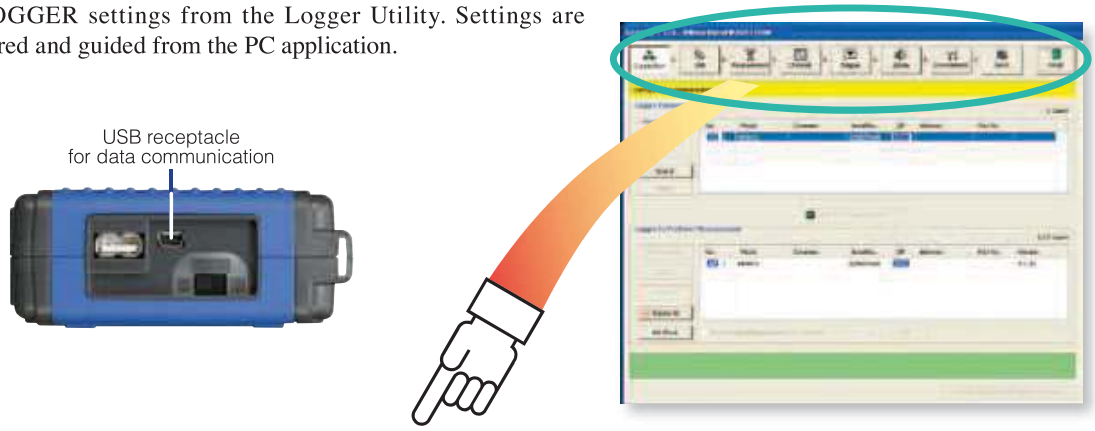
(using the supplied Logger Utility program)

Collect data in real-time with a computer **Logger Utility** (Accessory)

The LR8431-20 ships standard with Logger Utility, a software application that supports multi-channel computer measurement. Simply connect the logger to a computer with a USB cable.

USB connection ensures easy setup

Configure HiLOGGER settings from the Logger Utility. Settings are sequentially ordered and guided from the PC application.

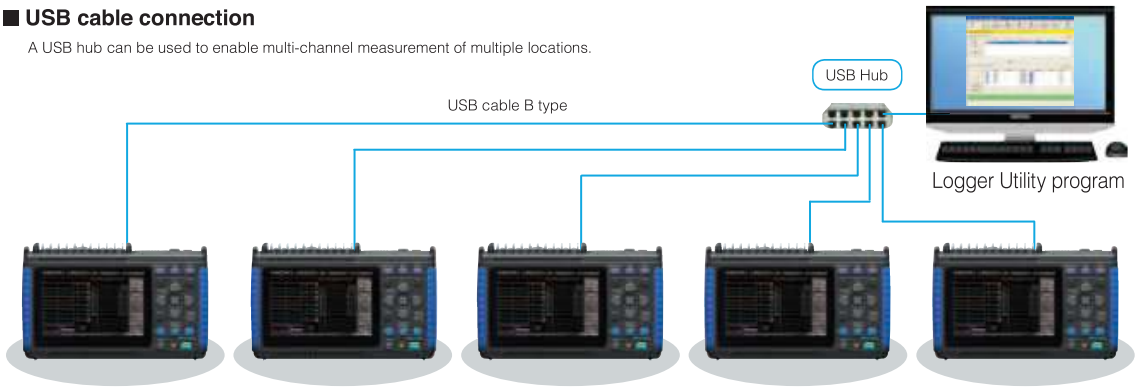


Up to five LR8431-20 instruments can be connected to a single computer with USB cables.

Providing 50 analog and 20 pulse channels that can be graphically displayed together in one window.

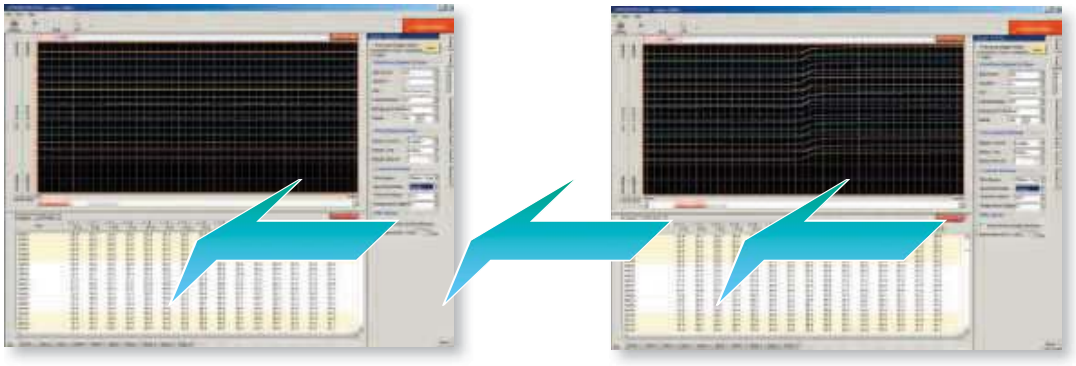
■ USB cable connection

A USB hub can be used to enable multi-channel measurement of multiple locations.



Collect data in real-time with a computer **Logger Utility** (Accessory)

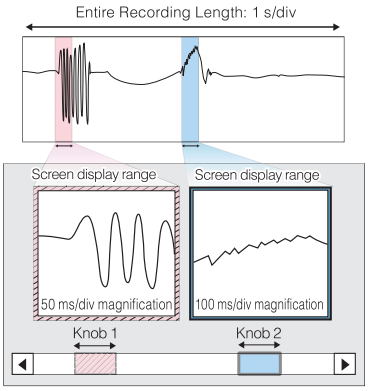
Control measurements from the PC screen



Use the supplied Logger Utility program to control real-time data recording from the PC. Scroll backward through the displayed trend graph window to view past waveforms even while recording.
Up to five LR8431-20 HiLOGGERs can be connected to one PC, providing 50 analog and 20 pulse channels that can be graphically displayed together in one window.

Patented "dual-knob function"

You can use the scrollbar to confirm what the position of the waveform portion displayed on the screen is within the whole recorded waveform. The ability to change the time axis shown on individual windows provides a convenient way to analyze data collected over an extended period of time.



■ **Logger Utility** (Bundled application software)

Supported units	Model 8423, 8430-20, LR8431-20, LR8432-20, LR8400-20, LR8401-20, LR8402-20, and LR8410-20
Operating environment	Windows 10/8/7 (32bit/64bit), Vista (32bit/64bit), XP (with SP2 or later) (32bit)
Real-time data acquisition	Measurements on multiple loggers connected by LAN or USB can be controlled to sequentially acquire, display and save waveform data (for recording up to 10 million samples) Number of controllable instruments: up to 5 units of any combination Display: Waveforms (time-axis divided display possible), numerical values (logging), and alarm status can be displayed at the same time Numerical value display: Can be monitored in a separate window Scroll: Waveform scroll while measuring Data saving destination: Real-time data transfer to Excel, or Real-time data acquisition file (LUW format) Event marks: Can be set while measuring
Data acquisition settings	Data acquisition settings for the logger or logging station Saving: The setting for multiple loggers or logging stations can be saved together in one file (LUS format); Instrument configuration settings can be sent and received
Waveform display	Processed data file: Real-time data acquisition file (LUW format), Record to internal memory data (MEM format) Display format: Simultaneously display waveform and numerical value, (time-axis divided display possible) Maximum number of channels: 675 channerls (measurement data) + 60 channels (waveform processing data) Others: Display each channel's waveform on 10 sheets, scroll, record event mark, cursor, screen hard copy, numerical value display
Data conversion	Target data: Real-time data acquisition file (LUW format), record to internal memory data (MEM format) Converted sections: All data, designation section Format: CSV format (separate by comma, space, tab), transfer to Excel spreadsheet, arbitrary data thinning
Waveform processing	Processing items: Four arithmetic operations Number of processing channels: 60 channerls
Parameter calculations	Target data: Real-time data acquisition file (LUW format), record to internal memory data (MEM format), data acquired in real time, waveform processing data Calculation items: Average, peak, maximum values, time to maximum values, minimum values, time to minimum values, ON time, OFF time, count the number of ON time and OFF time, standard deviation, integration, area values, totalization
Search functions	Target data: Real-time data acquisition file (LUW format), record to internal memory data (MEM format) Search mode: Event mark, time and date, maximum position, minimum position, maximum pole, minimum pole, alarm position, level, window, amount of change
Print functions	Supported printer: Printer compatible with the OS Target data: Real-time data acquisition file (LUW format), record to internal memory data (MEM format) Print format: Waveform image, report format, list print (channel settings, event, cursor value) Print area: The entire area, area between cursors A and B Print preview: Supported

Functionality

- **A variety of transducer outputs (DC voltage), or thermocouple measurements over 10 channels**
- **4 Pulse (count) Input Channels, 1 Alarm Output Channel**
- **Real-time Save & Long-term recording to CF Card or USB memory**

For more reliable data protection, we recommend use of HIOKI CF cards, which are manufactured to strict industrial standards, for real-time saving of data or long-term storage of important data. The USB communications function cannot be used while saving data to a USB flash drive. Operation of non-HIOKI CF cards is not guaranteed.

Terminal 2: Trigger Output

- Outputs a signal when triggering occurs
- Use for synchronous parallel triggering of multiple HiLOGGERs

Terminal 3: External Trigger Input

- Causes triggering when signaled by an external trigger source
- Use for synchronous parallel triggering of multiple HiLOGGERs

Terminal 4: Alarm Output

- Outputs a signal when alarm criteria are satisfied
- The output signal shares common ground with the HiLOGGER
- Use for simultaneous control of an external alarm device

Note: Open-collector output (active low, with voltage output)

Alarm

Terminal 1: GND

Pulse Inputs (measure integration/revolution count variations)

- Four input channels
- Pulse inputs share common ground with the HiLOGGER
- For measuring energy consumption and cumulative flow

Note: Uses special HIOKI Input Cable 9641

Pulse totalization revolution

Integration count 0 to 1000M (count)

Rotation count 0 to 5000/n (r/s)

Voltage/Temperature Measurement (using thermocouples)

- Ten input channels
- Isolated walls around all input channel terminals (M3 dia. screws)
- Voltage or temperature measurement settings can be independently set up for each channel

Note: Thermocouple types K, J, E, T, N, R, S, B

DC V

Voltage ±100 mV to ±60 V

Voltage 1 to 5 V

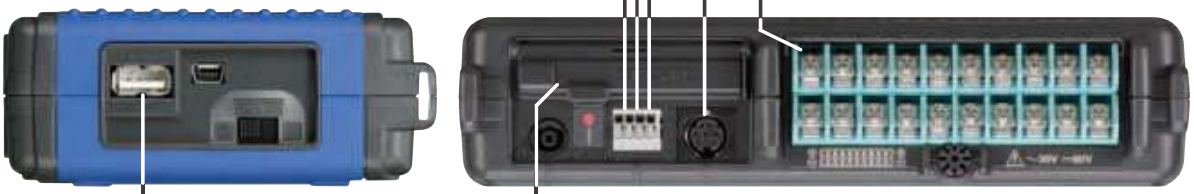
°C Thermocouple

Thermocouple K, J, E, T, N, R, S, B

-200°C to 2000°C

4-20mA

To record 4 - 20mA instrumentation signals, attach a commercially available 250Ω shunt resistance to the input terminals (between + and -) to convert the signals to 1 - 5 V. Then use the 1-5V or the 10V f.s. input range in the HiLOGGER.



USB Memory (for real-time data saving)

CF Card (for real-time data saving)

- Supports HIOKI's 2GB Card

Note: Non-Hioki CF cards are not supported

Key Point

Real-time Save to CF Card or USB memory

Save every measurement to CF card or USB memory in real time. For more reliable data protection we recommend use of HIOKI CF cards, which are manufactured to strict industrial standards, for long-term storage of important data.
(Non-Hioki CF cards are not supported)

Recording Time (Save to External storage in real-time of binary data)

Note: When saving in CSV data format, total recording time is 1/10 or shorter of the following.

	Recording All Channels (ten analog, four pulse and one alarm)			
Recording intervals	Internal memory (7 MB)	512 MB	1 GB	2 GB
10 ms	32m	1d 15h 14m	3d 06h 29m	6d 12h 58m
20 ms	1h 04m	3d 06h 29m	6d 12h 58m	13d 01h 57m
50 ms	2h 40m	8d 04h 13m	16d 08h 26m	32d 16h 53m
100 ms	5h 21m	16d 08h 26m	32d 16h 53m	65d 09h 47m
200 ms	10h 43m	32d 16h 53m	65d 09h 47m	130d 19h 35m
500 ms	1d 02h 49m	81d 18h 14m	163d 12h 29m	327d 00h 59m
1 s	2d 05h 39m	163d 12h 29m	327d 00h 59m	"★"
2 s	4d 11h 18m	327d 00h 59m	"★"	"★"
5 s	11d 04h 16m	"★"	"★"	"★"
10 s	22d 08h 33m	"★"	"★"	"★"
20 s	44d 17h 06m	"★"	"★"	"★"
30 s	67d 01h 39m	"★"	"★"	"★"
1 min	134d 03h 18m	"★"	"★"	"★"
2 min	268d 06h 36m	"★"	"★"	"★"
5 min to 1 hour	"★"	"★"	"★"	"★"

- *Maximum recording time is inversely proportional to number of recording channels.*
- *Because the actual capacity of the External strage is less than that indicated, and because the header portion of waveform files is not included in capacity calculations, expect actual maximum times to be about 90% of those in the table.*
- *★: Exceeds 365 days*

■ Product Specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

General specifications (product guaranteed for one year)

Input System/ Channels	**Analog inputs:** 10 (M3 mm dia. screw terminal block), electrically isolated between channels, and from chassis ground. **Input impedance:** 1 MΩ (when voltage input or temperature measuring with thermocouple burn-out detection OFF), 800 kΩ (with thermocouple burn-out detection ON) **Pulse inputs:** 4 channels (requires HIOKI Input Cable 9641) *Note: all pulse inputs share common ground with the HiLOGGER*
Analog Inputs	**Maximum rating:** 60 V DC (max. voltage between input terminals without damage) **Maximum rated voltage from isolated terminals to ground:** 60 V DC (max. voltage between input channel terminals, and from terminals to chassis ground without damage)
Pulse Inputs	**Input limits:** -5 to +10 V DC (max. voltage between input terminals without damage), non-isolated (common ground between pulse input channels, and with chassis) **Pulse signal characteristic:** No-voltage relay contact "a", open collector or voltage input (High: ≥ 2.5 V, Low: ≤ 0.9 V), **Period:** at least 200 µs (both high and low periods at least 100 µs)
Alarm Output	**One channel, non-isolated:** output from external control connector (common ground) **Signal criteria:** configurable high/low threshold levels, enter/exit threshold window, logical sum (OR) and logical product (AND) for every input channel. Output is refreshed each time recording starts. **Signal characteristic:** Open-collector output (active low, with voltage output) **Voltage levels:** 4.0 to 5.0 V (H) and 0 to 0.5 V (L), **Max. sink current:** 5 mA DC, Max. applied voltage: 30 V DC
Internal storage	3.5 MWords (7 MB of two-byte data points, or four-byte pulse measurements)
External storage	**CF card:** CF card slot × 1 (Up to 2GB), Data format: FAT, FAT32 **USB memory:** USB 2.0 High-speed capable, series mini-B receptacle, Data format: FAT, FAT32
Backup Function (@25°C)	**Backup battery life for clock and settings:** approx. 5 years **For measurement data:** 100 hours with fully charged battery pack, or for as long as AC adapter is connected
External Control Terminals	External Trigger/Event Mark input (exclusion function), Trigger Output, Alarm Output
Display type	4.3-inch WQVGA-TFT color LCD (480 × 272 dots)
Displayable languages	English, Japanese
External Interface	One USB 2.0 series mini B receptacle **Functions:** Control from a PC (Ver 1.00 or later), Transfers internal data on the CF card to a PC
Environmental conditions (no condensation)	**Temperature and humidity range for use:** 0°C to 40°C (32°F to 104°F), (or 5°C to 30°C, 41°F to 86°F when battery charging), 80% rh or less **Temperature and humidity range for storage:** -10°C to 50°C (14°F to 122°F), 80% rh or less
Compliance standard	**Safety:** EN61010, **EMC:** EN61326, EN61000
Power Sources	(1) 100 to 240 V AC, 50/60 Hz using AC ADAPTER Z1005 (2) BATTERY PACK 9780 (when used with the AC Adapter, the AC Adapter has priority) (3) 12 V battery (10 to 16 V DC ±10%, Please contact HIOKI for connection cord)
Power Consumption	10 VA
Continuous Operating Time	Approx. 2.5 hours (with Battery Pack Model 9780 while saving to the CF card) **Charging time**: Approx. 200 minutes (@5°C to 30°C ambient)
Dimensions and mass	Approx. 176 mm (6.93 in) W × 101 mm (3.98 in) H × 41 mm (1.61 in) D, 550 g (19.4 oz) (HiLOGGER only)
Supplied Accessories	Measurement Guide × 1, AC ADAPTER Z1005 × 1, USB cable × 1, CD-R (Instruction Manual, data collection software "Logger Utility") × 1

Trigger functions

Trigger Source (selectable for each channel)	All analog and pulse channels P1 to P4, external trigger, logical sum (OR) and product (AND) of each trigger source
External Trigger	**Criteria:** Short-circuit between external trigger input and ground, or voltage input (H-L transition from [3.0 – 5 V] to [0 – 0.8 V]) **Pulse width:** At least 1 ms (H), and 2 µs (L) **Input limits:** 0 to 7 V DC
Trigger Timing	Start, Stop and Start/Stop (different trigger criteria can be set to start and stop)
Trigger Types (Analog, Pulse)	**Level:** Triggers when rising or falling through preset threshold **Window:** Triggers when entering or exiting range defined by preset upper and lower thresholds
Level Resolution	**Analog:** 0.025% f.s. (f.s. = 10 display divisions) **Pulse:** Totalization 1 count, Rotations 1/n [r.s] (n: pulses per rotation)
Pre-trigger	Records for a specified period before triggering; can be set for real-time saving
Trigger Output	(1) Output signal at trigger occured, (2) Output signal at start or trigger occured, (1) or (2) mode selectable Open collector (active low, with voltage output, at least 10 ms pulse width, Voltage levels: 4.0 to 5.0 V (H) and 0 to 0.5 V (L), Max. sink current: 5 mA DC, Max. applied voltage: 30 V DC)

Measurement Settings

Recording Intervals (sampling period)	10 ms to 1 hour, 19 selections *Note: All input channels are scanned within each recording interval*
Graph Timebase Scaling	100 ms to 1 day per division, 21 selections *Note: Setting is independent from the recording interval*
Repeating Recording	(ON/OFF) Enable to repeat recording after the specified recording time span has elapsed
Recording Time	Enable continuous recording ON (records until the Stop key is pressed), or disable to record for a specified time span (days, hours, minutes and seconds)
Timer Recording	(ON/OFF) Enable to record for a specified time span, or between specified start and stop times
Auto Saving	**Waveform** (Binary or CSV data): stores data to the CF card or USB memory during real-time measurement **Numerical value calculations:** stores calculated values to the CF card or USB memory when finished measuring *Note: Don't shutdown while data saving*
Data Storage Methods	Each recording can be saved in a separate file **Overwriting save (endless loop recording):** New data overwrites the oldest data when the storage media is full **Divided Saving:** Enable to save data at a specified interval (days, hours and minutes) **Divided Saving:** Specified Time (specify a time of day at which to start saving data to files at a specified interval) *Note: Don't shutdown while data saving*
Load Stored Data	Stored data can be recalled by the HiLOGGER in 3.5 MWord (7 MB) quantities (for a single channel; less for multiple channels)
Settable Save/ Reload	Configure saving and reloading to and from CF card or USB memory or internal memory Ten types for internal memory, no limit for CF card and USB memory
Numerical Calculations	Calculations 1 to 4, may be simultaneous Selections: average, peak, maximum and minimum values, time-to-maximum and time-to-minimum
Selectable Filters	50Hz, 60 Hz, or OFF (digital filtering of high frequencies on analog channels)

Channel Settings

Channel Settings	Enable/disable measurement (ON/OFF), selectable waveform color **Analog channels (10):** Voltage (DC only), Temperature (thermocouple only). Thermocouple types K, J, E, T, N, R, S, B **Pulse input channels (4):** Count Integration or revolutions **Alarm output (1):** Hold/not-hold, beeper enable/disable (ON/OFF), Show/hide alarm waveform display (ON/OFF)

Measurement parameters	Ranges	Range of Measurements	Finest Resolution
Voltage	100 mV f.s.	-100 mV to +100 mV	5 µV
	1 V f.s.	-1 V to +1 V	50 µV
	10 V f.s.	-10 V to +10 V	500 µV
	20 V f.s.	-20 V to +20 V	1 mV
	100 V f.s.	-60 V to +60 V	5 mV
	1 – 5 V *(Note)*	1 V to 5 V	500 µV
	Accuracy: ±0.1 % f.s. *(Note: 1 - 5V range's f.s. = 10 V)*		

Measurement parameters	Ranges	Range of Measurements	Finest Resolution
Temperature (Thermocouples)	2000°C f.s.	-200°C to 2000°C	0.1°C
Temperature input ranges (JIS C 1602-1995)	(K) -200°C to 1350°C (E) -200°C to 1000°C (N) -200°C to 1300°C (S) 0°C to 1700°C	(J) -200°C to 1200°C (T) -200°C to 400°C (R) 0°C to 1700°C (B) 400°C to 1800°C	
Measurement Accuracy @23 ±5°C/73 ±9°F, 80% rh or less After 30 minutes warm-up Defined after zero adjustment has been performed	K, J, E, T, : ±1.0°C (-100°C or more), ±1.5°C (-200°C to -100°C) N : ±1.2°C (-100°C or more), ±2.2°C (-200°C to -100°C) R, S: ±2.2°C (300°C or more), ±4.5°C (0°C to 300°C) B: ±2.5°C (1000°C or more), ±5.5°C (400°C to 1000°C) **Reference junction compensation [RJC] accuracy:** ±0.5°C (horizontal positioning), ±1°C (vertical positioning) **Internal [RJC] (internal reference junction compensation at 0°C):** Measurement accuracy = (temp. measurement accuracy) + (RJC accuracy) **External [RJC] (using external junction compensation at 0°C):** Measurement accuracy = temp. measurement accuracy only		
Temperature Other Functions	Thermocouple burn-out detection: ON or OFF		

Measurement parameters	Ranges	Range of Measurements	Finest Resolution
Pulse (Totalization)	1,000 M (count) f.s.	0 to 1,000 M (count)	1 (count)
	Totalization mode: cumulative (counts from start) **Instantaneous value:** instantaneous value during each recording period		
Pulse (Rotations)	5,000/n (r/s) f.s.	0 to 5,000/n (r/s)	1/n (r/s)
	Settable pulses per rotation: 1 to 1,000 ("n" above is the number of sensor output pulses per rotation)		
Slope Setting	↑ (count of L-to-H pulse transitions), ↓ (count of H-to-L pulse transitions)		
Displayed Range	Specified by position, or by upper/lower display limit values (Upper/lower limit values only at Totalization mode)		

Common Channel Settings

Scaling	Decimal (display decimal values), Exponential (display base-10 exponents), or Off **Method:** Ratio (set by slope and intercept), or 2-point (set by input/ output values at two points)
Other Common Channel Settings	Enter comments for each channel, set start/stop triggers and alarm criteria

Options in Detail

MEMORY HiLOGGER LR8431

Order Code: LR8431-20 (English model)

Supplied Accessories:
Measurement Guide × 1, AC ADAPTER Z1005 × 1, USB cable × 1, CD-R (Instruction Manual, data collection software "Logger Utility") × 1

Supplied Accessories

AC ADAPTER Z1005
100 to 240 V AC

Removable storage (CF card)

Supplied with PC Card adapter

PC Card Precaution

Use only PC Cards sold by HIOKI. Compatibility and performance are not guaranteed for PC cards made by other manufacturers. You may be unable to read from or save data to such cards.

- PC CARD 2G 9830 (2 GB capacity)
- PC CARD 1G 9729 (1 GB capacity)
- PC CARD 512M 9728 (512 MB capacity)

Battery Pack

Charges while installed in the HiLOGGER

BATTERY PACK 9780
Ni-MH, Charges while installed

Input cables

CONNECTION CABLE 9641
For pulse inputs, 1.5 m (4.92 ft) length

Other

To prevent damage to the instrument's display

PROTECTION SHEET 9809
For LCD protection, pairs of additional sheets can be purchased separately.

Case

SOFT CASE 9812
Includes space for small items, Neoprene rubber

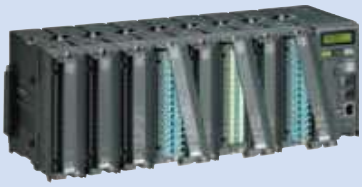
CARRYING CASE 9782
Includes compartment for options, Resin coated

Related Products

MEMORY HiLOGGER LR8400-20
30 isolated analog input channels
With built-in VOLTAGE/TEMP UNIT × 2 modules

MEMORY HiLOGGER LR8401-20
30 isolated analog input channels
With built-in UNIVERSAL UNIT × 2 modules

MEMORY HiLOGGER LR8402-20
30 isolated analog input channels
With built-in UNIVERSAL UNIT × 1, VOLTAGE/TEMP UNIT × 1 modules



MEMORY HiLOGGER 8423
15 to 120 isolated analog channels, with up to 600-channel systems available
LAN/USB support, for measuring with a PC

HEAT FLOW LOGGER LR8432-20
10 isolated analog channels
Use a heat flow sensor to measure the movement and volume of heat energy
Ultra-compact for convenient portability

WIRELESS LOGGING STATION LR8410-20
15 to 105 isolated analog channels
Logging multi-point data has never been so easy
Install logging modules in hard-to-reach locations