



Oscilloscope-like Waveform Observation, Plus Recording of RMS Variations - In a Single Device!

Features ultra-compact oscilloscope functionality, RMS recording, and the ability to save data to a CF card during measurement

- **Measure safely, with isolated input for all channels**
Test commercial power lines with ease of mind thanks to isolated input for both channels
- **Monitor instantaneous waveforms on-site**
High-speed waveform observation/recording with 1 M sampling, despite compact size
- **Monitor fluctuations in commercial power lines**
Despite its ultra-compact size, it measures at a 1ms recording interval while saving data to a CF card
- **Synchronize two HiCORDERs together to measure three-phase lines and other channels needing three or more channels**
Bundled PC application enables integration/observation of synchronized data from two HiCORDERs on a single screen

Memory Recorder

An oscilloscope in the palm of your hand

Capture unpredictable phenomena using waveforms !

Recording of EV and HEV starting current waveforms

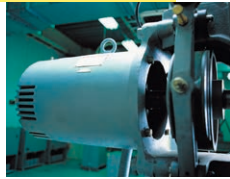
The MR8870 can be used with a clamp-on AC/DC current sensor to observe the current waveform at motor start. Hioki's clamp-on sensor line covers a frequency band ranging from DC to frequencies of 10 kHz and higher.



The photograph shows the MR8880, the MR8870's four-channel sister product.

Recording of motor rush current

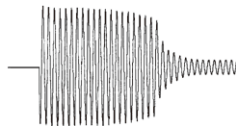
Motor power-on inrush current waveforms can be precisely recorded. The Clamp On Probe the 9018-50 is available for current measurement, as is the AC Leak Clamp Meter CM4003.



9018-50

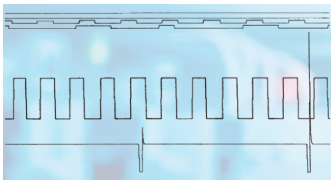


CM4003



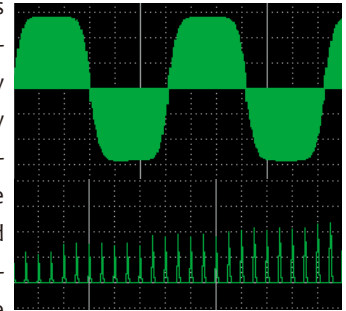
Analysis of sequence controller issues

When sequence controllers being used in applications such as production and testing lines stop due to errors or generate warning output, potential causes include momentary AC power interruptions and brownouts. The MR8870 is ideal for analyzing the operation of such systems since it can record the correlation of sequence relay signals, AC power circuits, and DC voltage circuits as waveforms using power supply anomalies as a trigger.



Check inverter output waveforms

Inverter performance analysis requires simultaneous observation of the high frequency carrier signal and the low frequency fundamental waveform being switched. The combination of high-speed sampling capability and high-capacity memory make these observations possible. For current waveform observations, use Hioki clamp sensors capable of high-frequency measurements without direct electrical contact.



CB timing measurements

Analyze the relationships of multi-point logic signals and analog waveforms to detect timing issues that can affect power supply circuit breakers. Use logic probes to record relay operations on up to four channels, or use the Differential Probe P9000 for three-phase 440 v power line measurements and for support of CAT III 600 V measurement categories.



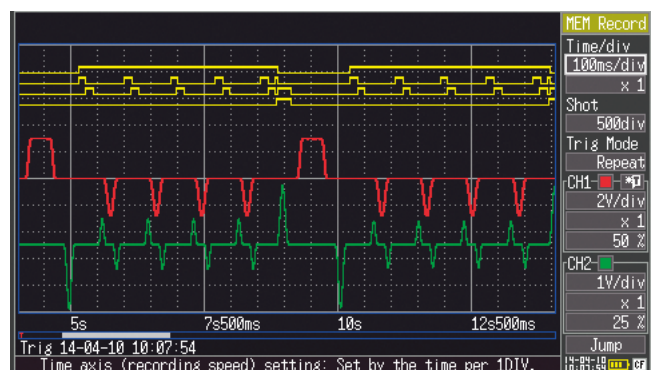
CAT IV 600 V



CAT III 600 V

For high voltage measurement
DIFFERENTIAL PROBE P9000-01, P9000-02

For high voltage measurement
DIFFERENTIAL PROBE 9322



RMS Recorder

A pen-free recorder in the palm of your hand Long-term RMS fluctuation recording !

Pen- and paper-free re- cording

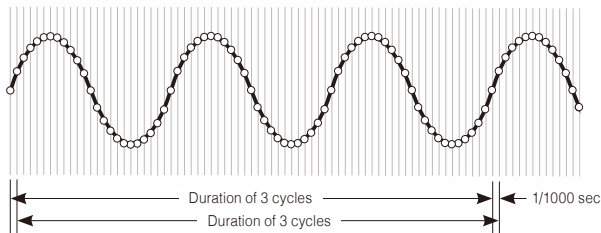
A substitute for the Micro HiCorder



The photo above shows the Hioki 8205-10 and 8206-10 Micro HiCorders. These products are no longer available.

RMS value calculation method

RMS values for three AC waveform cycles are calculated 1,000 times every second (see figure below). Readings other than maximum and minimum values are eliminated based on the set recording interval, and the resulting data is displayed and saved.



AC RMS data recording

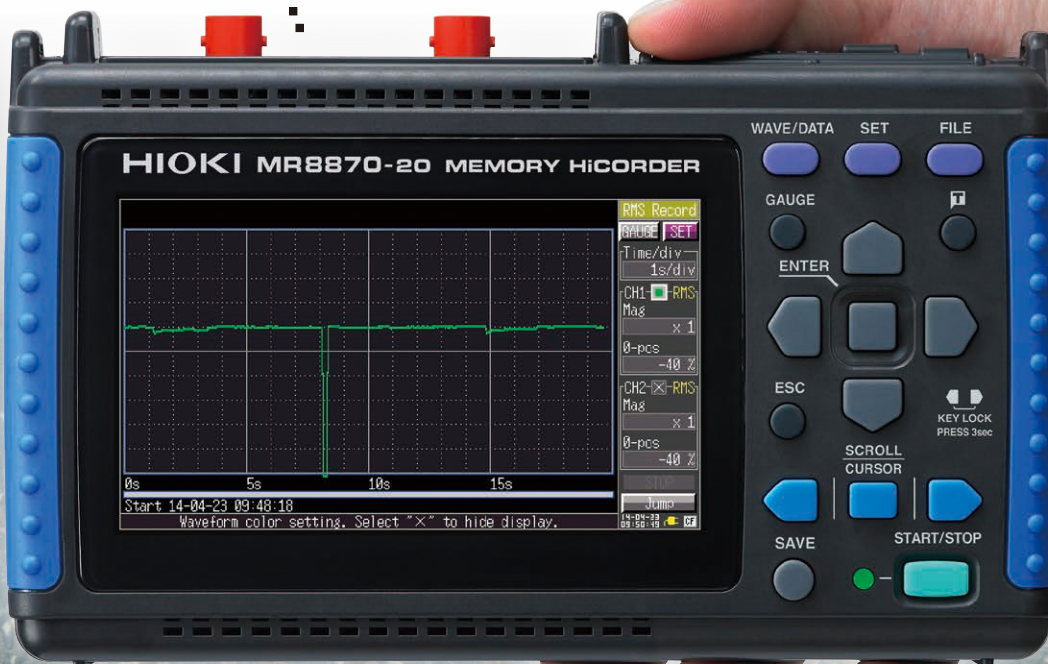
Use the device in conjunction with an AC voltage input and a clamp current sensor to record RMS values for current. Input instantaneous waveforms are acquired via high-speed sampling at 200 μ sec. RMS data is staggered at a rate of 1000 times per second as it is computed – not even abrupt fluctuations will escape notice.

RMS data recorded in internal memory

The RMS recorder can output data into the internal memory at rates of up to once per millisecond. Internal memory recordings of up to 10,000 div (1 million data items) are supported. Additionally, with automatic saving settings, measured values can be saved to the media at the specified recording interval.

* A new data file is created for each 10,000 div worth of data.

* It is possible to save the data repeatedly up until the media's full capacity is reached, but after that periods of dead time (when measurement is not possible) will occur every 10,000 div.



Tough & Professional
MR8870



Compact and lightweight

Small-bodied design for ease of portability

Volume is just 30% and weight just 40% of Hioki's 4-channel Memory HiCorder, the MR8880 – a 70% and 60% reduction, respectively.

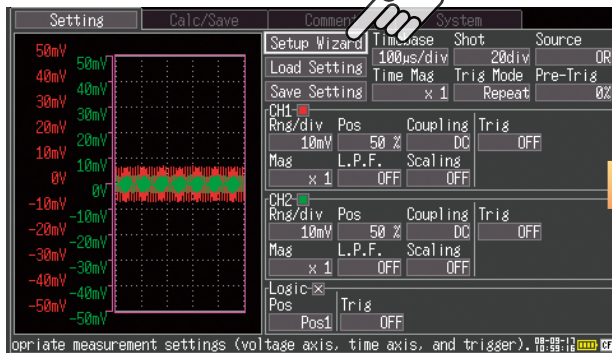
A waveform measurement instrument that you can slip into your briefcase and carry anywhere. Should you suddenly discover you need it on a work trip, you can simply take it out and begin to use it, just as you would a tester.



Intuitive, no-fuss operation

Built-in Setup Wizard to help you get started

Activate the Setup Wizard



When powered on, the Settings screen appears along with the waveform monitor, and the new Setup Wizard blinks.

By activating the Setup Wizard, you can easily navigate by following the simple instructions. Soon you will be operating the device like a seasoned professional.

Real-Time waveform monitoring



The help text crawls along the bottom of the screen, describing the function of the setting at the blinking cursor.

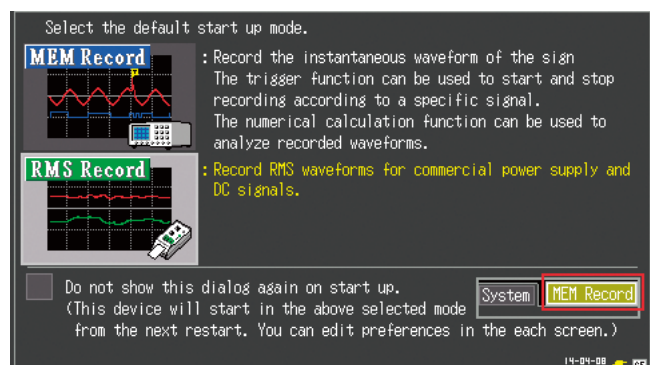
The enhanced "Waveform Monitor" window with level meter display facilitates changes to settings by simultaneously displaying real-time input waveforms.



Select mode at start-up

No unnecessary fuss before you can start working. You select which measurement mode to use (memory recorder or RMS value recorder) when you switch on the device.

Choose the mode once, and you'll never need to select it again.





Data analysis in tandem with a PC

Dedicated PC application program bundled as standard accessory

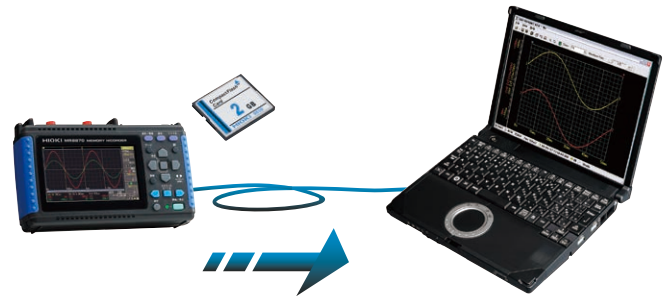
■ Saves data to media during measurement, reducing dead time

The memory recorder's instantaneous waveform recording functionality automatically saves data to storage media in a way that minimizes the interval during which the instrument cannot perform measurement while data is being saved (so-called dead time). This allows data to be saved to the media during measurement up to the set recording length on time axes of 50ms/div or slower.



■ Binary data (MEM/RMS data) loadable into PC

Using a specialized application that ships standard with the MR8870, you can print or display measurement data from the MR8870 with a computer. To load measurement data saved on a CF card onto a computer, you can either insert the card directly into the computer or connect the MR8870 to which the card is connected to the computer using a USB cable (known as USB drive mode).



* Hioki's optional CF card (PC card) is required in order to send MR8870 data to a computer using a USB cable.

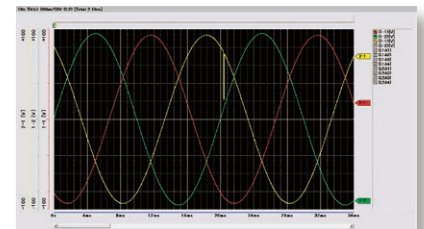
* The MR8870 is not provided with a communication function for controlling it from a PC connected to it with a USB cable.

■ Synchronize two HiCorders together for 4ch recording! (MEM data)

For those times when 2-channels are just not enough, synchronize two MR8870's using the external trigger I/O terminals (apply the trigger output from one to the external trigger input of the other). Then use synchronous start to automatically record four channels of measurement data to a CF card.



● Use the bundled software to composite waveform files. For example, to monitor the waveforms of a 3P 200 V line, you can use two HiCorders at the same time and view the waveforms of all 4 channels on the same screen on the PC.

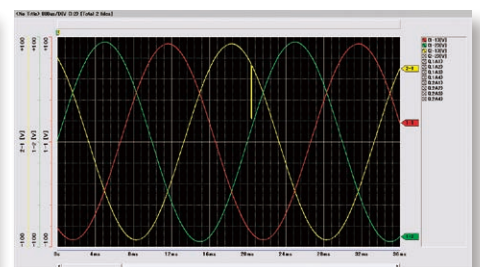
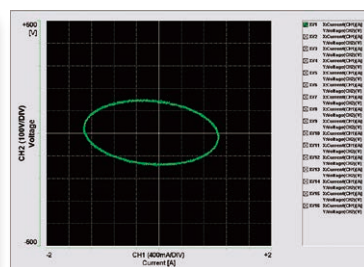
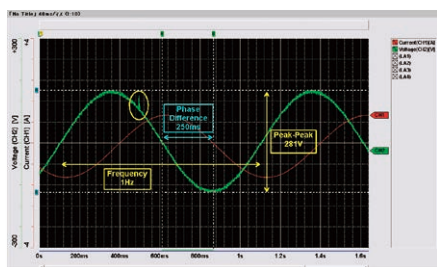


■ Waveform display and printing, and CSV conversion with PC (MEM data, RMS data)

Open a data file with the dedicated Wave Processor (PC application program) for the MR8870/8870, to import and print waveforms with your own arrow and figure annotations. Of course, screen data can be copied and pasted into common Word and Excel documents to easily create reports.

■ Features of the Dedicated Wave Processor Program (supplied accessory)

- Designed especially for MEMORY HiCORDER MR8870/8870
Application program displays and prints waveforms, and converts measurement data to CSV text files on a Windows PC.
- Provides X-Y display capability not available on the HiCorder
- Generate reports using templates, with figure annotations and entered comments
- Multiple files can be batch-converted to CSV data
- Use two HiCorders to monitor 3 or 4 channels of waveforms that are measured using the same time axis range on the same PC window.



■ Specifications (Accuracy guaranteed for 1 year)

Basic specifications	
Measurement functions	Memory recorder (high-speed recording), RMS recorder (50/60 Hz, or DC only)
No. of channels	2 analog and 4 logic channels (For analog inputs, channels are isolated from each other and from frame GND. For logic terminals, all channels has common GND.)
Maximum sampling rate	1 MS/s (1 μs period, all channels simultaneously)
Memory capacity	12 bits × 2 M-Words/ch
Removable storage	CF card Type I slot (standard equipment) ×1: Up to 2 GB, supports FAT, or FAT-32 format Memory items: Setting condition, measurement data (binary or text), screen shot, result of numerical calculation, reduced text saving data
Backup function	Clock and settings: 5 years or more (@25°C 77°F) Waveform backup function: available when Battery pack 9780 is installed with charge remaining or AC adapter is connected (up to 100 hours with fully charged battery pack).
Control terminals	Terminal block: External trigger input, trigger output
External interface	USB: USB 2.0, mini-B receptacle ×1 port, Function: Transfer files from the installed CF card to a PC via USB cable, but communication functions such as the capability to change HiCorder settings from the PC are not provided.
Display type	4.3-inch TFT color LCD (480 × 272 dots)
Display resolution	Waveform section: 20 div (time axis) × 10 div (voltage axis) (1 division = 20 dots × 20 dots)
Display languages	MR8870-20: English, Japanese (Default settings: English) MR8870-30: Chinese, English, Japanese (Default settings: Chinese) <i>Note: Korean (special order only, please contact Hioki)</i>
Environmental conditions (no condensation)	Operation: 0°C (32°F) to 40°C (104°F), 80 % rh or less Storage: -10°C (14°F) to 50°C (122°F), 80 % rh or less
Compliance standard	Safety: EN61010, EMC: EN61326, EN61000-3-2, EN61000-3-3
Power supply	• AC Adapter Z1005: 100 to 240 V AC, 50/60 Hz • Battery pack 9780: continuous operation times: approx. 2 hours (reference value at 25°C/77°F, waiting for trigger) (AC adapter has priority when used in combination with battery pack) • DC power supply: 10 to 16 V DC (please contact your Hioki distributor for connection cord, max. 3 m/9.84 ft length)
Power consumption	30 VA max. (When using the AC adapter and charging internal battery pack 9780) 10 VA max. (When using external DC power supply and charging internal battery pack 9780) 3 VA max. (When using the battery pack 9780)
Charging functions	The installed battery pack charges when the AC adapter is connected. Charging time is about 200 minutes (reference value at 25°C/77°F) <i>Notes: Charging time depends on battery condition. Charging is disabled to protect the battery at ambient temperatures out of 5°C (41°F) to 30°C (86°F).</i>
Dimensions and mass	Approx. 176 mm (6.93 in) W × 101 mm (3.98 in) H × 41 mm (1.61 in) D, 600 g (21.2 oz) (with the Battery pack 9780 installed)
Accessories	Instruction Manual ×1, Measurement Guide ×1, AC adapter Z1005 ×1, Strap ×1, USB cable ×1, Application Disk (Wave Processor Program for the 8870) ×1, Protection sheet 9809 ×1
Trigger functions (For memory recorder only)	
Trigger modes	Single, continuous
Trigger sources	Two analog channels, four logic channels, external trigger (falls below 2.5 V, or shorted terminals), ON/OFF switching of each source, AND/OR between sources, manual triggering
Trigger types (Analog)	• Level: Triggering occurs when preset voltage level is crossed (upwards or downwards) • Voltage drop: Triggering occurs when voltage drops below peak voltage setting (for 50/60 Hz AC power lines only) • Window: Triggering occurs when window defined by upper and lower limit is entered or exited
Level setting resolution	0.5% f.s. (f.s.=10 divisions)
Trigger types (Logic)	1, 0, or ×, Pattern setting
Trigger filter	Set by the number of samples, from 0 to 100 samples, in five steps
Other functions	Trigger output: open collector 5 voltage output, active low with at least 1 ms pulse width
Analog Input (Accuracy at 23 ±5°C/73 ±9°F, 80 % rh or less, after 30 minutes of warm-up time)	
Measurement functions	Number of channels: 2, for voltage measurement
Input connectors	Isolated BNC connector (input impedance 1 MΩ, input capacitance 7 pF) Max. rated voltage to earth: 300 V AC, DC, CAT II (with input isolated from the unit, the maximum voltage that can be applied between input channel and chassis and between input channels without damage)
Measurement range (at Memory recorder)	10 mV to 50 V/div, 12 ranges, full scale: 10 div, AC voltage for possible measurement/display using the memory function: 280 V rms, Low-pass filter: 5 /50 /500 /5 kHz
Measurement resolution	1/100 of measurement range (using 12-bit A/D conversion, measurement range is ±10 times range value)
Highest sampling rate	1 MS/s (simultaneous sampling in 2 channels)
Accuracy	±0.5 % f.s. (after zero-adjust, in measurement range, f.s. = 10 div)
Frequency characteristics	DC to 50 kHz -3dB
Input coupling	DC / GND
Max. allowable input	400 V DC (the maximum voltage that can be applied across input pins without damage)
Display functions	• Numerical value display: instantaneously value, or RMS value (DC, or 50/60 Hz only) (cannot select at measuring) • Waveform display zoom at voltage axis ×2 to ×10, compression ×1/2, ×1/5 <i>Note: X-Y display N/A (X-Y possible on PC screen by supplied software only)</i>

Memory recorder (high-speed recording)	
Measurement targets	Instantaneous waveform of DC to AC waveform recording / monitor
Time axis	100 μs to 5 min/div (100 samples/div) 20 ranges Time axis zoom: ×2 to ×10 in 3 stages, compression: 1/2 to 1/1000 in 9 stages
Sampling period	1/100 of time axis range (minimum 1 μs period)
Recording length	20 to 20,000 div, or continuous (available at 50 ms/div to 5 min/div only) <i>Note: limited by timebase, only the last 20,000 div are saved</i>
Pre-trigger	Record data from before the trigger point at 0 to 100% of the recording length in 13 stages
Calculation functions	• Numerical calculation: Up to four simultaneous calculations (common to all channels), calculation results are saved to CF card • Calculation contents: average, peak-peak, maximum and minimum values, RMS, period and frequency • Calculation range: specified by A/B cursors or whole recording length • Waveform processing: N/A

■ Recording Time to internal memory using memory recorder mode (abridged)

- If you set automatic saving of binary-format data to the CF card in the 50-ms/div-and-slower range of the time axis, data is saved simultaneously with measurement. This considerably reduces the amount of dead time (the period from the completion of the saving of internal memory data (of the applicable capacity below) to the CF card, to when measurement/recording begins again). This is a new function – the MR8870 is the first in the series to feature it.
- The possible length of a single measurement/recording is the length given below for the applicable time axis range.
- The maximum recording length is the same whether 1 or 2 channels are used.
- The internal memory capacity is 4 MB/channel. Media capacity depends on the card (for example, 512 MB).

Time axis	Sampling period	Recording length 20,000 div Max. 1 div = 100 sampling data
100 μs/div	1 μs	2s
1 ms/div	10 μs	20s
10 ms/div	100 μs	3min 20s
100 ms/div	1 ms	33min 20s
1 s/div	10 ms	5h 33min 20s
10 s/div	100 ms	2d 07h 33min 20s
1 min/div	600 ms	13d 21h 20min 00s
5 min/div	3.0 s	69d 10h 40min 00s

RMS recorder (high-speed recording)	
Measurement targets	Commercial power line (50 ±1 Hz/ 60 ±1 Hz), DC <i>Note: Logic measurement N/A</i>
Measurement mode	Selectable for each channel (AC voltage, DC voltage, AC current, DC current)
Input ranges	Selectable for each channels on measurement mode • AC voltage: 100 V, 200 V system (400 V, 600 V system using the Differential Probe) • AC current: 10 A to 5000 A rms f.s., 10 mA rms f.s. to (depending on the current sensor in use) • DC voltage: 100 mV to 500 V f.s. (500 V to 2000 V f.s. using the Differential Probe) • DC current: 10 A to 2000 A f.s. (depending on the current sensor in use)
RMS accuracy	±3.0 % f.s. (after zero-adjustment, add current sensor accuracy in use)
Recording interval	1 ms to 1 minutes in 16 stages, Sampling period: 200 μs fixed (AC voltage / AC current: 1000 RMS data/second) Envelope mode: always ON <i>Note: Record maximum/minimum value pairs each recording interval</i>
Recording time	10,000 div <i>Note: If recording stops before 10,000 div is reached, only the data up to that point can be displayed and saved.</i>
Other functions	Time axis zoom/compression: 100 ms to 1 days/div Numerical calculation N/A
Repeating functions	Single / Repeat selectable <i>Note: external trigger terminal cannot use</i>

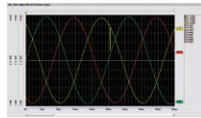
■ Recording Time to internal memory using RMS recorder mode (abridged)

- If you set automatic saving to the CF card, data is saved simultaneously with measurement at all times.
- The possible length of a single measurement/recording is the applicable time given below.
- The internal memory capacity is 4 MB/channel. Media capacity depends on the card (for example, 512 MB).

Recording interval	Sampling period	Recording length 10,000 div Max. 1 div = pair of (Max. / Min.) data × 100
1 ms	200 μs	16min 40s
10 ms	200 μs	2h 46min 40s
100 ms	200 μs	1d 3h 46min 40s
1 s	200 μs	11d 13h 46min 40s
10 s	200 μs	115d 17h 46min 40s
30 s	200 μs	347d 5h 20min 0s
1 min	200 μs	694d 10h 40min 0s

Other functions	
Convenient functionality	Setup Wizard – guides you through the settings. Waveform monitor – lets you make settings while waveforms are displayed, and reflects the changes on the display in real time.
Saving to external memory	Automatic saving of measurement data to CF card <i>Note: In the 50-ms/div-and-slower time axis range, binary-format waveform data is saved simultaneously with measurement, shortening the dead time due to writing.</i> Updating save possible (old files are deleted as new files are saved)
Cursor readout function	Readouts of potential at A/B cursor position, time since triggering, time difference and potential difference between A and B cursor positions, and frequencies at their positions
Scaling functionality	Settable for individual channels • Memory recorder: OFF, model setting, conversion ratio setting, 2-point setting method • RMS value recorder: For voltage: OFF, model setting. For current: sensor model setting.
Other functions	Comment entry, screen capture, gauges, start condition preservation, auto setup, waveform scrolling (possible during measurement)

■ Software specifications (Bundled accessory)



Wave Processor Program for the 8870 (Bundled accessory)	
Supported measurement instruments	MR8870-20, 8870-20
Operating environment	Computer running under Windows 8/7 (32/64-bit), Vista (32-bit), XP
File loading	Loadable data format: Memory function data (MEM extension) of the MR8870-20/ 8870-20 Max. loadable file size: The maximum size that can be stored by the MR8870-20/ 8870-20 (subject to the capacity of the PC's operating environment) Waveform Composite Function: Composite the waveforms of up to 8 HiCorders (16 analog channels)
Overwriting save	Overwrites saved scaling and title/channel comments
Slide show display	Sequentially displays waveform files in the same folder
Text conversion	Data conversion format: Select from CSV, tab-separated or space-separated Object data range: Whole range, or between cursors Data thinning: Available by specifying interval Conversion methods: Analog waveform data to voltage values, logic data is converted to ones and zeros Conversion channels: selectable Header contents: Title, trigger date, timebase, comments, per-channel setting conditions Batch conversion: specify multiple files for batch conversion
Displaying	Display language: English or Japanese (select during installation) Waveform display: Scroll and magnify/reduce the time axis of the displayed waveform data image, move the zero position of each channel, zoom and set the vertical axis of each channel independently (variable gain) Numerical value display: included Cursor functions: Manipulate A and B cursors independently, and display time and voltage numerically. Max. displayable channels: 16 analog and 32 logic channels Gauge display: Time gauge (absolute or relative time, seconds, data points), voltage gauge (for each channel) Figure annotations: Text boxes, straight lines, arrows, circles and rectangles at any location Screen capture: Extended meta format, bitmap format Search functions: Date, maximum, minimum, level and window search Template function: Save and reload waveform file display configurations
Printing	Printer support: Color and monochrome printing on printers supported by the operating system Printable ranges: All data, screen capture and specifiable areas Print formats: Undivided, 2, 4, 8 divisions, 2, 4, 8 or 16 traces, 1, 2 or 4 XY screen, gauges, channel comments, zero-position comments, and A/B cursor values Print preview and waveform screen hard copy/logging print functions are included

■ Options specifications (Sold separately)

Cable length and mass: Main unit cable 1.5 m (4.92 ft), input section cable 30 cm (0.98 ft), approx. 150 g (5.3 oz)
Note: The unit-side plug of the 9320-01 is different from the 9320.



LOGIC PROBE 9320-01	
Function	Detection of voltage signal or relay contact signal for High/Low state recording
Input	4 channels (common ground between unit and channels), digital/contact input, switchable (contact input can detect open-collector signals) Input resistance: 1 M Ω (with digital input, 0 to +5 V) 500 k Ω or more (with digital input, +5 to +50V) Pull-up resistance: 2 k Ω (contact input: internally pulled up to +5 V)
Digital input threshold	1.4V/ 2.5V/ 4.0V
Contact input detection resistance	1.4 V: 1.5 k Ω or higher (open) and 500 Ω or lower (short) 2.5 V: 3.5 k Ω or higher (open) and 1.5 k Ω or lower (short) 4.0 V: 25 k Ω or higher (open) and 8 k Ω or lower (short)
Detectable pulse width	500 ns or longer
Max. allowable input	0 to +50 V DC (the maximum voltage that can be applied across input pins without damage)

Cable length and mass: Main unit cable 1.5 m (4.92 ft), input section cable 1 m (3.28 ft), approx. 320 g (11.3 oz)
Note: The unit-side plug of the MR9321-01 is different from the MR9321.



LOGIC PROBE MR9321-01	
Function	Detection of AC or DC relay drive signal for High/Low state recording Can also be used for power line interruption detection
Input	4 channels (isolated between unit and channels), HIGH/LOW range switching Input resistance: 100 k Ω or higher (HIGH range), 30 k Ω or higher (LOW range)
Output (H) detection	170 to 250 V AC, $\pm$ DC 70 to 250 V (HIGH range) 60 to 150 V AC, $\pm$ DC 20 to 150 V (LOW range)
Output (L) detection	0 to 30 V AC, $\pm$ DC 0 to 43 V (HIGH range) 0 to 10 V AC, $\pm$ DC 0 to 15 V (LOW range)
Response time	Rising edge 1 ms max., falling edge 3 ms max. (with HIGH range at 200 V DC, LOW range at 100 V DC)
Max. allowable input	250 Vrms (HIGH range), 150 Vrms (LOW range) (the maximum voltage that can be applied across input pins without damage)

Cable length and mass: Main unit cable 1.3 m (4.27 ft), input section cable 46 cm (1.51 ft), approx. 350 g (12.3 oz)



DIFFERENTIAL PROBE 9322 (Accuracy guaranteed for 1 year)	
Measurement functions	DC mode: Waveform monitor output, DC to 10 MHz $\pm$ 3 dB AC mode: Detection of power line surge noise, 1 kHz to 10 MHz $\pm$ 3 dB (Low frequency cut-off frequency 1 kHz $\pm$ 300 Hz) RMS mode: Rectified RMS output of DC and AC voltages, DC, 40 Hz to 100 kHz, Response speed: 200 ms or less (400 V AC)
Max. allowable input	2000 V DC, 1000 V AC
Max. rated voltage to earth	When using the Grabber Clip L9243: 1000 V AC/DC (CAT II) When using alligator clip: 1000 V AC/DC (CAT II), 600 V AC/DC (CAT III)
Output	Voltage division ratio: 1/1000, BNC terminal (DC/AC/RMS 3-mode selectable output)
DC amplitude accuracy	$\pm$ 1 % f.s. (1000 V DC or less), $\pm$ 3 % f.s. (2000 V DC or less) (f.s.=2000 V DC)
RMS amplitude accuracy	$\pm$ 1 % f.s. (DC, 40 Hz to 1 kHz), $\pm$ 4 % f.s. (1 kHz to 100 kHz) (f.s.=1000 VAC)
Input resistance, capacity	H-L: 9 M Ω , approx 10 pF (C at 100 kHz) H-case, L-case: 4.5 M Ω , approx 20 pF (C at 100 kHz)
Power supply	+5 V to +12 V, less than 300 mA (DC jack OD 5.5 mm [0.22 in.], ID 2.1 mm [0.08 in.]) - Via AC Adapter 9418-15 - Via MR6000 dedicated Probe Power Unit Z5021 through Power Cord 9248 - Via Logic terminal on Memory HiCorder through Power Cord 9324 (*1) - Via sensor terminal of F/V Unit 8940 (*1) through Power Cord 9325 (*1) - Via DC power output terminal attached to the input unit for the 8855 through Power Cord 9328 (*1) - Via the 8860 series dedicated Probe Power Unit 9687 (*1) through Power Cord 9248
Dimensions and mass	70 mm (2.76 in)W $\times$ 150 mm (5.91 in)H $\times$ 25 mm (0.98 in)D, 350 g (12.3 oz), Cord length: Input 46 cm (1.51 ft), Output 1.3 m (4.27 ft)
Included accessories	Alligator clips $\times$ 1 (red/black set), Grabber Clip L9243 $\times$ 1 (red/black set), Carrying case C0203 $\times$ 1, Instruction manual $\times$ 1

Cable length and mass: 70 cm (2.30 ft), Output side: 1.5 m (4.92 ft), 170g (6.0 oz)



DIFFERENTIAL PROBE P9000 (Accuracy guaranteed for 1 year)	
Measurement modes	P9000-01: For waveform monitor output, Frequency properties: DC to 100 kHz -3 dB P9000-02: Switches between waveform monitor output/AC effective value output Wave mode frequency properties: DC to 100 kHz -3 dB, RMS mode frequency properties: 30 Hz to 10 kHz, Response time: Rise 300 ms, Fall 600 ms
Division ratio	Switches between 1000:1, 100:1
DC output accuracy	$\pm$ 0.5 % f.s. (f.s. = 1.0 V, division ratio 1000:1), (f.s. = 3.5 V, division ratio 100:1)
Effective value measurement accuracy	$\pm$ 1 % f.s. (30 Hz to less than 1 kHz, sine wave), $\pm$ 3 % f.s. (1 kHz to 10 kHz, sine wave)
Input resistance/capacity	H-L: 10.5 M Ω , 5 pF or less (at 100 kHz)
Maximum input voltage	1000 V AC, DC
Maximum rated voltage to ground	1000 V AC, DC (CAT III)
Operating temperature range	-40°C to 80°C (-40°F to 176°F)
Power supply	(1) AC adapter Z1008 (100 to 240 V AC, 50/60 Hz), 6 VA (including AC adapter), 0.9 VA (main unit only) (2) USB bus power (5 V DC, USB-microB terminal), 0.8 VA (3) External power source 2.7 V to 15 V DC, 1 VA
Accessories	Instruction manual $\times$ 1, Alligator clip $\times$ 2, Carrying case $\times$ 1

MR8870 Options in Detail

***Voltage is limited to the specifications of the input section**

Input cable (A)

CONNECTION CORD L9790
Flexible ϕ 4.1 mm (0.16 in) thin dia., cable allowing for up to 600 V input. 1.8 m (5.91 ft) length
* The end clip is sold separately.

ALLIGATOR CLIP L9790-01
Red/black set attaches to the ends of the cables L9790

CONTACT PIN 9790-03
Red/black set attaches to the ends of the cables L9790

GRABBER CLIP 9790-02
Red/black set attaches to the ends of the cables L9790
* When this clip is attached to the end of the L9790, input is limited to CAT II 300 V. Red/black set.



L9790 L9790-01 9790-03 9790-02

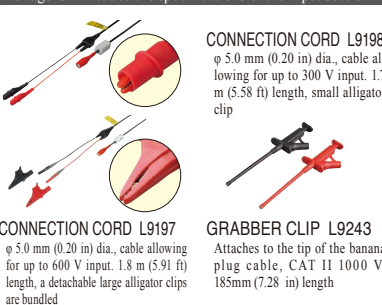
***Voltage is limited to the specifications of the input section**

Input cable (B)

CONNECTION CORD L9198
 ϕ 5.0 mm (0.20 in) dia., cable allowing for up to 300 V input. 1.7 m (5.58 ft) length, small alligator clip

GRABBER CLIP L9243
Attaches to the tip of the banana plug cable, CAT II 1000 V, 185mm (7.28 in) length

CONNECTION CORD L9197
 ϕ 5.0 mm (0.20 in) dia., cable allowing for up to 600 V input. 1.8 m (5.91 ft) length, a detachable large alligator clips are bundled



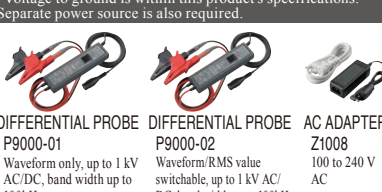
***Voltage to ground is within this product's specifications. Separate power source is also required.**

Input cable (D)

DIFFERENTIAL PROBE P9000-01
Waveform only, up to 1 kV AC/DC, band width up to 100kHz

DIFFERENTIAL PROBE P9000-02
Waveform/RMS value switchable, up to 1 kV AC/DC, band width up to 100kHz

AC ADAPTER Z1008
100 to 240 V AC

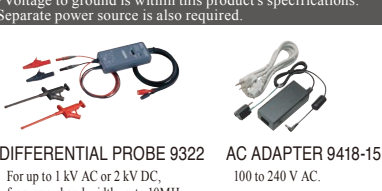


***Voltage to ground is within this product's specifications. Separate power source is also required.**

Input cable (E)

DIFFERENTIAL PROBE 9322
For up to 1 kV AC or 2 kV DC, frequency band width up to 10MHz

AC ADAPTER 9418-15
100 to 240 V AC.

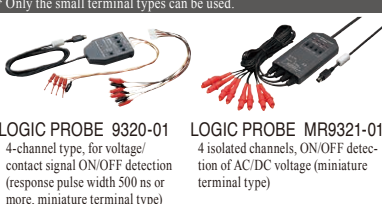


*** Only the small terminal types can be used.**

Logic signal measurement

LOGIC PROBE 9320-01
4-channel type, for voltage/contact signal ON/OFF detection (response pulse width 500 ns or more, miniature terminal type)

LOGIC PROBE MR9321-01
4 isolated channels, ON/OFF detection of AC/DC voltage (miniature terminal type)



Model : MEMORY HiCORDER MR8870

Model No. (Order Code) (Note)

MR8870-20 (2ch, English model)

**Test leads are not included. Purchase the leads appropriate for your application separately*



***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.

Storage media

PC CARD 2G 9830
(2 GB)

PC CARD 1G 9729
(1 GB)

PC CARD 512M 9728
(512 MB)



***Z1005 is a bundled accessory**

Power supply

BATTERY PACK 9780
NiMH, Charges while installed in the main unit

AC ADAPTER Z1005
100 to 240 V AC



***The 9809 is a bundled accessory**

Other options

SOFT CASE 9812
Includes space for small items, neoprene rubber

CARRYING CASE 9782
Includes compartment for options, resin-coated

PROTECTION SHEET 9809
For LCD protection, pairs of additional sheets

CONNECTION CORD L9217
Cord has insulated BNC connectors at both ends, 1.6 m (5.25 ft) length



***A separate power supply (CT955x) is required in order to use a high-precision current sensor.**
***Only sensors with ME15W (12-pin) terminals (-05 type) can be connected to the CT955x.**
***The separately available Conversion Cable CT9900 is required in order to use a sensor with PL23 (10-pin) terminal.**

POWER SUPPLY for Current Sensors

SENSOR UNIT CT9555 1ch, with Waveform output

CONNECTION CORD L9217
Cord has insulated BNC connectors at both ends, 1.6 m (5.25 ft) length

PL23 (10-pin) - ME15W (12-pin) conversion

CONVERSION CABLE CT9900
Convert PL23 (10-pin) terminal to ME15W (12-pin) terminal

Up to 1000 A (High precision) *ME15W (12-pin) terminal type

High-precision pull-through current sensors, observe waveforms from DC to distorted AC

AC/DC CURRENT SENSOR CT6875A, 2 MHz, 500 A

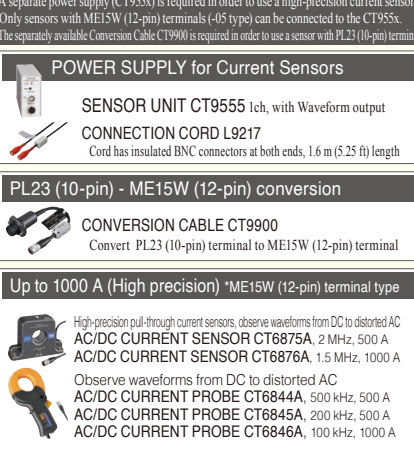
AC/DC CURRENT SENSOR CT6876A, 1.5 MHz, 1000 A

Observe waveforms from DC to distorted AC

AC/DC CURRENT PROBE CT6844A, 500 kHz, 500 A

AC/DC CURRENT PROBE CT6845A, 200 kHz, 500 A

AC/DC CURRENT PROBE CT6846A, 100 kHz, 1000 A



Precautions when connecting a high-precision current sensor to a Memory HiCorder

Connecting to the MR8880/MR8875/MR8870

- High-precision current sensor (ME15W) + CT9555 + BNC cable → MR8870
- High-precision current sensor (PL23) + CT9900 + CT9555 + BNC cable → MR8870

Other current sensor types

The MR8870 can be used with various types of current sensors and probes. For details, see product information on HioKI's website.

The CM7290 (available separately) is required in order to use these current sensors.

100 A to 2000 A (Medium speed)

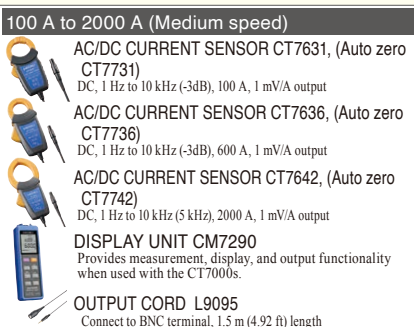
AC/DC CURRENT SENSOR CT7631, (Auto zero CT7731)
DC, 1 Hz to 10 kHz (-3dB), 100 A, 1 mV/A output

AC/DC CURRENT SENSOR CT7636, (Auto zero CT7736)
DC, 1 Hz to 10 kHz (-3dB), 600 A, 1 mV/A output

AC/DC CURRENT SENSOR CT7642, (Auto zero CT7742)
DC, 1 Hz to 10 kHz (5 kHz), 2000 A, 1 mV/A output

DISPLAY UNIT CM7290
Provides measurement, display, and output functionality when used with the CT7000s.

OUTPUT CORD L9095
Connect to BNC terminal, 1.5 m (4.92 ft) length

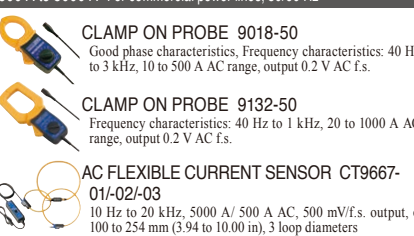


500 A to 5000 A *For commercial power lines, 50/60 Hz

CLAMP ON PROBE 9018-50
Good phase characteristics, Frequency characteristics: 40 Hz to 3 kHz, 10 to 500 A AC range, output 0.2 V AC f.s.

CLAMP ON PROBE 9132-50
Frequency characteristics: 40 Hz to 1 kHz, 20 to 1000 A AC range, output 0.2 V AC f.s.

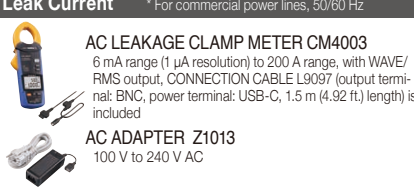
AC FLEXIBLE CURRENT SENSOR CT9667-01/-02/-03
10 Hz to 20 kHz, 5000 A/ 500 A AC, 500 mV/f.s. output, ϕ 100 to 254 mm (3.94 to 10.00 in), 3 loop diameters



Leak Current * For commercial power lines, 50/60 Hz

AC LEAKAGE CLAMP METER CM4003
6 mA range (1 μ A resolution) to 200 A range, with WAVE/RMS output, CONNECTION CABLE L9097 (output terminal: BNC, power terminal: USB-C, 1.5 m (4.92 ft) length) is included

AC ADAPTER Z1013
100 V to 240 V AC



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