MEMORY HiCORDER MR8847A

Max. 20 MS/s high-speed sampling
All analog channels isolated Max. 16 channels
Logic channels Max. 64 ch 16 channels standard

For on-site work and R&D testing
Global Standard Recorder

High-voltage 1000 V direct input measurement

HIGH-VOLTAGE UNIT Max. 1 MS/s high-speed sampling, 16-bit resolution measurement

Generate and record in a single unit

ARBITRARY WAVEFORM GENERATOR UNIT Reproduce and output problematic waveform measurements
No amp needed; max. 15 V output

CE Guarantee
A high-spec, high-quality versatile measuring device

20 MS/sec sampling speed
Perform multi-channel, high-speed sampling at 20 M samples/sec (time axis resolution: 50 nsec) for all channels at the same time.

Isolated input for all channels
Connections between analog input channels, and between the input channel and the main unit, are isolated by isolation elements. So potential differences can be measured without any concerns, just like with an oscilloscope.

A4 size built-in printer
Print large, high-definition hard copies for easy on-site checking. Paper is easy to replace by inserting a new roll, rolling out the paper slightly, and then closing the cover.
Hioki has developed an internal storage FPGA for super-high-speed access. Used in combination with large capacity high-speed memory, this enables many hours of high-speed sampling to be recorded.

The MR8847A is resistant to strong mechanical shock and vibration, such as short drops.

The durable design has been tested to withstand vertical drops of up to 50 cm.

* Tested based on in-house conditions. A dropped unit is not guaranteed to be free of damage or trouble.

Abundant modules

Hioki has added new high-performance modules in response to overwhelming demand. The Memory HiCorder now supports a wide variety of measurements.

64 logic input channels +10 analog channels

The MR8847A has 16 built-in logic input channels. Add 3 logic input units to record a total of 64 channels at once. You can also display the waveforms for all channels on a single screen—ideal for timing measurements. Up to 10 channels of analog waveforms can be recorded at the same time for efficiency.

Large 512 MW capacity (MR8847-53 only)

Hioki has developed an internal storage FPGA for super-high-speed access. Used in combination with large capacity high-speed memory, this enables many hours of high-speed sampling to be recorded.

NEW SSD 128 GB storage media

The new internal SSD unit (available as an additional option) has 128 GB of capacity, allowing large amounts of data to be stored.

Durable design, with resistance to dropping up to 50 cm

The MR8847A is resistant to strong mechanical shock and vibration, such as short drops. The durable design has been tested to withstand vertical drops of up to 50 cm.

* Tested based on in-house conditions. A dropped unit is not guaranteed to be free of damage or trouble.
HIGH VOLTAGE UNIT U8974

Directly input high voltage without a differential probe

1000 V DC, 700 V AC high-voltage direct input

Since you can directly input up to 1000 V DC and 700 V AC, a differential probe is no longer necessary. Maximum rated voltage to ground is 1000 V for CAT III and 600 V for CAT IV environments.

Global power supply line measurement

Ideal for primary and secondary measurements of UPS power supplies and commercial power supply transformers, and for recording the primary and secondary waveforms of inverters. It can also be used to measure high-voltage power supply lines, such as 380 V and 480 V systems used in many countries.

Applicable to a variety of characteristics tests

Maximum 1 MS/s high-speed sampling and 16-bit resolution allow the MR8847A to be used for interruption testing and switch testing. The voltage of each battery cell can be input separately. This uses 1000 V DC input, which can withstand even if high voltage is applied when a cell shorts. The digital voltmeter unit, which allows input up to 500 V DC, is suitable for the testing of individual battery cells.

Transformer Dump Tests

Interchannel isolation allows for safe circuit connections. Simultaneous high-speed sampling can record waveforms before and after the dump. Input large numbers of control and circuit signals.

Recommended units:

- HIGH VOLTAGE UNIT U8974
- CURRENT UNIT 8971
- LOGIC UNIT 8973

Application of each unit allows analysis of the correlation between voltage before and after the interruption of a generator, RPM fluctuation rate, governor servo motor operation conditions, and suppression machine switching.

- Maximum 1 MS/s high-speed sampling and 16-bit resolution in the high-voltage unit allow the MR8847A to be used for interruption and switch testing.
ARBITRARY WAVEFORM GENERATOR UNIT U8793

Generate and record in a single unit

Output and record results seamlessly

Just one MEMORY HiCORDER gives you a function generator mode, arbitrary waveform generator mode, and waveform measurement mode. This makes it easy to observe waveforms while varying test conditions, such as changing the signal’s amplitude and frequency and programming various waveforms to output in order.

Output recorded waveforms without modification

For example, you could output actual waveforms recorded from a car without modification, and then use them for standalone testing. You can also generate isolated output of up to 15 V without a generator or amplifier, which is traditionally necessary in order to generate output while varying the signal’s amplitude and frequency.

Process actual waveforms for reproducibility testing

Process and calculate signals recorded with the MEMORY HiCORDER and output the arbitrary waveforms that you create.

Waveform Maker Software included

After you install the included SF8000 Waveform Maker software on your computer, you can create waveforms easily by either entering them directly or by entering the functions behind them. You can also quickly add noise and multiply waveforms.

Anomality Simulation

Reproduce and output the observed waveforms without modification. When resolving problems observed during research or development, you can reproduce such problems for efficient testing.

Recommended units

- ARBITRARY WAVEFORM GENERATOR UNIT U8793
- ANALOG UNIT 8966
- HIGH RESOLUTION UNIT 8968

Record anomalous waveforms

Max. 15 V output + amplifier

Reproduce and output anomalous waveforms

- Create power supply waveforms such as power supply dips, instantaneous interruptions, and voltage fluctuations for immunity tests to regulate malfunctions in equipment caused by power supply harmonics to perform evaluation testing.
The right unit for your measurement needs

**Inverter / UPS Test**
- Operation testing and evaluation during load fluctuation
- Confirmation of UPS switching

Perfect for inverter and UPS evaluation / start-up tests. Record using both logic (control signals) and analog (primary/secondary voltage or current for a UPS or inverter).

**Power Monitor and Logger**
- Identify power fluctuations when power supply is turned ON/OFF and during load fluctuations
- Long-term fluctuations in power

Load the analog output for the rms (instant power / voltage / current, etc.) calculated by the power analyzer, or import the waveform output from the power analyzer to observe data for long-term tests or irregular waveforms.

**Control Simulation**
- Generate simulated output of each type of sensor signal
- Fluctuating simulated output for 12 V DC car batteries

Use actual waveforms to perform testing on control boards, such as for engine control, airbags, brake systems, power steering, and active suspension. This allows efficient simulation of actual waveforms obtained from cars.
Vibration / Endurance Tests

- Analyze the relationship between engine control and vibration
- Confirm equipment durability

512 MW of high-capacity memory makes it easy to observe vibration waveforms for many hours while performing high-speed sampling. This feature is perfect for detecting waveform peaks.

Replace multiple DMMs with a single unit

Save space by replacing multiple desktop DMM units with a single MEMORY HiCORDER. This eliminates the need to control multiple units and simplifies your system.

Digital Voltmeter Unit MR8990

Fine precision and resolution

Proprietary specifications for DC voltage measurements

Measure minute fluctuations in sensor output for automobiles or voltage fluctuations in batteries with high precision and at high resolution. The maximum voltage that you can input is 500 V DC. Another feature is high input resistance.

<table>
<thead>
<tr>
<th>Measurement range</th>
<th>Effective input range (Guaranteed measurement accuracy range)</th>
<th>Max. resolution</th>
<th>Input resistance</th>
<th>Measurement accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 mV/div (f.s. = 100 mV)</td>
<td>-120 mV to 120 mV</td>
<td>0.1 μV</td>
<td>±5%</td>
<td>±0.01% rdg., ±0.015% f.s.</td>
</tr>
<tr>
<td>50 mV/div (f.s. = 1000 mV)</td>
<td>-1200 mV to 1200 mV</td>
<td>1 μV</td>
<td>±0.01% rdg., ±0.015% f.s.</td>
<td></td>
</tr>
<tr>
<td>500 mV/div (f.s. = 10 V)</td>
<td>-12 V to 12 V</td>
<td>10 μV</td>
<td>±0.0025% rdg., ±0.003% f.s.</td>
<td></td>
</tr>
<tr>
<td>5 V/div (f.s. = 100 V)</td>
<td>-120 V to 120 V</td>
<td>100 μV</td>
<td>±5%</td>
<td>±0.025% rdg., ±0.003% f.s.</td>
</tr>
<tr>
<td>50 V/div (f.s. = 1000 V)</td>
<td>-500 V to 500 V</td>
<td>1 mV</td>
<td>±5%</td>
<td>±0.025% rdg., ±0.003% f.s.</td>
</tr>
</tbody>
</table>

- 6.5-digit display (Resolution: 0.1 μV), 24-bit high resolution
Full range of supporting functions

On-site assistance

Help function

Understand operation methods without even reading the instruction manual using the built-in Help function. Place the cursor on a field in the settings and press the HELP button to view a detailed description of that setting.

Master triggers

Set triggers while viewing waveforms

Set input triggers while checking waveforms. You can also display the settings screen separately as a floating screen.

Trigger functions for monitoring all measurement channels
- Level trigger for comparing a single voltage value
- Window trigger for comparing 2 voltage values
- Voltage drop trigger for detecting voltage drops in commercial power lines
- Period trigger for monitoring periods
- Glitch trigger for detecting anomalies in pulses
- Pattern trigger for comparisons when the logic signal is ON/OFF

Acquiring data with triggers, and post-acquisition searching

The MR8847A includes a search function for finding abnormal waveforms within all of the acquired data. You can use this function to search for anomalies after data has been acquired, when it is too difficult to set triggers because it is not possible to predict what types of anomalies might be observed.

Set the number of events for each source
* Only for level and glitch triggers

Set trigger conditions in a variety of combinations.

Label each channel

Comment entry function

Set comments for each channel and display them on the screen, even when observing multiple channels, making identification easy. When printing, you can also print the channel comments. Input comments directly on the unit or by using a USB keyboard.
Enlarge waveforms

**Zoom function**

Display time axis reduced waveforms at the top of the screen, and time axis enlarged waveforms at the bottom of the screen. You can use the scroll function to display the entire waveform while also observing specific parts.

- **Collapse waveform**
  - Check the entire waveform.

- **Expand waveform**
  - Enlarge/shrink along the time/vertical axes.

Scan and clip

**AB cursor function**

Apply the Zoom function to set point A and point B for the area you want to clip.

- **Scan**
  - Scan data at the cursor and the waveform’s cross point.

- **Extract**
  - Specify the segment to save as binary or CSV data.

PC operations

**Connect to LAN for HTTP/FTP server functions**

Use the HTTP function to operate the MEMORY HiCORDER with a browser on a PC connected via LAN. You can also use the FTP function to acquire data from the internal memory or from storage media inserted in the MEMORY HiCORDER. You can even acquire data from the internal memory or from storage media connected to the MEMORY HiCORDER via USB.
Record the data you need

Simultaneous recording on storage media

Memory functions

- Sampling is done at the set period, and all data is recorded.
- Automatic data saving on SSD / CF card or USB memory stick
- During high-speed sampling, data is written to internal memory first and later saved on other media
- During low-speed sampling, data is written to internal memory while also saved on other media
- Highly effective for long-term recording

Maximum Recording Time to internal memory (excerpt)

- Caution: Available recording duration is determined by internal RAM capacity, not by external media.
- Caution: Although USB memory sticks enable automatic data saving, for more reliable data protection, we recommend use of HIOKI CF cards, which are guaranteed to work with the instrument.
- Note: Table shows maximum values at arbitrary recording length settings.
- Note: Saving to media in near real-time is possible at sampling speeds of 100 ms/div (1 msec sampling) or slower.

Analysis software

WAVE PROCESSOR 9335

(Software sold separately)

- Waveform display, calculations
- Print function

9335 Brief Specifications

- Display functions: Waveform display, X-Y display, Cursor function, etc.
- File backing: Readable data formats (.MEM, .REC, .RMS, .POW)
- Maximum loadable file size: Maximum file size that can be saved by a given device (file size may be limited depending on the computer configuration)
- Data conversion: Conversion to CSV format, Batch conversion of multiple files, etc.
- Print function: Printing image file output (expanded META type, *.EMF)
- Print formatting: 1 up, 2-to-16 up, 2-to-16 rows, X-Y 1-to-4 up, preview, hard copy

LAN COMMUNICATOR 9333

(Software sold separately)

- Auto-save waveform data to PC
- Remote control via LAN connection
- Save in CSV format and transfer to spreadsheet programs

9333 Brief Specifications

- Display functions: Waveform display, X-Y display, Cursor function, etc.
- File backing: Readable data formats (.MEM, .REC, .RMS, .POW)
- Maximum loadable file size: Maximum file size that can be saved by a given device (file size may be limited depending on the computer configuration)
- Data conversion: Conversion to CSV format, Batch conversion of multiple files, etc.
- Auto-save waveform data to PC: Remote control of Memory HiCorder (by sending key codes and receiving images on screen), print report, print images from the screen, receive waveform data in same format as waveform files from the Memory HiCorder (binary only)
- Waveform data acquisition: Accept auto-saves from the Memory HiCorder, same format as auto-save files of Memory HiCorder (binary only), print automatically with a Memory HiCorder from a PC
- Waveform viewer: Simple display of waveform files, conversion to CSV format, etc.
Chart recording without missing transient events

Recorder functions

Sampling is done at the set period, and data other than the maximum and minimum values is thinned out for recording.

- High-speed sampling ensures that transient events are captured also with slow recording
- Data compression achieved by recording maximum/minimum value pairs
- Max. 833-day (1 hr/div) long-term recording even for 64 MW model
- Continuous recording until paper runs out for chart output

Maximum Recording Time with the Recorder function

<table>
<thead>
<tr>
<th>REC time axis</th>
<th>Sampling period</th>
<th>To internal memory</th>
<th>Continuous (approx. recording time with 30 m paper roll)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 ms/div</td>
<td>33 min 20 s</td>
<td>Display only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>200 ms/div</td>
<td>1 h 6 min 40 s</td>
<td>Display only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>200 ms/div</td>
<td>2 h 46 min 40 s</td>
<td>24 min 46 s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 s/div</td>
<td>5 h 33 min 20 s</td>
<td>49 min 30 s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 s/div</td>
<td>11 h 6 min 40 s</td>
<td>1 h 39 min 00 s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 s/div</td>
<td>1 d 3 h 46 min 40 s</td>
<td>4 h 7 min 30 s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 s/div</td>
<td>2 d 7 h 33 min 20 s</td>
<td>8 h 15 min 00 s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 s/div</td>
<td>6 d 22 h 40 min 00 s</td>
<td>24 h 45 min 00 s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 s/div</td>
<td>11 d 13 h 46 min 40 s</td>
<td>1 d 17 h 15 min 00 s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 s/div</td>
<td>2 d 1 h 20 min 00 s</td>
<td>2 d 1 h 30 min 00 s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>200 s/div</td>
<td>27 d 18 h 40 min 00 s</td>
<td>4 d 3 h 00 min 00 s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 min/div</td>
<td>69 d 10 h 40 min 00 s</td>
<td>10 d 7 h 30 min 00 s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 min/div</td>
<td>138 d 21 h 20 min 00 s</td>
<td>20 d 15 h 00 min 00 s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 min/div</td>
<td>416 d 16 h 00 min 00 s</td>
<td>61 d 21 h 00 min 00 s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 h/div</td>
<td>833 d 8 h 00 min 00 s</td>
<td>123 d 18 h 00 min 00 s</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes
- When opening data created with the Recorder function on a computer, the maximum and minimum data pairs are lined up in a time series.
- Length of printer paper roll is 30 meters. Paper can be changed during operation without stopping the recording process.
- With settings between 100 ms and 200 ms/div on the time axis, continuous recording is not possible if printer is ON.
- The table shows values for the MR8847-51 (64 M-words memory capacity). Model MR8847-52 (256 MW) can record four times and Model MR8847-53 (512 MW) eight times as much. At "Continuous" setting in recording length, total recording time cannot be increased.

iPad App for Memory HiCorder HMR Terminal

Free app (exclusively for iPad) downloadable from the App Store

- Freely control waveforms using iPad’s gesture controls
- Fingertip operation of Max. 32 channels of waveform data
- Operate the Memory HiCorder via network
You can change settings, and monitor waveforms during measurement.

Wave Viewer Wv (Bundled software)

- Check waveforms with binary data on a PC
- Save data in CSV format and transfer to spreadsheet programs

Wave Viewer (Wv) Brief Specifications

<table>
<thead>
<tr>
<th>Operating environment</th>
<th>Functions</th>
</tr>
</thead>
</table>
| Windows 10/8/7 (32/64-bit) | - Simple display of waveform files  
- Convert binary data files to text format, CSV, etc.  
- Scroll function, enlarge/reduce display, jump to cursor/finger position, etc. |

HMR Terminal Brief specifications (free software)

<table>
<thead>
<tr>
<th>Operating environment</th>
<th>Functions</th>
</tr>
</thead>
</table>
| OS on the iPad (Apple Inc.) | - Data acquisition: Send-to-iPad via FTP  
- Intuitively operate waveform level searches, maximum/minimum/average values, zero position adjustment, and more at your fingertips  
- Waveform monitoring  
- Meter setting  
- Logic waveforms and computational waveforms are not supported |
Definitive analysis of important data

Calculate parameter values from measured waveforms

The MR8847A can perform 24 calculations, including RMS, peak value, and maximum value, from measured waveforms. It can also perform time difference measurements, phase difference measurements, histogram measurements for HIGH level and LOW level, and statistical processing. Calculation results are displayed together on the waveform observation screen.

Process waveforms with formulas

If you know the required formulas, you can also perform complicated calculations. By entering formulas, you can perform a variety of calculations even after measurements are complete. For example, you can make the settings shown on the right to find the RMS value from a measured waveform.

FFT analysis function

The MR8847A can perform one-signal FFT for analyzing frequency components, two-signal FFT for analyzing transfer functions, and octave analysis for acoustics.

FFT calculations from memory waveforms

When performing FFT analysis of data measured with the memory function, you can use the jog shuttle to specify analysis points while also viewing the calculation results at the same time. You can also display both the raw data measured with the memory function and the calculation results for storage waveforms at the same time, which improves operability during analysis by displaying spectrum waveforms while checking the results of window functions.

Running spectrum display

Display the spectrum as it changes over time in 3D

Change the number of calculation points after measurement

Scaling by 'dB'

Before scaling  
After scaling
**X-Y RECORDER**

Now even easier to use with independent pen up/down control. Saving data in chronological order allows records to be saved as digital data, rather than paper hardcopies that need to be stored.

**Pen up/down control**

Pen up/down during X-Y recording is controlled independently. Press the function button or use an external control terminal (EXT. IN 1, 2, 3) for external control.

**Replaces mechanical pen recorders**

Use pen up/down control to record only the required data. This allows you to reduce the amount of unnecessary data that is recorded, and lower the running cost for paper.

**Determine waveform quality**

Use the waveform judgment function, which monitors whether a waveform extends beyond the given area, to easily determine the quality of signal waveforms that are normally difficult to judge. For time axis ranges that are slower than 100 msec/div, you can even make judgments while loading waveforms. This allows you to take the appropriate action the moment a poor waveform is detected on the production line. You can stop the line as soon as an abnormality is detected.

**Judge FFT analysis waveforms**

Judge FFT analysis waveforms in the same way.

**Judge X-Y waveforms**

In addition to time axis signals, the MR8847A also has a waveform judgment function for X-Y waveforms built in. Use this to detect:
- Displacement and pressure of presses
- Pressure and flow rate of pumps
The X-Y waveforms of the above and other data can be tested automatically based on area judgment.
**Product Specifications**

**Basic Specifications**

<table>
<thead>
<tr>
<th>Measurement functions</th>
<th>MEMORY (high-speed recording), RECORDER (real-time recording)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[8 analog input modules]: 16 analog channels + 16 logic channels (built-in)</td>
<td>XY RECORDER/FET</td>
</tr>
<tr>
<td>[5 analog input modules + 3 logic input modules]: 10 analog channels + 64 logic channels (16 built-in channels + 48 channels in logic input modules)</td>
<td></td>
</tr>
<tr>
<td>* For analog units, channels are isolated from each other and from frame GND. For logic units and internal standard logic terminals, all channels have a common ground.</td>
<td></td>
</tr>
<tr>
<td>Max. sampling speed</td>
<td>20 MS/second (50 ns period, all channels simultaneously)</td>
</tr>
<tr>
<td>External sampling (10 MS/second, 100 ns period)</td>
<td></td>
</tr>
<tr>
<td>Memory capacity</td>
<td></td>
</tr>
<tr>
<td>MR8847-51: Total 64 M-words (Memory expansion: none) 52 MW/ch (using 2 Analog channels), to 4 MW/ch (using 16 Analog channels)</td>
<td></td>
</tr>
<tr>
<td>MR8847-52: Total 256 M-words (Memory expansion: none) 256 MW/ch (using 2 Analog channels), to 16 MW/ch (using 16 Analog channels)</td>
<td></td>
</tr>
<tr>
<td>MR8847-53: Total 512 M-words (Memory expansion: none) 512 MW/ch (using 2 Analog channels), to 256 MW/ch (using 16 Analog channels)</td>
<td></td>
</tr>
<tr>
<td>Removable storage</td>
<td>CF card slot (standard) + 1 (up to 2GB, FAT, or FAT-32 format), SSD (128 GB, optional), USB memory stick (USB 2.0)</td>
</tr>
<tr>
<td>Backup function</td>
<td>Clock and parameter setting backup: at least 10 years, Waveform backup function: none</td>
</tr>
<tr>
<td>Control terminals</td>
<td>External trigger input, Trigger output, External sampling input, Two external outputs (G0, G1), Three external inputs (START, STOP, PRINT)</td>
</tr>
<tr>
<td>External interface</td>
<td>USB: USB2.0 compliant, series A receptacle ×1, series B receptacle (for use with the DC POWER UNIT 9784; Factory installation only)</td>
</tr>
<tr>
<td>Environmental conditions (no condensation)</td>
<td>Operation: -15°C to 40°C (5°F to 104°F), 20% to 80% RH</td>
</tr>
<tr>
<td>With printer and/or SSD in use: 0°C to 40°C (32°F to 104°F), 20% to 80% RH</td>
<td></td>
</tr>
<tr>
<td>Storage: -20°C to 50°C (-4°F to 122°F), 90% RH or less</td>
<td></td>
</tr>
<tr>
<td>Compliance standard</td>
<td>Safety: EN61010</td>
</tr>
<tr>
<td>ENMC: EN61326, EN61000-3-2, EN61000-3-3</td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>100 to 240 V AC, 50/60 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>130 VA max. (Printer not used), 220 VA max. (Printer used)</td>
</tr>
<tr>
<td>Dimensions and mass</td>
<td>Approx. 351 mm (13.82 in) W × 261 mm (10.28 in) H × 140 mm (5.51 in) D, 7.6 kg (16.81 lb) main unit only</td>
</tr>
<tr>
<td>Accessories</td>
<td>Instruction Manual ×1, Measurement Guide ×1, Application Disk (Waveform Maker Software SF8000, Wave Viewer Wv, Communication Commands table) ×1, Power cord ×1, Input cord label ×1, USB cable ×1, Printer paper ×1, Roll paper attachment ×2, Ferrite clamp ×1</td>
</tr>
<tr>
<td>Internal printer</td>
<td></td>
</tr>
<tr>
<td>Features</td>
<td>Printer paper one-touch loading, high-speed thermal printing</td>
</tr>
<tr>
<td>Recording Paper</td>
<td></td>
</tr>
<tr>
<td>Paper feed density</td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>Max. 50 mm (1.97 in/sec)</td>
</tr>
<tr>
<td>Display section</td>
<td></td>
</tr>
<tr>
<td>Display language</td>
<td>English, Japanese, Korean, Chinese</td>
</tr>
<tr>
<td>Waveform display</td>
<td>Time axis: x10 to x2 (zoom at MEMORY function only), x1, x/12 to x/2000</td>
</tr>
<tr>
<td>Zoom/compression</td>
<td>Voltage axis: x10 to x2, x1/2 to x1/2000</td>
</tr>
<tr>
<td>Variable display</td>
<td>Upper/Lower limit set, display/div set</td>
</tr>
<tr>
<td>Scaling</td>
<td>80 to 10 000:1, automatic scaling for various probes</td>
</tr>
<tr>
<td>Comment entry</td>
<td>Manual scaling (conversion ratio setting, 2-point setting, unit setting)</td>
</tr>
<tr>
<td>Logic waveform</td>
<td>Display point move 1% step, Line width 3 types</td>
</tr>
<tr>
<td>Display partition</td>
<td>Max. 16 graphs</td>
</tr>
<tr>
<td>Monitor functions</td>
<td>Level monitor</td>
</tr>
<tr>
<td>Other display functions</td>
<td>Waveform inversion (positive/negative)</td>
</tr>
<tr>
<td>- Cursor measurement (A, B, cursor, for all channels)</td>
<td></td>
</tr>
<tr>
<td>- Vernier function (amplitude fine adjustment)</td>
<td></td>
</tr>
<tr>
<td>- Zoom function (horizontal screen division, zoomed waveform shown in lower section)</td>
<td></td>
</tr>
<tr>
<td>- 16 selectable colors for waveform display</td>
<td></td>
</tr>
<tr>
<td>- Zero position shift in 1% steps for analog waveform</td>
<td></td>
</tr>
<tr>
<td>- Global zero adjust for all channels and all ranges</td>
<td></td>
</tr>
<tr>
<td>MEMORY (High-speed recording)</td>
<td></td>
</tr>
<tr>
<td>Time axis</td>
<td>3 ps to 5 m/div (100 samples/div) 26 ranges, External sampling: 100 samples/div, or free setting, Time axis zoom: x2 to x10 in 3 stages, compression: 1/2 to 1/2000 in 16 stages</td>
</tr>
<tr>
<td>Sampling period</td>
<td>1/100 of time axis range (minimum 50 ms period)</td>
</tr>
<tr>
<td>Recording length</td>
<td>MR8847-51: 16 ch margin: 25 to 20 000 div, 2 ch margin: 25 to 200 000 div (built-in preset) or arbitrary setting in 1-dip steps (max. 500 000 div)</td>
</tr>
<tr>
<td>Pre-trigger</td>
<td>Record data from before the trigger point at 0 to +100% or -95% of the recording length in 15 stages, or in 1 div step settings</td>
</tr>
<tr>
<td>Numerical calculations</td>
<td>Simultaneous calculation for up to 16 selected channels</td>
</tr>
<tr>
<td>Average value, effective (rms) value, peak to peak value, maximum value, time to maximum value, minimum value, time to minimum value, period, frequency, rise time, fall time, standard deviation, area value, X-Y area value, specified level time, specified time level, pulse width, duty ratio, pulse count, four arithmetic operations, time difference, phase difference, high-level and low-level</td>
<td></td>
</tr>
<tr>
<td>- Calculation result evaluation output: G0/G1 (with open-collector 5 V output)</td>
<td></td>
</tr>
<tr>
<td>Automatic saving of calculation results</td>
<td></td>
</tr>
<tr>
<td>Waveform processing</td>
<td>For up to 16 freely selectable channels, the following functions can be performed (results are automatically stored): Automatic saving of four arithmetic operations, absolute value, exponentiation, common logarithm, square root, moving average, differentiation (primary, secondary), integration (primary, secondary), parallel displacement among channels, trigonometric functions, reverse trigonometric functions, calculation results</td>
</tr>
<tr>
<td>Memory segmentation</td>
<td>- No logging</td>
</tr>
<tr>
<td>Other</td>
<td>- XY waveform synthesis (1-screen, 4-screens)</td>
</tr>
<tr>
<td></td>
<td>- Overlay (always overlay when started/overlay only required waveform)</td>
</tr>
<tr>
<td></td>
<td>- Automatic/ Manual / A-B cursor range printing/ Report printing</td>
</tr>
<tr>
<td>Recorder (Real-time recording)</td>
<td>10 ms to 1 hour/div, 19 ranges, time axis resolution 100 points/div * Out of data acquired at selected sampling rate, only maximum and minimum value data determined using 100 points/div units are stored.</td>
</tr>
<tr>
<td>Sampling period</td>
<td>1/100 to 1000 ps, 1/100 ms (selectable from 1/100 to 1/50 000)</td>
</tr>
<tr>
<td>Real-time printing</td>
<td>Supported</td>
</tr>
<tr>
<td></td>
<td>* Real-time printing is possible at time axes settings slower than 500 mDIV</td>
</tr>
<tr>
<td></td>
<td>* Delayed print is performed when recording length is not set to &quot;Continuous&quot; and time axis setting is 10 ms to 200 ms/div</td>
</tr>
<tr>
<td></td>
<td>* When recording length is set to &quot;Continuous&quot; and time axis setting is 10 ms to 200 ms/div, manual printing can be performed after measurement stop</td>
</tr>
<tr>
<td>Recording length</td>
<td>MR8847-51: Built-in presets of 25 to 20 000 div, or &quot;Continuous&quot; or arbitrary setting in 1-dip steps (max. 20 000 div)</td>
</tr>
<tr>
<td></td>
<td>MR8847-52: Built-in presets of 25 to 50 000 div, or &quot;Continuous&quot; or arbitrary setting in 1-dip steps (max. 50 000 div)</td>
</tr>
<tr>
<td></td>
<td>MR8847-53: Built-in presets of 25 to 100 000 div, or &quot;Continuous&quot; or arbitrary setting in 1-dip steps (max. 100 000 div)</td>
</tr>
<tr>
<td>Additional recording</td>
<td>Supported (recording is resumed without overwriting previous data)</td>
</tr>
<tr>
<td>Waveform memory</td>
<td>Store data for most recent 20 000 div in memory</td>
</tr>
<tr>
<td>Waveform memory</td>
<td>Store data for most recent 80 000 div in memory</td>
</tr>
<tr>
<td>Waveform memory</td>
<td>Store data for most recent 160 000 div in memory</td>
</tr>
<tr>
<td>Auto saving</td>
<td>* Backward scrolling and re-printing available</td>
</tr>
<tr>
<td>Data are automatically saved on CF card, USB memory stick or internal drive after measurement stops.</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>No logging</td>
</tr>
<tr>
<td></td>
<td>Manual / A-B cursor range printing/ Report printing</td>
</tr>
<tr>
<td>X-Y Recorder (X-Y real-time recording)</td>
<td></td>
</tr>
<tr>
<td>Sampling period</td>
<td>1/100 ms (dot), 100 ms (line)</td>
</tr>
<tr>
<td>Recording length</td>
<td>Continuous</td>
</tr>
<tr>
<td>Screen, Printing</td>
<td>Split screen (1 or 4), Manual printing only</td>
</tr>
<tr>
<td>Number of X-Y</td>
<td>1 to 8 phenomena</td>
</tr>
<tr>
<td>X-Y channel setting</td>
<td>Any 8 channels out of 16 can be selected for X axis and Y axis respectively</td>
</tr>
<tr>
<td>X-Y axis resolution</td>
<td>25 dots/div (screen), horizontal 80 dots/div × vertical 80 dots/div printer</td>
</tr>
<tr>
<td>Waveform memory</td>
<td>Sampling data for last 4 000 000 points are stored in memory</td>
</tr>
<tr>
<td>Pen up/down</td>
<td>Simultaneous for all phenomena</td>
</tr>
<tr>
<td>External pen control</td>
<td>Possible via external input connector (simultaneous up/down for all phenomena)</td>
</tr>
</tbody>
</table>
### Trigger functions

**Trigger mode**
- MEMORY (high-speed recording), FFT: Single, Repeat, Auto RECODER (real-time recording). Single, Repeat

**Trigger source**
- CH1 to CH6 (analog), Standard Logic 16ch + Logic Unit (Max. 3 units 48 channels), External (a rise of 2.5V or terminal short circuit), Timer, Manual (either ON or OFF for each source), Logical AND/OR of sources

**Trigger types**
- **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 commercial power supply only)
- **Window**: Triggering occurs when window defined by upper and lower limit is entered or exited

**Period**: Rising edge or falling edge cycle of preset voltage value is measured and triggering occurs when defined cycle range is exceeded

**Glitch**: Triggering occurs when pulse width from rising or falling edge of preset voltage edge is under run

**Event setting**: Event count is performed for each source, and triggering occurs when a preset count is exceeded

- **Logic**: 1, 0, or ×, Pattern setting

### Level setting resolution
- 0.1% of full scale (full scale = 20 divisions)

### Trigger filter
- Selectable 0.1 div to 10.0 div, or OFF (high-speed recording)
- ON (10 ms off) or OFF (at RECODER function)

### Trigger output
- Open collector (5 voltage output, active Low)
- At Level setting: pulse width (Sampling period + data number after trigger)
- At Pulse setting: pulse width (2 ms)

### Other functions
- Trigger priority (OFF/ON), Pre-trigger function for capturing data from before / after trigger event (at MEMORY function), Level display during trigger standby, Start and stop trigger (at RECODER function), Trigger search function

### Maximum Internal Memory Recording Time (MEMORY Function)

<table>
<thead>
<tr>
<th>Timebase</th>
<th>Analog 16 ch + Internal Logic 16 ch</th>
<th>Analog 2 ch + Internal Logic 16 ch</th>
<th>Analog 16 ch + Internal Logic 16 ch</th>
<th>Analog 2 ch + Internal Logic 16 ch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timebase</td>
<td>40 000 divisions</td>
<td>300 000 div</td>
<td>50 000 divisions</td>
<td>400 000 divisions</td>
</tr>
</tbody>
</table>

#### Measurement Indices
- **Max. resolution**: 50 µV
- **Temperature (Thermocouple)**
  - 220°C (392°F) f.s. to 800°C (1472°F) f.s.
  - Note: Upper and lower limit values depend on the thermocouple
  - 0.01°C (0.02°F)

#### Other
- Storage waveform, Linear spectrum, RMS spectrum, Power spectrum, Density of power spectrum, Cross power spectrum, Auto-correlation function, Histogram, Transfer function, Cross-correlation function, Impulse response, Coherence function, 1/1 Octave analysis, 1/3 Octave analysis, LPC analysis, Phase spectrum

### Analysis mode
- Selectable from all analog input channels

#### Analysis channels
- 133 mHz to 8 MHz, External
- Resolution: 1/4096, 1/8192, 1/16384, 1/32768

#### Number of sampling points
- 1000, 2000, 5000, 10 000 points

#### Display format
- Single, Dual, Nyquist, Running spectrum

#### Averaging function
- Time axis / frequency axis simple averaging, Exponential averaging, Peak hold (frequency axis), Averaging times: 2 times to 10 000 times

#### Print functions
- Same as the previous function (print partial print not available)

### FTT function

#### Waveform judgment function (In MEMORY or FFT function)
- Area comparison with reference waveform area for time domain waveform, X-Y waveform, or FFT analysis waveform
- Parameter calculated value comparison with reference value
- Output: GO/NG decision, Open-collector 5V
* 100 microsec (1 msec sampling) and thereafter allows for evaluation in almost real-time

#### Measurement Indices
- **Max. resolution**: 100 mV f.s. to 400 V f.s.
- **Voltage**: 100 mV f.s. to 400 V f.s.
- **Current**: 100 mV f.s. to 400 V f.s.
- **Frequency**: 100 mV f.s. to 1000 V f.s.
- **Resistivity**: 100 mV f.s. to 400 V f.s.

#### Notes
- Each unit has two input channels, except Logic Unit.
- Besides logic units (16 channels), the MRB847A series comes standard with 16 logic inputs integrated in the device.

### Notes
- Saving to media in near real-time is possible at sampling speeds of 100 m/s/div (1 msec sampling) or slower.
- Operation cannot be guaranteed for extended recording periods one year or longer. The above table represents theoretical values.
16. Optional Specifications (sold separately)

Dimensions and mass: approx. 106 mm (4.17 in) W × 19.8 mm (0.78 in) H × 196.5 mm (7.74 in) D, approx. 250 g (8.8 oz) Accessories: None

ANALOG UNIT 8996

Measurement functions
- Number of channels: 2, for voltage measurement
- Input terminals: Isolated BNC connector (input impedance 1 MΩ, input capacity 30 pF)
- Max. rated voltage to ground: 300 V AC or DC (with input isolated from the main unit, the maximum voltage that can be applied between input channel and chassis, and between input channels without damage)
- Measurement range
  - mV to 20 V: dc, full range, 32 channels, 20 ms, AC voltage for possible measurement/display using the memory function. 280 V rms, Low-pass filter: 5/50/500 Hz, ±5 kHz

Frequency characteristics
- Input terminals: Isolated BNC connector (input impedance 1 MΩ, input capacity 30 pF)
- Max. rated voltage to ground: 300 V AC or DC (with input isolated from the main unit, the maximum voltage that can be applied between input channel and chassis, and between input channels without damage)
- Frequency mode
  - Range: Between 0 Hz to 1 kHz (maximum width pulse 2μs, 1 Hz/div to 5 kHz (full scale = 20 μs))
  - Settings
    - Accuracy: 0.1% (±5 kHz) (full scale = 5 kHz)

Input coupling
- DC/0
- Maximum input voltage: 50 V DC (maximum voltage that can be applied between input connectors without damage)

Dimensions and mass: approx. 106 mm (4.17 in) W × 19.8 mm (0.78 in) H × 196.5 mm (7.74 in) D, approx. 250 g (8.8 oz) Accessories: None

FREQ UNIT 8970

Measurement functions
- Number of channels: 2, for voltage input based frequency measurement, rotation, power frequency, integration, pulse duty ratio, pulse width, RMS
- Input terminals: Isolated BNC connector (input impedance 1 MΩ, input capacity 30 pF)
- Max. rated voltage to ground: 300 V AC or DC (with input isolated from the main unit, the maximum voltage that can be applied between input channel and chassis, and between input channels without damage)
- Frequency mode
  - Range: Between 0 Hz to 100 kHz (minimum width pulse 2 μs, 1 Hz/div to 5 kHz (full scale = 20 μs))
  - Settings
    - Accuracy: 0.1% (±5 kHz) (full scale = 5 kHz)

Rotation mode
- Range: Between 0 to 2 million rotations/minute (minimum width pulse 2 μs, 100 counts to 100 μm/div (full scale = 20 μs), 7 settings)

Accuracy
- 0.1% (±5 kHz) (full scale = 5 kHz)

Power frequency mode
- Range: 50 Hz (60 Hz to 60 Hz, 60 Hz to 60 Hz, 400 Hz (500 Hz to 400 Hz) (full scale = 5 kHz), 3 settings)

Integration mode
- Range: 2 counts to 1 MeV Coulomb, 6 settings

Dimensions and mass: approx. 106 mm (4.17 in) W × 19.8 mm (0.78 in) H × 196.5 mm (7.74 in) D, approx. 250 g (8.8 oz) Accessories: None

TEMP UNIT 8967

Measurement functions
- Number of channels: 2, for temperature measurement with thermocouple (voltage measurement not available)
- Input terminals: Thermaprobe plug-in connector. Recommended wire size: single wire, 0.14 to 0.78 in (3.5 to 19.5 mm) diameter, 0.018 in (0.4 mm) solid, 0.02 to 0.12 in (0.5 to 3.0 mm) stranded, 0.02 in (0.5 mm) outer diameter. 18 AWG to 26 AWG input impedance max.: 5 MΩ (with line fault detection OFF)
- Accuracy
  - ±0.5% of full scale (with filter 3 Hz, zero position accuracy included)

Frequency characteristics
- Input terminals
  - Number of channels: 2, for distortion measurement (electronic auto-balancing, balance display using the memory function: 280 V rms, Low-pass filter: 5/50/500 Hz, 5 k/50 k Hz)

Isolated BNC connector (input impedance 1 MΩ, input capacitance 30 pF), with internal reference junction compensation)

Thermoprobe
- Range: ±0.1% of full scale ±3°C (±5°F) (at 0°C (32°F) to less than 400°C (752°F); However, no accuracy guarantee of less than 400°C (752°F), ±0.1% of full scale ±3.5°C (±6.3°F) (at 0°C (32°F) to less than 400°C (752°F)).

Thermocouple R, S, B, W: ±0.1% of full scale ±3°C (±5°F) (at 0°C (32°F) to less than 400°C (752°F), ±0.1% of full scale ±2°C (±3.6°F) (at 0°C (32°F) to less than 400°C (752°F)), ±0.1% of full scale ±1°C (±1.8°F) (at 0°C (32°F) to less than 400°C (752°F)), ±0.1% of full scale ±0.1°C (±0.18°F) (at 0°C (32°F) to less than 400°C (752°F)).

Input voltage range and measurement range
- DC to 400 kHz -3 dB, (with AC coupling: 7 Hz to 400 kHz -3 dB)

Reference junction compensation: internal/external (switchable, Line fault detection ON/OFF possible)

Number of channels: 2, for voltage measurement, DC/RMS selectable
- Input terminals: Isolated BNC connector (input impedance 1 MΩ, input capacity 30 pF)
- Max. rated voltage to ground: 300 V AC or DC (with input isolated from the main unit, the maximum voltage that can be applied between input channel and chassis, and between input channels without damage)

Measurement range
- mV to 20 mV: dc, full range, 20 mV, 1/1000 of range (excluding integration, power frequency mode)

RMS measurement
- Range: ±10 V to ±400 V, 6 settings, selectable threshold level at each range

Other functions
- Measurements with 5 Hz and 0.5 Hz (280 V rms, Low-pass filter: 5/50/500 Hz, 5 k/100 kHz)

TEMP UNIT 8971

Measurement functions
- Number of channels: 2, for temperature measurement with thermocouple (voltage measurement not available)
- Input terminals: Thermaprobe plug-in connector. Recommended wire size: single wire, 0.14 to 0.78 in (3.5 to 19.5 mm) diameter, 0.018 in (0.4 mm) solid, 0.02 to 0.12 in (0.5 to 3.0 mm) stranded, 0.02 in (0.5 mm) outer diameter. 18 AWG to 26 AWG input impedance max.: 5 MΩ (with line fault detection OFF)
- Accuracy
  - ±0.5% of full scale (with filter 3 Hz, zero position accuracy included)

Frequency characteristics
- Input terminals
  - Number of channels: 2, for frequency measurement, rotation, power frequency, integration, pulse duty ratio, pulse width, RMS

Rotation mode
- Range: Between 0 to 2 million rotations/minute (minimum width pulse 2 μs, 100 counts to 100 μm/div (full scale = 20 μs), 7 settings)

Accuracy
- 0.1% (±5 kHz) (full scale = 5 kHz)

Power frequency mode
- Range: 50 Hz (60 Hz to 60 Hz, 60 Hz to 60 Hz, 400 Hz (500 Hz to 400 Hz) (full scale = 5 kHz), 3 settings)

Integration mode
- Range: 2 counts to 1 MeV Coulomb, 6 settings

Dimensions and mass: approx. 106 mm (4.17 in) W × 19.8 mm (0.78 in) H × 196.5 mm (7.74 in) D, approx. 250 g (8.8 oz) Accessories: None

CURRENT UNIT 8971

Measurement functions
- Number of channels: 2, for current measurement with optional current sensor
- Input terminals: Current connector (input impedance 1 MΩ, exclusive current sensor for current via connection cable the 9130, common GND with recorder)
- Measurement range

RMS measurement
- Range: ±10 V to ±400 V, 6 settings, selectable threshold level at each range

Other functions
- Measurements with 5 Hz and 0.5 Hz (280 V rms, Low-pass filter: 5/50/500 Hz, 5 k/100 kHz)

TEMP UNIT 8972

Measurement functions
- Number of channels: 16, for voltage measurement
- Input terminals: Input voltage range and measurement range

RMS measurement
- Range: ±10 V to ±400 V, 6 settings, selectable threshold level at each range

Other functions
- Measurements with 5 Hz and 0.5 Hz (280 V rms, Low-pass filter: 5/50/500 Hz, 5 k/100 kHz)

TEMP UNIT 8973

Measurement functions
- Number of channels: 16 (4 ch) probe connector + 4 connectors
- Input terminals: Main 9130 connector (8-pin D-sub connector, compatible logic probes only)
**Dimensions and mass:** approx. 106 mm (4.17 in) W × 19.8 mm (0.78 in) H × 195.6 mm (7.74 in) D, approx. 260 g (9.2 oz)

**Accessories:** None

**ARBITRARY WAVEFORM GENERATOR UNIT U8793**

**Output terminal**
- Number of channels: 2, SMB terminal (Output impedance: 1 Ω or less)
- Max. rated voltage to ground: 30 V DC or AC (CAT II)

**Output voltage range**
- DC: 0 V to +3 V (Amplitude setting range: 0.1 V to 3 V p-p, Setting resolution: 0.01 mV)
- AC: 0 V to +3 V (Amplitude setting range: 0.1 V to 3 V p-p, Setting resolution: 1 mV)
- Max. output current: 3 mA (Allowable total load resistance: 1.5 kΩ or less)

**Arbitrary waveform generator model**
- Waveform measured by MB8545A, etc., generated by Hoki Module 7875 or MB8000, CSV waveform 0.6 s refresh rate: 2 ms (using Rodland DA).

**Sweep function**
- Frequency, Amplitude, Offset, Duty (Pulse only)

**Program function**
- Max. 128 steps (Number of loops for each step, Number of total loops)

**Other**
- Soft-function (Voltage), External input/output control

**Differential PROBE P9000**

**Measurement modes**
- P9000-00: For waveform monitor output, Frequency characteristics: DC to 100 kHz ±3 dB

**Effective value measurement accuracy**
- ±1% (30 Hz to 1 kHz, sine wave), ±0.5% (1 kHz to 10 kHz, sine wave)

**Input/output capacitance**
- DC: 10 MΩ, 5 pF or less (at 1 kHz)

**Accessories:** Instruction manual #1, Alligator clip #2, Carrying case #7

**Differential PROBE P9322**

**Functions**
- For high-voltage/low-current measurement, power line surge noise detection, RMS output measurement

**DC mode**
- For waveform monitor output, Frequency characteristics: DC to 10 kHz ±3 dB, Amplitude accuracy: ±1% of full scale (at 1 mV DC), ±3% of full scale (at 100 mV DC, full scale 2000 V)

**AC mode**
- For detection of power line surge noise, Frequency characteristics: 1 kHz to 10 MHz ±3 dB

**Input**
- Input type: balanced differential input, Input impedance: capacitance 100 pF, Input resistance: 1 MΩ ±20%, Input offset: ±10 mV ±10% of full scale

**Maximum input voltage**
- DC: 10000 V DC, 10000 V AC (CAT III)

**Logic PROBE MR9321-01**

**Functions**
- 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 output selection: 1 MΩ (digital input, 0 to +5 V), 500 kΩ or more (with digital input, +5 V to +15 V)

**Contact input**
- 1.5 V ±15 kΩ or higher (open)
- 1.5 V ±15 kΩ or higher (closed)
- 1.5 V ±15 kΩ or higher (short)
- 100 mV ±150 kΩ (open and 150 mV ±150 kΩ (short)

**Detectable pulse width**
- 0 μs to 50 μs DC (the maximum voltage that can be applied across input pins without damage)

**Maximum input voltage**
- 500 V DC (RMS mode), 150 V DC (LOW mode) (the maximum voltage that can be applied across input pins without damage)
### System Chart of Options

#### Model : MEMORY HiCORDER MR8847A

<table>
<thead>
<tr>
<th>Model No. (Order Code)</th>
<th>(Note)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MR8847-51</td>
<td>(MR8847A, 64MW memory, main unit only)</td>
</tr>
<tr>
<td>MR8847-52</td>
<td>(MR8847A, 256MW memory, main unit only)</td>
</tr>
<tr>
<td>MR8847-53</td>
<td>(MR8847A, 512MW memory, main unit only)</td>
</tr>
</tbody>
</table>

*Cannot operate alone. You must install other options.*

#### Factory-installed option A
- **DC POWER UNIT 9784**
  - Factory-installed option - not user installable, built in on the bottom case. 10 to 28 V DC drive.

#### Factory-installed option B
- **SSD UNIT U9331**
  - Specified upon order; built-in type, 128 GB

#### Storage media
- The CF card includes a PC Card adapter.
- Use only CF Cards or USB drive sold by HIOKI. Compatibility and performance are not guaranteed for CF cards/USB memory stick made by other manufacturers. You may be unable to read from or save data to such cards.

- **PC CARD 2G 9830 (2 GB)**
- **PC CARD 1G 9729 (1 GB)**
- **PC CARD 512M 9728 (512 MB)**
- **USB DRIVE Z4006 16 GB, Long life, High-reliability SLC Flash Memory**

#### PC Software
- **WAVE PROCESSOR 9335**
  - Convert data, print and display waveforms
- **LAN COMMUNICATOR 9333**
  - Waveform data collected function
  - Remote control with the PC
  - iPad App for MEMORY HiCORDER HMR
    - Download from the App Store (exclusively for Apple iPad)
- **LAN CABLE 9642**
  - Straight Ethernet cable, supplied with straight to cross conversion cable, 5 m (16.41 ft) length

#### Printer options
- **RECORDING PAPER 9231**
  - A4 width 216 mm (8.50 in) x 30 m (98.43 ft), 6 rolls/set

#### Case
- **CARRYING CASE 9783**
  - Hard trunk type to protect unit during transport

#### Output modules
* Input cords not included. Please purchase separately.

- **WAVEFORM GENERATOR UNIT MR8790**
  - 4ch, DC Output: ±10 V, Sine wave output: 10 mHz to 20 kHz
- **PULSE GENERATOR UNIT MR8791**
  - 8ch, Pulse output: 0.1 Hz to 20 kHz, Pattern output
- **ARBITRARY WAVEFORM GENERATOR UNIT U8793**
  - 2ch, 10 mHz to 100 kHz function generator, arbitrary waveform generator with 2 MHz D/A refresh rate, -10 V to 15 V output

#### Output cable
* Please contact your local HIOKI distributor for connectors that support Model MR8793.

- **CONNECTION CABLE L9795-01**
  - Maximum rated voltage to ground: 33 V AC rms or 70 V DC, SMB terminal - alligator clip, Cord length: 1.5 m (4.92 ft)
- **CONNECTION CABLE L9795-02**
  - Maximum rated voltage to ground: 33 V AC rms or 70 V DC, SMB terminal - BNC terminal, Cord length: 1.5 m (4.92 ft)

#### Logic signal measurement
- **LOGIC PROBE 9527**
  - 4-channel type, for voltage/contact signal ON/OFF detection (response pulse width 100 ns or more, miniature terminal type)
- **LOGIC PROBE MR9521-01**
  - 4-scaled channels, ON/OFF detection of AC/DC voltage (miniature terminal type)
- **LOGIC PROBE 9520-01**
  - 4-channel type, for voltage/contact signal ON/OFF detection (response pulse width 500 ns or more, miniature terminal type)
- **CONVERSION CABLE 9323**
  - Used for connecting the 9320/9321/MR9321 and the 9324 to the MEMORY HiCORDER with small logic terminal models.* The cable is not required for the small terminal types 9321, 9321-01, 9221-01 and MR9321-01.

#### Input modules
* Input cords not included. Please purchase them separately.

- **ANALOG UNIT 8968**
  - 2ch, Voltage input, DC to 5 MHz bandwidth
- **TEMP UNIT 8967**
  - 2ch, thermocouple temperature input
- **HIGH RESOLUTION UNIT 8968**
  - 2ch, voltage input, DC to 100 kHz bandwidth
- **STRAIN UNIT U8969**
  - 2ch, strain gauge type converter amp
  - Conversion Cable L9769
  - (for STRAIN UNIT U8969 only, included)
- **FREQ UNIT 8970**
  - 2ch, for measurement of frequency, RPM, pulse, etc.
- **CURRENT UNIT 8971**
  - 2ch, for measuring current using dedicated current sensors, bundled two Conversion cable 9518
  - Note: Max. up to 4 modules can be installed in the MR8847A, MR8827
- **DC/RMS UNIT 8972**
  - 2ch, voltage/DC to 400 kHz, RMS rectifier, DC and 30 to 100 kHz bandwidth
- **LOGIC UNIT 8973**
  - 4 terminals, 16 ch
  - Note: Max. up to 3 modules can be installed in the MR8847A
- **DIGITAL VOLTMETER UNIT MR8990**
  - 2ch, high-precision DC-V, 0.1 μV resolution, maximum sampling rate 500 times/s
  - HIGH-VOLTAGE UNIT U8974
  - 2ch, voltage input, max. 1000 V DC and 700 V AC

#### Input modules
- **ANALOG UNIT 8968**
  - 2ch, Voltage input, DC to 5 MHz bandwidth

#### Storage media
- The CF card includes a PC Card adapter.
- Use only CF Cards or USB drive sold by HIOKI. Compatibility and performance are not guaranteed for CF cards/USB memory stick made by other manufacturers. You may be unable to read from or save data to such cards.

- **PC CARD 2G 9830 (2 GB)**
- **PC CARD 1G 9729 (1 GB)**
- **PC CARD 512M 9728 (512 MB)**
- **USB DRIVE Z4006 16 GB, Long life, High-reliability SLC Flash Memory**

#### Logic signal measurement
- **LOGIC PROBE 9527**
  - 4-channel type, for voltage/contact signal ON/OFF detection (response pulse width 100 ns or more, miniature terminal type)
- **LOGIC PROBE MR9521-01**
  - 4-scaled channels, ON/OFF detection of AC/DC voltage (miniature terminal type)
- **LOGIC PROBE 9520-01**
  - 4-channel type, for voltage/contact signal ON/OFF detection (response pulse width 500 ns or more, miniature terminal type)
- **CONVERSION CABLE 9323**
  - Used for connecting the 9320/9321/MR9321 and the 9324 to the MEMORY HiCORDER with small logic terminal models.* The cable is not required for the small terminal types 9321, 9321-01, 9221-01 and MR9321-01.

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#### Language
- **Japanese**
- **English**

#### Additional Information
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**INPUT CORD (A)** Voltage is limited to the specifications of the input modules in use.

**CONNECTION CORD L9790** Flexible 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 clips is sold separately.

**ALLIGATOR CLIP L9790-01** Red/black clip set attached to the ends of the cables L9790

**GRABBER CLIP 9790-02** Red/black clip set attached to the ends of the cables L9790 when this clip is attached to the end of the L9790, input is limited to CAT III 200 V.

**CONTACT PIN 9790-03** Red/black clip set attached to the ends of the cables L9790

**INPUT CORD (B)** Voltage is limited to the specifications of the input modules in use.

**CONNECTION CORD L1908** 5.0 mm (0.20 in) dia., cable allowing for up to 500 V input, 1.7 m (5.58 ft) length, small alligator clip

**CONNECTION CORD L1907** 5.0 mm (0.20 in) dia., cable allowing for up to 600 V input, 1.8 m (5.91 ft) length, detachable large alligator clips are bundled

**GRABBER CLIP 9243** Attach to the tip of the banana plug cable, CAT III 1000 V, 196 mm (7.72 in) length

**INPUT CORD (C)** This probe does not expand the maximum rated voltage above ground of an isolated input.

**TOP PROBE 9665** Max. rated voltage to earth is same as for input module, max. input voltage 1 kV rms (up to 500Vdc), 1.5 m (4.92 ft) length

**10.1 PROBE 8666** Max. rated voltage to earth is same as for input module, max. input voltage 5 kV peak (up to 5 MHz), 1.5 m (4.92 ft) length

**INPUT CORD (D)** Voltage to ground is within this product’s specifications, separate power source is also required.

**DIFFERENTIAL PROBE P9000-01** (Wave Only) For Memory HiCorder, 1 kV AC, DC, Frequency band: 100 Hz

**DIFFERENTIAL PROBE P9000-02** (Switch between Wave/RMS) For Memory HiCorder, 1 kV AC, DC, Frequency band: 100 Hz

**AC ADAPTER Z1008** 100 to 240 V AC

**INPUT CORD (E)** Voltage to ground is within this product’s specifications, separate power source is also required.

**DIFFERENTIAL PROBE 9322** 1 kV AC, 2 kV DC, Frequency band: 10 MHz

**AC ADAPTER 9418-15** 100 to 240 V AC

**INPUT CORD (F)** Voltage input via banana terminals limited by the voltage specifications of the respective input unit.

**CONNECTOR CABLE L4940** Banana plug - banana plug, Cont. width: 1.6 mm (0.06 in)

**EXTENSION CABLE L4931** Extend the length of banana plug cables, Cable length: 1.5 m (4.92 ft)

**ALLIGATOR CLIP L4935** Attach to the tip of banana plug cables, CAT IV 600 V, CAT III 1000 V

**BUS BAR CLIP L4936** Attach to the tip of banana plug cables, CAT III 600 V

**MAGNETIC ADAPTER L4937** Attach to the tip of banana plug cables, CAT III 1000 V

**GRABBER CLIP 9243** Attach to the tip of banana plug cables, red/black set, full length: 196 mm (7.72 in), CAT III 1000 V

**INPUT CORD (G)** For the MR8950 Voltage is limited to the specifications of the input modules in use.

**TEST LEAD L2200** Cable length: 70 cm, pins interchangeable with a pin test lead or alligator clip, maximum input voltage: CAT I to 600 V, CAT II 1000 V

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**Non-contact Voltage measuring**

**NON-CONTACT AC VOLTAGE PROBE SP9000-01** 5 V rms rated, 10 Hz to 1 kHz bandwidth with NON-CONTACT AC VOLTAGE PROBE SP9000

**AC VOLTAGE PROBE SP9001** Sold individually

**Temperature sensor**

**THERMOCOUPLE** For reference only. Please purchase locally

**Power supply**

**AC ADAPTER 9445-02** Connect to terminal block, 1.5 m (4.92 ft) length

**OUTPUT CORD L9095** Receiving side banana, output BNC terminal

**CONVERSION ADAPTER 9199** 3.5 mm (0.14 in) dia. mini plug to banana, 1.5 m (4.92 ft) length

**CONVERSION CABLE 9318** For P9001. Inquire with your local Hioki distributor.

**Custom cable**

(1) Bus powered USB cable
(2) 5 Vrms rated, 10 Hz to 100 kHz band width
(3) 3-prong cable

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**Other current sensors**

**CURRENT UNIT 8971** 3-ch, with Waveform output

**CURRENT UNIT 8940** 3-ch, with Waveform output

**Current unit for sensors**

**CURRENT UNIT 8941**

**CURRENT UNIT 8942**

**CURRENT UNIT 8943**

**AC VOLTAGE PROBE SP9000**

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**Link Current**

**LEAK PROBE 8971**

**LEAK PROBE 8940**

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**Display unit**

**DISPLAY UNIT CM7290**

**DISPLAY UNIT CM7291**

**Power supply**

**POWER SUPPLY 3269** For Hioki wide bandwidth current probes

**POWER SUPPLY 3269** Single sensor connected

**POWER SUPPLY 3296** Current unit for sensors

**AC ADAPTER 9445-02** Connect to terminal block, 1.5 m (4.92 ft) length

**AC ADAPTER 9453-02** 3-prong cable

**AC ADAPTER 9454-02** 3-prong cable

**AC ADAPTER 9455-02** 3-prong cable
Anomaly simulation testing

Output measured anomalous waveforms and processed arbitrary waveforms at max. 15 V, and record the results without modification.

Set example

- **MEMORY HiCORDER**: MR8847-51 1 unit
- **ARBITRARY WAVEFORM GENERATOR UNIT**: U8793 4
- **ANALOG UNIT**: 8966 4
- **CONNECTION CABLE**: L9795-01 8
- **CONNECTION CORD**: L9198 6

Reproduce anomaly waveforms

Record results while testing

Output both measured anomalous waveforms and waveforms that you created yourself for testing. You can also measure the results at the same time.

Arbitrary waveforms generated for 8 units, max. 16 channels

Isolated output for all channels

Channels can be expanded without connecting additional recorders. Isolation between the Memory HiCorder and each channel and between the channels allows connections with devices with different potentials.

High-voltage direct input measurement

Direct input is also possible without a differential probe for high voltage of 1000 V DC and 700 V AC.

Set example

- **MEMORY HiCORDER**: MR8847-51 1 unit
- **HIGH-VOLTAGE UNIT**: U8374 2
- **CURRENT UNIT**: 8971 2
- **CLAMP ON SENSOR**: 9272-10 3
- **CONNECTION CABLE**: L4940 3
- **ALLIGATOR CLIP**: L4055 2

No DIFFERENTIAL PROBE needed for direct high-voltage measurements

Perform direct measurement of up to 1000 V DC and 700 V AC for high-voltage power equipment as well as 380 V and 480 V systems used globally.

Simultaneous measurement with high-speed camera recording

Synchronize high-speed video with multi-channel signals for recording.

Visualize prototype evaluations and problem analyses together with measurement data.

Easily visualize the relationship between various factors through the simultaneous measurement of data such as multi-system voltage, current and vibration together with high-speed camera recording.

Set example

- **MEMORY HiCORDER**: MR8847-51 1 unit
- **ANALOG UNIT**: 8966 1
- **CONNECTION CORD**: L4917 1
- **High-speed camera**: 1 unit

* Please contact your local Hioki distributor for more information about the use of high-speed cameras.