The Memory HiCorder MR8827 achieves isolated input between the main unit and channel or between channels, at a maximum sampling speed of 20 MS/s on all channels.

It provides mixed recording that combines 32 analog channels and 32 logic channels, and logic input can be expanded up to 64 channels.

Welcome to the next generation of Hioki Memory HiCorders that deliver multi-channel waveform recording of a diverse array of signals to meet complex and demanding applications.

*When using 64 logic channels, 28 analog channels are available.
MR8827 - Evolving to the Next Stage of High-Speed Waveform Recording

The high-performance 8826 delivered the most analog channels out of all portable-type Memory HiCorders. The new MEMORY HiCORDER MR8827 inherits that concept and evolves even further.

### 20x Sampling Speed

- **1MS/s** → **20MS/s**

  The sampling speed (for all channels simultaneously) increased by 20 times, while maintaining isolated input.

### 2x Logic Input Channels

- **32ch** → **64ch**

  A maximum of 8 logic probes can be inserted in the main unit. Use of 2 Logic Unit 8973 will add 8 more connections, supporting 64 channel logic signal input. (This reduces the number of available analog channels to 28.)

### 8x Internal Memory Capacity

- **64MW** → **512MW**

  With 8 times more internal memory capacity from 64 MW to 512 MW, you can now record signals of fast events easily and for extended periods of time.

### Storage Devices and Media

- **USB Memory/CF Card SSD (Solid State Drive)**

  Use various storage devices and media with more capacity and faster writing speeds than conventional drives or PC cards. The optional internal SSD has 128 GB of capacity so you can store large amounts of data.

### 3x PC Transfer Speed

- 3 times faster transfer speed!

  Transferring speed of stored data from internal memory or SSD to the PC has greatly increased.

### LCD Resolution

- **10.4 inch TFT** 10.4 inch SVGA

  - **640×480** → **800×600**

  Overlapping waveforms are easier to identify now with a new high resolution LCD.

### 2x Paper Feeding Speed

- **25mm/sec** → **50mm/sec**

  Use of a high-speed thermal printer gives you 2 times the printing speed.

### Easy Setup of Recording Paper

- No more hassles of feeding recording paper between the rubber roller and the thermal head. Just drop it in to set it up.
Scalable Input Channels

A maximum of 16 modules can be connected on the rear side. The main unit also has connectors for connecting 8 logic probes.

Isolated Input for Security

The MR8827 differentiates itself from typical oscilloscopes by providing complete isolation for the input of each channel, and between each channel and the main frame, enabling you to handle electrical potential differences among multiple signals without any concern.

High Resolution LCD

Conventional devices used a 640×480 dot TFT LCD, but the next-generation MR8827 uses an 800×600 dot SVGA high resolution LCD to make it even easier to identify overlapping measured waveforms.

Sampling Speed and Recording Time

<table>
<thead>
<tr>
<th>Time axis range/div</th>
<th>Sampling speed</th>
<th>Maximum recording length</th>
<th>Time axis range/div</th>
<th>Sampling speed</th>
<th>Maximum recording length</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 µs</td>
<td>50 ns</td>
<td>0.8 s</td>
<td>15 ms</td>
<td>1.6 s</td>
<td>100 ns</td>
</tr>
<tr>
<td>10 µs</td>
<td>100 ns</td>
<td>1.6 s</td>
<td>20 µs</td>
<td>200 ns</td>
<td>3.2 s</td>
</tr>
<tr>
<td>50 µs</td>
<td>500 ns</td>
<td>8 s</td>
<td>100 µs</td>
<td>1 µs</td>
<td>16 s</td>
</tr>
<tr>
<td>500 µs</td>
<td>5 µs</td>
<td>1 min 20 s</td>
<td>2 ms</td>
<td>20 µs</td>
<td>5 min 20 s</td>
</tr>
<tr>
<td>5 s</td>
<td>50 µs</td>
<td>13 min 20 s</td>
<td>10 ms</td>
<td>100 µs</td>
<td>26 min 40 s</td>
</tr>
<tr>
<td>20 ms</td>
<td>200 µs</td>
<td>53 min 20 s</td>
<td>50 ms</td>
<td>500 µs</td>
<td>2 h 13 min 20 s</td>
</tr>
<tr>
<td>1 s</td>
<td>1 ms</td>
<td>4 h 13 min 20 s</td>
<td>10 s</td>
<td>10 ms</td>
<td>9 h 13 min 20 s</td>
</tr>
<tr>
<td>30 s</td>
<td>300 ms</td>
<td>13 h 20 min 0 s</td>
<td>1 min</td>
<td>1 s</td>
<td>23 h 13 min 20 s</td>
</tr>
<tr>
<td>50 s</td>
<td>500 ms</td>
<td>23 h 20 min 0 s</td>
<td>2 s</td>
<td>20 ms</td>
<td>2 h 13 min 20 s</td>
</tr>
<tr>
<td>100 s</td>
<td>1 s</td>
<td>4 h 13 min 20 s</td>
<td>5 s</td>
<td>50 µs</td>
<td>6 h 13 min 20 s</td>
</tr>
</tbody>
</table>

Sampling period: 1 µs, 10 µs, 1 ms, 10 ms, 100 ms

*Select within 1/100 of the time axis. Also limited by combination with the time axis setting for memory recording.

A4 Size Printer

Print in fine detail, with 2 times the paper feeding speed. Get a printout of enlarged waveforms on A4 size paper so you can check them easily on-site.

Scroll

Scroll through the waveform to check all or just part of it.

Expand / shrink

Not only can you expand or shrink the time axis or vertical axis, you can also split the screen to check the expanded waveform of the shrunk waveform.

Scanning

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

Cutout

Specify the segment to save as binary or CSV data.
Signal Input and Output

The right module 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.

---

**Table of Modules**

<table>
<thead>
<tr>
<th>Generation</th>
<th>Voltage</th>
<th>DC voltage</th>
<th>Generation</th>
<th>Pulse</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARBITRARY WAVEFORM GENERATOR UNIT U8793</td>
<td>HIGH VOLTAGE UNIT U8974</td>
<td>DIGITAL VOLTOMETER UNIT MR8990</td>
<td>WAVEFORM GENERATOR UNIT U8793</td>
<td>PULSE GENERATOR UNIT MR8791</td>
<td>ANALOG UNIT 8966</td>
</tr>
<tr>
<td>No. of channels: 2</td>
<td>Measurement resolution: 16-bit 1/1600 of measurement range</td>
<td>Measurement resolution: 24-bit 150 000 of measurement range</td>
<td>No. of channels: 4</td>
<td>Waveform output</td>
<td>Measurement resolution: 12-bit 20 MΩs high-speed sampling</td>
</tr>
<tr>
<td>Arbitrary waveform output</td>
<td>High voltage</td>
<td>DC output: -10 V to 10 V</td>
<td>Pulse output</td>
<td>0.1 Hz to 20 kHz</td>
<td>Various amps</td>
</tr>
<tr>
<td></td>
<td>Commercial power supply (primary/secondary)</td>
<td>Minute sensor voltage</td>
<td>Pattern output</td>
<td></td>
<td>Transducers</td>
</tr>
<tr>
<td></td>
<td>EV battery voltage</td>
<td>10 mHz to 20 kHz</td>
<td></td>
<td></td>
<td>Sensors</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Industrial motors</td>
</tr>
</tbody>
</table>

13 units to choose from
Abundant modules
Hiioki has added new high-performance modules in response to overwhelming demand.
The Memory HiCorder now supports a wide variety of measurements.

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.

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.

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Voltage</th>
<th>Distortion</th>
<th>Frequency, RPM</th>
<th>Current</th>
<th>Voltage</th>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEMP UNIT 8967</td>
<td>HIGH RESOLUTION UNIT U8969</td>
<td>STRAIN UNIT U8969</td>
<td>FREQ UNIT 8970</td>
<td>CURRENT UNIT 8971</td>
<td>DCPMS UNIT 8972</td>
<td>LOGIC UNIT 8973</td>
</tr>
<tr>
<td>Measurement resolution: 16-bit (1/10000) of measurement range</td>
<td>Measurement resolution: 16-bit (1/10000) of measurement range</td>
<td>Measurement resolution: 16-bit (1/10000) of measurement range</td>
<td>Measurement resolution: 12-bit Clamp sensor direct connection</td>
<td>Measurement resolution: 12-bit RMS measurement</td>
<td>No. of channels: 16 Observation of control signal</td>
<td></td>
</tr>
</tbody>
</table>
Data Storage

Save on devices and media

Input signals after A/D conversion stored in internal memory can be saved on the optional internal SDD, USB memory, or CF card.

Transfer to PC

Check and analyze data saved in the internal SSD, USB memory, or CF card, by transferring it to a PC, via LAN or USB.

LAN Connection

Use the HTTP function to operate MR8827 with a browser on a PC connected via LAN. You can also use the FTP function to retrieve data from internal memory, devices or media connected to the main unit.

USB Connection

Use a PC to retrieve data saved on devices and media such as internal memory, SSD, or CF card connected to the main unit via USB.

Analysis software

WAVE PROCESSOR 9335

(Software sold separately)

- Waveform display, calculations
- Print function

<table>
<thead>
<tr>
<th>9335 Brief Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating environment</strong></td>
</tr>
<tr>
<td><strong>Functions</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Printing</strong></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>9333 Brief Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating environment</strong></td>
</tr>
<tr>
<td><strong>Functions</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
**iPad App for Memory HiCorder**  
**HMR Terminal**

- 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.

*New function on Ver 2.0*

- Data can be viewed by the iPad using Hocki’s dedicated apps available from the App Store. Search for “HMR” and download the “HMR Terminal” app.

**Wave Viewer Wv**

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

Transformer Interruption Tests
Interchannel isolation allows for safe circuit connections. Simultaneous high-speed sampling can record waveforms before and after the interruption, and allows you to input many control and circuit signals.

Battery Charge/Discharge Tests
Input and test the voltage of each battery cell. The MR8827 is built for up to 400 V DC input, protecting it even if high voltage is applied when there is a short-circuit.

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

Power Monitor and Logger
By loading the analog output for the effective value (instant power / voltage / current, etc.) calculated by the power analyzer, or by importing the waveform output from the power analyzer to MR8827, you can observe data for long-term tests or irregular waveforms.
**Record a diverse array of signals simultaneously**

### Mechatronics

#### ECU Evaluation

The 32 analog channels and 32 logic channels work great for observing input and output signals of an Engine Control Unit. Over 4 hours of recording can be achieved with 1 ms sampling.

#### Engine Strain Measurements

Use the Strain Unit U8969 to perform strain measurements of up to 32 channels. You can use the numerical value calculation function to automatically calculate the maximum value, minimum value, and P-P value of strain waveforms.

#### Vibration / Endurance Tests

Use the long 512MW memory to observe vibration waveforms easily (Memory function). Also, with the recorder function, you can perform long-term observation by capturing the waveform peaks while sampling at high speeds.

#### Injection Molder Evaluation

Along with a pneumatic pressure or valve closure, you can record the logic input from control signals. Select from a rich lineup of Hioki input units that support a wide range of sensors and converters.
### Main Unit Specifications

#### Basic Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power consumption</td>
<td>401 mm (15.79 in) W x 233 mm (9.17 in) H x 388 mm (15.28 in) D, 12.6 kg (444.4 oz) (main unit only)</td>
</tr>
<tr>
<td>Dimensions and mass</td>
<td>Two external outputs (GO/NG output), three external inputs (start/IN1, stop/IN2, logic channel)</td>
</tr>
<tr>
<td>Data storage media</td>
<td>Environmental conditions: Storage: -10°C to 50°C (14°F to 122°F), 90% rh or less; Operating: 0°C to 40°C (32°F to 104°F), 20 to 80% rh, 10 μV or less (at 40°C/70% rh)</td>
</tr>
<tr>
<td>Power supply</td>
<td>200 ms/div, manual printing can be performed after measurement stops</td>
</tr>
<tr>
<td>Power consumption</td>
<td>Dimensions and mass: 401 mm (15.79 in) × 233 mm (9.17 in) × 388 mm (15.28 in), 12.6 kg (444.4 oz)</td>
</tr>
<tr>
<td>Recording length</td>
<td>Sampling period: 10 ms to 1 hour/div, 19 ranges, time axis resolution 100 points/div. Note: Out of data acquired at selected sampling rate, only maximum and minimum value data determined using 100 points/div units are stored Time axis axis resolution selectable in 13 steps, from 1/12 to 1/120000</td>
</tr>
<tr>
<td>Recording speed</td>
<td>60 MHz (50% duty cycle) memory, 30 MHz (75% duty cycle) memory, 15 MHz (87.5% duty cycle) memory, 10 MHz (93.75% duty cycle) memory</td>
</tr>
<tr>
<td>Recording paper</td>
<td>240 VA max. (when not using the printer), 350 VA max. (when using the printer)</td>
</tr>
<tr>
<td>Paper feed density</td>
<td>Display: Instruction manual, Application disk (Wave Viewer Jr, Communication commands table), Power cord, Input cord label, USB cable, Printer paper (when equipped with a printer unit), Roll paper attachment (when equipped with a printer unit)</td>
</tr>
<tr>
<td>Features</td>
<td>Output functions: Manual, A-B cursor range printing/Report printing Logging is not available</td>
</tr>
<tr>
<td>Other functions</td>
<td>Memory segmentation: Maximum 1024 blocks, sequential storage, multi-block storage</td>
</tr>
<tr>
<td>Other functions</td>
<td>Waveform processing: X-Y waveform synthesis (1 screen, 4 screens) Overlay (always overlay when started/overlay only required waveform) Automatic/Manual A-B cursor range printing/Report printing</td>
</tr>
<tr>
<td>Other functions</td>
<td>MEMORY (high-speed recording)</td>
</tr>
<tr>
<td>Time axis</td>
<td>Sampling period: 1/100 of time frame range (minimum 50 ms period)</td>
</tr>
<tr>
<td>Recording length</td>
<td>Built-in presets: (at 4, 8, 16 ch mode) 25 to 20000 div, (at 4, 8, 16 ch mode) 25 to 500000 div (at 4 ch mode) 25 to 1000000 div Arbitrary presets: setting in 1 div steps, Max. 1280000 div (at 4 ch mode), 6400000 div (at 8 ch mode), 3200000 div (at 16 ch mode), 16000000 div (at 32 ch mode)</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 calculation</td>
<td>Calculations: Simultaneous calculation for up to 16 selected channels 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 Calculation result evaluation: GO/NG (with open-collector 5 V output) Automatic storing of calculation results</td>
</tr>
<tr>
<td>Waveform processing</td>
<td>Four arithmetic operations, absolute value, exponentiation, common logarithm, square root, moving average, differentiation (primary, secondary), integration (primary, secondary), parallel displacement along time axis, trigonometric functions, reverse trigonometric functions, integration time correction for each NPLC setting, auto-save of calculation results</td>
</tr>
<tr>
<td>Memory recording method</td>
<td>Sampling is done at the set sampling period.</td>
</tr>
</tbody>
</table>

#### PRINTER UNIT U8350

**Factory-installed option**

**Features**

- Printer paper one-touch loading, high-speed thermal printing
- Recording paper:
  - 216 mm (8.50 in) × 30 m (98.43 ft), thermal paper roll (use the 9231 paper)
  - Recording width: 200 mm (7.87 in) 20 division full scale, 1 div = 10 mm (0.39 in) 80 dots
- Paper feed density: 10 lines/mm

**Display**

- 10.4 inches SVGA-TFT color LCD (640 × 640 dots)
- Time axis: 10 V/div, 20 V/div, X-Y 20 V/div ± 20 div

**Languages**

- English, Japanese, Korean, Chinese

**Waveform display/zoom/compression**

- Time axis: ±10 to ±2 (zoom at MEMORY function only), ±1, ±1/2 to ±1/50000, Voltage axis: ±100 to ±2, ±1, ±1/2 to ±1/10

**Variable display**

- Upper/Lower limit set, display/div set
- Scaling: 0.1 to 10000, automatic scaling for various probes
- Manual scaling (conversion ratio-setting, 2-point setting, unit setting)

**Comment input**

- Alphanumeric input (title, analog and logic channels)
- Simple input, history input, phrase input

**Logic waveform**

- Display point move 1 % step, Line width 3 types

**Display partition**

- Max. eight divisions

**Monitor function**

- Input level monitor
- Numerical value (Sampling 10K/s fixed, refresh rate 0.5s)
- Wavelength measurement (A, B, C, cursor, for all channels)
- Vernier function (amplitude fine adjustment)
- Zoom function (horizontal screen division, zoomed waveform shown in lower section)
- 16 selectable colors for waveform display
- Zero position shift in 1% steps for analog waveform
- Global zero adjust for all channels and all ranges

**Other display functions**

- Wavelength inversion (positive/negative)
- Cursor measurement (A, B, cursor, for all channels)
- Vernier function (amplitude fine adjustment)
- Zoom function (horizontal screen division, zoomed waveform shown in lower section)
- 16 selectable colors for waveform display
- Zero position shift in 1% steps for analog waveform
- Global zero adjust for all channels and all ranges

**Main unit Specifications**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement functions</td>
<td>MEMORY (high-speed recording), RECORDER (real-time recording), XY RECORDER (X-Y real-time recording), FFT (frequency analysis)</td>
</tr>
<tr>
<td>Main unit OS</td>
<td>aITRON (Non-Windows OS)</td>
</tr>
<tr>
<td>Number of channels (Max.)</td>
<td>[16 analog input modules]: 32 analog channels + 32 logic channels (logic probe terminals standard, logic has common GND); [14 analog input modules] + 2 logic input modules; [28 analog channels] + 64 logic channels (standard 32 channels + 32 channels in Logic Unit 8973) * Max., up to two modules of the Logic Unit 8973, the Current Unit 8971 up to four modules</td>
</tr>
<tr>
<td>Maximum sampling rate</td>
<td>20 MS/second (all channels simultaneously)</td>
</tr>
<tr>
<td>Internal memory</td>
<td>6MMW (total capacity 512MW memory), 16MMW using (32 analog channels), 32MMW using (16 analog channels), 64MMW using (8 analog channels), 128MMW using (4 analog channels)</td>
</tr>
<tr>
<td>Data storage media</td>
<td>CF card slot (standard) *1 (up to 2GB, FAT, or FAT-32 format), USB port *2 (USB 2.0)</td>
</tr>
<tr>
<td>Backup battery life</td>
<td>Clock and parameter setting backup: at least 10 years (reference value at 25°C)</td>
</tr>
<tr>
<td>External control connectors</td>
<td>External trigger input, Trigger output, External sampling input, GND, Two external outputs (GO/NG output), Three external inputs (start/IN1, stop/IN2, logic channel)</td>
</tr>
<tr>
<td>External interfaces</td>
<td>LAN: 100BASE-TX (DHP, DNS supported, FTP server, HTTP server) USB: USB 2.0 compliant, series A receptacle *1, series B receptacle *1, (File transfer SSD/CF card to PC, or remote control from PC)</td>
</tr>
<tr>
<td>Environmental conditions</td>
<td>Operating: 0°C to 40°C (32°F to 104°F), 20% to 80% rh, Storage: -10°C to 50°C (14°F to 122°F), 90% rh or less</td>
</tr>
<tr>
<td>Standards</td>
<td>Safety: EN61010 EMC: EN61326, EN61000-3-2, EN61000-3-3</td>
</tr>
<tr>
<td>Power supply</td>
<td>AC 100 to 240 V, 50/60 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>220 VA max. (when not using the printer), 350 VA max. (when using the printer)</td>
</tr>
</tbody>
</table>

**PRINTER UNIT U8350**

- Instruction manual, Application disk (Wave Viewer Jr, Communication commands table), Power cord, Input cord label, USB cable, Printer paper (when equipped with a printer unit), Roll paper attachment (when equipped with a printer unit)
How is FFT Analysis Performed?

Designate a range of the waveform stored in the memory function to perform FFT analysis. It is rendered simultaneously on the screen.

Convert data measured with few calculation points into data with many points for re-analysis. *Not possible with frequency averaging ON

Display the spectrum as it changes over time in 3-D.

Scale by dB. Input the overall value (sum of the power spectrum) directly as a dB value.
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. 200 g (8.8 oz)

Accessories: None

**FREQ UNIT 8970**

- **Frequency range**: Range: Between 0 Hz to 1 kHz (minimum pulse width: 2 μs), 1 Hz/div to 5 kHz/div (full scale = 20 div), 7 settings
- **Accuracy**: ±0.1% f.s. (including 10 kHz/div), ±0.7% f.s. (at 10 kHz/div)
- **Power measurement function**: Range: 50 Ohm to 600 Ohm, 600 Ohm to 470 Ohm (full scale = 5 div), 3 settings
- **Integration mode**: Range: 2 k counts to 1 Counts, 6 settings
- **Duty ratio**: Range: Between 10 Hz to 1 kHz (minimum pulse width: 2 μs), 3%/div (full scale = 20 div)
- **Accuracy**: ±1.5% (10 Hz to 1 kHz), ±4% (1 kHz to 10 kHz)
- **Measurement resolution**: ±0.1% f.s. (with filter 5 Hz/div) ±0.7% f.s. (at 5 kHz/div)
- **Input coupling**: AC/DC/GND
- **Maximum input voltage**: ±300 V RMS or 600 V DC (maximum voltage that can be applied between input channels without damage)
- **Compatible current sensors**: Using 9272-10 (200 A), CT6843, CT6863: 1 A to 50 A/div (f.s. = 20 div, 6 settings)
- **Using CT6862: 200 mA to 10 A/div (f.s. = 20 div, 6 settings)
- **Response time**: 0.65 ms (f.s. = 20 div, 6 settings)
- **Crest factor**: 2
- **Frequency characteristics**: DC to 100 kHz, ±0.1% f.s. (AC coupling), 7 Hz to 100 kHz (via conversion cable the 9771)
- **Conversion cable the 9771 (via conversion cable the 9318)**
- **Input terminals**: Input terminals: Level, Hold, Smoothing, Low-pass filter, Switchable AC/DC input coupling, Frequency dividing, Integration over-range keep/return
- **Number of channels**: 2
- **Frequency measurement accuracy**: ±5% f.s. ±3°C (at 23 ±5°C/73 ±9°F, 20 to 80% rh after 30 minutes of warm-up time and zero adjustment; Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)
- **Measurement range**: ±0.5% of full scale (with filter 5 Hz/div, zero position accuracy included)
- **Measurement functions**: Frequency: ±1% f.s. ±3°C (including 10 kHz/div)

**LOGIC UNIT 8973**

- **Number of channels**: 16
- **Input terminals**: Logic probes (the 9318, compatible logic probes only)
- **Maximum input voltage**: ±400 V DC (maximum voltage that can be applied between input connectors without damage)
- **Number of connectors**: 16 channels (4 ch probe connector x 4 connectors)
- **Accuracy**: ±0.1% f.s. ±3°C (filter 5 Hz/div)
- **Maximum input voltage**: ±300 V RMS or 600 V DC (maximum voltage that can be applied between input channels without damage)
- **Compatible current sensors**: Using 9272-10 (200 A), CT6843, CT6863: 1 A to 50 A/div (f.s. = 20 div, 6 settings)
- **Using CT6862: 200 mA to 10 A/div (f.s. = 20 div, 6 settings)
- **Response time**: 0.65 ms (f.s. = 20 div, 6 settings)
- **Crest factor**: 2
- **Frequency characteristics**: DC to 100 kHz, ±0.1% f.s. (AC coupling), 7 Hz to 100 kHz (via conversion cable the 9771)
- **Conversion cable the 9771 (via conversion cable the 9318)**
- **Input terminals**: Input terminals: Level, Hold, Smoothing, Low-pass filter, Switchable AC/DC input coupling, Frequency dividing, Integration over-range keep/return
- **Number of channels**: 2
- **Frequency measurement accuracy**: ±5% f.s. ±3°C (at 23 ±5°C/73 ±9°F, 20 to 80% rh after 30 minutes of warm-up time and zero adjustment; Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)
- **Measurement range**: ±0.5% of full scale (with filter 5 Hz/div, zero position accuracy included)
- **Measurement functions**: Frequency: ±1% f.s. ±3°C (including 10 kHz/div)

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. 260 g (9.2 oz)

Accessories: None

DIAGRAM VOLTAGE UNIT U8794

Input terminals
- Banana input terminals (Input resistance: 100 MΩ or higher)
- Max. rated voltage to ground: 300 V AC or DC (CAT III), 600 V AC or DC (CAT IV)
- Measurement range: 20 mV to 1 V
- Frequency: 30 Hz to 100 kHz
- Basic measurement accuracy: ±0.5% ± 0.2 mV
- Maximum input voltage: ±150 V AC or ±100 V DC

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 (8.1 oz)

Accessories: None

DIFFERENTIAL PROBE P9000

Measurement modes
- P9000-00: For waveform monitor output, Frequency characteristics: DC to 10 kHz 30 dB
- P9000-02: Switches between waveform monitor output/AC effective value output
- Wave mode frequency characteristics: DC to 10 kHz 30 dB, RMS mode frequency characteristics: 30 Hz to 100 kHz, Response time: Rise 30 μs, Fall 60 μs

Division ratio
- Switches between 1000:1, 100:1

DC output accuracy
- ±0.5% (f.s. = 1 V, division ratio 1000:1), ±3% (f.s. = 100 Hz, division ratio 100:1)

Effective value measurement accuracy
- ±1% (f.s. = 10 Hz to less than 1 kHz, sine wave), ±3% (f.s. = 1 kHz to less than 3 kHz, sine wave)

Input resistance (at 100 kHz, ±1 kHz deviation)
- DC: 15 MΩ, 100 MΩ (for waveform monitor output, ±2% deviation)

Maximum input capacity
- ±10 MΩ, 5 pF or less (at 10 kHz)

Minimum input voltage to ground
- ±100 V AC, ±100 V DC

Maximum rated voltage to ground
- ±100 V AC, ±100 V DC (CAT III)

Operating temperature range
- -40°C to 80°C (+4°F to 176°F)

Power supply
- For 10 kHz: 120 V AC, 100 to 240 V AC, 50/60 Hz, 8 W (including AC adapter), 0.9 VA (main unit only)
- (2) USB bus power (5 V DC, USB micro-b connector), 0.4 W

Accessories
- Instruction manual ±1, Alligator clip ±2, Carrying case ±1

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 P9322

Functions
- For high-voltage measuring instrument, power line surge noise detection, RMS output rectified functions

DC mode
- For waveform monitor output, Frequency characteristics: DC to 10 kHz (±3 dB), Amplitude accuracy: ±1% of full scale (at 1000 V DC), ±3% of full scale (at 2000 V DC)

AC mode
- For detection of power line surge noise, Frequency characteristics: 1 kHz to 10 MHz (±3 dB), RMS mode: AC output RMS output, DC input, Frequency characteristics: DC, 40 Hz to 100 kHz, Response speed: 20 ms or less (at 100 V DC), Accuracy: ±1% ± 1 mV (DC, 40 Hz to 1 kHz), ±3% of full scale (DC, 1 kHz or less, ±10 mV (DC, 10 kHz or less))

Input
- Input range: balanced differential input, Input impedance: capacitive ±4.5 MΩ/20 pF, Input range: AC voltage input: ground; when using ac coupling, ±150 V AC (CAT III), ±1000 V AC/DC (CAT IV), ±1000 V AC/DC (CAT III), when using dc coupling, ±1000 V AC/DC (CAT III), ±1000 V DC (CAT III)

Maximum input voltage
- ±2000 V DC, ±1500 V CAT (CAT III), ±600 V AC (CAT III)

Output
- Voltage divider for 10100 V max, AIN connector/outputs switchable for 3 models; DC, AC, RMS
- Power supply
- Any of the following: (1) AC Adaptor 9042-12, (2) Power Cord 9248 with Probe Power Unit, (3) Power Cord 9032 + Conversion Cable 9322 with ISOLDER logic terminal, (4) Power Cord 9032/9428, (5) USB

LOGIC PROBE P9320-01/S32

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 (contact input can detect open-collector signals)
- Input resistance: 1 MΩ (with digital input, 0 to +5 V), 500 kΩ or more (with digital input, 0 to +5 V), ±20 mV or more (contact input; contact internally pulled up to +5 V)

Digital input threshold
- 4.0 V: 25 kΩ or higher and 4.8 kΩ or lower

Contact input sensitivity
- 1.5 V: 1.5 kΩ or higher and 4.8 kΩ or lower
- 2.5 V: 1.5 kΩ or higher and 4.8 kΩ or lower
- 4.0 V: 2.5 kΩ or higher and 4.8 kΩ or lower

Detectable pulse width
- 0.01 μs to 1000 μs, 95% to 100% as long

Maximum input voltage
- ±150 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 30 cm (0.98 ft), approx. 150 g (5.3 oz)

Note: The unit-side plug of the 9320 and 9327 is different from the 9320.

LOGIC PROBE MR9321-01

Functions
- Detection of AC or DC relay drive signal for High/Low state recording

Input
- 4 channels (isolated between unit and channels), differential input
- Input resistance: 100 kΩ or higher (HIGH range), 50 kΩ or higher (LOW range)

Output (H) detection
- 150 to 250 V AC, ±100 Hz to 250 Hz (HIGH range)
- 150 to 250 V AC, ±100 Hz to 250 Hz (LOW range)

Output (L) detection
- 0 to 10 V AC, ±5 V or more (HIGH range)
- 0 to 10 V AC, ±5 V or more (LOW range)

Response time
- Rising edge: 1 μs max., Falling edge: 3 μs max. (with HIGH range at 200 V DC, LOW range at 10 V DC)

Maximum input voltage
- ±250 V (HIGH range), ±100 V (LOW range)

Note: The unit-side plug of the MR9321-01 is different from the MR9321.
## System Chart of Options

### Model: MEMORY HiCORDER MR8827

**Model No.** (Order Codes) (Note)

- **MR8827**
  - (Max. 32ch, 512MW memory, main unit only)

  *Cannot operate alone. You must install other options*

### Printer options

- **PRINTER UNIT** is a built-in option that must be specified upon order.

  **PRINTER UNIT U8350**
  - Specified upon order. Printing width 200 mm (7.87 inch).

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

### Factory-installed option

- **SSD UNIT U8330**
  - Specified upon order; built-in type, 128 GB

### Storage media

- **The CF card includes a PC card adapter.**

  **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 Terminal
    - 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

### Case

- **CARRYING CASE** (special order)
  - Inquire with your local HIOKI distributor.

### Input modules

- **ANALOG UNIT U8966**
  - 2 ch, Voltage input. DC to 5 MHz bandwidth

- **TEMP UNIT 8967**
  - 2 ch, thermocouple temperature input

- **HIGH RESOLUTION UNIT 8968**
  - 2 ch, Voltage input. DC to 100 kHz bandwidth

- **STRAIN UNIT U8969**
  - 2 ch, strain gauge type converter amp

  **Conversion Cable L9769**
  - (for STRAIN UNIT U8969 only, included)

- **FREQ UNIT 8970**
  - 2 ch, for measurement of frequency, RPM, pulse, etc.

- **CURRENT UNIT 8971**
  - 2 ch, for measuring current using dedicated current sensors, bundled two Conversion cable 9318

  **Note:** Max. up to 4 modules can be installed in the MR8847A, MR8827

- **DC/RMS UNIT 8972**
  - 2 ch, 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 2 modules can be installed in the MR8827

- **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

### Output modules

- **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 MR8791.**

  **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 9327**
  - 4-channel type, for voltage/contact signal ON/OFF detection (response pulse width 100 ns or more, miniature terminal type)

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

- **LOGIC PROBE 9320-01**
  - 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 9327 to the Memory HiCorder with small logic terminal models.* This cable is not required for the small-terminal type models 9327: 9330-01, 9221-01 and MR9321-01.
**INPUT CORD (A)**

- **Voltage is limited to the specifications of the input modules in use.**
- **CONNECTION CORD L9790**
  - Flexible 6.1 mm (0.24 in) 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 attached to the ends of the cables L9790
- **GRABBER CLIP L9790-02**
  - Red/black set attached to the ends of the cables L9790
  - Voltage to ground is within this product's specifications of the input modules in use.

**INPUT CORD (B)**

- **Voltage is limited to the specifications of the input modules in use.**
- **CONNECTION CORD L9198**
  - 5.0 mm (0.20 in) dia., cable allowing for up to 500 V input, 1.8 m (5.91 ft) length, detachable large alligator clips are bundled
- **GRABBER CLIP 9243**
  - Attaches 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.**
- **10 mA class to 500 A (High speed)**
  - **CLAMP ON PROBE 3273-50**
    - Wide DC to 10 MHz bandwidth, 10 mA class to 50 A
  - **CLAMP ON PROBE 3276**
    - Wide DC to 100 kHz bandwidth, 10 mA class to 10 A
  - **CLAMP ON PROBE 3274**
    - Wide DC to 10 MHz bandwidth, up to 150 A
  - **CLAMP ON PROBE 3275**
    - Wide DC to 5 MHz bandwidth, up to 500 A

**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 V AC, DC, Frequency band: 100 kHz
- **DIFFERENTIAL PROBE P9000-02**
  - (Switch between Wave/PM) For Memory HiCorder, 1 V AC, DC, Frequency band: 100 kHz
- **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 V AC, 2 V 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.**
- **CONNECT CABLE L4090**
  - Banana plug - banana plug, Cont. length: 1.5 m (4.92 ft)
- **EXTENSION CABLE L4931**
  - Extend the length of banana plug cables, Cable length: 1.5 m (4.92 ft)
- **ALLIGATOR CLIP L4935**
  - Attaches to the tip of banana plug cables, CAT IV 600 V, CAT III 1000 V
- **BUS BAR CLIP L4936**
  - Detachable large alligator clips for up to 600 V input, 1.8 m (5.91 ft) length
- **MAGNETIC ADAPTER L4937**
  - Attaches to the tip of banana plug cables, CAT III 1000 V
- **GRABBER CLIP 9243**
  - Attaches to the tip of the 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, tips interchangeable with a pin test lead or alligator clip, maximum input voltage: CAT I 600 V, CAT III 1000 V
ARBITRARY WAVEFORM GENERATOR UNIT U8793

Generate and record in a single unit

2 channels, SMB terminals
2 types of output cables (sold separately)

Anomaly 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.

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.

Recommended units

DIGITAL VOLTMETER UNIT MR8990

2 channels, banana input terminal
High precision, high resolution

Install up to 16 DVM Units to expand up to 32 channels

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>100 MΩ or more</td>
<td>±0.01% rdg.</td>
</tr>
<tr>
<td>50 mV/div (f.s. = 1000 mV)</td>
<td>-1200 mV to 1200 mV</td>
<td>1 μV</td>
<td>500 MΩ or more</td>
<td>±0.01% rdg.</td>
</tr>
<tr>
<td>500 mV/div (f.s. = 10 V)</td>
<td>-12 V to 12 V</td>
<td>10 μV</td>
<td>10 MΩ or more</td>
<td>±0.025% rdg.</td>
</tr>
<tr>
<td>5 V/div (f.s. = 100 V)</td>
<td>-120 V to 120 V</td>
<td>100 μV</td>
<td>500 MΩ or more</td>
<td>±5%</td>
</tr>
<tr>
<td>50 V/div (f.s. = 1000 V)</td>
<td>-500 V to 500 V</td>
<td>1 mV</td>
<td>10 MΩ or more</td>
<td>±5%</td>
</tr>
</tbody>
</table>

6.5-digit display (Resolution: 0.1 μV), 24-bit high resolution

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