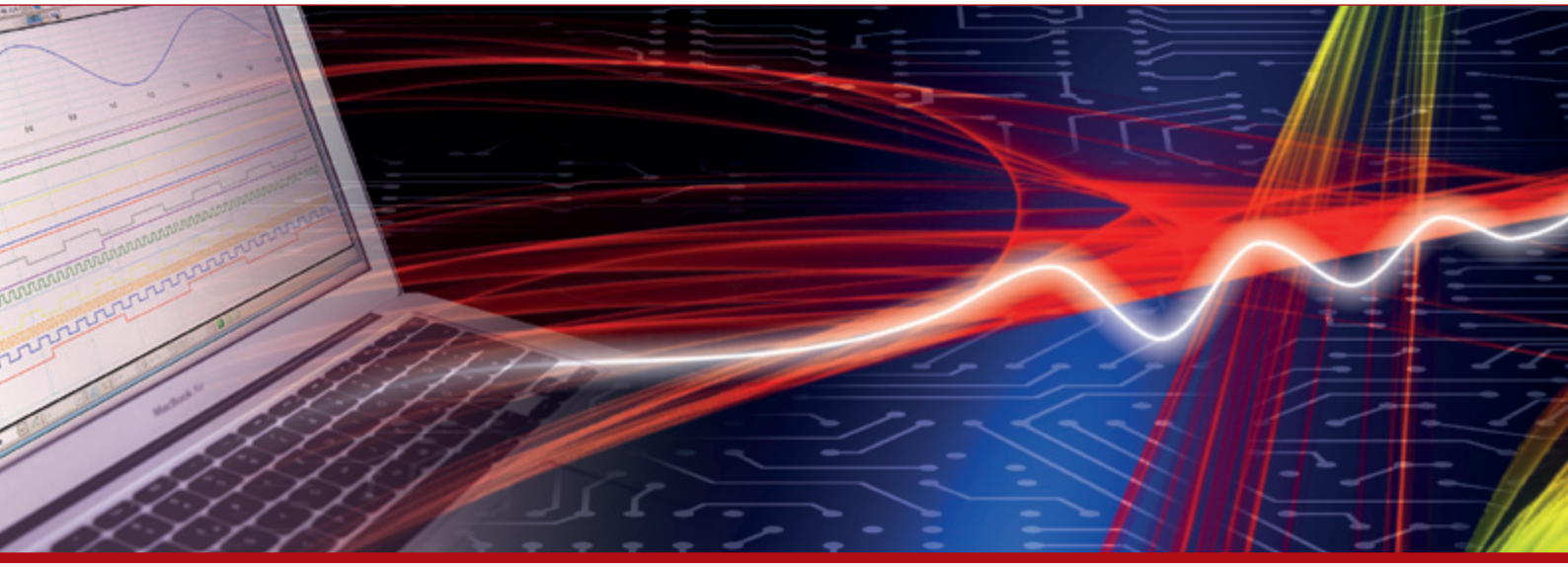
Product Datasheet - Technical Specifications



More information in our Web-Shop at ▸ **www.meilhaus.com**

Your contact

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HIOKI

MR8848

MEMORY HICORDER

High-performance recorder featuring:
- Up to 32 channels of isolated analog input
- High-speed sampling at up to 20 MS/s
- Detachable modules for various signal inputs
- Long-time recording on SSD[1]
- FFT analysis
- Numerical calculation
- Large 10.4-inch display
- A4 size printer[1]

3 year Warranty[2] CE

1. Optional, sold separately
2. 1 year warranty for INTERNAL STORAGE U8334 (1 TB optional SSD)

Features

- Safely measure with isolated channels
- Capture data quickly with 20 MS/s high-speed sampling
- Handle complex tasks with 32 analog and 64 logic channels
- Record for extended periods with high-capacity memory
- Work onsite with a durable, shock-resistant, portable design
- Save data directly to 1 TB SSD or external storage
- Capture diverse events using versatile trigger options
- Make pass/fail judgments with waveform and numerical analysis
- Smoothly connect to PCs via LAN or USB
- Check hard copies of waveforms on-site using a built-in printer

Applications

- High-voltage circuit breaker operation tests for power generation, transformation, and transmission
- Circuit breaker timing monitor test on power systems
- Load rejection test for hydropower generation
- Switching operation test of UPS equipment
- Analysis of railway vehicle operation
- Weld quality using waveform-based judgement
- Mobility control vibration testing
- Check equipment durability
- Reproduction test by generation of recorded waveforms

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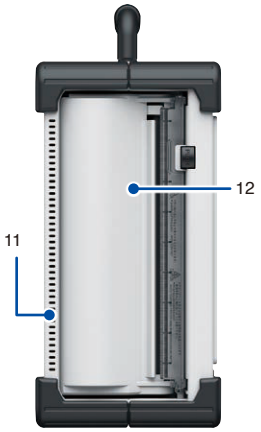
All information correct as of June 26, 2025.

MR8848

MEMORY HiCORDER

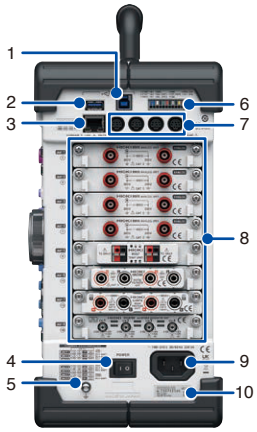
Parts Names and Functions

Left Side



Front

Right side



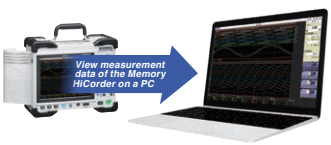
1	USB terminal (Type B)	5	GND terminal (functional ground terminal)	9	Power inlet	13	Carrying handle
2	USB terminal (Type A)	6	External control terminal (any external sampling signal can be input for control of the Memory HiCorder)	10	Serial number	14	Display
3	LAN terminal	7	Built-in logic probe terminals	11	Vent	15	SD card slot
4	Power switch	8	Various modules (sold separately)	12	PRINTER UNIT U8351 (sold separately)	16	Operation keys

Software

MR6000 Viewer

(free download software)

- Waveform display on PC
- Numerical operations, waveform operations, FFT operations, etc.



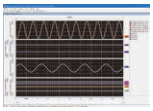
MR6000 Viewer Overview Specifications

Operating environment	Windows 10, Windows 11
Features	- Measured waveform data is loaded onto a PC and displayed - Numerical calculations, waveform calculations, FFT calculations, and other functions similar to those of the MR8848 can be performed on a PC.

WAVE PROCESSOR 9335

(Software sold separately)

- Waveform display, calculation
- Printing function



9335 Overview Specifications

Operating environment	Windows 10, Windows 11
Features	- Display functions Waveform display, X-Y display, cursor function, etc. - File loading Readable data formats: .MEM, .REC, .RMS, .POW Maximum loadable file size: limited by PC specs and configuration - Data conversion: Conversion to CSV format, batch conversion of multiple files, etc.
Printing	- Print function Export print images to a file (possible in Enhanced Metafile format, .EMF) - Print formatting: No divisions; 2, 4, 8, or 16 divisions; 2, 4, 8, or 16 columns; X-Y 1–4 divisions; preview/hard copy

Measurement System Construction

LabVIEW® Drivers and MATLAB® Toolkit

LabVIEW's simple GUI operation and the use of MATLAB functions allow you to quickly build your measurement system.

(LabVIEW® is a trademark of NATIONAL INSTRUMENTS. MATLAB® is a trademark of Mathworks, Inc.)

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Maximum Recording Time to Internal Memory

Memory function

Time axis	Sampling cycle	Sampling speed	Maximum recording time for example channel configurations		
			32 ch analog + 16 ch built-in logic	16 ch analog + 16 ch built-in logic	4 ch analog + 16 ch built-in logic
5 µs/div	50 ns	20 MS/s	Cannot be set	1.6 s	6.4 s
10 µs/div	100 ns	10 MS/s	1.6 s	3.2 s	12.8 s
20 µs/div	200 ns	5 Ms/s	3.2 s	6.4 s	25.6 s
50 µs/div	500 ns	2 MS/s	8.0 s	16.0 s	1 min 4 s
100 µs/div	1 µs	1 MS/s	16.0 s	32.0 s	2 min 8 s
200 µs/div	2 µs	500 kS/s	32.0 s	1 min 4 s	4 min 16 s
500 µs/div	5 µs	200 kS/s	1 min 20 s	2 min 40 s	10 min 40 s
1 ms/div	10 µs	100 kS/s	2 min 40 s	5 min 20 s	21 min 20 s
5 ms/div	50 µs	20 kS/s	13 min 20 s	26 min 40 s	1 h 46 min 40 s
10 ms/div	100 µs	10 kS/s	26 min 40 s	53 min 20 s	3 h 33 min 20 s
50 ms/div	500 µs	2 kS/s	2 h 13 min 20 s	4 h 26 min 40 s	17 h 46 min 40 s
100 ms/div	1 ms	1 kS/s	4 h 26 min 40 s	8 h 53 min 20 s	1 d 11 h 33 min 20 s
500 ms/div	5 ms	200 S/s	22 h 13 min 20 s	1 d 20 h 26 min 40 s	7 d 9 h 46 min 40 s

Recorder function

Time axis	When neither U8975, U8977, nor U8978 is installed	When one of U8975, U8977, or U8978 is installed
10 ms/div	26 min 40 s	13 min 20 s
20 ms/div	53 min 20 s	26 min 40 s
50 ms/div	2 h 13 min 20 s	1 h 6 min 40 s
100 ms/div	4 h 26 min 40 s	2 h 13 min 20 s
200 ms/div	8 h 53 min 20 s	4 h 26 min 40 s
500 ms/div	22 h 13 min 20 s	11 h 6 min 40 s
1 s/div	1 d 20 h 26 min 40 s	22 h 13 min 20 s
2 s/div	3 d 16 h 53 min 20 s	1 d 20 h 26 min 40 s
5 s/div	9 d 6 h 13 min 20 s	4 d 15 h 6 min 40 s
10 s/div	18 d 12 h 26 min 40 s	9 d 6 h 13 min 20 s
30 s/div	55 d 13 h 20 min 00 s	27 d 18 h 40 min 00 s

Recording to Storage Media (Direct Write to Storage MR9001-01)

Maximum sampling speed and maximum recording time when recording waveforms (Memory Function)

Destination to save	Maximum sampling speed	Number of channels[1]	Maximum recording time
Internal storage U8334 (1 TB)	1 MS/s	4 channels	8 min 56 s
USB memory Z4006 (16 GB)	200 kS/s	4 channels	44 min 44 s
SD Memory Card Z4003 (8 GB)	200 kS/s	4 channels	44 min 44 s

1. The number of channels that can be saved in real time depends on the sampling rate.

Maximum sampling speed by number of recording channels when recording waveforms (Memory Function)

Destination to save	32 ch analog	16 ch analog	8 ch analog	4 ch analog
INTERNAL STORAGE U8334 (1 TB)	100 kS/s	200 kS/s	500 kS/s	1 MS/s
USB DRIVE Z4006 (16 GB)	20 kS/s	50 kS/s	100 kS/s	200 kS/s
SD MEMORY CARD Z4003 (8 GB)	20 kS/s	50 kS/s	100 kS/s	200 kS/s

Maximum recording time for storage to 1 TB SSD (INTERNAL STORAGE U8334, when recording waveforms [Memory Function])

Time axis	Sampling cycle	Sampling speed	Maximum recording time for example channel number			
			32 ch analog	16 ch analog	8 ch analog	4 ch analog
100 µs/div	1 µs	1 MS/s	-	-	-	8 min 56 s
200 µs/div	2 µs	500 kS/s	-	-	17 min 53 s	17 min 53 s
500 µs/div	5 µs	200 kS/s	-	44 min 44 s	44 min 44 s	44 min 44 s
1 ms/div	10 µs	100 kS/s	1 h 29 min 28 s	1 h 29 min 28 s	1 h 29 min 28 s	1 h 29 min 28 s
5 ms/div	50 µs	20 kS/s	7 h 27 min 23 s	7 h 27 min 23 s	7 h 27 min 23 s	7 h 27 min 23 s
10 ms/div	100 µs	10 kS/s	14 h 54 min 47 s	14 h 54 min 47 s	14 h 54 min 47 s	14 h 54 min 47 s
50 ms/div	500 µs	2 kS/s	3 d 2 h 33 min 55 s	3 d 2 h 33 min 55 s	3 d 2 h 33 min 55 s	3 d 2 h 33 min 55 s
100 ms/div	1 ms	1 kS/s	6 d 5 h 7 min 50 s	6 d 5 h 7 min 50 s	6 d 5 h 7 min 50 s	6 d 5 h 7 min 50 s
500 ms/div	5 ms	200 S/s	31 d 1 h 39 min 14 s	31 d 1 h 39 min 14 s	31 d 1 h 39 min 14 s	31 d 1 h 39 min 14 s

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Product Specifications

Basic specifications (accuracy guaranteed for 1 year)	
Measurement functions	Memory Function (waveform recording), Recorder Function (peak/trough recording) X-Y Recorder Function, FFT Function
Example channel configurations/ numbers	Eight analog input modules: 16 analog channels + 16 logic channels (built-in) Eight 4-channel analog input modules: 32 analog channels + 16 logic channels (built-in) Five analog input modules + three logic input modules: 10 analog channels + 64 logic channels (16 built-in channels + 48 channels from input modules) Five 4-channel analog input modules + three logic input modules: 20 analog channels + 64 logic channels (16 built-in channels + 48 channels from input modules)
Module slots	Up to 8 modules Restrictions: Up to 4 modules of model 8971 CURRENT UNIT Up to 3 modules of model 8973 LOGIC UNIT Up to 3 modules of model U8977 3CH CURRENT UNIT
Number of built-in logic channels	16 channels - The measurement resolution of the units installed in module slot 1 and 2 is limited to a maximum of 12 bits - A FREQ UNIT 8970 cannot be used in module slot 1 and 2 - Grounding is shared between the ground terminal of the logic probe input connector and the ground terminal of the Memory HiCorder - When a DIGITAL VOLTMETER UNIT MR8990 is installed on module slot 1 or 2, the built-in logic cannot be used - Limitations when the built-in logic measurement is set enable
Maximum sampling speeds	20 MS/s for simultaneous use of all channels (when using ANALOG UNIT 8966) 10 MS/s for external sampling
Memory capacity	Total 512 megawords (16 megawords/channel using 32 analog channels, 256 megawords/channel using 2 analog channels)
Backup function (Reference value at 25°C [77°F])	Clock value and Setting configurations: more than 10 years Waveform backup: none
Control terminals	External trigger input, trigger output, external sampling input, two external outputs (GO, NG), three external inputs (START, STOP, SAVE)
External interfaces	LAN: 1000 BASE-T, 100 BASE-TX, 10 BASE-T (DHCP, DNS, FTP, HTTP) USB: USB 3.0 and USB 2.0 compliant, series A receptacle × 1, series B receptacle × 1 (External interfaces are used for transferring files from INTERNAL STORAGE U8334 1 TB SSD or SD memory card to a PC, and PC-based control)
Environmental conditions (no condensation)	Operation: -10°C to 40°C (14°F to 104°F), 20% RH to 80% RH With printer or SSD in use: 0°C to 40°C (32°F to 104°F), 20% RH to 80% RH Storage: -20°C to 50°C (-4°F to 122°F), 90% RH or less
Compatible standards	Safety: EN 61010 EMC: EN 61326 Class A
Power source	100 V to 240 V AC, 50/60 Hz 10 V to 28 V DC (when using DC POWER UNIT 9784)
Power consumption	130 VA (220 VA when using PRINTER UNIT U8351)
Dimensions and weight	Approx. 351 mm (13.82 in.) W × 261 mm (10.28 in.) H × 140 mm (5.51 in.) D (excluding protrusions), 7.6 kg (268.1 oz., excluding modules)
Included accessories	Startup guide × 1, precautions for use × 1, input cord label × 1, power cord × 1 (RECORDING PAPER 9231 × 1 and roll paper attachment × 1, when PRINTER UNIT U8351 is installed)
Product warranty period	3 years (INTERNAL STORAGE U8334: 1 year)
Data saving	
Save destinations	SD MEMORY CARD Z4001 (2 GB), SD MEMORY CARD Z4003 (8 GB) USB DRIVE Z4006 (16 GB) INTERNAL STORAGE U8334 (1 TB) FTP transmission
File formats	SD memory card: FAT, FAT32 INTERNAL STORAGE U8334: FAT32
Automatic saving	Switchable ON/OFF Automatically saves to SD memory card, USB drive, internal storage, or LAN connection destination after measurement (binary or text format storage)
Direct write to storage (when MR9001-01 is installed)	Switchable ON/OFF Directly writes to SD memory card, USB drive, or internal storage SSD (binary format only)
Data saving formats	- Setting data: (.SET) - Measurement data: binary format (.MEM, .REC, .XYC, .FFT), text format (.TXT) - Index files: memory splitting to reduce dead time (.SEQ), split data saving for easier PC loading (.IDX) - Images: screenshot images (.BMP), printout-like images (.BMP), waveform judgment area images (.BMP) - Settings: startup settings (STARTUP.SET), waveform judgment area and setting configurations (.ARE) - Waveform generation data: , arbitrary waveform data (.WFG, when U8793 is installed), program data for generating waveforms (.FGP, when U8793 is installed) - Pulse pattern data: (.PLS, when MR8791 is installed)
Data decimation saving settings	When saving in text format OFF, 1/2, 1/5, 1/10, 1/20, 1/50, 1/100, 1/200, 1/500, 1/1,000
Split data saving settings	When saving in binary format 16, 32, 64 MB
Built-in printer (when PRINTER UNIT U8351 is equipped)	
Mechanism overview	Single-action loading of paper, high-speed thermal printing
Recording paper	216 mm (8.5 in.) × 30 m (98.4 ft.) Thermal paper roll (RECORDING PAPER 9231) Width for waveform printing section: 200 mm
Printing speed	50 mm/s max.

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Display	
Display area	10.4 in. SVGA TFT color LCD (800× 600 dots) (25 division time axis × 20 division voltage axis, 20 × 20 divisions when X-Y function is used)
Language setting	Japanese, English, Korean, simplified Chinese
Waveform display expansion/ compression	Time axis Multiplied by: 10, 5, 2, 1, 1/2, 1/5, 1/10, 1/20, 1/50, 1/100, 1/200, 1/500, 1/1,000, 1/2,000, 1/5,000, 1/10,000, 1/20,000, 1/50,000, 1/100,000, 1/200,000 (expansion is enabled for waveform recording Memory Function only) Voltage axis Multiplied by: 100, 50, 20, 10, 5, 2, 1, 1/2, 1/5, 1/10
Variable display	Users can define the vertical/amplitude divisions of the screen by either setting the upper/lower limits or by specifying the amplitude (e.g., voltage) per division
Scaling	Automatic scaling: - Configures various probes (set by model name or attenuation ratio), 10:1, 100:1, 1,000:1 Manual scaling: - Conversion ratio is set by user - 2-point scaling is set by user - Measurement unit is set by user (e.g., °C, A, m/s²; not related to module configuration)
Comment input	Character types: English letters, numbers, and symbols, Japanese characters (applicable for title, each analog channels and logic channels) Input method: simple input, input from log, defined word input, single-sentence kana-kanji conversion input
Logic waveform display	Display position can be shifted in 1% steps of the vertical axis The width between waveforms can be selected from wide, normal, and narrow
Graph display	Max.16 graphs
Monitor functions	Allows users to observe input signals in real-time on the Memory Hicorder's screen before initiating full recording or triggering • Level monitor • Instantaneous value monitor (sampling speed is fixed at 10 kS/s, update rate is 0.5 second)
Other display functions	• Waveform inversion (positive/negative inversion) • Cursor measurement (user places two markers on the time axis—A and B—to display or use values from all waveforms at those points) • Vernier function (fine tuning of amplitude) • Zoom function (splitting the screen vertically, the zoomed waveform is displayed in the lower half) • Waveform colors selectable from 16 colors • Zero position of analog waveforms can be shifted in 1% steps of vertical axis • Zero adjustment is implemented simultaneously across all channels and ranges
Memory function (measurement function for high-speed waveform recording)	
Time axis	Range setting: 26 steps from 5 µs/div to 5 min/div (100 samples/div) (When U8975, U8977, or U8978 is installed, 5 us/div cannot be selected) External sampling: 100 sampling/div (the user can arbitrarily set the number of sampling/div) Expand/compress display: expansion ratio is selected from 3 steps (×2 to ×10), compression ratio is selected from 16 steps (×1/2 to ×1/200,000)
Sampling cycle	1/100 of time axis range setting (minimum. 50 ns cycle)
Recording length	Fixed recording length: between 25 to 100,000 horizontal divisions (32 channel mode) and 25 to 2,000,000 horizontal divisions (2 channel mode) Arbitrary record length: max. 2,560,000 horizontal divisions (can be set by 1 div steps, but is limited by the number of channels that are in use) When U8975, U8977, or U8978 is installed, the channel mode is fixed to 32 channels (2 to 16 channel modes cannot be selected).
Pre-trigger	Records waveforms before the trigger It can be set as a percentage of the recording length (in 15 steps from 0% to 100%, -95%) or set arbitrary by 1 div steps.
Numerical calculations	• Up to 16 of the calculations below can be performed simultaneously on any channel: Average value, RMS value, P-P value, max value, time-to-max value, min value, time-to-min 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, arithmetic operations, time difference calculation, phase difference calculation, high level, low level • Judgment output of calculation results: GO/NG (with open-drain 5 V voltage output) • Automatic saving of calculation results
Waveform processing	• Up to 16 of the operations below can be performed simultaneously on selected channels: Arithmetic operations, absolute value, exponentiation, common logarithms, square roots, moving averages, differentiation (1st and 2nd order), integration (1st and 2nd order), time axis parallel shifts, trigonometric functions, inverse trigonometric functions • Automatic saving of calculation results
Memory splitting	Memory can be split into a maximum of 1,024 segments to avoid dead time Sequential saving function, multi-block saving function
Others	• X–Y waveform synthesis (full screen, 4-split screen) • Overlay drawing (selectable between always overlaying and overlaying only chosen waveforms) • Printing types: automatic printing, manual printing, AB cursor-to-cursor printing, report printing
Recorder function (measurement function for peak/trough recording)	
Time axis	Records only the two datasets of maximum and minimum for every 100 points/div from data acquired at the set sampling cycle Range setting: 19 steps from 10 ms/div to 1 hour/div Resolution: 100 samples/div Compression display: compression ratio is selected from 14 steps (× 1/2 to × 1/50,000)
Sampling cycle	1 µs, 10 µs, 100 µs, 1 ms, 10 ms, 100 ms (selectable from 1/100 or less of selected time axis setting)
Real-time print	Real-time print is available for time axis range slower than 500 ms/div (when the time axis is set to 10 ms to 200 ms/div, the printout is delayed, except when the recording length is set to "continuous." When the recording length is set to "continuous", manual printing is possible after recording is stopped when the time axis is set between 10 and 200 ms/div.)
Record length	Fixed setting (25 to 100,000 div), continuous, or arbitrary setting (in 1 div steps, 160,000 div max.) (The maximum recording length is half of the above when using modules U8975, U8977, or U8978)
Waveform memory	Last 160,000 div of data stored in on-board memory Memory data can be used for back-scrolling observation of past waveforms during measurement, and reprinting after measurement (The maximum recording length is half of the above when module U8975, U8977, or U8978 is installed)
Auto saving	Data is automatically saved to an SD memory card, USB drive, or internal storage after measurement is stopped
Others	Manual printing, AB cursor-to-cursor printing, report printing

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X-Y recorder function (measurement function)	
Sampling cycle	When dot drawing: 1, 10, 100 ms When line drawing: 10, 100 ms
Record length	Continuous
Screen and printing	Full screen or 4-split screen (manual print only)
X-Y numbers for display	8 graphs max.
X-Y channels setting	Select any 8 channels out of 32 channels for both X and Y axis
X-Y axis resolution	Displayed on screen: 25 dot/div Printer: 80 dots/div (horizontal) × 80 dots/div (vertical)
Waveform memory	Saves the last 4,000,000 points of sampling data to memory (Saves the last 2,000,000 points when using modules U8975, U8977, or U8978)
Pen up/down function	Users can toggle X-Y ploting. This setting applies to all X-Y plots simultaneously (While the pen up/down function is set to "up", nothing will be drawn on all X-Y graphs.)
External control of pen up/down function	Pen up/down is controllable by external input terminal (all X-Y graphs are controlled simultaneously)
Trigger	
Trigger modes	Memory function and FFT function: single trigger, continual trigger, automatic trigger Recorder function: single trigger, continual trigger
Trigger sources	Analog channels: channel 1 to channel 32, depends on installed modules Logic channels: built-in 16 logic channels + up to 3 logic modules on 48 channels External input: 2.5 V (rise, fall, or terminal short), timer, manual (AND/OR settings possible between multiple trigger sources)
Trigger types	• Level: Trigger occurs when the measured value crosses a threshold voltage value (rising edge, falling edge, or both rising and falling edges) • Voltage drop: Trigger occurs when the voltage peak value falls below a threshold level (for commercial power supply 50/60 Hz only) • Window: Trigger occurs when the measured value enters or exits the threshold upper and lower limit values • Period: Trigger occurs when the period between the rising or falling edge of the reference voltage value is outside the threshold period range • Glitch: Trigger occurs when the time between the rising/falling edge of the reference voltage value and the next rising/falling edge is less than a set pulse width • Event: Trigger occurs when the number of level triggers or glitch triggers counted as events exceeds the set event count • Logic: Trigger occurs when the pattern matches the set pattern of 1, 0, or X
Level setting resolution	0.1% of full scale (full scale is derived from the upper to lower limit of the vertical axis range, which is 20 div)
Trigger filter	Memory function: 0.1 to 10.0 div (9 steps) or OFF Recorder function: ON (fixed at 10 ms) or OFF
Trigger output	Open-drain output (with 5 V voltage output, active low) Level output setting: output pulse time is longer than the sampling period multiplied by the number of data after the trigger Pulse output setting: outputs a 2 ms pulse.
Others	Trigger priority function: triggers even during the standby period before pre-triggering Pre-trigger function: captures waveforms before and after trigger (Memory function) Start & stop trigger (recorder function) Trigger search
FFT function (measurement function)	
Analysis modes	Storage waveform, linear spectrum, RMS spectrum, power spectrum, cross power spectrum, autocorrelation function, histogram, transfer function, cross-correlation function, impulse response, coherence function, 1/1 octave analysis, 1/3 octave analysis, LPC analysis, phase spectrum
Analysis channels	Arbitrary analog channel
Frequency range/resolution	133 mHz to 8 MHz (133 mHz to 4 MHz when U8975, U8977, U8978 is installed), or depends on external sampling input Frequency resolution: 1/400, 1/800, 1/2,000, 1/4,000
Number of sampling points	1,000 points, 2,000 points, 5,000 points, 10,000 points
Window functions	Rectangular, Hanning, exponential, hamming, Blackman, Blackman-Harris, flat-top
Display Formats	Single, dual, Nyquist display, running spectrum display
Averaging	Simple average in the time domain and the frequency domain, exponential moving average, peak hold (frequency axis) Number of averaging (2 to 10,000)
Print function	Same as memory function (partial prints are not allowed)
Other	
Waveform judgment function	Available with measurement functions of Memory function, X-Y function, FFT function Judgment types: area judgment for measurement waveforms and parameter judgment for result of waveform calculations Judgment outputs: GO/NG judgment output with open-drain 5 V voltage output

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MEMORY HiCORDER

Accessory/Option Specifications (Sold Separately)

ANALOG UNIT 8966 (Accuracy at 23°C ± 5°C [73°F ± 9°F], 20% to 80% RH after 30 minutes of warm-up time and zero adjustment; accuracy guaranteed for 1 year)	
Measurement function	Voltage measurement (2 channels)
Input terminals	Isolated BNC connector (input impedance 1 MΩ, input capacitance 30 pF) Maximum rated voltage to ground: 300 V AC or DC (the maximum voltage that can be applied between input channel and casing, and between input channels, without damage—made possible due to isolation between input and Memory HiCorder)
Measurement range	5 mV/div to 20 V/div, 12 ranges Full scale of vertical axis: 20 div The maximum AC voltage that can be measured by the memory function: 280 V RMS
Measurement resolution	1/100 of range (using 12-bit A/D converter)
Maximum sampling speed	20 MS/s (simultaneous sampling across 2 channels)
Measurement accuracy	±0.5% of full scale (with 5 Hz filter, zero position accuracy included)
Frequency characteristics	DC to 5 MHz, -3 dB (with AC coupling: 7 Hz to 5 MHz, -3 dB)
Low pass filter	5 Hz, 50 Hz, 500 Hz, 5 kHz, 50 kHz, 500 kHz
Input coupling	AC, DC, GND
Maximum input voltage	400 V DC (maximum voltage that can be applied between input connectors without damage)
Dimensions and weight	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.)
Included accessories	None

4CH ANALOG UNIT U8975 (Accuracy at 23 ± 5°C [73°F ± 9°F] 20% to 80% RH, after 30 minutes of warm-up time and zero adjustment; accuracy guaranteed for 1 year)	
Measurement functions	Voltage measurement (4 channels)
Input terminals	Isolated BNC connector (input impedance 1 MΩ, input capacitance 30 pF) Maximum rated voltage to ground: 300 V AC or DC (the maximum voltage that can be applied between input channel and casing, and between input channels, without damage—made possible due to isolation between input and Memory HiCorder)
Measurement range	200 mV/div to 10 V/div, 6 ranges, Full scale of vertical axis: 20 div AC voltage for possible measurement/display: 140 V RMS
Measurement resolution	1/1,600 of measurement range (using 16-bit A/D converter)
Maximum sampling speed	5 MS/s (simultaneous sampling across 4 channels)
Measurement accuracy	±0.1% of full scale (with 5 Hz filter, zero position accuracy included)
Frequency characteristics	DC to 2 MHz, -3 dB
Low-pass filter	5 Hz, 500 Hz, 5 kHz, 200 kHz
Input coupling	DC, GND
Maximum input voltage	200 V DC (the maximum voltage that can be applied across input pins without damage)
Dimensions and weight	Approx. 106 mm (4.17 in.) W x 19.8 mm (0.78 in.) H x 196.5 mm (7.74 in.) D Approx. 250 g (8.8 oz.)
Included accessories	None

4CH ANALOG UNIT U8978 (Accuracy at 23 ± 5°C [73°F ± 9°F] 20 to 80% RH, after 30 minutes after of warm-up time and zero adjustment; accuracy guaranteed for 1 year)	
Measurement functions	Voltage measurement (4 channels)
Input terminals	Isolated BNC connector (input impedance 1 MΩ, input capacitance 30 pF) Maximum rated voltage to ground: 30 V AC or 60 V DC for direct input, 300 V AC or DC (CAT II) when combined with the 9665 (between each input channel and the Memory HiCorder, and between the input channels)
Measurement range	5 mV/div to 2 V/div, 9 ranges Full scale of vertical axis: 20 div
Measurement resolution	1/1,600 of measurement range (using 16-bit A/D converter)
Maximum sampling speed	5 MS/s (simultaneous sampling across 4 channels)
Measurement accuracy	±0.3% of full scale (with 5 Hz filter, zero position accuracy included)
Frequency characteristics	DC to 2 MHz, -3 dB
Low-pass filter	5 Hz, 500 Hz, 5 kHz, 200 kHz
Input coupling	DC, GND
Maximum input voltage	40 V DC (with direct input), 400 V DC (with 9665)
Dimensions and weight	Approx. 106 mm (4.17 in.) W x 19.8 mm (0.78 in.) H x 196.5 mm (7.74 in.) D Approx. 250 g (8.8 oz.)
Included accessories	None

HIOKI E.E. CORPORATION

DIGITAL VOLTMETER UNIT MR8990

(Accuracy at 23°C ± 5°C [73°F ± 9°F], 20% to 80% RH after 30 minutes of warm-up time and calibration, accuracy guaranteed for 1 year)

Measurement functions	DC voltage measurement (2 channels)
Input terminals	Banana input connectors (input resistance ≥ 100 MΩ for measurement ranges 100 mV f.s. to 10 V f.s., 10 MΩ in otherwise) Maximum rated voltage to ground: 300 V AC or DC (the maximum voltage that can be applied between input channel and casing, and between input channels, without damage—made possible due to isolation between input and Memory HiCorder)
Measurement range	5 mV/div to 50 V/div, 5 ranges Full scale of vertical axis: 20 div
Measurement resolution	1/50,000 of measurement range (using 24-bit ΔΣ modulation A/D converter)
Integration time	20 ms × NPLC (50 Hz power source), 16.67 ms × NPLC (60 Hz power source) (NPLC defines how many power line cycles are used for one integration time in a measurement)
Response time	≤ 2 ms + 2 × integration time (rise from -f.s. to +f.s., fall from +f.s. to -f.s.)
Basic measurement accuracy	±0.01% of reading ±0.0025% of full scale (at range of 1,000 mV f.s.)
Maximum input voltage	500 V DC (maximum voltage that can be applied between input connectors without damage)
Dimensions and weight	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.)
Included accessories	None

HIGH RESOLUTION UNIT 8968

(Accuracy at 23°C ± 5°C [73°F ± 9°F], 20% to 80% RH after 30 minutes of warm-up time and zero adjustment; accuracy guaranteed for 1 year)

Measurement functions	Voltage measurement (2 channels)
Input terminals	Isolated BNC connector (input impedance 1 MΩ, input capacitance 30 pF) Maximum rated voltage to ground: 300 V AC or DC (the maximum voltage that can be applied between input channel and casing, and between input channels, without damage—made possible due to isolation between input and Memory HiCorder)
Measurement range	5 mV/div to 20 V/div, 12 ranges Full scale of vertical axis: 20 div The maximum AC voltage that can be measured by the memory function: 280 V RMS
Anti-aliasing filter	Built-in filter to reduce aliasing distortion from FFT processing (automatic cutoff frequency setting, on/off switchable)
Measurement resolution	1/1,600 of measurement range (using 16-bit A/D converter)
Maximum sampling speed	1 MS/s (simultaneous sampling across 2 channels)
Measurement accuracy	±0.3% of full scale (with 5 Hz filter, zero position accuracy included)
Frequency characteristics	DC to 100 kHz, -3 dB (with AC coupling: 7 Hz to 100 kHz, -3 dB)
Low-pass filter	5 Hz, 50 Hz, 500 Hz, 5 kHz, 50 kHz
Input coupling	AC, DC, GND
Maximum input voltage	400 V DC (maximum voltage that can be applied between input connectors without damage)
Dimensions and weight	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.)
Included accessories	None

DC/RMS UNIT 8972

(Accuracy at 23°C ± 5°C [73°F ± 9°F], 20% to 80% RH after 30 minutes of warm-up time and zero adjustment; accuracy guaranteed for 1 year)

Measurement functions	Voltage measurement (2 channels, DC/RMS selectable)
Input terminals	Isolated BNC connector (input impedance 1 MΩ, input capacitance 30 pF) Maximum rated voltage to ground: 300 V AC or DC (the maximum voltage that can be applied between input channel and casing, and between input channels, without damage—made possible due to isolation between input and Memory HiCorder)
Measurement range	5 mV/div to 20 V/div, 12 ranges Full scale of vertical axis: 20 div AC voltage for possible measurement/display using the memory function: 280 V RMS
Measurement resolution	1/100 of range (using 12-bit A/D converter)
Maximum sampling speed	1 MS/s (simultaneous sampling across 2 channels)
Measurement accuracy	±0.5% of full scale (with 5 Hz filter, zero position accuracy included)
RMS measurement	RMS amplitude accuracy DC, 30 Hz to 1 kHz: ±1% of full scale 1 kHz to 100 kHz: ±3% of full scale Response time Slow: 5 s (rise time from 0% to 90% of full scale) Normal: 800 ms (rise time from 0% to 90% of full scale) Fast: 100 ms (rise time from 0% to 90% of full scale) Crest factor: 2
Frequency characteristics	DC to 400 kHz, -3 dB (with AC coupling: 7 Hz to 400 kHz, -3 dB)
Low-pass filter	5 Hz, 50 Hz, 500 Hz, 5 kHz, 100 kHz
Input coupling	AC, DC, GND
Maximum input voltage	400 V DC (maximum voltage that can be applied between input connectors without damage)
Dimensions and weight	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.)
Included accessories	None

HIOKI E.E. CORPORATION

MR8848

MEMORY HiCORDER

HIGH-VOLTAGE UNIT U8974

(Accuracy at 23°C ± 5°C [73°F ± 9°F], 20% to 80% RH after 30 minutes of warm-up time and zero adjustment; accuracy guaranteed for 1 year)

Measurement functions	Voltage measurement (2 channels, DC/RMS selectable)
Input terminals	Banana input terminals (input impedance: 4 MΩ, Input capacitance: 5 pF) Maximum rated voltage to ground: 1,000 V AC or DC (CAT III), 600 V AC or DC (CAT IV) (the maximum voltage that can be applied between input channel and casing, and between input channels, without damage—made possible due to isolation between input and Memory HiCorder)
Measurement range	DC mode: 200 mV, 500 mV, 1 V, 2 V, 5 V, 10 V, 20 V, 50 V RMS mode: 500 mV, 1 V, 2 V, 5 V, 10 V, 20 V, 50 V
Measurement resolution	1/1,600 of measurement range (using 16-bit A/D converter)
Maximum sampling speed	1 MS/s
Measurement accuracy	±0.25% of full scale (with 5 Hz filter, zero position accuracy included)
RMS measurement	Accuracy DC, 30 Hz to 1 kHz: ±1.5% of full scale 1 kHz to 100 kHz: ±3% of full scale Response time Slow: 2.5 s Normal: 500 ms Fast: 150 ms
Frequency characteristics	DC to 100 kHz, -3 dB
Input coupling	DC, GND
Maximum input voltage	1,000 V DC, 700 V AC
Dimensions and weight	Approx. 106 mm (4.17 in.) W × 19.8 mm (0.78 in.) H × 196.5 mm (7.74 in.) D Approx. 230 g (8.1 oz.)
Included accessories	None

FREQ UNIT 8970

(Accuracy at 23°C ± 5°C [73°F ± 9°F], 20% to 80% RH after 30 minutes of warm-up time; accuracy guaranteed for 1 year)

Measurement functions	Voltage input based measurement of frequency, rotation, power frequency, integration, pulse duty ratio, pulse width (number of channels: 2)
Input terminals	Isolated BNC connector (input impedance 1 MΩ, input capacitance 30 pF) Maximum rated voltage to ground: 300 V AC or DC (the maximum voltage that can be applied between input channel and casing, and between input channels, without damage—made possible due to isolation between input and Memory HiCorder)
Frequency mode	Measurement range: 1 Hz/div to 5 kHz/div (full scale = 20 div), 8 ranges Measurement frequency band: DC to 100 kHz (minimum pulse width 2 µs), Measurement accuracy: ±0.1% of full scale (except at 5 kHz/div), ±0.7% of full scale (at 5 kHz/div)
Rotation mode	Measurement range: 100 rpm/div to 100 k rpm/div (full scale = 20 div), 7 ranges Measurement rotation value: 0 to 2 million rpm (minimum pulse width 2 µs), Measurement accuracy: ±0.1% of full scale (except at 100 krpm/div), ±0.7% of full scale (at 100 krpm/div)
Power frequency mode	Measurement range: 50 Hz (40 to 60 Hz), 60 Hz (50 to 70 Hz), 400 Hz (390 to 410 Hz) (full scale = 20 div), 3 ranges Measurement accuracy: 50/60 Hz: ±0.03 Hz, 400 Hz range: ±0.1 Hz
Integration mode	Measurement range: 2 kilocounts/div to 1 megacounts/div, 6 ranges Measurement accuracy: ±1/2,000 of range
Duty ratio mode	Measurement range: 10 Hz to 100 kHz (min. pulse width 2 µs), 5%/div (full scale = 20 div) Measurement accuracy: 10 Hz to 10 kHz: ±1%, 10 to 100 kHz: ±4%
Pulse width mode	Measurement range: 2 µs to 2 sec, 500 µs/div to 100 ms/dv (full scale = 20 div) Measurement accuracy: ±0.1% of full scale
Measurement resolution	Integration mode: 1/2,000 of range Power frequency mode: 1/100 of range Other modes: 1/500 of range
Input voltage range and threshold level	Input voltage range: ±10 V to ±400 V, 6 ranges Threshold level: selectable threshold level at each range
Other functions	Slope, level, hold, smoothing, low-pass filter, switchable DC/AC input coupling, frequency dividing, integration over-range keep/return
Dimensions and weight	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.)
Included accessories	None

TEMP UNIT 8967

(Accuracy at 23°C ± 5°C [73°F ± 9°F], 20% to 80% RH after 30 minutes of warm-up time and zero adjustment; accuracy guaranteed for 1 year)

Measurement functions	Temperature measurement with thermocouple (2 channels, voltage measurement not available)
Input terminals	AWG 26 to 16 Thermocouple input: plug-in connector Recommended wire diameter Single-wire: 0.14 to 1.5 mm² Braided wire: 0.14 to 1.0 mm² (conductor wire diameter min. 0.18 mm) Input impedance: min. 5 MΩ (with line fault detection on/off) Maximum rated voltage to ground: 300 V AC or DC (the maximum voltage that can be applied between input channel and casing, and between input channels, without damage—made possible due to isolation between input and Memory HiCorder)
Measurement range Note: Upper and lower limit values depend on each thermocouple	3 ranges 10 °C/div (50 °F/div): -100°C to 200°C (-148°F to 392°F) 50 °C/div (122°F/div: -200°C to 1,000°C (-328°F to 1,832°F) 100 °C/div (212°F/div): -200°C to 2,000°C (-328°F to 3,632°F) Full scale of vertical axis: 20 div, Measurement resolution: 1/1,000 of measurement range (using 16-bit A/D converter)
Thermocouple measurement range (ASTM E-988-96) (JIS C 1602)	K: -200°C to 1,350°C (-328°F to 2,462°F) J: -200°C to 1,100°C (-328°F to 2,012°F) E: -200°C to 800°C (-328°F to 1,472°F) T: -200°C to 400°C (-328°F to 752°F) N: -200°C to 1,300°C (-328°F to 2,372°F) R: 0°C to 1,700°C (32°F to 3,092°F) S: 0°C to 1,700°C (32°F to 3,092°F) B: 400°C to 1,800°C (752°F to 3,272°F) W (WRe5-26): 0°C to 2,000°C (32°F to 3,632°F), Reference junction compensation: internal/external switchable Wire failure detection: on/off switchable
Data refresh rate	Slow: 500 ms (internal digital filter, 10 Hz cutoff) Normal: 100 ms (internal digital filter, 50/60 Hz cutoff) Fast: 1.2 ms (internal digital filter off)
Measurement accuracy	Thermocouple K, J, E, T, N At 0°C (32°F) or higher: ±0.1% of full scale ± 1°C (1.8°F) From -200°C to below 0°C (-328°F to 32°F): ±0.1% of full scale ± 2°C (± 3.6°F) Thermocouple R, S, B, W From 0°C to below 400°C (32°F to 752°F): ±0.1% of full scale ± 3.5°C (6.3°F) (Type B accuracy not guaranteed below 400°C/752°F) At 400°C (752°F) or higher: ±0.1% of full scale ± 3°C (5.4°F) Reference junction compensation accuracy ±1.5°C (2.7°F) (added to measurement accuracy when using internal reference junction compensation settings)
Dimensions and weight	Approx. 106 mm (4.17 in.) W × 19.8 mm (0.78 in.) H × 204.5 mm (8.05 in.) D Approx. 240 g (8.5 oz.)
Included accessories	Ferrite clamp × 2

HIOKI E.E. CORPORATION

STRAIN UNIT U8969 (Accuracy at 23°C ± 5°C [73°F ± 9°F], 80% RH or less, after 30 minutes of warm-up time and auto-balancing; accuracy guaranteed for 1 year)	
Measurement function	Strain measurement (2 channels, electronic auto-balancing, balance adjustment range within ±10,000 με or less)
Input terminals	NDIS connector EPRC07-R9FNDIS (The included CONVERSION CABLE L9769 enables connection to NDIS connector PRC03-12A10-7M10.5.) Maximum rated voltage to ground: 30 V RMS or 60 V DC (the maximum voltage that can be applied between input channel and casing, and between input channels, without damage—made possible due to isolation between input and Memory HiCorder)
Suitable transducer	Strain gauge transducer Bridge resistance: 120 Ω to 1 kΩ Bridge voltage: 2 V ± 0.05 V Gauge factor 2.0
Measurement range	20 to 1,000 με/div, 6 ranges Full scale of vertical axis: 20 div
Measurement resolution	1/1,250 of measurement range (using 16-bit A/D converter)
Maximum sampling speed	200 kS/s (simultaneous sampling across 2 channels)
Measurement accuracy	±0.5% of full scale ± 4 με (when 5 Hz filter is on)
Frequency characteristics	DC to 20 kHz, +1/-3 dB
Low-pass filter	5 Hz, 10 Hz, 100 Hz, 1 kHz
Dimensions and weight	Approx. 106 mm (4.17 in.) W × 19.8 mm (0.78 in.) H × 196.5 mm (7.74 in.) D Approx. 245 g (8.6 oz.)
Included accessories	CONVERSION CABLE L9769 × 2 (cable length 60 cm [1.97 ft.])

CHARGE UNIT U8979 (Accuracy at 23°C ± 5°C [73°F ± 9°F], 80% RH or less, after 30 minutes of warm-up time and zero adjustment; accuracy guaranteed for 1 year)	
Measurement function	Acceleration measurement (2 channels)
Input terminals	Voltage input or pre-amp embedded input: metal BNC connector (input impedance under voltage input 1 MΩ, input capacitance 200 pF or less) Charge input: miniature connector (#10-32UNF) Maximum rated voltage to ground: 30 V AC or 60 V DC (the maximum voltage that can be applied between input channel and casing, and between input channels, without damage—made possible due to isolation between input and Memory HiCorder) *The ground is common between the voltage input terminal and charge input terminal for the same channel.
Suitable transducer	Charge output type accelerometer Pre-amp embedded accelerometer (type IEPE)
Charge input (miniature connector)	Measurement range: 1 m/s2 to 200 km/s2 of full scale, 12 ranges, 6 steps by input sensitivity Charge input sensitivity: 0.1 pC/(m/s2) to 10 pC/(m/s2) Amplitude accuracy: ±2% of full scale Frequency characteristics: 1.5 Hz to 50 kHz, -3 dB (charge input) Low-pass filter: 500 Hz, 5 kHz Input coupling: AC, GND Maximum input charge: ±500 pC (6 high-sensitivity ranges), 50,000 pC (6 low-sensitivity ranges)
Pre-amp embedded input (BNC connector)	Measurement range: 1 m/s2 to 200 km/s2 of full scale, 12 ranges, 6 steps by input sensitivity Pre-amp embedded input sensitivity: 0.1 mV/(m/s2) to 10 mV/(m/s2) Amplitude accuracy: ±2% of full scale Frequency characteristics: 1 Hz to 50 kHz, -3 dB (charge input) Low-pass filter: 500 Hz, 5 kHz Input coupling: AC, GND Pre-amp supply power: 3.0 mA ± 20%. 22 V ± 5%
Voltage input (BNC connector)	Measurement range: 10 mV to 40 V of full scale, 12 ranges Measurement accuracy: ±0.5% of full scale Frequency characteristics: DC to 50 kHz, -3 dB (with DC coupling), 1 Hz to 50 kHz, -3 dB (with AC coupling) Low-pass filter: 5 Hz, 500 Hz, 5 kHz Input coupling: AC, DC, GND Maximum input voltage: 40 V DC
Measurement resolution	1/25,000 of measurement range (using 16-bit A/D converter)
Maximum sampling speed	200 kS/s
Anti-aliasing filter	Internal filter to eliminate aliasing (rollover distortion) in FFT processing (automatic cutoff frequency setting is on/off switchable)
TEDS	IEEE 1451.4 class 1 supported (support for sensor information reading and automatic sensitivity setting)
Dimensions and weight	Approx. 106 mm (4.17 in.) W × 19.8 mm (0.78 in.) H × 196.5 mm (7.74 in.) D Approx. 230 g (8.1 oz.)
Included accessories	None

LOGIC UNIT 8973	
Measurement function	Logic signal capture (16 channels, logic probes sold separately)
Input terminals	Mini DIN connector (for Hioki logic probes only) Compatible logic probes: 9320-01, 9327, MR9321-01
Dimensions and weight	Approx. 106 mm (4.17 in.) W × 19.8 mm (0.78 in.) H × 196.5 mm (7.74 in.) D Approx. 190 g (6.7 oz.)
Included accessories	None

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3CH CURRENT UNIT U8977 (Accuracy at 23°C ± 5°C [73°F ± 9°F], 20% to 80% RH after 30 minutes of warm-up time and zero adjustment; accuracy guaranteed for 1 year)	
Measurement function	Current measurement (3 channels, current sensors sold separately
Input terminals	ME15W (dedicated connector terminal, input impedance 1 MΩ, ground terminal is common with Memory HiCorder)
Compatible current sensors and measurement ranges (full scale = 20 div)	Current sensor that automatically identify rating (don't require conversion adapters) 2 A rated sensor: CT6830 — 10 mA/div, 20 mA/div, 50 mA/div, 100 mA/div, 200 mA/div, 500 mA/div 20 A rated sensors: 9272-05 (20 A), CT6831, CT6841A — 100 mA/div, 200 mA/div, 500 mA/div, 1 A/div, 2 A/div, 5 A/div 50 A rated sensors: CT6862-05, CT6872 — 200 mA/div, 500 mA/div, 1 A/div, 2 A/div, 5 A/div, 10 A/div 200 A rated sensors: 9272-05 (200 A), CT6833, CT6843A, CT6863-05, CT6873 — 1 A/div, 2 A/div, 5 A/div, 10 A/div, 20 A/div, 50 A/div 500 A rated sensors: CT6834, CT6844A, CT6845A, CT6904A, CT6875A — 2 A/div, 5 A/div, 10 A/div, 20 A/div, 50 A/div, 100 A/div 1,000 A current sensors: CT6846A, CT6876A — 5 A/div, 10 A/div, 20 A/div, 50 A/div, 100 A/div, 200 A/div 2,000 A current sensor: CT6877A — 10 A/div, 20 A/div, 50 A/div, 100 A/div, 200 A/div, 500 A/div Current sensors connected using CT9920 conversion cable (conversion rate or model number is manually input for rating settings) 100 A rated sensors: CT7631, CT7731 — 10 A/div 600 A rated sensors: CT7636, CT7736 — 10 A/div, 20 A/div, 50 A/div 2,000 A rated sensors: CT7642, CT7742 — 100 A/div, 200 A/div 6,000 A rated flexible sensors: CT7044, CT7045, CT7046 — 100 A/div, 200 A/div, 500 A/div (The measurable range is rated by the connected sensor)
Measurement accuracy (with 5 Hz filter on)	±0.3% of full scale (The accuracy error of each current sensor being used must be added. Similarly, characteristics of each sensor such as frequency may limit performance.) Frequency characteristics: DC to 2 MHz, ±3 dB
Measurement resolution	1/1,600 of measurement range (using 16-bit A/D converter)
Maximum sampling speed	5 MS/s (simultaneous sampling across 3 channels)
Other functions	Input coupling: DC, GND Low-pass filter: 5 Hz, 500 Hz, 5 kHz, 200 kHz
Dimensions and weight	Approx. 106 mm (4.17 in.) W x 19.8 mm (0.78 in.) H x 196.5 mm (7.74 in.) D Approx. 250 g (8.8 oz.)
Included accessories	None

CURRENT UNIT 8971 (Accuracy at 23°C ± 5°C [73°F ± 9°F], 20% to 80% RH after 30 minutes of warm-up time and zero adjustment; accuracy guaranteed for 1 year)	
Measurement function	Current measurement (2 channels, current sensors sold separately)
Input terminals	Sensor connector (input impedance 1 MΩ, exclusive connector for current sensor via conversion cable the 9318, common ground with Memory HiCorder)
Compatible current sensors and measurement ranges (full scale = 20 div)	20 A rated sensors: 9272-05 (20 A), CT6841A. — 100 mA/div, 200 mA/div, 500 mA/div, 1 A/div, 2 A/div, 5 A/div 50 A rated sensors: CT6862-05, CT6872 — 200 mA/div, 500 mA/div, 1 A/div, 2 A/div, 5 A/div, 10 A/div 200 A rated sensors: 9272-05 (200 A), CT6863-05, CT6873, CT6843A, CT6833 — 1 A/div, 2 A/div, 5 A/div, 10 A/div, 20 A/div, 50 A/div 500 A rated sensors: CT6844A, CT6845A, CT6846A*, CT6875A, CT6876A*, CT6834 — 2 A/div, 5 A/div, 10 A/div, 20 A/div, 50 A/div, 100 A/div * Scaling settings are required when using in combination with the 8971 Note: CONVERSION CABLE 9318 and CONVERSION CABLE CT9901 (discontinued) are both required to connect current sensors to the 8971 The measurable ranges depend on the connected sensor(s). Read specs of each sensor for more details
Measurement accuracy (with 5 Hz filter on)	±0.65% of full scale (The accuracy error of each current sensor being used must be added. Similarly, characteristics of each sensor such as frequency may limit performance.) RMS amplitude accuracy: ±1% of full scale (DC, 30 Hz to 1 kHz), ±3% of full scale (1 to 10 kHz) RMS response time: 100 ms (rise time from 0% to 90% of full scale) Crest factor: 2 Frequency characteristics: DC to 100 kHz, ± 3 dB (using AC coupling: 7 Hz to 100 kHz)
Measurement resolution	1/100 of range (using 12-bit A/D converter)
Maximum sampling speed	1 MS/s (simultaneous sampling across 2 channels)
Other functions	Input coupling: AC, DC, GND Low-pass filter: 5 Hz, 50 Hz, 500 Hz, 5 kHz, 50 kHz
Dimensions and weight	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.)
Included accessories	CONVERSION CABLE 9318 × 2 (to connect the current sensors to the 8971)

HIOKI E.E. CORPORATION

WAVEFORM GENERATOR UNIT MR8790

(Accuracy at 23°C ± 5°C [73°F ± 9°F], 80% RH or less after 30 minutes of warm-up time; accuracy guaranteed for 1 year)

Output terminals	Number of channels: 4 SMB terminal (output impedance: 1 Ω or less) Maximum rated voltage to ground: 30 V AC or 60 V DC
Output voltage range	-10 V to 10 V Amplitude setting range: 0 V to 20 V p-p Setting resolution: 1 mV
Maximum output current	5 mA
Output function	DC, sine wave (output frequency: 1 Hz to 20 kHz)
Accuracy	Amplitude accuracy: ±0.25% of setting ± 2 mV p-p (1 Hz to 10 kHz) Offset accuracy: ±3 mV DC output accuracy: ±0.6 mV
Others	Self-test function (voltage, current)
Dimensions and weight	Approx. 106 mm (4.17 in.) W × 19.8 mm (0.78 in.) H × 196.5 mm (7.74 in.) D Approx. 230 g (8.1 oz.)
Included accessories	None

PULSE GENERATOR UNIT MR8791

(Accuracy at 23°C ± 5°C [73°F ± 9°F], 80% RH or less with no condensation; accuracy guaranteed for 1 year)

Output terminals	Number of channels: 8 D-sub half-pitch 50-pin connector Maximum rated voltage to ground: 30 V AC or 60 V DC (between module and output channels) Logic output or open collector output
Output mode 1	Pattern output Clock frequency range:10 Hz to 120 kHz Memory of 2,048 logic patterns for output steps
	Pulse output Frequency setting: 0.1 Hz to 20 kHz Duty settings: 0.1% to 99.9%
Output mode 2	Logic output Voltage level: 0 V to 5 V (high level: 3.8 V or higher, low level: 0.8 V or lower)
	Open collector output: 50 V absolute maximum rated voltage for collector/emitter Overcurrent protection: 100 mA
Other function	Self-test function
Dimensions and weight	Approx. 106 mm (4.17 in.) W × 19.8 mm (0.78 in.) H × 196.5 mm (7.74 in.) D Approx. 230 g (8.1 oz.)
Included accessories	None

ARBITRARY WAVEFORM GENERATOR UNIT U8793

(Accuracy at 23°C ± 5°C [73°F ± 9°F], 80% RH or less after 30 minutes or more of warm-up time; power supply frequency range of installed MEMORY HiCORDER at 50/60 Hz ±2 Hz; accuracy guaranteed for 1 year)

Output terminals	Number of channels: 2 SMB terminal (output impedance: 1 Ω or less) Maximum rated voltage to ground: 30 V AC or 60 V DC
Output voltage range	-10 V to 15 V Amplitude setting range: 0 V to 20 Vp-p Setting resolution: 1 mV
Maximum output current	10 mA Allowable load resistance: 1.5 kΩ or more
FG function	Sine wave, rectangular wave, pulse wave (variable duty ratio), triangular wave, ramp wave, DC Output frequency: 0 Hz to 100 kHz (setting resolution: 10 mHz)
User-defined waveform generation function	Waveforms measured with the MR8848, MR8847A and other specific HiCorders Waveforms generated by WAVEFORM MAKER SF8000 software based on CSV format data D/A refresh rate: 2 MHz (using 16-bit D/A converter)
Sweep function	Frequency, amplitude, offset, duty (pulse only)
Program function	128 steps max. (number of loops for each step is configurable, number of total loops is configurable)
Other	Self-test function (voltage) External input/output control
Dimensions and weight	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.)
Included accessories	None

HIOKI E.E. CORPORATION

MR8848

MEMORY HiCORDER

Main unit

MEMORY HiCORDER MR8848
512 megawords internal memory
Modules sold separately, storage media, voltage cables, current probes, or any other accessories/options are not included and must be purchased separately

Factory options
(Please specify when ordering as it will be installed during production)

DC POWER SUPPLY UNIT 9784
Factory option, built-in on the back of the Memory HiCorder
10 V to 28 V DC input

PRINTER UNIT U8351
Factory option, built-in printer
Width for waveform printing section: 200 mm
Compatible recording paper: RECORDING PAPER 9231

RECORDING PAPER 9231
A4 width roll paper, 216 mm × 30 m, set of 6 rolls

INTERNAL STORAGE U8334
Factory option, built-in SSD drive, 1 TB

Additional function

DIRECT WRITE TO STORAGE MR9001-01
Directly write data to storage device (e.g., PC, USB DRIVE Z4006, INTERNAL STORAGE U8334)

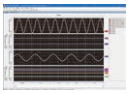
Storage devices
*Make sure to use Hioki's storage media sold separately. If you use a storage media other than these, Hioki will cannot guarantee stable operation; it may not be able to save or read the data.

SD MEMORY CARD 2GB Z4001
2 GB data storage

SD MEMORY CARD 8GB Z4003
8 GB data storage

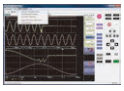
USB DRIVE Z4006
16 GB
Long life and highly reliable SLC type flash memory

PC-related



WAVE PROCESSOR 9335
Data conversion, print function, waveform display

MR6000 Viewer (Free download software)
Waveform display, numerical calculation, waveform calculation, FFT calculation, and other calculations equivalent to MR8848 can be performed on a PC



LAN COMMUNICATOR 9333
Automatic saving of waveform data to a PC via LAN, remote control of HiCorder, printing of measured data via printers connected to a PC

LAN CABLE 9642
Straight, cross conversion connector included, 5 m

Carrying case

PORTABLE CASE 9783
Hard trunk type that can withstand transportation of the Memory HiCorder

Measurement modules
(Input cables are not included and must be purchased separately)

ANALOG UNIT 8966
2 channels, voltage input, 20 MS/s, (DC to 5 MHz)

4CH ANALOG UNIT U8975
4 channels, voltage input, 5 MS/s (DC to 2 MHz)
Input voltage limit: 200 V DC

4CH ANALOG UNIT U8978
4 channels, voltage input, 5 MS/s (DC to 2 MHz)
Highest sensitivity range 100 mV f.s.

HIGH RESOLUTION UNIT 8968
2 channels, voltage input, 1 MS/s (DC to 100 kHz), 16-bit A/D converter included

DC/RMS UNIT 8972
2 channels, voltage input, 1 MS/s (DC to 400 kHz)
RMS rectifier (DC, 30 Hz to 100 kHz)

HIGH-VOLTAGE UNIT U8974
2 channels, voltage input, 1,000 V DC or 700 V AC max.

DIGITAL VOLTMETER UNIT MR8990
2 channels, high-precision DC voltage, 0.1 µV resolution
Maximum sampling rate 500 times/s

3CH CURRENT UNIT U8977
3 channels, for measuring current using dedicated current sensors, can be directly connected to ME15W (12-pin) connector-type sensors, for use with up to 3 modules

CURRENT UNIT 8971
2 channels, for measuring current using dedicated current sensors, two CONVERSION CABLE 9318 included, for use with up to 4 modules

TEMP UNIT 8967
2 channels, thermocouple input for temperature measurement

STRAIN UNIT U8969
2 channels, strain gauge type converter amp

CONVERSION CABLE L9769
Included with STRAIN UNIT U8969, for STRAIN UNIT U8969 only

FREQ UNIT 8970
2 channels, for measurement of frequency, rotation speed, pulse, etc.

CHARGE UNIT U8979
2 channels, for acceleration measurement, supports charge output, pre-amp output (IEPE-type), and voltage output

LOGIC UNIT 8973
4 terminals, 16 channels, for use with up to 3 modules

Output modules
(Output cables are not included and must be purchased separately)

WAVEFORM GENERATOR UNIT MR8790
4 channels, ±10 V DC output, 1 Hz to 20 kHz sine waveform output

PULSE GENERATOR UNIT MR8791
8 channels, 0.1 Hz to 20 kHz pulse output, pattern output

ARBITRARY WAVEFORM GENERATION UNIT U8793
2 channels, 10 mHz to 100 kHz FG function, -10 V to 15 V output, D/A refresh rate (arbitrary waveform generator mode): 2 MHz

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Output cables

CONNECTION CABLE L9795-01
SMB terminal to alligator clip, 1.5 m (4.92 ft.)

CONNECTION CABLE L9795-02
SMB terminal to BNC terminal, 1.5 m (4.92 ft.)

Logic probes

LOGIC PROBE 9327
LOGIC PROBE 9320-01
· 4-channel type, for voltage or contact signal on/off detection
· Not isolated
· Response pulse width
9327: 100 ns or more
9320-01: 500 ns or more
· Digital input threshold: 1.4, 2.5, 4.0 V
· Maximum input voltage: 0 to 50 V DC

LOGIC PROBE MR9321-01
· 4 channels, on/off detection of AC/DC voltage
· Isolated
· Response time: rising edge of 1 ms max., falling edge of 3 ms max.
· Output (high) detection
Low range: 60 to 150 V AC, ±(20 to 150) V DC
High range:170 to 250 V AC, ±(70 to 250) V DC
· Output (low) detection
Low range: 0 to 10 V AC, ±(0 to 15) V DC
High range: 0 to 30 V AC, ±(0 to 43) V DC
· Maximum input voltage:
Low range: 150 V RMS
High range: 250 V RMS

Input cord (A)

For 8966, U8975, U8978, 8968, 8972, 8970
Voltage is limited to the specifications of the input modules in use

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

ALLIGATOR CLIP L9790-01
Red/black set, attaches to the ends of the CONNECTION CORD L9790

GRABBER CLIP 9790-02
When this clip is attached to the end of the CONNECTION CORD L9790, input voltage is limited to CAT II 300 V; red/black set

CONTACT PIN 9790-03
Red/black set, attaches to the ends of the CONNECTION CORD L9790

Input cord (B)

For 8966, U8975, U8978, 8968, 8972, 8970
Input voltage is limited to the voltage of the input module to which it is connected.

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

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

GRABBER CLIP L9243
Attaches to the tip of the CONNECTION CORD L9197, red/black set, 185 mm (7.28 in.) length

Input cord (C)

For 8966, U8975, U8978, 8968, 8972, 8970
The maximum input voltage is derated and based on the input frequency. Please refer to the instruction manual of each probe for details.

10:1 PROBE 9665
Max. rated voltage to ground is same as for the input module being used, 1.5 m (4.92 ft.) length

100:1 PROBE 9666
Max. rated voltage to ground is same as for the input module, 1.5 m (4.92 ft.) length

Input cord (D)

For 8966, U8975, U8978, 8968, 8972, 8970
(Voltage to ground is the same as that of the Memory HiCorder 8848's specifications. A dedicated power source is required for each of the following.)

DIFFERENTIAL PROBE P9000-01
Waveform only, for use with a Memory HiCorder, 1 kV AC or DC
Frequency band: 100 kHz

DIFFERENTIAL PROBE P9000-02
Switchable between waveform and RMS, for use with a Memory HiCorder, 1 kV AC or DC
Frequency band: 100 kHz

AC ADAPTER Z1008
100 to 240 V AC

Input cord (E)

For 8966, U8975, U8978, 8968, 8972, 8970
(Voltage to ground is the same as that of the Memory HiCorder 88487's specifications. A dedicated power source is required for each of the following.)

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)

For U8974

CONNECTING CABLE L4940
Banana plug, 1.5 m (4.92 ft.) length, red and black,1 each

EXTENSION CABLE L4931
Extends 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 1,000 V

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

MAGNETIC ADAPTER L4937
Attaches to the tip of banana plug cables, CAT III 1,000 V

GRABBER CLIP L9243
Attaches to the tip of banana plug cables, red/black set, 185 mm (7.28 in.) length, CAT II 1,000 V

Input cord (G)

For MR8990

TEST LEAD L2200
70 cm (2.30 ft.) length, tips are interchangeable with a pin test lead or alligator clip, maximum input voltage of CAT IV 600 V or CAT III 1,000 V

Input cord (H)

For U8979

CONNECTION CORD9166
BNC-clips, 1.5 m (4.92 ft.) length

Other accessories for input

CONNECTION CORD L9217
Has insulated BNC connectors at both ends, signal output use, 1.6 m (5.25 ft.) length

CONVERSION ADAPTER 9199
Receiving side banana terminal, output BNC terminal

Thermocouple

For 8967

For reference only. Please purchase separately

HIOKI E.E. CORPORATION

High-precision current sensors

ME15W (12 pins) terminal type
For U8977 (Can be directly connected)
For 8971 (excluding CT6904A, CT6877A, CT6830, CT6831)
For 8966, U8975, U8978, 8968, 8972 (separate power supply required)

 High-accuracy pass-through type	**AC/DC CURRENT SENSOR CT6862-05** DC to 1 MHz, 50 A **AC/DC CURRENT SENSOR CT6863-05** DC to 500 kHz, 200 A
 High-accuracy pass-through type	**AC/DC CURRENT SENSOR CT6872** DC to 10 MHz, 50 A **AC/DC CURRENT SENSOR CT6873** DC to 10 MHz, 200 A
 High-accuracy pass-through type	**AC/DC CURRENT SENSOR CT6904A** DC to 4 MHz, 500 A (not compatible with 8971)
 High-accuracy pass-through type	**AC/DC CURRENT SENSOR CT6875A** DC to 2 MHz, 500 A **AC/DC CURRENT SENSOR CT6876A** DC to 1.5 MHz, 1,000 A
 High-accuracy pass-through type	**AC/DC CURRENT SENSOR CT6877A** DC to 1 MHz, 2,000 A (not compatible with 8971)
 Compact slide type	**AC/DC CURRENT PROBE CT6830** DC to 100 kHz, 2 A (not compatible with 8971) **AC/DC CURRENT PROBE CT6831** DC to 100 kHz, 20 A (not compatible with 8971)
 Compact & thin clamp type	**AC/DC CURRENT PROBE CT6833** DC to 50 kHz, 200 A **AC/DC CURRENT PROBE CT6834** DC to 50 kHz, 500 A
 High-accuracy clamp type	**AC/DC CURRENT PROBE CT6841A** DC to 2 MHz, 20 A **AC/DC CURRENT PROBE CT6843A** DC to 700 kHz, 200 A **AC/DC CURRENT PROBE CT6844A** DC to 500 kHz, 500 A
 High-accuracy clamp type	**AC/DC CURRENT PROBE CT6845A** DC to 200 kHz, 500 A **AC/DC CURRENT PROBE CT6846A** DC to 100 kHz, 1,000 A
 High-accuracy clamp type	**CLAMP ON SENSOR 9272-05** 1 Hz to 100 kHz, AC only, 20/200 A switchable

How to connect to 3CH CURRENT UNIT U8977

High-precision current sensor (ME15W) → 3CH CURRENT UNIT U8977

How to connect to CURRNT UNIT 8971

High-precision current sensor (ME15W) + CT9901[1] + 9318[2] → CURRENT UNIT 8971

1: CT9901 is discontinued
2: 9318 is included with CURRENT UNIT 8971

How to connect 8966, U8975, U8978, 8968, 8972 modules

High-precision current sensor (ME15W) + CT9550 series + L9217
→ 8966, U8975, U8978, 8968, 8972

Power supplies

For high-precision current sensors

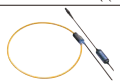
	**SENSOR UNIT CT9555** 1 channel, waveform output
	**SENSOR UNIT CT9556** 1 channel, waveform, RMS output
	**SENSOR UNIT CT9557** 4 channel, waveform, total waveform, total RMS output
	**CONNECTION CORD L9217** Has insulated BNC connectors at both ends, 1.6 m (5.25 ft.) length

Conversion cable

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

General-purpose current measurement

PL14 terminal type
(for U8977, conversion cable CT9920 is required)

	**AC/DC AUTO ZERO CURRENT SENSOR CT7731** DC to 5 kHz, 100 A
	**AC/DC AUTO ZERO CURRENT SENSOR CT7736** DC to 5 kHz, 600 A
	**AC/DC AUTO ZERO CURRENT SENSOR CT7742** DC to 5 kHz, 2,000 A
	**AC/DC CURRENT SENSOR CT7631** DC to 10 kHz, 100 A
	**AC/DC CURRENT SENSOR CT7636** DC to 10 kHz, 600 A
	**AC/DC CURRENT SENSOR CT7642** DC to 10 kHz, 2,000 A
	**AC FLEXIBLE CURRENT SENSOR CT7044** ϕ 100 mm (3.94 in.), 6,000 A
	**AC FLEXIBLE CURRENT SENSOR CT7045** ϕ 180 mm (7.09 in.), 6,000 A
	**AC FLEXIBLE CURRENT SENSOR CT7046** ϕ 254 mm (10.00 in.), 6,000 A

Conversion cable

	**CONVERSION CABLE CT9920** Converts PL14 terminal to ME15W (12-pin) terminal

How to connect to 3CH CURRENT UNIT U8977

Current Sensor (PL14) + CT9920 → 3CH CURRENT UNIT U8977

Precautions for connecting current sensors and current probes

* The bandwidth of current sensors and current probes is limited by the bandwidth of the current module to which they are connected.
* Depending on the combination of current sensors and current probes, physical and space limitations may prevent simultaneous connection. Hioki can assist with special order conversion cables. Please inquire with your local distributor.
* A total of 9 current sensors and current probes can be simultaneously connected to the Memory HiCorder MR8848. However, the number of connectable sensors/probes may decrease depending on the power consumption of the connected current sensor/probe.
* Three U8977 current modules and four 8971 current modules can be simultaneously connected to the Memory HiCorder MR8848.
* Limitations for the connectable number of current sensors/probes (which results from power supplying) can be eliminated by combining current sensors/probes with a sensor power source and using the voltage input analog modules.
* Only the U8977 can use the CT9920 to convert a PL14 connector sensor. The 8971 does not support this combination.

HIOKI E.E. CORPORATION

MEMORY HiCORDER

High sensitivity, wideband current sensors
For 8966, U8975, U8978, 8968, 8972

CURRENT PROBE CT6710
DC to 50 MHz, 30 A RMS

CURRENT PROBE CT6711
DC to 120 MHz, 30 A RMS

CURRENT PROBE CT6700
DC to 50 MHz, 5 A RMS

CURRENT PROBE CT6701
DC to 120 MHz, 5 A RMS

CLAMP ON PROBE 3273-50
DC to 50 MHz, 30 A RMS

CLAMP ON PROBE 3276
DC to 100 MHz, 30 A RMS

CLAMP ON PROBE 3274
DC to 10 MHz, 150 A RMS

CLAMP ON PROBE 3275
DC to 2 MHz, 500 A RMS

Power supplies
For CT6700 series and 3270 series current probes

POWER SUPPLY 3272
One sensor can be powered
(two sensors can be powered depending on conditions)
Not available for CT6710 and CT6711

POWER SUPPLY 3269
Up to four sensors can be powered
Only two probes can be powered in combination with the CT6710 or CT6711

Precautions for connecting current sensors and current probes

* The bandwidth of current sensors and current probes is limited by the bandwidth of the current module to which they are connected.
* Depending on the combination of current sensors and current probes, physical and space limitations may prevent simultaneous connection. Hioki can assist with special order conversion cables. Please inquire with your local distributor.
* A total of 9 current sensors and current probes can be simultaneously connected to the Memory HiCorder MR8848. However, the number of connectable sensors/probes may decrease depending on the power consumption of the connected current sensor/probe.
* Three U8977 current modules and four 8971 current modules can be simultaneously connected to the Memory HiCorder MR8848.
* Limitations for the connectable number of current sensors/probes (which results from power supplying) can be eliminated by combining current sensors/probes with a sensor power source and using the voltage input analog modules.
* Only the U8977 can use the CT9920 to convert a PL14 connector sensor. The 8971 does not support this combination.

Leakage current measurement
For 8966, U8975, U8978, 8968, 8972
For 50/60 Hz commercial power line

AC LEAKAGE CLAMP METER CM4003
6 mA range to 200 A range, with WAVE/RMS output

CONNECTION CABLE L9097
Included accessory of CM4003
For waveform output, 1.5 m (4.92 ft.),
Output terminal: BNC
Power terminal: USB-C

AC Adapter Z1013
100 to 240 V AC

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