

# HIOKI

## MEMORY HiCORDER MR6000

NEW



# Exceed All Limits

Fast and powerful - the best specs in the history of Memory HiCorders



Best-in-Class  
Flagship  
Model

**Measurement** Blazing fast, never-fail sampling  
High-speed isolation measurement at 200 MS/s

**Storage** Superior processing capacity lets you save data while measuring  
Save data in real time, 32 times faster than conventional models

**Usability** User-friendly design for accurate and smooth operation  
Intuitive operation via large 12.1-inch touch screen

CE

# Overwhelming high speed technology A revolutionary approach to measurement, recording and analysis

## MEMORY HiCORDER MR6000

The MR6000 overcomes all barriers to reach new ground and meet challenges that are yet to be seen.

World class specifications, operability and design - Hioki's newest memory recorder has been re-engineered from top to bottom, delivering unprecedented performance that will change how you look at waveform recording.

Redefining the world standard for recorders - that is the Hioki MR6000.

**200MS/s**

*High-speed  
optical isolated  
measurement*

**Instant saving**

*Real-time save*

**Intuitive operation**

*Touch screen*





Increased efficiency of inverters and improved performance of power electronics technologies have been achieved in the power electronics, renewable energy and automotive industries. We have drastically improved the technology of our Memory HiCorder to meet the

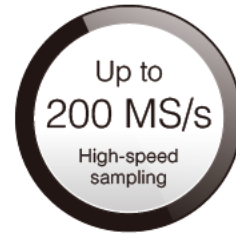


# Series-Leading Measurement Performance

## High-speed isolated measurement at 200 MS/s

### Up to 32 ch in the analog unit and up to 128 ch in the logic unit

The Hioki Memory HiCorder lineup now includes a powerful input unit that unlocks the full measuring potential of the MR6000. The HIGH SPEED ANALOG UNIT U8976 boasts the highest sampling rate in its entire series, an order of magnitude faster than conventional models, enabling the unit to perform isolated measurement at 200 MS/s. Combine multiple modules of the 4ch ANALOG UNIT U8975, which provides 4 channels of input with a speed of 5 MS/s at 16 bits, to perform multi-channel measurements up to 32 channels. Make the most of the Memory HiCorder's capabilities as we continue its development to meet your advanced measurement needs.



### Blazing fast, never-fail sampling Record high-precision waveforms



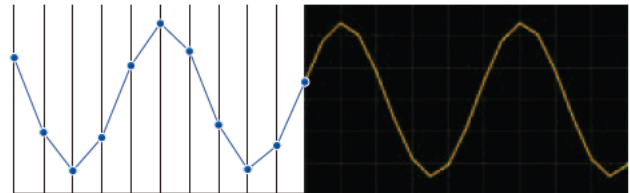
#### **NEW** HIGH SPEED ANALOG UNIT U8976

You need accurate detection of switching waveforms in inverter evaluation tests, which requires a high level of efficiency. We developed the HIGH SPEED ANALOG UNIT U8976 to meet those needs. In addition to high-speed sampling at 200 MS/s, the unit supports frequency bands up to 30 MHz. Adapted to the Memory HiCorder's direct input feature, it supports inputs up to 400 V DC.

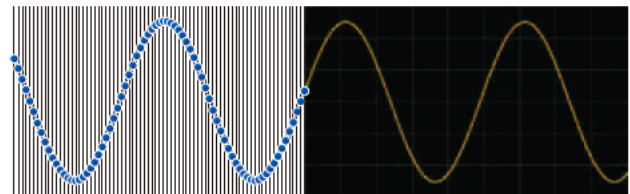
Available recording duration **5-second continuous recording at 200 MS/s**

Sampling rate	1 ch	2 ch	3 to 4 ch	5 to 8 ch	9 to 16 ch
200 MS/s	5 s	2.5 s	1 s	0.5 s	0.25 s
100 MS/s	10 s	5 s	2 s	1 s	0.5 s
50 MS/s	20 s	10 s	4 s	2 s	1 s
20 MS/s	50 s	25 s	10 s	5 s	2.5 s
⋮	⋮	⋮	⋮	⋮	⋮

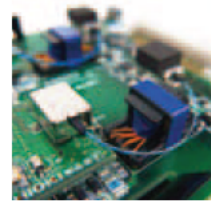
\*Internal memory used \*U8976 installed in 8 slots



Conventional sampling (20 MS/s)



200 MS/s High-speed sampling



### Isolated input with optical isolation devices

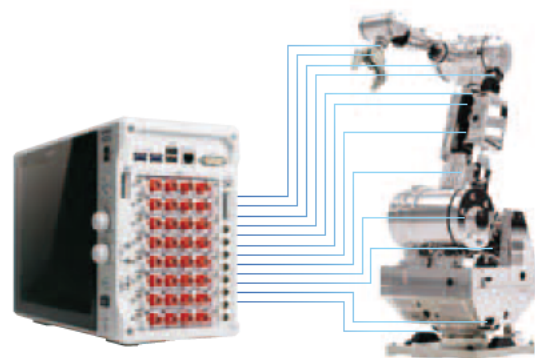
Connections between analog input channels, and between the input channel and the main unit, are fully isolated. This means that, unlike an oscilloscope, measurements can be made without concern with negative effects from potential differences.

### Install up to 8 units with 4 channels each Measure multiple points simultaneously

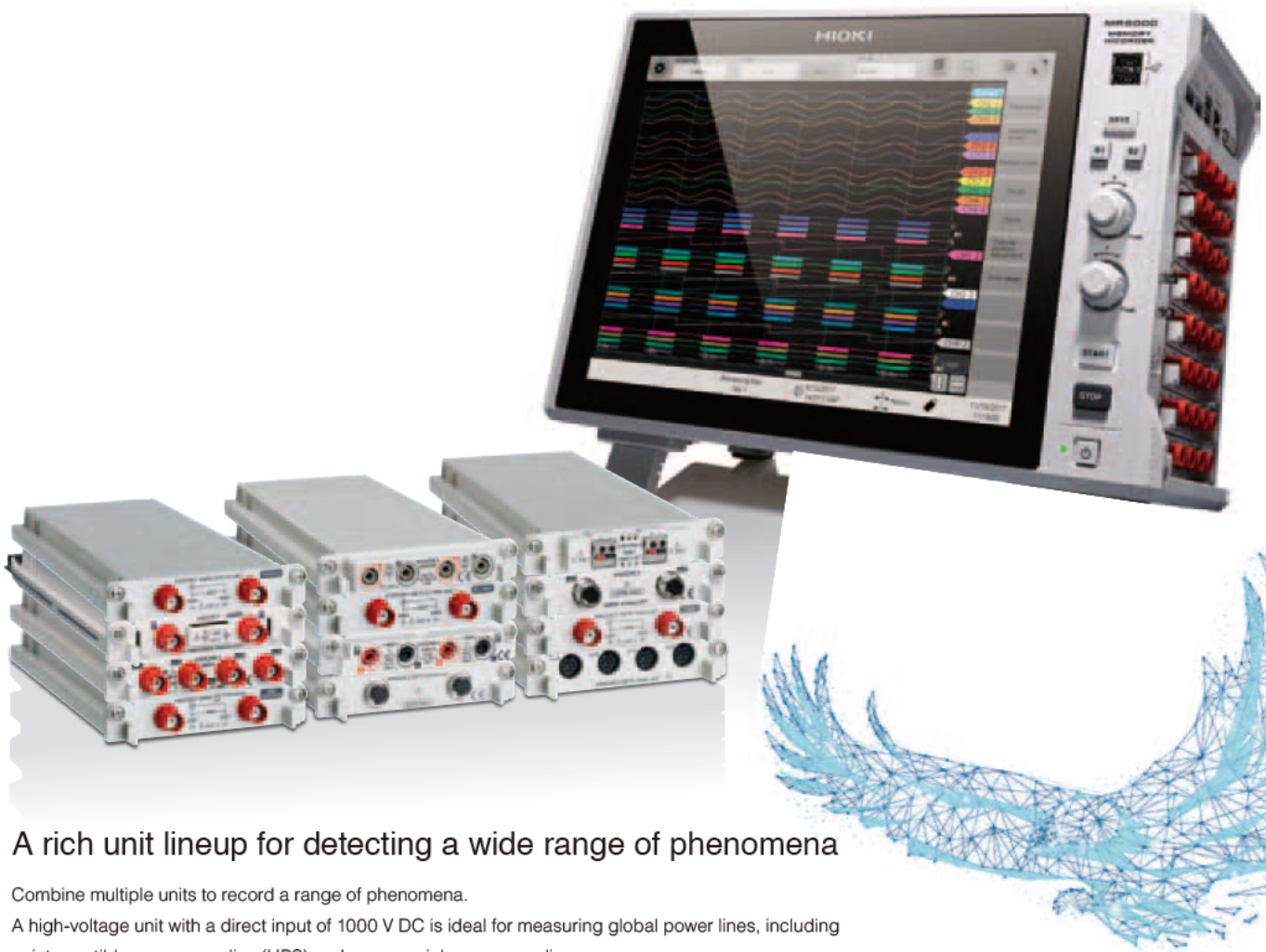


#### **NEW** 4ch ANALOG UNIT U8975

Our lineup now includes a 4ch Analog Unit with 4-channel input on a single unit, improving the multi-channel measurement performance of the Memory HiCorder. The unit supports direct inputs up to 200 V DC, and its sampling rate is five times faster than conventional models. In addition, its high 16-bit resolution allows you to measure voltage with superior accuracy.



Simultaneous measurement of multiple locations in 32 channels at 5 MS/s



## A rich unit lineup for detecting a wide range of phenomena

Combine multiple units to record a range of phenomena.













A high-voltage unit with a direct input of 1000 V DC is ideal for measuring global power lines, including uninterruptible power supplies (UPS) and commercial power supplies.

Use multiple logic units to measure relay ON/OFF signals or PLC (programmable logic controller) signals across up to 128 channels simultaneously.

### Unit interchangeability

The unit types compatible with the MR6000 are identical to the ones compatible with the MEMORY HiCORDER MR8827, MR8847A, MR8740, and MR8741. Use any of the 12 types listed in the unit selection guide below. However, the U8975 and U8976 can only be used with the MR6000.

## Unit selection guide (All 12 types)

Measured signal	Model	Description	No. of channels	Fastest sampling	Bandwidth	A/D resolution	DC accuracy	Max. input voltage	Sensitivity (#1)	Max. sensitivity range	Isolation	Supplement
 Voltage (high speed)	U8976	High-Speed Analog Unit	2ch	200MS/s	DC to 30MHz	12bit	±0.5%f.s.	400V DC / 1000V DC (#2)	0.0625mV	100mVf.s.	Yes	n/a
 Voltage	8966	Analog Unit	2ch	20MS/s	DC to 5MHz	12bit	±0.5%f.s.	400V DC	0.05mV	100mVf.s.	Yes	n/a
 Voltage (4ch)	U8975	4ch Analog Unit	4ch	5MS/s	DC to 2MHz	16bit	±0.1%f.s.	200V DC	0.125mV	4Vf.s.	Yes	n/a
 Voltage (high resolution)	8968	High Resolution Unit	2ch	1MS/s	DC to 100kHz	16bit	±0.3%f.s.	400V DC	3.125µV	100mVf.s.	Yes	with AAF
 Voltage (DC, RMS)	8972	DC/RMS Unit	2ch	1MS/s	DC to 400kHz	12bit	±0.5%f.s.	400V DC	0.05mV	100mVf.s.	Yes	with RMS
 Voltage (high voltage)	U8974	High Voltage Unit	2ch	1MS/s	DC to 100kHz	16bit	±0.25%f.s.	1000V DC / 700V AC	0.125mV	4Vf.s.	Yes	CAT IV 600V
 Voltage (high resolution)	MR8990	Digital Voltmeter Unit	2ch	2ms	n/a	24bit	±0.01%rdg. ±0.0025%f.s.	500V DC	0.1µV	100mVf.s.	Yes	CAT II 300V
 Current	8971	Current Unit	2ch	1MS/s	DC to 100kHz	12bit	±0.65%f.s.	Current sensor only	Depends on current sensor	n/a	n/a	with RMS Max. 4 Units
 Temperature	8967	Temperature Unit	2ch	1.2ms	DC	16bit	Detailed reference	Thermocouples only	0.01°C	200°Cf.s.	Yes	n/a
 Strain	U8969	Strain Unit	2ch	200kS/s	DC to 20kHz	16bit	±0.5%f.s. ±4µε	Strain only	0.016µε	400µεf.s.	Yes	n/a
 Frequency	8970	Frequency Unit	2ch	200kS/s	DC to 100kHz (#3)	16bit	n/a	400V DC	0.002Hz	Depend ng mode	Yes	n/a
 Logic	8973	Logic Unit	4 probes (16ch)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Requ res 9320-01,9327 or MR9320-01

(#1) Minimum resolution shows the highest sensitivity resolution (#2) When using the 9665 (#3) Min. pulse width 2µs

## Concentration of sensing technologies with superior accuracy: A rich set of functions suitable for all measuring purposes

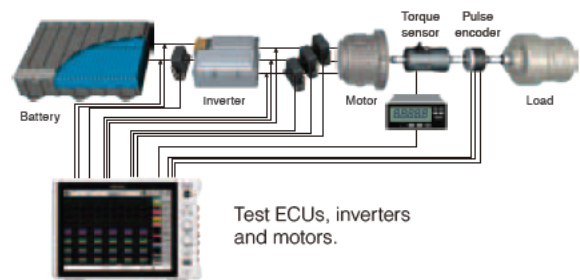
The sensing technology that serves as the inlet for measurement data is essential for detecting various phenomena in multiple channels. The MR6000 is a high-spec model that fully utilizes the capacity of Hioki's high-precision sensors.



### Compatible with high-precision sensors for measuring large currents

Combine the CURRENT UNIT 8971 and a current probe or current sensor designed and manufactured by Hioki to use the system within a wide temperature range or measure large currents with a high level of precision at solar power plants or development sites for EVs/HEVs. The convenient, built-in sensor identification function lets you simply connect the sensor to easily configure the scaling settings through automatic recognition.

Combine the HIGH SPEED ANALOG UNIT U8976 and a Hioki current probe or clamp-on probe for high-precision wideband observation of current waveforms. Furthermore, install the optional PROBE POWER UNIT Z5021 to drive these probes from the MR6000 main unit.



## Triggers that detect targeted events

Set triggers on any channel to record data whenever an event occurs.

Level trigger	Compares to one voltage value.
Window trigger	Compares to two voltage values.
Voltage drop trigger	Detects voltage drops in commercial power lines.
Period trigger	Monitors periods.
Glitch trigger	Detects anomalies in pulses.
Pattern trigger	Compares when the logic signal is ON/OFF.



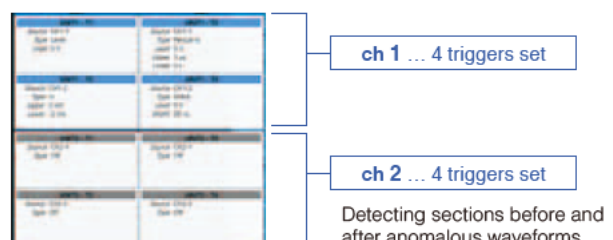
Clear trigger system diagram

### Setting multiple triggers for a single channel

Set up to 4 triggers for a single channel.

If, for instance, you set the glitch, level, window-in, and window-out triggers for the same input waveform, that waveform is monitored according to the set trigger conditions.

Various triggers × Up to 4 Settable for any channel



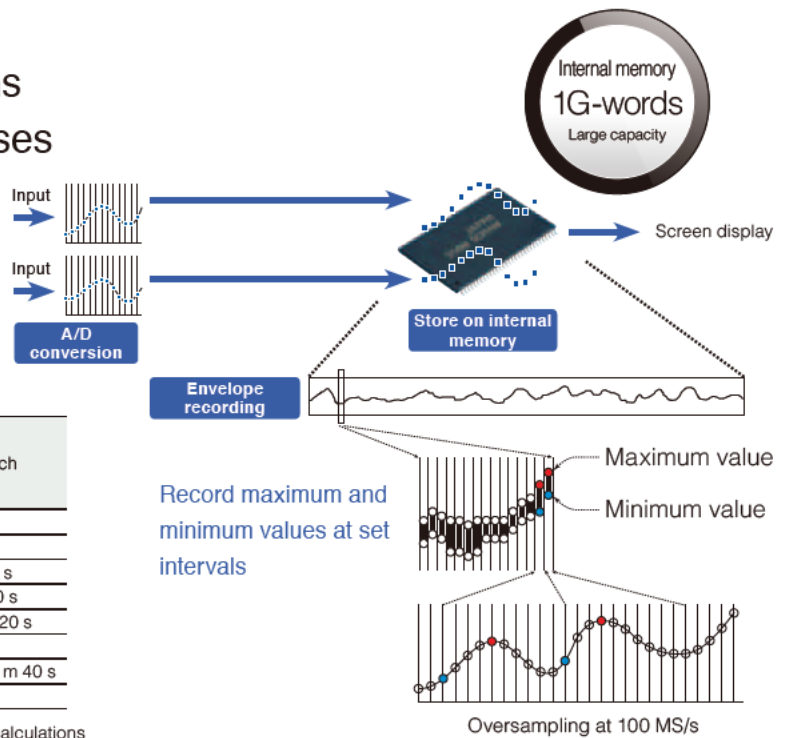
## Observe long-term fluctuations without any sampling rate losses

The system uses the envelope measurement method to record maximum and minimum values at set intervals while performing oversampling at 100 MS/s.

The internal memory has a capacity of 1 G-words, which ensures that the measuring process continues for a long time without any data losses. Save data in real time while measuring.

Over sampling speed	Recording intervals	1 ch	...	9 to 16 ch
100 MS/s	10 MS/s	50 s	...	2 s
	1 MS/s	8 m 20 s	...	20 s
	100 kS/s	1 h 23 m 20 s	...	3 m 20 s
	10 kS/s	13 h 53 m 20 s	...	33 m 20 s
	1 kS/s	5 d 18 h 53 m 20 s	...	5 h 33 m 20 s
	...	...	...	...
	20 S/s	289 d 8 h 26 m 40 s	...	11 d 13 h 46 m 40 s
...	...	...	...	

\*Without the U8975, MR8990, or real-time waveform processing calculations



## Numerical calculation function boasting high analytical performance

**ALL** Installed in MR6000, MR6000-01

The measured waveforms are analyzed with numerical parameters.

The MR6000 features some new numerical calculations including overshoot and undershoot calculations. In addition to analog and logic channels, this model performs calculations on real-time waveform processing channels. It also features the numerical judgment function.

**ONLY** Installed in MR6000-01

**Calculate measurement data during measurement :**  
Real-time waveform processing

The MR6000-01 features powerful optional equipment for real-time waveform processing. This function performs the four arithmetic operations (addition, subtraction, multiplication, and division), differentiation calculations, or integration calculations during the measuring process. This lets you use waveforms to check the calculation results while measuring. The equipment also saves and computes the calculation results numerically after the measuring process.

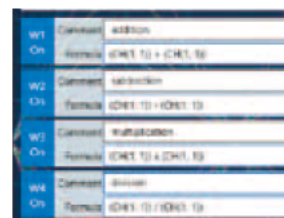
**ONLY** Installed in MR6000-01

**Observe clear waveforms without noise :**  
Digital filter calculation

This function removes harmonic noise or specific frequency noise from measurement data. Use it to eliminate the noise that cannot be resolved with the standard filter installed in the unit.

Simultaneous calculations of up to 16 out of a total of 33 computations

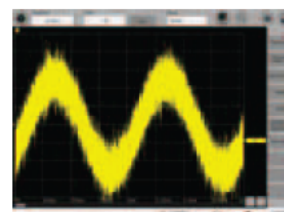
Average value	Rise time	Duty ratio	Amplitude
RMS value	Fall time	Pulse count	Overshoot
Peak to peak value	Standard deviation	Four arithmetic operations	Undershoot
Maximum value	Area value	Time difference	Width
Time to maximum value	X Y area value	Phase difference	Width
Minimum value	Specified level time	High level	Burst width
Time to minimum value	Specified time level	Low level	Integration values
Period	Pulse width	Median value	XY waveform angle
Frequency			



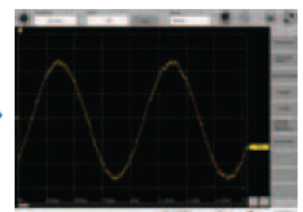
Simple setting method



Optional equipment for real-time waveform processing



Digital filter disabled



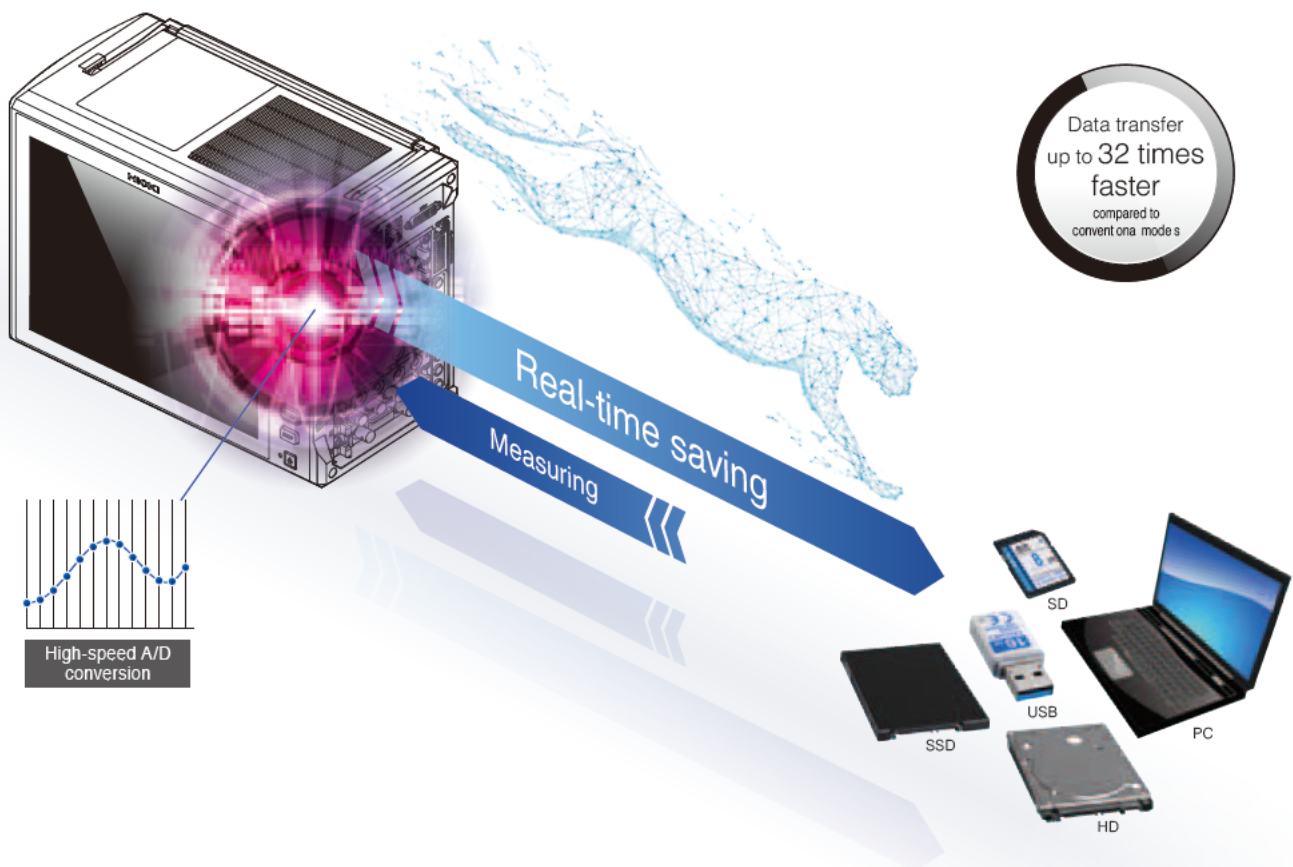
Digital filter enabled

# Highest Transfer Speed in the Entire Series

Data transfer up to 32 times faster compared to conventional models  
Outstanding real-time save function that saves data during measurement

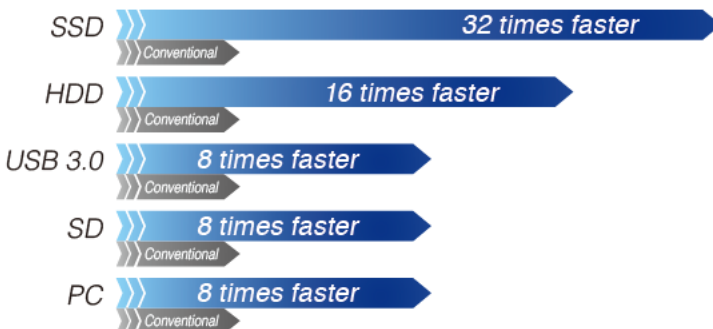
The MR6000 features a brand new interface that makes data transfer up to 32 times faster.

In addition, faster internal processing allows data to be saved to external media in real time during measurement.



## Drastically increased data transfer speed

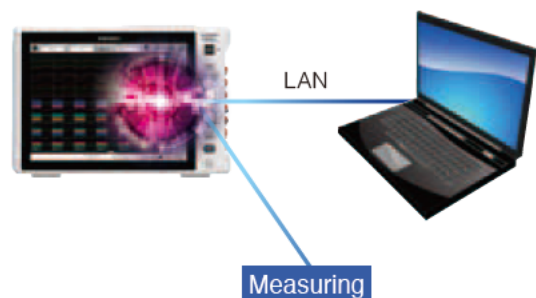
Data transfer to storage devices is now up to 32 times faster. While conventional models transferred data at 1 MS/s in a single channel, the MR6000 transfers data for 32 channels.



\*Compared to other recorders in the Hioki Memory HiCorder series.  
\*Results vary according to measurement conditions.

## Saving data directly to your PC

Transfer measurement data directly to your PC by using the FTP sending function together with the real-time save function. This makes it easier to observe data after the measuring process.

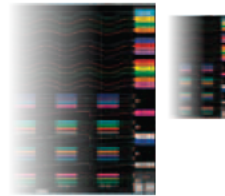
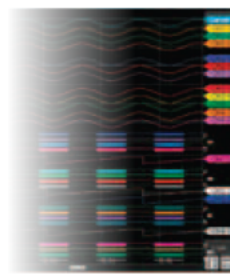
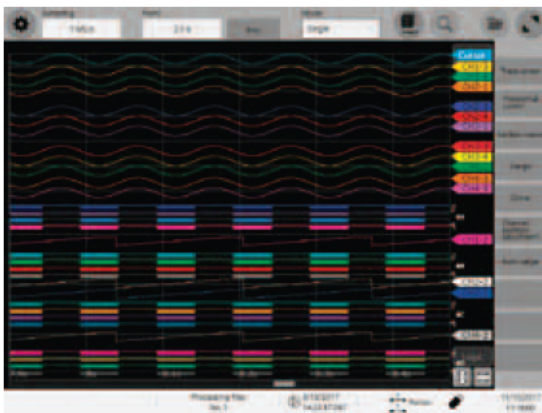




# Longest Continuous Recording in the Entire Series

## Long-term recording and high-speed sampling in multiple channels All in a single measurement

The real-time save function controls the available measurement duration without relying on the capacity of the internal storage memory. For long-term recording, we recommend a high-capacity SSD or HD unit. You can also use a more convenient USB memory stick or SD memory card. All phenomena can be recorded at a high sampling rate over a long period of time. This feature is ideal for situations where it is hard to predict the nature of a phenomenon or for measurements that can only be performed once. When saved in real time, data is split into several 512 MB files.



32 ch  
1MS/s for 1h  
of continuous  
recording

1 hour of continuous recording across as many as 32 channels at 1 MS/s

### Available real-time save duration for various media

Save destination	Sampling speed	Number of channels	Available measurement duration	Maximum sampling rate for real-time save *1
SSD UNIT U8332 (256 GB)	1 MS/s	32 ch	Approx. 1 h	20 MS/s
HD UNIT U8333 (320 GB)	1 MS/s	16 ch	Approx. 2 h 40 min	10 MS/s
USB DRIVE Z4006 (16 GB)	1 MS/s	8 ch	Approx. 16 min	5 MS/s *2
SD MEMORY CARD Z4003 (8 GB)	1 MS/s	8 ch	Approx. 8 min	5 MS/s
PC	1 MS/s	8 ch	Depends on PC capacity	5 MS/s

\*1: For 2 channels (no settings for 1 channel) \*2: When using the USB 3.0 connector

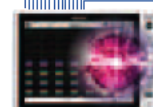
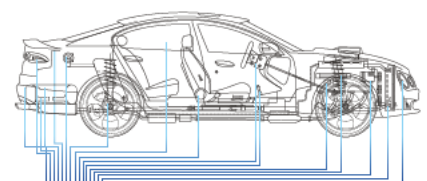
### Maximum recording duration for real-time save with an SSD UNIT U8332/Reference values

d: days h: hours min: minutes s: seconds

Sampling rate	Number of channels used				
	2	4	8	16	32
20 MS/s	53 min 20 s	-	-	-	-
10 MS/s	1 h 46 min 40 s	53 min 20 s	-	-	-
5 MS/s	3 h 33 min 20 s	1 h 46 min 40 s	53 min 20 s	-	-
2 MS/s	8 h 53 min 20 s	4 h 26 min 40 s	2 h 13 min 20 s	1 h 6 min 40 s	-
1 MS/s	17 h 46 min 40 s	8 h 53 min 20 s	4 h 26 min 40 s	2 h 13 min 20 s	1 h 6 min 40 s
500 kS/s	1 d 11 h 33 min 20 s	17 h 46 min 40 s	8 h 53 min 20 s	4 h 26 min 40 s	2 h 13 min 20 s
200 kS/s	3 d 16 h 53 min 20 s	1 d 20 h 26 min 40 s	22 h 13 min 20 s	11 h 6 min 40 s	5 h 33 min 20 s
100 kS/s	7 d 9 h 46 min 40 s	3 d 16 h 53 min 20 s	1 d 20 h 26 min 40 s	22 h 13 min 20 s	11 h 6 min 40 s
50 kS/s	14 d 19 h 33 min 20 s	7 d 9 h 46 min 40 s	3 d 16 h 53 min 20 s	1 d 20 h 26 min 40 s	22 h 13 min 20 s
20 kS/s	37 d 0 h 53 min 20 s	18 d 12 h 26 min 40 s	9 d 6 h 13 min 20 s	4 d 15 h 6 min 40 s	2 d 7 h 33 min 20 s
10 kS/s	74 d 1 h 46 min 40 s	37 d 0 h 53 min 20 s	18 d 12 h 26 min 40 s	9 d 6 h 13 min 20 s	4 d 15 h 6 min 40 s
5 kS/s	148 d 3 h 33 min 20 s	74 d 1 h 46 min 40 s	37 d 0 h 53 min 20 s	18 d 12 h 26 min 40 s	9 d 6 h 13 min 20 s
2 kS/s	∴	185 d 4 h 26 min 40 s	92 d 14 h 13 min 20 s	46 d 7 h 6 min 40 s	23 d 3 h 33 min 20 s
1 kS/s	∴	∴	185 d 4 h 26 min 40 s	92 d 14 h 13 min 20 s	46 d 7 h 6 min 40 s
500 S/s			∴	185 d 4 h 26 min 40 s	92 d 14 h 13 min 20 s
200 S/s				∴	231 d 11 h 33 min 20 s
100 S/s					∴

### Long-term measurements for more efficient testing

The real-time save function boasts high-speed sampling and multi-channel measurements. Perform an approximately 1-hour measurement at 20 MS/s in 2 channels or 1 MS/s in 32 channels.



Conduct a range of operation tests during a single measurement.



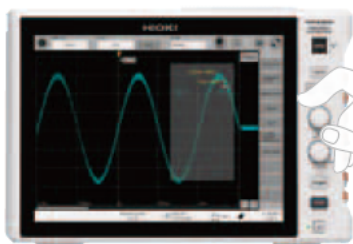
## User-Friendly Flexible Design

### Fast and convenient touch screen Operation as smooth as silk

The capacitive touch screen delivers intuitive operability.

Select a setting item directly by tapping the screen, and use your fingers to enlarge the part you want to see.

The new user interface makes setting measurement items for multiple channels easier compared to the more complicated conventional models where you had to press the keys several times to configure a setting.



▲ Use the rotary knobs to move the tracing cursor.



▲ Simply tap the screen to switch between the items you want to set.

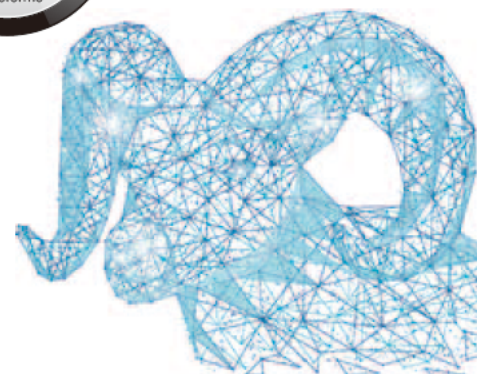
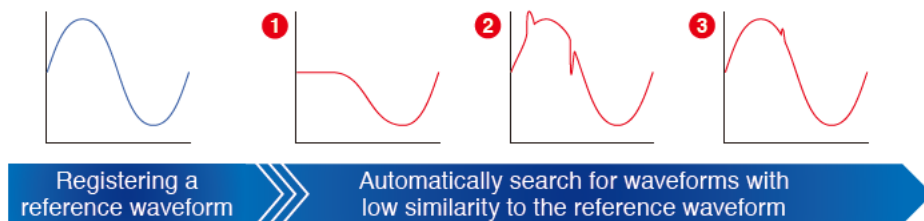
## Easy method for pinpointing a specific waveform within large amounts of measurement data

Set the peak values or trigger conditions you want to search for to have the relevant data retrieved and displayed automatically. Our new Memory HiCorder Concierge function automatically calculates the characteristics of the reference waveform you have set and searches all of the measured data to detect and array any waveforms with low similarity as anomalous waveforms. This drastically reduces the amount of time required to search for anomalies by eliminating the need to scroll through measured waveforms and check them visually.

### Memory HiCorder Concierge

Use the Concierge to look for anomalous waveforms.

A new waveform search function finds anomalous waveforms in all of the measured data. This function is ideal for situations where it is difficult to set the right triggers before measuring because the nature of potential anomalies cannot be predicted.



### Rich set of search functions

#### Peak search

Search for the maximum value, minimum value, local maxima, or local minima in all of the measured data, and mark the search point in the waveform.

#### Trigger search

Set trigger conditions for all of the measured data again to search for points where the conditions are fulfilled, even if no triggers were set during the measuring process.

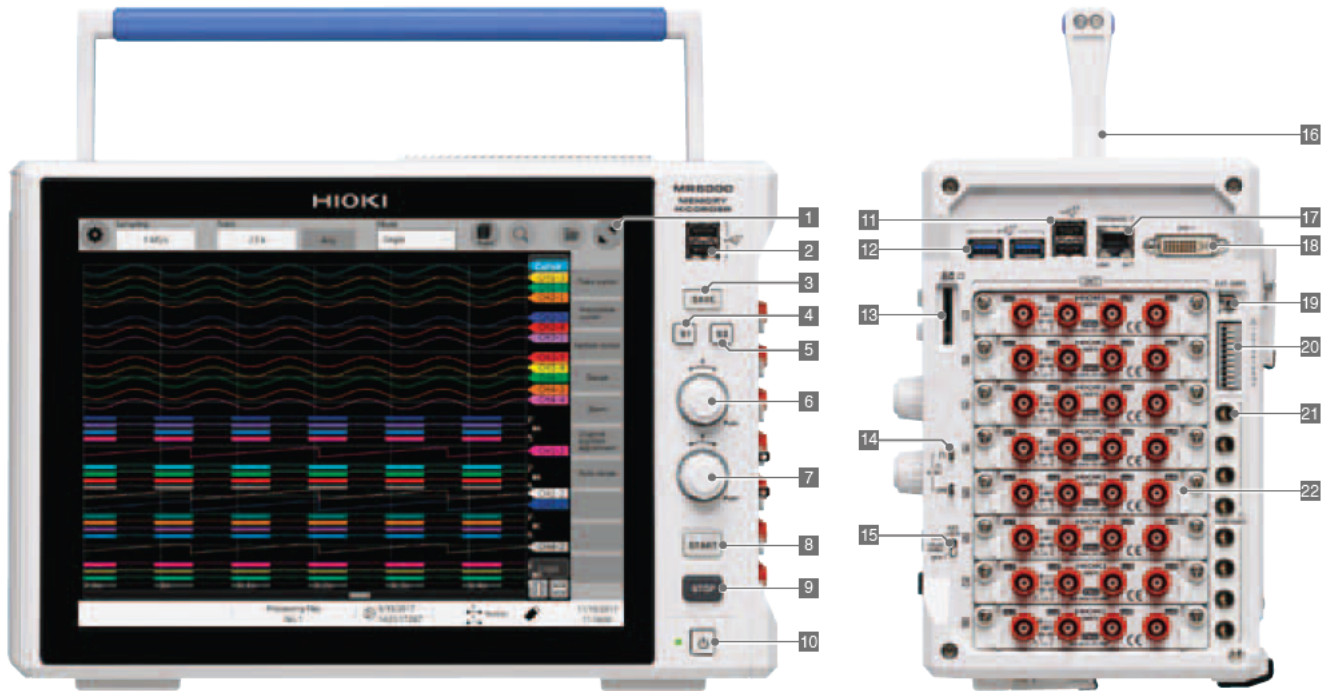
#### Jump

Jump to an event mark you made while measuring, to the cursor position on the display, or to the location measured at a specified time.

## Radically improved data saving time

Transferring very large amounts of data measured over a long period of time used to be very time-consuming. The MR6000 features a brand new interface and faster internal processing, reducing the time required to save measurement data to media. This saves you the trouble of waiting for data to be saved and improves work efficiency.

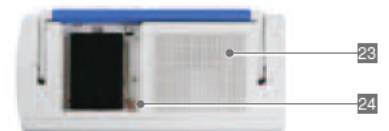
USB 2.0	Existing models		
	MR6000		◀ Reduced to 1/5
USB 3.0	MR6000		◀ Further reduced to 1/10
HD	Existing models		
	MR6000		◀ Reduced to 1/20
SSD	MR6000		◀ Further reduced to 1/30



## Multifunctional Interface

Only 6 keys in total  
New recorder design

Use the touch screen to configure all the basic settings.



Open or close the top panel of the main unit.  
Z4006 USB DRIVE installable.

<p><b>1</b> Display 12.1-inch capacitive touch screen TFT color LCD display</p>	<p><b>9</b> STOP button For importing the set recording length and stopping the measuring process</p>	<p><b>17</b> 1000 BASE-T connector For connecting to the network via LAN cable</p>
<p><b>2</b> USB 2.0 connector x2 For connecting a USB memory stick, USB mouse, or USB keyboard</p>	<p><b>10</b> Power button For turning the power on or off</p>	<p><b>18</b> DVI terminal For outputting the screen display</p>
<p><b>3</b> SAVE button For displaying the manual save dialog box</p>	<p><b>11</b> USB 2.0 connector x2 For connecting a USB memory stick, USB mouse, or USB keyboard</p>	<p><b>19</b> External sampling terminal For inputting various external sampling signals</p>
<p><b>4</b> Shortcut button 1 For registering frequently used settings</p>	<p><b>12</b> USB 3.0 connector x2 For connecting a USB memory stick, USB mouse, or USB keyboard</p>	<p><b>20</b> External control terminal For inputting various external signals to control the device</p>
<p><b>5</b> Shortcut button 2 For registering frequently used settings</p>	<p><b>13</b> SD MEMORY CARD slot For inserting SD memory cards</p>	<p><b>21</b> Dedicated power supply terminal for current clamp For supplying power to the current sensor (Option)</p>
<p><b>6</b> Rotary knob X For moving the tracing cursor and scrolling or zooming the waveform in and out</p>	<p><b>14</b> Output terminal for probe compensation signals For outputting 10:1 or 100:1 PROBE compensation signals</p>	<p><b>22</b> Various units Install input units appropriate for the measurement target</p>
<p><b>7</b> Rotary knob Y For changing the position and zooming the waveform in and out</p>	<p><b>15</b> KEY LOCK For disabling the touch screen and buttons</p>	<p><b>23</b> Air inlet For reducing the internal temperature</p>
<p><b>8</b> START button To begin the measuring process</p>	<p><b>16</b> Handle For carrying the device</p>	<p><b>24</b> Media box For USB 3.0 connectors (USB memory sticks only)</p>

Operability and visibility suited for a variety of work environments

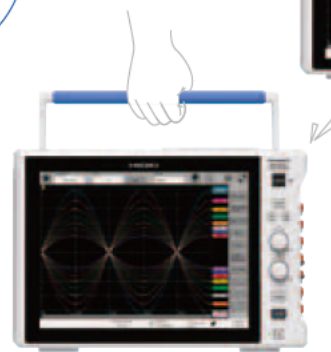
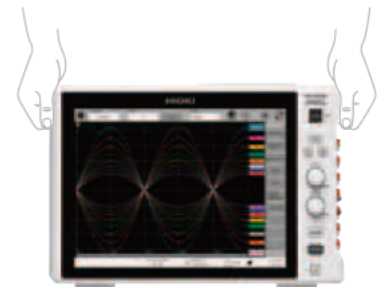


17°

### Ergonomical operating angle

Our search for a touch screen with the best operability and visibility angle led us to develop retractable feet that maximize those two important attributes. Tilting the MR6000 with the feet reduces the strain on your wrists when you use the device on a desk, and keeps your line of sight at a natural level. The rear side also features the same retractable feet, making it easy to use the device on the floor.

Easy multi-touch  
Horizontal and vertical

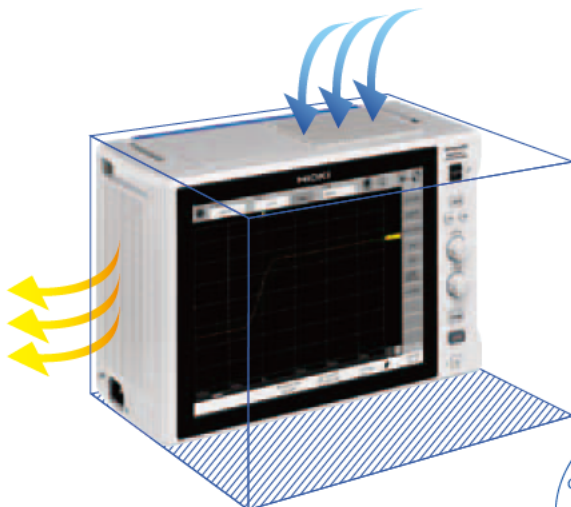


Convenient long handle  
Robust design

### Easy handling

The rubber handle boasts excellent grip and makes it easy to carry the device with either one or both hands. The grips on either side of the device can also be used to lift it with both hands.

Simple protectors on the top and bottom right side of the device protect the interface and unit input terminals from sudden physical shocks.



Compared to conventional models  
1/2 size  
When compared to 8861-50

### Space-saving size

We have achieved a design that is compact while still delivering blazing fast processing speeds by using thermal liquid analysis to optimally position the air inlets, heating components, and cooling fans. The smaller form factor requires less space for installation, making the device just right for tight workspaces.

Refined attractive shape  
Simple design

### Sleek details

The bevelled chassis edges give the device a compact and sleek look. The left side is slightly curved with slits to match the mesh of the air outlet. The air outlet is therefore in harmony with the design of the flat and solid-looking chassis. The simple and refined appearance achieved by these efforts well suits a device used for R&D purposes.



# Product Specifications

Basic specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)		
Recording method	Norma: Regular waveform recording Erve ope: Per od ca y record ng max mum and m n mum va use *Erve ope se ng no ava ab e w h ex erma samp ng	
No. of channels	Ana og w h up o 32 channe s (w h 4ch ANALOG UNIT U8975) Log c w h up o 128 channe s (LOGIC UNIT 8973) *Common GND for he og c probe npu connect or and ma n un	
Maximum sampling rate	200 MS/s (a channe s a he same me) (w h HIGH SPEED ANALOG UNIT U8976) Ex erma samp ng (10 MS/s)	
Memory capacity	1 G-words	
Operating environment	Indoors, po u on degree 2, a ude up o 2000 m (6562.20 f)	
Operating temperature and humidity range	0°C o 40°C (32°F o 104°F), ess han 80% RH (no condensa on)	
Storage temperature and humidity range	-10°C o 50°C (14°F o 122°F), 80% RH or ess (no condensa on)	
Compliance standards	Safe y: EN61010, EMC EN61326	
Power supply	Ra ed supp y vo age: AC 100 V o 240 V (cons der ±10% vo age f uc ua ons for ra ed supp y vo age) Ra ed power supp y frequency: 50 Hz / 60 Hz An c pa ed rans en overvo age: 2500 V	
Max. power consumption	300 VA	
Clock	Au o-ca endar, eap- year correc ng 24-hour c ock	
Backup battery life	Approx. 10 years (a 23°C (73°F)) for c ock and se ngs	
PC nterface (overview)	LAN, USB, SD, SATA, mon or	
External dimensions	353 mm (13.90 n) W x 235 mm (9.25 n) H x 154.8 mm (6.09 n) D (exc ud ng pro no nes)	
Mass	6.5 kg (229.3 oz) (ma n un on y) 6.7 kg (236.3 oz) (w h Z5021, U8332, or U8333 ns a ed) 8.9 kg (313.9 oz) (w h HIGH SPEED ANALOG UNIT U8976 ns a ed)	
Accessories	Power cord, Qu ck S ar Manua (book e), opera ng preca u ons (book e), app ca on d sk (CD-R), Ins ruc on Manua (de a ed ed on) (CD-R), Ins ruc on Manua (ca cu a on ed on) (CD-R), b ank pane (b ank s on y)	
Accuracy		
Accuracy guarantee conditions	Tempera ure and hum d y range: 23°C ±5°C (73°F ±9°F), 80% RH or ess	
Time axis accuracy	±0.0005%	
Display		
Display type	12.1 inch XGA TFT co r LCD (1024 x 768 do s) w h capac ve ouch screen	
LAN Interface		
Compatibility specifications	IEEE 802.3 E heme 1000BASE-T, 100BASE-TX, 10BASE-T	
Functions	DHCP, DNS, FTP, HTTP, e-ma send ng func on	
Connector	RJ-45	
USB interface		
Compatibility specifications	USB 3.0 comp an x3, USB 2.0 comp an x4	
Host	Connect or: Ser es A recep ac e Connect ed dev ces: Keyboard, mouse, USB memory s ck	
Available options	Z4006 USB MEMORY STICK (16 GB)	
SD card slot		
Compatibility specifications	Comp an w h SD s andards x1 (compa b e w h SD, SDHC, SDXC memory cards)	
Available options	Z4001 SD MEMORY CARD (2 GB), Z4003 SD MEMORY CARD (8 GB)	
SATA interface		
Compatibility specifications	Ser a ATA Revs on 3.0 comp an x1	
Available options	U8332 SSD UNIT (256 GB), U8333 HD UNIT (320 GB)	
Monitor output		
Connector	DVI-I	
Output type	Dg a ou pu for ex erma dsp ays 1024 x 768 (XGA)*No compa b e w h dua nk	
External sampling terminal		
Connector	SMB	
Maximum input voltage	10 VDC	
Input voltage	2.5 V o 10 V for hgh eve, 0 V o 0.8 V for ow eve	
Response pulse width	50 ns or more dur ng hgh per ods, 50 ns or more dur ng ow per ods	
Maximum input frequency	10 MHz	
Functions	Ex erma samp ng c ock npu, r s ngfla ng se ec on poss b e	
External control terminals		
Terminal block	Push-bu on ype	
External input	Max mum npu vo age	10 VDC
	Inpu vo age	2.5 V o 10 V for hgh eve, 0 V o 0.8 V for ow eve
	Response pulse width	50 ms or more dur ng hgh per ods, 50 ms or more dur ng ow per ods
	Puse n erve	200 ms or grea er
	Number of ermas	2
External output	Func ons	START, STOP, START/STOP, SAVE, ABORT, even
	Ou pu ype	Open dra n ou pu (ac ve ow, w h 5 V vo age ou pu)
	Ou pu vo age	4.0 V o 5.0 V for hgh eve, 0 V o 0.5 V for ow eve
	Max mum npu vo age	50 V DC, 50 mA, 200 mW
	Number of ermas	2
External trigger	Func ons	Judgmen (PASS), judgmen (FAIL), occurrence of errors, busy, r gger s andby
	Max mum npu vo age	10 VDC
	External trigger filter	ON / OFF
	Response pulse width	Ex erma r gger f er OFF: 1 ms or more dur ng hgh per ods, 2 us or more dur ng ow per ods Ex erma r gger f er ON: 2.5 ms or more dur ng hgh per ods, 2.5 ms or more dur ng ow per ods
	Func ons	R s ngfla ng se ec on poss b e R s ng: Tr gger ng occurs when he vo age r ses from ow (0 V o 0.8 V) o hgh (2.5 V o 10 V) Fa ng: Tr gger ng occurs when he vo age f s from hgh (2.5 V o 10 V) o ow (0 V o 0.8 V) or when a erma shor c r ou occurs. *Tr gger m ng: W h he START&STOP op on, r s ngfla ng can be se ec ed for e her START or STOP.

Trigger output	Ou pu ype	Open dra n ou pu (ac ve ow, w h 5 V vo age ou pu)
	Ou pu vo age	4.0 V o 5.0 V for hgh eve, 0 V o 0.5 V for ow eve
	Max mum npu vo age	50 VDC, 50 mA, 200 mW
	Ou pu puse wd h	Leve o puse se ec on poss b e Leve: Samp ng per od x da a number af er r gger Puse: 2 ms ±1 ms
Output terminal for probe correction signals		
Output signals	0 V o 5 V ±10%, 1 kHz ±1% square waves	
Functions	9665 10:1 PROBE, 9666 100:1 PROBE correc on	
Dedicated power supply terminal for current sensor *Option to be specified upon order placement (with Z5021 PROBE POWER UNIT installed)		
Number of terminals	8	
Output voltage	±12 V ±0.5 VDC	
Trigger *Not available when the real-time save function is used		
Trigger type	Dg a comparison ype	
Trigger conditions	AND or OR cond on for r gger sources and n erve r gger	
Trigger source	Ana og, og c, rea - me waveform process ng When START or STOP s se ec ed: Up o 32 channe s *Up o 4 ana og r ggers can be se for each ana og channe . *Up o 4 og c r ggers can be se for each og c probe. *Up o 2 ana og r ggers can be se for each rea - me waveform process ng channe . When START&STOP s se ec ed: Up o 16 channe s / group Ana og Up o 16 channe s / group (Up o 2 channe s per un can be se ec ed) Log c Up o 16 probes / group (Up o 2 probes per un can be se ec ed) Rea - me waveform process ng: Up o 16 ca cu a ons / group *Up o 2 r gger ypes from each group can be se for each ana og channe . *Up o 2 og c r ggers from each group can be se for each og c probe. Ex erma r gger The free run func on s ac va ed fa r gger sources are umed off.	
	Leve r gger	Tr gger ng occurs when he se eve r ses (fa s).
	Vo age drop r gger	Tr gger ng occurs when peak vo age drops be ow he se eve . (For a 50 Hz / 60 Hz commerc a power supply on y) *D sab ed when samp ng ra e s se o 200 MS/s. *No ava ab e w h MR8990 or 8970 *No ava ab e w h erve ope se ng
	Wdow r gger	Se s he upper and over m for r gger eve . Tr gger ng occurs when sav ng (OUT) or en er ng (IN) he area. *D sab ed when samp ng ra e s se o 200 MS/s.
	Period r gger	Se s he per od reference va ue and cyc e range. Tr gger ng occurs when he r s ng (fa ng) reference va ue per od s measured and de erm ned o be ou s de or w h h he cyc e range. *D sab ed when samp ng ra e s se o 200 MS/s. *No ava ab e w h MR8990 or 8970 *No ava ab e w h erve ope se ng
Analog triggers	G ch r gger	Se s he reference va ue and puse wd h (g ch wd h). Tr gger ng occurs f he va ue s be ow he puse wd h from r s ng or fa ng of he reference va ue. *D sab ed when samp ng ra e s se o 200 MS/s. *No ava ab e w h MR8990 *No ava ab e w h erve ope se ng
	Spec fy ng even s	Spec fy ng even s (1 o 4000) Coun s he number of mes cond oners ve fu f ed for each r gger source. Tr gger ng occurs when he number of mes s reached. *No ava ab e w h he r gger cond oners ve o AND
Logic trigger	Pa em r gger us ng 1, 0, or x	
Forcible trigger	Included (Forc b e r gger ng can be pr or zed over a r gger sources.)	
Interval trigger	Recording poss b e a spec f ed measur ng n erva s (hours, m nu es, or seconds) The r gger cond oners are fu f ed when he measur ng process ar s. Af erwards, he r gger cond oners are me a he se measur ng erva s.	
Trigger filter	Norma	OFF, 10, 20, 50, 100, 150, 200, 250, 500, 1000, 2000, 5000, 10,000 samp es
	Erve ope	OFF, 1 ms, 10 ms
Level setting resolution	1 LSB	
Pre trigger	0% o 100% (any va ue se n 1% s eps ava ab e), dsp ay ng he record ng me for pre-r gger	
Post trigger	0% o 40%, dsp ay ng he record ng me for pos-r gger	
Trigger priority	ON / OFF	
Trigger mark	Dsp ays r gger marks for he pos ons where r ggers are se .	
Trigger timing	START, STOP, START&STOP	
Waveform monitoring display	Dsp ays he waveform mon or n he r gger s andby s a e. (The dsp ay can be umed off.)	
Waveform screen		
Numerical display format	Waveform dsp ay n chrono og ca order *Dsp ays up o 64 channe s per shee . *Mu p shee s can be se for he same channe .	
Sheet function	Up o 16 shee s *The dsp ay forma can be se ec ed for each shee .	
Zoom display	ON / OFF (Waveforms are dsp ayed n chrono og ca order n he op ar of he waveform screen, whereas he zoomed waveforms are dsp ayed n he bo om par .)	
Full screen display	Dsp ays waveforms over he en re waveform screen.	
Waveform display	Waveform co or	Fxed co ors (32 co ors)
	In erpo a on	L near
	Variable display	A ways ON
	Vern er	Adjus ab e npu waveform (Adjus men range: 50% o 200% of he npu)
	Gr d	OFF / ON
Enlarge / Reduce	Logic display width	W de / S andard / Narrow
	Waveform nvers on	Dsp ays waveforms ups de down. *No ava ab e w h 8967, 8970, and 8973
	Waveform scrolling	A ows you o adjus he zoom ra e as necessary by p nch ng n or ou .
Roll display mode	Scro el or r gh by swp ng he screen and scro back wh e measur ng. A ways dsp ays he a es da a by fo ow ng he measur ng process. The drawing s ar pos on (el or r gh edge) can be se ec ed. *The ro canno be dsp ayed when he over ay func on s umed on.	
Waveform monitoring function	ON / OFF (The mon or can a so be dsp ayed n he r gger s andby s a e.)	
Overlay	The OFF, au oma c, or manua op on can be se ec ed. *The ro canno be dsp ayed when he over ay func on s umed on.	
Cursor	Tracing cursor	Up o 8 cursors can be dsp ayed. *Dsp ays po en a a, me from r gger, me d fference be ween cursors, and po en a d fference.
	Hor zon a cursor	Up o 8 cursors can be dsp ayed. *Dsp ays po en a and po en a d fference.
	Gauge	Up o 8 gauges can be dsp ayed.
	Spec fy ng segmen s	Segmen cursor 1 / Segmen cursor 2 *Spec f es he ca cu a on range, sav ng range, and search range.
	Jump	Tap he screen o jump o he spec f ed oca on.
Event mark	Inpu ava ab e dur ng he measur ng process (up o 1000 marks) Use he s ar bu on or ex erma npu erma na for npu .	

Setting screen	
Sampling rate	<p>Norma</p> <p>200 M, 100 M, 50 M, 20 M, 10 M, 5 M, 2 M, 1 M 500 k, 200 k, 100 k, 50 k, 20 k, 10 k, 5 k, 2 k, 1 k 500, 200, 100, 50, 20, 10, 5, 2, 1 [S/s] *The speed for real-time waveform processing can be set from 100 MS/s.</p> <p>Envelope</p> <p>10 M, 5 M, 2 M, 1 M 500 k, 200 k, 100 k, 50 k, 20 k, 10 k, 5 k, 2 k, 1 k 500, 200, 100, 50, 20, 10, 5, 2, 1 [S/s] 30, 12, 6, 2, 1 [S/m/n] *Caution speed for maximum and minimum values *Oversampling rate: 100 MS/s</p> <p>For real-time saving</p> <p>Maximum available sampling rate [Save destination: SSD] 20 MS/s (2 channels), 10 MS/s (4 channels), 5 MS/s (8 channels), 2 MS/s (16 channels), 1 MS/s (32 channels), 500 kS/s (64 channels) [Save destination: HDD] 10 MS/s (2 channels), 5 MS/s (4 channels), 2 MS/s (8 channels), 1 MS/s (16 channels), 500 kS/s (32 channels), 200 kS/s (64 channels) [Save destination: SD memory card, USB memory stick, send ring or FTP] 5 MS/s (4 channels), 2 MS/s (8 channels), 1 MS/s (16 channels), 500 kS/s (16 channels), 200 kS/s (32 channels), 100 kS/s (64 channels) *Guaranteed only when the available operation is specified for the save destination.</p>
	<p>Norma</p> <p>[Buffer - n preset] 20 M (32 channels), 50 M (16 channels), 100 M (8 channels), 200 M (4 channels), 500 M (2 channels), 1 G (1 channel) [Po n] [Arbitrary recording length] 33554400 (32 channels), 67108800 (16 channels), 134217700 (8 channels), 268435400 (4 channels), 536870900 (2 channels), 1073741800 (1 channel) [Po n] *Setting possible in units of 100 points.</p> <p>Envelope</p> <p>[Buffer - n preset] 10 M (32 channels), 20 M (16 channels), 50 M (8 channels), 100 M (4 channels), 200 M (2 channels), 500 M (1 channel) [Po n] [Arbitrary recording length] 1677200 (32 channels), 33554400 (16 channels), 67108800 (8 channels), 134217700 (4 channels), 268435400 (2 channels), 536870900 (1 channel) [Po n] *Setting possible in units of 100 points.</p> <p>For real-time saving</p> <p>Dependent according to the amount of free space in the save destination, file system, and number of measurement channels. *The values in parentheses indicate the number of channels used. In U8975, CH1/CH2 or CH3/CH4 count as a single channel. Each real-time waveform processing operation counts as a single channel. *In U8975, MR8990, or real-time waveform processing, the maximum recording length is a sampling rate of 10 MS/s or less than the length or less compared to the values set above.</p>
	<p>Maximum recording length</p> <p>Norma</p> <p>[Buffer - n preset] 10 M (32 channels), 20 M (16 channels), 50 M (8 channels), 100 M (4 channels), 200 M (2 channels), 500 M (1 channel) [Po n] [Arbitrary recording length] 1677200 (32 channels), 33554400 (16 channels), 67108800 (8 channels), 134217700 (4 channels), 268435400 (2 channels), 536870900 (1 channel) [Po n] *Setting possible in units of 100 points.</p> <p>For real-time saving</p> <p>Dependent according to the amount of free space in the save destination, file system, and number of measurement channels. *The values in parentheses indicate the number of channels used. In U8975, CH1/CH2 or CH3/CH4 count as a single channel. Each real-time waveform processing operation counts as a single channel. *In U8975, MR8990, or real-time waveform processing, the maximum recording length is a sampling rate of 10 MS/s or less than the length or less compared to the values set above.</p>
Repeated measurements	<p>Single, repeated, specified number of times *Repeated measurements cannot be set and the number of times cannot be specified for real-time saving.</p>
Waveform monitoring function	Displayed on the channel setting screen
Scaling	<p>Converts on and offset / 2-point / n-point / Mode / Output rate / dB / Range *Mode: Set the mode / control gain / scaling / scale / auto scale. *Auto scale mode: on and auto scale are available when current unit is used.</p>
Comments	<p>The comments, channel comments Channel numbers and channel comments are added on the setting screen and waveform screen.</p>
Digital filter	<p>Caution formulas 32 formulas</p> <p>Caution arguments Measurement channels n 8966, 8967, 8968, U8969, 8970, 8971, 8972, U8974, U8975, U8976 *The 8973 and MR8990 measurement channels are not arguments.</p> <p>Calculation update rate 10 M / 1 M / 100 k / 10 k / 1 k / 100 / 10 / 1 [S/s] *Up to 8 caution arguments can be set for 10 MS/s. *Up to 16 caution arguments can be set for 1 MS/s.</p> <p>Caution update rate Caution update rate 10 MS/s 1 MS/s 100 kS/s 10 kS/s or less Caution update rate Caution update rate 6.2 or 6.3 us 5 us 20 us Caution update rate per period</p> <p>Filter types FIR (LPF / HPF / BPF / BSF), IIR (LPF / HPF / BPF / BSF), moving average, delay device</p>
Saving	
Save destination	<p>SD MEMORY CARD Z4001 (2 GB), Z4003 (8 GB)</p> <p>USB MEMORY STICK Z4006 (16 GB)</p> <p>SSD U8332 SSD UNIT (256 GB)</p> <p>HDD U8333 HD UNIT (320 GB)</p> <p>Send ring via FTP PC with LAN connection</p>
File format	FAT, FAT32, NTFS, exFAT
Filename	Alphanumeric and Japanese input
Processing identical filenames	Adding a serial number at the beginning before saving
Auto saving	<p>ON / OFF *Auto scale saves the data automatically for the recording length at the end of a measuring process. *Settings are not supported. *This function is not available when real-time saving is selected.</p>
Real time saving	<p>ON / OFF *Saves the waveform data (binary) automatically during the measuring process directly to the save destination. *The auto saving function is not available. Files are divided for approx. every 512 MB of data.</p>
Deleting and saving	Deletes the files with the created data and saves data when there is no free space left on the specified media at the save destination. *Enabled for auto saving and real-time saving.
Types of saved data	<p>Settings data SET</p> <p>Measurement data Binary form (MEM, REC, FLT), excel form (CSV)</p> <p>Index Divided saving (IDX)</p> <p>Displayed images .BMP, .PNG, .JPG</p> <p>Numerical data on results .CSV</p> <p>Startup (STARTUP.SET)</p>
Saving channels	Select a channel from all the channels available or from the displayed channels when saving measurement data.
Culled data saving	Measurement data (excel form) saved according to the specified cutting value (from 2 to 1000) before saving.
File division	<p>Types of saved data Divided mode</p> <p>Binary form OFF / Every 16 MB of data / Every 32 MB of data / Every 64 MB of data</p> <p>Text form OFF / Every 60,000 points of data / Every 1,000,000 points of data</p> <p>Numerical data on results OFF / By the caution argument</p>
Specifying files	New files / Existing files *Enabled when numerical data on results are saved. *Select whether to create a new file or add data to an existing file when saving or measuring.

SAVE button operation	<p>In saving Press the SAVE button to save data to a save destination, under a filename, and when saving settings have been pre-set.</p> <p>Saving range See the full range of a specific segment. *Enabled only when data is saved with the SAVE key.</p>										
Loading data											
Loading source	<p>SD MEMORY CARD Z4001 (2 GB), Z4003 (8 GB)</p> <p>USB MEMORY STICK Z4006 (16 GB)</p> <p>SSD U8332 SSD UNIT (256 GB)</p> <p>HDD U8333 HD UNIT (320 GB)</p>										
Types of loaded data	Settings data (SET) Measurement data Binary form (MEM, REC) Index Divided saving (IDX) Startup (STARTUP.SET)										
Numerical calculations											
Maximum number of calculations	16 channels Measurement channels										
Calculation range	Full range / Specified segments										
Calculation items	<p>Norma</p> <p>Peak to peak value, maximum value, minimum value, high-level, low-level, average value, effective (RMS) value, standard deviation, rise time (*), fall time (*), frequency (*), period (*), duty ratio (*), pulse count, area value, X-Y area value, time difference (*), phase difference (*), time to maximum value, time to minimum value, specified level, specified time level, pulse width (*), four arithmetic operations, median value, amplitude, integration value, burst width (*), X-Y waveform angle, overshoot, undershoot, +width (*), -width (*). *Statistical function available for: Beginning, average, maximum, minimum</p>										
Numerical judgment	<p>Targeted waveforms Analog channels digital channels real-time waveform processing channels</p> <p>Judgment settings ON / OFF</p> <p>Stop conditions PASS, FAIL, PASS&amp;FAIL</p>										
Real-time waveform processing											
*Option to be specified upon order placement (MR6000-01)											
Maximum number of calculations	16 formulas										
Calculation targets	Measurement channels n 8966, 8967, 8968, U8969, 8970, 8971, 8972, 8973, U8974, MR8990 (*), U8975, U8976 *The MR8990 DVM UNIT performs caution arguments only for the 16 bits of the 24-bit AD resolution.										
Calculation update rate	10 M, 1 M, 100 k, 10 k, 1 k, 100, 10, 1 [S/s] *Up to 8 caution arguments can be set for 10 MS/s. *Some types of caution arguments cannot be set when a caution argument is set.										
Calculation delay	<table border="1"> <thead> <tr> <th>Calculation update rate</th> <th>10 MS/s</th> <th>1 MS/s</th> <th>100 kS/s</th> <th>10 kS/s or less</th> </tr> </thead> <tbody> <tr> <td>Caution delay</td> <td>6.2 or 6.3 us</td> <td>5 us</td> <td>20 us</td> <td>Caution update rate per period</td> </tr> </tbody> </table> <p>Add the delay times set below when real-time waveform processing channels are selected for caution.</p>	Calculation update rate	10 MS/s	1 MS/s	100 kS/s	10 kS/s or less	Caution delay	6.2 or 6.3 us	5 us	20 us	Caution update rate per period
	Calculation update rate	10 MS/s	1 MS/s	100 kS/s	10 kS/s or less						
Caution delay	6.2 or 6.3 us	5 us	20 us	Caution update rate per period							
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Calculation update rate	10 MS/s	1 MS/s	100 kS/s	10 kS/s or less							
Added caution delay	1.6 us	2 us	10 us	Caution update rate per period							
Calculation type	Addition, subtraction, multiplication, division, four arithmetic operations with coefficients, quartic equations, monomials, addition and subtraction and on a logarithmic scale on F/R (LPF / PF / BPF / BSF) R (LPF / PF / BPF / BSF) moving average delay device										
Waveform search *Disabled with envelope setting (only jump enabled)											
Search mode	<p>Trigger Level, window, window-ou Log trigger search available when analog channels selected as the target channel.</p> <p>Peak Maximum value, minimum value, maximum, minimum</p> <p>CONCIERGE Histogram, standard deviation *Select whether to compare each value to the reference waveform or the direct waveform.</p> <p>Jump Event mark, cursor, time (absolute time, relative time, or time specified by the number of points)</p>										
	<p>Search range Full range All the data stored in the memory</p> <p>Specifying segments Select the range specified for segment 1 or the one specified for segment 2.</p>										
	<p>Search method Full search Searches through a of the search ranges a once. Up to 1000 data points can be searched.</p> <p>Partial search Searches from the beginning (middle) of the search range. The search operation continues until the specified number of values are found, after which the results are displayed.</p>										
Display method	Specify a search location to display the data.										
Other											
Auto setup	Available (Start) by loading the settings data (STARTUP.SET) saved in advance after the power is turned on. *Save destinations are searched for on the HDD/SSD first, followed by the SD and USB memory sticks.										
Rotary knobs	<p>X In the horizontal direction, the sampling rate, compression rate, or display position can be changed and the cursor can be moved.</p> <p>Y In the vertical direction, the measurement range, compression rate, or display position can be changed and the cursor can be moved.</p>										
Shortcut button	S1, S2 A function can be accessed.										
Auto range	Available (The optimal sampling rate and measurement range for the input waveform are automatically set.) *Not available for envelope, real-time saving, or external sampling.										
Key lock	Three levels of settings are available: OFF, touch screen only, or touch screen and hard buttons.										
Beep sound	OFF / Alarm only / Alarm and operation										
Sending e-mails	<p>Send ring via SMTP</p> <p>Send ring via FTP Auto scale saving, saving with the SAVE button</p> <p>Send data Attach data specified in the main excel or excel specified by a type of saved data</p>										
Initialization	Waveform data in a zero state, setting in a zero state, compensation in a zero state										
Self check	Memory, LCD, buttons, LAN, media, touch screen										
Language	English, Japanese										
Error and warning display	Displays the details of errors and warnings when they occur.										
Touch keyboard	Displays the on-screen keyboard.										
Time value display	Hours, seconds, minutes, days, etc.										
Zero position display	ON / OFF										
Waveform screen background color	Black or white										
Restart permission	Permitted / No permitted *Permitted: If settings are changed during the measuring process, the user is alerted. *No permitted: Settings cannot be changed during the measuring process.										
Display settings	Adjust brightness or set the display to turn off automatically.										
Time settings	Set the date and time.										
System protection function	ON / OFF Protects the system against unnecessary power shutdowns. (However, we recommend turning off the system protection function and mounting an external UPS when using the unit continuously for long periods of time.)										
Number of current sensor connections	Up to 8 connections together on the PROBE POWER UNIT Z5021 and CURRENT UNIT 8971										
Unit installation restrictions	CURRENT UNIT 8971: Up to 4 sockets										

# Option Specifications (sold separately)

Dimensions/mass: approx. 106 mm (4.17 in) W × 19.8 mm (0.78 in) H × 196.5 mm (7.74 in) D, approx. 280 g (9.9 oz)  
Accessories: None



## HIGH SPEED ANALOG UNIT U8976

(Accuracy 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 functions	No. of channels: 2, for voltage measurement
Input terminals	Isolated BNC connector (input impedance 1 MΩ, input capacitance 22 pF) Max. rated voltage to ground: 1000 V AC, DC (with input isolated from the unit, the maximum voltage that can be applied between input channel and chassis and between input channels without damage)
Measurement range	100, 200, 400 mV f.s. 1, 2, 4, 10, 20, 40, 100, 200, 400 V f.s., 12 ranges AC voltage for possible measurement/display: 280 V rms Low-pass filter: 5/500/5 k/1 MHz
Measurement resolution	1/1600 of measurement range (using 12-bit A/D conversion)
Maximum sampling rate	200 MS/s (simultaneous sampling in 2 channels)
Measurement accuracy	±0.5% f.s. (with filter 5 Hz, zero position accuracy included)
Frequency characteristics	DC to 30 MHz -3 dB (with AC coupling: 7 Hz to 30 MHz -3 dB)
Input coupling	AC/DC/GND
Maximum input voltage	400 V DC (with direct input), 1000 V DC (with 9665)

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



## DC/RMS UNIT 8972

(Accuracy 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 functions	No. of channels: 2, for voltage measurement, DC/RMS selectable
Input terminals	Isolated BNC connector (input impedance 1 MΩ, input capacitance 30 pF) Max. rated voltage to ground: 300 V AC, DC (with input isolated from the unit, the maximum voltage that can be applied between input channel and chassis and between input channels without damage)
Measurement range	100, 200, 400 mV f.s. 1, 2, 4, 10, 20, 40, 100, 200, 400 V f.s., 12 ranges AC voltage for possible measurement/display: 280 V rms Low-pass filter: 5/50/500/5 k/100 kHz
Measurement resolution	1/2000 of measurement range (using 12-bit A/D conversion)
Maximum sampling rate	1 MS/s (simultaneous sampling in 2 channels)
Measurement accuracy	±0.5% f.s. (with filter 5 Hz, zero position accuracy included)
RMS measurement	RMS accuracy: ±1% f.s. (DC, 30 Hz to 1 kHz) ±3% f.s. (1 kHz to 100 kHz) Response time: SLOW 5 s (rise time from 0 to 90% of full scale), MID 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)
Input coupling	AC/DC/GND
Maximum input voltage	400 V DC (the maximum voltage that can be applied across input pins without damage)

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



## ANALOG UNIT 8966

(Accuracy 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 functions	No. of channels: 2, for voltage measurement
Input terminals	Isolated BNC connector (input impedance 1 MΩ, input capacitance 30 pF) Max. rated voltage to ground: 300 V AC, DC (with input isolated from the unit, the maximum voltage that can be applied between input channel and chassis and between input channels without damage)
Measurement range	100, 200, 400 mV f.s. 1, 2, 4, 10, 20, 40, 100, 200, 400 V f.s., 12 ranges AC voltage for possible measurement/display: 280 V rms Low-pass filter: 5/50/500/5 k/50 k/500 kHz
Measurement resolution	1/2000 of measurement range (using 12-bit A/D conversion)
Maximum sampling rate	20 MS/s (simultaneous sampling in 2 channels)
Measurement accuracy	±0.5% f.s. (with filter 5 Hz, zero position accuracy included)
Frequency characteristics	DC to 5 MHz -3 dB (with AC coupling: 7 Hz to 5 MHz -3 dB)
Input coupling	AC/DC/GND
Maximum input voltage	400 V DC (the maximum voltage that can be applied across input pins without damage)

Dimensions/mass: 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)  
Accessories: None



## HIGH-VOLTAGE UNIT U8974

(Accuracy 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 functions	No. of channels: 2, for voltage measurement, DC/RMS selectable
Input terminals	Banana input terminal (input impedance: 4 MΩ, input capacitance: 5 pF) Max. rated voltage to ground: 1000 V AC, DC for measurement category III, 600 V AC, DC for measurement category IV
Measurement range	4, 10, 20, 40, 100, 200, 400, 1000 V f.s. (DC mode), 8 ranges 10, 20, 40, 100, 200, 400, 1000 V f.s. (RMS mode), 7 ranges Low-pass filter: 5/50/500/5 k/50 kHz
Measurement resolution	1/32,000 of measurement range (using 16-bit A/D conversion)
Maximum sampling rate	1 MS/s
Measurement accuracy	±0.25% f.s. (with filter 5 Hz, zero position accuracy included)
RMS measurement	RMS accuracy: ±1.5% f.s. (DC, 30 Hz to 1 kHz), ±3% f.s. (1 kHz to 100 kHz) Response time: High speed 150 ms, medium speed 500 ms, low speed 2.5 s
Frequency characteristics	DC to 100 kHz -3 dB
Input coupling	DC / GND
Maximum input voltage	1000 V DC, 700 V AC

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



## 4ch ANALOG UNIT U8975

(Accuracy 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 functions	No. of channels: 4, for voltage measurement
Input terminals	Isolated BNC connector (input impedance 1 MΩ, input capacitance 30 pF) Max. rated voltage to ground: 300 V AC, DC (with input isolated from the unit, the maximum voltage that can be applied between input channel and chassis and between input channels without damage)
Measurement range	4, 10, 20, 40, 100, 200 V f.s., 6 ranges AC voltage for possible measurement/display: 140 V rms Low-pass filter: 5/500/5 k/200 kHz
Measurement resolution	1/32,000 of measurement range (using 16-bit A/D conversion)
Maximum sampling rate	5 MS/s (simultaneous sampling in 4 channels)
Measurement accuracy	±0.1% f.s. (with filter 5 Hz, zero position accuracy included)
Frequency characteristics	DC to 2 MHz -3 dB
Input coupling	DC / GND
Maximum input voltage	200 V DC (the maximum voltage that can be applied across input pins without damage)

Dimensions/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



## DIGITAL VOLTMETER UNIT MR8990

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

Measurement functions	No. of channels: 2, for DC voltage measurement
Input terminals	Banana input connectors (input impedance: 100 MΩ or higher with 100 mV f.s. to 10 V f.s. range, otherwise 10 MΩ) Max. rated voltage to ground: 300 V AC, DC (with input isolated from the unit, the maximum voltage that can be applied between input channel and chassis and between input channels without damage)
Measurement range	100, 1000 mV f.s. 10, 100, 1000 V f.s., 5 ranges
Measurement resolution	1/1,000,000 of measurement range (using 24-bit ΔΣ modulation A/D)
Integration Time	20 ms × NPLC (during 50 Hz), 16.67 ms × NPLC (during 60 Hz)
Response time	2 ms + 2 × integration time or less (rise - f.s. → + f.s., fall + f.s. → - f.s.)
Basic measurement accuracy	±0.01% rdg. ±0.0025% f.s. (at range of 1000 mV f.s.)
Maximum input voltage	500 V DC (the maximum voltage that can be applied across input pins without damage)

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



## HIGH RESOLUTION UNIT 8968

(Accuracy 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 functions	No. of channels: 2, for voltage measurement
Input terminals	Isolated BNC connector (input impedance 1 MΩ, input capacitance 30 pF) Max. rated voltage to ground: 300 V AC, DC (with input isolated from the unit, the maximum voltage that can be applied between input channel and chassis and between input channels without damage)
Measurement range	100, 200, 400 mV f.s. 1, 2, 4, 10, 20, 40, 100, 200, 400 V f.s., 12 ranges AC voltage for possible measurement/display: 280 V rms Low-pass filter: 5/50/500/5 k/50 kHz
Anti-aliasing filter	Integrated filter for suppressing aliasing distortion caused by FFT processing (automatic cutoff frequency setting/OFF)
Measurement resolution	1/32,000 of measurement range (using 16-bit A/D conversion)
Maximum sampling rate	1 MS/s (simultaneous sampling in 2 channels)
Measurement accuracy	±0.3% f.s. (with filter 5 Hz, zero position accuracy included)
Frequency characteristics	DC to 100 kHz -3 dB (with AC coupling: 7 Hz to 100 kHz -3 dB)
Input coupling	AC/DC/GND
Maximum input voltage	400 V DC (the maximum voltage that can be applied across input pins without damage)

Dimensions/mass: 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)  
Accessories: CONVERSION CABLE L9769 x2 (Cable length: 60 cm)



## STRAIN UNIT U8969

(Accuracy at 23 ±5°C/73 ±9°F, 80% RH or less after 30 minutes of warm-up time and auto-balance. Accuracy guaranteed for 1 year. Post-adjustment accuracy guaranteed for 1 year)

Measurement functions	No. of channels: 2, for distortion measurement
Input terminals	(electronic auto-balancing, balance adjustment range within ±10,000 με or less) NDIS connector EPRC07-R9FNDIS (via CONVERSION CABLE L9769, NDIS connector PRC03-12A10-7M10.5) Max. rated voltage to ground: 30 V AC rms or 60 V DC (with input isolated from the main unit, the maximum voltage that can be applied between input channel and chassis, and between input channels without damage)
Suitable transducer	Strain gauge converter, Bridge impedance: 120 Ω to 1 kΩ, Bridge voltage: 2 V ±0.05 V, Gauge rate: 2.0
Measurement range	400, 1000, 2000, 4000, 10,000, 20,000 με f.s., 6 ranges Low-pass filter: 5/10/100/1 kHz
Measurement resolution	1/25,000 of measurement range (using 16-bit A/D conversion)
Maximum sampling rate	200 kS/s (simultaneous sampling in 2 channels)
Measurement accuracy	±0.5% f.s. ±4 με (5 Hz filter ON)
Frequency characteristics	DC to 20 kHz +1/-3 dB



Dimensions/mass: approx. 106 mm (4.17 in) W × 19.8 mm (0.78 in) H × 196.5 mm (7.74 in) D, approx. 250 g (8.8 oz)  
 Accessories: CONVERSION CABLE 9318 × 2 (To connect the current sensor to the 8971)



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

CURRENT UNIT 8971	
(Accuracy 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 functions	No. of channels: 2, Current measurement with optional current sensor
Input terminals	Sensor connector (input impedance 1 MΩ, exclusive connector for current sensor via the CONVERSION CABLE 9318, common GND with recorder)
Compatible current sensors	CT6862, CT6863, 9709, CT6865, CT6841, CT6843, CT6844, CT6845, CT6846, 9272-10 (To connect to the 8971 via the CONVERSION CABLE 9318)
Measurement range	Using 9272-10 (20 A), CT6841: 2 A to 100 A f.s., 6 ranges Using CT6862: 4 A to 200 A f.s., 6 ranges Using 9272-10 (200 A), CT6843, CT6863: 20 A to 1000 A f.s., 6 ranges Using CT6844, CT6845, 9709, CT6846*1, CT6865*1: 40 A to 2000 A f.s., 6 ranges *1: The conversion ratio needs to be set to 2 for scaling.
Measurement accuracy (with 5 Hz filter ON) Note: Add the accuracy and attributes of the current sensor being used.	±0.65% f.s. RMS accuracy: ±1% f.s. (DC, 30 Hz to 1 kHz), ±3% f.s. (1 kHz 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 (with AC coupling: 7 Hz to 100 kHz)
Measurement resolution	1/2000 of measurement range (using 12-bit A/D conversion)
Maximum sampling rate	1 MS/s (simultaneous sampling in 2 channels)
Other functions	Input coupling: AC/DC/GND, Low-pass filter: 5/50/500/5 k/50 kHz

Dimensions/mass: 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)  
 Accessories: Ferrite clamp × 2



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)



TEMP UNIT 8967	
(Accuracy 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 functions	No. of channels: 2, for temperature measurement with thermocouple (voltage measurement not available)
Input terminals	Thermocouple input: Push-button terminal block, Recommended wire diameter: single-wire 0.14 to 1.5 mm <sup>2</sup> , braided wire 0.14 to 1.0 mm <sup>2</sup> (conductor wire diameter φ0.18 mm or more), AWG 26 to 16 Input impedance: min. 5 MΩ (with line fault detection ON/OFF) Max. rated voltage to ground: 300 V AC, DC (with input isolated from the unit, the maximum voltage that can be applied between input channel and chassis and between input channels without damage)
Temperature measurement range Note: Upper and lower limit values depend on the thermocouple	200°C (392°F) f.s. (-100°C to 200°C (-148°F to 392°F)), 1000°C (1832°F) f.s. (-200°C to 1000°C (-328°F to 1832°F)), 2000°C (3632°F) f.s. (-200°C to 2000°C (-328°F to 3632°F)), 3 ranges Measurement resolution: 1/20,000 of measurement range (using 16-bit A/D conversion)
Thermocouple range (JIS C 1602-1995) (ASTM E-988-96)	K: -200°C to 1350°C (-328°F to 2462°F), J: -200°C to 1100°C (-328°F to 2012°F), E: -200°C to 800°C (-328°F to 1472°F), T: -200°C to 400°C (-328°F to 752°F), N: -200°C to 1300°C (-328°F to 2372°F), R: 0°C to 1700°C (32°F to 3092°F), S: 0°C to 1700°C (32°F to 3092°F), B: 400°C to 1800°C (752°F to 3272°F), W (WRa5-26): 0 to 2000°C (32°F to 3632°F) Reference junction compensation: internal/ external (switchable), line fault detection ON/OFF possible
Data refresh rate	3 methods, Fast: 1.2 ms (digital filter OFF), Normal: 100 ms (digital filter 50/60 Hz), Slow: 500 ms (digital filter 10 Hz)
Measurement accuracy	Thermocouple K, J, E, T, N: ±0.1% f.s. ±1°C (±1.8°F), (±0.1% f.s. ±2°C (±3.6°F) at -200°C to 0°C (-328°F to 32°F)) Thermocouple R, S, B, W: ±0.1% f.s. ±3.5°C (±6.3°F) (at 0°C (32°F) to less than 400°C (752°F)); However, no accuracy guarantee at less than 400°C (752°F) for B), ±0.1% f.s. ±3°C (±5.4°F) (at 400°C (752°F) or more) Reference junction compensation (RJC) accuracy: ±1.5°C (±2.7°F) (added to measurement accuracy with internal reference junction compensation)

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



Cable length and mass: Main unit cable 1.5 m (4.92 ft), input section cable 30 cm (0.98 ft), approx. 150 g (5.3 oz)  
 Note: The unit-side plug of the 9320-01 and 9327 is different from that of the 9320.



FREQ UNIT 8970	
(Accuracy at 23 ±5°C/73 ±9°F, 20 to 80% RH after 30 minutes of warm-up time, Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)	
Measurement functions	No. of channels: 2, for voltage input based frequency measurement, rotation, power frequency, integration, pulse duty ratio, pulse width
Input terminals	Isolated BNC connector (input impedance 1 MΩ, input capacitance 30 pF), Max. rated voltage to ground: 300 V AC, DC (with input isolated from the unit, the maximum voltage that can be applied between input channel and chassis and between input channels without damage)
Frequency mode	Measurement range: Between DC to 100 kHz (minimum pulse width 2 μs), 20 Hz to 100 kHz f.s., 8 ranges Accuracy: ±0.1% f.s. (exclude 100 kHz range), ±0.7% f.s. (100 kHz range)
Rotation mode	Measurement range: Between 0 to 2 million rotations/minute (minimum pulse width 2 μs), 2 kr/min to 2 Mr/min f.s., 7 ranges Accuracy: ±0.1% f.s. (exclude 2 Mr/min range), ±0.7% f.s. (2 Mr/min range)
Power frequency mode	Measurement range: 50 Hz (40 to 60 Hz), 60 Hz (50 to 70 Hz), 400 Hz (390 to 410 Hz), 3 ranges Accuracy: ±0.03 Hz (50, 60 Hz), ±0.1 Hz (400 Hz range)
Integration mode	Measurement range: 40 k-counts f.s. to 20 M-counts f.s., 6 ranges Accuracy: ±0.0025% f.s.
Duty ratio mode	Measurement range: Between 10 Hz to 100 kHz (minimum pulse width 2 μs), 100% f.s. Accuracy: ±1% (10 Hz to 10 kHz), ±4% (10 kHz to 100 kHz)
Pulse width mode	Measurement range: Between 2 μs to 2 s, 10 ms to 2 s f.s. Accuracy: ±0.1% f.s.
Measurement resolution	0.0025% f.s. (Integration mode), 0.01% f.s. (exclude integration, power frequency mode), 0.01 Hz (power frequency mode)
Input voltage range and threshold level	±10 V to ±400 V, 6 ranges, 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/mass: 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)  
 Accessories: None



LOGIC PROBE 9320-01/9327	
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 impedance: 1 MΩ (with digital input, 0 to +5 V) 500 kΩ or higher (with digital input, +5 to +50 V) Pull-up resistance: 2 kΩ (contact input: internally pulled up to +5 V)
Digital input threshold	1.4 V / 2.5 V / 4.0 V
Contact input detection resistance	1.4 V: 1.5 kΩ or higher (open) and 500 Ω or lower (short) 2.5 V: 3.5 kΩ or higher (open) and 1.5 kΩ or lower (short) 4.0 V: 25 kΩ or higher (open) and 8 kΩ or lower (short)
Response speed	9320-01: 500 ns or lower, 9327: detectable pulse width 100 ns or higher
Maximum input voltage	0 to +50 V DC (the maximum voltage that can be applied across input pins without damage)

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



LOGIC UNIT 8973	
Measurement functions	No. of channels: 16 channels (4 ch/1 probe connector × 4 connectors)
Input terminals	Mini DIN connector (for HIOKI logic probes only) Compatible logic probes: 9320-01, 9327, MR9321-01


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

# System Chart of Options

**Model: MEMORY HiCORDER MR6000**

Model No.  
(Order code) (Spec ificat ons)


MR6000 (Main unit only, install up to 8 optional input modules)  
MR6000 01 (Real-time waveform processing and other functions included)



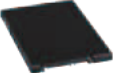
Note: The main unit cannot operate alone. You must install one or more optional input modules in the unit. The Z5021, U8332, and U8333 are factory built-in options and cannot be installed by the user.

**Factory-installed option A** \*Must specify when ordering

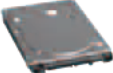
\*Power can be supplied to up to 8 current sensors, including the current sensors connected to the CURRENT UNIT 8971.

 **PROBE POWER UNIT Z5021**  
Spec ified upon order, DC ±12 V, supply for up to 8 units

**Factory-installed option B** \*Must specify when ordering


 **SSD UNIT U8332**  
Spec ified upon order; bu t n type, 256 GB


**Factory-installed option C** \*Must specify when ordering


 **HD UNIT U8333**  
Spec ified upon order; bu t n type, 320 GB

**Storage media**

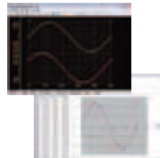
\*Use only the storage media sold by HIOKI. Compatibility and performance are not guaranteed for storage media made by other manufacturers. You may be unable to read from or save data to such media.

 **SD MEMORY CARD Z4001**  
2 GB

 **SD MEMORY CARD Z4003**  
8 GB

 **USB DRIVE Z4006**  
16 GB  
Using highly durable and reliable SLC flash memory

**PC Software**


 **Waveform Viewer Wv** ..... Standard accessory

Software for checking waveforms with binary data on a PC, saving data in CSV format, and transferring to spreadsheet programs


Operating environment: Windows 10/8/7 (32/64 bit), Vista (32 bit), XP


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.


**Case**


 **CARRYING CASE C1010**  
Hard trunk type for storing the MR6000 with its optional devices


**Input modules** \*Input cords not included. Please purchase separately. \*When using 9709 with CURRENT UNIT 8971, a total of 7 current probes can be used.


 **HIGH SPEED ANALOG UNIT U8976**  
2 ch, voltage input, 200 MS/s, (DC to 30 MHz)


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


 **4ch ANALOG UNIT U8975**  
4 ch, voltage input, 5 MS/s, (DC to 2 MHz)


 **HIGH RESOLUTION UNIT 8968**  
2 ch, voltage input, 1 MS/s (DC to 100 kHz)


 **DC/RMS UNIT 8972**  
2 ch, voltage/1 MS/s, (DC to 400 kHz)  
RMS rect fier (DC, 30 to 100 kHz)


 **HIGH-VOLTAGE UNIT U8974**  
2 ch, voltage input, max. 1000 V DC and 700 V AC


 **DIGITAL VOLTMETER UNIT MR8990**  
2 ch, h gh prec s on DC vo tage, 0.1  $\mu$ V reso ut on, maximum sampling rate 500 times/s


 **CURRENT UNIT 8971**  
2 ch, for measuring current using dedicated current sensors, 2 CONVERSION CABLES 9318 included, for use with up to 4 units

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


 **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.

 **LOGIC UNIT 8973**  
4 terminals, 16 ch, installable in all 8 slots


**Logic signal measurement**


 **LOGIC PROBE 9327**  
4 channel type, for vo tage/contact s gna ON/OFF detect on (response pu se w dth 100 ns or more, m n ature term na type)

 **LOGIC PROBE MR9321-01**  
4 so ated channel s, ON/OFF detect on of AC/DC vo tage (m n ature term na type)

 **LOGIC PROBE 9320-01**  
4 channel type, for vo tage/contact s gna ON/OFF detect on (response pu se w dth 500 ns or more, m n ature term na type)

**External sampling measurement**

 **CONNECTION CABLE L9795-01**  
Max. rated vo tage to ground: 33 V AC rms or 70 V DC, SMB term na to a gator c p, 1.5 m (4.92 ft)

 **CONNECTION CABLE L9795-02**  
Max. rated vo tage to ground: 33 V AC rms or 70 V DC, SMB term na to BNC term na, 1.5 m (4.92 ft)


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

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

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

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

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




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

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

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


**GRABBER CLIP 9243**  
Attaches to the tip of the L9197, red/black set, full length: 196 mm (7.72 in)



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

**10: 1 PROBE 9665**  
Max. rated voltage to ground is same as for input module, max. input voltage 1 kV rms (up to 500 kHz), 1.5 m (4.92 ft) length

**100: 1 PROBE 9666**  
Max. rated voltage to ground is same as for input module, max. input voltage 5 kV peak (up to 1 MHz), 1.5 m (4.92 ft) length




**INPUT CORD (D)** \*Voltage to ground is within this product's specifications. \*Separate power source is also required.

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

**DIFFERENTIAL PROBE P9000 02**  
(Switch between Wave/RMS) For Memory HiCorder, 1 kV 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 kV AC, 2 kV DC, Frequency band: 10 MHz

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



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

**CONNECTION CABLE L4940**  
Banana plug - banana plug, Cord 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**  
Attach to the tip of banana plug cables, CAT IV 600 V, CAT III 1000 V

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


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

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



**INPUT CORD (G)** \*For the MP8990 \*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 IV 600 V, CAT III 1000 V



**Up to 200 A (High precision) \*ME15W (12-pin) terminal type**

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


AC/DC CURRENT SENSOR CT6862-05, 1 MHz, 50 A  
AC/DC CURRENT SENSOR CT6863-05, 500 kHz, 200 A

Observe waveforms from DC to distorted AC

AC/DC CURRENT PROBE CT6841-05, 1 MHz, 20 A  
AC/DC CURRENT PROBE CT6843-05, 500 kHz, 200 A

Observe AC waveforms (cannot observe DC)

CLAMP ON SENSOR 9272-05, 100 kHz, 200 A




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

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

AC/DC CURRENT SENSOR 9709-05, 100 kHz, 500 A  
AC/DC CURRENT SENSOR CT6865-05, 20 kHz, 1000 A

Observe waveforms from DC to distorted AC

AC/DC CURRENT PROBE CT6844-05, 200 kHz, 500 A  
AC/DC CURRENT PROBE CT6845-05, 100 kHz, 500 A  
AC/DC CURRENT PROBE CT6846-05, 20 kHz, 1000 A



**Precautions for connecting high-precision current sensors**

Hgh prec s on current sensor (ME15W) + CT9901 + 9318 → CURRENT UNIT 8971

Hgh prec s on current sensor (ME15W) + CT955x + BNC cable → except CURRENT UNIT 8971

Hgh prec s on current sensor (PL23) + 9318 → CURRENT UNIT 8971

Hgh prec s on current sensor (PL23) + CT9900 + CT955x + BNC cable → except CURRENT UNIT 8971

\*The 9318 comes with the CURRENT UNIT 8971.

**Other current sensor types**

The MEMORY HiCORDER can be used with various types of current sensors and probes.

For details, see product information on Hioki's website.

**10 mA class to 500 A (High speed)**

**CURRENT PROBE CT6700**  
Frequency characteristics: DC to 50 MHz wideband response, 1 mA class up to 5 A rms


**CURRENT PROBE CT6701**  
Frequency characteristics: DC to 120 MHz wideband response, 1 mA class up to 5 A rms

**CLAMP ON PROBE 3273 50**  
Frequency characteristics: DC to 50 MHz wideband response, 10 mA class up to 30 A rms

**CLAMP ON PROBE 3276**  
Frequency characteristics: DC to 100 MHz wideband response, 10 mA class up to 30 A rms

**CLAMP ON PROBE 3274**  
Frequency characteristics: DC to 10 MHz wideband response, up to 150 A rms

**CLAMP ON PROBE 3275**  
Frequency characteristics: DC to 2 MHz wideband response, up to 500 A rms



**Custom cable For P9000. Inquire with your local Hioki distributor.**


(1) Bus powered USB cable  
(2) USB(A) Micro B cable  
(3) 3 prong cable

**Non-contact voltage measuring**

**NON CONTACT AC VOLTAGE PROBE SP3000 01**  
5 V rms rated, 10 Hz to 100 kHz band width

**NON CONTACT AC VOLTAGE PROBE SP3000**  
Sold individually


**AC VOLTAGE PROBE SP9001**  
Sold individually



**Other options for input**

**CONNECTION CORD L9217**  
Cord 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



**Temperature sensor**

**THERMOCOUPLE (K) 9810**  
Tolerance class: 2, Cable length: 5 m (16.41 ft), Wire diameter:  $\phi$ 0.32 mm (0.01 in), 5/set

**THERMOCOUPLE (T) 9811**  
Tolerance class: 2, Cable length: 5 m (16.41 ft), Wire diameter:  $\phi$ 0.32 mm (0.01 in), 5/set



\*A separate power supply (CT9555) is required in order to use a high-precision current sensor.  
\*Only sensors with ME15W (12-pin) terminals (-05 type) can be connected to the CT9555.  
\*The separately available CONVERSION CABLE CT9900 is required in order to use a sensor with a PL23 (10-pin) terminal.


**POWER SUPPLY for Current Sensors**

**SENSOR UNIT CT9555,**  
1 ch, with waveform output

**CONNECTION CORD L9217**  
Both cord ends are isolated BNC, 1.6 m (5.25 ft)

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

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



\*The separately available CONVERSION CABLE CT9901 is required in order to use a high-precision current sensor equipped with a PL23 (10-pin) terminal (-05 type) with the CURRENT UNIT 8971.  
\*While the CT955x is not required in order to use a sensor equipped with a PL23 (10-pin) terminal with the 8971, the CONVERSION CABLE 9318 (which comes with the 8971) is required for that setup.


**Directly connectable with the Current Sensor**

**CURRENT UNIT 8971**

**CONVERSION CABLE 9318**  
For connecting CT6841/43 and similar probes to 8971.

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

**CONVERSION CABLE CT9901**  
Convert ME15W (12 pin) terminal to PL23 (10 pin) terminal



**Precautions for connecting current sensors and current probes**

\*Some combinations may not allow the devices to be connected simultaneously.  
\*Up to 4 CURRENT UNITS 8971 can be connected to the MEMORY HiCORDER main unit, and up to 8 current sensors can be used, including those connected to the PROBE POWER UNIT Z5021.  
\*There is no limit if you connect a current sensor to the voltage input analog unit.

**Leak Current**

\*For commercial power lines, 50/60 Hz

**CLAMP ON LEAK HITESTER 3283**  
10 mA range / 10  $\mu$ A resolution to 200 A range, with monitor / analog output 1 V f.s.


**OUTPUT CORD L9094**  
3.5 mm (0.14 in) dia. mini plug to banana terminal, 1.5 m (4.92 ft) length

**CONVERSION ADAPTER 9199**  
Receiving side banana terminal, output BNC terminal

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

**OUTPUT CORD L9096**  
Connect to terminal block, 1.5 m (4.92 ft) length

**AC ADAPTER 9445 02**  
100 to 240 V AC, 9 V/ 1 A



# R&D Tests and Critical Analyses

## Meeting the High Demands of a Broad Range of Industries



### High-speed 200 MS/s measurement of inverter waveforms

Perform high-speed isolated recording across 16 channels at 200 MS/s by installing 8 units of U8976.

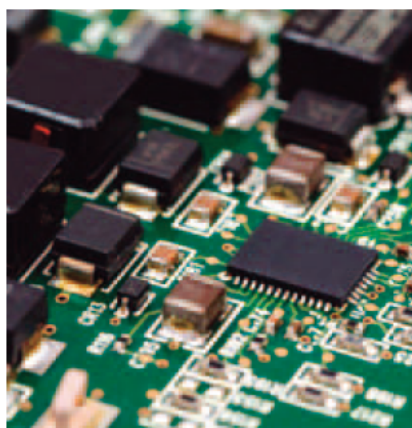
MEMORY HiCORDER	MR6000	1 unit
HIGH SPEED ANALOG UNIT	U8976	8
10:1 PROBE	9665	16



### Multi-channel measurement for ECU development

Perform multi-channel recording across 32 channels at 5 MS/s by installing 8 units of U8975.

MEMORY HiCORDER	MR6000	1 unit
4ch ANALOG UNIT	U8975	8
CONNECTION CORD	L9790	32
ALLIGATOR CLIP	L9790-01	32



Perform mixed multi-channel measurements across 16 analog and 64 logic channels by installing 4 units of U8975 and 4 units of 8973.

MEMORY HiCORDER	MR6000	1 unit
4ch ANALOG UNIT	U8975	4
CONNECTION CORD	L9790	16
ALLIGATOR CLIP	L9790-01	16
LOGIC UNIT	8973	4
LOGIC PROBE	9327	16

### Remove harmonic noise

The MR6000-01 comes with a digital filter calculation function that removes specific frequency noise from measurement data.

MEMORY HiCORDER	MR6000-01	1 unit
ANALOG UNIT	8966	8
CONNECTION CORD	L9790	16
ALLIGATOR CLIP	L9790-01	16

Note: Company names and Product names appearing in this catalog are trademarks or registered trademarks of various companies.

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