Modello	MR8875	MR8880/20	MR8870/20	MR8847 MR8847A	MR8827	MR8740 MR8741
Modalità di funzionamento						
MEM – HIGHSPEED	SI	SI	SI	SI	SI	SI
REC – REALTIME	SI	SI	-	SI	SI	SI
Calcolo RMS	-	SI	SI	SI*	SI	SI
Diagramma X-Y	-	-	-	SI	SI	solo MR8741
Analisi FFT	SI	-	-	SI	SI	SI
Segnali CAN	SI	-	-	SI*	-	-
Comparazione della forma d'onda	-	-	-	SI	SI	solo MR8741
Prestazioni di misura						
Velocità di campionamento	500KS/s	1MS/s	1MS/s	20MS/s	20MS/s	20MS/s
Elaborazione del dato	16 bit*	14 bit	12 bit	16 bit*	24 bit*	24 bit*
Tensione max tra canali	1000 Vcc*	600 Vcc/ca	400 Vcc/ca	1000 Vcc/ca*	1000 Vcc/ca*	1000 Vcc/ca*
Tensione max verso terra	1000 Vcc/ca*	600 Vcc/ca	300 Vcc/ca	1000 Vcc/ca*	1000 Vcc/ca*	1000 Vcc/ca*
Ingressi di misura						
Ingressi isolati tra loro	SI	SI	SI	SI	SI	SI
Max ingressi analogici	16	4	2	16	32	MR8740: 52 MR8741: 16
Max ingressi digitali	8	8	4	64*	32	16
Moduli di ingresso a slot	SI	-	-	SI	SI	SI
Memoria dati						
Memoria interna	64MB	8MB	4MB	/01 - /51= 128MB /52 = 512MB /53 = 1024MB	1024MB	MR8740: 1728MB MR8741: 512MB
Card**	2GB	fino a 2GB	fino a 2GB	fino a 2GB	fino a 2GB	-
SSD (Solid State Drive)	-	-	-	128GB***	128GB***	-
Display e stampante carta						
Dimensioni display grafico	8.4 pollici	5.7 pollici	4.3 pollici	10.4 pollici	10.4 pollici	10.4 pollici
Stampante su carta	-	opzionale	-	SI	opzionale***	-
Interfacce						
USB	SI	SI	SI	SI	SI	SI
Slot per chiavi USB	SI	SI	SI	SI	SI	SI
LAN	SI	-	-	SI	SI	SI
GP-IB	-	-	-	-	-	-
RS232	-	-	-	-	-	-
SD Card	SI	-	-	-	-	-
CF Card	-	SI	SI	SI	SI	-
Alimentazione						
Diretta in CA	-	-	-	SI	SI	SI
Tramite adattatore in CA	SI	SI	SI	-	-	-
Tramite batterie ricaricabili**	SI	SI	SI	-	-	-
Diretta in CC	SI	SI	SI	MR8847A***	-	-

(*) le caratteristiche indicate con asterisco (*) sono da valutare in funzione dei moduli di ingresso intercambiabili (opzionali) installati sull'unità principale
(**) non fornite in dotazione
(***) installazione in fabbrica

HIOKI

MR8875

Smart & Touch,
il nuovo volto
dei memorecorder!!!

La soluzione ideale
per il settore automotive e trasporti

Registrazione sincronizzata mista di dati CAN e dati reali quali tensione, temperatura, segnali di distorsione

I segnali CAN-bus, utilizzati nelle applicazioni automotive ed industriali di tipo embedded, sono registrati analizzati e convertiti sotto forma di forme d'onda analogiche.

La visualizzazione e la contemporanea registrazione delle forme d'onda analogiche in uscita dai sensori CAN, in aggiunta ai dati CAN, permette di analizzare l'incidenza del rumore e delle variazioni di livello del segnale sui dati di comunicazione.
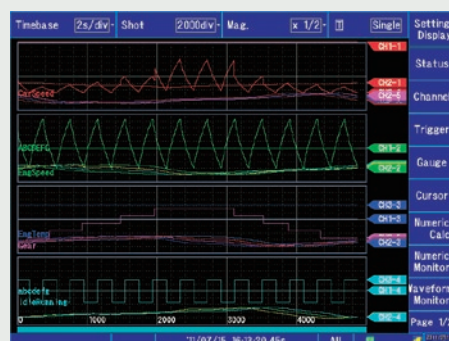
Database dei dati CAN caricabile sullo strumento tramite software in dotazione

I file del database CANdb® standard possono essere caricati nelle configurazioni di MR8875 ed associati ai segnali CAN in esame. I messaggi CAN possono essere visualizzati con il formato, il nome e le scale di misura specificate dall'utente.

Siccome i parametri quali il tipo di segnale, i bit di start, la lunghezza e la sequenza sono pre-definiti nel CANdb, l'utilizzatore è libero da ogni impostazione e può dedicare il proprio tempo all'analisi dei dati di misura.

CAN editor (bundled software)

## Immune a qualsiasi condizione avversa: vibrazioni, temperature estreme, mancanze di alimentazione

Nelle prove su strada, è abituale trovarsi in condizioni di lavoro severe ed estreme.

MR8875 può operare per temperature da -10°C a +50°C ed è compatibile con lo standard JIS DI1601 per la resistenza alle vibrazioni in quanto è nato per resistere alle severe condizioni di prova "in-abitacolo".

Se manca alimentazione durante la fase di registrazione, MR8875 rimane acceso finché i dati non vengono completamente scritti nella SD card o chiave USB.

Il rischio di perdere dati è ridotto al minimo, ed al ripristino dell'alimentazione, la registrazione si riavvia in automatico.
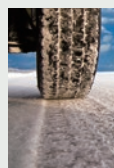
Display touch-screen, reversibile

La tastiera laterale è ridotta al minimo per dare spazio al grande display touch-screen.

Il display a colori TFT ad alta luminosità da 8.4 pollici assicura una rapida ed intuitiva modalità di utilizzo.

MR8875 può essere utilizzato con i terminali di misura verso l'alto o verso il basso; con un semplice click è possibile ruotare la visualizzazione di 180°.

Forme d'onda sempre presenti a display, in configurazione o preparazione alla misura

La pagina delle forme d'onda è visibile sia in fase di preparazione alla misura, sia in fase di configurazione degli ingressi quando si devono definire le portate e le condizioni di registrazione.

In certi casi può presentarsi la necessità di controllare i segnali di ingresso durante l'impostazione del canale di misura.

MR8875 visualizza le forme d'onda affiancate alle pagine di setup per facilitarne l'impostazione.

Ridimensiona e scorre le forme d'onda... come un tablet

È possibile visualizzare le forme d'onda passate durante la registrazione, senza interrompere la misura, semplicemente toccando le icone di scorrimento sul display.

È inoltre possibile ridimensionare l'ampiezza della forma d'onda scorrendo un dito sul display, in alto per ingrandire, in basso per ridurre.
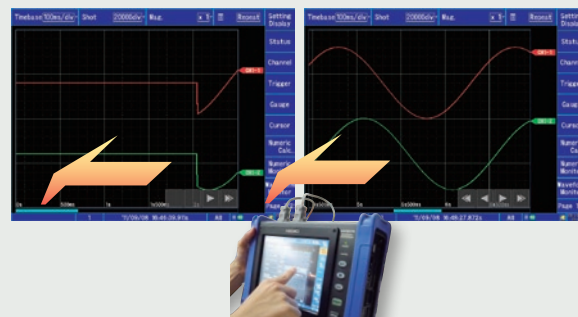
Funzione cursori
per analisi multi-canale

Sono disponibili 6 cursori aggiuntivi A B C D E F oltre ai convenzionali cursori A- e B-.

In modo singolo, i cursori A B C D visualizzano l'ampiezza del segnale ed il tempo del trigger; i cursori E e F l'ampiezza del segnale.

In modo combinato, A-B e C-D visualizzano la differenza di ampiezza e di tempo, mentre E-F la sola differenza di ampiezza.
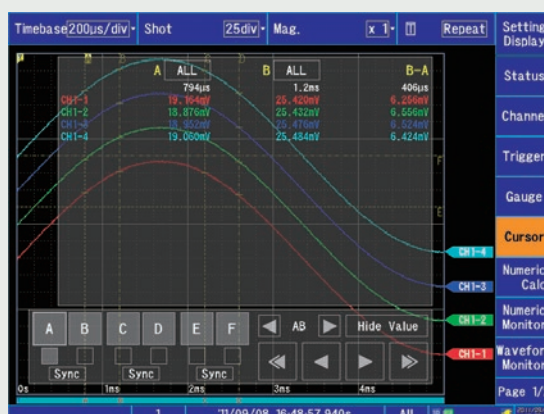
Funzione di calcolo
per analisi multi-canale

MR8875 può eseguire fino a 8 calcoli matematici contemporanei. È possibile selezionare i fattori tra 24 parametri primari quali valori RMS e medie e salvare i risultati di calcolo su chiave USB o SD Card.

La dimensione temporale di calcolo può essere definita in funzione di tutta la registrazione, della sezione tra i cursori A-B, o tra i cursori C-D.

Misura di spostamento-pressione
di una pressa o di pressione-portata di
una pompa

MR8875 può visualizzare le forme d'onda su base tempo o come diagramma di relazione X-Y.

Questa funzione è estremamente utile in quanto permette di individuare l'andamento di un segnale Y in funzione di un segnale di riferimento X, stabilendone i rapporti di causa-effetto, nonché analizzare il comportamento di uno o più parametri in relazione a particolari fattori di variazione.
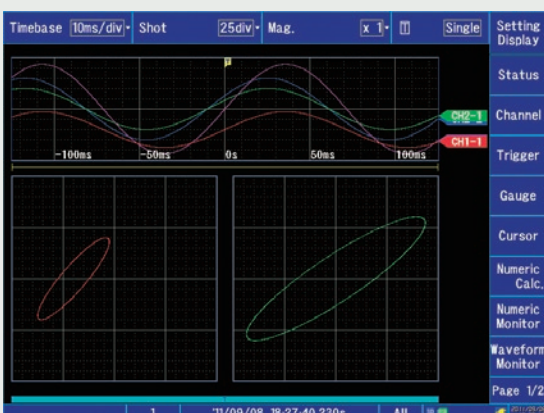
Moduli di ingresso
modulari intercambiabili

MR8875 dispone di 4 slot di ingresso per l'installazione plug-in dei moduli di ingresso. La configurazione minima deve prevedere almeno un modulo di ingresso; ulteriori moduli possono essere installati ed attivati successivamente. Il modulo di ingresso MR8903 ha una sensibilità di 1mV f.s. (risoluzione 0,04mV).

Sonde logiche per segnali impulsivi

MR8875 dispone di 2 connettori multicanale per segnali impulsivi di tipo a potenziale zero (no tensione), a collettore aperto, o di tensione. I segnali di tipo a treno di impulsi, quali quelli di rotazione e velocità, possono essere misurati o conteggiati. Sono disponibili 2 tipologie di sonde logiche in funzione del segnale da analizzare: 9320/01 (contatti e tensione fino a 50V) oppure MR9321/01 (tensione cc e ca fino a 250V, stati logici di controllo, contatti) *(vedi tabella accessori)*.

Ingressi digitali conta impulsi

Connessione diretta di encoder per la lettura della velocità di rotazione, con rapporto di trasformazione impulsi/giro impostabile da 1 a 50.000 conteggi.

Campionamento a 500KS/s con risoluzione a 25000 punti a fondo scala

Il principio di funzionamento di un oscilloscopio digitale tradizionale, con la funzionalità aggiuntiva di registrazione dati in memoria ad alta velocità e per elevati volumi di dati. Frequenza di campionamento 500kS/s (2 microsecondi) contemporanea su tutti i canali. Le forme d'onda del segnale in esame sono rilevate e rappresentate con estrema fedeltà. Risoluzione A/D a 16 bit.

Registrazione ad elevata velocità su SD Card

MR8875 utilizza SD Card per assicurare elevatissime velocità di registrazione dati in real time con il massimo campionamento possibile (2 microsecondi). Con intervallo di registrazione a 50microsec o superiore, MR8875 può salvare i dati di tutti i 60 canali continuamente per un lungo periodo.
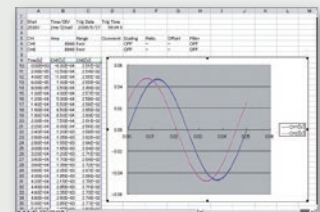
Una interfaccia per ogni necessità

- Interfaccia LAN 100Base-TX
- Funzione Web server
- Funzione FTP server
- Applicativo software Wave Viewer
- Driver per chiavi USB
- Porta per mini-USB
- Slot per SD Card
- Applicativo E-mail sender
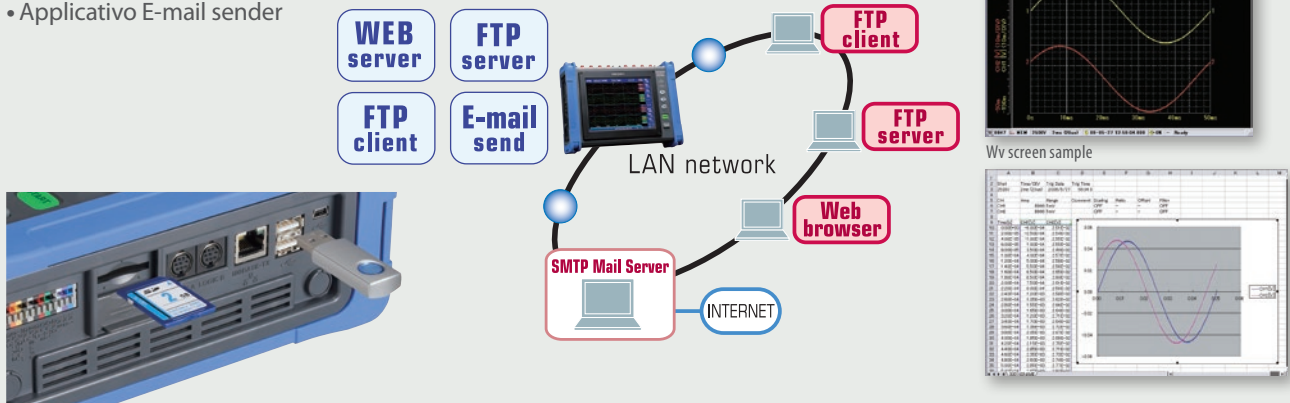
Wv screen sample

■ Support for various measurement items
(Using the optional input unit, and the optional differential probe for AC RMS voltage)

Measurement target	Input unit	Measurement range	Resolution	Sampling	Frequency characteristics
Voltage	ANALOG UNIT MR8901	100 mV f.s. to 200 V f.s.	4 μV	2 μsec (500 kS/s)	DC to 100 kHz
	VOLTAGE/TEMP UNIT MR8902	10 mV f.s. to 100 V f.s.	0.5 μV	10 msec	n/a
	STRAIN UNIT MR8903	1 mV f.s. to 20 mV f.s.	0.04 μV	5 μsec (200 kS/s)	DC to 20 kHz
Current	ANALOG UNIT MR8901 + optional current sensor	Depends on current sensor(s) in use * Certain current sensors require a separate power supply	1/1250 div	2 μsec (500 kS/s)	* Depends on current sensor(s)
RMS AC voltage	ANALOG UNIT MR8901 + optional Differential probe 9322	100 V rms to 1 kV rms	1/1250 div	2 μsec (500 kS/s)	* Depends on differential probe
Temperature (Thermo-couple)	VOLTAGE/TEMP UNIT MR8902	200 °C f.s. to 2000 °C f.s. * Upper and lower limit values depend on the thermocouple in use	0.01 ˚C	10 msec	n/a
Distortion, Stress	STRAIN UNIT MR8903	400 με to 20,000 με f.s.	0.016 με	5 μsec (200 kS/s)	DC to 20 kHz
Analyze CAN signal	CAN UNIT MR8904	2 ports /unit *Up to 15 analog channels each equivalent to a 16-bit analog signal *Up to 16 logic channels each equivalent to a 1-bit logic signal	n/a	50 μsec	n/a

■ Support for various measurement items
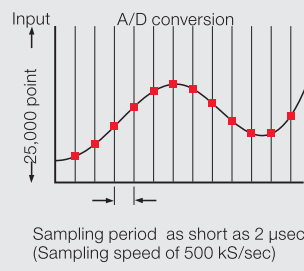(Standard pulse inputs, and using the optional Logic Probes)

Measurement target	Input unit	Measurement range	Resolution	Sampling	Frequency characteristics
Rotation	Standard included Pulse input	5000 (r/s) f.s.	1 (r/s)	10 msec (100S/s)	n/a
Pulse totalization	Standard included Pulse input	65,535 counts to 3,276,750 ,000 counts f.s.	1 count	n/a	n/a
Relay contacts, voltage on/off	Logic probe 9320-01	Depends on logic probe(s) in use * Max. input 50 V, Threshold +1.4/ +2.5/ +4.0 V * Contact Short/ Open, non voltage	n/a	2 μsec (500 kS/s)	500 nsec or lower response
AC/DC voltage on/off	Logic probe MR9321-01	Depends on logic probe(s) in use * Up to 250V AC/DC, Detect live or not live	n/a	2 μsec (500 kS/s)	3 msec or lower response

Note: Power line frequency, duty ratio and pulse width measurements are not supported.

■ Maximum recordable time to an 2GB SD memory card
* Since the header information is included, actually recordable measurement data is approximately 90% of the times shown in the table below. The upper limit is 1,000 days but operation is guaranteed for 1 year.
* The recording interval is limited depending on the number of measurement ON channels.
* Built-in logic, pulses P1 and P2 each use the capacity equivalent to one analog channel.

Time axis	Recording intervals	1ch	2ch	4ch	8ch	16ch	30ch	60ch
200μs/div	2μs	35min 47s	17min 53s	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
500μs/div	5μs	1h 29min 28s	44min 44s	22min 22s	11min 11s	Not applicable	Not applicable	Not applicable
1ms/div	10μs	2h 58min 57s	1h 29min 28s	44min 44s	22min 22s	11min 11s	Not applicable	Not applicable
2ms/div	20μs	5h 57min 54s	2h 58min 57s	1h 29min 28s	44min 44s	22min 22s	11min 55s	Not applicable
5ms/div	50μs	14h 54min 47s	7h 27min 23s	3h 43min 41s	1h 51min 50s	55min 55s	29min 49s	14min 54s
10ms/div	100μs	1d 05h 49min 34s	14h 54min 47s	7h 27min 23s	3h 43min 41s	1h 51min 50s	59min 39s	29min 49s
20ms/div	200μs	2d 11h 39min 08s	1d 05h 49min 34s	14h 54min 47s	7h 27min 23s	3h 43min 41s	1h 59min 18s	59min 39s
50ms/div	500μs	6d 05h 07min 50s	3d 02h 33min 55s	1d 13h 16min 57s	18h 38min 28s	9h 19min 14s	4h 58min 15s	2h 29min 07s
100ms/div	1ms	12d 10h 15min 41s	6d 05h 07min 50s	3d 02h 33min 55s	1d 13h 16min 57s	18h 38min 28s	9h 56min 31s	4h 58min 15s
200ms/div	2ms	24d 20h 31min 23s	12d 10h 15min 41s	6d 05h 07min 50s	3d 02h 33min 55s	1d 13h 16min 57s	19h 53min 02s	9h 56min 31s
500ms/div	5ms	62d 03h 18min 29s	31d 01h 39min 14s	15d 12h 39min 14s	7d 18h 24min 48s	3d 21h 12min 24s	2d 01h 42min 36s	1d 00h 51min 18s
1s/div	10ms	124d 06h 36min 58s	62d 03h 18min 29s	31d 01h 39min 14s	15d 12h 49min 37s	7d 18h 24min 48s	4d 03h 25min 13s	2d 01h 42min 36s
2s/div	20ms	248d 13h 13min 56s	124d 06h 36min 58s	62d 03h 18min 29s	31d 01h 39min 14s	15d 12h 49min 37s	8d 06h 50min 27s	4d 03h 42min 36s
5s/div	50ms	621d 09h 04min 51s	310d 16h 32min 25s	155d 08h 16min 12s	77d 16h 08min 06s	38d 20h 04min 03s	20d 17h 06min 09s	10d 08h 33min 04s
10s/div	100ms	Upper limit 1000days	621d 09h 04min 51s	310d 16h 32min 25s	155d 08h 16min 12s	77d 16h 08min 06s	41d 10h 12min 19s	20d 17h 06min 09s
30s/div	300ms	Upper limit 1000days	Upper limit 1000days	932d 01h 37min 16s	466d 00h 48min 38s	233d 00h 24min 19s	124d 06h 36min 58s	62d 03h 18min 29s
50s/div	500ms	Upper limit 1000days	Upper limit 1000days	Upper limit 1000days	776d 17h 21min 04s	388d 08h 40min 32s	207d 03h 01min 37s	103d 13h 30min 48s
60s/div	600ms	Upper limit 1000days	Upper limit 1000days	Upper limit 1000days	932d 01h 37min 17s	466d 00h 48min 38s	248d 13h 13min 56s	124d 06h 36min 48s
100s/div	1.0s	Upper limit 1000days	Upper limit 1000days	Upper limit 1000days	Upper limit 1000days	776d 17h 21min 04s	414d 06h 03min 14s	207d 03h 01min 37s
2min/div	1.2s	Upper limit 1000days	Upper limit 1000days	Upper limit 1000days	Upper limit 1000days	932d 01h 07min 17s	497d 02h 27min 53s	248d 13h 13min 56s
5min/div	3.0s	Upper limit 1000days	Upper limit 1000days	Upper limit 1000days	Upper limit 1000days	Upper limit 1000days	Upper limit 1000days	621d 09h 04min 51s

Input   A/D conversion

25,000 point

Isolation

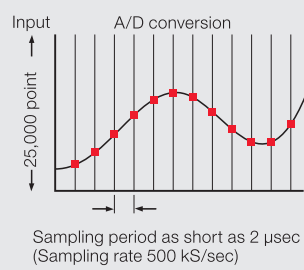Sampling period as short as 2 μsec (Sampling speed of 500 kS/sec)

Write to internal memory

■ Maximum time to record to the internal storage memory (Abridged)
* The maximum number of channels to be used is 16 because memory for recording to the internal memory is allocated to each input unit.
* Built-in logic, and pulses P1 and P2 each use the capacity equivalent to one analog channel..

Number of channels to be used * Number of channels for the unit with the largest number of measurement ON channels among the units that are mounted		1ch	3 - 4ch	9 - 16ch
Time axis (Abridged)	Sampling	80,000div	20,000div	5000div
200μs/div	2μs	16s	4s	1s
1ms/div	10μs	1min 20s	20s	5s
10ms/div	100μs	13min 20s	3min 20s	50s
100ms/div	1ms	2h 13min 20s	33min 20s	8min 20s
1s/div	10ms	22h 13min 20s	5h 33min 20s	1h 23min 20s
10s/div	100ms	9d 06h 13min 20s	2d 07h 33min 20s	13h 53min 20s
100s/div	1.0s	92d 14h 13min 20s	23d 03h 33min 20s	5d 18h 53min 20s
5min/div	3.0s	277d 18h 40min	69d 10h 40min	17d 08h 40min

Input   A/D conversion

25,000 point

Insulation

Sampling period as short as 2 μsec (Sampling rate 500 kS/sec)

Write to SD memory card in real-time

Basic Specifications <small>(Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)</small>

Measurement function	High-speed recording
No. of input modules that can be installed	Up to 4 slots, user installable in any combination by plugging into the main unit [MR8901 ×4]: 16 analog channels + standard 8 logic and 2 pulse channels [MR8905 ×4]: 8 analog channels + standard 8 logic and 2 pulse channels [MR8902 ×4]: 60 analog channels + standard 8 logic and 2 pulse channels [MR8903 ×4]: 16 analog channels + standard 8 logic and 2 pulse channels [MR8904 ×4]: 8 CAN ports (analyzed 60 analog + analyzed 64 logic ch) + standard 8 logic and 2 pulse channels *For analog units, channels are isolated from each other and from the MR8875's GND. For CAN unit ports or standard logic terminals or standard pulse terminals, all channels have common GND.
Max. sampling rate	MR8901/MR8905: 500 kS/s (2 μs period, all channels simultaneously) MR8902: 10 msec (channel scanning) MR8903: 200 kS/s (5 μs period, all channels simultaneously) External sampling: 200 kS/s (5 μs period)
Storage memory capacity	Total 32 M-words (memory expansion: none, 8 MW/module) * 1 word = 2 bytes, therefore 32 Mega-words = 64 Mega-bytes. * Memory can be allocated depending on the number of channels used at each input module
External storage	SD card slot ×1, USB memory stick (USB 2.0 standard) * FAT-16 or FAT-32 format on SD or USB
Backup functions (At 23°C/ 73°F)	Clock and parameter setting backup: at least 10 years Waveform backup function: none
Interfaces	LAN ×1: 100BASE-TX (DHCP, DNS supported, FTP server/ client, Web server, send E-mail, command control) USB series mini-B receptacle × 1 (setting and measurement by communications commands, transfer data from SD card to a PC) USB series mini-A receptacle × 2 (USB memory stick, USB mouse, USB keyboard)
External control connectors	External trigger input, trigger output, external sampling input, pulse input ×2, external input ×3, external output ×2
External power supply	Three lines, +5V, 2A total output * Connectable to three 9322 differential probes via power cord 9328

Operating temperature and humidity (No condensation)	Temperature: -10°C to 40°C (14°F to 104°F), 80 % rh or less
	    40°C to 45°C (104°F to 113°F), 60 % rh or less
	    45°C to 50°C (113°F to 122°F), 50 % rh or less
	When powered by the battery pack: 0°C to 40°C (32°F to 104°F), 80 % rh or less
	When charging the battery pack: 10°C to 40°C (50°F to 104°F), 80 % rh or less
	Storage: -20°C to 40°C (-4°F to 104°F), 80 % rh or less
	    40°C to 45°C (104°F to 113°F), 60 % rh or less
	    45°C to 50°C (113°F to 122°F), 50 % rh or less
	Battery pack storage: -20°C to 40°C (-4°F to 104°F), 80 % rh or less

Applicable standards	Safety: EN61010-1, EMC: EN61326, EN61000-3-2, EN61000-3-3
Compliance standards	Anti-vibration: JIS D1601: 1995 5.3 (1) Corresponds to Class 1: a passenger car, Condition: class A
Power supply	AC adapter Z1002: 100 to 240 V AC (50/60 Hz) Battery Pack Z1003: 7.2 V DC Continuous operation times: one hour with back light ON (AC adapter has priority when used in combination with battery pack) DC power supply: 10 to 28 V DC (please contact your Hioki distributor for connection cord)
Charging function (At 23°C/ 73°F)	Recharging time: Approx. 3 hours (using the AC adapter and main unit to recharge the Battery Pack Z1003)
Power consumption	When using the AC adapter Z1002, or external DC power supply: 56 VA When using the battery pack: 36 VA
Dimensions and mass	Approx. 298W × 224H × 84D mm (11.73W × 8.82H × 3.31D in), 2.4 kg (84.7 oz), (excluding input modules and battery pack) Reference data: 2.75 kg (97.0 oz, excluding input modules and including battery pack), 3.47 kg (122.4 oz, including MR8901 ×4 and battery pack)
Supplied accessories	Instruction manual ×1, Measurement guide ×1, AC adapter Z1002 ×1, Protection sheet ×1, USB cable ×1, Shoulder strap ×1, Application disk (Wave viewer Wv, communication commands table, CAN Editor) ×1

Display

Display type	8.4 inch SVGA-TFT color LCD (800 × 600 dots, with touch screen), (time axis 25 div × voltage axis 20 div, X-Y waveform 20 div × 20 div)
Screen settings	Waveform split screen (1, 2, or 4), X-Y 1 & X-Y 2 screens, time axis + X-Y waveform screen, sheet display (sheet all, sheet 1 to 4 selectable)
Screen display types	•Waveform display •Simultaneous waveform and gauge display •Simultaneous waveform, gauge, and settings display •Simultaneous waveform and numerical calculation results display •Waveform and A/B, C/D, E/F cursor values displayed at the same time •Simultaneous waveform and instantaneous value display
Waveform monitor	See waveform without recording (setting screen, waiting for trigger screen)
Real-time value monitor	Values for all channels can be monitored during measurement (Instantaneous value, average value, P-P value, Max. value, Min. value)
Display functions (Ver. 1.00 or later)	•Waveform scroll (scroll backwards through the display trend graph to view pas waveforms even while recording) • Event marker input and jump functions (up to 1000 markers) •Waveform inversion (positive/ negative) •Cursor readout (use A/B/C/D/E/F/ cursors) •Vernier display (fine amplitude adjustment)
Display functions (Ver. 2.01 or later)	•Waveform zoom (splits the screen vertically; supports waveform magnification and overall display) •Waveform overlay (select from off, overlay for each measurement, overlay at user-selected timing) • Waveform history (up to 16 past data sets can be selected and displayed.)

Measurement function <small>(High-speed recording)</small>

Time axis	200 μs, 500 μs/div, 1 ms to 500 ms/div, 1 s to 5 min/div, 21 ranges, external sampling (max. 200 kS/s), Recording interval time at real-time save ON: 2 μs/S (channels up to 2), 5 μs/S (channels up to 8), 10 μs/S (channels up to 16), 20 μs/S (channels up to 30), 50 μs/S (channels up to 64), 100 μs/S (with no limit on number of channels in use)
Accuracy of time axis	± 0.0005 %
Time axis resolution	100 points /div
Recording length (with MR8901 × 4, logic and pulse inputs OFF)	25 to 20,000 div *1 *2, 50,000 div *3, or user-configurable from 5 to 80,000 div *3 in 1 div increments *1: 4 ch/module, *2: 2 ch/module, *3: 1 ch/module
Waveform expansion, compression	Time axis: ×10 to ×2 or ×1, ×1/2 to ×1/50,000 Voltage axis: ×100 to ×2, ×1, ×1/2 to ×1/10 Upper and lower limit settings, or position setting
Pre-trigger	(Trigger timing: At start) Pre-trigger data can be recorded for an interval set in steps ranging from 0 to 100 % of the recording length.
Post-trigger	(Trigger timing: At stop) Post-trigger data can be recorded for an interval set in steps ranging from 0 to 40 % of the recording length
Real-time data save	ON /OFF selectable (exclusive real-time save or automatic save) Function: Waveforms are saved as binary data to the SD memory card at each interval (Note: Cannot save in real-time to a USB memory, use only SD memory cards sold by Hioki) Endless loop saving: New file overwrites the oldest file when the SD memory card capacity runs short (Note: Delete files only at saved repeat trigger mode) Normal saving: Saving stops when the SD memory card capacity is full
Auto data save	Select from Off, waveform data (Binary or CSV), numerical calculation results, and image data (compressed BMP or PNG). Function: Data are saved to either SD memory card or USB memory stick at once after the specified recording length is acquired. Endless loop saving: New file overwrites the oldest file when the SD memory card or USB memory capacity runs short Normal saving: Saving stops when the SD memory card or USB memory capacity is full
Data protection	In the event of a power outage during saving to storage media, the file is closed and then the power is shut down. Note: This function is enabled 15 minutes after the power is turned on.
Loading data from media	•Binary data stored in the SD memory card or the USB memory stick can be recalled by the MR8875 internal storage memory •Waveform data saved in real time to the SD memory card can be loaded starting at a specified position up to the maximum storage memory capacity.
Memory segmentation	N/A

Trigger functions

Mode	Single, Repeat
Timing	Start / Stop / Start & Stop (separate trigger conditions can be set to start and stop)
Trigger sources	•Trigger source selectable for each channel (Free-running when all trigger sources are off) •Analog input: Select up to 4 channels for each module •Inter-channel calculation results: W1-1 to W4-2 (Ver.2.01 or later) •Logic input: LA1 to LA4, LB1 to LB2 (4 channels x 2 probes), CAN L1 to 16 (for each MR8904 CAN Unit). Pattern triggers can be configured for each of the above trigger sources. •Pulse input: P1, P2 (2 channels) •External input: Input signal to external trigger terminal •Logical AND/ OR of all sources •Forced trigger execution: Priority over any other trigger source •Interval trigger: Trigger is activated at recording start, and again at each set interval
Trigger types (Analog, pulse)	• Level: A trigger is applied when rise or fall to set voltage value. • Window: Set the upper and lower limits of trigger level
Trigger types (Logic)	• Logic pattern: Settable to 1, 0, or × for each logic probes • The trigger condition (AND/OR) can be set between logic input channels in each probe.
Trigger types (External input)	•Rise or fall selectable (max. allowable input voltage 10 V DC) Rising: A trigger is applied when rise from "Low" (0 to 0.8 V) to "High" (2.5 to 10 V) Falling: A trigger is applied when fall from "High" (2.5 to 10 V) to "Low" (0 to 0.8 V) or terminal short. •External trigger filter and response pulse width: When external filter Off: H period 1 ms or greater, L period 2 μs or greater When external filter On: H period 2.5 ms or greater, L period 2.5 ms or greater
Trigger level resolution	• Analog: 0.1 % f.s. (f.s.=20 div) Note: With the CAN Unit MR8904, resolution fluctuates according to the bit length defined by the CAN •Pulse integration: 0.002 % f.s., •Pulse rotation count: 0.02 % f.s. (f.s.=20 div)
Trigger filter	Set by number of samples (Off, 10 to 1000 points)
Trigger output	•Open drain output (with 5 voltage output, active Low) •Output voltage: 4.0 to 5.0 V (high level), 0 to 0.5 V (low level) •Output pulse width: Selectable level or pulse Level: Sampling period × (number of data since trigger -1) or longer (2 μs or longer) Pulse: 2 ms ±10%

Calculation functions

Real-time inter-channel calculations (Ver.2.01 or later)	• Up to 2 calculations per module can be performed simultaneously. • Calculation target: Analog Unit MR8901, Voltage/Temp Unit MR8902, Strain Unit MR8903 * Inter-channel calculations are limited to single module. * Scaling and probe settings for calculation channels targeted for calculations are disabled. * Calculation results can be scaled. * Calculations between different modes on the MR8902 and MR8903 are not supported. • Calculations: Addition, subtraction, multiplication
Numerical calculation	• Up to 8 calculations can be performed simultaneously • Calculation target: Internal memory • Calculations: Average, effective (rms), peak to peak, maximum value, time to maximum value, minimum value, time to minimum value, period, frequency, rise time, fall time, area value, X-Y area value, standard deviation, specified level time, specified time level, pulse width, duty ratio, pulse count, time difference, phase difference, high-level, low-level, four arithmetic operations, Calculation results can be saved to SD memory card or USB memory stick. • Calculation range: Select from all measurement data or between A/B or C/D cursors • Automatic storing of calculation results in CSV format to the SD card or the USB memory stick.
Waveform calculations (Ver.2.01 or later)	• Up to 8 calculations can be performed simultaneously. • Calculation target: Internal memory • Calculations: Basic arithmetic, absolute value, exponents, common logarithms, square roots, differentials (1st and 2nd order), integrals (1st and 2nd order), moving averages, time-axis moving averages, trigonometric operations (SIN, COS, TAN), inverse trigonometric operations (ASIN, ACOS, ATAN), FIR filter operations, IIR filter operations, average value, maximum value, minimum value, level at time • Calculation range: All measurement data; areas between the A/B and C/D cursors can be selected.
FFT calculations (Ver.2.01 or later)	• Up to 4 calculations can be performed simultaneously. • Calculation target: Internal memory • Calculation modes: Single, repeat • Number of points: 1000 to 10000 • Number of skips: Automatic, 100 to 10000 * Can be set only when the calculation mode is "Repeat". • Window functions: Rectangular window, Hanning, Hamming, Blackman, Blackman-Harris, flat top, exponential • Averaging: Off, simple average, indexed average, peak hold • Compensation: None, power, average • Peak value display: Off, local maximum value, maximum value • Analysis mode: Off, linear spectrum, RMS spectrum, power spectrum, transmission function, cross-power spectrum, coherence function, phase spectrum • Display scale: Linear scale, log scale
Evaluation	Calculation result evaluation output: GO/NG (with open-drain 5 V output)

Other functions

External sampling	Maximum input: Up to 10 V DC Maximum input frequency: 200 kHz Input signal condition: High level 2.5 to 10 V, Low level 0 to 0.8 V, Pulse width H or L 2.5 µs or longer
Other	•Scaling, Comment entry, Select from time, date, and number of data for the horizontal axis display, Key lock •Beep sound ON/OFF •Auto range setting (automatically sets the best suitable sampling rate and amplitude range) •Hold start condition (when the power is interrupted during recording, measurement automatically resumes after power is restored) •Auto set up (automatically load setting files stored in internal memory or the SD card) •Save the setting condition in internal memory (up to 6 conditions) •Manual data save

Pulse input section

No. of channels	2 channels, push button type terminal, not isolated (common GND with main unit)
Mode	Rotation, Integration
Measurement functions	•Divided rotation: 1 to 50,000 count (Rotation number: number of pulses per rotation; Integration: number of pulses per count) •Timing: Select from "starting the count at the trigger" or "at the start of measurement". •Integration mode: Select from "integration from the start of measurement" or "instantaneous value at each sampling period" •Processing of integration overflows: Select either "value returns to 0 and counting continues" or "the overflow state persists"
Input form	•No-voltage 'a' contact (normally open contact), No-voltage 'b' contact (normally short contact), Open collector or voltage input •Input resistance: 1.1 MΩ
Max. allowable input	0 V to 50 V DC (max. voltage between input terminals that does not cause damage)
Max. rated voltage between channels	Not isolated (common GND with main unit)
Max. rated voltage to earth	Not isolated (common GND with main unit)
Detect level	4 V: (High: over 4.0 V, Low: 0 to 1.5 V) 1 V: (High: over 1.0 V, Low: 0 to 0.5 V)
Pulse input period	With filter Off: 200 µs or more (both H and L periods must be at least 100 µs) With filter On: 100 ms or more (both H and L periods must be at least 50 ms)
Slope	Count at rising edge, or count at falling edge
Filter	Chatter prevention filter (On/Off switchable)

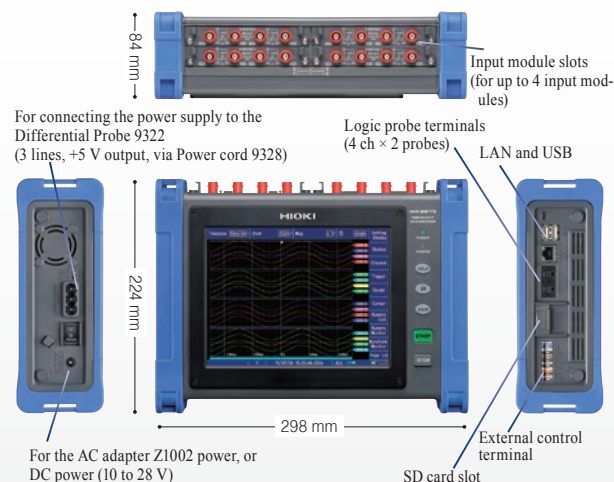| Setting range	Resolution	Measurement range
2,500 c /div	1 c/LSB	0 to 65,535 c
25k c /div	10 c/LSB	0 to 655,350 c
250k c /div	100 c/LSB	0 to 6,553,500 c
5M c /div	2k c/LSB	0 to 131,070,000 c
125M c /div	50k c/LSB	0 to 3,276,750,000 c
Rotation: 250 [r/s] /div	1 [r/s] /LSB	0 to 5,000 [r/s]

■ Maximum time to record to the internal storage memory

* The maximum number of channels to be used is 16 because memory for recording to the internal memory is allocated to each input module.
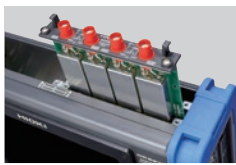* Built-in logic, and pulses P1 and P2 each use the capacity equivalent to one analog channel.

Number of channels to be used *Number of channels for input module with most enabled-measurement channels		9 to 16 ch	5 to 8 ch	3 to 4 ch	2 ch	1 ch
Time axis	Sampling	5000 div	10,000 div	20,000 div	40,000 div	80,000 div
200 µs/div	2 µs	1 s	2 s	4 s	8 s	16 s
500 µs/div	5 µs	2.5 s	5 s	10 s	20 s	40 s
1 ms/div	10 µs	5 s	10 s	20 s	40 s	1 min 20 s
2 ms/div	20 µs	10 s	20 s	40 s	1 min 20 s	2 min 40 s
5 ms/div	50 µs	25 s	50 s	1 min 40 s	3 min 20 s	6 min 40 s
10 ms/div	100 µs	50 s	1 min 40 s	3 min 20 s	6 min 40 s	13 min 20 s
20 ms/div	200 µs	1 min 40 s	3 min 20 s	6 min 40 s	13 min 20 s	26 min 40 s
50 ms/div	500 µs	4 min 10 s	8 min 20 s	16 min 40 s	33 min 20 s	1 h 06 min 40 s
100 ms/div	1 ms	8 min 20 s	16 min 40 s	33 min 20 s	1 h 06 min 40 s	2 h 13 min 20 s
200 ms/div	2 ms	16 min 40 s	33 min 20 s	1 h 06 min 40 s	2 h 13 min 20 s	4 h 26 min 40 s
500 ms/div	5 ms	41 min 40 s	1 h 23 min 20 s	2 h 46 min 40 s	5 h 33 min 20 s	11 h 06 min 40 s
1 s/div	10 ms	1 h 23 min 20 s	2 h 46 min 40 s	5 h 33 min 20 s	11 h 06 min 40 s	22 h 13 min 20 s
2 s/div	20 ms	2 h 46 min 40 s	5 h 33 min 20 s	11 h 06 min 40 s	22 h 13 min 20 s	1 d 20 h 26 min 40 s
5 s/div	50 ms	6 h 56 min 40 s	13 h 53 min 20 s	1 d 03 h 46 min 40 s	2 d 07 h 33 min 20 s	4 d 15 h 06 min 40 s
10 s/div	100 ms	13 h 53 min 20 s	1 d 03 h 46 min 40 s	2 d 07 h 33 min 20 s	4 d 15 h 06 min 40 s	9 d 06 h 13 min 20 s
30 s/div	300 ms	1 d 17 h 40 min	3 d 11 h 20 min	6 d 22 h 40 min	13 d 21 h 20 min	27 d 18 h 40 min
50 s/div	500 ms	2 d 21 h 26 min 40 s	5 d 18 h 53 min 20 s	11 d 13 h 46 min 40 s	23 d 03 h 33 min 20 s	46 d 07 h 06 min 40 s
60 s/div	600 ms	3 d 11 h 20 min	6 d 22 h 40 min	13 d 21 h 20 min	27 d 18 h 40 min	55 d 13 h 20 min
100 s/div	1.0 s	5 d 18 h 53 min 20 s	11 d 13 h 46 min 40 s	23 d 03 h 33 min 20 s	46 d 07 h 06 min 40 s	92 d 14 h 13 min 20 s
2 min/div	1.2 s	6 d 22 h 40 min	13 d 21 h 20 min	27 d 18 h 40 min	55 d 13 h 20 min	111 d 02 h 40 min
5 min/div	3.0 s	17 d 08 h 40 min	34 d 17 h 20 min	69 d 10 h 40 min	138 d 21 h 20 min	277 d 18 h 40 min

■ External appearance and dimensions

84 mm

Input module slots (for up to 4 input modules)

For connecting the power supply to the Differential Probe 9322 (3 lines, +5 V output, via Power cord 9328)

Logic probe terminals (4 ch × 2 probes)

LAN and USB

224 mm

298 mm

For the AC adapter Z1002 power, or DC power (10 to 28 V)

External control terminal

SD card slot

■ Options specifications (sold separately)

Plug-in slot for the input modules

Measurement target	Input module	Measurement range	Resolution
Voltage	Analog Unit MR8901	100 mV f.s. to 200 V f.s.	4 µV
	Analog Unit MR8905	10 V f.s. to 1000 V f.s.	400 µV
	Voltage/Temp Unit MR8902	10 mV f.s. to 100 V f.s.	0.5 µV
	Strain Unit MR8903	1 mV f.s. to 20 mV f.s.	0.04 µV
Current	Analog Unit MR8901 + optional current sensor	Depends on current sensor(s) in use *Certain current sensors require a separate power supply*	1/1250 div
RMS AC voltage	Analog Unit MR8905	10 V rms f.s. to 700 V rms f.s.	400 µV
	Analog Unit MR8901 + optional Differential Probe 9322	100 V rms to 1 kV rms	1/1250 div
Temperature (Thermocouple)	Voltage/Temp Unit MR8902	200 °C f.s. to 2000 °C f.s. *Upper and lower limit values depend on the thermocouple in use*	0.01 °C
Distortion, Stress	Strain Unit MR8903	400 µε to 20,000 µε f.s.	0.016 µε
Analyze CAN signals	CAN Unit MR8904	2 ports /unit *Up to 15 analog channels each equivalent to a 16-bit analog signal *Up to 16 logic channels each equivalent to a 1-bit logic signal*	N/A
Relay contacts, voltage on/off	Logic Probe 9320-01	Depends on logic probes in use *Max. input 50 V, threshold +1.4/+2.5/+4.0 V *Contact short/open, non voltage*	N/A
AC/DC voltage on/off	Logic Probe MR9321-01	Depends on logic probes in use *Up to 250V AC/DC, detect live or not live*	N/A

Dimensions, mass: Approx. 119.5W × 18.8H × 151.5D mm (4.70W × 0.74H × 5.96D in), Approx. 180 g (6.3 oz) **Accessories:** None

Analog Unit MR8901
(Accuracy at 23 ±5 °C/73 ±9 °F, 20 to 80 % rh after 30 min. of warm-up time and zero adjustment; Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

Functions	No. of channels: 4, for voltage measurement
Input connectors	Isolated BNC connector (input resistance 1 MΩ, input capacitance 10 pF) Max. rated voltage to earth: 100 V AC, DC (with input isolated from the main unit, the max. voltage that can be applied between input channel and chassis and between input channels without damage)
Measurement range	5 mV to 10 V/div, 11 ranges, full scale: 20 div *AC voltage can be measured/displayed: up to 140 V rms at ×1/2 amplitude compression, but limited to 100 V rms according as max. rated voltage to earth*
Low-pass filter	Low-pass filter: 5/50/500 Hz, 5 kHz, OFF
Resolution	1/1250 of measurement range (using 16-bit A/D converter)
Highest sampling rate	500 kS/s (simultaneous sampling across 4 channels)
Accuracy	±0.5 % of full scale (with filter 5 Hz, Zero position accuracy included)
Frequency characteristics	DC to 100 kHz -3 dB
Input coupling	DC/GND
Max. allowable input	150 V DC (the max. voltage that can be applied across input pins without damage)

Dimensions, mass: Approx. 119.5W × 18.8H × 184.8D mm (4.70W × 0.74H × 7.28D in), Approx. 190 g (6.7 oz) **Accessories:** Ferrite clamp ×2

Voltage/Temp Unit MR8902
(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)

Functions	No. of channels: 15, for voltage/temperature measurement (selectable for each channels)
Input connectors	Voltage/thermocouple input: push button terminal Recommended wire diameter: single-wire φ 0.32 mm to φ 0.65 mm, stranded wire 0.08 to 0.32 mm² (conductor wire diameter min. φ 0.12 mm), AWG 28 to 22 Input resistance: 1 MΩ Max. rated voltage to earth: 100 V AC, DC (with input isolated from the main unit, the max. voltage that can be applied between input channel and chassis and between input channels without damage)
Voltage measurement ranges	500 µV to 5 V/div, 9 ranges, full scale: 20 division * The AC instantaneous voltage waveform cannot be measured due to the slow sampling speed. Resolution: 1/1000 of measurement range (using 16-bit A/D converter) Accuracy: ±0.1 % f.s. (with digital filter ON, Zero position accuracy included)
Temperature measurement range	Reference junction compensation: Internal/ External (selectable) Thermocouple broken-wire detection: ON/OFF (selection applies to entire unit) Thermocouple type: K, J, E, T, N, R, S, B, WRe5-26 *For thermocouple measurement ranges, resolution, and accuracy, refer to the specifications table below*
Digital filter	50 Hz, 60 Hz, or OFF
Data refresh rate	10 ms (with filter OFF, burn-out detection OFF) 20 ms (with filter OFF, burn-out detection ON) 500 ms (with filter ON, data refresh rate: Fast) 2 s (with filter ON, data refresh rate: Normal)
Max. allowable input	100 V DC (the max. voltage that can be applied across input pins without damage)

■ MR8902 specifications

Thermocouples	Setting ranges (full scale=20 div)	Resolution	Measurement ranges	Accuracy
K	10 °C/div	0.01 °C	-100 to less than 0°C	±0.8 °C
			0 to 200°C	±0.6 °C
	50 °C	0.05 °C	-200 to less than -100 °C	±1.5 °C
			-100 to 1000 °C	±0.8 °C
	100 °C	0.1 °C	-200 to less than -100 °C	±1.5 °C
			-100 to 1350 °C	±0.8 °C
J	10 °C/div	0.01 °C	-100 to less than 0°C	±0.8 °C
			0 to 200°C	±0.6 °C
	50 °C	0.05 °C	-200 to less than -100 °C	±1.0 °C
			-100 to 1000 °C	±0.8 °C
	100 °C	0.1 °C	-200 to less than -100 °C	±1.5 °C
			-100 to 1200 °C	±0.8 °C
E	10 °C/div	0.01 °C	-100 to less than 0°C	±0.8 °C
			0 to 200°C	±0.6 °C
	50 °C	0.05 °C	-200 to less than -100 °C	±1.5 °C
			-100 to less than 0 °C	±0.8 °C
			0 to 1000 °C	±0.6 °C
	100 °C	0.1 °C	-200 to less than -100 °C	±1.5 °C
			-100 to less than 0 °C	±0.8 °C
			0 to 1000 °C	±0.6 °C
T	10 °C/div	0.01 °C	-100 to less than 0°C	±0.8 °C
			0 to 200°C	±0.6 °C
	50 °C	0.05 °C	-200 to less than -100 °C	±1.5 °C
			-100 to less than 0 °C	±0.8 °C
			0 to 400 °C	±0.6 °C
	100 °C	0.1 °C	-200 to less than -100 °C	±1.5 °C
			-100 to less than 0 °C	±0.8 °C
			0 to 400 °C	±0.6 °C

Note: The thermocouple accuracy is obtained by adding a reference junction compensation accuracy of ±0.5 °C

Dimensions, mass: Approx. 119.5W × 18.8H × 151.5D mm (4.70W × 0.74H × 5.96D in), Approx. 173 g (6.1 oz) **Accessories:** Conversion cable ×2 (Connector: TAJIMI PRC03-12A10-7M10.5)

Strain Unit MR8903
(Accuracy at 23 ±5 °C/73 ±9 °F, 20 to 80 % rh after 30 minutes of warm-up time and auto-balance; Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

Functions	No. of channels: 4, for voltage/strain measurements (selectable for each channel, electronic auto-balancing, balance adjustment range within ±10000 µV, ±10000 µε)
Input connectors	Unit side: "HDR-EC14LFDTG2-SLE+" made by Honda Tsushin Kogyo Co., Ltd. Japan Via conversion cable, "PRC03-12A10-7M10.5" made by Tajimi Electronics Co., Ltd. Japan Max. rated voltage to earth: 33 V ACrms or 70 V DC (with input isolated from the main unit, the max. voltage that can be applied between input channel and chassis and between input channels without damage)
Suitable transducer	Strain gauge converter, Bridge resistance: 120 Ω to 1 kΩ, Bridge voltage: 2 V ±0.05 V, Gauge rate: 2.0
Input resistance	More than 1 MΩ
Voltage measurement ranges	50 µV to 1000 µV/div, 5 ranges, full scale: 20 division Accuracy: ±0.5 % f.s. + 4 µV (at 50 µV/div only), other ranges ±0.5 % f.s. (after auto-balance, with filter 5 Hz, zero position accuracy included)
Strain measurement ranges	20 µε to 1000 µε/div, 6 ranges, full scale: 20 division Accuracy: ±0.5 % f.s. + 4 µε (at 20, 50 µε/div), other ranges ±0.5 % f.s. (after auto-balance, with filter 5 Hz, zero position accuracy included)
Low-pass filter	Low-pass filter: 5/10/100 Hz, 1 kHz, OFF
Resolution	1/1250 of measurement range (using 16-bit A/D converter)
Highest sampling rate	200 kS/s (simultaneous sampling across 4 channels)
Frequency characteristics	DC to 20 kHz +1/-3 dB
Max. allowable input	10 V DC (the max. voltage that can be applied across input pins without damage)

Dimensions, mass: Approx. 119.5W × 18.8H × 151.5D mm (4.70W × 0.74H × 5.96D in), Approx. 185 g (6.5 oz) **Accessories:** None

CAN Unit MR8904

Input CAN port	Number of ports: 2, Connector: D-sub a male 9 pin ×2
Standards	ISO 11898 CAN 2.0b, ISO 11898-1, ISO 11898-2, ISO 11898-3, SAE J2411
Interface	Selectable: High-speed CAN, Low-speed CAN, or Single-wire CAN by port (with built-in corresponding transceiver)
Transmit ACK	ON/OFF for transmitting a ACK for receiving CAN signal with the MR8904
Terminator	ON/OFF via commands, 120 Ω ±10 Ω built-in resistance
Baud rate	50 kbps to 1 Mbps at "High-speed", 10 kbps to 125 kbps at "Low-speed", 10 kbps to 83.3 kbps at "Single-wire"
Analyzed signal output channel	Up to 15 analog channels each equivalent to a 16-bit analog signal Up to 16 logic channels each equivalent to a 1-bit logic signal
Signal form	1-bit signal: 1 channel of Logic, or 1 channel of Analog 1-bit to 16-bits signal: 1 channel of Analog 17-bits to 32-bits signal: 2 channels of Analog *Cannot handle signals over 32-bits*
ID trigger	Output "H" level pulse to designated logic channel when receiving set ID signal *Output pulse width: 50 µs below 5 ms/div time axis, 1 sampling time at more than 10 ms/div time axis*
Response time	Within 200 µs after completely receiving CAN message
Transmit CAN message	Can transmit the setting CAN message to the CAN bus by a port

■ Options specifications (sold separately)

■ CAN Editor specifications (software bundled with the MR8904)
(The following values are for one MR8904)

Operating environment	Windows 7 / Vista (32-bit/64-bit), Windows XP (32-bit)
CAN definition settings	CAN message ID, Start position, Data length Data order: U/L (Motorola), L/U (Motorola), L/U (Intel) Code: Unsigned, 1-Signed, 2-Signed
CAN db file	• Load CAN db file • Convert to ".cdf" file • Register to list (editing not available), 33-bit data and above not supported • Convert data order: Motorola (CANdb file) to U/L (Motorola) • Convert coded file (CANdb file) to 2-Signed, IEEE float or double (CANdb file) not supported • Convert signal name (CANdb file) to the label • Convert comment (CANdb file) to the signal name
Registration list settings	CAN input port setting: Port 1, Port 2, Item number: 1 to 200 Setting upper / lower limit display on the MR8875 screen
CAN communication settings	• Interface: High-speed, Low-speed, Single-wire • Terminator: ON/OFF (ON is enabled at High-Speed only) • ACK: ON/OFF • Baud rate: AUTO (enabled at ACK OFF only) 50 kbps to 1 Mbps at "High-speed", 10 kbps to 125 kbps at "Low-speed", 10 kbps to 83.3 kbps at "Single-wire"
Analog channel settings	Number of channels: 15 • Assign the definition on the registration list under 16-bits to 1 channel • Assign the definition on the registration list for 17-bits to 32-bits to 2 channels
Logic channel settings	Number of channels: 16 • Assign the definition on the registration list under 16-bits, with bit position • Assign the definition on the registration list to the ID trigger
Transmission settings	Transmission number, Mode, CAN output port, Frame type, Transmission ID, Transmission byte length, Transmission data, Answer ID, Transmission period
Communication with the MR8875	Search MR8875 via USB, Registration list, CAN communication setting, Analog channels settings, Logic channel settings, Transmission setting information, etc.
Printing functions	Registration list, All items of CAN communication settings, Assigned analog list, Assigned logic list, All items of transmission settings
Save functions	CAN definition data: Binary form, ".cdf" extension, convertible to software for Hioki Model 8910 Setting date (All contents without CAN definition data): Binary form, ".ces" extension

Dimensions, mass: Approx. 119.5W × 18.8H × 151.5D mm (4.70W × 0.74H × 5.96D in), Approx. 185 g (6.5 oz) **Accessories:** None

Analog Unit MR8905
(Accuracy at 23 ±5 °C/73 ±9 °F, 20 to 80 % rh after 30 min. of warm-up time and zero adjustment; Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

Functions	No. of channels: 2, switchable between instantaneous value and AC RMS value
Input connectors	Banana connector (input impedance 4 MΩ, input capacitance less than 1 pF) Max. rated voltage to earth: CAT II 1000 V AC & DC, CAT III 600 V AC & DC (with input isolated from the main unit, the max. voltage that can be applied between input channel and chassis and between input channels without damage)
Measurement range	500 mV to 50 V/div, 7 ranges, full scale: 20 div *The maximum displayable AC voltage is 700 Vrms when using 1/2 compression of the vertical axis.
Low-pass filter	5/50/500/5 kHz, OFF
Resolution	1/1250 of measurement range (using 16-bit A/D converter)
Highest sampling rate	500 kS/s (simultaneous sampling across 2 channels)
Accuracy	±0.5% f.s. (with 5 Hz filter ON)
RMS measurement	RMS accuracy: ±1.5% f.s. (30 Hz up to but not including 1 kHz, sine wave input) or ±3% f.s. (1 kHz up to 10 kHz, sine wave input) Response time: 300 ms (filter off, rising from 0% to 90% f.s.) or 600 ms (filter off, falling from 100% to 10% f.s.) Crest factor 2
Frequency characteristics	DC to 100 kHz -3 dB
Input coupling	DC/AC-RMS/GND
Max. allowable input	1000 V DC, 700 V AC (the max. voltage that can be applied across input pins without damage)

(Compatible with MR8875 firmware version 2.14/3.14 or later)

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

LOGIC PROBE MR9321-01

Function	Detection of AC or DC relay drive signal for High/Low state recording Can also be used for power line interruption detection
Input	4 channels (isolated between unit and channels), HIGH/LOW range switching Input resistance: 100 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)
Max. allowable input	250 Vrms (HIGH range), 150 Vrms (LOW range) (the maximum voltage that can be applied across input pins without damage)

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

LOGIC PROBE 9320-01

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

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

DIFFERENTIAL PROBE P9000
(Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

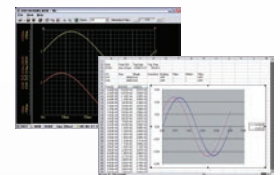|	
Measurement modes	P9000-01: For waveform monitor output, Frequency properties: DC to 100 kHz -3 dB P9000-02: Switches between waveform monitor output/AC effective value output Wave mode frequency properties: DC to 100 kHz -3 dB, RMS mode frequency properties: 30 Hz to 10 kHz, Response time: Rise 300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

Analyzing data on a computer

● WAVE PROCESSOR 9335 (option)
• Waveform display and calculation
• Print function
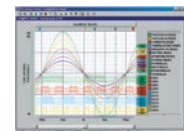
● Wave Viewer (Wv) Software (bundled software)
• Confirmation of binary data waveforms on a computer
• Saving data in the CSV format for transfer to spreadsheet software

■ 9335 Outline specifications (option)

Operating environment	Windows 8/7 (32/64-bit), Vista (32-bit), XP
Functions	• Display: Waveform display, X-Y display, cursor function, etc. • File loading: Readable data formats (.MEM, .REC, .RMS, .POW) Largest readable file: Largest file that can be saved by supported instruments (Supported file size may be limited due to computer's operating environment.) • Data conversion: Conversion to CSV format, batch conversion of multiple files
Print	• Print function: Saving of print image files (with support for enhanced metafile [EMF] format) • Print format: Select from no tiling, 2 to 16 tiles, 2 to 16 rows, X/Y 1 to 4 tiles, preview/hard copy

■ Wave Viewer (Wv) Outline specifications (bundled software)

Operating environment	Windows 8/7 (32/64-bit), Vista (32-bit), XP
Functions	• Simple display of waveform file • Convert binary data file to text format, CSV • Scroll display, enlarge/reduce, jump to cursor/trigger position, etc.

Input modules

*Install by inserting into the main unit. Can be replaced by user. Input cables are not supplied.

ANALOG UNIT MR8901
4ch, Voltage measurement, DC to 100kHz bandwidth

VOLTAGE/TEMP UNIT MR8902
15ch, Voltage measurement, Thermocouple measurement

STRAIN UNIT MR8903
4ch, Voltage measurement, Strain gauge converter input, Conversion cable included

CAN UNIT MR8904
Up to 15 analog channels each equivalent to a 16-bit analog signal, and up to 16 logic channels each equivalent to a 1-bit logic signal

ANALOG UNIT MR8905
2 channels, high-voltage DC/RMS input, DC to 100 kHz band
(Compatible with MR8875 firmware version 2.14/3.14 or later)

Input cable (A)

*Voltage is limited to the specifications of the input modules in use

[ICE Recommended]

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

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

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

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

L9790   L9790-01   9790-03   9790-02

Input cable (B)

*Voltage is limited to the specifications of the input modules in use

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

Input cable (C)

Options for the Analog unit MR8905

CONNECTION CABLE SET L4940
Banana plug - banana plug, 1.5 m (4.92 ft) length, red/black each 1

EXTENSION CABLE SET L4931
Expands the length of L4930/4940, 1.5 m (4.92 ft) length

ALLIGATOR CLIP SET L4935
Attaches to the tip of the L4930/4940, CAT IV 600V, CAT III 1000V

GRABBER CLIP 9243
Attaches to the tip of the Connection cord or cable, CAT III 1000 V, 196 mm (7.72 in) length

Input cable (D)

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

DIFFERENTIAL PROBE P9000-01
(Wave mode only)
For the Memory HiCorder series, input up to 1kV AC/DC

DIFFERENTIAL PROBE P9000-02
(Select between WAVE/RMS mode)
For the Memory HiCorder series, input up to 1kV AC/DC

AC ADAPTER Z1008
100 to 240 V AC

Custom cable

*For P9000. Inquire with your Hioki distributor.

Bus powered USB cable
For power supply from a USB-A terminal

USB(A)- Micro B cable
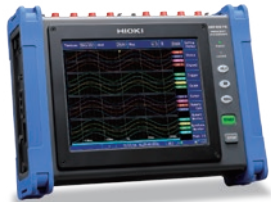For power supply via USB Micro B terminal from a USB-A terminal

3-prong cable
AC adapter output terminal split into 3

Order Code: MR8875
. . .(Max. 16 - 60ch, 32MW memory, main unit only)

Note: The MR8875 cannot operate alone. You must install one or more optional input modules in the unit.

Storage media

*SD Card Precaution
Use only SD Cards sold by HIOKI. Compatibility and performance are not guaranteed for SD cards made by other manufacturers. You may be unable to read from or save data to such cards.

SD MEMORY CARD 2GB Z4001
2GB capacity

PC Software

WAVE PROCESSOR 9335
Convert data, print and display waveforms

LAN CABLE 9642
Straight Ethernet cable, supplied with straight to cross conversion cable, 5 m (16.41 ft) length

Power supply

*Z1002 is a bundled accessory

AC ADAPTER Z1002
For main unit, 100 to 240 V AC

BATTERY PACK Z1003
NiMH, Charges while installed in the main unit

Case

CARRYING CASE C1004
Includes compartment for options, hard trunk type, also suitable for transporting the MR8875

Other options for input

CAN CABLE 9713-01
For the MR8904, 8910, Unprocessed on one end, 1.8 m (5.91 ft) length

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, output BNC terminal

Logic signal measurement

Small terminal type only

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

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

CONVERSION CABLE 9323
*Used for connecting the 9320/9321/MR9321 and the 9324 to the Memory HiCorder with small logic terminal models
* This cable is not required for the small-terminal types 9327, 9320-01, 9321-01 and MR9321-01.

Up to 200 A (High precision)

High-Precision pull-through current sensors, observe waveforms from DC to distorted AC.
AC/DC CURRENT SENSOR CT6862, 50A
AC/DC CURRENT SENSOR CT6863, 200A

Observe waveforms from DC to distorted AC.
AC/DC CURRENT PROBE CT6841, 20A
AC/DC CURRENT PROBE CT6843, 200A

CLAMP ON SENSOR 9272-10
Enables observation of AC current waveforms. 1 Hz to 100 kHz response, input selectable 20 and 200A, 2V AC output.

Up to 500 A (High precision)

AC/DC CURRENT SENSOR 9709
High-Precision pull-through current sensors, observe waveforms from DC to distorted AC. DC to 100 kHz response, input 500A, 2V AC output.

UNIVERSAL CLAMP ON CT 9279-01
Enables observation from DC to AC current waveforms. DC to 20 kHz response, input 500A, 2V AC output. (CE marked)

Power supply for sensor
Necessary for use high precision current sensors

SENSOR UNIT 9555-10
For signal output L9217 is necessary

CONNECTION CORD L9217
Insulated BNC connectors at both ends, 1.6 m (5.25 ft) length.

100 A to 2000 A (Medium speed)

CLAMP ON AC/DC SENSOR CT9691-90
DC to 10kHz (-3dB), 100A, Output 0.1 V/f.s., bundled the Sensor Unit CT6590

CLAMP ON AC/DC SENSOR CT9692-90
DC to 20kHz (-3dB), 200A, Output 0.2 V/f.s., bundled the Sensor Unit CT6590

CLAMP ON AC/DC SENSOR CT9693-90
DC to 15kHz (-3dB), 2000A, Output 0.2 V/f.s., bundled the Sensor Unit CT6590

500 A to 1000 A
*For commercial power lines, 50/60Hz (separate power supply not required)

CLAMP ON PROBE 9018-50
Excellent phase characteristics, Input from 10 to 500 A, 40 Hz to 3 kHz for 0.2 V AC output, BNC terminal

CLAMP ON PROBE 9132-50
Input from 20 to 1000 A, 40 Hz to 1 kHz for 0.2 V AC output, BNC terminal

HIOKI

Wave-Viewer software

Applicativo software per lavisualizzazione dei dati delle forme d'onda

L'applicativo software Wave-Viewer è fornito in dotazione a tutti gli oscilloscopi registratori presentati in questo catalogo, ad esclusione del modello MR8870/20 per il quale il software si chiama "Wave-Processor" sebbene mantenga le medesime funzionalità e prestazioni.

Wave-Viewer consente di aprire i file dati salvati e di svolgere le seguenti funzioni:

• Visualizzazione delle forme d'onda, così come rappresentate a display sullo strumento

• Possibilità di utilizzare i cursori orizzontali e verticali, scorrere con il puntatore all'interno della forma d'onda, la controllare la posizione del trigger, utilizzare la funzione di zoom per ingrandire/ridurre il dettaglio visualizzato

• Conversione dei file di dati binari in formato CSV o equivalente, per elaborazione su foglio di calcolo commerciale quale Excel, OpenOffice, …
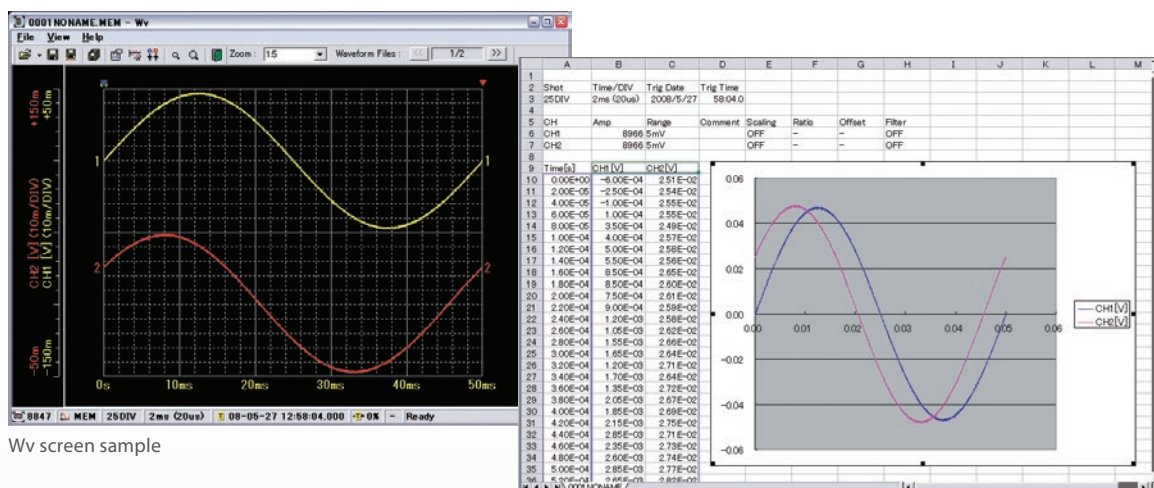
Wv screen sample

Excel spreadsheet sample

Il trasferimento del file può essere realizzato tramite diverse modalità in funzione delle caratteristiche di comunicazione e interfaccia specifiche di ogni modello di oscilloscopio registratore: tramite connessione LAN, USB, chiave USB, CF card, SD card, FTP server.

Wave-Viewer è compatibile con i Sistemi Operativi Windows 10 (32-bit o 64-bit), Windows 8/8.1 (32-bit o 64-bit), Windows 7 (32-bit o 64-bit), Windows Vista (32-bit), Windows XP (32-bit).

Wave-Processor, specifico per oscilloscopio registratore MR8870/20, è compatibile con i Sistemi Operativi Windows 8/8.1 (32-bit o 64-bit), Windows 7 (32-bit o 64-bit), Windows Vista (32-bit), Windows XP (32-bit), Windows 2000.