						
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

NEW

MR8847

Performance, affidabilità, consistenza... quando i duri iniziano a giocare!!!

Componibile ed espandibile fino a 16 canali analogici, ideale per le misure “in campo”

Dimensione della memoria interna selezionabile su 4 modelli distinti:

- **MR8847/01: 64Mword (128MB)**
- **MR8847A/51: 64Mword (128MB)**
- **MR8847A/52: 256Mword (512MB)**
- **MR8847A/53: 512Mword (1024MB)**

Il campionamento a 20MS/s è troppo veloce per consentire la registrazione diretta su CF Card o chiavi USB.
Gli oscilloscopi registratori MR8847 incorporano il dispositivo FPGA di accesso memoria ad alta velocità brevettato Hioki che consente registrazioni prolungate con la massima velocità di campionamento.

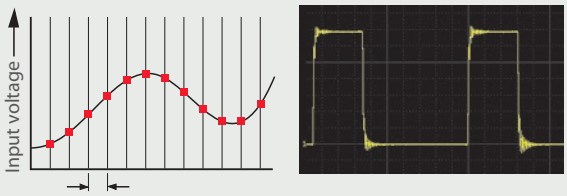
NOTA: la versione MR8847/01 non supporta i moduli di ingresso mod. MR8990, MR8790, MR8791, U8793.
Tutte le altre funzionalità e prestazioni sono identiche per i 4 modelli.

		MR8847-01 (64 MW) MR8847A-51 (64 MW)	MR8847A-52 (256 MW)	MR8847A-53 (512 MW)
Maximum recording length fluctuates depending on number of channels used.		16 analog channels + 16 internal logic channels	16 analog channels + 16 internal logic channels	16 analog channels + 16 internal logic channels
Time axis	Sampling period	40.000 divisions	160.000 divisions	320.000 div
5 µs/div	50 ns	0.2 s	0.8 s	1.6 s
10 µs/div	100 ns	0.4 s	1.6 s	3.2 s
100 µs/div	1 µs	4 s	16 s	32 s
1 ms/div	10 µs	40 s	2 min 40 s	5 min 20 s
100 ms/div	1 ms	1 h 06 min 40 s	4 h 26 min 40 s	8 h 53 min 20 s
1 s/div	10 ms	11 h 06 min 40 s	1 d 20 h 26 min 40 s	3 d 16 h 53 min 20 s
1 min/div	600 ms	27 d 18 h 40 min 00 s	111 d 02 h 40 min 00 s	222 d 05 h 20 min 00 s
5 min/div	3.0 s	138 d 21 h 20 min 00 s	555 d 13 h 20 min 00 s	1111 d 02 h 40 min 00 s

REC time axis	Sampling period	To internal memory 20,000 divisions	Continuous (approx. recording time with one 30m paper roll) *Note: Calculated as 30 m = 2,970 divisions Changing paper enables permanent continuation of recording*
100 ms/div	1 µs, 10 µs, 100 µs, 1 ms, 10 ms, 100 ms *Note: Limited by combination of selections under 1/100 on time axis and time axis setting for memory recording*	33 min 20 s	Display only
200 ms/div		1 h 6 min 40 s	Display only
500 ms/div		2 h 46 min 40 s	24 min 45 s
1 s/div		5 h 33 min 20 s	49 min 30 s
2 s/div		11 h 6 min 40 s	1 h 39 min 00 s
5 s/div		1 d 3 h 46 min 40 s	4 h 7 min 30 s
10 s/div		2 d 7 h 33 min 20 s	8 h 15 min 00 s
30 s/div		6 d 22 h 40 min 00 s	24 h 45 min 00 s
50 s/div		11 d 13 h 46 min 40 s	1 d 17 h 15 min 00 s
100 s/div		23 d 3 h 33 min 20 s	3 d 10 h 30 min 00 s
1 min/div		13 d 21 h 20 min 00 s	2 d 1 h 30 min 00 s
2 min/div		27 d 18 h 40 min 00 s	4 d 3 h 00 min 00 s
5 min/div		69 d 10 h 40 min 00 s	10 d 7 h 30 min 00 s
10 min/div		138 d 21 h 20 min 00 s	20 d 15 h 00 min 00 s
30min/div		416 d 16 h 00 min 00 s	61 d 21 h 00 min 00 s
1 hr/div		833 d 8 h 00 min 00 s	123 d 18 h 00 min 00 s

Velocità di campionamento 20MS/s

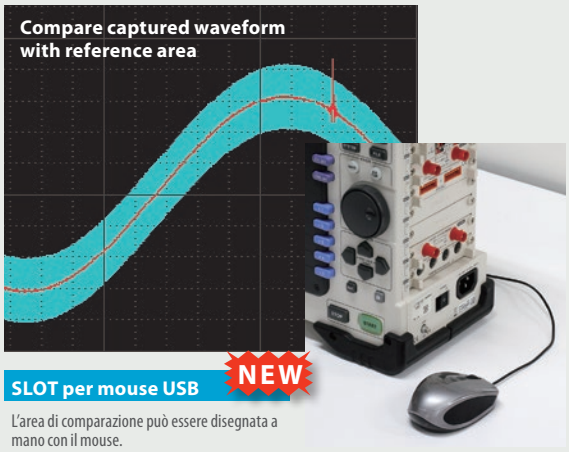
Il principio di funzionamento degli oscilloscopi registratori permette di memorizzare i dati con una altissima velocità mantenendo una elevata capacità di registrazione storica in memoria interna.
La velocità di campionamento fino a 20MS/s (50 nanosecondi) è garantita in simultanea su tutti i canali di misura attivi.
Ciò assicura che tutte le eventuali sovratensioni impulsive vengano catturate con estrema confidenza.



Minimum 50 nsec (Maximum sampling speed 20 MS/s)

Comparazione di forme d'onda ad alta velocità

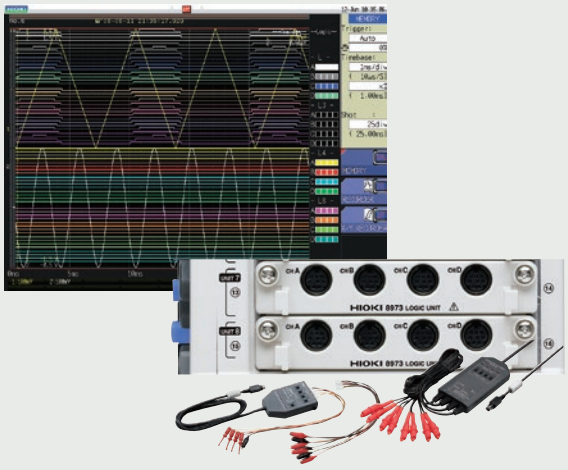
La funzione di comparazione della forma d'onda consente di ottenere un risultato PASS o FAIL in funzione della misura svolta.
Velocità, funzionalità e certezza del risultato al massimo livello, sfruttando le prestazioni avanzate di MR8847, quali il campionamento a 20MS/s e la gestione multi-canale di cattura delle forme d'onda, ideale per applicazioni di manutenzione urgenti.
Utilizzando un tempo/divisione più lento di 100msec/div, le forme d'onda in misura sono comparate in tempo reale, consentendo di rilevare all'istante eventuali guasti.
In tali casi il ciclo produttivo ne risente al minimo, eliminando probabili sprechi di risorse.



L'area di comparazione può essere disegnata a mano con il mouse.

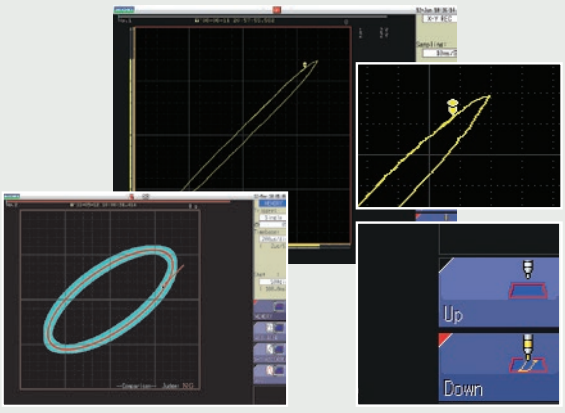
Versatilità senza confini: 16 analogici + 16 digitali, 10 analogici + 64 digitali, ...

Gli oscilloscopi registratori MR8847 gestiscono 8 slot per svariati moduli di ingresso in funzione delle caratteristiche dei segnali da esaminare.
La configurazione massima può quindi essere di 16 analogici + 16 digitali, 10 analogici + 64 digitali, o una diversa combinazione mista.
Tutti i segnali in esame possono essere visualizzati su singola schermata, mentre la registrazione simultanea è possibile per un massimo di 10 canali analogici.



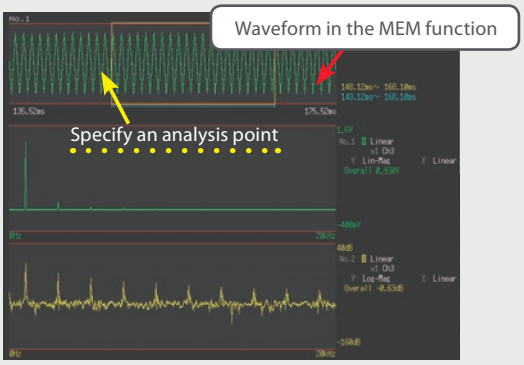
Registrazione del diagramma X-Y

Il diagramma di relazione X-Y nasconde vantaggi spesso trascurati.
La gamma MR8847 introduce il controllo grafico "matita up/down" che permette approfondimenti tecnici altrimenti possibili solamente su carta o tramite successivo trasferimento del file a computer.
In aggiunta, la funzione di comparazione della forma d'onda può essere utilizzata sia per registrazioni con dominio nel tempo sia per diagrammi di relazione X-Y.
È quindi possibile verificare i rapporti causa-effetto, nonché definire un limite di scostamento accettabile tra l'uno e l'altro segnale.



Funzione di analisi FFT

L'analisi FFT può essere svolta per un segnale di ingresso alla volta, per la valutazione delle componenti sovrapposte a frequenze armoniche rispetto alla fondamentale, valutazione IN-OUT durante la funzione di trasferimento, analisi delle ottave per misurazioni acustiche,...
Il segnale in ingresso può essere frammentato in una quantità di dati configurabile da 1000 a 10000 punti.
Anche sulla funzione FFT può essere condotta la comparazione delle forme d'onda al alta velocità.



Source waveform (captured in Memory function), and FFT analyzed waveform display simultaneously

Ricalcolo immediato dell'analisi FFT

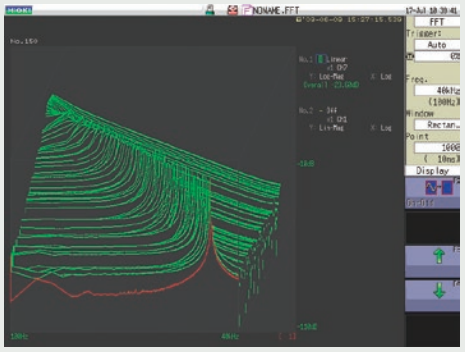
La quantità di punti dell'analisi FFT può essere modificata anche in fase successiva all'elaborazione iniziale.
Ad esempio, i dati misurati in configurazione a 1000 punti possono essere convertiti e ri-analizzati con impostazione a 10000 punti. Ciò si traduce in un aumento di dieci volte della risoluzione di analisi in frequenza.


1,000 points

Convert 1,000 to 10,000 points

Visualizzazione dello spettro

La visualizzazione dello spettro in 3D dell'analisi FFT in frequenza consente di valutare ogni singola componente armonica di ordine superiore alla fondamentale.
I dati possono essere salvati e richiamati istantaneamente su computer oppure convertiti in file di testo per la successiva elaborazione grafica su foglio di calcolo commerciale (Excel, OpenOffice, ecc…).



Fattore di conversione "scaling"

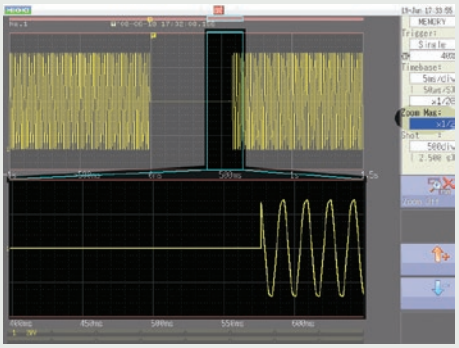
Gli oscilloscopi registratori MR8847 offrono l'importante funzione denominata "scaling" che consente di attribuire un coefficiente matematico di trasformazione al segnale in ingresso.
In questo modo un valore in ingresso di 10mV può essere visualizzato e registrato come ad esempio 847rpm (il fattore di conversione impostato è 84.7rpm/mV).
Il coefficiente può essere di tipo logaritmico, così da rendere estremamente semplice l'elaborazione di un segnale non lineare quale un rumore in dB.

Before scaling

After scaling

Ingrandimento ZOOM parzializzato

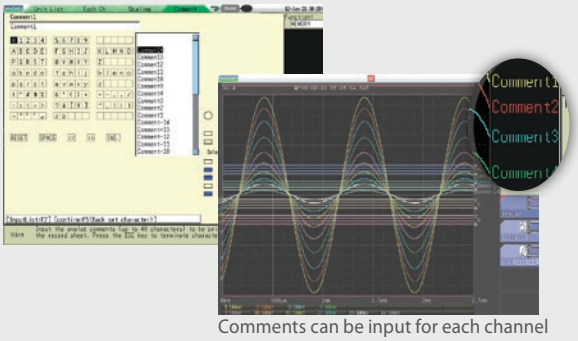
La funzione di ZOOM consente di doppiare la visualizzazione a display mantenendo l'intera registrazione nella parte superiore ed offrendo nella parte inferiore una finestra ingrandita di una sezione della forma d'onda analizzata.
La finestra di zoom presenta una base tempi espansa ed adeguata al livello di ingrandimento definito.



While observing the entire waveform, zoom in on portions of interest

Inserimento commenti tecnici

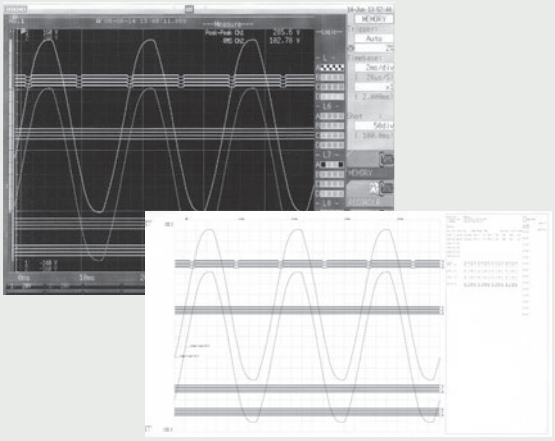
Per ogni segnale monitorato e visualizzato è possibile inserire un commento tecnico di supporto che rimane presente sia a display, sia in stampa su carta termica.



Comments can be input for each channel

Stampa formato A4

MR8847 è in grado di stampare su carta con istantaneità immediata. La carta termica in formato A4 rappresenta le mostra forme d'onda con alta risoluzione grafica.
L'elevata qualità di stampa consente di individuare dettagli minimi, anche grazie alla presenza su carta dei parametri di misura utilizzati. La velocità di stampa è due volte superiore rispetto a qualsiasi altro oscilloscopio registratore.
Oltre alla stampa su carta è naturalmente possibile salvare la visualizzazione a display come file BMP su CF Card o su chiave USB.



Connessioni a computer

I dati registrati possono essere salvati su qualsiasi supporto fisico, chiave USB o PC Card, oppure immediatamente trasferiti a computer tramite connessione USB o LAN.
In connessione LAN è inoltre possibile gestire l'oscilloscopio registratore in modalità remota tramite HTTP/FTP server function.
Il software Wave-Viewer fornito in dotazione permette di visualizzare le registrazioni gestendone la rappresentazione grafica e la stampa.

Product Specifications

Basic specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

Measurement functions	MEMORY (high-speed recording), RECORDER (real-time recording) X-Y RECORDER, FFT
Number of input units	[8 analog input modules]: 16 analog channels + 16 logic channels (built-in) [5 analog input modules + 3 logic input modules]: 10 analog channels + 64 logic channels (16 built-in channels + 48 channels in logic input modules) * For analog units, channels are isolated from each other and from frame GND. For logic units and internal standard logic terminals, all channels have a common ground.
Max. sampling speed	20 MS/second (50 ns period, all channels simultaneously) External sampling (10 MS/second, 100 ns period)
Memory capacity	MR8847-51: Total 64 M-words (Memory expansion: none) 32 MW/ch (using 2 Analog channels), to 4 MW/ch (using 16 Analog channels) MR8847-52: Total 256 M-words (Memory expansion: none) 128 MW/ch (using 2 Analog channels), to 16 MW/ch (using 16 Analog channels) MR8847-53: Total 512 M-words (Memory expansion: none) 256 MW/ch (using 2 Analog channels), to 32 MW/ch (using 16 Analog channels)
Removable storage	CF card slot (standard) × 1 (up to 2GB, FAT, or FAT-32 format), SSD (128 GB, optional), USB memory stick (USB 2.0)
Backup function (At 25°C/ 77°F)	Clock and parameter setting backup: at least 10 years, Waveform backup function: none
Control terminals	External trigger input, Trigger output, External sampling input, Two external outputs (GO, NG), Three external inputs (START, STOP, PRINT)
External interface	LAN: 100BASE-TX (FTP server, HTTP server) USB: USB2.0 compliant, series A receptacle ×1, series B receptacle ×1, (File transfer internal drive/CF card to PC, or remote control from PC)
Environmental conditions (no condensation)	Operation: -10°C to 40°C (14°F to 104°F), 20% to 80% RH With printer and/or SSD in use: 0°C to 40°C (32°F to 104°F), 20% to 80% RH Storage: -20°C to 50°C (-4°F to 122°F), 90% RH or less
Compliance standard	Safety: EN61010 EMC: EN61326, EN61000-3-2, EN61000-3-3
Power supply	100 to 240 V AC, 50/60 Hz 10 to 28 V DC (use the DC POWER UNIT 9784: Factory installation only)
Power consumption	130 VA max. (Printer not used), 220 VA max. (Printer used)
Dimensions and mass	Approx. 351 mm (13.82 in) W × 261 mm (10.28 in) H × 140 mm (5.51 in) D, 7.6 kg (268.1 oz) (main unit only)
Accessories	Instruction Manual ×1, Measurement Guide ×1, Application Disk (Waveform Maker Software SF8000, Wave Viewer Wv, Communication Commands table) ×1, Power cord ×1, Input cord label ×1, USB cable ×1, Printer paper ×1, Roll paper attachment ×2, Ferrite clamp ×1

Internal printer

Features	Printer paper one-touch loading, high-speed thermal printing
Recording Paper	216 mm (8.50 in) × 30 m (98.43 ft), thermal paper roll (use 9231 paper) Waveform section recording width: 200 mm (7.87 in) 20 division full scale, 1 div = 10 mm (0.39 in) 80 dots
Recording speed	Max. 50 mm (1.97 in)/sec
Paper feed density	10 dots/mm

Display

Display section	10.4 inch SVGA-TFT color LCD (800 × 600 dots) (Time axis 25 div × Voltage axis 20 div, X-Y waveform 20 div × 20 div)
Display languages	English, Japanese, Korean, Chinese
Waveform display zoom/compression	Time axis: x10 to x2 (zoom at MEMORY function only), x1, x1/2 to x1/20 000 Voltage axis: x100 to x2, x1, x1/2 to x1/10
Variable display	Upper/Lower limit set, display/div set
Scaling	10:1 to 1000:1, automatic scaling for various probes Manual scaling (conversion ratio setting, 2-point setting, unit setting)
Comment entry	Alphanumeric input (title, analog and logic channels), Simple input, history input, phrase input
Logic waveform	Display point move 1% step, Line width 3 types
Display partition	Max. 16 graphs
Monitor functions	- Level monitor - Numerical value (sampling 10 kS/s fixed, refresh rate 0.5 s)
Other display functions	- Waveform inversion (positive/negative) - Cursor measurement (A, B, 2-cursor, for all channels) - Vernier function (amplitude fine adjustment) - Zoom function (horizontal screen division, zoomed waveform shown in lower section) - 16 selectable colors for waveform display - Zero position shift in 1% steps for analog waveform - Global zero adjust for all channels and all ranges

MEMORY (High-speed recording)

Time axis	5 µs to 5 min/div (100 samples/div) 26 ranges, External sampling (100 samples/div, or free setting), Time axis zoom: x2 to x10 in 3 stages, compression: 1/2 to 1/200 000 in 16 stages
Sampling period	1/100 of time axis range (minimum 50 ns period)
Recording length	MR8847-51: 16 ch mode: 25 to 20 000 div, 2 ch mode: 25 to 200 000 div (built-in presets) or arbitrary setting in 1-div steps (max. 320 000 div) MR8847-52: 16 ch mode: 25 to 100 000 div, 2 ch mode: 25 to 1 000 000 div (built-in presets) or arbitrary setting in 1-div steps (max. 1 280 000 div) MR8847-53: 16 ch mode: 25 to 200 000 div, 2 ch mode: 25 to 2 000 000 div (built-in presets) or arbitrary setting in 1-div steps (max. 2 560 000 div)
Pre-trigger	Record data from before the trigger point at 0 to +100% or -95% of the recording length in 15 stages, or in 1 div step settings
Numerical calculations	- Simultaneous calculation for up to 16 selected channels Average value, effective (rms) value, peak to peak value, maximum value, time to maximum value, minimum value, time to minimum value, period, frequency, rise time, fall time, standard deviation, area value, X-Y area value, specified level time, specified time level, pulse width, duty ratio, pulse count, four arithmetic operations, time difference, phase difference, high-level and low-level - Calculation result evaluation output: GO/NG (with open-collector 5 V output) - Automatic saving of calculation results
Waveform processing	- For up to 16 freely selectable channels, the following functions can be performed (results are automatically stored): Automatic saving of four arithmetic operations, absolute value, exponentiation, common logarithm, square root, moving average, differentiation (primary, secondary), integration (primary, secondary), parallel displacement along time axis, trigonometric functions, reverse trigonometric functions, calculation results
Memory segmentation	- Max. 1024 blocks, sequential storage, multi-block storage
Other	- No logging - X-Y waveform synthesis (1-screen, 4-screens) - Overlay (always overlay when started/overlay only required waveforms) - Automatic/ Manual/ A-B cursor range printing/ Report printing

RECORDER (Real-time recording)

Time axis	10 ms to 1 hour/div, 19 ranges, time axis resolution 100 points/div * Out of data acquired at selected sampling rate, only maximum and minimum value data determined using 100 points/div units are stored. Time axis compression selectable in 14 steps, from ×1/2 to ×1/50 000
Sampling period	1/10/100 µs, 1/10/100 ms (selectable from 1/100 or less of time axis)
Real-time printing	Supported * Real-time printing is possible at time axis settings slower than 500 ms/div * Delayed print is performed when recording length is not set to "Continuous" and time axis setting is 10 ms to 200 ms/div * When recording length is set to "Continuous" and time axis setting is 10 ms to 200 ms/div, manual printing can be performed after measurement stop
Recording length	MR8847-51: Built-in presets of 25 to 20 000 div, or "Continuous" or arbitrary setting in 1-div steps (max. 20 000 div) MR8847-52: Built-in presets of 25 to 50 000 div, or "Continuous" or arbitrary setting in 1-div steps (max. 80 000 div) MR8847-53: Built-in presets of 25 to 100 000 div, or "Continuous" or arbitrary setting in 1-div steps (max. 160 000 div)
Additional recording	Supported (recording is resumed without overwriting previous data)
Waveform memory	MR8847-51: Store data for most recent 20 000 div in memory MR8847-52: Store data for most recent 80 000 div in memory MR8847-53: Store data for most recent 160 000 div in memory * Backward scrolling and re-printing available
Auto saving	Data are automatically saved on CF card, USB memory stick or internal drive after measurement stops.
Other	- No logging - Manual/ A-B cursor range printing/ Report printing

X-Y RECORDER (X-Y real-time recording)

Sampling period	1/10/100 ms (dot), 10/100 ms (line)
Recording length	Continuous
Screen, Printing	Split screen (1 or 4), Manual printing only
Number of X-Y	1 to 8 phenomena
X-Y channel setting	Any 8 channels out of 16 can be selected for X axis and Y axis respectively
X-Y axis resolution	25 dots/div (screen), horizontal 80 dots/div × vertical 80 dots/div (printer)
Waveform memory	Sampling data for last 4 000 000 points are stored in memory
Pen up/down	Simultaneous for all phenomena
External pen control	Possible via external input connector (simultaneous up/down for all phenomena)

Trigger functions

Trigger mode	MEMORY (high-speed recording), FFT: Single, Repeat, Auto RECORDER (real-time recording): Single, Repeat
Trigger source	CH1 to CH16 (analog), Standard Logic 16ch + Logic Unit (Max. 3 units 48 channels), External (a rise of 2.5V or terminal short circuit), Timer, Manual (either ON or OFF for each source), Logical AND/OR of sources
Trigger types	- Level: Triggering occurs when preset voltage level is crossed (upwards or downwards) - Voltage drop: Triggering occurs when voltage drops below peak voltage setting (for 50/60 Hz commercial power supply only) - Window: Triggering occurs when window defined by upper and lower limit is entered or exited - Period: Rising edge or falling edge cycle of preset voltage value is measured and triggering occurs when defined cycle range is exceeded - Glitch: Triggering occurs when pulse width from rising or falling edge of preset voltage value is under run - Event setting: Event count is performed for each source, and triggering occurs when a preset count is exceeded - Logic: 1, 0, or ×, Pattern setting
Level setting resolution	0.1% of full scale (full scale = 20 divisions)
Trigger filter	Selectable 0.1 div to 10.0 div, or OFF (high-speed recording) ON (10 ms fixed) or OFF (at RECORDER function)
Trigger output	Open collector (5 voltage output, active Low) At Level setting: pulse width (Sampling period × data number after trigger) At Pulse setting: pulse width (2 ms)
Other functions	Trigger priority (OFF/ON), Pre-trigger function for capturing data from before / after trigger event (at MEMORY function), Level display during trigger standby, Start and stop trigger (at RECORDER function), Trigger search function

Other

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

FFT function

Analysis mode	Storage waveform, Linear spectrum, RMS spectrum, Power spectrum, Density of power spectrum, Cross power spectrum, Auto-correlation function, Histogram, Transfer function, Cross-correlation function, Impulse response, Coherence function, 1/1 Octave analysis, 1/3 Octave analysis, LPC analysis, Phase spectrum
Analysis channels	Selectable from all analog input channels
Frequency range	133 mHz to 8 MHz, External (resolution 1/400, 1/800, 1/2000, 1/4000)
Number of sampling points	1000, 2000, 5000, 10 000 points
Window functions	Rectangular, Hanning, Hamming, Blackman, Blackman-Harris, Flat-top, Exponential
Display format	Single, Dual, Nyquist, Running spectrum
Averaging function	Time axis / frequency axis simple averaging, Exponential averaging, Peak hold (frequency axis), Averaging times: 2 times to 10000 times
Print functions	Same as the MEMORY function (partial print not available)

- Maximum Internal Memory Recording Time (MEMORY Function)

		MR8847-51 (64 MW)		MR8847-52 (256 MW)		MR8847-53 (512 MW)	
Maximum recording length increases depending on number of channels used		Analog 16 ch + internal Logic 16 ch	Analog 2 ch + internal Logic 16 ch	Analog 16 ch + internal Logic 16 ch	Analog 2 ch + internal Logic 16 ch	Analog 16 ch + internal Logic 16 ch	Analog 2 ch + internal Logic 16 ch
Time axis	Sampling period	40 000 divisions	320 000 div	160 000 divisions	1 280 000 divisions	320 000 div	2 560 000 divisions
5 µs/div	50 ns	0.2 s	1.6 s	0.8 s	6.4 s	1.6 s	12.8 s
10 µs/div	100 ns	0.4 s	3.2 s	1.6 s	12.8 s	3.2 s	25.6 s
20 µs/div	200 ns	0.8 s	6.4 s	3.2 s	25.6 s	6.4 s	51.2 s
50 µs/div	500 ns	2 s	16 s	8 s	1 min 04 s	16 s	2 min 08 s
100 µs/div	1 µs	4 s	32 s	16 s	2 min 08 s	32 s	4 min 16 s
200 µs/div	2 µs	8 s	1 min 04 s	32 s	4 min 16 s	1 min 04 s	8 min 32 s
500 µs/div	5 µs	20 s	2 min 40 s	1 min 20 s	10 min 40 s	2 min 40 s	21 min 20 s
1 ms/div	10 µs	40 s	5 min 20 s	2 min 40 s	21 min 20 s	5 min 20 s	42 min 40 s
2 ms/div	20 µs	1 min 20 s	10 min 40 s	5 min 20 s	42 min 40 s	10 min 40 s	1 h 25 min 20 s
5 ms/div	50 µs	3 min 20 s	26 min 40 s	13 min 20 s	1 h 46 min 40 s	26 min 40 s	3 h 33 min 20 s
10 ms/div	100 µs	6 min 40 s	53 min 20 s	26 min 40 s	3 h 33 min 20 s	53 min 20 s	7 h 06 min 40 s
20 ms/div	200 µs	13 min 20 s	1 h 46 min 40 s	53 min 20 s	7 h 06 min 40 s	1 h 46 min 40 s	14 h 13 min 20 s
50 ms/div	500 µs	33 min 20 s	4 h 26 min 40 s	2 h 13 min 20 s	17 h 46 min 40 s	4 h 26 min 40 s	35 h 33 min 20 s
100 ms/div	1 ms	1 h 06 min 40 s	8 h 53 min 20 s	4 h 26 min 40 s	1 d 11 h 33 min 20 s	8 h 53 min 20 s	2 d 23 h 06 min 40 s
200 ms/div	2 ms	2 h 13 min 20 s	17 h 46 min 40 s	8 h 53 min 20 s	2 d 23 h 06 min 40 s	17 h 46 min 40 s	5 d 22 h 13 min 20 s
500 ms/div	5 ms	5 h 33 min 20 s	1 d 20 h 26 min 40 s	22 h 13 min 20 s	7 d 09 h 46 min 40 s	44 h 26 min 40 s	14 d 19 h 33 min 20 s
1 s/div	10 ms	11 h 06 min 40 s	3 d 16 h 53 min 20 s	1 d 20 h 26 min 40 s	14 d 19 h 33 min 20 s	3 d 16 h 53 min 20 s	29 d 15 h 06 min 40 s
2 s/div	20 ms	22 h 13 min 20 s	7 d 09 h 46 min 40 s	3 d 16 h 53 min 20 s	29 d 15 h 06 min 40 s	7 d 09 h 46 min 40 s	59 d 06 h 13 min 20 s
5 s/div	50 ms	2 d 07 h 33 min 20 s	18 d 12 h 26 min 40 s	9 d 06 h 13 min 20 s	74 d 01 h 46 min 40 s	18 d 12 h 26 min 40 s	148 d 03 h 33 min 20 s
10 s/div	100 ms	4 d 15 h 06 min 40 s	37 d 00 h 53 min 20 s	18 d 12 h 06 min 40 s	148 d 03 h 33 min 20 s	37 d 00 h 53 min 20 s	296 d 07 h 06 min 40 s
30 s/div	300 ms	13 d 21 h 20 min 00 s	111 d 02 h 40 min 00 s	55 d 13 h 20 min 00 s	444 d 10 h 40 min 00 s	111 d 02 h 40 min 00 s	888 d 21 h 20 min 00 s
50 s/div	500 ms	23 d 03 h 33 min 20 s	185 d 04 h 26 min 40 s	92 d 14 h 13 min 20 s	740 d 17 h 46 min 40 s	185 d 04 h 26 min 40 s	"H"
1 min/div	600 ms	27 d 18 h 40 min 00 s	222 d 05 h 20 min 00 s	111 d 02 h 40 min 00 s	888 d 21 h 20 min 00 s	222 d 05 h 20 min 00 s	"H"
100 s/div	1.0 s	46 d 07 h 06 min 40 s	370 d 08 h 53 min 20 s	185 d 04 h 26 min 40 s	"H"	370 d 08 h 53 min 20 s	"H"
2 min/div	1.2 s	55 d 13 h 20 min 00 s	444 d 10 h 40 min 00 s	222 d 05 h 20 min 00 s	"H"	444 d 10 h 40 min 00 s	"H"
5 min/div	3.0 s	138 d 21 h 20 min 00 s	"H"	555 d 13 h 20 min 00 s	"H"	"H"	"H"

Notes
- The above table shows maximum values at arbitrary recording length settings.
- Saving to media in near real-time is possible at sampling speeds of 100 ms/div (1 msec sampling) or slower.
- Operation cannot be guaranteed for extended recording periods one year or longer. The above table represents theoretical values.

- Measurement Indices (Input units sold separately)

Measurement targets	With use input unit	Display range	Max. resolution
Voltage	ANALOG UNIT 8966	100 mV f.s. to 400 V f.s.	50 µV
	HIGH RESOLUTION UNIT 8968	100 mV f.s. to 400 V f.s.	3.125 µV
	DC/RMS UNIT 8972	100 mV f.s. to 400 V f.s.	50 µV
	HIGH-VOLTAGE UNIT U8974	4 V f.s. to 1000 V f.s.	0.125 mV
Current	CURRENT UNIT 8971 + optional current sensor	20 A f.s. or larger When driving current sensors with separate power supply, measurement can be conducted with voltage input units.	1 mA or larger
RMS AC voltage	DC/RMS UNIT 8972	100 mV f.s. to 400 V f.s.	50 µV
Temperature (Thermocouple input)	TEMP UNIT 8967	200°C (392°F) f.s. to 2000°C (3632°F) f.s. Note: Upper and lower limit values depend on the thermocouple	0.01°C (0.02°F)
Frequency, RPM	FREQ UNIT 8970	20 Hz f.s. to 100 kHz f.s. 2 (kr/min) f.s. to 2000 (kr/min) f.s.	2 mHz 0.2 (r/min)
Power supply frequency	FREQ UNIT 8970	40 to 60 Hz, 50 to 70 Hz, 390 to 410 Hz	0.01 Hz
Integration count	FREQ UNIT 8970	40 k-counts f.s. to 20 M-counts f.s.	1 count
Pulse duty ratio	FREQ UNIT 8970	100% f.s.	0.01%
Pulse width	FREQ UNIT 8970	0.01 s f.s. to 2 s f.s.	1 µs
Vibration stress	STRAIN UNIT 8969	400 µe f.s. to 20000 µe f.s.	0.016 µe
Relay contacts, voltage on/off	LOGIC UNIT 8973	—	—

Notes
- Each unit has two input channels, except Logic Unit.
- Besides logic units (16 channels), the MR8847A series comes standard with 16 logic inputs integrated in the device.

Optional Specifications (sold separately)

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

ANALOG UNIT 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	Number 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 or DC (with input isolated from the main unit, the maximum voltage that can be applied between input channel and chassis, and between input channels without damage)
Measurement range	5 mV to 20 V/div, 12 ranges, full scale: 20 div, AC voltage for possible measurement/display using the memory function: 280 V rms, Low-pass filter: 5/50/500 Hz, 5 k/50 k/500 kHz
Measurement resolution	1/100 of range (using 12-bit A/D conversion)
Maximum sampling rate	20 MS/s (simultaneous sampling in 2 channels)
Measurement accuracy	±0.5% of full scale (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 (maximum voltage that can be applied between input connectors without damage)

Dimensions and mass: approx. 106 mm (4.17 in) W × 19.8 mm (0.78 in) H × 204.5 mm (8.05 in) D, approx. 240 g (8.5 oz)
Accessories: Ferrite clamp × 2

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	Number of channels: 2, for temperature measurement with thermocouple (voltage measurement not available)
Input terminals	Thermocouple input: plug-in connector, Recommended wire diameter: single-wire, 0.14 to 1.5 mm², braided wire 0.14 to 1.0 mm² (conductor wire diameter min. 0.18 mm), AWG 26 to 16 Input impedance: min. 5 M Ω (with line fault detection ON/OFF), Max. rated voltage to ground: 300 V AC or DC (with input isolated from the main unit, the maximum voltage that can be applied between input channel and chassis, and between input channels without damage)
Temperature measurement range Note: Upper and lower limit values depend on the thermocouple	10°C (50°F)/div (-100°C to 200°C (-148°F to 392°F)), 50°C (122°F)/div (-200°C to 1000°C (-328°F to 1832°F)), 100°C (212°F)/div (-200°C to 2000°C (-328°F to 3632°F)), 3 ranges, full scale: 20 div, Measurement resolution: 1/1000 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 (WRe5-26): 0°C 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% of full scale ±1°C (±1.8°F) (±0.1% of full scale ±2°C (±3.6°F) at -200°C to 0°C (-328°F to 32°F)), Thermocouple R, S, B, W: ±0.1% of full scale ±3.5°C (±6.3°F) (at 0°C (32°F) to less than 400°C (752°F); However, no accuracy guarantee of 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 accuracy: ±1.5°C (±2.7°F) (added to measurement accuracy with internal reference junction compensation)

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

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	Number 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	5 mV to 20 V/div, 12 ranges, full scale: 20 div, AC voltage for possible measurement/display using the memory function: 280 V rms, Low-pass filter: 5/50/500 Hz, 5k/50k Hz
Anti-aliasing filter	Integrated filter for suppressing aliasing distortion caused by FFT processing (automatic cutoff frequency setting/OFF)
Measurement resolution	1/1600 of measurement range (using 16-bit A/D conversion)
Maximum sampling rate	1 MS/s (simultaneous sampling in 2 channels)
Measurement accuracy	±0.3% of full scale (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 (maximum voltage that can be applied between input connectors without damage)

Dimensions and mass: approx. 106 mm (4.17 in) W × 19.8 mm (0.78 in) H × 196.5 mm (7.74 in) D, approx. 220 g (7.8 oz)
Accessories: Conversion cable 9769 × 2 (cable length 50 cm/1.64 ft)

STRAIN UNIT 8969

(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)

Measurement functions	Number of channels: 2, for distortion measurement (electronic auto-balancing, balance adjustment range within ±10 000 με or less)
Input terminals	Weidmuller SL 3.5/7/90G (via Conversion Cable 9769, TAJIMI PRC03-12A10-7M10.5) Max. rated voltage to ground: 33 V rms or 70 V 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)
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	20 με to 1000 με/div, 6 ranges, full scale: 20 div, Low-pass filter: 5/10/100 Hz, 1 kHz
Measurement resolution	1/1250 of measurement range (using 16-bit A/D conversion)
Maximum sampling rate	200 kS/s (simultaneous sampling across 2 channels)
Measurement accuracy After auto-balancing	±(0.5% f.s. +4 με) (5 Hz filter ON)
Frequency characteristics	DC to 20 kHz +1/-3 dB

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

FREQ UNIT 8970

(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	Number 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 or DC (with input isolated from the main unit, the maximum voltage that can be applied between input channel and chassis, and between input channels without damage)
Frequency mode	Range: Between DC to 100 kHz (minimum pulse width 2 μs), 1 Hz/div to 5 kHz/div (full scale = 20 div), 8 settings Accuracy: ±0.1% f.s. (exclude 5 kHz/div), ±0.7% f.s. (at 5 kHz/div)
Rotation mode	Range: Between 0 to 2 million rotations/minute (minimum pulse width 2 μs), 100 (r/min)/div to 100 k (r/min)/div (full scale = 20 div), 7 settings Accuracy: ±0.1% f.s. (excluding 100 k (r/min)/div), ±0.7% f.s. (at 100 k (r/min)/div)
Power frequency mode	Range: 50 Hz (40 to 60 Hz), 60 Hz (50 to 70 Hz), 400 Hz (390 to 410 Hz) (full scale = 20 div), 3 settings Accuracy: ±0.03 Hz (50, 60 Hz), ±0.1 Hz (400 Hz range)
Integration mode	Range: 2 k counts/div to 1 M counts/div, 6 settings Accuracy: ±range/2000
Duty ratio mode	Range: Between 10 Hz to 100 kHz (minimum pulse width 2 μs), 5%/div (full scale = 20 div) Accuracy: ±1% (10 Hz to 10 kHz), ±4% (10 kHz to 100 kHz)
Pulse width mode	Range: Between 2 μs to 2 sec, 500 μs/div to 100 ms/div (full scale = 20 div), Accuracy: ±0.1% f.s.
Measurement resolution	1/2000 of range (Integration mode), 1/500 of range (exclude integration, power frequency mode), 1/100 of range (power frequency mode)
Input voltage range and threshold level	±10 V to ±400 V, 6 settings, selectable threshold level at each range
Other functions	Slope, Level, Hold, Smoothing, Low-pass filter, Switchable DC/AC input coupling, Frequency dividing, Integration over-range keep/return

Dimensions and 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)

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	Number of channels: 2, Current measurement with optional current sensor, Note: Maximum 4 units connectable to main unit
Input terminals	Sensor connector (input impedance 1 MΩ, exclusive connector for current sensor via conversion cable the 9318, common GND with recorder)
Compatible current sensors	CT6863, CT6862, 9709, CT6841, CT6843, CT6844, CT6845, 9272-10 (To connect the 8971 via conversion cable the 9318)
Measurement range	Using 9272-10 (20 A), CT6841: 100 mA to 5 A/div (f.s. = 20 div, 6 settings) Using CT6862: 200 mA to 10 A/div (f.s. = 20 div, 6 settings) Using 9272-10 (200 A), CT6843, CT6863: 1 A to 50 A/div (f.s. = 20 div, 6 settings) Using CT6844, CT6845, 9709: 2 A to 100 A/div (f.s. = 20 div, 6 settings)
Measurement accuracy (with 5 Hz filter ON) Note: Add the accuracy and attributes of the current sensor being used.	±0.65% f.s. RMS amplitude 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	1/100 of 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 and mass: approx. 106 mm (4.17 in) W × 19.8 mm (0.78 in) H × 196.5 mm (7.74 in) D, approx. 250 g (8.8 oz)
Accessories: None

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	Number 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 or DC (with input isolated from the main unit, the maximum voltage that can be applied between input channel and chassis, and between input channels without damage)
Measurement range	5 mV to 20 V/div, 12 ranges, full scale: 20 div, AC voltage for possible measurement/display using the memory function: 280 V rms, Low-pass filter: 5/50/500 Hz, 5 k/100 kHz
Measurement resolution	1/100 of range (using 12-bit A/D conversion)
Maximum sampling rate	1 MS/s (simultaneous sampling in 2 channels)
Measurement accuracy	±0.5% of full scale (with filter 5 Hz, zero position accuracy included)
RMS measurement	RMS amplitude accuracy: ±1% f.s. (DC, 30 Hz to 1 kHz), ±3% of full scale (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 (maximum voltage that can be applied between input connectors without damage)

Dimensions and mass: approx. 106 mm (4.17 in) W × 19.8 mm (0.78 in) H × 196.5 mm (7.74 in) D, approx. 190 g (6.7 oz)
Accessories: None

LOGIC UNIT 8973

Measurement functions	Number 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

NEW Dimensions and mass: approx. 106 mm (4.17 in) W × 19.8 mm (0.78 in) H × 196.5 mm (7.74 in) D, approx. 260 g (9.2 oz)
Accessories: None

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	Number of channels: 2, for DC voltage measurement
Input terminals	Banana input connectors (Input resistance: 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 or DC (with input isolated from the main unit, the maximum voltage that can be applied between input channel and chassis, and between input channels without damage)
Measurement range	100 mV f.s. (5 mV/div) to 1000 V f.s. (50 V/div), 5 ranges, full scale: 20 div
Measurement resolution	1/50 000 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 (maximum voltage that can be applied between input connectors without damage)

Note: Cannot use with 8847 or MR8847

NEW Dimensions and mass: approx. 106 mm (4.17 in) W × 19.8 mm (0.78 in) H × 196.5 mm (7.74 in) D, approx. 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	Number of channels: 2, for voltage measurement, DC/RMS selectable Maximum rated voltage to ground: 1000 V AC or DC (CAT III), 600 V AC or DC (CAT IV)
Input terminals	Banana input terminal (Input impedance: 4 MΩ, Input capacitance: 5 pF)
Measurement range	200 mV, 500 mV, 1, 2, 5, 10, 20, 50 V/div (DC mode) 500 mV, 1, 2, 5, 10, 20, 50 V/div (RMS mode)
Measurement resolution	1/1600 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

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

ARBITRARY WAVEFORM GENERATOR UNIT U8793

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

Output terminal	Number of channels: 2, SMB terminal (Output impedance: 1 Ω or less) Max. rated voltage to ground: 33 V rms AC or 70 V DC
Output voltage range	-10 V to 15 V (Amplitude setting range: 0 V to 20 V p-p, Setting resolution: 1 mV)
Max. output current	10 mA (Allowable load resistance: 1.5 kΩ or more)
FG function	DC, Sine wave, Square wave, Pulse wave, Triangular wave, Ramp wave, Output frequency: 0 Hz to 100 kHz
Arbitrary waveform generator mode	Waveforms measured by MR8847A, etc., generated by Hioki Model 7075 or SF8000, CSV waveforms D/A refresh rate: 2 MHz (using 16-bit D/A)
Sweep function	Frequency, Amplitude, Offset, Duty (Pulse only)
Program function	Max. 128 steps (Number of loops for each step, Number of total loops)
Other	Self-test function (Voltage), External input/output control

Note: Cannot use with 8847 or MR8847

NEW Dimensions and mass: approx. 106 mm (4.17 in) W × 19.8 mm (0.78 in) H × 196.5 mm (7.74 in) D, approx. 230 g (8.1 oz)
Accessories: None

WAVEFORM GENERATOR UNIT MR8790

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

Output terminal	Number of channels: 4, SMB terminal (Output impedance: 1 Ω or less) Max. rated voltage to ground: 33 V rms AC or 70 V DC
Output voltage range	-10 V to 10 V (Amplitude setting range: 0 V to 20 V p-p, Setting resolution: 1 mV)
Max. output current	5 mA
Output function	DC, Sine wave (Output frequency range: 0 Hz to 20 kHz)
Accuracy	Amplitude accuracy: ±0.25% of setting ±2 mV p-p (1 Hz to 10 kHz) Offset accuracy: ±3 mV DC output accuracy: ±0.6 mV
Other	Self-test function (Voltage, Current)

Note: Cannot use with 8847 or MR8847

NEW Dimensions and mass: approx. 106 mm (4.17 in) W × 19.8 mm (0.78 in) H × 196.5 mm (7.74 in) D, approx. 230 g (8.1 oz)
Accessories: None

PULSE GENERATOR UNIT MR8791

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

Output terminal	Number of channels: 8, Connector: D-sub, half-pitch, 50-pin Max. rated voltage to ground: 33 V rms AC or 70 V DC (between unit and output channels) Logic output/Open collector output
Output mode 1	Pattern output: Read frequency: 0 Hz to 120 kHz, 2048 logic patterns
	Pulse output: Frequency 0 Hz to 20 kHz, Duty 0.1% to 99.9%
Output mode 2	Logic output: Output voltage level: 0 V to 5 V (H level: 3.8 V or more, L level: 0.8 V or less)
	Open collector output: Absolute maximum rated voltage for collector/emitter: 50 V Overcurrent protection: 100 mA
Other	Self-test function

Note: Cannot use with 8847 or MR8847

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)

DIFFERENTIAL PROBE P9000

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

Measurement modes	P9000-01: For waveform monitor output, Frequency characteristics: DC to 100 kHz -3 dB P9000-02: Switches between waveform monitor output/AC effective value output Wave mode frequency characteristics: DC to 100 kHz -3 dB, RMS mode frequency characteristics: 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 micro-B connector), 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

Cable length and mass: Main unit cable 1.3 m (4.27 ft), input section cable 46 cm (1.51 ft), approx. 350 g (12.3 oz)

DIFFERENTIAL PROBE 9322

(Accuracy guaranteed for 1 year)

Functions	For high-voltage floating measurement, power line surge noise detection, RMS rectified output measurement
DC mode	For waveform monitor output, Frequency characteristics: DC to 10 MHz (±3 dB), Amplitude accuracy: ±1% of full scale (at max. 1000 V DC), ±3% of full scale (at max. 2000 V DC) (full scale: 2000 V DC)
AC mode	For detection of power line surge noise, Frequency characteristics: 1 kHz to 10 MHz ±3 dB
RMS mode	DC/AC voltage RMS output detection, Frequency characteristics: DC, 40 Hz to 100 kHz, Response speed: 200 ms or less (400 V AC), Accuracy: ±1% of full scale (DC, 40 Hz to 1 kHz), ±4% of full scale (1 kHz to 100 kHz) (full scale: 1000 V AC)
Input	Input type: balanced differential input, Input impedance/capacitance: H-L 9 MΩ/ 10 pF, H/L-unit 4.5 MΩ/20 pF, Max. rated voltage to ground: when using grabber clip 1500 V AC/DC (CAT II), 600 V AC/DC (CAT III), when using alligator clip: 1000 V AC/DC (CAT II), 600 V AC/DC (CAT III)
Maximum input voltage	2000 V DC, 1000 V AC (CAT II), 600 V AC/DC (CAT III)
Output	Voltage divider for 1/1000 of input, BNC connectors (output switchable for 3 modes DC, AC, RMS)
Power supply	Any of the following: (1) AC Adapte 9418-15, (2) Power Cord 9248 with Probe Power Unit 9687, (3) Power Cord 9324 + Conversion Cable 9323 with HiCORDER logic terminal, (4) Power Cord 9325 with F/V Unit 8940

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 the 9320.

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 resistance: 1 MΩ (with digital input, 0 to +5 V) 500 kΩ or more (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 the MR9321.

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 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)
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 MR8847A

(Order code)	(Memory capacity)
MR8847-51	64 MW Memory
MR8847-52	256 MW Memory
MR8847-53	512 MW Memory

NEW

Note: Main unit MR8847A cannot operate alone.
You must install one or more optional input modules in the unit.

Power supply unit

* Manufacturing option that must be specified upon order.

DC POWER UNIT 9784 — Order Code: 9784
Dimensions: Approx. 290 mm (11.42 in) W x 29 mm (1.14 in) H x 219.5 mm (8.64 in) D
Weight: Approx. 1.2 kg (42.3 oz)
Specified upon factory shipping, built-in on back of unit, 10 V to 28 V DC

Storage Devices and Media

* SSD is a built-in option that must be specified upon order. * The CF card includes a PC card adapter.

NEW SSD UNIT U8331 — Order Code: U8331
Specified upon order; built-in type, 128 GB

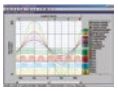
* CF Card Precaution
Use only CF Cards sold by HIOKI. Compatibility and performance are not guaranteed for CF cards made by other manufacturers. You may be unable to read from or save data to such cards.

PC CARD 2G 9830 — Order Code: 9830
(2 GB)

PC CARD 1G 9729 — Order Code: 9729
(1 GB)

PC CARD 512M 9728 — Order Code: 9728
(512 MB)

PC Software



WAVE PROCESSOR 9335 — Order Code: 9335
Convert data, print and display waveforms

LAN COMMUNICATOR 9333 — Order Code: 9333
• Waveform data collect function
• Remote control with the PC

iPad App for MEMORY HiCORDER HMR Terminal
Download from the App Store (exclusively for Apple iPad)

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

Printer options

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

RECORDING PAPER 9231 — Order Code: 9231
A4 width 216 mm (8.50 in) × 30 m (98.43 ft), 6 rolls/set

Case

CARRYING CASE 9783 — Order Code: 9783
Hard trunk type to protect unit during transport

Input modules

* Input cords not included. Please purchase them separately.
* When using 9709 with Current Unit 8971, a total of 7 current probes can be used.

ANALOG UNIT 8966 — Order Code: 8966
2 ch, Voltage input, DC to 5 MHz bandwidth

TEMP UNIT 8967 — Order Code: 8967
2 ch, thermocouple temperature input

HIGH RESOLUTION UNIT 8968 — Order Code: 8968
2 ch, voltage input, DC to 100 kHz bandwidth

STRAIN UNIT 8969 — Order Code: 8969
2 ch, strain gauge type converter amp

Conversion Cable 9769 — Order Code: 9769
(For and bundled with the strain unit)

FREQ UNIT 8970 — Order Code: 8970
2 ch, for measurement of frequency, RPM, pulse, etc.

CURRENT UNIT 8971 — Order Code: 8971
2 ch, for measuring current using dedicated current sensors, bundled two Conversion cable 9318
* Max. up to four modules of the Current unit 8971

DC/RMS UNIT 8972 — Order Code: 8972
2 ch, voltage/DC to 400 kHz, RMS rectifier, DC and 30 to 100 kHz bandwidth

LOGIC UNIT 8973 — Order Code: 8973
4 terminals, 16 ch
Max. 3 modules can be installed in the MR8847A

NEW DIGITAL VOLTMETER UNIT MR8990 — Order Code: MR8990
2ch, high-precision DC V, 0.1 µV resolution, maximum sampling rate 500 times/s

NEW HIGH-VOLTAGE UNIT U8974 — Order Code: U8974
2ch, voltage input, max. 1000 V DC and 700 V AC

Output modules

* Input cords not included. Please purchase separately.

NEW WAVEFORM GENERATOR UNIT MR8790 — Order Code: MR8790
4ch, DC Output: ±10 V,
Sine wave output: 10 mHz to 20 kHz

NEW PULSE GENERATOR UNIT MR8791 — Order Code: MR8791
8ch, Pulse output: 0.1 Hz to 20 kHz, Pattern output

NEW ARBITRARY WAVEFORM GENERATOR UNIT U8793 — Order Code: U8793
2ch, 10 mHz to 100 kHz function generator, arbitrary waveform generator with 2 MHz D/A refresh rate, -10 V to 15 V output

Output cable

* Please contact your local HIOKI distributor for connectors that support Model MR8791.

NEW CONNECTION CABLE L9795-01 — Order Code: L9795-01
Maximum rated voltage to ground: 33 V AC rms or 70 V DC
SMB terminal - alligator clip
Cord length: 1.5 m (4.92 ft)

NEW CONNECTION CABLE L9795-02 — Order Code: L9795-02
Maximum rated voltage to ground: 33 V AC rms or 70 V DC
SMB terminal - BNC terminal
Cord length: 1.5 m (4.92 ft)

Logic signal measurement

LOGIC PROBE 9327 — Order Code: 9327
4-channel type, for voltage/contact signal ON/OFF detection (response pulse width 100 ns or more, miniature terminal type)

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

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

CONVERSION CABLE 9323 — Order Code: 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.

* You can connect up to 4 Current Unit 8971 to the Memory HiCorder main unit, allowing up to 8 current sensors to be used.
* There is no limit if you connect a current sensor to the voltage input analog unit.

INPUT CORD (A)

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

CONNECTION CORD L9790 — Order Code: 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 — Order Code: L9790-01
Red/black set attaches to the ends of the cables L9790

GRABBER CLIP 9790-02 — Order Code: 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.

CONTACT PIN 9790-03 — Order Code: 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 — Order Code: 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

CONNECTION CORD L9197 — Order Code: L9197
ϕ 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 — Order Code: 9243
Attaches to the tip of the banana plug cable, CAT III 1000 V, 196 mm (7.72 in) length

INPUT CORD (C)

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

10:1 PROBE 9665 — Order Code: 9665
Note: This probe does not expand the maximum rated voltage above ground of an isolated input. 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 — Order Code: 9666
Note: This probe does not expand the maximum rated voltage above ground of an isolated input. 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)

* For measuring high voltage. *Voltage to ground is within this product's specifications, and is not affected by connected input modules. Separate power source is also required.

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

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

AC ADAPTER Z1008 — Order Code: Z1008
100 to 240 V AC

INPUT CORD (E)

* For measuring high voltage. *Voltage to ground is within this product's specifications, and is not affected by connected input modules. Separate power source is also required.

DIFFERENTIAL PROBE 9322 — Order Code: 9322
1 kV AC, 2 kV DC, Frequency band: 10 MHz

AC ADAPTER 9418-15 — Order Code: 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 — Order Code: L4940
Banana plug - banana plug, Cord length: 1.5 m (4.92 ft)

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

ALLIGATOR CLIP L4935 — Order Code: L4935
Attach to the tip of banana plug cables, CAT IV 600 V, CAT III 1000 V

BUS BAR CLIP L4936 — Order Code: L4936
Attach to the tip of banana plug cables, CAT III 600 V

MAGNETIC ADAPTER L4937 — Order Code: L4937
Attach to the tip of banana plug cables, CAT III 1000 V

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

INPUT CORD (G)

* For the MR8990 *Voltage is limited to the specifications of the input modules in use

TEST LEAD L2200 — Order Code: 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 20 A (High precision)

AC/DC CURRENT PROBE CT6841 — Order Code: CT6841
Can observe waveforms from DC currents to skewed AC currents, Frequency characteristics: DC to 1 MHz, Input 20 A/Output 0.1 V/A

Up to 50 A (High precision)

AC/DC CURRENT SENSOR CT6862 — Order Code: CT6862
CAT III 1000 V, 50 A AC/DC rated current, DC to 1 MHz response, 24 mm (0.94 in) core dia., 3 m (9.84 ft) cord length

Up to 200 A (High precision)

AC/DC CURRENT SENSOR CT6863 — Order Code: CT6863
High-Precision pull-through current sensors, observe waveforms from DC to distorted AC, DC to 500 kHz response, input 200 A, 2 V AC output

AC/DC CURRENT PROBE CT6843 — Order Code: CT6843
Can observe waveforms from DC currents to skewed AC currents, Frequency characteristics: DC to 500 kHz, Input 200 A/Output 0.01 V/A

CLAMP ON SENSOR 9272-10 — Order Code: 9272-10
CAT III 600 V rms, 20 A/200 A AC rated current, 1 Hz to 100 kHz response, 46 mm (1.81 in) core dia., 3 m (9.84 ft) cord length

Up to 500 A (High precision)

AC/DC CURRENT SENSOR 9709 — Order Code: 9709
CAT III 1000 V, 500 A AC/DC rated current, DC to 100 kHz response, 36 mm (1.42 in) core dia., 3 m (9.84 ft) cord length

NEW
AC/DC CURRENT PROBE CT6844 — Order Code: CT6844
Monitor the waveforms of DC to distorted AC current, Frequency characteristics: DC to 200 kHz, Input 500 A/Output 4 mV/A

NEW
AC/DC CURRENT PROBE CT6845 — Order Code: CT6845
Monitor the waveforms of DC to distorted AC current, Frequency characteristics: DC to 100 kHz, Input 500 A/Output 4 mV/A

Up to 30 A (High speed)

CLAMP ON PROBE 3273-50 — Order Code: 3273-50
Wide DC to 50 MHz bandwidth, 10 mA to 30 A rms

CLAMP ON PROBE 3276 — Order Code: 3276
Wide DC to 100 MHz bandwidth, 10 mA to 30 A rms

Up to 150 A (High speed)

CLAMP ON PROBE 3274 — Order Code: 3274
Wide DC to 10 MHz bandwidth, max. 150 A rms

Up to 500 A (High speed)

CLAMP ON PROBE 3275 — Order Code: 3275
Wide DC to 2 MHz bandwidth, max. 500 A rms

Power supply

* Not necessary when using Current Unit 8971.

SENSOR UNIT 9555-10 — Order Code: 9555-10
For power supply when using a current sensor by itself.

CONNECTION CORD L9217 — Order Code: L9217
Both cord ends are isolated BNC, used in signal output, 1.6 m (5.25 ft)

Power supply

POWER SUPPLY 3272 — Order Code: 3272
For powering 1 Hioki wideband current probe

POWER SUPPLY 3269 — Order Code: 3269
For powering up to 4 Hioki wideband current probes

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

100 A to 5000 A (Medium speed)

CLAMP ON AC/DC SENSOR CT9691-90 — Order Code: CT9691-90
DC to 10 kHz (-3 dB), 100 A, Output 0.1 V/f.s., Cord length 2 m (6.56 ft)

CLAMP ON AC/DC SENSOR CT9692-90 — Order Code: CT9692-90
DC to 20 kHz (-3 dB), 200 A, Output 0.2 V/f.s., Cord length 2 m (6.56 ft)

CLAMP ON AC/DC SENSOR CT9693-90 — Order Code: CT9693-90
DC to 15 kHz (-3 dB), 2000 A, Output 0.2 V/f.s., Cord length 2 m (6.56 ft)

NEW
AC FLEXIBLE CURRENT SENSOR CT9667-01/-02/-03 — Order Code: CT9667-01, CT9667-02, CT9667-03
10 Hz to 20 kHz, 5000 A/500 A AC, Output 500 mV/f.s. AC, ϕ 100 to 254 mm (3.94 to 10.0 in) core dia.

500 A to 1000 A

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

CLAMP ON PROBE 9018-50 — Order Code: 9018-50
Good 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 — Order Code: 9132-50
Input from 20 to 1000 A, 40 Hz to 1 kHz for 0.2 V AC output, BNC terminal

Other options for Input

CONNECTION CORD L9217 — Order Code: L9217
Cord has insulated BNC connectors at both ends, signal output use, 1.6 m (5.25 ft) length

CONVERSION ADAPTER 9199 — Order Code: 9199
Receiving side banana terminal, output BNC terminal

CONNECTION CORD 9165 — Order Code: 9165
Metallic BNC at both ends, for metallic BNC terminals, 1.5 m (4.92 ft) , not CE marked

CONVERSIONCABLE 9318 — Order Code: 9318
For connecting CT6841/43 and similar probes to 8971/40/51.

Temperature sensor

THERMOCOUPLE
*For reference only. Please purchase locally.

HIOKI

NEW

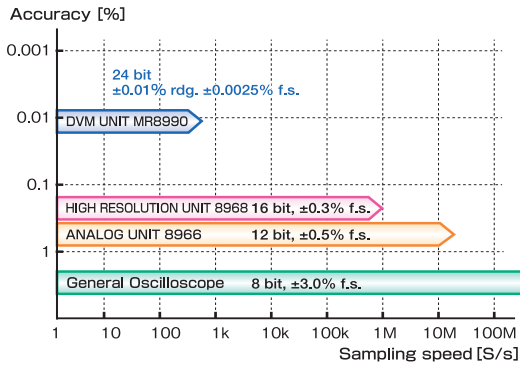
MR8990

Modulo Multimetro Digitale DVM ad alta risoluzione 24bit ed elevata precisione

MR8990 è una unità a 2 canali di ingresso per la misura di tensione CC ad elevata precisione e risoluzione.
Tramite MR8990 è possibile rilevare minime fluttuazioni di tensione da dispositivi quali batterie, sensori di processo e di automotive.

- **Elevata risoluzione: 24bit a 6 ½ cifre**
  La minima risoluzione di misura di MR8990 è pari a 0.1uV
- **Elevata precisione: ±0.01% rdg ±0.0025 f.s.**
  Elevata precisione di misura a fronte di un campionamento pari a 500 campioni/secondo.
- **Tensione massima ammessa: 500Vcc**
- **Alta impedenza di ingresso**
  da 5mV/DIV a 500mV/DIV: 100MΩ o superiore
  da 5V/DIV a 50V/DIV: 1MΩ ± 5%

Input Unit Comparison Chart (Sampling Period and Accuracy)



*Nota: il modulo MR8990 non è compatibile con gli oscilloscopi registratori mod. MR8847/01

Specifications

Product guaranteed for one year
Accuracy guaranteed for one year

Measurement range

Measurement range		Effective input range(*)	Measurement resolution	Input resistance
5 mV/div	(f.s. = 100 mV)	-120 mV to 120 mV	0.1 µV	**More than 100 MΩ**
50 mV/div	(f.s. = 1000 mV)	-1200 mV to 1200 mV	1 µV	
500 mV/div	(f.s. = 10 V)	-12 V to 12 V	10 µV	
5 V/div	(f.s. = 100 V)	-120 V to 120 V	100 µV	**10 MΩ ±5%**
50 V/div	(f.s. = 1000 V)	-500 V to 500 V	1 mV	

Measurement accuracy

*Measurement guaranteed accuracy range

Measurement range		NPLC: Less than 1	NPLC: More than 1
5 mV/div	(f.s. = 100 mV)	±0.01% rdg. ±0.015% f.s.	±0.01% rdg. ±0.01% f.s.
50 mV/div	(f.s. = 1000 mV)	±0.01% rdg. ±0.0025% f.s.	
500 mV/div	(f.s. = 10 V)		
5 V/div	(f.s. = 100 V)	±0.025% rdg. ±0.0025% f.s.	
50 V/div	(f.s. = 1000 V)		

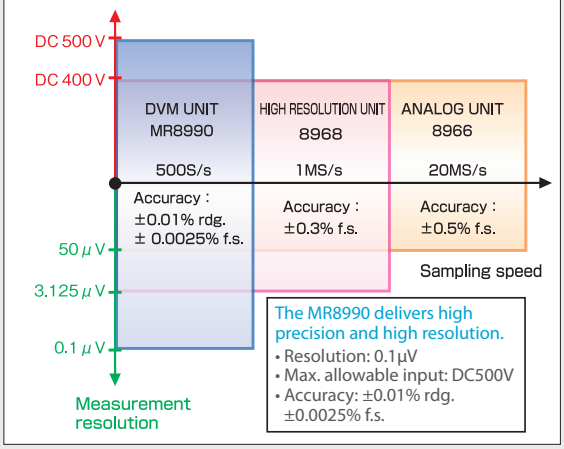
Integration time

Power supply frequency	Integration time
50 Hz	20 ms × NPLC
60 Hz	16.67 ms × NPLC

NPLC: Settable from 0.1 to 0.9 (in increments of 0.1), 1 to 9 (in increments of 1), and 10 to 100 (in increments of 10). The number of power line cycles (NPLC), representing the number of cycles in the power supply (50 Hz or 60 Hz) period, determines the integration time. Larger NPLC values result in more effective rejection of noise caused by the power supply at the expense of lower sampling speeds.

Temperature characteristics: ± (0.002% rdg. ±0.00025% f.s.) / °C
A/D conversion nmeasurement method: ΔΣ modulation method 24bit
Measurement functions: DC V
Number of channels: 2ch

Input Unit Comparison Chart (Input Voltage and Sampling Speed)



Option for MR8990
TEST LEAD L2200
One set (Red×1, Black×1) , 70cm (2.30ft) length
Unit jack: Banana terminal
The tip can be replaced with a pin lead or alligator clip.
Max. allowable input: CAT Ⅳ 600V, CAT Ⅲ 1000V

Maximum sampling rate: 2 ms (500 sampling/sec)
Max. allowable input: DC 500 V
Max. rated voltage to earth: AC, DC 300 V

HIOKI

MR8790

NEW

Modulo Generatore di forme d'onda

MR8790 è una unità a 4 canali di uscita per la generazione di 4 forme d'onda sinusoidali nel campo di frequenza compreso tra 10mHz e 20kHz.
L'ampiezza massima del segnale sinusoidale di uscita è di 20 V picco-picco.

Dimensions and mass: approx. 106 mm (4.17 in) W × 19.8 mm (0.78 in) H × 196.5 mm (7.74 in) D, approx. 230 g (8.1 oz).
Accessories: None

WAVEFORM GENERATOR UNIT MR8790	(Accuracy at 23 ±5°C/73 ±9°F, 80% rh after 30 minutes of warm-up time; Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)
Output terminal	Number of channels: 4, SMB terminal (Output impedance: 1 Ω or less) Max. rated voltage to ground: 33 V rms AC or 70 V DC
Output voltage range	-10 V to 10 V (Amplitude setting range: 0 V to 20 V p-p, Setting resolution: 1 mV)
Max. output current	5 mA
Output function	DC, Sine wave (Output frequency range: 0 Hz to 20 kHz)
Accuracy	Amplitude accuracy: ±0.25% of setting ±2 mV p-p (1 Hz to 10 kHz) Offset accuracy: ±3 mV DC output accuracy: ±0.6 mV
Other	Self-test function (Voltage, Current)

*Nota: il modulo MR8790 non è compatibile con gli oscilloscopi registratori mod. MR8847/01

HIOKI

MR8791

NEW

Modulo Generatore di Impulsi

MR8791 è una unità a 8 canali di uscita per la generazione di treni di impulsi con una velocità di frequenza d'uscita compresa tra 0.1Hz e 20kHz.
Tramite questo modulo è possibile generare uscite simulate per riprodurre ogni tipo di segnale fornito da sensori quali ad esempio quelli utilizzati negli ambiti automotive e ferroviario.

Dimensions and mass: approx. 106 mm (4.17 in) W × 19.8 mm (0.78 in) H × 196.5 mm (7.74 in) D, approx. 230 g (8.1 oz).
Accessories: None

PULSE GENERATOR UNIT MR8791	(Accuracy at 23 ±5°C/73 ±9°F, 80% rh or less with no condensation; Accuracy guaranteed for 1 year)
Output terminal	Number of channels: 8, Connector: D-sub, half-pitch, 50-pin Max. rated voltage to ground: 33 V rms AC or 70 V DC (between unit and output channels) Logic output/Open collector output
Output mode 1	Pattern output: Read frequency: 0 Hz to 120 kHz, 2048 logic patterns
	Pulse output: Frequency 0 Hz to 20 kHz, Duty 0.1% to 99.9%
Output mode 2	Logic output: Output voltage level: 0 V to 5 V (H level: 3.8 V or more, L level: 0.8 V or less)
	Open collector output: Absolute maximum rated voltage for collector/emitter: 50 V Overcurrent protection: 100 mA
Other	Self-test function

*Nota: il modulo MR8791 non è compatibile con gli oscilloscopi registratori mod. MR8847/01

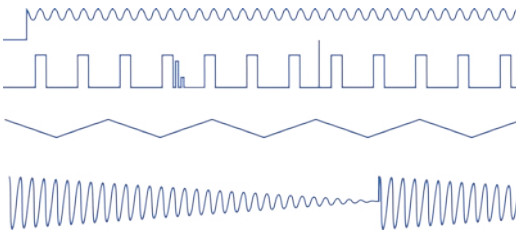
HIOKI

NEW

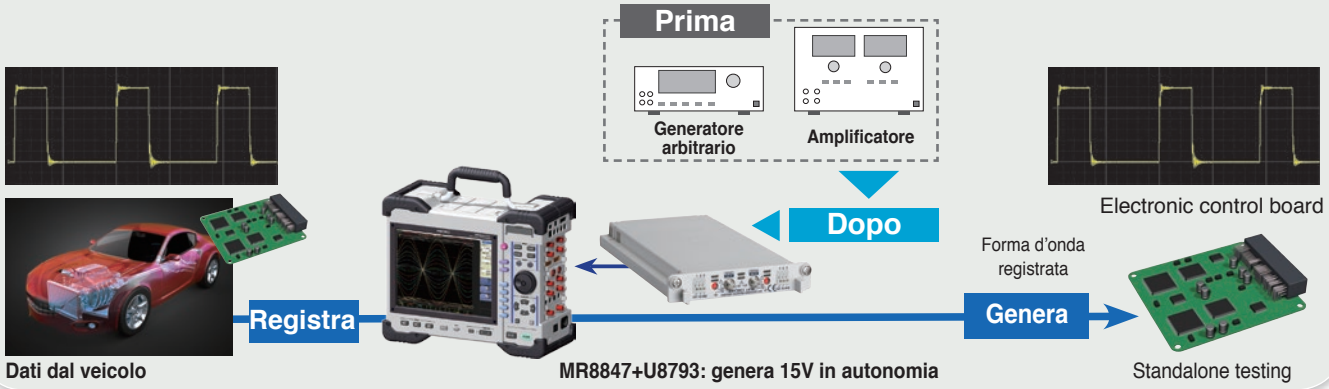
U8793

Modulo Generatore di forme d'onda arbitrarie

L'installazione del modulo di ingresso U8793 sugli oscilloscopi registratori MR8847, MR8827 e MR874x, consente di ottenere un sistema di controllo che combina le funzioni di registrazione e generazione di forme d'onda. È quindi possibile catturare una forma d'onda e successivamente riprodurla con le stesse identiche caratteristiche di ampiezza, frequenza, variazione.
Il modulo U8793 è in grado di generare un segnale d'uscita isolato fino a 15V senza necessità di generatore o amplificatore supplementare.



Esempio applicativo su scheda di controllo per automotive



General Specifications

Number of output channels	2 channels per unit
Output format	Unbalanced output (floating)
Output terminal	SMB terminal
Dimensions and mass	Approx. 106 (W) × 19.8 (H) × 196.5 (D) mm, approx. 250 g
Accessory	User manual

Arbitrary Waveform Generation

Output waveforms	Waveforms measured with the Memory HiCorder MR8847, MR8847A, MR8827, MR8740, and MR8741
	Waveforms created with Waveform Creation Software SF8000
	Waveforms saved by the Arbitrary Waveform Generator 7075
	Power Quality Analyzer PW3198 and power meter waveforms
	Waveforms created as CSV-format files
	*Logic waveforms are not supported.
Voltage axis resolution	16 bits
Waveform memory capacity	256 kW/ch. × 8 blocks
Low-pass filter	2-stage LPF, 50 Hz to 1 MHz (14 steps in 1-2-5 progression)
D/A refresh rate	Up to 2 MHz (from 0 to 2 MHz, 10 mHz resolution)
Delay	-250.000 to 250.000
Number of loops	∞, 1 to 50,000

Function Generator Mode

Output waveforms	Sine, square, pulse (variable duty), triangle, ramp, DC
Output frequency range	10 mHz to 100 kHz (setting resolution: 10 mHz)

Analog Output Specifications
(applicable to both custom waveform generation and function generation mode)

Maximum output voltage	-10 V to 15 V
Amplitude setting range	0 V to 20 V p-p (setting resolution: 1 mV)
DC offset setting range	-10 V to 15 V
Output impedance	1 Ω or less
Maximum output current	±10 mA (per channel)
Output type	Waveform output, open, shorted

Other Specifications

Channel synchronization	Set phase between unit channels or between units
Sweep functions	Frequency sweep, amplitude sweep, offset sweep
	(can be set simultaneously),
	duty sweep (during pulse output)
	*Up and down sweep operation is supported.
	(Target: Non-DC function generation waveforms and custom waveforms)
Program functions	Sequence length: Max. 128 steps
	(Hold on/off can be set by step.)
	Number of step loops: 1 to 1,000
	Number of overall loops: 1 to 50,000 or ∞

*Nota: il modulo MR8791 non è compatibile con gli oscilloscopi registratori mod. MR8847/0x

HIOKI

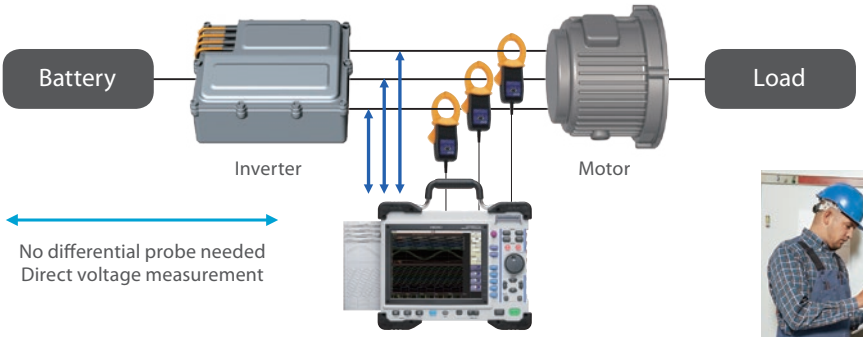
U8974

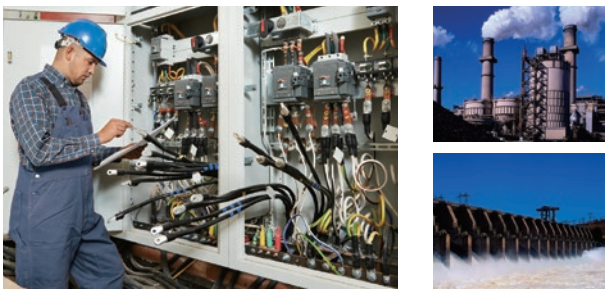
NEW

Modulo per alta tensione (1000VCC / 700VCA)

MR8790 è una unità a 4 canali di uscita per la generazione di 4 forme d'onda sinusoidali nel campo di frequenza compreso tra 10mHz e 20kHz.
L'ampiezza massima del segnale sinusoidale di uscita è di 20 V picco-picco.

Dimensions and mass: approx. 106 mm (4.17 in) W × 19.8 mm (0.78 in) H × 196.5 mm (7.74 in) D, approx. 230 g (8.1 oz)
Accessories: None





Supports high voltage systems around the world

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	Number of channels: 2, for voltage measurement, DC/RMS selectable Maximum rated voltage to ground: 1000 V AC or DC (CAT III), 600 V AC or DC (CAT IV)
Input terminals	Banana input terminal (Input impedance: 4 MΩ, Input capacitance: 5 pF)
Measurement range	200 mV, 500 mV, 1, 2, 5, 10, 20, 50 V/div (DC mode) 500 mV, 1, 2, 5, 10, 20, 50 V/div (RMS mode)
Measurement resolution	1/1600 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

*Nota: l'oscilloscopio registratore mod. MR8847/0x necessita di version update (in fabbrica) per essere abbinato al modulo U8974

HIOKI

NEW

HMR-Terminal

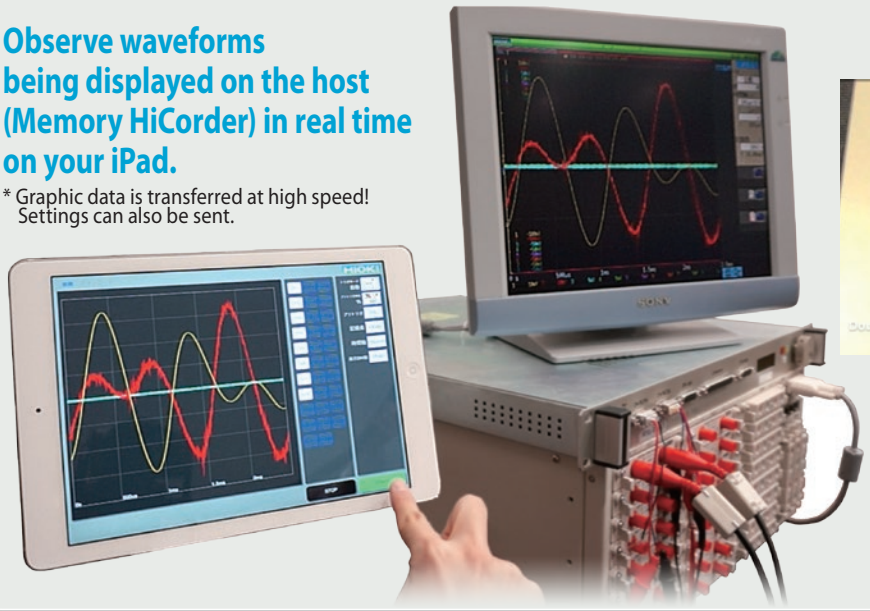
Applicazione APP per iPAD dedicata ai modelli MR8847, MR8827 e MR874x

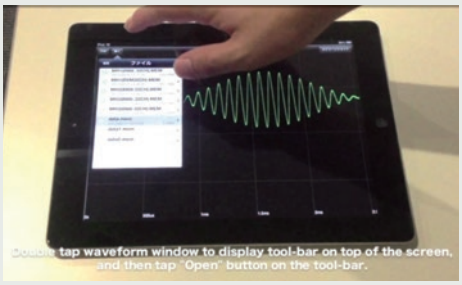
HMR-Terminal è una applicazione APP, disponibile esclusivamente per tablet iPAD, scaricabile gratuitamente dall'APP-Store che consente di configurare, visualizzare e registrare le forme d'onda dagli oscilloscopi registratori modello MR8847, MR8827, MR8740 e MR8741.
La modifica delle configurazioni e la visualizzazione istantanea sfruttano la connessione wi-fi del tablet, pertanto è necessario che l'oscilloscopio registratore sia connesso ad una rete wi-fi, attraverso la propria interfaccia LAN-Ethernet. Il trasferimento su iPAD dei file registrati avviene tramite connessione al server FTP di cui sono dotati gli oscilloscopi registratori compatibili.
Su display remoto è possibile visualizzare ed analizzare fino a 32 canali di misura, sfruttando le funzionalità tattili e di gestione menù tipiche del dispositivo iPAD.

Esempio applicativo su scheda di controllo per automotive

Observe waveforms being displayed on the host (Memory HiCorder) in real time on your iPad.

* Graphic data is transferred at high speed! Settings can also be sent.

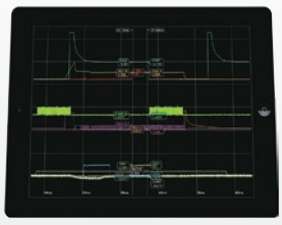




Download waveform files stored in the host (Memory HiCorder) via FTP

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

- Easy waveform operation on iPad
- Fingertip operation of Max. 32 channels of waveform data
- Operate MEMORY HiCORDER via network, change settings, and monitor waveforms during measurement
  * New function in Ver 2.0



HMR Terminal Brief Specifications	
Operating environment	iOS on the iPad (Apple Inc.)
Supported OS	iOS
Functions	- Data acquisition: Send to iPad via FTP using a WiFi router, or load to iPad via iTunes (PC app) - Intuitively operate waveform level searches, maximum / minimum / average values, zero position adjustment, and more at your fingertips - Waveform monitor - Meter setting * Logic waveforms and computational waveforms are not supported.

HIOKI

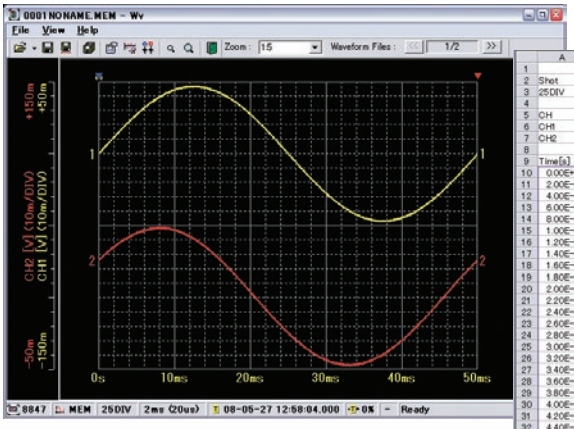
Wave-Viewer software

Applicativo software per lavisualizzazione dei dati delle forme d'onda

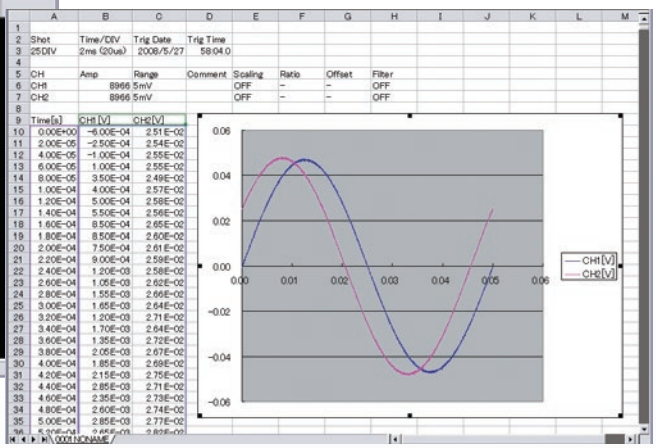
L'applicativo software Wave-Viewer è fornito in dotazione a tutti gli oscilloscopi registratori presentati in questo catalogo, ad esclusione del modello MR8870/20 per il quale il software si chiama "Wave-Processor" sebbene mantenga le medesime funzionalità e prestazioni.

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.

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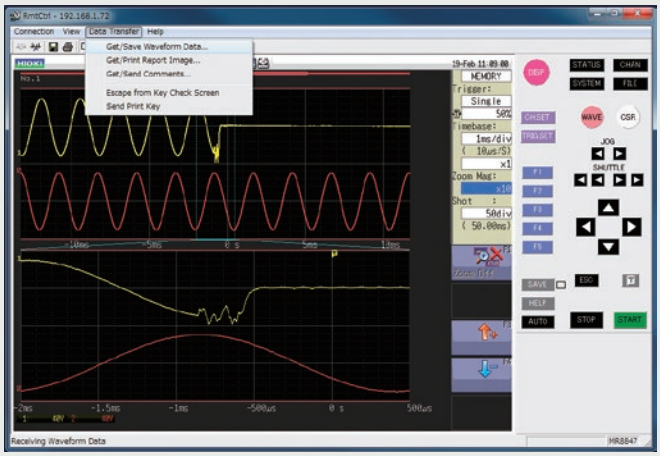
9333

Applicativo software per il controllo remoto tramite connessione LAN

L'applicativo software 9333 (opzionale e compatibile con i modelli MR8847/0x, MR8847A/5x, MR8827, MR8741 e MR8741) consente di:

- Abilitare il controllo remoto tramite interfacciamento LAN
- Acquisizione dei dati tramite la funzione di auto-salvataggio su PC del file binario delle forme d'onda
- Trasferimento e salvataggio su PC del file dati di tipo CSV per elaborazione su foglio di calcolo commerciale quale Excel, OpenOffice, …
- Stampa di report ed immagini del display, sia su stampante termica installata sullo strumento (quando prevista), sia su stampante di rete connessa a PC.

9333 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).



9333 Brief Specifications	
Supported OS	Windows 8/7 (32/64-bit), Vista (32-bit), XP (9333 ver.1.09 or later)
Functions	- Auto-saves waveform data to PC, Remote control of Memory HiCorder (by sending key codes and receiving images on screen), print report, print images from the screen, receive waveform data in same format as waveform files from the Memory HiCorder (binary only) - Waveform data acquisition: Accept auto-saves from the Memory HiCorder, same format as auto-save files of Memory HiCorder (binary only), print automatically with a Memory HiCorder from a PC. The Memory HiCorder's print key launches printouts on the PC - Waveform viewer: Simple display of waveform files, conversion to CSV format, etc.

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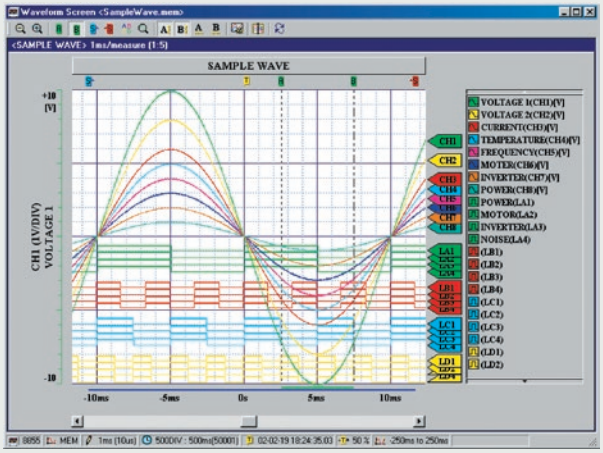
9335

Applicativo software per l'analisi e l'elaborazione dei dati delle forme d'onda

L'applicativo software 9335 (opzionale e compatibile con i modelli MR8847/0x, MR8847A/5x, MR8827, MR8741 e MR8741) consente di visualizzare, convertire, calcolare e stampare tramite PC le forme d'onda e i dati acquisiti dall'oscilloscopio registratore in uso.

9335 consente all'operatore di realizzare a monitor le svariate modalità di visualizzazione ed analisi numerico-grafiche disponibili sul display dell'oscilloscopio registratore.
In particolare, è possibile realizzare rappresentazioni su diagramma X-Y, rivelare tracciare e identificare i fenomeni di interesse inserendo marcatori di riferimento, cercare un particolare evento in base a data ora o ampiezza, e ri-assegnare una nuova condizioni di trigger.
9335 incorpora 19 tipologie di funzioni di calcolo che consentono di realizzare analisi statistiche semplici e veloci.

9335 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.



9335 Brief Specifications	
Supported OS	Windows 8/7 (32/64-bit), Vista (32-bit), XP
Functions	- Display functions: Waveform display, X-Y display, Cursor function, etc. - File loading: Readable data formats (.MEM, .REC, .RMS, .POW) / Maximum loadable file size: Maximum file size that can be saved by a given device (file size may be limited depending on the computer configuration) - Data conversion: Conversion to CSV format, Batch conversion of multiple files, etc.
Printing	- Print function: Printing image file output (expanded META type, ".EMF") - Print formatting: 1 up, 2-to-16 up, 2-to-16 rows, X-Y 1-to-4 up, preview, hard copy