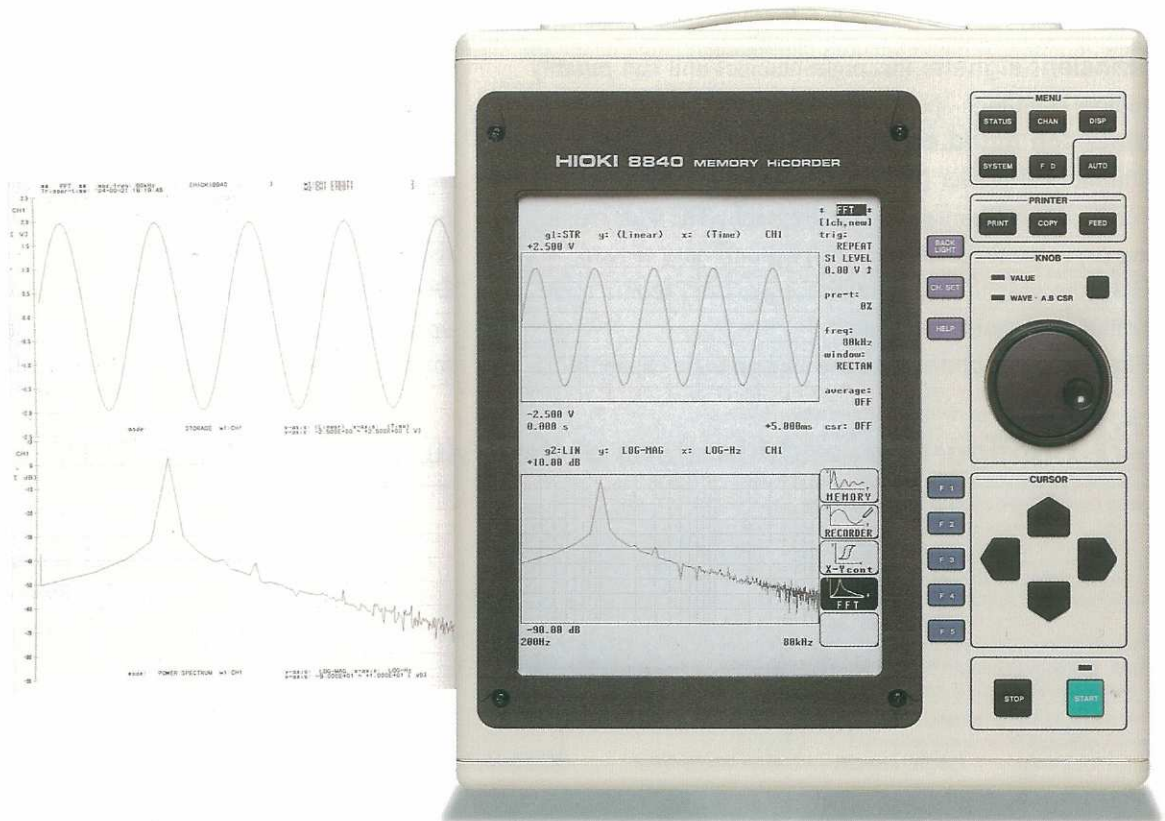


NEW

8840 MEMORY HiCORDER

Recorders



Eight Isolated Input Channels and New FFT Function

Nine-inch waveform monitor and 216-mm wide printing

This eight-channel recorder packs a powerful set of functions into a portable unit, with the additional ability to use a DC power supply.

This is a new release of the highly successful 8840 MEMORY HiCORDER, with the addition of a built-in FFT analysis function. With wide printing (corresponding to A4 size paper), this multifunction unit employs a GUI operating style for simplicity of use, together with a nine-inch waveform monitor.



MEMORY HiCORDER are accredited to ISO 9001, the international standard relating to quality control and quality assurance. Certificate No. JQA-0216/ISO 9001

New Version of the Function

1) Features of the 8840 MEMORY HiCORDER

Transient signals: this eight-channel unit can reliably capture even high-speed and unpredictable events.

Nine-inch liquid crystal display: together with 216-mm thermal printer (A4 size) this provides the operating 'feel' of an electromagnetic oscillograph. The wide recording paper makes multi-channel printouts easy to read.

GUI: the graphical user interface provides iconic representations to guide key input.

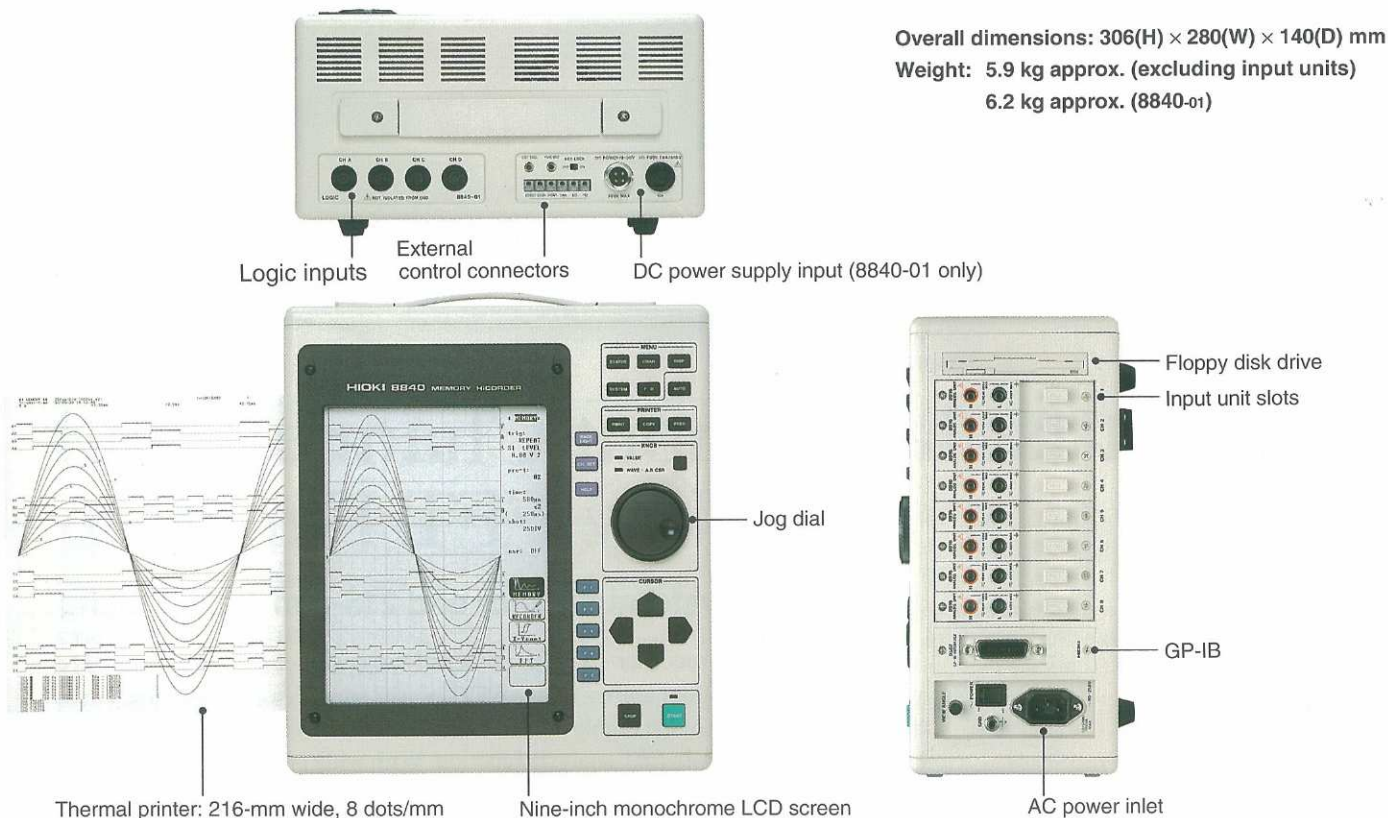
Eight analog channels: and sixteen logic channels can

be input simultaneously. The analog inputs are all floating, and insulated to 450 V.

Large memory capacity: the unit can use 1M words of memory for a single channel, or 100k words per channel for eight channels. The memory can also be segmented as required.

Dual AC/DC power supply (8840-01): this version operates either on either AC or an external DC supply, allowing it to be used for vehicle-mounted applications.

2) Configuration and functions of the 8840 MEMORY HiCORDER



Overall dimensions: 306(H) × 280(W) × 140(D) mm
 Weight: 5.9 kg approx. (excluding input units)
 6.2 kg approx. (8840-01)

To ensure flexibility to meet the requirements of a particular application, the plug-in input units can be interchanged and combined freely.

This is a recorder capable of waveform measurement, and provided with a monochrome LCD screen with backlighting. After searching the captured waveform data on the screen, it is possible to make a printed recording of only

the required portion.

The printer uses a 216 mm × 30 m roll of paper. See the specification for details of recording times when the unit is used simply as a pen recorder.

For communications, a GP-IB interface is supplied as an option. This allows remote control and also the transfer of data to an external computer.

8840 and 8840-01 with FFT Analysis

■ Main Unit Specification 8840 8840-01

Basic specification	
Measurement functions	①Memory recorder②recorder③X-Y recorder④FFT
Input units	Plug-in input units, inputs isolated from each other and frame.
Number of channels (maximum)	8 analog channels + 16 logic channels* *The 16 logic channels are fitted as standard; common ground with main unit.
Memory capacity	1M 12-bit words per channel (using 1 channel); 500k words per channel (using 2 channels); 200k words per channel (using 3 or 4 channels); 100k words per channel (using 5 to 8 channels)
External storage	3.5-inch floppy disk drive, MS-DOS format, 1.44MB, 1.2MB, or 720 KB capacity
Battery Backup	Clock and settings; battery life 8 years (at 25°C)
External control terminals	3.5-mm dia. mini-jacks (trigger input/output), terminal board (start, stop and print inputs, waveform judgment output)
Interface(option)	GP-IB IEEE-488.2 1987 compliant HP-GL plotter output support Weight: approx. 110 g
Power supply	90 to 250V AC (universal) 50/60Hz. (Also 10 to 30V DC for 8840-01 only)
Power consumption	350VA Max. (when printer off, using 100V AC, 110VA approx.) (For 8840-01, DC power consumption 70VA max.; when printer off, 40VA approx.)
Supplied accessories	Power cord, recording paper (1 roll), dust cover, input cable label. (For 8840-01, additional DC power cord and spare fuse)

Recording and display functions	
Recording paper	216mm × 30m ; roll type thermosensitive paper
Recording width	20 divisions full scale, 1 division = 10mm (80 dots)
Longitudinal resolution	10 rows/mm (20 rows/mm in memory recorder smooth printing mode)
Recording speed	Maximum 25mm/s
Display screen	9-inch LCD (4 grayscale levels), 640 × 480 pixels

Trigger functions	
Trigger sources	Channels 1 to 8, external and timer trigger sources set either on or off. For channels 1 to 4, analog or logic settings possible. Timer trigger can be set for start, stop or interval
Trigger combination	logical AND or OR of trigger sources
Types of trigger (analog)	Level trigger: The voltage value can be set digitally; triggering occurs on rising above, or falling below, the set level. Window-in trigger: Upper and lower trigger levels can be set. Triggering occurs when the area is entered. Window-out trigger: Upper and lower trigger levels can be set. Triggering occurs when the area is exited.
Trigger level resolution	1% f.s. on voltage range(f.s. = 20 divisions)
Types of trigger (logic)	Pattern trigger: 1, 0, or × (don't care) pattern setting; Each group of four channels can be ANDed or ORed.

Auxiliary functions	
Scaling function	Scaling: conversion of range only. Variable; arbitrary setting of lower and upper limits of waveform display range
Cursor measurement	Five significant figures, voltage, voltage difference, time, time difference

MEMORY HiCORDER (AC power supply only) MEMORY HiCORDER (dual AC/DC power supply)

Memory recorder function	
Time axis	18 ranges from 500 μs to 5 minutes/division; 1 division = 100 samples; time axis magnification 3 settings from ×2 to ×8, compression 9 settings from ×1/2 to ×1/1000
Sampling period	1/100 of the time axis range; 5μs to 3s.
Recording length	25 to 1000 divisions (using 5 to 8 channels), 2000 divisions (using 4 channels), 5000 divisions (using 2 channels), 10000 divisions (using 1 channel)
Display and print formats	Full-width (single), or 2, 4 or 8 sections, X-Y (single, or dual), logging (numeric) print, A4 report
Pre-trigger function	Fraction of recording before trigger event: 15 settings from 0% to 100% and -95%.
Computation functions	*Maximum 200-division waveform; accurate to tolerance of input unit: 8 calculations Waveform processing calculations: four arithmetic operations (+, -, *, /), absolute value, exponentiation, common logarithm, square root, moving average, differentiation once and twice, integration once and twice, and parallel displacement along the time axis. Waveform decision function: maximum value, minimum value, peak to peak value, average value, effective (rms) value, area value, period, frequency, time to maximum value, time to minimum value, rise time, fall time, X-Y area.
Waveform judgment function	For a time axis waveform, x-y plot, or FFT display, decision against a bounding area, and also against reference values for a calculated waveform parameter Decision (pass/fail) output: open collector 5 V voltage output Decision time: not more than 30 ms; decision period: about 200ms; Above are reference values for minimum conditions.
Other functions	Waveform averaging, memory segmentation (3, 7, 15 and 31 divisions), superimposition function, voltage axis zoom functions (4 settings, ×2 to ×8 and ×1/2), waveform display scroll functions (time and voltage axes)

FFT function	
1-signal analysis	Linear spectrum, rms spectrum, power spectrum, autocorrelation, histogram, and octave analysis
2-signal analysis	Transfer function, cross power spectrum, cross correlation, unit impulse response, and coherence function
Channels analyzed	Any one or two of the analog channels
Frequency range	133 mHz to 80 kHz; resolution 1/400; sampling 1000 points
Window types	Rectangular, Hanning and exponential
Waveform judgment function	Same functions as in the memory recorder function

Recorder function	
Time axis	200ms/division (display only), or 0.5s to 1hour/division (13 settings); time axis compression 1/2 to 1/50 (5 settings)
Sampling period	From 280 μs (using 5 to 8 channels) to 100 μs (using 1 channel)
Display, Print format	Full-width (single), or 2, 4 or 8 sections, logging (numeric) print
Other functions	Simultaneous printing and display possible, memory print (most recent 580 divisions), voltage axis zoom functions (4 settings, ×2 to ×8 and ×1/2)

X-Y recorder function	
Channels	Maximum 4, x- and y-axes independent.
Sampling period	360μs fixed (dot display); 500μs minimum (line display)
Recording time	unlimited (superimposing).
Print format	Full width 200 × 200mm (20 × 20 divisions), 2 sections, A4 size
Resolution on x-y axes	16 dots/division (screen), 80 dots/division (printer)

Input Units Freely Inter-Requirements

Option Specifications

(Accuracy at 23°C ±5 °C, after 60 minutes warming-up time; accuracy guaranteed for six months.)

8916 ANALOG UNIT	
Number of input channels	1 (input isolated from output)
Measurement ranges	5 mV to 20 V per division, 12 ranges; full-scale (f.s.) is 20 divisions; maximum 500 V (DC+AC peak); measurement resolution is 1/80 of range; low-pass filter 5 Hz, 50 Hz, 500 Hz, or 5 kHz
Maximum sampling rate	200 kS/s
DC amplitude accuracy	±0.25% f.s.
Origin setting (zero position)	-28 to 128% of recording width, in 1% steps, with zero adjust function
Zero position accuracy	±0.1% f.s. (after zero adjustment)
Frequency characteristics	DC to 100 kHz -3 dB
Input resistance and capacitance	1 MΩ±1%; approximately 20 pF at 100 kHz
Maximum floating voltage	450 V AC or DC (between input unit and frame, and between input units)
Temperature characteristics	Gain ±0.02% f.s./°C Zero ±0.015% f.s./°C (after zero adjustment)
Dimensions and weight	20 (H) × 110 (W) × 88 (D) mm, approx.; 110 g approx.
Accessories	9574 INPUT CORD, 1.7 m (×1)

8917 DC/RMS UNIT	
Number of input channels	1 (input isolated from output)
Measurement ranges	5 mV to 20 V per division, 12 ranges; full-scale (f.s.) is 20 divisions; maximum 500 V (DC+AC peak); measurement resolution is 1/80 of range; low-pass filter 5 Hz or 500 Hz
Maximum sampling rate	200 kS/s
DC amplitude accuracy	±0.3% f.s.
RMS accuracy	±1% f.s. (DC, 40 Hz - 1 kHz); ±8% f.s. (1 - 100 kHz) * Valid input range: 10% to 128% of range setting; crest factor 2
Origin setting (zero position)	-28 to 128% of recording width, in 1% steps, with zero adjust function
Zero position accuracy	±0.1% f.s. (after zero adjustment)
Frequency characteristics	DC to 100 kHz -3 dB
Response time	Low-pass filter off: rise 100 ms, fall 200 ms (typical)
↑: 0 to 90% f.s. input	Low-pass filter 500 Hz: 1 ms addition
↓: 100 to 10% f.s. input	Low-pass filter 5 Hz: 100 ms addition
Input resistance and capacitance	1 MΩ±1%; approximately 20 pF at 100 kHz
Maximum floating voltage	450 V AC or DC (between input unit and frame, and between input units)
Temperature characteristics	Gain ±0.02% f.s./°C Zero ±0.05% f.s./°C (after zero adjustment)
Dimensions and weight	20 (H) × 110 (W) × 88 (D) mm, approx.; 110g approx.
Accessories	9574 INPUT CORD, 1.7 m (×1)

8919 FFT ANALOG UNIT	
Anti-aliasing filter	Cutoff frequency 20 Hz, 40 Hz, 80 Hz, 200 Hz, 400 Hz, 800 Hz, 2 kHz, 4 kHz, 8 kHz, 20 kHz, 40 kHz, switched automatically with frequency range
Low-pass filter	5 Hz or 500 Hz
Input resistance and capacitance	1 MΩ±1%; approximately 27 pF at 100 kHz
Other specifications	Same as for the 8916 ANALOG UNIT

8918 TEMPERATURE UNIT	
Number of input channels	1 (input isolated from output)
Measurement ranges	10 °C/division (0.125 °C resolution), 20 °C/division (0.25 °C resolution), 50 °C/division (0.625 °C resolution); full-scale is 20 divisions
Thermocouple ranges	K(CA) thermocouple -90 to 1200 °C J(IC) thermocouple -90 to 800 °C T(CC) thermocouple -90 to 400 °C
Maximum sampling rate	50 kS/s
Accuracy	±0.25% f.s. ±2 °C (including reference junction compensation accuracy)
Zero position adjustment	-110% to +110% of chart width, settable in 1% steps; no zero adjust function
Frequency characteristics	DC to 500 Hz -3 dB
Low-pass filter settings	Approx. 1.5 Hz or 5 Hz
Response time	Low-pass filter off: rise and fall 1 ms (typical)
↑: 0 to 90% f.s. input	Low-pass filter 5 Hz: rise and fall 100 ms (typical)
↓: 100 to 10% f.s. input	Low-pass filter 1.5 Hz: rise and fall 300 ms (typical)
Maximum floating voltage	250 V AC or DC (between input unit and frame, and between input units)
Thermal characteristics	±0.05 %f.s./°C
Dimensions and weight	20 (H) × 110 (W) × 88 (D)mm, approx.; 110 g approx.

Memory recorder function recording times

Time/division	Sampling interval	Using one channel 1M words 10,000 divisions	Using eight channels 100k words/channel 1,000 divisions
500µs/division	5µs	5s	0.5s
1ms/division	10	10s	1s
2	20	20s	2s
5	50	50s	5s
10	100	1m40s	10s
20	200	3m20s	20s
50	500	8m20s	50s
100	1ms	16m40s	1m40s
200	2	33m20s	3m20s
500	5	1h23m20s	8m20s
1s/division	10	2h46m40s	16m40s
2	20	5h33m20s	33m20s
5	50	13h53m20s	1h23m20s
10	100	27h46m40s	2h46m40s
20	200	55h33m20s	5h33m20s
1min/division	0.6s	6days22h40m	16h40m
2	1.2	13days21h20m	1days9h20m
5	3	34days17h20m	3days11h20m

Recorder function recording times (Total length 30 m, or approx. 2970 divisions) *1

Time/division	Sampling interval	Using eight channels, approximate time for complete roll of paper
200 ms/division		No limit (display only)
500 ms/division		24m45s
1 s/division		49m30s
2	Using 1 channel: 100 µs	1h39m
5	Using 2 channels: 120 µs	4h7m30s
10	Using 4 channels: 160 µs	8h15m
20	Using 8 channels: 280 µs	16h30m
1 min/division		2days1h30m
2		4days3h
5		10days7h30m
10		20days15h
20		41days6h
1 hour/division		123days18h

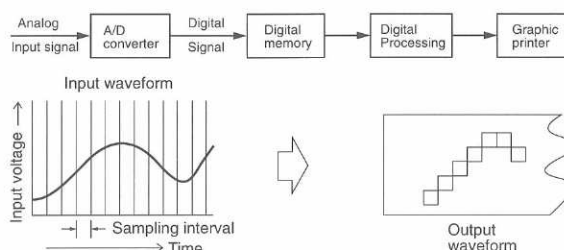
*1 The figure of 2970 divisions assumes that about 30 cm of the paper length will not be used.

changeable to Meet Signal Measurement

3) Measurement function summary and examples

Memory recorder function

The input signal is first converted to digital form and stored in memory, and then is available for display and printing, thus allowing very brief transient events to be captured reliably. It is also possible to make x-y plots for any pair of channels.



Range of trigger functions

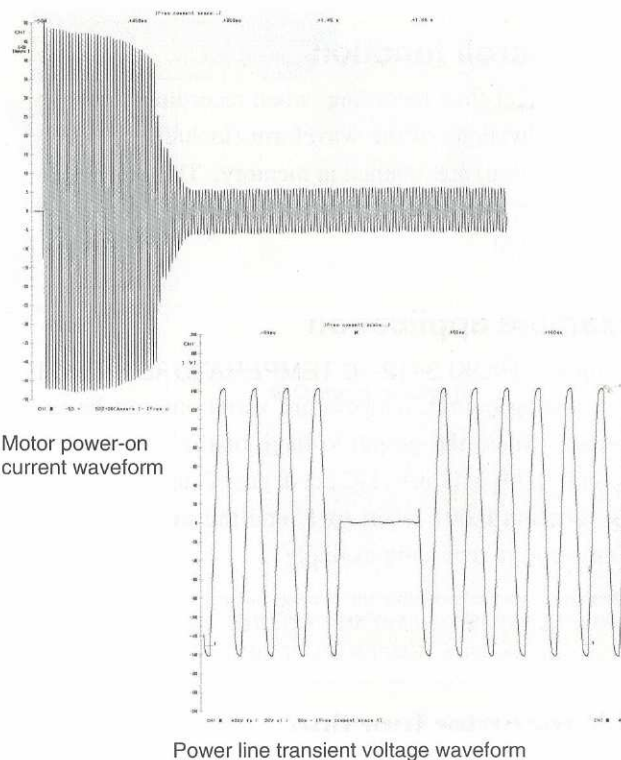
Waveforms can be captured taking the input signal crossing a preset level as the trigger. Also, when recording a current waveform, the current must be converted to a voltage signal, using a clamp sensor for example. In this case, the scaling function can be used for convenience when reading values. (Power-on current waveform example)

Options and functions used: 9272 CLAMP ON SENSOR and 9555 SENSOR UNIT, memory recorder function, level trigger, scaling, pre-trigger 2%, time axis 5 ms/division, with 1/20 compression

Voltage drop detection trigger

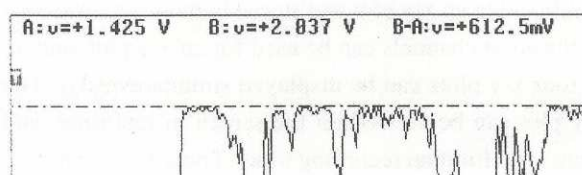
By combining a window-in trigger, which triggers when the signal enters the range between two specified values, with a trigger filter, which delays the trigger generation, it is possible to capture transient drops in the voltage on a domestic power line. (Transient voltage drop waveform example)

Functions used: memory recorder function, window-in trigger ± 112 V, trigger filter 5 divisions, time axis 2 ms/division, with 1/5 compression



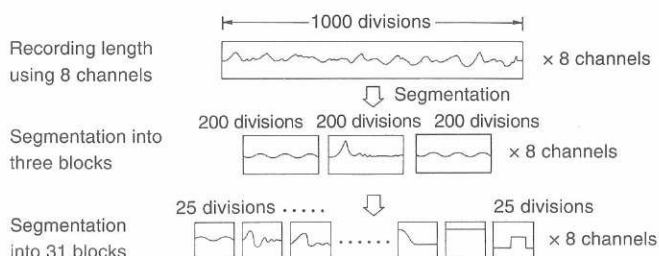
Cursor read-out functions

Using two cursors on the display screen, it is possible to read out time differences or voltage differences. (Screen copy example)



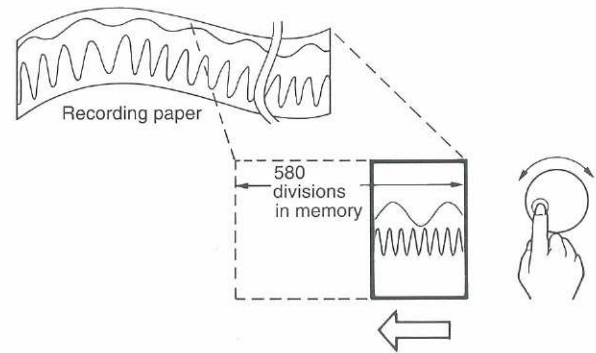
Memory segmentation function

In the memory recorder function, the memory can be divided into 3, 7, 15 or 31 blocks (subject to some restrictions). The waveforms in the reference block and any other block can be superimposed and compared, and dead time during printing in which signals cannot be captured can be reduced.



Recorder function

The input signal is converted to digital form and displayed and printed in real time. The chart speed is a maximum of 20 mm/s (in 500 ms/division range), and with display only the equivalent of 50 mm/s (200 ms/division). Even with this real-time recording, the last 580 divisions of the waveform are retained in memory, allowing redisplay and printing.



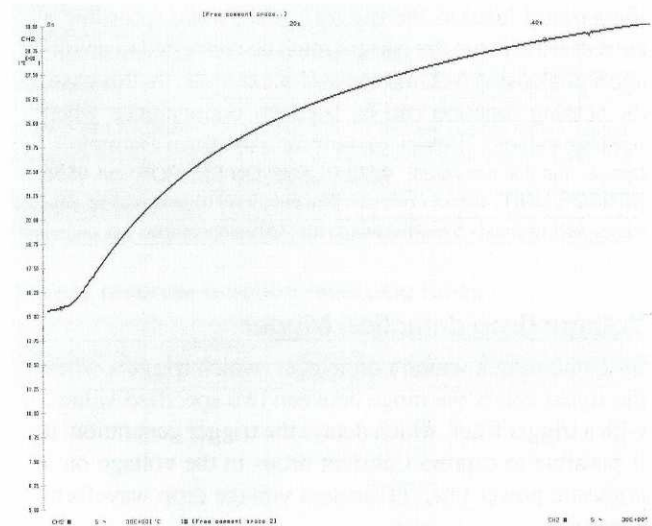
Back scroll function

Even for real-time recording, when recording stops the last 580 divisions of the waveform (including the displayed section) are retained in memory. This can be observed by scrolling both horizontally and vertically, and also reprinted.

Example application

Using the HIOKI 3412-50 TEMPERATURE METER with analog output, temperature variations can be recorded. Since the output voltage of the temperature meter is 0.001 V (1 mV) DC per degree C, using the scaling function 0.001 is set to 1, and the unit to "1°C". (Temperature recording example)

* For the example recording the analog output from a temperature meter was input to the 8916 ANALOG UNIT, but it is equally possible to use the 8918 TEMPERATURE UNIT.



Voltage axis 5 mV/division $\times 4$ magnification, scaling $\times 1000$, display at 1.25 °C/division

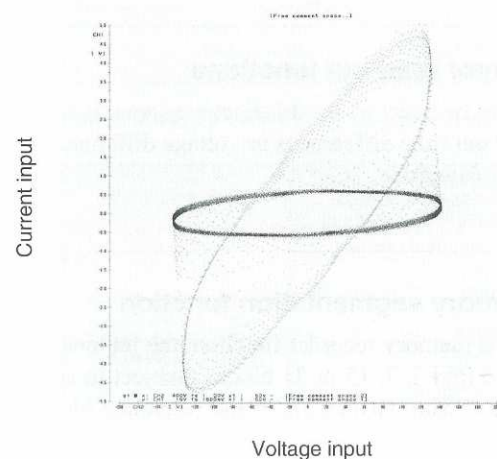
X-Y recorder function

This allows two signals converted to digital form to be combined in an x-y plot and stored in memory. Any two of the eight channels can be used for an x-y plot, and up to four x-y plots can be displayed simultaneously. The x-y plot can be viewed on the screen in real time, and there is no limit on recording time. The x-y plot can also be printed.

Example application

The phase relationship between current and voltage when a motor starts is drawn as a Lissajous figure. A 9272 CLAMP ON SENSOR and 9555 SENSOR UNIT were used for the current input signal.

Settings: using 8 channels, dot display, single (full-size) format

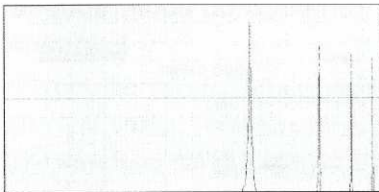


Eleven Different FFT Analysis Functions

FFT analysis functions

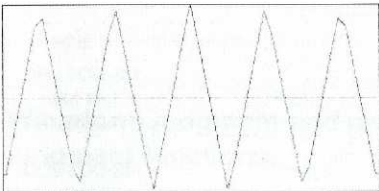
The single-channel FFT function is principally for spectrum analysis, while the two-channel FFT function allows transfer functions to be computed for a pair of signals. The octave analysis functions allow acoustic analysis. The signal source for FFT analysis is a section specified from the waveform captured in the memory recorder long memory. It is also possible to carry out FFT analysis in real time on a signal as it is captured.

● Linear spectrum



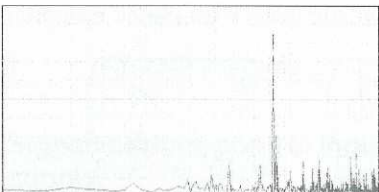
This is used for analysis of the frequency distribution in the waveform, and for investigating harmonics and spurious low frequency components.

● Autocorrelation



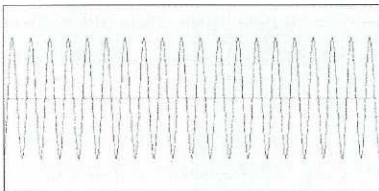
This can be used to determine the cyclic characteristics of a waveform which appears random, or for checking frequency components in a waveform with superimposed noise.

● Transfer function



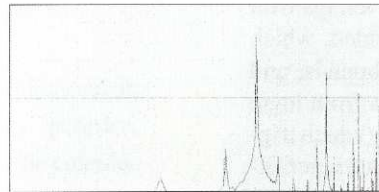
This finds the frequency response (amplitude and phase) in a measurement system, and is useful for analyzing resonance frequencies in a structure.

● Cross correlation



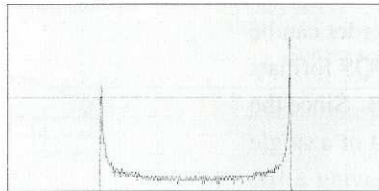
This can be used for looking at phase differences between two waveforms in time units.

● RMS spectrum



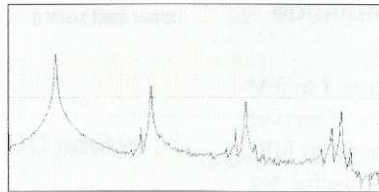
This is the root-mean-square, or effective value, of the linear spectrum.

● Histogram



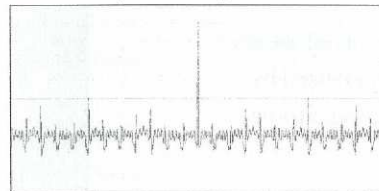
This shows deviation and fluctuations on the amplitude axis of the waveform in graphical form, making it easy to check these characteristics.

● Cross power spectrum



This displays the product of the spectra of two signals, and allows common frequency components to be found in the two waveforms.

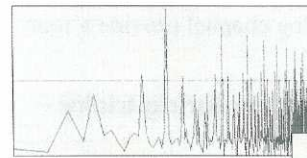
● Unit impulse response



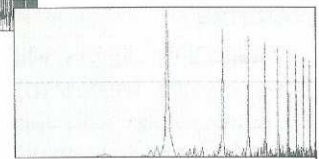
This shows the transfer characteristics of the measurement system as a time waveform, and can be used for finding time delays in a signal.

Anti-aliasing filter

The 8919 FFT ANALOG UNIT is equipped with an anti-aliasing filter to eliminate aliasing distortion and allow accurate spectrum analysis. The 8919 is therefore recommended for all FFT applications. (Figure shows the results obtained with and without an anti-aliasing filter.)

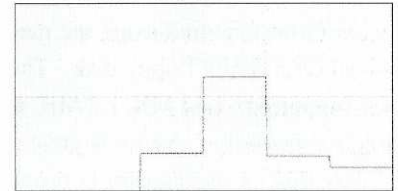


Without anti-aliasing filter OFF



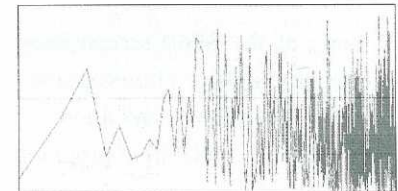
Using anti-aliasing filter ON

● Octave analysis



This shows a histogram of the sound spectrum collected at octave or one-third octave intervals.

● Coherence function



This shows the relation between input and output waveforms, enabling the transfer function reliability to be determined.

More and More Functionality

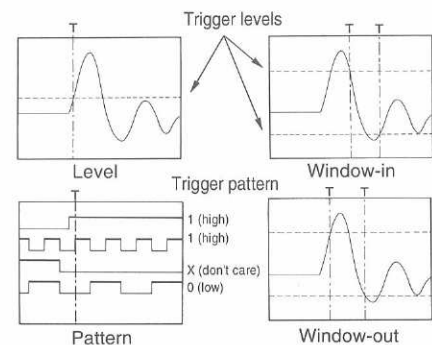
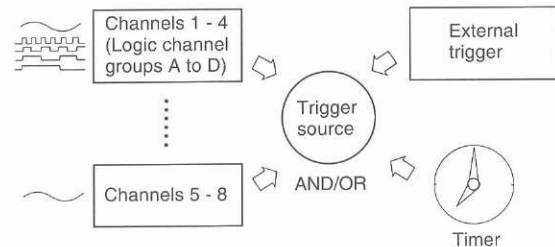
4 Summary of ancillary functions

Trigger functions to monitor all eight channels

In all of the functions -- including memory recorder, real-time recorder, X-Y recorder, and FFT -- all eight analog channels can be used for trigger input. (For four channels, either analog or logic inputs can be selected. When a channel is selected for a logic input, the four logic channels corresponding to the analog channel provide a four-bit pattern.)

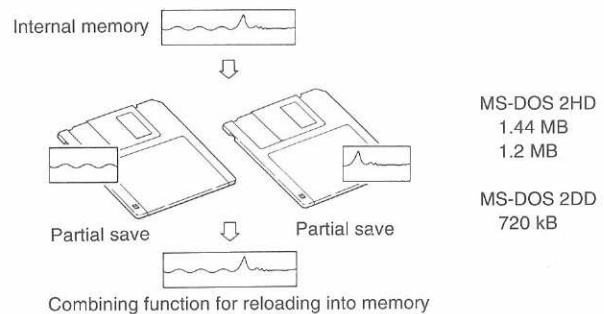
Different trigger types for capturing tricky waveforms

In addition to level triggers, which compare a voltage with a reference value, window triggers are provided, which compare the voltage with upper and lower bounds, and triggers which match an on/off pattern of bits from logic signals. By combining a "window-in" trigger (which triggers when the signal enters the bounds) with a trigger filter, it is possible to capture transient drops in the voltage on a power line.



Convenient 3.5-inch floppy disk drive

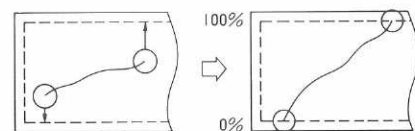
Waveforms captured using the memory recorder can be saved on a handy floppy disk. Three MS-DOS formats are supported: 1.44 MB, 1.2 MB, and 720 kB. Since the internal memory capacity is greater than that of a single floppy disk, a mechanism is provided for saving a file over a number of disks when necessary.



Function for adjusting the signal amplitude to the full paper width

When recording instrumentation signals, such as 1 to 5 V or 4 to 20 mA, the memory recorder "variable" function can be used to align the range from the zero point to full-scale reading with the paper width. This is useful for power station load shut-off testing, for example.

Upper limit setting $X.XXXX10^{XX}$ [V]

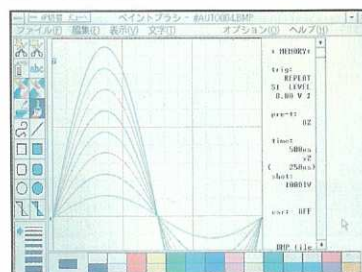


Lower limit setting $X.XXXX10^{XX}$ [V]

Variable function enabled

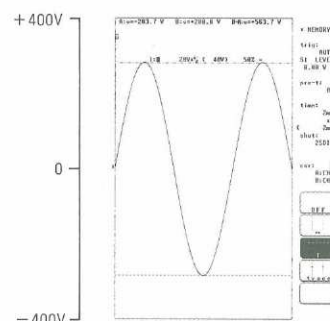
Direct screen copy to bitmap file

A copy of the 8840 screen image can be saved as a bitmap (.bmp) file. This is a standard file format used by Microsoft Windows, and allows the screen image to be imported into application programs.



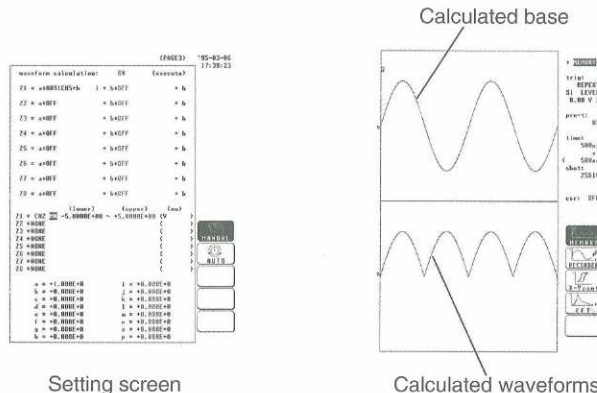
Direct input from a 240 V AC line

Each input channel is isolated to 450 V AC. Thus, using a voltage axis 1/2 compression display allows measurement with a full scale range of ± 400 V, and the unit can measure a 240 V line directly without needing a voltage transformer (PT).



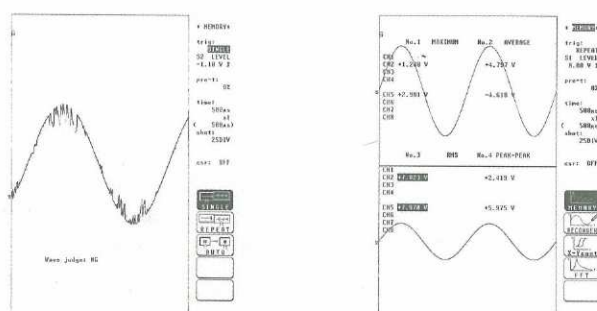
Simultaneous computation on eight channels

It is possible to carry out simultaneous computations on all eight channels captured by the memory recorder. The waveform can be displayed after arithmetic calculations, differentiation, integration, and so forth. Up to four of the parameter calculations (maximum, minimum, etc.) can be carried out simultaneously on the eight channels. The FFT functions can be carried out for any selected one or two channels.



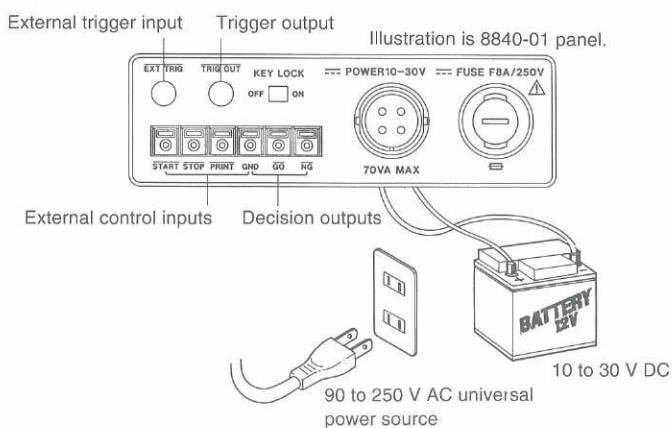
Waveform judgment and parameter judgment functions

After defining a reference bounding area for the waveform captured in memory recorder mode, it is possible to check whether waveforms go outside this reference area. Similarly, the parameter decision operates by setting reference values for a calculated waveform parameter.



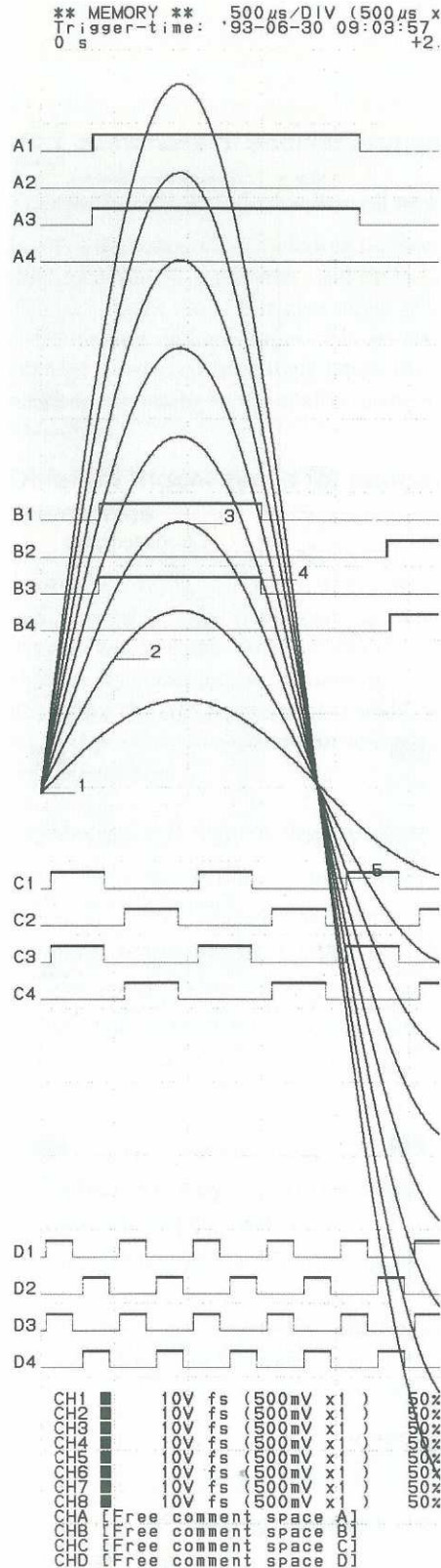
Signal outputs, control inputs, and DC power supply

The results of waveform decisions, parameter decisions and triggers are output as open collector signals. The unit is also provided with signal inputs for remote control of the start, stop, and print buttons. The 8840-01 has a dual AC/DC power supply specification, and can be for vehicle-mounted applications, for example, where an AC supply is not available. If both supplies are connected, the AC supply takes precedence, but if the AC supply is lost the unit automatically switches to DC operation.



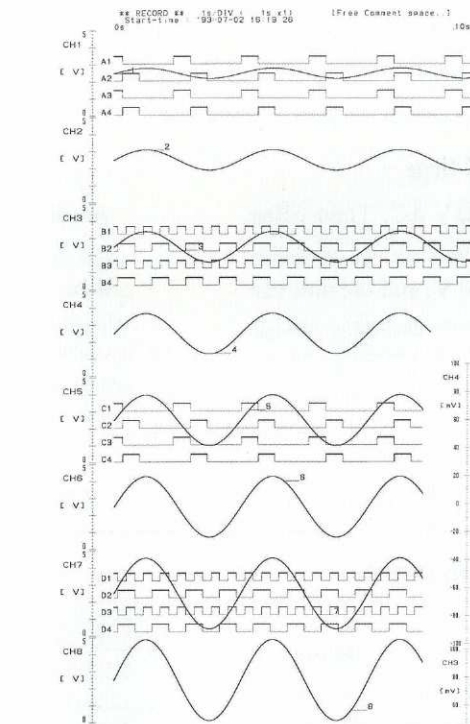
Example Print-Outs

(Actual size)



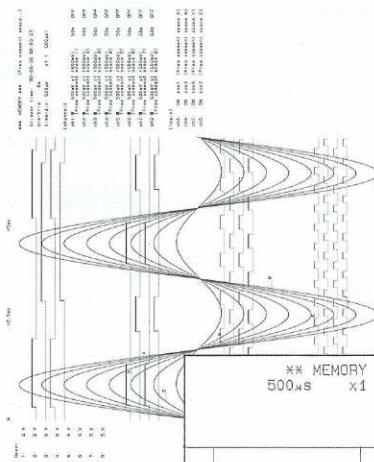
Example recording in memory recorder mode (full width)

Recording width can also be divided into two, four or eight, and X-Y plots are also possible.



Example recording in recorder mode (eight sections)

Full width recordings, and recordings divided into two or four are also possible.

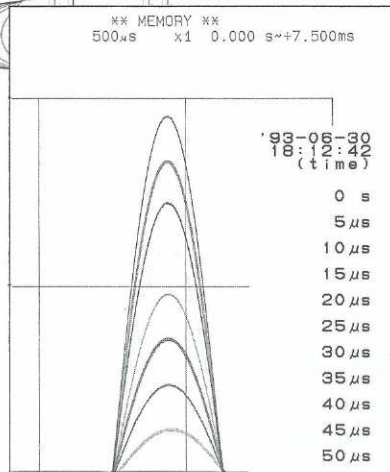


Example recording in X-Y recorder mode (two sections)

X-Y plots can be drawn full-width (200 × 200 mm) or in two sections, each 100 × 100 mm.

A4 report output

This presents the entire screen display at high resolution on an A4 sheet.



Plotter output

The screen display can be output through the GP-IB interface to a plotter supporting the HP-GL plotter standard.

Logging output

Prints instantaneous voltage values for every sampling.

5 Option specifications

9306 LOGIC PROBE

Detector for 0/5 V signals or relay contact signals, for high/low recording. Connects to the logic inputs of the MEMORY HiCORDER.

Inputs: 4 channels (common ground); digital / contact signal on/off detection

Input impedance: at least 50 k Ω (digital), 2 k Ω (contacts)

Threshold level: +1.4 V $\overline{\uparrow}$

Response time: 2 μ s maximum

Dimensions and weight: 137 (H) \times 64 (W) \times 22 (D) mm;
200 g approx.

9307 LINE LOGIC PROBE

Detector for AC or DC relay drive signals, for high/low recording. Connects to the logic inputs of the MEMORY HiCORDER. Can also be used as outage detector on a power supply line.

Inputs: 4 channels (isolated); Hi/Lo range switchable

Input impedance: 100 k Ω (Hi range), 30 k Ω (Lo range)

Detection levels: 170 - 250 V AC, \pm 70 - 250 V DC (Hi range)

$\overline{\uparrow}$ 60 - 150 V AC, \pm 20 - 150 V DC (Lo range)

Non-detection levels: 0 - 30 V AC, \pm 0 - 43 V DC (Hi range)

$\overline{\downarrow}$ 0 - 10 V AC, \pm 0 - 15 V DC (Lo range)

Response time: rise 1 ms max., fall 3 ms max.

* With on/off switch at 200 V DC for Hi and 100 V DC for Lo

Dimensions and weight: 137 (H) \times 64 (W) \times 22 (D) mm;
400 g approx.

9308 LINE DIP DETECTOR

Detector for instantaneous drops on a 100/120V AC line, sending a trigger signal. Connects to the logic inputs of the MEMORY HiCORDER.

Input: 100/120 V AC (50/60 Hz)

Detection level: approx. 80/90% of 100 or 120 V

Response time: approx. 2 cycles of input AC signal

Input impedance: approx. 12 k Ω

With 1/100 waveform output

Dimensions and weight: 137 (H) \times 64 (W) \times 22 (D) mm;
300 g approx.

9303 PT

This voltage transformer converts 400 or 200 V AC to 10 V AC.

Transformer ratio: 1/40 or 1/20, \pm 1%

Maximum permitted input: 440/220 V AC

Frequency characteristics: 40 Hz to 3 kHz, \pm 1%

Dimensions and weight: 113 (H) \times 56 (W) \times 93 (D) mm;
730 g approx.

9305 TRIGGER CORD

This connects the trigger inputs and outputs of a number of MEMORY HiCORDERs.

3.5 mm dia. mini-plugs, length 1.5 m approx.

220H PAPER WINDER

Paper width: 70 to 220 mm

Power supply: 100 V AC (using special-purpose AC adaptor)

Dimensions and weight: 190 (H) \times 240 (W) \times 160 (D) mm
2.6 kg approx.

9270 - 9272 CLAMP ON SENSORS and 9555 SENSOR UNIT

These current sensors are capable of reliable measurement of distorted AC current waveforms. Each clamp-on sensor operates together with the 9555 unit.

Input ranges: 20 A (9270), 200 A (9271), and 20/200 A (9272)

Output voltage: 2 V AC for full-range value

Frequency characteristics: 5 Hz to 50 kHz (9270 and 9271)
 \pm 2.5% f.s.

5 Hz to 10 kHz (9272) \pm 2.5% f.s.

Clamp aperture: 20 mm dia. (9270 and 9271)

46 mm dia. or 50 \times 20 mm bus bar (9272)

Conductor voltage rating: 600 V AC (insulated) *

9277-9279 UNIVERSAL CLAMP ON CTs and 9555 SENSOR UNIT

These current sensors are capable of reliable measurement from DC to distorted AC current waveforms. Each clamp-on sensor operates together with the 9555 unit.

Input ranges: 20 A (9277), 200 A (9278), and 500 A (9279)

Output voltage: 2 V AC for full-range value

Frequency characteristics: DC to 100 kHz (9277 and 9278)
 \pm 5% f.s.

DC to 20 kHz (9279) \pm 5% f.s.

Clamp aperture: 20 mm dia. (9277 and 9278); 40 mm dia. (9279)

Conductor voltage rating: 600 V AC, 850 V peak (insulated) *

* The core and shield casing are not insulated. To avoid the possibility of accidents, do not use on bare conductors.

9536 UTILITY DISK

The software provided on this disk converts captured data to a form directly loadable into a personal computer for use with a spreadsheet such as Lotus 1-2-3 or DADiSP.

Models supported: 8825, 8840, 8851 and 8852

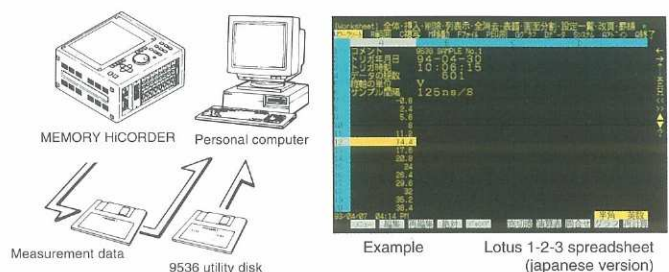
Supplied medium: 3.5-inch floppy disk; 2HD (9536), 2DD (9536-01)

Operating environment: (9536) PC9801 series VM or later, MS-DOS version 3.0 or later, bus mouse support

(9536-01) IBM PC/AT or compatible, EGA graphics monitor (640 \times 350), MS-DOS version 4.0 or later, PS/2 mouse support

Function: Converts waveform data saved on disk to ASCII format, with voltage value conversion (supports scaling and calculation functions); conversion of all channels together

Software supported: Lotus 1-2-3, DADiSP, Excel, etc.



Options



220H



9305



8916, 8917, 8919



8918



9306



9307

(Holds 8840 plus accessories)

(Holds accessories only)



9370

Approximate dimensions and weight: 340(H) × 290(W) × 220(D) mm; 1.3 kg
Material: soft PVC leather



9084

Approximate dimensions and weight: 120 (H) × 260 (W) × 300 (D) mm; 750 g
Material: rigid PVC leather



9369

Approximate dimensions and weight: 192 (H) × 550 (W) × 440 (D) mm; 4.7 kg
Material: Rigid plastic



9303



9308



9555

9270
9271

9272

* Cord length: 3 m



9277, 9278



9279



9536, 9536-01



9587

Main recorder unit (8840 or 8840-01) + (8916 - 8919 units × required number) + (other options)

Maximum number of measurements	1 channel	2 channels	3 channels	4 channels	5 channels	6 channels	7 channels	8 channels
Number of 8916 - 8919 units	1	2	3	4	5	6	7	8
Memory capacity per channel	1M words	500k words	200k words		100k words			

Ordering information

8840 MEMORY HiCORDER main unit

8840-01 MEMORY HiCORDER main unit

Options Factory fitted or user-interchangeable

8916 ANALOG UNIT

8917 DC/RMS UNIT

Options

9231 RECORDING PAPER (30 m, 6 rolls)

9303 PT

9305 TRIGGER CORD: 3.5 mm dia. mini-plug, 1.5 m approx.

9306 LOGIC PROBE: 4 channel digital / contact signal on/off detection

9307 LINE LOGIC PROBE: 4 isolated channels AC/DC voltage on/off detection

9308 LINE DIP DETECTOR

9369 CARRYING CASE (rigid type)

9370 CARRYING CASE (soft type)

9084 CARRYING CASE (for accessories)

* The 8840/8840-01 cannot operate alone; appropriate input units for the application are also required.

* HIOKI does not supply thermocouples for use with the 8918 TEMPERATURE UNIT. Consult your specialist supplier.

8918 TEMPERATURE UNIT

8919 FFT ANALOG UNIT

9587 GP-IB INTERFACE

9151-02 GP-IB INTERFACE CABLE (2 m)

9151-04 GP-IB INTERFACE CABLE (4 m)

220H PAPER WINDER

9270 CLAMP ON SENSOR: 20 A, 5 Hz to 50 kHz

9271 CLAMP ON SENSOR: 200 A, 5 Hz to 50 kHz

9272 CLAMP ON SENSOR: 20/200 A, 5 Hz to 10 kHz

9277 UNIVERSAL CLAMP ON CT: 20 A, DC to 100 kHz

9278 UNIVERSAL CLAMP ON CT: 200 A, DC to 100 kHz

9279 UNIVERSAL CLAMP ON CT: 500 A, DC to 20 kHz

9555 SENSOR UNIT

9536 UTILITY DISK (for PC9801)

9536-01 UTILITY DISK (for IBM PC/AT)

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