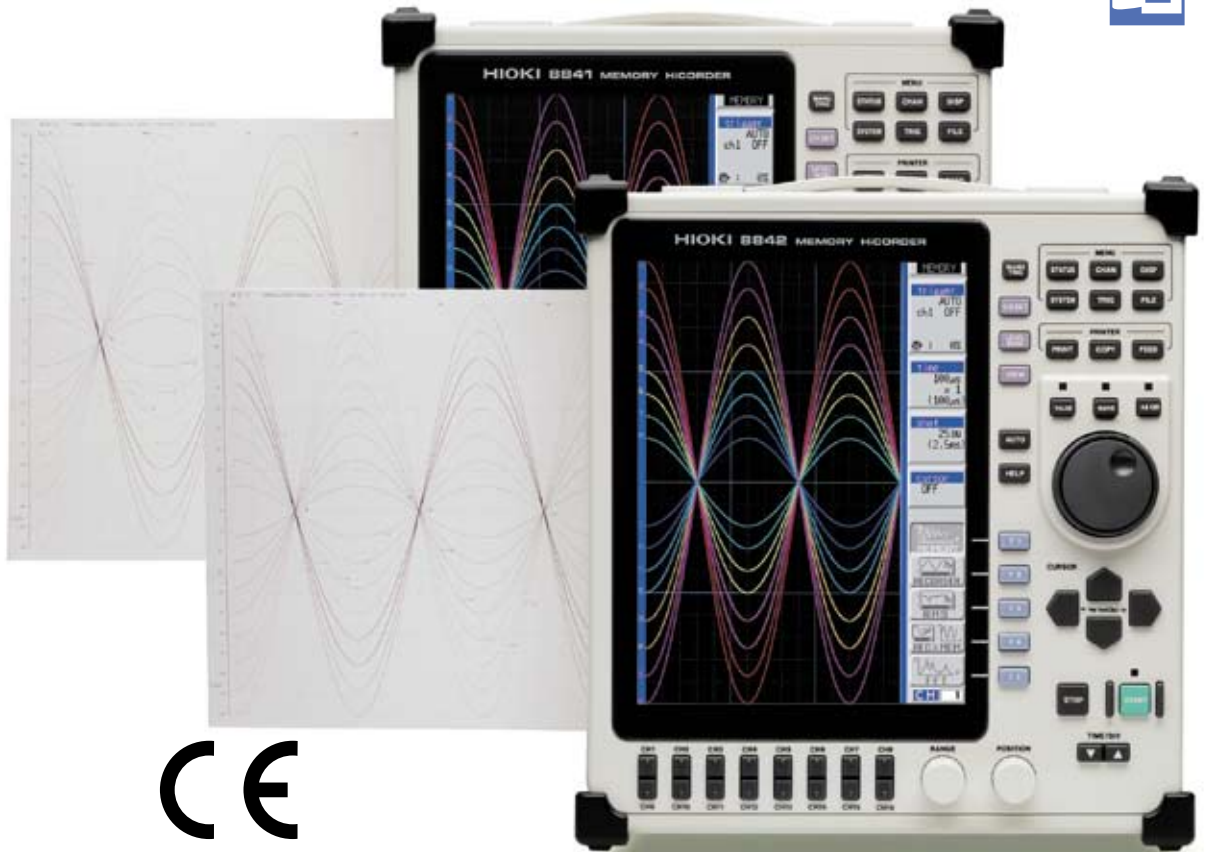


MEMORY HiCORDER 8841/8842

Recorders 



Isolated 16-Channel Recording

Network Recording Instrument for LAN

MEMORY HiCORDER 8841, 8842 is a recording instrument with a unique shape which can be used with A4-wide recording paper, large-sized color screens, desktops, or flatbeds. The new addition of LAN support enables its use with PCs as a recording instrument suitable for the Internet age. It comes with a rich product lineup as input unit for measuring different types of signals. You can select a type most suitable for your needs.



ISO 9001
JMI-0216



ISO14001
JQA-E-90091



<http://www.hioki.co.jp/>

HIOKI company overview, new products, environmental considerations and other information are available on our website.



Dial Knob with Analog Sensibility! Easy-to-use 16-channel Recorder.

- Features -

● Simultaneous measurement in up to 16 analog channels

HIOKI's portable MEMORY HiCORDERs feature 16 isolated input channels. They allow simultaneous measurement in 16 analog + 16 logic channels.

● Dial knob with analog sensibility

The dial knob ensures superior operational ease when setting voltage ranges and zero position. This feature guarantees intuitive operation.

● Capability for PC data processing using a PC card or FD

Type III PC card slot x 1 for flash ATA cards up to 1GB. A floppy disk drive is provided as a standard outfit.

* Note: Optional MO drive unit 9607 is discontinued.

● Compatibility with 8840 floppy disk data

Data measured with the MEMORY HiCORDER 8840 and stored on floppy disks can be read to the 8841 and 8842 and processed with the functions offered by these models.

* Data measured using the 8841/8842 cannot be used with the 8840.

● Large-capacity memory

In the standard memory configuration, a total of 8 mega-words can be stored. With expansion memory installed, capacity is a full 32 mega-words. This provides for up to 2 mega-words per channel when 16 channels are used. Even with high-speed sampling, long-term recording is possible.

● 10.4 inch color TFT display for easy visual identification

The color display makes it easier to identify waveforms and eases installation of devices, and makes the unit all the more easier to operate.

● Internal sampling rate of 1 MS/s, 500 kS/s external sampling rate

The A/D converter that digitizes measurement signals operates at the high sampling rate of 1 M sample/s (1 μ sec cycle). Resolution for the voltage axis is 12 bits. Sampling is carried out for all channels simultaneously.

● Converts to text file used with a Wave viewer (supplied accessories, PC application software)

To open measurement data in PC applications such as Excel, the data must be converted to text data in the CSV format. The PC application software which comes standard in the package enables easy operation.

● Connects to PCs and printers on a LAN network

Its use with PCs can be selected according to the usage. It allows remote operation and data transfer via LAN connection, GP-IB connection, or RS-232C connection.

● On-screen help

Explanation of button operations and many basic operations can be displayed on the screen with the provided online help function.

● Plug-in slots enhance versatility

The number of measurement channels can be matched to the application requirements by using plug-in modules. New types of converter amplifiers and other accessories to be introduced in the future will allow direct measurement of various physical quantities.

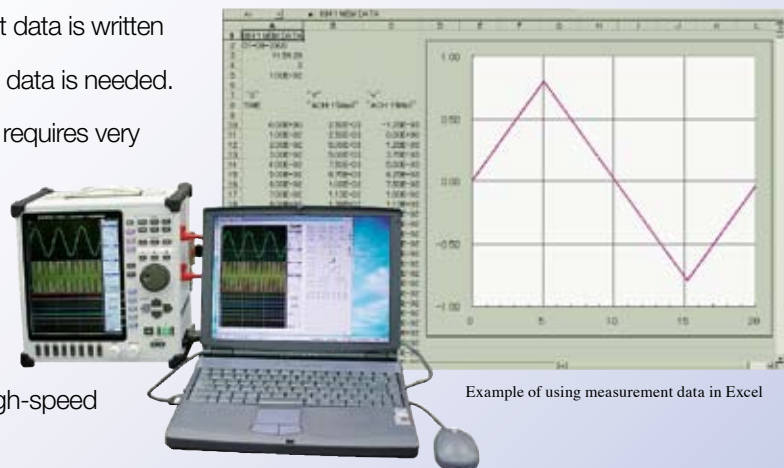
● CE Mark compliant

Complies with the EC directive determining safety standards in Europe (within the EU).

A LAN-Connectable Recorder! Digitally Process Test Data

With a conventional pen recorder, even if all test data is written on the paper, usually only a small portion of the data is needed. However, to look for just a small important part requires very extensive search of the recording paper.

MEMORY HiCORDER 8841, 8842 stores and manages all waveform measurement data electronically. Furthermore, use of a LAN card and **LAN COMMUNICATOR 9333** enables high-speed data file transfer to PCs on a network.



Example of using measurement data in Excel

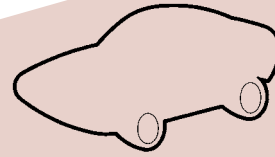
Monitors non-visual (mechanical or electrical) operations and provides support to solving problems

- Application -

Research and development of automobiles (8841)

In vehicle and engine running tests, the relationship among various parameters must be examined. Multi-channel recorders are necessary to accomplish this. While **8841** has retained the size of its predecessor, the **8840**, it allows recording with 16 analog channels + 16 logic channels. Using the DC POWER ADAPTER **9433** enables operation using the vehicle's battery (+12 V/+24 V).

* With the 4ch ANALOG UNIT **8946** (4-channel unit) attached.



■ Engine tuning

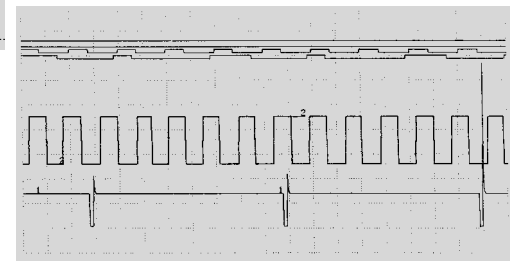
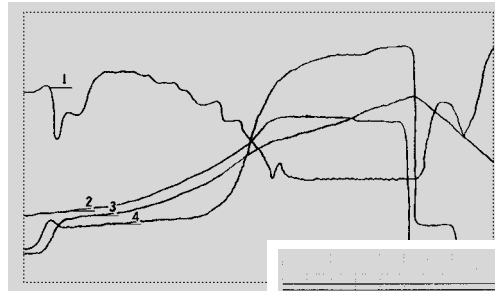
Allows the balance between boost, oil pressure, air fuel ratio, ignition timing, engine speed, injector aperture, etc., to be observed and recorded as waveforms.

■ Analysis of engine characteristics

The pressure waveforms of injection pipes and fuel-injection pumps, etc., can be recorded and stored in the internal memory and then superimposed on a reference waveform for analysis.

■ Evaluation of electrical circuits

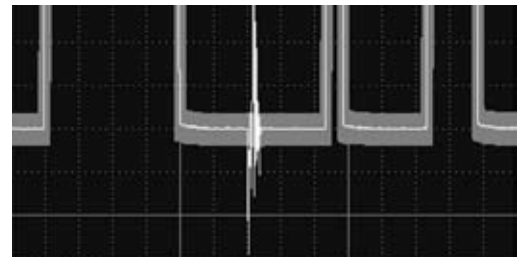
Quality evaluation of meter boards for use in automobiles can be performed by recording and evaluating analog waveforms.



Waveform judgment

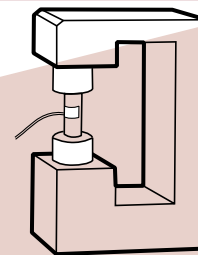
After defining a reference waveform bounding area, it is possible to check whether waveforms go outside this reference area. As opposed to simple voltage level-based triggering, even complex waveforms can be evaluated quickly and reliably, because both the level direction and the time axis direction are taken into consideration simultaneously.

* Registered patent no. 2028013, in Japan



Evaluation of machines and materials

Pressure waveforms can be measured and recorded simultaneously at various points of hydraulic machines to determine whether such machines are operating normally. Using, for example, the recorder's X-Y recording function, performance dispersion check can be conducted by recording the relationship between one cycle operation command signal for an injection molding machine, the pressure and the position change.



■ Analysis of injection molding machine operation

The quality of molded products can be evaluated by recording the relationship between the injection molding machine's operation command and the pressure and position change.

■ Analysis of tensile tests

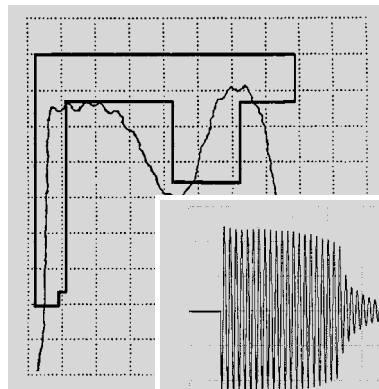
When conducting stretching characteristic test and tensile test of steel tubing, the relationship between load and contraction can be recorded.

■ Recording of motor rush current

The rush current occurring when the power to a motor or a relay is turned on can be accurately measured as a waveform.

■ Servo-controller analysis

The operation of a servo-controller utilizing a PWM inverter and used to control a general motor can be accurately measured as a waveform.



Recorder function X-Y display

The recording time is unlimited in the case of recording an X-Y plot of two analog channels. The channel combination is arbitrary. The X-Y plot can be viewed on the screen, and it can also be printed out as many times as desired, making this more useful than what is offered by standard X-Y recorders.

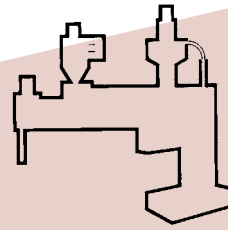
Fast response recorder function

The **8841** and **8842** have a recording function which can print out data onto paper in real-time. Recording continues until the recording paper (30 m per roll) is used up. The recorder functions offered by the **8841** and **8842** outperform others in the way that the recorder's pen response is extremely fast in relation to the sampling speed. The maximum sampling speed is $1 \mu\text{s}$, which is the same as the memory recorder function speed.

- Application -

Vibration analysis

When installing rotating machinery, such as agitators, that create many vibrations, damping precautions are normally taken to ensure that the vibrations are not propagated directly to the floor surface. Analysis of the vibration damping measures and effects can be conducted by measuring the natural frequency and the transfer function.



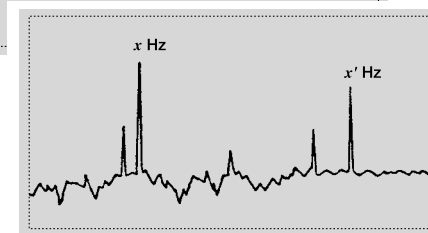
Measurement of the damping of vibrations reaching the solid base from the rotating machinery

By striking the agitator with an impulse hammer, the vibrations propagated to the solid base can be measured by the acceleration speed pick up. Finding the transfer function can show to what extent specific frequencies are being dampened.



Measurement of the natural frequency of objects

Resonance phenomena can be avoided by ensuring that the natural frequency of an object is different from the vibration frequency of the surroundings. By striking the object with an impulse hammer and finding the transfer function, the natural frequency of the object can be found.

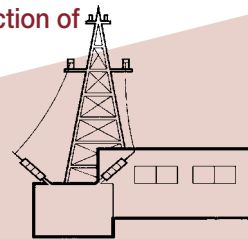


FFT analysis function

FFT capability includes single-signal FFT for analyzing frequency components, two-signal FFT for transfer function analysis, and octave analysis for acoustic analysis. The source signal can be selected from waveform data captured by the memory recorder, and isolating required sections is also possible. (Number of data points: 1000 - 10000)

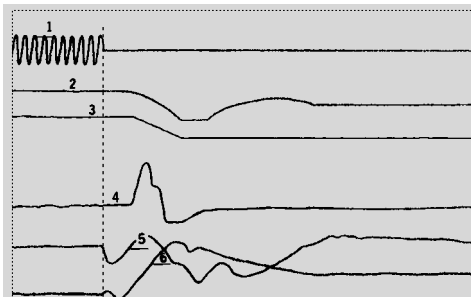
Load shutdown tests in power generation plants and inspection of electric systems

For load shutdown tests in power generation plants, the pre-trigger function can be used to measure and record waveforms before and after the test, enabling accurate analysis. The vernier function, which can be used to perform fine adjustment of amplitudes, is also a useful tool. In the field of electricity, the recorders have many applications, such as recording of rush current frequency, recording of breaker activation timing, and monitoring of power lines for irregularities.



Load shutdown test

Analysis of the relationship between the generator voltage, rotation speed regulation, governor servo operation condition, and the open and close timing of the pressure regulator before and after load shutdown can be performed.

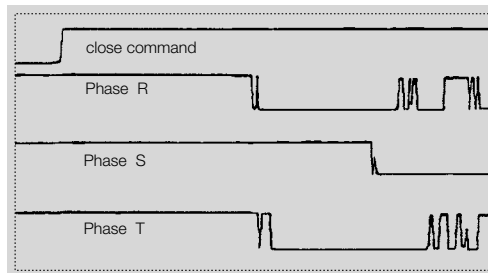


Memory recorder function

The input signal is converted to digital form and stored in the internal memory. It can then be displayed on the screen or printed out on paper. Since the recordable signal speed is determined by the sampling rate and the memory saving rate, it is simple to capture even very fast transient events that escape normal recorders.

CB timing measurement

For inspection of the shutdown timing of circuit breakers for electrical circuits, the relations between logic signals and analog waveforms of multiple points can be analyzed.



All channel inputs isolated

Each channel has its own dedicated A/D converter, allowing simultaneous sampling in all 16 analog channels and in all 16 logic channels.

Momentary loss of power recording

Momentary loss of power in power-supply circuits can be recorded by using the voltage drop detection trigger, thus enabling accurate waveform recording of unexpected events.

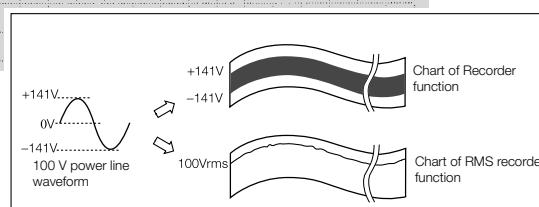


RMS recorder function

This function is exclusively for use on 50/60 Hz power-supply lines and DC. High-speed sampling is applied to calculate the rms value from the waveform data, and the result is recorded as a graph.

Ground fault line detection

To identify the ground fault line of transmission lines, measurement can be conducted using the trigger that combines a leak current meter and the recorder. This allows observation and recording of the waveform before and after ground faulting to identify the line.



*Using 200 μs high-speed sampling, data for two waveforms are captured for calculating the rms value. This process is repeated 20 times per second, resulting in high-speed response that is 10 times faster than that of a digital tester or similar (using a 2-second update rate).

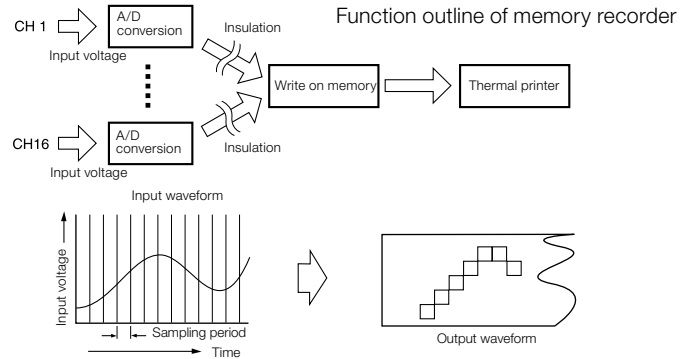
High-Speed Response for Capturing Transient Events

- Function Details -

Large memory capacity allows long-term recording of high-speed data

In the standard configuration, the **8841** and **8842** can store a total of 8 mega-words, and with memory expansion 32 mega-words, using internal solid-state memory. This provides ample capacity to store data for all 16 channels. The table at right shows possible recording times, according to the time axis setting and the number of channels in use. A reduction in the number of channels prolongs the recording time.

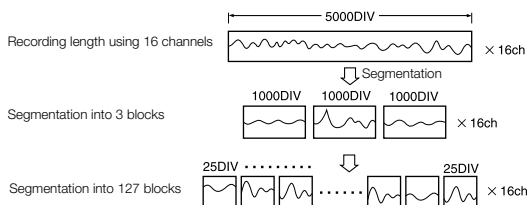
* The table applies to the standard memory configuration. When the optional **MEMORY BOARD 9608** is installed, recording times are extended by a factor of 4 (from 16 mega-words/channel, 160,000 divisions for 2 channels to 2 mega-words/channel, 20,000 divisions for 16 channels).



Memory segmentation function

When using the memory recorder function, the data memory can be divided into a maximum of 255 blocks. Data can be written sequentially to the memory blocks, and the waveform in a reference block and any other block can be superimposed and compared.

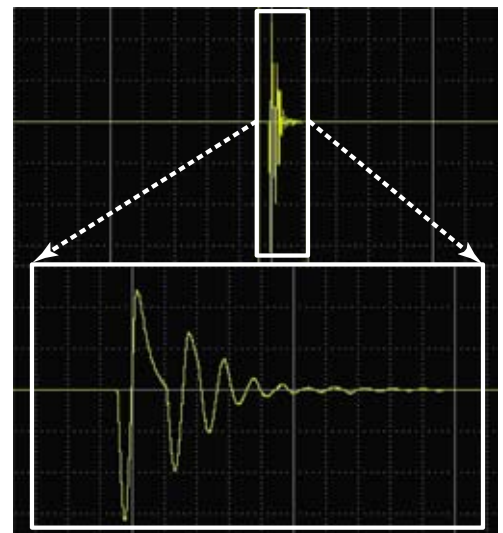
* In the standard memory configuration (8 mega-words), the maximum number of blocks using the 16 channel setting is 127. When the memory expansion is installed, or when the channel setting is 2 to 8, the maximum number of blocks is 255.



Time axis	Sampling period	2-channel setting	
		4 MW/channel 40,000 DIV	16-channel setting 500 kW/channel 5,000 DIV
100µs/DIV	1µs	4 s	0.5 s
200µs/DIV	2µs	8 s	1 s
500µs/DIV	5µs	20 s	2.5 s
1ms/DIV	10µs	40 s	5 s
2ms/DIV	20µs	1 m 20 s	10 s
5ms/DIV	50µs	3 m 20 s	25 s
10ms/DIV	100µs	6 m 40 s	50 s
20ms/DIV	200µs	13 m 20 s	1 m 40 s
50ms/DIV	500µs	33 m 20 s	4 m 10 s
100ms/DIV	1ms	1 h 6 m 40 s	8 m 20 s
200ms/DIV	2ms	2 h 13 m 20 s	16 m 40 s
500ms/DIV	5ms	5 h 33 m 20 s	41 m 40 s
1s/DIV	10ms	11 h 6 m 40 s	1 h 23 m 20 s
2s/DIV	20ms	22 h 13 m 20 s	2 h 46 m 40 s
5s/DIV	50ms	2 days 7 h 33 m 20 s	6 h 56 m 40 s
10s/DIV	100ms	4 days 15 h 6 m 40 s	13 h 53 m 20 s
30s/DIV	300ms	13 days 21 h 20 m	1 day 17 h 40 m
1min/DIV	0.6s	27 days 18 h 40 m	3 days 11 h 20 m
2min/DIV	1.2s	55 days 13 h 20 m	6 days 22 h 40 m
5min/DIV	3.0s	138 days 21 h 20 m	17 days 8 h 40 m

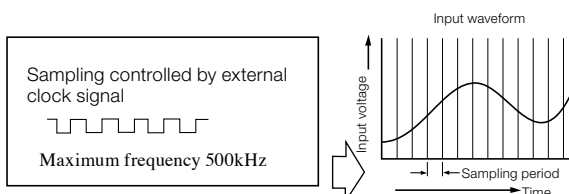
Zoom function *In memory recorder function

To make the most of the large-capacity memory, it is possible to display a compressed waveform simultaneously with a magnified waveform. Since the **8841** and **8842** are capable of storing a large amount of data, high-speed sampling is also possible for waveforms with a long duration. Accordingly, while observing the compressed image of the entire waveform, it is also possible to observe the magnified details of desired parts. Compressed display of a part of the entire waveform is also possible.



Clock input for external sampling *In memory recorder function

The sampling rate for the memory recorder can be controlled by the timing of an external clock signal. This is useful for example to collect data synchronized to the running cycle of an engine.



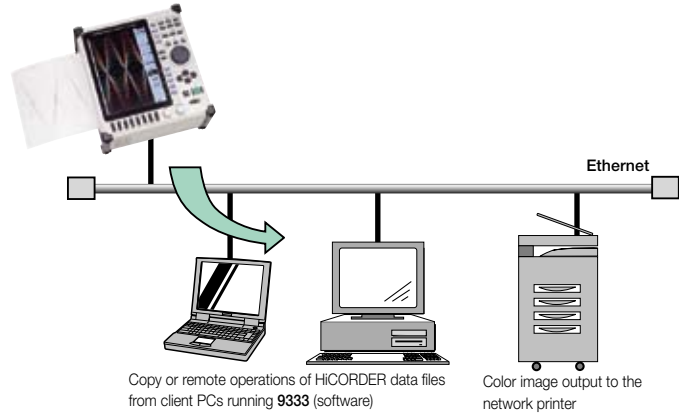
- Function Details -

Support for connection to PCs via Ethernet

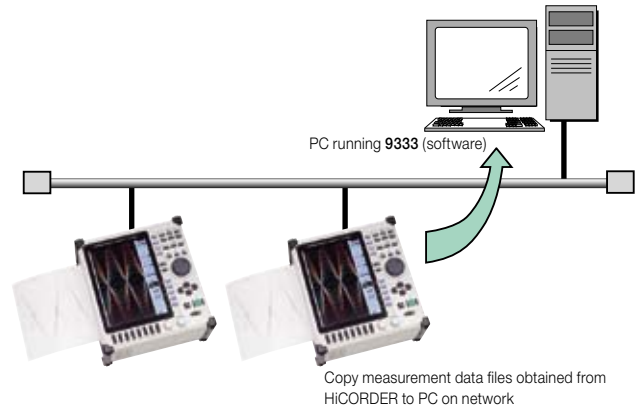
8841/8842 can be connected to Ethernet, a standard network protocol in the Internet age (using the optional LAN CARD and LAN COMMUNICATOR 9333). For those who frequently analyse measurement data on PCs, this function offers a good match. Also, connection to PCs using RS-232C connection or GP-IB connection is possible (using the optional RS-232C CARD 9557 and GP-IB CARD 9558). 8841/8842 data can be sent to PCs or be remotely controlled from PCs.

* Because LAN card, GP-IB card, and RS-232C card all use the same PC card slot of 8841/8842, when one of them is inserted into the PC card slot, then any memory card cannot be used at the same time.

■ Connect HiCORDER to departmental LAN (using TCP/IP communication protocol)



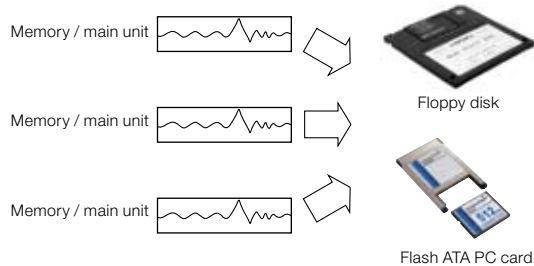
■ Save data to network server (using TCP/IP communication protocol)



Offline data exchange with PCs

The supplied waveform viewer (PC application) can convert saved waveform data to text files (CSV format). For data storage, FD/PC card (supplied as standard) can be used. This allows easy offline data exchange with PCs.

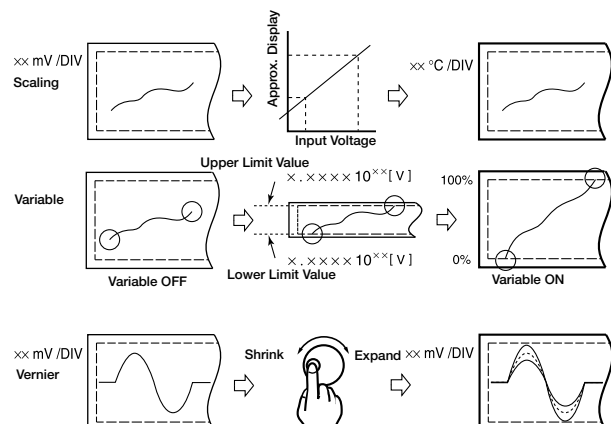
* In addition to HiCORDER's read/write native file (binary format), data can also be saved to text files (CSV format) which can be opened by PC spreadsheet applications, or waveform bitmap files (BMP format). However, because data saved in text files cannot be read by HiCORDER, it is recommended that text data conversion be performed on PCs.



Scaling Functions

Actual measurements usually involve parameters other than voltage. Various physical parameters such as speed, vibration and temperature commonly need to be recorded, and this signal data should be directly readable, without having to be manually converted. In such measurement conditions, the scaling function can be used to automatically convert to the desired parameter value. Additionally, waveform amplitude can be adjusted using the Variable Gain function.

In addition, if accurate input voltage amplitude measurement is not required, the amplitude can be intentionally modified with the Vernier Adjustment function.



- Function Details -

Real time save function *supported in version 2.60 or later

The real time save function enables data to be saved to the PC card while waveform is being measured. The compressed waveform is displayed on the screen at real time. This function is valid at the recorder and memory function. Write to the PC card can be up to 2kS/s (=50ms/DIV) for 8 channels, or up to 1kS/s (100ms/DIV) for 16 channels. With the real time save function, data measured at the pre-determined sampling below the maximum sampling can be saved to the PC card at any time.

In addition, since the same data is compressed along the time axis and displayed on the screen, you can check how recording is going. Compressed data is saved to the PC card for later retrieval.

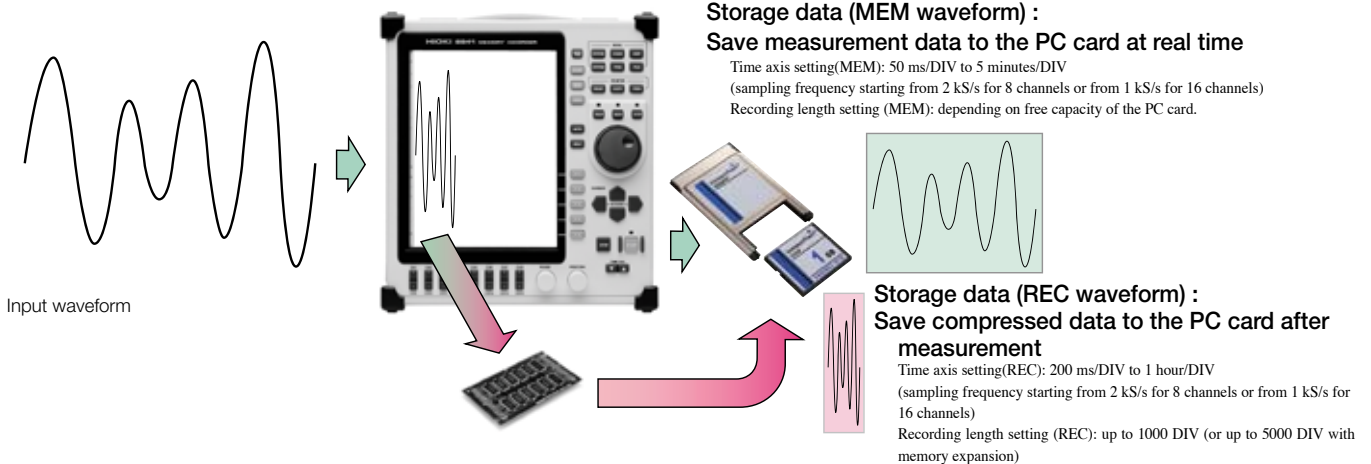
Maximum continuous recording time using 256MB/1GB PC card (with MEMORY BOARD 9608 expansion)

Time axis	Sampling period	256MB PC card	1GB PC card
50ms/DIV	500 μ s	2 h 13 m 12 s	8 h 53 m 4 s
100ms/DIV	1ms	2 h 13 m 12 s	8 h 53 m 3 s
200ms/DIV	2ms	4 h 26 m 22 s	17 h 46 m 2 s
500ms/DIV	5ms	11 h 5 m 50 s	1 day 20 h 24 m 35 s
1s/DIV	10ms	22 h 11 m 20 s	3 days 16 h 47 m 50 s
2s/DIV	20ms	1 day 20 h 21 m 00 s	7 days 9 h 29 m 40 s
5s/DIV	50ms	4 days 14 h 41 m 40 s	18 days 11 h 00 m 00 s
10s/DIV	100ms	9 days 4 h 46 m 40 s	36 days 19 h 31 m 40 s
30s/DIV	300ms	27 days 7 h 5 m	109 days 5 h 40 m
1min/DIV	0.6s	53 days 17 h 00 m	208 days 8 h 00 m
2min/DIV	1.2s	104 days 1 h 00 m	208 days 8 h 00 m
5min/DIV	3.0s	208 days 0 h 00 m	208 days 8 h 00 m

Note: Saved at 8 channels for 50 ms/DIV, or at 16 channels otherwise.

Note: Maximum continuous recording time at MEM function, with time axis is 1 hour/DIV in REC function.

Note: Limit of maximum continuous recording time at MEM function is 208 days and 8 hours.



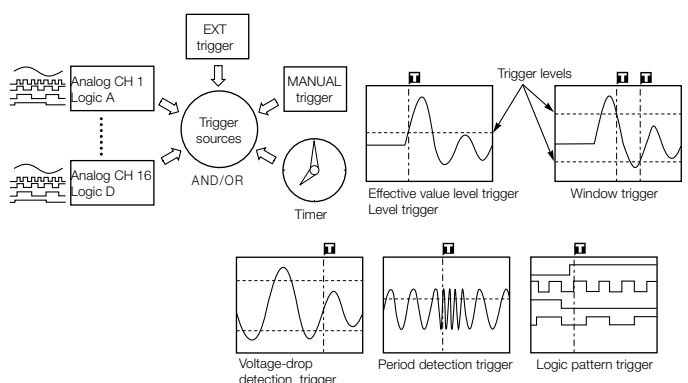
Display data (REC waveform): compressed waveform is displayed on screen Compressed data is saved temporarily in the internal memory.

However, display time axis of REC data is 2 steps later than that of MEM data. The maximum recording time that can be set is determined by the free capacity of the PC card, and the time axis and recording length of MEM/REC. Nevertheless, since the maximum recording length of REC is fixed at 1000 DIV, or 5000 DIV if there is memory expansion, even if there is plenty of free capacity on the PC card, the recording time cannot exceed the value determined by REC time axis multiplied by 1000 DIV.

Trigger functions capable of monitoring all 16 channels

For all of the measurement functions, including record and memory recorder, triggers can be set on all 16 channels. In addition to a simple level trigger based on comparison with a single voltage value, the following trigger functions are also available:

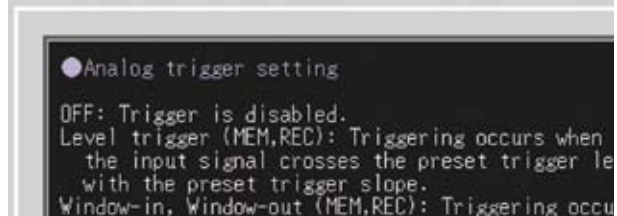
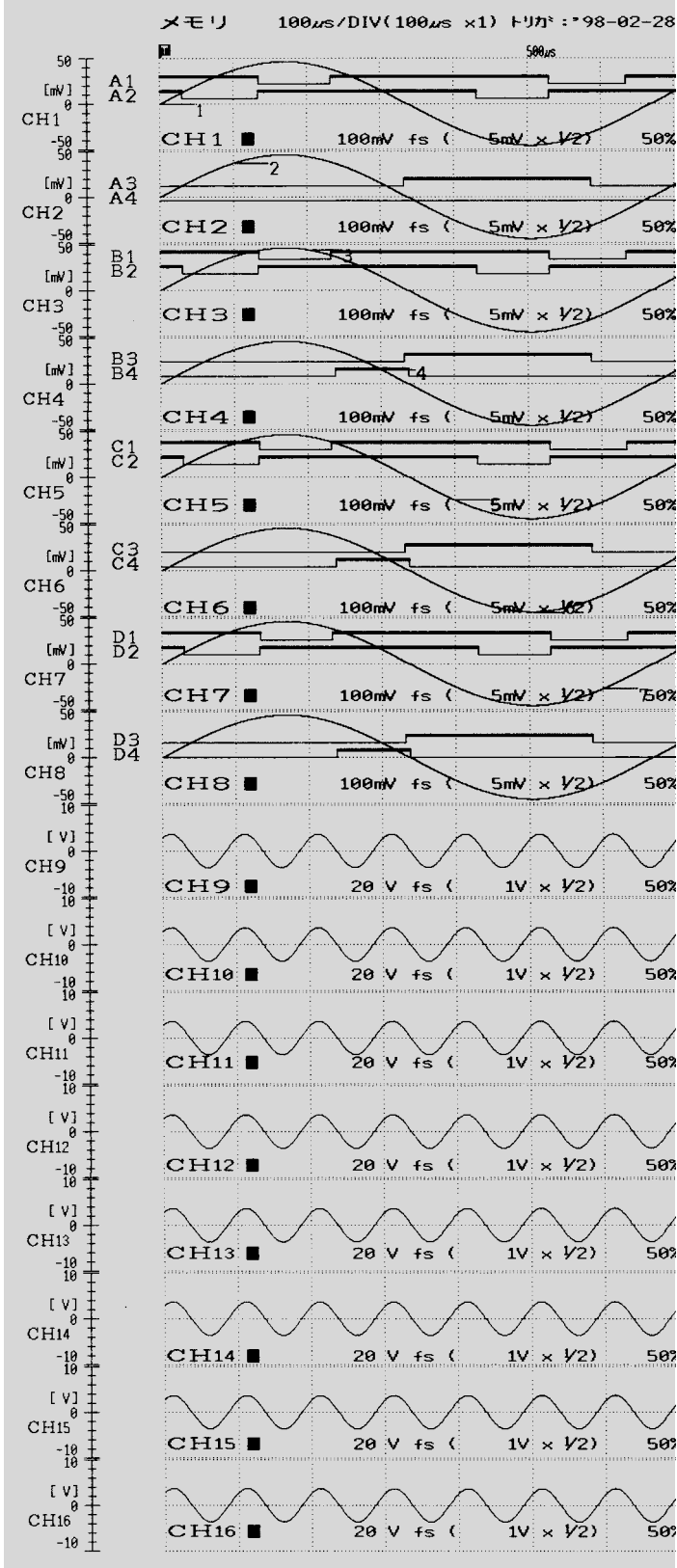
- Window trigger based on 2 voltage values
- Voltage drop trigger for AC power lines
- Level trigger based on rms values
- Cycle trigger monitoring the rising edge of a voltage
- Pattern trigger monitoring the Hi/Low condition of a logic signal



Example Printouts & Screen

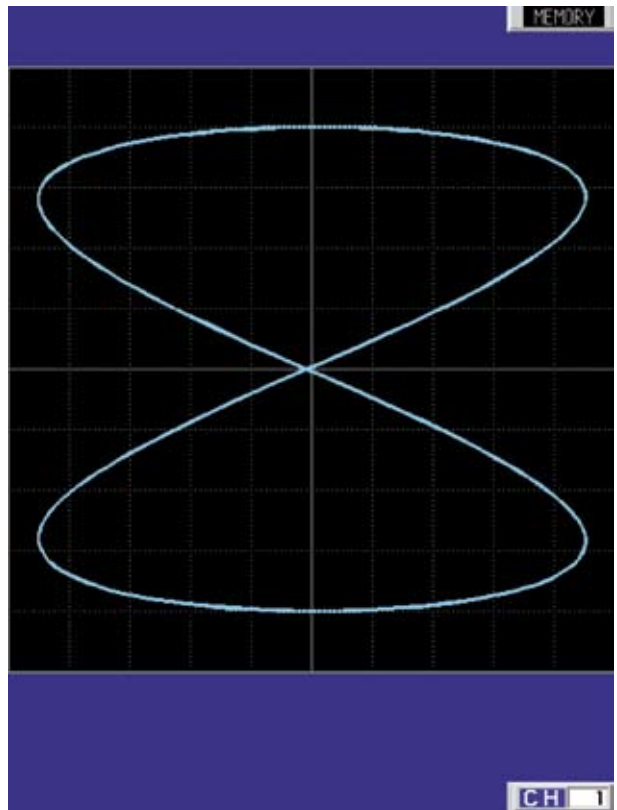
Actual size printout example

Example showing printing in 16 divisions. As illustrated by the picture on the front page, overlapping recording is also possible.



Online help and error indication

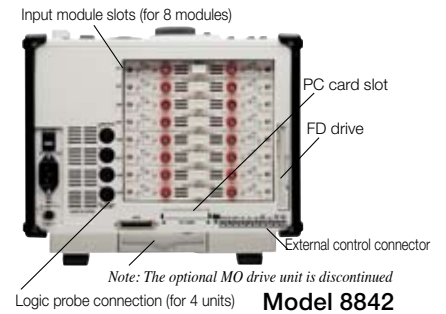
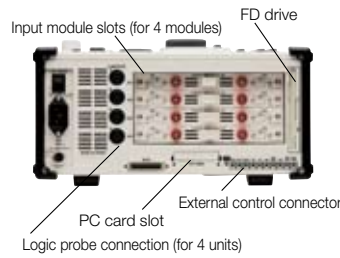
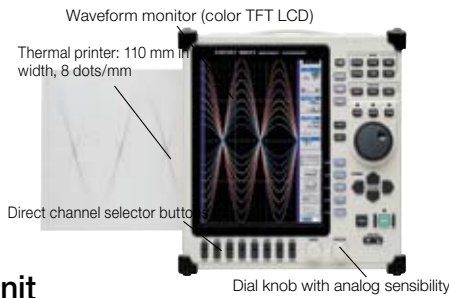
Simply pressing the help key will bring up relevant information on functions and operation steps. If an error has occurred, the reason for it is also displayed to ease operation.



Large screen X-Y display mode *In memory recorder function

X-Y waveforms can be displayed with the memory recorder functions. In particular, the memory recorder function has been enhanced to provide enlarged display in a larger screen area than with display by the recorder function. This provides greater utility than with previous X-Y recorders.

Note: Large screen display is supported from version 2.30 of the MEMORY RECORDERs 8841 and 8842. X-Y waveforms have been made easier to view by utilizing the entire screen display area.



Model 8841

Model 8842

Main unit

Basic specifications	8841 (max. 4 input modules)	8842 (max. 8 input modules)
Input type/number of channels	Plug-in input modules Max. 16 analog ch's + 16 logic ch's (Isolated analog channels, isolated input and frame, logic has common GND)	Plug-in input modules Max. 16 analog ch's + 16 logic ch's (Isolated analog channels, isolated input and frame, logic has common GND)
Measurement functions	MEM (high-speed recording), REC (real-time recording), RMS (50/60Hz, or DC only), REC & MEM (include the Real-time save function), FFT	
Maximum sampling rate	1 MS/second (1 μ s, all channels simultaneously) External sampling (500kS/second, 2 μ s)	
Memory capacity	8 Mwords total : (12 analog bits + 4 logic bits) \times 4 Mwords/channel (2 channels used) to (12 analog bits + 4 logic bits) \times 500 kwords/channel (16 channels used) * Memory capacity can be expanded 4 times.	
Data storage media	PC Card Type III slot \times 1: up to 1GB (Flash ATA) FD drive \times 1: 1.44MB, 1.2MB, 720KB, MS-DOS format File format: Binary, text, BMP Note: The optional MO UNIT 9607 is discontinued	
Backup functions (at 25°C/77°F)	Clock and setting conditions: battery life of at least 10 years Waveform data: none	
External control connectors	Terminal board: external trigger input, trigger output, waveform judgment output, external start/stop, print input, external sampling input.	
Interfaces (option)	GP-IB, RS-232C, LAN Note: Use one of the following: RS-232C CARD 9557, GP-IB CARD 9558, LAN CARD (HIOKI-tested)	
Environmental conditions (no condensation)	Operation: +5°C (41°F) to +40°C (104°F), 35% to 80% rh Storage: -10°C (14°F) to +50°C (122°F), 20% to 90% rh	
Compliance standard	Safety: EN61010 EMC: EN61326, EN61000-3-2, EN61000-3-3	
Power requirements	100 to 240V AC (50/60 Hz) 10 to 28V DC (AC has priority) (use the DC POWER ADAPTER 9433 : option)	
Power consumption (with 8936 full loaded)	300VA, max. for 100V AC (95VA with the printer off) 230VA, max. for 12V DC	300VA, max. for 100V AC (110VA with the printer off) 230VA, max. for 12V DC
Dimensions and mass	280mm (11.02in) W \times 300mm (11.81in) H \times 140mm (5.51in) D, 6kg (211.6oz.) (main unit only)	280mm (11.02in) W \times 300mm (11.81in) H \times 220mm (8.66in) D, 7.5kg (264.6oz.) (main unit only)
Dimensions and mass (with MO UNIT 9607 attached)	280mm (11.02in) W \times 300mm (11.81in) H \times 167mm (6.57in) D, 6.6kg (232.8oz.) (main unit only)	280mm (11.02in) W \times 300mm (11.81in) H \times 247mm (9.72in) D, 8.1kg (285.7oz.) (main unit only)
Supplied accessories	Instruction Manual \times 1, Power cord \times 1, Printer paper \times 1, Protective cover \times 1, Roll paper attachment \times 2, PC card protector \times 1, Application Disk (Wave Viewer Wv, Communication Commands table) \times 1	

Print/display section

Display	10.4 inch TFT color LCD, with English/Japanese selector (480 \times 640 dots)
Recording paper	216 mm (8.50 in) \times 30 mm (98.4 ft), thermal paper roll
Recording width	20 divisions for full scale, 1 DIV = 10 mm (0.39 in) (80 dots)
Paper feed density	10 rows/mm (250 rows/in) * 20 rows/mm (500 rows/in with the memory recorder's smooth print function)
Recording speed	Max. 25 mm/s (0.98 in/s)

Trigger functions

Trigger sources	CH1 to CH16 (analog), CHA to CHD (logic), external, timer, manual (either ON or OFF for each source), logical AND/OR of sources
Trigger types (analog)	Level: Digital setting of voltage. Triggered when set value is exceeded in UP or DOWN direction. Window: When entering or exiting a level range defined by upper or lower limit Voltage drop: Only for AC power lines. Triggered when the peak voltage falls below setting value Period: When rising or falling edge of set voltage does not fall within cycle range RMS level: Only for DC and AC power lines. Triggered when rms value crosses set value in UP or DOWN direction
Level setting resolution	Equivalent to 0.25% when full scale is set to 20 divisions
Trigger types (logic)	Pattern trigger: 1, 0, or \times (disregard), logical product (AND) or logical sum (OR) set for 4 channels
Trigger filter (analog/logic)	OFF, setting range 0.1 to 10.0 DIV; 9 ranges (MEM, MEM waveform in REC & MEM function, FFT function), ON (10 ms)/OFF (REC function)
Other functions	Pre-trigger function to capture pre- and post-trigger waveform, trigger output (active Low and open collector 5V voltage output), Start & stop trigger in REC function

Memory functions

Time axis	100 μ s to 5min/DIV, 20 ranges or external sampling, time axis resolution 100 points/DIV, time axis zoom: \times 2 to \times 10 in 3 stages, compression: 1/2 to 1/10,000 in 12 stages
Sampling rate	1/100 of time axis ranges (minimum sampling period 1 μ s)
External sampling	Max. 500kS/s (minimum sampling period 2 μ s)
Recording length	Settable in 1 DIV steps, 20 to 40,000 DIV*1 *1 Depending on the number of channels in use. With memory expansion max. 160,000 DIV.
Pre-trigger	Can record data from before the trigger point, 0 to 100% or -95% of recording length; 15 settings
Other functions	waveform processing, waveform parameter processing, waveform averaging, memory segmentation (up to 255 segments), logging (numerical printout), X-Y waveform plot, voltage axis zoom \times 2 to \times 10, 3 settings, compression 1/2, zoom, variable display, graph superimposition, waveform judgment function

Recorder functions (time axis waveform and X-Y format)

Time axis	20ms to 1 hr/DIV with 16 ranges, time axis resolution 100 points/DIV, time axis compression: 1/2 to 1/500 in 8 stages At 20ms to 200ms/DIV, printing in real time is not possible, but waveform data are stored in memory and can be monitored on screen. Data are stored for 2,000 divisions before the end of measurement. At recording length settings other than "Continuous", the printer can be used simultaneously, for follow-up printing of waveforms.
Sampling rate	1 μ s to 100ms; 6 settings (selectable from 1/100 or less of time axis)
Recording length	Settable in 1 DIV steps, 25 to 2,000 DIV*2, or "Continuous"*3 At X-Y format: only continuous for X-Y plotting *2 Measure all channels, 10,000 DIV at expanded memory. *3 When time 20 ms - 200 ms/DIV and printer is ON, continuous is not available.
X-Y sampling period	300 μ s; fixed (dot), 300 μ s to 25ms (line)
X-Y axis resolution	32dots/DIV (display), 80dots (horizontal) \times 80 dots (vertical)/DIV (printer)
Waveform memory	Store data for most recent 2,000 DIV (10,000 DIV at expanded memory) in memory. Backward scrolling and re-printing available.
Other functions	logging (numerical printout), additional recording (recording is resumed without overwriting previous data), voltage axis magnification \times 2 to \times 10; 3 settings, compression 1/2; 1 setting, variable display.

RMS Recorder Function (for 50/60 Hz and DC)

Time axis	5s to 1 hr/DIV; 9 settings, time axis compression 1/2 to 500; 8 settings
Sampling rate	200 μ s fixed (20 rms datas/s)
RMS calculation accuracy	\pm 3% f.s.
Recording length	Settable in 1 DIV steps, 25 to 2,000 DIV*4 (10,000 DIV at expanded memory) or "Continuous" *4 Measure all channels.
Waveform memory	Store data for most recent 2,000 DIV (10,000 DIV at expanded memory) in memory. Backward scrolling and re-printing available.
Other functions	logging (numerical printout), additional recording (recording is resumed without overwriting previous data), voltage axis magnification \times 2 to \times 10; 3 settings, compression 1/2; 1 setting, variable display.

Auxiliary Functions

General	Printing of settings including input range, trigger time, etc, cursor measurement, scaling, free comment input, screen hard copy, start condition retention, auto setup, auto saving, remote control, auto ranging, view function, online help, key lock, list printing, level monitor, etc.
Scaling	Scaling: Translation of amplitude gradation only Variable: Arbitrary setting of the upper and lower limit of the waveform display range
Vernier function	Allows precision adjustment of input voltage.
Waveform judgment function (MEM function) (FFT function)	Type: Area judgment using reference waveform for time axis waveform, X-Y plot, or FFT display. Parameter judgment for waveform parameter processing. Judgment output: pass/fail output, open-collector 5V voltage output
Waveform parameter calculation (MEM function)	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, and X-Y area value.
Waveform processing calculations (MEM function)	(Maximum possible calculation up to 1,000 DIV, or 5,000 DIV at expanded memory; accuracy is within the tolerance of the input module.) Four arithmetic operations, absolute value, exponentiation, common logarithm, square root, moving average, differentiation once and twice, integration once and twice, parallel displacement along the time axis, trigonometric functions, reverse trigonometric functions, 16 arbitrary operational equation.

■ Main unit specifications

REC & MEM functions (version 2.00 or later. Real-time save function: version 2.30 or later)	
Time axis (REC)	20ms to 1hour/DIV; 16 settings, 1 DIV = 100 samples, time axis compression 1/2 to 1/500, 8 settings Note: Sampling period 1/100 of time axis range at memory recorder function
Time axis (MEM)	100 μ s to 5 minutes/DIV; 20 settings, 1 DIV = 100 samples, time axis zoom $\times 2$ to $\times 10$; 3 settings, compression 1/2 to 1/10,000, 12 settings Note: Sampling period 1/100 of time axis range (min. 1 μ s)
Recording length	REC: Settable in 1-division steps, 25 to 1,000 DIV (5,000 DIV at expanded memory), or continuous MEM: Settable in 1-division steps, 25 to 2,000 DIV (10,000 DIV at expanded memory)
Trigger source	REC: timer trigger, or OFF MEM: CH1 to CH16 (analog), logic A to D, or external trigger
Real-time save functions <i>Note: Used with the PC card, firmware version 2.60 or later</i>	Time axis: 50ms/DIV to 5 minutes/DIV (less than 8 channels), 100ms/DIV to 5 minutes/DIV (more than 9 channels) (1 DIV=100 samples, sampling period 1/100 of time axis range) Save destination: PC card, or MO disk in the optional MO UNIT 9607 Trigger: trigger settings are not applicable to the MEM waveform, and the start of MEM waveform recording coincides with the start of the REC waveform. Time axis at REC: 200ms/DIV to 1 hour/DIV (less than 8 channels), 500ms/DIV to 1 hour/DIV (more than 9 channels) (1 DIV=100 samples, sampling period 1/100 of time axis range)
Other functions	Only REC waveform is output when printer output is started, reprinting of stored REC waveform data (last 1,000 DIV; or 5,000 DIV at expanded memory), Additional recording function (recording is resumed without overwriting previous data), variable display

FFT functions (version 2.00 or later.)	
Analysis mode	Storage waveform, Linear spectrum, RMS spectrum, Power spectrum, Cross-power spectrum, Auto-correlation function, Histogram, Transfer function, Cross-correlation function, Unit-impulse response, Coherence function, Octave analysis
Analysis channels	1 or 2 selected channels out of all analog channels
Frequency range	133mHz to 400kHz, External, (resolution 1/400, 1/800, 1/2000, 1/4000)
Number of sampling points	1000, 2000, 5000, 10000 points
Windows	Rectangular, Hanning, Exponential
Averaging function	Time axis / frequency axis simple averaging, exponential averaging, peak hold

■ PC Software Specifications

Wave Viewer (Wv) Software (Application disk CD-R, bundled accessory)	
Functions	<ul style="list-style-type: none"> • Simple display of waveform file • Text conversion: convert binary data file to text format, with selectable space or tab separators in addition to CSV, and specifiable section, thinning available • Display format settings: scroll functions, enlarge/reduce display, display channel settings • Others: voltage value trace function, jump to cursor/trigger position function
Compatible PC operating systems	Windows 95/98/Me, Windows NT 4.0 (SP3 or later), 2000, XP

■ Input unit specifications (sold separately)

Dimensions and mass: approx. 170 (6.69in) W \times 20 (0.79in) H \times 148.5 (5.85in) D mm, approx. 290 g (10.2 oz) Accessories: None

ANALOG UNIT 8936 (Accuracy at 23 \pm 5 $^{\circ}$ C/73 \pm 9 $^{\circ}$ F, 35 to 80 % rh after 30 minutes of warm-up time and zero-adjust; accuracy guaranteed for 1 year)	
Measurement functions	Number of channels: 2, for voltage measurement
Input connectors	Isolated BNC connector (input impedance 1M Ω , input capacitance 30pF), Max. rated voltage to earth: 370V 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	5mV to 20V/DIV, 12 ranges, full scale: 20DIV, AC voltage for possible measurement/display using the memory function: 280V rms, low-pass filter: 5Hz/500Hz/5kHz/100kHz
Measurement resolution	1/80 of measurement range (using 12-bit A/D conversion; installed in the 8841/8842)
Highest sampling rate	1MS/s (simultaneous sampling in 2 channels)
Accuracy	DC amplitude: $\pm 0.4\%$ of full scale, zero position: $\pm 0.1\%$ of full scale (after zero adjustment)
Frequency characteristics	DC to 400kHz ± 3 dB, with AC coupling: 7Hz to 400kHz ± 3 dB
Input coupling	DC, GND, AC
Max. allowable input	400V DC (the maximum voltage that can be applied across input pins without damage)

FFT ANALOG UNIT 8938 (Accuracy at 23 \pm 5 $^{\circ}$ C/73 \pm 9 $^{\circ}$ F, 35 to 80 % rh after 30 minutes of warm-up time and zero-adjust; accuracy guaranteed for 1 year)	
Measurement functions	Number of channels: 2, for voltage measurement
Anti-aliasing filter	Integrated filter for suppressing aliasing distortion caused by FFT processing (automatic cutoff frequency setting/OFF)
Other functions	Other specifications same as the ANALOG UNIT 8936

Dimensions and mass: approx. 170 (6.69in) W \times 20 (0.79in) H \times 148.5 (5.85in) D mm, approx. 300 g (10.6 oz) Accessories: None



VOLTAGE/TEMP UNIT 8937 (Accuracy at 23 \pm 5 $^{\circ}$ C/73 \pm 9 $^{\circ}$ F, 35 to 80 % rh after 1 hour of warm-up time and zero-adjust; accuracy guaranteed for 1 year)	
Measurement functions	Number of channels: 2, for voltage measurement/temperature measurement with thermocouple
Input connectors	Voltage input: metallic BNC connector (input impedance 1M Ω , input capacitance 50pF), thermocouple input: terminal connector (input impedance min. 5.1M Ω), Max. rated voltage to earth: 30Vrms or 60V 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)
Voltage measurement range	500 μ V to 2V/DIV, 12 ranges, full scale: 20DIV, low-pass filter: 5Hz/500Hz/5kHz/100kHz, Measurement resolution: 1/80 of measurement range (using 12-bit A/D conversion; installed in the 8841/8842)
Temperature measurement range	10 $^{\circ}$ C to 100 $^{\circ}$ C/DIV, 4 ranges, full scale: 20DIV, low-pass filter: 5Hz/500Hz, Measurement resolution: 1/80 of measurement range (using 12-bit A/D conversion; installed in the 8841/8842)
Thermocouple range	K: -200 to 1350 $^{\circ}$ C, E: -200 to 800 $^{\circ}$ C, J: -200 to 1100 $^{\circ}$ C, T: -200 to 400 $^{\circ}$ C, N: -200 to 1300 $^{\circ}$ C, R: 0 to 1700 $^{\circ}$ C, S: 0 to 1700 $^{\circ}$ C, B: 300 to 1800 $^{\circ}$ C, Reference junction compensation: internal/ external (switchable)
Highest sampling rate	Voltage input: 1MS/s, Temperature measurement: 4KS/s (simultaneous sampling in 2 channels)
Accuracy	Voltage input: DC amplitude $\pm 0.4\%$ of full scale, zero position $\pm 0.15\%$ of full scale, Temperature measurement (K, E, J, T, N): $\pm 0.1\%$ of full scale $\pm 1^{\circ}$ C, $\pm 0.1\%$ of full scale $\pm 2^{\circ}$ C (-200 to 0 $^{\circ}$ C), (R, S): $\pm 0.1\%$ of full scale $\pm 3^{\circ}$ C, (B): $\pm 0.1\%$ of full scale $\pm 4^{\circ}$ C (400 to 1800 $^{\circ}$ C). Reference junction compensation accuracy: $\pm 0.1\%$ of full scale $\pm 1.5^{\circ}$ C (internal reference junction compensation)
Frequency characteristics	Voltage input: DC to 400 kHz +1/-3dB Temperature measurement: DC to 1kHz +1/-3dB
Input coupling	DC, GND, AC
Max. allowable input	30Vrms or 60V DC (the maximum voltage that can be applied across input pins without damage)

Dimensions and mass: approx. 170 (6.69in) W \times 20 (0.79in) H \times 148.5 (5.85in) D mm, approx. 250 g (8.8 oz) Accessories: Conversion cable \times 2



STRAIN UNIT 8939 (Accuracy at 23 \pm 5 $^{\circ}$ C/73 \pm 9 $^{\circ}$ F, 35 to 80 % rh after 1 hour of warm-up time and auto-balancing; accuracy guaranteed for 1 year)	
Measurement functions	Number of channels: 2, for distortion measurement (electronic auto-balancing, balance adjustment range within $\pm 10000\mu$ e)
Input connectors	Via conversion cable, TAJIMI PRC03-12A10-7M10.5, Max. rated voltage to earth: 30Vrms or 60V 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 1k Ω , bridge voltage 2 ± 0.05 V
Measurement range	20 μ e to 1000 μ e/DIV, 6 ranges, full scale: 20DIV, low-pass filter: 10Hz/30Hz/300Hz/3kHz
Measurement resolution	1/80 of measurement range (using 12-bit A/D conversion; installed in 8841/8842)
Highest sampling rate	1MS/s (simultaneous sampling in 2 channels)
Accuracy After auto-balancing	DC amplitude: $\pm (0.5\%$ of full scale + 2 μ e), zero position: $\pm 0.5\%$ of full scale
Frequency characteristics	DC to 20 kHz +1/-3dB
Max. allowable input	10V DC + AC peak (the maximum voltage that can be applied across input pins without damage)

CONVERSION CABLE 9318 (to connect 9270 to 9272, 9277 to 9279 and 8940)
CONVERSION CABLE 9319 (to connect 3273, 3273-50 and 8940)

Dimensions and mass: approx. 170 (6.69in) W \times 20 (0.79in) H \times 148.5 (5.85in) D mm, approx. 300 g (10.6 oz) Accessories: None



F/V UNIT 8940 (Accuracy at 23 \pm 5 $^{\circ}$ C/73 \pm 9 $^{\circ}$ F, 35 to 80 % rh after 30 minutes of warm-up time and zero-adjust; accuracy guaranteed for 1 year)	
Measurement functions	Number of channels: 2, for voltage input based frequency measurement, integration, pulse duty ratio, current (with optional clamp-on sensor), and voltage measurement
Input connectors	Metallic BNC connector (input impedance 1M Ω , input capacitance 60pF), sensor connector (dedicated connector for clamp-on sensor via conversion cable, common ground with recorder), Max. rated voltage to earth: 30Vrms or 60V 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)
Compatible current sensors	9270, 9271, 9272, 9277, 9278, 9279, 3273, 3273-50
Measurement range	Frequency: DC to 100kHz, with 0.05Hz to 5kHz/DIV, 11 ranges, 5 (r/min) to 500 (r/min)/DIV, 5 ranges, P50Hz (40 to 60Hz), P60Hz (50 to 70Hz) * Power line frequency measurement requires the DIFFERENTIAL PROBE 9322 or PT 9303, Accuracy: $\pm 0.2\%$ of full scale (except 10kHz/DIV range), $\pm 0.7\%$ of full scale (10kHz/DIV range), ± 0.032 Hz (P50Hz, P60Hz range) Integration: DC to 90kHz, with 5counts to 500kcounts/DIV, 11 ranges Pulse duty ratio: 10Hz to 100kHz, with 100% of full scale, 1 range, Accuracy: $\pm 1\%$ of full scale (10Hz to 10kHz) Threshold: -10 to +10V (settable in 0.2V steps) Full scale: 10DIV, Max. allowable input: 30Vrms or 60V DC (the maximum voltage that can be applied across input pins without damage)
Measurement range	Voltage: 0.5mV to 2V/DIV, 12 ranges Current: 5mA to 100A/DIV, 10 ranges, using current sensor (powered from the 8940, max. 4 sensors total) DC amplitude accuracy: $\pm 0.4\%$ of full scale, zero position $\pm 0.15\%$ of full scale (current measurement accuracy dependent on sensor accuracy/ characteristics) Frequency characteristics: DC to 400kHz ± 3 dB Full scale: 20DIV, Max. allowable input: 30Vrms or 60V DC (the maximum voltage that can be applied across input pins without damage)
Measurement resolution	1/80 of measurement range (installed in the 8841/8842, excluding current range when using 9279)
Highest sampling rate	1MS/s (simultaneous sampling in 2 channels), (frequency/duty ratio measurement: 1.125 μ s cycle)
Other functions	Voltage input pull-up: ON (10k Ω)/OFF, input coupling: DC, GND, AC (voltage/current), DC (others), low-pass filter: 5Hz/500Hz/5kHz/100kHz

Dimensions and mass: approx. 170 (6.69in) W × 20 (0.79in) H × 148.5 (5.85in) D mm, approx. 310 g (10.9 oz) **Accessories:** None



4ch ANALOG UNIT 8946 <small>(Accuracy at 23 ±5°C/73 ±9°F, 35 to 80 % rh after 30 minutes of warm-up time and zero-adjust; accuracy guaranteed for 1 year)</small>	
Measurement functions	Number of channels: 4, for voltage measurement
Input connectors	Metallic BNC connector (input impedance 1MΩ, input capacitance 15pF), Max. rated voltage to earth: 30Vrms or 60V 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	10mV to 2V/DIV, 8 ranges, full scale: 20DIV, low-pass filter, 5Hz/500Hz/5kHz/50kHz, input coupling: DC, GND
Measurement resolution	1/80 of measurement range (using 12-bit A/D conversion; installed in the 8841/8842)
Highest sampling rate	1MS/s (simultaneous sampling in 4 channels)
Accuracy	DC amplitude: ±0.5% of full scale, zero position: ±0.15% of full scale (after zero adjustment)
Frequency characteristics	DC to 100kHz ±3dB
Max. allowable input	30Vrms or 60V 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 30 cm (0.98 ft), approx. 150 g (5.3 oz)



LOGIC PROBE 9320 <small>(Accuracy at 23 ±5°C/73 ±9°F, 35 to 80% rh; accuracy guaranteed for 1 year)</small>	
Function	Detection of voltage signal or relay contact signal for High/Low state recording
Input	4 channels (common ground between unit and channels), digital/contact input, switchable (contact input can detect open-collector signals), input impedance: 1MΩ (with digital input, 0 to +5V), 500kΩ or more (with digital input, +5 to +50V), pull-up resistance: 2kΩ (contact input: internally pulled up to +5V)
Digital input threshold	1.4V/2.5V/4.0V
Contact input detection resistance	1.5kΩ or higher (open) and 500Ω or lower (short), 3.5kΩ or higher (open) and 1.5kΩ or lower (short), 25kΩ or higher (open) and 8kΩ or lower (short)
Response speed	Detectable pulse width 500ns or lower
Max. allowable input	0 to +50V 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)



LOGIC PROBE 9321 <small>(Accuracy at 23 ±5°C/73 ±9°F, 35 to 80% rh; accuracy guaranteed for 1 year)</small>	
Function	Detection of AC or DC relay drive signal for High/Low state recording. Can also be used for power line interruption detection
Input	4 channels (isolated between unit and channels), HIGH/LOW range switching Input impedance: 100kΩ or higher (HIGH range), 30kΩ or higher (LOW range)
Output (H) detection	170 to 250V AC, ±DC (70 to 250V) (HIGH range) 60 to 150V AC, ±DC (20 to 150V) (LOW range)
Output (L) detection	0 to 30V AC, ±DC (0 to 43V) (HIGH range) 0 to 10V AC, ±DC (0 to 15V) (LOW range)
Response time	Rising edge 1ms max., falling edge 3ms max. (with HIGH range at 200V DC, LOW range at 100V DC)
Maximum allowable input voltage	250Vrms (HIGH range), 150Vrms (LOW range) (the maximum voltage that can be applied across input pins without damage)

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 <small>(Accuracy at 23 ±5°C/73 ±9°F, 35 to 80% rh, after 30 minutes of warm-up time; accuracy guaranteed for 1 year)</small>	
Function	For high-voltage floating measurement, power line surge noise detection, RMS rectified output measurement
DC mode	For waveform monitor output, frequency characteristics: DC to 10MHz (±3dB), amplitude accuracy: ±1% of full scale (at max. 1000V DC), ±3% of full scale (at max. 2000V DC) (full scale: 2000V DC)
AC mode	For detection of power line surge noise, frequency characteristics: 1kHz to 10MHz ±3dB
RMS mode	DC/AC voltage RMS output detection, frequency characteristics: DC, 40Hz to 100kHz, response speed: 200ms or less (400V AC), accuracy: ±1% of full scale (DC, 40Hz to 1kHz), ±4% of full scale (1kHz to 100kHz) (full scale: 1000V AC)
Input	Input type: balanced differential input, input impedance/capacitance: H-L 9MΩ/10pF, H/L-unit 4.5MΩ/20pF, Max. rated voltage to earth: when using grabber clip 1500V AC/DC (CAT II), 600V AC/DC (CAT III), when using alligator clip: 1000V AC/DC (CAT II), 600V AC/DC (CAT III)
Maximum allowable input voltage	2000V DC, 1000V AC (CAT II) 600V AC/DC (CAT III)
Output	Voltage divider for 1/1000 of input, BNC connectors (output switchable for 3 modes DC, AC, RMS)
Power source	Use of the AC ADAPTER 9418-15 (12V DC)

Dimensions and mass: approx. 170 (6.69in) W × 20 (0.79in) H × 148.5 (5.85in) D mm, approx. 310 g (10.9 oz) **Accessories:** None



CHARGE UNIT 8947 <small>(Accuracy at 23 ±5°C/73 ±9°F, 35 to 80 % rh after 1 hour of warm-up time and zero-adjust; accuracy guaranteed for 1 year)</small>	
Measurement functions	Number of channels: 2, for acceleration measurement
Input connectors	Voltage input/integrated preamplifier input: metallic BNC connector (for voltage input: input impedance 1MΩ, input capacitance 200pF or less) Charge input: miniature connector (#10-32 UNF) Max. rated voltage to earth: 30Vrms or 60V 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	Charge input: Charge-output type piezoelectric acceleration pick-up sensor Internal preamp input: Acceleration pick-up sensor with an internal preamp
Measurement range	50m (m/s ²)/DIV to 10k (m/s ²)/DIV, 12 ranges × 6 types, charge input sensitivity: 0.1 to 10 pC/(m/s ²), integrated pre-amplifier input: 0.1 to 10 mV/(m/s ²), amplitude accuracy: ±2% of full scale, frequency characteristics: 1 to 50kHz, +1/-3dB, low-pass filter: 500Hz/5kHz, pre-amplifier drive power source: 2mA ±20%, +15V ±5%, maximum input charge: ±500pC (high-sensitivity setting, 6 ranges), ±50000pC (low-sensitivity setting, 6 ranges)
Measurement range	500μV to 2V/DIV, 12 ranges, DC amplitude accuracy: ±0.4% of full scale, frequency characteristics: DC to 400kHz, +1/-3 dB, low-pass filter: 5Hz/500Hz/5kHz/100kHz, input coupling: DC, GND, AC, Max. allowable input: 30Vrms or 60V DC
Measurement resolution	1/80 to 1/32 of measurement range (depending on measurement sensitivity; installed in the 8841/8842)
Highest sampling rate	1MS/s (simultaneous sampling in 2 channels)
Anti-aliasing filter	Integrated filter for suppressing aliasing distortion caused by FFT processing (automatic cutoff frequency setting/OFF)

LAN COMMUNICATOR 9333



Distribution media	One CD-R
Operating environment	Computer equipped with Pentium (133 MHz) or better CPU, running under Windows 95/98/Me or Windows NT 4.0/ 2000/XP operating system, with network adapter installed and configured to use TCP/IP protocol, and at least 64 MB of memory.
HiCORDER side	Standard LAN connector, LAN card
Communications	Ethernet, TCP/IP
Remote control	Remote control of MEMORY HiCORDER (by sending key codes and receiving images on screen), print reports, 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, Scroll function, enlarge/reduce display, display CH settings.

WAVE PROCESSOR 9335



Distribution media	One CD-R
Operating environment	Computer equipped with Pentium (133 MHz) or better CPU and at least 32 MB of memory, and running under Windows 95/98/Me, Windows NT 4.0/2000/XP, or Windows Vista 32-bit type (recommended system: Pentium (200 MHz) or better with at least 64 MB of memory)
Display functions	Waveform display/X-Y display/digital value display/cursor function/scroll function/maximum number of channels (32 channels analog, 32 channels logic)/gauge display (time, voltage axes)/graphical display
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, tab delimited, space delimited/data culling (simple)/convert for specified channel/batch conversion of multiple files
Print functions	Print formatting (1 up, 2-to-16 up, 2-to-16 rows, X-Y 1-to-4 up) /preview/hard copy functions usable on any printer supported by operating system
Other	Parameter calculation/search/clipboard copy/launching of other applications



Input modules

- ANALOG UNIT 8936
- VOLTAGE/TEMP UNIT 8937
- FFT ANALOG UNIT 8938
- STRAIN UNIT 8939
- F/V UNIT 8940
- (used with the 8841/8842, Ver. 2.10 or later)
- 4ch ANALOG UNIT 8946
- (for the 8841 only, cannot use with the 8842.)
- CHARGE UNIT 8947
- (used with the 8841/8842, Ver. 2.20 or later)

Install by inserting into the main unit. Can be replaced by user.
 Note: Input cables are not supplied. Please purchase the appropriate cable for the intended application.

Logic signal measurement

- LOGIC PROBE 9320**
4-channel type, for voltage/contact signal ON/OFF detection
- LOGIC PROBE 9321**
4 isolated channels, ON/OFF detection of AC/DC voltage

Voltage measurement

- CONNECTION CORD 9197**
For high voltage (up to 500V)
- DIFFERENTIAL PROBE 9322**
For up to 2kV DC or 1kV AC, AC adapter 9418-15 required for operation.
- AC ADAPTER 9418-15**
For powering Differential probe 9322, 100 to 240V AC, 12V/2.5 A
- CONNECTION CORD 9198**
For low voltage (up to 300V)
- POWER CORD 9324**
Use to the 9322 from the logic terminal. * Note that usage restrictions apply.
- CONNECTION CORD 9199**
For low voltage (up to 300V)
- POWER CORD 9325**
Use to the 9322 from the F/V UNIT 8940. * Note that usage restrictions apply.
- CONNECTION CORD 9217**
Insulated BNC connectors at both ends, and connects to insulated BNC connectors
- PT 9303**
Insulation transformer, 400V or 200V AC input, 10V AC output, for AC power line measurement.
- CONNECTION CORD 9165**
Metal BNC connectors at both ends, and connects to metal BNC connectors
- CONVERSION ADAPTER 9199**
Banana-to-BNC, use to connect to insulation-BNC terminal on Input section

MEMORY HiCORDER 8841

* The MEMORY HiCORDER 8841 cannot operate alone. You must install one or more optional input modules in the unit.

MEMORY HiCORDER 8842

* The MEMORY HiCORDER 8842 cannot operate alone. You must install one or more optional input modules in the unit.

Current measurement

- F/V UNIT 8940**
- CONVERSION CABLE 9318** (to connect 9270-9272 and 8940)
- CLAMP ON SENSOR 9270**
5Hz to 50kHz response, up to 20A rms, 2V AC output
- CLAMP ON SENSOR 9271**
5Hz to 50kHz response, up to 200A rms, 2V AC output
- CLAMP ON SENSOR 9272-10**
1Hz to 100kHz response, selectable 20 and 200A rms ranges, 2V AC output
- CONVERSION CABLE 9318**
to connect 9270/9271/9272 and 8940
- SENSOR UNIT 9555-10**
Model 9555-10 is required to power the Clamp-On Sensors, except for connecting Clamp-On Sensor Model 9270, 9271, 9272-10 to Model 8940, and for signal output. Model 9217 Connection Cord is required to connect for input modules.
- CLAMP ON PROBE 9018-10**
Input from 10 to 500A, 40Hz to 3kHz for 0.2V AC output. BNC terminal
- CLAMP ON PROBE 9132-10**
Input from 20 to 1000A, 40Hz to 1kHz for 0.2V AC output. BNC terminal, Not CE certified.
- CLAMP ON LEAK SENSOR 9657-10**
For leak current only, 10A for rated current, 40Hz to 5kHz, output rate 100mV/AAC, BNC terminal

Current measurement

* The 3274, 3275, and 3276 cannot be used for the F/V UNIT 8940

- F/V UNIT 8940**
- CONVERSION CABLE 9318** (to connect 9270-9272 and 8940)
- UNIVERSAL CLAMP ON CT 9277**
Observe waveforms from DC to distorted AC. DC to 100kHz response, input 20A / output 2V AC
- CLAMP ON PROBE 3273-50**
DC to 50MHz wideband response, mA-class current up to 30A rms
- CONVERSION CABLE 9319**
to connect 3273-50 and 8940
- UNIVERSAL CLAMP ON CT 9278**
Observe waveforms from DC to distorted AC. DC to 100kHz response, input 200A / output 2V AC
- CONNECTION CORD 9217**
Cord has insulated BNC connectors at both ends, and connects to the 9555-10 and input modules.
- UNIVERSAL CLAMP ON CT 9279**
Observe waveforms from DC to distorted AC. DC to 20kHz response, input 500A / output 2V AC
- CONVERSION CABLE 9318**
to connect 9277/9278/9279 and 8940
- SENSOR UNIT 9555-10**
Model 9555-10 is required to power the Clamp-On CTs, except for connecting Clamp-On CT Model 9277/78/79 to Model 8940, and for signal output. Model 9217 Connection Cord is required to connect for input modules.

Internal option

- MEMORY BOARD 9608**
Expands main unit memory by 4x. Must specify when ordering; not user installable.
- MO UNIT 9607**
Discontinued

- Supplied with PC Card adapter
- PC CARD 128M 9726**
(128 MB capacity)
- PC CARD 256M 9727**
(256 MB capacity)
- PC CARD 512M 9728**
(512 MB capacity)
- PC CARD 1G 9729**
(1 GB capacity)

- DC POWER ADAPTER 9433**
Supplies operating power in the range 10 to 28V DC.

- CARRYING CASE 9397-01**
(for 8841/8855 only)
With casters for convenient transportation.
- CARRYING CASE 9349**
(for 8842 only)
With casters for convenient transportation.

Printing

- RECORDING PAPER 9231**
216 mm (8.50 in) x 30 m (98.43 ft), 6 rolls set
- PAPER WINDER 220H**
Paper width 70mm (2.75 in) to 220mm (8.66 in), using special-purpose AC adapter

Communication

- RS-232C CARD 9557**
PCMCIA-compliant
- GP-IB CARD 9558**
PCMCIA-compliant, cord length: 2m (6.6ft)
- LAN CARD**
May not operate depending on the environment. .10BASE-T
- LAN CABLE 9642**
Supplied with cross conversion cable, straight Ethernet cable, length: 5m (16.4ft)
- LAN COMMUNICATOR 9333**
Application software to create a LAN connection with Windows 95/98/Me, or Windows NT 4.0/2000/XP.
- WAVE PROCESSOR 9335**
Data conversion, print functions, waveform display, compatible with Windows 95/98/Me, Windows NT 4.0/2000/XP, and Windows Vista 32-bit type.

■ Combination example: 8841 (normal choice of the input unit, up to 200V AC direct input.)

	Main unit	Memory 8MW	4ch	8ch
Model number x quantity	8841x1	standard	8936x2	8936x4
Input cable			9198x4	9198x8

■ Combination example: 8842 (normal choice of the input unit, up to 200V AC direct input.)

	Main unit	Memory 8MW	4ch	8ch	12ch	16ch
Model number x quantity	8842x1	standard	8936x2	8936x4	8936x6	8936x8
Input cable			9198x4	9198x8	9198x12	9198x16

■ Combination example: 8841 (select an automotive input unit that can handle up to 30 V AC.)

	Main unit	Memory 8MW	8ch	16ch
Model number x quantity	8841x1	standard	8946x2	8946x4
Input cable			9198x8	9198x16



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