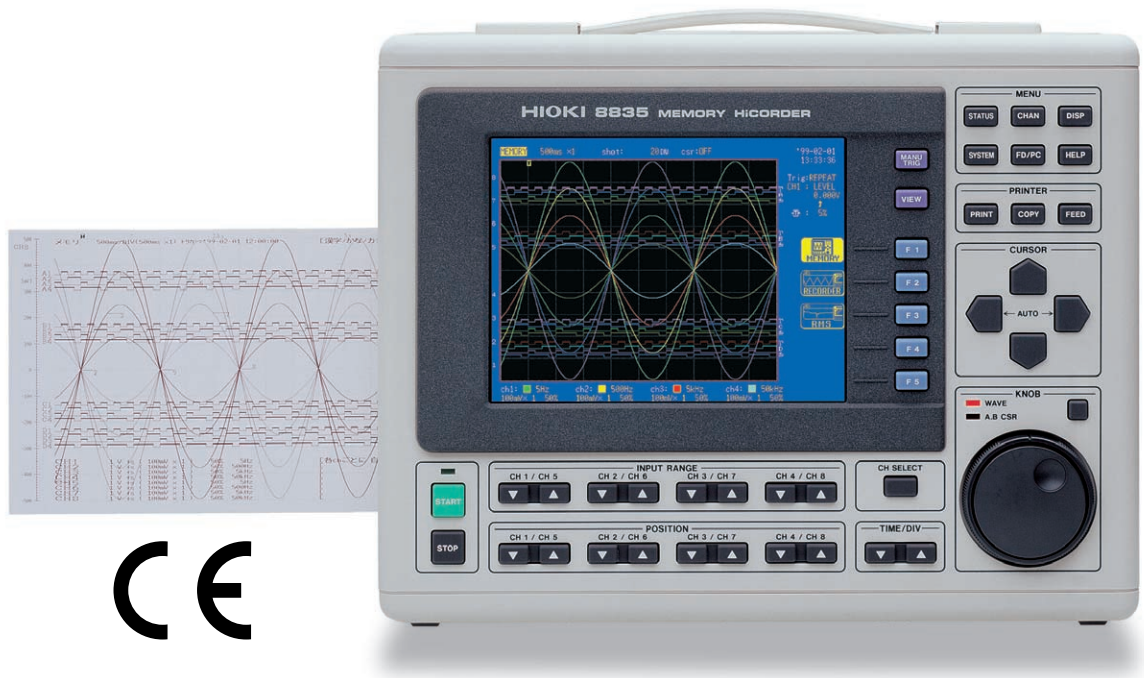# HIOKI

8835-01 MEMORY HiCORDER

Recorders

High-visibility display, Compact body, Multi-channeled inputs

Field Measurement has never been easier

The **8835-01 MEMORY HiCORDER** is a high-speed waveform recorder with the special features of advanced performance of the basic "wave recording" function for easy field measurement, easy-to-see color display, compact dimensions of an A4-sized paper, and 4/8* channels for measurement. The **8835-01 MEMORY HiCORDER** inherits all the functions of the **8835 MEMORY HiCORDER** and accommodates a total of 8* channels when used with the input unit group to support a wide range of signals. The **8835-01** also comes standardly equipped with 8x the memory of the previous unit, making long-term recording possible.
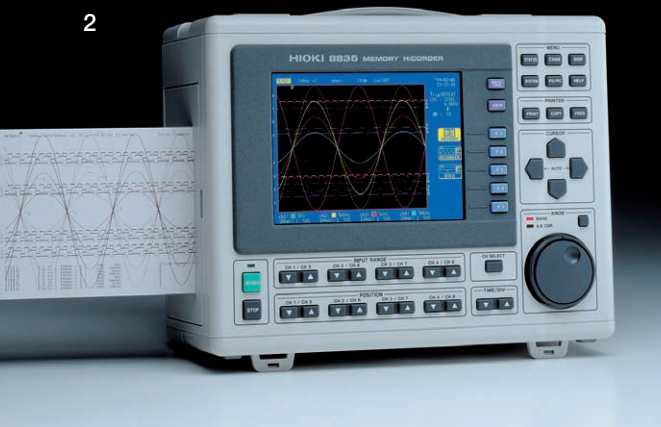
* When using the **8946 4ch ANALOG UNIT**, maximum input is 30 V rms or 60 V DC.

ISO14001 JQA-E-90091

ISO 9001 JMI-0216

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

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

Compact 4/8^{*1} ch recorder saves space with slim profile

CE

- Features -

● **Conversion According to the Measurement, Plug-in Input Function for a Maximum of 8 Channels**[*1]

The 8835-01 employs a plug-in unit system that can change the measurement channels according to the measurement use. Directly inputting physical signals through inserted conversion amplifiers is also possible. A maximum of 8 channels[*1] can be used for measurement by mounting a 4-channel analog unit on the recorder.

[*1] When using the 8946 4ch ANALOG UNIT, maximum input is 30 V rms or 60 V DC

● **High-visibility waveforms displayed on a 6.4-inch color TFT liquid crystal display**

The color display makes it easier to identify waveforms and install the device. It enhances visibility and facilitates operations.

● **Compact and thin, occupying a space equivalent to 60% of an A4-size sheet of paper**

Occupying desktop space equivalent to 60 % of an A4-size sheet of paper, the MEMORY HiCORDER 8835-01 is functionally designed so as to permit operation on a flat bed.

● **Highly Improved Basic Performance with 1MS/s, 12bit-A/D, 4MW**

The 8835-01 employs a sampling rate of 1 MS/s (1 μ s cycle) and 12-bit voltage-axis resolution for the A/D converter unit, which digitizes measurement signals, enabling accurate detection of signal waveforms. With the 8835-01, the standard memory capacity is 4MW.

● **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.

● **Function upgrade system to meet varied needs**

The basic model provides several standard functions for users who don't require functional complexity. Users requiring a wider range of measurement functions can add functions through the use of a function upgrade disk.

● **On-screen help**

To help the user get started or clarify operating steps, the 8835-01 can display tips on-screen for many basic operations, including key-button operations.

● **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.

8835-01 MEMORY HiCORDER stores and manages all waveform measurement data electronically. Furthermore, use of a LAN card and 9333 LAN Communicator enables high-speed data file transfer to PCs on a network.
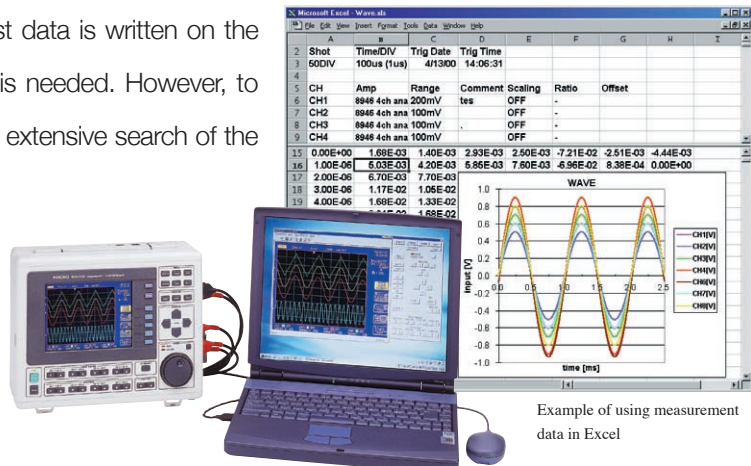
Example of using measurement data in Excel

High-Speed Response for Capturing Transient Events
## - Function Details -

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

The **8835**-01 can store a total of 4 mega-words, using internal solid-state memory. This provides ample capacity to store data for all 8 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.

Function outline of memory recorder
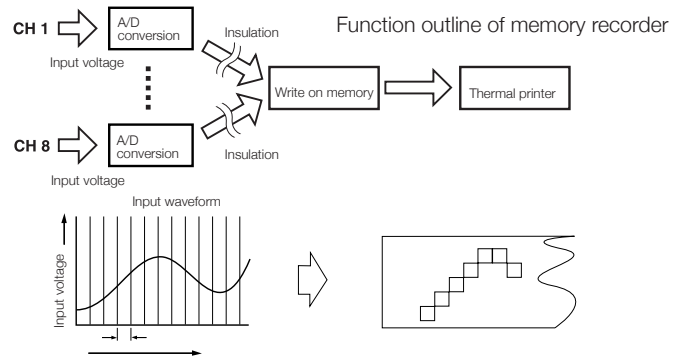
■ Memory segmentation function
#### (an optional 9540-01 FUNCTION UP DISK is needed)

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.
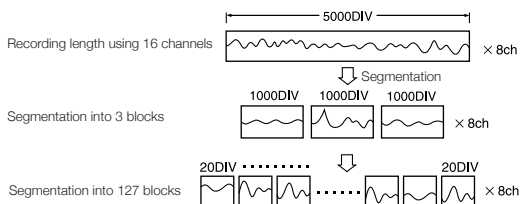
| Time axis	Sampling period	1-channel setting 4 MW/channel, 40000 divisions	8-channel setting 500 kW/channel, 5000 divisions
100 μs /DIV	1 μs	4 s	0.5 s
200 μs /DIV	2 μs	8 s	1 s
500 μs /DIV	5 μs	20 s	2.5 s
1 ms /DIV	10 μs	40 s	5 s
2	20 μs	1 m 20 s	10 s
5	50 μs	3 m 20 s	25 s
10	100 μs	6 m 40 s	50 s
20	200 μs	13 m 20 s	1 m 40 s
50	500 μs	33 m 20 s	4 m 10 s
100	1 ms	1 h 6 m 40 s	8 m 20 s
200	2 ms	2 h 13 m 20 s	16 m 40 s
500	5 ms	5 h 33 m 20 s	41 m 40 s
1 s /DIV	10 ms	11 h 6 m 40 s	1 h 23 m 20 s
2	20 ms	22 h 13 m 20 s	2 h 46 m 40 s
5	50 ms	2 days 7 h 33 m 20 s	6 h 56 m 40 s
10	100 ms	4 days 15 h 6 m 40 s	13 h 53 m 20 s
30	300 ms	13 days 21 h 20 m	1 day 17 h 40 m
1 min /DIV	0.6 s	27 days 18 h 40 m	3 days 11 h 20 m
2	1.2 s	55 days 13 h 20 m	6 days 22 h 40 m
5	3.0 s	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 **8835**-01 is 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.
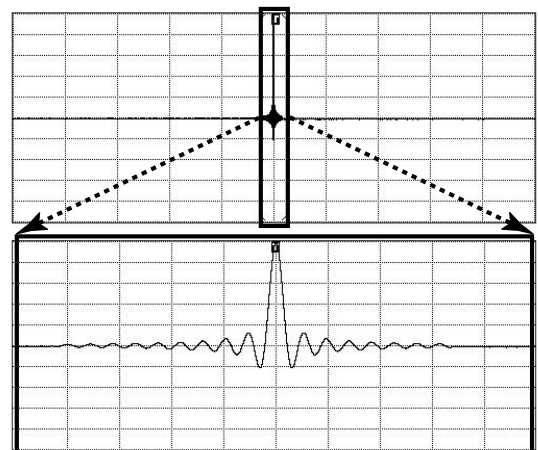
■ Clock input for external sampling *In memory recorder function

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.
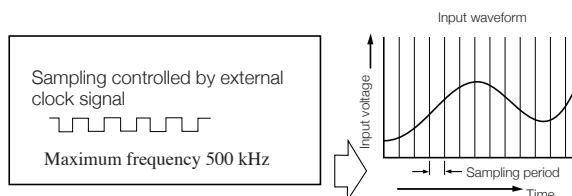
High-speed response and Effective value recorder functions are useful in following signal variations

- Function Details -

Outline of 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 the 500 ms/division range). Even with real-time recording, the last 2000 divisions of the waveform can be observed (by scrolling both horizontally and vertically) and reprinted following measurement.

Recording paper

2000DIV divisions in memory
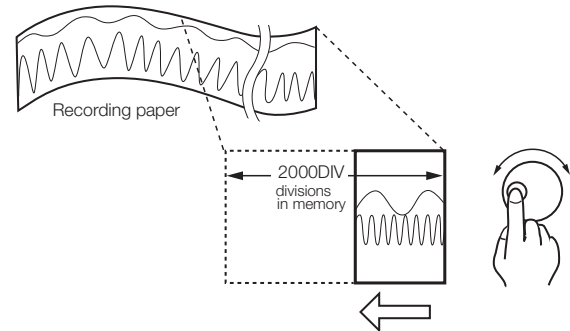
Virtual recording

The 8835-01 supports a high-speed recording function in the memory with no need for recording paper. Although real-time recording on the recording paper is not possible in the high-speed range of the recorder function (10 ms to 200 ms/ division), the waveforms are stored in the memory and can therefore be monitored on the screen. The last 2000 divisions of the waveform are retained in the memory before the measurement is completed. If the recording length is not set to "continuous", the printer can also be operated, allowing waveforms to be printed out later.

Recording Time of the Recorder

Time axis	Chart speed	Sampling frequency	Recording time for approx. 1 roll of recording paper (30m)[*1]
10[*2] ms/DIV		1 μs	20 s
20[*2]	20 mm/sec	10 μs	40 s
50[*2]		100 μs	1 m 40 s
100[*2]			3 m 20 s
200[*2]	20 mm/sec	1 μs, 10 μs 100 μs, 1 ms	6 m 40 s
500 ms/DIV			24 m 45 s
1 s/DIV	10		49 m 30 s
2	5	1 μ, 10 μ, 100 μs 1 ms, 10 ms	1 h 39 m
5	2		4 h 7 m 30 s
10	1		8 h 15 m
30	20 mm/min		24 h 45 m
1 min/DIV	10	1 μs	2 days 1 h 30 m
2	5	10 μs 100 μs	4 days 3 h
5	2	1 ms	10 days 7 h 30 m
10	1	10 ms 100 ms	20 days 15 h
30	20 mm/hour		61 days 21 h
1 hr/DIV	10 mm/hour		123 days 18 h

*1 Based on 2970 divisions, assuming that about 30 cm of the paper length will not be used.
*2 Real-time recording on the recording paper is not possible.

Continuous X-Y recorder function

This function allows two signals converted to digital form to be combined in an x-y plot and stored in memory. Any of the four analog channels can be used for an x-y plot, and up to three x-y plots can be combined. The x-y plot can be viewed on the screen in real time, and the recording time is unlimited. The x-y plot can also be reprinted.

Y input

X input

X-Y matrix memory

Display

Illustration of X-Y recorder concept
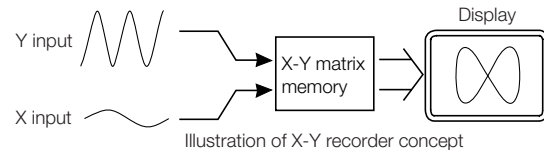
Effective value (RMS-value) recorder function

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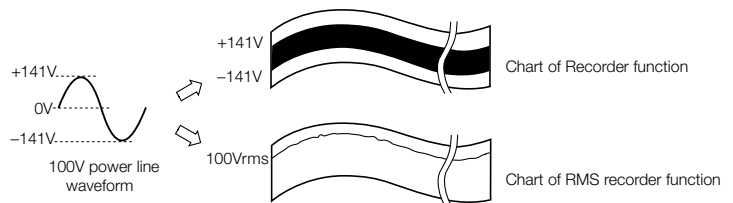
* Using fixed 200 μs sampling, data for two waveforms are captured for calculating the rms value. This process is repeated 20 times per second, resulting in high-speed response that is 10 times faster than that of a digital tester or similar (using a 2-second update rate).

+141V
0V
−141V
100V power line waveform

+141V
−141V
Chart of Recorder function

100Vrms
Chart of RMS recorder function

PC friendly

Support for connection to PCs via Ethernet

8835-01 can be connected to Ethernet, a standard network protocol in the Internet age (using the optional **9578 10BASE-T LAN CARD** and **9333 LAN COMMUNICATOR**). 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 **9557 RS-232C CARD** and **9558 GP-IB CARD**). **8835**-01 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 **8835-01**, when one of them is inserted into the PC card slot, then any memory card (SRAM, flash ATA, or hard disk card) cannot be used at the same time.
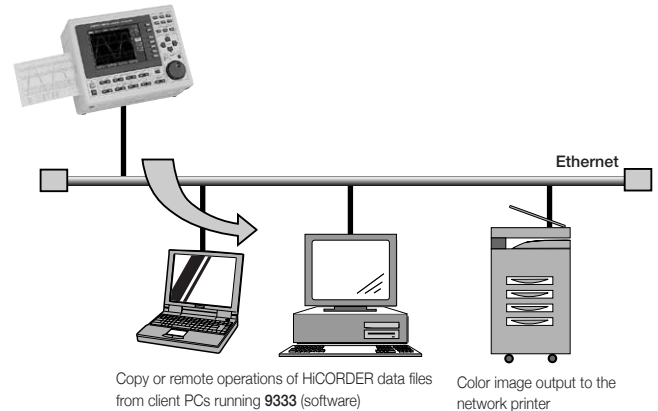
Advantages of Ethernet and TCP/IP Connected Systems
● Cable length may be up to 100 meters using 10Base-T.
● Data can be used immediately by an application program on the PC (**9333 LAN COMMUNICATOR**).
● Less susceptible to errors compared with RS-232C communications, and faulty data is automatically resent.
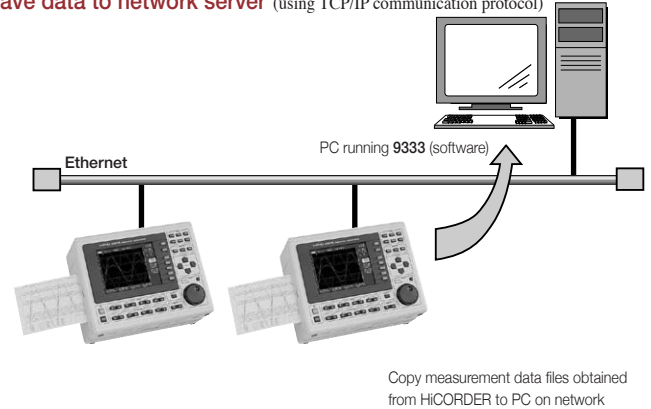● Installation costs at the PC side are lower than GP-IB.

Disadvantages of Ethernet and TCP/IP Connected Systems
● Transfer time depends on network usage, because the network is shared with other LAN devices.
● Transfer time between other devices on the LAN may be affected, depending on the amount of data transferred from the recorder.

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

Ethernet

Copy or remote operations of HiCORDER data files from client PCs running **9333** (software)

Color image output to the network printer

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

PC running **9333** (software)

Ethernet

Copy measurement data files obtained from HiCORDER to PC on network

Offline data exchange with PCs

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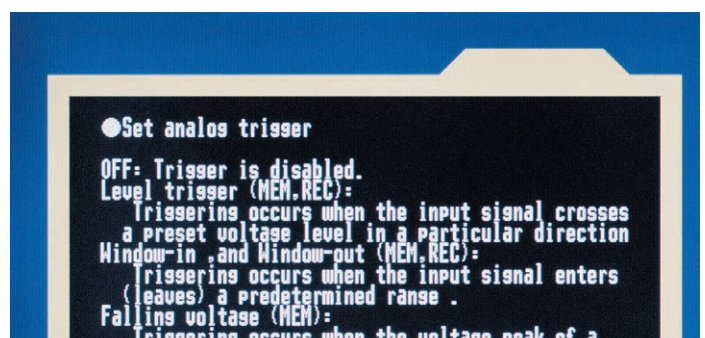For data storage, FD/PC card (supplied as standard) can be used. This allows easy offline data exchange with PCs.

Memory / main unit

Memory / main unit

Memory / main unit

Floppy disk

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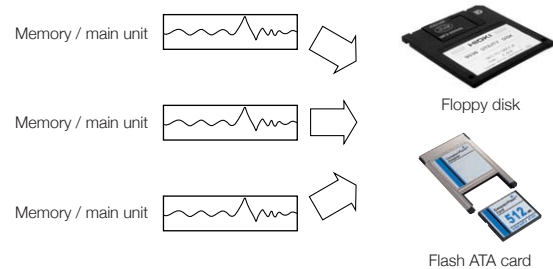
* In addition to HiCORDER's read/write native file (binary format), data can also be saved to text files (CSV format) which can be opened by PC spreadsheet applications, or waveform bitmap files (BMP format). However, because data saved in text files cannot be read by HiCORDER, it is recommended that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

Online help function

To ease the task of completely memorizing the enhanced features of the **8835**-01, such as trigger settings and button functions, press the help button, and the **8835**-01 will display tips which describe the intended operations on-screen.

●Set analog trigger

OFF: Trigger is disabled.
Level trigger (MEM.REC):
    Triggering occurs when the input signal crosses a preset voltage level in a particular direction
Window-in and Window-out (MEM.REC):
    Triggering occurs when the input signal enters (leaves) a predetermined range.
Falling voltage (MEM):
   Triggering occurs when the voltage peak of a

- Function Details -

## Trigger functions for monitoring of all four channels

In all of the functions, including the memory recorder and recorder, all eight analog input channels and sixteen logic input channels can be used for trigger input. In addition to a level trigger, which compares voltages based on a reference value, the **8835**-01 supports the following triggers:

● Window trigger that compares voltages based on two reference values
● Voltage-drop detection trigger that detects voltage drops in commercial power lines
● RMS-value level trigger that compares signals based on the RMS-value level
● Period detection trigger that measures periods and detects all deviating periods
● Pattern trigger that compares signals based on the logic signal ON/OFF pattern
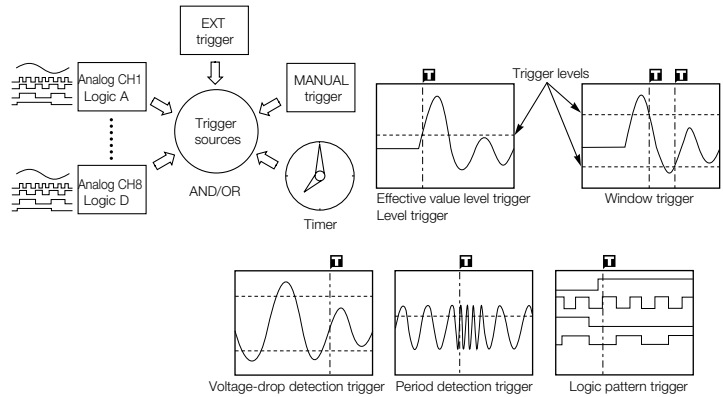
Variable (span adjustment), vernier (fine adjustment)

When sensors are used to measure and record noise, temperature, acceleration or other physical quantities, precise calibration is important. This is facilitated by the vernier function that allows fine adjustment of amplitude. The variable function lets the user numerically specify the measurement span, such as 1 - 5 V or 4 - 20 mA. This is useful for matching the range of instrumentation to the full span of the recording paper. A scaling function for converting measurement results is also available.
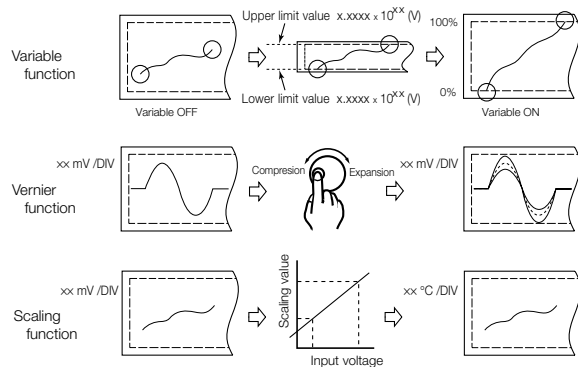
Manipulation using the cursor

Use of the two cursors on the screen enables the user to read the time difference and potential difference.
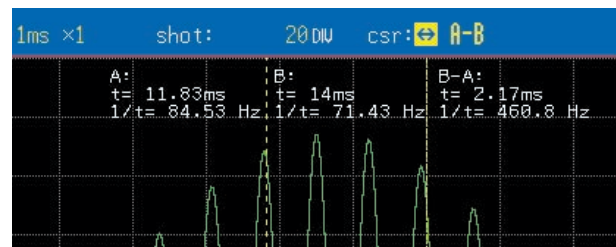
Signal outputs, control inputs, DC input

The results of waveform decisions, parameter decisions, and triggers are output as open collector signals. The **8835**-01 is also provided with signal inputs for remote control of the start, stop, and print buttons.

The **8835**-01 has a dual AC/DC power-supply specification, and an external battery can be used by means of a **9439 DC POWER ADAPTER**, in addition to normal AC power supply. This allows vehicle-mounted applications, where an AC power supply is not available. If both supplies are connected, the AC power supply takes precedence, but if the AC power fails, the unit automatically switches to DC operation.
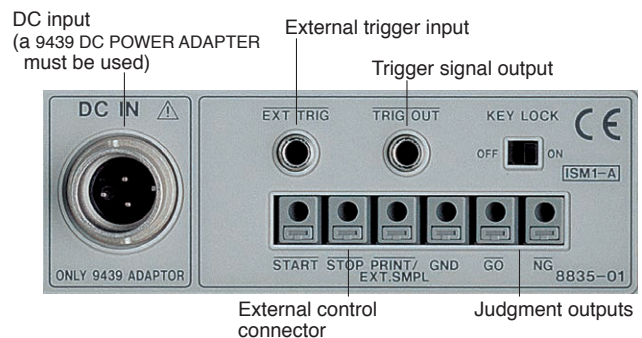
*When using the 8940 F/V UNIT with 12 V DC power, the printer can only be used for up to 2 channels.

Upgrading provides sophisticated functions

Additional functions provided by the 9540-01 FUNCTION UP DISK (with the 8835, use the 9540 FUNCTION UP DISK)
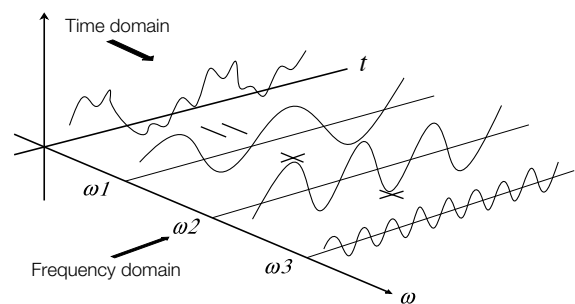
Recorder and memory functions

If an abnormal event is detected by triggers during the real-time recording of signals using the recorder function, it is stored in memory by the high-speed sampling memory recorder. The recorder function works independently and is therefore continuous. These functions are useful when the user wants to record normal waveforms as well as abnormal waveforms.

Slow speed recording

High speed storage in memory
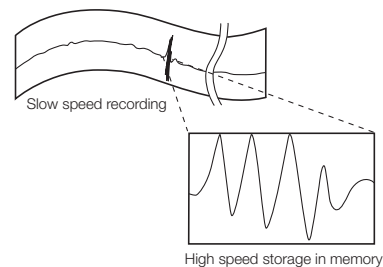
FFT analysis functions

The single-channel FFT function is used in spectrum analysis. The two-channel FFT function analyzes transfer functions. The octave analysis function is used in acoustic analysis. The signal source for FFT analysis is a section obtained from the waveforms captured in the memory recorder (the required number of pieces of data for FFT analysis are 1000, 2000, 5000 and 10000).

Time domain

t

$\omega 1$

$\omega 2$

Frequency domain

$\omega 3$

ω

Waveform and parameter judgment functions
*In memory recorder functions and FFT analysis functions

Waveforms captured in memory recorder mode are monitored in a predetermined bounding area. Similarly, it is possible to use a numerical determination that monitors the parameter operation results of the input waveform based on a predetermined reference value.

Waveform judgment

Parameter judgment
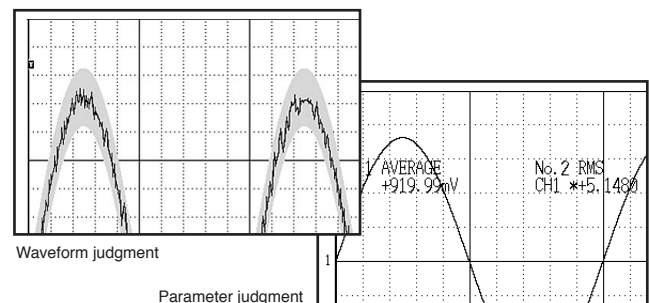
Simultaneous computation on eight channels

It is possible to simultaneously compute four different types of waveforms, each of which has been captured on one of the eight channels in memory recorder mode. The results of four basic arithmetic computations, differentiation, or integral are displayed in a waveform.
(The waveform computation requires a **9540-01 FUNCTION UP DISK**. With the **8835**, the waveform computation requires a **9540 FUNCTION UP DISK**.)

For parameter calculations that calculate numerical values such as the maximum and minimum values, up to eight waveforms can be operated simultaneously on four channels.
(The parameter operations are a standard function.)

Example Printouts

(Actual size)
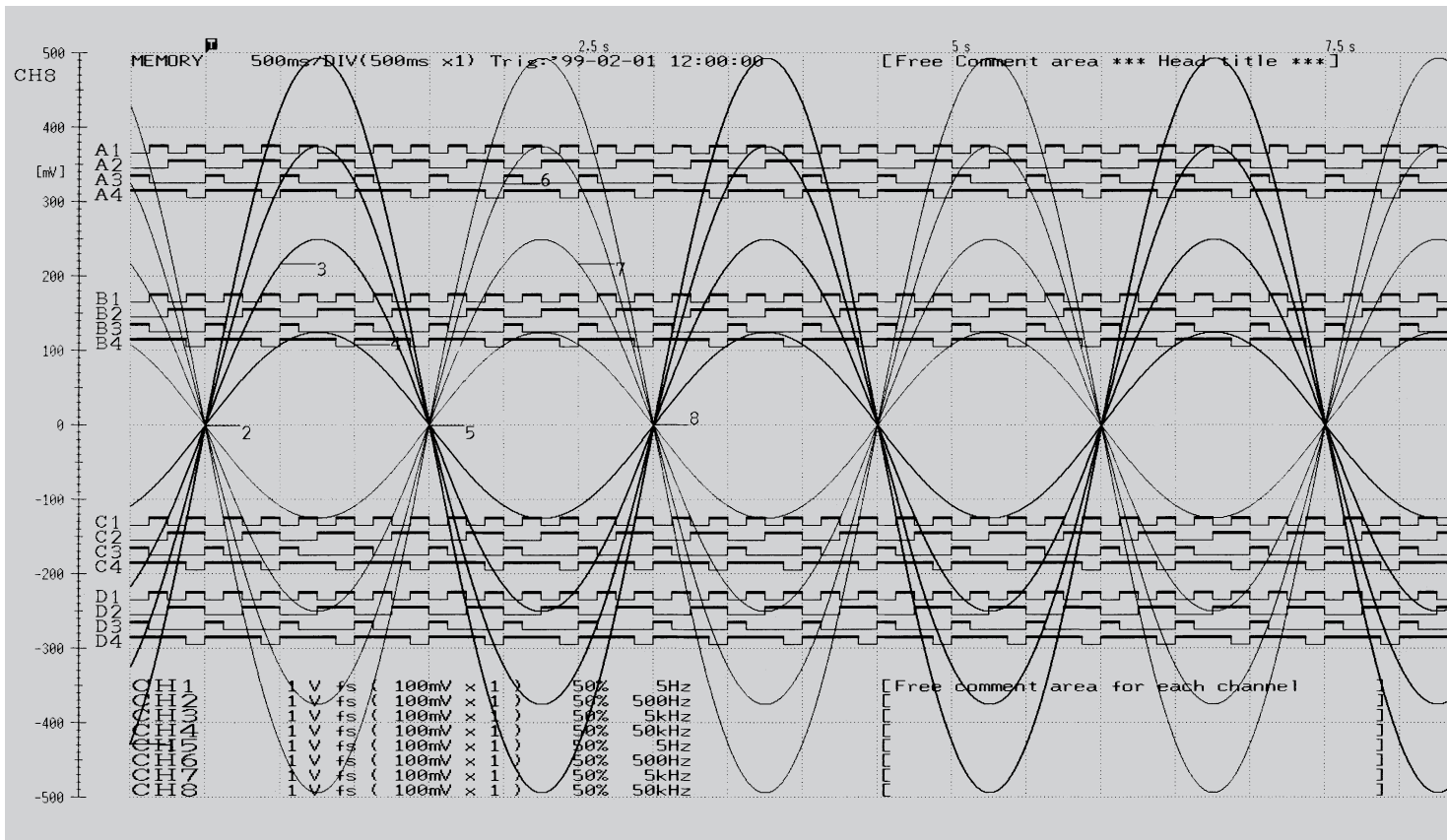
Sample recording in memory recorder function (full width)
The recording width can also be divided into two or four parts, and X-Y plots are possible.

Sample recording (two sections)

Sample recording (four sections)
Full-width recordings and recordings divided into two or four parts are also possible.
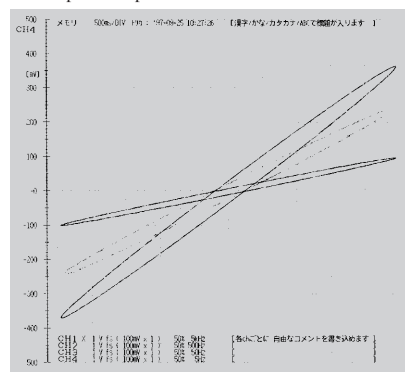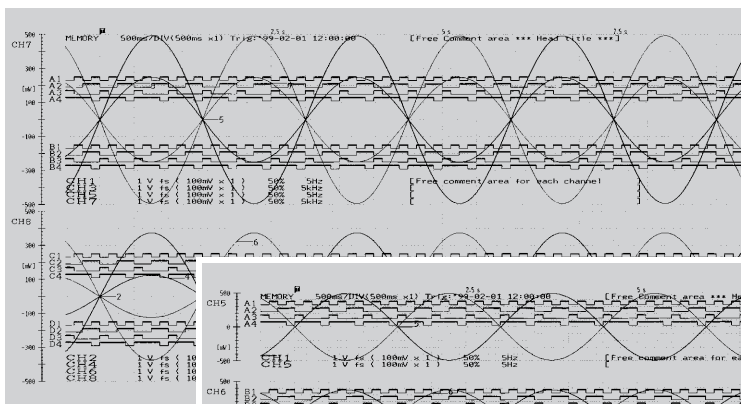
Sample recording in X-Y format
* Example when used with 1-4 channels set

Synthesized X-Y waveforms can be output where amplitude data for each input channel is plotted on the vertical and horizontal axes, based on the waveform data obtained using the memory recorder. The recording size is 100 mm × 100 mm.

Although the sample print out is in Japanese, the actual print out appears in English. (Two languages selectable)

Logging output * Example when used with 1-4 channels set

Instantaneous voltage values are printed for each sampling.
Although the sample print out is in Japanese, the actual print out appears in English. (Two languages selectable)

Select the Input Module for Your Application

- Product Specifications -

(accuracy at 23 ±5°C/ 73 ±9°F is guaranteed for 1 year)

8835-01 MEMORY HiCORDER Basic Specifications

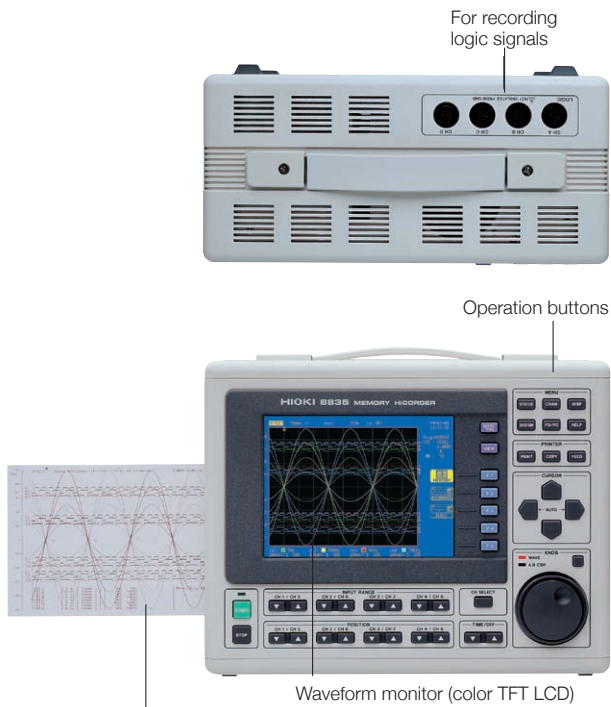|	
Measurement functions	(1) Memory recorder, (2) Recorder, (3) RMS recorder (50/60 Hz/ or DC only)
Input type and number of channels	Plug-in input modules 4 analog + 16 logic, 8* analog + 16 logic / * when using 4-channel unit * Isolated analog channels, isolated input and frame, logic has common GND.
Maximum sampling rate	1 M sample/s (1 μs cycle) * Simultaneous sampling for 8 analog + 16 logic channels
Memory capacity	12 bits × 4 mega-words/channel (1 channels used) to 12 bits × 500 kilo-words/channel (8 channels used)
File storage	Floppy disk drive × 1: 1.44 M/1.2 M/720 KB, MS-DOS format Type Ⅲ PC card slot × 1: For flash ATA cards up to 528 MB. File format: Binary, text, BMP
Battery backup	Waveform data; battery life of at least 1 hour after system power is turned OFF (at 2 minutes after power-on) Clock and setting conditions; battery life of at least 10 years (at 25°C)
External control connector	**Mini-jack 3.5 mm in dia.:** Trigger input/output **Terminal board:** External start, stop, print input/sampling input, decision output
Interfaces (option)	GP-IB, RS-232C, LAN * Use one of the following: **9557 RS-232C CARD, 9558 GP-IB CARD, LAN CARD (HIOKI-tested)**
Environment 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
Power requirements	100 to 120 VAC or 200 to 240 VAC (50/60 Hz) * Arange of 10 to 28 VDC is applicable during use of the 9439 DC POWER ADAPTER.
Power consumption (when using two units of 8936)	120 VA, max. for 100 VAC (approx. 60 VA with the printer off) 70 VA, max. for 12 VDC (approx. 30 VA with the printer off)
Power consumption (when using two units of 8940)	170 VA, max. for 100 VAC (approx. 110 VA with the printer off) 80 VA, max. for 12 VDC (approx. 50 VA with the printer off) * When using the 8940 F/V UNIT with 12 VDC power, the printer can only be used for up to 2 channels.
Dimensions and mass	285 (W) × 220 (H) × 132 (D)mm 11.22 (W) × 8.66 (H) × 5.20 (D)inch, 4.5 kg (158.73 oz.) (main unit only)
Supplied accessories	Power cord ×1, Printer paper ×1, Protective cover ×1, Roll paper attachment ×2, PC card protector ×1, Wave viewer software ×1

Recording and Display Section

Printer paper	110 mm (4.33 inch) × 30 m (98.4 feet), thermal paper roll
Recording width	10 divisions for full scale, 1 DIV = 10 mm (0.39 inch) (80 dots)
Paper feed density	10 rows/mm (250 rows/inch) * 20 rows/mm (500 rows/inch with the memory recorder's smooth print function
Recording speed	Max. 25 mm/s (0.98 inch/s)
Display method	6.4 inch TFT color LCD, with English/Japanese selector * 480 × 640 dots

Trigger Function

Trigger source	CH1 to CH8 (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 RMS level: Only for DC and AC power lines. Triggered when rms value crosses set value in UP or DOWN direction Period: When rising or falling edge of set voltage does not fall within cycle range
Level setting resolution	Equivalent to 0.25% when full scale is set to 10 divisions
Trigger types (Logic)	Pattern trigger: 1, 0, or × (disregard), logical product (AND) or logical sum (OR) set for 4 channels

Memory Recorder Function

Time axis	100 μs to 5 minutes/division, 20 settings, external sampling (100 samples/division), Time axis zoom ×2 to ×10; 3 settings Compression 1/2 to 1/2000; 10 settings
Sampling period	1/100 of time axis ranges (minimum sampling period 1 μs)
External sampling	Max. 500 kS/s (minimum sampling period 2 μs)
Recording length	Settable in 1-division steps, 20 to 40000 divisions* * Depending on the number of channels in use.
Pre-trigger	Can record data from before the trigger point, 0 to 100% or -95% of recording length; 15 settings
Other functions	waveform parameter processing, logging (numerical printout), X-Y waveform plot, voltage axis zoom ×2 to ×10; 3 settings, compression 1/2, zoom, variable display, graph superimposition

Recorder Function

Time axis	10 ms to 1 hour/division; 17 settings, 1 division = 100 samples, time axis compression 1/2 to 1/50; 5 settings * 10 ms to 200 ms/division ranges shown on display. Printout speed is 20 mm/s.
Sampling period	1 μs to 100 ms; 6 settings (selectable from 1/100 or less of time axis)
Recording length	Settable in 1-division steps, 20 to 2000 divisions, "continuous"*[1], only continuous for X-Y plotting *[1] When time 10 ms – 200 ms/division and printer is ON, continuous is not available.
X-Y sampling period	100 μs; fixed (dot), 100 μs to 25 ms (line)
X-Y axis resolution	40 dots/division (display), 80 dots (horizontal) × 80 dots (vertical)/division (printer)
Other functions	Reprinting of stored data (last 2000 divisions), logging (numerical printout), virtual recording (data are written to internal memory without the use of printer paper), additional recording (recording is resumed without overwriting previous data), voltage axis magnification ×2 to ×10; 3 settings, compression 1/2; 1 setting, variable display.

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

Time axis	5s to 1 hour/division; 9 settings, time axis compression 1/2 to 50; 5 settings
Sampling period	200 μs fixed (20 rms data/s)
RMS calculation accuracy	±3 % f.s.
Recording length	Settable in 1-division steps, 20 to 2000 divisions, continue
Other functions	Reprinting of stored data (last 2000 divisions), logging (numerical printout), additional recording (recording is resumed without overwriting previous data), voltage axis magnification ×2 to ×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, registration of setting conditions (eight conditions), start condition retention, auto setup, auto saving, remote control, auto ranging, view function, online help, key lock, list printing, 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 parameter calculation (Memory recorder)	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, area value, X-Y area value, and standard deviation.

CE mark compliance

Applicable standards	Safety: EN61010 EMC: EN55011, EN50082-1

For recording logic signals

Analog input unit mount

PC card slot for type-III cards
A PC card-type GP-IB or
RS-232C interface is used
for this slot as well.

External control terminal

DC power inlet

AC power inlet

Floppy-disk drive

Operation buttons

Waveform monitor (color TFT LCD)

Thermal printer: 110 mm in width, 8 dots/mm

External dimensions: 285 W × 220 H × 132 D mm approx.
11.22 W × 8.66 H × 5.20 D inch approx.
Mass: Approx. 4.5 kg (158.73 oz.) (main unit, excluding input units)

Recorder & memory function
(Additional functions provided by the **9540-01 FUNCTION UP DISK**)

Time axis (real-time recorder)	500 ms to 1 hour/division; 17 settings, 1 division = 100 samples, time axis compression 1/2 to 1/50, 5 settings * Sampling period 1/100 of time axis range at memory recorder function
Time axis (memory recorder)	100 µs to 5 minutes/division; 20 settings, 1 division = 100 samples, time axis zoom ×2 to ×10; 3 settings, compression 1/2 to 1/2000, 10 settings * Sampling period 1/100 or less of time axis range (min. 1 µs)
Recording length	**Recorder:** 20 to 1000 divisions, continuous **Memory recorder:** 20 to 2000 divisions (Arbitrary setting in 1-division steps also possible.)
Trigger source	Recorder: timer trigger, OFF Memory recorder: CH1 to CH8 (analog), logic A to D, external trigger
Other functions	Only recorder waveform is output when printer output is started, reprinting of stored recorder waveform data (last 1000 divisions), Additional recording function (recording is resumed without overwriting previous data), variable display, vertual recording function

FFT Function
(Additional functions provided by the **9540-01 FUNCTION UP DISK**)

1 Signal analysis	Linear spectrum, RMS spectrum, power spectrum, auto-correlation, histogram, octave analysis
2 Signal analysis	Transfer function, cross-power spectrum, cross-correlation function, impulse response, coherence function
Analysis channels	1 or 2 selected channels out of all analog channels
Frequency range	133 mHz to 400 kHz, resolution 1/400, 1/800, 1/2000, 1/4000
Number of sampling points	1000, 2000, 5000, 10000 points
Window functions	Rectangular, Hanning, Exponential

Other Additional Functions
(Additional functions provided by the **9540-01 FUNCTION UP DISK**)

Waveform processing calculations (Memory recorder)	(Maximum possible calculation up to 1000 DIV; accuracy is within the tolerance of the input module, 8 simultaneous operations) 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
Waveform judgment function (Memory recorder) (FFT)	**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 5 V voltage output
Others	Waveform averaging; memory segmentation (up to 255 segments)

Wave viewer (Wv) software (Supplied accessories, added from Sep. 2000)

Functions	• Simple display of waveform files, • Converts binary files to text files; CSV/space/tab pause selectable, a selection can be specified and thinning enabled. • Display format settings: scroll function, enlarge/reduce display, display CH settings • Trace the voltage value, jump to the point of cursor/trigger, etc.,
Operating environment	Windows95/98/Me, Windows NT 4.0 (OSR3 or later)/2000/XP
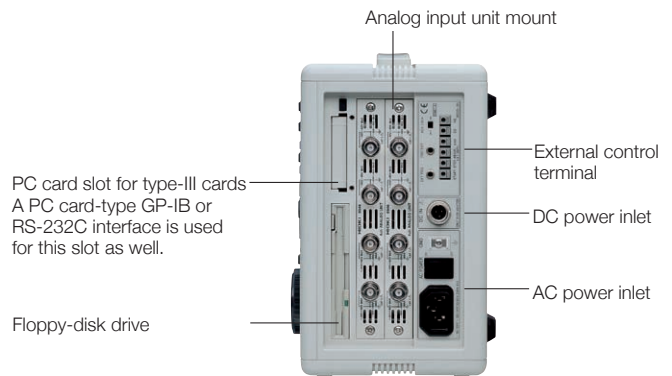
■ Options (sold separately)

Dimensions and mass:
Approx. 170 (6.69) W × 20 (0.79) H × 148 (5.83) D mm (inch), approx. 290 g (10.2 oz)

8936, 8938

8936 ANALOG UNIT (accuracy at 23 ±5°C/ 73 ±9°F after 30 min of warm-up time; accuracy guaranteed for 1 year)

Inputs	Number of channels: 2, Connector: Insulated BNC * Input isolated from output, inter-channel isolation
Measurement range	10 mV to 50 V/division, 12 ranges, full-scale (f.s.) = 10 divisions, AC voltage for possible measurement/display using the memory function : 280 V rms, Low-pass filter, 5/ 500/ 5 k/ 100 kHz, the measurement resolution is 1/160 of range * When used with **8835-01**
Max. sampling rate	1 MS/s (simultaneous sampling of two channels)
Accuracy	**DC amplitude:** ±0.4 %f.s. **Zero-position:** ±0.1 %f.s.
Zero-position	-50% to 150%, 1% step * With zero-adjustment function
Frequency characteristics	DC to 400 kHz ±3 dB, **with AC coupling:** 7 Hz to 400 kHz ±3 dB
Input resistance and capacitance	1 MΩ, 30 pF approx. (at C 100 kHz)
Input coupling	DC, GND, AC
Max. allowable input	400 V DC (upper voltage which when applied to between input pins does not damage them)
Max. rated voltage to earth	370 V AC, DC (upper voltage which when applied to input channel casing or between input channels does not damage them)
Accessories	None * The input cord is optional

8938 FFT ANALOG UNIT (accuracy at 23 ±5°C/73 ±9°F, 30 minutes after power-on; accuracy guaranteed for 1 year)

Anti-aliasing filter	Cutoff frequency 20, 40, 80, 200, 400, 800, 2k, 4k, 8k, 20k, 40 kHz auto-select (linked to frequency range)
Other functions	Same as the **8936 ANALOG UNIT**
Accessories	None * The input cord is optional

Dimensions and mass:
Approx. 170 (6.69) W × 20 (0.79) H × 148 (5.83) D mm (inch), approx. 300 g (10.6 oz)

8937

8937 VOLTAGE/TEMPERATURE UNIT (accuracy at 23 ±5°C/ 73 ±9°F, 60 minutes after power-on; accuracy guaranteed for 1 year)

Inputs	Number of channels: 2 each for voltage and temperature * Input isolated from output, inter-channel isolation Voltage input: isolated BNC, thermocouple input: plug-in terminal
Voltage measurement range	1 mV to 5 V/division; 12 settings, full-scale (f.s.) = 10 divisions, low-pass filter: 5/ 500/ 5 k/ 100 kHz, the measurement resolution is 1/160 of range * When used with **8835-01**
Temperature measurement range	20°C to 200°C/division; 4 settings, full-scale (f.s.) = 10 divisions, low-pass filter: 5/ 500 Hz, measurement resolution: 1/160 of range * When used with **8835-01**
Thermocouple range	**K:** -200 to 1350°C, **E:** -200 to 800°C, **J:** -200 to 1100°C, **T:** -200 to 400°C, **N:** -200 to 1300°C, **R:** 0 to 1700°C, **S:** 0 to 1700°C, **B:** 300 to 1800°C, Reference junction compensation: internal/ external (switchable)
Max. sampling rate	Voltage input: 1 MS/s, Temperature measurement: 4 kS/s (2-channel simultaneous sampling)
Accuracy	**Voltage input:** DC amplitude ±0.4% of f.s. Zero-position ±0.15% of f.s. **Temperature measurement (K, E, J, T, N):** ±0.1% of f.s. ±1°C, ±0.1% of f.s. ±2°C (-200 to 0°C), **(R, S):** ±0.1% of f.s. ±3°C, **(B):** ±0.1% of f.s. ±4°C (400 to 1800°C) **Reference junction compensation accuracy:** ±0.1 % f.s. ±1.5 °C (internal compensation)
Zero position	Voltage input: -50% to 150%, 1% steps * With zero-adjust function Temperature measurement: -100% to 100%, 1% steps
Frequency characteristics	**Voltage input:** DC to 400 kHz + 1/-3 dB **Temperature measurement:** DC to 1 kHz + 1/-3 dB
Input resistance and capacitance	**Voltage input:** 1 MΩ, 50 pF approx. (at C 100 kHz) **Temperature measurement:** 5.1 MΩ
Input coupling	DC, GND, AC
Max. allowable input	30 V rms or 60 V DC (upper voltage which when applied to between input pins does not damage them)
Max. rated voltage to earth	30 V rms or 60 V DC (upper voltage which when applied to input channel casing or between input channels does not damage them)
Accessories	None * The input cord is optional

Dimensions and mass:
Approx. 170 (6.69) W × 20 (0.79) H × 148 (5.83) D mm (inch),
approx. 250 g (8.8 oz)

8939

8939 STRAIN UNIT (accuracy at 23±5°C/ 73±9°F, 60 minutes after power-on; accuracy guaranteed for 1 year)

Inputs	Number of channels: 2, Connector: Adapter cable connector * Input isolated from output, inter-channel isolation
Converter connector	Via adapter cable, TAJIMI PRC03-32A10-7F10.5
Suitable converter	Strain gage converter, bridge impedance: 120 Ω to 1 kΩ, gage factor 2.00, bridge voltage 2 ±0.05 V
Measurement range	50 με to 2000 με/division; 6 settings, full-scale (f.s.) = 10 divisions, low-pass filter: 10 Hz, 30 Hz, 300 Hz, 3 kHz, OFF the measurement resolution is 1/160 of range * Using 8835-01
Max. sampling rate	1 MS/s (simultaneous sampling for 2 channels)
Accuracy (after auto-balancing)	**DC amplitude:** ±(0.5 %f.s. +2 με) **Zero-position:** ±0.5 %f.s.
Balancing	Electronic auto-balancing, max. adjustment range ±10000 με
Zero position	-50 % to 150 %; in 1% steps * With auto-balancing
Frequency characteristics	DC to 20 kHz +1/-3 dB
Max. allowable input	10 V (DC + AC peak) (upper voltage which when applied to between input pins does not damage them)
Max. rated voltage to earth	30 V rms or 60 V DC (upper voltage which when applied to input channel casing or between input channels does not damage them)
Accessories	Conversion cable ×2

* The 8940 can be used with the 8835-01. but cannot be used with the 8835, main unit only, current probe cannot be used. The 8940 can be used with the 8835 standard models later than Ver. 2.10, 9540 install models later than Ver.5.10 can be used.

Dimensions and mass:
Approx. 170 (6.69) W × 20 (0.79) H × 148 (5.83) D mm (inch),
approx. 300 g (10.6 oz)

8940

8940 F/V UNIT (accuracy at 23 ±5°C/ 73 ±9°F after 30 min of warm-up time; accuracy guaranteed for 1 year)

Inputs	Number of channels: 2*[1], Voltage input: BNC terminal *[1] Input isolated from output, inter-channel isolation
Sensor connector terminal	Number of channels: 2 (for current measurement)*[2] *[2] Models that allow unit insertion up to a total of 4 channels: 8841, 8842, 8720
Compatible current sensors	9270, 9271, 9272, 9277, 9278, 9279, 3273 (the 3274/3275, requires the 3272)
Measurement range	**Frequency:** 0.1 Hz to 10 kHz/division, 11 ranges, 10 (r/min) to 1 k(r/min)/ division, 5 ranges, P50 Hz (40 to 60 Hz), P60 Hz (50 to 70 Hz) **Integration:** 10 counts to 1 M counts/division, **Pulse duty ratio:** 100 % f.s. **Current:** 10 mA to 200 A/division, 10 ranges, linked to use with type of the clamp-on sensor, **Voltage:** 1 mV to 5 V/division, 12 ranges, **Max. allowable input:** 30 V rms or 60 V DC, full-scale (f.s.) = 10 divisions, low-pass filter, 5/ 500/ 5 k/ 100 kHz or OFF, the measurement resolution is 1/160*[3] of range *[3] When used with 8835-01, and when used with 9279 CLAMP ON SENSOR, the resolution is 1/64 of range
Max. sampling period	1 μs (voltage, current, integration), 1.125 μs (frequency, pulse duty ratio)
Other functions	**Voltage input pull-up:** ON (10 kΩ)/OFF **Input coupling:** DC, GND, AC (voltage, current), DC (others)
Max. rated voltage to earth	30 V rms or 60 V DC (upper voltage which when applied to input channel casing or between input channels does not damage them)
Accessories	None * The input cord and conversion cable are optional

* The 8946 can be used with the 8835-01, but cannot be used with the 8835.

Dimensions and mass:
Approx. 170 (6.69) W × 20 (0.79) H × 148 (5.83) D mm (inch),
approx. 310 g (10.9 oz)

8946

8946 4ch ANALOG UNIT (accuracy at 23 ±5°C/ 73 ±9°F after 30 minutes warm-up time; accuracy guaranteed for 1 year)

Inputs	Number of channels: 4, Terminal: Metallic BNC * Input isolated from output, inter-channel isolation
Measurement range	20 mV to 5 V/division, 8 ranges, full-scale (f.s.) = 10 divisions, low-pass filter, 5/ 500/ 5 k/ 50 kHz; the measurement resolution is 1/160 of range * When used in 8835-01
Max. sampling rate	1 MS/s (simultaneous sampling of four channels)
Accuracy	**DC amplitude:** ±0.5 %f.s. **Zero-position:** ±0.15 %f.s.
Zero-position	-50% to 150%, 1% step * With zero-adjustment function
Frequency characteristics	DC to 100 kHz ±3 dB
Input resistance and capacitance	1 MΩ, 15 pF approx. (at C 100 kHz)
Input coupling	DC, GND
Max. allowable input	30 V rms or 60 V DC (upper voltage which when applied to between input pins does not damage them)
Max. rated voltage to earth	30 V rms or 60 V DC (upper voltage which when applied to input channel casing or between input channels does not damage them)
Accessories	None * The input cord is optional

Dimensions and mass:
Approx. 170 (6.69) W × 20 (0.79) H × 148 (5.83) D mm (inch),
approx. 310 g (10.9 oz)

8947

8947 CHARGE UNIT (accuracy at 23 ±5°C/ 73 ±9°F after 60 min of warm-up time; accuracy guaranteed for 1 year)

Inputs	Number of channels: 2 Measurement objects can be selected individually for each channel. Full isolation between inputs, and between inputs and recorder. Common GND for voltage input and charge input channels. **Voltage and pre-amplifier internal inputs:** BNC terminals (With voltage input: input resistance, 1 MΩ ; input capacitance, less than 200 pF) **Charge input:** miniature connector (#10-32 UNF)
Suitable converters	**Charge input:** piezoelectric charge output acceleration pickup sensors, **Internal pre-amplifier input:** acceleration pickup sensors with built-in pre-amplifier
Measurement ranges **Charge input** (miniature connector) **Pre-amplifier internal input** (BNC terminal)	100 m (m/s²)/DIV to 20 k (m/s²)/DIV, 12 ranges × 6 types, the measurement resolution is 1/160 to 1/64 of range (changes according to measurement sensitivity) **Measurement sensitivity:** 0.1 to 10 pC/ (m/s²), **Pre-amplifier internal input measurement sensitivity:** 0.1 to 10 mV/ (m/s²), **Amplitude accuracy:** ±2 % f.s., **Frequency characteristics:** 1 to 50 kHz +1/ -3 dB, **Low-pass filter:** 500 / 5 kHz, **Pre-amplifier driving power supply:** 2 mA ±20%, +15 V ±5%, **Highest input charge** : ±500 pC (high sensitivity side 6 ranges), ±50000 pC (low sensitivity side 6 ranges) * When used with 8835-01
Measurement ranges **Voltage input** (BNC terminal)	1 mV to 5 V/DIV, 12 ranges, the measurement resolution is 1/160 to 1/64 of range (changes according to measurement sensitivity) **DC amplitude accuracy:** ±0.4 % f.s., **Frequency characteristics:** DC to 400 kHz +1/ -3 dB, **Low-pass filter:** 5/ 500/ 5 k/ 100 kHz, **Input coupling:** DC, AC, GND, **Max. allowable input:** 30 V rms or 60 V DC * When used with 8835-01
Max. sampling rate	1 MS/s (simultaneous sampling of two channels)
Anti-aliasing filter	Cutoff frequency 20, 40, 80, 200, 400, 800, 2k, 4k, 8k, 20k, 40 kHz auto-select (linked to frequency range)
Max. rated voltage to earth	30 V rms or 60 V DC (upper voltage which when applied to input channel casing or between input channels does not damage them)
Accessories	None * The input cord is optional

9320 LOGIC PROBE

Detector for high/low recording of voltage signals or relay contacts.

Inputs: 4 channels (common ground), digital / contact signal detection. Can detect open-collector signal at contact input.
Input resistance: 1 MΩ (digital input, at 0 to +5 V), at least 500 kΩ (digital input, at +5 to +50 V)
Pull up resistance: 2 kΩ (contact input : pull-up at +5 V internal)
Threshold level (digital input)**:** +1.4 V, +2.5 V, +4.0 V
Detect resistance (contact input)**:** open at least 1.5kΩ / close at 500Ω or smaller, open at least 3.5kΩ / close at 1.5kΩ or smaller, open at least 25kΩ / close at 8kΩ or smaller
Response time: 500 ns maximum
Dimensions and mass:
Approx. 62 (2.44) W × 94 (3.7) H × 20 (0.78) D mm (inch), 150 g
(5.3 oz)

9320

Max. allowable input: 0 to +50 V DC

9335 WAVE PROCESSOR

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 or Windows NT 4.0/2000/XP (recommended system: Pentium (200 MHz) or better with at least 64 MB of memory)
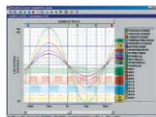**Functions:** ■ **Display functions:** Waveform display/X-Y display/digital value display/cursor function/scroll function/maximum number of channels (32 channels analog, 32 channels logic)/gauge display (time, voltage axes)/graphical display
■ **File loading:** Readable data formats (.MEM, .REC, .RMS)/Maximum 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 DSV 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

9321 LOGIC PROBE

Detector for high/low recording of relay drive signals. Can be used for detecting outages on a power line.

Inputs: 4 channels (isolate), HIGH/LOW range switching type
Input resistance: at least 100 kΩ (HIGH range), 30 kΩ (LOW range)
High detection levels: 170 to 250 V AC, ±70 to 250 V DC (HIGH range)
60 to 150 V AC, ±20 to 150 V DC (LOW range)
Low detection levels: 0 to 30 V AC, 0 to ±43 V DC (HIGH range)
0 to 10 V AC, 0 to ±15 V DC (LOW range)
Response time: rising edge 1 ms max., falling edge 3 ms max.
(ON/OFF, with HIGH range at 200 V DC, LOW range at 100 V DC)
Max. allowable input: 250 V rms (HIGH range), 150 V rms (LOW range)
Dimensions and mass:
Approx. 62 (2.44) W × 127 (5) H × 20 (0.78) D mm (inch), 320 g (1.13 oz)

9321

9333 LAN COMMUNICATOR

Supported recorders: 8826 (ver 2.30 or later), 8835-01 (ver 1.10 or later, except ver 5.00 to 5.09), 8841, 8842 (ver 2.30 or later), 8720 (ver 2.00 or later), 8855
Provided media: CD-R (1)
Operating environment: IBM PC/AT or compatible, (1024 × 768 or higher screen resolution is recommended when using the remote control functions), Windows95/98/Me, WindowsNT4.0/2000/XP (network functions installed, with a TCP/IP environment)
Recorder operating environment: Compatible PC Card: **LAN CARD (HIOKI-tested)**, Connector: 10BASE-T
Communication system: Ethernet, TCP/IP
Functions: • **Remote Control Applications:** • Remote Control of **MEMORY HiCORDER** (control by sending key codes and receiving screen images) • Report Printing • Screen image printing • Receives waveform data in same format as waveform files from **MEMORY HiCORDER** (binary only)
❑ **Waveform Data Acquisition Applications** • Accepts auto saving from **MEMORY HiCORDER** : same format as auto save files of **MEMORY HiCORDER** (binary only) • Automatic printing by **MEMORY HiCORDER** at PC side. • **MEMORY HiCORDER** Print key prints at PC side.
❑ **Waveform Viewer** • Simple display of waveform files. • Converts to CSV format: a selection can be specified, and thinning can be enabled. • Display format setting: Scroll function, Enlarge/Reduce display, display CH settings.
❑ **GP-IB Command Functions** (MEMORY HiCORDER main unit) • **MEMORY HiCORDER**s can be controlled by the same commands as GP-IB using TCP/IP Port 1 (GP-IB command functions are not required with the **9333**)

Composition of options *designated products are not CE-Mark compliant*

Note: Product names appearing herein are trademarks or registered trademarks of various companies.

Logic Signal Measurement

9321 LOGIC PROBE
4-channel isolated, on/off detection of AC/DC voltage

9320 LOGIC PROBE
4-channels, on/off detection of voltage/contact signal

Instrument

Function Up Disk

9540-01 FUNCTION UP DISK
for 8835-01, use the 9540 FUNCTION UP DISK with the 8835

Input Modules

Various input modules
Install by inserting into the instrument
Can be replaced by user
8936 ANALOG UNIT
8937 VOLTAGE/TEMPERATURE UNIT
8938 FFT ANALOG UNIT
8939 STRAIN UNIT
8940 F/V UNIT
8946 4ch ANALOG UNIT The 8946 can be used with the 8835-01, but cannot be used with the 8835.
8947 CHARGE UNIT

Case

9388 CARRYING CASE
with casters for convenient transportation.

Storage Media

9626 PC CARD 32M (PCMCIA adapter, 32 MB)
9627 PC CARD 64M (PCMCIA adapter, 64 MB)
9726 PC CARD 128M (PCMCIA adapter, 128 MB)
9727 PC CARD 256M (PCMCIA adapter, 256 MB)
9728 PC CARD 512M (PCMCIA adapter, 512 MB)

Important Notice !
Use only PC Cards sold by HIOKI. Compatibility and performance are not guaranteed for PC cards made by other manufacturers. You may be unable to read from or save data to such cards.

9221 RECORDING PAPER
30 m/ 98.43 feet, 10 rolls / 1 set

High-voltage input

9322 DIFFERENTIAL PROBE
for up to 2 kV DC, 1 kV AC

9324 POWER CORD
for logic terminal

9325 POWER CORD
for 8940 sensor terminal

9197 CONNECTION CORD
for high voltage (up to 500V)

9198 CONNECTION CORD
for low voltage (up to 300V)

DC Power Supply

9439 DC POWER ADAPTER
Supplies operating power in the range 10 to 28 V DC.

PC communication

9557 RS-232C CARD
(compliance with the PCMCIA Standard)

9558 GP-IB CARD
(compliance with the PCMCIA Standard) * With a GP-IB cable, cord length : 2m (6.6 feet)

*LAN CARD
(HIOKI-tested)
(compliance with the PCMCIA Standard) 10BASE-T

9333 LAN COMMUNICATOR
software required to use LAN connection with Windows 95/ 98/ Me, WindowsNT 4.0/2000/XP

9335 WAVE PROCESSOR
Data conversion, print functions, waveform display, compatible with Windows 95/98/Me, Windows NT 4.0, and Windows 2000/XP

Current Measurement, other options

9018-10 CLAMP ON PROBE
Input from 10 to 500 A 40 Hz to 3 kHz for 0.2 V AC output. BNC terminal

*9132-10 CLAMP ON PROBE
Input from 20 to 1000 A 40 Hz to 1 kHz for 0.2 V AC output. BNC terminal

9199 CONVERSION ADAPTER
Banana-to-BNC, use to connect to BNC terminal on Input Module

9657-10 CLAMP ON LEAK SENSOR
Input 10 A, 40 Hz to 5 kHz, Output rate 100mV/A AC, BNC terminal

9217 CONNECTION CORD
Cord has insulated BNC connectors at both ends, and connects to insulated BNC connectors on the input unit.

*9165 CONNECTION CORD
Cord has metal BNC connectors at both ends, and connects to metal BNC connectors

*9305 TRIGGER CORD
3.5 mm dia. mini-plug, 1.5 m (4.9 feet) length

9277 UNIVERSAL CLAMP ON CT
Observe waveforms from DC to distorted AC. Input up to 20 A, DC to 100 kHz for 2 VAC out

9278 UNIVERSAL CLAMP ON CT
Observe waveforms from DC to distorted AC. Input up to 200 A, DC to 100 kHz for 2 VAC out

*9279 UNIVERSAL CLAMP ON CT
Observe waveforms from DC to distorted AC. Input up to 500 A, DC to 20 kHz for 2 VAC out
Note : Can only be used in combination with the **9555 SENSOR UNIT** or **8940 F/V UNIT**.

*9555 SENSOR UNIT
Used together with **9270** to **9272**, **9277** to **9279** clamp-on sensors. Power supply unit.

9318 ADAPTER CABLE
Connects **9270** to **9272**, **9277** to **9279** clamp-on sensors to **8940 F/V UNIT**.

3272/3269 POWER SUPPLY For 3273, 3274, 3275, 3276

3273 CLAMP ON PROBE
Wide (DC to 50 MHz) range, mA-level to 15 A rms current. Requires power from **3272/3269** or **8940 F/V UNIT** with the **9319 ADAPTER CABLE**.

3274 CLAMP ON PROBE
Wide (DC to 10 MHz) range, mA-level to 150 A rms current. Not for use with the **8940 F/V UNIT + 9319**. Requires the **3272** or **3269 POWER SUPPLY**.

3275 CLAMP ON PROBE
Wide (DC to 2 MHz) range, mA-level to 500 A rms current. Not for use with the **8940 F/V UNIT + 9319**. Requires the **3272** or **3269 POWER SUPPLY**.

3276 CLAMP ON PROBE
Wide (DC to 100 MHz) range, mA-level to 30 A rms current. Requires power from **3272** or **3269 POWER SUPPLY**.

9319 ADAPTER CABLE
Connects only the **3273** to the **8940 F/V UNIT**.

3272 POWER SUPPLY
Single sensor connectable. Two of the **3273**.

3269 POWER SUPPLY
Four sensors connectable.

*9303 PT
Insulation transformer, 400 V or 200 V AC input, 10 V AC output, for AC power line measurement.

*220H PAPER WINDER
Paper width 70 (2.75") – 220 (8.66") mm

Ordering information

8835-01 MEMORY HiCORDER (main unit only)

- The **8835-01 MEMORY HiCORDER** cannot operate alone. To use the **8835-01**, mount one or more optional input modules on it.
- An input cord for measurement use is not provided with the input module. Please purchase the optional **9197** or **9198 CONNECTION CORD** together with the input module.

Maximum number of measurements	2ch	4ch	8ch
Input unit selection	1 unit of **8936** (2ch)	2 unit of **8936** (4ch)	2 unit of **8946** (8ch)
9198 CONNECTION CORDs	two	four	eight

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