

RECORDER

HIOKI

MEMORY Hi CORDER

8850

Intelligent Waveform Analysis Station with High-Speed 20MS/s Sampling



GP-IB

Reduced Display Shows Up to 1200 DIV of Waveform (10m on chart) in a Single Frame

20 MS/s High speed sampling and 64k word/channel waveform memory provide powerful data collection ability

Memory Hi Corder 8850 combines waveform observation and recording in a single unit

High-speed sampling at 20 MS/s, 64k-words/ch of data storage, and a 2 cm/s thermal printer enable recording of any portion of a waveform at any time.

As a measurement tool, the 8850 serves four functions: memory recorder, recorder, X-Y recorder and FFT analyzer. It is also equipped with a waveform discrimination function, a variety of calculation functions, and various other features required for waveform processing and analysis. Thus, the 8850 is an intelligent waveform station.

Memory recorder

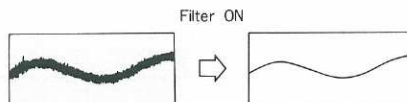
Stores the input signal, then displays and records the desired portion of the stored signal. Useful for analysis of high-speed phenomena.

- All input channels are recorded on the same time base axis.
- Time base of 2.5 μ s / DIV to 5 s/DIV (10 μ s / DIV to 5 s/DIV for isolation type)
- Maximum memory of 60k word/ch (equivalent to 1200DIV) with sequential storage; 64k word/ch with the multi-block storage
- Capable of displaying reduced, enlarged or overlapping waveforms
- Waveform scroll function
- Normal, dual and X-Y display
- Smooth print, partial print, reprint functions
- Dividable memory
- Waveform discrimination
- Computation functions: read-out of x or y axis data specified with cursors, calculation of RMS values, and arithmetic operations
- Averaging

Recorder

Real-time continuous recording is possible.

- All input channels are recorded on the same time base axis.
- 13 recording speeds from 400 ms/DIV to 1h/ DIV (CRT monitoring at all speeds except 400 ms/DIV and 500 ms/DIV)
- 125 μ s high-speed sampling (with 1 channel dot display)
- Low-drift input amplifier
- Low-pass filter reduces noise and ripple.



- Waveform for the last 95 DIV is stored in memory and can be reverse-scrolled.

X-Y recorder

Real-time observation of X-Y waveforms. While X-Y waveforms of stored data can be displayed with the memory recorder function, those of input data can be displayed on the realtime basis by using the X-Y recorder function.

- Unlimited recording time
- Linear interpolation function
- 125 μ s high-speed sampling (with dot display)

FFT analyzer function

Two input methods. One method uses 1024 words of the current input signal data for FFT calculation; the other uses any 1024 words of stored data with the memory recorder function for FFT calculation.

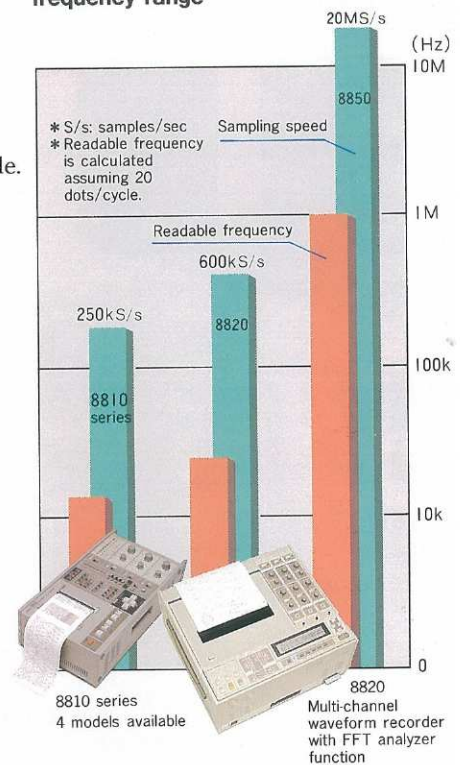
- A maximum of 256 samples can be used for averaging.
- Waveform discrimination function can be used with frequency data.
- 6 analysis modes
Waveform on time axis/ linear spectra/ power spectra/ histograms/ transfer functions/ coherence

Powerful Data Collection Ability

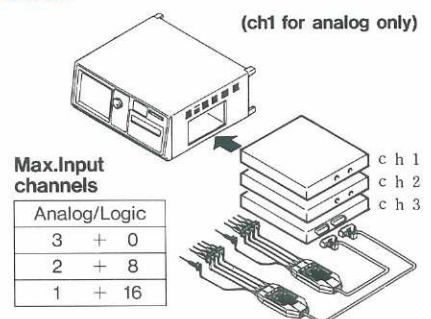
High-speed sampling-20MS/s Large memory-64k words/ch

High-speed sampling corresponding to 2.5 μ s / DIV. Wide range of readable frequencies from DC to approx. 1MHz. Maximum record length of 1200 DIV. Stores sample data for a maximum of 1200 DIV (equivalent to 10m of recording paper).

Max. sampling speed and readable frequency range



Select plug-in input units of your choice

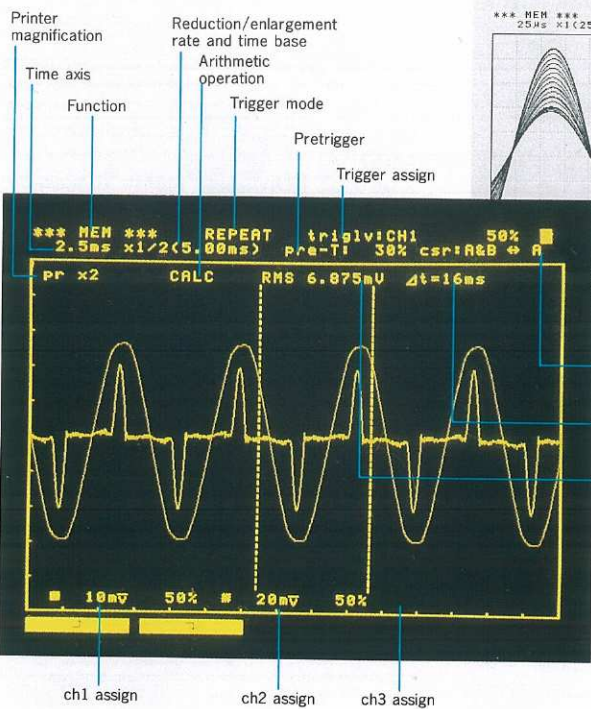


High-Speed Waveform Recorder Incorporating Both Display and Recording Functions

7-inch CRT makes speedy search and observation of waveforms possible; any desired portion can be printed

Speedy Search and Measurement

Two-tone CRT, makes it easy to search and observe waveforms

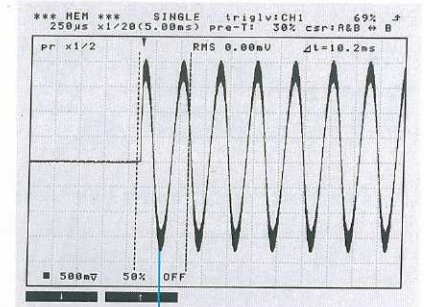


- Reduced and enlarged display
The time-base reduction function makes it possible to display waveforms of up to 1200DIV in a single frame. The reduced waveform can be enlarged, (Reduction ratio: 1/2 to 1/100, enlargement ratio: $\times 2$ to $\times 10$)
- Overlap display
Normally, a displayed waveform disappears when the next waveform is displayed. However, any displayed waveform can be left on the CRT screen.

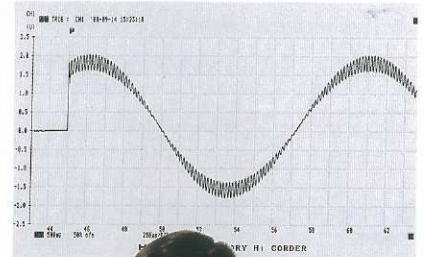
Versatile Recording Functions

2cm/s High-Speed Printer

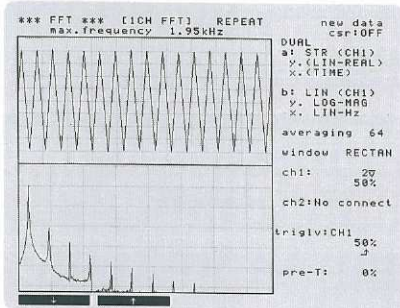
- The maximum recording speed is approx. 2cm/s
- Four waveform-recording methods
- Automatic print: Always records input waveform.
 - Manual print: Records waveform when requested.
 - CRT copy: Prints screen.
 - Partial print: Records specified portion of input waveform.
- Any part of the waveform can be printed at any magnification.



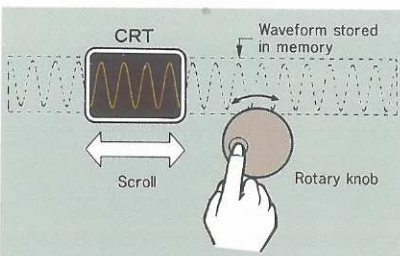
enlarged print of this part



FFT dual screen example



- Waveform scroll
Waveform can be scrolled on the CRT screen.



Communications/Data Saving

- GP-IB interface provided
- IC card (option)



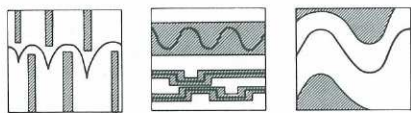
Waveform Discrimination, Calculation... Variety of Functions!

The waveform discrimination function detects very small difference in waveforms. The calculation function provides Δt , ΔV , Δf , and RMS.

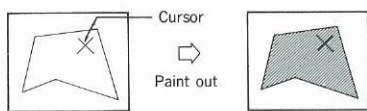
Waveform Discrimination Function

This function, unique to the 8850, judges whether or not an input waveform is within the reference area on the CRT. This function can be used with the memory recorder and FFT analysis functions, and is useful for monitoring abnormal phenomena and inspecting production lines.

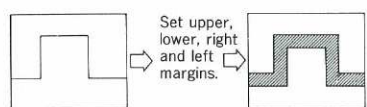
Free reference area specification
Any reference area on the CRT can be set with the graphic editor. The selected area is displayed in half-tone, making clear the relationship between the input waveform and the reference area.



(Polyline) and (Paint) drawing examples

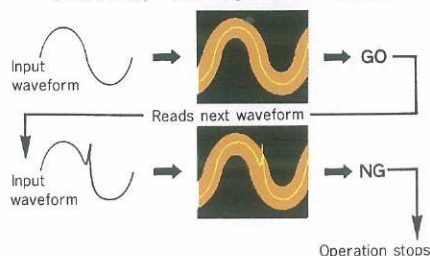


(Reference area paint) example



Waveform discrimination (GO/NG) mode

- Discrimination mode
 - 1 GO when the entire waveform is within the area.
 - 2 GO when any part of waveform is within the area.
 - 3 GO when the entire waveform is outside the area.
 - 4 GO when any part of waveform is outside the area.
 - Stop mode
 - GO: Stop operation when judgment is GO.
 - NG: Stop operation when judgment is NG.
 - GO & NG: Stop operation when judgment is either GO or NG.
- Example of waveform discrimination when trigger mode = (SINGLE), judgment mode = (MODE 1), and stop mode = (NG).

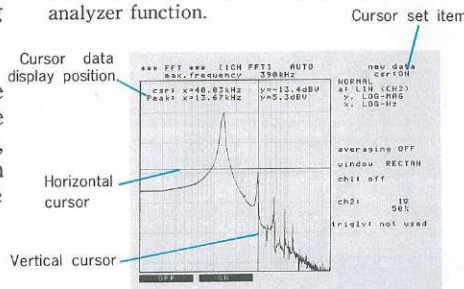


Discrimination result can be output

Computation Functions

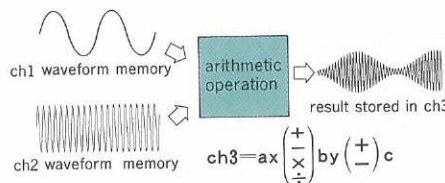
Calculation using A and B cursors

- Voltage, time difference, frequency, and RMS value can be obtained from the part of the waveform specified with the A and B cursors.
- The data value at the point of intersection of the vertical and horizontal cursors can be obtained by frequency analysis with the FFT analyzer function.



Cross-channel arithmetic operations

Arithmetic operation can be performed on waveform data for two channels, and the resultant waveform can be displayed.



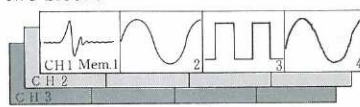
X, Y: waveform data from ch1 or ch2
a, b, c: coefficients

For example, a power waveform can be obtained by applying a voltage waveform to ch1 and a current waveform to ch2, then performing arithmetic on ch1 and ch2.

Dividable Memory

Multi-block function

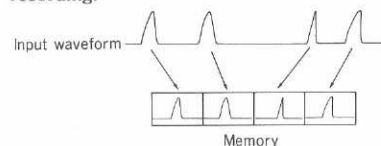
The 64k word waveform memory can be divided into up to 16 blocks, each of which can be used separately. Setting a reference block makes it possible to overlay the waveforms from two blocks.



Set the 2nd block as the reference waveform and the 4th block as the using block.

Sequential storage function

With the sequential storage function, waveform memory is divided into multiple blocks and input waveform is stored into the blocks sequentially, without displaying or recording, every time the trigger signal is input. This reduces idle time consumed during display and recording.



IC Card (option)

9526 IC card (64kB)

An IC card can be used for external memory. Various settings, measured data, and the waveform discrimination area can be stored in the IC card, and then can be read whenever necessary.

START UP function

The START UP function makes it possible to automatically load specific settings and a waveform discrimination area when the power is turned on.

Storage of partial waveform measurements Using the A and B cursors, part of the waveform can be selected for IC card storage.

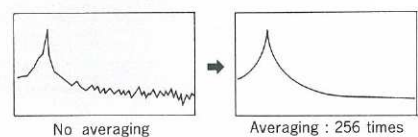
9532 ROM card (Calculation IC card)

The 9532 ROM card makes it possible to perform a variety of calculations on input waveforms, such as differentiation, integration, peak value calculation and area calculation.

Versatile Range of Functions

Averaging function

The averaging function makes it possible to eliminate noise components from repetitive waveforms, allowing observation of the waveform by itself.



Help function

With the memory recorder function, pressing the help key lets you know how memory is allocated and what part of the measured waveform is currently being displayed.



The whole measured waveform The part of displayed waveform

Other functions

- Backup of settings
After the power is turned off, settings are backed up for about 1 month by a built-in backup battery.
- Key lock
The key lock function locks keys to prevent them from being accidentally pressed during measurement.
- Calendar clock
- Gauge print
- Probe calibration output
- Probe zoom setting
- Remote start/stop control
- Self-check function
- Waveform memory backup terminals

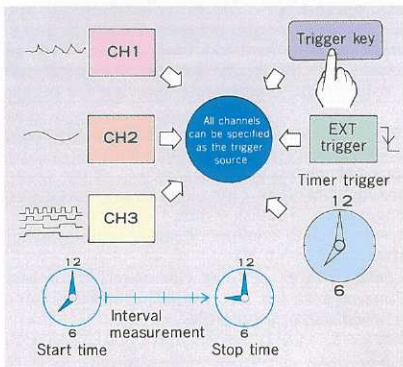
Versatility-from Waveform Observation to Logic Analysis

Measures waveforms from DC to 1 MHz...analyzes digital circuit timing...and much more.



Trigger Function Provided for All Channels

The trigger level can be set separately for each channel. Several channels can be specified as the trigger source, so recording can be started by inputting a trigger signal to any of the specified channels. The trigger filter, timer trigger function, and interval measurement function are also provided.



● Trigger level

The trigger level can be set in 1% steps (from 0% to 100%).

● Trigger mode

The 8850 supports three trigger modes: single, repeat and auto-trigger. In the auto-trigger mode, the device is triggered repeatedly in the same manner as with the repeat mode, but is also triggered automatically if there is no trigger input for a certain time.

● Interval measurement

The interval measurement function repeatedly triggers the device at a certain interval over the period from the start time to the stop time.

● Trigger level hysteresis

● Trigger filter

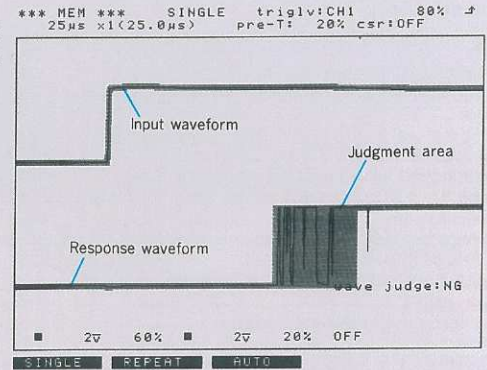
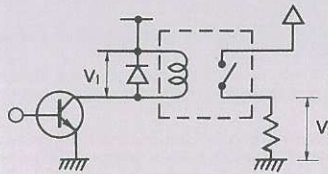
The trigger filter prevents noise in the measured waveform at the down-slope of waveforms from erroneously triggering the device.

● External trigger input/output terminals

Application Examples

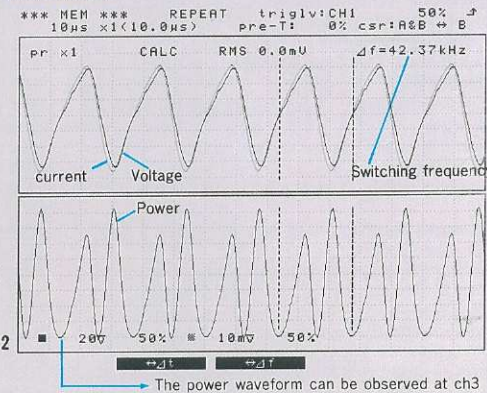
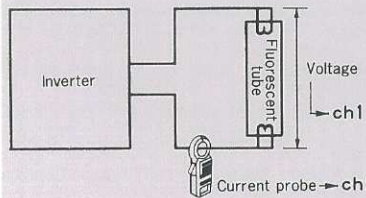
■ Reed relay timing test

This test measures the response time of a reed relay when it is activated with the waveform discrimination function. Trigger at the rising edge of V1 to observe V2.



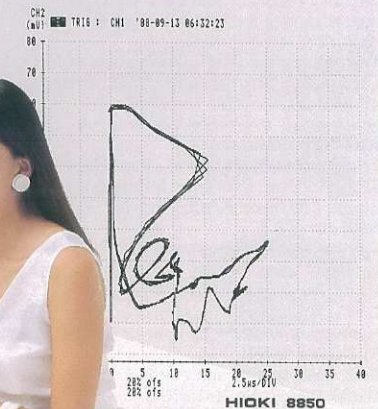
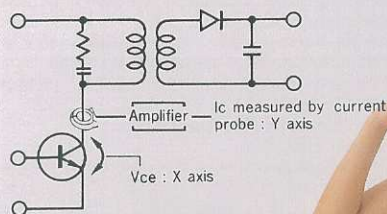
■ Measuring voltage across a fluorescent lamp (inverter type) Recording current and power waveforms

Apply voltage across the lamp to ch1 and the current waveform to ch2. Multiply ch1 and ch2 to obtain the instantaneous power waveform.



■ Recording voltage and current waveforms of a switching transistor in a switching power supply

Record the transistor's collector voltage and current. The SOA waveform can be observed by drawing the X-Y waveform.



General Specifications

[Basic specifications]

Max. sampling rate: 20M samples/second (5MS/s with an isolation type analog input unit)
Storage capacity: 8bit × 64k word/channel
Input method: Plug-in input unit
No. of channels (max.): 3 analog, 2 analog + 8 logic, 1 analog + 16 logic
* CH1 is used for analog input only, so no logic unit can be connected.
Measurement functions; recorder (real-time recording), memory recorder (high-speed recording), X-Y recorder (continuous X-Y recording), FFT analyzer (high-speed Fourier transformation)
External control terminals: External trigger input/output, START/STOP input, GO/NG output, Data backup battery input
Calibration signal: 1kHz, 5 V ±10%, square wave
Temperature/humidity: 0 to 40°C, 35 to 80% RH (no condensation).
Environment where accuracy assured: Temperature 23 ±5°C, humidity 35 to 80% RH (no condensation)
Storage temperature/humidity: -10 to 50°C, 5 to 90% RH (no condensation).
Insulation resistance/dielectric strength: greater than 100 MΩ /500 VDC, 1.5 kVAC/1 min. (between case and power supply)
Power supply: 100, 120, 200, 220, 240 V AC ±10% (specify at order) 50/60Hz
Power consumption: 200 W Max. (Approx. 70 W during normal operation)
Dimensions: 179H × 428W × 390D mm
Weight: Approx. 12.6 kg
Accessories: power cable (1), 9228 recording paper (1 roll), 4A spare fuse (1)

[Recorder]

Recording method: Thermal transfer through a line head
Recording paper: Paper width 114mm, length 30m (roll paper).
Recording width: Total width 105.6 mm (640 dots)
Waveform recording 82.5 mm full scale, 1 DIV = 8.25 mm = 50 dots
Max recording speed: Approx. 2cm/s
Paper feed accuracy: ±2% (25°C, 60% RH)

[Display]

Display method: Raster-scan (2-tone) on 7-inch CRT screen
Display resolution: Waveform display 751 × 256 dots, Character display 48 char. × 29 lines

[Trigger]

Trigger method: Digital comparison
Trigger mode: single, repeat and auto modes for memory recorder and FFT analyzer; single and repeat modes for recorder; single mode for X-Y recorder
Trigger source: Any combination of CH1, CH2, CH3, EXT, MANU, and TIME. Free run when all sources are off.
Start time, stop time and interval can be set with TIME trigger.
Trigger condition: OR of channels selected
Trigger slope: Rising or falling edge for analog input; TRUE or FALSE for logic input; falling edge for EXT
Trigger level: for analog input, 0 to 100% digital setting, step width variable according to hysteresis width (0.4% min.); for EXT, TTL level (active low) or shorting input terminals
Hysteresis width: 1, 2, 3, 8, or 16 dot (1 dot = 0.4% trigger level)
Best level setting accuracy: ±0.2% f.s. (f.s. = 100%)
Pre-trigger: 0, 2, 5, 10, 20, 30, 40, 50, 60, 70, 80, 90, 95, 100, or -100% (memory recorder, X-Y recorder)
Trigger timing: Start, stop (recorder, X-Y recorder), start & stop (recorder, X-Y recorder)
Trigger filter: 3, 4, 6, 10, 18, 34, 66, or 130 sampling cycles, OFF (CH1 to CH3)
Trigger output: TTL level (active low), pulses width approx. 50 μs
Trigger input/output terminal: BNC connector

Function Specifications

● Memory recorder function

Time base (TIME/DIV): 2.5 μs / DIV to 5 s/DIV
20 ranges (1-2.5-5 step), (10 μs / DIV to 5 s/DIV with isolation type)
Time base resolution: 50 dot/DIV
Sampling period: Automatically set to 1/50 of time base
Recording shot length: 15, 20, 40, 80, 160, 300, 600, or 1200 DIV
Format: Normal, dual, X-Y
Interpolation: Dot or line
Overwrite: Possible
Enlargement/reduction (time base axis): 1/100, 1/50, 1/20, 1/10, 1/5, 1/2, ×1, ×2, ×5, or ×10
Scroll: Left or right scroll
Grid: ON/OFF
Automatic print: ON/OFF. Automatically prints stored waveform.
Manual print: Possible
CRT copy: Possible
Partial print: Prints waveform between cursors A and B.
Smooth print: ON/OFF. Interpolation density is set double when ON to print smooth waveform.

● Recorder function

Time base (TIME/DIV): 400·500[ms/DIV] 1·2·5·10·20[s/DIV] 1·2·5·10·20[min/DIV] 1[h/DIV]
Time base resolution: 50 dot/DIV for 400 ms and 500 ms ranges; 100 dot/DIV for other ranges
Sampling period: dot display line display
1 channel used 125 μs 200 μs
2 channels used 200 μs 250 μs
3 channels used 500 μs 500 μs
Recording length: 15, 20, 40, 80, 160, 300, 600 DIV or CONT
Format: Normal, Dual
Interpolation: Dot or line
CRT display: Can be used together with printer at ranges other than 400 ms/DIV and 500 ms/DIV.
Waveform memory: Last 95 DIV can be stored in memory.
Reverse scroll is possible for the stored waveform. (can be printed only with CRT copy function)
Print function: ON/OFF, CRT copy function provided

● X-Y recorder function

X channel: CH 1
Y channel: CH2, CH3 (analog input)
Effective recording area: 82.5 × 82.5 mm (10 DIV × 10 DIV)
X-Y axis resolution: 25 dot/DIV
Sampling period: dot display line display
1 channel used 125 μs 125 μs to 12.5ms
2 channels used 125 μs 125 μs to 25ms
Recording time: Unlimited
Interpolation: Dot/line
Monitor function: Real time display with CRT
Print function: Manual print/CRT copy

● FFT analyzer function

Analyzer mode: 1 CH FFT (CH1 or CH2)
1 Waveform on time base axis
2 Linear spectrum
3 Power spectrum
4 Histogram
2CH FFT (CH 1: input signal, CH 2: output signal)
5 Transfer function
6 Coherence
Calculation time: approx. 1.5 s for 1 CH FFT; approx. 3 sec for 2CH FFT (data input and display time not included)
Frequency range: 3.90 Hz to 7.79 MHz (3.90 Hz to 1.95 MHz when isolation type analog unit is used)
Frequency resolution: 1/400
Sampling points: 1024
Dynamic range: 48 dB (theoretical value)
Input data: Part of waveform stored with the memory recorder function, or currently input waveform
Window: Rectangular or Hanning
Display scale: Linear scale, logarithmic scale, phase, or Nyquist diagram
Format: Normal or dual
Print function: Same as the memory recorder except for partial print function

● Additional functions

Averaging: 2, 4, 8 to 256 times, OFF (memory recorder, FFT analyzer function)
Dividable memory: With the memory recorder function, memory can be divided into 16 divisions (max.).
1 Use of divided memory (multi-block memory)
2 Sequential storage
Waveform discrimination function: With the waveform on the time base axis, the X-Y waveform, and FFT function, whether or not input waveform is within the reference area can be judged. (GO/NG)
Judgment modes: Mode 1 to Mode 4
Stop mode: GO stop, NG stop, GO & NG stop
Judgment result output: Judgment result can be output. (TTL level, active low)
Judgment time: Approx. 150 ms
Graphic editor: Editor for making the reference area for discrimination
Editor command: line, paint, erase, parallel, QUIT, end
Calculation function (memory recorder): Arithmetic operation (× ÷ + -) between ch1 and ch2, RMS calculation between cursors A and B
Cursor measurement function: Time, voltage or frequency difference between cursors A and B; voltage and time from triggering for cursor A
Clock function: Automatic calendar, automatic leap year adjustment, 24-hour clock
Clock accuracy: 100 ppm (25°C)
Backup battery life (for clock and settings): Longer than 1 month (when fully charged)
Waveform data backup: Possible with external battery (2.7 to 5.0 V)
IC card: Stores settings, measured data and reference area for discrimination. Partial save (between cursors) possible.
Command: LOAD, SAVE, INIT, KILL, COPY, TEST
Capacity: 8k to 256k bytes
List print function: ON/OFF. Setting conditions can be printed after waveform data.
Remote control: Start/stop signal input terminals (TTL level, active low)
GP-IB: Electric and mechanical specifications conforming to IEEE Std. 488-1978. The 8850, including input units can be remotely controlled (except for gain and CRT brightness controls).
Help function: With the memory recorder function, the currently displayed location in the memory is displayed. With the divided memory function, the use of each block is displayed. With the FFT analyzer function, the scale for the calculated result is displayed.
Key lock: All keys other than the KEY LOCK key can be locked.

Your Choice of Plug-in Units

Option specifications (input units)

8941 analog input unit

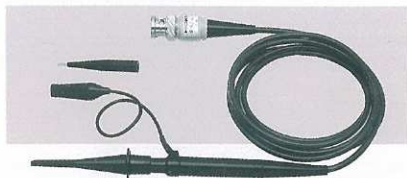
Measurement range: 5mV/DIV to 5V/DIV, 10 ranges (1-2-5 step)
 Gain adjustment: Continuous control from approx. 50% to 100% (with gain control knob)
 DC amplitude accuracy: $\pm 1\%$
 Offset adjustment: -100% to $+100\%$, in 1% steps, with zero-adjustment function
 Offset accuracy: $\pm 0.8\%$ f.s.
 Frequency response: DC to 7MHz ± 3 dB (DC coupling)
 Approx. 7Hz to 7MHz ± 3 dB (AC coupling)
 Rise-up time: Approx. 50 ns (analog amplifier)
 Low-pass filter: ON/OFF. Cut-off frequency: approx. 5 Hz
 Input type: Unbalanced input (ground common)
 Input RC: Direct; 1 M Ω $\pm 1\%$, approx. 50 pF (at 100 kHz)
 When 9162 (10:1 probe) is used; 10 M Ω $\pm 3\%$, less than 23 pF
 Input coupling method: AC, GND, DC
 Allowable input voltage: Direct; 150 V (DC+AC peak)
 When 9162 (10:1 probe) is used; 250 V (DC+AC peak)
 A/D converter method: 8-bit parallel comparison
 Max. sampling speed: 20MS/s
 Input terminal: BNC connector
 Dimensions and weight: Approx. 170 H \times 35 W \times 200 D mm, approx. 600 g
 Accessory: 9166 input cord (BNC-clip)



9166 Input cord (available)

Optional accessories

9162 Input probe (10 : 1)

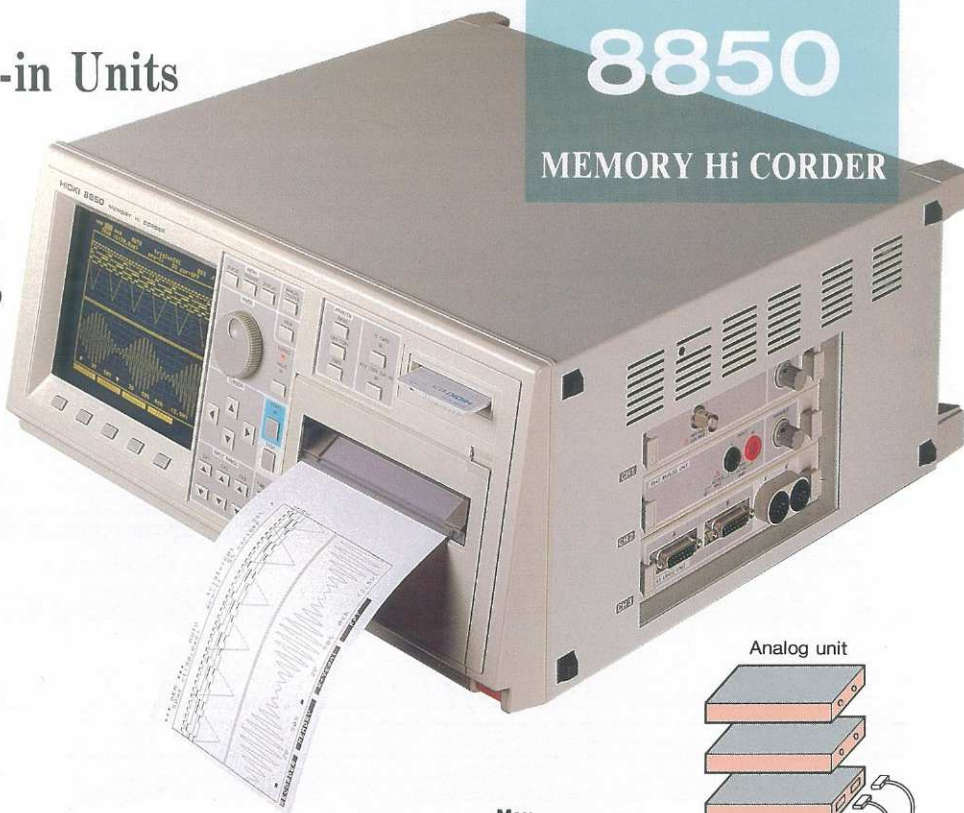


9165 Input cord (BNC-BNC)



8942 analog unit (isolation type)

Measurement range: 5mV/DIV to 20V/DIV, 12 ranges (1-2-5 step)
 Gain adjustment: Continuous control from approx. 50% to 100% (with gain control knob)
 DC amplitude accuracy: $\pm 1\%$
 Offset adjustment: -100% to $+100\%$, in 1%



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steps, with zero-adjustment function
 Offset accuracy: $\pm 0.8\%$ f.s.
 Frequency response: DC to 2MHz ± 3 dB (DC coupling)
 Approx. 7Hz to 2MHz ± 3 dB (AC coupling)
 Rise-up time: Approx. 150 ns (analog amplifier)
 Low-pass filter: ON/OFF. Cut-off frequency: approx. 5 Hz
 Input type: Unbalanced input (input separated from output)
 Input RC: Direct; 1 M Ω $\pm 1\%$, approx. 50 pF (at 100 kHz)
 Input coupling method: AC, GND, DC
 Allowable input voltage: Direct; 200 V (DC+AC peak)
 Max. floating voltage: 350 VDC, 250 VAC (between input unit and case)
 Insulation resistance/dielectric strength: greater than 100 M Ω /500 VDC, 1.5 kVAC/1 min. (between input unit and case) greater than 100 M Ω /500 VDC, 1.5 kVAC/1 min. (between input units)
 Common mode rejection ratio: 80 dB or more (at 50/60 Hz with signal source impedance of less than 100 Ω)
 A/D converter method: 8-bit parallel comparison
 Max. sampling speed: 5MS/s
 Input terminal: 2 terminals (for banana plugs)
 Dimensions and weight: Approx. 170 H \times 35 W \times 200 D mm, 600 g
 Accessory: 9163 input cord (banana-plug - clip)



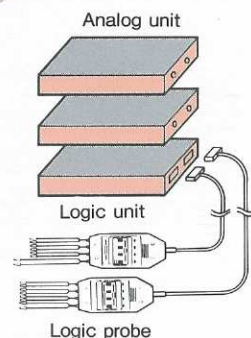
9163 Input cord (available)

Optional accessories



Max. input channels

Analog/Logic	
3	+ 0
2	+ 8
1	+ 16



8943 logic unit

Input channels: 8 (two 4-channel logic probes can be connected)
 Input method: Logic probe connection, ground common
 Max. sampling speed: 20MS/s
 Compatible logic probes: 9306, 9307, 9308 or 9310 high-speed probe (9308 can be used when 8942 analog unit is installed.)
 Dimensions and weight: Approx. 170 H \times 35 W \times 200 D mm, 600 g



Optional accessories :

- 9310 High-speed probe
- 9306 Input probe
- 9307 Line logic probe
- 9308 Line dip detector

9311 Attenuator

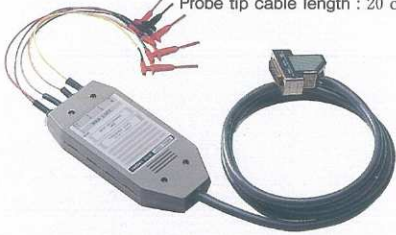
Attenuation ratio: 10 : 1 $\pm 2\%$
 Max. input voltage: 500 VDC (AC peak)
 Input impedance: 10 M Ω
 Frequency characteristics: DC to 2MHz ± 3 dB

Option (accessories, probes)

Logic Probe

9310 High-speed logic probe

Cord length : 1.5 m
Probe tip cable length : 20 cm



137H × 64W × 22Dmm

- For high-speed digital signals
- 1 MΩ input impedance
- Variable threshold level (controlled from the main unit)

No. of channels	4 (ground common with the main unit)
Input impedance	1 MΩ, 20 pF or less (at 100 kHz)
Threshold level	-6.3 to +6.3 V (in 0.1 V step)
Max. input voltage	±50 V
Response time	50 ns or less (-7.0 V to +7.0 V)

9306 Logic probe

- With digital input, contact point input switch
 - Digital input can be from TTL level to 50 V.
- 137H × 64W × 22Dmm
Cord length: 1.5m
Probe tip cable length: 20cm

9307 Line logic probe

- Can be used with AC and DC voltages.
 - 4 channels (floating)
 - On and off detectable from 24 VDC to 240 VAC
- 137H × 64W × 22Dmm
Cord length: 1.5m
Probe tip cable length: 1m

9308 Line dip detector

This instrument detects momentary dips in commercial power lines (100, 120 VAC). The detected dip level can be switched between 80 % and 90%.

137H × 64W × 22Dmm
Cord length: 1.5m
Probe tip cable length: 1m

	9306	9307	9308	9310
		line type	line type	high-speed type
Purpose	Contact Digital IC	AC/DC voltage detection	AC voltage-drop detection	Digital IC (threshold variable)
Input type	COM input Max.±50V	Insulated 4 ch input Max.AC250V	Max.AC120V	COM input Max.±50V
Response time	2 μsec	↑ 1 msec ↓ 3 msec	2 cycles of AC input	50 nsec

IC Card

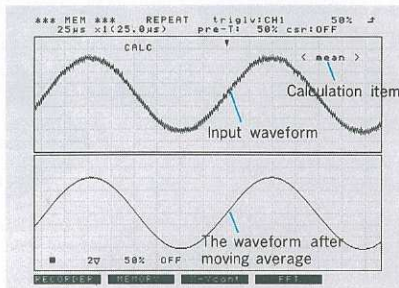
9526 IC card (64kB)

Stores function settings, waveform data, and the reference area for waveform discrimination.

9532 ROM card (calculation IC card)

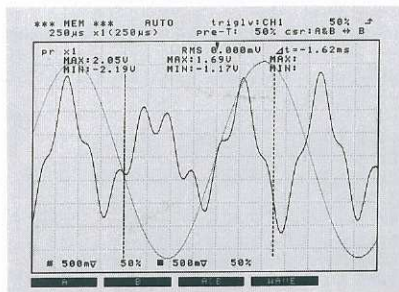
This ROM card enables linear differentiation of input signals, calculation of peak values, area calculation, and averaging. These calculations are available with the memory recorder function, providing a wide range of applications.

- Calculation results (linear differentiation, moving average, etc.) are stored in ch3.



The calculation result of moving average

- CRT display of calculation results
- Using the A and B cursors, it is possible to specify the area which is subjected to calculation (peak value, area calculation, etc.).



The calculation result of minimum and maximum

(Type of calculation)

- Calculation on waveforms
- Linear differentiation, linear integration, moving average (2 to 100 points), arithmetic operation, data transfer between channels
- Calculation for obtaining numeric values
- Maximum value, minimum value, peak value, effective value, area, period, frequency, rise time, breaking time, average

Other Accessories

9303PT Transformation ratio : 40 : 1/20 : 1
Max. input voltage : 500V AC/250V AC
Frequency characteristics : 40 to 3kHz (±1%)
Insulation dielectric strength : 2000V AC/1 minutes



220H Paper winder



Winding paper width : 70 to 220 mm
Winding method : Intermittent winding
Power supply : Using the exclusive adapter (6V)
Dimensions : 190H × 240W × 160D mm

The 8850 needs optional units

Optional units

- 8941 high-speed analog unit with 9166 input cable
- 8942 isolation type analog unit with 9163 input cable
- 8943 logic unit

Optional accessories

- 9151-01 GP-IB cable (1m)
- 9151-02 GP-IB cable (2m)
- 9151-04 GP-IB cable (4m)
- 9162 input probe (10 : 1, for 8941)
- 9163 input cable (provided with 8942)
- 9165 input cable (BNC-BNC)
- 9166 input cable (provided with 8941)
- 9228 recording paper (30m, 10rolls)
- 9303 PT (40 : 1, 20 : 1)
- 9306 logic probe
- 9307 line type logic probe
- 9308 line dip detector
- 9310 high-speed logic probe
- 9311 attenuator (10 : 1, for 8942)
- 9526 IC card (64k bytes)
- 9532 ROM card (IC card for calculation)
- 220H paper winder

Standard Packing (double carton box)

Sets	N.W.kg	G.W.kg	M ³
1	14	19	0.12m ³

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