



*Intelligent, feature-packed,
large memory capacity, high
performance recorder and
analyzer.*

8851

MEMORY HI CORDER



91-08-21
15:47

CALCULATION ***

1) Z1 = a X1 + b Y1 + c
X1 = OFF (CH1 + a)
Y1 = OFF (CH1 + a)

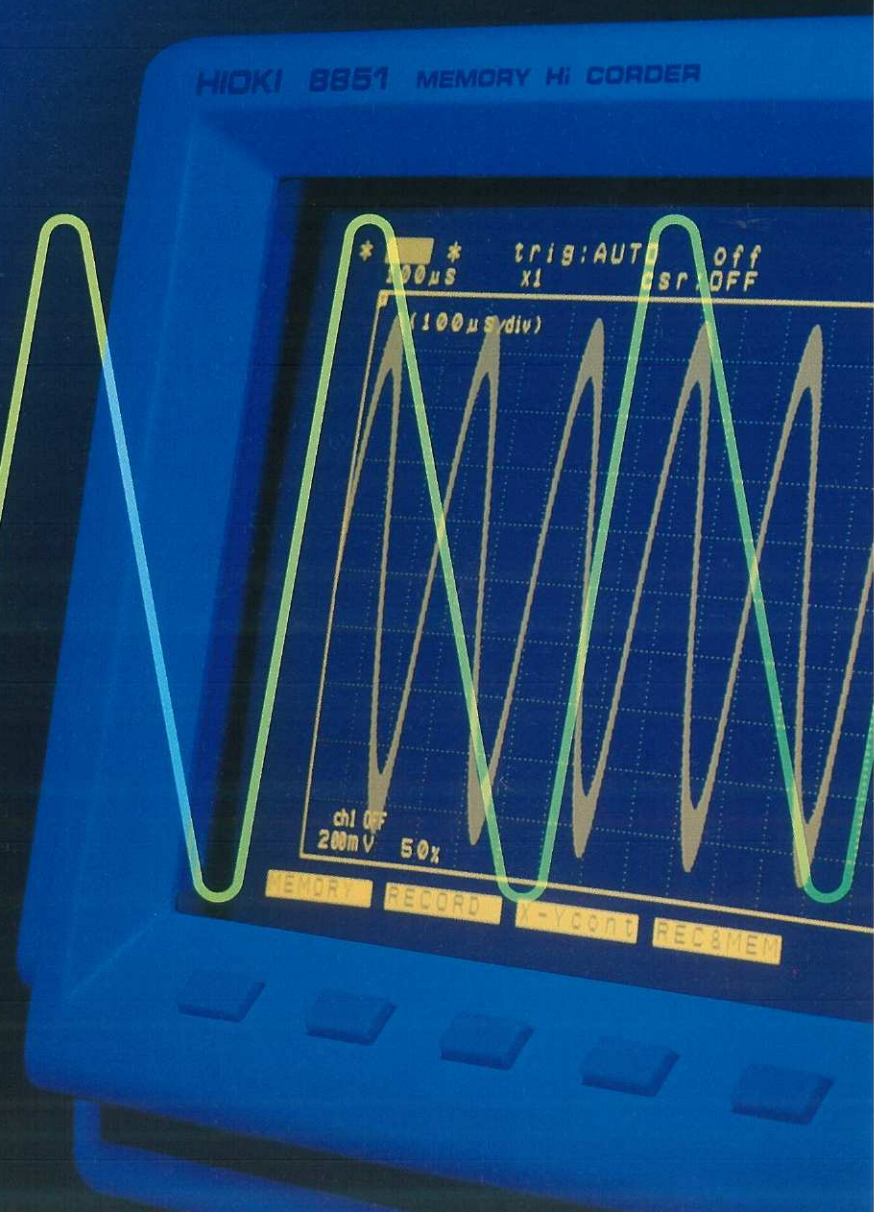
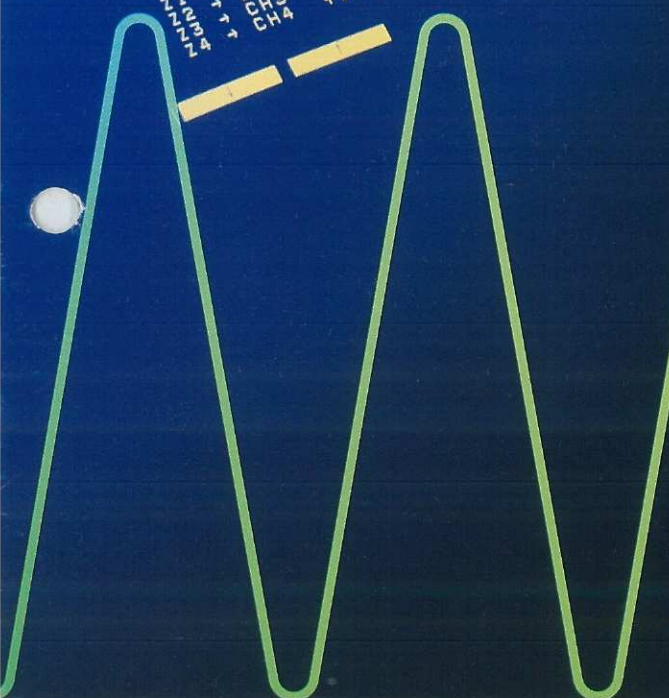
2) Z2 = a X2 + b Y2 + c
X2 = OFF (CH1 + a)
Y2 = OFF (CH1 + a)

3) Z3 = a X3 + b Y3 + c
X3 = OFF (CH1 + a)
Y3 = OFF (CH1 + a)

4) Z4 = a X4 + b Y4 + c
X4 = OFF (CH1 + a)
Y4 = OFF (CH1 + a)

CH1: 100mV
CH2: 100mV
CH3: 100mV
CH4: 100mV

(upper) +0.000E+0 (V)
+1.000E+0 (V)
+1.000E+0 (V)
+1.000E+0 (V)
(lower) +0.000E+0 (V)
+0.000E+0 (V)
+0.000E+0 (V)
+0.000E+0 (V)



HIOKI 8851 MEMORY HI CORDER

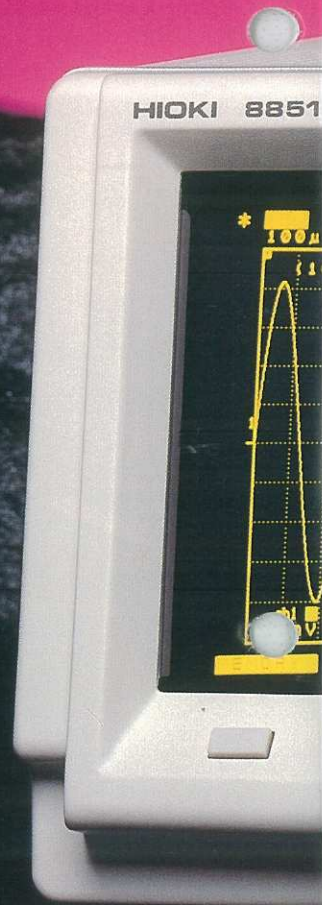
* * trig: AUTO off
200μs X1 CSR OFF
(100μs/div)

ch1 OFF
200mV 50x

MEMORY RECORD RECMEM

Capture, store and replay - the new generation of recorders and analyzers.

New features have the potential to open up a new dimension on the measuring instrument scene.



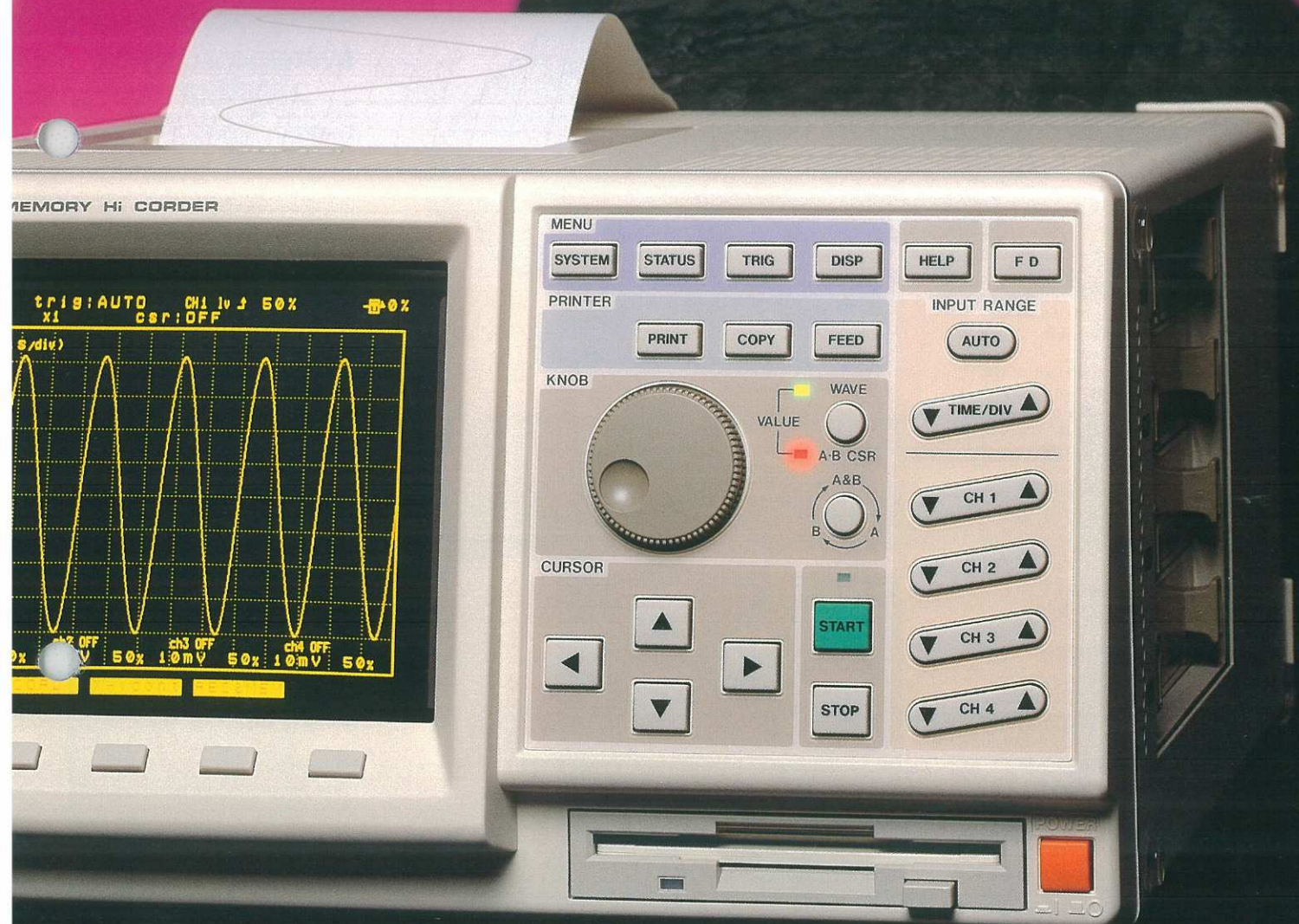
12-bit resolution

Voltages are measured with a 12-bit resolution, that is to an accuracy of 1 in 2^{12} , or 1 in 4096. This enables even small fluctuations in the voltage waveform to be detected and recorded. It also allows expansion or compression of the recording on the voltage axis. All calculations - parameters, waveforms, and FFT - yield higher accuracy.

1 MS/s sampling rate

The signal being measured is converted to a digital value at a rate of 1 million samples per second. To display the sampled data as a waveform, if the resolution is 8 bits, between 20 and 25 samples will be necessary per cycle of a sine wave. Therefore at a 1 MS/s sampling rate, a sine wave can be reproduced up to a frequency of 40 to 50 kHz. Again, for FFT analysis, at least 2 data samples per cycle are required, so analysis is possible up to a maximum of 500 kHz.

Memory Hi Corder 8851



2-million words

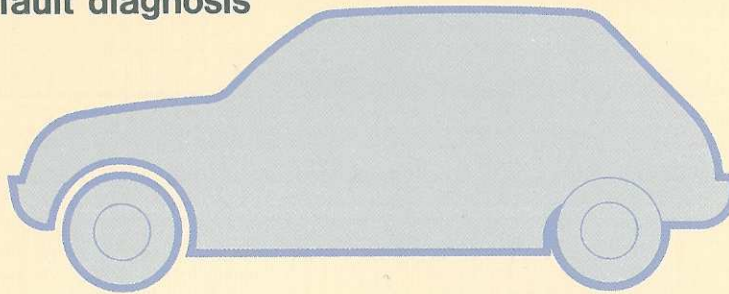
The internal memory for waveform data is 2,000,000 words. This corresponds to 500m of recording paper. The memory can be divided up according to the number of channels used, making 500,000 words. In this case the corresponding recording would be 125 m long. The memory can be further divided into a maximum of 63 sections.

Waveform capture

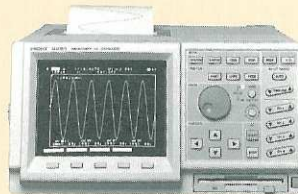
The 8851 Memory Hi Corder is the latest evolution of high-speed, high-accuracy recorders. Its basic functions testify to its excellence. A/D conversion with a 12-bit resolution and 1 MS/s sampling rate enable complex and rapid waveform variations to be captured. It provides all required measurement, recording and analysis functions at high speed. A range of trigger functions ensure that data capture can be timed precisely.

Automobile fault diagnosis

- Throttle sensor signal
- Airflow signal
- Ignition signal
- Injection signal
- Crankshaft signal
- Ignition switch signal
- Power steering switch signal



In current automobiles, the move toward electronic control of the engine systems has made accurate, high speed measurement and analysis of the actuator operation and control signals essential. Simultaneous monitoring of the various analog signal waveforms and digital signal states assists product research and development.



Servo motor control systems analysis

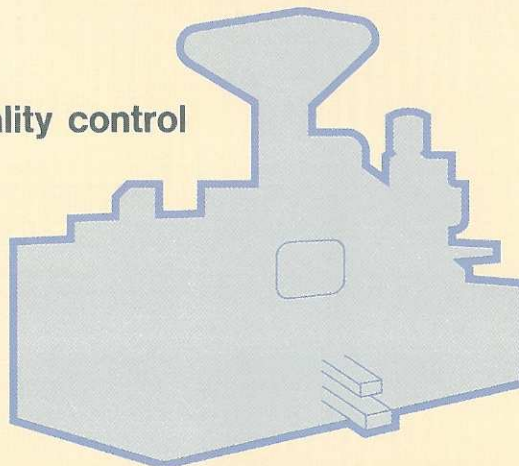
- Drive signal
- Feedback signal
- Control signal

The 12-bit resolution and 1 MS/s sampling rate facilitate operational analysis of feedback control systems such as servo motors. With four analog channels and 16 logic channels available simultaneously, and the high sampling rate - 1 MS/s - the relations among signals can be determined accurately and easily.



Injection molding quality control

- Operation control signal
- Cavity pressure signal
- Position signal



For quality control of plastic injection molded products, an X-Y chart is used to show the relations between the operation control signal, the pressure and the position through one cycle of the machine operation. In addition to the built-in printer, results can also be output to an external plotter.



Boiler operational analysis

- Fuel signal
- Gas pressure operation signal
- Pilot operation signal
- Afterburn operation signal

For analysis of gas boiler combustion faults the operation timing and analog waveforms of constituent parts are recorded. By monitoring while waiting for a trigger, suddenly occurring erratic phenomena can be captured.



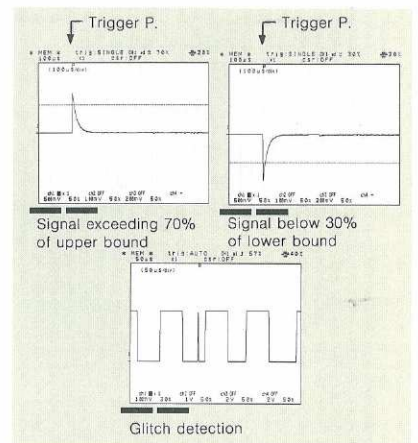


Window trigger function for monitoring with two trigger levels.

A normal trigger has a single level, but the window trigger provides upper and lower trigger levels. If the signal goes outside this range, the trigger is applied.

Glitch detection trigger function for monitoring spikes and other noise

A normal trigger monitors by level only, but this function monitors by pulse width at the same time as the level, and applies the trigger at the set pulse width.



Event trigger function

The trigger application is controlled by the number of level trigger pulses produced. For example, while monitoring the output signal waveform of a pulse encoder, the trigger can be set by the set number of cycles.

Logic pattern trigger function

A predetermined high/low pattern for the logic signal waveform can be set, and the trigger occurs when that pattern appears on the signal.

Pretrigger function

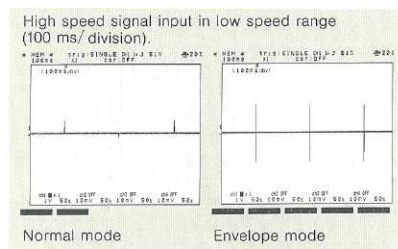
This is an effective way to exploit the characteristics of a memory recorder. When a trigger occurs, a portion of the preceding signal can be observed. A trigger can also be used to observe the waveform after a certain time interval has elapsed (minus pretrigger function)

All channel trigger function

All input channels can be used as trigger channels, and logical ANDs or ORs can be used to build complicated trigger conditions. (Logical AND can be used with a level trigger or window trigger.)

Reliable capture of noise peaks

In principle, varying the time axis setting of a memory recorder changes the associated sampling rate, but by enabling the envelope function, a constant high sampling rate of 800 kS/s (1.25 μ s cycle) is maintained. In this way narrow pulses in spiky signals can still be captured reliably.



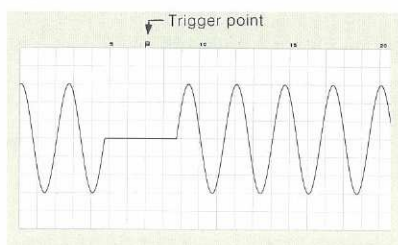
High speed CRT display

When displaying measured waveforms on the screen, instant response would be ideal, but this is normally affected by the memory capacity. Typically a conventional system requires up to 10 seconds to display a waveform of 1200 divisions in compressed form on the screen, but the use of custom ICs in this unit provides much improved response. Display is completed within 0.1 to 0.2 seconds.



Time out trigger for monitoring voltage drops or instantaneous power failures on a commercial supply.

The trigger cycle is computed, and if the set time period is exceeded a trigger is generated. When the measurement signal has a low level, a trigger can be applied.

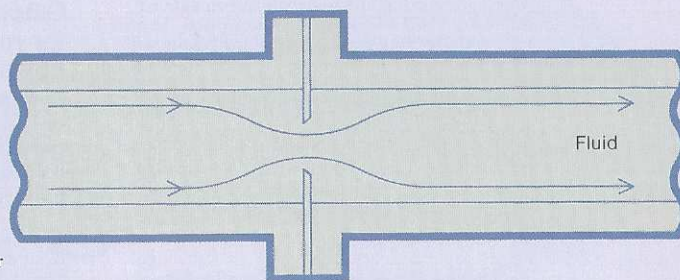


Storing waveform

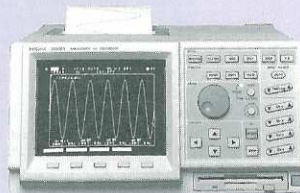
The 8851 - answering to evolving requirements for measurement. Its huge potential is witness to its development. Long recording times, with a total of 2-million words of memory. Four analog signal channels, and 16 logical signal channels can be recorded simultaneously. Waveform judgment functions enable more accurate assessment. Brings high efficiency to measurement tasks.

Flow measurement analysis

- Pressure signal
- Differential pressure signal
- Displacement signal
- Control signal
- Valve opening signal



To measure a flow, using for example an orifice, the differential pressure in the fluid is measured, and from it the flow rate can be derived. The large capacity memory and 12-bit resolution, together with the range of computation functions support fluid research.



Electrocardiogram recording

Electrocardiogram

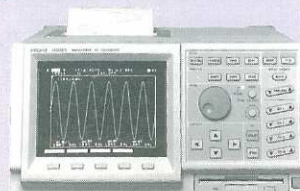
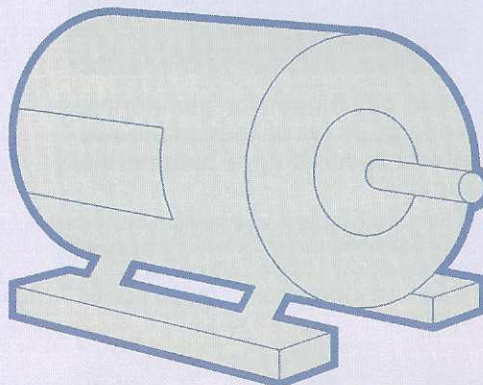
Rather than a memory recorder function, a real time recording is used, at a maximum speed of 2.5 cm/s. The 12-bit resolution, and simultaneous screen and printer operation all help electrocardiogram analysis. Moreover, when the recording is stopped, a further 300 seconds * of waveform is still held in memory. (* at 400 ms/division)



Motor fault vibration analysis

Vibration sensor signal

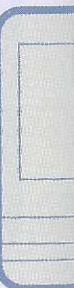
For investigation of failures in rotary components such as bearings, a fast Fourier transform of the vibration waveform is used for analysis.

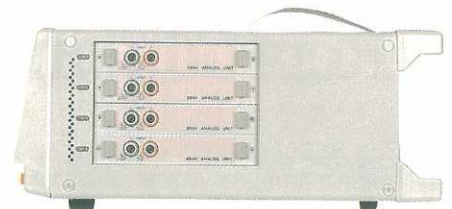


Inverter current waveform

Current clamp sensor signal

A clamp sensor facilitates current measurement in power supplies. In particular, for waveform monitoring for inverter control, for example, in which high harmonics are present to a large extent, Hioki's wide waveband clamp sensor (9270 series) is the ideal tool.



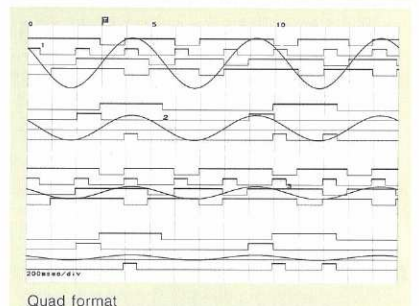
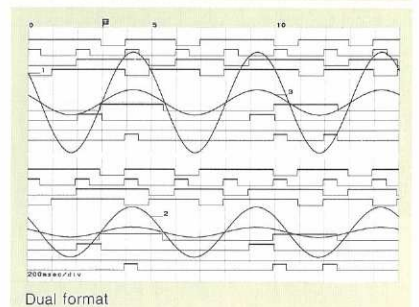
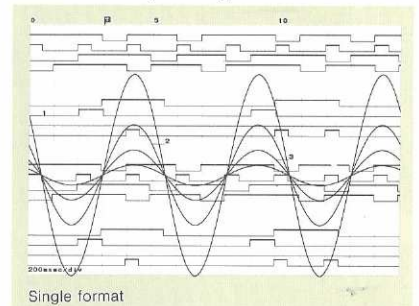


In this photograph, the 8851 is shown fully equipped with optional input units.

abnormal can be saved in memory, output to the printer, or output as an external signal.

Seeing relations among the analog and logic channels

Since the four analog channels (floating) and the 16 logic channels (common ground) are sampled simultaneously, the relations among the signals can easily be seen, on the same time axis. Three different formats are available for printing.



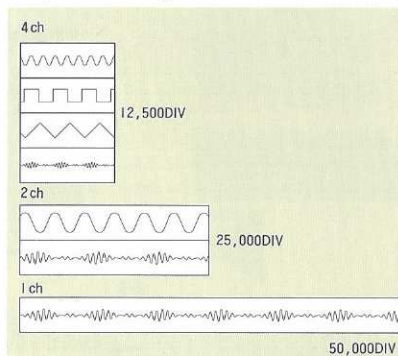
3.5 inch floppy disk drive

A floppy disk can be used as an external storage medium. The format is MS-DOS *, either 1.2 megabytes (2HD for PC-9801 series *) or 720K bytes (2DD, for IBM-PC *)

- * MS-DOS is a registered trademark of Microsoft Corporation.
- * PC-9801 is a product of NEC Corporation.
- * IBM-PC is a product of IBM Corporation.

Long recording times

The unit includes a total of 2-million words of memory. This allows for 2 seconds of recording, even at the maximum sampling rate of 1 MS/s (1 μ s cycle) when using one channel. Divided into four channels, this is 500,000 words per channel.



Direct readout of levels, using the scaling function

The scaling function allows direct readout of the physical units being measured, allowing for different conversion factors to the voltage level.

```

*** SYSTEM *** SCALING '91-08-23 17:14:28
                                (MEM)
scaling
  ch1 TYPE.A
  ch2 TYPE.B
  ch3 TYPE.C
  ch4 TYPE.D

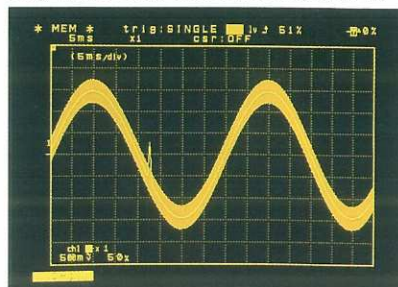
(EU/V) (EU offset) (EU)
(default) +1.000E+0 +0.000E+0 IV 3
type.A -9.999E+0 -9.000E+0 °C 3
type.B +1.234E+0 +0.000E+0 mA 1
type.C +5.678E+0 +0.000E+0 VVA 1
type.D +9.999E+0 +9.000E+0 Vva1 1

```

Level conversion value Addition value Units

Convenient waveform judgment function for inspection processes

By comparing the measured waveform with a predetermined judgment area, only waveforms which are detected as

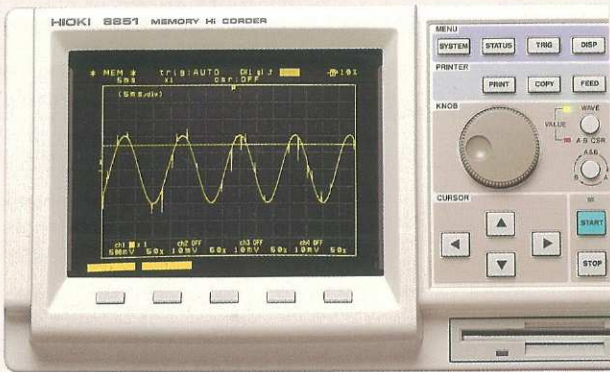


ding

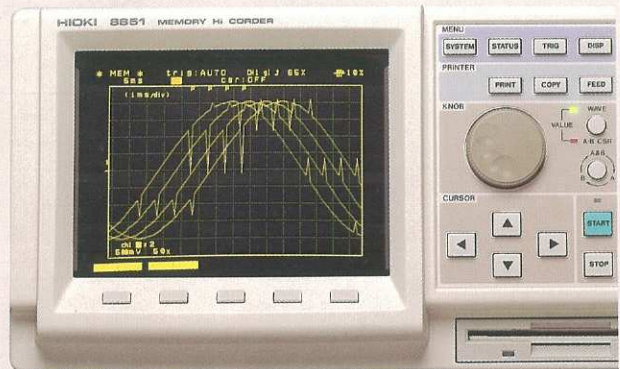
n recording

Reproducing waveforms

The 8851 provides efficient operation for all measurement applications. A wide range of functions combine with ease of use. Not only waveform computation and parameter computation, but also FFT analysis. Interface functions - 3.5 inch floppy disk drive and GP-IB interface - fitted as standard. Provides top accuracy waveform analysis.

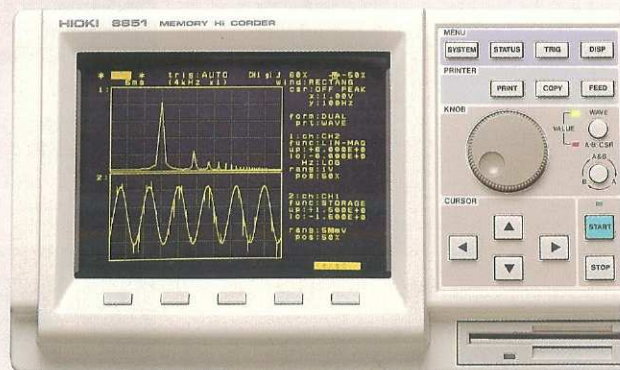
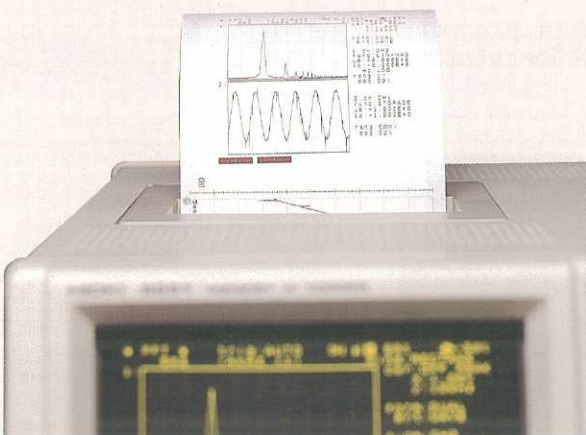


Glitch trigger function provides reliable capture of difficult-to-catch waveforms.

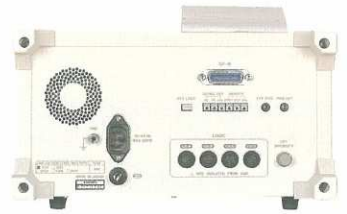


Time axis scrolling function for easy finding of the required portion.

Built-in graphics printer for saving of records. Output to external plotter also provided. (HP-GL)

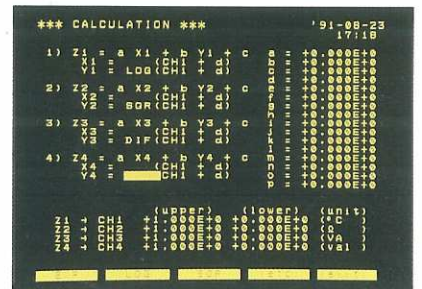


The waveform stored can be analysed by various calculations, including FFT.

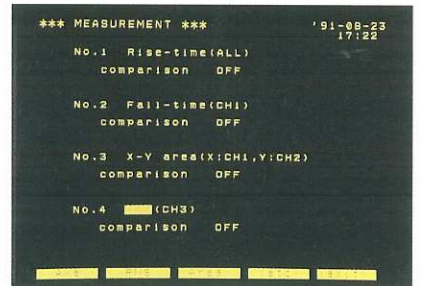


Accurate discrimination

The fast computation facilities provide not only the raw measurement waveform, but also 14 various derived values, including arithmetic operations, differentiation, and integration, 11 parameter calculations including maximum and minimum values, and area calculations, and two fast Fourier transforms - linear and power spectrum. The multi-faceted analysis of the data allows accurate discrimination.



Waveform processing setting screen



Waveform parameter calculation setting screen

Equipped with GP-IB interface and various signal outputs

The GP-IB interface complies with the new IEEE standard 488.2-1987. The unit also has trigger inputs and outputs, external start and stop control lines, and waveform judgment (GO, NG) terminals.



Thermal printer for observation and immediate recording. Plotter output for data.

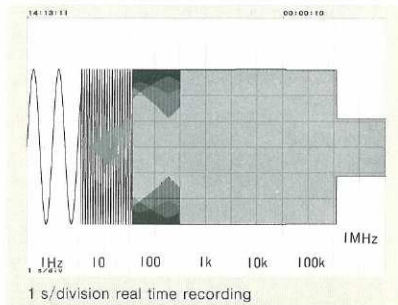
High speed built-in printer has a printing speed of 25 mm/s, density 8 dots/mm, and recording width of 100 mm. Ideal for applications requiring observation and immediate recording. The HP-GL plotter output also allows large 4-color waveforms to be plotted on larger paper (any size). Use it for all experiment report generation.

Accurate wave capturing

A/D conversion with a 12-bit resolution and 1 MS/s sampling rate enable complex and rapid signal variations to be captured and reproduced accurately.

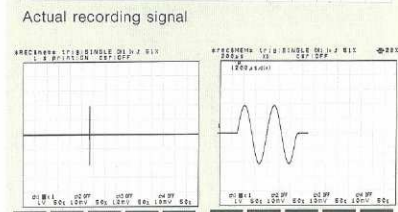
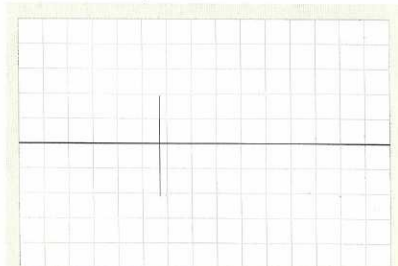
Fast input response, and real time recording function.

The signal response of a conventional recorder is governed by the mechanical response of the pen motor, and is limited to an absolute maximum of several hundred Hertz. The 8851, however, provides a (fixed) high sampling rate of 400 kS/s. It can therefore cope with a signal in the tens of kHz frequency range.

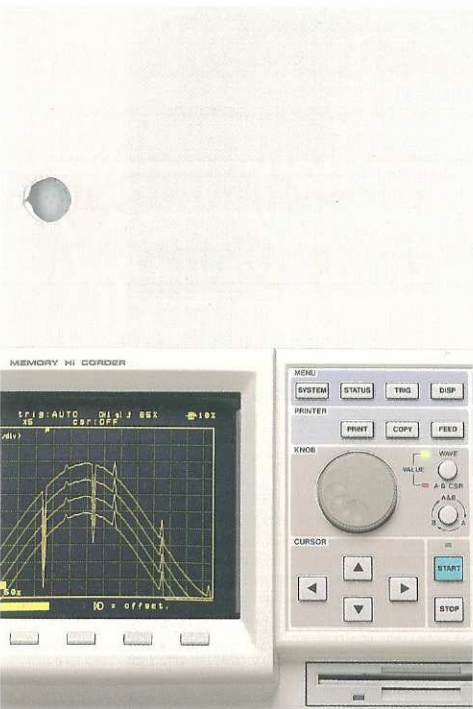


Offers high-speed recording of erratic waveforms during real time recording.

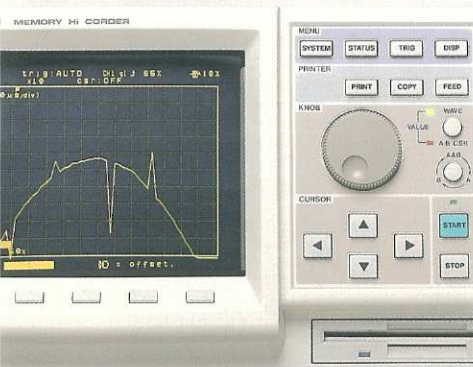
Built-in recorder and memory functions. The real time recorder means that while recording at a low speed over a long interval, any sudden high frequency signal changes can be stored internally in the memory recorder.



Recorder screen: 1 s/DIV Memory screen: 200 μs/DIV



Waveforms captured with 12-bit accuracy; scrolling on voltage axis also possible.



Close-up function for detailed inspection of important measurements.

General Specifications

(Basic specification)

Measurement functions:

Memory recorder, Recorder, X-Y recorder, Recorder & Memory

Input system:

Plug-in input units

Channels (max.):

4 analog channels + 16 logic channels *
* Logic channels are built into unit, with common ground connection.

Max. sampling speed:

1MS/s (1 μ s sampling cycle)

Memory capacity:

2,000,000 12-bit words for one channel (using one analog channel); 500,000 12-bit words per channel, using four analog channels.

External control terminals:

3.5 mm dia. mini-jacks (trigger inputs/outputs), terminal board (external start input, stop input, waveform judgment output)

Temperature / humidity:

5 to 40°C, 35 to 80% R.H. (no condensation)

Power supply:

100,120,200,220,240V AC (specify at order) \pm 10% (max.250VAC), 50/60Hz

Power:

200W MAX (approx.70W during normal recording)

Dimensions/weight:

Approx.170H \times 330W \times 400Dmm \cdot 10.7kg (main unit only)

Accessories:

Power cord(1), recording paper(1), dust cover(1), and spare fuse(1)

(Trigger section)

Triggering method:

Digital comparison

Modes:

Single, repeat, auto

Sources:

On/off for each of channels 1 to 4, EXT, TIMER

Channels 1 to 4 can use analog or logic settings; TIMER trigger allows start time, stop time and interval.

Conditions:

Logical AND or OR of different triggers (TIMER trigger OR only)

Trigger types (analog):

Level trigger - digital setting 0% to 100%, rising or falling edge
Event trigger - when level trigger specified; setting to 2 to 4000 times.
Window trigger - specify upper and lower trigger levels.

Glitch detection trigger - detection glitch width 2 to 4000 samples.

Timeout trigger - setting 2 to 4000 samples.

Trigger types (logic):

Pattern trigger - 1, 0, \times (don't care) pattern setting; AND/OR setting for each 4 channels.

Level setting accuracy:

\pm 0.4% f.s.

Pretrigger:

0, 2, 5, 10, 20, 30, 40, 50, 60, 70, 80, 90, 95, 100%

-50 to -950*% (memory recorder)

* Affected by recording length.

Timing:

Start, stop, start & stop

Filter:

Filter width 2 to 4000 samples (using a level trigger or logic trigger)

Output:

Open collector (with 5 V output, active low, pulse width 1.5 ms approx., max. input voltage 30 V)

Function Specifications

● Recorder function

Time axis:

13 ranges - 400 ms/DIV, 0.5 s - 1 hour per division in 1-2-5 steps, except 50 s, 50 min

Time axis resolution:

160 dots/DIV (half, for 400ms and 500ms settings only)

Sampling cycle:

2.5 μ s, constant regardless of time axis

Recording length:

15,30,75,150,300,750DIV,continuous

Formats:

Single, dual, (quad, printer only)

Interpolation, gray scale display:

Line display only, dark/light

Printing functions:

On/off (simultaneous operation with display), screen copy, reprinting recorded portion

● Memory recorder function

Time axis:

17 ranges - 40 μ s/DIV, 50 μ s - 5s per division in 1-2-5 steps

Time axis resolution:

40 dots/DIV

Sampling cycle:

1/40 of time axis, 1 μ s to 0.125s

Recording length:

15,30,75,150,300,750,1500,3000,6000,12500DIV (25000DIV/2ch),(50000DIV/1ch)

Formats:

Single, dual, (quad, printer only), X-Y (not possible when envelope specified)

Interpolation, gray scale display:

Dot/line, dark/light

Printing functions:

Auto, manual, smooth, partial print, screen copy

● X-Y recorder function

Channels:

Max. 3, arbitrary x- and y-axes

Effective recording area:

100mm \times 100mm (10DIV \times 10DIV)

X/Y axis resolution:

25 dots/DIV (display), 80 dots/DIV (printer)

Sampling cycle:

300 μ s fixed (dot)
300 μ s to 40 ms (line) depends on setting conditions

Recording length:

unlimited

Interpolation, gray scale display:

Dot/line, dark/light

Printing functions:

Manual, screen copy

● Recorder & memory function

Time axis, resolution:

The time axis and resolution depend on whether recorder or memory recorder (memory recorder only 40 μ s and 50 μ s per division not available; recorder is eight times slower than memory recorder)

Sampling cycle:

Depends on whether recorder or memory recorder

Recording length:

Memory recorder only 6000 divisions max.

Interpolation, gray scale display:

Depends on whether recorder or memory recorder

Printing functions:

During start operation, recorder waveform only

(Analysis functions -memory recorder only)

Waveform processing computations:

Arithmetic operations, absolute value, exponents, common logarithms, square roots, dynamic average, 1st derivative, 2nd derivative, 1st integral, 2nd integral, parallel shift on time axis, UPPER, LOWER

Waveform parameter calculation:

Maximum value, minimum value, peak-peak value, mean value, rms value, area value, period, frequency, rise time, fall time, XY area value,

Scaling:

Value conversion, offset, unit setting

Averaging:

Additive mean, exponentiated mean

FFT computations:

Types - linear spectrum, power spectrum; Channels - any one channel; Sampling - 800 points; Frequency range - 4 Hz to 400 kHz, 500 kHz; Frequency resolution - 1/400; Dynamic range - 72 dB logical value; Window - rectangular, hanning

(Recording & display section)

Recording method:

Thermal printing with thermal line head

Recording paper:

110mm \times 30mm, roll type thermal recording paper

Recording width:

(total)108mm(864 dots)
(waveform section)100mm f.s., 1DIV = 10mm

Printing speed:

Approx. 2.5cm/s max.

Display method:

Raster scan 7-inch CRT (gray-scale display)

(Auxiliary functions)

Recorder:

(1) Waveform storage (holds last 750 divisions in memory); (2) Data conversion (transfers stored data to memory recorder function)

Memory recorder:

(1) Memory division function; (2) Overwrite function; (3) Envelope function (sampling 800 kS/s); (4) Waveform expansion and compression (time axis \times 10 to \times 1/4000, voltage axis \times 10 to \times 1/2; (5) Waveform scrolling (time axis, voltage axis)

Recorder & memory:

(1) Sequential saving to divided memory; (2) Overwrite function

External memory:

3.5-inch floppy disk drive, 2HD/2DD type

Format:

MS-DOS * (formatted capacity - 2HD = 1.2M bytes, 2DD = 720K bytes)

Memory contents:

Setting conditions, measurement data, waveform judgment area

Waveform judgment functions:

Types - area judgment for Y-T waveform, X-Y waveform, or FFT waveform; parameter judgment for waveform parameter calculations.

Judgment output:

GO/NG judgment output (open collector 5 V output, active low, pulse width 40 ms min., maximum input voltage 30 V)

When stopped, printer output or data save.

Judgment time and cycle:

50 ms max.; cycle approx. 200 ms (50 μ s, 15 divisions, 1 channel, excluding waveform input time) reference value

Backup:

Time, setting conditions, battery life 10 years (25 degrees C)

Interface:

GP-IB the new IEEE standard 488.2-1987; HP-GL plotter output

Miscellaneous:

Cursor measurement function, clock function, key lock function, help function, auto-range function, auto-save/auto-set up function

* MS-DOS is a registered trademark of Microsoft Corporation.

Sampling rates and recording times

(memory recorder function)

Time axis resolution is 1/40

* 1 Recording length is 50,000DIV

* 2 Recording length is 25,000DIV

* 3 Recording length is 12,500DIV

TIME/DIV	Sampling period	Recording time (maximum)		
		1ch ※1	2ch ※2	3, 4ch ※3
40μs/DIV	1μs	2s	1s	0.5s
50	1.25	2.5s	1.25s	0.625s
100	2.5	5s	2.5s	1.25s
200	5	10s	5s	2.5s
500	12.5	25s	12.5s	6.25s
1ms/DIV	25	50s	25s	12.5s
2	50	100s	50s	25s
5	125	4m10s	2m5s	62.5s
10	250	8m20s	4m10s	2m5s
20	500	16m40s	8m20s	4m10s
50	1.25ms	41m40s	20m50s	10m25s
100	2.5	1h23m20s	41m40s	20m50s
200	5	2h46m40s	1h23m20s	41m40s
500	12.5	6h56m40s	3h28m20s	1h44m10s
1s/DIV	25	13h53m20s	6h56m40s	3h28m20s
2	50	27h46m40s	13h53m20s	6h56m40s
5	125	69h26m40s	34h43m20s	17h21m40s

● 9270-9271-9272 clamp on sensor and 9555 sensor unit

Can monitor current waveforms on line lines up to 20A AC or 200A AC. Frequency range is extremely wide (5Hz to 50kHz/±2.5%), making possible recording of inverter-controlled current waveforms on the Memory Hi Corder.

9555 Sensor unit

Compatible sensor: 9270, 9271, 9272

Output: 2V AC/20A(20A-range), 2VAC/200A(200A-range)

Temperature Performance: 0 to 40°C

Humidity: 80%R.H. or less

Power requirement: 85 to 250VAC (47 to 440Hz)

Power: 5.5W max. (1.7W under no load)

Dimensions: 100H×48W×180Dmm, 700g

Accessories: 9177cord 1, power cord 1, spare fuse 1, rubber legs 4, rack mounting fittings 2

Input unit specifications

(sold separately)

8944 analog unit

(Accuracy at 23±5°C, 30 minutes after powering on; accuracy guaranteed for six months.)

Input method:

Unbalanced input(input and output mutually insulated)

Measurement ranges:

12 ranges - 10mV to 50V/DIV in 1-2-5 steps

DC amplitude accuracy:

±0.25% f.s.

Zero position adjustment:

0% to 100% of recording width in 1% steps, with zero adjust function.

Zero position accuracy:

±0.1% f.s. (after zero adjustment)

Frequency characteristics:

DC to 500 kHz ±3dB (with DC coupling)
Approx. 7 Hz to 500 kHz ±3dB (with AC coupling)

Input RC (C at 100 kHz):

1 MΩ ±1%, 30 pF approx.

Input coupling:

AC, GND, DC

Low-pass filter:

Approx.5Hz,500Hz(-3dB),OFF

A/D conversion resolution:

12bit

Max. sampling speed:

1MS/s

Allowable input voltage:

500V(DC + AC peak)

Max.floating voltage * 1:

450V AC,DC

Insulation resistance, withstand voltage (unit - case; between units):

100MΩ minimum, 500 V DC and 2kV AC, 1 minute

Common mode rejection ratio * 2:

90dB(typ.)

Internal noise levels * 3:

350μV p-p (typ.)

Temperature characteristics:

gain ±0.025% f.s./°C

zero ±0.015% f.s./°C

Dimensions:

Approx.30H × 160W × 110Dmm

Weight:

Approx.300g

Accessories:

9574 input cord (1.7m) (1)

* 1 (between input unit and case, and between input units)

* 2 (source impedance 100Ω max. at 50 or 60Hz)

* 3 (In maximum sensitivity range, input shorted)

Optional accessories specifications

● 9303 PT

Used for level detection and isolation for measurement of 400VAC power line and commercial power line voltages. Because it is designed for waveform recorder use, it features a wide frequency range.



Transformation ratio: 40:1/20:1±1%

Allowable input voltage: 440V/220VAC

Frequency characteristics: 40Hz to 3kHz (±1%)

Insulation dielectric strength: 2kVAC/ 1 minute.

Dimensions: Approx. 113H×56W×93Dmm

Weight: Approx. 730g

Cord length: 1m (input, output)

Accessories: Input cord 1, output cord 1, spare fuse 1

● 9305 trigger cord

Used to synchronize multiple Memory Hi Corders for simultaneous recording, by connecting their trigger I/O terminals.



Terminal: 3.5mm-dia. miniplug

Cord length: Approx. 1.5m

● 220H Recording paper winder



Winding paper width: 70 to 220mm

Winding method: Intermittent winding

Winding power: Approx. 500g-cm

Power requirement: Using the exclusive adapter (6V DC out)

Power: Approx. 7W

Dimensions: Approx. 190H×240W×160Dmm

Weight: Approx. 2.6kg

Accessories: AC-adapter 1, paper guide pin 1set



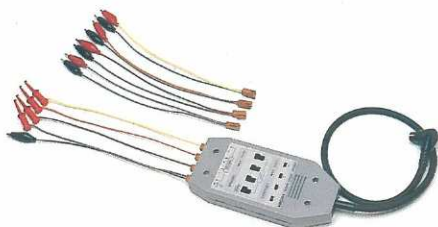
9270, 9271, 9272 Clamp on sensor

	9270	9271
Rated current	20A AC	200A AC
Accuracy (23±3°C) 45 to 66Hz	±0.5% rdg. ±0.05% f.s. (amplitude) ±0.2° max. (phase)	
Frequency characteristics (vibration amplitude, phase deviation from the basic accuracy)	5Hz to 50kHz ±2.5%, ±1.0° max.	
Operating input range	0 to 50Arms	0 to 300Arms
Max. allowable input (continuous)	100Arms	500Arms
Max. circuit voltage	600V AC	
Measurable conductor diameter	20mm-dia.	
Dimensions - Weight	60H×145W×33Dmm - Approx. 230g	
	9272	
Rated current	20A AC	200A AC
Accuracy (23±3°C) 45 to 66Hz	±0.5% rdg. ±0.05% f.s. (amplitude) ±0.2° max. (phase)	
Frequency characteristics (vibration amplitude, phase deviation from the basic accuracy)	5Hz to 10kHz ±2.5%, ±2.0° max.	
Operating input range	0 to 60Arms (20A range)	0 to 300Arms (200A range)
Max. allowable input (continuous)	400Arms	
Max. circuit voltage	600V AC	
Measurable conductor diameter	46mm-dia. or 50×20mm busbar	
Dimensions - Weight	174H×62W×33Dmm - Approx. 420g	

Optional accessories specifications

●9306 logic probe

It can be used as a high/low detector when recording operation timing for electronic circuit digital signals, or as an on/off detector when recording no-voltage contact signal operation timing for relays and similar circuits. The digital signal is -COM only, and the threshold is fixed to +1.4V.



Channels	4 (Common ground)	
Input waveform	Digital input	Contact input
Input impedance	*50k Ω or more	2k Ω
Threshold level	+1.4V	+1.4V
Allowable input voltage	50V	30V
Response time	2 μ sec or less	

* 100k Ω at input levels up to 5V
50k Ω at input levels above 5V.
Dimensions: Approx. 137H \times 64W \times 22Dmm
Weight: Approx. 200g
Cord length: 1.5m
Probe tip cable length: 20cm
Accessories: Soft case 1, digital probe tip 4, contact probe tip 4

●9307 line logic probe

Can be used as an on/off detector when recording AC/DC high-voltage drive circuit operation timing, such as in elevator relay sequence control. The detection threshold is high, and the design is noise-resistant. Because on/off detection response is only a few msec, it can also be used as a power failure detector for commercial power lines.



Channels	4 (floating)	
Input voltage range	Low	High
Input impedance	About 30k Ω	About 100k Ω
Detectable level (H)	60V to 150VAC \pm (20 to 150)VDC	170 to 250 V DC \pm (70 to 250)V DC
Non-detectable level (L)	0 to 10VAC \pm (0 to 15)V DC	0 to 30VAC \pm (0 to 43)V DC
Response time	1ms or less 3ms or less (at 100 V DC)	1ms or less 3ms or less (at 200 V DC)
Maximum floating voltage	250V	

* Since the absolute value is detected, DC input is bipolar input.
Dimensions: Approx. 137H \times 64W \times 22Dmm
Weight: Approx. 400g
Cord length: 1.5m
Input cord length: 1m
Accessories: Soft case 1, spare fuse 1

●9308 line dip detector *

Detects instantaneous voltage drops in 100VAC-class (100V, 120V) commercial power lines, and triggers the recorder. At the same time a signal 1/100th of the measured voltage is output, allowing the waveform during voltage drop to be recorded.



Channels	1
Input impedance	About 12k Ω
Input range	100V AC/120V AC
Voltage drop detection level	80% or 90% of the input range
Detection method	Peak detection
Response time	2 cycles of the input AC voltage
Maximum floating voltage	130VAC
ATT. section	100 : 1 \pm 3% DC to 100kHz (\pm 3 dB)

Dimensions: Approx. 137H \times 64W \times 22Dmm
Weight: Approx. 300g
Cord length: 1.5m
Input cord length: 1m
Accessories: Soft case 1, spare fuse 1
* Using the 8851 timeout trigger function an AC voltage drop can be detected in the same way as with the 9308.

Ordering information

* The 8851 alone cannot be used for measurement; please also order the required input units (separately chargeable). For shipping with input units already installed, specify at the time of order. Note that units cannot be shipped with empty channels; for safety reasons, if channels are not used, they must always be fitted with blanking panels.

● Option

8944 analog unit
9509 blank panel

● Optional accessories

9221 recording paper (30m, 10 rolls)
9303 PT
9305 trigger cord
9306 logic probe

9307 line logic probe
9308 line dip detector
9151-02 GP-IB cable (2m)
9151-04 GP-IB cable (4m)
220H recording paper winder
9270 clamp on sensor (max. 20A)
9271 clamp on sensor (max. 200A)
9272 clamp on sensor (max. 20/200A)
9555 sensor unit

In addition to the 8851 Memory Hi Corder, we offer many models, including the 20MS/s high sampling rate 8850 Memory Hi Corder, the multi-channel 8821 Memory Hi Corder capable of recording 13 channels, the compact portable type 8815/8830 series Memory Hi Corder.

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