

## MICRO HiCORDER 8205-10, 8206-10

Recorders 



*Direct Measurement of Current up to 1000A!  
New and improved*



CE

Successor to the long-popular Model 8202 & 8203 MICRO HiCORDERs

## True RMS Voltage and Current Recorders with Multimeter Operability !

The MICRO HiCORDERs **8205-10** and **8206-10** incorporate the latest technology in HIOKI's best selling MICRO HiCORDER **8200** series. Maintaining the operational simplicity of an analog multimeter, these data recorders offer easy to use features such as;

- A fast LCD level meter vs. a stylus to quickly display the measured level
- True RMS rectification system to accurately read distorted waveforms
- Climate-resistant recording paper is easy to read and lasts longer!
- Sampling rate of 100 samples/second with selectable chart speeds

There are two models to choose from. The **8205-10** has one channel for recording either AC/DC voltage or AC current, while the **8206-10** has two channels for recording of AC voltage and AC current simultaneously, allowing it to be used for recording power line fluctuations. Packaged in a rugged case, the HIOKI MICRO HiCORDERs work where you work !



ISO 9001  
JMI-0216



ISO 14001  
JQA-E-90091



[www.hioki.com](http://www.hioki.com)

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

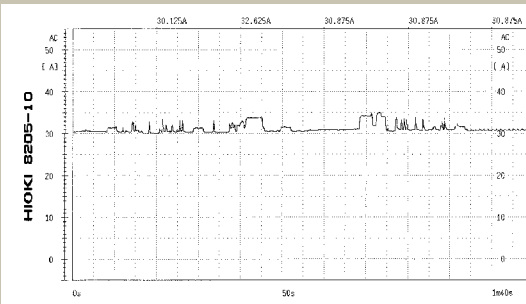
# The Standard for Recorders

Depending on your application, select either the 8205-10 for general applications or the 8206-10 for power lines.

## 8205-10: For Recording AC Voltage, DC Voltage, or AC Current on a Single Channel

The 8205-10 can be used for basic recording in a wide range of applications, with features such as a wide AC/DC measurement range of 0.1V to 500V, an analog level monitor function, and a special clamp-on probe for recording large currents.

- Range: AC/DC 0.1V to 500V (AC 10A to 500A when using the 9651, AC 10A to 1000A when using the 9668)
- Input Channels: One, for voltage or current
- Paper Feed Speed: 20 cm/min to 2 cm / hr ●Sampling Frequency: 10ms



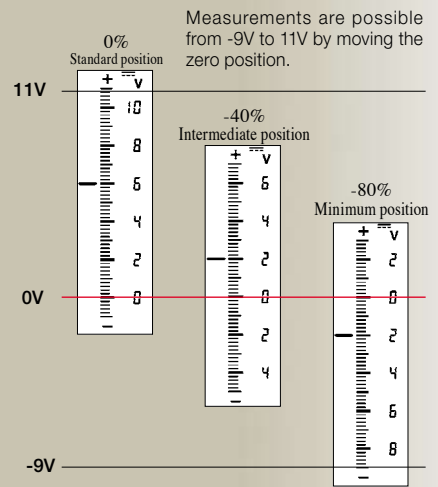
- Range and mode setting data is printed every 10 divisions.
- Voltage or current values can be read directly from the vertical axis scale.
- Time is printed every 5 divisions.
- Interval printing of average values on a grid with points every 2 divisions.

Easy viewing of the input level with a full-range level monitor.



For DC measurement, the zero position can be changed in steps that are -20% of the range, which is convenient for tasks such as recording both polarities.

Example of a level display for the DC 10V range

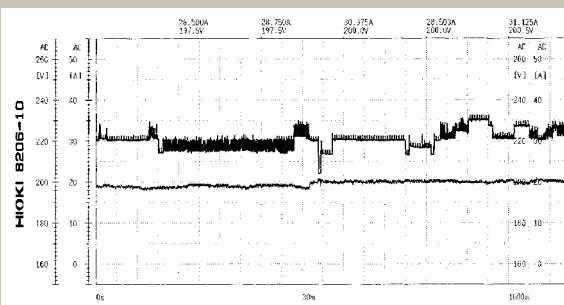


Measurements are possible from -9V to 11V by moving the zero position.

## 8206-10: For 2-Channel Special Purpose Recording of AC Voltage and Current from Power Lines

The 8206-10 provides simultaneous voltage and current measurement (a frequent requirement of power line management) along with a zoom function that allows 2X recording centered around the range value. Providing ranges that are expressly intended use with power lines, the instrument is capable of recording voltages of up to 600V.

- Range: AC 100V, 200V, or 500V (AC 10A to 500A when using the 9651, AC 10A to 1000A when using the 9668)
- Input Channels: Two, for simultaneous recording of voltage and current
- Paper Feed Speed: 60 cm/hr to 2 cm/hr ●Sampling Frequency: 10ms

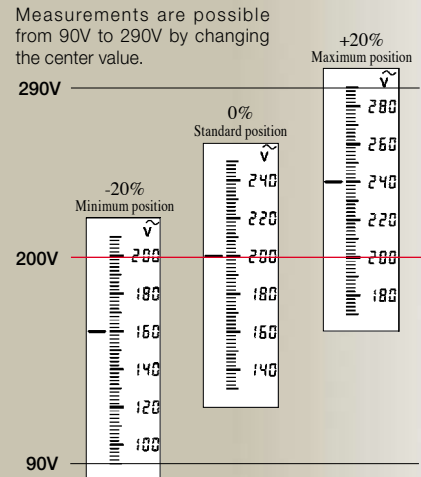


- Range and mode setting data is printed every 10 divisions.
- Voltage or current values can be read directly from the vertical axis scale.
- Time is printed every 5 divisions.
- Interval printing of average values on a grid with points every 2 divisions.

For voltage measurements, the display can be expanded from 25% to -35% around the center of the range. The center value can be changed in steps that are -10% of the range, which is convenient when it is necessary to adjust the measurement position for electric circuits with different rated voltages.



Example of a level display for the 200V range



Measurements are possible from 90V to 290V by changing the center value.

# Simple Operation, Rugged Design and Quiet !

## NEW MICRO HiCORDER

**No.1** Operational simplicity with multimeter ease-of-use.



Intuitive analog dials are used to set the input range and paper feed speed. This makes the recorders as easy to operate as a multimeter.

**No.2** The 8206-10 has two recording channels, one for voltage and one for current. (clamp on sensor sold separately)



With 2-channel recording, a single instrument can simultaneously record both voltage and current. This is ideal for management and testing of power lines.



**No.3** A sensor allow measurement up to 1000A. (clamp on sensor sold separately)



The recorder provides selectable current ranges. Used together with a special clamp on sensor, this makes it possible to read values directly and eliminates the need for scaling conversion. In addition to 100A and 500A sensors, a sensor has been added to allow measurement up to 1000A.

**No.4** Sensitized recording paper provides clean, easy-to-read printouts.



Sensitized recording paper is used, providing clean, quiet recording. Further, **HIOKI's RECORDING PAPER 9236-01** and provides superior climate resistance and is much less susceptible to discoloration due to chemical exposure than ordinary thermal recording paper, providing much longer print life.

### ■ Paper feed speed and recording time

\*With a time axis resolution of 80 points / DIV (1DIV=10mm)

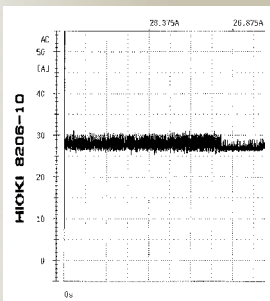
8205-10 Paper feed speed	8206-10 Paper feed speed	9235,9236-01 Sensitized paper 15m (49ft 2.5in) roll
20 cm (7.9 in)/m	—	1 hr 15 m
6 cm (2.36 in)/m	—	4 hr 10 m
60 cm (23.8 in)/m	60 cm (23.8 in)/hr	1 day 1 hr
—	60 cm (23.8 in)/hr	3 days 3 hr
10 cm (3.94 in)/hr	10 cm (3.94 in)/hr	6 days 6 hr
—	6 cm (2.36 in)/hr	10 days 10 hr
2 cm (0.79 in)/hr	2 cm (0.79 in)/hr	31 days 6 hr

### Adaptable for Special Applications

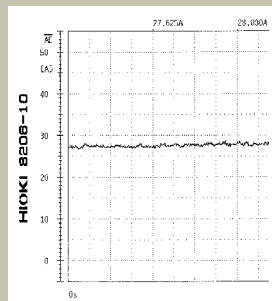
As a special-order option, the DC power supply connector can be converted to a signal input terminal. Although this makes it impossible to use a DC power supply, it allows recording on paper to be turned on or off externally, or to input a contact signal and record the occurrence of events on recording paper. Please contact your nearest **HIOKI** sales representative for details.

- Special order modification (disables DC power supply)
- External CHART ON / OFF control
- Event recording

### Standard/Average Print Modes



Standard Mode



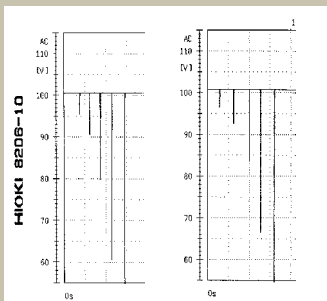
Average Mode

For printing, you can select standard mode or average mode.

- Standard mode prints values interpolated from the maximum and minimum values sampled every 10 ms. This is effective for recording widths of steep input signal changes, such as instantaneous power outages.
- Average mode prints the average value of the data during the print interval. This makes it possible to print something that is smooth and easy to see, at times when there are violent fluctuations.

\* Switch to average mode by holding down the paper feed button when turning on the power.

### Example of Instantaneous Power Outage Recording



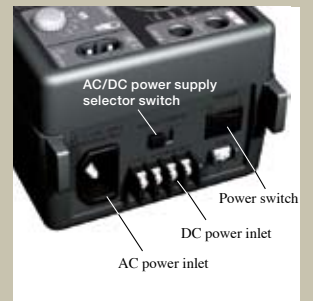
50 Hz

60 Hz

This example shows recording of a simulated instantaneous power outage by the 8206, for AC 100V with frequencies of 50Hz or 60Hz and 0V durations of 0.5, 1, 2, 4, or 8 cycles.

Even for a 0.5 cycle instantaneous power failure, the high speed response can catch the line abnormality.

### Also runs on DC Power !



In addition to a universal power AC supply of 100 to 240V, the recorders can operate on 9.5 to 14V DC power supplies. This is useful outdoors and in other field applications.

\* Runs off either AC or DC. DC cannot be used as a backup power supply.

### 8205-10 and 8206-10 Common Specifications

<b>Recording method</b>	60mm (2.36in) amplitude (1 DIV = 10mm/0.39in), heat-sensitive recording
<b>Display</b>	Level meter and scaling values by LCD bar graph, plus other setting information
<b>Sampling rate</b>	100S/s (sampling period : 10ms fixed)
<b>Recording time axis accuracy</b>	Within $\pm 0.5\%$ .
<b>Environmental conditions (non-condensating)</b>	Operation: $+5^{\circ}\text{C}$ ( $41^{\circ}\text{F}$ ) to $+40^{\circ}\text{C}$ ( $104^{\circ}\text{F}$ ), 35% to 80% rh Storage: $-10^{\circ}\text{C}$ ( $14^{\circ}\text{F}$ ) to $+50^{\circ}\text{C}$ ( $122^{\circ}\text{F}$ ), within 80% rh
<b>Applicable standards</b>	Safety: EN61010 EMC: EN61326, EN61000-3-2, EN61000-3-3
<b>Power</b>	100 to 240V AC (auto selecting) at 50/60 Hz, or 9.5 to 14V DC
<b>Maximum power consumption</b>	30 VA maximum (AC or DC operation)
<b>Dimensions and mass</b>	250mm (9.4in) $\times$ 122mm (4.8in) $\times$ 93.5mm (3.66in), 1.2kg (42.33oz)
<b>Included Accessories</b>	RECORDING PAPER 9235 $\times$ 1, Roll paper holder $\times$ 2, Power cord $\times$ 1, CONNECTION CORD 9257 $\times$ 1, CARRYING CASE 9344 $\times$ 1

### External appearance and dimensions (for both the 8205-10 and 8206-10)



	8205-10 (Accuracy at $23 \pm 5^{\circ}\text{C}/73 \pm 9^{\circ}\text{F}$ , 35 to 80 % rh ; accuracy guaranteed for 1 year)	8206-10 (Accuracy at $23 \pm 5^{\circ}\text{C}/73 \pm 9^{\circ}\text{F}$ , 35 to 80 % rh ; accuracy guaranteed for 1 year)																																
<b>Input channels</b>	One channel, AC or DC voltage, or one channel AC current. (Simultaneous recording not available, one channel may be either type, input is voltage isolated.)	One channel AC voltage and one channel AC current. (Simultaneous recording based on two channel alternating sampling, for commercial power lines, input is voltage isolated.)																																
<b>Voltage measurement ranges</b> * Resolution = 400points/ range	0.1, 0.2, 0.5, 1, 2, 5, 10, 20, 50, 100, 200, or 500V AC/DC. In DC mode, the zero position can be set in steps of 20% of the range. Max. input voltage: 500V rms. Accuracy: $\pm 2\%$ of the range. (ACV/ 45Hz to 66Hz) Frequency characteristic: 20Hz to 30kHz/ $+3$ dB to $-3$ dB Max. rated voltage to earth: 500V rms (the maximum voltage that can be applied between input channel and chassis without damage)	100, 200, or 500V AC, Max. input voltage: 600V rms. Magnified display from $+25\%$ to $-35\%$ of the range. Center position of the magnified display can be set in 10% steps from $+20\%$ to $-20\%$ . Accuracy: $\pm 2\%$ of the range, (45Hz to 66Hz) Frequency characteristic: 30 Hz to 30 kHz/ $+0.5$ dB to $-3$ dB Max. rated voltage to earth: 600V rms (the maximum voltage that can be applied between input channel and chassis without damage)																																
<b>Current measurement ranges</b> * Resolution = 400points/ range	10, 20, 50, or 100A AC (with CLAMP ON SENSOR 9650). 10, 20, 50, 100, 200, or 500A AC (with CLAMP ON SENSOR 9651). 10, 20, 50, 100, 200, 500 or 1000A AC (with CLAMP ON SENSOR 9668). Bar graph displays from 0% to 110% of range. Frequency characteristic is determined by the clamp on sensor.	Combination accuracy with the clamp-on sensor (% of full scale value)																																
		<table border="1"> <thead> <tr> <th>Range</th> <th>10A</th> <th>20A</th> <th>50A</th> <th>100A</th> <th>200A</th> <th>500A</th> <th>1000A</th> </tr> </thead> <tbody> <tr> <td>9650</td> <td><math>\pm 3.8\%</math></td> <td><math>\pm 3.65\%</math></td> <td><math>\pm 3.56\%</math></td> <td><math>\pm 3.53\%</math></td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>9651</td> <td><math>\pm 5.0\%</math></td> <td><math>\pm 4.25\%</math></td> <td><math>\pm 3.8\%</math></td> <td><math>\pm 3.65\%</math></td> <td><math>\pm 3.58\%</math></td> <td><math>\pm 3.53\%</math></td> <td>—</td> </tr> <tr> <td>9668</td> <td><math>\pm 8.0\%</math></td> <td><math>\pm 6.5\%</math></td> <td><math>\pm 5.6\%</math></td> <td><math>\pm 5.3\%</math></td> <td><math>\pm 5.15\%</math></td> <td><math>\pm 5.06\%</math></td> <td><math>\pm 6.03\%</math></td> </tr> </tbody> </table>	Range	10A	20A	50A	100A	200A	500A	1000A	9650	$\pm 3.8\%$	$\pm 3.65\%$	$\pm 3.56\%$	$\pm 3.53\%$	—	—	—	9651	$\pm 5.0\%$	$\pm 4.25\%$	$\pm 3.8\%$	$\pm 3.65\%$	$\pm 3.58\%$	$\pm 3.53\%$	—	9668	$\pm 8.0\%$	$\pm 6.5\%$	$\pm 5.6\%$	$\pm 5.3\%$	$\pm 5.15\%$	$\pm 5.06\%$	$\pm 6.03\%$
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<b>Rectification system</b>	True RMS.																																	
<b>Input resistance</b>	Voltage input: approx. $1\text{M}\Omega$ . Clamp input: $1\Omega \pm 10\%$ .																																	

### Ordering Information

**MICRO HiCORDER 8205-10** (1-channel recording)

**MICRO HiCORDER 8206-10** (2-channel simultaneous recording)

The CLAMP ON SENSOR 9650, 9651 and 9668 for current measurement are not supplied with the MICRO HiCORDERs 8205-10 and 8206-10. To measure current, an optional CLAMP ON SENSOR must be purchased separately.

#### Options

**CONNECTION CORD 9326**  
(1.7m/ 5.58ft, for 8205 and 8205-10 voltage input)



**RECORDING PAPER 9236-01**  
(Climate-resistant, 15m/ 49ft roll, 10 rolls/ set)

#### Supplied as standard

**CONNECTION CORD 9257**  
(1.3m/ 4.27ft, voltage input, Supplied as standard)

**CARRYING CASE 9344**  
Holds optional accessories (Supplied as standard)

**RECORDING PAPER 9235**  
(15m (49.22ft) roll, 10 rolls/ sets; one roll only, provided with recorder)

### Option Specifications (sold separately)



CLAMP ON SENSOR 9650



CLAMP ON SENSOR 9651



CLAMP ON SENSOR 9668

Individual Specifications	9650	9651	9668
<b>Rated current</b>	Primary: 100A AC, Secondary: 100mA AC	Primary: 500A AC, Secondary: 500mA AC	Primary: 1000A AC, Secondary: 1000mA AC
<b>Secondary current amplitude accuracy</b>	Combined accuracy with recorder depends on recorder accuracy.	Combined accuracy with recorder depends on recorder accuracy.	Combined accuracy with recorder depends on recorder accuracy.
<b>Frequency characteristic</b>	$\pm 8\%$ or better from 40Hz to 1kHz	$\pm 3\%$ or better from 40Hz to 1kHz	$\pm 3\%$ or better from 40Hz to 1kHz
<b>Maximum input current</b>	130A continuous at 45 to 66Hz	600A continuous at 45 to 66Hz	1000A continuous at 45 to 66Hz
<b>Application circuit voltage</b>	300V rms AC or less (insulated conductor)	600V rms AC or less (insulated conductor)	600V rms AC or less (insulated conductor)
<b>Diameter of measurable conductor</b>	$\phi$ 15mm (0.59 in) or less	$\phi$ 46mm (1.81 in) or less	$\phi$ 55mm (2.17 in) or less, 80mm (3.15 in) $\times$ 20mm (0.79 in) busbar
<b>Dimensions and mass</b>	Approx. W 46mm (1.81 in) $\times$ H 135mm (5.31 in) $\times$ D 21mm (0.83 in) Cable length: 3m (9.84 ft), mass: 230g (8.1 oz)	Approx. W 77mm (3.03 in) $\times$ H 151mm (5.94 in) $\times$ D 42mm (1.65 in) Cable length: 3m (9.84 ft), mass: 360g (12.7 oz)	Approx. W 46mm (1.81 in) $\times$ H 135mm (5.31 in) $\times$ D 21mm (0.83 in) Cable length: 3m (9.84 ft), mass: 230g (8.1 oz)

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