Oscilloscope-like Waveform Observation,  
Plus Recording of RMS Variations - In a Single Device!

**RMS recording function** makes its debut on this device!
Enhancing the ultra-compact oscilloscope-functioning Hioki 8870, the new MR8870 features a new RMS recording mode and real-time save to a CF card.

- **Measure safely, with isolated input for all channels**
  Test commercial power lines with ease of mind thanks to isolated input for both channels

- **Monitor instantaneous waveforms on-site**
  High-speed waveform observation/recording with 1 M sampling, despite compact size

- **Monitor fluctuations in commercial power lines**
  Real-time recording of data to CF card with 1 ms recording interval in a compact package

- **Synchronize two HiCORDERs together to measure three-phase lines and other channels needing three or more channels**
  Bundled PC application enables integration/observation of synchronized data from two HiCORDERs on a single screen
An oscilloscope in the palm of your hand
Capture unpredictable phenomena using waveforms!

**Recording of EV and HEV starting current waveforms**

The MR8870 can be used with a clamp-on AC/DC current sensor to observe the current waveform at motor start. Hioki’s clamp-on sensor line covers a frequency band ranging from DC to frequencies of 10 kHz and higher.

**Check inverter output waveforms**

Inverter performance analysis requires simultaneous observation of the high frequency carrier signal and the low frequency fundamental waveform being switched. The combination of high-speed sampling capability and high-capacity memory make these observations possible. For current waveform observations, use Hioki clamp sensors capable of high-frequency measurements without direct electrical contact.

**Recording of motor rush current**

Motor power-on inrush current waveforms can be precisely recorded. The Clamp On Probe the 9018-50 is available for current measurement, as is the Clamp On Leak HiTester 3283. In addition, to measure direct current waveforms, a variety of Current meters such as the CLAMP ON AC/DC Hitester 3284/3285 are available upon request.

**CB timing measurements**

Analyze the relationships of multi-point logic signals and analog waveforms to detect timing issues that can affect power supply circuit breakers. Use logic probes to record relay operations on up to four channels, or use the Differential Probe P9000 for three-phase 440 V power line measurements and for support of CAT III 600 V measurement categories.

**Analysis of sequence controller issues**

When sequence controllers being used in applications such as production and testing lines stop due to errors or generate warning output, potential causes include momentary AC power interruptions and brownouts. The MR8870 is ideal for analyzing the operation of such systems since it can record the correlation of sequence relay signals, AC power circuits, and DC voltage circuits as waveforms using power supply anomalies as a trigger.
A pen-free recorder in the palm of your hand
Long-term RMS fluctuation recording!

Pen- and paper-free recording
A substitute for the Hioki Micro HiCorder

The photo above shows the Hioki 8205-10 and 8206-10 Micro HiCorders. These products are no longer available.

RMS value calculation method
RMS values for three AC waveform cycles are calculated 1,000 times every second (see figure below). Readings other than maximum and minimum values are eliminated based on the set recording interval, and the resulting data is displayed and saved.

AC RMS data recording
Use the device in conjunction with an AC voltage input and a clamp current sensor to record RMS values for current. Input instantaneous waveforms are acquired via high-speed sampling at 200 μsec. RMS data is staggered at a rate of 1000 times per second as it is computed – not even abrupt fluctuations will escape notice.

RMS data recorded in internal memory
The RMS recorder can output data into the internal memory at rates of up to once per millisecond. Internal memory recordings of up to 10,000 div (1 million data items) are supported. Furthermore, if you set automatic saving to storage media, the device writes data to the media (at each recording interval) in real time as it makes measurements.

* A new data file is created for each 10,000 div worth of data.
* It is possible to save the data repeatedly up until the media’s full capacity is reached, but after that periods of dead time (when measurement is not possible) will occur every 10,000 div.
Compact and lightweight
Small-bodied design for ease of portability

Volume is just 30% and weight just 40% of Hioki’s 4-channel Memory HiCorder, the MR8880 – a 70% and 60% reduction, respectively.

A waveform measurement instrument that you can slip into your briefcase and carry anywhere. Should you suddenly discover you need it on a work trip, you can simply take it out and begin to use it, just as you would a tester.

Intuitive, no-fuss operation
Built-in Setup Wizard to help you get started

When powered on, the Settings screen appears along with the waveform monitor, and the new Setup Wizard blinks.

By activating the Setup Wizard, you can easily navigate by following the simple instructions. Soon you will be operating the device like a seasoned professional.

Activate the Setup Wizard

Real-Time waveform monitoring

The help text crawls along the bottom of the screen, describing the function of the setting at the blinking cursor.

The enhanced “Waveform Monitor” window with level meter display facilitates changes to settings by simultaneously displaying real-time input waveforms.

Select mode at start-up

No unnecessary fuss before you can start working.

You select which measurement mode to use (memory recorder or RMS value recorder) when you switch on the device.

Choose the mode once, and you’ll never need to select it again.
Data analysis in tandem with a PC

Dedicated PC application program bundled as standard accessory

■ Pseudo-real-time data recording to media (MEM data)

The memory recorder’s instantaneous waveform recording functionality automatically saves data to storage media in a way that minimizes the interval during which the instrument cannot perform measurement while data is being saved (so-called dead time). This approach allows the instrument to write data up to the set recording length to media in real time (for each sampling interval) while continuing measurement with a time axis setting of 50 ms/div. or slower.

■ Binary data (MEM/RMS data) loadable into PC

You can copy data saved on the CF card to a PC in two ways: via the card, or by connecting the MR8870 to the PC with a USB cable. The bundled PC application lets you display waveforms on the PC and print them out.

* The MR8870 is not provided with a communication function for controlling it from a PC connected to it with a USB cable.

■ Synchronize two HiCorders together for 4ch recording! (MEM data)

For those times when 2-channels are just not enough, synchronize two MR8870’s using the external trigger I/O terminals (apply the trigger output from one to the external trigger input of the other). Then use synchronous start to automatically record four channels of measurement data to a CF card.

■ Waveform display and printing, and CSV conversion with PC (MEM data, RMS data)

Open a data file with the dedicated Wave Processor (PC application program) for the MR8870/8870, to import and print waveforms with your own arrow and figure annotations. Of course, screen data can be copied and pasted into common Word and Excel documents to easily create reports.

■ Features of the Dedicated Wave Processor Program (supplied accessory)

- Designed especially for MEMORY HiCORDER MR8870/8870
- Application program displays and prints waveforms, and converts measurement data to CSV text files on a Windows PC.
- Provides X-Y display capability not available on the HiCorder
- Generate reports using templates, with figure annotations and entered comments
- Multiple files can be batch-converted to CSV data
- Use two HiCorders to monitor 3 or 4 channels of waveforms that are measured using the same time axis range on the same PC window.

■ Use the bundled software to composite waveform files. For example, to monitor the waveforms of a 3P 200 V line, you can use two HiCorders at the same time and view the waveforms of all 4 channels on the same screen on the PC.
Basic specifications

Measurement functions: Memory recorder (high-speed recording), RMS recorder (50/60 Hz, or DC only)

No. of channels: 2 analog and 4 logic channels (For analog inputs, channels are isolated from each other and from frame GND. For logic terminals, all channels have common GND.)

Maximum sampling rate: 1 MS/s (per channel, all channels simultaneously)

Memory capacity: 12 h × 2 × 2MB (with DVD)

Removable storage: CF Card Type I slot (standard equipment) × 1. Up to 2 GB, supports FAT, or FAT-32 format

Memory items: Setting, measurement data (binary or text), screen shot, result of numerical calculation, reduced text saving data and graph

Backup function: Clock and settings: 5 years or more (±25°C 77°F)

Waveform backup function: available when Battery pack 9780 is installed with charge remaining (or connected up to 10 hours with fully charged battery pack)

Control terminals: Terminal block: External trigger input, trigger output

External interface: USB: USB 2.0, mini-B receptacle × 1 port

Display type: 4.3-inch TFT color LCD (480 × 272 dots)

Display resolution: Waveform display: 20 div (time axis) × 10 div (voltage axis) (1 div = 20 dots × 20 dots)

Display languages: MR8870-20: English, Japanese (Default settings: English)

Environmental conditions: (no condensation)
Operating temperature: 0°C (32°F) to 40°C (104°F), 80 % rh or less
Storage temperature: -10°C (14°F) to 50°C (122°F), 80 % rh or less

Compliance standard: Safety: EN61010

Power supply: AC Adapter Z1050: 100 to 240 V AC, 50/60 Hz
Battery pack 9780: continuous operation time: approx. 2 hours (reference value at 25°C, waiting for trigger). AC adapter has priority when used in combination with battery pack
DC power supply: 10 to 16 V DC (please contact your Hioki distributor for correction chart, max. 3 m/9 ft. length)

Power consumption: 30 VA max. (When using the AC adapter and charging internal battery pack 9780)
19 VA max. (When using external DC power supply and charging internal battery pack 9780)
3 VA max. (When using the battery pack 9780)

Charging functions: The installed battery pack charges when the AC adapter is connected. Charging time is about 200 minutes (reference value at 25°C)

Dimensions and mass: Approx. 176 mm (6.93 in) × 146 mm (5.75 in) × 39 mm (1.54 in)

Accessories: Instruction Manual × 1, Measurement Guide × 1, AC adapter Z1050 × 1, Strap × 1, USB cable × 1, Application Disk (Wave Processor Program for the 8870), Protection sheet 9801 × 1

Trigger functions (For memory recorder only)

Trigger modes: Single, continuous

Trigger sources: Two analog channels, four logic channels, external trigger (falls below 2.5 V, or shorted terminals), ON/OFF switching of each source, AND/OR between sources, manual triggering

Trigger types (Analog)

• Level: Triggering occurs when preset voltage level is crossed (upwards or downwards)
• Voltage drop: Triggering occurs when voltage drops below peak voltage setting (for 50/60 Hz, AC power lines only)
• Window: Triggering occurs when window defined by upper and lower limit is entered or exited

Level setting resolution: 0.5% fs. (±10 divisions)

Trigger/Types (Logic)

1, 0, or x. Pattern setting

Trigger filter: Set by the number of samples, from 0 to 100 samples, in five steps

Other functions: Trigger output: open-collector 5 voltage output, active low with at least 1 ms pulse width

Trigger functions (For memory recorder only)

Trigger modes: Single, continuous

Trigger sources: Two analog channels, four logic channels, external trigger (falls below 2.5 V, or shorted terminals), ON/OFF switching of each source, AND/OR between sources, manual triggering

Trigger types (Analog)

• Level: Triggering occurs when preset voltage level is crossed (upwards or downwards)

Level setting resolution: 0.5% fs. (±10 divisions)

Trigger functions (For memory recorder only)

Trigger modes: Single, continuous

Trigger sources: Two analog channels, four logic channels, external trigger (falls below 2.5 V, or shorted terminals), ON/OFF switching of each source, AND/OR between sources, manual triggering

Trigger types (Analog)

• Level: Triggering occurs when preset voltage level is crossed (upwards or downwards)

Level setting resolution: 0.5% fs. (±10 divisions)

Trigger types (Logic)

1, 0, or x. Pattern setting

Trigger filter: Set by the number of samples, from 0 to 100 samples, in five steps

Other functions: Trigger output: open-collector 5 voltage output, active low with at least 1 ms pulse width

Input connectors: Isolated BNC connector (input impedance 1 MΩ, input capacitance 7 pF)

Max. rate to earth: 300 V AC, DC, CAT II (with input isolated from the unit, the maximum voltage that can be applied between input channel and chassis and between input channels without damage)

Measurement range (at Memory recorder)

10 mV to 50 Vdc, 12 ranges, full scale: 10 div, AC voltage for possible measurement/display using the memory function: 240 V rms, Low-pass filter: 5.0/50/500 kHz

Measurement resolution: 1/100 of measurement range (using 12-bit A/D conversion, measurement range is 100 times range)

Highest sampling rate: 1 MS/s (simultaneous sampling in 2 channels)

Accuracy: ±0.5 % fs. (after auto-adjust, in measurement range, ±0.10 div)

Frequency characteristics: DC to 50 kHz ±3dB

Input coupling: DC GND

Max. allowable input: 400 V DC (the maximum voltage that can be applied across input pins without damage)

Display functions: Numerical value display: instantaneously value, or RMS value (DC, or 50/60 Hz only) (cannot select at measuring)
Waveform display at zoom voltage axis <2 to 10, compression ±1:2, ±1.5 Note: X-Y display NA (Supported on PC screen by supplied software only)

Memory recorder (high-speed recording)

Measurement targets:
Instantaneous waveform of DC to AC waveform monitoring/monitoring

Time axis
100 µs/div to 5 min/div (100 samples/div) 20 ranges
Time axis zoom: 2 × to 10 × in 3 stages, compression: 1/2 to 1/1000 in 9 stages

Sampling period
1/100 of time axis range (minimum 1 µs period)

Recording length
20 to 10,000 div, or continuous (available at 50 ms/div to 5 min/div only)
Note: limited by timebase, only the last 20,000 div are saved

Pre-trigger
Record data from before the trigger point at 0 to 100% of the recording length in 13 stages

Calculation functions:
• Numerical calculation: Up to four simultaneous calculations (common to all channels), calculation results are saved to CF card
• Calculation content: average, peak-peak, maximum and minimum values, RMS, period and frequency
• Calculation range: specified by A/B cursors or whole recording length
• Waveform processing: N/A

Recording Time to internal memory using memory recorder mode (abridged)

• If you set automatic saving of binary-format data to the CF card in the 50-mils-and-downer range of the time axis, data is saved simultaneously with measurement. This considerably reduces the amount of dead time (the period from the completion of saving the internal memory data of the applicable capacity below) to the CF card, when measurement/recording begins again. This is a new function – the MR8870 is the first in the series to feature it.

• The possible length of a single measurement/recording is the length given below for the applicable time axis range.

• The maximum recording length is the same whether 1 or 2 channels are used.

• The internal memory capacity is 4 MB/channel. Media capacity depends on the card (for example, 512 MB)

RMS recorder (high-speed recording)

Measurement targets: Commercial power line (50 Hz/60 Hz ±1 Hz), DC

Measurement mode: Selectable for each channel (AC voltage, DC voltage, AC current, DC current)

Input ranges: Selectable for each channel on measurement mode

• AC voltage: 100 V, 200 V system (400 V, 600 V system using the Differential Probe)
• AC current: 10 A to 5000 A rms fs., 10 mA rms fs. to (depending on the current sensor in use)
• DC voltage: 100 mV to 500 V fs. (500 V to 2000 V fs. using the Differential Probe)
• DC current: 10 A to 2000 A fs. (depending on the current sensor in use)

RMS accuracy: ±3.0 % fs. (after zero-adjustment, add current sensor accuracy in use)

Recording interval: 1 ms to 1 minutes in 16 stages, Sampling period: 200 µs fixed (AC voltage / DC voltage / AC current: 1000 RMS data/second)

Recording time: 10,000 div
Note: If recording range before 10,000 div is reached, only the data up to that point can be displayed and saved

Numerical calculation N/A

Repeating functions:
Single / Repeat selectable
Note: external trigger terminal cannot use

Recording Time to internal memory using RMS recorder mode (abridged)

• If you set automatic saving of binary-format data to the CF card in the 50-mils-and-downer range of the time axis, data is saved simultaneously with measurement. This considerably reduces the amount of dead time (the period from the completion of saving the internal memory data of the applicable capacity below) to the CF card, when measurement/recording begins again. This is a new function – the MR8870 is the first in the series to feature it.

• The possible length of a single measurement/recording is the length given below for the applicable time axis range.

• The maximum recording length is the same whether 1 or 2 channels are used.

• The internal memory capacity is 4 MB/channel. Media capacity depends on the card (for example, 512 MB)

Recording interval: 1 ms to 1 minutes in 16 stages, Sampling period: 200 µs fixed (AC voltage / DC voltage / AC current: 1000 RMS data/second)

Numerical calculation N/A

Repeating functions:
Single / Repeat selectable
Note: external trigger terminal cannot use
Other functions

Convenient functionality
Software specifications (Bundled accessory)

Saving to external memory
Automatic saving of measurement data to CF card

Cursor readout function
Readouts of potential at A/B cursor position, time since triggering, time difference and potential difference between A and B cursor positions

Scaling functionality
Settable for individual channels

Other functions
Comment entry, screen capture, gauges, start condition preservation, auto setup, waveform scrolling (possible during measurement)

Software specifications (Bundled accessory)

Wave Processor Program for the 8870 (Bundled accessory)

Supported measurement instruments
MR8870-20, 8870-20

Operating environment
Computer running under Windows 8/7 (32/64-bit), Vista (32-bit), XP

File loading
Loadable data format: Memory function data (MEM extension) of the MR8870-20/8870-20 (the maximum size that can be stored by the MR8870-20/8870-20 (subject to the capacity of the PC's operating environment)
Waveform Composite Function: Composite the waveforms of up to 8 HCHolders (16 analog channels)

Overwriting save
Overwrites saved scaling and title/channel comments

Text conversion
Data conversion format: Select from CSV, tab-separated or space-separated
Object data range: Whole range, or between cursors
Conversion methods: Analog waveform data to voltage values, logic data is converted to ones and zeros
Conversion channels: selectable
Header contents: Title, trigger date, timestamp, comments, per-channel setting conditions
Batch conversion: specify multiple files for batch conversion

Displaying
Display language: English or Japanese (select during installation)
Waveform display: Scroll and magnify/reduce the time axis of the display
Gauge display: Time gauge (absolute or relative time, seconds, data points)
Figure annotations: Text boxes, straight lines, arrows, circles and rectangles at any location
Screen capture: Extended meta format, bitmap format
Search functions: Date, maximum, minimum and window search
Template function: Save and reload waveform file display configurations

Printing
Printer support: Color and monochrome printing on printers supported by the operating system
Printable ranges: All data, screen capture and selectable areas
Print formats: Undivided, 2, 4, 8 divisions, 2, 4, 8 or 16 traces, 1, 2 or 4 X/Y screen, gauge, channels comments, zero-position comments, and A-B cursor values
Print preview and waveform screen hard copy/locking print functions are included

Options specifications (Sold separately)

Cable length and mass: Main unit cable 1.5 m (4.9 ft), input section cable 30 cm (0.98 ft), approx. 150 g (0.33 lb)

LOGIC PROBE 9328-01

Function
Detection of voltage signal or relay contact signal for High/Low state recording

Input
4 channels (common ground between unit and channels, digital contact input, switchable contact input: contact can detect open-closed signal)
Input resistance: 1 MΩ (with digital input, 0 to +5 V)
500 kΩ or more (with digital input, 5 to +50 V)

Pull-up resistance: 2 kΩ (contact input: internally pulled up to +5 V)

Digital input threshold
1.4V ±25% / 4.0V ±25%

Contact input detection resistance
1.4 V: 1.5 kΩ or higher (open) and 500 Ω or lower (short)
2.5 V: 3.5 kΩ or higher and 1.5 kΩ or lower (short)
4.0 V: 25 kΩ or higher and 8 kΩ or lower (short)

Detectable pulse width
100 µs or longer

Max. allowable input
0 to +50 V DC (the maximum voltage that can be applied across input pins without damage)

Cable length and mass: Main unit cable 1.5 m (4.9 ft), input section cable 1 m (3.28 ft), approx. 320 g (0.71 lb)

LOGIC PROBE MR321-01

Function
Detection of AC or DC relay drive signal for High/Low state recording Can also be used for power line interruption detection

Input
4 channels (isolated between unit and channels), HIGH LOW range switching
Input resistance: 100 kΩ or higher (HIGH range), 30 kΩ or higher (LOW range)

DC mode
For waveform monitor output, Frequency characteristic: DC to 10 MHz (-3.48 dB)
Amplitude characteristic: ±1 % of full scale (at max. 1000 V DC), ±3 % of full scale (at max. 200 V DC)

AC mode
For detection of power line surge noise, Frequency characteristics: 1 kHz to 1 MHz (-3 dB)

RMS mode
DC/AC voltage RMS output detection, Frequency characteristic: DC, 40 Hz to 100 kHz, Response speed: 200 ms or less (400 V AC, ±1 % of full scale (DC), 40 Hz to 1 kHz), ±5 % of full scale (1 kHz to 100 kHz) (full scale: 1000 V AC)
Input type: balanced differential input, Input impedance/capacitance: H-L 9 MΩ/10 pF, H/L-unit 4.5 MΩ/20 pF
Input: Rated voltage to earth: when using grabbing clip: 1500 V AC/DC (CAT II), 600 V AC/DC (CAT III), when using alligator clip: 1000 V AC/DC (CAT II)

Max. allowable input
2000 V DC, 1000 V AC/DC (CAT III), 600 V AC/DC (CAT II)

Output
Power divider for 1/1000 of input, BNC connectors (output switchable for 3 modes DC, AC, RMS)

Power source
Use the AC Adapter 9418-15 (power cannot be supplied from the logic terminals of the MR8870)

Cable length and mass: Main unit cable 1.3 m (4.27 ft), input section cable 46 cm (1.5 ft), approx. 300 g (0.67 lb)

DIFFERENTIAL PROBE 9322

Function
For high-voltage floating measurement, power line surge noise detection, RMS rectified output measurement

DC mode
For waveform monitor output, Frequency characteristic: DC to 10 MHz (-3.48 dB)
Amplitude characteristic: ±1 % of full scale (at max. 1000 V DC), ±3 % of full scale (at max. 200 V DC)

AC mode
For detection of power line surge noise, Frequency characteristics: 1 kHz to 1 MHz (-3 dB)

RMS mode
DC/AC voltage RMS output detection, Frequency characteristic: DC, 40 Hz to 100 kHz, Response speed: 200 ms or less (400 V AC, ±1 % of full scale (DC), 40 Hz to 1 kHz), ±5 % of full scale (1 kHz to 100 kHz) (full scale: 1000 V AC)
Input type: balanced differential input, Input impedance/capacitance: H-L 9 MΩ/10 pF, H/L-unit 4.5 MΩ/20 pF
Input: Rated voltage to earth: when using grabbing clip: 1500 V AC/DC (CAT II), 600 V AC/DC (CAT III), when using alligator clip: 1000 V AC/DC (CAT II), 600 V AC/DC (CAT III)

Max. allowable input
2000 V DC, 1000 V AC/DC (CAT III), 600 V AC/DC (CAT III)

Output
Power divider for 1/1000 of input, BNC connectors (output switchable for 3 modes DC, AC, RMS)

Power source
Use the AC Adapter 9418-15 (power cannot be supplied from the logic terminals of the MR8870)

Cable length and mass: 70 cm (2.3 ft), Output pin: side 1.5 m (4.9 ft), 170 g (0.38 lb)

DIFFERENTIAL PROBE P9000

Function
For waveform monitor output, Frequency properties: DC to 100 kHz -3 dB

Measurement modes
P9000:01: For waveform monitor output, Frequency properties: DC to 100 kHz, -3 dB
P9000:00-02: Switches between waveform monitor output/AC effective value output Wave mode frequency properties: DC to 100 kHz, RMS mode frequency properties: 30 Hz to 10 kHz, Response time: Rise 300 ms, Fall 600 ms

Division ratio
Switches between 10001, 1001

DC output accuracy
10.5 % f.A (f.A = 1.0 V, division ratio: 100mV), ±3 % (f.A = 3.5 V, division ratio: 100mV)

Effective value measurement accuracy
±1 % f.A (20 Hz to less than 1 kHz, sine wave), ±5 % f.A (20 Hz to 30 kHz, sine wave)

Input resistance/capacitance
H-L: 10.5 MΩ, 5 pF or less (at 100 Hz)

Maximum input voltage
100 V AC, DC

Maximum rated voltage to ground
1000 V AC, DC (CAT III)

Operating temperature range
-40°C to 80°C (-40°F to 176°F)

Power supply
(1) AC adapter Z1008 (100 to 240 V AC, 50/60 Hz), 6 VA (including AC adapter), 0.9 VA (main unit only)
(2) USB has power 5 V DC, USB microB terminal), 0.8 VA
(3) External power source 2.7 V to 15 V DC, 1 VA

Accessories
Instruction manual ×1, Alligator clip ×2, Carrying case ×1
**POWER SUPPLY for Current Sensors**

- **Sensor Unit CT9555**
  - USB, with Waveform output
  - **Connection Cord L9217**
  - Cord has insulated BNC connectors at both ends, 1.6 m (5.25 ft) length

**PL23 (10-pin) to PL155 (12-pin) conversion**

- **Conversion Cable 95990**
  - Converter PL21 (10-pin) to PL155 (12-pin) terminal

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**Differentiated Probes**

- **Differential Probe**
  - Cord has insulated BNC connectors at both ends, 1.6 m (5.25 ft) length
  - **Model No.** MR8870-20
  - **Order Code** (Note)
  - **English model**

- **Input Cable (B)**
  - **Model No.** L9197
  - **Order Code** (Note)
  - **Rating**

- **Input Cable (D)**
  - **Model No.** L9790
  - **Order Code** (Note)
  - **Rating**

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**Connection Cords**

- **Connection Cord L9197**
  - **Model No.** L9197
  - **Order Code** (Note)
  - **Rating**

- **Connection Cord L9197**
  - **Model No.** L9197
  - **Order Code** (Note)
  - **Rating**

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**Logic Probes**

- **Logic Probe MR9321-01**
  - **Model No.** MR9321-01
  - **Order Code** (Note)
  - **Rating**

- **Logic Probe**
  - **Model No.** MR9320-01
  - **Order Code** (Note)
  - **Rating**

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**Grabber Clips**

- **GRABBER CLIP 9243**
  - **Model No.** 9243
  - **Order Code** (Note)
  - **Rating**

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**Battery Packs**

- **Battery Pack 9760**
  - **Model No.** 9760
  - **Order Code** (Note)
  - **Rating**

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**AC Adapters**

- **AC Adapter Z1008**
  - **Model No.** Z1008
  - **Order Code** (Note)
  - **Rating**

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**Output Cords**

- **Output Cord L9095**
  - **Model No.** L9095
  - **Order Code** (Note)
  - **Rating**

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**Non-Contact Current Probes**

- **Non-Contact Current Probe**
  - **Model No.** CT9555
  - **Order Code** (Note)
  - **Rating**

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**Leak Current Probes**

- **Leak Current Probe**
  - **Model No.** CT9555
  - **Order Code** (Note)
  - **Rating**

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