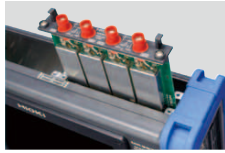


Options specifications (sold separately)



Plug-in slot for the input modules



Measurement target	Input module	Measurement range	Resolution
Voltage	Analog Unit MR8901	100 mV f.s. to 200 V f.s.	4 μ V
	Analog Unit MR8905	10 V f.s. to 1000 V f.s.	400 μ V
	Voltage/Temp Unit MR8902	10 mV f.s. to 100 V f.s.	0.5 μ V
	Strain Unit MR8903	1 mV f.s. to 20 mV f.s.	0.04 μ V
Current	Analog Unit MR8901 + optional current sensor	Depends on current sensor(s) in use <i>* Certain current sensors require a separate power supply</i>	1/1250 div
	Analog Unit MR8905	10 V rms f.s. to 700 V rms f.s.	400 μ V
RMS AC voltage	Analog Unit MR8901 + optional Differential Probe 9322	100 V rms to 1 kV rms	1/1250 div
Temperature (Thermocouple)	Voltage/Temp Unit MR8902	200 $^{\circ}$ C f.s. to 2000 $^{\circ}$ C f.s. <i>* Upper and lower limit values depend on the thermocouple in use</i>	0.01 $^{\circ}$ C
Distortion, Stress	Strain Unit MR8903	400 μ e to 20,000 μ e f.s.	0.016 μ e
Analyze CAN signals	CAN Unit MR8904	2 ports /unit <i>*Up to 15 analog channels each equivalent to a 16-bit analog signal</i> <i>*Up to 16 logic channels each equivalent to a 1-bit logic signal</i>	N/A
Relay contacts, voltage on/off	Logic Probe 9320-01	Depends on logic probes in use <i>* Max. input 50 V, threshold +1.4/+2.5/+4.0 V</i> <i>* Contact short/open, non voltage</i>	N/A
AC/DC voltage on/off	Logic Probe MR9321-01	Depends on logic probes in use <i>* Up to 250V AC/DC, detect live or not live</i>	N/A

Dimensions, mass: Approx. 119.5W \times 18.8H \times 151.5D mm (4.70W \times 0.74H \times 5.96D in), Approx. 180 g (6.3 oz) Accessories: None



Analog Unit MR8901 (Accuracy at 23 \pm 5 $^{\circ}$ C/73 \pm 9 $^{\circ}$ F, 20 to 80 % rh after 30 min. of warm-up time and zero adjustment; Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

Functions	No. of channels: 4, for voltage measurement
Input connectors	Isolated BNC connector (input resistance 1 M Ω , input capacitance 10 pF) Max. rated voltage to earth: 100 V AC, DC (with input isolated from the main unit, the max. voltage that can be applied between input channel and chassis and between input channels without damage)
Measurement range	5 mV to 10 V/div, 11 ranges, full scale: 20 div <i>* AC voltage can be measured/displayed: up to 140 V rms at \times1/2 amplitude compression, but limited to 100 V rms according as max. rated voltage to earth</i>
Low-pass filter	Low-pass filter: 5/50/500 Hz, 5 kHz, OFF
Resolution	1/1250 of measurement range (using 16-bit A/D converter)
Highest sampling rate	500 kS/s (simultaneous sampling across 4 channels)
Accuracy	\pm 0.5 % of full scale (with filter 5 Hz, Zero position accuracy included)
Frequency characteristics	DC to 100 kHz -3 dB
Input coupling	DC/GND
Max. allowable input	150 V DC (the max. voltage that can be applied across input pins without damage)

Dimensions, mass: Approx. 119.5W \times 18.8H \times 184.8D mm (4.70W \times 0.74H \times 7.28D in), Approx. 190 g (6.7 oz) Accessories: Ferrite clamp \times 2



Voltage/Temp Unit MR8902 (Accuracy at 23 \pm 5 $^{\circ}$ C/73 \pm 9 $^{\circ}$ F, 20 to 80 % rh after 30 minutes of warm-up time and zero adjustment; Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

Functions	No. of channels: 15, for voltage/temperature measurement (selectable for each channels)
Input connectors	Voltage/thermocouple input: push button terminal Recommended wire diameter: single-wire ϕ 0.32 mm to ϕ 0.65 mm, stranded wire 0.08 to 0.32 mm ² (conductor wire diameter min. ϕ 0.12 mm), AWG 28 to 22 Input resistance: 1 M Ω Max. rated voltage to earth: 100 V AC, DC (with input isolated from the main unit, the max. voltage that can be applied between input channel and chassis and between input channels without damage)
Voltage measurement ranges	500 μ V to 5 V/div, 9 ranges, full scale: 20 division * The AC instantaneous voltage waveform cannot be measured due to the slow sampling speed. Resolution: 1/1000 of measurement range (using 16-bit A/D converter) Accuracy: \pm 0.1 % f.s. (with digital filter ON, Zero position accuracy included)
Temperature measurement range	Reference junction compensation: Internal/ External (selectable) Thermocouple broken-wire detection: ON/OFF (selection applies to entire unit) Thermocouple type: K, J, E, T, N, R, S, B, WR5-26 <i>* For thermocouple measurement ranges, resolution, and accuracy, refer to the specifications table below</i>
Digital filter	50 Hz, 60 Hz, or OFF
Data refresh rate	10 ms (with filter OFF, burn-out detection OFF) 20 ms (with filter OFF, burn-out detection ON) 500 ms (with filter ON, data refresh rate: Fast) 2 s (with filter ON, data refresh rate: Normal)
Max. allowable input	100 V DC (the max. voltage that can be applied across input pins without damage)

MR8902 specifications

Thermocouples	Setting ranges (full scale=20 div)	Resolution	Measurement ranges	Accuracy
K	10 $^{\circ}$ C/div	0.01 $^{\circ}$ C	-100 to less than 0 $^{\circ}$ C 0 to 200 $^{\circ}$ C	\pm 0.8 $^{\circ}$ C \pm 0.6 $^{\circ}$ C
	50 $^{\circ}$ C	0.05 $^{\circ}$ C	-200 to less than -100 $^{\circ}$ C -100 to 1000 $^{\circ}$ C	\pm 1.5 $^{\circ}$ C \pm 0.8 $^{\circ}$ C
	100 $^{\circ}$ C	0.1 $^{\circ}$ C	-200 to less than -100 $^{\circ}$ C -100 to 1350 $^{\circ}$ C	\pm 1.5 $^{\circ}$ C \pm 0.8 $^{\circ}$ C
J	10 $^{\circ}$ C/div	0.01 $^{\circ}$ C	-100 to less than 0 $^{\circ}$ C 0 to 200 $^{\circ}$ C	\pm 0.8 $^{\circ}$ C \pm 0.6 $^{\circ}$ C
	50 $^{\circ}$ C	0.05 $^{\circ}$ C	-200 to less than -100 $^{\circ}$ C -100 to 1000 $^{\circ}$ C	\pm 1.0 $^{\circ}$ C \pm 0.8 $^{\circ}$ C
	100 $^{\circ}$ C	0.1 $^{\circ}$ C	-200 to less than -100 $^{\circ}$ C -100 to 1200 $^{\circ}$ C	\pm 1.5 $^{\circ}$ C \pm 0.8 $^{\circ}$ C
E	10 $^{\circ}$ C/div	0.01 $^{\circ}$ C	-100 to less than 0 $^{\circ}$ C 0 to 200 $^{\circ}$ C	\pm 0.8 $^{\circ}$ C \pm 0.6 $^{\circ}$ C
	50 $^{\circ}$ C	0.05 $^{\circ}$ C	-200 to less than -100 $^{\circ}$ C -100 to less than 0 $^{\circ}$ C 0 to 1000 $^{\circ}$ C	\pm 1.5 $^{\circ}$ C \pm 0.8 $^{\circ}$ C \pm 0.6 $^{\circ}$ C
	100 $^{\circ}$ C	0.1 $^{\circ}$ C	-200 to less than -100 $^{\circ}$ C -100 to less than 0 $^{\circ}$ C 0 to 1000 $^{\circ}$ C	\pm 1.5 $^{\circ}$ C \pm 0.8 $^{\circ}$ C \pm 0.6 $^{\circ}$ C
T	10 $^{\circ}$ C/div	0.01 $^{\circ}$ C	-100 to less than 0 $^{\circ}$ C 0 to 200 $^{\circ}$ C	\pm 0.8 $^{\circ}$ C \pm 0.6 $^{\circ}$ C
	50 $^{\circ}$ C	0.05 $^{\circ}$ C	-200 to less than -100 $^{\circ}$ C -100 to less than 0 $^{\circ}$ C 0 to 400 $^{\circ}$ C	\pm 1.5 $^{\circ}$ C \pm 0.8 $^{\circ}$ C \pm 0.6 $^{\circ}$ C
	100 $^{\circ}$ C	0.1 $^{\circ}$ C	-200 to less than -100 $^{\circ}$ C -100 to less than 0 $^{\circ}$ C 0 to 400 $^{\circ}$ C	\pm 1.5 $^{\circ}$ C \pm 0.8 $^{\circ}$ C \pm 0.6 $^{\circ}$ C

Note: The thermocouple accuracy is obtained by adding a reference junction compensation accuracy of \pm 0.5 $^{\circ}$ C



Dimensions, mass: Approx. 119.5W \times 18.8H \times 151.5D mm (4.70W \times 0.74H \times 5.96D in), Approx. 173 g (6.1 oz) Accessories: Conversion cable \times 2 (Connector: TAJIMI PRC03-12A10-7M10.5)



Strain Unit MR8903 (Accuracy at 23 \pm 5 $^{\circ}$ C/73 \pm 9 $^{\circ}$ F, 20 to 80 % rh after 30 minutes of warm-up time and auto-balance; Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

Functions	No. of channels: 4, for voltage/strain measurements (selectable for each channel, electronic auto-balancing, balance adjustment range within \pm 10000 μ V, \pm 10000 μ e)
Input connectors	Unit side: "HDR-EC14LFDTG2-SLE+" made by Honda Tsushin Kogyo Co., Ltd. Japan Via conversion cable, "PRC03-12A10-7M10.5" made by Tajimi Electronics Co., Ltd. Japan Max. rated voltage to earth: 33 V ACrms or 70 V DC (with input isolated from the main unit, the max. voltage that can be applied between input channel and chassis and between input channels without damage)
Suitable transducer	Strain gauge converter, Bridge resistance: 120 Ω to 1 k Ω , Bridge voltage: 2 V \pm 0.05 V, Gauge rate: 2.0
Input resistance	More than 1 M Ω
Voltage measurement ranges	50 μ V to 1000 μ V/div, 5 ranges, full scale: 20 division Accuracy: \pm 0.5 % f.s. + 4 μ V (at 50 μ V/div only), other ranges \pm 0.5 % f.s. (after auto-balance, with filter 5 Hz, zero position accuracy included)
Strain measurement ranges	20 μ e to 1000 μ e/div, 6 ranges, full scale: 20 division Accuracy: \pm 0.5 % f.s. + 4 μ e (at 20, 50 μ e/div), other ranges \pm 0.5 % f.s. (after auto-balance, with filter 5 Hz, zero position accuracy included)
Low-pass filter	Low-pass filter: 5/10/100 Hz, 1 kHz, OFF
Resolution	1/1250 of measurement range (using 16-bit A/D converter)
Highest sampling rate	200 kS/s (simultaneous sampling across 4 channels)
Frequency characteristics	DC to 20 kHz +1/-3 dB
Max. allowable input	10 V DC (the max. voltage that can be applied across input pins without damage)

Dimensions, mass: Approx. 119.5W \times 18.8H \times 151.5D mm (4.70W \times 0.74H \times 5.96D in), Approx. 185 g (6.5 oz) Accessories: None



CAN Unit MR8904

Input CAN port	Number of ports: 2, Connector: D-sub a male 9 pin \times 2
Standards	ISO 11898 CAN 2.0b, ISO 11898-1, ISO 11898-2, ISO 11898-3, SAE J2411
Interface	Selectable: High-speed CAN, Low-speed CAN, or Single-wire CAN by port (with built-in corresponding transceiver)
Transmit ACK	ON/OFF for transmitting a ACK for receiving CAN signal with the MR8904
Terminator	ON/OFF via commands, 120 Ω \pm 10 Ω built-in resistance
Baud rate	50 kbps to 1 Mbps at "High-speed", 10 kbps to 125 kbps at "Low-speed", 10 kbps to 83.3 kbps at "Single-wire"
Analyzed signal output channel	Up to 15 analog channels each equivalent to a 16-bit analog signal Up to 16 logic channels each equivalent to a 1-bit logic signal
Signal form	1-bit signal: 1 channel of Logic, or 1 channel of Analog 1-bit to 16-bits signal: 1 channel of Analog 17-bits to 32-bits signal: 2 channels of Analog <i>* Cannot handle signals over 32-bits</i>
ID trigger	Output "H" level pulse to designated logic channel when receiving set ID signal <i>* Output pulse width: 50 μs below 5 ms/div time axis, 1 sampling time at more than 10 ms/div time axis</i>
Response time	Within 200 μ s after completely receiving CAN message
Transmit CAN message	Can transmit the setting CAN message to the CAN bus by a port

Options specifications (sold separately)

CAN Editor specifications (software bundled with the MR8904) (The following values are for one MR8904)

Operating environment	Windows 7 / Vista (32-bit/64-bit), Windows XP (32-bit)
CAN definition settings	CAN message ID, Start position, Data length Data order: U/L (Motorola), L/U (Motorola), L/U (Intel) Code: Unsigned, 1-Signed, 2-Signed
CAN db file	<ul style="list-style-type: none"> • Load CAN db file • Convert to ".cdf" file • Register to list (editing not available), 33-bit data and above not supported • Convert data order: Motorola (CANdb file) to U/L (Motorola) • Convert coded file (CANdb file) to 2-Signed, IEEE float or double (CANdb file) not supported • Convert signal name (CANdb file) to the label • Convert comment (CANdb file) to the signal name
Registration list settings	CAN input port setting: Port 1, Port 2, Item number: 1 to 200 Setting upper / lower limit display on the MR8875 screen
CAN communication settings	<ul style="list-style-type: none"> • Interface: High-speed, Low-speed, Single-wire • Terminator: ON/OFF (ON is enabled at High-Speed only) • ACK: ON/OFF • Baud rate: AUTO (enabled at ACK OFF only) 50 kbps to 1 Mbps at "High-speed", 10 kbps to 125 kbps at "Low-speed", 10 kbps to 83.3 kbps at "Single-wire"
Analog channel settings	Number of channels: 15 <ul style="list-style-type: none"> • Assign the definition on the registration list under 16-bits to 1 channel • Assign the definition on the registration list for 17-bits to 32-bits to 2 channels
Logic channel settings	Number of channels: 16 <ul style="list-style-type: none"> • Assign the definition on the registration list under 16-bits, with bit position • Assign the definition on the registration list to the ID trigger
Transmission settings	Transmission number, Mode, CAN output port, Frame type, Transmission ID, Transmission byte length, Transmission data, Answer ID, Transmission period
Communication with the MR8875	Search MR8875 via USB, Registration list, CAN communication setting, Analog channels settings, Logic channel settings, Transmission setting information, etc.
Printing functions	Registration list, All items of CAN communication settings, Assigned analog list, Assigned logic list, All items of transmission settings
Save functions	CAN definition data: Binary form, ".cdf" extension, convertible to software for Hioki Model 8910 Setting date (All contents without CAN definition data): Binary form, ".ces" extension

Dimensions, mass: Approx. 119.5W × 18.8H × 151.5D mm (4.70W × 0.74H × 5.96D in), Approx. 185 g (6.5 oz) Accessories: None



Analog Unit MR8905 (Accuracy at 23±5 °C/73±9 °F, 20 to 80 °rh after 30 min. of warm-up time and zero adjustment; Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

Functions	No. of channels: 2, switchable between instantaneous value and AC RMS value
Input connectors	Banana connector (input impedance 4 MΩ, input capacitance less than 1 pF) Max. rated voltage to earth: CAT II 1000 V AC & DC, CAT III 600 V AC & DC (with input isolated from the main unit, the max. voltage that can be applied between input channel and chassis and between input channels without damage)
Measurement range	500 mV to 50 V/div, 7 ranges, full scale: 20 div *The maximum displayable AC voltage is 700 Vrms when using 1/2 compression of the vertical axis.
Low-pass filter	5/50/500/5 kHz, OFF
Resolution	1/1250 of measurement range (using 16-bit A/D converter)
Highest sampling rate	500 kS/s (simultaneous sampling across 2 channels)
Accuracy	±0.5% f.s. (with 5 Hz filter ON)
RMS measurement	RMS accuracy: ±1.5% f.s. (30 Hz up to but not including 1 kHz, sine wave input) or ±3% f.s. (1 kHz up to 10 kHz, sine wave input) Response time: 300 ms (filter off, rising from 0% to 90% f.s.) or 600 ms (filter off, falling from 100% to 10% f.s.) Crest factor 2
Frequency characteristics	DC to 100 kHz -3 dB
Input coupling	DC/AC-RMS/GND
Max. allowable input	1000 V DC, 700 V AC (the max. voltage that can be applied across input pins without damage)

(Compatible with MR8875 firmware version 2.14/3.14 or later)

Cable length and mass: Main unit cable 1.5 m (4.92 ft), input section cable 1 m (3.28 ft), approx. 320 g (11.3 oz)
Note: The unit-side plug of the MR9321-01 is different from the MR9321.

LOGIC PROBE MR9321-01

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)
Output (H) detection	170 to 250 V AC, ±DC 70 to 250 V (HIGH range) 60 to 150 V AC, ±DC 20 to 150 V (LOW range)
Output (L) detection	0 to 30 V AC, ±DC 0 to 43 V (HIGH range) 0 to 10 V AC, ±DC 0 to 15 V (LOW range)
Response time	Rising edge 1 ms max., falling edge 3 ms max. (with HIGH range at 200 V DC, LOW range at 100 V DC)
Max. allowable input	250 Vrms (HIGH range), 150 Vrms (LOW range) (the maximum voltage that can be applied across input pins without damage)

Cable length and mass: Main unit cable 1.5 m (4.92 ft), input section cable 30 cm (0.98 ft), approx. 150 g (5.3 oz)
Note: The unit-side plug of the 9320-01 is different from the 9320.



LOGIC PROBE 9320-01

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 can detect open-collector signals) Input resistance: 1 MΩ (with digital input, 0 to +5 V) 500 kΩ or more (with digital input, +5 to +50V) Pull-up resistance: 2 kΩ (contact input: internally pulled up to +5 V)
Digital input threshold	1.4V/ 2.5V/ 4.0V
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 (open) and 1.5 kΩ or lower (short) 4.0 V: 25 kΩ or higher (open) and 8 kΩ or lower (short)
Detectable pulse width	500 ns 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: 70 cm (2.30 ft), Output side: 1.5 m (4.92 ft), 170g (6.0 oz)



DIFFERENTIAL PROBE P9000 (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

Measurement modes	P9000-01: For waveform monitor output, Frequency properties: DC to 100 kHz -3 dB P9000-02: Switches between waveform monitor output/AC effective value output Wave mode frequency properties: DC to 100 kHz -3 dB, RMS mode frequency properties: 30 Hz to 10 kHz, Response time: Rise 300 ms, Fall 600 ms
Division ratio	Switches between 1000:1, 100:1
DC output accuracy	±0.5 % f.s. (f.s. = 1.0 V, division ratio 1000:1), (f.s. = 3.5 V, division ratio 100:1)
Effective value measurement accuracy	±1 % f.s. (30 Hz to less than 1 kHz, sine wave), ±3 % f.s. (1 kHz to 10 kHz, sine wave)
Input resistance/capacity	H-L: 10.5 MΩ, 5 pF or less (at 100 kHz)
Maximum input voltage	1000 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 bus 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

Capture Voltage Signals from Outside the Wire Cover: SP9000-01

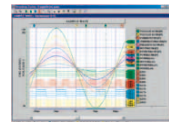
- Measure signals from electric equipment on vehicles, capture LIN and other communications signals.
- Measure insulated wires with outside diameters 1 mm to 2.5 mm
 - 10 Hz to 100 kHz band width



Analyzing data on a computer

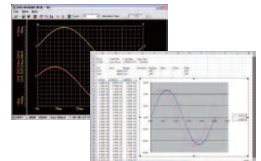
● WAVE PROCESSOR 9335 (option)

- Waveform display and calculation
- Print function



● Wave Viewer (Wv) Software (bundled software)

- Confirmation of binary data waveforms on a computer
- Saving data in the CSV format for transfer to spreadsheet software



■ 9335 Outline specifications (option)

Operating environment	Windows 10/8/7 (32/64-bit)
Functions	<ul style="list-style-type: none"> • Display: Waveform display, X-Y display, cursor function, etc. • File loading: Readable data formats (MEM, REC, RMS, POW) Largest readable file: Largest file that can be saved by supported instruments (Supported file size may be limited due to computer's operating environment.) • Data conversion: Conversion to CSV format, batch conversion of multiple files
Print	<ul style="list-style-type: none"> • Print function: Saving of print image files (with support for enhanced metafile [EMF] format) • Print format: Select from no tiling, 2 to 16 tiles, 2 to 16 rows, X/Y 1 to 4 tiles, preview/hard copy

■ Wave Viewer (Wv) Outline specifications (bundled software)

Operating environment	Windows 10/8/7 (32/64-bit)
Functions	<ul style="list-style-type: none"> • Simple display of waveform file • Convert binary data file to text format, CSV • Scroll display, enlarge/reduce, jump to cursor/trigger position, etc.