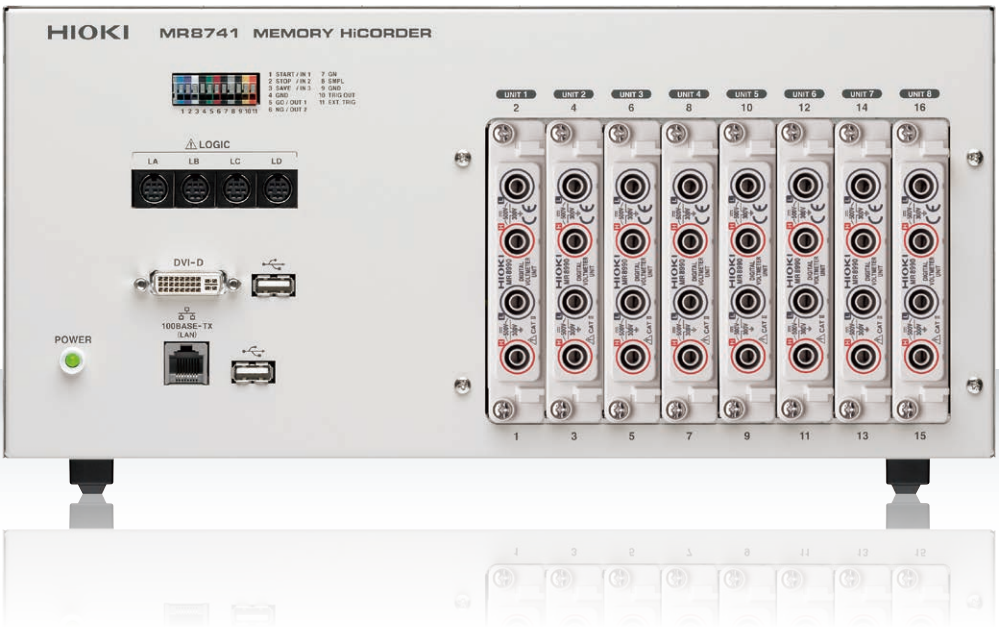
HIOKI

Digital Multi-Module (DMM) Station
MR8990+MR8741/MR8740

Measuret from 16 digital multimeters in a single device

16ch isolated, full simultaneous sampling



Multi-channel measurements, no scanner required

Simultaneous sampling across all channels
High-speed/high-precision measurement without a scanner

High-resolution 6 1/2-digit display

Max resolution of 0.1 µV, covering micro-voltage changes in sensors and other devices

Uniform data management

The MR8741/MR8740 can save data from 16 digital multi-meters at once
Useful as a powerful high-speed/high-precision data logger

Extended applications

Eight interchangeable modules available
Simultaneously record temperature, distortion, logic, etc.

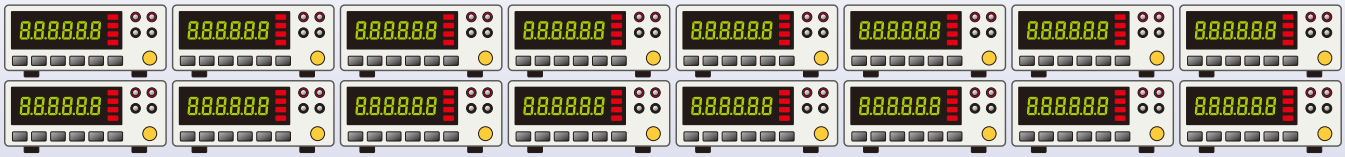
Observe changes using waveforms and area judgment

Monitor voltage waveforms and set thresholds for pass/fail evaluations

Save space and power

Modular design uses smaller overall footprint and wiring is simple - all you need is one power cord and one LAN cable for PC control. Maximum power consumption is 120 VA, even at 16ch.

CE



Measure from 16 digital multimeters in a single device

Dimensions/weight (with 8 modules installed)
Approx. 350W×160H×320D mm (13.78W×6.30H×12.60in),
7.8 kg (275.1 oz)

DIGITAL VOLTAGE METER

DVM UNIT MR8990: the heart of the system

±0.01% precision and 0.1 µV resolution

New module for DMM STATION MR8741/8740

The DVM UNIT MR8990 is a 2-channel V DC measurement module for the MR8741/8740. It can measure minute fluctuations in output from sensors in automobiles and other equipment, as well as voltage fluctuations in devices such as batteries, at high levels of precision and resolution.

DVM UNIT
MR8990

- **High precision: ±0.01% rdg. ±0.0025% f.s.**
  High precision measurement is delivered even at 500 samples/sec
- **High resolution: 6 ½-digit display (0.1 µV resolution), 24-bit**
  Even minute fluctuations in the output voltage of sensors and other equipment can be measured. Max 1200000 counts
- **Max. allowable input: DC 500 V**
  All input channels are individually isolated
- **High input resistance**
  100 mV range to 10 V range: **More than 100 MΩ**
  100 V range to 1000 V range: **10 MΩ±5%**

* Specifications (Product quality and accuracy guaranteed for one year)

● Measurement range

Measurement range:	Effective input range(*)	Input resistance
100 mV (5 mV/div)	-120.0000 mV to 120.0000 mV	More than 100 MΩ
1000 mV (50 mV/div)	-1200.000 mV to 1200.000 mV	
10 V (500 mV/div)	-12.00000 V to 12.00000 V	
100 V (5 V/div)	-120.0000 V to 120.0000 V	10 MΩ ±5%
1000 V (50 V/div)	-500.000 V to 500.000 V	

(*) Guaranteed measurement accuracy range

● Measurement accuracy

Measurement range:	NPLC: Less than 1	NPLC: More than 1
100 mV (5 mV/div)	±0.01% rdg. ±0.015 %f.s.	±0.01% rdg. ±0.01% f.s.
1000 mV (50 mV/div)	±0.01% rdg. ±0.0025% f.s.	
10 V (500 mV/div)		
100 V (5 V/div)	±0.025% rdg. ±0.0025% f.s.	
1000 V (50 V/div)		

(f.s. = measurement range)

● Integration time

Power supply frequency	Integration time
50 Hz	20 ms × NPLC
60 Hz	16.67 ms × NPLC

NPLC:
Can be set to 0.1 to 0.9 (step 0.1) /
1 to 9 (step 1) /10 to 100 (step 10)

The number of power line cycles (NPLC), which indicates the number of cycles in the power supply's period (50 Hz or 60 Hz), determines the integration time. Larger NPLC values result in more effective rejection of noise caused by the power supply at the expense of lower sampling speeds.

- Temperature characteristics: ±(0.002% rdg. ±0.00025% f.s.)/°C
- A/D conversion measurement method : ΔΣ modulation method 24-bit
- Measurement functions : VDC
- Number of channels : 2ch
- Maximum sampling rate : 2 ms (500 samples/sec)
- Max. allowable input : 500 V DC
- Max. rated voltage to earth : 300 V AC/DC

Options for MR8990

TEST LEAD L2200

One set (Red × 1, Black × 1) , 70 cm (2.30 ft) length
Unit jack: Banana terminal
Pin leads and alligator clips
Replaceable clips
Max. allowable input: CAT Ⅳ 600 V, CAT Ⅲ 1000 V

The MR8990 cannot measure AC voltage, current, or resistance. Select from other modules for a variety of measurement options.

Functions/Features

Superior functions and features you won't find in general-purpose digital multimeters.

Fully isolated 16ch simultaneous sampling

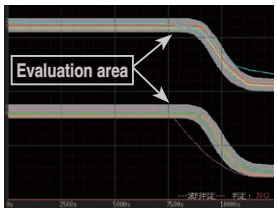
All 16 channels can be sampled at the same time. There's none of the time lag that appears when using a scanner to switch between multiple measurement devices, providing you **full simultaneous sampling**. Make completely accurate measurements without misalignment in start times or between channels. Inputs are also isolated for all channels.

Plug-in module design

Inputs are user-exchangeable plug-in modules. By combining different modules, it is possible to measure temperature, logic signals and other data types along with DC voltage. Current can also be measured by using a clamp-on AC/DC sensor (Hioki CT9690 series).

Area-based evaluation

Define a detection area to evaluate the shape of measured waveforms. This is useful for battery-discharge and power supply durability testing. The instrument's real-time* evaluation capability also allows it to be used for constant monitoring. Evaluation results can also be output to external device.



(*) In slow ranges (time axis range: 100 ms/div or less)

Waveform calculation functions

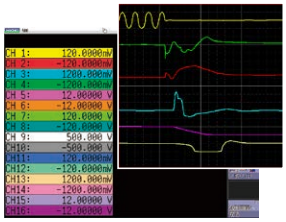
Wave calculations can be applied to measured waveforms. This is useful for checking changes in potential differences between battery cells (cell 1 - cell 2) or DC power (voltage × current). Up to 16 calculations can be defined simultaneously for any given channel. 10 function types are available, in addition to arithmetic operations.

Numerical calculation functions

Numerical calculations can be performed on all measurement data or on a subset of the measurement data. A total of 24 calculations, including interval-specific maximum, minimum, and average values, can be performed using data measured at high precision with the DVM unit on user-specified channels, and up to 16 calculations can be performed simultaneously. Upper/lower limit can also be defined for calculation results, allowing for value-based evaluation.

All channels displayed as waveforms

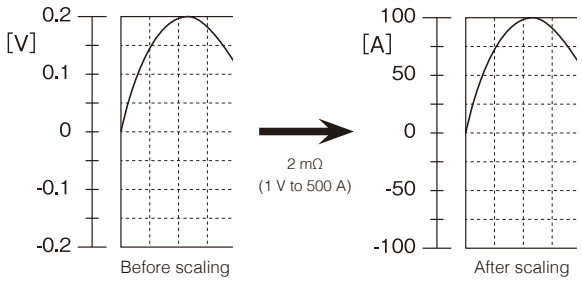
The MR8741 can generate time plots depicting all channels on the same time axis, and it can measure waveform levels over extended periods of time. Values are displayed on the connected display or PC screen. You can also switch between waveform and value display during measurement.



Scaling functions

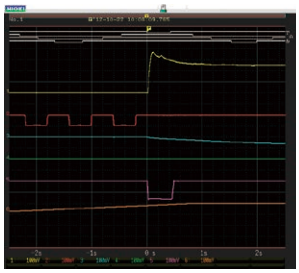
Voltage output from sensors and other equipment can be converted into actual physical quantities for measurement and display.

Ex.: Convert shunt resistance voltage to current



Triggers

Triggers can be applied based on signals input from an external source, logic, or other means, and the voltage value at the point of trigger application can be measured at a high degree of precision with the MR8990. The pre-trigger function can be used to observe data leading up to the trigger. In addition, modules other than the MR8990 provide a variety of triggers, including level triggers.



Applications

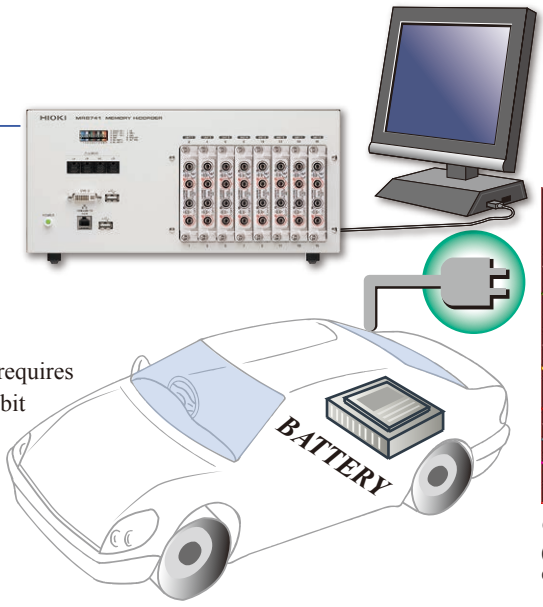
EV battery evaluation

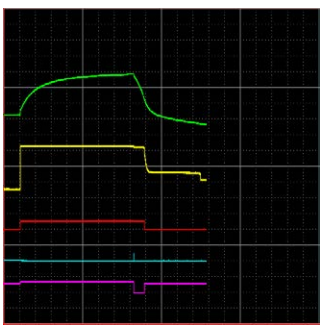
Support for high precision,
high resolution voltage measurement

* Hardware setup example

MEMORY HiCORDER MR8741	×1
DVM UNIT MR8990	×as needed
TEMP UNIT 8967	×1

Voltage measurements for battery cells, which requires high precision and resolution, is possible at 24-bit resolution ±0.01% rdg. ±0.0025% f.s.
The module boasts high input resistance, reducing impact on the measurement target.
Modules can be combined to simultaneously record temperature and other data.





● Battery evaluation
(Example control signal and charge/discharge time measurement)

Available modules

Measured signal	Model No.	Description	No. of channels	Fastest sampling	Bandwidth	A/D resolution	DC accuracy	Max. input voltage	Min. resolution (*1)	Max. sensitivity range	Isolated/ Non-isolated	Notes
Voltage	8966	ANALOG UNIT	2 ch	20 MS/s	DC to 5 MHz	12 bits	±0.5% f.s.	400 V DC	0.05 mV	100 mV f.s.	Yes	n/a
Voltage (high resolution)	8968	HIGH RESOLUTION UNIT	2 ch	1 MS/s	DC to 100 kHz	16 bits	±0.3% f.s.	400 V DC	3.125 uV	100 mV f.s.	Yes	with AAF
Voltage (DC, RMS)	8972	DC/RMS UNIT	2 ch	1 MS/s	DC to 400 kHz	12 bits	±0.5% f.s.	400 V DC	0.05 mV	100 mV f.s.	Yes	with RMS
Voltage (high voltage)	U8974	HIGH VOLTAGE UNIT	2 ch	1 MS/s	DC to 100 kHz	16 bits	±0.25% f.s.	1000 V DC 700 V AC	0.125 mV	4 V f.s.	Yes	Maximum rated voltage to ground 600 V AC/DC CAT IV
Voltage (high resolution)	MR8990	DIGITAL VOLTMETER UNIT	2 ch	2 ms	n/a	24 bits	±0.01% rdg. ±0.0025% f.s.	500 V DC	0.1 uV	100 mV f.s.	Yes	Maximum rated voltage to ground 300 V AC/DC CAT II
Current	8971	CURRENT UNIT	2 ch	1 MS/s	DC to 100 kHz	12 bits	±0.65% f.s.	Current sensor only	Depends on current sensor		No	with RMS Max. 4 units
Temperature	8967	TEMPERATURE UNIT	2 ch	1.2 ms	DC	16 bits	Detailed reference	Thermocouples only	0.01°C	200°C (392°F) f.s.	Yes	n/a
Strain	U8969	STRAIN UNIT	2 ch	200 kS/s	DC to 20 kHz	16 bits	±0.5% f.s. ±4 με	Strain only	0.016 με	400 με f.s.	Yes	n/a
Frequency	8970	FREQ UNIT	2 ch	200 kS/s	DC to 100 kHz (*2)	16 bits	n/a	400 V DC	0.002 Hz	Depends on mode	Yes	n/a
Acceleration	U8979	Charge Unit	2 ch	200 kS/s	DC to 50 kHz (DC) 1 Hz to 50 kHz (AC)	16 bits	±0.5% f.s. (Voltage) ±2.0% f.s. (Acceleration)	40 V DC	Depends on acceleration sensor		Yes	Supports TEDS
Logic	8973	LOGIC UNIT	4 probes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	No	9320-01,9327, Requires 9320-01, 9327 or MR9321-01

(*1) Minimum resolution shows the highest sensitivity resolution. (*2) Minimum pulse width 2 μs

Target	Model No.	Description	Channels	Output	Frequency	Output range
Voltage	U8793	ARBITRARY WAVEFORM GENERATOR UNIT U8793	2 ch	FG: Sine, Square, Pulse, Triangle, Ramp, DC Arbitrary waveform generation: Measurement waveform with Memory HiCorder, Waveform editted with the SP8000	DC, 10 mHz to 100 kHz	Output: -10 V to 15 V (Amplitude setting range: 0 to 20 Vpp)
Voltage	MR8790	WAVEFORM GENERATOR UNIT	4 ch	DC, sine wave	DC, 1 Hz to 20 kHz	Output: -10 V to 10 V (Amplitude setting range: 0 to 20 Vpp)
Voltage	MR8791	PULSE GENERATOR UNIT	8 ch	Pulse, pattern	0.1 Hz to 20 kHz (pulse) 10 Hz to 120 kHz (pattern clock)	Logic output (Amplitude: 0 to 5 V), Open collector output

Use communication commands to configure the settings for generator units.

MR8740

MR8741

Model : Digital Multi-Module (DMM) Stations

Model No. (Order Code)	(Note)
MR8990	(For the MR8740/MR8741, MR8827, etc.)
MR8740	(Max. 54ch, 864MW memory, main unit only)
MR8741	(Max. 16ch, 256MW memory, main unit only)

Note: Instrument requires input units and other dedicated options. Input cords not included. The MR8990 cannot operate alone.

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