

RM3542C

HIOKI

RM3542C-1
RM3542C-2
RM3542C-3
RM3542C-4
RM3542C-5

Startup Guide

RESISTANCE METER

Check for the latest edition and
other language versions.



**Read carefully before use.
Keep for future reference.**

Safety Information ▶ p.4

Part Names and Functions ▶ p.6

Measurement Process ▶ p.7

Maintenance and Service ▶ p.12

Error display ▶ p.14

EN

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RM3542K971-00



Introduction

Thank you for choosing the Hioki RM3542C-1, RM3542C-2, RM3542C-3, RM3542C-4, and RM3542C-5 Resistance Meters.

To ensure your ability to get the most out of this instrument over the long term, please read this manual carefully and keep it available for future reference.

See the following manuals before using these instruments.

Material	Description
Startup Guide	This is composed of excerpts from the Instruction Manual. Please read this manual first when you receive the instrument. It also describes remedies for possible problems.
Instruction Manual (Download the PDF)	This manual provides detailed descriptions and specifications for the instrument. To read this manual, please download it from the main Hioki website.
Operating Precautions	This manual provides the information required to use the instrument safely.

Information on download site

For details on the product application, the update file for the instrument, and the instruction manual, please check Hioki's website:

<https://cloud.gennect.net/dl>



Product registration

Register your product in order to receive important product information.

<https://www.hioki.co.jp/jp/mypage/registration/>



Overview

This instrument is designed to measure the DC resistance of resistors, ferrite beads, and other components quickly and accurately using the four-terminal method.

The instrument is equipped with advanced functions such as a contact check function, a comparator function, and a data output function. The intuitive user interface and high noise resistance make it optimal for taping machines and sorting machines.

Verifying Package Contents

When you receive the instrument, inspect it to ensure that there are no abnormalities or damage to the instrument. If you find any damage or discover that the instrument does not perform as indicated in its specifications, please contact your authorized Hioki distributor or reseller.

Instrument

- ☐ RM3542C-1, RM3542C-2, RM3542C-3, RM3542C-4, or RM3542C-5 Resistance Meter



Accessories

- ☐ Power cord
- ☐ EXT. I/O connector
- ☐ Startup Guide
- ☐ Operating Precautions (0990A905)

Options

For details of options, see "Options" in the Instruction Manual.

- ☐ 9140-10 4-terminal Probe
- ☐ 9262 Test Fixture
- ☐ 9263 SMD Test Fixture
- ☐ IM9100 SMD Test Fixture
- ☐ 9637 RS-232C Cable (9-pin to 9-pin/crossover cable/1.8 m)
- ☐ 9151-02 GP-IB Connector Cable (2 m)

Other Symbols

Safety notations

In this manual, the risk levels are classified as follows.

	DANGER	Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.
	WARNING	Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.
	CAUTION	Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury or potential risks of damage to the supported product (or to other property).
		Indicates a prohibited action.
		Indicates an action that must be performed.

Symbols on the instrument

	Indicates the presence of a potential hazard. For more information about locations where this symbol appears on instrument components, see the "Precautions for Use" section, warning messages listed at the beginning of operating instructions, and the accompanying document entitled "Operating Precautions".
	Indicates alternating current (AC).

Symbols for various standards

	Indicates that the product is subject to the Waste Electrical and Electronic Equipment (WEEE) Directive in EU member nations. Dispose of the product in accordance with local regulations.
	Indicates that the product complies with standards imposed by EU directives.
	Indicates that the product complies with Korean regulations. Declarer: TAISHIN CO., LTD.

Safety Information

This instrument is designed to conform to IEC 61010 International Standards and has been thoroughly tested for safety prior to shipment. However, using the instrument in a way not described in this manual may negate the safety specifications of the instrument. Before using the instrument, be sure to carefully read the following safety precautions.

DANGER

■ Familiarize yourself with the instructions and precautions in this manual before use.

- ! Failure to do so could cause improper use of the instrument, resulting in serious bodily injury or damage to the instrument.

WARNING

■ If you have not used any electrical measuring instruments before, you should be supervised by a technician who has experience in electrical measurement.

- ! Failure to do so could cause the operator to experience an electric shock. Moreover, it could cause serious hazards, such as heat generation, fire, and an arc flash due to a short-circuit.

Precautions for Use

Instrument installation

WARNING

■ Do not use the instrument in locations such as the following:

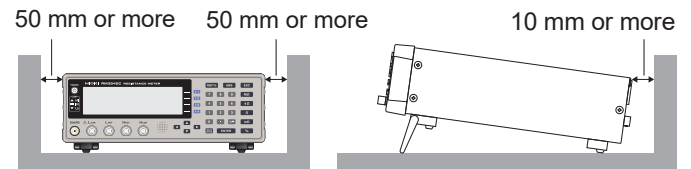
- In locations where it would be subject to direct sunlight or high temperatures
- In locations where it would be exposed to corrosive or explosive gases
- In locations where it would be exposed to powerful electromagnetic radiation or close to objects carrying an electric charge
- Close to inductive heating devices (high-frequency inductive heating devices, IH cooktops, and so on)
- In locations characterized by a large amount of mechanical vibration
- In locations where it would be exposed to water, oil, chemicals, or solvents
- In locations where it would be exposed to high humidity or condensation
- In locations with an excessive amount of dust
- In unstable or slanted locations

The instrument may be damaged or malfunction, resulting in bodily injury.

■ Place the instrument, leaving enough space around it to facilitate unplugging the power cord.

- ! If there is not enough space left around, the power cannot be shut off immediately in an emergency. Failure to follow this guidance could result in bodily injury, fire, or damage to the instrument.

In order to prevent temperature increase of the instrument, keep at least the relevant specified distance between the instrument and its surroundings. Place with its bottom side.



Power supply

WARNING

■ Connect the power cord to a 3-prong grounded-type (2-pole) power outlet.

Connecting the product to an ungrounded power outlet could cause the operator to experience an electric shock.

- ! ■ Ensure that the insulation on the cables is undamaged and that no bare conductors are improperly exposed before use.

Any damage to the instrument leads to electric shock. If any damage is found, please contact your authorized Hioki distributor or reseller.

CAUTION

- ! ■ Before connecting the power cord to the power outlet, make sure the supply voltage to be used falls inside the voltage range indicated on the power connector of the instrument.

Supplying a voltage that falls outside the specified range to the AC Adapter could damage the product or AC Adapter, causing bodily injury.

Measurement probe

DANGER

■ Do not use measurement probes whose insulation is damaged or whose metal portion is exposed.

Doing so could cause serious bodily injury.

- ! ■ Do not short wires carrying a voltage with the tips of the measurement probes.

Doing so could cause a short-circuit, resulting in serious bodily injury.

WARNING

■ When using the instrument while connected to optional probes, use the lower of the ratings indicated on the instrument and the probes.

- ! Using the product to make measurements that exceed either rating could cause the operator to experience an electric shock.

■ Cut off power to measurement lines before connecting them to measurement terminals.

- ! Failure to do so can cause electric shock or a short-circuit.

Handling the fixture

When using the fixture, please carefully read the instruction manual that comes with the product to be used.

External control (EXT. I/O)

See "8 External Control (EXT. I/O)" in the Instruction Manual.

WARNING

- **When connecting a device to the instrument's EXT. I/O connector, use screws to secure the connector.**

During operation, a connector becoming dislocated and contacting another conductive object could cause an electric shock.

- **Follow the steps below before wiring the EXT. I/O connector.**

1. Turn off the instrument and the device being connected.
2. Remove any static electricity charged on your body.
3. Confirm that the signals do not exceed the rating for the external I/O.
4. Properly isolate the instrument and the device being connected.

CAUTION

Always observe the following precautions when wiring to the EXT. I/O connector.

- **Do not apply voltage or current to the EXT. I/O connector that exceeds the rating.**

- **Do not apply external power to the EXT. I/O connector. Do not short-circuit to ISO_COM.**

The ISO_5V terminal of the EXT. I/O connector is a 5 V power output.

The ISO_12V terminal of the EXT. I/O connector is a 12 V power output.

Doing so could cause instrument failure.

- **Ground the grounding terminal of this instrument and the grounding terminals of devices connected to this instrument at one location.**

Connecting the cable in a state where there is a ground potential difference could cause malfunction or failure.

- **Before connecting or disconnecting the data cables, turn off the instrument and the connected devices.**

Failure to do so may damage the instrument or connected devices or cause malfunction.

- **Once you have connected the cables, tighten the screws on the connectors.**

Otherwise, the data may not be transferred correctly.

Communication, SET MONITOR

See "9 Communications (RS-232C/GP-IB Interface)" in the Instruction Manual.

CAUTION

- **Do not short-circuit the connector or apply any voltage to it.**

Doing so could damage the instrument.

- **Ground the grounding terminal of this instrument and the grounding terminals of devices connected to this instrument at one location.**

Connecting the cable in a state where there is a ground potential difference could cause malfunction or failure.

- **Before connecting or disconnecting the data cables, turn off the instrument and the connected devices.**

Failure to do so may damage the instrument or connected devices or cause malfunction.

- **Once you have connected the cables, tighten the screws on the connectors.**

Otherwise, the data may not be transferred correctly.

Before measuring

DANGER

- **Do not apply voltage to the EXT. I/O connector that exceeds the maximum input voltage.**

Doing so could cause electric shock or damage to the instrument.

CAUTION

- **Do not apply voltage to the measurement terminals.**

Doing so could damage the instrument.

- **Do not measure at a point where voltage is applied.**

In particular, attempting a measurement immediately after the temperature rise test or withstanding voltage test of the transformer or motor may damage the instrument due to induced voltage or residual charge.

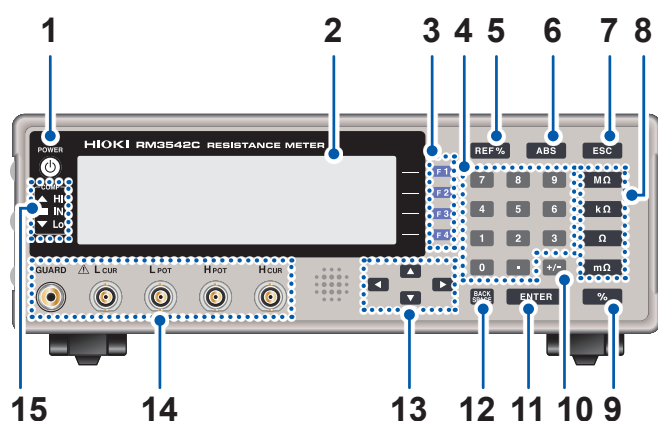
- **Do not measure the battery internal resistance.**

Doing so may damage the instrument. To measure the battery internal resistance, we recommend using the HIOKI 3561, BT3554, BT3561A, BT3562, BT3563, and BT3564 Battery Testers.

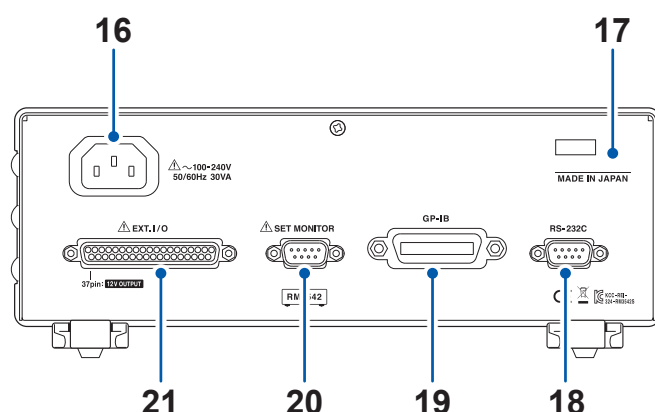
Part Names and Functions

The illustration shows RM3542C-2.

Front



Rear



	Name	Function
1	POWER button	Turns the power on and off.
2	Display screen	Used to check the measured values and various settings.
3	F keys	Used to select items displayed on the right of the screen.
4	Numeric keypad	Used to set a numeric value.
5	REF% key	Used for comparator function settings.
6	ABS key	Used for comparator function settings.
7	ESC key	Cancels the comparator settings and returns to the previous screen.
8	mΩ to MΩ keys	Used for unit settings.
9	% key	Used for reference value range settings.
10	+/- key	Switches between positive and negative numbers.
11	ENTER key	Confirms the comparator threshold value.
12	BACK SPACE key	Clears the value in the selected setting field.
13	Cursor keys	Used to navigate between setting items on the screen.
14	Measurement terminals	Used to connect the measurement probe or fixture. H _{CUR} terminal: Current generation terminal H _{POT} terminal: HIGH voltage detection terminal L _{POT} terminal: LOW voltage detection terminal L _{CUR} terminal: Current detection terminal GUARD terminal: Shield terminal (Measurement GND)
15	COMP indicator	Indicates the judgment result of the measured value. Hi Upper limit value < Measured value IN Within the judgement criteria Lo Lower limit value > Measured value

	Name	Function
16	Power inlet	Used for power cord connection.
17	Serial number	For the latest information, check Hioki's website. Do not remove this sticker because the number is required for product tracking.
18	RS-232C connector	Used to connect the PLC or PC when using the RS-232C interface. Also used to connect a generally available printer compatible with the serial interface.
19	GP-IB connector (RM3542C-2 and RM3542C-5 only)	Used to connect the PC when using the GP-IB interface.
20	SET MONITOR connector	Used to connect another instrument when you want to compare the settings of two instruments.
21	EXT. I/O connector	Used to connect a PLC or I/O board to start measurements and acquire judgement results.

Pre-Operation Inspection

DANGER

- Before use, check that the sheath of the measurement probe is not damaged and that no metal is exposed.

- ! ■ Before use, inspect the instrument and verify that it is operating properly.

Use of the instrument while malfunctioning could result in serious bodily injury. If you find any damage, contact your authorized Hioki distributor or reseller.

Before use, inspect the instrument and verify that it is operating properly.
See "3.1 Pre-Operation Inspection" in the Instruction Manual.

- ☐ The sheathes on the power cord and measurement probe are not torn.
No metal is exposed.
- ☐ No evident damage to the instrument.
- ☐ When turning the power on, the self-test is displayed.
- ☐ After the completion of the self-test, the Measurement screen is displayed.

Measurement Process

Before measuring

WARNING

- Do not apply voltage to the measurement terminals.

-  Doing so could cause damage to the instrument or electric shock accidents.

- ! ■ Perform measurements after turning off the power to the object under measurement.

Failure to do so could cause an electrical hazard.

Precautions for measurement

DANGER

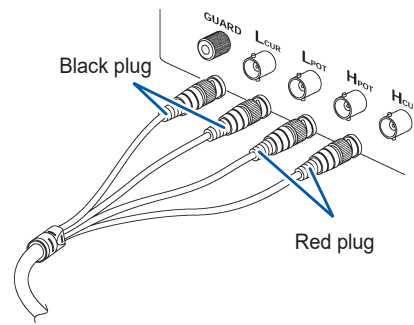
- Do not use the instrument outside its rated or specified ranges.

-  Doing so could cause damage to the instrument, resulting in heat generation and serious bodily injury.

- 1 Perform the pre-operation inspection.

- 2 Plug the power cord into the power outlet.

- 3 Connect the measurement probes to the measurement terminals.



- 4 Connect the instrument to the devices using the external interface.

- GP-IB (RM3542C-2 and RM3542C-5 only) or RS-232C
- EXT. I/O
- Printer

- 5 Press the **POWER** button to turn on the power.

The **POWER** button changes from red to green.
To obtain highly precise measurements, provide about 30 minutes of warm-up after turning the power on.

- 6 Check the object under measurement.

- 7 Make instrument settings.

- Measurement range
- Measurement speed
- Settings in accordance with the object under measurement
To carry out proper resistance measurement, set the relevant functions according to the object under measurement. (Low-power mode, measurement current, and so on)
See "3 Measurement Settings (Basic Measurements)" and "4 Customizing Measurement Conditions" in the Instruction Manual.

- 8 Perform zero adjustment (as required).

- Always perform zero adjustment in the two-terminal measurement.
- Zero adjustment is not required for the four-terminal measurement. However, if the effect of the offset voltage such as thermal EMF is large, perform zero adjustment.

- 9 Connect the measurement probe to the object under measurement.

- 10 Perform measurement.

- 11 After use, press the **POWER** button to turn off the power.

The **POWER** button changes from green to red.
When disconnecting the power cord from the power inlet, the **POWER** button turns off.

Screen Configuration

Measurement screen

INT 10Ω FAST	QVC	MENU F1
10.01211 Ω	REF 10.000 Ω	
+ 0.121 %	UPP +1.000 %	
	LOW -1.000 %	

Operations on the Measurement screen
See “Setting the Judgement Criteria for Measured Values” (p. 9), “Measurement Screen Display” (p. 9), and “Measured Value Errors” (p. 9).

Basic setting screen

TRG RANGE SPEED OADJ COMP LOCK MISC	RETURN F1
INT 10Ω FAST OFF ON OFF	INT F2
10.01211 Ω REF 10.000 Ω	EXT F3
+ 0.121 %	
UPP +1.000 %	
LOW -1.000 %	
	MEAS F2
	DATA F3
	SYSTEM F4

TRG	Trigger source
RANGE	Measurement range
SPEED	Measurement speed
OADJ	Zero adjustment function
COMP	Comparator function
LOCK	Key lock function

Detailed setting screen

MEAS SETTINGS : 100Ω (NUM)	RETURN F1	DATA SETTINGS	RETURN F1	SYSTEM	RETURN F1
DELAY1 0.0 ms : ALL RANGE		AUTO MEMORY OFF		SET MONITOR OFF	
DELAY2 0.0 ms : ALL RANGE		STATISTICS OFF		ΔR MODE OFF	
SCALING OFF : ALL RANGE		DATA OUT OFF		STAGE SHIFT 32	
(A#R+B) A: 1.00000				1ST-NG 2TRG OFF	
B: +0.0000 mΩ				1ST-ER 2TRG OFF	

(MISC > MEAS F2 > MEAS SETTINGS)

Measurement condition settings

DELAY1	Adjustment of the time difference between probing and trigger input
DELAY2	Adjustment of the electric response of the object under measurement
SCALING	Scaling function settings*1
INT(FAST/MED/SLOW)	Fine adjustment of integration time
AVERAGE	Average function settings*2
CONT CHECK	Contact check
CONT IMP	Contact improvement function settings
VOLT MONITOR	Voltage monitor function
CURRENT MODE	Current mode settings

(MISC > DATA F3 > DATA SETTINGS)

Data memory settings

AUTO MEMORY	Auto memory function
STATISTICS	Statistical calculation
DATA OUT	Measurement value auto-exporting

(MISC > SYSTEM F4 > SYSTEM)

System settings

SET MONITOR	Comparison of measurement conditions for two instruments
ΔR MODE	ΔR function settings*2
STAGE	Stage mismatch prevention function setting
PROBE CHECK	Probe short-circuit detection
RETRY	Retry function
VOLT LIMIT	Applied voltage limit function settings*1
JUMPER MODE	Jumper resistance measurement support function settings*1
TRIG EDGE	(EXT. I/O) Trigger signal rise/fall settings
EOM	(EXT. I/O) EOM (end of measurement signal) output method settings
INTERFACE	Communication interface settings
%OUTPUT	Measured value % output function*1
PRINT MODE	Printer printing method settings
LOW POWER	Low-power resistance parts measurement
JUDGE BEEP	Judgment beeper
KEY BEEP	Key operation sound
CLOCK(Y-M-D)	Internal clock settings
LINE FREQ	Power frequency settings
CONTRAST	Screen contrast adjustment
BACKLIGHT	Backlight adjustment
PRESET	Preset function settings*1
RESET	Initialization
ADJUST	Instrument adjustment

*1. RM3542C-1, RM3542C-2, RM3542C-3

*2. RM3542C-3

Setting the Judgement Criteria for Measured Values

Judgement based on reference value and allowable range

1 REF% mode

Setting screen

2 Item selection

3 Numerical value change: BACK SPACE / change: +/- / Cancel: ESC

Set the reference value. (Example: 10.5 Ω)

Set the upper limit value. (Example: +4.5%)

Set the lower limit value. (Example: -4.5%)

When the upper limit value is set, the negative lower limit value is automatically set. Change if necessary.

4 Returns to the Measurement screen.

ENTER

Judgement based on upper and lower limit values

1 ABS mode

Setting screen

2 Item selection

3 Numerical value change: BACK SPACE / Cancel: ESC

Set the upper limit value. (Example: 150 mΩ)

Set the lower limit value. (Example: 50 mΩ)

4 Returns to the Measurement screen.

ENTER

Measurement Screen Display

Measurement speed
FAST/MED/SLOW

Measurement range
100 mΩ to 100 MΩ

Trigger source
INT: Internal trigger
EXT: External trigger

0ADJ	Zero adjustment
OVC	Offset voltage compensation function
LP	Low-power resistance measurement
VL	Applied voltage limit function
S	Scaling function
NUM	Numeric keypad input enabled
F.LOCK	Setting change disabled
M.LOCK	Other than comparator settings disabled
RMT	Remote state

INT	10Ω	FAST	0ADJ	OVC	LP	VL	S	NUM	F.LOCK	M.LOCK	RMT	MENU
10.01211	Ω		REF	10.000	Ω							
+ 0.121	%		UPP	+1.000	%							
			LOW	-1.000	%							

UNLOCK F1	Cancels the key lock. (Press for one second.) (Enabled when LOCK:FULL/MENU is set on the MENU screen.)
LOCAL F1	Cancels the remote state. See "9.5 Communication Methods" in the Instruction Manual.
PRINT F2	Prints the measured value. (SYSTEM window INTERFACE: Enabled when PRINT is set.)
STAT F3	Displays statistical calculation results. (DATA window STATISTICS: Enabled when ON is set.)
NUMBER F4	Sets the number of auto memory data. (DATA window AUTO MEMORY: Enabled when ON is set.)

Measured Value Errors

+OvrRng	Overrange The measurement range for the object under measurement is exceeded or the object under measurement is broken (open work).
-OvrRng	
C.E. Hi	Contact check error The measurement probe may have a poor contact or the cable may be broken.
C.E. Lo	
C.E. Volt	Voltage monitor error The probe contact may be unstable or the external noise may be large.
-----	No measurement data There are no measured values immediately after turning on the power or switching the range. No measured values are displayed due to other errors.

PRINT F2	Prints the statistical data. (SYSTEM window INTERFACE: Enabled when PRINT is set.)
UNDO F3	Erases the last memory data and calculation result. (Erases only once.)
ALLCLR F4	Clears all stored memory data and calculation results.

Specifications

For detailed specifications, see “10 Specifications” in the Instruction Manual.

General specifications

Operating environment	Indoor use, pollution degree 2, altitude up to 2000 m (6562 ft.)
Storage temperature and humidity range	–10°C to 50°C (14°F to 122°F), 80% RH or less (no condensation)
Operating temperature and humidity range	0°C to 40°C (32°F to 104°F), 80% RH or less (no condensation)
Withstand voltage	1.69 kV AC for 1 min. (Cutoff current 10 mA) Between (all power terminals) and (protective ground, interfaces, and measurement terminals)
Applicable standards	Safety EN 61010 EMC EN 61326 Class A
Power source	Rated supply voltage: 100 V to 240 V AC (Assuming voltage fluctuation of $\pm 10\%$) Rated power-supply frequency: 50 Hz/60 Hz Anticipated transient overvoltage: 2500 V Maximum rated power: 30 VA Typical power consumption: 12 W (1 Ω range, COMP indicator ON)
Dimensions	Approx. 260W $\times$ 88H $\times$ 300D mm (10.2W $\times$ 3.5H $\times$ 11.8D in.)
Weight	Approx. 2.9 kg (6.4 lb.)
Product warranty period	3 years

EXT. I/O

Input signals	Optocoupler-isolated, non-voltage contact inputs
	Effective voltage 0 V to 1 V (Input current: 3 mA (reference value))
	Reactive voltage OPEN or 5 V to 30 V
Output signals	Optocoupler-isolated, Nch open-drain output
	Load voltage DC 30 V max.
	Residual voltage 1.0 V max. (Output current 50 mA)
	Output current 50 mA max./ch
External power output	Voltage/current 4.5 V to 5 V / 100 mA max. 11 V to 13 V / 20 mA max. Do not take load from both the +5 V power supply and the +12 V power supply at the same time.
	Isolation Floating from protective ground potential and measurement circuit
	Insulation rating Line-to-ground voltage: Not more than 50 V DC, 30 V rms AC, and 42.4 V peak AC

Measurement specifications

- f.s.: Indicates the maximum display value. Generally, it indicates the currently used range.
- rdg. (Read value, display value): Indicates the value currently being measured and the value currently being displayed on the instrument.
- dgt. (Resolution): Indicates the minimum display unit (in other words, the smallest digit that can have a value of “1”) for a digital measuring instrument.

(1) Resistance measurement accuracy (For RM3542C-3, 90-day accuracy is specified.)

Accuracy guarantee conditions	Warm-up time	At least 30 minutes
	Integration time	Longer than the initial value of the integration time setting function. When the initial value is set to PLC, the ms setting is not specified.
	Accuracy guarantee for temperature and humidity	23°C $\pm 5^\circ\text{C}$ (73°F $\pm 9^\circ\text{F}$), 80% RH or less
	Accuracy guarantee duration	1 year
	The temperature fluctuation after self-calibration is within $\pm 2^\circ\text{C}$. From 0°C to 18°C and 28°C to 40°C, add a temperature coefficient of $\pm (1/10 \text{ of measurement accuracy})/^\circ\text{C}$.	

LOW POWER: OFF

Range	Maximum display *1	f.s.	Measurement accuracy $\pm$ (% rdg. + % f.s.)			Measurement current*2	Open voltage
			FAST	MED	SLOW		
10 m Ω *7	12.00000 m Ω	1,000,000 dgt.	0.015 + 0.080	0.015 + 0.030	0.015 + 0.010*6 0.015 + 0.020	100 mA	20 V max. *3, *4, *5
100 m Ω	120.0000 m Ω	1,000,000 dgt.	0.015 + 0.008	0.015 + 0.003	0.015 + 0.002	100 mA	
1000 m Ω	1200.000 m Ω	1,000,000 dgt.	0.012 + 0.003	0.012 + 0.002	0.012 + 0.001	100 mA	
3 Ω *8	3.60000 Ω	300,000 dgt.	0.012 + 0.003	0.012 + 0.002	0.012 + 0.001	33.3 mA	
10 Ω	12.00000 Ω	1,000,000 dgt.	0.010 + 0.003	0.008 + 0.002	0.008 + 0.001	10 mA	
100 Ω	120.0000 Ω	1,000,000 dgt.	0.009 + 0.003	0.007 + 0.002	0.007 + 0.001	10 mA	
300 Ω *8	360.000 Ω	300,000 dgt.	0.009 + 0.003	0.007 + 0.002	0.007 + 0.001	3.33 mA	
1000 Ω	1200.000 Ω	1,000,000 dgt.	0.008 + 0.003	0.006 + 0.002	0.006 + 0.001	1 mA	
10 k Ω	12.00000 k Ω	1,000,000 dgt.	0.009 + 0.003	0.007 + 0.002	0.007 + 0.001	1 mA	
30 k Ω *8	36.0000 k Ω	300,000 dgt.	0.009 + 0.003	0.007 + 0.002	0.007 + 0.001	333 μA	
100 k Ω	120.0000 k Ω	1,000,000 dgt.	0.010 + 0.003	0.007 + 0.002	0.007 + 0.001	100 μA	
300 k Ω *8	360.000 k Ω	300,000 dgt.	0.010 + 0.003	0.007 + 0.002	0.007 + 0.001	33.3 μA	
1000 k Ω	1200.000 k Ω	1,000,000 dgt.	0.010 + 0.003	0.008 + 0.002	0.008 + 0.001	10 μA	
3 M Ω *8	3.60000 M Ω	300,000 dgt.	0.010 + 0.003	0.008 + 0.002	0.008 + 0.001	3.33 μA	
10 M Ω	12.00000 M Ω	1,000,000 dgt.		0.030 + 0.004		1 μA	
30 M Ω *8	36.0000 M Ω	300,000 dgt.		0.030 + 0.010		333 nA	
100 M Ω	120.0000 M Ω	1,000,000 dgt.		0.100 + 0.020		100 nA	

LOW POWER: ON

Range	Maximum display *1	f.s.	Measurement accuracy $\pm$ (% rdg. + % f.s.)			Measurement current*2	Open voltage
			FAST	MED	SLOW		
1000 m Ω	1200.000 m Ω	1,000,000 dgt.	0.010 + 0.008	0.008 + 0.003	0.008 + 0.002	10 mA	10 V max. *3, *5
3 Ω *8	3.60000 Ω	300,000 dgt.	0.010 + 0.008	0.008 + 0.003	0.008 + 0.002	3.33 mA	
10 Ω	12.00000 Ω	1,000,000 dgt.	0.010 + 0.008	0.008 + 0.003	0.008 + 0.002	1 mA	
100 Ω	120.0000 Ω	1,000,000 dgt.	0.010 + 0.003	0.008 + 0.002	0.008 + 0.001	1 mA	
300 Ω *8	360.000 Ω	300,000 dgt.	0.010 + 0.003	0.008 + 0.002	0.008 + 0.001	333 μ A	
1000 Ω	1200.000 Ω	1,000,000 dgt.	0.020 + 0.003	0.008 + 0.002	0.008 + 0.001	100 μ A	

*1. The negative side is up to 10% of the positive full scale.

*2. The measurement current accuracy is $\pm 5\%$.

*3. When not measuring with current mode PULSE and contact improvement OFF/PULSE settings: 20 mV or less (with a voltmeter with an input resistance of 10 M Ω).

*4. VOLTAGE LIMIT: When ON, 10 V max.

*5. The total of the allowable measurement probe, object under measurement, and contact resistance is less than the resistance value calculated by (open voltage) divided by (measurement current).

Example: At a measurement current of 100 mA, the total of the measurement probe, object under measurement, and contact resistance can be measured up to 20 Ω .

*6. (RM3542C-3) When the average function is set to ON and the number of averages is set to 16 or more. Only 10 m Ω range and SLOW are specified, and others do not depend on the average settings.

*7. RM3542C-3

*8. RM3542C-1, RM3542C-2, RM3542C-3

(2) Resistance measurement time

Measurement range	LOW POWER: OFF			LOW POWER: ON		
	FAST	MED	SLOW	FAST	MED	SLOW
10 m Ω *9	3.8 ms	13.0 ms	43 ms 36 ms	—	—	—
100 m Ω	3.8 ms	13.0 ms	43 ms 36 ms	—	—	—
1000 m Ω	2.0 ms	6.4 ms	41 ms 35 ms	2.3 ms	12 ms	42 ms 35 ms
3 Ω *10	1.6 ms	6.0 ms	41 ms 34 ms	2.3 ms	12 ms	42 ms 35 ms
10 Ω	1.6 ms	6.0 ms	41 ms 34 ms	2.3 ms	12 ms	42 ms 35 ms
100 Ω	0.9 ms	3.6 ms	21 ms 17 ms	1.7 ms	6.1 ms	41 ms 34 ms
300 Ω *10	0.9 ms	3.6 ms	21 ms 17 ms	3.2 ms	7.6 ms	43 ms 36 ms
1000 Ω	0.9 ms	3.6 ms	21 ms 17 ms	7.2 ms	12 ms	47 ms 40 ms
10 k Ω	1.0 ms	3.6 ms	21 ms 17 ms	—	—	—
30 k Ω *10	0.9 ms	3.6 ms	21 ms 17 ms	—	—	—
100 k Ω	1.3 ms	3.8 ms	21 ms 18 ms	—	—	—
300 k Ω *10	1.3 ms	3.8 ms	21 ms 18 ms	—	—	—
1000 k Ω	2.5 ms	6.0 ms	21 ms 18 ms	—	—	—
3 M Ω *10	2.5 ms	6.0 ms	21 ms 18 ms	—	—	—
10 M Ω	5.3 ms	23 ms 20 ms	23 ms 20 ms	—	—	—
30 M Ω *10	5.8 ms	23 ms 20 ms	23 ms 20 ms	—	—	—
100 M Ω	26 ms 22 ms	46 ms 39 ms	86 ms 72 ms	—	—	—

Upper: Power frequency 50 Hz

Lower: Power frequency 60 Hz

Tolerance $\pm 10\%$ ± 0.2 ms (Do not retry.)

*9. RM3542C-3

*10. RM3542C-1, RM3542C-2, RM3542C-3

Maintenance and Service

Inspection and repair

See “11.1 Troubleshooting” in the Instruction Manual.

WARNING

- **Do not attempt to modify, disassemble, or try to repair the instrument.**



Doing so could cause electric shock to the worker or a fire.

Cleaning

CAUTION

- **If the instrument becomes dirty, wipe the instrument clean with a soft cloth moistened with water or a neutral detergent.**



Never use solvents such as benzine, alcohol, acetone, ether, ketone, thinners or gasoline. Doing so could deform and discolor the instrument.

Wipe the LCD gently with a soft, dry cloth.

Disposing of the instrument (Removing the lithium battery)

See “11.4 Disposing of the Instrument” in the Instruction Manual.

WARNING

- **Before removing the lithium battery, turn off the power and disconnect the cords from the object under measurement.**



Failure to do so could cause the operator to experience an electric shock.

- **Store the removed lithium battery out of reach of children.**

Failure to do so could allow children to accidentally ingest battery.

Rack mounting

See “Appendix 5 Rack Mounting” in the Instruction Manual.

WARNING

- **When installing the rack mounting plates on the sides, do not allow the screws to intrude more than 3.5 mm inside the instrument.**



Doing so could damage the instrument, causing the operator to experience an electric shock.

- **When installing the rack mounting plate on the instrument, use the specified screws. (M4 × 8 mm)**

- **When removing the rack mounting plate to return the instrument to stand-alone use, reuse the same screws that were installed originally.**



(Feet: M3 × 6 mm, sides: M4 × 6 mm)

Fixing with other screws could cause damage to the instrument, resulting in bodily injury. If you lose or damage the screws, contact your authorized Hioki distributor or reseller.

Troubleshooting

If damage is suspected, read “Before returning for repair” to remedy the problem.

If this does not help you, contact your authorized Hioki distributor or reseller.

Before returning for repair

If the instrument operates improperly, check the following items.

Symptom	Cause	Remedy or reference destination
The screen is not displayed even when the power is turned on.	The power cord is disconnected or not connected properly.	Check that the power cord is connected properly. “2.1 Connecting the Power Cord” in the Instruction Manual
The keys are unresponsive.	Any key is held down.	Check the operation keys.
	The instrument is in the key lock mode (M.LOCK or F.LOCK is displayed).	Cancel the key lock state. “Re-Enabling Key Operations (Key-Lock Cancel)” in the Instruction Manual
	The instrument is in the remote mode, in which it is controlled by communications functionality (RMT is displayed).	Put the instrument in the local mode. “To Cancel the Remote Status (Enter the Local Status)” in the Instruction Manual
	The KEY_LOCK signal of EXT.I/O is at the Low (ON) level.	Set the KEY_LOCK signal to the High (OFF) level.
Measured values are unstable.	- A power transformer or large choke coil is measured. - The probe or object under measurement is not shielded.	“Appendix 3 Unstable Measurement Values” in the Instruction Manual
A measured value shifts.	- The zero adjustment function is ON. - The CUR terminal and POT terminal are connected before contacting the object under measurement. - The object under measurement is not calibrated properly. - A current of 10 mA or more is flowing through the GUARD terminal. (The GUARD terminal and BNC terminal shells may be in contact with each other.) - The thermal EMF is large.	“3.6 Measuring with Two-terminal Wiring (Zero Adjustment)” in the Instruction Manual

If the cause cannot be found, perform a system reset. All settings are reset to factory default values.

See “5.8 Initializing (Reset)” in the Instruction Manual.

Error display

When an error is displayed on the screen, check or repair is necessary. If any damage is found, please contact your authorized Hioki distributor or reseller.

Display		Description	Remedy
+OvrRng or -OvrRng		Overrange	Select the appropriate range.
C.E. Hi		Hi wiring contact error	Check for cable breakage and worn out probes.
C.E. Lo		Lo wiring contact error	Check for cable breakage and worn out probes.
C.E. Volt		Voltage monitor error	Check for worn out probes.
ERR:001	LOW limit is higher than UPP limit.	Upper limit value < Lower limit value	Check the comparator settings.
ERR:002	(When low-power resistance measurement is disabled) Exceeding range. (From 0 Ω to 120 M Ω) (When low-power resistance measurement is enabled) Exceeding range. (From 0 Ω to 1200 Ω)	The comparator input exceeds its range. (E.g., out of reference value range 1000 M Ω)	Check the comparator settings.
ERR:003	Setting monitor error. (COMP)	The comparator settings are different from those of another instrument.	Set the comparator settings to the same.
ERR:004	Setting monitor error. (SPEED)	The SPEED settings are different from those of another instrument.	Set the SPEED settings to the same.
ERR:011	Zero adjustment error. Offset value exceeds 10 Ω.	Out of zero adjustment range	Check the zero adjustment procedure.
ERR:021	Probe short error	Probe short-circuit	Check that the probe is connected properly.
ERR:031	Command error	Command error	Check for incorrect commands.
ERR:032	Execution error	Execution error.	Check for incorrect commands or instrument state.
ERR:033	RS-232C communication error	IF communication error	Check the communication settings or wiring.
ERR:034	Setting monitor communication error	Setting monitor communication error	Check the setting monitor settings or wiring.
ERR:041	Line frequency detection error	Power frequency detection error	Set the frequency to match that of the power being supplied to the instrument.
ERR:042	Clock error Reset? (16-01-01 00:00:00) Press F1 Key.	The clock is not set, so pressing the F1 (OK) key initializes to 16-01-01 00:00:00.	The backup battery needs to be replaced. Contact your authorized Hioki distributor or reseller.
ERR:101	Hardware error (Main CPU ROM)	Hardware failure	Repair is required.
ERR:102	Hardware error (Main CPU RAM)	Hardware failure	Repair is required.
ERR:103	Hardware error (SRAM)	Hardware failure	Repair is required.
ERR:104	Hardware error (Adjustment data)	Hardware failure	Repair is required.
ERR:105	Hardware error (Backup data) Reset? Press F1 Key.	Hardware failure (Backup data is corrupted.)	Repair is required. Press the F1 (OK) key to perform the initialization.
ERR:106	Hardware error (Meas CPU communication)	Hardware failure	Repair is required.

Display		Description	Remedy
ERR:107	Hardware error (Meas CPU ROM)	Hardware failure	Repair is required.
ERR:108	Hardware error (Meas CPU RAM)	Hardware failure	Repair is required.
ERR:109	Hardware error (Measurement end)	Hardware failure	Repair is required.
ERR:110	Hardware error (Zero measurement end)	Hardware failure	Repair is required.
ERR:111	Hardware error (F.S. measurement end)	Hardware failure	Repair is required.
ERR:112	Hardware error (Calibration)	Hardware failure	Repair is required.
ERR:113	Hardware error (Meas CPU A/D data)	Hardware failure	Repair is required.
ERR:114	Hardware error (Meas CPU)	Hardware failure	Repair is required.

Message display

The message display section displays the description and remedy as follows.

Display		Description	Remedy
INFO:001	Printing...	Printing in progress	–
INFO:002	Memory full	The memory is full.	Clear the saved data.
INFO:011	Zero adjusting...	Zero adjustment in progress	–
INFO:012	Clearing zero adjustment	Zero adjustment clearing in progress	–
INFO:021	Clear all memory and statistics data?	Check that the memory data is cleared.	F1: CANCEL F2: YES
INFO:022	Undo memory and statistics data?	Check that one memory data unit is cleared.	F1: CANCEL F2: YES
INFO:023	Save and Return? [CANCEL]: Continue to edit.	Check the MISC settings.	F1: CANCEL (Returns to the original screen.) F2: SAVE F3: NOSAVE
INFO:024	System Reset?	Check the system reset.	F1: CANCEL F4: YES
INFO:031	Press enter code.	Waiting for code input to enter the adjustment mode.	–
-----		Unmeasured state Waiting for trigger after changing settings, just after turning on the power, or similar operations.	–

Warranty Certificate

HIOKI

Model	Serial number	Warranty period Three (3) years from date of purchase (____ / ____)
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Customer name: _____

Customer address: _____

Important

- Please retain this warranty certificate. Duplicates cannot be reissued.
- Complete the certificate with the model number, serial number, and date of purchase, along with your name and address. The personal information you provide on this form will only be used to provide repair service and information about Hioki products and services.

This document certifies that the product has been inspected and verified to conform to Hioki's standards.

Please contact the place of purchase in the event of a malfunction and provide this document, in which case Hioki will repair or replace the product subject to the warranty terms described below.

Warranty terms

- The product is guaranteed to operate properly during the warranty period (three [3] years from the date of purchase). If the date of purchase is unknown, the warranty period is defined as three (3) years from the date (month and year) of manufacture (as indicated by the first four digits of the serial number in YYYY format).
- If the product came with an AC adapter, the adapter is warranted for one (1) year from the date of purchase.
- The accuracy of measured values and other data generated by the product is guaranteed as described in the product specifications.
- In the event that the product or AC adapter malfunctions during its respective warranty period due to a defect of workmanship or materials, Hioki will repair or replace the product or AC adapter free of charge.
- The following malfunctions and issues are not covered by the warranty and as such are not subject to free repair or replacement:
 - 1. Malfunctions or damage of consumables, parts with a defined service life, etc.
 - 2. Malfunctions or damage of connectors, cables, etc.
 - 3. Malfunctions or damage caused by shipment, dropping, relocation, etc., after purchase of the product
 - 4. Malfunctions or damage caused by inappropriate handling that violates information found in the instruction manual or on precautionary labeling on the product itself
 - 5. Malfunctions or damage caused by a failure to perform maintenance or inspections as required by law or recommended in the instruction manual
 - 6. Malfunctions or damage caused by fire, storms or flooding, earthquakes, lightning, power anomalies (involving voltage, frequency, etc.), war or unrest, contamination with radiation, or other acts of God
 - 7. Damage that is limited to the product's appearance (cosmetic blemishes, deformation of enclosure shape, fading of color, etc.)
 - 8. Other malfunctions or damage for which Hioki is not responsible
 - 9. After disassembly, such as opening the product, has been performed by the customer without permission by Hioki
- The warranty will be considered invalidated in the following circumstances, in which case Hioki will be unable to perform service such as repair or calibration:
 - 1. If the product has been repaired or modified by a company, entity, or individual other than Hioki
 - 2. If the product has been embedded in another piece of equipment for use in a special application (aerospace, nuclear power, medical use, vehicle control, etc.) without Hioki's having received prior notice
- If you experience a loss caused by use of the product and Hioki determines that it is responsible for the underlying issue, Hioki will provide compensation in an amount not to exceed the purchase price, with the following exceptions:
 - 1. Secondary damage arising from damage to a measured device or component that was caused by use of the product
 - 2. Damage arising from measurement results provided by the product
 - 3. Damage to a device other than the product that was sustained when connecting the device to the product (including via network connections)
- Hioki reserves the right to decline to perform repair, calibration, or other service for products for which a certain amount of time has passed since their manufacture, products whose parts have been discontinued, and products that cannot be repaired due to unforeseen circumstances.

HIOKI E. E. CORPORATION

25-10 EN-3

HIOKI

www.hioki.com/



**All regional
contact
information**

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