

Ohmmeter Replacement Guide (From 3541 to RM3545)

- 1. Measurement**
- 2. External Control (EXT I/O)**
- 3. Commands**

Please prepare copies of the user manuals for the old and new instruments and review the applicable sections of each.

If you do not have access to these manuals, they can be downloaded in PDF format from your myHIOKI website.

<http://www.hioki.com/>

Please note that this guide may be revised or up dated without notice.



ISO 9001
JMI-0216



ISO14001
JQA-E-90091



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1. Measurement

(1) Range structure comparison

3541

Range	Display range	Measurement current	Open terminal voltage
20mΩ	20. 0000mΩ	1A	5. 0V max
200mΩ	200. 000mΩ	1A/100mA	
2Ω	2000. 00mΩ	100mA	
20Ω	20. 0000 Ω	10mA	2. 6V max
200Ω	200. 000 Ω	10mA	
2kΩ	2000. 00 Ω	1mA	
20kΩ	20. 0000k Ω	100μA	
100kΩ	110. 000k Ω	100μA	13V max
1MΩ	1100. 00k Ω	10μA	
10MΩ	11. 0000MΩ	1μA	
100MΩ	110. 000MΩ	100nA	

RM3545

Range	Display range	Measurement current	Open terminal voltage
10mΩ	12. 00000mΩ	1A	5. 5V max
100mΩ	120. 0000mΩ	1A/100mA	
1000mΩ	1200. 000 Ω	100mA/10mA	
10Ω	12. 00000 Ω	10mA/1mA	
100Ω	120. 0000 Ω	10mA/1mA	
1000Ω	1200. 000k Ω	1mA	20V max
10kΩ	12. 00000k Ω	1mA	
100kΩ	120. 0000k Ω	100μA	
1000kΩ	1200. 000k Ω	10μA	
10MΩ	12. 00000MΩ	1μA	
100MΩ	120. 0000MΩ	100nA	
	120. 00 MΩ	Up to 1μA	
1000MΩ	1200. 0 MΩ	Up to 1μA	

Low-power

Range	Display range	Measurement current	Open terminal voltage
2Ω	2000. 00mΩ	10mA	60mV max
20Ω	20. 0000 Ω	1mA	
200Ω	200. 000 Ω	100μA	
2kΩ	2000. 00 Ω	10μA	

Range	Display range	Measurement current	Open terminal voltage
1000mΩ	1200. 00mΩ	1mA	20mV max
10Ω	12. 0000mΩ	500μA	
100Ω	120. 000Ω	50μA	
1000Ω	1200. 00Ω	5μA	

- The 3541 and RM3545 use different range structures. When setting the range by command, an optimal range is selected based on the setting value.
- The RM3545 has more ranges for which the measurement current can be changed. Please select an appropriate current.
 - How to set the number of display digits
Menu [P.2/2] Setting screen (SETTING) → Measurement Setting screen (MEAS) → Measurement current (MEAS CURRENT)
- If you require an equivalent number of digits and accuracy as the 3541 with a 100 MΩ range, switch to the 100 MΩ high-precision range.
 - How to set the number of display digits
Menu [P.2/2] Setting screen (SETTING) → Measurement Setting screen (MEAS) → High-precision mode
- The RM3545 provides ranges with one extra display digit, making the instrument capable of displaying a maximum of seven digits. To use the same display as the 3541, set the number of display digits to six.
 - How to set the number of display digits
Menu [P.2/2] Setting screen (SETTING) → Measurement Setting screen (MEAS) → Number of display digits to six (6DGT)

(2) Temperature sensor

Use of the 9451 Temperature Sensor that came with the 3541 is not recommended. Doing so will cause completely different temperature measured values (around 70°C) to be displayed.

Only use the accessory Z2001 Temperature Sensor. Please note that the Z2001 is not a standard accessory of the RM3545.

(3) Measurement leads

Use of 3541 measurement leads (9287-10, etc.) with the RM3545 is not recommended (and doing so will place the performance of the instrument outside the accuracy guarantee). The leads that come with the RM3545 and optional measurement leads (L2101, etc.) include a guard terminal in order to reduce the effects of external noise. Although there is no difference in the leads' center value (average value), use of the 3541 measurement leads with the new instrument will make measurement more susceptible to the effects of noise, so their performance should be verified in the environment in which they are to be used first.

If you plan to make your own measurement leads, refers to "Appendix 10: Making Your Own Measurement Leads" in the RM3545 User Manual.

(4) Self-calibration

- Auto

Measurement will not stop every 30 minutes as with the 3541. The RM3545 performs self-calibration, which takes approximately 5 ms, between measurements. It also performs a 5 ms self-calibration every second during TRIG standby operation. The self-calibration is canceled if the TRIG signal is received during that 5 ms period, in which case measurement starts after 0.5 ms.

- Manual

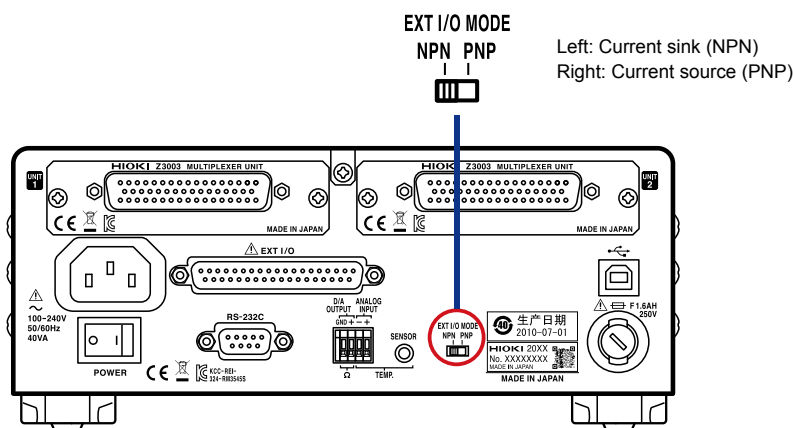
As with the 3541, self-calibration is triggered by the EXT I/O CAL signal or a communications command.

2. External Control (EXT I/O)

The timing of some aspects of the RM3545's operation differs from that of the 3541. Be sure to review the timing charts in the RM3545's User Manual.

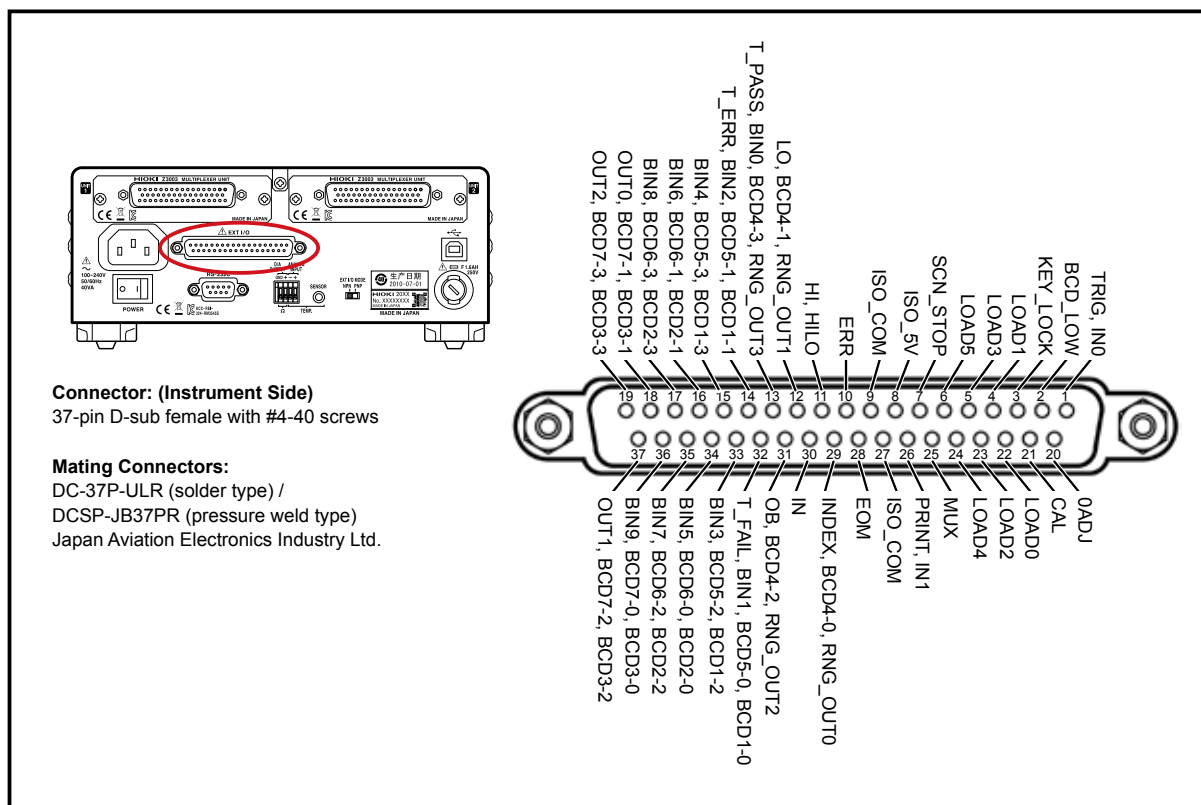
(1) Switching between current sink (NPN) and current source (PNP)

The RM3545 allows you to switch between NPN and PNP operation. To control the instrument in the same way as the 3541, set the NPN/PNP switch to NPN. The instrument ships with the switch in the NPN position. The EXT I/O mode cannot be changed using commands.



(2) Connector

The RM3545 connector is configured as follows:



(3) Signal table

Power

Description	3541	RM3545
Power	INT.VCC	ISO_5V
Ground/common	INT.GND	ISO_COM

Input

Description	3541	RM3545
TRIG (measurement start)	TRIG	TRIG
Zero adjustment	0ADJ	0ADJ
Printer output	PRINT	PRINT
Calibration	CAL	CAL
Key lock	-	KEY_LOCK
BCD low-order byte output*	-	BCD_LOW
Table/panel	LOAD0 to 4	LOAD0 to 5
General-purpose input	IN0, 1	IN0, 1
Multiplexer	-	MUX SCN_STOP

Output

Description	3541	RM3545
Comparator Hi	Hi	HI
Comparator IN	IN	IN
Comparator Lo	Lo	LO
Comparator HiLo	-	HILO
Measurement fault	ERR	ERR
Measurement complete	EOC	EOM
Analog measurement complete	INDEX	INDEX
Range data output	-	RNG_OUT
BCD output *	BCDm-n	BCDm-n
BIN output	BIN0 to 9	BIN0 to 9
	OB	OB
General-purpose output	OUT0 to 7	OUT0 to 2
Multiplexer	-	T_PASS T_FAIL T_ERR

* BCDm-n: Outputs the nth bit of digit m. (BCD1-x is the lowermost digit, while BCDx-0 is the LSB.)

(4) BCD signals

BCD output cannot be read all at once. To acquire all the digits, the BCD_LOW signal must be controlled. For more information, see the RM3545 User Manual.

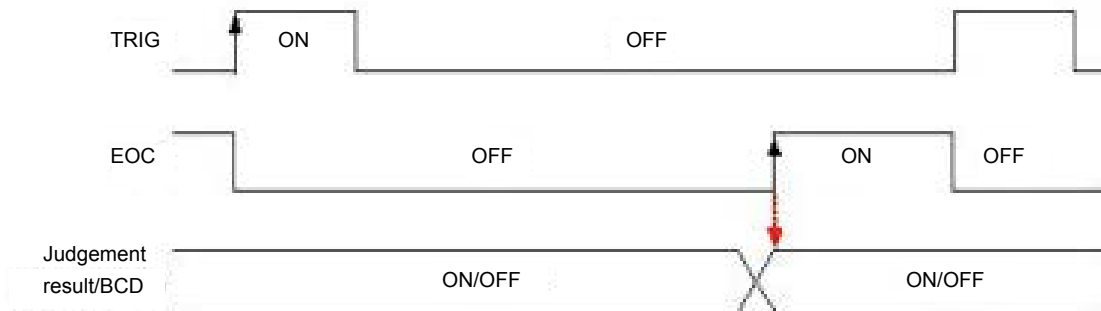
Pin	BCD_LOW	
	OFF	ON
9	ISO_COM	
10	ERR	
11	HILO	
12	BCD4-1	RNG_OUT1
13	BCD4-3	RNG_OUT3
14	BCD5-1	BCD1-1
15	BCD5-3	BCD1-3
16	BCD6-1	BCD2-1
17	BCD6-3	BCD2-3
18	BCD7-1	BCD3-1
19	BCD7-3	BCD3-3

Pin	BCD_LOW	
	OFF	ON
28	EOM	
29	BCD4-0	RNG_OUT0
30	IN	
31	BCD4-2	RNG_OUT2
32	BCD5-0	BCD1-0
33	BCD5-2	BCD1-2
34	BCD6-0	BCD2-0
35	BCD6-2	BCD2-2
36	BCD7-0	BCD3-0
37	BCD7-2	BCD3-2

(5) Acquiring judgment results

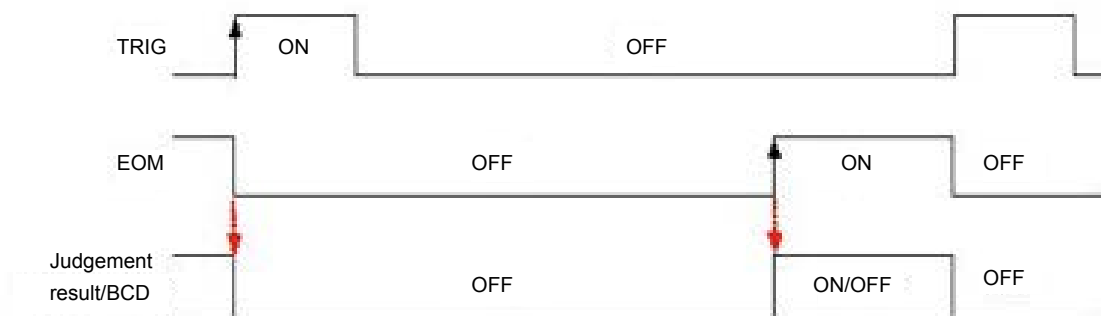
The 3541 and RM3545 use different timing for clearing judgment result and BCD signals. As with the 3541, judgment results should be acquired while the EOM signal is on.

3541: Timing chart when using the external trigger [EXT] setting



- When the EOC signal turns on, the judgment result and BCD signals change.

RM3545: Timing chart when using the external trigger [EXT] setting



- When the TRIG signal turns on, the judgment result and BCD signals are cleared.
- When the EOM signal turns on, the judgment result and BCD signals change

3. Commands

When using 3541 messages (commands) on the RM3545, some commands can be used in the same manner as with the 3541, while some require changes. Be sure to read the following before using 3541 messages on the RM3545.

(1) Message correspondence chart

- The following correspondence chart includes only messages that are implemented differently on the RM3545 and 3541.
- When replacing a message with an RM3545 command, see the corresponding command.
- Although communications were not backed up by the 3541, all settings are backed up by the RM3545, including in the event of a reset.

3541 message		Corresponding RM3545 message		Operation when using 3541 commands and associated operating precautions
Message	Data portion content (): Response data	Message	Data portion content (): Response data	

Shared commands

*IDN?	(<Manufacturer name>, <model name>, <software version>)	Same as 3541	(<Manufacturer name>, <model name>, <serial number>, <software version>)	The model name and software version vary by model.
*TST?	(0 to 3(NR1))	Same as 3541	(0 to 15(NR1))	The error content differs. For more information, see the Communications Command User Manual.

Event registers

ESE0?	(0 to 255(NR1))	Same as 3541	(0 to 255(NR1))	The event status register contents differ. See correspondence chart (2) below.
ESE1?	(0 to 255(NR1))	Same as 3541	(0 to 255(NR1))	
ESR0?	(0 to 255(NR1))	Same as 3541	(0 to 255(NR1))	
ESR1?	(0 to 255(NR1))	Same as 3541	(0 to 255(NR1))	

Load measured valued

:FETCh?	(<Measured value(NR2)>)	Same as 3541	(<Measured value(NR2)>)	The measured value format differs. See correspondence chart (1) below.
:READ?	(<Measured value(NR2)>)	Same as 3541	(<Measured value(NR2)>)	
:MEASure:TEMPerature?	(<Temperature measured value (NR2)>)	Same as 3541	(<Temperature measured value (NR2)>)	
:MEASure:LPResistance?	<Anticipated measured value> (<Measured value(NR2)>)	Same as 3541	<Anticipated measured value> (<Measured value(NR2)>)	
:MEASure:RESistance?	<Anticipated measured value> (<Measured value(NR2)>)	Same as 3541	:<Anticipated measured value> (<Measured value(NR2)>)	

Measurement speed

:SAMPle:RATE	FAST/MEDium/SLOW1/SLOW2	Same as 3541	FAST/MEDium/SLOW1/SLOW2	Can be used without modification on the RM3545.
:SAMPle:RATE?	(FAST/MEDIUM/SLOW1/SLOW2)	Same as 3541	(FAST/MEDIUM/SLOW1/SLOW2)	

Comparator

:CALCulate:LIMit:MODE	HL/REF	Same as 3541	ABSolute/REFerence	HL is interpreted as an ABSolute value.
:CALCulate:LIMit:MODE?	(HL/REF)	Same as 3541	(ABSOLUTE/REFERENCE)	The response string differs.
:CALCulate:LIMit:UPPer	<Upper limit value(NR1)>	Same as 3541	<Upper limit value(NR3)>	Please change the data portion to an NR3 (resistance value) rather than an NR1 (count value).
:CALCulate:LIMit:UPPer?	(<Upper limit value(NR1)>)	Same as 3541	(<Upper limit value(NR3)>)	
:CALCulate:LIMit:LOWer	<Lower limit value(NR1)>	Same as 3541	<Lower limit value(NR3)>	
:CALCulate:LIMit:LOWer?	(<Lower limit value(NR1)>)	Same as 3541	(<Lower limit value(NR3)>)	The response will be an NR3 (resistance value) rather than an NR1 (count value).
:CALCulate:LIMit:REFerence	<Reference value(NR1)>	Same as 3541	<Reference value(NR3)>	
:CALCulate:LIMit:REFerence?	(<Reference value(NR1)>)	Same as 3541	(<Reference value(NR3)>)	
:CALCulate:LIMit:PERCent	<Range(%) (NR2)>	Same as 3541	<Range(%) (NR2)>	Can be used without modification on the RM3545.
:CALCulate:LIMit:BEEPer	<OFF/ HL/ IN>	Same as 3541	<HI/IN/LO>, <0 to 4(type)>, <0 to 5(times)>	Please change the format of the data portion.
:CALCulate:LIMit:BEEPer?	(<OFF/ HL/ IN>)	Same as 3541	(<HI/IN/LO>, <0 to 4(type)>, <0 to 5(times)>)	

3541 message		Corresponding RM3545 message		Operation when using 3541 commands and associated operating precautions
Message	Data portion content (): Response data	Message	Data portion content (): Response data	

BIN function

:CALCulate:BIN:MODE	<BINNo.>,<HL/REF>	Same as 3541	ABSolute/REFERENCE	HL is interpreted as an ABSolute value.
:CALCulate:BIN:MODE?	<BINNo.>,(HL/REF)	Same as 3541	(ABSOLUTE/REFERENCE)	The response string differs.
:CALCulate:BIN:UPPer	<BINNo.>,<Upper limit value(NR1)>	Same as 3541	<BINNo.>,<Upper limit value(NR3)>	Please change the data portion to an NR3 (resistance value) rather than an NR1 (count value).
:CALCulate:BIN:UPPer?	<BINNo.>(<Upper limit value(NR1)>)	Same as 3541	<BINNo.>(<Upper limit value(NR3)>)	
:CALCulate:BIN:LOWer	<BINNo.>,<Lower limit value(NR1)>	Same as 3541	<BINNo.>,<Lower limit value(NR3)>	The response will be an NR3 (resistance value) rather than an NR1 (count value).
:CALCulate:BIN:LOWer?	<BINNo.>(<Lower limit value(NR1)>)	Same as 3541	<BINNo.>(<Lower limit value(NR3)>)	
:CALCulate:BIN:REFerence	<BINNo.>,<Reference value(NR1)>	Same as 3541	<BINNo.>,<Reference value(NR3)>	
:CALCulate:BIN:REFerence?	<BINNo.>(<Reference value(NR1)>)	Same as 3541	<BINNo.>(<Reference value(NR3)>)	

Statistical calculations

:CALCulate:STATistics:MEAN?	<Average value(NR2)>	Same as 3541	<Average value(NR2)>	The measured value format differs. See correspondence chart (1) below.
:CALCulate:STATistics:MAXimum?	<Maximal value(NR2)>,<Data number(NR1)>	Same as 3541	<Maximal value(NR2)>,<(Data numberNR1)>	
:CALCulate:STATistics:MINimum?	<Minimum value(NR2)>,<Data number(NR1)>	Same as 3541	<Minimum value(NR2)>,<Data number(NR1)>	
:CALCulate:STATistics:DEViation?	<σn>,<σn-1>	Same as 3541	<σn>,<σn-1>	

Temperature conversion (ΔT)

:CALCulate:TCONversion:DELTA:PARameter	<Initial resistance value(NR3)>,<Initial temperature(NR3)>,<Constant(NR2)>	Same as 3541	<Initial resistance value(NR3)>,<Initial temperature(NR3)>,<Constant(NR2)>	The format of the initial resistance value differs. See correspondence chart (1) below.
:CALCulate:TCONversion:DELTA:PARameter?	<Initial resistance value(NR3)>,<Initial temperature(NR3)>,<Constant(NR2)>	Same as 3541	<Initial resistance value(NR3)>,<Initial temperature(NR3)>,<Constant(NR2)>	

Memory function

:MEMory:DATA?	<Memory number(NR1)>,<Measured value(NR2)>	Same as 3541	<Measured value(NR2)>,<Measured value(NR2)>,...,<Measured value(NR2)>	The format of the initial resistance value differs. Additionally, measured values comprise a batch response for all memory.
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Measurement function

[[:SENSe:]]FUNCTION	RESistance/LPRESistance/TEMPerature	[[:SENSe:]]RESistance:LP:STATe	1/0/ON/OFF	This message will be ignored when the data portion is TEMPerature. Additionally, a data portion of RESistance will cause low-power resistance measurement to be turned off, while a data portion of LPRESistance will cause low-power resistance measurement to be turned on.
[[:SENSe:]]FUNCTION?	(RESISTANCE/LPRESISTANCE/TEMPERATURE)	[[:SENSe:]]RESistance:LP:STATe?	(ON/OFF)	When low-power resistance measurement is off, the response will be RESISTANCE. When low-power resistance measurement is on, the response will be LPRESISTANCE. The instrument will never issue a response of TEMPERATURE.

Measurement range

[[:SENSe:]]RESistance:RANGe	0 to 110E+6	Same as 3541	0 to 120E+6	Due to differences in range structure, these messages may result in selection of an unintended range. See Table 2 for more information about the RM3545's range structure.
[[:SENSe:]]RESistance:RANGe?	(20.0000E-3 to 110.000E+6)	Same as 3541	(10.00000E-3 to 100.0000E+6)	
[[:SENSe:]]LPRESistance:RANGe	0 to 2000	[[:SENSe:]]RESistance:LP:RANGe	0 to 3.5E+3	
[[:SENSe:]]LPRESistance:RANGe?	(2000.00E-3 to 2000.00E+0)	[[:SENSe:]]RESistance:LP:RANGe?	(3.00000E+0 to 3.00000E+3)	

3541 message		Corresponding RM3545 message		Operation when using 3541 commands and associated operating precautions
Message	Data portion content (): Response data	Message	Data portion content (): Response data	

Current switching

:SYSTem:CURRent	<1A/0.1A>	[:SENSe:]RESistance:CURRent	HIGH/LOW	When the data portion is 1A, measurement is performed using high current. When the data portion is 0.1A, measurement is performed using low current. Please note that the current values for multiple ranges have changed on the RM3545.
:SYSTem:CURRent?	(<1A/0.1A>)	[:SENSe:]RESistance:CURRent?	(HIGH/LOW)	When the current is HIGH, the response will be 1A. When the current is LOW, the response will be 0.1A.

Offset voltage correction function

:SYSTem:OVC	1/0/ON/OFF	[:SENSe:]RESistance:OVC	1/0/ON/OFF	This message is compatible with [:SENSe:]RESistance:OVC and can be used without modification.
:SYSTem:OVC?	(ON/OFF)	[:SENSe:]RESistance:OVC?	(ON/OFF)	This message is compatible with [:SENSe:]RESistance:OVC? and can be used without modification.

Temperature measurement

:SYSTem:TEMPerature:SENSor	PT/ANALOG	[:SENSe:]TEMPerature:SENSor	THERmistor/ANALog	When the data portion is PT, the Z2001 Temperature Sensor (thermistor) will be selected.
:SYSTem:TEMPerature:SENSor?	(PT/ANALOG)	[:SENSe:]TEMPerature:SENSor?	(THERMISTOR/ANALOG)	When the Z2001 Temperature Sensor (thermistor) is selected, the response will be PT.
:SYSTem:TEMPerature:PARAmeter	<V1>,<T1>,<V2>,<T2>	[:SENSe:]TEMPerature:PARAmeter	<V1>,<T1>,<V2>,<T2>	This message is compatible with [:SENSe:]TEMPerature:PARAmeter and can be used without modification.
:SYSTem:TEMPerature:PARAmeter?	(<V1>,<T1>,<V2>,<T2>)	[:SENSe:]TEMPerature:PARAmeter?	(<V1>,<T1>,<V2>,<T2>)	This message is compatible with [:SENSe:]TEMPerature:PARAmeter? and can be used without modification.

Current fault mode

:SYSTem:FORMat	CF/NORMAL	[:SENSe:]RESistance:ERRor:CURRentcheck	ERRor/OVER	When the data portion is NORMAL, the current fault mode will be set to current fault. When the data portion is CF, the current fault mode will be set to over-range.
:SYSTem:FORMat?	(CF/NORMAL)	[:SENSe:]RESistance:ERRor:CURRentcheck?	(ERRor/OVER)	When the current fault mode is current fault, the response will be NORMAL. When the current fault mode is over-range, the response will be CF.

Saving and loading measurement conditions

:SYSTem:SAVE	<TableNo.>	:SYSTem:PANel:SAVE	<TableNo.>	This message is compatible with :SYSTem:PANel:SAVE and can be used without modification.
:SYSTem:LOAD	<TableNo.>	:SYSTem:PANel:LOAD	<TableNo.>,<Zero-adjustment load=1/0/ON/OFF>	This message is compatible with :SYSTem:PANel:LOAD and can be used without modification. Zero-adjustment data is always loaded.

Line frequency

:SYSTem:LFRequency	50/60	Same as 3541	AUTO/50/60	An AUTO setting is available.
:SYSTem:LFRequency?	(50/60)	Same as 3541	(AUTO/50/60)	The response may be AUTO.

3541 message		Corresponding RM3545 message		Operation when using 3541 commands and associated operating precautions
Message	Data portion content (): Response data	Message	Data portion content (): Response data	

EXT I/O

:SYSTem:EOC:MODE	HOLD/PULSe	:IO:EOM:MODE	HOLD/PULSe	This message is compatible with :IO:EOM:MODE and can be used without modification.
:SYSTem:EOC:MODE?	(HOLD/PULSe)	:IO:EOM:MODE?	(HOLD/PULSe)	This message is compatible with :IO:EOM:MODE? and can be used without modification.
:SYSTem:EOC:PULSe	<PULSe width>	:IO:EOM:PULSe	<PULSe width(NR2)>	This message is compatible with :IO:EOM:PULSe and can be used without modification.
:SYSTem:EOC:PULSe?	(0.001 to 0.100)	:IO:EOM:PULSe?	(0.001 to 0.100)	This message is compatible with :IO:EOM:PULSe? and can be used without modification.
:SYSTem:EXTeRnalout	<BIN/BCD>	:IO:JUDGe:MODE	JUDGe/BCD	This message is compatible with :IO:JUDGe:MODE and can be used without modification. When the data portion is BIN, EXT I/O will be set to judgment mode.
:SYSTem:EXTeRnalout?	(<BIN/BCD>)	:IO:JUDGe:MODE?	(JUDGe/BCD)	This message is compatible with :IO:JUDGe:MODE? and can be used without modification. When EXT I/O is in judgment mode, the response will be BIN.
:IO:IN?	0 to 3	:IO:INPut?	0 to 3	This message is compatible with :IO:INPut? and can be used without modification.
:IO:OUT	0 to 255	:IO:OUTPut	0 to 7	This message is compatible with :IO:OUTPut and can be used without modification. However, only 3-bit general-purpose output is supported.

Functionality not provided by the RM3545

[:SENSe:]TeRMinal	A/B	Command error	Command error	These messages are invalid and will result in a command error.
[:SENSe:]TeRMinal?	(A/B)	Command error	Command error	
:SYSTem:FDETeCt:AUTO		Command error	Command error	
:SYSTem:FDETeCt:AUTO?		Command error	Command error	
:SYSTem:FDETeCt	0 to 9.998	Command error	Command error	
:SYSTem:FDETeCt?	(0 to 9.998)	Command error	Command error	
:SYSTem:ERRor	SYNChronous/ ASYNchronous	Command error	Command error	
:SYSTem:ERRor?	(SYNCHRONOUS/AS YNCHRONOUS)	Command error	Command error	

(2) Event state register correspondence chart

Event, state, register 0 (ESR0)				
Bit	3541		RM3545	
Bit 7	BIN1	BIN1	OutBIN	Out of BIN
Bit 6	BIN0	BIN0	OvrRng	Over-range
Bit 5	ERR	Measurement fault	ERR	Measurement fault
Bit 4	Hi	Comparator result Hi	Hi	Comparator result Hi
Bit 3	IN	Comparator result IN	IN	Comparator result IN
Bit 2	Lo	Comparator result Lo	Lo	Comparator result Lo
Bit 1	INDEX	Measurement complete	INDEX	Measurement complete
Bit 0	EOC	Measurement complete	EOM	Measurement complete

Event, state, register 1 (ESR1)				
Bit	3541		RM3545	
Bit 7	BIN9	BIN9	-	Unused
Bit 6	BIN8	BIN8	-	Unused
Bit 5	BIN7	BIN7	-	Unused
Bit 4	BIN6	BIN6	NO UNIT	Multiplexer unit not inserted
Bit 3	BIN5	BIN5	SW.ERR	Multiplexer relay hot switching prevention function error
Bit 2	BIN4	BIN4	CURR	Current monitor error
Bit 1	BIN3	BIN3	CONTACT TERM.A	Contact check sense A error
Bit 0	BIN2	BIN2	CONTACT TERM.B	Contact check sense B error

(3) Measured value format correspondence chart

The plus sign for measured values has been replaced with the space character (ASCII code 20h).

3541				RM3545			
Range	Measured value	±OF	Measurement fault	Range	Measured value *	±OvrRng	Measurement fault
20.0000mΩ	±00.0000E-3	±10.0000E+8	+10.0000E+9	10.00000mΩ	±00.00000E-03	±10.00000E+19	+10.00000E+29
200.000mΩ	±000.000E-3	±100.000E+7	+100.000E+8	100.0000mΩ	±000.0000E-03	±100.0000E+18	+100.0000E+28
2000.00mΩ	±0000.00E-3	±1000.00E+6	+1000.00E+7	1000.000mΩ	±0000.000E-03	±1000.000E+17	+1000.000E+27
20.0000Ω	±00.0000E+0	±10.0000E+8	+10.0000E+9	10.00000Ω	±00.00000E+00	±10.00000E+19	+10.00000E+29
200.000Ω	±000.000E+0	±100.000E+7	+100.000E+8	100.0000Ω	±000.0000E+00	±100.0000E+18	+100.0000E+28
2000.00Ω	±0000.00E+0	±1000.00E+6	+1000.00E+7	1000.000Ω	±0000.000E+00	±1000.000E+17	+1000.000E+27
20.0000kΩ	±00.0000E+3	±10.0000E+8	+10.0000E+9	10.00000kΩ	±00.00000E+03	±10.00000E+19	+10.00000E+29
100.000kΩ	±000.000E+3	±100.000E+7	+100.000E+8	100.0000kΩ	±000.0000E+03	±100.0000E+18	+100.0000E+28
1000.00kΩ	±0000.00E+3	±1000.00E+6	+1000.00E+7	1000.000kΩ	±0000.000E+03	±1000.000E+17	+1000.000E+27
10.0000MΩ	±00.0000E+6	±10.0000E+8	+10.0000E+9	10.00000MΩ	±00.00000E+06	±10.00000E+19	+10.00000E+29
100.000MΩ	±000.000E+6	±100.000E+7	+100.000E+8	100.0000MΩ	±000.0000E+06	±100.0000E+18	+100.0000E+28
				1000.000MΩ	±0000.000E+06	±1000.000E+17	+1000.000E+27
				Low-power on (6 digits)			
				1000.000mΩ	±0000.00E-03	±1000.00E+17	+1000.00E+27
				10.00000Ω	±00.0000E+00	±10.0000E+19	+10.0000E+29
				100.0000Ω	±000.000E+00	±100.000E+18	+100.000E+28
				1000.000Ω	±0000.00E+00	±1000.00E+17	+1000.00E+27
3541				RM3545			
	Measured value	±OF display	Measurement fault		Measured value	±OvrRng display	Measurement fault
	±0000.00E+0	±100.000E+7	+100.000E+8		±0000.00E+00	±100.000E+18	+100.000E+28
3541				RM3545			
	Measured value	±OF display	Measurement fault		Measured value	±OvrRng display	Measurement fault
	±000000.0E+0	±10000.0E+5	+10000.0E+6		±0000.0E+00	±100.0E+18	±100.0E+28
3541				RM3545			
	Measured value	±OF display			Measured value	±OvrRng display	Measurement fault
	±0000.0E+0	±100.0E+7			±0000.0E+00	±100.0E+18	±100.0E+28



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