
Programming Guide

RIGOL

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DM3000 Series Digital Multimeter

DM3061/2/3/4

DM3051/2/3/4

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Summary

This manual provides the guidance for remote control programming of DM3000 series digital multimeters. Users can carry on remote control to a multimeter or do the further development according to this manual. We believe that this manual's readers have read the detailed **RIGOL** DM3000 series multimeter user guide, and been familiar with the **RIGOL** DM3000 series multimeter's operation.

The manual contains four chapters:

Chapter 1 Generalize the methods of using commands;

Chapter 2 Introduce the detailed commands according to the functions of **RIGOL** DM3000 series digital multimeter;

Chapter 3 List other commands that the **RIGOL** DM3000 series digital multimeter are compatible with;

Chapter 4 The application examples of the **RIGOL** DM3000 series digital multimeter commands.

Index lists all the commands of the **RIGOL** DM3000 series digital multimeter, and makes it easier for users to quickly find.

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Chapter 1 Introduction

This chapter provides the guidance for user to use a **RIGOL** DM3000 series digital multimeter for remote control programming correctly, and to achieve a long-distance measuring operation.

This chapter includes:

- Programming Introduction
- Symbol Instruction
- Parameter Types
- Commands Introduction

Programming Introduction

This part introduces the basic programming operations. These programming commands provide the methods for remote control to a multimeter.

The Basic operations that you can do with a computer and a multimeter include:

- Setup a multimeter.
- Measure.
- Receive data (equipment working condition or measurement results) from a multimeter.

A computer can communicate with a multimeter by sending and receiving messages over an I/O port, such as USB, GPIB port or a RS-232 port. The commands appear as ASCII strings embedded inside the output statements of a “host” language available on your computer, so users can control and do the secondary development. Please refer to the user guide about the connection methods of communication interface.

Symbol Instruction

1. Colon :

Commands usually begin with a colon (:). A colon (:) is used to separate a command keyword from a lower-level keyword. It shows the operation that a multimeter will implement.

2. Blank Space □

A Blank space is used to separate commands from the program data. If your command does not need any program data, the blank space is not needed.

3. Interrogation ?

A query is formed by adding an interrogation (?) to the end of the commands. The query commands usually include different data, and both of them usually divided by a space □. But some commands don't include data.

4. Braces { }

When several elements separated by a vertical line (|) are enclosed by braces, { }, only one element may be selected. For example, {ON | OFF} indicates that only ON or OFF may be selected, not both.

5. Triangle Brackets < >

A item enclosed in < > should be replaced by a numerical value or character string.

Parameter Types

1. Consecutive Integer Parameter

The parameters can be any integer only in effective range. Note that do not set the parameters for decimal format, or else abnormal. For example, setting screen brightness command **": system: display: bright"**, the parameter range is from 0 to 255.

2. Consecutive Real Number Parameter

In effective value range, the parameters can be random value according to precision (usually the default precision takes six effective digits behind decimal point). For example, setting NULL offset command **": calculate: NULL: offset"**, the parameters meet the range of the real number Table 2- 12 indicated.

3. Discrete Parameters

The parameters can only be the cited value. For example, setting AC voltage measure range command **": measure: voltage: AC"**, the parameter can only be 0, 1, 2 or 3, but not other values.

4. Boolean Parameters

The parameters can only be ON or OFF. For example, setting beeper state command **":system:beeper:state"**, the parameter can only be ON or OFF.

5. ASCII Character string

The parameter should be composed of ASCII character string. For example, setting date command **":system:clock:date"**, the parameter can be a character string of date format.

Commands Introduction

To meet the needs of different users, DM3000 provides **RIGOL** commands and another two commands that are compatible with the related products.

- **RIGOL** DM3000 commands
- The commands compatible with Agilent
- The commands compatible with Fluke

Send **CMDSET** command to change the commands type. For the usage please see the follows:

Syntax:

CMDSET□{RIGOL|AGILENT|FULUKE}
CMDSET?

Function:

The command sets and queries command types.

- The first command parameters include RIGOL, AGILENT and FLUKE, and it means choosing the corresponding commands.
- The second command queries the current commands, and returns the commands' name.

Parameters:

Name	Type	Range of values	Default
Digital parameter	Discrete	{RIGOL AGILENT FLUKE}	RIGOL

Remarks:

If you don't want to send this commands when strating machine, the default will be **ROGOL**.

Chapter 2 DM3000 Commands System

In **RIGOL** DM3000 series digital multimeter commands, all the command parameters and the returned values are ASCII characters. All the commands do not distinguish the letter size.

RIGOL DM3000 series digital multimeter includes the following commands subsystems:

- Common Commands
- Function Commands
- Measure Commands
- Precision Commands
- System Commands
- Application Commands
- Trigger Commands
- Calculate Commands
- Datalog Commands
- Scan Commands

Common Commands

This commands are used to query equipment state and perform some basic operations.

The commands mainly include:

- *IDN?
- *RST

1. *IDN?

Syntax:

*IDN?

Function:

The command queries equipment ID, and returns 35 characters at least.

Return Format:

The query returns a character string, and it shows the equipment ID.

2. *RST

Syntax:

*RST

Function:

The command resets the equipment state, and makes it the factory default.

Function Commands

The commands are used to set the basic measurement functions, and they equal to select the measure function buttons in DM3000 front panel.

The commands mainly include:

- :function
- :function:voltage:DC:ratio
- :function:voltage:DC
- :function:voltage:AC
- :function:current:DC
- :function:current:AC
- :function:resistance
- :function:fresistance
- :function:frequency
- :function:period
- :function:continuity
- :function:diode
- :function:capacitance

1. :function

Syntax:

:function?

Function:

The command queries the kinds of measure functions.

Return Format:

The query returns the current DM3000 measure function's shortening. The possible returned values are: DCV, ACV, DCI, ACI, RESISTANCE, CAPACITANCE, CONTINUITY, FRESISTANCE, DIODE, FREQUENCY, PERIOD, RATIO.

2. :function:voltage:DC:ratio

Syntax:

:function:voltage:DC:ratio

Function:

The command turns on DC voltage ratio measure function.

Remark:

In ":function?" , this function is corresponding to the returned value" RATIO".

3. :function:voltage:DC

Syntax:

:function:voltage:DC

Function:

The command turns on DC voltage measure function.

Remark:

In ":function?" , this function is corresponding to the returned value" DCV".

4. :function:voltage:AC

Syntax:

:function:voltage:AC

Function:

The command turns on AC voltage measure function.

Remark:

In ":function?" , this function is corresponding to the returned value "ACV".

5. :function:current:DC**Syntax:**

:function:current:DC

Function:

The command turns on DC current measure function.

Remark:

In ":function?" , this function is corresponding to the returned value "DCI".

6. :function:current:AC**Syntax:**

:function:current:AC

Function:

The command turns on AC current measure function.

Remark:

In ":function?" , this function is corresponding to the returned value "ACI".

7. :function:resistance**Syntax:**

:function:resistance

Function:

The command turns on resistance measure function.

Remark:

In “:function?” , this function is corresponding to the returned value “RESISTANCE”.

8. :function:fresistance**Syntax:**

:function:fresistance

Function:

The command turns on fresistance measure function.

Remark:

In “:function?” , this function is corresponding to the returned value “FRESISTANCE”.

9. :function:frequency**Syntax:**

:function:frequency

Function:

The command turns on frequency measure function.

Remark:

In “:function?” , this function is corresponding to the returned value “FREQUENCY”.

10. :function:period**Syntax:**

:function:period

Function:

The command turns on period measure function.

Remark:

In “:function?” , this function is corresponding to the returned value “PERIOD”.

11. :function:continuity

Syntax:

:function:continuity

Function:

The command turns on continuity measure function.

Remark:

In ":function?" , this function is corresponding to the returned value "CONTINUITY".

12. :function:diode

Syntax:

:function:diode

Function:

The command turns on diode measure function.

Remark:

In ":function?" , this function is corresponding to the returned value "DIODE".

13. :function:capacitance

Syntax:

:function:capacitance

Function:

The command turns on capacitance measure function.

Remarks:

In ":function?" , this function is corresponding to the returned value "CAPACITANCE".

Measure Commands

The commands are used to set measure function further which equal to select measure function buttons in DM3000 front panel.

The commands mainly include:

- :measure?
- :measure
- :measure:voltage:DC?
- :measure:voltage:DC
- :measure:voltage:DC:range?
- :measure:voltage:DC:impedance
- :measure:voltage:DC:digit
- :measure:voltage:DC:ratio
- :measure:voltage:DC:ratio:digit
- :measure:voltage:AC?
- :measure:voltage:AC
- :measure:voltage:AC:range?
- :measure:voltage:AC:filter
- :measure:voltage:AC:digit
- :measure:voltage:AC:freq?
- :measure:voltage:AC:freq:display
- :measure:voltage:AC:freq:hide
- :measure:voltage:AC:freq:state?
- :measure:current:DC?
- :measure:current:DC
- :measure:current:DC:range?
- :measure:current:DC:digit
- :measure:current:AC?
- :measure:current:AC
- :measure:current:AC:range?
- :measure:current:AC:digit
- :measure:current:AC:freq?
- :measure:current:AC:freq:display
- :measure:current:AC:hide
- :measure:current:AC:state?
- :measure:resistance?

- :measure:resistance
- :measure:resistance:range?
- :measure:resistance:digit
- :measure:fresistance?
- :measure:fresistance
- :measure:fresistance:range
- :measure:fresistance:digit
- :measure:frequency?
- :measure:frequency
- :measure:frequency:range?
- :measure:frequency:digit
- :measure:period?
- :measure:period
- :measure:period:range?
- :measure:period:digit
- :measure:continuity?
- :measure:continuity
- :measure:diode
- :measure:diode:digit
- :measure:capacitance?
- :measure:capacitance
- :measure:capacitance:range?
- :measure:capacitance:digit

1. :measure?**Syntax:**

:measure?

Function:

The command queries whether the current measure have been completed.

Explanations:

To query whether the current measure have been completed or not. If "complete" returns "ture", or else "false".

Return Format:

The query returns true or false.

2. :measure**Syntax:**

:measure□{AUTO|MANU}

Function:

The command sets measure mode as auto or manual.

Example:

To set as manual:

:measure□MANU

3. :measure:voltage:DC?**Syntax:**

:measure:voltage:DC?

Function:

The command queries DC voltage.

Return Format:

The query returns the current DC voltage in the form of scientific countity, for example: 8.492853e-05, unit is V

4. :measure:voltage:DC

Syntax:

```
:measure:voltage:DC<range>|MIN|MAX|DEF}
```

Function:

The command sets the measure range of DC voltage and resolution.

Parameters:

Name	Type	Range of values	Default
<range>	discrete	{0 1 2 3 4}	0

Explanations:

To set the DC voltage range and the resolution at the same time.

The measure mode will be changed into manual when setting range

Table 2- 1 indicates the parameters and the resolutions.

Table 2- 1 The DC voltage range and the resolution

Parameter	DC Voltage Range	Resolution
0	200mV	100 nV
1	2V	1 μ V
2	20V	10 μ V
3	200V	100 μ V
4	1000V	1 mV
MIN	200mV	100 nV
MAX	1000V	1 mV
DEF	20V	10 μ V

Examples:

To set the DC voltage range as 200.0V.

```
:measure:voltage:DC3
```

To set the DC voltage range as minimum.

```
:measure:voltage:DCMIN or :measure:voltage:DC0
```

5. :measure:voltage:DC:range?

Syntax:

```
:measure:voltage:DC:range?
```

Function:

The command queries DC voltage range.

Remark:

Please make sure the DC voltage measure must be set at least one time before using this command

Return Format:

The query returns the current range parameter: 0,1,2,3 or 4(see Table 2- 1).

6. :measure:voltage:DC:impedance**Syntax:**

```
:measure:voltage:DC:impedance?
```

```
:measure:voltage:DC:impedance□{10M|10G}
```

Function:

The command queries and sets DC voltage impedance.

Explanations: :

:measure:voltage:DC:impedance? returns 10M or 10G(>10G).

:measure:voltage:DC:impedance□{10M|10G} sets the DC voltage impedance as 10MΩ or >10GΩ.

Remark: ">10G" is available only in 200mV, 2V, 20V of the DC voltage range.

Example:

To set the DC voltage impedance as 10GΩ:

```
:measure:voltage:DC:impedance□10G
```

7. :measure:voltage:DC:digit**Syntax:**

```
:measure:voltage:DC:digit?
```

```
:measure:voltage:DC:digit□{INC|DEC|5|6|7}
```

Function:

The command queries and sets the digit of DC voltage.

Explanations:

:measure:voltage:DC:digit? queries the digit of the DC voltage.

:measure:voltage:DC:digit{INC|DEC|5|6|7} set the digit of DC voltage.

Remarks: If the showing digit reaches 5, DEC command will be invalid. If 7, INC invalid.

The table 2-2 indicates the meanings of the digit.

Table 2- 2 The meanings of the digit

Parameter	Meaning
INC	increase digit
DEC	decrease digit
5	the digit is 5
6	the digit is 6
7	the digit is 7

Return Format:

:measure:voltage:DC:digit? returns the current digit: 5、6 or 7.

Examples:

To set the digit of the DC voltage as 7:

:measure:voltage:DC:digit7

To decrease the digit to 5, please send the following command two times:

:measure:voltage:DC:digitDEC

8. :measure:voltage:DC:ratio**Syntax:**

:measure:voltage:DC:ratio?

Function:

The command queries the ratio of DC voltages in two circuits.

Remark:

At the same time the DC voltages in two circuits should be input in the multimeter.

Return Format:

The query returns the current ratio in the form of 4.656613e-05(for example).

9. :measure:voltage:DC:ratio:digit**Syntax:**

:measure:voltage:DC:ratio:digit?

:measure:voltage:DC:ratio:digit□{INC|DEC|5|6|7}

Function:

The command queries and sets the digit of the ratio of DC voltages in two circuits.

Explanations:

:measure:voltage:DC:ratio:digit? queries the digit of the ratio of the DC voltages in two circuits.

:measure:voltage:DC:ratio:digit□ <value> sets the digit of the ratio of the DC voltages in two circuits.

The Table 2- 2 indicates the parameters and their meanings.

Remarks: If the showing digit reaches 5, DEC command will be invalid. If 7,INC invalid.

Return Format:

:measure:voltage:DC:ratio:digit? returns the current digit: 5、 6 or 7.

Examples:

To set the digit of the ratio as 6:

:measure:voltage:DC:ratio:digit□6

To increase the digit to 7:

:measure:voltage:DC:ratio:digit□INC

10. :measure:voltage:AC?**Syntax:**

:measure:voltage:AC?

Function:

The command queries AC voltage.

Return Format:

The query returns the current AC voltage in the form of 3.941713e-01, unit is V(for example).

11. :measure:voltage:AC**Syntax:**

:measure:voltage:AC□{<range>|MIN|MAX|DEF}

Function:

The command sets the measure range of AC voltage.

Parameters:

Name	Type	Range of Value	default
<range>	discrete	{0 1 2 3 4}	2

Explanations:

The Table 2- 3 lists the parameters and the ranges.

Table 2- 3 The range of AC voltage

Parameter	Range
0	200mV
1	2.0V
2	20.0V
3	200.0V
4	750.0V
MIN	200mV
MAX	750V
DEF	20.0V

Example:

To set the AC voltage range as 750.0V:

:measure:voltage:AC□MAX or :measure:voltage:AC□4

12. :measure:voltage:AC:range?**Syntax:**

:measure:voltage:AC:range?

Function:

The command queries the measure range of AC voltage.

Return Format:

The query returns the range parameter: 0、1、2、3 or 4(see Table 2- 3).

13. :measure:voltage:AC:filter**Syntax:**

:measure:voltage:AC:filter?

:measure:voltage:AC:filter□{SLOW|MID|FAST}

Function:

The command queries and sets the speed of AC voltage filter.

Explanations:

:measure:voltage:AC:filter? queries the filter speed.

:measure:voltage:AC:filter□{SLOW|MID|FAST} sets the filter speed as "slow", "middle", or "fast", and the default is "fast".

Return Format:

:measure:voltage:AC:filter? returns the current filter speed: slow, mid or fast.

Example:

To set the filter speed as "middle":

:measure:voltage:AC:filter□MID

14. :measure:voltage:AC:digit**Syntax:**

:measure:voltage:AC:digit?

:measure:voltage:AC:digit□{INC|DEC|5|6|7}

Function:

The command queries and sets the digit of AC voltage.

Explanations:

:measure:voltage:AC:digit? queries the digit of the AC voltage.

:measure:voltage:AC:digit{INC|DEC|5|6|7} sets the digit of the AC voltage.

The Table 2- 2 indicates the parameters and their meanings.

Remarks: If the showing digit reaches 5, DEC command will be invalid. If 7, INC invalid.

Return Format:

:measure:voltage:AC:digit? returns the current digit of the AC voltage: 5、 6 or 7.

Example:

To set the digit as 7:

:measure:voltage:AC:digit7

15. :measure:voltage:AC:freq?**Syntax:**

:measure:voltage:AC:freq?

Function:

The command queries AC voltage frequency.

Remarks:

Before sending the command, please turn on AC voltage measure function.

Return Format:

The query returns the current frequency in the form of 5.000000e+01, and unit is Hz.
(for example)

16. :measure:voltage:AC:freq:display**Syntax:**

:measure:voltage:AC:freq:display

Function:

The command displays frequency on the secondary screen while measuring the AC voltage.

17. :measure:voltage:AC:freq:hide**Syntax:**

:measure:voltage:AC:freq:hide

Function:

The command hides frequency on the secondary screen while measuring AC voltage.

Remarks:

When the frequency display is on in measuring AC voltage, the command is invalid.

18. :measure:voltage:AC:freq:state?**Syntax:**

:measure:voltage:AC:freq:state?

Function:

The command queries whether the frequency displays on the secondary screen in measuring AC voltage.

Return Format:

The query returns the current state: display or hide.

19. :measure:current:DC?**Syntax:**

:measure:current:DC?

Function:

The command queries DC current.

Return Format:

The query returns the DC current in the form of 9.674418e-05, and unit is A.

20. :measure:current:DC**Syntax:**

```
:measure:current:DC<range>|MIN|MAX|DEF}
```

Function:

The command sets the measure range of DC current.

Parameters:

Name	Type	Range of Value	Default
< range >	discrete	{0 1 2 3 4 }	0

Explanations:

To set the measurement range of DC current and the resolution at the same time.

The measure mode will be changed into manual when setting range.

The table 2-4 indicates the current ranges and the resolutions.

Table 2- 4 The DC current ranges and their resolutions

Parameter	Current	Resolution
0	2mA	1 nA
1	20mA	10nA
2	200mA	100nA
3	1A	1μA
4	10A	10μA
MIN	2mA	1 nA
MAX	10A	10μA
DEF	200mA	100nA

Example:

To set the DC current range as 10.0A:

```
:measure:current:DCMAX or :measure:current:DC4
```

21. :measure:current:DC:range?**Syntax:**

```
:measure:current:DC:range?
```

Function:

The command queries the measure range of DC current.

Return Format:

The query returns the current range parameter: 0、1、2、3 or 4.(see Table 2- 4)

22. :measure:current:DC:digit

Syntax:

:measure:current:DC:digit?

:measure:current:DC:digit{INC|DEC|5|6|7}

Function:

The command queries and sets the digit of DC current.

Explanations:

:measure:current:DC:digit? queries the digit of the DC current.

:measure:current:DC:digit{INC|DEC|5|6|7} sets the digit of the DC current.

The Table 2- 2 indicates the meanings of the digit.

Remarks: If the showing digit reaches 5, DEC command will be invalid. If 7,INC invalid.

Return Format:

:measure:current:DC:digit? returns the current digit : 5, 6 or 7.

Example:

To set the digit as 6:

:measure:current:DC:digit6

23. :measure:current:AC?

Syntax:

:measure:current:AC?

Function:

The command queries AC current.

Return Format:

The query returns the current in the form of 9.293791e-05, and unit is A. (For example)

24. :measure:current:AC**Syntax:**

:measure:current:AC□{<range>|MIN|MAX|DEF}

Function:

The command sets the measure range of AC current.

Parameters:

Name	Type	Range	Default
<range>	discrete	{0 1 2 3}	2

Explanations:

:measure:current:AC? queries the AC current. Before sending the command, please turn on AC current measure function.

:measure:current:AC□<value> sets the AC current range. At the same time the manual mode is set.

The Table 2- 5 indicates the parameters and their meanings.

Table 2- 5 The AC current parameters and their meanings

Parameter	Range
0	20mA
1	200mA
2	2A
3	10A
MIN	20mA
MAX	10A
DEF	200mA

Example:

To set the AC current range as 10.0A:

:measure:current:AC□MAX or :measure:current:AC□3

25. :measure:current:AC:range?**Syntax:**

:measure:current:AC:range?

Function:

The command queries AC current range.

Remark:

Before sending the command, please turn on AC current measure function.

Return Format:

The query returns the range parameter: 0、1、2 or 3.(see Table 2- 5)

26. :measure:current:AC:digit**Syntax:**

:measure:current:AC:digit?

:measure:current:AC:digit{INC|DEC|5|6|7}

Function:

The command queries and sets the digit of AC current.

Explanations:

:measure:current:AC:digit? queries the digit of the AC current. Before sending the command, please turn on AC current measure function.

:measure:current:AC:digit{INC|DEC|5|6|7} sets the digit of the AC current.

The Table 2- 2 indicates the parameters and their meanings.

Remarks: If the showing digit reaches 5, DEC command will be invalid. If 7,INC invalid.

Return Format:

:measure:current:AC:digit? returns the current digit: 5、6 or 7.

Example:

To set the digit as 7:

:measure:current:AC:digit7

27. :measure:current:AC:freq?**Syntax:**

:measure:current:AC:freq?

Function:

The command queries the measure frequency of AC current.

Return Format:

The query returns the current frequency in the form of 5.000000e+01, and unit is Hz.
(for example)

28. :measure:current:AC:freq:display**Syntax:**

:measure:current:AC:freq:display

Function:

The command displays AC current frequency on the secondary screen.

Remark:

Please turn on AC current measure function before sending command.

29. :measure:current:AC:hide**Syntax:**

:measure:current:AC:hide

Function:

The command hides AC current frequency on the secondary screen.

Remark:

Please turn on AC current measure function before sending command.

30. :measure:current:AC:state?**Syntax:**

:measure:current:AC:state?

Function:

The command queries whether the frequency displays on the secondary screen or not.

Remark:

Please turn on AC current measure function before sending command.

Return Format:

The query returns the current state: display or hide.

31. :measure:resistance?**Syntax:**

:measure:resistance?

Function:

The command queries two circuits resistance.

Return Format:

The query returns the current resistance in the form of 8.366031e-05, and unit is Ω . (for example)

32. :measure:resistance**Syntax:**

:measure:resistance[<range>|MIN|MAX|DEF]

Function:

The command sets the measure range of two circuits resistance.

Parameters :

Name	Type	Range	Default
<range>	discrete	{0 1 2 3 4 5 6}	3

Explanations:

The table 2-6 indicates the parameters and the range.

Table 2- 6 The two circuits resistance range

Parameter	Range
0	200Ω
1	2KΩ
2	20KΩ
3	200KΩ
4	1MΩ
5	10MΩ
6	100MΩ
MAX	100MΩ
MIN	200Ω
DEF	200KΩ

Example:

To set the measure range of the two circuits resistance as 200.0Ω:

:measure:resistance□MIN or :measure:resistance□0

33. :measure:resistance:range?**Syntax:**

:measure:resistance:range?

Function:

The command queries the measure range of two circuits resistance.

Return Format:

The query returns the current range parameter: 0, 1, 2, 3, 4, 5 or 6.(see Table 2- 6)

34. :measure:resistance:digit**Syntax:**

:measure:resistance:digit?

:measure:resistance:digit□{INC|DEC|5|6|7}

Function:

The command queries and sets the digit of two circuits resistance.

Explanations:

:measure:resistance:digit? queries the digit of the two circuits resistance.

:measure:resistance:digit{INC|DEC|5|6|7} sets the digit of the two circuits resistance.

Remarks: If the showing digit reaches 5, DEC command will be invalid. If 7, INC invalid.

Return Format:

:measure:resistance:digit? returns the digit of the current resistance: 5、6 or 7.

Example:

To set the digit as 6:

:measure:resistance:digit6

35. :measure:fresistance?

Syntax:

:measure:fresistance?

Function:

The command queries four circuits resistance.

Return Format:

The query returns the current four circuits resistance in the form of 8.822946e-05, and unit is Ω . (for example)

36. :measure:fresistance

Syntax:

:measure:fresistance{<range>|MIN|MAX|DEF}

Function:

The command sets the measure range of four circuits resistance.

Parameters:

Name	Type	Range	Default
<range>	discrete	{0 1 2 3 4 5 6 }	3

Explanation:

The Table 2- 6 indicates the parameters and their meanings.

Example:

To set the measure range of the four circuits resistance as 200.0Ω:

:measure:fresistance□MIN or :measure:fresistance□0

37. :measure:fresistance:range?**Syntax:**

:measure:fresistance:range?

Function:

The command queries the measure range for four circuits resistance.

Return Format:

The query returns the current range parameter: 0、1、2、3、4、5 or 6.(see Table 2-6)

38. :measure:fresistance:digit**Syntax:**

:measure:fresistance:digit?

:measure:fresistance:digit□{INC|DEC|5|6|7}

Function:

The command queries and sets the digit of four circuits resistance.

Explanations:

:measure:fresistance:digit? queries the digit of the four circuits resistance.

:measure:fresistance:digit□{INC|DEC|5|6|7} sets the digit of the four circuits resistance.

Remarks: If the showing digit reaches 5, DEC command will be invalid. If 7,INC invalid.

Return Format:

:measure:fresistance:digit? returns the current digit. The Table 2- 2 indicates the meanings.

Example:

To set the digit as 6:

```
:measure:resistance:digit 6
```

39. :measure:frequency?**Syntax:**

```
:measure:frequency?
```

Function:

The command queries frequency.

Remark:

The range of frequency is 3Hz~300kHz.

Return Format:

The query returns the current frequency in the form of 8.485240e-05, and unit is Hz. (for example)

40. :measure:frequency**Syntax:**

```
:measure:frequency {<range>|MIN|MAX|DEF}
```

Function:

The command sets input voltage range in measuring frequency.

Parameters:

Name	Type	Range	Default
<range>	discrete	{0 1 2 3 4}	2

Explanations:

The frequency range is 3Hz~300kHz. The Table 2- 3 indicates the parameters and the ranges.

Example:

To set the voltage range as 20V:

:measure:frequency□DEF

41. :measure:frequency:range?

Syntax:

:measure:frequency:range?

Function:

The command queries AC voltage range in measuring frequency.

Explanations:

The range is the same as the DC voltage. See Table 2- 3.

Return Format:

The query returns the current range parameter: 0、1、2、3 or 4.(see Table 2- 3)

42. :measure:frequency:digit

Syntax:

:measure:frequency:digit?

:measure:frequency:digit□{INC|DEC|5|6|7}

Function:

The command queries and sets the digit of frequency.

Explanations:

:measure:frequency:digit? queries the digit of the frequency. Before sending the command, please turn on frequency measure function.

:measure:frequency:digit□{INC|DEC|5|6|7} sets the digit of the frequency. The Table 2- 2 indicates the meanings of the digit.

Remarks: If the showing digit reaches 5, DEC command will be invalid. If 7,INC invalid.

Return Format:

:measure:frequency:digit? returns the current digit: 5、6 or 7.

Example:

To set the digit as 6:

:measure:frequency:digit□6

43. :measure:period?

Syntax:

:measure:period?

Function:

The command queries period.

Return Format:

The query returns the current AC period in the form of 9.185433e-05, and unit is s. (for example)

44. :measure:period

Syntax:

:measure:period□{<range>|MIN|MAX|DEF}

Function:

The command sets input voltage range in measuring period.

Parameters:

Name	Type	Range	Default
<range>	Discrete	{0 1 2 3 4}	2

Explanations:

The period range is 3.3us~0.33s. The Table 2- 3 indicates the parameters and their ranges.

Example:

To set the input voltage range as 20V:

:measure:period□DEF or :measure:period□2

45. :measure:period:range?

Syntax:

:measure:period:range?

Function:

The command queries AC voltage range in measuring period.

Explanations:

The range is the same as the AC voltage range. See Table 2- 3.

Return Format:

The query returns the current range parameter: 0、1、2、3 or 4.(see Table 2- 3)

46. :measure:period:digit**Syntax:**

:measure:period:digit?

:measure:period:digit□{INC|DEC|5|6|7}

Function:

The command queries and sets the digit of period.

Explanations:

:measure:period:digit? queries the digit of the period. Before sending the command, please turn on period measure function.

:measure:period:digit□{INC|DEC|5|6|7} sets the digit of the period. The Table 2- 2 indicates the parameters and the ranges.

Remarks: If the showing digit reaches 5, DEC command will be invalid. If 7,INC invalid.

Return Format:

:measure:period:digit? returns the current digit: 5、6 or 7.

Example:

To set the digit as 6:

:measure:period:digit□6

47. :measure:continuity?**Syntax:**

:measure:continuity?

Function:

The command queries resistance in the state of short circuit.

Return Format:

The query returns the current resistance in the form of 8.888000e+03, and unit is Ω .
(For example)

48. :measure:continuity

Syntax:

:measure:continuity \square { <range>|MIN|MAX|DEF }

Function:

The command sets the limit resistance in measuring short circuit.

Parameters:

Name	Type	Range	Default
<range>	Consecutive Integer	1 Ω ~2000 Ω	10

Remarks:

The resistance range is a consecutive Integer among 1 Ω ~2000 Ω .

The default resistance is 10 Ω . MAX denotes the maximum is 2000 Ω . MIN denotes the minimum is 1 Ω . DEF denotes the default is 10 Ω .

Example:

To set the limit resistance as 1K Ω :

:measure:continuity \square 1000

49. :measure:diode?

Syntax:

:measure:diode?

Function:

The command queries diode voltage at both ends.

Remarks:

In measuring diode, the beep condition is $0.1V \leq V_{\text{measured}} \leq 2.4V$.

Return Format:

The query returns the current diode voltage in the form of 4.492510e-04, and unit is V.
(for example)

50. :measure:diode:digit**Syntax:**

:measure:diode:digit?

:measure:diode:digit<value> {INC|DEC|5|6|7}

Function:

The command queries and sets the digit of diode voltage.

Explanations:

:measure:diode:digit? queries the digit of the diode voltage.

:measure:diode:digit<value> sets the digit of the diode voltage.

See Table 2- 2 .

Remarks: If the showing digit reaches 5, DEC command will be invalid. If 7, INC invalid.

Return Format:

:measure:diode:digit? returns the current digit: 5、 6 or 7.

Example:

To set the digit as 6:

:measure:diode:digit<value>6

51. :measure:capacitance?**Syntax:**

:measure:capacitance?

Function:

The command queries capacitance.

Return Format:

The query returns the current capacitance in the form of 8.889030e-05, and unit is F. (for examole)

52. :measure:capacitance**Syntax:**

:measure:capacitance□{<range>|MIN|MAX|DEF}

Function:

The command sets the measure range of capacitance.

Parameters:

Name	Type	Range	Default
<range>	discrete	{0 1 2 3 4 5 }	2

Explanations:

The Table 2- 7 indicates the parameters and the ranges.

Table 2- 7 The parameters and the ranges

Parameter	Range
0	2nF
1	20nF
2	200nF
3	2uF
4	20uF
5	200uF
MIN	2nF
MAX	200uF
DEF	200nF

Example:

To set the capacitance range as 2uF:

:measure: capacitance□3

53. :measure:capacitance:range?**Syntax:**

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:measure:capacitance:range?

Function:

The command queries the measure range of capacitance.

Return Format:

The query returns the current range parameter: 0、1、2、3、4 or 5.(see Table 2- 7)

54. :measure:capacitance:digit**Syntax:**

:measure:capacitance:digit?

:measure:capacitance:digit{INC|DEC|5|6|7}

Function:

The command queries and sets the digit of capacitance.

Explanations:

:measure:capacitance:digit? queries the digit of the capacitance.

:measure:capacitance:digit{INC|DEC|5|6|7} sets the digit of the capacitance.

The Table 2- 2 indicates the parameters and their meanings.

Return Format:

:measure:capacitance:digit? returns the current digit: 5、6 or 7.

Precision Commands

The commands are used to set the measure precision for a multimeter.

The commands mainly includes:

- :resolution:voltage:DC
- :resolution:voltage:DC:ratio
- :resolution:voltage:AC
- :resolution:current:DC
- :resolution:current:AC
- :resolution:resistance
- :resolution:fresistance
- :resolution:capacitance

1. :resolution:voltage:DC

Syntax:

:resolution:voltage:DC?

:resolution:voltage:DC□{<range>|MIN|MAX|DEF}

Function:

The command queries and sets the measure precision of DC voltage.

Parameters:

Name	Type	Range	Default
<range>	discrete	{0 1 2}	2

Explanations:

:resolution:voltage:DC? queries the measure precision of the DC voltage. Before sending the command, please turn on DC voltage measure function.

:resolution:voltage:DC□{<range>|MIN|MAX|DEF} sets the measure precision of the DC voltage.

The Table 2- 8 indicates the parameters and their meanings.

Table 2- 8 The DC parameters and their meanings

Parameter	Meaning
0	4 ½ digit(measure precision)
1	5 ½ digit
2	6 ½ digit
MAX	6 ½ digit
MIN	4 ½ digit
DEF	5 ½ digit

Return Format:

:resolution:voltage:DC? returns the current precision parameter: 0、1 or 2.(see Table 2- 8)

Example:

To set the measure precision of the DC voltage as 5 ½:

:resolution:voltage:DC□1

2. :resolution:voltage:DC:ratio

Syntax:

:resolution:voltage:DC:ratio?

:resolution:voltage:DC:ratio□{<range>|MIN|MAX|DEF}

Function:

The command queries and sets the measure precision of DC voltage ratio.

Parameters:

Name	Type	Range	Default
<range>	Discrete	{0 1 2}	2

Explanations:

:resolution:voltage:DC:ratio? queries the measure precision of the DC voltage ratio. Before sending the command, please turn on DC voltage ratio measure function.

:resolution:voltage:DC:ratio□{<range>|MIN|MAX|DEF} sets the measure precision of the DC voltage ratio.

The Table 2- 8 indicates the parameters and their meanings.

Return Format:

:resolution:voltage:DC:ratio? returns the current parameter: 0、1 or 2.(see Table 2- 8)

Example:

To set the measurement precision of the DC voltage ratio as 5 ½:

:resolution:voltage:DC:ratio□1

3. :resolution:voltage:AC**Syntax:**

:resolution:voltage: AC?

:resolution:voltage: AC□{<range>|MIN|MAX|DEF}

Function:

The command queries and sets the measure precision of AC voltage.

Parameters:

Name	Type	Range	Default
<range>	discrete	{0 1 2}	2

Explanations:

:resolution:voltage: AC? queries the measure precision of the AC voltage. Before sending the command, please turn on AC voltage measure function.

:resolution:voltage: AC□{<range>|MIN|MAX|DEF} sets the measure precision of the AC voltage.

The Table 2- 9 indicates the parameters and their meanings.

Table 2- 9 The AC parameters and their meanings

Parameter	Meaning
0	3 ½ digit(measure precision)
1	4 ½ digit
2	5 ½ digit
MAX	5 ½ digit
MIN	3 ½ digit
DEF	4 ½ digit

Return Format:

:resolution:voltage: AC? returns the current parameter: 0、1 or 2.(see Table 2- 8)

Example:

To set the measurement precision of the AC voltage as 5 ½:

:resolution:voltage:AC□2

4. :resolution:current:DC**Syntax:**

:resolution:current:DC?

:resolution:current:DC□{<range>|MIN|MAX|DEF}

Function:

The command queries and sets the measure precision of DC current.

Parameters:

Name	Type	Range	Default
<range>	Discrete	{0 1 2}	2

Explanations:

:resolution:current:DC? queries the measure precision of the DC current. Before

sending the command, please turn on DC current measure function.

:resolution:current:DC□{<range>|MIN|MAX|DEF} sets the measurement precision of the DC current.

The Table 2- 8 indicates the parameters and their meanings.

Return Format:

:resolution:current:DC? returns the current parameter: 0、1 or 2.(see Table 2- 8)

Example:

To set the measure precision of the DC current as 5 ½:

:resolution:current:DC□1

5. :resolution:current:AC

Syntax:

:resolution:current:AC?

:resolution:current:AC□{<range>|MIN|MAX|DEF}

Function:

The command queries and sets the measure precision of AC current.

Parameters:

Name	Type	Range	Default
<range>	discrete	{0 1 2}	2

Explanations:

:resolution:current:AC? queries the measure precision of the AC current. Before sending the command, please turn on AC current measure function.

:resolution:current:AC□{<range>|MIN|MAX|DEF} sets the measure precision of the AC current.

The Table 2- 9 indicates the parameters and their meanings.

Return Format:

:resolution:current:AC? returns the current parameter: 0、1 or 2.(see Table 2- 9)

Example:

To sets the measure precision of the AC current as 5 ½:

:resolution: current:AC□2

6. :resolution:resistance

Syntax:

:resolution:resistance?

:resolution:resistance□{<range>|MIN|MAX|DEF}

Function:

The command queries and sets the measure precision of two circuits resistance.

Parameters:

Name	Type	Range	Default
<range>	discrete	{0 1 2}	2

Explanations:

:resolution:resistance? queries the measure precision of the two circuits resistance.

Before sending the command, please turn on two circuit resistance measure function.

:resolution:resistance□{<range>|MIN|MAX|DEF} sets the measure precision of the two circuits resistance.

The Table 2- 8 indicates the parameters and their meanings.

Return Format:

:resolution:resistance? returns the current parameter: 0、1 or 2.(see Table 2- 8)

Example:

To set the measure precision of the two circuits resistance as 5 ½:

:resolution:resistance□1

7. :resolution:fresistance

Syntax:

:resolution:fresistance?

:resolution:fresistance□{<range>|MIN|MAX|DEF}

Function:

The command queries and sets the measure precision of four circuits resistance.

Parameters:

Name	Type	Range	Default
< range >	discrete	{0 1 2}	2

Explanations:

:resolution:fresistance? queries the measure precision of the four circuit resistance. Before sending the command, please turn on four circuits resistance measure function.

:resolution:fresistance□{<range>|MIN|MAX|DEF} sets the measure precision of the four circuit resistance.

The Table 2- 8 indicates the parameters and their meanings.

Return Format:

:resolution:fresistance? returns the current parameter: 0、1 or 2.(see Table 2- 8)

Example:

To set the measure precision of the four circuit resistance as 5 ½:

:resolution:fresistance□1

8. :resolution:capacitance**Syntax:**

:resolution:capacitance?

:resolution: capacitance□{<range>|MIN|MAX|DEF}

Function:

The command queries and sets the measure precision of capacitance.

Parameters:

Name	Type	Range	Default
<range>	discrete	{0 1 2}	2

Explanations:

:resolution:capacitance? queries the capacitance measure precision. Before sending the command, please turn on capacitance measure function.

:resolution:capacitance□{<range>|MIN|MAX|DEF} sets the capacitance measure precision.The Table 2- 8 indicates the parameters and their meanings.

Return Format:

:resolution:capacitance? returns the current parameter: 0、1 or 2.(see Table 2- 8)

Example:

To set the capacitance measure precision as 5 ½:

:resolution: capacitance□1

System Commands

The commands are used to set the system parameters.

The commands mainly include:

- :system:beeper
- :system:beeper:state
- :system:configure:poweron
- :system:configure:default
- :system:language
- :system:clock:state
- :system:clock:date
- :system:clock:time
- :system:format:decimal
- :system:format:separate
- :system:display:bright
- :system:display:contrast
- :system:display:invert
- :system:scanserial
- :system:macaddr
- :system:lanserial
- :system:opentimes

1. :system:beeper**Syntax:**

:system:beeper

Function:

The command tests the beeper.

Remarks:

The beeper is beeping only one time When testing. Before sending the command, please do open the beeper.

2. :system:beeper:state**Syntax:**

:system:beeper:state?

:system:beeper:state ☐ <value>

Function:

The command queries and sets the beeper state.

Parameters:

Name	Type	Range	Default
<value>	Boolean	{ON OFF}	ON

Explanations:

:system:beeper:state? queries whether the beeper is on.

:system:beeper:state ☐ <value> sets the beeper state. The parameter "ON" means turning on the beeper, "OFF" means turning off. If the beeper was off by using "OFF", ":system:beeper" is invalid.

Return Format:

:system:beeper:state? returns the beeper state. "ON" returns 1, else for 0.

Example:

To turn on the beeper:

:system:beeper:state ☐ ON

3. :system:configure:poweron

Syntax:

:system:configure:poweron□ <value>

Function:

The command sets system parameters on power.

Parameters:

Name	Type	Range	Default
<value>	Discrete	{LAST DEFAULT}	DEFAULT

Explanations:

The command is used to set the system parameters as the last setting or the system default when powering on. "LAST" means to read the last setting, and "DEFAULT" means the system default.

4. :system:configure:default

Syntax:

:system:configure:default

Function:

The command sets system default.

Explanation:

The command sets the system setting as default.

5. :system:language

Syntax:

:system:language?

:system:language□ <value>

Function:

The command queries and sets system language category.

Parameters:

Name	Type	Range	Default
<value>	discrete	{CHINESE ENGLISH}	CHINESE

Explanations:

:system:language? queries the system language category.

:system:language□ <value> sets the system language category. "CHINESE" means the system language is chinese, "ENGLISH" means english.

Return Format:

:system:language? returns the current system language: CHINESE or ENGLISH.

6. :system:clock:state**Syntax:**

:system:clock:state?

:system:clock:state□ <value>

Function:

The command queries and sets the display state of system clock.

Parameters:

Name	Type	Range	Default
<value>	discrete	{HIDE DISPLAY}	DISPLAY

Explanations:

:system:clock:state? queries whether the system clock displays or not.

:system:clock:state□ <value> sets whether the system clock displays or not.

Return Format:

:system:clock:state? returns the system clock display state:DISPLAY or HIDE.

7. :system:clock:date**Syntax:**

:system:clock:date?

:system:clock:date□ <value>

Function:

The command queries and sets system date.

Parameters:

Name	Type	Range	Default
<value>	ASCII string	{xxxx-xx-xx}	---

Explanations:

:system:clock:date? queries the system date.

:system:clock:date□ <value> sets the system date. The format is {year-month-day}.

Return Format:

:system:clock:date? returns the current system date in the form of xxxx-xx-xx.

8. :system:clock:time**Syntax:**

:system:clock:time?

:system:clock:time□ <value>

Function:

The command queries and sets system time.

Parameters:

Name	Type	Range	Default
<value>	ASCII string	{xx-xx-xx}	---

Explanations:

:system:clock:time? queries the system time.

:system:clock:time□ <value> sets the system time. The format is {hour -minute -second}.

Return Format:

:system:clock:time? returns the current system time in the form of xx-xx-xx.

9. :system:format:decimal**Syntax:**

:system:format:decimal?

:system:format:decimal□ <value>

Function:

The command queries and sets radix point format used in system.

Parameters:

Name	Type	Range	Default
<value>	Discrete	{COMMA DOT}	DOT

Explanations:

:system:format:decimal? queries the radix point format.

:system:format:decimal□ <value> sets the radix point format. "COMMA" means to use "," as a radix point, and at the same time the former "." is changed into ":". "DOT" means to use "." as a radix point, meanwhile the former ":" is changed into ",".

Remarks: As it is easier to change the format of data separator by using this command, so please do it carefully.

Return Format:

:system:format:decimal? returns the current radix point format.: COMMA or DOT.

10. :system:format:separate**Syntax:**

:system:format:separate?

:system:format:separate□ <value>

Function:

The command queries and sets the format of system separator.

Parameters:

Name	Type	Range	Default
<value>	discrete	{ON NONE SPACE}	ON

Explanations:

:system:format:separate? queries the system data separator format.

:system:format:separate□ <value> sets the system data separator format.

"ON" denotes displaying the separator, "NONE" denotes not displaying the separator,

and "SPACE" denotes that a space replaces the separator.

Return Format:

:system:format:separator? returns the current data separator format:ON、NONE or SPACE.

11. :system:display:bright

Syntax:

:system:display:bright?

:system:display:bright□ <value>

Function:

The command queries and sets display brightness.

Parameters:

Name	Type	Range	Default
<value>	Consecutive Integer	0~255	168

Explanations:

:system:display:bright? queries the display brightness.

:system:display:bright□ <value> sets the display brightness.

The brightness value is an integer among 0~255. 0 is the minimum bright, and 255 is maximum.

Return Format:

:system:display:bright? returns the current bright, and the range is 0~255.

12. :system:display:contrast

Syntax:

:system:display:contrast?

:system:display:contrast□ <value>

Function:

The command queries and sets display contrast.

Parameters:

Name	Type	Range	Default
<value>	Consecutive Integer	0~255	152

Explanations:

:system:display:contrast? queries the display contrast.

:system:display:contrast□ <value> sets the display contrast.

The contrast is an integer among 0~255. 0 is the minimum, and 255 is maximum.

Return Format:

:system:display:contrast? returns the current display contrast, and the range is 0~255.

13. :system:display:invert**Syntax:**

:system:display:invert

Function:

The command inverts the display color.

Explanation:

To invert the current display color.

14. :system:scanserial?**Syntax:**

:system:scanserial?

Function:

The command queries the state of inspection panel.

Explanation:

To query the installation state of inspection panel.

Return Format:

The query returns the current panel state: None or Installed, and they denote that the

panel has not been installed and the panel has been installed.

15. :system:macaddr

Syntax:

:system: macaddr?

Function:

The command queries MAC address.

Explanation:

To query the MAC address for network communication setting.

Return Format:

The query returns the current MAC address in the form of XX-XX-XX-XX-XX-XX. For example, 00-01-02-03-04-05.

16. :system:lanserial

Syntax:

:system:lanserial?

Function:

The command queries the module state of interface.

Explanation:

To query the interface module state for the instrument.

Return Format:

The query returns the current state: None or Installed, and they denotes that the module has not been installed and the module has been installed.

17. :system:opentimes?

Syntax:

:system:opentimes?

Function:

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The command queries the number of start-up.

Explanation:

To query the number of start-up.

Return Format:

The query returns the current number of start-up.

Utility Commands

The commands are used to set communication control and self-inspection. Before controlling communication, please make sure that communication interface has been connected stably, otherwise it possibly to be abnormal or wrong.

The commands mainly include:

- :utility:interface:LAN:dhcp
- :utility:interface:LAN:host
- :utility:interface:LAN:domain
- :utility:interface:LAN:ip
- :utility:interface:LAN:mask
- :utility:interface:LAN:gateway
- :utility:interface:LAN:dns
- :utility:interface:GPIB:address
- :utility:interface:RS232:baud
- :utility:interface:RS232:parity

1. :utility:interface:LAN:dhcp**Syntax:**

:utility:interface:LAN:dhcp?

:utility:interface:LAN:dhcp ☐ <value>

Function:

The command queries and sets the state of DHCP for LAN connection.

Parameters:

Name	Type	Range	Default
<value>	Boolean	{ON OFF}	ON

Explanations:

:utility:interface:LAN:dhcp? queries whether the DHCP is on.

:utility:interface:LAN:dhcp ☐ <value> sets the DHCP state. "ON" denotes DHCP is on, and "OFF" denotes DHCP is off.

Return Format:

:utility:interface:LAN:dhcp? returns the current DHCP state: ON or OFF.

2. :utility:interface:LAN:host**Syntax:**

:utility:interface:LAN:host?

:utility:interface:LAN:host ☐ <value>

Function:

The command queries and sets HOST name for LAN connection.

Parameters:

Name	Type	Range	Default
<value>	character string	self-definition	DM3000

Explanations:

:utility:interface:LAN:host? queries the HOST name.

:utility:interface:LAN:host ☐ <value> sets the HOST name. The parameter is the user-defined character string.

Return Format:

:utility:interface:LAN:host? returns the current HOST name.

3. :utility:interface:LAN:domain**Syntax:**

:utility:interface:LAN:domain?

:utility:interface:LAN:domain□ <value>

Function:

The command queries and sets domain name for LAN connection.

Parameters:

Name	Type	Range	Default
<value>	character string	self-definition	RIGOL

Explanations:

:utility:interface:LAN:domain? queries the equipment domain name.

:utility:interface:LAN:domain□ <value> sets the equipment domain name. The parameter is the user-defined character string.

Return Format:

:utility:interface:LAN:domain? returns the current domain name.

4. :utility:interface:LAN:ip**Syntax:**

:utility:interface:LAN:ip?

:utility:interface:LAN:ip□ <value>

Function:

The command queries and sets IP address for LAN connection.

Parameters:

Name	Type	Range	Default
<value>	character string	self-definition	168.254.0.238

Explanations:

:utility:interface:LAN:ip? queries the IP address.

:utility:interface:LAN:ip□ <value> sets the IP address. The parameter is the user-defined character string.

Return Format:

:utility:interface:LAN:ip? returns the current IP address.

5. :utility:interface:LAN:mask**Syntax:**

:utility:interface:LAN:mask?

:utility:interface:LAN:mask□ <value>

Function:

The command queries and sets IP mask for LAN connection.

Parameters:

Name	Type	Range	Default
<value>	character string	self-definition	255.255.255.0

Explanations:

:utility:interface:LAN:mask? queries the IP mask.

:utility:interface:LAN:mask□ <value> sets the IP mask. The parameter is the user-defined character string.

Return Format:

:utility:interface:LAN:mask? returns the current IP mask.

6. :utility:interface:LAN:gateway**Syntax:**

:utility:interface:LAN:gateway?

:utility:interface:LAN:gateway□ <value>

Function:

The command queries and sets gateway for LAN connection.

Parameters:

Name	Type	Range	Default
<value>	character string	self-definition	172.16.3.1

Explanations:

:utility:interface:LAN:gateway? queries the gateway.

:utility:interface:LAN:gateway□ <value> sets the gateway. The parameter is the user-defined character string.

Return Format:

:utility:interface:LAN:gateway? returns the current gateway.

7. :utility:interface:LAN:dns**Syntax:**

:utility:interface:LAN:dns?

:utility:interface:LAN:dns□ <value>

Function:

The command queries and sets DNS address for LAN connection.

Parameters:

Name	Type	Range	Default
<value>	character string	self-definition	0.0.0.0

Explanations:

:utility:interface:LAN:dns? queries the DNS address.

:utility:interface:LAN:dns□ <value> sets the DNS address. The parameter is the user-defined character string.

Return Format:

:utility:interface:LAN:dns? returns the current DNS address.

8. :utility:interface:GPIB:address**Syntax:**

:utility:interface:GPIB:address?

:utility:interface:GPIB:address□ <value>

Function:

The command queries and sets GPIB address.

Parameters:

Name	Type	Range	Default
<value>	Consecutive Integer	1~30	7

Explanations:

:utility:interface:GPIB:address? queries the GPIB address.

:utility:interface:GPIB:address□ <value> sets the GPIB address.

Return Format:

:utility:interface:GPIB:address? returns the current GPIB address.

9. :utility:interface:RS232:baud

Syntax:

:utility:interface:RS232:baud?

:utility:interface:RS232:baud□ <value>

Function:

The command queries and sets communication baud rate of serial interface (RS232).

Parameters:

Name	Type	Range	Default
<value>	discrete	{1200 2400 4800 9600 19200 38400 57600 115200}	9600

Explanations:

:utility:interface:RS232:baud? queries the RS232 baud rate.

:utility:interface:RS232:baud□ <value> sets the RS232 baud rate.

Return Format:

:utility:interface:RS232:baud? returns the current RS232 baud rate.

10. :utility:interface:RS232:parity

Syntax:

:utility:interface:RS232:baud?

:utility:interface:RS232:baud ☐ <value>

Function:

The command queries and sets communication parity bit of serial interface(RS232).

Parameters:

Name	Type	Range	Default
<value>	discrete	{none8bits odd8bits even8bits}	none8bits

Explanations:

:utility:interface:RS232:baud? queries the RS232 parity bit.

:utility:interface:RS232:baud ☐ <value> sets the RS232 parity bit.

Return Format:

:utility:interface:RS232:baud? returns the current parity bit. The range of the returned value is the same as the setting parameter. It respectively means "none parity, 8 bits", "odd, 8bits", and "even, 8bits".

Trigger Commands

The commands are used to set the trigger system parameters.

The commands mainly include:

- :trigger:source
- :trigger:auto:interval
- :trigger:auto:hold
- :trigger:single:triggered
- :trigger:ext
- :trigger:vmcomplete:polar
- :trigger:vmcomplete:pulsewidth

1. :trigger:source

Syntax:

:trigger:source?

:trigger:source□ <value>

Function:

The command queries and sets trigger mode in measuring.

Parameters:

Name	Type	Range	Default
<value>	discrete	{AUTO SINGLE EXT}	AUTO

Return Format:

:trigger:source? returns the current trigger mode: auto、single or ext, and they respectively denotes "automatic trigger","single trigger", and "exterior trigger".

2. :trigger:auto:interval

Syntax:

:trigger:auto:interval?

:trigger:auto:interval□ <value>

Function:

The command queries and sets display interval.

Parameters:

Name	Type	Range	Default
<value>	consecutive	4½ 30~2000ms	30ms
	integer	5½ 200~2000ms	200ms
		6½ 400~2000ms	400ms

Return Format:

:trigger:auto:interval? returns the current display interval.

:trigger:auto:interval□ <value> sets the display interval. The range of value: the resolution is 4½, 30~2000ms, and the default is 30ms; the resolution is 5½, 200~2000ms, and the default is 200ms; the resolution is 6½, 400~2000ms, and the default is 400ms.

Remarks: For ACV and ACI measurement, the range of value: the resolution is 3½,

30~2000ms, and the default is 30ms; the resolution is 4½, 200~2000ms, and the default is 200ms; the resolution is 5½, 400~2000ms, and the default is 400ms.

3. :trigger:auto:hold

Syntax:

:trigger:auto:hold?

:trigger:auto:hold□ <value>

Function:

The command queries and sets auto trigger delay state.

Parameters:

Name	Type	Range	Default
<value>	Boolean	{ON OFF}	OFF

Return Format:

:trigger:auto:hold? returns the current auto trigger delay state. "ON" means the delay is on, and "OFF" means off.

4. :trigger:auto:hold:sensitivity

Syntax:

:trigger:auto:hold:sensitivity?

:trigger:auto:hold:sensitivity□ <value>

Function:

The command queries and sets the sensitivity of auto trigger delay.

Parameters:

Name	Type	Range	Default
<value>	discrete	{0 1 2 3}	1

Explanations:

The Table 2- 10 indicates the parameters and their meanings.

Table 2- 10 The sensitivity parameters and their meanings

Parameter	sensitivity
0	0.01%
1	0.1%
2	1%
3	10%

Return Format:

:trigger:auto:hold:sensitivity? returns the current sensitivity parameter: 0,1,2 or 3.(see Table 2- 10)

5. :trigger:single**Syntax:**

:trigger:single?

:trigger:single□ <value>

Function:

The command queries and sets sampling times in single trigger.

Parameters:

Name	Type	Range	Default
<value>	consecutive integer	1~1000	1

Return Format:

:trigger:single? returns the current sampling times.

6. :trigger:single:triggered**Syntax:**

:trigger:single:triggered

Function:

The command carry out the function of single trigger.

Explanation:

The command equals to doing a single trigger in manual operation.

7. :trigger:ext

Syntax:

:trigger:ext?

:trigger:ext ☐ <value>

Function:

The command queries and sets exterior trigger mode.

Parameters:

Name	Type	Range	Default
<value>	discrete	{RISE FALL HIGH LOW}	RISE

Explanations:

:trigger:ext? queries the exterior trigger mode, and the default is the rise edge trigger.

:trigger:ext ☐ <value> sets the exterior trigger mode. The parameters include {RISE|FALL|HIGH|LOW}, and respectively means "rise edge trigger.", "fall edge trigger.", "high level trigger" and "low level trigger".

Return Format:

:trigger:ext? returns the current trigger mode.

8. :trigger:vmcomplete:polar

Syntax:

:trigger:vmcomplete:polar?

:trigger:vmcomplete:polar ☐ <value>

Function:

The command queries and sets VMC output polar.

Parameters:

Name	Type	Range	Default
<value>	discrete	{POS NEG}	POS

Explanations:

:trigger:vmcomplete:polar? queries the VMC output polar, and the default is positive.

:trigger:vmcomplete:polar□ <value> sets the VMC output polar. The parameters include {POS|NEG}, and respectively means "positive polar" and "negative polar".

Return Format:

:trigger:vmcomplete:polar? returns the current VMC output polar.

9. :trigger:vmcomplete:pulsewidth

Syntax:

:trigger:vmcomplete:pulsewidth?

:trigger:vmcomplete:pulsewidth□ <value>

Function:

The command queries and sets VMC output pulsewidth.

Parameters:

Name	Type	Range	Default
<value>	consecutive integer	4½ 1~30ms	30ms
		5½ 1~200ms	100ms
		6½ 1~400ms	100ms

Explanations:

:trigger:vmcomplete:pulsewidth? queries the VMC output pulsewidth.

:trigger:vmcomplete:pulsewidth□ <value> sets the VMC output pulsewidth. The range of value: the resolution is 4½, 1~30ms, and the default is 30ms; the resolution is 5½, 1~200ms, and the default is 100ms; the resolution is 6½, 1~400ms, and the default is 100ms.

Remarks: For ACV and ACI measurement, the range of value: the resolution is 3½, 1~30ms, and the default is 30ms; the resolution is 4½, 1~200ms, and the default is 100ms; the resolution is 5½, 1~400ms, and the default is 100ms.

Return Format:

:trigger:vmcomplete:pulsewidth? returns the current VMC output pulsewidth.

Calculate Commands

The commands are used to set the calculate system parameters for instrument.

The commands mainly include:

- :calculate:function
- :calculate:statistic:min
- :calculate:statistic:max
- :calculate:statistic:average
- :calculate:statistic:count
- :calculate:NULL:offset
- :calculate:DB
- :calculate:DB:reference
- :calculate:DBM
- :calculate:limit:lower
- :calculate:limit:upper

1. :calculate:function

Syntax:

:calculate:function?

:calculate:function □ <value>

Function:

The command queries and sets math calculation function.

Parameters:

Name	Type	Range	Dedault
<value>	discrete	{NONE NULL DB DBM MIN MAX AVERAGE TOTAL LIMIT}	NONE

Explanations:

:calculate:function? queries the math calculation function. The default is NONE (turning off math calculation).

:calculate:function □ <value> sets the math calculation function.

The Table 2- 11 indicates the math calculation parameters and their meanings.

Table 2- 11 The math calculation parameters and their meanings

Parameter	Meaning
NONE	turning off calculation
NULL	NULL calculation
DB	dB calculation
DBM	dBm calculation
MIN	minimum calculation
MAX	maximum calculation
AVERAGE	average calculation
TOTAL	total calculation
LIMIT	limit calculation

Return Format:

:calculate:function? returns the current math calculation parameter(see Table 2- 11).

2. :calculate:statistic:min

Syntax:

:calculate:statistic:min?

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Function:

The command queries statistic minimum.

Remark:

Only when MIN calculation is available, the command should be available.

Return Format:

The query returns the current statistic minimum.

3. :calculate:statistic:max**Syntax:**

:calculate:statistic:max?

Function:

The command queries statistic maximum.

Remark:

When MAX calculation is available, the command is just available.

Return Format:

The query returns the current statistic maximum.

4. :calculate:statistic:average**Syntax:**

:calculate:statistic:average?

Function:

The command queries the statistic average .

Remark:

Only when the AVERAGE calculation is available, the command is just available.

Return Format:

The query returns the current statistic average.

5. :calculate:statistic:count

Syntax:

:calculate:statistic:count?

Function:

The command queries measure number in calculation.

Remark:

The command is available to the current measure operation.

Return Format:

The query returns the current measure number.

6. :calculate:NULL:offset

Syntax:

:calculate:NULL:offset?

:calculate:NULL:offset□ <value>

Function:

The command queries and sets NULL calculation offset.

Parameters:

Name	Type	Range	Default
<value>	consecutive real number	{<range> MIN MAX DEF}	0

Explanations:

:calculate:NULL:offset? queries the NULL calculation offset.

:calculate:NULL:offset□ <value> sets the NULL calculation offset.

For the parameter range please see the follows:

<range> varies with the measurement. See Table 2- 12. All the values can be set 7digits after a demical point. MAX denotes the maximum, and MIN denotes the minimum. All the value is just available to the corresponding measurement.

Table 2- 12 The range of NULL calculation offset

Measurement	Range	DEF	Unit
DC voltage	±1200	0	V
AC voltage	±900	0	V
DC current	±12	0	A
AC current	±12	0	A
resistance	±1.2e+08	0	Ω
capacitance	±2.4e-04	0	F
frequency	±3.6e+05	0	HZ

Return Format:

:calculate:NULL:offset? returns the current NULL calculation offset.

7. :calculate:DB**Syntax:**

:calculate:DB?

Function:

The command queries dB value.

Return Format:

The query returns the current dB value.

8. :calculate:DB:reference**Syntax:**

:calculate:DB:reference?

:calculate:DB:reference<value>

Function:

The command queries and sets dB reference value.

Parameters:

Name	Type	Range	Default
<value>	consecutive integer	{<range> MIN MAX DEF}	0

Explanations:

:calculate:DB:reference? queries the dB reference value.

:calculate:DB:reference<value> sets the dB reference value.

When setting dB reference value, the value is an integer, and the range is between +120dB and -120dB. MIN denotes -120dB, MAX denotes +120dB, and DEF denotes 0.

Return Format:

:calculate:DB:reference? returns the current dB reference value.

9. :calculate:DBM

Syntax:

:calculate:DBM?

Function:

The command queries dBm value.

Return Format:

The query returns the current dBm value.

10. :calculate:DBM:reference

Syntax:

:calculate:DBM:reference?

:calculate:DBM:reference<value>

Function:

The command queries and sets dBm reference resistance.

Parameters:

Name	Type	Range	Default
<value>	Consecutive integer	{<range> MIN MAX DEF}	600

Explanations:

:calculate:DBM:reference? queries the dBm reference resistance.

:calculate:DBM:reference<value> sets the dBm reference resistance.

When setting dBm reference resistance, the value should be an integer, and the range is between 2 and 8000, unit is Ω . MIN denotes 2Ω , MAX denotes 8000Ω , and DEF denotes 600Ω .

Return Format:

:calculate:DBM:reference? returns the current dBm reference resistance.

11. :calculate:limit**Syntax:**

:calculate:limit?

Function:

The command queries limit calculation.

Remark:

When the measure value is between min and max, the command returns pass, or else fail.

Return Format:

The query returns whether the limit calculation have passed: pass or fail.

12. :calculate:limit:lower**Syntax:**

:calculate:limit:lower?

:calculate:limit:lower□ <value>

Function:

The command queries and sets lower value in limit calculation.

Parameters:

Name	Type	Range	Default
<value>	consecutive real number	{<range>}	0

Explanations:

:calculate:limit:lower? queries the lower value in limit calculation.

:calculate:limit:lower□ <value> sets the lower value in limit calculation.

The Table 2- 13 indicates the ranges and the units. But the lower can not be bigger than the upper.

Table 2- 13 The range of NULL calculation upper and lower limit

Measurement	Range	DEF	Unit
DC voltage	±1200	0	V
AC voltage	0 ~ 900	0	V
DC current	±12	0	A
AC current	0 ~ 12	0	A
Resistance	0 ~ 1.2e+08	0	Ω
Capacitance	0 ~ 2.4e-04	0	F
Frequency	0 ~ 3.6e+05	0	HZ
Period	3.0e-06 ~ 3.0e-01	0	s
Ratio	-1.0e+09 ~ 1.0e+09	0	
dB	-120 ~ +120	0	

Return Format:

:calculate:limit:lower? returns the current lower value.

13. :calculate:limit:upper**Syntax:**

:calculate:limit:upper?

:calculate:limit:upper□ <value>

Function:

The command queries and sets upper value in limit calculation.

Parameters:

Name	Type	Range	Default
<value>	consecutive real number	{<range> }	0

Explanations:

:calculate:limit:upper? queries the upper value in limit calculation.

:calculate:limit:upper□ <value> sets the upper value in limit calculation.

The Table 2- 13 indicates the range and the unit. But the upper can not be smaller than the upper.

Return Format:

:calculate:limit:upper? returns the current upper value.

Datalog Commands

The commands are used to set the datalog system parameters for instrument.

The commands mainly include:

- :datalog
- :datalog:configure:funcition
- :datalog:configure:startmode
- :datalog:configure:startmode:auto
- :datalog:configure:startmode:extern
- :datalog:configure:startmode:delaytime
- :datalog:configure:stopmode
- :datalog:configure:stopmode:time
- :datalog:configure:stopmode:number
- :datalog:configure:rate
- :datalog:run
- :datalog:stop
- :datalog:fetchdata

NOTE: DM3000 series Digital Multimeter that the version is or later than 03.03.00.03 .02. 00.01 supports the Datalog Commands.

1. :datalog

Syntax:

:datalog?

Function:

The command queries whether the datalog function is on.

Explanation:

Before the datalog function is on, please configure the datalog settings.

Return Format:

The return value "Run" and "Stop" respectively denote that the datalog system runs or stops.

2. :datalog:configure:function

Syntax:

:datalog:configure:function?

:datalog:configure:function \square *<DCV,DCI,2WR,4WR>, <range>*

Function:

The command queries and sets the datalog function.

Explanations:

:configure:function? queries the current datalog function.

:configure:function \square *<DCV,DCI,2WR,4WR>, <range>* sets the datalog function. The first parameter including DCV,DCI,2WR and 4WR shows the datalog type.; the second parameter shows the corresponding range.

Remarks: the auto range is unavailable for the datalog function. The lower level of the range is 1; and the upper level is related with the set function. The upper level of DCV range is 5; the upper level of DCI is 5; the upper level of 2WR is 7; and the upper level of 4WR is 7.

Return Format:

:datalog:configure:function? returns the corresponding range parameters of DCV,DCI,2WR or 4WR.

3. :datalog:configure:startmode**Syntax:**

:datalog:configure:startmode?

Function:

The command queries the startmode of the scan function.

Return Format:

:datalog:configure:startmode? returns the startmode name: Auto or Extern. The delay startmode is considered as Auto, and by querying the delay time, you can be sure whether the delay startmode is on.

4. :datalog:configure:startmode:auto**Syntax:**

:datalog:configure:startmode:auto

Function:

The command sets the datalog startmode as auto.

Explanation:

If you have set the delay time, the datalog system starts automatically when the delay time is reached. If not, the datalog system starts the datalog function when the command is received.

5. :datalog:configure:startmode:extern**Syntax:**

:datalog:configure:startmode:extern

Function:

The command sets the scan startmode as extern.

Explanations:

After receiving this order, if not acquire the trigger signal, the system will be in wait state. Until the advent of triggering signals, datalog system starts. Please refer to the manual about the setting and requirement of the trigger signal.

6. :datalog:configure:startmode:delaytime

Syntax:

:datalog:configure:startmode:delaytime?
:datalog:configure:startmode:delaytime□ <value>

Function:

The command queries and sets the delay time of auto startmode.

Explanations:

:datalog:configure:startmode:delaytime? queries the delay time of auto startmode.
:datalog:configure:startmode:delaytime□ <value> sets the delay time of auto startmode. The value is the delay time you will set, the default unit is s. The range of the value is 0 ~ 3600s.

Return Format:

:datalog:configure:startmode:delaytime? returns the delay time in auto startmode, and the default unit is s.

7. :datalog:configure:stopmode?

Syntax:

:datalog:configure:stopmode?

Function:

The command queries the stop condition of datalog function.

Explanation:

:datalog:configure:stopmode? queries the stop condition of datalog function.

Return Format:

:datalog:configure:stopmode? returns "Time" or "Number", respectively showing the datalog system stops according to the set time or the datalog number.

8. :datalog:configure:stopmode:time

Syntax:

:datalog:configure:stopmode:time?

:datalog:configure:stopmode:time□ <value>

Function:

The command queries and sets the stop time of datalog function.

Explanations:

:datalog:configure:stopmode:time? queries the stop time of datalog function.

:datalog:configure:stopmode:time□ <value> sets the time every datalog function lasts for. At the same time the stopmode sets as time. The value is the time the every datalog function lasts for.

Return Format:

:datalog:configure:stopmode:time? returns the time every datalog function lasts for.

9. :datalog:configure:stopmode:number**Syntax:**

:datalog:configure:stopmode:number?

:datalog:configure:stopmode:number□ <value>

Function:

The command queries and sets the datalog number of stopmode.

Explanations:

:datalog:configure:stopmode:number? queries the datalog number the datalog function needs for stop.

:datalog:configure:stopmode:number□ <value> sets the datalog number and the stopmode as number. The value is the datalog number needed.

Return Format:

:datalog:configure:stopmode:number? returns the datalog number the datalog function needs for stop.

10. :datalog:configure:rate**Syntax:**

:datalog:configure:rate?

:datalog:configure:rate□ <range>

Function:

The command queries and sets the sample rate of datalog function.

Explanations:

:datalog:configure:rate? queries the sample rate of datalog function.

:datalog:configure:rate□ <range> sets the sample rate of datalog function, the range is 1~13, respectively showing the sample rate is 1/10min, 1/5min, 1/min, 1/10s, 1/s, 10/s, 50/s, 100/s, 833/s, 1K/s, 5K/s, 10K/s, 50K/s.

Return Format:

:datalog:configure:rate? returns the range of the current sample rate : 1~13.

11. :datalog:run**Syntax:**

:datalog:run

Function:

The command runs the datalog function according to the startmode.

Explanation:

Before sending the command, you should send ":datalog:configure" to set the datalog function and range. Or else the system will not run, and return the wrong sign.

12. :datalog:stop**Syntax:**

:datalog:stop

Function:

The command stops the datalog function.

13. :datalog:fetchdata**Syntax:**

:datalog:fetchdata□ <value>

Function:

The command fetches the data the datalog system acquire.(32 digits binary format data)

Explanations:

:datalog:fetchdata□ <value> fetches the data the datalog system acquire. The instrument can storage data for 2097152, and the command can acquire a data packet every time, including 512 sampling data and occupying the storage space for 2K. The value is the serial number of the data packet, the range is 1 ~ 4096. Every datalog starts storing from the first packet. The sencondary developmant of the PC programm needs **RIGOL** drive programm and dynamic link library to change the obtained 32 digits binary data into floating-point-type data, and calculates the numbers of the effective data and pick up. Please refer to **RIGOL** Demo programm about the use methods of the programm.

Return Format:

:datalog:fetchdata□ <value> returns the data packet in the form of 32digits binary data.

Scan Commands

The commands are used to set the scan system parameters for instrument.

The commands mainly include:

- :scan:create
- :scan:addtask
- :scan:deletetask
- :scan:intervalttime
- :scan:run
- :scan:run:cycle
- :scan:stop
- :scan:list:task
- :scan:list:project
- :scan:current:cycle
- :scan:current:projname
- :scan:fetchdata
- :scan:saveproj
- :scan:loadproj
- :scan:deleteproj
- :scan:cardID

NOTE: DM3000 series Digital Multimeter that the version is or later than 03.03.00.03 .02. 00.01 supports the Scan Commands.

1. :scan:create**Syntax:**

```
:scan:create□ <value>
```

Function:

The command creates the project.

Explanation:

:scan:create□ <value> creates the project. The value is the project name. You may not set the project name, but you must use the command for the initialization. Or else the system can not runs the latter operation, and returns the wrong sign.

2. :scan:addtask**Syntax:**

```
:scan:addtask□ <value1>, <value2>, ..... , <value7>
```

Function:

The command adds the task for the scan project.

Explanations:

:scan:addtask□ <value> adds a scan task, the value are the new task's parameters, including task number, channel, function, precision, sampling number and delay time. Their parameter ranges are shown in Table 2- 14. You only can add the task in number order. If the two task have the same number, the previous setting will be changed.

Table 2- 14 The Task Parameter and Their Range

Parameter	Type	Range
Task Number	Consecutive Integer	0 ~ 99
* ¹ Channel	Consecutive Integer	1 ~ 16
Function	Discrete	DCV, ACV, DCI, ACI, 2WR, FREQ, PERI, CAP, DIODE
* ² Range	Discrete	0 ~ 7 (0 - Auto)
* ³ Precision	Discrete	0, 1, 2
Sampling Number	Consecutive Integer	0 ~ 99
Delay Time	Consecutive Real Number	The default unit is s

***1Note:** the scan channel includes 1~16, the channel 1~12 is connected

for measuring DCV, ACV, DCI, ACI, 2WR, FREQ, PERI, CAP, DIODE. The channel 13~16 is connected for measuring DCV, ACV, DCI, ACI and 2WR.

***2Note:** the different measure function have the different range, and all the range parameter increase from 0 to 7, the corresponding ranges also increase in order.

***3Note:** for 6 1/2 digits multimeter respectively shows the range as 4 1/2, 5 1/2, 6 1/2; for 5 1/2 digits multimeter respectively shows the range as 3 1/2, 4 1/2, 5 1/2.

3. :scan:deletetask

Syntax:

:scan:deletetask□ <value>

Function:

The command deletes the added task.

Explanations:

:scan:deletetask□ <value> deletes the added task, the value is the deleted task number, and the range is 0~99. If the middle task is deleted, the latter task moves forward in order.

4. :scan:intervalltime

Syntax:

:scan:intervalltime□ <value>

Function:

The command sets the interval time of the project cycle.

Explanations:

:scan:intervalltime□ <value> sets the interval time of the project cycle. The value is the interval time you will set, and the unit is s. When the project cycle number is greater than 1, the command sets the interval time between the close project cycles.

5. :scan:run

Syntax:

:scan:run

Function:

The command circulates the current project one time.

6. :scan:run:cycle**Syntax:**

:scan:run:cycle□ <value>

Function:

The command sets the project cycle number, and runs the current project.

Explanations:

:scan:run:cycle□ <value> sets the project cycle number, and runs the current project.
The value is the cycle number.

7. :scan:stop**Syntax:**

:scan:stop

Function:

The command forces to stop the scan task in operating.

8. :scan:list:task**Syntax:**

:scan:list:task□ <value>

Function:

The command lists all the task of the setting project.

Explanations:

:scan:list:task□ <value> lists the task table of the setting project. The value is the project number. If don't set the project number, the command lists the task table of the current project.

Return Format:

:scan:list:task□ <value> returns the task table of the setting project in the form of :

<task number>: channel, range, precision, sampling number and function.

9. :scan:list:project

Syntax:

:scan:list:project

Function:

The command returns the table of all the project names in DM3000 local storage.

10. :scan:current:cycle

Syntax:

:scan:current:cycle?

Function:

The command queries the cycle number completed.

Return Format:

:scan:current:cycle? returns the cycle number completed.

11. :scan:current:projname

Syntax:

:scan:current:projname?

Function:

The command queries the project name in current cache.

Return Format:

:scan:current:projname? queries the project name in current cache. If there is not any project in cache, return the right sign "R".

12. :scan:fetchdata

Syntax:

:scan:fetchdata□ <value>

Function:

The command fetches the data.

Explanation:

:scan:fetchdata□ <value> has the same usage with :datalog:fetchdata□ <value>.

13. :scan:saveproj**Syntax:**

:scan:saveproj□ <value>

Function:

The command saves the setting project.

Explanation:

:scan:saveproj□ <value> saves the setting project in DM3000 local. The value is the number of the file location. DM3000 can save up to 10 projects, if exceeded, and return the wrong sign.

14. :scan:loadproj**Syntax:**

:scan:loadproj□ <value>

Function:

The command loads the saved project to cache, and directly can run the project.

Explanation:

:scan:loadproj□ <value> loads the saved project to cache. The value is the number of the file location.

15. :scan:deleteproj**Syntax:**

:scan:deleteproj□ <value>

Function:

The command deletes the set project.

Explanation:

:scan:deleteproj□ <value> deletes the set project, the value is the number of the file location.

16. :scan:cardID

Syntax:

:scan:cardID?

Function:

The command queries the hardware version of scan card.

Return Format:

:scan:cardID? returns the hardware version of scan card. After the scan operation runs at least a time, the command just can query. If wrong, return 0.

Chapter 3 DM3000 Compatible Commands

The DM3000 series digital multimeter not only supports **RIGOL** commands system, but also have been compatible with Agilent and Fluke multimeter's some remote control commands. If users have been familiar with Agilent and Fluke's commands, you can operate **RIGOL** DM3000 conveniently.

This chapter lists Agilent and Fluke's some commands that **RIGOL** DM3000 series digital multimeter supports, and it makes easy to find commands for users. For the detailed meaning of commands and operation methods please refer to related companies' commands introduction.

- Agilent Commands
- Fluke Commands

Agilent Commands

The following table lists the commands of Agilent supported by **RIGOL** DM3000 series digital multimeter.

Before using the commands, to send CMDSET command, that is: CMDSET□AGILENT.
For the details, please refer to the "Commands Introduction" in page 1-5.

Agilent SCPI Commands				
CALCulate	:AVERage	:AVERage?		
		:CLEar		
		:COUNT?		
		:MAXimum?		
		:MINimum?		
		:PTPeak?		
		:SDEViation?		
	:DB	:REFerence		
		:REFerence?		
	:DBM	:REFerence		
		:REFerence?		
	:FUNction			
	:FUNction?			
	:LIMit	:LOWer		
		:LOWer?		
		:UPPer		
		:UPPer?		
	:NULL	:OFFSet		
		:OFFSet?		
CONFigure	?			
	:CAPacitance			
	:CONTinuity			
	:CURRent	:AC		
		[:DC]		
	:DIODE			
	:FREQuency			
	:FREStance			
	:PERiod			

	:RESistance			
	[:VOLTage]	:AC		
		[:DC]		
CAPacitance	:NULL	[:STATe]		
		[:STATe]?		
		:VALue		
		:VALue?		
	:RANGe	:AUTO		
		:AUTO?		
		[:UPPer]		
		[:UPPer]?		
CURRent	:AC	:BANDwidth		
		:BANDwidth?		
		:NULL	[:STATe]	
			[:STATe]?	
			:VALue	
			:VALue?	
		:PEAK	:STATe	
			:STATe?	
		:RANGe	:AUTO	
			:AUTO?	
			[:UPPer]	
			[:UPPer]?	
	[:DC]	:APERTure		
		:APERTure?		
		:NPLC		
		:NPLC?		
		:NULL		
			[:STATe]	
			[:STATe]?	
			:VALue	
			:VALue?	
		:PEAK		
			:STATe	
		:RANGe	:STATe?	
			:AUTO	
			:AUTO?	

			[:UPPer]	
			[:UPPer]?	
		:RESolution		
		:RESolution?		
DATA	:COPY			
	:DATA?			
	:DELeTe			
	:LAST?			
	:POINts?			
	:REMove?			
FETCh	?			
	:CURRent	:AC	:PTPeak?	
		[:DC]	:PEAK	:MAXimum?
				:MINmum?
			:PTPeak?	
	:VOLTage	:AC	:PTPeak?	
		[:DC]	:PEAK	:MAXimum?
				:MINmum?
			:PTPeak?	
FREQuency	:APERTure			
	:APERTure?			
	:NULL	[:STATe]		
		[:STATe]?		
		:VALue		
		:VALue?		
	:RANGe	:LOWer		
		:LOWer?		
	:VOLTage	:RANGe	:AUTO	
			:AUTO?	
			[:UPPer]	
			[:UPPer]?	
FRESistance	:APERTure			
	:APERTure?			
	:NPLC			
	:NPLC?			
	:NULL	[:STATe]		
		[:STATe]?		
		:VALue		

		:VALue?		
	:RANGe	:AUTO		
		:AUTO?		
		[:UPPer]		
		[:UPPer]?		
	:RESolution			
	:RESolution?			
FUNctIon	[:ON]			
	[:ON]?			
*IDN?				
MEASure	:CAPacitance?			
	:CONTInuity?			
	:CURRent	:AC?		
		[:DC]?		
	:DIODe?			
	:FREQuency?			
	:FRESistance?			
	:PERiod?			
	:RESistance?			
	[:VOLTage]	:AC?		
		[:DC]?		
MEMory	:NSTates?			
	:STATe	:CATalog?		
		:DELeTe		
		:DELeTe	:ALL	
		:NAME		
		:NAME?		
		:RECall	:AUTO	
		:RECall	:AUTO?	
			:SElect	
			:SElect?	
		:VALId?		
OUTPut	:TRIGger	:SLOPe		
PERiod	:APERture			
	:APERture?			
	:NULL	[:STATe]		
		[:STATe]?		
		:VALue		

		:VALue?		
	:RANGe	:LOWer		
		:LOWer?		
	:VOLTage	:RANGe	:AUTO	
			:AUTO?	
			[:UPPer]	
			[:UPPer]?	
*RCL				
*RST				
RESistance	:APERTure			
	:APERTure?			
	:NPLC			
	:NPLC?			
	:NULL	[:STATe]		
		[:STATe]?		
		:VALue		
		:VALue?		
	:RANGe	:AUTO		
		:AUTO?		
		[:UPPer]		
		[:UPPer]?		
	:RESolution			
	:RESolution?			
*SAV				
SAMPLE	:SOURce			
	:SOURce?			
	:TIMer			
	:TIMer?			
[SENSe:]	CAPacitance	:NULL	[:STATe]	
			[:STATe]?	
			:VALue	
			:VALue?	
		:RANGe	:AUTO	
			:AUTO?	
			[:UPPer]	
			[:UPPer]?	
	CURRent	:AC	:BANDwidth	
			:BANDwidth?	

			:NULL	[:STATe]
				[:STATe]?
				:VALue
				:VALuE?
			:PEAK	:STATe
				:STATe?
			:RANGe	:AUTO
				:AUTO?
				[:UPPer]
				[:UPPer]?
		[:DC]	:APERTure	
			:APERTure?	
			:APERTure	:ENABled?
			:NPLC	
			:NPLC?	
			:NULL	[:STATe]
				[:STATe]?
				:VALue
				:VALuE?
			:PEAK	:STATe
				:STATe?
			:RANGe	:AUTO
				:AUTO?
				[:UPPer]
				[:UPPer]?
			:RESolution	
			:RESolution?	
			:ZERO	:AUTO
				:AUTO?
	FREQuency	:APERTure		
		:APERTure?		
		:NULL	[:STATe]	
			[:STATe]?	
			:VALue	
			:VALue?	
		:RANGe	:LOWer	
			:LOWer?	
		:VOLTage	:RANGe	:AUTO

				:AUTO?
				[:UPPer]
				[:UPPer]?
	FREStance	:APERTure		
		:APERTure?		
		:APERTure	:ENABled?	
		:NPLC		
		:NPLC?		
		:NULL	[:STATe]	
			[:STATe]?	
			:VALue	
			:VALue?	
		:OCOMpensated		
		:OCOMpensated?		
		:RANGe	:AUTO	
			:AUTO?	
			[:UPPer]	
			[:UPPer]?	
		:RESolution		
	FUNCTion	:RESolution?		
		[:ON]		
	PERiod	[:ON]?		
		:APERTure		
		:APERTure?		
		:NULL	[:STATe]	
			[:STATe]?	
			:VALue	
			:VALue?	
		:RANGe	:LOWer	
			:LOWer?	
		:VOLTage	:RANGe	:AUTO
				:AUTO?
				[:UPPer]
				[:UPPer]?
	RESistance	:APERTure		
		:APERTure?		
		:APERTure	:ENABled?	
		:NPLC		

		:NPLC?		
		:NULL	[:STATe]	
			[:STATe]?	
			:VALue	
			:VALue?	
		:OCOMpensated		
		:OCOMpensated?		
		:RANGe	:AUTO	
			:AUTO?	
			[:UPPer]	
			[:UPPer]?	
		:RESolution		
		:RESolution?		
		:ZERO	:AUTO	
			:AUTO?	
	VOLTage	:AC	:BANDwidth	
			:BANDwidth?	
			:NULL	[:STATe]
				[:STATe]?
				:VALue
				:VALue?
			:PEAK	:STATe
				:STATe?
		:RANGe		:AUTO
				:AUTO?
				[:UPPer]
				[:UPPer]?
		[:DC]	:APERTure	
			:APERTure?	
			:APERTure	:ENABled?
			:IMPedance	:AUTO
				:AUTO?
			:NPLC	
			:NPLC?	
			:NULL	[:STATe]
				[:STATe]?
				:VALue
				:VALue?

RIGOL

			:PEAK	:STATe
				:STATe?
			:RANGe	:AUTO
				:AUTO?
				[:UPPer]
				[:UPPer]?
			:RESolution	
			:RESolution?	
			:ZERO	:AUTO
				:AUTO?
SYStem	:BEEPer			
	:COMMunicate	:STATe		
		:STATe?		
		:ENABle		
		:ENABle?		
		:GPIB	[:SELF]	:ADDRess
				:ADDRess?
		:LAN	:BSTatus?	
			:CONTrol?	
			:DDNS	
			:DDNS?	
			:DHCP	
			:DHCP?	
			:DNS	
			:DNS?	
			:DOMain	
			:DOMain?	
			:GATEway	
			:GATEway?	
			:HOSTname	
			:HOSTname?	
			:IPADdress	
			:IPADdress?	
			:MAC?	
			:SMASk	
			:SMASk?	
	:LANGuage			
	:LANGuage?			
	:VERSion?			
*TRG				
TRIGger	:COUNT			

	:COUNT?			
	:DELay			
	:DELay?			
	:DELay			
	:SLOPe	:AUTO		
	:SLOPe?	:AUTO?		
	:SOURce			
VOLTage	:SOURce?			
	:AC			
		:BANDwidth		
		:BANDwidth?		
		:NULL	[:STATe]	
			[:STATe]?	
			:VALue	
			:VALue?	
		:PEAK	:STATe	
			:STATe?	
		:RANGe	:AUTO	
			:AUTO?	
	[:DC]		[:UPPer]	
			[:UPPer]?	
		:APERTure		
		:APERTure?		
		:IMPedance	:AUTO	
			:AUTO?	
		:NPLC		
		:NPLC?		
		:NULL	[:STATe]	
			[:STATe]?	
			:VALue	
			:VALue?	
		:PEAK	:STATe	
			:STATe?	
		:RANGe	:AUTO	
			:AUTO?	
			[:UPPer]	

RIGOL

			[:UPPer]?	
		:RESolution		
		:RESolution?		

Fluke Commands

The following table lists the Fluke commands which supported by **RIGOL** DM3000 series digital multimeter.

Before using the commands, to send CMDSET command, that is: CMDSET□FLUKE.

For the details please refer to the "Commands Introduction" in page 1-5.

Fluke Commands
AAC
ADC
AUTO
AUTO?
COMP
COMP?
COMPCLR
COMPHI
COMPLO
CONT
DB
DBCLR
DBPOWER
DBREF?
DBREF
DIODE
FIXED
FREQ
FREQ2
FUNC1?
FUNC2?
HOLD
HOLDCLR
HOLDTHRESH?
HOLDTHRESH
MAX
MAXSET
MEAS?

RIGOL

MEAS1?
MEAS2?
MIN
MINSET
MMCLR
MOD?
OHMS
RANGE
RANGE1?
RATE
RATE?
REL
RELCLR
RELSET?
RELSET
VAC
VAL?
VAL1?
VAL2?
VDC

Chapter 4 DM3000 Commands Examples

This chapter lists some application examples of **RIGOL** DM3000 commands. Users can refer and deepen the understanding to the commands.

In order to explain easily, the serial number before every command is used to mark current command but not be the content of command. The contents between " / * " and " * / " after every command are explanations which can help users to understand.

Before operating, please connect the related test equipment and the tested device.

- Example 1 : Reading Statistic
- Example 2 : Elimination of test impedance error
- Example 3 : dBm Measurement

Example 1 : Reading Statistic

Purpose: To achieve the maximum statistic.

In maximum statistic calculation, the first reading is regarded as the maximum. If continuing measuring, the multimeter is updating the readings. Until catching the maximum, the multimeter is beeping(the beeper must be on).

The programming steps:

```
0  *RST                      /*reset */
1  *IDN?                    /*query equipment ID*/
2  :function:voltage:AC     /*turn on AC voltage measure function*/
3  :measure AUTO            /*set measure methode as auto*/
4  :calculate:function:max  /*turn on maximum statistic calculation function*/
5  :calculate:statistic:max? /*query the the measurement maximum AC voltage*/
6  :calculate:statistic:count? /*query the automatic measurement number*/
```

Remarks:

1. The fifth command returns the current maximum AC voltage.
2. The sixth command returns the automatic measurement number.

Example 2 : Elimination of test impedance error

Purpose: To eliminate impedance error of test down-lead

In measuring the smaller resistance, the impedance of test down-lead leads to error.

So users should eliminate the impedance error of test down-lead before measuring.

The programming steps:

```

0  *RST                                /*reset */
1  *IDN?                              /*query equipment ID*/
2  :function:resistance               /*turn on 2WR measue function*/
3  :measure:resistance□MIN           /*set the two circuits resistance range as 200Ω*/
4  /*at the times, please connect the red and black table T for measuring
resistance*/
5  :calculate:function□AVERAGE /*turn on AVERAGE calculation function*/
6  :calculate:statistic:average? /*query the average resistance*/
7  /*note the resistance value: 3.302198e-01 */
8  :calculate:function□NULL          /*turn on NULL calculation function*/
9  :calculate:NULL:offset?           /*query the NULL calculation offset, and use it for
examining the equipment*/
10 /*here , the return value is 0*/
11 :calculate:NULL:offset□0.330219 /*set offset as 0.330219*/
12 :calculate:function□NULL          /* set NULL calculation with the above
offset*/
13 :calculate:function□AVERAGE /*turn on AVERAGE calculation function*/
14 :calculate:statistic:average? /*query the average resistance*/
15 /*the returned value is 3.173456e-04*/

```

Remark:

1. Before sending the fifth command, to do send the fourth command.
2. The fifteenth line shows: the above calculation lowers the error three orders. And the test to eliminate the impedance error of test down-lead is successful.

Example 3 : dBm Measurement

Purpose: To achieve dBm measurement.

dBm is a commonly measure units which widely used in electrical, radio, mechanics, shock and vibration, mechanical power and acoustics, and other fields, and dBm caluation is usually used for RF signal measurement.

The programming steps:

```

0   *RST                                /*reset */
1   *IDN?                               /*query equipment ID*/
2   :function:resistance                /*turn on 2WR measure function*/
3   :measure□AUTO                      /*set resistance measurement as auto*/
4   :measure:resistance?                /*query the resistance*/
                                         /*measure the reference resistance for dBm calculation*/
5   :function:voltage:AC                /*turn on AC voltage measure function*/
6   :measure□AUTO                      /*set AC voltage measurement as auto*/
7   :calculate:function DBM             /*turn on dBm calculation function*/
8   :calculate:DBM:reference □ <value> /*set reference voltage for dBm
calculation*/
9   :calculate:DBM?                    /*query the dBm value*/

```

Remark:

1. Before sending the fourth command, please connect equipment according to resistance measure type.
2. The parameter of eighth command is the above measurement resistance.

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:measure:fresistance 2-27
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