HIOKI

ST5680

Communications Command Instruction Manual

DC HIPOT TESTER

EN

Contents

1 Introduction

When creating a program, using the command monitor function displays commands and responses on the measurement screen. For command monitor function, please see the instruction manual of this instrument.

Various messages are provided to control the instrument in the interface.
Messages include program messages sent from a computer or other controller to the instrument and response messages sent from the instrument to the controller.

Program Messages

| Controller | → | Instrument |

Response Messages

Communication commands are classified as follows.

```
                                        ┌─ Command Messages
                    ┌─ Program Messages ─┤
Communication ──────┤                    └─ Query Messages
commands            │
                    └─ Response Messages
```

Commands with data should be entered in the specified data format.

Message Format

■ Program Messages

Program messages can be divided into command and query messages.

(1) Command Messages

Instruction to control equipment such as equipment setting and reset
(Example) Instruction to set momentary out function

:SYSTem:MOMentary:OUT   1

　　Header section　　　Space Data part

(2) Query Messages

Instructions to query operation results, measurement results, or equipment setting status
(Example) Instruction to query momentary out function

:SYSTem:MOMentary:OUT?

　　Header section　　　Question mark

See "Header" (p. 3), "Separator" (p. 4), and "Data part" (p. 5).

■ **Response Messages**

Receives a query message and creates it when the syntax is checked.
If any error occurs when a query message is received, no response message will be created to match that query message.

■ **Command Syntax**

Command names are chosen for instructions that are as understandable as possible to the function to be executed, and yet can be shortened. The mandate name itself is called the "long form" and its shortened form is called the "short form". This document describes the part of the short form as a large character and the rest in small letters, but accepts either large or small characters.

START   OK (Long form)
STAR   OK (Short form)
STA   Error

The response message from the instrument is returned in a large character long form.

■ **Headers**

A header is always required for program messages.

(1) Command Program Header
    There are three types: simple command type, compound command type, and Standard Command type.
    • Simple Command type Header
      Header consisting of a single word beginning with an English letter
      :STOP
    • Combined Command type Header
      Header consisting of multiple simple command type headers separated by colon (:)
      :SYSTem:MOMentary:OUT
    • Standard Command type Header
      A header starting with an asterisk 'software' indicating that it is a Standard Command (provided by IEEE 488.2)
      ∗RST

(2) Query Program Header
    Used to query the result of an action to a device command, the result of a measurement, or the current device setting status.
    As in the example below, the question mark (**?**) is attached at the end of the program header.
    :STATe?
    :SYSTem:MOMentary:OUT?

■ **Message Terminators**
The instrument accepts the following as a message terminator (delimiter).

[RS-232C/USB/LAN]
  • CR
  • LF
  • CR+LF
[GP-IB]
  • CR
  • LF
  • CR+LF
  • EOI
  • EOI with CR
  • EOI with LF
  • EOI with CR+LF

In addition, the following can be selected as terminators for response messages, depending on the interface settings.
For settings, see "Setting for message terminators" (p.116, p.116, p.118, p.119).

[RS-232C/USB/LAN]
  • CR
  • LF
  • CR+LF
[GP-IB]
  • EOI with CR
  • EOI with LF
  • EOI with CR+LF

■ **Separators**
(1) Message Unit Separator
  Multiple messages can be written on a single line by connecting each with a semicolon (;).
  :SYSTem:MOMentary:OUT 1;*IDN?

  • If the message is described continuously, if an error occurs in the sentence, message from after that to the message terminator will not be executed.

(2) Header Separator
  Messages with headers and data are separated into the header and data parts by using a blank (ASCII code 20h).

  :SYSTem:MOMentary:OUT   1

(3) Data Separator
  Messages with multiple data separate between data by comma (,).

  :SYSTem:DATE 22,1,1

■ Data Formats

The instrument uses "character data," "decimal numeric value data," and "string data" in the data section, and is more used to commands.

(1) Character Data

It is data that always starts with English letters and consists of English letters and numbers. Character data accepts both large and small characters, but response messages from this instrument are always returned in large letters. In the Command data part <1/0/ON/OFF >, for 0 is OFF, 1 behaves similar to ON, query response OFF is 0, ON is 1.

:SYSTem:MOMentary:OUT OFF

(2) Decimal Numeric Value Data

Numerical data formats include NR1, NR2, and NR3 formats. Each accepts both signed and unsigned numerical values. For unsigned numerical value treat as a positive numerical value. If the precision of the numerical value exceeds the handling range of the instrument, it is rounded off.
• NR1 integer data (Example: +12, -23, 34)
• NR2 decimal data (Example: +1.23, -23.45, 3.456)
• NR3 floating point exponential display data (Example: +1.0E-2、-2.3E+4))
A format that includes all three of these types is called an "NRf format."
For response data, the format is specified for each command and sent in that format.

:CONFigure:WITHstand:VOLTage:LEVel 11

:MONitor:VOLTage?
8.400E+03

(3) String Data

• String data surrounds the front and rear with a quota mark.
• Data consisting of 8 bit ASCII characters.
• Characters that can not be handled by this instrument are an error.
• Quotation mark, transmission from this instrument is only double quote (") but reception accepts both double quote and single quote (').

:FILE:NAME "DATA"

[GP-IB]

This instrument is not fully compatible with IEEE 488.2. As much as possible, use the data shown in the reference.

■ **Omission of Compound Command type Header**
What the leading parts of the compound commands are common (example: **:SYSTem:BEEPer: VOLume:PASS** and **:SYSTem:BEEPer:VOLume:FAIL**) can omit the common part of the command (example: **:SYSTem:BEEPer:VOLume**) only if they continue to describe them.
This common part is called the "current path," and until it is cleared, subsequent commands are analyzed as if the "current path" is omitted.

The following example illustrates the use of the current path.
Usual notation
:SYSTem:BEEPer:VOLume:PASS 1; :SYSTem:BEEPer:VOLume:FAIL 5

Abbreviated notation
:SYSTem:BEEPer:VOLume:PASS 1; FAIL 5
⬆
This is the current path and can be omitted in the following commands.

The current path can be a power-up, a reset by keystroke, or a colon (:) at the beginning of the command and clears on detection of message terminators.
Messages of the Standard Command type can be executed regardless of the current path. It also does not affect the current path.

Simple and compound command type headers do not need to be prefixed with a colon (:). However, to prevent confusion with abbreviations and malfunctions, we recommends prefixing the command with (:).

Output Queue and Input Buffer

■ **Output Queue**
The response message is stored in the output queue and cleared when the controller reads the data. Otherwise, the output queue is cleared when
• Power-on
• Device clear [GP-IB].
• Query of error

■ **Input Buffer**
The capacity of the input buffer is 1460 bytes.
When the buffer runs out of space, the operation stops until that space becomes available.

NOTES: The length of a single line of command should be less than 1460 bytes.

Status Byte Register

[GP-IB]

This instrument uses the status model specified in IEEE 488.2 for the part related to serial polling by the Service Request function. An event is a matter that causes a Service Request to occur.
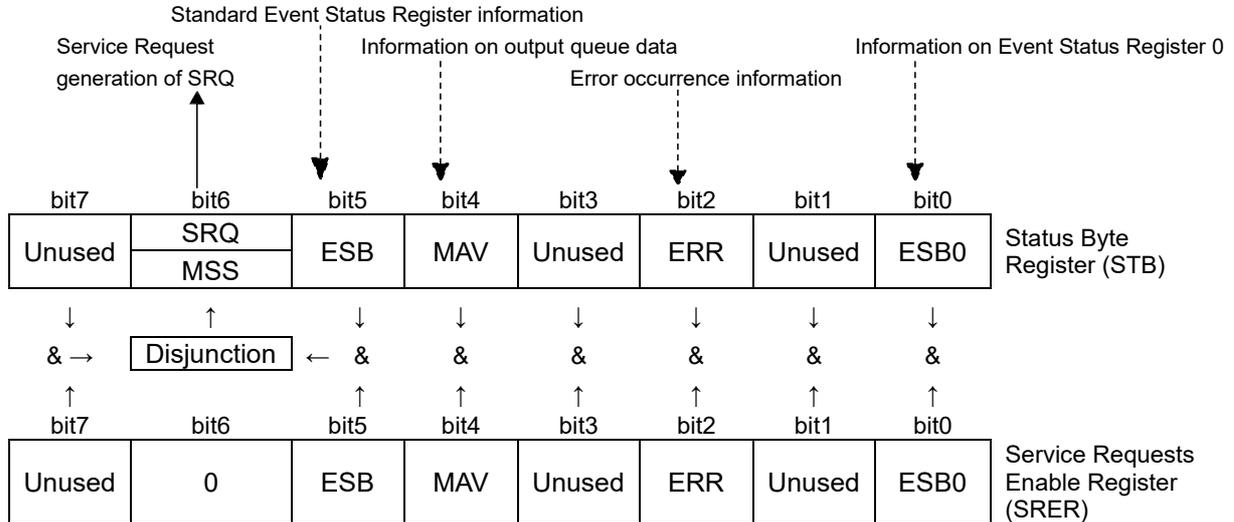
Conceptual diagram of Service Request generation

The Status Byte Register is set to the event register and output queue information. From among this information, the Service Request enable register allows you to select what you need. If the selected information is set, bit 6 (MSS Master Summary Status bit) of the Status Byte Register is set, generating an SRQ (Service Request) message, which in turn generates a Service Request.

NOTES: SRQ (Service Request) is a GP-IB only function.
        However, STB (Status Byte Register) information can also be obtained via
        RS-232C/USB/LAN by using the **∗STB?** command.

        STB (Status Byte Register) information can be obtained by using the **∗STB?** command.

[RS-232C/USB/LAN]

RS-232C/USB/LAN does not have the ability to generate Service Requests. However, it is possible to set SRER and read STB.

■ **Status Byte Register (STB)**

The Status Byte Register is an 8-bit register that is output from the instrument to the controller when performing serial polls. The MSS bit is set to "1" when any bit in the Status Byte Register changes from "0" to "1" among the bits set to be available in the Service Request enable register. At the same time, the SRQ bit is set to "1" and a Service Request is generated.
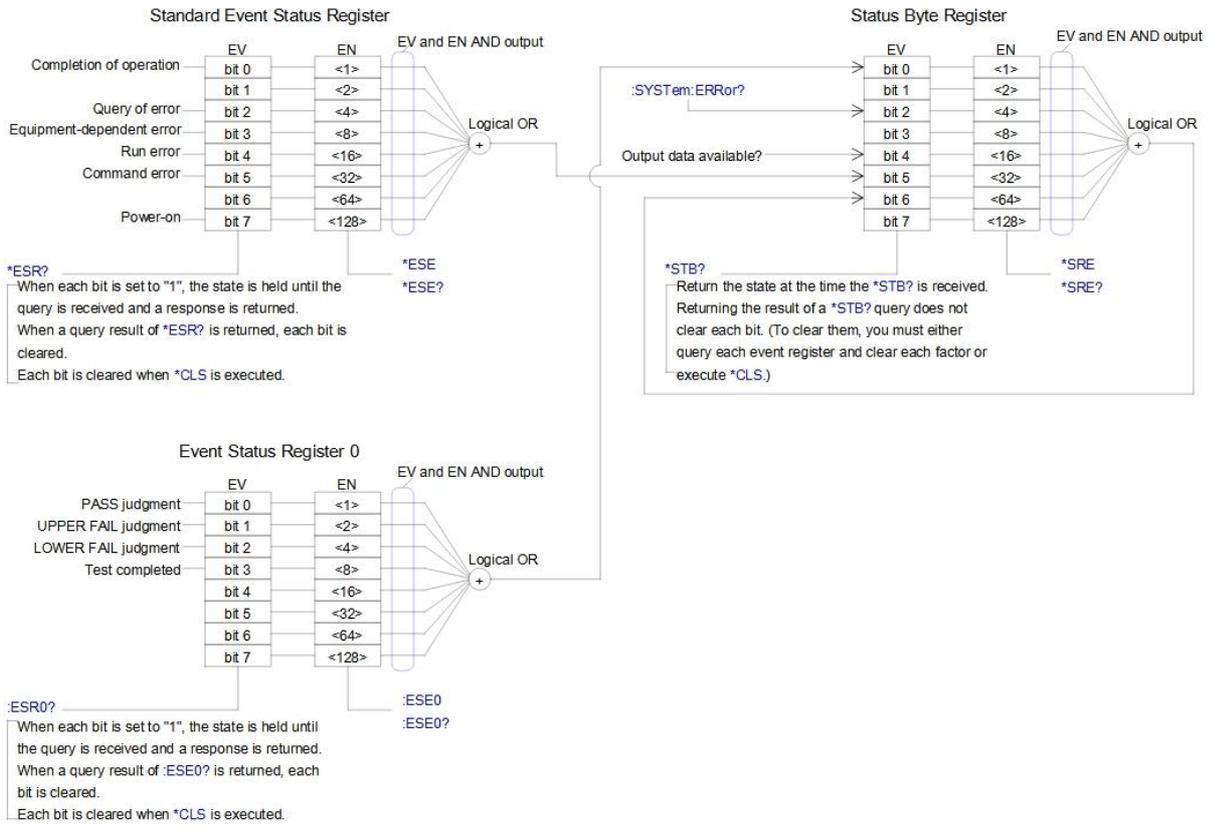
The SRQ bit is always synchronized with the Service Request and is read only when it is serially polled and cleared at the same time. The MSS bit is only read by the ***STB?** query, but is not cleared until the event is cleared by the ***CLS** command, for example.

bit7		Unused
bit6	SRQ	When a Service Request is sent out, it is set to "1".
	MSS	Represents the logical OR of the other bits in the Status Byte Register (STB).
bit5	ESB	Standard Event summary (logical OR) bit Represents the logical OR of the Standard Event Status Register. It is cleared when the Standard Event Status Register value is output by the ***ESR?** command.
bit4	MAV	Message-available It is set to "1" when there is a message in the output queue.
bit3		Unused
bit2	ERR	Error bit If there is error information, it is set to "1". It is reset when error information is output by the **:SYSTem:ERRor?** command.
bit1		Unused
bit0	ESB0	Event summary (logical OR) bit 0 Represents the logical OR of Event Status Register 0.

■ **Service Request Enable Register (SRER)**

The Service Request Enable Register is a register that allows each bit to be "1" the corresponding bits in the Status Byte Register become available.

Event Resisters

Standard Event Status Register

	EV	EN	
Completion of operation	bit 0	<1>	
	bit 1	<2>	
Query of error	bit 2	<4>	
Equipment-dependent error	bit 3	<8>	
Run error	bit 4	<16>	
Command error	bit 5	<32>	
	bit 6	<64>	
Power-on	bit 7	<128>	

EV and EN AND output

Logical OR +

*ESR?
When each bit is set to "1", the state is held until the query is received and a response is returned.
When a query result of *ESR? is returned, each bit is cleared.
Each bit is cleared when *CLS is executed.

*ESE
*ESE?

Status Byte Register

	EV	EN	
	bit 0	<1>	
	bit 1	<2>	
:SYSTem:ERRor?	bit 2	<4>	
	bit 3	<8>	
Output data available?	bit 4	<16>	
	bit 5	<32>	
	bit 6	<64>	
	bit 7	<128>	

EV and EN AND output

Logical OR +

*STB?
Return the state at the time the *STB? is received. Returning the result of a *STB? query does not clear each bit. (To clear them, you must either query each event register and clear each factor or execute *CLS.)

*SRE
*SRE?

Event Status Register 0

	EV	EN	
PASS judgment	bit 0	<1>	
UPPER FAIL judgment	bit 1	<2>	
LOWER FAIL judgment	bit 2	<4>	
Test completed	bit 3	<8>	
	bit 4	<16>	
	bit 5	<32>	
	bit 6	<64>	
	bit 7	<128>	

EV and EN AND output

Logical OR +

:ESR0?
When each bit is set to "1", the state is held until the query is received and a response is returned.
When a query result of :ESE0? is returned, each bit is cleared.
Each bit is cleared when *CLS is executed.

:ESE0
:ESE0?

■ Standard Event Status Register (SESR)

The Standard Event Status Register is an 8-bit register. When any bit in the Standard Event Status Register is set to "1" among the bits set to be available in the Standard Event Status Enable Register, bit 5 (ESB) in the Status Byte Register is set to "1".

See "Standard Event Status Register (SESR) and Standard Event Status Enable Register (SESER)" (p.11)

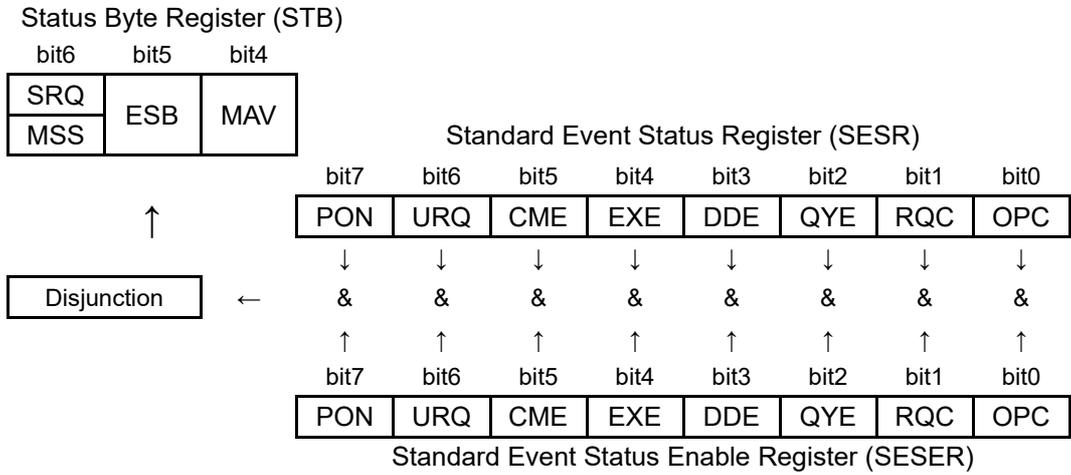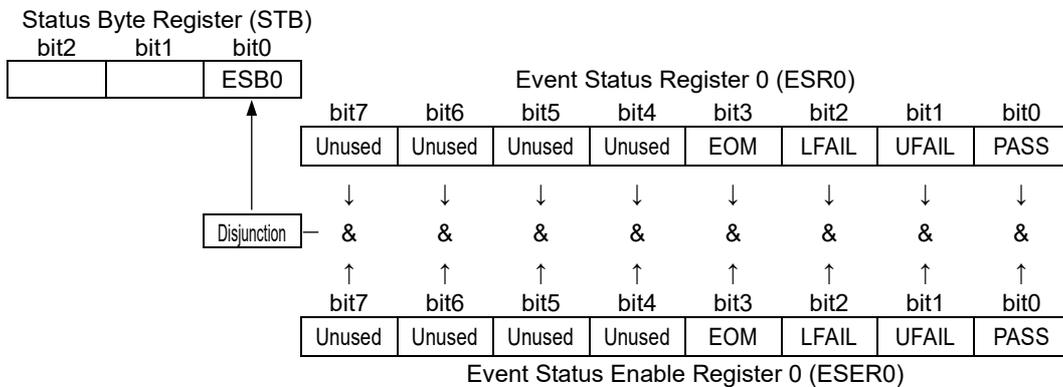The contents of the Standard Event Status Register are cleared when:
- When the **∗CLS** command is executed
- When an event register query is executed (**∗ESR?**)
- When the power is turned on again

bit7	PON	**Power-On Flag** It is set to "1" when the power is turned on or when the power is restored from a power failure.
bit6	URQ (Unused)	Not used in this unit. **User Request**
bit5	CME	**Command error (Ignore commands up to the message terminator)** It is set to "1" when there is a grammatical or semantic error in the received command. • Errors in the program header • If the number of data is different from that specified • If the data format is different from that specified • When a command that does not exist in this instrument is received
bit4	EXE	**Execution error** It is set to "1" when the received command cannot be executed for some reason. • If the specified data is outside the setting range • If the specified data cannot be set • If another function is running and cannot be performed
bit3	DDE	**Equipment-Dependent Error** It is set to "1" when the command could not be executed due to reasons other than command error, query of error, or execution error.
bit2	QYE	**Query Error (Clears the output queue)** It is set to "1" when an error occurs in processing related to the output queue. • When data overflows the output queue • If data in the output queue is lost
bit1	RQC (Unused)	Not used in this unit. **Request Control**
bit0	OPC	**Completion of Operation** • When the ∗OPC command is executed • When the operation of all messages up to the ∗OPC command is completed

■ **Standard Event Status Enable Register (SESER)**

The Standard Event Status Enable Register enables the corresponding bit in the Standard Event Status Register by setting each bit to "1".

Standard Event Status Register (SESR) and Standard Event Status Enable Register (SESER)

Status Byte Register (STB)

bit6	bit5	bit4
SRQ	ESB	MAV
MSS		

Standard Event Status Register (SESR)

	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
↑	PON	URQ	CME	EXE	DDE	QYE	RQC	OPC
	↓	↓	↓	↓	↓	↓	↓	↓
Disjunction ←	&	&	&	&	&	&	&	&
	↑	↑	↑	↑	↑	↑	↑	↑
	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
	PON	URQ	CME	EXE	DDE	QYE	RQC	OPC

Standard Event Status Enable Register (SESER)

■ Unique Event Status Register (ESR0)

A single Event Status register is provided to manage the instrument's events. The Event Status register is an 8-bit register.

If any bit in the Event Status register is set to "1" among the bits set to be available in the Event Status enable register, the following occurs.
  • For Event Status Register 0: Bit 0 (ESB0) of the Status Byte Register (STB) is "1".

The contents of Event Status register 0 are cleared when:
  • When the **CLS** command is executed
  • When an event register query is executed (**:ESR0?**)
  • When the power is turned on again

Unique Event Status Register 0 (ESR0)		
bit7	-	Unused
bit6	-	Unused
bit5	-	Unused
bit4	-	Unused
bit3	EOM	Test completed
bit2	LFAIL	LOWER FAIL judgment
bit1	UFAIL	UPPER FAIL judgment
bit0	PASS	PASS judgment

Event Status Register 0 (ESR0) and
Unique Event Status Enable Register 0 (ESER0)

■ Read/Write Each Register

Register	Read	Write
Status Byte Register	***STB?**	-
Service Request Enable Register	***SRE?**	***SRE**
Standard Event Status Register	***ESR?**	-
Standard Event Status Enable Register	***ESE?**	***ESE**
Event Status Register 0	**:ESR0?**	-
Event Status Enable Register 0	**:ESE0?**	**:ESE0**

■ **GP-IB Commands**

The interface function allows the following commands to be used.

Commands		Contents
GTL	Go To Local	The remote state is released and the local state is set.
LLO	Local Lock Out	All keys, including local keys, are rendered inoperable.
DCL	Device CLear	Clears the input buffer and output queue.
SDC	Selected Device Clear	Clears the input buffer and output queue.
GET	Group Execute Trigger	When in READY state, the test is started.

Response Format

• Interval time (withstand voltage test, insulation resistance test), remaining test time (withstand voltage test, insulation resistance test), elapsed test time (withstand voltage test, insulation resistance test, BDV measurement)

Positive value				
	□	□	□	.	□
		□	□	.	□
			□	.	□

    Units: s, NR2 numerical format

• Test frequency (withstand voltage test, BDV measurement)

D	C			

Test voltage (withstand voltage test), initial voltage (BDV measurement), end voltage (BDV measurement), voltage step (BDV measurement), median breakdown voltage (BDV measurement), average breakdown voltage (BDV measurement)

Positive value			
	□	□	□	□
		□	□	□
			□	□
				□

    Unit: V, NR1 numerical format

• Dielectric breakdown voltage standard deviation (BDV measurement)

Positive value						
	□	□	□	.	□	□	□
		□	□	.	□	□	□
			□	.	□	□	□

    Units: V, NR2 numerical format

• Test voltage (insulation resistance test)

Positive value			
	□	□	□	□
		□	□	□
			□	□

Negative value			
-	□	□	□	□
	-	□	□	□
		-	□	□

    Unit: V, NR1 numerical value format

• Start voltage (withstand voltage test)

Positive value	
	□	□
		□

    Unit: %, NR1 numerical value format

• Test time (withstand voltage test, insulation resistance test), voltage rise time (withstand voltage test, insulation resistance test), voltage fall time (withstand voltage test, insulation resistance test)

Positive value				
	□	□	□		
		□	□	.	□
			□	.	□

    Units: s, NR1 or NR2 numerical value format

- Judgment waiting time (withstand voltage test, insulation resistance test)

Positive value				
	□	□	.	□
		□	.	□

Units: s, NR2 numerical value format

- Test upper limit (withstand voltage test), test lower limit (withstand voltage test), current upper limit reference value (BDV measurement)

Positive value							
	□	□	□	.	□		
		□	□	.	□	□	
			□	.	□	□	□

Units: mA, NR2 numerical value format

- Upper current limit of ARC discharge detection function (withstand voltage test, BDV measurement)

Positive value		
	□	□
		□

Unit: %, NR1 numerical value format

- Test upper limit (insulation resistance test), test lower limit (insulation resistance test)

Positive value											
	□	□	□	□	□						
		□	□	□	□						
			□	□	□	.	□				
				□	□	.	□	□			
					□	.	□	□	□		
					□	.	□	□	□	□	
					□	.	□	□	□	□	□

Units: MΩ, NR1 or NR2 numerical value format

- Distance between electrodes (BDV measurement)

Positive value				
	□	□	.	□	□
		□	.	□	□

Units: mm, NR2 numerical value format

- Voltage rise rate (BDV measurement)

Positive value					
	□	□	□	□	
		□	□	□	
			□	□	
			□	□	.	□
				□	

Units: V/s, NR1 or NR2 numerical value format

- Voltage holding time for each step (BDV measurement)

Positive value		
	□	□	□
		□	□
			□

Units: s, NR1 numerical value format

• Median dielectric breakdown strength (BDV measurement), average dielectric breakdown strength (BDV measurement)

Positive value						
	□	□	□	.	□	□	□
		□	□	.	□	□	□
			□	.	□	□	□

Units: kV/mm NR2 numerical value format

• Dielectric breakdown voltage standard deviation (BDV measurement)

Positive value						
	□	□	□	.	□	□	□
		□	□	.	□	□	□
			□	.	□	□	□

Units: V/mm NR2 numerical value format

• Judgment threshold value for contact check (withstand voltage test, insulation resistance test)

Positive value				
	□	□	□	.	□
		□	□	.	□
			□	.	□

Units: nF, NR2 numerical value format

• Test mode

W	
I	R
B	D	V

• Test method (BDV measurement)

R	A	T	E
S	T	E	P

• Test start date and time

| □ | □ | □ | □ | - | □ | □ | - | □ | □ | | □ | □ | : | □ | □ | : | □ | □ |

• Judgment result

P	A	S	S
U	F	A	I	L
L	F	A	I	L
U	L	F	A	I	L
O	F	F

• Test results (programmed test mode)

P	A	S	S
F	A	I	L

• Contact check judgment result

N	O	N	E
P	A	S	S
F	A	I	L

• Timer type

Positive value
□

NR1 numerical value format

• Measuring range (withstand voltage test)

3	0	0	u	A
3	m	A		
3	0	m	A	
3	0	0	m	A
N	O	N	E	

• Measuring range (insulation resistance test)

1	0	0	k	o	h	m
1	M	o	h	m		
1	0	M	o	h	m	
1	0	0	M	o	h	m
1	G	o	h	m		
1	0	G	o	h	m	
1	0	0	G	o	h	m
N	O	N	E			

• Voltage measurements (withstand voltage test, insulation resistance test)

Positive value									
	□	.	□	□	□	E	±	□	□

Negative value									
-	□	.	□	□	□	E	±	□	□

Unit: V, NR3 numerical value format

• Measured voltage (BDV measurement)

Positive value									
	□	.	□	□	□	E	±	□	□

Unit: V, NR3 numerical value format

• Measured current (withstand voltage test, insulation resistance test, BDV measurement), offset cancellation correction value (withstand voltage test)

Positive value									
	□	.	□	□	□	E	±	□	□

Unit: A, NR3 numerical value format

• Resistance measurements (withstand voltage test, insulation resistance test), offset cancellation correction values (insulation resistance test)

Positive value									
	□	.	□	□	□	E	±	□	□

Unit: Ω, NR3 numerical value format

• Contact check correction value (withstand voltage test, insulation resistance test), contact check measurement value (withstand voltage test, insulation resistance test)

Positive value									
	□	.	□	□	□	E	±	□	□

Unit: F, NR3 numerical value format

• Number of points (measured value voltage, measured value current, measured value resistance)

Positive value									
				□	□	□	□	□	□

NR1 numerical value format

Measured Value in case of Measurement Error

- Overflow
  1.000E+24 or the maximum value of the measurement range [1] [2]
- Underflow
  0.000E+00
- Auto range no judgment
  3.333E+33

[1]. Depending on the setting for the measured value at the time of range-over
[2]. Waveform data and trend data are not dependent on the setting for the measured value at the time of range-over 1.000E+24

Item to return to Initial State

item	When the power is turned on	Reset the instrument	*RST command	Device clear (GP-IB only)	*CLS command
Device-Specific Features (test conditions, correction values, etc.)	-	✓	✓	-	-
Output Queue	✓	✓	-	✓	-
Input Buffer	✓	✓	-	✓	-
Status Byte Register	✓	✓	-	✓[1]	✓[2]
Event Register	✓[3]	✓	-	-	✓
Enable Register	✓	✓	-	-	-
Current Path	✓	✓	-	✓	-

[1]. Clear MAV bit (bit4) only.
[2]. Clear all bits except the MAV bit.
[3]. Except for the PON bit (bit7).

Errors during Communication

Executing a message in the following cases, it will result in an error.
- Command error
  If the spelling of the message is incorrect
  If the data portion of the command or query is in the wrong format
- Query of error
  When the controller is unable to send a response message because the instrument is in a state where it cannot receive the message
- Run error
  When set with data other than the specified character or numerical value data

2 Message List

Classification	Communication commands	Feature	Reference
Standard Commands	*CLS	Clear Event Status Register	p. 29
	*IDN?	Inquiry of device ID (identification code)	p. 29
	*OPC	After all running operations are completed, set the Operation Complete bit in the Standard Event Status Register (SESR) to 1.	p. 29
	*OPC?	Respond 1 after all running operations are completed.	p. 29
	*OPT?	Query of installed options	p. 30
	*RST	Initialization of equipment	p. 30
	*TRG	Start of test	p. 30
	*TST?	Run self-test and query of result	p. 30
	*WAI	After command processing is completed, subsequent commands are executed.	p. 31
	*ESE	Standard Event Status Enable Register (SESER) setting	p. 31
	*ESE?	Standard Event Status Enable Register (SESER) query	p. 31
	*ESR?	Standard Event Status Register (SESR) query	p. 31
	*SRE	Service Request Enable Register (SRER) setting	p. 32
	*SRE?	Service Request Enable Register (SRER) query	p. 32
	*STB?	Status Byte Register (STB) query	p. 32
Event Register	:ESE0	Event Status Enable Register 0 (ESER0) setting	p. 33
	:ESE0?	Event Status Enable Register 0 (ESER0) query	p. 33
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Classification	Communication commands	Feature	Reference
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Classification	Communication commands	Feature	Reference
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Classification	Communication commands	Feature	Reference
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| Classification	Communication commands	Feature	Reference
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3 Message Reference

Standard Event Status Enable Register (SESER) setting			
Syntax	Commands	**∗ESE** <mask value>	
		<mask value> = 0 to 255 (NR1)	
Description	Set the mask pattern for the Standard Event Status Enable Register (SESER). The initial value (at power-on) is 0.		
Example	**∗ESE 32** Set the CME bit (bit 5) of the Standard Event Status Enable Register (SESER) to 1.		
NOTES:	Bits 1 and 6 are not used in this instrument.		

No.	Description	
1	<>	The characters surrounded by this symbol represent the parameters required to send the command.
2	Indicates the content of the command.	
3	Describes the syntax of communication commands. The following is an explanation of the data part of the command or the response message.	
4	Explain the command.	
5	An example of actual command usage.	
6	Here is some advice on the use of communication commands.	

Command, Query

Controller → Instrument

Response
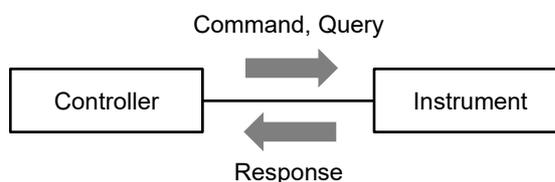
Standard Commands

Clear Event Status Register

Syntax	Commands	***CLS**
Description	Clear the Event Status Register. The bits in the Status Byte Register corresponding to the Event Status Register are also cleared. Errors are also cleared.	
Example	*CLS Clear the Event Status Register.	
NOTES:	The MAV bit (bit4) in the Status Byte Register (STB) is not cleared.	

Query of equipment ID (identification code)

Syntax	Query	***IDN?**
	Response	<Manufacturer's name>,<Model name>,<Serial number>,<software version>
Description	Return the ID of the equipment.	
Example	*IDN? HIOKI,ST5680,123456789,V1.00 The manufacturer's name is HIOKI, the model name is ST5680, the serial number is 123456789, and the software version is V1.00.	
NOTES:	No header is attached to the response message.	

After all running operations are completed, set the operation complete bit in the Standard Event Status Register (SESR) to 1

Syntax	Commands	***OPC**
Description	Set the OPC bit (bit0) of the Standard Event Status Register (SESR) to 1 when the processing of an incomplete command is complete. It will stop accepting subsequent commands until completion, but will accept the :STOP command.	
Example	*OPC *ESR? 1 The previous process has completed and the OPC bit (bit0) in the Standard Event Status Register (SESR) has been set to 1.	

Respond 1 after all running operations are completed

Syntax	Query	***OPC?**
	Response	1
Description	When the processing of an incomplete command is completed, it responds with a 1. It will stop accepting subsequent commands until completion, but will accept the :STOP command.	
Example	*OPC? 1 The last process has been completed.	
NOTES:	No header is attached to the response message.	

Inquiry installed options

Syntax	Query	***OPT?**
	Response	<0/GPIB/RS232C>
		<0/GPIB/RS232C> = 0: no interface board installed, GPIB: GP-IB interface board installed, RS232C: RS-232C interface board installed
Description	Return the options installed in the instrument.	
Example	*OPT? RS232C RS-232C interface board is installed.	
NOTES:	No header is attached to the response message.	

Initialization of equipment

Syntax	Commands	***RST**
Description	Set this instrument to the initialize setting. Panel memory and communication interface settings are not initialized. See "Initialization items list" (p. 122)	
Example	*RST Performs initialization of the instrument.	
NOTES:	TEST or corrected measurement status results in an execution error.	

Start of test

Syntax	Commands	***TRG**
Description	Start the test. When in the interval state of withstand voltage test → insulation resistance test, insulation resistance test → withstand voltage test, and programmed test, proceed to the next stage.	
Example	*TRG Start the test.	
NOTES:	Any condition other than READY or interval, it will result in an execution error. If the momentary out function is set to be enabled, an execution error will occur.	

Run self-test and query of result

Syntax	Query	***TST?**
	Response	<result>
		<mask value> = 0 to 31 (NR1)
Description	Performs a self-test of the instrument and returns the results. Return 0 for no error.	

128	64	32	16	8	4	2	1
bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
-	-	-	SRAM Error	VRAM Error	SDRAM Error	Internal RAM Error	ROM Error

Example	*TST? 1 A ROM error has occurred. Since there is a possibility that the test cannot be performed correctly, discontinue use and request repair.
NOTES:	No header is attached to the response message. Any status other than READY, it will result in an execution error.

After command processing is completed, subsequent commands are executed.	
Syntax	Commands ***WAI**
Description	Wait for incomplete commands to be processed. It will stop accepting subsequent commands until completion, but will accept the :STOP command.
Example	*WAI Wait for incomplete commands to be processed.

Standard Event Status Enable Register (SESER) settings	
Syntax	Commands *** ESE \<mask value\>**
	\<mask value\> = 0 to 255 (NR1)
Description	Set the mask pattern for the Standard Event Status Enable Register (SESER). The initial value (at power-on) is 0.

128	64	32	16	8	4	2	1
bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
PON	URQ	CME	EXE	DDE	QYE	RQC	OPC

Example	*ESE 32 Set the CME bit (bit 5) of the Standard Event Status Enable Register (SESER) to 1.
NOTES:	Bits 1 and 6 are not used in this instrument.

Standard Event Status Enable Register (SESER) query	
Syntax	Query ***ESE?**
	Response \<mask value\>
	\<mask value\> = 0 to 255 (NR1)
Description	Return the mask pattern of the Standard Event Status Enable Register (SESER).

128	64	32	16	8	4	2	1
bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
PON	URQ	CME	EXE	DDE	QYE	RQC	OPC

Example	*ESE? 32 CME bit (bit 5) of the Standard Event Status Enable Register (SESER) is set to 1.
NOTES:	No header is attached to the response message. Bits 1 and 6 are not used in this instrument.

Standard Event Status Register (SESR) query	
Syntax	Query ***ESR?**
	Response \<register value\>
	\<register value\> = 0 to 255 (NR1)
Description	Return the contents of the Standard Event Status Register (SESR) and clears the register.

128	64	32	16	8	4	2	1
bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
PON	URQ	CME	EXE	DDE	QYE	RQC	OPC

Example	*ESR? 32 The CME bit (bit 5) in the Standard Event Status Register (SESR) has been set to 1.
NOTES:	No header is attached to the response message. Bits 1 and 6 are not used in this instrument.

Service Request Enable Register (SRER) settings

Syntax	Commands	*** SRE <mask value>**							
		<mask value> = 0 to 255 (NR1)							

Description	Set the mask pattern for the Service Request Enable Register (SRER). The initial value (at power-on) is 0.							
	128	64	32	16	8	4	2	1
	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
	-	-	ESB	MAV	-	ERR	-	ESB0

Example	*SRE 33
	Set the ESB0 bit (bit 0) and the ESB bit (bit 5) of the Service Request Enable Register (SRER) to 1.

Service Request Enable Register (SRER) query

Syntax	Query	***SRE?**							
	Response	<mask value>							
		<mask value> = 0 to 255 (NR1)							

Description	Return the mask pattern for the Service Request Enable Register (SRER).							
	128	64	32	16	8	4	2	1
	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
	-	-	ESB	MAV	-	ERR	-	ESB0

Example	*SRE?
	33
	ESB0 bit (bit 0) and ESB bit (bit 5) of the Service Request Enable Register (SRER) are set to 1.

NOTES:	No header is attached to the response message.

Status Byte Register (STB) query

Syntax	Query	***STB?**							
	Response	<register value>							
		<register value> = 0 to 255 (NR1)							

Description	Return the contents of the Status Byte Register (STB).							
	128	64	32	16	8	4	2	1
	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
	-	MSS	ESB	MAV	-	ERR	-	ESB0

Example	*STB?
	1
	ESB0 bit (bit 0) of the Status Byte Register (STB) has been set to 1.

NOTES:	No header is attached to the response message.

Event Register

Event Status Enable Register 0 (ESER0) settings

Syntax	Commands	**:ESE0 <mask value>**							
		<mask value> = 0 to 255 (NR1)							
Description	Event Status Enable Register 0 (ESER0) settings								
		128	64	32	16	8	4	2	1
		bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
		-	-	-	-	EOM	LFAIL	UFAIL	PASS
Example	:ESE0 8 Set the EOM bit (bit 3) of the Event Status Enable Register 0 (ESER0) to 1.								
NOTES:	Bits 4 through 7 are not used in this instrument.								

Event Status Enable Register 0 (ESER0) query

Syntax	Query	**:ESE0?**							
	Response	<mask value>							
		<mask value> = 0 to 255 (NR1)							
Description	Return the mask pattern for Event Status Enable Register 0 (ESER0).								
		128	64	32	16	8	4	2	1
		bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
		-	-	-	-	EOM	LFAIL	UFAIL	PASS
Example	:ESE0? 8 The EOM bit (bit 3) of the Event Status Enable Register 0 (ESER0) is set to 1.								
NOTES:	Bits 4 through 7 are not used in this instrument.								

Event Status Register 0 (ESR0) query

Syntax	Query	**:ESR0?**							
	Response	<register value>							
		<register value> = 0 to 255 (NR1)							
Description	Return the contents of the Event Status Register 0 (ESR0) and clears the register.								
		128	64	32	16	8	4	2	1
		bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
		-	-	-	-	EOM	LFAIL	UFAIL	PASS
Example	:ESR0? 8 The EOM bit (bit 3) in the Event Status Register 0 (ESR0) has been set to 1.								
NOTES:	Bits 4 through 7 are not used in this instrument.								

Test Mode

Test mode setting

Syntax	Commands	**:MODE \<Test mode\>**
		\<Test mode\> = W: Withstand voltage test, IR: Insulation resistance test, WIR: Withstand voltage test → Insulation resistance test, IRW: Insulation resistance test → Withstand voltage test, PROGram: Programmed test, BDV: BDV measurement
Description		Set the test mode.
Example		:MODE W Set the test mode to withstand voltage test.
NOTES:		Any status other than READY, it will result in an execution error.

Test mode query

Syntax	Query	**:MODE?**
	Response	\<Test mode\>
		\<Test mode\> = W: Withstand voltage test, IR: Insulation resistance test, WIR: Withstand voltage test → Insulation resistance test, IRW: Insulation resistance test → Withstand voltage test, PROGRAM: Programmed test, BDV: BDV measurement
Description		Return the test mode setting.
Example		:MODE? W The test mode is set to withstand voltage test.

Withstand Voltage Test

Setting for the interval time for withstand voltage test

Syntax	Commands	**:CONFigure:WITHstand:STEP:INTerval \<Interval time/TRIGger>**
		\<Interval time/TRIGger> = 0.1 to 100.0 [s] (NRf), TRIGger:STOP until START key is pressed
Description		Set the interval time for the withstand voltage test.
Example		:CONFigure:WITHstand:STEP:INTerval 1.0 Set the interval time for the withstand voltage test to 1.0 s.
NOTES:		Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is insulation resistance test or BDV measurement.

Query of interval time for withstand voltage test

Syntax	Query	**:CONFigure:WITHstand:STEP:INTerval?**
	Response	\<Interval time/TRIGGER>
		\<Interval time/TRIGGER> = 0.1 to 100.0 [s] (NR2), TRIGGER:START until START key is pressed
Description		Return the interval time setting for the withstand voltage test.
Example		:CONFigure:WITHstand:STEP:INTerval? 1.0 The interval time for the withstand voltage test is set to 1.0 s.
NOTES:		Execution error occurs when the test mode is insulation resistance test or BDV measurement.

Setting test voltage for withstand voltage test

Syntax	Commands	**:CONFigure:WITHstand:VOLTage:LEVel \<Test voltage>**
		\<Test voltage> = 10 to 8000 [V] (NR1)
Description		Set the test voltage for the withstand voltage test. When the test voltage for the withstand voltage test is changed, the offset cancel function, offset cancel correction value, and contact check correction value become initial values.
Example		:CONFigure:WITHstand:VOLTage:LEVel 100 Set the test voltage for the withstand voltage test to 100 V.
NOTES:		Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is insulation resistance test or BDV measurement. If a voltage greater than the limit voltage for the DC withstand voltage test is set, an execution error occurs.

Query of test voltage for withstand voltage test

Syntax	Query	**:CONFigure:WITHstand:VOLTage:LEVel?**
	Response	\<Test voltage>
		\<Test voltage> = 10 to 8000 [V] (NR1)
Description		Return the test voltage setting for the withstand voltage test.
Example		:CONFigure:WITHstand:VOLTage:LEVel? 100 The test voltage for the withstand voltage test is set to 100 V.
NOTES:		Execution error occurs when the test mode is insulation resistance test or BDV measurement.

Setting the starting voltage for withstand voltage tests

Syntax	Commands	**:CONFigure:WITHstand:VOLTage:STARt <Start voltage>**
		<Start voltage> = 0 to 99 [%] (NR1)
Description		Set the starting voltage for the withstand voltage test.
Example		:CONFigure:WITHstand:VOLTage:STARt 1 Set the starting voltage for the withstand voltage test to 1%.
NOTES:		Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is insulation resistance test or BDV measurement. When the test time of the withstand voltage test is set other than CONTinue and the judgment wait time of the withstand voltage test is set other than OFF, setting the value of "Judgment wait time of withstand voltage test ≥ voltage rise time of withstand voltage test + test time of withstand voltage test + 0.1 s (when the start voltage of withstand voltage test is other than 0%)," it will result in an execution error.

Query the starting voltage for withstand voltage tests

Syntax	Query	**:CONFigure:WITHstand:VOLTage:STARt?**
	Response	<Start voltage>
		<Start voltage> = 0 to 99 [%] (NR1)
Description		Return the starting voltage setting for the withstand voltage test.
Example		:CONFigure:WITHstand:VOLTage:STARt? 1 The starting voltage for the withstand voltage test is set at 1%.
NOTES:		Execution error occurs when the test mode is insulation resistance test or BDV measurement.

Setting the test time for withstand voltage tests

Syntax	Commands	**:CONFigure:WITHstand:TIMer <Test time/CONTinue>**
		<Test time/CONTinue> = 0.1 to 999.0 [s] (NRf), CONTinue: test continuously
Description		Set the test time for the withstand voltage test.
Example		:CONFigure:WITHstand:TIMer 1.0 Set the test time for the withstand voltage test to 1.0 s.
NOTES:		CONTinue cannot be set in program test mode. Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is insulation resistance test or BDV measurement. When the judgment waiting time for withstand voltage test is set other than OFF, setting the value of "Judgment wait time of withstand voltage test ≥ voltage rise time of withstand voltage test + test time of withstand voltage test + 0.1 s (when the start voltage of withstand voltage test is other than 0%)," will cause an execution error.

Query the test time for withstand voltage tests

Syntax	Query	**:CONFigure:WITHstand:TIMer?**
	Response	<Test time/CONTINUE>
		<Test time/CONTINUE> = 0.1 to 999.0 [s] (NR2), CONTINUE: test continuously
Description		Return the test time setting for the withstand voltage test.
Example		:CONFigure:WITHstand:TIMer? 1.0 The test time for the withstand voltage test is set to 1.0 s.
NOTES:		Execution error occurs when the test mode is insulation resistance test or BDV measurement.

Setting the voltage rise time for withstand voltage tests

Syntax	Commands	**:CONFigure:WITHstand:RISE:TIMer \<Voltage rise time\>**
		\<Voltage rise time\> = 0.1 to 300.0 [s] (NRf)
Description		Set the voltage rise time for the withstand voltage test.
Example		:CONFigure:WITHstand:RISE:TIMer 1.0 Set the voltage rise time for the withstand voltage test 1.0 s.
NOTES:		Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is insulation resistance test or BDV measurement. When the test time of the withstand voltage test is set other than CONTinue and the judgment wait time of the withstand voltage test is set other than OFF, setting the value of "Judgment wait time of withstand voltage test ≥ voltage rise time of withstand voltage test + test time of withstand voltage test + 0.1 s (when the start voltage of withstand voltage test is other than 0%)," it will result in an execution error.

Query the voltage rise time for withstand voltage tests

Syntax	Query	**:CONFigure:WITHstand:RISE:TIMer?**
	Response	\<Voltage rise time\>
		\<Voltage rise time\> = 0.1 to 300.0 [s] (NR2)
Description		Return the voltage rise time setting for the withstand voltage test.
Example		:CONFigure:WITHstand:RISE:TIMer? 1.0 The voltage rise time for the withstand voltage test is set to 1.0 s.
NOTES:		Execution error occurs when the test mode is insulation resistance test or BDV measurement.

Setting for the voltage drop time for withstand voltage tests

Syntax	Commands	**:CONFigure:WITHstand:FALL:TIMer \<Voltage drop time/OFF\>**
		\<Voltage drop time/OFF\> = 0.1 to 300.0 [s] (NRf), OFF: no voltage drop time
Description		Set the voltage drop time for the withstand voltage test.
Example		:CONFigure:WITHstand:FALL:TIMer 1.0 Set the voltage drop time for the withstand voltage test to 1.0 s.
NOTES:		Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is insulation resistance test or BDV measurement. When the contact check function performs a contact check, an execution error occurs.

Query of the voltage drop time for withstand voltage tests

Syntax	Query	**:CONFigure:WITHstand:FALL:TIMer?**
	Response	\<Voltage drop time/OFF\>
		\<Voltage drop time/OFF\> = 0.1 to 300.0 [s] (NR2), OFF: no voltage drop time
Description		Return the voltage drop time setting for the withstand voltage test.
Example		:CONFigure:WITHstand:FALL:TIMer? 1.0 The voltage drop time for the withstand voltage test is set to 1.0 s.
NOTES:		Execution error occurs when the test mode is insulation resistance test or BDV measurement.

Setting of judgment waiting time for withstand voltage test

Syntax	Commands	:CONFigure:WITHstand:JUDGment:DELay \<Judgment wait time/OFF\>
		\<Judgment wait time/OFF\> = 0.1 to 99.9 [s] (NRf), OFF: Do not set decision wait time
Description		Set the judgment wait time for the withstand voltage test.
Example		:CONFigure:WITHstand:JUDGment:DELay 1.0 Set the judgment wait time for the withstand voltage test to 1.0 s.
NOTES:		Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is insulation resistance test or BDV measurement. When the test time of the withstand voltage test is set other than CONTinue, setting the value of "Judgment wait time of withstand voltage test ≥ voltage rise time of withstand voltage test + test time of withstand voltage test + 0.1 s (when the start voltage of withstand voltage test is other than 0%)," will cause an execution error.

Query of judgment wait time for withstand voltage test

Syntax	Query	:CONFigure:WITHstand:JUDGment:DELay?
	Response	\<Judgment wait time/OFF\>
		\<Judgment wait time/OFF\> = 0.1 to 99.9 [s] (NR2), OFF: Do not set Judgment wait time
Description		Return the judgment wait time setting for the withstand voltage test.
Example		:CONFigure:WITHstand:JUDGment:DELay? 1.0 The judgment time for the withstand voltage test is set to 1.0 s.
NOTES:		Execution error occurs when the test mode is insulation resistance test or BDV measurement.

Setting for the upper test limit value for withstand voltage tests

Syntax	Commands	:CONFigure:WITHstand:LIMit:UPPer\<Upper test limit value\>
		\<Upper test limit value\> = 0.010 to 20.0 [mA] (NRf)
Description		Set the upper limit value of the current value that is the criterion for pass/fail judgment in the withstand voltage test. When the upper test limit value for the withstand voltage test is changed, the offset cancel function and offset cancel correction value become the initial values.
Example		:CONFigure:WITHstand:LIMit:UPPer 0.1 Set the upper test limit value of the withstand voltage test to 0.1 mA.
NOTES:		Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is insulation resistance test or BDV measurement. When ON/OFF is set to ON for the lower limit value of the withstand voltage test, setting a value of "upper test limit value ≤ lower test limit value," it will result in an execution error.

Query of the upper test limit value for withstand voltage tests

Syntax	Query	:CONFigure:WITHstand:LIMit:UPPer?
	Response	\<Upper test limit value\>
		\<Upper test limit value\> = 0.010 to 20.0 [mA] (NR2)
Description		Return the upper test limit value setting for the withstand voltage test.
Example		:CONFigure:WITHstand:LIMit:UPPer? 0.100 The test upper limit value for the withstand voltage test is set at 0.1 mA.
NOTES:		Execution error occurs when the test mode is insulation resistance test or BDV measurement.

Setting for the lower test limit value for withstand voltage tests

Syntax	Commands	**:CONFigure:WITHstand:LIMit:LOWer <Lower test limit value>**
		<Lower test limit value> = 0.010 to 20.0 [mA] (NRf)
Description		Set the lower limit value of the current value that is the criterion for pass/fail judgment in the withstand voltage test.
Example		:CONFigure:WITHstand:LIMit:LOWer 0.1 Set the lower test limit value of the withstand voltage test to 0.1 mA.
NOTES:		Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is insulation resistance test or BDV measurement. When ON/OFF is set to ON for the lower limit value of the withstand voltage test, setting a value of "Upper test limit value ≤ lower test limit value," it will result in an execution error.

Query of the lower test limit for withstand voltage tests

Syntax	Query	**:CONFigure:WITHstand:LIMit:LOWer?**
	Response	<Lower test limit value>
		<Lower test limit value> = 0.010 to 20.0 [mA] (NR2)
Description		Return the lower test limit value setting for the withstand voltage test.
Example		:CONFigure:WITHstand:LIMit:LOWer? 0.100 The test lower limit value for the withstand voltage test is set at 0.1 mA.
NOTES:		Execution error occurs when the test mode is insulation resistance test or BDV measurement.

ON/OFF setting of the lower test limit value for withstand voltage test

Syntax	Commands	**:CONFigure:WITHstand:LIMit:LOWer:STATe <1/0/ON/OFF>**
		<1/0/ON/OFF> = 1/ON: Judgment is made at the lower test limit value, 0/OFF: Judgment is not made at the lower test limit value
Description		Set the lower test limit value ON/OFF for the withstand voltage test.
Example		:CONFigure:WITHstand:LIMit:LOWer:STATe 1 Set to judge at the lower test limit value for the withstand voltage test.
NOTES:		Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is insulation resistance test or BDV measurement. When the upper and lower test limits value of the withstand voltage test are "Upper test limit value ≤ lower test limit value," setting ON/OFF of the lower test limit value of the withstand voltage test to ON causes an execution error.

Query of ON/OFF of the lower test limit for withstand voltage test

Syntax	Query	**:CONFigure:WITHstand:LIMit:LOWer:STATe?**
	Response	<1/0>
		<1/0> = 1: Judgment is made at the lower test limit value, 0: Judgment is not made at the lower test limit value
Description		Return the ON/OFF setting of the lower test limit for the withstand voltage test.
Example		:CONFigure:WITHstand:LIMit:LOWer:STATe? 1 It is set to be judged at the lower limit value of the test for the withstand voltage test.
NOTES:		Execution error occurs when the test mode is insulation resistance test or BDV measurement.

Setting the ARC discharge detection function for withstand voltage tests		
Syntax	Commands	**:CONFigure:WITHstand:ARC:STATe \<OFF/CONTinue/STOP>**
		\<OFF/CONTinue/STOP> = OFF: Arc beyond the upper current limit value is not detected, CONTinue: Arc beyond the upper current limit value is detected and the test continues, STOP: Arc beyond the upper current limit value is detected and the test stops
Description		Set the ARC discharge detection function for withstand voltage test.
Example		:CONFigure:WITHstand:ARC:STATe STOP Set the voltage withstand test to detect arcs that exceed the upper current limit value and stop the test.
NOTES:		Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is insulation resistance test or BDV measurement.

Query of the ARC discharge detection function for withstand voltage test		
Syntax	Query	**:CONFigure:WITHstand:ARC:STATe?**
	Response	\<OFF/CONTINUE/STOP>
		\<OFF/CONTINUE/STOP> = OFF: Arc beyond the upper current limit value is not detected, CONTINUE: Arc beyond the upper current limit value is detected and the test continues, STOP: Arc beyond the upper current limit value is detected and the test stops
Description		Return the setting of the ARC discharge detection function of the withstand voltage test.
Example		:CONFigure:WITHstand:ARC:STATe? :STOP The test is set to detect arcs that exceed the upper current limit value in the withstand voltage test and the test is stopped.
NOTES:		Execution error occurs when the test mode is insulation resistance test or BDV measurement.

Setting the upper current limit value of the ARC discharge detection function for withstand voltage tests		
Syntax	Commands	**:CONFigure:WITHstand:ARC:LIMit \<Upper current limit value>**
		\<Upper current limit value> = 1 to 50 [%] (NR1)
Description		Set the upper current limit value for the ARC discharge detection function in the withstand voltage test.
Example		:CONFigure:WITHstand:ARC:LIMit 3 Set the upper current limit value of the ARC discharge detection function for the withstand voltage test to 3 %.
NOTES:		Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is insulation resistance test or BDV measurement.

		Query of the upper current limit value of the ARC discharge detection function for withstand voltage tests	
Syntax	Query	**:CONFigure:WITHstand:ARC:LIMit?**	
	Response	<Upper current limit value>	
		<Upper current limit value> = 1 to 50 [%] (NR1)	
Description		Return the upper current limit value setting for the ARC discharge detection function of the withstand voltage test.	
Example		:CONFigure:WITHstand:ARC:LIMit? 　　3 The upper current limit value of the ARC discharge detection function for withstand voltage test is set at 3 %.	
NOTES:		Execution error occurs when the test mode is insulation resistance test or BDV measurement.	

		Setting for the offset cancel function for withstand voltage test	
Syntax	Commands	**:CONFigure:WITHstand:OFFSet:CANCel <1/0/ON/OFF>**	
		<1/0/ON/OFF> = 1/ON: offset cancellation correction value is subtracted from the measured value, 0/OFF: offset cancellation correction value is not subtracted from the measured value	
Description		Set the offset cancel function for withstand voltage test.	
Example		:CONFigure:WITHstand:OFFSet:CANCel 1 Set the offset cancellation correction value to be subtracted from the measured value in the withstand voltage test.	
NOTES:		Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is insulation resistance test or BDV measurement.	

		Query of the offset cancel function for withstand voltage test	
Syntax	Query	**:CONFigure:WITHstand:OFFSet:CANCel?**	
	Response	<1/0>	
		<1/0> = 1: offset cancellation correction value is subtracted from the measured value, 0: offset cancellation correction value is not subtracted from the measured value	
Description		Return the offset cancel function setting for the withstand voltage test.	
Example		:CONFigure:WITHstand:OFFSet:CANCel? 1 The offset cancellation correction value is set to be subtracted from the measured value in the withstand voltage test.	
NOTES:		Execution error occurs when the test mode is insulation resistance test or BDV measurement.	

		Query of the offset cancellation correction value for withstand voltage test	
Syntax	Query	**:CONFigure:WITHstand:OFFSet:CANCel:VALue?**	
	Response	<Correction value>	
		<Correction value> = 0.0000E+00 to 1.0000E-02 [A] (NR3)	
Description		Return the offset cancellation compensation value for the withstand voltage test.	
Example		:CONFigure:WITHstand:OFFSet:CANCel:VALue? 　1.000E-06 The offset cancellation correction value for the withstand voltage test is 0.001 mA.	
NOTES:		Execution error occurs when the test mode is insulation resistance test or BDV measurement.	

Setting for the threshold value for judging contact checks in withstand voltage tests		
Syntax	Commands	**:CONFigure:WITHstand:CONTactcheck:THReshold <Threshold value>**
		<Threshold value> = 1.0 to 100.0 [nF] (NRf)
Description	Set the judgment threshold value for the contact check of the withstand voltage test.	
Example	:CONFigure:WITHstand:CONTactcheck:THReshold 1.0 Set the judgment threshold value for the contact check of the withstand voltage test to 1.0 nF.	
NOTES:	Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is insulation resistance test or BDV measurement.	

Query of the threshold value for judging contact checks in withstand voltage tests		
Syntax	Query	**:CONFigure:WITHstand:CONTactcheck:THReshold?**
	Response	<Threshold value>
		<Threshold value> = 1.0 to 100.0 [nF] (NR2)
Description	Return the judgment threshold value setting for the withstand voltage test contact check.	
Example	:CONFigure:WITHstand:CONTactcheck:THReshold? 1.0 The judgment threshold value for the contact check of the withstand voltage test is set to 1.0 nF.	
NOTES:	Execution error occurs when the test mode is insulation resistance test or BDV measurement.	

Query of the contact check correction value for withstand voltage test		
Syntax	Query	**:CONFigure:WITHstand:CONTactcheck:VALue?**
	Response	<Correction value>
		<Correction value> = 0.000E+00 or more [F] (NR3)
Description	Return the contact check correction value for the withstand voltage test.	
Example	:CONFigure:WITHstand:CONTactcheck:VALue? 1.000E-09 The contact check correction value for the withstand voltage test is 1 nF.	
NOTES:	Return -4.444E+30 if no correction measurement is performed. Execution error occurs when the test mode is insulation resistance test or BDV measurement.	

Insulation Resistance Test

Setting the interval time for insulation resistance test

Syntax	Commands	:CONFigure:INSulation:STEP:INTerval <Interval time/TRIGger>
		<Interval time/TRIGger> = 0.1 to 100.0 [s] (NRf), TRIGger:STOP until START key is pressed
Description		Set the interval time for insulation resistance test.
Example		:CONFigure:INSulation:STEP:INTerval 1.0 Set the interval time for the insulation resistance test to 1.0 s.
NOTES:		Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is withstand voltage test or BDV measurement.

Query the interval time for insulation resistance test

Syntax	Query	:CONFigure:INSulation:STEP:INTerval?
	Response	<Interval time/TRIGGER>
		<Interval time/TRIGGER> = 0.1 to 100.0 [s] (NR2), TRIGGER:START until START key is pressed
Description		Return the interval time setting for the insulation resistance test.
Example		:CONFigure:INSulation:STEP:INTerval? 1.0 The interval time for insulation resistance test is set to 1.0 s
NOTES:		Execution error occurs when the test mode is withstand voltage test or BDV measurement.

Setting test voltage for insulation resistance test

Syntax	Commands	:CONFigure:INSulation:VOLTage:LEVel <Test voltage>
		<Test voltage> = 10 to 2000 [V] (NR1)
Description		Set the test voltage for the insulation resistance test. When the test voltage for the insulation resistance test is changed, the offset cancel function, offset cancel correction value, and contact check correction value become initial values.
Example		:CONFigure:INSulation:VOLTage:LEVel 20 Set the test voltage for the insulation resistance test to 20 V.
NOTES:		Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is withstand voltage test or BDV measurement. Setting a voltage greater than the limit voltage for the insulation resistance test, it will result in an execution error.

Query of test voltage for insulation resistance test

Syntax	Query	:CONFigure:INSulation:VOLTage:LEVel?
	Response	<Test voltage>
		<Test voltage> = 10 to 2000 [V] (NR1)
Description		Return the test voltage setting for the insulation resistance test.
Example		:CONFigure:INSulation:VOLTage:LEVel? 20 The test voltage for the insulation resistance test is set to 20 V.
NOTES:		Execution error occurs when the test mode is withstand voltage test or BDV measurement.

Setting for the test time for insulation resistance test

Syntax	Commands	**:CONFigure:INSulation:TIMer <Test time/CONTinue>**
		<Test time/CONTinue> = 0.1 to 999.0 [s] (NRf), CONTinue: test continuously
Description		Set the test time for the insulation resistance test.
Example		:CONFigure:INSulation:TIMer 1.0 Set the test time for the insulation resistance test to 1.0 s.
NOTES:		CONTinue cannot be set in program test mode. Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is withstand voltage test or BDV measurement. When the judgment waiting time for insulation resistance test is set other than OFF, setting the value of "Judgment waiting time for insulation resistance test ≥ voltage rise time for insulation resistance test + test time for insulation resistance test," it will result in an execution error.

Query of the test time for insulation resistance test

Syntax	Query	**:CONFigure:INSulation:TIMer?**
	Response	<Test time/CONTINUE>
		<Test time/CONTINUE> = 0.1 to 999.0 [s] (NR2), CONTINUE: test continuously
Description		Return the test time setting for the insulation resistance test.
Example		:CONFigure:INSulation:TIMer? 1.0 The test time of the insulation resistance test is set to 1.0 s.
NOTES:		Execution error occurs when the test mode is withstand voltage test or BDV measurement.

Setting for the voltage rise time for insulation resistance test

Syntax	Commands	**:CONFigure:INSulation:RISE:TIMer <Voltage rise time>**
		<Voltage rise time> = 0.1 to 300.0 [s] (NRf)
Description		Set the voltage rise time for the insulation resistance test.
Example		:CONFigure:INSulation:RISE:TIMer 1.0 Set the voltage rise time for the insulation resistance test to 1.0 s.
NOTES:		Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is withstand voltage test or BDV measurement. When the test time of the insulation resistance test is set other than CONTinue and the judgment wait time of the insulation resistance test is set other than OFF, setting the value of "Judgment waiting time for insulation resistance test ≥ voltage rise time for insulation resistance test + test time for insulation resistance test," causes an execution error.

Query of the voltage rise time for insulation resistance test

Syntax	Query	**:CONFigure:INSulation:RISE:TIMer?**
	Response	<Voltage rise time>
		<Voltage rise time> = 0.1 to 300.0 [s] (NR2)
Description		Return the voltage rise time setting for the insulation resistance test.
Example		:CONFigure:INSulation:RISE:TIMer? 1.0 The voltage rise time for the insulation resistance test is set to 1.0 s.
NOTES:		Execution error occurs when the test mode is withstand voltage test or BDV measurement.

Setting for the voltage drop time for insulation resistance test

Syntax	Commands	**:CONFigure:INSulation:FALL:TIMer <Voltage drop time/OFF>**
		<Voltage drop time/OFF> = 0.1 to 300.0 [s] (NRf), OFF: no voltage drop time
Description	Set the voltage drop time for the insulation resistance test.	
Example	:CONFigure:INSulation:FALL:TIMer 1.0 Set the voltage drop time for the insulation resistance test to 1.0 s.	
NOTES:	Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is withstand voltage test or BDV measurement. When the contact check function performs a contact check, an execution error occurs.	

Query of the voltage drop time for insulation resistance test

Syntax	Query	**:CONFigure:INSulation:FALL:TIMer?**
	Response	<Voltage drop time/OFF>
		<Voltage drop time/OFF> = 0.1 to 300.0 [s] (NR2), OFF: no voltage drop time
Description	Return the voltage drop time setting for the insulation resistance test.	
Example	:CONFigure:INSulation:FALL:TIMer? 1.0 The voltage drop time for the insulation resistance test is set to 1.0 s.	
NOTES:	Execution error occurs when the test mode is withstand voltage test or BDV measurement.	

Setting of judgment waiting time for insulation resistance test

Syntax	Commands	**:CONFigure:INSulation:JUDGment:DELay <Judgment wait time/OFF>**
		<Judgment wait time/OFF> = 0.1 to 99.9 [s] (NRf), OFF: Do not set decision wait time
Description	Set the judgment waiting time for the insulation resistance test.	
Example	:CONFigure:INSulation:JUDGment:DELay 1.0 Set the judgment wait time for the insulation resistance test to 1.0 s.	
NOTES:	Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is withstand voltage test or BDV measurement. When the test time for insulation resistance test is set other than CONTinue, setting the value of "Judgment waiting time for insulation resistance test ≥ voltage rise time for insulation resistance test + test time for insulation resistance test," it will result in an execution error.	

Query of judgment waiting time for insulation resistance test

Syntax	Query	**:CONFigure:INSulation:JUDGment:DELay?**
	Response	<Judgment wait time/OFF>
		<Judgment wait time/OFF> = 0.1 to 99.9 [s] (NR2), OFF: Do not set Judgment wait time
Description	Return the judgment wait time setting for the insulation resistance test.	
Example	:CONFigure:INSulation:JUDGment:DELay? 1.0 The judgment wait time of the insulation resistance test is set to 1.0 s.	
NOTES:	Execution error occurs when the test mode is withstand voltage test or BDV measurement.	

Setting for the upper test limit value for insulation resistance test

Syntax	Commands	**:CONFigure:INSulation:LIMit:UPPer <Upper test limit value>**
		<Upper test limit value> = 0.1 to 99990 [MΩ] (NRf)
Description		Set the upper limit value of resistance value, which is the criterion for pass/fail judgment in insulation resistance test.
Example		:CONFigure:INSulation:LIMit:UPPer 0.1 Set the upper test limit value for insulation resistance testing at 0.1 MΩ.
NOTES:		Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is withstand voltage test or BDV measurement. If the test upper limit ON/OFF is set to ON for the insulation resistance test, setting a value of "Upper test limit value ≤ lower test limit value," it will result in an execution error.

Query of the upper test limit value for insulation resistance test

Syntax	Query	**:CONFigure:INSulation:LIMit:UPPer?**
	Response	<Upper test limit value>
		<Upper test limit value> = 0.1 to 99990 [MΩ] (NR2)
Description		Return the upper test limit value setting for the insulation resistance test.
Example		:CONFigure:INSulation:LIMit:UPPer? 0.1000 The upper test limit value of the insulation resistance test is set to 0.1 MΩ.
NOTES:		Execution error occurs when the test mode is withstand voltage test or BDV measurement.

ON/OFF setting of the upper test limit value for insulation resistance test

Syntax	Commands	**:CONFigure:INSulation:LIMit:UPPer:STATe <1/0/ON/OFF>**
		<1/0/ON/OFF> = 1/ON: Judgment is made at the upper test limit value, 0/OFF: Judgment is not made at the upper test limit value
Description		Set the test upper limit value ON/OFF for the insulation resistance test.
Example		:CONFigure:INSulation:LIMit:UPPer:STATe 1 Set to judge at the upper test limit value of the insulation resistance test.
NOTES:		Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is withstand voltage test or BDV measurement. When the upper and lower test limits value of the insulation resistance test are "Upper test limit value ≤ lower test limit value," setting ON/OFF of the upper test limit value of the insulation resistance test to ON causes an execution error.

Query for ON/OFF of the upper test limit value for insulation resistance test

Syntax	Query	**:CONFigure:INSulation:LIMit:UPPer:STATe?**
	Response	<1/0>
		<1/0> = 1: Judgment is made at the upper test limit value, 0: Judgment is not made at the upper test limit value
Description		Return the ON/OFF setting of the upper test limit value for insulation resistance testing.
Example		:CONFigure:INSulation:LIMit:UPPer:STATe? 1 It is set to be judged at the upper test limit value of the insulation resistance test.
NOTES:		Execution error occurs when the test mode is withstand voltage test or BDV measurement.

Setting for the lower test limit value for insulation resistance tests

Syntax	Commands	**:CONFigure:INSulation:LIMit:LOWer \<Lower test limit value\>**
		\<Lower test limit value\> = 0.1 to 99990 [MΩ] (NRf)
Description		Set the lower limit value of resistance value, which is the criterion for pass/fail judgment in insulation resistance test. When the lower test limit value for the insulation resistance test is changed, the offset cancel function and offset cancel correction value become the initial values.
Example		:CONFigure:INSulation:LIMit:LOWer 0.1 Set the lower test limit value for insulation resistance testing at 0.1 MΩ.
NOTES:		Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is withstand voltage test or BDV measurement. If the test upper limit ON/OFF is set to ON for the insulation resistance test, setting a value of "Upper test limit value ≤ lower test limit value," it will result in an execution error.

Query of the lower test limit value for insulation resistance test

Syntax	Query	**:CONFigure:INSulation:LIMit:LOWer?**
	Response	\<Lower test limit value\>
		\<Lower test limit value\> = 0.1 to 99990 [MΩ] (NR2)
Description		Return the lower test limit value setting for the insulation resistance test.
Example		:CONFigure:INSulation:LIMit:LOWer? 0.1000 The lower test limit value of the insulation resistance test is set to 0.1 MΩ.
NOTES:		Execution error occurs when the test mode is withstand voltage test or BDV measurement.

Setting for the offset cancel function for insulation resistance test

Syntax	Commands	**:CONFigure:INSulation:OFFSet:CANCel \<1/0/ON/OFF\>**
		\<1/0/ON/OFF\> = 1/ON: offset cancellation correction value is subtracted from the measured value, 0/OFF: offset cancellation correction value is not subtracted from the measured value
Description		Set the offset cancel function for insulation resistance test.
Example		:CONFigure:INSulation:OFFSet:CANCel 1 Set the offset cancellation correction value to be subtracted from the measured value in the insulation resistance test.
NOTES:		Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is withstand voltage test or BDV measurement.

Query of the offset cancel function for insulation resistance test

Syntax	Query	**:CONFigure:INSulation:OFFSet:CANCel?**
	Response	\<1/0\>
		\<1/0\> = 1: offset cancellation correction value is subtracted from the measured value, 0: offset cancellation correction value is not subtracted from the measured value
Description		Return the offset cancel function setting for the insulation resistance test.
Example		:CONFigure:INSulation:OFFSet:CANCel? 1 The offset cancellation correction value is set to be subtracted from the measured value in the insulation resistance test.
NOTES:		Execution error occurs when the test mode is withstand voltage test or BDV measurement.

Query of offset cancel correction value for insulation resistance test

Syntax	Query	**:CONFigure:INSulation:OFFSet:CANCel:VALue?**
	Response	<Correction value>
		<Correction value> = 0.000E+00 or more [Ω] (NR3)
Description		Return the offset cancellation correction value for the insulation resistance test.
Example		:CONFigure:INSulation:OFFSet:CANCel:VALue? 1.000E+06 The offset cancel correction value for the insulation resistance test is 1.000 MΩ.
NOTES:		Execution error occurs when the test mode is withstand voltage test or BDV measurement.

Setting for the threshold for judging contact checks in insulation resistance test

Syntax	Commands	**:CONFigure:INSulation:CONTactcheck:THReshold <Threshold value>**
		<Threshold> = 1.0 to 100.0 [nF] (NRf)
Description		Set the judgment threshold value for the insulation resistance test contact check.
Example		:CONFigure:INSulation:CONTactcheck:THReshold 1.0 Set the judgment threshold value for the insulation resistance test contact check to 1.0 nF.
NOTES:		Any status other than READY, it will result in an execution error. Execution error occurs when the test mode is withstand voltage test or BDV measurement.

Query of the threshold for judging contact checks in insulation resistance test

Syntax	Query	**:CONFigure:INSulation:CONTactcheck:THReshold?**
	Response	<Threshold>
		<Threshold> = 1.0 to 100.0 [nF] (NR2)
Description		Return the judgment threshold value setting for the insulation resistance test contact check.
Example		:CONFigure:INSulation:CONTactcheck:THReshold? 1.0 The judgment threshold value for the insulation resistance test contact check is set to 1.0 nF.
NOTES:		Execution error occurs when the test mode is withstand voltage test or BDV measurement.

Query of the contact check correction value in insulation resistance test

Syntax	Query	**:CONFigure:INSulation:CONTactcheck:VALue?**
	Response	<Correction value>
		<Correction value> = 0.000E+00 or more [F] (NR3)
Description		Return the contact check correction value for the insulation resistance test.
Example		:CONFigure:INSulation:CONTactcheck:VALue? 1.000E-09 The contact check correction value for the insulation resistance test is 1 nF.
NOTES:		Return -4.444E+30 if no correction measurement is performed. Execution error occurs when the test mode is withstand voltage test or BDV measurement.

Program Test

Setting for the number of test steps for programmed tests

Syntax	Commands	:CONFigure:PROGram:COUNt <Number of steps>
		<Number of steps> = 1 to 50 (NR1)
Description	Set the number of test steps for program test.	
Example	:CONFigure:PROGram:COUNt 2 Set the number of test steps for the program test to 2.	
NOTES:	Any status other than READY, it will result in an execution error. When the test mode is other than program test, an execution error occurs.	

Query of the number of test steps for program test

Syntax	Query	:CONFigure:PROGram:COUNt?
	Response	<Number of steps>
		<Number of steps> = 1 to 50 (NR1)
Description	Return the setting for the number of test steps in the program test.	
Example	:CONFigure:PROGram:COUNt? 2 The number of test steps for the program test is set to 2.	
NOTES:	When the test mode is other than program test, an execution error occurs.	

Selection of program steps

Syntax	Commands	:CONFigure:PROGram:SELect <Step No.>
		<Step No.> = 1 to 50 (NR1)
Description	Select a program step.	
Example	:CONFigure:PROGram:SELect 2 Select program step 2.	
NOTES:	Any status other than READY, it will result in an execution error. When the test mode is other than program test, an execution error occurs.	

Query of select program steps

Syntax	Query	:CONFigure:PROGram:SELect?
	Response	<Step No.>
		<Step No.> = 1 to 50 (NR1)
Description	Return the selected program step.	
Example	:CONFigure:PROGram:SELect? 2 Program step 2 is selected.	
NOTES:	When the test mode is other than program test, an execution error occurs.	

Copying program steps

Syntax	Commands	:CONFigure:PROGram:COPY <Copy source step No.>,<Copy destination step No.>
		<Copy source step No.> = 1 to 50 (NR1) <Copy destination step No.> = 1 to 50 (NR1)
Description	Copy a program step from the source step to the destination step.	
Example	:CONFigure:PROGram:COPY 2,3 Copy program step 2 to program step 3.	
NOTES:	Any status other than READY, it will result in an execution error. When the test mode is other than program test, an execution error occurs.	

Insert program steps

Syntax	Commands	**:CONFigure:PROGram:INSert <Step No.>**
		<Step No.> = 1 to 49 (NR1)
Description		Insert a new program step with default settings. Program steps after the inserted step No. are moved backward.
Example		:CONFigure:PROGram:INSert 2 Insert a new program step into program step 2.
NOTES:		Any status other than READY, it will result in an execution error. When the test mode is other than program test, an execution error occurs.

Delete program steps

Syntax	Commands	**:CONFigure:PROGram:DELete <Step No.>**
		<Step No.> = 1 to 50 (NR1)
Description		Delete the program step. The program step behind the deleted program step is moved forward.
Example		:CONFigure:PROGram:DELete 2 Delete program step 2.
NOTES:		Any status other than READY, it will result in an execution error. When the test mode is other than program test, an execution error occurs.

Initialization of program steps

Syntax	Commands	**:CONFigure:PROGram:CLEar <Step No./ALL>**
		<Step No./ ALL> = 1 to 50 (NR1), ALL: All steps
Description		Initializes the specified program step.
Example		:CONFigure:PROGram:CLEar 2 Initialize program step 2.
NOTES:		Any status other than READY, it will result in an execution error. When the test mode is other than program test, an execution error occurs.

Setting for the test mode for the program steps

Syntax	Commands	**:CONFigure:PROGram:MODE <Test mode>**
		<Test mode>=W: withstand voltage test, IR: insulation resistance test
Description		Set the test mode for the program steps.
Example		:CONFigure:PROGram:MODE W Set the test mode of the program step to the withstand voltage test.
NOTES:		Any status other than READY, it will result in an execution error. When the test mode is other than program test, an execution error occurs.

Query of the test mode for the program steps

Syntax	Query	**:CONFigure:PROGram:MODE?**
	Response	<Test mode>
		<Test mode>=W: withstand voltage test, IR: insulation resistance test
Description		Return the test mode setting for the program step.
Example		:CONFigure:PROGram:MODE? W The test mode of the program step is set to withstand voltage test.
NOTES:		When the test mode is other than program test, an execution error occurs.

Setting of test mode and test conditions for program steps (withstand voltage test)		
Syntax	Commands	**:CONFigure:PROGram:EDIT:STEP <Step No.>, <Test mode>, <Interval time>, <Test frequency>, <Test voltage>, <Start voltage>, <DC superimposed voltage>, <Test time>, <Voltage rise time>, <Voltage drop time>, <Judgment wait time>, <Upper test limit value>, <Lower test limit value ON/OFF>, <Lower test limit value>, <ARC discharge detection function>, <Upper current limit value of ARC discharge detection function>, <Offset cancel function>, <Judgment threshold value of contact check>, <DC contact check method>**
		<Step No.> = 1 to 50 (NR1) <Test mode>=W: withstand voltage test <Interval time> = 0.1 to 100.0 [s] (NRf), TRIGger:Stop until START key is pressed <Test frequency> = DC <Test voltage> = 10 to 8000 [V] (NR1) <Start voltage> = 0 to 99 [%] (NR1) <DC superimposed voltage> = OFF <Test time> = 0.1 to 999 [s] (NRf) <Voltage rise time> = 0.1 to 300 [s] (NRf) <Voltage drop time> = 0.1 to 300 [s] (NRf), OFF: Do not set voltage drop time <Judgment wait time> = 0.1 to 99.9 [s] (NRf), OFF: Do not set judgment wait time <Upper test limit value> = 0.010 to 20.0 [mA] (NRf) < Lower test limit value ON/OFF> = 1/ON: Judgment is made at the lower test limit value, 0/OFF: Judgment is not made at the lower test limit value <Lower test limit value> = 0.010 to 20.0 [mA] (NRf) <ARC discharge detection function> = OFF: No detection, CONTinue: Arc exceeding the upper current limit value is detected and the test continues, STOP: Arc exceeding the upper current limit value is detected and the test stops <Upper current limit value of ARC discharge detection function> = 1 to 50 [%] (NR1) <Offset cancel function> = 1/ON: Enable offset cancel function, 0/OFF: Disable offset cancel function <Judgment threshold value of contact check> = 1.0 to 100.0 [nF] (NRf) <DC contact check method> = DISCharge
Description		Set the test mode and test conditions for the program step.
Example		:CONFigure:PROGram:EDIT:STEP 1,W,0.1,DC,10,0,OFF,0.1,0.1,OFF,OFF,0.011,0,0.010,OFF,1,0,1.0,DISCharge
NOTES:		When the contact check function performs a contact check, only OFF can be set for the voltage drop time. Any status other than READY, it will result in an execution error. When the test mode is other than program test, an execution error occurs. Setting a test voltage greater than the limit voltage for the DC withstand voltage test, it will result in an execution error. If a value other than OFF is set for the DC superimposed voltage, an execution error occurs. When a value other than OFF is set for the judgment wait time, setting a value of "Judgment wait time ≥ voltage rise time + test time + 0.1 s (when the start voltage of the withstand voltage test is other than 0%)," it will result in an execution error. If the upper and lower test limits are "Upper test limit value ≤ Lower test limit value," setting ON/OFF of the lower test limit value to ON, it will result in an execution error.

Query of test mode and test conditions for program steps (withstand voltage test)		
Syntax	Query	**:CONFigure:PROGram:EDIT:STEP? <Step No.>**
		<Step No.> = 1 to 50 (NR1)
	Response	<Step No.>, <Test mode>, <Interval time>, <Test frequency>, <Test voltage>, <Start voltage>, <DC superimposed voltage>, <Test time>, <Voltage rise time>, <Voltage drop time>, <Judgment wait time>, <Upper test limit value>, <Lower test limit value ON/OFF>, <Lower test limit value>, <ARC discharge detection function>, <Upper current limit value of ARC discharge detection function>, <Offset cancel function>, <Judgment threshold value of contact check>, <DC contact check method>
		<Step No.> = 1 to 50 (NR1) <Test mode>=W: withstand voltage test <Interval time> = 0.1 to 100.0 [s] (NRf), TRIGger:Stop until START key is pressed <Test frequency> = DC <Test voltage> = 10 to 8000 [V] (NR1) <Start voltage> = 0 to 99 [%] (NR1) <DC superimposed voltage> = OFF <Test time> = 0.1 to 999 [s] (NRf) <Voltage rise time> = 0.1 to 300 [s] (NRf) <Voltage drop time> = 0.1 to 300 [s] (NRf), OFF: Do not set voltage drop time <Judgment wait time> = 0.1 to 99.9 [s] (NRf), OFF: Do not set judgment wait time <Upper test limit value> = 0.010 to 20.0 [mA] (NRf) < Lower test limit value ON/OFF> = 1/ON: Judgment is made at the lower test limit value, 0/OFF: Judgment is not made at the lower test limit value <Lower test limit value> = 0.010 to 20.0 [mA] (NRf) <ARC discharge detection function> = OFF: No detection, CONTinue: Arc exceeding the upper current limit value is detected and the test continues, STOP: Arc exceeding the upper current limit value is detected and the test stops <Upper current limit value of ARC discharge detection function> = 1 to 50 [%] (NR1) <Offset cancel function> = 1/ON: Enable offset cancel function, 0/OFF: Disable offset cancel function <Judgment threshold value of contact check> = 1.0 to 100.0 [nF] (NR2) <DC contact check method> = DISCHARGE
Description	Return the test mode and test condition settings for the program step.	
Example	:CONFigure:PROGram:EDIT:STEP? 1 1,W, 0.1,DC , 10, 0,OFF, 0.1, 0.1,OFF,OFF, 0.011,0, 0.010,OFF, 1,0, 1.0,DISCHARGE	
NOTES:	When the test mode is other than program test, an execution error occurs.	

Setting of test mode and test conditions for program steps (Insulation resistance test)		
Syntax	Commands	**:CONFigure:PROGram:EDIT:STEP <Step No.>, <Test mode>, <Interval time>, <Test voltage>, <Test time>, <Voltage rise time>, <Voltage drop time>, <Judgment wait time>, <Upper test limit value ON/OFF>, <Upper test limit value>, <Lower test limit value>, <Offset cancel function>, <Judgment threshold value of contact check>, <DC contact check method>**
		<Step No.> = 1 to 50 (NR1) <Test mode>= IR: insulation resistance test <Interval time> = 0.1 to 100.0 [s] (NRf), TRIGger:Stop until START key is pressed <Test voltage> = 10 to 2000 [V] (NR1) <Test time> = 0.1 to 999 [s] (NRf) <Voltage rise time> = 0.1 to 300 [s] (NRf) <Voltage drop time> = 0.1 to 300 [s] (NRf), OFF: Do not set voltage drop time <Judgment wait time> = 0.1 to 99.9 [s] (NRf), OFF: Do not set judgment wait time <Upper test limit value ON/OFF> = 1/ON: Judgment is made at the upper test limit value, 0/OFF: Judgment is not made at the upper test limit value <Upper test limit value> = 0.1 to 99990 [MΩ] (NRf) <Lower test limit value> = 0.1 to 99990 [MΩ] (NRf) <Offset cancel function> = 1/ON: Enable offset cancel function, 0/OFF: Disable offset cancel function <Judgment threshold value of contact check> = 1.0 to 100.0 [nF] (NRf) <DC contact check method> = DISCharge
Description		Set the test mode and test conditions for the program step.
Example		:CONFigure:PROGram:EDIT:STEP 1,IR,0.1,10,0.1,0.1,OFF,OFF,0,100.0,1.000,0,1.0,DISCharge
NOTES:		When the contact check function performs a contact check, only OFF can be set for the voltage drop time. Any status other than READY, it will result in an execution error. When the test mode is other than program test, an execution error occurs. Setting a test voltage greater than the limit voltage, it will result in an execution error. When a value other than OFF is set for the judgment wait time, setting a value of "Judgment wait time ≥ Voltage rise time + Test time," it will result in an execution error. If the upper and lower test limits values are "Upper test limit value ≤ lower test limit value," setting ON/OFF of the upper test limit value to ON, it will result in an execution error.

Query of test mode and test conditions for program steps (insulation resistance test)

Syntax	Query	**:CONFigure:PROGram:EDIT:STEP? \<Step No.\>**
		\<Step No.\> = 1 to 50 (NR1)
	Response	\<Step No.\>, \<Test mode\>, \<Interval time\>, \<Test voltage\>, \<Test time\>, \<Voltage rise time\>, \<Voltage drop time\>, \<Judgment wait time\>, \<Upper test limit value ON/OFF\>, \<Upper test limit value\>, \<Lower test limit value\>, \<Offset cancel function\>, \<Judgment threshold value of contact check\>, \<DC contact check method\>
		\<Step No.\> = 1 to 50 (NR1) \<Test mode\>= IR: insulation resistance test \<Interval time\> = 0.1 to 100.0 [s] (NRf), TRIGger:Stop until START key is pressed \<Test voltage\> = 10 to 2000 [V] (NR1) \<Test time\> = 0.1 to 999 [s] (NRf) \<Voltage rise time\> = 0.1 to 300 [s] (NRf) \<Voltage drop time\> = 0.1 to 300 [s] (NRf), OFF: Do not set voltage drop time \<Judgment wait time\> = 0.1 to 99.9 [s] (NRf), OFF: Do not set judgment wait time \<Upper test limit value ON/OFF\> = 1/ON: Judgment is made at the upper test limit value, 0/OFF: Judgment is not made at the upper test limit value \<Upper test limit value\> = 0.1 to 99990 [MΩ] (NRf) \<Lower test limit value\> = 0.1 to 99990 [MΩ] (NRf) \<Offset cancel function\> = 1/ON: Enable offset cancel function, 0/OFF: Disable offset cancel function \<Judgment threshold value of contact check\> = 1.0 to 100.0 [nF] (NR2) \<DC contact check method\> = DISCHARGE
Description		Return the test mode and test condition settings for the program step.
Example		:CONFigure:PROGram:EDIT:STEP? 1 1,IR, 0.1, 10, 0.1, 0.1,OFF,OFF,0, 100.0 , 1.000 ,0, 1.0,DISCHARGE
NOTES:		When the test mode is other than program test, an execution error occurs.

Query of offset cancellation correction values for all steps of the program test

Syntax	Query	**:CONFigure:PROGram:OFFSet:CANCel:VALue?**
	Response	\<Correction value\>
		For the step of withstand voltage test: \<Correction value\> = 0.000E+00 to 1.000E-02 [A] (NR3) **For insulation resistance test step :** \<Correction value\> = 0.000E+00 or more [Ω] (NR3)
Description		Return offset cancellation correction values for all steps of the program test. If the number of test steps in a programmed test is 2 or more, the correction values for each step are separated by a message terminator.

Example		:CONFigure:PROGram:OFFSet:CANCel:VALue?
		  1.000E-06
		  1.001E-06
		 Return offset cancellation correction values for all steps of the program test.

NOTES:		No header is attached to the response message. When the test mode is other than program test, an execution error occurs.

Query of contact check correction values for all steps of the program test		
Syntax	Query	**:CONFigure:PROGram:CONTactcheck:VALue?**
	Response	<Correction value>
		<Correction value> = 0.000E+00 or more [F] (NR3)
Description	Return offset cancellation correction values for all steps of the program test. If the number of test steps in a programmed test is 2 or more, the correction values for each step are separated by a message terminator.	
Example	:CONFigure:PROGram:CONTactcheck:VALue? 　1.000E-09 　2.000E-09 Return offset cancellation correction values for all steps of the program test.	
NOTES:	No header is attached to the response message. Return -4.444E+30 if no correction measurement is performed. When the test mode is other than program test, an execution error occurs.	

BDV Measurement

Setting for the test method for BDV measurement

Syntax	Commands	**:CONFigure:BDV:METHod <Test method>**
		<Test method> = RATE: Continuous step-up voltage test, STEP: Step-up voltage test
Description		Set the test method for BDV measurement. When the test method of BDV measurement is changed, the initial voltage, end voltage, voltage rise rate, voltage step, each step voltage holding time, and number of steps are the initial values.
Example		:CONFigure:BDV:METHod RATE Set the test method for BDV measurement to the continuous step-up voltage test.
NOTES:		Any status other than READY, it will result in an execution error. When the test mode is other than BDV measurement, an execution error occurs.

Query of the test method for BDV measurement

Syntax	Query	**:CONFigure:BDV:METHod?**
	Response	<Test method>
		<Test method> = RATE: Continuous step-up voltage test, STEP: Step-up voltage test
Description		Return the test method setting for BDV measurement.
Example		:CONFigure:BDV:METHod? RATE The test method for BDV measurement is set to continuous step-up voltage test.
NOTES:		When the test mode is other than BDV measurement, an execution error occurs.

Setting for the distance between electrodes for BDV measurement

Syntax	Commands	**:CONFigure:BDV:ELECtrode:DISTance <Distance between electrodes>**
		<Distance between electrodes> = 0.01 to 10.0 [mm] (NRf)
Description		Set the distance between electrodes for BDV measurement.
Example		:CONFigure:BDV:ELECtrode:DISTance 0.1 Set the distance between electrodes for BDV measurement to 0.1 mm.
NOTES:		Any status other than READY, it will result in an execution error. When the test mode is other than BDV measurement, an execution error occurs.

Query of the distance between electrodes for BDV measurement

Syntax	Query	**:CONFigure:BDV:ELECtrode:DISTance?**
	Response	<Distance between electrodes>
		<Distance between electrodes> = 0.01 to 10.0 [mm] (NR2)
Description		Return the distance between electrodes setting for BDV measurement.
Example		:CONFigure:BDV:ELECtrode:DISTance? 0.10 The distance between electrodes for BDV measurement is set to 0.1 mm.
NOTES:		When the test mode is other than BDV measurement, an execution error occurs.

Setting for the number of tests for BDV measurement

Syntax	Commands	**:CONFigure:BDV:COUNt <Number of tests>**
		<Number of tests> = 1 to 20 (NR1)
Description	Set the number of tests for BDV measurement.	
Example	:CONFigure:BDV:COUNt 2 Set the number of tests for BDV measurement to 2.	
NOTES:	Any status other than READY, it will result in an execution error. When the test mode is other than BDV measurement, an execution error occurs.	

Query of the number of tests for BDV measurement

Syntax	Query	**:CONFigure:BDV:COUNt?**
	Response	<Number of tests>
		<Number of tests> = 1 to 20 (NR1)
Description	Return the setting for the number of tests for the BDV measurement.	
Example	:CONFigure:BDV:COUNt? 2 The number of tests for BDV measurement is set to 2.	
NOTES:	When the test mode is other than BDV measurement, an execution error occurs.	

Setting for the initial voltage for BDV measurement

Syntax	Commands	**:CONFigure:BDV:VOLTage:STARt <Initial voltage>**
		<Initial voltage> = 10 to 7999 [V] (NR1)
Description	Set the initial voltage for BDV measurement.	
Example	:CONFigure:BDV:VOLTage:STARt 100 Set the initial voltage for BDV measurement to 100 V.	
NOTES:	Any status other than READY, it will result in an execution error. When the test mode is other than BDV measurement, an execution error occurs. If the test method for BDV measurement is set to continuous step-up voltage test, setting the voltage higher than the end voltage for BDV measurement, it will result in an execution error.	

Query of the initial voltage for BDV measurement

Syntax	Query	**:CONFigure:BDV:VOLTage:STARt?**
	Response	<Initial voltage>
		<Initial voltage> = 10 to 7999 [V] (NR1)
Description	Return the initial voltage setting for BDV measurement.	
Example	:CONFigure:BDV:VOLTage:STARt? 100 The initial voltage for BDV measurement is set to 100 V.	
NOTES:	When the test mode is other than BDV measurement, an execution error occurs.	

Setting for the end voltage for BDV measurement

Syntax	Commands	**:CONFigure:BDV:VOLTage:END <End voltage>**
		<End voltage> = 11 to 8000 [V] (NR1)
Description	Set the end voltage for BDV measurement.	
Example	:CONFigure:BDV:VOLTage:END 4000 Set the end voltage for the BDV measurement to 4000 V.	
NOTES:	Any status other than READY, it will result in an execution error. When the test mode is other than BDV measurement, an execution error occurs. If the test method for BDV measurement is set to the step-up voltage test, an execution error occurs. If the voltage is set lower than the initial voltage for BDV measurement, it will result in an execution error.	

Query of the end voltage for BDV measurement

Syntax	Query	**:CONFigure:BDV:VOLTage:END?**
	Response	<End voltage>
		<End voltage> = 11 to 8000 [V] (NR1)
Description		Return the setting for the end voltage of the BDV measurement.
Example		:CONFigure:BDV:VOLTage:END? 4000 The end voltage for BDV measurement is set to 4000 V.
NOTES:		When the test mode is other than BDV measurement, an execution error occurs.

Setting for the voltage step for BDV measurement

Syntax	Commands	**:CONFigure:BDV:VOLTage:STEP <Voltage step/ PERCent10>**
		<Voltage step/PERCent10> = 10 to 5000 [V] (NR1), PERCent10: 10% of initial voltage
Description		Set the voltage step for BDV measurement.
Example		:CONFigure:BDV:VOLTage:STEP 100 Set the voltage step for BDV measurement to 100 V.
NOTES:		Any status other than READY, it will result in an execution error. When the test mode is other than BDV measurement, an execution error occurs. If the test method for BDV measurement is set to the continuous step-up voltage test, an execution error occurs.

Query of the voltage step for BDV measurement

Syntax	Query	**:CONFigure:BDV:VOLTage:STEP?**
	Response	<Voltage step/PERCENT10>
		<Voltage step/PERCENT10> = 10 to 5000 [V] (NR1), PERCENT10: 10% of initial voltage
Description		Return the voltage step setting for the BDV measurement.
Example		:CONFigure:BDV:VOLTage:STEP? 100 The voltage step for BDV measurement is set to 100 V.
NOTES:		When the test mode is other than BDV measurement, an execution error occurs.

Setting for the voltage rise rate for BDV measurement

Syntax	Commands	**:CONFigure:BDV:RISE:RATE <Voltage rise rate>**
		<Voltage rise rate> = 1/2/5/10/12/20/50/100/200/500/1000/2000/5000 [V/s]
Description		Set the voltage rise rate for BDV measurements.
Example		:CONFigure:BDV:RISE:RATE 2 Set the voltage rise rate for BDV measurement to 2 V/s.
NOTES:		Any status other than READY, it will result in an execution error. When the test mode is other than BDV measurement, an execution error occurs. If the test method for BDV measurement is set to the step-up voltage test, an execution error occurs.

Query of the voltage rise rate for BDV measurement

Syntax	Query	**:CONFigure:BDV:RISE:RATE?**
	Response	<Voltage rise rate>
		<Voltage rise rate> = 1/2/5/10/12/20/50/100/200/500/1000/2000/5000 [V/s]
Description		Return the voltage rise rate setting for BDV measurement.
Example		:CONFigure:BDV:RISE:RATE? 2 The voltage boost rate for BDV measurement is set to 2 V/s.

NOTES:	When the test mode is other than BDV measurement, an execution error occurs.

Setting for the voltage holding time for each stage of BDV measurement

Syntax	Commands	**:CONFigure:BDV:HOLD:TIMer <Voltage holding time for each stage/HOLD>**
		<Voltage holding time for each stage/HOLD> = 1 to 300 [s] (NR1), HOLD: Pressing the START key or inputting the START signal of EXT. I/O or accepting the *TRG command or accepting the :STARt command to proceed to the next stage
Description		Set the voltage holding time for each stage of BDV measurement.
Example		:CONFigure:BDV:HOLD:TIMer 2 Set the voltage holding time for each step of the BDV measurement to 2 s.
NOTES:		Any status other than READY, it will result in an execution error. When the test mode is other than BDV measurement, an execution error occurs. If the test method for BDV measurement is set to the continuous step-up voltage test, an execution error occurs.

Query of the voltage holding time for each stage of BDV measurement

Syntax	Query	**:CONFigure:BDV:HOLD:TIMer?**
	Response	<Voltage holding time for each step/ HOLD>
		<Voltage holding time for each stage/HOLD> = 1 to 300 [s] (NR1), HOLD: Pressing the START key or inputting the START signal of EXT. I/O or accepting the *TRG command or accepting the :STARt command to proceed to the next stage
Description		Return the voltage holding time setting for each stage of the BDV measurement.
Example		:CONFigure:BDV:HOLD:TIMer? 2 The voltage holding time for each stage of BDV measurement is set to 2 s.
NOTES:		When the test mode is other than BDV measurement, an execution error occurs.

Setting for the number of steps for BDV measurement

Syntax	Commands	**:CONFigure:BDV:STEP:COUNt <Number of steps>**
		<Number of steps> = 2 to 20 (NR1)
Description		Set the number of steps in the BDV measurement.
Example		:CONFigure:BDV:STEP:COUNt 3 Set the number of steps in the BDV measurement to 3.
NOTES:		Any status other than READY, it will result in an execution error. When the test mode is other than BDV measurement, an execution error occurs. If the test method for BDV measurement is set to the continuous step-up voltage test, an execution error occurs.

Query of the number of steps for BDV measurement

Syntax	Query	**:CONFigure:BDV:STEP:COUNt?**
	Response	<Number of steps>
		<Number of steps> = 2 to 20 (NR1)
Description		Return the setting for the number of steps in the BDV measurement.
Example		:CONFigure:BDV:STEP:COUNt? 3 The number of steps for BDV measurement is set to 3.
NOTES:		When the test mode is other than BDV measurement, an execution error occurs.

Setting for the current upper limit reference value for BDV measurement

Syntax	Commands	**:CONFigure:BDV:LIMit:UPPer <Current upper limit reference value>**
		<Current upper limit reference value> = 0.010 to 20.0 [mA] (NRf)
Description		Set the current upper limit reference value for BDV measurement.
Example		:CONFigure:BDV:LIMit:UPPer 0.1 Set the current upper limit reference value for BDV measurement to 0.1 mA.
NOTES:		Any status other than READY, it will result in an execution error. When the test mode is other than BDV measurement, an execution error occurs.

Query of the current upper limit reference value for BDV measurement

Syntax	Query	**:CONFigure:BDV:LIMit:UPPer?**
	Response	<Current upper limit reference value>
		<Current upper limit reference value> = 0.010 to 20.0 [mA] (NR2)
Description		Return the setting of the current upper reference value for BDV measurement.
Example		:CONFigure:BDV:LIMit:UPPer? 0.100 The current upper limit reference value for BDV measurement is set at 0.1 mA.
NOTES:		When the test mode is other than BDV measurement, an execution error occurs.

ON/OFF setting of ARC discharge detection function for BDV measurement

Syntax	Commands	**:CONFigure:BDV:ARC:STATe <1/0/ON/OFF>**
		<1/0/ON/OFF> = 1/ON: Arc beyond the upper current limit value is detected, 0/OFF: Arc beyond the upper current limit value is not detected
Description		Set the ON/OFF of the ARC discharge detection function for BDV measurement.
Example		:CONFigure:BDV:ARC:STATe 1 Set the BDV measurement to detect arcs that exceed the upper current limit value.
NOTES:		Any status other than READY, it will result in an execution error. When the test mode is other than BDV measurement, an execution error occurs.

Query of ON/OFF of ARC discharge detection function for BDV measurement

Syntax	Query	**:CONFigure:BDV:ARC:STATe?**
	Response	<1/0>
		<1/0> = 1: Arc beyond the upper current limit value is detected, 0: Arc beyond the upper current limit value is not detected
Description		Return the ON/OFF of ARC discharge detection function setting for BDV measurements.
Example		:CONFigure:BDV:ARC:STATe? 1 The BDV measurement is set to detect arcs that exceed the upper current limit value.
NOTES:		When the test mode is other than BDV measurement, an execution error occurs.

Setting for the upper current limit value of the ARC discharge detection function for BDV measurement		
Syntax	Commands	**:CONFigure:BDV:ARC:LIMit <Upper current limit value>**
		<Upper current limit value> = 1 to 50 [%] (NR1)
Description	Set the upper current limit value of the ARC discharge detection function for BDV measurement.	
Example	:CONFigure:BDV:ARC:LIMit 3 Set the upper current limit value of the ARC discharge detection function for BDV measurement to 3 %.	
NOTES:	Any status other than READY, it will result in an execution error. When the test mode is other than BDV measurement, an execution error occurs.	

Query of the upper current limit value of the ARC discharge detection function for BDV measurement		
Syntax	Query	**:CONFigure:BDV:ARC:LIMit?**
	Response	<Upper current limit value>
		<Upper current limit value> = 1 to 50 [%] (NR1)
Description	Return the upper current limit value setting for the ARC discharge detection function of the BDV measurement.	
Example	:CONFigure:BDV:ARC:LIMit? 3 The upper current limit value of the ARC discharge detection function for BDV measurement is set at 3 %.	
NOTES:	When the test mode is other than BDV measurement, an execution error occurs.	

Test Common

Setting for the limit voltage for the DC withstand voltage test

Syntax	Commands	**:SYSTem:DC:WITHstand:VOLTage:LIMit \<Limit voltage>**
		\<Limit voltage> = 10 to 8000 [V] (NR1)
Description		Set the limit voltage for the DC withstand voltage test.
Example		:SYSTem:DC:WITHstand:VOLTage:LIMit 100
		Set the limit voltage for the DC withstand voltage test to 100 V.
NOTES:		Any status other than READY, it will result in an execution error.

Query of the limit voltage for the DC withstand voltage test

Syntax	Query	**:SYSTem:DC:WITHstand:VOLTage:LIMit?**
	Response	\<Limit voltage>
		\<Limit voltage> = 10 to 8000 [V] (NR1)
Description		Return the limit voltage setting for the DC withstand voltage test.
Example		:SYSTem:DC:WITHstand:VOLTage:LIMit?
		100
		The limit voltage for the DC withstand voltage test is set to 100 V.

Setting for the limit voltage for insulation resistance test

Syntax	Commands	**:SYSTem:INSulation:VOLTage:LIMit \<Limit voltage>**
		\<Limit voltage> = 10 to 2000 [V] (NR1)
Description		Set the limit voltage for insulation resistance test.
Example		:SYSTem:INSulation:VOLTage:LIMit 100
		Set the limit voltage for the insulation resistance test to 100 V.
NOTES:		Any status other than READY, it will result in an execution error.

Query of the limit voltage for insulation resistance test

Syntax	Query	**:SYSTem:INSulation:VOLTage:LIMit?**
	Response	\<Limit voltage>
		\<Limit voltage> = 10 to 2000 [V] (NR1)
Description		Return the limit voltage setting for the insulation resistance test.
Example		:SYSTem:INSulation:VOLTage:LIMit?
		100
		The limit voltage for the insulation resistance test is set to 100 V.

Setting for the contact check function

Syntax	Commands	**:SYSTem:CONTactcheck:VERify \<Contact check function>**
		\<Contact check function> = OFF: Do not perform contact check, ON: Perform contact check
Description		Set the contact check to be performed.
Example		:SYSTem:CONTactcheck:VERify ON
		Set the contact check to be performed.
NOTES:		Any status other than READY, it will result in an execution error.
		If the output timing of the judgment signal for the withstand voltage test or the judgment signal for the insulation resistance test is set to output ON when the test is completed, setting the contact check function ON will result in an execution error.

Query of the contact check function

Syntax	Query	:SYSTem:CONTactcheck:VERify?
	Response	\<Contact check function\>
		\<Contact check function\> = OFF: Do not perform contact check, ON: Perform contact check
Description		Return the settings for the contact check function.
Example		:SYSTem:CONTactcheck:VERify? ON It is set to perform contact check.

Setting for the insulation resistance test end mode

Syntax	Commands	:SYSTem:INSulation:TERMinate \<CONTinue/PASS/FAIL\>
		\<CONTinue/PASS/FAIL\> = CONTinue: Test until set time, PASS: End with PASS judgment, FAIL: End with FAIL judgment
Description		Set the insulation resistance test end mode.
Example		:SYSTem:INSulation:TERMinate PASS Set the insulation resistance test end mode to end with PASS judgment.
NOTES:		Any status other than READY, it will result in an execution error.

Query of the insulation resistance test end mode

Syntax	Query	:SYSTem:INSulation:TERMinate?
	Response	\<CONTINUE/PASS/FAIL\>
		\<CONTINUE/PASS/FAIL\> = CONTINUE: Test until set time, PASS: End with PASS judgment, FAIL: End with FAIL judgment
Description		Return the setting for the insulation resistance test end mode.
Example		:SYSTem:INSulation:TERMinate? PASS The insulation resistance test end mode is set to end with PASS judgment.

Setting for operation at FAIL judgment

Syntax	Commands	:SYSTem:JUDGe:FAIL \<STOP/CONTinue\>
		\<STOP/CONTinue\> = STOP: Test ended, CONTinue: Test continued
Description		Set the operation at the time of FAIL judgment.
Example		:SYSTem:JUDGe:FAIL STOP Set the operation at the time of FAIL judgment to test termination.
NOTES:		Any status other than READY, it will result in an execution error.

Query of operation at the time of FAIL judgment

Syntax	Query	:SYSTem:JUDGe:FAIL?
	Response	\<:STOP/CONTINUE\>
		\<:STOP/CONTINUE\> = STOP: Test ended, CONTINUE: Test continued
Description		Return the setting of the operation at the time of FAIL judgment.
Example		:SYSTem:JUDGe:FAIL? :STOP Operation at the time of FAIL judgment is set to test end.

Setting for the auto-range function for withstand voltage test

Syntax	Commands	:SYSTem:WITHstand:RANGe:AUTO <1/0/ON/OFF>
		<1/0/ON/OFF> = 1/ON: Enable the auto-range function of the withstand voltage test, 0/OFF: Disable the auto-range function of the withstand voltage test.
Description		Set the auto-range function for the withstand voltage test.
Example		:SYSTem:WITHstand:RANGe:AUTO 1 Set the auto-range function of the withstand voltage test to enable.
NOTES:		Any status other than READY, it will result in an execution error.

Query of the auto-range function for withstand voltage test

Syntax	Query	:SYSTem:WITHstand:RANGe:AUTO?
	Response	<1/0>
		<1/0> = 1: Auto-range function for withstand voltage test is enabled, 0: Auto-range function for withstand voltage test is disabled
Description		Return the auto-range function setting of the withstand voltage test.
Example		:SYSTem:WITHstand:RANGe:AUTO? 1 The auto-range function of the withstand voltage test is set to enable.

Setting for the auto-range function for insulation resistance test

Syntax	Commands	:SYSTem:INSulation:RANGe:AUTO <1/0/ON/OFF>
		<1/0/ON/OFF> = 1/ON: Enable auto-range function of insulation resistance test, 0/OFF: Disable auto-range function of insulation resistance test
Description		Set the auto-range function for insulation resistance test.
Example		:SYSTem:INSulation:RANGe:AUTO 1 Set the auto-range function of the insulation resistance test to Enabled.
NOTES:		Any status other than READY, it will result in an execution error.

Query of the auto-range function for insulation resistance test

Syntax	Query	:SYSTem:INSulation:RANGe:AUTO?
	Response	<1/0>
		<1/0> = 1: Auto-range function of insulation resistance test is enabled, 0: Auto-range function of insulation resistance test is disabled
Description		Return the auto-range function setting of the insulation resistance test.
Example		:SYSTem:INSulation:RANGe:AUTO? 1 The auto-range function of the insulation resistance test is set to enable.

Setting for the use of the previous value of data during auto-ranging

Syntax	Commands	:SYSTem:RANGe:AUTO:DATA:KEEP <1/0/ON/OFF>
		<1/0/ON/OFF> = 1/ON: Enables the use of the previous value of data during auto-range, 0/OFF: Disables the use of the previous value of data during auto-range
Description		Set the use of the previous value of the data during auto-range.
Example		:SYSTem:RANGe:AUTO:DATA:KEEP 1 Set the use of the previous value of the data during auto-range to Enabled.
NOTES:		Any status other than READY, it will result in an execution error.

Query of the use of the previous value of data during auto-ranging

Syntax	Query	**:SYSTem:RANGe:AUTO:DATA:KEEP?**
	Response	<1/0>
		<1/0> = 1: Enables the use of the previous value of data during auto-range, 0: Disables the use of the previous value of data during auto-range
Description		Return the setting of the use of the previous value of the data being auto-range.
Example		:SYSTem:RANGe:AUTO:DATA:KEEP? 1 The use of the previous value of the data during auto-ranging is set to enable.

Setting for the measured value when range-over

Syntax	Commands	**:SYSTem:FORMat:OVER <TYPE1/TYPE2>**
		<TYPE1/TYPE2> = TYPE1:Return 1E+24, TYPE2:Return the maximum value of the measurement range
Description		Set the measured value at the time of range-over.
Example		:SYSTem:FORMat:OVER TYPE2 Set the measured value at the time of range-over to TYPE2.
NOTES:		Waveform and trend data are always processed with TYPE1 regardless of the setting of this command. Any status other than READY, it will result in an execution error.

Query of the measured value at the time of range-over

Syntax	Query	**:SYSTem:FORMat:OVER?**
	Response	<TYPE1/TYPE2>
		<TYPE1/TYPE2> = TYPE1:Return 1E+24, TYPE2:Return the maximum value of the measurement range
Description		Return the setting of the measured value at the time of range-over.
Example		:SYSTem:FORMat:OVER? TYPE2 The measured value at the time of range-over is set to TYPE2.

Panel Memory

Storage of test conditions

Syntax	Commands	:PANel:SAVE <Panel No.>,<"Panel name">
		For withstand voltage test mode: <Panel No.> = 1 to 64 <"Panel name"> = (max. 10 characters) **For insulation resistance test mode:** <Panel No.> = 1 to 64 <"Panel name"> = (max. 10 characters) **For program test mode:** <Panel No.> = 1 to 30 <"Panel name"> = (max. 10 characters) **For BDV measurement mode:** <Panel No.> = 1 to 10 <"Panel name"> = (max. 10 characters)
Description		Save the test conditions to the panel memory of the specified panel No.
Example		:PANel:SAVE 1,"PANEL1" Save the test condition to the panel memory of panel No. 1 under the name "PANEL1".
NOTES:		Any status other than READY, it will result in an execution error. An execution error occurs when the test mode is withstand voltage test → insulation resistance test, insulation resistance test → withstand voltage test.

Query of panel memory storage status

Syntax	Query	:PANel:SAVE? <Panel No.>
		For withstand voltage test mode: <Panel No.> = 1 to 64 **For insulation resistance test mode:** <Panel No.> = 1 to 64 **For program test mode:** <Panel No.> = 1 to 30 **For BDV measurement mode:** <Panel No.> = 1 to 10
	Response	<1/0> --- <1/0> = 1:Saved, 0:Not saved
Description		Return the panel memory storage status of the specified panel No.
Example		:PANel:SAVE? 1 1 Panel memory for panel No. 1 has already been saved.
NOTES:		An execution error occurs when the test mode is withstand voltage test → insulation resistance test, insulation resistance test → withstand voltage test.

Query of the date and time of panel memory storage		
Syntax	Query	**:PANel:SAVE:DATE? <Panel No.>**
		For withstand voltage test mode: <Panel No.> = 1 to 64 **For insulation resistance test mode:** <Panel No.> = 1 to 64 **For program test mode:** <Panel No.> = 1 to 30 **For BDV measurement mode:** <Panel No.> = 1 to 10
	Response	<Year>,<Month>,<Day>,<Hour>,<Minute>,<Second>
		<Year> = 0 to 99 (NR1) <Month> = 1 to 12 (NR1) <Day> = 1 to 31 (NR1) <Hour> = 0 to 23 (NR1) <Minute> = 0 to 59 (NR1) <Second> = 0 to 59 (NR1)
Description	Return the date and time the panel memory of the specified panel No. is saved.	
Example	:PANel:SAVE:DATE? 1 20, 2,21,11,37,29 The date and time of the panel memory save for panel No. 1 is February 21, 2020, 11:37:29.	
NOTES:	An execution error occurs when the test mode is withstand voltage test → insulation resistance test, insulation resistance test → withstand voltage test. Specifying a panel No. that has not been saved will result in an execution error.	

Loading test conditions		
Syntax	Commands	**:PANel:LOAD <Panel No.>**
		For withstand voltage test mode: <Panel No.> = 1 to 64 **For insulation resistance test mode:** <Panel No.> = 1 to 64 **For program test mode:** <Panel No.> = 1 to 30 **For BDV measurement mode:** <Panel No.> = 1 to 10
Description	Load test conditions from the panel memory of the specified panel No.	
Example	:PANel:LOAD 1 Load test conditions from the panel memory of panel No. 1.	
NOTES:	Any status other than READY, it will result in an execution error. An execution error occurs when the test mode is withstand voltage test → insulation resistance test, insulation resistance test → withstand voltage test. Specifying a panel No. that has not been saved will result in an execution error.	

Query of panel name

Syntax	Query	**:PANel:NAME? <Panel No.>**
		For withstand voltage test mode: <Panel No.> = 1 to 64 **For insulation resistance test mode:** <Panel No.> = 1 to 64 **For program test mode:** <Panel No.> = 1 to 30 **For BDV measurement mode:** <Panel No.> = 1 to 10
	Response	<"Panel name">
		<"Panel name"> = (max. 10 characters)
Description		Return the panel name of the panel memory of the specified panel No.
Example		:PANel:NAME? 1 "PANEL1" The panel memory panel name for panel No. 1 is "PANEL1".
NOTES:		No header is attached to the response message. An execution error occurs when the test mode is withstand voltage test → insulation resistance test, insulation resistance test → withstand voltage test. Specifying a panel No. that has not been saved will result in an execution error.

Change panel name

Syntax	Commands	**:PANel:REName <Panel No.>,<"Panel name">**
		For withstand voltage test mode: <Panel No.> = 1 to 64 <"Panel name"> = (max. 10 characters) **For insulation resistance test mode:** <Panel No.> = 1 to 64 <"Panel name"> = (max. 10 characters) **For program test mode:** <Panel No.> = 1 to 30 <"Panel name"> = (max. 10 characters) **For BDV measurement mode:** <Panel No.> = 1 to 10 <"Panel name"> = (max. 10 characters)
Description		Change the panel name in the panel memory of the specified panel No.
Example		:PANel:REName 1,"PANEL_1" Change the panel name in the panel memory of panel No. 1 to "PANEL_1".
NOTES:		Any status other than READY, it will result in an execution error. An execution error occurs when the test mode is withstand voltage test → insulation resistance test, insulation resistance test → withstand voltage test. Specifying a panel No. that has not been saved will result in an execution error.

Delete panel memory		
Syntax	Commands	**:PANel:DELete \<Panel No./ALL\>**
		For withstand voltage test mode: \<Panel No./ ALL\> = 1 to 64, ALL: All panels **For insulation resistance test mode:** \<Panel No./ ALL\> = 1 to 64, ALL: All panels **For program test mode:** \<Panel No./ ALL\> = 1 to 30, ALL: All panels **For BDV measurement mode:** \<Panel No./ ALL\> = 1 to 10, ALL: All panels
Description	Delete the panel name in the panel memory of the specified panel No.	
Example	:PANel:DELete 1 Delete the panel memory of panel No. 1.	
NOTES:	Any status other than READY, it will result in an execution error. An execution error occurs when the test mode is withstand voltage test → insulation resistance test, insulation resistance test → withstand voltage test. Specifying a panel No. that has not been saved will result in an execution error.	

Query of panel No. of stored panel memory		
Syntax	Query	**:PANel:LIST?**
	Response	\<Panel No. list\>
Description		
	Return the list of panel No. In the saved panel memory, separated by comma (,).	
Example	:PANel:LIST? 1, 2, 3, 4 Saved panel memories are panel No. 1, 2, 3, and 4.	
NOTES:	No header is attached to the response message. If the number of saved panel memories is 0, 0 is returned. An execution error occurs when the test mode is withstand voltage test → insulation resistance test, insulation resistance test → withstand voltage test.	

Data Memory

Query of test results stored in data memory

Syntax	Query	:MEMory:FETCh?
	Response	<Test mode>,<Test start date and time>,<Voltage measured value>,<Current measured value>,<Resistance measured value>,<Measurement range>,<Remaining test time>,<Judgment result>,<Timer type>
		<Test mode>=W: withstand voltage test, IR: insulation resistance test <Test start date and time> = YYYYY-MM-DD HH:MM:SS (YYYYY:year, MM:month, DD:day, HH:hour, MM:minute, SS:second) <Voltage measured value> = [V] (NR3) <Current measured value> = [A] (NR3) <Resistance measured value> = [Ω] (NR3) <Measurement range> = Withstand voltage test mode : 300uA, 3mA, 20mA, NONE (no measured value) / Insulation resistance test mode : 1Mohm, 10Mohm, 100Mohm, 1Gohm, 10Gohm, 100Gohm, NONE (no measured value) <Remaining test time> = [s] (NR2) <Judgment result> = PASS:PASS, UFAIL:UPPER FAIL, LFAIL:LOWER FAIL, ULFAIL:UPPER LOWER FAIL, OFF:Other <Timer type> = 0: Test time, 1: Voltage rise time (NR1)

Description	Return the test results stored in data memory. If there is more than one test result, each result is separated by a message terminator.
Example	:MEMory:FETCh? W,2020-03-13 15:55:36, 1.000E+03, 2.000E-03, 0.000E+00,3mA, 30.0,PASS,0 W,2020-03-13 15:55:46, 1.000E+03, 2.010E-03, 0.000E+00,3mA, 30.1,PASS,0 Return the test results stored in data memory.
NOTES:	No header is attached to the response message. Executing this command clears the contents of the data memory. Once the data memory is full, no further test results will be stored. To save a new test result, read the contents of the data memory with this command or delete the contents of the data memory by executing the :MEMory:CLEar command. Any status other than READY, it will result in an execution error. When the test mode is BDV measurement, an execution error occurs. If the test results are not stored in data memory, an execution error occurs.

Save test results stored in data memory

Syntax	Commands	:MEMory:SAVE <"File name">
		<"File name"> = (max. 251 characters)

Description	Save the test results stored in data memory to a USB memory device by specifying a file name. The file name extension does not need to be specified. If the beginning of the file name is not a slash (/), a slash is added to the beginning. At this time, please specify up to 250 characters.
Example	:MEMory:SAVE "/MEMORY/DATA1" Save the test results stored in the data memory to a USB flash device with the file name "/MEMORY/DATA1".
NOTES:	If you do not specify a slash (/) at the beginning of the file name, please specify the file name within 250 characters. Executing this command clears the contents of the data memory. Any status other than READY, it will result in an execution error. When the test mode is BDV measurement, an execution error occurs. If the test results are not stored in data memory, an execution error occurs. If the USB flash device is not connected, an execution error will occur.

Query of test results stored in data memory

Syntax	Query	**:MEMory:COUNt?**
	Response	<Number of data>
		<Number of data> = 0 to 32000 (NR1)
Description	Return the test results stored in data memory.	
Example	:MEMory:COUNt? 2 The number of test results stored in data memory is 2.	
NOTES:	When the test mode is BDV measurement, an execution error occurs.	

Setting for data memory function

Syntax	Commands	**:MEMory:CONTrol <1/0/ON/OFF>**
		<1/0/ON/OFF> = 1/ON: Save test results in data memory, 0/OFF: Do not save test results in data memory
Description	Set the data memory function.	
Example	:MEMory:CONTrol 1 Set the test results to be stored in data memory.	
NOTES:	Any status other than READY, it will result in an execution error. When the test mode is BDV measurement, an execution error occurs.	

Query of data memory function

Syntax	Query	**:MEMory:CONTrol?**
	Response	<1/0>
		<1/0> = 1: Save test results in data memory, 0: Do not save test results in data memory
Description	Return the data memory function setting.	
Example	:MEMory:CONTrol? 1 It is set to store test results in data memory.	
NOTES:	When the test mode is BDV measurement, an execution error occurs.	

Delete data memory

Syntax	Commands	**:MEMory:CLEar**
Description	Delete all test results stored in data memory.	
Example	:MEMory:CLEar Delete all test results stored in data memory.	
NOTES:	Any status other than READY, it will result in an execution error. When the test mode is BDV measurement, an execution error occurs.	

EXT. I/O

Query of NPN/PNP switch status

Syntax	Query	**:IO:MODE?**
	Response	<Switch status>
		<Switch status> = NPN/PNP
Description		Return the status of the NPN/PNP switch on the back of the unit.
Example		:IO:MODE? NPN The switch is set to NPN.

Output of versatile output terminal

Syntax	Commands	**:IO:OUTPut <Terminal>,<Data>**
		<Terminal>> = OUT0/OUT1 <Data> = 0 to 1 (NR1)
Description		Output data to the versatile output terminal.
Example		:IO:OUTPut OUT0,1 Output 1 to the versatile output terminal OUT0.

Setting for judgment signal output timing for withstand voltage test

Syntax	Commands	**:IO:WITHstand:JUDGe:TIMing <MEASure/TEST>**
		<MEASure/TEST> = MEASure: Output ON when test is completed and test voltage is OFF, TEST: Output ON when test is completed
Description		Set the output timing of the judgment result of the withstand voltage test.
Example		:IO:WITHstand:JUDGe:TIMing TEST Set the output timing of the judgment result of the withstand voltage test to output ON when the test is completed.
NOTES:		Any status other than READY, it will result in an execution error. If the contact check function is set to perform contact check, setting output ON when the test is completed will result in an execution error.

Query of judgment signal output timing for withstand voltage test

Syntax	Query	**:IO:WITHstand:JUDGe:TIMing?**
	Response	<MEASURE/TEST>
		<MEASURE/TEST> = MEASURE: Output ON when test is completed and test voltage is OFF, TEST: Output ON when test is completed
Description		Return the output timing setting of the judgment result of the withstand voltage test.
Example		:IO:WITHstand:JUDGe:TIMing? TEST The output timing of the judgment result of the withstand voltage test is set to output ON when the test is completed.

Setting for the output timing of the judgment signal for the insulation resistance test

Syntax	Commands	**:IO:INSulation:JUDGe:TIMing \<MEASure/TEST\>**
		\<MEASure/TEST\> = MEASure: Output ON when test is completed and test voltage is OFF, TEST: Output ON when test is completed
Description		Set the output timing of the judgment result of the insulation resistance test.
Example		:IO:INSulation:JUDGe:TIMing TEST Set the output timing of the judgment result of the insulation resistance test to output ON when the test is completed.
NOTES:		Any status other than READY, it will result in an execution error. If the contact check function is set to perform contact check, setting output ON when the test is completed will result in an execution error.

Query of the output timing of the judgment signal for the insulation resistance test

Syntax	Query	**:IO:INSulation:JUDGe:TIMing?**
	Response	\<MEASURE/TEST\>
		\<MEASURE/TEST\> = MEASURE: Output ON when test is completed and test voltage is OFF, TEST: Output ON when test is completed
Description		Return the setting of the output timing of the judgment result of the insulation resistance test.
Example		:IO:INSulation:JUDGe:TIMing? TEST The output timing of the judgment result of the insulation resistance test is set to output ON when the test is completed.

Setting for TEST signal output timing

Syntax	Commands	**:IO:TEST:SIGNal \<PROBe/TEST/RISE/MEASure\>**
		\<PROBe/TEST/RISE/MEASure\> = PROBe: Output ON from test start until test voltage turns OFF, TEST: Output ON during test time, RISE: Output ON from test start until test voltage is reached, MEASure: Output ON from test start until judgment output turns OFF
Description		Set the output timing of the TEST signal of EXT. I/O.
Example		:IO:TEST:SIGNal MEASure Set the output timing of the TEST signal of EXT. I/O to output ON from the start of the test until the judgment output is turned OFF.
NOTES:		Any status other than READY, it will result in an execution error.

Query of TEST signal output timing

Syntax	Query	**:IO:TEST:SIGNal?**
	Response	\<PROBE/TEST/RISE/MEASURE\>
		\<PROBE/TEST/RISE/MEASURE\> = PROBE: Output ON from test start until test voltage turns OFF, TEST: Output ON during test time, RISE: Output ON from test start until test voltage is reached, MEASURE: Output ON from test start until judgment output turns OFF
Description		Return the output timing setting of the TEST signal of EXT. I/O.
Example		:IO:TEST:SIGNal? MEASURE The output timing of the TEST signal of EXT. I/O is set to output ON from the start of the test until the judgment output is turned OFF.

System

Buzzer volume setting for PASS judgment

Syntax	Commands	**:SYSTem:BEEPer:VOLume:PASS <Volume/OFF>**
		<Volume/OFF> = 1 to 5 (NR1), OFF: No buzzer sound
Description	Set the volume of the buzzer at the time of PASS judgment.	
Example	:SYSTem:BEEPer:VOLume:PASS 2 Set the buzzer volume at the time of PASS judgment to 2.	

Query of buzzer volume setting for PASS judgment

Syntax	Query	**:SYSTem:BEEPer:VOLume:PASS?**
	Response	<Volume/OFF>
		<Volume/OFF> = 1 to 5 (NR1), OFF: No buzzer sound
Description	Return the buzzer volume setting for the PASS judgment.	
Example	SYSTem:BEEPer:VOLume:PASS? 2 The buzzer volume at the time of PASS judgment is set to 2.	

Buzzer volume setting for FAIL judgment

Syntax	Commands	**:SYSTem:BEEPer:VOLume:FAIL <Volume/OFF>**
		<Volume/OFF> = 1 to 5 (NR1), OFF: No buzzer sound
Description	Set the volume of the buzzer at the time of FAIL judgment.	
Example	:SYSTem:BEEPer:VOLume:FAIL 2 Set the buzzer volume at the time of FAIL judgment to 2.	

Query of buzzer volume setting for FAIL judgment

Syntax	Query	**:SYSTem:BEEPer:VOLume:FAIL?**
	Response	<Volume/OFF>
		<Volume/OFF> = 1 to 5 (NR1), OFF: No buzzer sound
Description	Return the buzzer volume setting for the FAIL judgment.	
Example	:SYSTem:BEEPer:VOLume:FAIL? 2 The buzzer volume at the time of FAIL judgment is set to 2.	

Momentary out function setting

Syntax	Commands	**:SYSTem:MOMentary:OUT <1/0/ON/OFF>**
		<1/0/ON/OFF> = 1/ON: Enable momentary output function, 0/OFF: Disable momentary output function
Description	Set the momentary out function.	
Example	:SYSTem:MOMentary:OUT 1 Set the momentary out function to Enabled.	

Momentary out function query

Syntax	Query	**:SYSTem:MOMentary:OUT?**
	Response	<1/0>
		<1/0> = 1: Momentary out function enabled, 0: Momentary out function disabled
Description	Return the momentary out function setting.	
Example	:SYSTem:MOMentary:OUT? 1 The momentary out function is set to enable.	

Perform key lock

Syntax	Commands	**:SYSTem:KEYLock**
Description	Set the key lock status.	
Example	:SYSTem:KEYLock Set the key lock status.	

Key lock status query

Syntax	Query	**:SYSTem:KEYLock?**
	Response	<1/0>
		<1/0> = 1: Key locked, 0: Not key locked
Description	Return the status of the key lock.	
Example	:SYSTem:KEYLock? 1 Key locked	

Key lock passcode setting

Syntax	Commands	**:SYSTem:KEYLock:PASScode <"Passcode"/None>**
		<"Passcode"> = 0 to 9 (max. 4 characters)
Description	Set the passcode for the key lock. If you omit the passcode, it will be set to no passcode. The factory passcode is set to"0000."	
Example	:SYSTem:KEYLock:PASScode "5680" Set the key lock passcode to "5680."	
NOTES:	The following cases will result in an execution error. ・When the key is locked. ・When the passcode contains invalid characters (such as alphabetic characters, spaces, slashes, etc.). ・When the passcode exceeds 4 characters.	

Unlocking the key lock

Syntax	Commands	**:SYSTem:KEYLock:UNLock <"Passcode"/None>**
		<"Passcode"> = 0 to 9 (max. 4 characters)
Description	Unlock the key lock. If a passcode is set, specify the passcode in the command data. The factory passcode is set to "0000."	
Example	:SYSTem:KEYLock:UNLock "5680" Specify the passcode "5680" to unlock the key lock.	
NOTES:	The following cases will result in an execution error. ・When the key is locked. ・When the passcode contains invalid characters (such as alphabetic characters, spaces, slashes, etc.). ・When the passcode exceeds 4 characters. ・When the passcode is wrong. If you forget the passcode, do a full reset and return to factory setting.	

Release of remote status

Syntax	Commands	**:SYSTem:LOCal**
Description	The remote state is released and the local state is set.	
Example	:SYSTem:LOCal The remote state is released and the local state is set.	

Setting for calibration due date

Syntax	Commands	**:SYSTem:CALibration:PERiod <Year>,<Month>,<Day>**
		<Year> = 0 to 99 (NR1) <Month> = 1 to 12 (NR1) <Day> = 1 to 31 (NR1)
Description		Set the calibration due date.
Example		:SYSTem:CALibration:PERiod 20,2,21 Set the calibration deadline to February 21, 2020.
NOTES:		Dates can range from January 1, 2000 to December 31, 2099. Therefore, the first two digits of the year are fixed at "20" and the last two digits of the year are set at "year." If a non-existent date is specified, an execution error will occur.

Query of calibration due date

Syntax	Query	**:SYSTem:CALibration:PERiod?**
	Response	<Year>,<Month>,<Day>
		<Year> = 0 to 99 (NR1) <Month> = 1 to 12 (NR1) <Day> = 1 to 31 (NR1)
Description		Return the calibration due date setting.
Example		:SYSTem:CALibration:PERiod? 20, 2,21 The calibration due date is set for February 21, 2020.

Setting for calibration due date check function

Syntax	Commands	**:SYSTem:CALibration:PERiod:CHECk <1/0/ON/OFF>**
		<1/0/ON/OFF> = 1/ON: Enable calibration due date check function, 0/OFF: Disable calibration due date check function
Description		Set the calibration due date check function.
Example		:SYSTem:CALibration:PERiod:CHECk 1 Set the calibration due date check function to Enabled.

Query of calibration due date check function

Syntax	Query	**:SYSTem:CALibration:PERiod:CHECk?**
	Response	<1/0>
		<1/0> = 1: Calibration due date check function enabled, 0: Calibration due date check function disabled
Description		Return the calibration due date check function setting.
Example		:SYSTem:CALibration:PERiod:CHECk? 1 The calibration due date check function is set to enable.

Setting for measurement speed

Syntax	Commands	**:SYSTem:MEASure:SPEed <NORMal/FAST/FAST2>**
		<NORMal/FAST/FAST2> = NORMal:100 ms, FAST:20 ms, FAST2:10ms
Description		Set the measurement speed of withstand voltage test mode, insulation resistance test mode, BDV measurement mode. If the measurement speed is FAST or FAST2, screen update stops during measurement.
Example		:SYSTem:MEASure:SPEed NORMal Set the measurement speed to 100 ms.
NOTES:		Any status other than READY, it will result in an execution error. Changing the settings clears trend and waveform data. If the measurement speed is FAST or FAST2, command monitor will not available. If the measurement speed is FAST or FAST2, number of decimal places of elapsed test time and remaining test time will be 2 in query response, memory data storage, and test result storage.

Query of measurement speed

Syntax	Query	**:SYSTem:MEASure:SPEed?**
	Response	<NORMAL/FAST/FAST2>
		<NORMAL/FAST/FAST2> = NORMAL:100 ms, FAST:20 ms, FAST2:10ms
Description		Return the measurement speed.
Example		:SYSTem:MEASure:SPEed? NORMAL The measurement speed is set to 100 ms.

Setting for length of waveform

Syntax	Commands	**:SYSTem:WAVeform:LENGth <Length>**
		<Length> = 0.5/1/2/4/8/16/32/64/128 [s]
Description		Set the length of waveform.
Example		:SYSTem:WAVeform:LENGth 0.5 Set the length of waveform to 0.5 s.
NOTES:		Any status other than READY, it will result in an execution error. Changing the settings clears trend and waveform data.

Query of length of waveform

Syntax	Query	**:SYSTem:WAVeform:LENGth?**
	Response	<Length>
		<Length> = 0.5/1/2/4/8/16/32/64/128 [s]
Description		Return the length of waveform.
Example		:SYSTem:WAVeform:LENGth? 0.5 The length of waveform is set to 0.5 s.

Query of cooldown time

Syntax	Query	**:SYSTem:COOLdown:TIME?**
	Response	<Cooldown time>
		<Cooldown time> = 0.0 ～ 2880.0 [s] (NR2)
Description		Return the remaining cooldown time limited by time rating.
Example		:SYSTem:COOLdown:TIME? 1.0 The remaining cooldown time is 1.0 s.

Setting for date

Syntax	Commands	:SYSTem:DATE <Year>,<Month>,<Day>
		<Year> = 0 to 99 (NR1) <Month> = 1 to 12 (NR1) <Day> = 1 to 31 (NR1)
Description		Set the date. The date is backed up by a rechargeable battery inside the instrument.
Example		:SYSTem:DATE 20,2,21 Set the date to February 21, 2020.
NOTES:		Dates can range from January 1, 2000 to December 31, 2099. Therefore, the first two digits of the year are fixed at "20" and the last two digits of the year are set at "year." If a non-existent date is specified, an execution error will occur.

Query of date

Syntax	Query	:SYSTem:DATE?
	Response	<Year>,<Month>,<Day>
		<Year> = 0 to 99 (NR1) <Month> = 1 to 12 (NR1) <Day> = 1 to 31 (NR1)
Description		Return the date. The date is backed up by a rechargeable battery inside the instrument.
Example		:SYSTem:DATE? 20, 2,21 The date is February 21, 2020.

Setting for time

Syntax	Commands	:SYSTem:TIME <Hour>,<Minute>,<Second>
		<Hour> = 0 to 23 (NR1) <Minute> = 0 to 59 (NR1) <Second> = 0 to 59 (NR1)
Description		Set the time. The time is backed up by a rechargeable battery inside the instrument.
Example		:SYSTem:TIME 11,37,15 Set the time to 11:37:15.

Query of time

Syntax	Query	:SYSTem:TIME?
	Response	<Hour>,<Minute>,<Second>
		<Hour> = 0 to 23 (NR1) <Minute> = 0 to 59 (NR1) <Second> = 0 to 59 (NR1)
Description		Return the time. The time is backed up by a rechargeable battery inside the instrument.
Example		:SYSTem:TIME? 11,37,29 The time is 11:37:29.

Query of serial number		
Syntax	Query	**:SYSTem:SERialno?**
	Response	\<Serial number\>
Description	Return the serial number.	
Example	:SYSTem:SERialno? 123456789 The serial number is 123456789.	

Initialization of equipment		
Syntax	Commands	**:SYSTem:RESet**
Description	Set this instrument to the initialize setting. Communication interface settings are not initialized. See "Initialization items list" (p. 122)	
Example	:SYSTem:RESet Performs initialization of the instrument.	
NOTES:	TEST or corrected measurement status results in an execution error.	

Query of error and clear error		
Syntax	Query	**:SYSTem:ERRor?**
	Response	<Error No.>,<"Error message">
		<Error No.> = (NR1) <"Error message"> = (enclosed in double quotes)
Description	If an error has occurred, it returns an error and clears the error. If an error occurs, the ERR bit (bit 2) in the Status Byte Register (STB) is set to 1 until it is read by this command or *CLS command is executed. However, it is not cleared in the event of a device error. If an error has occurred, an error No. and error message are returned. If no error occurs, error No. 0 and the message "No error" are returned. Response List 0,"No error" -100,"Command error" -102,"Syntax error" -200,"Execution error" -220,"Parameter error" -313,"Backup lost" -315,"Setting backup lost" -330,"Self-test failed" -335,"ADJUST FAILED" -341,"PANEL LOAD FAILED" -342,"TIME SETTING ERROR" -343,"JUDGE SETTING ERROR" -344,"DELAY SETTING ERROR" -345,"VOLTAGE LIMIT ERROR" -346,"POWER OVER ERROR" -347,"CONTACT SETTING ERR" -348,"HARDWARE ERROR" -349,"HARDWARE ERROR" -350,"DOUBLE ACTION" -351,"COOLING DOWN" -360,"Communication error" -361,"Rs232c Parity error" -362,"Rs232c Framing error" -363,"Rs232c overrun" -365,"Time out error" -370,"Module backup failed" -371,"Bad Slot/Ch" -372,"Module backup failed" -373,"INTERLOCK STATE" -374,"REMOTE CONNECTER" -375,"GROUND FAULT" -377,"SUPPLY VOLTAGE FREQ ERROR" -378,"POWER TEMP ERROR" -379,"SUPPLY VOLTAGE ERROR" -380,"HIGHLOAD POWER OUTAGE" -381,"OVERLOAD POWER OUTAGE" -382,"OUTPUT TIME LIMIT" -383,"POWER SYSTEM ERROR" -384,"UNKNOWN DEVICE" -386,"POWER SUPPLY ERROR" -388,"FAN ERROR" -389,"LED ERROR" -390,"POWER SUPPLY ERROR" -391,"STOP OR INTERLOCK ERROR" -400,"Query error"
Example		:SYSTem:ERRor? -100,"Command error" A command error has occurred.

Query of SCPI version

Syntax	Query	**:SYSTem:VERSion?**
	Response	\<SCPI version\>
Description		Return the version of SCPI with which this instrument complies.
Example		:SYSTem:VERSion? 1990.0 The SCPI version with which this instrument complies is 1990.0.

Query of FPGA version No.

Syntax	Query	**:SYSTem:FPGA? \<Type/None\>**
		\<Type/None\> = MAIN:Main FPGA, SUB:Sub FPGA, None:Main FPGA
	Response	\<FPGA version No.\>
Description		Return the FPGA version No. of this instrument.
Example		:SYSTem:FPGA? MAIN A1234567 The version No. of the main FPGA of this instrument is A1234567.

Initialization of equipment

Syntax	Commands	**:PRESet**
Description		Set this instrument to the initialize setting. Panel memory and communication interface settings are not initialized. See "Initialization items list" (p. 122)
Example		:PRESet Performs initialization of the instrument.
NOTES:		TEST or corrected measurement status results in an execution error.

Run

Start of test

Syntax	Commands	**:STARt**
Description	Start the test. When in the interval state of withstand voltage test → insulation resistance test, insulation resistance test → withstand voltage test, and programmed test, proceed to the next stage.	
Example	:STARt Start the test.	
NOTES:	Any condition other than READY or interval will result in an execution error. If the momentary out function is set to be enabled, an execution error will occur.	

Forced termination of test, forced termination of correction measurement

Syntax	Commands	**:STOP**
Description	Force termination of test or correction measurement when in TEST state.	
Example	:STOP Force termination of the test.	

Equipment state query

Syntax	Query	**:STATe?**
	Response	<State>
		<State> = WPASS: Withstand voltage test READY state (PASS), IPASS: Insulation resistance test READY state (PASS), WUFAIL: Withstand voltage test READY state (UPPER FAIL), IUFAIL: Insulation resistance test READY state (UPPER FAIL), WLFAIL: Withstand voltage test READY state (LOWER FAIL), ILFAIL: Insulation resistance test READY state (LOWER FAIL), WULFAIL: Withstanding voltage test READY state (UPPER LOWER FAIL), IULFAIL: Insulation resistance test READY state (UPPER LOWER FAIL), WREADY: Withstanding voltage test READY state (not measured), IREADY: Insulation resistance test READY state (not measured), BDVREADY: BDV measurement READY state, WTEST: Withstanding voltage test TEST state or withstand voltage test compesation measurement state, ITEST: Insulation resistance test TEST state or insulation resistance test compesation measurement state, BDVTEST: BDV measurement TEST state, INTERVAL: Interval state, PROTECTION: Protection state, NULL: Other
Description	Return the state of the equipment.	
Example	:STATe? WREADY RREADY state (unmeasured) of withstand voltage test.	

Start of correction measurement

Syntax	Commands	**:STARt:CORRection**
Description	Start correction measurement. When in the interval state of the compensatio measurement of the programmed test, proceed to the next step.	
Example	:STARt:CORRection Start correction measurement.	
NOTES:	Any condition other than READY or interval will result in an execution error. If the momentary out function is set to be enabled, an execution error will occur. An execution error occurs when the test mode is withstand voltage test → insulation resistance test, insulation resistance test → withstand voltage test, BDV measurement.	

Measured Value Output

Query of the test results of withstand voltage test

Syntax	Query	**:FETCh:RESult:WITHstand? <bit value/None>**
		<bit value/None> = bit value:1 to 1023 (NR1), None:Set bit value to 1023
	Response	**Response with specified items separated by comma.** <Test mode>,<Test start date and time>,<Test frequency>,<Voltage measured value>,<Current measured value>,<Resistance measured value>,<Measurement range>,<Remaining test time>,<Judgment result>,<Timer type>
		<Test mode>=W: withstand voltage test <Test start date and time> = YYYYY-MM-DD HH:MM:SS (YYYYY:year, MM:month, DD:day, HH:hour, MM:minute, SS:second) <Test frequency> = DC <Voltage measured value> = [V] (NR3) <Current measured value> = [A] (NR3) <Resistance measured value> = [Ω] (NR3) <Measurement range> = 300uA, 3mA, 20mA, NONE (no measured value) <Remaining test time> = [s] (NR2) <Judgment result> = PASS:PASS, UFAIL:UPPER FAIL, LFAIL:LOWER FAIL, ULFAIL:UPPER LOWER FAIL, OFF:Other <Timer type> = 0: Test time, 1: Voltage rise time (NR1)
Description		Return the test results of the withstand voltage test.

512	256	128	64	32
bit 9	bit 8	bit 7	bit 6	bit 5
Timer type	Judgment result	Remaining test time	Measurement range	Resistance measured value

16	8	4	2	1
bit 4	bit 3	bit 2	bit 1	bit 0
Current measured value	Voltage measured value	Test frequency	Test start date and time	Test mode

Example	:FETCh:RESult:WITHstand? W,2020-03-13 15:55:36,DC , 1.000E+03, 2.000E-03, 0.000E+00,3mA, 30.0,PASS,0 The test start date and time is 2020-03-13 15:55:36, the test frequency is DC, the voltage measurement is 1000 V, the current measurement is 2.000 mA, the measurement range is 3 mA, the remaining test time is 30.0 s, the judgment result is PASS, the timer type is test time.
NOTES:	No header is attached to the response message. Any condition other than READY, interval will result in an execution error. An execution error occurs when the test mode is insulation resistance test, programmed test, BDV measurement. If the immediately preceding test is not a withstand voltage test, withstand voltage test → insulation resistance test or insulation resistance test → withstand voltage test, an execution error occurs.

Query of the test results of insulation resistance test

Syntax	Query	**:FETCh:RESult:INSulation? <bit value/None>**
		<bit value/None> = bit value:1 to 1023 (NR1), None:Set bit value to 1007
	Response	**Response with specified items separated by comma.** <Test mode>,<Test start date and time>,<Voltage measured value>, <Resistance measured value>,<Measurement range>,<Remaining test time>, <Judgment result>,<Timer type>
		<Test mode>= IR: insulation resistance test <Test start date and time> = YYYYY-MM-DD HH:MM:SS (YYYYY:year, MM:month, DD:day, HH:hour, MM:minute, SS:second) <Voltage measured value> = [V] (NR3) <Current measured value> = [A] (NR3) <Resistance measured value> = [Ω] (NR3) <Measurement range> = 1Mohm, 10Mohm, 100Mohm, 1Gohm, 10Gohm, 100Gohm, NONE (no measurements) <Remaining test time> = [s] (NR2) <Judgment result> = PASS:PASS, UFAIL:UPPER FAIL, LFAIL:LOWER FAIL, ULFAIL:UPPER LOWER FAIL, OFF:Other <Timer type> = 0: Test time, 1: Voltage rise time (NR1)

Description

Return the test results of the insulation resistance test.

512	256	128	64	32
bit 9	bit 8	bit 7	bit 6	bit 5
Timer type	Judgment result	Remaining test time	Measurement range	Resistance measured value

16	8	4	2	1
bit 4	bit 3	bit 2	bit 1	bit 0
Current measured value	Voltage measured value	-	Test start date and time	Test mode

Example

:FETCh:RESult:INSulation?
IR,2020-03-13 15:55:36, 5.000E+02, 1.000E+08,100Mohm,   10.0,PASS,0
The test start date and time is 2020-03-13 15:55:36, the voltage measurement is 500 V,
the resistance measurement is 100.0 MΩ, the measurement range is 100Mohm, the
remaining test time is 10.0 s, the judgment result is PASS, and the timer type is test time.

NOTES:

No header is attached to the response message.
Any condition other than READY, interval will result in an execution error.
An execution error occurs when the test mode is withstand voltage test, program test, BDV
measurement.
If the immediately preceding test is not an insulation resistance test, a withstand voltage test
→ insulation resistance test or an insulation resistance test → withstand voltage test, an
execution error occurs.
Bit 2 is not used. Specifying only bit 2 results in an execution error.

Query of the test results for program test		
Syntax	Query	**:FETCh:RESult:PROGram?**
	Response	<Test results>
		<Test results> = PASS:PASS, FAIL:FAIL
Description	Return the test results of the program test.	
Example	:FETCh:RESult:PROGram? FAIL The test result of the program test is FAIL.	
NOTES:	No header is attached to the response message. Any status other than READY, it will result in an execution error. When the test mode is other than program test, an execution error occurs. If the immediately preceding test is not a program test, an execution error occurs.	

Query the number of steps to be tested in the program test		
Syntax	Query	**:FETCh:RESult:PROGram:STEP:COUNt?**
	Response	<Number of steps>
		<Number of steps> = 1 to 50 (NR1)
Description	Return the number of steps in which the program test was conducted.	
Example	:FETCh:RESult:PROGram:STEP:COUNt? 5 The number of steps to be tested in the program test is 5.	
NOTES:	No header is attached to the response message. Any status other than READY, it will result in an execution error. When the test mode is other than program test, an execution error occurs. If the immediately preceding test is not a program test, an execution error occurs.	

Query of the test results for each step of the program test		
Syntax	Query	**:FETCh:RESult:PROGram:STEP? <Step No.>,<bit value/None>**
		<Step No.> = 1 to 50 (NR1) <bit value> = 1 to 1023 (NR1) <None> = **If the specified step is a withstand voltage test:** Set bit value to 1023. **If the specified step is an insulation resistance test:** Set bit value to 1007.
	Response	**Response with specified items separated by comma.** **If the specified step is a withstand voltage test:** <Test mode>,<Test start date and time>, <Test frequency>, <Voltage measured value>,<Current measured value>,<Resistance measured value>, <Measurement range>,<Remaining test time>,<Judgment result>,<Timer type> **If the specified step is an insulation resistance test:** <Test mode>,<Test start date and time>,<Voltage measured value>,<Current measured value>, <Resistance measured value>,<Measurement range>, <Remaining test time>,<Judgment result>,<Timer type>
		<Test mode> = W:withstand voltage test, IR:insulation resistance test <Test start date and time> = YYYYY-MM-DD HH:MM:SS (YYYYY:year, MM:month, DD:day, HH:hour, MM:minute, SS:second) <Test frequency> = DC (**If the specified step is a withstand voltage test**) <Voltage measured value> = [V] (NR3) <Current measured value> = [A] (NR3) <Resistance measured value> = [Ω] (NR3) <Measurement range> = **If the specified step is a withstand voltage test:** 300uA, 3mA, 20mA, NONE (no measured value) **If the specified step is an insulation resistance test:** 1Mohm, 10Mohm, 100Mohm, 1Gohm, 10Gohm, 100Gohm, NONE (no measurements) <Remaining test time> = [s] (NR2) <Judgment result> = PASS:PASS, UFAIL:UPPER FAIL, LFAIL:LOWER FAIL, ULFAIL:UPPER LOWER FAIL, OFF:Other <Timer type> = 0: Test time, 1: Voltage rise time (NR1)
Description	Return the step-by-step test results of the program test.	

512	256	128	64	32
bit 9	bit 8	bit 7	bit 6	bit 5
Timer type	Judgment result	Remaining test time	Measurement range	Resistance measured value

16	8	4	2	1
bit 4	bit 3	bit 2	bit 1	bit 0
Current measured value	Voltage measured value	Test frequency	Test start date and time	Test mode

Example	:FETCh:RESult:PROGram:STEP? 3 IR,2020-03-13 15:55:36, 5.000E+02, 1.000E+08,100Mohm, 10.0,PASS,0 Step No. 3 is an insulation resistance test, the test start date and time is 2020-03-13 15:55:36, the voltage measurement is 500 V, the resistance measurement is 100.0 MΩ, the measurement range is 100Mohm, the remaining test time is 10.0 s, the judgment result is PASS, and the timer type is test time.
NOTES:	No header is attached to the response message. Any condition other than READY, interval will result in an execution error. When the test mode is other than program test, an execution error occurs. If the immediately preceding test is not a program test, an execution error occurs. If the specified step is an insulation resistance test, bit 2 is not used. Specifying only bit 2 results in an execution error.

Query of the test results of BDV measurement		
Syntax	Query	**:FETCh:RESult:BDV? <bit value/None>**
		<bit value/None> = bit value:1 to 1023 (NR1), None:Set bit value to 1023
	Response	<Test mode>,<Test method>,<Test start date and time>,<Median breakdown voltage>,<Dielectric breakdown voltage average>,<Breakdown voltage standard deviation>,<Median dielectric breakdown strength>,<Dielectric breakdown strength average>,<Dielectric breakdown strength standard deviation>,<Elapsed test time>
		<Test mode> = BDV: BDV measurement <Test method> = RATE: Continuous step-up voltage test, STEP: Step-up voltage test <Test start date and time> = YYYYY-MM-DD HH:MM:SS (YYYYY:year, MM:month, DD:day, HH:hour, MM:minute, SS:second) <Median breakdown voltage> = [V] (NR1) <Dielectric breakdown voltage average> = [V] (NR1) <Breakdown voltage standard deviation> = [V] (NR2) <Median dielectric breakdown strength> = [kV/mm] (NR2) <Dielectric breakdown strength average> = [kV/mm] (NR2) <Dielectric breakdown strength standard deviation> = [V/mm] (NR2) <Elapsed test time> = [s] (NR2)
Description		Return the test results of the BDV measurement.

512	256	128	64	32
bit 9	bit 8	bit 7	bit 6	bit 5
Elapsed test time	Dielectric breakdown strength standard deviation	Dielectric breakdown strength average	Median dielectric breakdown strength	Breakdown voltage standard deviation

16	8	4	2	1
bit 4	bit 3	bit 2	bit 1	bit 0
Dielectric breakdown voltage average	Median breakdown voltage	Test start date and time	Test method	Test mode

Example	:FETCh:RESult:BDV? BDV,RATE,2020-03-13 15:55:36, 38, 38, 0.471, 3.800, 3.767, 47.140, 3.1 The test start date and time is 2020-03-13 15:55:36, the median breakdown voltage is 38 V, the dielectric breakdown voltage average is 38 V, the breakdown voltage standard deviation is 0.471 V, the median dielectric breakdown strength is 3.800 kV/mm, the dielectric breakdown strength average is 3.767 kV/mm, the dielectric breakdown strength standard deviation is 47.140 V/mm, and the elapsed test time is 3.1 s.
NOTES:	No header is attached to the response message. Any status other than READY, it will result in an execution error. When the test mode is other than BDV measurement, an execution error occurs. If the immediately preceding test is not a BDV measurement, an execution error occurs.

Query the number of test runs for BDV measurement

Syntax	Query	**:FETCh:RESult:BDV:TEST:COUNt?**
	Response	<Number of tests>
		<Number of tests> = 1 to 20 (NR1)
Description		Return the number of times the BDV measurement has been tested.
Example		:FETCh:RESult:BDV:TEST:COUNt? 5 The number of tests performed for BDV measurement is 5.
NOTES:		No header is attached to the response message. Any status other than READY, it will result in an execution error. When the test mode is other than BDV measurement, an execution error occurs. If the immediately preceding test is not a BDV measurement, an execution error occurs.

Query of the test results for each test of BDV measurement

Syntax	Query	**:FETCh:RESult:BDV:TEST? <Test No.>**
		<Test No.> = 1 to 20 (NR1)
	Response	<Current measured value>,<Elapsed test time>,<Breakdown Voltage>,<Dielectric breakdown strength>
		<Current measured value> = [A] (NR3) <Elapsed test time> = [s] (NR2) <Breakdown Voltage> = [V] (NR1) <Dielectric breakdown strength> = [kV/mm] (NR2)
Description		Return the test result for each test of the BDV measurement.
Example		:FETCh:RESult:BDV:TEST? 5 2.000E-03, 3.1, 38, 3.800 Test No. 5 has the measured current value of 2.000 mA, the test elapsed time of 3.1 s, the breakdown voltage of 38 V, and the breakdown strength of 3.800 kV/mm.
NOTES:		No header is attached to the response message. Any status other than READY, it will result in an execution error. When the test mode is other than BDV measurement, an execution error occurs. If the immediately preceding test is not a BDV measurement, an execution error occurs.

Query of the measured value in text format for withstand voltage test		
Syntax	Query	**:FETCh:MEASure:WITHstand:TEXT? <Data type>,<Value type>[,<Wave number/ALL>,<Thinning rate/ALL>[,<Thinning type>]]**
		<Data type> = TRENd:Trend data, WAVeform:Waveform data <Value type> = V: Voltage, I: Current <Wave number/ALL> = 1 or more (NR1), ALL: All sections <Thinning rate/ALL> = 1/2/5/10/20/50 [ms], ALL:No thinning <Thinning type> = AVERage:Average of thinning interval, MINimum:Minimum of thinning interval, MAXimum:Maximum of thinning interval, INITial:First value of thinning interval
	Response	**For voltage measured value:** <Number of points>,<Voltage value>,<Voltage value>, ... <Voltage value> **For current measured value:** <Number of points>,<Current value>,<Current value>, ... <Current value>
		For voltage measured value: <Number of points> = (NR1) <Voltage value> = [V] (NR3) **For current measured value:** <Number of points> = (NR1) <Current value> = [A] (NR3)
Description		Return the measured value of the withstand voltage test in text format.
Example		:FETCh:MEASure:WITHstand:TEXT? WAVeform,V,1,ALL 8000, 2.000E+01, 2.100E+01, ... 2.200E+01 Return the waveform data of one wave of voltage for withstand voltage test in text format.
NOTES:		No header is attached to the response message. If the wave number is not ALL, maximum number of data is multiplication of wave number and 10000. Wave number/ALL and Thinning rate/ALL cannot be specified when the data type is trend data. Return the entire section without thinning. Thinning type cannot be specified when the thinning rate is ALL. Any status other than READY, it will result in an execution error. An execution error occurs when the test mode is other than withstand voltage test. If the immediately preceding test is not a withstand voltage test, an execution error occurs.

Query of the measured value in binary form for withstand voltage test

Syntax	Query	:FETCh:MEASure:WITHstand:BINary? <Data type>,<Value type>[,<Wave number/ALL>,<Thinning rate/ALL>[,<Thinning type>]]
		<Data type> = TRENd:Trend data, WAVeform:Waveform data <Value type> = V: Voltage, I: Current <Wave number/ALL> = 1 or more (NR1), ALL: All sections <Thinning rate/ALL> = 1/2/5/10/20/50 [ms], ALL:No thinning <Thinning type> = AVERage:Average of thinning interval, MINimum:Minimum of thinning interval, MAXimum:Maximum of thinning interval, INITial:First value of thinning interval
	Response	<Binary data>
Description		Return the measured value of the withstand voltage test in binary format. As shown in the figure below, binary data outputs the number of byte digits and the number of bytes (the total number of measured value data points and the total number of bytes of the entire measured value data) at the beginning, followed by the number of points and measured value data, and finally the terminator. The number of points is a 32-bit unsigned integer, and the measured value data is output as a single-precision floating-point number (binary32) in little-endian format.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	…		
Binary (Hexadecimal)		23	36	31	34	34	30	31	36	10	27	00	00	41	20	00	00	…	0d(0a)	(0a)
Contents	#	Number of digits		Byte count						Number of points				Measured value					CR(LF)	(LF)

Example	:FETCh:MEASure:WITHstand:BINary? WAVeform,V,1,ALL #6144016.... Return the waveform data of one wave of voltage for withstand voltage test in binary format.
NOTES:	No header is attached to the response message. If the wave number is not ALL, maximum number of data is multiplication of wave number and 10000. Wave number/ALL and Thinning rate/ALL cannot be specified when the data type is trend data. Return the entire section without thinning. Thinning type cannot be specified when the thinning rate is ALL. Any status other than READY, it will result in an execution error. If the immediately preceding test is not a withstand voltage test, an execution error occurs. An execution error occurs when the test mode is other than withstand voltage test. If the communication interface is RS-232C and the communication handshake is set to software handshake, an execution error occurs.

Query the measured value in text format for insulation resistance test		
Syntax	Query	**:FETCh:MEASure:INSulation:TEXT? \<Data type\>,\<Value type\>[,\<Wave number/ALL\>,\<Thinning rate/ALL\>[,\<Thinning type\>]]**
		\<Data type\> = TRENd:Trend data, WAVeform:Waveform data \<Value type\> = V: Voltage, I: Current, R: Resistance \<Wave number/ALL\> = 1 or more (NR1), ALL: All sections \<Thinning rate/ALL\> = 1/2/5/10/20/50 [ms], ALL:No thinning \<Thinning type\> = AVERage:Average of thinning interval, MINimum:Minimum of thinning interval, MAXimum:Maximum of thinning interval, INITial:First value of thinning interval
	Response	**For voltage measured value:** \<Number of points\>,\<Measured value voltage\>,.\<Measured value voltage \>, ... \<Measured value voltage \> **For current measured value:** \<Number of points\>,\<Current value\>,\<Current value\>, ... \<Current value\> **For resistance measured value:** \<Number of points\>,\<Resistance value\>,\<Resistance value\>, ... \<Resistance value\>
		For voltage measured value: \<Number of points\> = (NR1) \<Voltage value\> = [V] (NR3) **For current measured value:** \<Number of points\> = (NR1) \<Current value\> = [A] (NR3) **For resistance measured value:** \<Number of points\> = (NR1) \<Resistance value\> = [Ω] (NR3)
Description	Return the measured value of an insulation resistance test in text format.	
Example	:FETCh:MEASure:INSulation:TEXT? TRENd,R 8000, 1.000E+04, 2.000E+04, ... 3.000E+04 Return resistance trend data from insulation resistance tests in text format.	
NOTES:	No header is attached to the response message. The value type resistance can be specified when the data type is trend data. If the wave number is not ALL, maximum number of data is multiplication of wave number and 10000. Wave number/ALL and Thinning rate/ALL cannot be specified when the data type is trend data. Return the entire section without thinning. Thinning type cannot be specified when the thinning rate is ALL. Any status other than READY, it will result in an execution error. An execution error occurs when the test mode is other than the insulation resistance test. If the immediately preceding test is not an insulation resistance test, an execution error occurs.	

Query of the measured value in binary form for insulation resistance test	

Syntax	Query	**:FETCh:MEASure:INSulation:BINary? <Data type>,<Value type>[,<Wave number/ALL>,<Thinning rate/ALL>[,<Thinning type>]]**
		<Data type> = TRENd:Trend data, WAVeform:Waveform data <Value type> = V: Voltage, I: Current, R: Resistance <Wave number/ALL> = 1 or more (NR1), ALL: All sections <Thinning rate/ALL> = 1/2/5/10/20/50 [ms], ALL:No thinning <Thinning type> = AVERage:Average of thinning interval, MINimum:Minimum of thinning interval, MAXimum:Maximum of thinning interval, INITial:First value of thinning interval
	Response	<Binary data>

Description	Return the measured value of an insulation resistance test in binary format. As shown in the figure below, binary data outputs the number of byte digits and the number of bytes (the total number of measured value data points and the total number of bytes of the entire measured value data) at the beginning, followed by the number of points and measured value data, and finally the terminator. The number of points is a 32-bit unsigned integer, and the measured value data is output as a single-precision floating-point number (binary32) in little-endian format.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	…		
Binary (Hexadecimal)	23	36	31	34	34	30	31	36	10	27	00	00	41	20	00	00	…	0d(0a)	(0a)
Contents	#	Number of digits	Byte count						Number of points				Measured value					CR(LF)	(LF)

Example	:FETCh:MEASure:INSulation:BINary? TRENd,R #6144016.... Return resistance trend data from insulation resistance tests in binary format.

NOTES:	No header is attached to the response message. The value type resistance can be specified when the data type is trend data. If the wave number is not ALL, maximum number of data is multiplication of wave number and 10000. Wave number/ALL and Thinning rate/ALL cannot be specified when the data type is trend data. Return the entire section without thinning. Thinning type cannot be specified when the thinning rate is ALL. Any status other than READY, it will result in an execution error. An execution error occurs when the test mode is other than the insulation resistance test. If the immediately preceding test is not an insulation resistance test, an execution error occurs. If the communication interface is RS-232C and the communication handshake is set to software handshake, an execution error occurs.

Query of the measured value in text format for BDV measurements		
Syntax	Query	**:FETCh:MEASure:BDV:TEXT? <Data type>,<Value type>[,<Wave number/ALL>,<Thinning rate/ALL>[,<Thinning type>]]**
		<Data type> = TRENd:Trend data, WAVeform:Waveform data <Value type> = V: Voltage, I: Current <Wave number/ALL> = 1 or more (NR1), ALL: All sections <Thinning rate/ALL> = 1/2/5/10/20/50 [ms], ALL:No thinning <Thinning type> = AVERage:Average of thinning interval, MINimum:Minimum of thinning interval, MAXimum:Maximum of thinning interval, INITial:First value of thinning interval
	Response	**For voltage measured value:** <Number of points>,<Measured value voltage>,.<Measured value voltage >, ... <Measured value voltage > **For current measured value:** <Number of points>,<Current value>,<Current value>, ... <Current value>
		For voltage measured value: <Number of points> = (NR1) <Voltage value> = [V] (NR3) **For current measured value:** <Number of points> = (NR1) <Current value> = [A] (NR3)
Description		Return the measured value of the BDV measurement in text format.
Example		:FETCh:MEASure:BDV:TEXT? WAVeform,I,1,ALL 8000, 2.000E-06, 3.000E-06, ... 4.000E-06 Return the waveform data of one wave of the current of the BDV measurement in text format.
NOTES:		No header is attached to the response message. If the wave number is not ALL, maximum number of data is multiplication of wave number and 10000. Wave number/ALL and Thinning rate/ALL cannot be specified when the data type is trend data. Return the entire section without thinning. Thinning type cannot be specified when the thinning rate is ALL. Any status other than READY, it will result in an execution error. When the test mode is other than BDV measurement, an execution error occurs. If the immediately preceding test is not a BDV measurement, an execution error occurs.

Query of the measured value in binary form for BDV measurements

Syntax	Query	:FETCh:MEASure:BDV:BINary? <Data type>,<Value type>[,<Wave number/ALL>,<Thinning rate/ALL>[,<Thinning type>]]
		<Data type> = TRENd:Trend data, WAVeform:Waveform data <Value type> = V: Voltage, I: Current <Wave number/ALL> = 1 or more (NR1), ALL: All sections <Thinning rate/ALL> = 1/2/5/10/20/50 [ms], ALL:No thinning <Thinning type> = AVERage:Average of thinning interval, MINimum:Minimum of thinning interval, MAXimum:Maximum of thinning interval, INITial:First value of thinning interval
	Response	<Binary data>
Description		Return the measured value of the BDV measurement in binary format. As shown in the figure below, binary data outputs the number of byte digits and the number of bytes (the total number of measured value data points and the total number of bytes of the entire measured value data) at the beginning, followed by the number of points and measured value data, and finally the terminator. The number of points is a 32-bit unsigned integer, and the measured value data is output as a single-precision floating-point number (binary32) in little-endian format.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	…		
Binary (Hexadecimal)	23	36	31	34	34	30	31	36	10	27	00	00	41	20	00	00	…	0d(0a)	(0a)
Contents	#	Number of digits		Byte count					Number of points				Measured value					CR(LF)	(LF)

Example	:FETCh:MEASure:BDV:BINary? WAVeform,I,1,ALL #6144016.... Return the waveform data of one wave of the current of the BDV measurement in binary format.
NOTES:	No header is attached to the response message. If the wave number is not ALL, maximum number of data is multiplication of wave number and 10000. Wave number/ALL and Thinning rate/ALL cannot be specified when the data type is trend data. Return the entire section without thinning. Thinning type cannot be specified when the thinning rate is ALL. Any status other than READY, it will result in an execution error. When the test mode is other than BDV measurement, an execution error occurs. If the immediately preceding test is not a BDV measurement, an execution error occurs. If the communication interface is RS-232C and the communication handshake is set to software handshake, an execution error occurs.

Query of the contact check results for withstand voltage test		
Syntax	Query	**:FETCh:CONTactcheck:WITHstand?**
	Response	<Judgment result>,<Measured value>
		<Judgment result> = NONE: Not checked, PASS: No error, FAIL: Contact error <Measured value> = [F] (NR3)
Description	Return the contact check results of the withstand voltage test.	
Example	:FETCh:CONTactcheck:WITHstand? PASS, 1.000E-09 The contact check result is PASS and the contact check measurement is 1 nF.	
NOTES:	No header is attached to the response message. Any condition other than READY, interval will result in an execution error. An execution error occurs when the test mode is insulation resistance test, programmed test, BDV measurement. If the immediately preceding test is not a withstand voltage test, withstand voltage test → insulation resistance test or insulation resistance test → withstand voltage test, an execution error occurs.	

Query of the contact check results for insulation resistance test		
Syntax	Query	**:FETCh:CONTactcheck:INSulation?**
	Response	<Judgment result>,<Measured value>
		<Judgment result> = NONE: Not checked, PASS: No error, FAIL: Contact error <Measured value> = [F] (NR3)
Description	Return the contact check result of the insulation resistance test.	
Example	:FETCh:CONTactcheck:INSulation? PASS, 1.000E-09 The contact check result is PASS and the contact check measurement is 1 nF.	
NOTES:	No header is attached to the response message. Any condition other than READY, interval will result in an execution error. An execution error occurs when the test mode is withstand voltage test, program test, BDV measurement. If the immediately preceding test is not an insulation resistance test, a withstand voltage test → insulation resistance test or an insulation resistance test → withstand voltage test, an execution error occurs.	

Query of the contact check results for each step of the program test		
Syntax	Query	**:FETCh:CONTactcheck:PROGram? <Step No.>**
		<Step No.> = 1 to 50 (NR1)
	Response	<Judgment result>,<Measured value>
		<Judgment result> = NONE: Not checked, PASS: No error, FAIL: Contact error <Measured value> = [F] (NR3)
Description	Return the contact check results for each step of the program test.	
Example	:FETCh:CONTactcheck:PROGram? 3 PASS, 1.000E-09 The judgment result of the contact check in step No. 3 is PASS, and the contact check measurement is 1 nF.	
NOTES:	No header is attached to the response message. Any condition other than READY, interval will result in an execution error. When the test mode is other than program test, an execution error occurs. If the immediately preceding test is not a program test, an execution error occurs.	

Query of the measurement error in withstand voltage test		
Syntax	Query	**:FETCh:MEASure:ERRor:WITHstand?**
	Response	<Error No. list>
Description	Return a list of error numbers, separated by a comma (,) of errors that occurred during withstand voltage test measuremens. If there is no error during measurement, 0 is returned. Error No. list 1:Discharge timeout 2:Contact error 3:Voltage error 4:High voltage ON error 17:Overload 19:ARC error 20:Power supply error 21:VMONI board error 29:Unsent error 30: Arithmetic error 31:FSI error 32:AD error 35:Voltage value underflow 36:Voltage value overflow 41:Current value underflow 42:Current value overflow 43:Resistance underflow 44:Resistance overflow		
Example	:FETCh:MEASure:ERRor:WITHstand? 1, 2 Discharge timeout and contact error occurred during measurement.		
NOTES:	No header is attached to the response message. Any condition other than READY, interval will result in an execution error. An execution error occurs when the test mode is insulation resistance test, programmed test, BDV measurement. If the immediately preceding test is not a withstand voltage test, withstand voltage test → insulation resistance test or insulation resistance test → withstand voltage test, an execution error occurs.		

Query of the measurement error in insulation resistance test		
Syntax	Query	**:FETCh:MEASure:ERRor:INSulation?**
	Response	\<Error No. list\>
Description		Return a list of error numbers, separated by a comma (,) of errors that occurred during insulation resistance test measurements. If there is no error during measurement, 0 is returned. Error No. list 1:Discharge timeout 2:Contact error 3:Voltage error 4:High voltage ON error 17:Overload 19:ARC error 20:Power supply error 21:VMONI board error 29:Unsent error 30:Arithmetic error 31:FSI error 32:AD error 35:Voltage value underflow 36:Voltage value overflow 41:Current value underflow 42:Current value overflow 43:Resistance underflow 44:Resistance overflow
Example		:FETCh:MEASure:ERRor:INSulation? 1, 2 Discharge timeout and contact error occurred during measurement.
NOTES:		No header is attached to the response message. Any condition other than READY, interval will result in an execution error. An execution error occurs when the test mode is withstand voltage test, program test, BDV measurement. If the immediately preceding test is not an insulation resistance test, a withstand voltage test → insulation resistance test or an insulation resistance test → withstand voltage test, an execution error occurs.

Query of the measurement error for each step of the program test		
Syntax	Query	**:FETCh:MEASure:ERRor:PROGram? <Step No.>**
		<Step No.> = 1 to 50 (NR1)
	Response	<Error No. list>
Description		Return a list of error numbers, separated by a comma (,) of errors that occurred during measurement at each step of the program test. If there is no error during measurement, 0 is returned. Error No. list 1:Discharge timeout 2:Contact error 3:Voltage error 4:High voltage ON error 17:Overload 19:ARC error 20:Power supply error 21:VMONI board error 29:Unsent error 30:Arithmetic error 31:FSI error 32:AD error 35:Voltage value underflow 36:Voltage value overflow 41:Current value underflow 42:Current value overflow 43:Resistance underflow 44:Resistance overflow
Example		:FETCh:MEASure:ERRor:PROGram? 3 1, 2 Discharge timeout and contact error occurred during measurement in step No. 3.
NOTES:		No header is attached to the response message. Any condition other than READY, interval will result in an execution error. When the test mode is other than program test, an execution error occurs. If the immediately preceding test is not a program test, an execution error occurs.

Query of the measurement error for BDV measurement		
Syntax	Query	**:FETCh:MEASure:ERRor:BDV? <Test No.>**
		<Test No.> = 1 to 20 (NR1)
	Response	<Error No. list>
Description		Return a list of error numbers, separated by a comma (,) of errors that occurred during the measurement for each BDV measurement test. If there is no error during measurement, 0 is returned. Error No. list 1:Discharge timeout 2:Contact error 3:Voltage error 4:High voltage ON error 17:Overload 19:ARC error 20:Power supply error 21:VMONI board error 29:Unsent error 30:Arithmetic error 31:FSI error 32:AD error
Example		:FETCh:MEASure:ERRor:BDV? 5 3 In test No. 5, an voltage error occurred during the measurement.
NOTES:		No header is attached to the response message. Any status other than READY, it will result in an execution error. When the test mode is other than BDV measurement, an execution error occurs. If the immediately preceding test is not a BDV measurement, an execution error occurs.

Query of voltage measured value

Syntax	Query	**:MONitor:VOLTage?**
	Response	<Voltage measured value>
		<Voltage measured value> = [V] (NR3)
Description		Return the voltage measured value.
Example		:MONitor:VOLTage? 8.400E+03 The voltage measured value is 8400 V.
NOTES:		No header is attached to the response message. An execution error will occur in conditions other than TEST or correction measurement.

Query of current measured value

Syntax	Query	**:MONitor:CURRent?**
	Response	<Current measured value>[,<Measurement range>]
		<Current measured value> = [A] (NR3) <Measurement range> = Withstand voltage test mode 300uA, 3mA, 20mA, NONE (no measured value) / Insulation resistance test mode : 1Mohm, 10Mohm, 100Mohm, 1Gohm, 10Gohm, 100Gohm, NONE (no measured value)
Description		Return the current measured value.
Example		:MONitor:CURRent? 2.000E-01,3mA The current measured value is 200.0 mA and the measurement range is 3 mA.
NOTES:		No header is attached to the response message. The measuremetn range is returned when the test mode is withstand voltage test. An execution error will occur in conditions other than TEST or correction measurement.

Query of resistance measured value

Syntax	Query	**:MONitor:RESistance?**
	Response	<Resistance measured value>[,<Measurement range>]
		<Resistance measured value> = [Ω] (NR3) <Measurement range> = Withstand voltage test mode : 300uA, 3mA, 20mA, NONE (no measured value) / Insulation resistance test mode : 1Mohm, 10Mohm, 100Mohm, 1Gohm, 10Gohm, 100Gohm, NONE (no measured value)
Description		Return the resistance measured value.
Example		:MONitor:RESistance? 1.000E+11,100Gohm The resistance measured value is 100.0 GΩ and the measurement range is 100 Gohm.
NOTES:		No header is attached to the response message. The measurement range is returned when the test mode is withstand voltage test or insulation resistance test. An execution error will occur in conditions other than TEST or correction measurement. When the test mode is BDV measurement, an execution error occurs.

Query of the test elapsed time		
Syntax	Query	**:MONitor:ETIMe?**
	Response	<Elapsed time>,<Timer type>
		<Elapsed time> = [s] (NR2) <Timer type> = 0: Test time, 1: Voltage rise time (NR1), 2: voltage drop time (NR1)
Description	Return the elapsed test time. When the timer type is test time, the remaining time from the set test time is returned. When the timer type is test time and the test time is set to OFF, the elapsed time from the start of the test to the present is returned.	
Example	:MONitor:ETIMe? 10,0,0 Elapsed time is 10.0 s. Timer type is test time.	
NOTES:	No header is attached to the response message. An execution error will occur in conditions other than TEST or correction measurement.	

On-Screen Display

Display screen settings

Syntax	Commands	**:DISPlay:SCReen <Display screen>**
		<Display screen> = BOTH: Measured value and graphs, NUMeric: Measured value, GRAPh: graphs
Description		Set the display screen.
Example		:DISPlay:SCReen BOTH Set the display screen to measured values and graphs.
NOTES:		An execution error occurs when the test mode is withstand voltage test → insulation resistance test, insulation resistance test → withstand voltage test, program test. An execution error occurs when the test mode is withstand voltage test, insulation resistance test, BDV measurement and measurement speed is set to FAST or FAST2 during measurement.

Query of display screen

Syntax	Query	**:DISPlay:SCReen?**
	Response	<Display screen>
		<Display screen> = BOTH: Measured value and graphs, NUMeric: Measured value, GRAPh: graphs
Description		Return the display screen setting.
Example		:DISPlay:SCReen? BOTH The display screen is set to measured values and graphs.
NOTES:		An execution error occurs when the test mode is withstand voltage test → insulation resistance test, insulation resistance test → withstand voltage test, program test.

Display graph setting

Syntax	Commands	**:DISPlay:GRAPh <Display graph>**
		<Display graph> = TRENd:Trend data, WAVeform:Waveform data
Description		Set the display graph.
Example		:DISPlay:GRAPh TRENd Set the display graph to trend data.
NOTES:		An execution error occurs when the test mode is withstand voltage test → insulation resistance test, insulation resistance test → withstand voltage test, program test.

Query of display graph

Syntax	Query	**:DISPlay:GRAPh?**
	Response	<Display graph>
		<Display graph> = TRENd:Trend data, WAVeform:Waveform data
Description		Return the setting for the display graph.
Example		:DISPlay:GRAPh? TREND The display graph is set to trend data.
NOTES:		An execution error occurs when the test mode is withstand voltage test → insulation resistance test, insulation resistance test → withstand voltage test, program test.

Voltage display color setting		
Syntax	Commands	**:DISPlay:VOLTage:COLor \<Color No.>**
		\<Color No.> = 0 to 11 (NR1)
Description		Set the voltage display color.
		Refer to the figure below to see which color No. indicates which display color.
Example		:DISPlay:VOLTage:COLor 1
		Set the voltage display color to 1.
NOTES:		An execution error occurs when the test mode is withstand voltage test → insulation resistance test, insulation resistance test → withstand voltage test, program test.

Query of voltage display color		
Syntax	Query	**:DISPlay:VOLTage:COLor?**
	Response	\<Color No.>
		\<Color No.> = 0 to 11 (NR1)
Description		Return the voltage display color setting
Example		:DISPlay:VOLTage:COLor?
		1
		The voltage display color is set to 1.
NOTES:		An execution error occurs when the test mode is withstand voltage test → insulation resistance test, insulation resistance test → withstand voltage test, program test.

Current display color setting

Syntax	Commands	**:DISPlay:CURRent:COLor <Color No.>**
		<Color No.> = 0 to 11 (NR1)

Description	Set the current display color.
	Refer to the figure below to see which color No. Indicates which display color.

	0	4	8
	1	5	9
	2	6	10
	3	7	11

Example	:DISPlay:CURRent:COLor 2
	Set the current display color to 2.

NOTES:	An execution error occurs when the test mode is withstand voltage test → insulation resistance test, insulation resistance test → withstand voltage test, program test.

Query of current display color

Syntax	Query	**:DISPlay:CURRent:COLor?**
	Response	<Color No.>
		<Color No.> = 0 to 11 (NR1)

Description	Return the current display color setting.

Example	:DISPlay:CURRent:COLor?
	2
	The current display color is set to 2.

NOTES:	An execution error occurs when the test mode is withstand voltage test → insulation resistance test, insulation resistance test → withstand voltage test, program test.

Resistance display color setting

Syntax	Commands	**:DISPlay:RESistance:COLor \<Color No.\>**
		\<Color No.\> = 0 to 11 (NR1)

Description	Set the resistance display color. Refer to the figure below to see which color No. Indicates which display color.
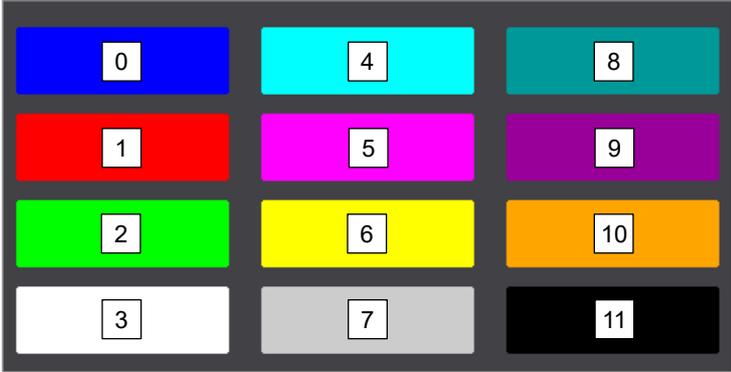
Example	:DISPlay:RESistance:COLor 3 Set the resistance display color to 3.

NOTES:	An execution error occurs when the test mode is withstand voltage test → insulation resistance test, insulation resistance test → withstand voltage test, program test.

Query of resistance display color

Syntax	Query	**:DISPlay:RESistance:COLor?**
	Response	\<Color No.\>
		\<Color No.\> = 0 to 11 (NR1)

Description	Return the resistance display color setting.

Example	:DISPlay:RESistance:COLor? 3 The resistance display color is set to 3.

NOTES:	An execution error occurs when the test mode is withstand voltage test → insulation resistance test, insulation resistance test → withstand voltage test, program test.

Screen Saving

| Obtaining an image of the display screen		
Syntax	Query	**:HCOPy:SDUMp:DATA? <Image type>**
		<Image type> = BMPColor:Color BMP data, BMPMono:B/W BMP data, PNGColor:Color PNG data, PNGMono:B/W PNG data
	Response	<Binary data>
Description	Return the image of the display screen as image data (binary format). Binary data outputs the number of digits and the number of image data bytes at the beginning, followed by the image data, and finally the terminator, as shown in the figure below.	

		1	2	3	4	5	6	7	8	9	10	…		
Binary (Hexadecimal)		23	36	31	33	31	36	34	30	42	4d	…	0d(0a)	(0a)
Contents		#	Number of digits	Image data bytes						Image data		CR(LF)	(LF)

Example	:HCOPy:SDUMp:DATA? BMPColor #6131640.... Return the image of the display screen as color BMP binary data.
NOTES:	No header is attached to the response message. If the communication interface is RS-232C and the communication handshake is set to software handshake, an execution error occurs.

File Saving

Execute file save

Syntax	Commands	**:FILE:SAVE**
Description	Execute file save.	
Example	:FILE:SAVE Execute file save.	
NOTES:	Any status other than READY, it will result in an execution error. If the test is not executed, an execution error occurs. If the USB flash device is not connected, an execution error will occur.	

Setting for behavior when saving a file

Syntax	Commands	**:FILE:SAVE:MODE <Operation>**
		<Operation> = SELect: Save as selected in save content selection window, QUICk: Save immediately according to setting
Description	Set the behavior when saving files.	
Example	:FILE:SAVE:MODE QUICk Set the behavior when saving a file to immediate save according to the setting.	

Query of behavior when saving a file

Syntax	Query	**:FILE:SAVE:MODE?**
	Response	<Operation>
		<Operation> = SELECT: Save as selected in save content selection window, QUICK: Save immediately according to setting
Description	Return the setting for the behavior when saving a file.	
Example	:FILE:SAVE:MODE? QUICK The behavior when saving a file is set to save immediately according to the setting.	

Setting for saving measurement result when saving file

Syntax	Commands	**:FILE:SAVE:TEXT <1/0/ON/OFF>**
		<1/0/ON/OFF> = 1/ON: Save the measurement result when saving the file, 0/OFF: Do not save the measurement result when saving the file
Description	Set the measurement result saving when saving a file.	
Example	:FILE:SAVE:TEXT 1 Set the measurement result to be saved when the file is saved.	

Query of saving measurement result when saving a file

Syntax	Query	**:FILE:SAVE:TEXT?**
	Response	<1/0>
		<1/0> = 1: Save the measurement result when saving the file, 0: Do not save the measurement result when saving the file
Description	Return the setting for saving measurement results when saving a file.	
Example	:FILE:SAVE:TEXT? 1 The measurement result is set to be saved when the file is saved.	

Setting for saving test result when saving measurement result

Syntax	Commands	:FILE:SAVE:TEXT:TEST <1/0/ON/OFF>
		<1/0/ON/OFF> = 1/ON: Save test result when saving measurement result, 0/OFF: Do not save test result when saving measurement result
Description		Set the test result storage when saving measurement result.
Example		:FILE:SAVE:TEXT:TEST 1 Set to save test result when saving measurement result.

Query of saving test result when saving measurement result

Syntax	Query	:FILE:SAVE:TEXT:TEST?
	Response	<1/0>
		<1/0> = 1: Save test results when saving measurement result, 0: Do not save test results when saving measurement result
Description		Return the setting for saving test result when saving measurement result.
Example		:FILE:SAVE:TEXT:TEST? 1 The test result is set to be saved when the measurement result is saved.

Setting for saving waveform data when saving measurement result

Syntax	Commands	:FILE:SAVE:TEXT:WAVeform <1/0/ON/OFF>
		<1/0/ON/OFF> = 1/ON: Save waveform data when saving measurement result, 0/OFF: Do not save waveform data when saving measurement result
Description		Set the waveform data storage when saving measurement result.
Example		:FILE:SAVE:TEXT:WAVeform 1 Set to save waveform data when saving measurement result.

Query of saving waveform data when saving measurement result

Syntax	Query	:FILE:SAVE:TEXT:WAVeform?
	Response	<1/0>
		<1/0> = 1: Save waveform data when saving measurement result, 0: Do not save waveform data when saving measurement result
Description		Return the setting for saving waveform data when saving measurement result.
Example		:FILE:SAVE:TEXT:WAVeform? 1 Waveform data is set to be saved when saving measurement result.

Setting for trend data storage when saving measurement result

Syntax	Commands	:FILE:SAVE:TEXT:TRENd <1/0/ON/OFF>
		<1/0/ON/OFF> = 1/ON: Save trend data when saving measurement result, 0/OFF: Do not save trend data when saving measurement result
Description		Set the trend data storage when saving measurement result.
Example		:FILE:SAVE:TEXT:TRENd 1 Set to save trend data when saving measurement result.

Query of trend data storage when saving measurement result

Syntax	Query	**:FILE:SAVE:TEXT:TRENd?**
	Response	<1/0>
		<1/0> = 1: Save trend data when saving measurement result, 0: Do not save trend data when saving measurement result
Description	Return the setting for trend data storage when saving measurement result.	
Example	:FILE:SAVE:TEXT:TRENd? 1 Trend data is set to be saved when saving measurement result.	

Setting for saving waveform data in binary format when saving a file

Syntax	Commands	**:FILE:SAVE:BINary:WAVeform <1/0/ON/OFF>**
		<1/0/ON/OFF> = 1/ON: Save waveform data in binary format when saving a file, 0/OFF: Do not save waveform data in binary format when saving a file
Description	Set to save waveform data in binary format when saving a file.	
Example	:FILE:SAVE:BINary:WAVeform 1 Set to save waveform data in binary format when saving a file.	

Query of saving waveform data in binary format when saving a file

Syntax	Query	**:FILE:SAVE:BINary:WAVeform?**
	Response	<1/0>
		<1/0> = 1: Save waveform data in binary format when saving a file, 0: Do not save waveform data in binary format when saving a file
Description	Return the setting for saving waveform data in binary format when saving a file.	
Example	:FILE:SAVE:BINary:WAVeform? 1 Waveform data in binary format is set to be saved when saving a file.	

Setting for saving trend data in binary format when saving a file

Syntax	Commands	**:FILE:SAVE:BINary:TRENd <1/0/ON/OFF>**
		<1/0/ON/OFF> = 1/ON: Save trend data in binary format when saving a file, 0/OFF: Do not save trend data in binary format when saving a file
Description	Set trend data saving in binary format when saving a file.	
Example	:FILE:SAVE:BINary:TRENd 1 Set to save trend data in binary format when saving a file.	

Query of saving trend data in binary format when saving a file

Syntax	Query	**:FILE:SAVE:BINary:TRENd?**
	Response	<1/0>
		<1/0> = 1: Save trend data in binary format when saving a file, 0: Do not save trend data in binary format when saving a file
Description	Return the setting for saving trend data in binary format when saving a file.	
Example	:FILE:SAVE:BINary:TRENd? 1 The file is set to save trend data in binary format when the file is saved.	

Settings for screen save when saving a file

Syntax	Commands	**:FILE:SAVE:SCReen <1/0/ON/OFF>**
		<1/0/ON/OFF> = 1/ON: Save the display screen as an image when saving a file, 0/OFF: Do not save the display screen as an image when saving a file
Description	Set screen save when saving a file.	
Example	:FILE:SAVE:SCReen 1 Set the display screen to save as an image when the file is saved.	

Query of screen save when saving a file

Syntax	Query	**:FILE:SAVE:SCReen?**
	Response	<1/0>
		<1/0> = 1: Save the display screen as an image when saving a file, 0: Do not save the display screen as an image when saving a file
Description	Return the screen save setting when saving a file.	
Example	:FILE:SAVE:SCReen? 1 The display screen is set to save an image when the file is saved.	

Setting for quotation marks when saving file

Syntax	Commands	**:FILE:FORMat:QUOTe <Quotation marks>**
		<Quotation marks> = OFF: Without quotes, DOUBle: Double quotes ("), SINGle: Single quotes (')
Description	Set quotation marks for file saving.	
Example	:FILE:FORMat:QUOTe DOUBle Set quotation marks to double quotes when saving a file.	

Query of quotation marks when saving a file

Syntax	Query	**:FILE:FORMat:QUOTe?**
	Response	<Quotation marks>
		<Quotation marks> = OFF: Without quotes, DOUBle: Double quotes ("), SINGle: Single quotes (')
Description	Return the quotation mark setting when saving the file.	
Example	:FILE:FORMat:QUOTe? DOUBLE Quotation marks are set to double quotes when saving the file.	

Setting for Item delimiter when saving a file

Syntax	Commands	**:FILE:FORMat:ITEM:DELimiter <Item delimiter>**
		<Item delimiter> = COMMa: Comma (,), TAB: tab, SEMicolon: Semicolon (;), DOT: Dot (.), SPACe:Space
Description	Set the Item delimiter for file saving	
Example	:FILE:FORMat:ITEM:DELimiter? Set the Item delimiter to a comma when saving the file.	

Query of Item delimiter when saving a file

Syntax	Query	**:FILE:FORMat:ITEM:DELimiter?**
	Response	<Item delimiter>
		<Item delimiter> = COMMA: Comma (,), TAB: tab, SEMicolon: Semicolon (;), DOT: Dot (.), SPACE:Space
Description	Return the item delimiter setting for file saving.	
Example	:FILE:FORMat:ITEM:DELimiter? COMMA The item delimiter is set to a comma when saving the file.	

Setting for the decimal character when saving a file

Syntax	Commands	**:FILE:FORMat:DECimal:CHARacter <Decimal character>**
		<Decimal character> = DOT: Dot (.), COMMa: Comma (,)
Description	Set the decimal character when saving the file.	
Example	:FILE:FORMat:DECimal:CHARacter DOT Set the decimal character to a point when saving the file.	

Query of the decimal character when saving a file

Syntax	Query	**:FILE:FORMat:DECimal:CHARacter?**
	Response	<Decimal character>
		<Decimal character> = DOT: Dot (.), COMMA: Comma (,)
Description	Return the decimal character setting for file saving.	
Example	:FILE:FORMat:DECimal:CHARacter? DOT The decimal character is set to a dot when saving the file.	

Setting for date format when saving a file

Syntax	Commands	**:FILE:FORMat:DATE<Date format>**
		<Date format> = YYYYMMDD/MMDDYYYY/DDMMYYYY/YYMMDD/MMDDYY/DDMMYY
Description	Set the date format for file saving.	
Example	:FILE:FORMat:DATE YYYYMMDD Set the date format to YYYYMMDD when saving the file.	

Query of date format when saving a file

Syntax	Query	**:FILE:FORMat:DATE?**
	Response	<Date format>
		<Date format> = YYYYMMDD/MMDDYYYY/DDMMYYYY/YYMMDD/MMDDYY/DDMMYY
Description	Return the date format setting for file saving.	
Example	:FILE:FORMat:DATE? YYYYMMDD The date format is set to YYYYMMDD when the file is saved.	

Setting for the date delimiter when saving a file

Syntax	Commands	**:FILE:FORMat:DATE:DELimiter <Date delimiter>**
		<Date delimiter> = SLASh: Slash (/), HYPHen: Hyphen (-), DOT: Dot (.)
Description	Set the date delimiter for file saving	
Example	:FILE:FORMat:DATE:DELimiter SLASh Set the date delimiter for file saving to a slash.	

Query of the date delimiter when saving a file

Syntax	Query	**:FILE:FORMat:DATE:DELimiter?**
	Response	\<Date delimiter\>
		\<Date delimiter\> = SLASh: Slash (/), HYPHen: Hyphen (-), DOT: Dot (.)
Description	Return the date delimiter setting for file saving.	
Example	:FILE:FORMat:DATE:DELimiter? SLASH The date separator is set to slash when saving the file.	

Setting for the image type when saving a file

Syntax	Commands	**:FILE:TYPE:PICTure \<Image type\>**
		\<Image type\> = BMPColor:Color BMP data, BMPMono:B/W BMP data, PNGColor:Color PNG data, PNGMono:B/W PNG data
Description	Set the image type when saving the file.	
Example	:FILE:TYPE:PICTure BMPColor Set the image type for file saving to color BMP data.	

Query of the image type when saving a file

Syntax	Query	**:FILE:TYPE:PICTure?**
	Response	\<Image type\>
		\<Image type\> = BMPCOLOR:Color BMP data, BMP MONO:B/W BMP data, PNG COLOR: Color PNG data, PNG MONO: B/W PNG data
Description	Return the image type setting when saving the file.	
Example	:FILE:TYPE:PICTure? BMPCOLOR The image type is set to color BMP data when the file is saved.	

Setting for the file name when saving a file

Syntax	Commands	**: FILE:NAME \<"File name"\>**
		\<"File name"\> = (max. 31 characters)
Description	Set the file name when the file is saved.	
Example	:FILE:NAME "DATA" Set the file name to "DATA" when saving the file.	

Query of the file name when saving a file

Syntax	Query	**:FILE:NAME?**
	Response	\<"File name"\>
		\<"File name"\> = (max. 31 characters)
Description	Return the file name setting when the file is saved.	
Example	:FILE:NAME? "DATA". The file name is set to "DATA" when the file is saved.	
NOTES:	No header is attached to the response message.	

Setting the folder when saving a file

Syntax	Commands	**:FILE:FOLDer \<"Folder name"\>**
		\<"Folder name"\> = (max. 31 characters)
Description	Set the folder when the file is saved.	
Example	:FILE:FOLDer "TEXT" Set the folder to "TEXT" when saving files.	

Query of the folder when saving a file

Syntax	Query	**:FILE:FOLDer?**
	Response	<"Folder name">
		<"Folder name"> = (max. 31 characters)
Description		Return the folder setting when the file is saved.
Example		:FILE:FOLDer? "TEXT". The folder is set to "TEXT" when the file is saved.
NOTES:		No header is attached to the response message.

Query of USB flash drive information

Syntax	Query	**:FILE:INFormation?**
	Response	<Format type>,<Total capacity>,<Used space>,<Free space>,<Utilization>
		<Format type> = FAT12/FAT16/FAT32
Description		Return the information about the USB flash drive.
Example		:FILE:INFormation? FAT32,1.9GB,960MB,949MB,50.3% The currently connected USB flash drive has a format of FAT32, a total capacity of 1.9 GB, 960 MB of used space, 949 MB of free space, and 50.3% utilization.
NOTES:		If the USB flash drive is not connected, an execution error will occur.

Save panel memory to USB flash drive

Syntax	Commands	**:FILE:PANel:SAVE <"File name">**
		<"File name"> = (max. 251 characters)
Description		Save the panel memory to USB flash drive by specifying a file name. The file name extension does not need to be specified. If the beginning of the file name is not "/", "/" is added to the beginning. At this time, please specify up to 250 characters.
Example		:FILE:PANel:SAVE "/SETTING/PANEL1" Save the panel memory to a USB flash drive with the file name "/SETTING/PANEL1".
NOTES:		Any status other than READY, it will result in an execution error. If the USB flash drive is not connected, an execution error will occur.

Load panel memory from USB flash drive

Syntax	Commands	**:FILE:PANel:LOAD <"File name">**
		<"File name"> = (max. 251 characters)
Description		Load the panel memory from USB flash drive by specifying the file name. The file name extension does not need to be specified. If the beginning of the file name is not "/", "/" is added to the beginning. At this time, please specify up to 250 characters.
Example		:FILE:PANel:LOAD "/SETTING/PANEL1" Load the panel memory with the file name "/SETTING/PANEL1" from USB flash drive.
NOTES:		When this command is executed, all panel memories stored in the instrument are overwritten. Any status other than READY, it will result in an execution error. If the USB flash drive is not connected, an execution error will occur.

Save panel memory and various setting information to USB flash drive		
Syntax	Commands	**:FILE:PANel:ALL:SAVE <"File name">**
		<"File name"> = (max. 251 characters)
Description	Save the panel memory and various setting information to USB flash drive by specifying a file name. The file name extension does not need to be specified. If the beginning of the file name is not "/", "/" is added to the beginning. At this time, please specify up to 250 characters.	
Example	:FILE:PANel:ALL:SAVE "/SETTING/ALLSET1" Save the panel memory and various setting information to a USB flash drive with the file name "/SETTING/ALLSET1".	
NOTES:	Any status other than READY, it will result in an execution error. If the USB flash drive is not connected, an execution error will occur.	

Load panel memory and various setting information from USB flash drive		
Syntax	Commands	**:FILE:PANel:ALL:LOAD <"File name">**
		<"File name"> = (max. 251 characters)
Description	Load panel memory and various setting information from USB flash drive by specifying file name. The file name extension does not need to be specified. If the beginning of the file name is not "/", "/" is added to the beginning. At this time, please specify up to 250 characters.	
Example	:FILE:PANel:ALL:LOAD "/SETTING/ALLSET1" Load the panel memory with the file name "/SETTING/ALLSET1" and various setting information from the USB flash drive.	
NOTES:	When this command is executed, all panel memories stored in the instrument are overwritten. Any status other than READY, it will result in an execution error. If the USB flash drive is not connected, an execution error will occur.	

Communication

Setting for presence/absence of response message headers

Syntax	Commands	**:SYSTem:COMMunicate:HEADer <1/0/ON/OFF>**
		<1/0/ON/OFF> = 1/ON: Header is added to response message, 0/OFF: Header is not added to response message
Description		Set whether or not the response message header is present. The initial value (when power is turned on) is OFF.
Example		:SYSTem:COMMunicate:HEADer 0 Set to not append headers to the response message.

Query of presence/absence of response message headers

Syntax	Query	**:SYSTem:COMMunicate:HEADer?**
	Response	<1/0>
		<1/0> = 1: Header is added to response message, 0: Header is not added to response message
Description		Return the setting of whether or not the response message header is present.
Example		:SYSTem:COMMunicate:HEADer? 0 It is set to not append headers to the response message.

Command monitor display setting

Syntax	Commands	**:SYSTem:COMMunicate:MONitor <1/0/ON/OFF>**
		<1/0/ON/OFF> = 1/ON: Command monitor is displayed, 0/OFF: Command monitor is not displayed
Description		Set the command monitor display.
Example		:SYSTem:COMMunicate:MONitor 1 Set the command monitor to be displayed.
NOTES:		If the measurement speed is FAST or FAST2, an execution error will occur.

Command monitor display query

Syntax	Query	**:SYSTem:COMMunicate:MONitor?**
	Response	<1/0>
		<1/0> = 1: Command monitor is displayed, 0: Command monitor is not displayed
Description		Return the command monitor display settings.
Example		:SYSTem:COMMunicate:MONitor? 1 It is set to display the command monitor.

Setting USB interface function

Syntax	Commands	**:SYSTem:COMMunicate:USB:FUNCtion <Function>**
		<Function> = COMMunicate:Communication, MEMory:Memory
Description		Set the function of the USB interface.
Example		:SYSTem:COMMunicate:USB:FUNCtion MEMory Set the functions of the USB interface in memory.
NOTES:		If the communication interface is USB, an execution error will occur.

Query of USB interface function

Syntax	Query	**:SYSTem:COMMunicate:USB:FUNCtion?**
	Response	\<Function\>
		\<Function\> = COMMUNICATE: Communication, MEMORY: Memory
Description		Return the setting of the USB interface function.
Example		:SYSTem:COMMunicate:USB:FUNCtion?
		MEMORY
		The function of the USB interface is set in memory.
NOTES:		If the communication interface is USB, an execution error will occur.

USB communication message terminator settings

Syntax	Commands	**:SYSTem:COMMunicate:USB:TERMinator \<Terminator\>**
		\<Terminator\> = CRLF:CR+LF, CR:CR, LF:LF
Description		Set the message terminator for USB communication.
Example		:SYSTem:COMMunicate:USB:TERMinator CR
		Set the message terminator for USB communication to CR.

USB communication message terminator query

Syntax	Query	**:SYSTem:COMMunicate:USB:TERMinator?**
	Response	\<Terminator\>
		\<Terminator\> = CRLF:CR+LF, CR:CR, LF:LF
Description		Return the message terminator setting for USB communication.
Example		:SYSTem:COMMunicate:USB:TERMinator?
		CR
		Message terminator for USB communication is set to CR.

LAN communication message terminator settings

Syntax	Commands	**:SYSTem:COMMunicate:LAN:TERMinator \<Terminator\>**
		\<Terminator\> = CRLF:CR+LF, CR:CR, LF:LF
Description		Set the message terminator for LAN communication.
Example		:SYSTem:COMMunicate:LAN:TERMinator CR
		Set the message terminator for LAN communication to CR.

LAN communication message terminator query

Syntax	Query	**:SYSTem:COMMunicate:LAN:TERMinator?**
	Response	\<Terminator\>
		\<Terminator\> = CRLF:CR+LF, CR:CR, LF:LF
Description		Return the message terminator setting for LAN communication.
Example		:SYSTem:COMMunicate:LAN:TERMinator?
		CR
		Message terminator for LAN communication is set to CR.

LAN IP address settings

Syntax	Commands	**:SYSTem:COMMunicate:LAN:IPADdress \<Numerical value 1\>,\<Numerical value 2\>,\<Numerical value 3\>,\<Numerical value 4\>**
		\<Numerical value 1\> to \<Numerical value 1\> = 0 to 255 (NR1)
Description		Set the IP address of the LAN. The settings take effect after the execution of the :SYSTem:COMMunicate:LAN:UPDate command or after a reboot.
Example		:SYSTem:COMMunicate:LAN:IPADdress 192,168,1,100 Set the IP address to 192.168.1.100.
NOTES:		Using incorrect or duplicate IP addresses can cause problems in existing networks.

LAN IP address query

Syntax	Query	**:SYSTem:COMMunicate:LAN:IPADdress?**
	Response	\<Numerical value 1\>,\<Numerical value2\>,\< Numerical value 3\>,\< Numerical value 4\>
		\<Numerical value 1\> to \<Numerical value 4\> = 0 to 255 (NR1)
Description		Return the IP address settings for the LAN.
Example		:SYSTem:COMMunicate:LAN:IPADdress? 192,168,1,100 The IP address is set to 192.168.1.100.

LAN subnet mask setting

Syntax	Commands	**:SYSTem:COMMunicate:LAN:SMASk \<Numerical value 1\>,\<Numerical value 2\>,\<Numerical value 3\>,\<Numerical value 4\>**
		\<Numerical value 1\> to \<Numerical value 4\> = 0 to 255 (NR1)
Description		Set the subnet mask for the LAN. The settings take effect after the execution of the :SYSTem:COMMunicate:LAN:UPDate command or after a reboot.
Example		:SYSTem:COMMunicate:LAN:SMASk 255,255,255,0 Set the subnet mask to 255.255.255.0.

LAN subnet mask query

Syntax	Query	**:SYSTem:COMMunicate:LAN:SMASk?**
	Response	\<Numerical value 1\>,\<Numerical value2\>,\< Numerical value 3\>,\< Numerical value 4\>
		\<Numerical value 1\> to \<Numerical value 4\> = 0 to 255 (NR1)
Description		Return the LAN subnet mask setting.
Example		:SYSTem:COMMunicate:LAN:SMASk? 255,255,255,0 Subnet mask is set to 255.255.255.0.

LAN default gateway setting

Syntax	Commands	**:SYSTem:COMMunicate:LAN:GATeway \<Numerical value 1\>,\<Numerical value 2\>,\<Numerical value 3\>,\<Numerical value 4\>**
		\<Numerical value 1\> to \<Numerical value 4\> = 0 to 255 (NR1)
Description		Set the IP address of the default gateway for the LAN. The settings take effect after the execution of the :SYSTem:COMMunicate:LAN:UPDate command or after a reboot.
Example		:SYSTem:COMMunicate:LAN:GATeway 192,168,0,200 Set the IP address of the default gateway to 192.168.0.200.

LAN default gateway query

Syntax	Query	**:SYSTem:COMMunicate:LAN:GATeway?**
	Response	\<Numerical value 1>,\<Numerical value2>,\< Numerical value 3>,\< Numerical value 4>
		\<Numerical value 1> to \<Numerical value 4> = 0 to 255 (NR1)
Description		Return the IP address setting of the default gateway for the LAN.
Example		:SYSTem:COMMunicate:LAN:GATeway? 192,168,0,200 The IP address of the default gateway is set to 192.168.0.200.

LAN port number setting

Syntax	Commands	**:SYSTem:COMMunicate:LAN:CONTrol \<Port number>**
		\<Port number> = 1 to 65535 (NR1)
Description		Set the TCP/IP port number that accepts commands for LAN communication. The settings take effect after the execution of the :SYSTem:COMMunicate:LAN:UPDate command or after a reboot.
Example		:SYSTem:COMMunicate:LAN:CONTrol 6866 Set the port number to 6866.

LAN port number query

Syntax	Query	**:SYSTem:COMMunicate:LAN:CONTrol?**
	Response	\<Port number>
		\<Port number> = 1 to 65535 (NR1)
Description		Return the TCP/IP port number setting that accepts commands for LAN communication.
Example		:SYSTem:COMMunicate:LAN:CONTrol? 6866 Port number is set to 6866.

Finalize LAN setting

Syntax	Commands	**:SYSTem:COMMunicate:LAN:UPDate**
Description		Reflects updated LAN settings. Connections in progress on the LAN will be disconnected.
Example		:SYSTem:COMMunicate:LAN:IPADdress 192,168,1,100 :SYSTem:COMMunicate:LAN:SMASk 255,255,255,0 :SYSTem:COMMunicate:LAN:GATeway 192,168,0,200 :SYSTem:COMMunicate:LAN:CONTrol 6866 :SYSTem:COMMunicate:LAN:UPDate Set the IP address to 192.168.1.100, the subnet mask to 255.255.255.0, the default gateway IP address to 192.168.0.200, and the port number to 6866.

MAC address query

Syntax	Query	**:SYSTem:COMMunicate:LAN:MAC?**
	Response	\<"MAC address">
Description		Return the MAC address of the instrument.
Example		:SYSTem:COMMunicate:LAN:MAC? "00-01-67-00-00-00" The MAC address of this unit is 00-01-67-00-00-00.

RS-232C communication message terminator setting

Syntax	Commands	**:SYSTem:COMMunicate: RS232C:TERMinator \<Terminator>**
		\<Terminator> = CRLF:CR+LF, CR:CR, LF:LF
Description		Set the message terminator for RS-232C communication.
Example		:SYSTem:COMMunicate:RS232C:TERMinator CR Set the message terminator for RS-232C communication to CR.

RS-232C communication message terminator query

Syntax	Query	**:SYSTem:COMMunicate:RS232C:TERMinator?**
	Response	<Terminator>
		<Terminator> = CRLF:CR+LF, CR:CR, LF:LF
Description	Return the message terminator setting for RS-232C communication.	
Example	:SYSTem:COMMunicate:RS232C:TERMinator? CR Message terminator for RS-232C communication is set to CR.	

RS-232C communication speed setting

Syntax	Commands	**:SYSTem:COMMunicate:RS232C:SPEed <Communication speed>**
		<Communication speed> = 9600/19200/38400/57600 [bps].
Description	Set the RS-232C communication speed. Setting is changed immediately. Other RS-232C communication parameters are fixed with data bit length = 8, stop bit = 1, and parity check = none.	
Example	:SYSTem:COMMunicate:RS232C:SPEed 19200 Set the communication speed to 19200 bps.	

RS-232C communication speed query

Syntax	Query	**:SYSTem:COMMunicate:RS232C:SPEed?**
	Response	<Communication speed>
		<Communication speed> = 9600/19200/38400/57600 [bps].
Description	Return the RS-232C communication speed setting.	
Example	:SYSTem:COMMunicate:RS232C:SPEed? 19200 The communication speed is set to 19200 bps.	

RS-232C handshake setting

Syntax	Commands	**:SYSTem:COMMunicate:RS232C:HANDshake <OFF/X>**
		<OFF/X> = OFF: No handshake, X: Software handshake
Description	Set the RS-232C handshake. Setting is changed immediately. Other RS-232C communication parameters are fixed with data bit length = 8, stop bit = 1, and parity check = none.	
Example	:SYSTem:COMMunicate:RS232C:HANDshake X Set handshake to software handshake.	

RS-232C handshake query

Syntax	Query	**:SYSTem:COMMunicate:RS232C:HANDshake?**
	Response	<OFF/X>
		<OFF/X> = OFF: No handshake, X: Software handshake
Description	Return the RS-232C handshake setting.	
Example	:SYSTem:COMMunicate:RS232C:HANDshake? X Handshake is set to software handshake.	

Message terminator setting for GP-IB communication

Syntax	Commands	**:SYSTem:COMMunicate:GPIB:TERMinator <Terminator>**
		<Terminator> = CRLF:CR+LF, CR:CR, LF:LF
Description	Set the message terminator for GP-IB communication.	
Example	:SYSTem:COMMunicate:GPIB:TERMinator CR Set the message terminator for GP-IB communication to CR.	

Message terminator query for GP-IB communication		
Syntax	Query	**:SYSTem:COMMunicate:GPIB:TERMinator?**
	Response	\<Terminator\>
		\<Terminator\> = CRLF:CR+LF, CR:CR, LF:LF
Description	Return the message terminator setting for GP-IB communication.	
Example	:SYSTem:COMMunicate:GPIB:TERMinator? CR Message terminator for GP-IB communication is set to CR.	

GP-IB address setting		
Syntax	Commands	**:SYSTem:COMMunicate:GPIB:ADDRess \<Address\>**
		\<Address\> = 0 to 30 (NR1)
Description	Set the GP-IB address.	
Example	:SYSTem:COMMunicate:GPIB:ADDRess 1 Set the address to 1.	

GP- IB address query		
Syntax	Query	**:SYSTem:COMMunicate:GPIB:ADDRess?**
	Response	\<Address\>
		\<Address\> = 0 to 30 (NR1)
Description	Return the GP-IB address setting.	
Example	:SYSTem:COMMunicate:GPIB:ADDRess? 1 The address is set to 1.	

Compatibility Mode

Command compatibility mode setting		
Syntax	Commands	**:COMMand:COMPatible <WT875/OFF>**
		<WT875/OFF> = WT875: WT-875x Compatible mode, OFF: Disabled
Description	Set command compatibility mode.	
Example	:COMMand:COMPatible WT875 Set command compatibility mode to WT-875x compatibility mode.	
NOTES:	Any status other than READY, it will result in an execution error.	

Command compatibility mode query		
Syntax	Query	**:COMMand:COMPatible?**
	Response	<WT875/OFF>
		<WT875/OFF> = WT875: WT-875x Compatible mode, OFF: Disabled
Description	Return command compatibility mode setting.	
Example	:COMMand:COMPatible? WT875 Command compatibility mode is set to WT-875x compatibility mode.	

4 List of Initialization Items

Classification	Item	Body		Communication			File	
		Reset	Full reset	:SYStem :RESet	*RST	:PRESet	Panel load	Panel and various setting loads
Test Mode	Test mode	✓	✓	✓	✓	✓	✓	✓
Withstand Voltage Test	Interval time	✓	✓	✓	✓	✓	✓	✓
	Test voltage							
	Start voltage							
	Test time							
	Voltage rise time							
	Voltage drop time							
	Judgment wait time							
	Upper test limit value							
	Lower test limit value ON/ OFF							
	Lower test limit value							
	ARC discharge detection function							
	Upper current limit value of ARC discharge detection function							
	Offset cancel function							
	Judgment threshold value for contact check							
	Offset cancel correction value							
	Contact check correction value							
Insulation Resistance Test	Interval time	✓	✓	✓	✓	✓	✓	✓
	Test voltage							
	Test time							
	Voltage rise time							
	Voltage drop time							
	Judgment wait time							
	Upper test limit value ON/ OFF							
	Upper test limit value							
	Lower test limit value							
	Offset cancel function							
	Judgment threshold value for contact check							
	Offset cancel correction value							
	Contact check correction value							
Program Test	Number of test steps	✓	✓	✓	✓	✓	✓	✓
	Interval time							
	Test mode							
	Test voltage							
	Start voltage							
	Test time							
	Voltage rise time							
	Voltage drop time							
	Judgment wait time							
	Upper test limit value							
	Lower test limit value ON/ OFF							

Classification	Item	Body		Communication			File	
		Reset	Full reset	:SYStem :RESet	*RST	:PRESet	Panel load	Panel and various setting loads
	Lower test limit value							
	ARC discharge detection function							
	Upper current limit value of ARC discharge detection function							
	Offset cancel function							
	Judgment threshold value for contact check							
	Offset cancel correction value							
	Contact check correction value							
BDV Measurement	Test method	✓	✓	✓	✓	✓	✓	✓
	Distance between electrodes							
	Number of Tests							
	Initial voltage							
	End voltage							
	Voltage step							
	Voltage rise rate							
	Voltage holding time for each step							
	Number of steps							
	Current upper limit reference value							
	ARC discharge detection function							
	Upper current limit value of ARC discharge detection function							
Test Common	Limiting voltage for DC withstand voltage test	✓	✓	✓	✓	✓	-	✓
	Limiting voltage for insulation resistance test							
	Contact check function							
	Insulation resistance test end mode							
	Operation at the time of FAIL judgment							
	Auto-range function for withstand voltage test							
	Auto-range function for insulation resistance test							
	Use of previous value of data during auto-range							
	Setting for the measured value at the time of range-over is exceeded							
System	Memory function	✓	✓	✓	✓	✓	-	✓
	Buzzer volume at the time of PASS judgment							
	Buzzer volume at the time of FAIL judgment							
	Momentary out function							
	Key locked							
	Key lock passcode							
	Withstand voltage test judgment signal output timing							
	Insulation resistance test judgment signal output timing							
	TEST signal output timing							
	Length of waveform							
	Measurement speed							
	Calibration due date check function	-	-	-	-	-	-	-

Classification	Item	Body		Communication			File	
		Reset	Full reset	:SYStem:RESet	*RST	:PRESet	Panel load	Panel and various setting loads
	Calibration due date							
	Clock							
Screen	Display screen	✓	✓	✓	✓	✓	-	✓
	Display Graph							
	Voltage display color							
	Current display color							
	Resistance display color							
Communication Interface	USB function	-	-	-	-	-	-	✓
	USB message terminator							
	LAN IP address							
	LAN subnet mask							
	LAN gateway							
	LAN command port							
	LAN message terminator							
	RS-232C communication speed							
	RS-232C handshake							
	RS-232C message terminator							
	GP-IB addres							
	GP-IB message terminator							
	Command compatibility mode							
	Command monitor							
	Presence/absence of response message headers	✓	✓	✓	✓	✓	-	-
File	Data storage	✓	✓	✓	✓	✓	-	✓
	Measurement result storage							
	Saving test result when saving measurement result							
	Saving waveform data when saving measurement result							
	Saving trend data when saving measurement result							
	Binary format waveform data storage							
	Binary format trend data storage							
	Screen saving							
	Item delimiter							
	Decimal character							
	Quotation marks							
	Date format							
	Date delimiter							
	Image format							
	Save file name							
	Save folder							
Panel	Withstand voltage test setting save date and time	-	✓	✓	-	-	-	✓
	Withstand voltage test setting							
	Insulation resistance test setting save date and time							
	Insulation resistance test							
	Program test setting save date and time							

Classification	Item	Body		Communication			File	
		Reset	Full reset	:SYStem :RESet	*RST	:PRESet	Panel load	Panel and various setting loads
	Program test setting							
	BDV measurement setting save date and time							
	BDV measurement setting							

5 Sample programs

Visual Studio® Here is how to create it in 2017.

Created in Visual C#®

Visual Studio® This section describes how to operate the instrument from a PC via LAN, capture test results, and save them to a file using
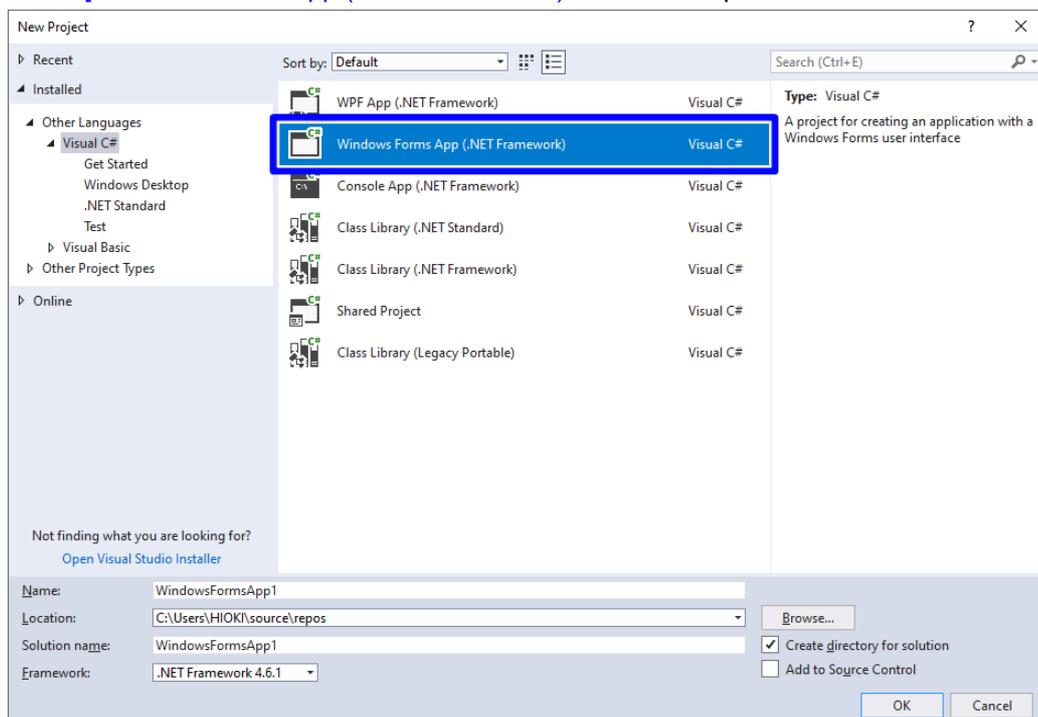Actual operation may differ depending on the PC and Visual C#® environment. For detailed instructions on using Visual C#®, please refer to the Visual C#® instruction manual or help.

■ Create a New Project

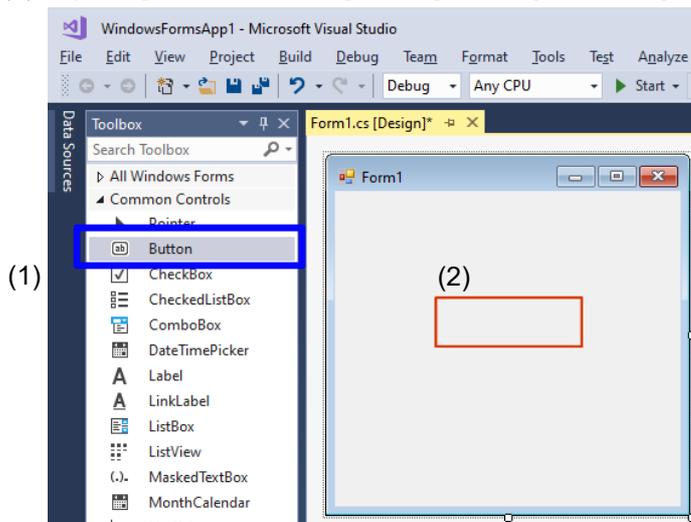(1) Launch Visual Studio®.

(2) Select [FILE] - [New] - [Project]
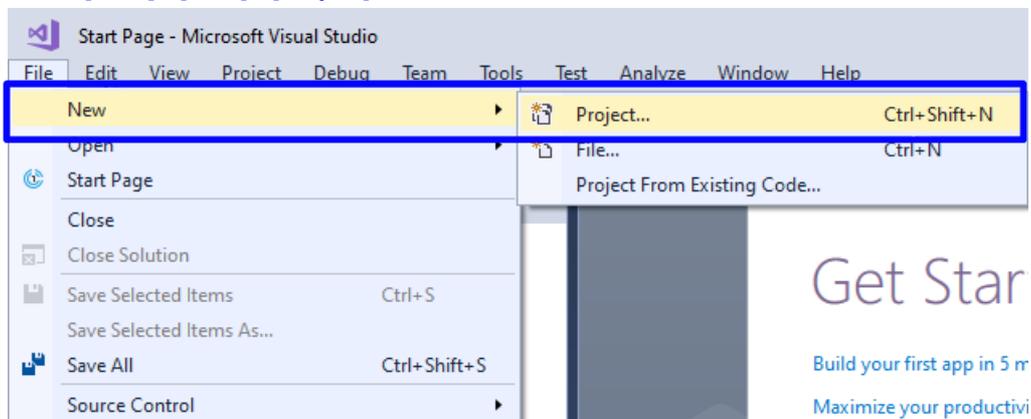
(3) Select [Windows Forms App (.NET Framework) from the template
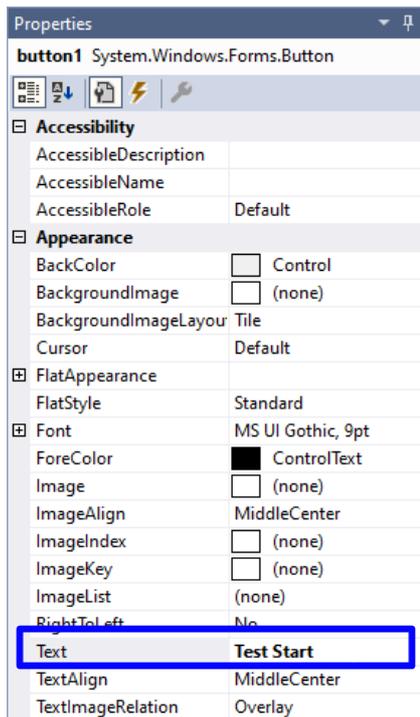

(4) Click [OK].

■ **Button Placement**

(1) Expand [Common control] in the [Toolbox] and click [Button]

(1)

(2)

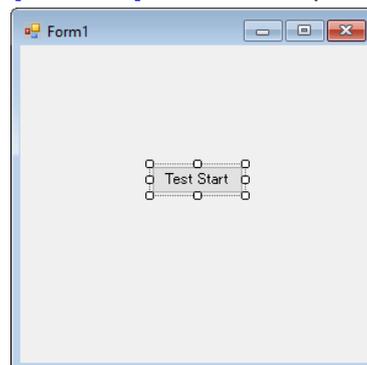(2) Drag the mouse button on the form layout screen and paste the button

(3) Change [Text] in [Properties] to [Test Start]
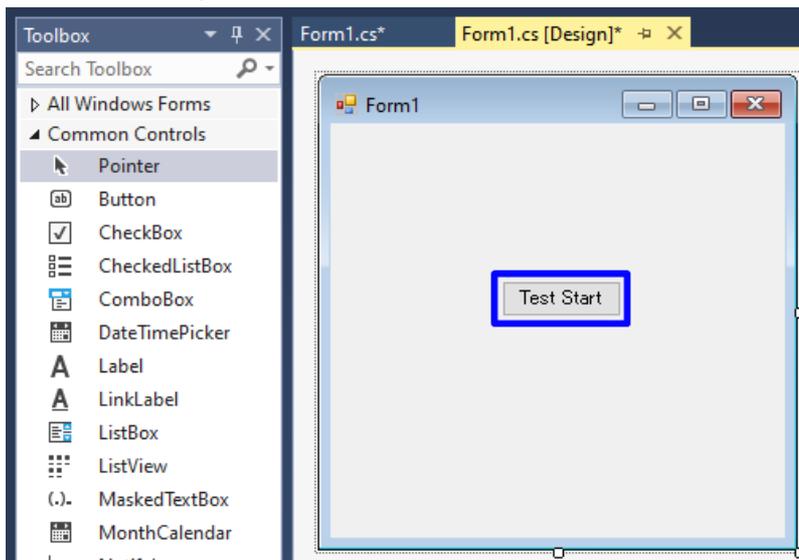

[Test Start] button will be placed on the form.
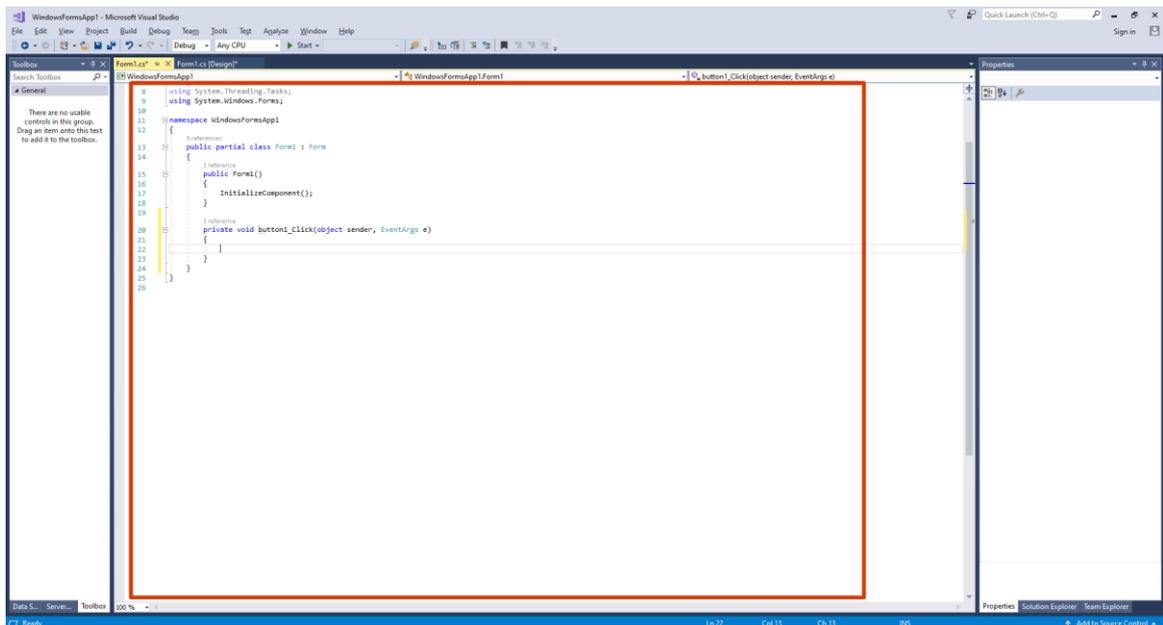
■ **Code Description**
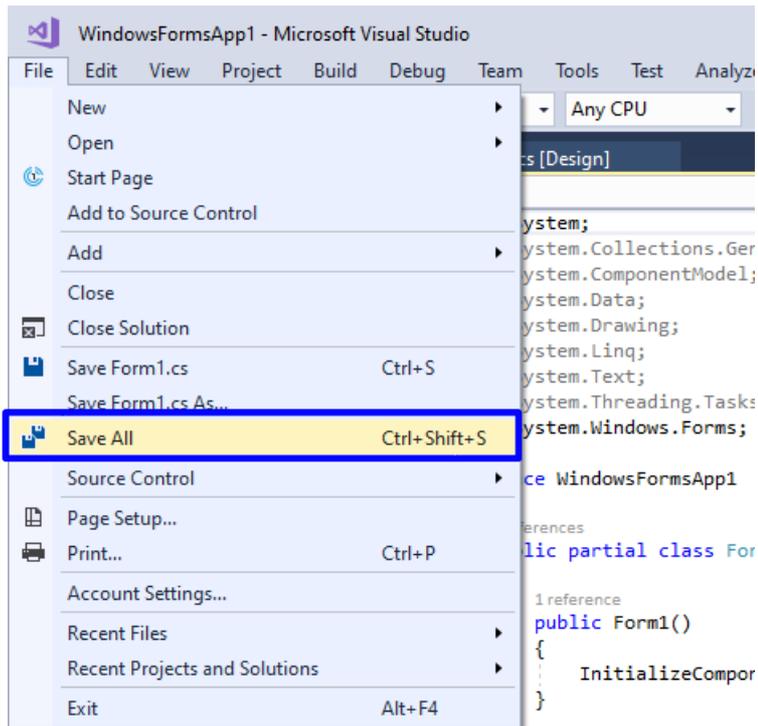
(1) Double-click the placed button

The code editor will appear.

(2) Enter the sample program in the code editor (p.130)

(3) Select [File] - [Save All]

(4) Confirm the save location and click [Overwrite]

This sample program sets test conditions and conducts tests via LAN communication, and outputs test results to a file. The IP address and port number in this sample program are the initial values of the instrument. If you have changed the LAN settings of this unit, change the code as well.

Sample program test conditions
• Test mode   Withstand voltage test
• Test voltage   : 1.00 kV
• Lower test limit value   : OFF
• Upper test limit value   : 1.0 mA
• Test time   : 60.0 s
• Voltage rise time   : 5.0 s
• Voltage drop time   : OFF
• Start voltage   : 50%.
One test is performed and the test results are output to a CSV file.

```csharp
using System;
using System.IO;
using System.Reflection;
using System.Windows.Forms;

namespace WindowsFormsApp1
{
    public partial class Form1 : Form
    {
        public Form1()
        {
            InitializeComponent();
        }

        private void button1_Click(object sender, EventArgs e)
        {
            TestSample();
        }

        private System.Net.Sockets.TcpClient LanSocket; // LAN socket
        private String MsgBuf = "";                     // Received data
        private const long Timeout_default = 3000;      // Receive timeout default time（ms）

        // Test sample
        private void TestSample()
        {
            // Test conditions
            String ip = "192.168.0.1";              // IP address
            String port = "6866";                   // Port number
            String mode = "W";                      // Test mode (withstand voltage test)
            String voltageLevel = "1000";           // Test voltage (1.00 kV)
            String lowerState = "0";                // Lower limit value of test (OFF)
            String upperLimit = "1.0";              // Upper limit value of test (1.0 mA)
            String testTimer = "60.0";              // Test time (60.0 s)
            String riseTimer = "5.0";               // Voltage rise time (5.0 s)
            String fallTimer = "OFF";               // Voltage drop time (OFF)（OFF）
            String voltageStart = "50";             // Start voltage (50 %)

            // Connect
            if (OpenInterface(ip, port))
            {
                // Open text file to output test result values
                Assembly myAssembly = Assembly.GetEntryAssembly();
                string path = Path.GetDirectoryName(myAssembly.Location);            // Output path
(where executable file is located)
                System.IO.StreamWriter fp = new System.IO.StreamWriter(path + "¥¥TestResult.csv", true,
System.Text.
```

```
                    Encoding.UTF8);

                    // Setup
                    SendMsg(":MODE " + mode);                                        // Test mode setup
                    SendMsg(":CONFigure:WITHstand:VOLTage:LEVel " + voltageLevel);   // Test voltage
setup
                    SendMsg(":CONFigure:WITHstand:LIMit:LOWer:STATe " + lowerState); // Lower test limit
value setup
                    SendMsg(":CONFigure:WITHstand:LIMit:UPPer " + upperLimit);       // Upper test limit
value setup
                    SendMsg(":CONFigure:WITHstand:TIMer " + testTimer);              // Test time set up
                    SendMsg(":CONFigure:WITHstand:RISE:TIMer " + riseTimer);         // Voltage rise time
set up
                    SendMsg(":CONFigure:WITHstand:FALL:TIMer " + fallTimer);         // Voltage drop time
set up
                    SendMsg(":CONFigure:WITHstand:VOLTage:STARt " + voltageStart);   // Start voltage set
up

                    // Wait until READY state or until the end of test
                    while (true)
                    {
                        SendQueryMsg(":STATe?");
                        if (MsgBuf == "WREADY" || MsgBuf == "WPASS" || MsgBuf == "WUFAIL" || MsgBuf ==
"WLFAIL" || MsgBuf == "WULFAIL")
                        {
                            break;
                        }
                        System.Threading.Thread.Sleep(100);
                    }

                    // Start the test.
                    SendMsg(":STARt");
                    System.Threading.Thread.Sleep(100);

                    // Wait until the end of the test
                    while (true)
                    {
                        SendQueryMsg(":STATe?");
                        if (MsgBuf == "WPASS" || MsgBuf == "WUFAIL" || MsgBuf == "WLFAIL" || MsgBuf ==
"WULFAIL")
                        {
                            break;
                        }
                        System.Threading.Thread.Sleep(100);
                    }

                    // Receive test result
                    SendQueryMsg(":FETCh:RESult:WITHstand?");

                    // Write test result to file
                    fp.Write(MsgBuf + "¥r¥n");

                    // Close the file
                    fp.Close();

                    // Disconnection
                    CloseInterface();

                    MessageBox.Show("Test completed");
                }
        }
```

```csharp
        // Connect
        private Boolean OpenInterface(String ipaddress, String port)
        {
            Boolean ret = false;
            System.Net.IPAddress ip = new System.Net.IPAddress(0);   // IP address

            try
            {
                if (System.Net.IPAddress.TryParse(ipaddress, out ip))
                {
                    LanSocket = new System.Net.Sockets.TcpClient();   // Create LAN socket object
                    LanSocket.NoDelay = true;                         // Disable transmission delay (Nagle
algorithm)
                    LanSocket.Connect(ip, Convert.ToInt32(port));     // LAN socket open
                    ret = true;
                }
            }
            catch (Exception e)
            {
                MessageBox.Show(e.Message);
            }
            return ret;
        }

        // Disconnection
        private Boolean CloseInterface()
        {
            Boolean ret = false;

            try
            {
                LanSocket.Close();                                    // LAN socket close
                ret = true;
            }
            catch (Exception e)
            {
                MessageBox.Show(e.Message);
            }
            return ret;
        }

        // Send command
        private Boolean SendMsg(String strMsg)
        {
            Boolean ret = false;
            Byte[] SendBuffer = new Byte[1024];

            try
            {
                strMsg += "¥r¥n";                                     // Add terminator
"CR+LF"
                SendBuffer = System.Text.Encoding.Default.GetBytes(strMsg);        // Convert to byte type
                LanSocket.GetStream().Write(SendBuffer, 0, SendBuffer.Length);     // Write to send buffer
                ret = true;
            }
            catch (Exception e)
            {
                MessageBox.Show(e.Message);
            }
            return ret;
        }
```

```csharp
        // Receive command response
        private Boolean ReceiveMsg(long timeout = Timeout_default)
        {
            Boolean ret = false;
            Byte[] rcv = new Byte[1024];
            System.Diagnostics.Stopwatch sw = new System.Diagnostics.Stopwatch();

            try
            {
                MsgBuf = "";                                    // Clear received data
                sw.Start();                                     // Start stopwatch for timeout

                // Loop until terminator "LF" is received
                while (true)
                {
                    // Received one character at a time
                    if (LanSocket.GetStream().DataAvailable)         // Read if data is in the receive buffer
                    {
                        LanSocket.GetStream().Read(rcv, 0, 1);       // Read one character from the receive
buffer
                        if (Convert.ToChar(rcv[0]) == '¥n')          // Terminate when terminator "LF" is
received
                        {
                            break;
                        }
                        else if (Convert.ToChar(rcv[0]) == '¥r')     // Ignore terminator 'CR'
                        {
                            ;
                        }
                        else
                        {
                            MsgBuf += Convert.ToChar(rcv[0]);        // Save received data
                        }
                    }
                    // Timeout processing
                    if (sw.ElapsedMilliseconds > timeout)
                    {
                        MsgBuf = "Timeout";
                        MessageBox.Show(MsgBuf);
                        return ret;
                    }
                }
                sw.Stop();                                      // Stop the stopwatch
                ret = true;
            }
            catch (Exception e)
            {
                MsgBuf = "Error";
                MessageBox.Show(e.Message);
            }
            return ret;
        }

        // Send and receive commands
        private Boolean SendQueryMsg(String strMsg, long timeout = Timeout_default)
        {
            Boolean ret = false;

            ret = SendMsg(strMsg);                              // Send command
            if (ret)
            {
                ret = ReceiveMsg(timeout);                      // Receive response after successful
```
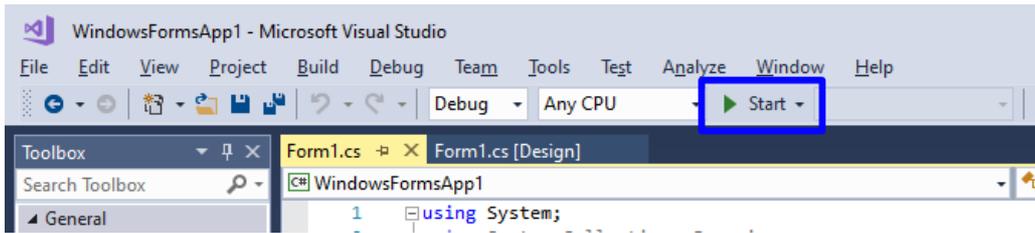
```
transmission
            }
            return ret;
        }
    }
}
```
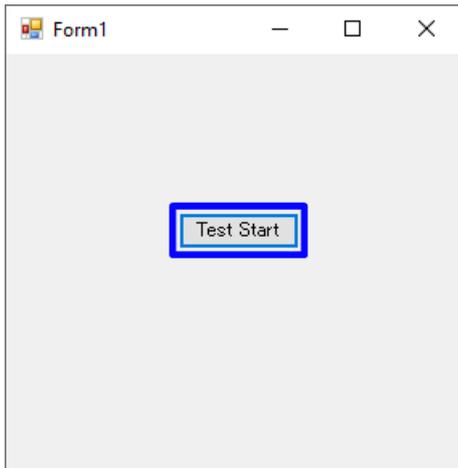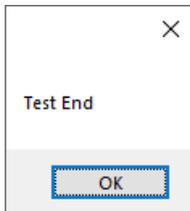
■ Program Execution

(1) Click [Start] button.

The program starts.

(2) Click [Test Start] button.

When the test is completed, a message will be displayed.

(3) Click [OK].

The test results are saved under the file name [TestResult.cSv] in the /bin/Debug folder where the project is saved.

6 Device Compliance Requirements [GP-IB]

IEEE488.2 Information on how the standard is implemented based on the standard

Item	Contents
1. Function of IEEE488.1 interface function	See "GP-IB Specifications (Interface Function)"
2. Explanation of operation when addresses are set other than 0 to 30	Cannot be set to anything other than 0 to 30.
3. Recognition of changes in the address initially set by the user	Address changes are recognized at the time they are made.
4. Explanation of device settings at power-on	Status information is cleared. Others are backed up. However, headers are initialized.
5. Description of message exchange options	• Input buffer capacitance and operation See "Input buffer" (p. 6). Queries that return multiple response message units :CONFigure:PROGram:EDIT:STEP? :CONFigure:PROGram:OFFSet:CANCel:VALue? :CONFigure:PROGram:CONTactcheck:VALue? :PANel:SAVE:DATE? :PANel:LIST? :MEMory:FETCh? :SYSTem:CALibration:PERiod? :SYSTem:DATE? :SYSTem:TIME? :SYSTem:ERRor? :FETCh:RESult:WITHstand? :FETCh:RESult:INSulation? :FETCh:RESult:PROGram:STEP? :FETCh:RESult:BDV? :FETCh:RESult:BDV:TEST? :FETCh:MEASure:WITHstand:TEXT? :FETCh:MEASure:INSulation:TEXT? :FETCh:MEASure:BDV:TEXT? :FETCh:CONTactcheck:WITHstand? :FETCh:CONTactcheck:INSulation? :FETCh:CONTactcheck:PROGram? :FETCh:MEASure:ERRor:WITHstand? :FETCh:MEASure:ERRor:INSulation? :FETCh:MEASure:ERRor:PROGram? :FETCh:MEASure:ERRor:BDV? :MONitor:ETIMe? :FILE:INFormation? :SYSTem:COMMunicate:LAN:IPADdress? :SYSTem:COMMunicate:LAN:SMASk? :SYSTem:COMMunicate:LAN:GATeway? • Query to create a response when a grammar check is performed 　All queries, when syntax-checked, produce a response. • Whether or not the query creates a response when read 　At the time the controller reads, there is no query to create a response. • Availability of commands to be coupled 　There are no applicable commands.

item	Contents
6. A list of functional elements to be used when configuring equipment-specific commands, and an explanation of whether composite command program headers are to be used	Use the following • Program message • Program message terminator • Program message unit • Program message unit delimiter • Command message unit • Query message unit • Command program header • Query program header • Program data • Character program data • Decimal numerical value data • String program data • Compound command program header
7. Explanation of buffer capacity limits for block data	Block data is not used.
8. List of program data elements used in the <Representation> and the maximum degree of nesting of subexpressions (including syntax restrictions imposed by the device on the <Representation>)	No subexpressions are used. The program data elements used are character program data, decimal numeric program data, and string program data.
9. Explanation of the response syntax for each query	See "Message Reference" (p.28)
10. Explanation of interdevice message transmission congestion that does not follow the principles of the response message element	There are no device-to-device messages.
11. Explanation of response capacity of block data	No response for block data.
12. List of Standard Commands and queries used	See "Message List" (p.19)
13. Description of the condition of the instrument after the calibration query has been successfully completed	The *CAL? query is not used.
14. "*With or without "DDT" command	The *DDT command is not used.
15. Presence of macro commands	No macros are used.
16. Query on identification, "*Description of response to "IDN?" query	See "Standard Commands" (p.29)
17. Capacity of protected user data storage space when "*PUD" command or "*PUD?" query is executed.	The *PUD command and the *PUD? query are not used. In addition, there is no user data storage area.
18. Description of resources when using "*RDT" command and "*RDT?" query	The *RDT command and the *RDT? query are not used. In addition, there is no user data storage area.
19. Description of the states affected by "*RST", "*LRN?", "*RCL" and "*SAV	The *LRN? query is not used. *The RST command returns the instrument to its initial state. *The SAV command saves the test conditions to panel memory. *The RCL command reads the test conditions from panel memory. See "Standard Commands" (p.29) and "Return to Initial state item" (p.18)
20. "*Description of the scope of self-tests performed by the "TST?" query	See "Standard Commands" (p.29)
21. Description of the additional structure of the status data used for instrument status reporting	See "Event register" (p.9)
22. Description of whether each command is an overlapping or sequential command	All commands are sequential commands.
23. Explanation of the criteria for the functionality required at the time of generating the end-of-operation message in response to each command.	The end of operation is generated when the command is parsed.

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