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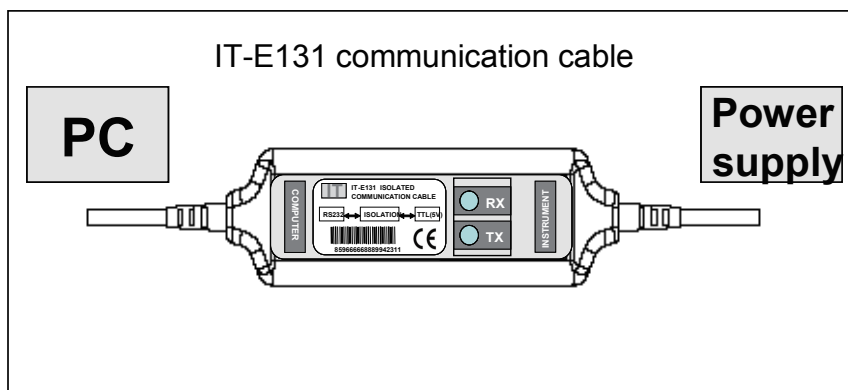


Chapter 1 Remote Operation Mode	3
1.1 IT-E131 RS232 COMMUNICATION CABLE	3
1.2 IT-E132 USB COMMUNICATION CABLE	3
1.3 IT-E135 GPIB COMMUNICATION CABLE	4
Chapter 2 Communication Order for IT6322	5
2.1 IEEE488.2 COMMON ORDER	5
2.2 SCPI ESSENTIAL ORDER	5
2.3 SCPI NONSTANDAR ORDER	6
Chapter 3 SCPI Condition Register	8
Chapter4 SCPI Order Description	10
4.1 IEEE488.2 COMMON ORDER	10
4.2 SCPI ESSENTIAL ORDER	12

The DB9 interface connector on the rear panel of the power supply can be transferred to RS-232 interface, the following information will tell you how to use the computer to control the output of the power supply.

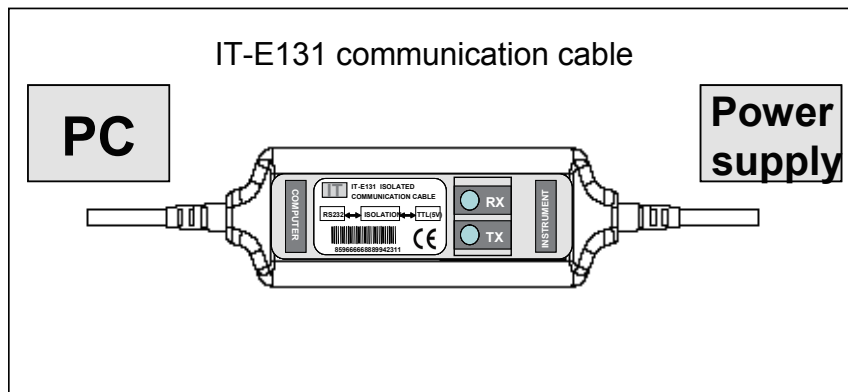
1.1 IT-E131 RS232 Communication Cable

The DB9 interface connector on the rear panel of power supply is TTL voltage level; you can use the communication cable (IT-E131) to connect the DB9 interface connector of the power supply and the RS-232 interface connector of computer for the communication.



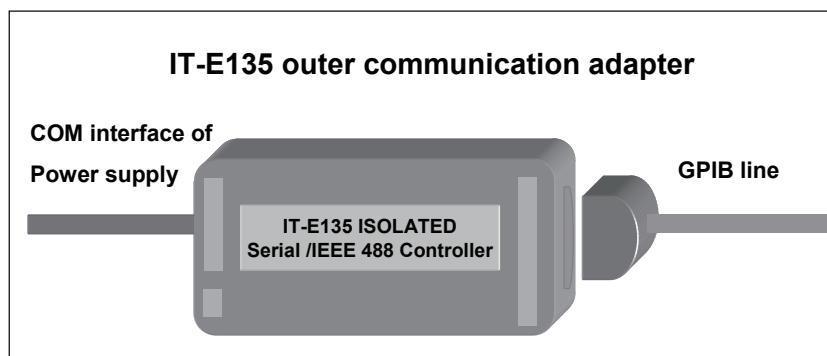
1.2 IT-E132 USB Communication Cable

The DB9 interface connector on the rear panel of power supply is TTL voltage level; you can use the communication cable (IT-E132) to connect the DB9 interface connector of the power supply and the USB interface connector of computer for the communication.



1.3 IT-E135 GPIB Communication Cable

The DB9 interface connector on the rear panel of power supply is TTL voltage level; you can use the GPIB communication cable (IT-E135) to connect the DB9 interface connector of the power supply, and then connect the GPIB interface of the IT-E135 and computer with GPIB/IEEE 488 line for the communication.



Note: Forbidden to connect DB9 connector in power supply directly with PC or other RS232 port.

2.1 IEEE488.2 Common Order

```

"*CLS"
"*ESE"
"*ESE?"
"*ESR?",
"*IDN?",
"*OPC",
"*OPC?",
"*PSC",
"*PSC? ",
"*RST",
"*SRE",
"*SRE?",
"*STB?",
"*TRG",
"*SAV ",
"*RCL",

```

2.2 SCPI Essential Order

```

SYSTem
    :ERRor?
    :VERSion?
    :BEEPper[:IMMediate]
    :ADDRess?

STATus
    :QUESTionable
        :ENABle <enable value>
        :ENABle?
        [:EVENT]i?
        :CONDition?
    :OPERation
        :ENABle <enable value>
        :ENABle?
        [:EVENT]i?
        :CONDition?
        :INSTrument
            [:EVENT]i?
            :ENABle <value>
            :ENABle?
            CONDition?

```



INSTrument

```
[.SElect] {FIRst|SECOnd|THIrd}
[.SElect]?
NSElect {1|2|3}
NSElect?
```

OUTPut

```
[.STATe] {0|1}
[.STATe]?
```

[SOURce:]

```
CURRent[:LEVel][:IMMediate][:AMPLitude] {<current>|MIN|MAX}
CURRent[:LEVel][:IMMediate][:AMPLitude]? {MIN|MAX}
VOLTage[:LEVel][:IMMediate][:AMPLitude] {<voltage>|MIN|MAX}
VOLTage[:LEVel][:IMMediate][:AMPLitude]? {MIN|MAX}
VOLTage:PROTection[:LEVel][:IMMediate][:AMPLitude]
VOLTage:PROTection[:LEVel][:IMMediate]:A
```

2.3 SCPI Non-standard Order

CALibration

```
:SECure[:STATe] {ON|OFF,<quoted code>}
:SECure[:STATe]?
:VOLTage
    LEVel <level>
    [:DATA] <voltage value>
:CURRent
    LEVel <level>
    [:DATA] <current value>
:CODE
:SAVe
:INITial
```

OUTPut

```
:TIMer
    :DATA <time>
    :DATA?
```

SYSTem

```
:LOCal
:REMote
:RWLock
```

DISPlay:

[:WINDow][:STATe] {OFF|ON}

[:WINDow][:STATe]?

MEASure[:SCALer]

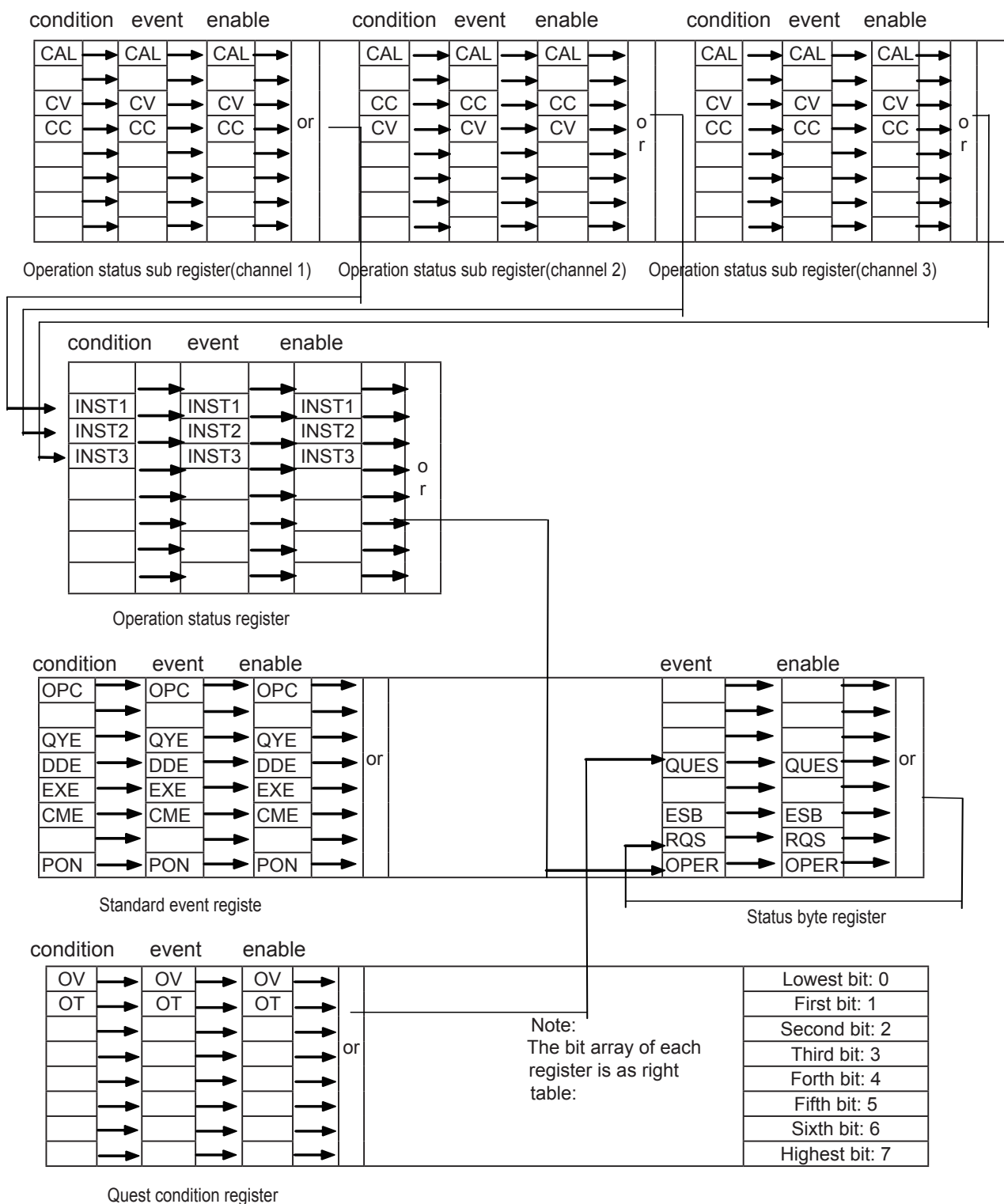
:CURRent[:DC]?

[:VOLTage][:DC]?

:POWer[:DC]?

You can get the condition of power supply and read parameter from the operation register. The power supply can get the different state by 7 condition registers. These registers are status byte register, standard event register, quest condition register and operation status register. The status byte register stores the information of 3 other register. You can get each register's meaning from the following table:

	bit	code	meaning
Operation status sub register	0	CAL	The power supply is calculating new calibration parameter.
	2	CV	The power supply is in constant voltage condition.
	3	CC	The power supply is in constant current condition.
Quest condition register	4	RI	Not used
	0	OV	Not used
Standard event register	1	OT	Over temperature
	0	OPC	Operation of power supply is completed.
	2	QYE	Query error. Data of output array is missing.
	3	DDE	Device-dependent error. Data stored in register is missing or error occurs in preliminary checkout.
	4	EXE	Execution error. Order parameter overflows or the condition is not right.
	5	CME	Command error. Syntax or semantic error occurs when receiving information.
Status byte register	7	PON	Power on. It is 1 when power supply is reset.
	3	QUES	If a quest enable condition changes, QUES is 1.
	4		
	5	ESB	If a standard event status enable register changes, ESB is 1.
	6	MSS	
operation status register	7	OPER	If a operation event enable register changes, OPER is 1.
	1	INST1	If the status of one operation status sub register changes, INST is 1
	2	INST2	As above
	3	INST3	As above





4.1 IEEE488.2 Common Order

*CLS

This order can clean the register as follows::

Standard event status register

Quest condition register

Operation status register

Operation status sub register

Status byte register

Error code

Order syntax: *CLS

Parameter: None

*ESE

This order can set the parameter of standard event enable register. Setting parameter can determine which bit value of standard event register is 1 and the byte will enable ESB of status byte register is 1.

Order syntax: *ESE <NRf>

Parameter: 0~255

Reset value: Consult *PSC order

Example: *ESE 128

*ESR?

This order can read the value of standard event status register. After executing this order, standard event status register is reset. Bit definition of standard event status register is as the same as the standard event status enable register

Quest syntax: *ESR?

Return parameter: <NR1>

Example: *ESR?

*IDN?

This order can read information about power supply. The parameter it returns contains 4 segments divided by comma.

Quest syntax: *IDN?

Return parameter: <AARD> segment description

ITECH manufacturer

XXXX product mode

XXXXXX product serial number

VX. XX software version number

For example: ITECH, 6322, 000000000000111101,V1.68

***OPC**

When all orders before this order are executed, OPC is 1 of the standard event status register.

Order syntax: *OPC

Quest syntax: *OPC?

Example: *OPC

***PSC**

This order control if power supply send a query or not when it is reset.

1|ON: When power supply is reset, operation event enable register, query event enable register and standard event status register are all reset.

0|OFF: The data of operation event enable register, quest event enable register and standard event status enable register is stored in nonvolatile register, and is recalled when power supply is reset.

Order syntax: *PSC

Parameter: 0|1|ON|OFF

Return parameter: data stored

Example: *PSC ON

***RST**

This order reset the power supply to default setting.

Order syntax: *RST

Example: *RST

***SRE**

This order can set the parameter of status byte enable register. Setting parameter can determine which byte value of status byte register is 1 and the byte will enable RQS of status byte register is 1. Bit definition of status byte enable register is as the same as the status byte register.

Order syntax: *SRE <parameter>

Parameter: 0~255

Reset value: consult order *PSC

Example: *SRE 110

***STB?**

This order can read the data from status byte register. After executing this order, status byte register is reset.

Order syntax: *STB?

Return parameter: <NR1>

Example: *STB?

***SAV**

This order can save the parameters of power supply to register. These parameter contains constant current, constant voltage, maximum voltage value and step voltage value.

Order syntax: *SAV

Parameter: 0~49

Example: *SAV 10

***RCL**

This order can recall the parameter you saved before from the register.

Order syntax: *RCL

Parameter: 0~49

Example: *RCL 10

4.2 SCPI Essential Order

SYSTem:ERRor

This order can get the error code and error information of the power supply.

Order syntax: SYSTem:ERRor?

Return parameter: please consult the error information table

Example: SYST:ERR?

SYSTem:VERSion

This order can query the software version.

Order syntax: SYSTem:VERSion?

Return parameter: software version

Example: SYST:VERS?

SYSTem:BEEPer

This order can make the buzzer moo.

Order syntax: SYSTem:BEEPer[:IMMediate]

Example YST:BEEP

SYSTem:LOCal

This order can set SOURCE METER as panel control mode.

Order syntax: SYSTem:LOCal

Example: SYST:LOC

SYSTem:REMote

This order can set SOURCE METER as remote control mode.

Order syntax: SYSTem:REMote

Example: SYST:REM

SYST:RWLock

This order can set SOURCE METER an remote control mode. But this order can not enable LOCATE key to change into panel control mode.

Order syntax: SYSTem:RWLock

Example: SYST:RWL

SYSTem:ADDRESS

This order can check the communication address of power supply.

Order syntax: SYSTem:ADDRESS?

Example: SYST:ADDR?

STATus:QUESTionable:ENABLE

This order can set the parameter of quest event enable register. Setting parameter can determine which bit value of quest event register is 1 and the bit will enable QUES of status byte register is 1.

Order syntax: STATus:QUESTionable:ENABLE <parameter>

Parameter: 0~255

Reset value: consult PSC order

Example: STAT: QUES: ENAB 110

STATus:QUESTionable:ENABLE?

This order can set the parameter of quest event enable register. After this order executed, quest event enable register is reset.

Order syntax: STATus:QUESTionable:ENABLE?

Return parameter: <NR1>

Example: STAT:QUES:ENAB?

STATus:QUESTionable?

This order can read parameter from the quest event register. After this order executed, quest event register is register.

Order syntax: STATus:QUESTionable[:EVENT]?

Return parameter: <NR1>。

Example: STAT:QUES?

STATus:QUESTionable:CONDition?

This order can read the parameter from quest condition register. When a bit of quest condition changes, the bit value corresponding in quest event register is 1.

Order syntax: : STATus:QUESTionable:CONDition?

Return parameter: <NR1>

Example: STAT:QUES:COND?

**STATus:OPERation ENABLE**

This order can set the parameter of quest event enable register. Setting parameter can determine which bit value of quest event register is 1 and the bit will enable QUES of status byte register is 1.

Order syntax: STATus: OPERation:ENABLE

Parameter: 0~255

Reset value: consult PSC order

Example: STAT:OPER:ENAB 110

STATus:OPERation:ENABLE?

This order can read parameter from the operation enable register. After this order executed, the operation enable is reset.

Order syntax: STATus:OPERation:ENABLE?

Return parameter: <parameter of operation enable register>

Example: STAT:OPER:ENAB?

STATus:OPERation?

This order can read parameter from the operation condition register. After this order executed, the operation condition is reset.

Order syntax: STATus:OPERation[:EVENT]?

Return parameter: <parameter of operation event register>

Example: STAT:OPER?

STATus:OPERation:INSTrument?

This order can read the parameter from the operation event sub register. After this order executed, the operation event sub register is register.

Note: this order is only valid for current channel.

Order syntax: STATus:OPERation:INSTrument[:EVENT]?

Return parameter: <parameter of operation event sub register>

Example: STAT:OPER:INST?

STATus:OPERation:INSTrument:ENABLE

This order can set parameter of operation event enable sub register. Setting parameter can determine which bit value of operation event enable sub register is 1 and the bit will enable OPER of status byte register is 1.

Note: this order is only valid for current channel.

Order syntax: STATus:OPERation:INSTrument:ENABLE <value>

Parameter: 0~255

Reset value: consult PSC order

Example: STAT:OPER:INST:ENAB 110

STATus:OPERation:INSTrument:ENABLE?

This order can read the parameter of operation event enable sub register. After this order executed, operation event enable sub register is reset.

Note: this order is only valid for current channel.

Order syntax: STATus:OPERation:INSTrument:ENABLE?

Return value: <parameter of operation event enable register>

Example: STAT:OPER:INST:ENAB?

STATus:OPERation:INSTrument:CONDition?

This order can read parameter from operation condition sub register. After this order executed, operation condition sub register is reset.

Note: this order is only valid for current channel.

Order syntax: STATus:OPERation:INSTrument:CONDition?

Return parameter: <parameter of operation condition register>

Example: STAT:OPER:INST:COND?

INSTrument[SElect]

This order can be used to select the channel.

Order syntax: INSTrument[:SElect]

Parameter: FIRSt|SECOnd|THIrd

Reset value: FIRSt

Example: INST SECO

INSTrument[:SElect]?

This order can check which channel is selected.

Order syntax: INSTrument[:SElect]?

Return parameter: FIRSt|SECOnd|THIrd

Example: INST?

INSTrument:NSElect

This order is similar to the order "INSTrument[SElect]", the only difference is that this order uses number to denote channel.

Order syntax: INSTrument:NSElect

Parameter: 1~3

Reset value: 1

Example: INST: NSEL?

OUTPut[:STATe]

This order can set the output state for current channel: ON/OFF

Order syntax: OUTPut[:STATe] <parameter>

Parameter: 1(ON)|0(OFF)

Example: OUTP 1

OUTPut[:STATe]?

This order can check the output state for current channel: ON/OFF

Order syntax: OUTPut[:STATe]?

Return parameter: 0|1

Example: OUTP?

OUTPut:TIMer:DATA

This order can set time of output-timer for current channel.

Order syntax: OUTPut:TIMer:DATA <parameter>

Parameter: 0~999999S (if you set 0S, the output-timer will be disabled.)

Reset value : it is concerned about the parameter you set in the menu.

Example: OUTPut:TIMer:DATA 100

OUTPut:TIMer:DATA?

This order can check the time of output-timer for current channel.

Order syntax: OUTPut:TIMer:DATA?

Return parameter: 0~999999

Unit: S

Example: OUTP:TIM:DATA?

[SOURce:]CURRent[:LEVel][:IMMediate][:AMPLitude]

This order can set current value of power supply.

Order syntax: [SOURce:]CURRent[:LEVel][:IMMediate][:AMPLitude] <parameter>

Parameter: MIN|MAX|MIN TO MAX

Unit: A mA uA

Reset value: it is concerned about the parameter you set in the menu.

*RST value: MAX

Example: CURR 2A

[SOURce:]CURRent[:LEVel][:IMMediate][:AMPLitude]?

This order can check current value of power supply.

Order syntax: [SOURce:]CURRent[:LEVel][:IMMediate][:AMPLitude]? <parameter>

Parameter: MIN | MAX |None

Return parameter: MIN TO MAX

Unit: A

Example: CURR?

[SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude]

This order can set voltage value of power supply.

Order syntax: [SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude]

Parameter: MIN|MAX|MIN TO MAX

Parameter: V mV uV kV

Reset value: IN TO MAX|MIN|MAX

*RST value: MIN

Example: VOLT 10V

[SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude]?

This order can check voltage value of power supply.

Order syntax: [SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude]? <parameter>

Parameter: MIN|MAX|None

Reset value: MIN TO MAX

Unit: V

Example: VOLT?

[SOURce:]VOLTage:PROTection[:LEVel][:IMMediate][:AMPLitude]

This order can set the max voltage for current channel.

Order syntax: [SOURce:]VOLTage:PROTection[:LEVel][:IMMediate][:AMPLitude] <parameter>

Parameter: IN TO MAX|MIN|MAX

Unit: V mV kV uV

Reset value: it is concerned about the parameter you set in the menu.

*RST value: MAX

Example: VOLT:PROT 20V

MEASure[:SCALer]:CURRent[:DC]?

This order can get the output current of power supply.

Order syntax: MEASure[:SCALer]:CURRent[:DC]?

Return parameter: the actual output current

Unit: A

Example: MEAS: CURR?

MEAS[:SCALer][:VOLTage][:DC]?

This order can get the actual output voltage value.

Order syntax: MEAS[:SCALer][:VOLTage][:DC]?

Return parameter: the actual output voltage

Unit: V

Example: MEAS?



MEASure[:SCALer]:POWer[:DC]?

This order can get the actual output power value.

Order syntax: MEASure[:SCALer]:POWer[:DC]?

Return parameter: the actual output power

Unit: W

Example: MEAS:POW?

DISPlay[:WINDow][:STATe]

This order can turn on the window display or off.

Order syntax: DISPlay[:WINDow][:STATe] <parameter>

Parameter: 0(OFF)|1(ON)

Reset value: 1(ON)

*RST value: 1(ON)

Example: DISP 1

DISPlay[:WINDow][:STATe]?

This order can check the state of the display window: ON/OFF.

Return parameter: 1(ON)|0(OFF)

Example: DISP?

CALibration:SECure[:STATe]

This order can set protection mode enable or disable. The power supply will be calibrated only if the calibration protection is disabled and other orders is disabled, either.

Order syntax: CALibration:SECure[:STATe] <parameter 1>, <parameter 2>

Parameter 1: 0(OFF)|1(ON)

Parameter 2: calibration password

Unit: none

Reset value: 1|(ON)

*RST value: 1|(ON)

Example: CAL: SEC 0,"6322"

CALibration:SECure[:STATe]?

This order can check protection mode: ON/OFF.

Quest syntax: CALibration:SECure[:STATe]?

Return parameter: 0(OFF)|1(ON)

Example: CAL:SEC?

CALibration:VOLTage:LEVel

This order can set voltage calibration point.

Order syntax: CALibration:VOLTage:LEVel <parameter>

Parameter: P1|P2

Example: CAL:VOLT P1

CALibration:VOLT[:DATA]

This order can set voltage value of voltage calibration point.

Order syntax: CALibration:VOLT[:DATA] <parameter>

Parameter: the actual output voltage value

Unit: V mV uV kV

Example: CAL:VOLT 1V

CALibration:CURREnt:LEVel

This order can set current calibration point.

Order syntax: CALibration:CURREnt:LEVel <parameter>

Parameter: P1|P2

Example: CAL:CURR:LEV P1

CALibration:CURREnt[:DATA]

This order can set voltage value of current calibration point.

Order syntax: CALibration:CURREnt[:DATA] <parameter>

parameter: P1|P2

Example: CAL:CURR 0.3A

CALibration:SECure:CODE

This order can set the new calibration password.

Order syntax: CALibration:SECure:CODE <parameter>

Parameter: the password (1 through 4digits)

Example: CAL:SEC:CODE "1234"

CALibration:STRing

This order can set the calibration information.

Order syntax: CALibration:STRing <parameter>

Parameter: the calibration information about time and so on.

Example: CAL:STR "2005-1-9 20:12"

CALibration:STRing?

This order can read the calibration information.

Order syntax: CALibration:STRing?

Return parameter: the calibration information saved in the EEPROM.

Example: CAL:STR?

CALibration:SAVe

This order can save calibration coefficient into EEPROM

Order syntax: CALibration:SAVe

Example: CAL:SAV

Note: the calibration parameter will take effect only after it is saved.



CALibration:INITal

This order can renew the calibration coefficient as default.

Order syntax: CALibration:INITal

Example: CAL:INIT

Note: if the calibration is failure, you can use this order to renew.



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