



**IN COOPERATION WITH NGI®**

**N3410 SCPI**

# N3410 Series Programming Guide SCPI Protocol

# SCPI

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# 1 Preface

Dear Customers,

First of all, we greatly appreciate your choice of N3410 series DC power supply (N3410 for short). We are also honored to introduce our company, Hunan Next Generation Instrumental T&C Tech. Co., Ltd. (NGI for short).

## **About Company**

NGI is a professional manufacturer of intelligent equipment and test & control instruments, committed to developing, manufacturing battery simulators, power supplies, electronic loads, and many more instruments. The products can be widely used in the industries of battery, power supply, fuel cell, consumer electronics, new energy vehicle, semiconductor, etc.

NGI maintains close cooperation with many universities and scientific research institutions, and maintains close ties with many industry leaders. We strive to develop high-quality, technology-leading products, provide high-end technologies, and continue to explore new industry measurement and control solutions.

## **About Manual**

This manual is applied to N3410 series DC power supply, including programming guide based on standard SCPI protocol. The copyright of the manual is owned by NGI. Due to the upgrade of instrument, this manual may be revised without notice in future versions.

This manual has been reviewed carefully by NGI for the technical accuracy. The manufacturer declines all responsibility for possible errors in this operation manual, if due to misprints or errors in copying. The manufacturer is not liable for malfunctioning if the product has not correctly been operated.

To ensure the safety and correct use of N3410, please read this manual carefully, especially the safety instructions.

Please keep this manual for future use.

Thanks for your trust and support.

## 2 Safety Instructions

In the operation and maintenance of the instrument, please strictly comply with the following safety instructions. Any performance regardless of attentions or specific warnings in other chapters of the manual may impair the protective functions provided by the instrument.

NGI shall not be liable for the results caused by the neglect of those instructions.
















### 2.1 Safety Notes

- **Confirm the AC input voltage before supplying power.**
- **Reliable grounding:** Before operation, the instrument must be reliably grounded to avoid the electric shock.
- **Confirm the fuse:** Ensure to have installed the fuse correctly.
- **Do not open the chassis:** The operator cannot open the instrument chassis. Non-professional operators are not allowed to maintain or adjust it.
- **Do not operate under hazardous conditions:** Do not operate the instrument under flammable or explosive conditions.
- **Confirm the working range:** Make sure the DUT is within N3410's rated range.

### 2.2 Safety Symbols

Please refer to the following table for definitions of international symbols used on the instrument or in the user manual.

Table 1

Symbol	Definition	Symbol	Definition
	DC (direct current)	N	Null line or neutral line
	AC (alternating current)	L	Live line
	AC and DC	I	Power-on
	Three-phase current		Power-off
	Ground		Back-up power
	Protective ground		Power-on state
	Chassis ground		Power-off state
	Signal ground		Risk of electric shock
WARNING	Hazardous sign		High temperature warning
Caution	Be careful		Warning

### 3 Commands

#### INST:NSEL

This command is used for channel selection.

<b>Data Type</b>	Uint32
<b>Query</b>	INST:NSEL?
<b>Example</b>	INST:NSEL 1 // select the 1 <sup>st</sup> channel INST:NSEL? // read the present channel

#### OUTP

This command is used to turn on/off output of present channel.

<b>Data Type</b>	Uint32
<b>Query</b>	OUTP?
<b>Example</b>	OUTP 1 // turn on output of channel 1 OUTP? // read whether the present channel is outputting

#### VOLT

This command is used for voltage setting.

**Data Type**          Float

**Query**                VOLT?

**Unit**                  V

<b>Example</b>	VOLT 1.000 // set voltage to 1V for the present channel VOLT? // read voltage setting of the present channel
----------------	---

### CURR

This command is used for current setting.

<b>Data Type</b>	Float
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<b>Query</b>	CURR?
--------------	-------

<b>Unit</b>	A
-------------	---

<b>Example</b>	CURR 2.1 // set current to 2.1A for the present channel CURR? // read current setting of the present channel
----------------	---

### MEAS:VOLT

This command queries the readback voltage of present channel.

<b>Data Type</b>	Float
------------------	-------

<b>Unit</b>	V
-------------	---

<b>Example</b>	MEAS:VOLT? // read the readback voltage for present channel
----------------	---

### MEAS:CURRE

This command queries the readback current of present channel.

**Data Type** Float

**Unit** A

**Example** MEAS:CURRE? // read the readback current for present channel

### VOLT? MAX

This command queries rated voltage of present channel.

**Data Type** Float

**Unit** V

**Example** VOLT?MAX // read the rated voltage for present channel

### CURRE? MAX

This command queries rated current of present channel.

**Data Type** Float

**Unit** A

**Example** CURRE?MAX // read the rated current for present channel



### OUTP:PARA

This command is used to set parallel mode.

**Data Type**            Uint32

**Query**                OUTP:PARA?

**Example**              OUTP:PARA 1 // enable the parallel mode  
OUTP:PARA? // read whether the parallel mode is enabled for  
present channel

### OUTP:SERI

This command is used to set series mode.

**Data Type**            Uint32

**Query**                OUTP:SERI?

**Example**              OUTP:SERI 1 // enable the series mode  
OUTP:SERI? // read whether the series mode is enabled for  
present channel

### OUTP:TRAC

This command is used to set trace mode.

**Data Type**            Uint32

**Query**                OUTP:TRAC?

**Example**              OUTP:TRAC 1 // enable the trace mode  
OUTP:TRAC? // read whether the trace mode is enabled for  
present channel

### MEAS:VOLT:ALL

This command queries readback voltage of three channels.

**Data Type**            Float

**Unit**                  V

**Example**              MEAS:VOLT:ALL? // read voltage of three channels

### MEAS:CURR:ALL

This command queries readback current of three channels.

**Data Type**            Float

**Unit**                  A

**Example**              MEAS:CURR:ALL? // read current of three channels

### **CURR:PROT**

This command is used to set over current protection value.

<b>Data Type</b>	Float
<b>Unit</b>	A
<b>Query</b>	CURR:PROT?
<b>Example</b>	CURR:PROT 3 //set over current protection to 3.0A for present channel CURR:PROT?//query the over current protection value for present channel

### **VOLT:PROT**

This command is used to set over voltage protection value.

<b>Data Type</b>	Float
<b>Unit</b>	V
<b>Query</b>	VOLT:PROT?
<b>Example</b>	VOLT:PROT 30 //set over voltage protection to 30V for present channel VOLT:PROT?//query the over voltage protection value for present channel

### MEAS:DVM

This command is used to read back DVM value.

<b>Data Type</b>	Float
<b>Unit</b>	V
<b>Query</b>	MEAS:DVM?

### \*ESR?

This command is used to read standard event register. After this command is operated, the standard event register will be cleared.

<b>Query</b>	*ESR?
<b>Parameter</b>	None
<b>Return</b>	<NR1> (register value)
<b>Related Commands</b>	*CLS, *ESE, *OPC

## 4 Programming Examples

This chapter will describe how to control the device by programming commands.

### 4.1 Single Channel Operation

1. Select channel 1  
INST:NSEL 1
2. Turn off output of present channel  
OUTP 0
3. Set voltage of channel 1 to 5V  
VOLT 5.000
4. Set current of channel 1 to 2A  
CURR 2
5. Turn on output of present channel  
OUTP 1
6. Read back voltage of present channel  
MEAS:VOLT?
7. Readback current of present channel  
MEAS:CURR?
8. Turn off output of present channel  
OUTP 0

### 4.2 Two Channels Operation

1. Turn off output of channel 1  
INST:NSEL 1;;OUTP 0

Note: When there are more than 1 commands, please use ;: to connect the commands.

2. Turn off output of channel 2  
INST:NSEL 2;;OUTP 0
3. Enable parallel mode  
OUTP:PARA 1
4. Set parallel voltage to 5V  
INST:NSEL 1;;VOLT 5.000
5. Set parallel current to 4A  
CURR 4
6. Turn on output of present channel  
OUTP 1
7. Read back voltage of present channel  
MEAS:VOLT?
8. Read back current of present channel  
MEAS:CURR?
9. Turn off output of present channel  
OUTP 0
10. Disable parallel mode  
OUTP:PARA 0

### **4.3 Readback Voltage and Current of All Channels**

1. Read back voltage of three channels  
MEAS:VOLT:ALL?
2. Read back current of three channels  
MEAS:CURR:ALL?