

- **Product Name:** High Precision 4-Channel Power Analyzer
- **Model Covered:** 87400
- **Manual Applicability:** 87400 and its variants

87400 High Precision 4-Channel Power Analyzer SCPI Programming Manual (V1.0)

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I、DISPlay

1. :DISPlay:MODE

(1) Function

Set or query the display mode.

(2) Command Format

:DISPlay:MODE {NUMeric|WAVE|HARMonic}

:DISPlay:MODE?

(3) Parameter Description

(1) NUMeric Display Numerical Interface

(2) WAVE Display Waveform Interface

(3) HARMonic Display Harmonic Mode/ Harmonic Values

(4) Sample

:DISPLAY:MODE NUMeric

:DISPLAY:MODE? -> NUM

2. :DISPlay:NUMeric[:NORMal]:ALL:PAGE

(1) Function Description

Set the the data page to be displayed in the data display interface, or query the current setting.

(2) Command Format

:DISPlay:NUMeric[:NORMal]:ALL:PAGE {<parameter>}

:DISPlay:NUMeric[:NORMal]:ALL:PAGE?

(3) Parameter Description

<parameter>=1~8(Number of Data Pages)

(4) Sample

:DISPLAY:NUMERIC:NORMAL:ALL:PAGE1

:DISPLAY:NUMERIC:NORMAL:ALL:PAGE? -> 1

(5) Precautions

After setting the displayed data page, the cursor moves to the beginning of the page for display.

3. :DISPlay:NUMeric[:NORMal]:FORMat

(1) Function Description

Set the data display format, or query this setting.

(2) Command Format

:DISPlay:NUMeric[:NORMal]:FORMat{VAL4|VAL8|VAL16|ALL}

:DISPlay:NUMeric[:NORMal]:FORMat?

(3) Parameter Description

VAL4: 4 data display items.

VAL8: 8 data display items.

VAL16: 16 data display items.

ALL: All data display items shown.

(4) Sample

:DISPLAY:NUMERIC:NORMAL:FORMAT VAL8

:DISPLAY:NUMERIC:NORMAL:FORMAT? -> VAL8

4. :DISPlay:NUMeric[:NORMal]:{VAL4|VAL8|VAL16}:ITEM<x>

(1) Function Description

Set the measurement items to be displayed on the data display interface in 4-items, 8-item, 16-item display mode, determined by the combination of measurement function, input unit, and harmonic order.

(2) Command Format

:DISPlay:NUMeric[:NORMal]:{VAL4|VAL8|VAL16}:ITEM<x>{NONE|<Function>,<Element>[,<Order>]}

:DISPlay:NUMeric[:NORMal]:{VAL4|VAL8|VAL16}:ITEM<x>?

(3) Parameter Description

<x>=1~32 (In the 4-column display mode, display the number of the display item)

<x>=1~64 (In the 8-column display mode, display the number of the display item)

<x>=1~128 (In the 16-column display mode, display the number of the display item)

NONE=No display item

<Function>={URMS|IRMS|P|S|Q|LAMBDA|PHI|TIME|WH|WHP|WHM|AH|AHP|AHM|TIMEL|FU|FI|UPEAK|UPPEAK|UMPEAK|IPEAK|IPPEAK|IMPEAK|CFU|CFI|URMN|UMN|UDC|IRMN|IMN|IDC|PHU|PHI|ETA1|ETA2|UTHD|ITHD|F1|F2}

<Element>={<parameter>|SIGMA|SIGMB}(<parameter>=1~4)

(4) Sample

:DISPLAY:NUMERIC:NORMAL:VAL4:ITEM1 URMS,1

:DISPLAY:NUMERIC:NORMAL:VAL4:ITEM1?->

:DISPLAY:NUMERIC:NORMAL:VAL4:ITEM1 URMS,1

5. :DISPlay:NUMeric[:NORMal]:{VAL4|VAL8|VAL16}:PAGE

(1) Function Description

Set the data page to be displayed in the data display view.

(2) Command Format

:DISPlay:NUMeric[:NORMal]:{VAL4|VAL8|VAL16}:PAGE {<parameter>}

:DISPlay:NUMeric[:NORMal]:{VAL4|VAL8|VAL16}:PAGE?

(3) Parameter Description

<parameter>=1~8(Number of data pages)

(4) Sample

:DISPLAY:NUMERIC:NORMAL:VAL4:PAGE 1

:DISPLAY:NUMERIC:NORMAL:VAL4:PAGE? -> 1

(5) Precaution

When the page number is set, the cursor moves to the start of the page.

6. :DISPlay:NUMeric[:NORMal]:{VAL4|VAL8|VAL16}:PRESet

(1) Function Description

Resets the display method of each measurement item in the data display page.

(2) Command Format

:DISPlay:NUMeric[:NORMal]:{VAL4|VAL8|VAL16}:PRESet{<parameter>}

(3) Parameter Description

<parameter>=1~8

Note: This parameter can be set to any value within the range of 1 to 8. Regardless of the value of this parameter, the measurement display items will be reset. ◦

(4) Sample

:DISPLAY:NUMERIC:NORMAL:VAL6:PRESET1

II、:HARMonics

1. :HARMonics:CONFigure:ALL

(1) Function

Set the harmonic PLL source group for all units.

(2) Command Format

:HARMonics:CONFigure:ALL {NRf}

(3) Parameter Description

NRf=1~2(Harmonic PLL source group number)

(4) Sample

:HARMonics:CONFigure:ALL 1

2. :HARMonics:CONFigure:ELEMEnt<x>

(1) Function

Set or query the harmonic PLL source group for a specified unit.

(2) Command Format

:HARMonics:CONFigure:ELEMEnt<x> {NRf}

:HARMonics:CONFigure:ELEMEnt<x>?

(3) Parameter Description

<x>=1~4(Uni number)

NRf=1~2(Harmonic PLL source group number)

(4) Sample

:HARMonics:CONFigure:ELEMEnt1 1

:HARMonics:CONFigure:ELEMEnt1? -> 1

3. :HARMonics:CONFigure:{SIGMA|SIGMB}

(1) Function

Set the harmonic PLL source group for a specified wiring group. ◦

(2) Command Format

```
:HARMonics:CONFigure:{SIGMA|SIGMB} {NRf}
```

(3) Parameter Description

NRf=1~2(Harmonic PLL source group number)

(4) Sample

```
:HARMonics:CONFigure:SIGMA 1
```

4. **:HARMonics:NORMal:ORDER**

(1) Function

Set or query the maximum and minimum harmonic orders in normal mode. (2) Command Format

```
:HARMonics:NORMal:ORDER {<parameter 1>,<parameter 2>}
```

```
:HARMonics:NORMal:ORDER?
```

(3) Parameter Description

First parameter=1 (Minimum order for measuring harmonics)

Second parameter=1~50 (Maximum order for measuring harmonics)

(4) Sample

```
:HARMONICS:NORMal:ORDER 1,50
```

```
:HARMONICS:NORMal:ORDER? ->1,50
```

(5) Precaution

This command operates the harmonic measurement count in normal mode.

5. **:HARMonics<x>:PLLSource**

(1) Function

Set or query the PLL source.

(2) Command Format

:HARMonics<x>:PLLSource {U<elem>|I<elem>}

:HARMonics<x>:PLLSource?

(3) Parameter Description

<x>=1~2(Harmonic PLL source group number)

<elem>=1~4 (input unit)

(4) Sample

:HARMONICS1:PLLSOURCEU1

:HARMONICS1:PLLSOURCE? -> U1

6. :HARMonics:THD

(1) Function

Set or query the THD formula for a specified harmonic PLL source group in harmonic mode.

(2) Command Format

:HARMonics:THD {IEC|CSA}

:HARMonics:THD?

(3) Sample

:HARMONICS1:THD IEC

:HARMONICS1:THD? -> IEC

III、 HOLD

1. :HOLD

(1) Function

Set or query the hold status of the data.

(2) Command Format

:HOLD {<Boolean value>}

:HOLD?

(3) Parameter Description

<Boolean value> = ON|OFF

(4) Sample

:HOLD OFF

:HOLD? -> 0

IV、:INPut

1. [:INPut]:CFACtor

(1) Function

Set or query the peak factor

(2) Command Format

[:INPut]:CFACtor {<NRf>|A6}

[:INPut]:CFACtor?

(3) Parameter Description

<NRf>=3,6

(4) Sample

:INPUT:CFACTOR 3

:INPUT:CFACTOR? -> 3

2. [:INPut]:CURRent:AUTO:ALL

(1) Function

Set the auto range function for all current input units.

(2) Command Format

:INPut:CURRent:AUTO:ALL {<Boolean value>}

(3) Parameter Description

<Boolean value>=ON|OFF

(4) Sample

:INPUT:CURRENT:AUTO:ALL ON

3. [:INPut]:CURRent:AUTO:ELEMent<x>

(1) Function

Set or query the auto range function for a specified input units.

(2) Command Format

:INPut:CURRent:AUTO:ELEMent<x> {<Boolean value>}

:INPut:CURRent:AUTO:ELEMent<x>?

(3) Parameter Description

<x> = 1~4 (Input unit)

<Boolean value>= ON|OFF

(4) Sample

:INPUT:CURRENT:AUTO:ELEMENT1ON

:INPUT:CURRENT:AUTO:ELEMENT1? -> 1

4. [:INPut]:CURRent:AUTO:{SIGMA|SIGMB }

(1) Function

Set or query the auto range function for the current input units of a wiring group.

(2) Command Format

[:INPut]:CURRent:AUTO:{SIGMA|SIGMB} {<Boolean>}

(3) Parameter Description

<x>=1~4(Input unit)

<Boolean value>=ON|OFF

(4) Sample

:INPUT:CURRENT:AUTO:SIGMA ON

5. [:INPut]:CURRent:CONFig:ALL

(1) Function

Set the available range configuration for current in all units.

(2) Command Format

:INPut:CURRent:CONFig:ALL {ALL|<Current>[,<Current>][,<Current>]...}

(3) Parameter Description

ALL = All ranges available;

20A Input unit

<Current> = 500mA, 1A, 2A, 5A, 10A, 20A

5A Input unit

<Current> = 100mA, 200mA, 500mA, 1A, 2A, 5A

1A Input unit

<Current> = 20mA, 50mA, 100mA, 200mA, 500mA, 1A

(4) Sample

:INPUT:CURRENT:CONF ig:ALL ALL

6. [:INPut]:CURRent:CONFig:ELEMent<x>

(1) Function

Set the available range configuration for a specified current.

(2) Command Format

:INPut:CURRent:CONFig:ELEMent<x>{ALL|<Current>[,<Current>][,<Current>]...}

(3) Parameter Description

<x> = 1~4 (Input unit);

ALL = All ranges available;

20A Input unit

<Current> = 500mA, 1A, 2A, 5A, 10A, 20A

5A Input unit

<Current> = 100mA, 200mA, 500mA, 1A, 2A, 5A

1A Input unit

<Current> = 20mA, 50mA, 100mA, 200mA, 500mA, 1A

Note: The actual current range levels should be referenced according to the selected model type.

(4) Sample

```
:INPUT:CURRENT:CONF ig:ELEMENT1 1,2,5,20
```

```
:INPUT:CURRENT:CONF ig:ELEMENT1? -> 1,2,5,20
```

7. [:INPut]:CURRent:RANGe:ALL

(1) Function

Set the range for all current input units.

(2) Command Format

```
:INPut:CURRent:RANGe:ALL {<Current>|(EXTErnal,<Voltage>)}
```

20A Input unit

```
<Current> = 500mA,1A,2A,5A,10A,20A
```

5A Input unit

```
<Current> = 100mA,200mA,500mA,1A,2A,5A
```

1A Input unit

```
<Current> = 20mA,50mA,100mA,200mA,500mA,1A
```

```
Extsensor = {50mV,100mV,200mV,500mV,1V,2V,5V,10V}
```

Note: Current refers to the current range, and Extsensor denotes the range for external current transformers. The actual current range levels should be referenced according to the selected model type. configuration for a specified current.

(3) Sample

```
:INPUT:CURRENT:RANGE:ALL 10mA,
```

```
:INPUT:CURRENT:RANGE:ALL EXTERNAL,10V
```

(4) Precaution

This command allows for the setting of the range for Extsensor (50mV|100mV|200mV|500mV|1V|2V|5V|10V), However, it must be used with:INPut:CURRent:EXTSensor Activate Extsensor.

8. [:INPut]:CURRent:RANGe:ELEMent<x>

(1) Function

Set or query the range for a specified current input unit.

(2) Command Format

:INPut:CURRent:RANGe:ELEMent<x>{<Current>|(EXTErnal,<Voltage>)}

(3) Parameter Description

<x> = 1~4 (Input unit)

(4) Sample

:INPUT:CURRENT:RANGE:ELEMent1 20A

:INPUT:CURRENT:RANGE:ELEMent1? -> 20A

:INPUT:CURRENT:RANGE:ELEMent1 10V

:INPUT:CURRENT:RANGE:ELEMent1? -> EXTERNAL,10V

(5) Precaution

This command allows for the setting of the range for extsensor (50mV|100mV|200mV|500mV|1V|2V|5V|10V), However, it must be used with:INPut:CURRent:EXTSensor Activate Extsensor.

9. [:INPut]:CURRent:RANGe: {SIGMA|SIGMB }

(1) Function

Set or query the current range for the wiring group.

(2) Command Format

[:INPut]:CURRent:RANGe: {SIGMA|SIGMB} {<Current>|(EXTErnal,<Voltage>)}

(3) Parameter Description

<Current>,<Voltage> = See [:INPut]: CURRent:RANGe[:ALL]

(4) Sample

:INPUT:CURRENT:RANGE:SIGMA 20A

:INPUT:CURRENT:RANGE:SIGMA EXTERNAL,10V

10. [:INPut]:CURRent:SRATio:ALL

(1) Function

Set the transformer ratio constant for all current input units.

(2) Command Format

:INPut:CURRent:SRATio:ALL {<parameter>}

(3) Parameter Description

<parameter> = 0.1~50000.0

(4) Sample

:INPUT:CURRENT:SRATIO:ALL 10

11. [:INPut]:CURRent:SRATio:ELEMent<x>

(1) Function

Set the transformer ratio constant for a specified current input unit.

(2) Command Format

[:INPut]:CURRent:SRATio:ELEMent<x> {<parameter>}

(3) Parameter Description

<x> = 1~4

<parameter> = 0.1~50000.00

(4) Sample

:INPUT:CURRENT:SRATIO:ELEMENT1 10

:INPUT:CURRENT:SRATIO:ELEMENT1? -> :INPUT:CURRENT:SRATIO:

ELEMENT1 10.0000

12. [:INPut]:CURRent:SRATIo: {SIGMA|SIGMB }

(1) Function

Set the transformer ratio constant for the current of a specified wiring group.

(2) Command Format

[:INPut]:CURRent:SRATIo:{SIGMA|SIGMB} {<parameter>}

(3) Parameter Description

<parameter> = 0.1~50000.00

(4) Sample

:INPUT:CURRENT:SRATIO:SIGMA 10

13. [:INPut]:FILTer:FREQuency[:ALL]

(1) Function

Set the frequency filter for all input units.

(2) Command Format

[:INPut]:FILTer:FREQuency[:ALL] {OFF|500Hz}

(3) Parameter Description

OFF = Frequency filter off

(4) Sample

:INPUT:FILTER:FREQUENCY:ALL OFF

14. [:INPut]:FILTer:FREQuency:ELEMent<x>

(1) Function

Set or query the frequency filter for a specified input unit.

(2) Command Format

[:INPut]:FILTer:FREQuency:ELEMent<x>{OFF|500Hz}

(3) Parameter Description

<x> = 1~4

OFF = Frequency filter off

(4) Sample

:INPUT:FILTER:FREQUENCY:ELEMENT1 500HZ

:INPUT:FILTER:FREQUENCY:ELEMENT1? -> :INPUT:FILTER:FREQUENCY:
ELEMENT1 500.0E+00

15. [:INPut]:FILTer:FREQUency:{SIGMA|SIGMB}

(1) Function

Set the frequency filter for a specified wiring group.

(2) Command Format

[:INPut]:FILTer:FREQUency: {SIGMA|SIGMB} {OFF|500Hz}

(3) Parameter Description

<x> = 1~4

OFF = Frequency filter off

(4) Sample

:INPUT:FILTER:FREQ:SIGMA 500Hz

16. [:INPut]:FILTer[:LINE][:ALL]

(1) Function

Set the line filter for all input units.

(2) Command Format

[:INPut]:FILTer[:LINE][:ALL] {OFF|<Frequency>}

(3) Parameter Description

OFF = Line filter off

<Frequency> = 500Hz,5.5KHz

(4) Sample

:INPUT:FILTER:LINE:ALL OFF

17. [:INPut]:FILTer[:LINE]:ELEMEnt<x>

(1) Function

Set or query the line filter for a specified input unit.

(2) Command Format

[:INPut]:FILTer[:LINE]:ELEMEnt<x> {OFF|<Frequency>}

[:INPut]:FILTer[:LINE]:ELEMEnt<x>?

(3) Parameter Description

<x>=1~4

OFF = Line filter off

<Frequency> = 500Hz,5.5KHz

(4) Sample

:INPUT:FILTER:LINE:ELEMENT1 5.5KHZ

:INPUT:FILTER:LINE:ELEMENT1? -> :INPUT:FILTER:LINE:ELEMENT1
5.50E+03

18. [:INPut]:FILTer[:LINE]: {SIGMA|SIGMB}

(1) Function

Set the line filter for a specified wiring group.

(2) Command Format

[:INPut]:FILTer[:LINE]:{SIGMA|SIGMB} {OFF|<Frequency>}

(3) Parameter Description

OFF = Line filter off

<Frequency> = 500Hz,5.5KHz

(4) Sample

:INPUT:FILTER:LINE:SIGMA 5.5KHZ

19. [:INPut]:SCALing:{VT|CT}[:ALL]

(1) Function

Set the VT ratio and CT ratio for all input units.

(2) Command Format

:INPut:SCALing:{VT|CT}:ALL {<parameter>}

(3) Parameter Description

<parameter> = 0.1~50000.00

(4) Sample

:INPUT:SCALING:VT:ALL 1

:INPUT:SCALING:CT:ALL 1

20. [:INPut]:SCALing:{VT|CT}:ELEMEnt<x>

(1) Function

Set or query the VT ratio and CT ratio for a specified input units.

(2) Command Format

:INPut:SCALing:{VT|CT}:ELEMEnt<x> {<parameter>}

:INPut:SCALing:{VT|CT}:ELEMEnt<x>?

(3) Parameter Description

<x> = 1~4 (Input unit)

<parameter> = 0.1~50000.00

(4) Sample

:INPUT:SCALING:VT:ELEMENT1 1

:INPUT:SCALING:VT:ELEMENT1? -> 1.0000

:INPUT:SCALING:CT:ELEMENT1 1

:INPUT:SCALING:CT:ELEMENT1? -> 1.0000

21. [:INPut]:SCALIng:{VT|CT}:{SIGMA|SIGMB}

(1) Function

Set the VT ratio and CT ratio for a specified wiring group.

(2) Command Format

:INPut:SCALIng:{VT|CT}:{SIGMA|SIGMB} {<parameter>}

(3) Parameter Description

<parameter> = 0.1~50000.00

(4) Sample

:INPUT:SCALING:VT:SIGMA 1

:INPUT:SCALING:CT:SIGMA 1

22. [:INPut]:SYNChronize:ALL

(1) Function

Set the synchronization source for all input units.

(2) Command Format

:INPut:SYNChronize:ALL {U<x>|I<x>|NONE}

(3) Parameter Description

NONE = No Synchronization Source

(4) Sample

:INPUT:SYNCHRONIZE:ALL I1

23. [:INPut]:SYNChronize:ELEMent<x>

(1) Function

Set or query the synchronization source for a specified input unit.

(2) Command Format

:INPut:SYNChronize:ELEMent<x> {U<x>|I<x>|EXT|NONE}

:INPut:SYNChronize:ELEMent<x>?

(3) Parameter Description

<x> = 1~4 (Input unit)

EXT = External clock input

NONE = No Synchronization Source

(4) Sample

:INPUT:SYNCHRONIZE:ELEMENT1 I1

:INPUT:SYNCHRONIZE:ELEMENT1? -> I1

24. [:INPut]:SYNChronize:{SIGMA|SIGMB}

(1) Function

Set the synchronization source for a specified wiring group.

(2) Command Format

:INPut:SYNChronize:{SIGMA|SIGMB} {U<x>|I<x>|NONE}

(3) Parameter Description

NONE = No Synchronization Source

(4) Sample

:INPUT:SYNCHRONIZE:SIGMA I1

25. [:INPut]:VOLTage:AUTO:ALL

(1) Function

Turn off or turn on the auto range function for all voltage input units.

(2) Command Format

:INPut:VOLTage:AUTO:ALL {<Boolean value>}

(3) Parameter Description

<Boolean value> = ON|OFF

(4) Sample

:INPUT:VOLTAGE:AUTO:ALL ON

26. [:INPut]:VOLTage:AUTO:ELEMent<x>

(1) Function

Set or query the automatic range function of the specified voltage input unit.

(2) Command Format

:INPut:VOLTage:AUTO:ELEMent<x> {<Boolean value>}

:INPut:VOLTage:AUTO:ELEMent<x>?

(3) Parameter Description

<x> = 1~4 (Input unit)

<Boolean value>= ON|OFF

(4) Sample

:INPUT:VOLTAGE:AUTO:ELEMENT1 ON

:INPUT:VOLTAGE:AUTO:ELEMENT1? ->1

27. [:INPut]:VOLTage:AUTO:{SIGMA|SIGMB}

(1) Function

Turn off or turn on the auto range function for a specified wiring group.

(2) Command Format

:INPut:VOLTage:AUTO:{SIGMA|SIGMB} {<Boolean value>}

(3) Parameter Description

<Boolean value> = ON|OFF

(4) Sample

:INPUT:VOLTAGE:AUTO:SIGMA ON

28. [:INPut]:VOLTage:CONFig:ALL

(1) Function

Set the available voltage range for all units

(2) Command Format

:INPut:VOLTage:CONFig:ALL {ALL|<Voltage>[,<Voltage>][,<Voltage>]...}

(3) Parameter Description

ALL: Set all ranges available

<Voltage> = 15V,30V,60V,100V,150V,300V,600V,1000V(峰值因数3)

<Voltage> = 7.5V,15V,30V,50V,75V,150V,300V,500V(峰值因数6)

(4) Sample

:INPUT:VOLTAGE:CONFIG:ALL ALL

29. [:INPut]:VOLTage:CONFig:ELEMent<x>

(1) Function

Set the available voltage range for a specified unit.

(2) Command Format

:INPut:VOLTage:CONFig:ELEMent<x> {ALL|<Voltage>[,<Voltage>][,<Voltage>]...}

(3) Parameter Description

<x> = 1~4 (Input unit)

ALL: Set all ranges available

<Voltage> = 15V,30V,60V,100V,150V,300V,600V,1000V(Peak factor 3)

<Voltage> = 7.5V,15V,30V,50V,75V,150V,300V,500V(Peak factor 6)

(4) Sample

```
:INPUT:VOLTAGE:CONFig:ELEMENT1 15,100,600
```

```
:INP UT:VOLTAGE:CONFig:ELEMENT1?->
```

```
1.5000e+001,1.000e+002,6.0000e+002
```

30. [:INPut]:VOLTage:RANGe:ALL

(1) Function

Set the measurement range for all voltage input units.

(2) Command Format

```
:INPut:VOLTage:RANGe:ALL{<Voltage>}
```

(3) Sample

```
:INPUT:VOLTAGE:RANGE:ALL 1000V
```

31. [:INPut]:VOLTage:RANGe:ELEMent<x>

(1) Function

Set the measurement range for a specified voltage input units

(2) Command Format

```
:INPut:VOLTage:RANGe:ELEMent<x>{<Voltage>}
```

```
:INPut:VOLTage:RANGe:ELEMent<x>?
```

(3) Parameter Description

<Voltage> = 15V,30V,60V,100V,150V,300V,600V,1000V(Peak factor 3)

<Voltage> = 7.5V,15V,30V,50V,75V,150V,300V,500V(Peak factor 6)

<x> = 1~4 (Input unit)

(4) Sample

:INPUT:VOLTAGE:RANGE:ELEMENT1 1000V

:INPUT:VOLTAGE:RANGE:ELEMENT1?->1000

32. [:INPut]:VOLTage:RANGe: {SIGMA|SIGMB}

(1) Function

Set the measurement range for a specified wiring group.

(2) Command Format

:INPut:VOLTage:RANGe: {SIGMA|SIGMB} {<Voltage>}

(3) Sample

:INPUT:VOLTAGE:RANGE:SIGMA 1000V

33. [:INPut]:WIRing

(1) Function

Set or query the wiring configuration.

(2) Command Format

:INPut:WIRing {(P1W2|P1W3|P3W3|P3W4|V3A3)[,(P1W2|P1W3|P3W3|P3W4|V3A3)][,(P1W2|P1W3|P3W3|P3W4|V3A3)][,(P1W2|P1W3|P3W3|P3W4|V3A3)][,(P1W2|P1W3|P3W3|P3W4|V3A3)][,(P1W2|P1W3|P3W3|P3W4|V3A3)]}

:INPut:WIRing?

(3) Parameter Description

P1W2 = Single-phase,two-wire system

P1W3 = Single-phase,three-wire system

P3W3 = Three-phase, three-wire system

P3W4 = Three-phase, four-wire system

V3A3 = Three-phase, three-wire (three-current, three-voltage)

(4) Sample

:INPUT:WIRING P1W2,P1W2,P1W2,P1W2,P1W2,P1W2

:INPUT:WIRING? ->P1W2,P1W2,P1W2,P1W2,P1W2,P1W2

:INPUT:WIRING V3A3,V3A3

:INPUT:WIRING? ->V3A3,V3A3

V、INTEGRate

1. :INTEGRate:MODE

(1) Function Description

Set integration mode or query current settings.

(2) Command Format

:INTEGRate:MODE {NORMal|CONTInuous}

:INTEGRate:MODE?

(3) Parameter Description

NORMal is normal integration mode; CONTInuous。

(4) Sample

:INTEGRate:MODE NORMal

:INTEGRate:MODE? -> NORMal

2. :INTEGRate:RESet

(1) Function Description

Reset integration value。

(2) Command Format

:INTEGRate:RESet

(3) Sample

:INTEGRate:RESET (reset all units integral)

4. :INTEGRate:STARt

(1) Function Description

Turn on integration function。

(2) Command Format

:INTEGrate:STARt

(3) Sample

:INTEGrate:STARt (Start all units integral)

5. :INTEGrate:STATe?

(1) Function Description

Query the execution status of integration function.

(2) Command Format

:INTEGrate:STATe?

(3) Parameter Description

Information returned as follows:

RESet = Reset integration

READy = Ready in real time integration mode

STARt = Start execute integral

STOP = Integral stop

ERRor = Integral exited error(possibly due to overflow, power loss, etc.)

(4) Sample

:INTEGRATE:STATE? -> RESET

6. :INTEGrate:STOP

(1) Function Description

Stop reset integral.

(2) Command Format

:INTEGrate:STOP

(3) Sample

:INTEGRATE: STOP (Stop all unit integral)

7. :INTEGRate: TIMER

(1) Function Description

Set parameters for all unit integral timers.

(2) Command Format

:INTEGRate: TIMER {<parameter 1>,<parameter 2>,<parameter 3>}

(3) Parameter Description

{<parameter 1>, <parameter 2>, <parameter 3>} = 0, 0, 0 ~ 10000, 0, 0

first<parameter 1> = 0 ~ 10000 (hour)

second<parameter 2> = 0 ~ 59 (minute)

third<parameter 3> = 0 ~ 59 (second)

(4) Sample

:INTEGRATE: TIMER 1,0,0

VI、MEASure

1. :MEASure:AVERaging:COUNT

(1) Function

Set or query average coefficient settings。

(2) Command Format

:MEASure:AVERaging:COUNT {<parameter>}

:MEASure:AVERaging:COUNT?

(3) Parameter Description

<parameter> = 8, 16, 32, 64

(4) Sample

:MEASURE:AVERAGING:COUNT 8

:MEASURE:AVERAGING:COUNT? ->8

2. :MEASure:AVERaging:STATE

(1) Function

Set or query the average switch function。

(2) Command Format

:MEASure:AVERaging:STATE {<Boolean value>}

:MEASure:AVERaging:STATE?

(3) Parameter Description

<Boolean value> = ON|OFF

(4) Sample

:MEASURE:AVERAGING:STATE ON

:MEASURE:AVERAGING:STATE? -> 1

3. :MEASure:AVERaging:TYPE

(1) Function

Set or query average type settings.

(2) Command Format

:MEASure:AVERaging:TYPE {EXP|LIN}

:MEASure:AVERaging:TYPE?

(3) Parameter Description

EXP = Exponential

LIN = Linear

(4) Sample

:MEASURE: AVERAGING:TYPE EXP

:MEASURE: AVERAGING:TYPE? -> EXP

4. :MEASure:EFFiciency:ETA<x>

(1) Function

Set or query a specific efficiency equation.

(2) Command Format

:MEASure:EFFiciency:ETA<x> {(OFF|P<x>|PA|PB|UDEF<x>)[,(P<x>|PA|PB|UDEF<x>)]}

:MEASure:EFFiciency:ETA<x>?

ETA<x>x = 1~2 (η_1 - η_2)

P<x>x = 1~4 (P1-P4)

UDEF<x>x = 1~2 (Udef1-Udef2) .

(3) Sample

: MEASure:EFFiciency:ETA1 PA,PB

: MEASure:EFFiciency:ETA1? -> PA,PB

5. :MEASure:EFFiciency:UDEF<x>

(1) Function

Set or query user-defined formulas in the efficiency equation.

(2) Command Format

:MEASure:EFFiciency:UDEF<x> {(P<x>|PA|PB),(P<x>|PA|PB)}

:MEASure:EFFiciency:UDEF<x>?

UDEF<x>x = 1~2 (Udef1-Udef2)

P<x>x = 1~4 (P1-P4)

(3) Sample

:MEASure:EFFiciency:UDEF1PA,PB

: MEASure:EFFiciency:UDEF1?->PA,PB

6. :MEASure:MHOLD

(1) Function

Set or query the maximum hold switch.

(2) Command Format

:MEASure:MHOLD {<Boolean>}

:MEASure:MHOLD?

(3) Sample

:MEASURE:MHOLD ON

:MEASURE:MHOLD? -> :MEASURE:MHOLD 1

7 :MEASure:SQFormula

(1) Function

Set or query the formula configuration for calculating apparent power S and reactive power Q.

(2) Command Format

:MEASure:SQFormula {TYPE1|TYPE2|TYPE3}

:MEASure:SQFormula?

(3) Sample

:MEASURE:SQFORMULA TYPE1

:MEASURE:SQFORMULA? -> TYPE1

VII、NUMERIC

1. :NUMERIC[:NORMAl]:CLEAr ALL

(1) Function Description

Clear all measurement data associated with each measurement item.

(2) Command Format

:NUMERIC[:NORMAl]:CLEAr ALL

(3) Parameter Description

ALL = Clear the measurement data for all measurement items.

(4) Sample

:NUMERIC:LIST:NORMAl:CLEAR ALL

2. :NUMERIC[:NORMAl]:ITEM<x>

(1) Function Description

Set or query the digital display output items for data (such as, function、input unit)。

(2) Command Format

:NUMERIC:NORMAl:ITEM<x> {NONE|<Function>,<Element>}

:NUMERIC:NORMAl:ITEM<x>?

(3) Parameter Description

<x> = 1 to 64 (Item number)

NONE = No output items

<Function>={NONE|URMS|IRMS|P|S|Q|LAMBDA|PHI|TIME|WH|WHP|WHM|AH|AHP|AHM|TIMEL|FU|FI|UPEAK|UPPEAK|UMPEAK|IPEAK|IPPEAK|IMPEAK|CFU|CFI|URMN|UMN|UDC|IRMN|IMN|IDC|PHU|PHI|ETA1|ETA2|UTHD|ITHD|F1|F2}

<Element> = {<parameter>|SIGMA|SIGMB} (<parameter>= 0 ~ 4)

(4) Sample

:NUMERIC:NORMAl:ITEM2 Urms,1 (This command indicates that the second item set is

Channel 1 Voltage rms value, that is, when calling :NUMeric:NORMal:VALue?The second data returned by the command is the voltage rms value of Channel 1.)。

3. :NUMeric[:NORMal]:NUMber

(1) Function Description

Set the number of numerical data values transmitted by the“:NUMeric[:NORMal]:VALue?”command, or query the current settings.

(2) Command Format

:NUMeric[:NORMal] :NUMBER {<parameter>}

:NUMeric[:NORMal] :NUMBER?

<parameter> = 1 ~255, Default is 255。

(3) Sample

:NUMeric:NORMal:NUMber 10 (This command sets the number of data points to be retrieved. Sending the:NUMeric:NORMal:VALue?command without any parameters returns 10 data points, the specific meaning of each data point is determined bythe:NUMeric:NORMal:ITEM<x> command) 。

:NUMeric:NORMal:NUMber? ->10 (This command queries the number of data points returned in a single response when the:NUMeric:NORMal:VALue?command is sent without parameters.)。

(4) Precaution

If the parameters for the“:NUMeric[:NORMal] :VALue?”command are omitted, the number of numerical data points output by the“:NUMeric[:NORMal]:VALue?” command is determined by the“:NUMeric[:NORMal] :NUMBER”command。

4. :NUMeric[:NORMal]:PRESet 1

(1) Function Description

Reset the measurement data of the numerical measurement items.

(2) Command Format

:NUMeric[:NORMal]:PRESe 1

(3) Sample

:NUMERIC:NORMal:PRESET 1

5. :NUMeric[:NORMal]:VALue?

(1) Function Description

Query numerical data.

(2) Command Format

:NUMeric[:NORMal] :VALue? {<parameter>}

<parameter> = 1 ~255

NUMeric:NORMal:VALue?

(3) Sample

NUMERIC:NORMAL:VALUE? 2 (When querying data, only return the data item set by:NUMeric :NORMal:ITEM2)。

:NUMERIC:NORMAL:VALUE? (The number of data points returned is determined by the :NUMeric[:NORMal]:NUMber command, The meaning of each data item is determined by the:NUMeric:NORMal:ITEM<x> command。)

例如， For example, to obtain the voltage rms value, current rms value, voltage DC value, and current DC value of the first channel, the command would be:

:NUMeric:NORMal:ITEM1 urms,1

:NUMeric:NORMal:ITEM2 irms,1

:NUMeric:NORMal:ITEM3 udc,1

:NUMeric:NORMal:ITEM4 idc,1

:NUMeric:NORMal:NUMber 4

:NUMeric:NORMal:VALue? ->104.75E+00,10.02E+00, 4.75E+00,5.02E+00

(4) Precaution

若“:NUMeric[:NORMal]:VALue?”命令参数省略，则“:NUMeric[:NORMal] :VALue?”命令输出的数值数据个数由“:NUMeric[:NORMal] :NUMBER”命令确定。当item 为NONE、仪器界面显示为“-----”或者“”时，查询返回“NAN”；若界面上显示为“---OF---”或“Error”时，查询结果返回“INF”。

6. :NUMeric:HOLD

(1) Function

Set or query the data hold switch.

(2) Command Format

:NUMeric:HOLD {<Boolean>}

:NUMeric:HOLD?

(3) Sample

NUMERIC:HOLD ON

:NUMERIC:HOLD? -> :NUMERIC:HOLD1

7. :NUMeric:LIST:CLEar ALL

(1) Function Description

Clear the measurement data associated with the specified measurement item.

(2) Command Format

:NUMeric:LIST:CLEar ALL

(3) Parameter Description

ALL = Clear the measurement data for all measurement items.

(4) Sample

:NUMERIC:LIST:CLEAR ALL

8. :NUMeric:LIST:ITEM<x>

(1) Function Description

Set the measurement items to be output from the harmonic measurement results list or query this setting.

(2) Command Format

```
:NUMeric:LIST:ITEM<x> {NONE|<Function>,<Element>}
```

```
:NUMeric:LIST:ITEM<x>?
```

(3) Parameter Description

<x> = 1 ~ 64 (Measurement item number)

NONE = None

<Function>={NONE|URMS|IRMS|P|S|Q|LAMBDA|PHI|TIME|WH|WHP|WHM|AH|AHP|AHM|TIMEL|FU|FI|UPEAK|UPPEAK|UMPEAK|IPEAK|IPPEAK|IMPEAK|CFU|CFI|URMN|UMN|UDC|IRMN|IMN|IDC|PHU|PHI|ETA1|ETA2|UTHD|ITHD|F1|F2}

<Element> = {<parameter>|SIGMA|SIGMB}(<parameter> = 1 ~ 4)

(4) Sample

```
:NUMERIC:LIST:ITEM1 UTHD,1
```

```
:NUMERIC:LIST:ITEM1? ->:NUMERIC:LIST:ITEM1 UTHD,1
```

9. :NUMeric:LIST:NUMber

(1) Function Description

When the“:NUMeric:LIST:VALue?”command is issued without parameters, this command sets the number of measurement items output by the“:NUMeric:LIST:VALue?”command.

(2) Command Format

```
:NUMeric:LIST:NUMber {<parameter>|ALL}
```

```
:NUMeric:LIST:NUMber?
```

(3) Parameter Description

<parameter> = 1 ~ 64 (ALL)

The default value of this parameter is 1.

(4) Sample

:NUMERIC:LIST:NUMBER 5

:NUMERIC:LIST:NUMBER? ->:NUMERIC:LIST:NUMBER 5

10. :NUMeric:LIST:ORDER

(1) Function Description

Set the number of harmonics for which measurement results can be output.

(2) Command Format

:NUMeric:LIST:ORDER {<NRf>|ALL}

:NUMeric:LIST:ORDER?

(3) Parameter Description

<NRf> = 1 ~ 50 (ALL)

(4) Sample

:NUMERIC:LIST:ORDER 50

:NUMERIC:LIST:ORDER? ->:NUMERIC:LIST:ORDER 50

11. :NUMeric:LIST:PRESet 1

(1) Function Description

Reset the measurement data for the harmonic measurement items.

(2) Command Format

:NUMeric:LIST:PRESet 1

(3) Sample

:NUMERIC:LIST:PRESET 1

12. :NUMeric:LIST:VALue?

(1) Function Description

Query the measurement data for each measurement item in the harmonic measurement results.

(2) Command Format

:NUMeric:LIST:VALue? {<parameter>}

(3) Parameter Description

<parameter> = 1 ~ 64 (Measurement Item Sequence Number)

(4) Sample

When a parameter value is given

:NUMERIC:LIST:VALUE? 1 ->103.58E+00,0.00E+00,103.53E+00,

.....,0.09E+00,..(omitted)..,0.01E+00,0.01E+00 When the parameter value is omitted and the“:NUMeric:LIST:NUMber”command is set to output five measurement items.

:NUMERIC:LIST:VALUE? ->103.58E+00,0.00E+00,103.53E+00,

0.09E+00,2.07E+00,0.04E+00,..(omitted)..,0.00E+00,0.00E+00

When the“:NUMeric:FORMat”command’s parameter is FLOat

:NUMERIC:LIST:VALUE? -> #6(Byte count,6位)(data byte sequence)

VIII、RATE

1. :RATE

(1) Function Description

Set or query data update rate.

(2) Command Format

```
:RATE    {<Time>}
```

```
:RATE?
```

(3) Parameter Description

<Time> =0.1, 0.2,0.5,1, 2, 5S ,10S

(4) Sample

```
:RATE    0.1S
```

```
:RATE?   ->0.1E+00
```

(5) Precaution

This command belongs to the instrument configuration commands.

IX、 Extra

1. *CLS

(1) Function Description

Clear all event registers and error queues in all register groups.

(2) Command Format

*CLS

(3) Sample

*CLS

2. *IDN?

(1) Function Description

Identification query, returns the instrument's identification string.。

(2) Command Format

*IDN?

(3) Sample

*IDN?->REXGEAR Electronics,87400

3. *RST

(1) Function Description

Restore the instrument configuration to factory settings (while keeping remote control configurations unchanged) .

(2) Command Format

*RST

(3) Sample

*RST