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SCPI COMMAND REFERENCE

# TH2692

## Insulation Resistance Tester

Companion document to the TH2692 Operation Manual. Full remote SCPI command set, organized by first-level command. The TH2692 uses SCPI only — it does not support MODBUS.

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Rev. 2026-10

# TH2692 SCPI Command Reference

## Insulation Resistance Tester

This document lists the full remote-control command set for the TH2692. It is the companion reference to the *TH2692 Operation Manual*, which covers front-panel operation, the physical remote interfaces (RS232C, USB Device, EXT.I/O) and general operating procedures.


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*The TH2692 uses the SCPI command set only, over RS232C or USB Device — it does not support MODBUS. Commands are case-insensitive and may be abbreviated (the short form is the abbreviated spelling shown under each command's full name) or spelled out in full. NR1 = integer; NR2 = fixed-point decimal; NR3 = scientific/floating-point; NL (newline, decimal 10, hex 0x0A) terminates each command line. A command followed directly by `?` executes the corresponding query.*

SECTION 1

# Conventions & Command Structure

## 1.1 Command structure

Instrument commands are SCPI (Standard Commands for Programmable Instruments). Commands are tree-structured: the highest level is called a subsystem command, and the levels under it are valid only once that subsystem command has been selected, using a colon to separate the command hierarchy.

```
:CURRENT:AUTO:DCLEAR ON    ·    :CURRENT:RANGE 0
```

## 1.2 Basic rules

- Commands are case-insensitive: `SHORTCHECK:TIME AUTO` = `shortcheck:time auto` = `Shortcheck:Time Auto`.
- A space separates a command from its parameter — everything before the space is the command, everything after is the corresponding parameter. Example: in `SHORTCHECK:TIME AUTO`, `SHORTCHECK` is the first-level command, `TIME` the second-level command, and `AUTO` its parameter.
- Some commands take no parameter, e.g. `START` (start the test).
- A space must not be placed before or after a colon. Example: `COMPARATOR : MODE CONTINUE` is invalid; `COMPARATOR:MODE CONTINUE` is correct.
- Commands can be abbreviated or spelled out in full (the abbreviated form is given under each command's full name in this reference). Example: `COMPARATOR:BEEPER OFF` = `COMP:BEEP OFF`.
- A command followed immediately by a question mark (`?`) executes the corresponding query, e.g. `*IDN?`.

## 1.3 Symbol conventions

| Symbol | Meaning |
|---|---|
| : | Command hierarchy — moves to the next level of commands |
| ; | Starts multiple commands (up to 64 bytes for a single command, up to 1024 bytes for multiple commands) |
| * | A command preceded by an asterisk is a public (common) command |
| ? | Indicates a query |
| , | Separator between multiple parameters |
| (space) | Separator between a command and its parameter |
| " " | Content inside quotation marks is quoted verbatim; the command-parsing program does not process it |

NR1 = integer, e.g. `123`. NR2 = floating point, e.g. `12.3`. NR3 = exponential floating point, e.g. `12.3E+5`. NL = newline character, integer 10 (0x0A), the terminator for string input/output. In the worked examples, `PC>` denotes a command sent from the PC and `TH2692>` denotes a message sent by the instrument; the actual commands do not include these prefixes.

> **NOTE — HEADER COMMAND**
> When the `HEADER` function is ON, a query response is echoed back with its command prefix (e.g. `:VOLTAGE 25`); when OFF, only the bare value is returned (e.g. `25`). Both forms are shown in this reference's worked examples.

SECTION 2

# Instrument Control & Main Parameter

| Command | Details |
|---|---|
| `*IDN?` | Query the manufacturer, instrument model, instrument type, and software version. Example: `PC>*IDN?` → `TH2692>Tonghui, TH2692, Insulation Tester, V1.0.0.` |
| `*RST` | Reset the instrument and initialize the system. Example: `PC>*RST`. |
| `START`<br>`STAR` | Start the output and the test. Example: `PC>:START`. |
| `STOP` | End the test. A stop command sent during a test stops the output; a stop command sent while already stopped clears the measurement data. Example: `PC>:STOP`. |
| `MAINPARM <IR\|CURRENT>` | Set the main parameter. `IR` (insulation resistance): the insulation-resistance value is shown in the central display area and the upper/lower limits judge it. `CURRENT`: the current value is shown in the central display area and the upper/lower limits judge it. Example: `PC>:MAINPARM IR`. |
| `MAINPARM?` | Query the main parameter. Returns `IR` or `CURRENT`. Example: `PC>:MAINPARM?` → `TH2692>:MAINPARM IR` (HEADER ON) / `TH2692>IR` (HEADER OFF). |
| `STATE?`<br>`STAT?` | Query the test status. Returns `0` (output off), `1` (output on), or `2` (output off but voltage has not yet dropped below 36 V). Example: `PC>:STATE?` → `TH2692>0`. |

SECTION 3

# Measurement & Comparator Query

| Command | Details |
|---|---|
| `MEASURE?`<br>`MEAS?` | Query the test value of the main parameter; returns `Over.F` if the current range needs to switch to a higher range, or `Under.F` if it needs to switch to a lower range. Example (insulation-resistance mode, 100.1 MΩ): `PC>:MEASURE?` → `TH2692>100.1E+06`. Example (current mode, 231.3 µA): `PC>:MEASURE?` → `TH2692>231.3E-06`. |
| `MEASURE:COMPARATOR?`<br>`MEAS:COMP?` | Query the upper/lower-limit judgment result. Returns `OFF` (judgment off), `NOCOMP` (not yet judged), `DELAY` (during test delay), `PASS`, `U.FAIL` (over upper limit) or `L.FAIL` (under lower limit). Example: `PC>:MEASURE:COMPARATOR?` → `TH2692>PASS`. |
| `MEASURE:RESULT?`<br>`MEAS:RESU?` / `MEAS:RES?` | Query the measured value and judgment result together. Returns `OFF` / `NOCOMP` / `DELAY` / `PASS` / `UFAIL` / `LFAIL` / `ULFAIL` (range error, no judgment) as the second field. Example: `PC>:MEASURE:RESULT?` → `TH2692>1.00E+09,PASS`. |
| `MEASURE:CLEAR`<br>`MEAS:CLEA` / `MEAS:CLE` | Clear the measured value and judgment result. Example: `PC>:MEASURE:CLEAR`. |
| `MEASURE:MONITOR?`<br>`MEAS:MONI?` | Query the voltage monitoring value, numeric only, in volts (V). Example: `PC>:MEASURE:MONITOR?` → `TH2692>25.12`. |

SECTION 4

# Voltage, Current Range & Zero

## 4.1 Voltage

| Command | Details |
|---|---|
| `VOLTAGE <value>`<br>`VOLT <value>` | Set the test voltage. `value`: integer 25–1000 V. Example: `PC>:VOLTAGE 25`. |
| `VOLTAGE?`<br>`VOLT?` | Query the test-voltage setting value, numeric only, in V. Example: `PC>:VOLTAGE?` → `TH2692>25`. |

## 4.2 Current range

| Command | Details |
|---|---|
| `CURRENT:RANGE <0\|1\|2\|3\|4>`<br>`CURR:RANG <0\|1\|2\|3\|4>` | Set the current range. `0` auto range, `1` = 2 mA, `2` = 200 µA, `3` = 20 µA, `4` = 2 µA. Example: `PC>:CURRENT:RANGE 0\|1\|2\|3\|4`. |
| `CURRENT:RANGE?`<br>`CURR:RANG?` | Query the current-range setting. Returns `0\|1\|2\|3\|4` per the same coding. |
| `CURRENT:AUTO:DCLEAR <ON\|OFF>`<br>`CURR:AUTO:DCLE` / `CURR:AUTO:DCL` | Set whether the measured value is cleared on an auto-range change during a test. `ON`: if the instrument is in auto range and the last test range changed before the end of the test, a subsequent `MEASURE?` returns `0000E+10` and `MEASURE:RESULT?` returns `0000E+10, NOCOMP`. `OFF`: the instrument returns the previous test's data instead. This avoids a misjudgment when the device-under-test range changes due to an insulation breakdown near the end of the test, but the test round ends before completing. Example: `PC>:CURRENT:AUTO:DCLEAR ON\|OFF`. |
| `CURRENT:AUTO:DCLEAR?` | Query the auto-range measured-value-clearing function. Returns `ON` or `OFF`. |

## 4.3 Current zero-clearing

| Command | Details |
|---|---|
| `ZERO` | Start the current zero-clearing function (see Operation Manual §3.1.7). Example: `PC>:ZERO`. |
| `ZERO?` | Query the current zero-clearing baseline. Example: `PC>:ZERO?` → `TH2692>0.03615 nA`. |
| `ZEROCLEAR` | Clear the current zero-clearing baseline. Example: `PC>:ZEROCLEAR`. |

SECTION 5

# Speed, Timer & Delay

| Command | Details |
|---|---|
| `SPEED <FAST\|MED\|SLOW>`<br>`SPED` / `SPE` | Set the measurement speed. `FAST` fast, `MED` medium, `SLOW` slow. Example: `PC>:SPEED FAST`. |
| `SPEED?`<br>`SPED?` / `SPE?` | Query the current measurement-speed setting. Returns `FAST`, `MED` or `SLOW`. Example: `PC>:SPEED?` → `TH2692>FAST`. |
| `TIMER <value>`<br>`TIME` / `TIM` | Set the test time (unit: s), 0.001–999.999 s; set to 0 to turn the timer off. Example: `PC>:TIMER 0.05` → sets the test time to 50 ms. |
| `TIMER?`<br>`TIME?` / `TIM?` | Query the test time (unit: s), range 0.001–999.999. Returns 0.000 if the time setting is off. |
| `DELAY <value\|AUTO>`<br>`DELA` / `DEL` | Set the delay time (unit: s), 0.000–999.999 s; `AUTO` sets automatic delay. Example: `PC>:DELAY 0.05` → sets the delay time to 50 ms. |
| `DELAY?`<br>`DELA?` / `DEL?` | Query the delay time (unit: s), range 0.000–999.999. Returns `AUTO` if the delay is set to automatic. |

SECTION 6

# COMParator Subsystem

Controls the upper/lower-limit comparator on the measurement page: limit values, test mode, and the comparator beeper.

| Command | Details |
|---|---|
| `COMPARATOR:LIMIT <lower>,<upper>`<br>`COMP:LIMI` / `COMP:LIM` | Set the comparator upper/lower-limit values, as an index: the first data item is the upper limit, the second the lower limit, separated by a comma — the upper limit must be greater than the lower limit. When the main parameter is insulation resistance, this sets the resistance limits; when current, the current limits. Example 1 (upper 5.281 GΩ, lower 1.678 MΩ): `PC>:MAINPARM IR` then `PC>:COMPARATOR:LIMIT 5.281E+09,1.678E+06`. Example 2 (upper 1.581 mA, lower 82.6 nA): `PC>:MAINPARM CURRENT` then `PC>:COMPARATOR:LIMIT 1.581E-03,82.6E-09`. |
| `COMPARATOR:LIMIT?`<br>`COMP:LIMI?` / `COMP:LIM?` | Query the comparator upper/lower-limit values, returned in the same indexed form (upper first, lower second, comma-separated). Returns `OFF` if the comparator is off. |
| `COMPARATOR:MODE <mode>`<br>`COMP:MODE` | Set the comparator test mode. `CONTinue`: upper/lower limits are compared on every test round. `PASSstop`: test stops when the upper/lower-limit comparison passes. `FAILstop`: test stops when the comparison fails. `SEQuence`: upper/lower limits are compared only when the test is terminated. Example: `PC>:COMPARATOR:MODE CONTINUE`. |
| `COMPARATOR:MODE?`<br>`COMP:MODE?` | Query the comparator test mode. Returns `CONTINUE` / `PASSSTOP` / `FAILSTOP` / `SEQUENCE`. |

| Command | Details |
| --- | --- |
| `COMPARATOR:BEEPER <OFF\|PASS\|FAIL\|END>`<br>`COMP:BEEP` | Set the comparator sound. `OFF` beeper off, `PASS` beeps on pass, `FAIL` beeps on fail, `END` beeps at test end. Example: `PC>:COMPARATOR:BEEPER OFF`. |
| `COMPARATOR:BEEPER?`<br>`COMP:BEEP?` | Query the comparator sound setting. Returns `OFF` / `PASS` / `FAIL` / `END`. |

**NOTE**

The comparator upper/lower-limit range depends on the main parameter: 0.000–1000 GΩ in insulation-resistance mode, 0.000–1000 A in current mode (Operation Manual §3.1.1).

SECTION 7

# Contact Check & Short Check

## 7.1 Contact check

| Command | Details |
|---|---|
| `CONTACTCHECK <ON\|OFF>`<br>`CONT` | Set the contact-check switch. Example: `PC>:CONTACTCHECK ON`. |
| `CONTACTCHECK:RESULT?`<br>`CONT:RESU?` / `CONT:RES?` | Query the contact-check judgment result. Returns `OFF` (off) / `NOCHK` (not yet judged) / `PASS` / `HFAIL` (high-end poor contact) / `LFAIL` (low-end poor contact) / `HLFAIL` (both high- and low-end poor contact). |
| `CONTACTCHECK?`<br>`CONT?` | Query the contact-check switch status. Returns `ON` or `OFF`. |

## 7.2 Short-circuit check

| Command | Details |
|---|---|
| `SHORTCHECK <ON\|OFF>`<br>`SHOR` | Set the short-circuit-check switch. Example: `PC>:SHORTCHECK OFF`. |
| `SHORTCHECK:RESULT?`<br>`SHOR:RESU?` / `SHOR:RES?` | Query the short-circuit-check judgment result. Returns `OFF` / `NOCHK` / `PASS` / `FAIL`. |
| `SHORTCHECK:TIME <value\|AUTO>` | Set the short-circuit-check time. `AUTO` sets the check time to automatic; a manual value is 0.010–999.999 s. Example: `PC>:SHORTCHECK:TIME 0.050` → sets short-circuit check to 50 ms. |
| `SHORTCHECK:TIME:MONITOR?`<br>`SHOR:TIME:MONI?` | Query the short-circuit-check execution time (unit: s). Example: `PC>:SHORTCHECK:TIME:MONITOR?` → `TH2692>0.005` (5 ms). |
| `SHORTCHECK:TIME?` | Query the short-circuit-check time setting (unit: s). Returns `AUTO` if set to automatic. |
| `SHORTCHECK?`<br>`SHOR?` | Query the short-circuit-check switch status. Returns `ON` or `OFF`. |

SECTION 8

# SYSTem Subsystem

System-level settings, plus the key beeper and double-action start switches.

| Command | Details |
|---|---|
| `KEY:BEEPER <ON\|OFF>`<br>`KEY:BEEP` | Set the key/touch beeper. Example: `PC>:KEY:BEEPER OFF`. |
| `KEY:BEEPER?`<br>`KEY:BEEP?` | Query the key/touch beeper switch status. Returns `ON` or `OFF`. |
| `DOUBLEACTION <ON\|OFF>`<br>`DOUB` | Set the double-action start switch (Operation Manual §3.2.2). Example: `PC>:DOUBLEACTION OFF`. |
| `DOUBLEACTION?`<br>`DOUB?` | Query the double-action start switch status. Returns `ON` or `OFF`. |
| `SYSTEM:LFREQUENCY <AUTO\|50\|60>`<br>`SYST:LFRE` / `SYST:LFR` | Set the power-supply line frequency. `AUTO` auto-detects the supply frequency; `50`/`60` fixes it to 50/60 Hz. Example: `PC>:SYSTEM:LFREQUENCY AUTO`. |
| `SYSTEM:LFREQUENCY?`<br>`SYST:LFRE?` / `SYST:LFR?` | Query the power-supply line frequency. Returns `AUTO` / `50Hz` / `60Hz`. |
| `SYSTEM:LOCAL` | Release the instrument from remote-control state after it received a command from the host computer, re-enabling the touchscreen and `Start` key. Example: `PC>:SYSTEM:LOCAL`. |
| `SYSTEM:DATAREFRESH <ON\|OFF>` | Set the data-refresh function (Operation Manual §3.2.6). `OFF` saves screen-refresh time to improve test speed, at the cost of a live display. Example: `PC>:SYSTEM:DATAREFRESH ON`. |
| `SYSTEM:DATAREFRESH?` | Query the data-refresh function status. Returns `ON` or `OFF`. |

SECTION 9

# PANEL (File Memory) & AOUT Subsystem

## 9.1 PANEL — 16-file memory

| Command | Details |
|---|---|
| `PANEL:CLEAR <1–16>`<br>`PANE:CLEA` / `PAN:CLE` | Delete a file. Parameter: integer 1–16, corresponding to file 1–16. Example: `PC>:PANEL:CLEAR 1`. |
| `PANEL:LOAD <1–16>` | Load the test conditions stored in a file. There must be saved parameters in the file, otherwise the information bar reports an execution error. Example: `PC>:PANEL:LOAD 1`. |
| `PANEL:SAVE <1–16>` | Save the current test conditions to a file. Example: `PC>:PANEL:SAVE 1`. |
| `PANEL:SAVE? <1–16>` | Query whether a file contains saved data. Returns `1` (file has data) or `0` (file has no data). Example: `PC>:PANEL:SAVE? 1` → `TH2692>1`. |
| `PANEL:NAME <1–16>,"name"` | Set a file's name. File number is an integer 1–16; the name is enclosed in double quotes; number and name are separated by a comma. Example: `PC>:PANEL:NAME 1, "test file1"`. |
| `PANEL:NAME? <1–16>` | Query a file's name. Example: `PC>:PANEL:NAME? 1` → `TH2692>test file1`. |

## 9.2 AOUT — analog output

| Command | Details |
|---|---|
| `AOUT:RANGE <OFF\|FULL\|EACH>`<br>`AOUT:RANG` | Set the analog-output range (Operation Manual §3.4.7). `OFF`: analog output off. `FULL`: output independent of the active range. `EACH`: output scaled to the active range. Example: `PC>:AOUT:RANGE FULL`. |
| `AOUT:RANGE?`<br>`AOUT:RANG?` | Query the analog-output range selection. Returns `OFF` / `FULL` / `EACH`. |

SECTION 10

# IO (EXT.I/O) & HEADER Subsystem

## 10.1 IO — external interface

| Command | Details |
|---|---|
| `IO:SIGNAL <FAST\|SLOW>`<br>`IO:SIGN` | Set the EXT.I/O `TEST` output signal timing (Operation Manual §3.4.4). `FAST`: `TEST` is pulled high immediately after the EXT.I/O interface receives the `STOP` signal. `SLOW`: `TEST` is pulled high only once the output voltage has dropped below 10 V. Example: `PC>:IO:SIGNAL FAST`. |
| `IO:SIGNAL?`<br>`IO:SIGN?` | Query the EXT.I/O `TEST` signal timing. Returns `FAST` or `SLOW`. |
| `IO:ILOCK <ON\|OFF>` | Set the interlock function (Operation Manual §3.4.5). Example: `PC>:IO:ILOCK ON`. |
| `IO:ILOCK?` | Query the interlock function status. Returns `ON` or `OFF`. |

## 10.2 HEADER — response command header

| Command | Details |
|---|---|
| `HEADER <ON\|OFF>`<br>`HEAD` | Set the response command header function. With `ON`, a query response is echoed with its command prefix (e.g. `:VOLTAGE 25`); with `OFF`, only the bare value is returned (e.g. `25`). Example: `PC>:HEADER ON`. |
| `HEADER?`<br>`HEAD?` | Query the response command header function status. Returns `ON` or `OFF`. |

## 10.3 Command error messages

When the instrument receives an invalid command, it shows an error message in the information bar at the bottom of the screen:

| Error | Meaning |
|---|---|
| Commands received via RS232 are too long | More than 1024 bytes received via RS232 |
| Commands received via USBCDC are too long | More than 1024 bytes received via USB Device |
| Inter-command interval via RS232C requires a longer delay | A new command arrived before the previous one finished executing |
| Inter-command interval via USBCDC requires a longer delay | A new command arrived before the previous one finished executing |
| Instruction error | The instrument received an invalid command |
| Wrong command parameters | The instrument received an invalid command parameter |
| Instruction execution error | While Interlock is open, the output cannot be manipulated regardless of the EXT.I/O LOCK pin state — an execution error is shown |
| A single command is too long | A single command exceeds 64 bytes |

## Contact, support & related documents

This command reference is the companion to the *TH2692 Operation Manual* (front-panel operation, remote-interface wiring, EXT.I/O interface) and the *TH2692 Datasheet* (specifications). For questions about any command's exact behaviour, or to report a discrepancy against your instrument's firmware, contact Techmize using the details below.

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