TECHMIZE by TONGHUI

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OPERATION MANUAL

TH615 / TH630 Series

Modular Cable / Wiring-Harness Comprehensive Test System. Covers front-panel operation, measurement setup, learning, file management and system configuration; see Chapter 10 for the communication interfaces. The full SCPI command set is documented in the companion *TH615/TH630 Series SCPI Command Reference*.

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TH615 / TH630 Series Operation Manual

Modular Cable / Wiring-Harness Comprehensive Test System

This manual describes the operation of the Techmize TH615 and TH630 series cable/harness testers. It covers both the **TH615** (AC 5–1000 V / DC 5–1500 V high-voltage platform) and the **TH630** (AC 5–2000 V / DC 5–3000 V platform). Platform-specific values are marked **[TH615]** / **[TH630]** where they differ; everything else applies to both series.

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The SCPI command set (8 subsystems, including a 19-command FETCH set) is issued as a separate companion document, TH615/TH630 Series SCPI Command Reference. Chapter 10 of this manual covers the physical communication interfaces only.

CHAPTER 1

Overview

This chapter covers the inspections to carry out after receiving the instrument and the prerequisites to confirm before installation and first use.

1.1 Unpacking and inspection

After unpacking, inspect the instrument carefully for any damage sustained during transport. Do not power on the instrument if it appears damaged — contact Techmize or your authorized distributor first. Check the contents against the packing list below and report any discrepancy promptly.

Item	Quantity
TH615 / TH630 wiring-harness comprehensive tester	1
EU power cable (Schuko, CEE 7/7)	1
Automatic point-finding probe	1
Adapter fixture	1 channel board, 2 sets

1.2 Power connection

Item	Value
Supply voltage range	100–242 V AC
Supply frequency range	47–63 Hz
Power consumption	≤ 100 VA

The power input phase (L), neutral (N) and ground (E) lines must match the instrument's power plug. The instrument is designed to minimize spurious interference from the AC supply, but should still be used in as low-noise an environment as possible; fit a power-supply filter if this cannot be avoided.

> **WARNING — GROUNDING**
>
> To prevent electrical leakage from harming the instrument or the operator, the ground wire of the power supply must be reliably connected to earth.

1.3 Fuse

The instrument ships with a factory-fitted fuse; replace only with the fuse type supplied by Techmize/Tonghui.

AC source	Fuse
~110 V / 60 Hz, 400 VA	T6AL 250V
~220 V / 50 Hz, 400 VA	T4AL 250V

> **WARNING**
>
> Before powering up the instrument, confirm that the fitted fuse matches the supply voltage range. Disconnect the power supply before replacing the fuse.

1.4 Environment

- Do not use in dusty areas, near vibrating equipment, in direct sunlight, or in corrosive-gas environments.
- Operating range: 0–40 °C, relative humidity ≤75%.
- The instrument's rear-panel heat-dissipation device requires clear left/right ventilation openings for accuracy and reliability — do not obstruct them.
- Use in as low-noise an AC environment as possible; fit a power-line filter if interference cannot be avoided.
- For long-term storage, use the original packaging or similar, in a ventilated room at 5–40 °C and ≤85% RH, free of corrosive impurities and direct sunlight.
- Keep the instrument and its test leads away from strong electromagnetic fields to avoid measurement interference.

1.5 Precautions

Use only the test fixtures, adapters and test cables supplied by Techmize/Tonghui. Third-party or user-made fixtures and cables can produce incorrect measurement results.

1. **Keep the adapter as short as possible.** Longer external cables carry more current, which can lead to incorrect continuity, resistance or short-circuit readings.
2. **Replace adapters regularly.** A reused adapter can develop unstable contact, causing erratic low-resistance continuity readings; if a known-good wire tests intermittently or poorly on repeat measurements, replace the adapter.
3. **Keep the fixture and adapter clean.** Dust accumulates with extended use, and in humid or rainy conditions this can degrade insulation and affect insulation-resistance test results.

1.6 Preheating

Allow the instrument to warm up for at least 15 minutes before relying on accurate measurements. Avoid powering the instrument on and off frequently, as this can cause data loss.

1.7 Electromagnetic compatibility & Low Voltage compliance

The instrument meets the safety requirements of Directive 2014/35/EU (EN 61010-1:2010+A1:2019, safety requirements for electrical equipment for measurement, control and laboratory use) and the electromagnetic compatibility requirements of Directive 2014/30/EU (EN 61326-1:2021).

Standard	Scope
CISPR 11:2015+A1:2016+A2:2019	Emitted and conducted radiation limits, group 1, category A
EN 61000-4-2:2009	Electrostatic discharge immunity
EN 61000-4-3:2020	Radiated immunity to RF electromagnetic fields
EN 61000-4-4:2012	Electrical fast transient/burst immunity
EN 61000-4-5:2014+A1:2017	Power-line surge immunity
EN 61000-4-6:2014	Conducted RF immunity
EN 61000-4-11:2020	Voltage dips and interruption immunity
EN 61000-3-2:2019+A1:2021	Harmonic current emissions from AC power lines
EN 61000-3-3:2013+A1:2019+A2:2021	Voltage changes, fluctuations and flicker

1.8 Other features

Item	Value
Power consumption	≤ 100 VA
Overall dimensions (W×H×D)	425 mm × 189 mm × 357 mm (base mainframe; chassis height increases with configuration – see below)
Weight	Approx. 28–60 kg, fully configured – see model table below

Model	Chassis height	Weight
TH630-160	7U	appr. 28 kg
TH630-320	9U	appr. 35 kg
TH630-640	15U	appr. 60 kg
TH615-640 (4-wire)	9U	appr. 35 kg
TH615-1280 (4-wire)	15U	appr. 60 kg
TH615-1280-2W	9U	appr. 35 kg
TH615-2560-2W	15U	appr. 60 kg

CHAPTER 2

Panel Description

This chapter describes the basic operating controls of the TH615/TH630 series. Please read it before first use.

2.1 Front panel

Control	Function
Trademark & model	Instrument brand and model number.
LCD display	7" widescreen TFT display, 800×480 resolution, 65K colours — shows measurement results and conditions.
PrtScn	Captures the current screen to a USB flash drive as an image file.
Menu keys (×6)	Function assigned to each key is shown immediately to its left on screen; it changes with the current page and cursor position.
HV indicator	Lit while a high-voltage test is in progress — high-voltage hazard warning.
PASS / FAIL indicators	Green PASS / red FAIL LEDs show the test result.
MEAS	Opens the measurement/test results page for the current file.
SETUP	Opens the current measurement parameter setting page.
▼	Quick page-turn key; also cycles a setting field through its available values on repeated presses.
LEARN	Runs a learning scan of the device under test (DUT) and opens the Learn page with the results.
STAT	Opens the statistical results page.
FILE	Opens file management.
SYS	Opens the system setup page.
UTILI	Opens the auxiliary function/measurement page.
ESC	Cancels the current data entry.
←	Backspace — deletes the last character entered.
USB HOST	Connects a USB flash drive for file save/recall and firmware upgrade.
TEST / EXIT	Starts / stops the test.
Power switch	Main power switch.
ENTER / SAVE	Confirms a data entry / saves the current file.
Pin Search interface	Connects the automatic point-finding probe for point search or point measurement.
Numeric keypad	Digits 0–9, decimal point, +/−; also usable for text entry (letters A–Z).
Hipot Calibration interface	High-voltage output pair (red = high side, black = low side), used when calibrating the high-voltage output.
Cursor keys	Move the cursor between fields; the selected field is highlighted.
RETURN	Returns the cursor to the start of the current page; also returns the instrument to local control during remote communication.
Channel connectors	Each channel board provides 2 connector slots; each slot is a 32-pin fixture connector.

2.2 Rear panel

Item	Description
RS232C	Serial interface for on-line computer communication.
LAN	Network interface for on-line computer communication.
USB DEVICE	USB communication interface for on-line computer communication.
HANDLER	Control/communication interface via level signals — see Chapter 10.
Aviation outlet	Reserved for backup use.
Enclosure ground terminal	Protective/shield ground connection to the instrument case.
Electric socket	AC power input, with fuse.

> **WARNING**
> To avoid electric shock, the power cord's protective grounding conductor must be connected to ground. Disconnect the power supply before replacing the fuse.

2.3 Power on

Plug in the three-wire power cable and press the power switch at the lower-left of the front panel. The power-on screen shows the company logo, model number and firmware version.

> **NOTE**
> Supply voltage, frequency and the phase/neutral/ground correspondence must match §1.2. Avoid frequent power cycling.

2.4 Main page

After boot, the main page shows company and software information. Its menu offers: **Brightness+** / **Brightness−** (adjust display brightness), **Fixture Check** (runs AC-withstand-voltage and insulation testing of the fixture itself), **OS List** (view the network table for the current test file), and **Keylock** (lock the keypad).

2.4.1 Fixture testing

Fixture Check runs two self-checks against the fixture: an AC withstand-voltage test (example: 300 V, 500.0 µA spec, 0.01 s) and an insulation-resistance test (example: 300 V, 20.00 MΩ spec, 0.01 s), each reporting PASS/FAIL. Menu: Learn / ACW Chk / IR Chk / Back.

2.5 Display areas

Area	Content
Title area	Name of the current page.
Main display area	Main content of the current page.
Menu area	Up to 6 menu items.
Information area	Prompt, inquiry and error messages.

2.6 Basic operation

1. Use the module keys ([MEAS], [SETUP], [LEARN], [STAT], [FILE], [SYS], [UTILI]) and the soft keys to select the page you want.
2. Use the cursor keys to move to the field you want to set; the selected field is highlighted.
3. The menu area shows the functions available for the current field; select with the corresponding soft key, or use the numeric keypad, [←] and [ENTER] for direct entry.
4. Pressing a numeric key shows the available letters/digits in the soft-key area; [ENTER] confirms the entry in the field's default unit (Hz, V or Ω as applicable — e.g. test frequency defaults to Hz).

CHAPTER 3

<Setting> Description

Press SETUP to enter the <Setup> page, which has six sub-pages: **Mode**, **OS** (Short Break), **Cond** (Conduction), **LCR**, **HV** (High Voltage) and **Item**.

3.1 <Mode>

Sets the general wire/test characteristics.

Field	Options / range
Cable Type	**Double** — both ends connected (bilateral wire). **Single** — one end connected (one-sided wire). **Probe** — meter-pen test.
Pin Range	Start/end pin numbers, 1 to the maximum test point, or Off if an endpoint is unused. Start pin must be ≤ end pin.
Trigger Mode	**Manual** (TEST key) / **External** (HANDLER interface) / **Bus** (remote trigger command) / **Automatic** (auto-detects DUT insertion).
Trigger Delay	0–99.9 s — delay between trigger and test start.
Display Mode	**All** (show all data) / **NG** (fail data only) / **Auto** (shows failing data first; ENTER shows all).
After the Failure	**Continue** (run all test items) / **Stop** (stop immediately, report FAIL) / **Skip HV** (continue, but skip high-voltage items).
Contact Check	Off / On — verifies good connection between the DUT and the instrument before the test starts.

> **NOTE — PLATFORM-SPECIFIC**
> Contact Check is not supported on the two-wire TH615 models (TH615-1280-2W / TH615-2560-2W).

3.2 <Short Break> (open/short detection)

Field	Options / range
Short Break Standard	0.01 kΩ–100 kΩ — resistance threshold used to judge whether a bilateral wire is open or shorted. Example: set to 2 kΩ; R>2 kΩ = open circuit, R<2 kΩ = through/short.
One-sided Sensitivity	0 pF–9.999 nF (manual entry or via Learn) — distributed-capacitance threshold for judging a one-sided wire's continuity. Example: 100 pF; C>100 pF = not disconnected, C<100 pF = break.
Side Judgment	Off / On — end-edge judgment function.
One-sided Speed	Slow / Medium / Fast — the slower the scan, the higher the accuracy; use Slow for very short wires with low distributed capacitance.
Instantaneous OS Time	0–999.9 s. 0 s = test runs until the DUT is withdrawn or STOP is pressed.
Interruption Time	0–999.9 s, same 0 s=infinite behaviour as above.
OS Speed	Manual entry, default 0 µs — scan delay before reading back the level; increase for wires with larger inter-wire capacitance.
OS Method	**Dich.** (dichotomous/bisection — fewer, faster scans: $\log_2(N)$ scans for N pins, e.g. 5 scans for a 32-pin wire; suited to pure-wire products). **One** (pair-by-pair — N scans for N pins, slower, suited to products with passive components).
After Failure	**Empty** (ends test once the DUT is removed and the network reads empty) / **Short** (ends on a bad short) / **Open** (ends on a bad break) / **Repeat** (ends after the same failure occurs N times, settable).
Number of Failures	Sets N for the "Repeat" After Failure option.

3.3 <Conduction>

Field	Options / range
Conductivity High / Low Limit	High: 0.001 Ω–950 Ω. Low: 0.001 Ω–949.99 Ω. Manual entry, or obtained via Learn against a reference sample.
Instantaneous Specification	Upper limit for the instantaneous conduction test; manual entry or copied from the high limit above.
Instantaneous Time	0.1–999.9 s (0 s / infinite mode is not supported here).
Test Speed	Slow / Medium / Fast — slower gives higher accuracy; use Slow for short wires with very low resistance.
Transient Test Failures	**Stop** (stop immediately, report FAIL) / **All** (continue testing, then report FAIL).
Conductivity Zero	Measured floor-error value, subtracted from all subsequent conductivity readings.
Test Current	**Standard** (default 20 mA) or manual entry, 1–20 mA.
Conductivity Balance	Off / On.

3.4 <LCR> (passive component test)

Up to several rows, each defining one passive-component test: Type, Pin+, Pin−, Spec, Tolerance %, Level.

Field	Options / range
Type Setting	13 types: Resistance, Capacitance, Diode, Capacitor polarity, Voltage drop, Diode reverse, Temperature, NTC resistance, NTC temperature, Resistance difference, Temperature difference, Welding resistance, Inductance.
Pin Setting	Pin+ / Pin− — observe polarity for components that require it.
Specification Setting	Numeric specification value and unit.
Tolerance Setting	3 modes: > specified value, < specified value, or specified value ±t%.
Level Setting	Category/size of the test power supply applied to the component — adjustable per test need.
Additional Settings	Component-specific extras — e.g. duration setting for testing LEDs (diodes); whether a capacitor is also tested at high voltage.

3.5 <High Voltage>

High-voltage settings are organized into 3 independent columns — AC withstand voltage (ACW), DC withstand voltage (DCW) and insulation resistance (IR) — across 2 pages (the second page covers grounding tests).

Field	[TH615]	[TH630]
Test Voltage	AC 5–1000 V, DC 5–1500 V	AC 5–2000 V, DC 5–3000 V
Grounding Voltage	AC 5–1000 V, DC 5–1500 V	AC 5–2000 V, DC 5–3000 V

Field	Range (both series)
Testing / Grounding Time	0.01–500.0 s
Test / Grounding Specification	ACW: 1 µA–10 mA. DCW: 1 µA–10 mA. IR: 0.1 MΩ–10 GΩ.
Test Method	**Dich.** (two-point rapid test — fast, cannot pinpoint the bad pin). **One** (scans each network individually — slower, finds the specific bad pin). **Auto** (runs Dich. first: pass→PASS; fail→re-runs with One: pass→PASS, fail→FAIL). **Gnd** (for shielded-wire testing — centerline-to-ground insulation or withstand test: specify a ground pin, connected to the high side; other pins connect to the low side).
Arc Detection	Off, or 1–8 (8 sensitivity levels).
Rising Time	Manual entry — time for the voltage to ramp up to the specified test voltage.
Null Point Test	On / Off — whether an empty position on the DUT is tested.
Grounding Pin	Required for all grounding tests — select via menu, manual pin entry, or the automatic point-finding probe.

3.6 <Item>

Checklist of which test items (OS, Cond., LCR, ACW, DCW, IR) are enabled for the current test profile.

CHAPTER 4

<Learn> Page

Pressing LEARN immediately runs a network scan of the DUT and opens the <Learn> page with the scan results.

4.1 Learn

Plug the DUT into the test port before learning. The purpose of learning is to capture the DUT's pin structure — the short-break network table — which subsequent tests are then run against.

4.2 Short-circuit table

Legs that are short-circuited to each other are grouped into a **Network (Net)**; a collection of networks forms the network table, shown as Net / Pins / Learning Value / Criterion Value.

- **One-sided wire:** Learning value = measured one-sided sensitivity (scanned automatically). Criteria value = the one-sided sensitivity standard from <Short Break> (§3.2), editable per network — useful when one-sided wires of different lengths are mixed in the same DUT.
- **Bilateral wire:** Learning value = none. Criteria value = the conductivity high limit from <Conduction> (§3.3), editable per network, for bilateral wires of different lengths.

4.3 Zero function

Eliminates measurement errors caused by temperature, humidity and fixture condition.

Function	Procedure
One-sided Zero	With the instrument open-circuit, run the clearing scan — the measured one-sided sensitivity per leg becomes the clearing value. Subsequent test data = measured − clearing value.
Conductivity Zero	Plug in the short-circuit board (short-circuit state), run the clearing scan per network — becomes the clearing value. Test data = measured − cleared.
AC Withstand Voltage Zero	Open-circuit state; scans the ACW leakage current per network — becomes the zeroing value. Test data = measured − cleared.
Insulation Zero	Open-circuit state; scans the DCW leakage current per network — becomes the clearing value. Test data = measured − cleared.
Reset to Zero	Resets all four zero values above to zero.

4.4 High-voltage network editor

Lets the user merge, create and delete high-voltage test networks — useful for protecting passive components or improving test efficiency.

- **Link:** select two or more networks (menu: Select — selected nets turn blue), then click Link to merge them into one.
- **Delete:** select one or more networks, then click Delete to remove them.
- **Create:** click Create, then enter the starting pin position (e.g. A1) and the termination pin position (e.g. A8) when prompted — a new one-sided network is created by default.
- **Reset:** restores the high-voltage network table to its initial state.

4.5 Conductivity network editor

Manual editing of conduction-test pin pairs; pin positions must correspond two by two.

- **Delete net:** move the cursor to the network and click Delete.
- **Modify pins:** move the cursor to the pin and enter the new pin number.
- **Modify limit values:** move the cursor to the conductivity high/low limit and enter a new standard value.

CHAPTER 5

<MEAS> Page

Press [MEAS] to open the <Test> page, showing the current test profile, test type and results.

5.1 Title

Four test types: **General test** (common wires) / **Single-sided test** (one-sided wires) / **Single test** (meter-pen spot test) / **Tests for sequencing** (sequential test files).

5.2 File

File name: numbers, letters and underscore/hyphen, up to 12 bytes. File types: **Normal** (single test file) or **Sequential** (sequence file).

5.3 Statistical column

Shows the running total of tests, passes and failures for the current test session.

5.4 Test results

Each result row shows: Test Item, Test Pin, Test Data and the Pass/Fail judgment.

5.5 Menu content

- **View Network:** switches to the Learn interface to view the network table for the current profile.
- **Page Up / Page Down:** scrolls through test results.
- **Lock:** set under <SYS> → Environment (§8.2.4), with 2 modes. **Manual** mode retains 4 functions while locked: [TEST] start, [STOP] stop, Unlock, and [FILE] for importing files. **Bus** mode retains 3: [TEST], [STOP], Unlock.

CHAPTER 6

<STAT> Page

Press STAT to open the <Statistics> screen.

6.1 Overall statistics

Sum, Pass, Fail and Yield(%) for the overall test run.

6.2 Itemized statistics

Pass count, fail count and yield for each of 9 test items — OS, Cond., LCR, ACW, DCW, IR, Int.OS, Int.Open, Int.Cond — to support failure analysis.

6.3 Menu functions

- **Clear:** confirmation prompt; confirming resets all statistics to 0.
- **Save:** saves the current statistics; information area shows "Statistics have been saved!".

CHAPTER 7

<FILE> Page

Press FILE to open the <File> page, showing the current file name, storage location and file operations. It has 3 sub-pages: **Internal**, **External** and **Sequence**.

7.1 Title

Shows the current file name and type, e.g. "Current file: UNNAME (Normal)".

7.2 Internal

Files held in the instrument's internal memory.

Operation	Description
New	Creates a new file with factory settings; prompts for a file name.
Save as	Saves the current parameter settings under a new file name.
Load	Imports an existing file (confirmation prompt).
Delete	Deletes the specified file (confirmation prompt).
Copy	Copies the file to a USB flash drive (drive must be plugged in first; confirmation prompt).
Rename	Renames the specified file via the keypad.
Copy All	Copies all internal files to a USB flash drive (confirmation prompt).

7.3 External

Files on an external USB drive.

Operation	Description
Save	Saves the current parameter settings to the USB drive under a new file name.
Load	Imports an existing external file into the instrument (confirmation prompt).
Copy	Copies the file from the USB drive to the instrument (confirmation prompt).
Delete	Deletes the specified external file (confirmation prompt).
Copy All	Copies all external files from the USB drive to the instrument (confirmation prompt).

7.4 Sequence

For sequential (multi-step) test files, shown as Step / Sequence List / File List.

Operation	Description
Create	Creates a new sequential profile; prompts for a file name, then opens the creation interface.
Load	Imports an existing sequence file (confirmation prompt).
Edit	**Add a step:** select an internal file and click Select to add it to the sequence (repeat for further files), then click Finish. **Delete a step:** cursor to a step, click Delete. **Reorder:** cursor to a step, click Up/Down to swap it with the neighbouring step.
Copy / Copy All	Copies one or all sequence files to the USB drive (confirmation prompt).
Delete	Deletes the specified sequence file (confirmation prompt).

CHAPTER 8

<SYS> Page

Press [SYS] to open the <System> page, with 3 sub-pages: **Measurement**, **Environment** and **Communication**. Click Save after changing settings to persist them.

8.1 Measurement

Field	Options / range
Measurement Mode	**Normal** (one test per DUT) / **Repeat** (repeats the test the configured number of times) / **Sequence** (cycles continuously until [EXIT] is pressed).
Repeat Count	0–999.
Repeat Interval	0–99.9 s between repeated/cycled tests.
Sequence Method	**Pushkey** (TEST key starts and advances through each step) / **Continue** (TEST key starts and completes all steps at once) / **Auto** (instrument scans continuously until the network table matches the profile's learning network, then auto-starts).
Spot Test Failure	**Repeat** (stop at the bad spot, repeat and display until PASS or [EXIT]) / **Next** (stop at the bad spot, display it, then a Next menu item skips to the following test).
Early Pull	Off / On — judges whether the DUT was unplugged prematurely.
Pull Check	Off / On — requires the DUT to be unplugged before the next test can start, preventing accidental re-testing.
Trigger Pins	Proportion of pins that must be inserted to start the test automatically (e.g. 70%).

8.2 Environment

Field	Options / range
Key Volume	Off / On — key-press sound.
System Language	Chinese / English.
Sound Volume	Off / Low / Medium / High.
Key Lock	**Manual** (TEST/EXIT work; FILE module remains accessible for importing files) / **BUS** (TEST/EXIT only).
Pass / Fail Volume	Off / On — sound on pass / fail.
LCD Brightness	0–10.
Fixture Life	Settable use-count; decrements by 1 each test; prompts when it reaches zero.
Date / Time Setting	Year/month/day and hour/minute/second.

8.3 Communication

The instrument provides 5 communication interfaces: RS232, GPIB, USB, LAN and RS485.

Interface	Settings
RS232	Baud rate: 9600 / 19200 / 38400 / 115200. Data bit: 8 / 7. Stop bit: 1 / 2. Parity: None / Odd / Even.
GPIB	Address, range 1–32.
USB	Mode: TMC / CDC.
LAN	Dynamic protocol (DHCP): Off / On. Auto IP: Off / On. IP address, subnet mask, default gateway, DNS 1, DNS 2 — each 4 octets, 0–255.
RS485	Address, range 0–32.

SCPI is the standard command protocol across all interfaces; the full command set is documented in the companion *TH615/TH630 Series SCPI Command Reference* (see also Chapter 10).

CHAPTER 9

<UTILI> Page

Press UTILI to open the <Auxiliary Functions> page, an icon grid of 8 utilities.

9.1 Pin Search

Click Start to begin continuous point detection; tap a pin with the point-finding probe and its number displays instantly. Click Stop to end detection, then EXIT to leave. A **4-wire** toggle is available when the DUT is confirmed to be 4-wire type, so all 4 points return test results.

9.2 System Self-test

Runs a 9-item hardware self-test: Channel PCBA, AC Voltage Source, DC Voltage Source, DC Current Source, HV AC Source, HV DC Source, OS, ACW, IR. Can be set to run automatically at power-up (Auto Chk On/Off) or started manually.

9.3 High Voltage Module

A standalone simple withstand/insulation tester, offering ACW, DCW and IR functions independently of a loaded test file — useful as a quick-check tool. Settable: mode, voltage, frequency, test pin, rising time, test time, range and arc level, with a real-time voltage/data/time display.

9.4 I/O Editor

Edits the HANDLER interface output assignment (<Handler Edit> page). Pins 1–8 are user-configurable output signals (signal type and active level); pins 11–12 are fixed input pins and cannot be edited. Nearly 40 selectable output signals are available (e.g. TEST, HV, PASS, FAIL, EOM, OS, IOS, IOPEN), each with 4 selectable level types: high level, low level, high pulse, low pulse.

9.5 Memory Initialization

Restores the instrument's memory to factory settings.

> **WARNING**
> This operation erases all stored files — back up any data you need to keep before initializing.

9.6 Program Update

Insert a USB flash drive containing the upgrade file (e.g. `TH630.sec`), select Update and confirm. A progress bar appears in the information area; once it reaches 100%, the instrument reboots automatically to complete the upgrade.

9.7 System Password

Sets a system password to lock the keypad and prevent changes to test conditions during production use. Once set, both locking and unlocking the keypad require the password.

9.8 LCR Module

A standalone simple LCR-bridge tool, independent of a loaded test file, for testing inductance, capacitance, AC resistance, DC resistance, conductivity, diode and voltage drop. Use DC resistance mode for resistances above 1 kΩ; use conductivity mode for resistances below 1 kΩ. Settable: mode, test level, frequency, test pin, test range and 2-wire/4-wire measurement, with a real-time test-data display.

CHAPTER 10

Communication Interface

10.1 HANDLER interface

A 25-pin interface for control and communication with automated test handling equipment via level signals.

Pins	Function
1–8 (CTL1–CTL8)	Output signal pins, configurable via the I/O Editor (§9.4). Powered from the on-board 5 V (pins 14, 15) or 12 V (pins 9, 10, 18, 19) supply, or from an external supply (common-grounded with the instrument case, or with its ground shorted to pins 20–25). For output-signal stability, pull-up resistors are recommended on each output (R31–R38 in the circuit diagram) — 10 kΩ is recommended.
11–13	Input pins — Stop, Start and Reset respectively. Connect external switches, or trigger with an external low level.
16, 17, 20–25	Ground.

> **CAUTION**
> For reliable HANDLER control and output signals, the user's external loop must share a common ground with the HANDLER interface ground pins (16, 17, 20–25).

10.2 RS232C interface

Signal	Code	Connector pin
Transmit data	TXD	3
Receive data	RXD	2
Ground	GND	5

The instrument uses a simple 3-wire RS-232 standard. When connecting the instrument to a computer, pins 2 and 3 must be crossed (RXD ↔ TXD), with GND connected straight through — a null-modem-style cable. The factory-supplied serial cable is already wired this way.

10.3 SCPI command set — overview

All interfaces (RS232, GPIB, USB, LAN, RS485) use the standard SCPI protocol. Commands are sent as ASCII strings terminated with LF; replies from the instrument also terminate with LF.

Subsystem	Covers
Setting Command Set	Mode, Short Break, Conductivity, Component (LCR), High Voltage, and Project settings — 6 subgroups
Test Command Set	`:TRIG` / `:START`, `:STOP`, `:LEARN`
FETCH Command Set	19 commands to read back results — `:FETCH:COND?`, `:ICOND?`, `:ICMAX?`, `:ICMIN?`, `:ACW?`, `:DCW?`, `:IR?`, `:AUTO`, `:ALL<step>?`, `:NCOND?`, `:OS?`, `:CROSS?`, `:STAT?`, `:FILE?`, `:USB?`, `:ITEM?`, `:NET:COND?`, `:NET:HV?`, `:NET:LCR?`
System Command Set	Test-system and environmental-system commands
File Command Set	`:FILE:SAVE`, `:LOAD`, `:DEL`, `:SEND`, `:RECE`, `:NAME`
DISP Command Set	Display interface control
Other Command Set	`:STAT:CLEAR`
Public Command Set	`*IDN`, `*TRG`

Full command syntax, parameters, data ranges and worked examples for every command listed above are documented in the companion *TH615/TH630 Series SCPI Command Reference*.

APPENDIX

Warranty & Contact

A.1 Warranty

The warranty period is one year, calculated from the date of shipment of the instrument to the original purchaser, and is issued together with the instrument's warranty card. During the warranty period, damage resulting from improper operation by the user is not covered; maintenance costs in that case are borne by the user.

Maintenance must be carried out by qualified technical personnel; do not replace internal components without authorization. Maintenance work may require re-calibration to preserve measurement accuracy. Damage resulting from unauthorized user maintenance or component replacement is not covered by the warranty, and the associated maintenance cost is borne by the user.

Protect the instrument from sunlight and humidity, and use it within the environmental conditions given in §1.4. When the instrument is not in use for an extended period, store it sealed in its original packaging.

> **DISCLAIMER**
>
> Techmize/Tonghui may improve or enhance the performance, functions, software, structure, appearance, accessories, packaging and manuals of this product without prior notice. If this causes any doubt, please contact Techmize.

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