TECHMIZE by TONGHUI

OM

OPERATION MANUAL

TH86XX Series

4-Wire Universal Cable & Wire Harness Testers — TH8610 / TH8610A, TH8601 / TH8601A, TH8602-1 / TH8602B / TH8602C / TH8602-2 / TH8602-3 / TH8602-4, TH8603-4. Covers front-panel operation, measurement setup and system configuration for the whole platform family; see the separate TH86XX Series SCPI Command Reference for the full remote-command set.

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English edition

TH86XX Series Operation Manual

This manual covers the TH8610, TH8601, TH8602 and TH8603-4 series. Because all series share one hardware and firmware platform, it documents the shared setup-menu system once and calls out per-model differences (test-pin count, connector slots, Type-C support, HANDLER outputs) where they actually occur.

Part I — Operation

1. Safety & Compliance 3
2. Out of the Box 5
3. Getting to Know the Instrument 6
4. [SETUP] Menu Details 9
5. [LEARN] Page 13
6. Measurement, Statistics & File Management 15
7. System & Utility Setup 16
8. Performance & Specifications 18

Part II — Remote Control & Handler

9. Remote Control Overview 19
10. Handler Interface 21

Appendix

Terms, Quick Reference & Contact 22

CHAPTER 1

Safety & Compliance

1.1 About this manual

This manual covers the Techmize TH86XX series of 4-wire universal cable/wire-harness testers: **TH8610, TH8610A, TH8601, TH8601A, TH8602-1, TH8602B, TH8602C, TH8602-2, TH8602-3, TH8602-4** and **TH8603-4**. All eleven models share the same front-panel controls, display system and setup-menu structure; they differ mainly in test-pin count, connector-slot count, and a small number of model-specific features (Type-C/EMARK cable testing, HANDLER output count) that are called out where relevant. Where this manual and the instrument itself appear to disagree, or a described function is not present on your particular model, contact Techmize or your authorized distributor (§1.10) before relying on the instrument for measurement or safety-compliance decisions.

Techmize continually improves the performance, features and construction of its instruments; content, specifications and accessories described here are subject to change without notice.

1.2 Safety symbols used in this manual

⚠ **WARNING**	a hazard that, if not avoided, could result in personal injury or death — this instrument outputs test voltages up to 1500 V DC / 1000 V AC.
! CAUTION	a hazard that, if not avoided, could damage the instrument or the device under test, or invalidate a measurement.
ⓘ **NOTE**	supplementary information that helps with correct or efficient use, but is not itself a hazard.
⏚ **Protective ground**	this terminal must be connected to protective earth; also printed on the instrument chassis ground terminal.

1.3 General safety requirements

The TH86XX series is a **Protection Class I** instrument: protective earthing of the chassis, via the power cord or the rear-panel ground terminal, is essential to safety and must not be defeated. The instrument also generates hazardous test voltages up to **1500 V DC / 1000 V AC** during withstand-voltage (ACW/DCW) testing.

> **WARNING — ELECTRIC SHOCK**
> Always use a supply outlet with a protective earth contact. Never connect the AC supply, or operate the instrument, with the protective ground disconnected. Never touch the test fixture, DUT or UNKNOWN terminals while the HV indicator is lit or a test is in progress — the instrument outputs hazardous voltage during withstand-voltage and insulation-resistance tests. Disconnect the power supply before replacing the fuse or opening the case.

Supply voltage: **100–242 V AC, 47–63 Hz**, power consumption ≤100 VA (all models). Confirm the fuse fitted matches your local supply before switching on: **T4AL 250V** at 110 V/60 Hz, **T2AL 250V** at 220 V/50 Hz.

> **CAUTION**
> Use only the fuse rating specified above when replacing the fuse.

Environment

- Operate indoors, at 0–40 °C and ≤75% relative humidity, away from dust, vibration, direct sunlight and corrosive gases; keep the side/rear ventilation openings clear.
- For storage, keep the instrument in its original packaging at 5–40 °C and ≤85% relative humidity, away from direct sunlight and corrosive contaminants.
- Keep the instrument and test leads away from strong electromagnetic fields, which can affect both safety and measurement accuracy.

Test fixtures and cables

Use only test fixtures, adapter boards and test cables supplied or approved by Techmize/Tonghui. A user-made or third-party fixture can produce incorrect measurement results and, for high-voltage testing in particular, can compromise safety. Keep adapter leads as short as practical: excess lead length adds parasitic resistance that can distort conduction-resistance and short/open-circuit readings, and worn adapter contacts can cause intermittent conduction faults — replace adapters regularly and keep fixtures free of dust and moisture.

1.4 Warm-up

Allow at least **15 minutes** of warm-up after switch-on before relying on rated accuracy. Avoid frequent, unnecessary power-cycling.

1.5 Low Voltage & EMC compliance

The TH86XX series is designed and tested to meet the essential requirements of the following EU directives:

Directive	Harmonised standard(s)
Low Voltage Directive 2014/35/EU	EN 61010-1:2010+A1:2019
EMC Directive 2014/30/EU	EN 61326-1:2021; CISPR 11:2015+A1:2016+A2:2019 (Group 1, Class A); EN 61000-4-2:2009, EN 61000-4-3:2020, EN 61000-4-4:2012, EN 61000-4-5:2014+A1:2017, EN 61000-4-6:2014, EN 61000-4-11:2020; EN 61000-3-2:2019+A1:2021, EN 61000-3-3:2013+A1:2019+A2:2021

As a Class A / Group 1 ISM-adjacent instrument, the TH86XX series is intended for industrial/laboratory environments; it may not provide adequate protection against radio interference in a residential setting.

1.6 WEEE & RoHS

Do not dispose of the instrument as unsorted municipal waste at the end of its service life. Within the EU, return it to Techmize, your distributor, or a designated collection point, per the WEEE Directive (2012/19/EU). The TH86XX series is designed to comply with Directive 2011/65/EU (RoHS), as amended.

1.7 Warranty & liability

Techmize warrants this instrument to be free from defects in material and workmanship for a period of **two (2) years** from delivery to the original purchaser, excluding damage from misuse, unauthorised modification, consumable/wear items (fuses, connectors, adapter fixtures), or operation outside the environmental limits in §1.3. Except as stated here, Techmize makes no other warranty, express or implied.

1.8 Common platform data

Item	Value
Dimensions (W×H×D)	425 × 189 × 357 mm
Weight	13 kg (all models)
Display	7" TFT true-colour LCD, 800×480, 16-bit colour
User interface	English

1.9 Manufacturer & EU contact

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Registration

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Register Court: Amtsgericht München
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CHAPTER 2

Out of the Box

2.1 Unpacking

Check the shipping carton and its contents against the packing list for your model below before use. If the carton or contents show signs of transport damage, do not power on the instrument — contact your carrier and your Techmize distributor before proceeding.

Model	Standard accessories
TH8610 / TH8610A	1× instrument, 1× EU power cable (Schuko, CEE 7/7), 1× operation manual, 1× auto pin-finder probe, 1× TH26036 test lead, adapter fixtures (2 pcs for 64-pin TH8610A, 4 pcs for 128-pin TH8610), TH26060H connecting cable (64-ch), TH26060A adapter fixture (64-ch, shared across the TH86XX family)
TH8601 / TH8601A	1× instrument, 1× EU power cable, 1× operation manual, 1× TH26036-R auto pin-finder probe, TH26060 adapter fixture (2 pcs for 64-pin TH8601A, 4 pcs for 128-pin TH8601), TH8601-32 test cable (2 pcs / 4 pcs respectively)
TH8602 series	1× instrument, 1× EU power cable, 1× operation manual, 1× TH26060D auto pin-finder probe, TH26060B adapter fixture, TH26060E Type-C test fixture (TH8602B / TH8602C only)
TH8603-4	1× instrument, 1× EU power cable, 1× operation manual, TH26060B & TH26060C adapter fixtures, 1× TH26060D auto pin-finder probe

If anything is missing or incorrect, contact your Techmize distributor. Keep the original packaging — it is the recommended way to store or return the instrument.

2.2 Connecting the power supply

Supply: 100–242 V AC, 47–63 Hz, ≤100 VA (all models). Match the phase (L), neutral (N) and protective-earth (E) leads of the supply cable to the instrument's power inlet, and confirm the fitted fuse matches your local supply (§1.3) before connecting. If mains conditions are noisy, fit a power-line filter ahead of the instrument.

2.3 Connecting a test fixture / adapter

Connect the appropriate adapter fixture and/or test cable to the front-panel connector slots (§3.1). Use only fixtures and cables supplied or approved by Techmize/Tonghui for this model — see §1.3 for why this matters for both accuracy and safety.

2.4 Starting the instrument for the first time

1. Connect the power cable at the rear panel.
2. Press the **POWER** switch at the front-left of the instrument.
3. A splash screen shows the company logo, instrument model and firmware version while the instrument loads, then opens on the home page (§3.4).

Allow at least 15 minutes of warm-up before relying on the rated accuracy (§1.4). For an overview of the front panel, rear panel and basic navigation, continue to Chapter 3.

CHAPTER 3

Getting to Know the Instrument

3.1 Front panel

All TH86XX models share the same front-panel control layout: an 800×480 colour TFT display on the left, a column of six page-navigation keys, a numeric/cursor keypad block, TEST/EXIT controls, and a bank of 32-pin connector slots below. Models differ only in how many 32-pin slots are fitted, per the table below.

Model	Test pins	Connector slots
TH8610A / TH8601A	64	2 (A–B)
TH8610 / TH8601	128	4 (A–D)
TH8602-1 / TH8602B / TH8602C	64	8-slot chassis (A–H), slots A–B populated
TH8602-2	128	8-slot chassis (A–H), slots A–D populated
TH8602-3	192	8-slot chassis (A–H), slots A–F populated
TH8602-4	256	8-slot chassis (A–H), all slots populated
TH8603-4	512	4-slot chassis (A–D), each slot handling 128 pins

#	Control	Function
1	Trademark & model	Instrument brand and model designation.
2	LCD display	800×480 colour TFT; shows the reading, test conditions and instrument status (§3.5).
3	[PrtScn]	Screen-capture key — saves the current display as an image to a connected USB drive.
4	Menu keys	Six softkeys; each key's current function is shown on screen directly to its left and changes with the page and cursor position.
5	HV indicator	Lit while a withstand-voltage test is in progress — hazardous voltage warning.
6	PASS indicator	Lit when the current test result is qualified (pass).
7	[MEAS]	Opens the <MEAS> page — current test file, measurement steps and results (Chapter 6).
8	[SETUP]	Opens the current measurement-parameter setup page (Chapter 4).
9	[►] page/toggle key	Quick page-forward, or toggles a field through its available values (e.g. repeated presses cycle an On/Off field).
10	[LEARN]	Runs a network-learning scan of the connected DUT and opens the <LEARN> page with the result (Chapter 5).
11	[STAT]	Opens the test-statistics page (§6.2).
12	[FILE]	Opens file management — save/recall test files (§6.3).
13	[SYS]	Opens system setup (§7.1).
14	[UTILI]	Opens auxiliary functions (pin search, self-test, password, HANDLER I/O editing — §7.2).
15	[←] backspace	Deletes the last digit/character entered.
16	USB HOST port	For a USB drive: save/recall test files, screenshots, and firmware upgrades.
17	[TEST]	Starts a test.
18	[EXIT]	Stops the current test.

19	[ENTER]	Confirms a data entry.
20	[SAVE]	Saves the current test file.
21	[ESC]	Cancels the current data entry.
22	Numeric keypad	Digits 0–9, decimal point, [+/–]; also used for A–Z text entry.
23	Cursor keys	Move the highlighted field between the on-screen fields.
24	UNKNOWN connector slots	32-pin adapter connectors; the count fitted depends on the model (table above).
25	FAIL indicator	Lit when the current test result fails.
26	[RETURN]	Returns the cursor to the start of the current page; also returns to local control from remote operation.
27	Pin Search jack	For the pin-search probe — locates connector pin numbers and supports point (probe) testing.
28	Hipot Calibration terminals	Red (+) / black (–) high-voltage output pair, used when calibrating the withstand-voltage source.
29	POWER switch	Instrument power on/off.

3.2 Rear panel

#	Interface	Notes
1	RS-232C	Standard on all models.
2	LAN	Present on the rear-panel interface plate as a physical position on all models; see the note below before relying on it.
3	GPIB (IEEE-488)	Optional.
4	USB DEVICE	Standard on all models.
5	HANDLER	Level-signal interface for automated handling equipment (Chapter 10).
6	Rating label	Production date, serial number, manufacturer information.
7	Chassis ground terminal	For protective/shield grounding (§1.3).
8	Power inlet	IEC AC inlet with integrated fuse holder.

> **NOTE — LAN INTERFACE**
> LAN requires a custom order with Techmize.

3.3 Power-on and the home page

Insert the three-wire power plug, switch on the supply, then press the POWER switch at the front-left; the splash screen shows the company logo, model and firmware version, then opens on the home page. The home page shows firmware information and Techmize contact details, with the following softkeys:

Brightness +/–	Increase / decrease display brightness.
Fixture check	Runs an AC withstand-voltage and insulation-resistance self-check on the connected fixture (§3.3.1).
View network	Shows the network table (learned pin map) of the currently loaded test file.
Key lock	Locks the front-panel keys.

3.3.1 Fixture check

Runs two self-checks on the connected adapter fixture before production use: an **AC withstand-voltage check** and an **insulation-resistance check**, helping catch a damaged or contaminated fixture before it produces false test results.

3.4 Display zones

The display is divided into four zones common to every page: a **title zone** (current page name), the **main display zone** (page content), a **menu zone** (six current softkey labels), and an **information zone** (prompts, confirmations and error messages).

3.5 Basic operation

1. Use the page keys ([MEAS], [SETUP], [LEARN], [STAT], [FILE], [SYS], [UTILI]) and softkeys to reach the page you want.
2. Use the cursor keys to move the highlight to the field you want to set.
3. The menu zone shows the softkey options for the highlighted field; select one, or use the numeric keypad, [←] and [ENTER] to enter a value.
4. After a numeric entry, the softkey row shows the available units (e.g. Ω, kΩ, V, s) — select one to complete entry, using the field's default unit if none is chosen explicitly.

CHAPTER 4

[SETUP] Menu Details

Press **[SETUP]** to open the setup pages. Six tabs cover every test condition for the current test file: **Mode, Short/Open, Conduction, Component, High Voltage** and **Item**. Move between tabs with the up/down softkeys. This chapter documents every field on these six pages; the field set is identical across all eleven TH86XX models unless noted.

4.1 <Mode>

Sets the basic characteristics of the wire/cable/harness under test.

Field	Options / range	Meaning
Learn network	Manual · Type-C auto · AC2.0 · AC3.0 · CC3.1IC · CC2.0IC · CC3.0IC · CC3.1 · CC2.0 · CC3.0 · AC2.0IC · CC both sides	How the pin-map (network) is built. **Type-C auto** generates the network automatically from the cable's own design; **Manual** requires you to learn the DUT's pin network yourself (Chapter 5); the remaining options select a specific Type-C/USB-PD protocol network.
Wire type	Normal · Single-ended · Point test	**Normal**: both ends of the cable are connected to the tester (two-sided cable). **Single-ended**: only one end is connected. **Point test**: testing with a hand probe.
Connector type	Normal · One end A/B · Both ends A/B	Whether either or both ends of the cable present two physical faces (e.g. a reversible connector).
Chip type	No chip · PD2.0 · PD3.0 · PD ALL	Identifies the USB-PD authentication protocol carried by an identification chip inside the cable, if any.
A/B/C/D-end range	1–32 per slot, or Off	Start and end pin of each connector slot to include in the test, e.g. A1 to A32; an unused slot can be switched off. The start pin number must not exceed the end pin number.

4.2 <Short/Open>

Sets the conditions for continuity, short-circuit and open-circuit detection.

Field	Options / range	Meaning
Short/open threshold	0.01 kΩ – 100 kΩ	Resistance threshold used to judge continuity vs. open circuit between the two ends of a two-sided cable — below the threshold reads as continuous/short, above it reads as open.
Single-side sensitivity	0 pF – 9.999 nF (or learned from a reference DUT)	For single-ended cables, open-circuit detection is based on measured distributed capacitance rather than end-to-end resistance; this sets the pass/fail capacitance threshold.
End-side judgement	Off · On · Split · %	**On** identifies which side of a short fault lies on. **Split** additionally rules out short combinations that cross between connector slots that cannot physically short together, narrowing down the fault location further. **%** reports the break position as a percentage of cable length.
Single-side speed	Slow · Medium · Fast	Scan speed for single-ended sensitivity testing; slower gives higher precision — useful for very short cables with a very small distributed capacitance.
Transient O/S time	0 – 999.9 s (0 = unlimited)	Duration of the transient short/open test.
Transient open time	0 – 999.9 s (0 = unlimited)	Duration of the transient open-circuit test.

Shell pin	Any test pin	Assigns a pin to the DUT's shield/housing to auto-trigger a test by detecting the body-capacitance change when an operator inserts the DUT — useful for connectors whose own single-side sensitivity is too small (<1 pF) to trigger reliably on its own.
Large-capacitance present	Yes · No	Whether the cable network includes a large capacitor, used to split the network table at that point.
Short/open delay	1 µs – 60.00 ms	Settle time before reading the level after each scan step; larger for cables with more inter-wire capacitance.
Scan method	Binary search · One-to-others	**Binary search**: fast, $\log_2(N)$ scans for N pins — suited to plain wiring. **One-to-others**: scans every pin individually (N scans) — slower but required for networks containing passive components.
Fast transient	Off · On	Standard transient detection catches a 4 ms glitch; enabling this detects transients as short as 5 µs (requires a matching test fixture).
Fail count	numeric	Number of consecutive identical faults before the instrument ends the test under "Repeat" stop mode (below).
Stop after fail	Empty stop · Short stop · Open stop · Repeat stop	Under automatic triggering, when to end the test and report a short/open fail: when the DUT is removed (empty network), immediately on a short, immediately on an open, or after the fail-count above repeats.
Precision short/open	Off · On (with a resistance value)	Standard short/open judges purely by threshold (coarse). Enabling this adds a conduction-resistance sub-scan after the initial short/open pass, refining the short/open boundary to the resistance value entered (e.g. 10 Ω).

4.3 <Conduction>

Sets the conditions for conduction-resistance (continuity) testing.

Field	Options / range	Meaning
Upper / lower limit	0.001 Ω – 950 Ω (upper) / 0.001 Ω – 949.99 Ω (lower)	Pass/fail band for conduction resistance; enter directly or learn from a reference DUT.
Transient spec	as above	Upper limit used for the transient-conduction test (can be copied from the main upper limit).
Transient time	0.1 – 999.9 s	Duration of the transient-conduction measurement (0 s / unlimited is not supported here).
Test speed	Slow · Medium · Fast	Slower gives higher resistance-measurement precision — useful for very short/low-resistance cables.
Transient fail action	Stop test · Complete all	Whether a transient-conduction fail stops the test immediately or lets remaining points finish first.
Error loop	Off · On	When on, a failing pin is re-scanned continuously (and shown live) until it passes or the operator presses STOP.
Test current	Standard (20 mA) or 1–20 mA	Conduction-resistance test current.
Common pin	up to 2 pins	Common-point pin(s) used by the "Common point" network-combination mode below.
Test options	All tests · Normal conduction · Point-test conduction	Which conduction sub-tests run.
Conduction offset	0 – 10 Ω	A fixed system offset (e.g. fixture/lead resistance) subtracted from every conduction reading.
Conduction network	Normal · Common point · A-to-B · Composite	How pin pairs are combined for conduction testing — see worked example below.
Conduction balance	Off · Grouped, with a max Δ value	Splits the conduction network into groups whose readings must not differ from each other by more than the set value.

EXAMPLE — CONDUCTION NETWORK COMBINATION MODES

For a network A1-A2-A3-B1: **Normal** tests adjacent shorted pins only (A1-A2, A2-A3, A3-B1 — 3 pairs). **Common point** tests every other pin against one designated common pin, e.g. A1 (A1-A2, A1-A3, A1-B1 — 3 pairs). **A-to-B** matches pins across different connector slots (A1-B1, A2-B1, A3-B1). **Composite** tests every possible pair, N×(N−1)/2 combinations (6 pairs for this example).

4.4 <Component>

Sets up passive-component tests within the network — resistance, capacitance, diode, capacitor polarity, voltage drop, reverse-diode (leakage), inductance, resistance-sum, resistance-balance and voltage-sum. Each row of the component list is configured the same way: select the **type**, the **+ pin** and **− pin** (enter directly or auto-find with the pin-search probe), the **spec** value (enter directly, or connect a reference part and learn it), the **tolerance**, and any **additional** parameter the type requires.

Component type	Additional parameter	Notes
Resistance / Capacitance / Inductance	—	Standard 2-terminal component measurement.
Diode	Test current, 1–20 mA	Measures forward voltage drop; the debug interface can also enable the diode to be lit for a set duration during test, for visual verification.
Capacitor polarity	Charge time	Spec entry of 1 = "+" orientation, 0 = "−"; the capacitor must be pre-charged before polarity can be judged — increase the charge time if larger capacitors give false results.
Voltage drop	Working current	Measures the voltage drop across the DUT at a set test current.
Reverse-diode (leakage)	—	Tests reverse leakage current of a diode.
Resistance-sum	Working voltage	Measures two resistances and reports their sum.
Resistance-balance	Working voltage	Measures two resistances and reports their difference.
Voltage-sum	Working voltage	Measures the voltage drop of two wires and reports their sum.

NOTE

A component-row list row can be deleted, duplicated, or multi-selected (for bulk delete/duplicate) from the list-operation softkeys.

4.5 <High Voltage>

Sets up the three independent high-voltage test items — **AC withstand voltage, DC withstand voltage** and **insulation resistance** — across two setup pages. Move between the two pages with the cursor.

Field	Range	Meaning
Test voltage	AC 50 V – 1000 V · DC 50 V – 1500 V	Test voltage for the selected HV item.
Test time	0.01 s – 500.0 s	Duration each net is held at test voltage.
Test spec	ACW/DCW: 1 µA – 10 mA leakage · Insulation resistance: 0.1 MΩ – 10 GΩ	Pass/fail threshold for the selected HV item.
Test method	Binary search · One-to-others · Automatic · All-to-ground · Product group · Odd-vs-even · Odd/even upper-lower	**Binary search**: fast but cannot pinpoint the failing pin. **One-to-others**: scans every net individually — slower, but identifies the exact failing pin. **Automatic**: tries binary search first; falls back to one-to-others only if the first pass fails. **All-to-ground**: for shielded-cable testing — designates one ground pin as the HV-high reference and tests every other pin against it. **Product group**, **Odd-vs-even** and **Odd/even upper-lower**: further grouping strategies for splitting the network into HV test batches — see Techmize for guidance on which suits a given harness layout.
Arc detection	Off, or level 1–8	Sensitivity of arc detection during the withstand-voltage test.

Rise time	numeric	Time allowed for the output to ramp up to the set test voltage.
Empty-point test	Off · On	Whether unpopulated (empty) points on the DUT are included in the HV test.
Ground pin	any test pin	Required for the All-to-ground method; enter directly or find with the pin-search probe.
Ground voltage / time / spec	same ranges as above	Independent voltage, duration and pass/fail spec for the ground-referenced HV test.

4.6 <Item>

Selects which of the test categories above (short/open, transient short/open, transient-open, conduction, transient-conduction, component, AC withstand voltage, DC withstand voltage, insulation resistance) actually run for the current test file — switch each item On or Off as needed.

CHAPTER 5

[LEARN] Page

Connect the reference (known-good) DUT to the test port, then press **[LEARN]**. The instrument immediately scans the network and opens the <LEARN> page with the result.

5.1 Learning a network

Learning captures the DUT's pin structure — the short/open network table — which subsequent tests are run against. The result is shown as a table with four columns:

Net	Net number, starting from 001 — pins that are shorted together form one net.
Pin(s)	The test pins that make up this net.
Learned value	For single-ended cables: the measured single-side sensitivity of this net. Not applicable for two-sided cables.
Standard value	The pass/fail threshold applied to this net — the single-side-sensitivity setting (§4.2) for single-ended cables, or the conduction upper limit (§4.3) for two-sided cables. Each net can be given its own standard value (useful for cables of varying length within the same harness) by moving the cursor into this column and entering a new number.

5.2 Zeroing functions

Removes systematic error introduced by temperature, humidity or the fixture itself. Each zeroing function scans every net with the instrument in the stated state and stores the result as an offset, which is then subtracted from every subsequent reading of that type.

Function	Fixture state	What it zeroes
Single-side zero	Open	Single-side sensitivity (capacitance) offset.
Conduction zero	Short (short board fitted)	Conduction-resistance offset.
ACW zero	Open	AC withstand-voltage leakage-current offset.
Insulation zero	Open	DC withstand-voltage/insulation leakage-current offset.
Reset zero	—	Clears all of the above offsets back to zero.

5.3 High-voltage network editing

Edits the HV test network directly — useful for protecting sensitive passive components from a full-voltage scan, or for speeding up testing.

- **Merge**: select two or more nets (softkey toggles the selection highlight), then choose Merge to combine them into one net.
- **Delete**: select one or more nets, then choose Delete to remove them from the HV network.
- **Create**: enter a start pin and an end pin (e.g. A1 to A8) to create a new single-ended net.
- **Reset**: restores the HV network table to its original (learned) state.

5.4 Conduction network editing

Manually edits the conduction test pin pairs (pins must always be edited in matched pairs).

- **Delete net**: removes the highlighted net.
- **Edit pin**: move the cursor to a pin and enter a new pin number to replace it.
- **Edit limit**: move the cursor to a net's upper/lower limit and enter a new standard value.

5.5 Sorting rules and chip information

Sorting rules lets you designate specific pins as permitted to short together, for cases where the short/open judgement needs an exception. **Chip information** reads the content written into a known-good cable's identification chip (first 20 bytes) to build a reference network from it.

CHAPTER 6

Measurement, Statistics & File Management

6.1 <MEAS> page

Press **[MEAS]** to see the current test file, test type and live results.

Title	Current test type: Normal, Single-ended, Point test, or Sequential (a multi-file test list).
File	Current file name (up to 12 characters: digits, letters and hyphens) and type (Normal / Sequential).
Statistics	Running total tested, passed and failed for the current session.
Test result	Test item, test pin(s), measured data, and the pass/fail verdict.

Softkeys: **View network** switches to the <LEARN> page to see the current file's network table; **Page up/down** scrolls through results; **Key lock** locks the front-panel keys (configured in §7.2) — in manual-lock mode, [TEST], [EXIT], unlock and file-import remain active; in bus-lock mode, only [TEST], [EXIT] and unlock remain active.

6.2 <STAT> page

Press **[STAT]** for cumulative pass/fail statistics.

- **Overall statistics**: total tested, passed, failed and yield (%) across the whole session.
- **Per-item statistics**: pass count, fail count and yield broken out for each of the nine test categories (short/open, transient short/open, transient open, conduction, transient conduction, component, ACW, DCW, insulation resistance) — useful for failure-mode analysis.

Softkeys: **Clear** (with confirmation) zeroes all statistics; **Save** writes the statistics to storage.

6.3 <FILE> page

Press **[FILE]** for file management, across three tabs: **Internal** (instrument memory), **External** (USB drive) and **Sequence** (multi-file sequential test lists).

Tab	Operations
Internal	New (factory-default file), Save-as, Import (from the highlighted file), Delete, Copy (to USB), Rename, Copy-all (to USB).
External (USB)	Save, Import, Copy (to instrument memory), Delete, Copy-all (to instrument memory).
Sequence	Create, Import, Edit (add/remove/reorder steps — each step is one internal test file run in order), Copy, Copy-all, Delete.

> **NOTE**
> Every destructive file operation (delete, overwrite) shows a confirmation prompt before it takes effect.

CHAPTER 7

System & Utility Setup

7.1 <SYS> page

Press **[SYS]** for three tabs: **Test, Environment** and **Communication**. Press Save after any change.

7.1.1 Test tab

Field	Options / range	Meaning
Trigger mode	Manual (front [TEST] key) · External (rear HANDLER) · Bus (remote trigger command) · Automatic (auto-detects a DUT and starts the test)	How a test cycle is started.
Trigger delay	0 – 99.9 s	Wait time between the trigger event and the start of the test.
Test mode	Normal (one pass) · Repeat (N passes) · Sequential (continuous until [EXIT])	How many times each DUT is tested.
Repeat count	0 – 999	Number of passes under Repeat test mode.
Test interval	0 – 99.9 s	Pause between passes under Repeat/Sequential test mode.
Fail-after action	Complete all · Stop test · Skip HV	What to do when a normal test file fails: finish every item regardless, stop immediately and report FAIL, or finish everything except the (hazardous) HV items.
Display mode	Show all · Show fails only · Auto (fails first, then all on [ENTER])	Which results are shown after a test completes.
Sequence trigger mode	Key-triggered · Continuous · Automatic (network-matched)	How steps of a sequential (multi-file) test are advanced.
Point-test fail action	Repeat · Next step	Whether a failing point-test step repeats until it passes, or can be skipped to the next step on demand.
Dual-station mode	Off · On	Enables dual-bench operation.
Early-removal detection	Off · On	Flags a DUT removed before the test cycle completes.
Removal check	Off · On	Requires the previous DUT to be removed before the next test can start — prevents accidentally re-testing the same unit.
Start-point count	numeric	Minimum proportion of pins that must be inserted before a test auto-starts.
Chip delay	numeric	Settle time before reading an identification chip.

7.1.2 Environment tab

Key sound	Off / On — audible click on keypress.
Buzzer volume	Off / Low / Medium / High.
Key lock mode	Manual (TEST/EXIT plus file-import remain usable) or Bus (TEST/EXIT only) — see §6.1.
Pass / Fail sound	Off / On, set independently.
Screen brightness	0–10, adjusted with +/–.
Fixture life counter	Set a use-count for the fixture; decrements on every test and warns at zero — helps schedule fixture replacement.
Date / time	Sets the instrument's real-time clock.

7.1.3 Communication tab

Selects and configures the active remote interface: **RS232, GPIB, USB, LAN** or **RS485** (see the LAN note in §3.2).

Interface	Settings
RS232	Baud rate 9600 / 19200 / 38400 / 115200; data bits 8 / 7; stop bits 1 / 2; parity None / Odd / Even.
GPIB	Address 1–32.
USB	Mode: TMC or CDC.
LAN (custom order only)	DHCP on/off; address 1–32; auto-IP on/off; static IP, subnet mask, default gateway, DNS 1 and DNS 2 (each a 4-octet address, 0–255 per octet).
RS485	Address 0–32.

7.2 <UTILI> page

Press **[UTILI]** for auxiliary functions:

Pin search	Continuously scans for a probe touch; touch the pin-search probe to any pin to read out its number live on screen. A 4-wire pin-search mode is available if the DUT uses 4-wire (Kelvin) connections.
Self-test	Runs the instrument's internal self-test, either automatically at power-on (configurable) or on demand.
HV module	A simple standalone withstand-voltage/insulation-resistance tester mode: select ACW, DCW or insulation resistance and set voltage, frequency, test pins, rise time, test time, range and arc level directly, with the live test voltage, data and elapsed time shown.
I/O edit	Configures the HANDLER interface (Chapter 10): pins 11–13 are fixed inputs, pins 1–8 are freely assignable outputs, each set to one of roughly 40 available signals (e.g. Pass, Fail, Conduction-fail) at one of four levels (high level, low level, high pulse, low pulse).
Memory init.	Restores factory defaults, clearing all stored test files (back up first); a separate 64/128-channel switch item exists for switching between hardware variants of the same instrument — do not use without Techmize guidance.
Firmware upgrade	Insert a USB drive containing the model-specific upgrade file, select Upgrade and confirm; a progress bar is shown, and the instrument restarts automatically on completion.
System password	Sets a password required to unlock the keypad lock (§6.1, §7.1.2).
LCR module	A simple standalone LCR-bridge mode: measure inductance, capacitance, AC resistance, DC resistance, conduction resistance, diode forward voltage or voltage drop directly, with test level, frequency, test pins and range set from the cursor. DC resistance covers values above roughly 1 kΩ; use the Conduction test (§4.3) for smaller resistances.

CHAPTER 8

Performance & Specifications

Full per-model electrical specifications (test-signal source, capacitance/resistance/withstand-voltage/ insulation-resistance ranges and accuracies, and the quick selection matrix across all eleven models) are given in the **TH86XX Series Datasheet**. The table below summarises the platform-level ranges referenced by the setup menu in Chapter 4; per-model accuracy figures are in the datasheet.

Test item	Setup range referenced in this manual
Short/open threshold	0.01 kΩ – 100 kΩ
Conduction resistance limits	0.001 Ω – 950 Ω
AC withstand voltage	50 V – 1000 V
DC withstand voltage	50 V – 1500 V
Insulation resistance spec	0.1 MΩ – 10 GΩ
HV leakage-current spec	1 µA – 10 mA

CHAPTER 9

Remote Control Overview

The TH86XX series provides an SCPI-style command set covering every setup-menu field in Chapter 4, plus trigger/learn control, result fetch, system settings and file transfer — roughly 120 commands in total. Because the set is large, the full command-by-command reference is published separately as the **TH86XX Series SCPI Command Reference**; this chapter covers the conventions and remote interfaces only.

9.1 Remote interfaces

Interface	Notes
RS-232C	Standard on all models; settings at §7.1.3.
USB Device	Standard on all models; TMC or CDC mode.
GPIB (IEEE-488)	Optional; requires the GPIB interface to be fitted.
LAN (custom order only)	Configurable via §7.1.3.
RS-485	Optional; address 0–32.

Select the active interface with the Communication tab (§7.1.3); for bus-triggered operation, also set Trigger mode to **Bus** (§7.1.1) or send the equivalent remote command.

9.2 Command conventions

Commands are colon-separated, hierarchical, and shown here with their full mnemonic (e.g. `:SETUP:MODE:TYPE`); most accept both a set form (with a data value) and a query form (appending `?`). Enumerated fields take a numeric code (0, 1, 2…) matching the order the options are listed in Chapter 4; numeric fields take the value directly, in the field's default unit unless otherwise stated.

9.3 Command subsystem map

Root	Covers	Corresponds to
`:SETUP:MODE`	Wire/connector/chip type, A–D pin ranges	§4.1
`:SETUP:OS`	Short/open test conditions	§4.2
`:SETUP:COND`	Conduction test conditions	§4.3
`:SETUP:LCR`	Passive-component test rows	§4.4
`:SETUP:HV` / `:SETUP:ITEM`	High-voltage test conditions; item on/off selection	§4.5 / §4.6
`:TRIG` / `:STOP` / `:LEARN`	Start, stop, and run a learn cycle	Chapters 3, 5
`:FETCH`	Read back test results, network tables and statistics	Chapter 6
`:SYS:MEAS` / `:SYS:ENVI`	Test-tab and Environment-tab system settings	§7.1.1 / §7.1.2
`:FILE`	Save/load/send/receive test files	§6.3
`:DISP` / `:STAT`	Display page control; clear statistics	Chapter 6

NOTE

See the standalone **TH86XX Series SCPI Command Reference** for the full syntax, data ranges and examples for every command in the table above.

CHAPTER 10

Handler Interface

The rear-panel HANDLER interface outputs bin-sort/status signals to automatic handling equipment and accepts basic control inputs. It is standard on all TH86XX models; the number of freely-assignable output signals depends on the specific model (see the datasheet's interface table).

10.1 Signal groups

Pins	Direction	Function
1–8 (CTL1–CTL8)	Output	Freely assignable — each pin can be set (§7.2 I/O edit) to one of roughly 40 available status/result signals (Pass, Fail, Conduction-fail, etc.) at High level, Low level, High pulse or Low pulse.
9–10, 18–19	Power (internal)	Internal +12 V supply, available for the output stage if an external supply is not used.
11–13	Input	Fixed function: Stop, Start and Reset. Accept an external switch (S1–S3) or a low-level trigger.
14–15	Power (internal)	Internal +5 V supply, available for the output stage if an external supply is not used.
16–17, 20–25	Ground	Common ground for the HANDLER interface — any external control loop must share this ground.

CAUTION

When using an external supply for the output stage, tie its ground to the instrument chassis (or to pins 20–25). Fit a pull-up resistor (Techmize recommends 10 kΩ) on each output line to ensure signal stability.

10.2 RS-232C wiring

The instrument uses a simple 3-wire RS-232 link: TXD (pin 3), RXD (pin 2) and GND (pin 5). The connecting cable must cross pins 2 and 3 between the instrument and the controlling PC — use the RS-232 cable supplied by Techmize/Tonghui to avoid wiring it incorrectly.

APPENDIX

Terms, Quick Reference & Contact

A.1 Front-panel key quick reference

Key	Function
[MEAS]	Test results page (§6.1)
[SETUP]	Measurement setup pages (Chapter 4)
[LEARN]	Runs a network-learning scan (Chapter 5)
[STAT]	Test statistics (§6.2)
[FILE]	File management (§6.3)
[SYS]	System setup (§7.1)
[UTILI]	Auxiliary functions (§7.2)
[TEST] / [EXIT]	Start / stop a test
[LEARN] + [RETURN]	Learn, then return the cursor to the page start

A.2 Common remote commands

Task	Command
Start a test	`:TRIG` (with Trigger mode = Bus)
Run a learn cycle	`:LEARN`
Read the conduction-resistance result	`:FETCH:COND?`
Read every test item's result	`:FETCH:ALL<step>?`
Save / load a test file	`:FILE:SAVE` · `:FILE:LOAD`

See the standalone **TH86XX Series SCPI Command Reference** for the full command set.

A.3 Contact, warranty and support

Warranty: two years from delivery, per §1.7. For service, calibration, accessories or optional interfaces (for example LAN, §3.2), contact Techmize using the details below.

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