TECHMIZE by TONGHUI

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OPERATION MANUAL

TH530-01

Programmable Inductive Load Box. Covers installation, the front-panel touchscreen interface, specifications and the remote control interfaces for use with the TH530 series avalanche energy tester.

Techmize Electronic GmbH · Ismaning, Germany · an international subsidiary of Changzhou Tonghui Electronic Co., Ltd.

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TH530-01 Operation Manual

Programmable Inductive Load Box

This manual describes the installation, front-panel touchscreen operation and remote control of the TH530-01 programmable inductive load box. The TH530-01 provides a selectable load inductance of 0.01–159.9 mH for avalanche-energy (UIS) testing, selected manually, over a LAN connection, or via a HANDLER-style control input from a host system such as the Techmize TH530 series avalanche energy tester.

> **NOTE — A STANDALONE, OPTIONAL UNIT**
>
> The TH530-01 is an **optional accessory** for the TH530 series mainframe, with its own independent specifications and remote command set — it is documented here as a standalone unit, separately from the *TH530 Series Operation Manual*. A customer who orders the TH530 mainframe alone is not supplied with this manual.

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The TH530-01's remote command set (LAN and HANDLER) is small enough to document in full within this manual — unlike the TH530 mainframe, it is not split into a separate command-reference document.

CHAPTER 1

Safety, Compliance & Warranty

1.1 About this manual & unpacking

This is the operation manual for the Techmize TH530-01 programmable inductive load box. Where this manual and the instrument itself appear to disagree, contact Techmize or your authorized distributor using the details in §1.7 before relying on the instrument for a measurement.

Inspect the shipping container for damage after unpacking; it is not recommended to power on the instrument if the container shows signs of damage. Check the contents against your order; if anything does not conform, notify Techmize or your distributor promptly.

1.2 General description

The TH530-01 is an industrial-grade programmable inductor box providing a load inductance of 0.01–159.9 mH. The inductance value is selected by electronic control signals (LAN or HANDLER), using a mechanical-relay switching network designed to minimize the inductance of the individual coils and their interconnections. Relay switching gives a reliable, low-resistance selection path; because inductance changes are infrequent in normal UIS testing, relay switching speed and wear are not limiting factors.

> **WARNING — HIGH VOLTAGE AND HIGH CURRENT**
>
> During an avalanche test, the connected tester can apply up to **3000 V peak** and **200 A peak** at the TH530-01's Inductor Connections terminals. Never touch these terminals or the connected test leads while a test is running.

1.3 Power requirements

Item	Specification
Supply voltage	100–240 V AC, single-phase, two-wire plus protective earth
Supply frequency	50/60 Hz
Fuse	250 V, T1AL (1 A, time-lag / slow-blow)

Ensure the mains supply matches the load box's rated power before connecting; use only the supplied power cable.

> **WARNING — GROUNDING**
>
> To prevent electric shock from leakage current, the supply's protective-earth conductor must be reliably connected to ground.

1.4 Environment

Item	Requirement
Operating temperature / humidity	23 °C ± 3 °C, 40–75% RH (for rated accuracy)
Storage temperature / humidity (extended, in original packaging)	−30–50 °C, ≤80% RH

- Observe ESD precautions when handling or testing with the unit, to avoid invisible damage to electronic components.
- Avoid dust, vibration, direct sunlight and corrosive gases.
- Keep the left/right ventilation openings clear to maintain measurement accuracy.
- Keep test leads to the device under test away from strong electromagnetic fields, to avoid measurement interference.

1.5 Safety requirements

The TH530-01 is a Class I safety instrument.

Item	Requirement
Insulation resistance (reference conditions)	≥50 MΩ, power terminals to chassis
Insulation resistance (humid transport conditions)	≥2 MΩ, power terminals to chassis
Insulation strength	1.5 kV AC, 50 Hz, 1 minute, power terminals to chassis — no breakdown or flashover
Leakage current	≤3.5 mA AC (RMS)
EMC — power-line transient susceptibility	Per GB/T 6833.4
EMC — conducted susceptibility	Per GB/T 6833.6
EMC — radiated emissions	Per GB/T 6833.10

1.6 CE marking & WEEE

The TH530-01 carries the CE mark and the WEEE “crossed-out wheeled bin” symbol, as shown on its rear-panel nameplate. Within the European Union, return the unit to Techmize, your distributor, or a designated collection point for electrical and electronic equipment at the end of its service life, per the WEEE Directive (2012/19/EU) and its national transposition in your country.

CHAPTER 2

Getting to Know the Instrument

2.1 Front panel



Item	Description
1	Carrying handles (×2)
2	7" 800×480 capacitive touchscreen — displays the current inductance value and all mode settings

The touchscreen offers three modes, selected from the **Mode** row: **Manual** (§2.2), **LAN** (§2.3) and **Handler** (§4.2). In Handler mode, the output inductance is controlled entirely by the HANDLER input signals and cannot be changed from the touchscreen.

2.2 Manual inductance setting



Tap **Manual** to switch to manual mode. The large numeric readout shows the current output inductance (0.01–159.9 mH); tap it to open a numeric keypad and enter a new value directly, or use the **+/−** buttons at the right to step it, or tap one of the ten shortcut buttons below for a commonly-used value.

Current value	+ step	− step
<0.1 mH	0.01 mH	
=0.1 mH	0.1 mH	0.01 mH
0.1–1 mH (exclusive)	0.1 mH	
=1 mH	1 mH	0.1 mH
1–10 mH (exclusive)	1 mH	
=10 mH	10 mH	1 mH
>10 mH	10 mH	

Each of the ten shortcut buttons (labelled 1–10) can be reassigned to a different inductance value by long-pressing it, which opens the same numeric keypad.

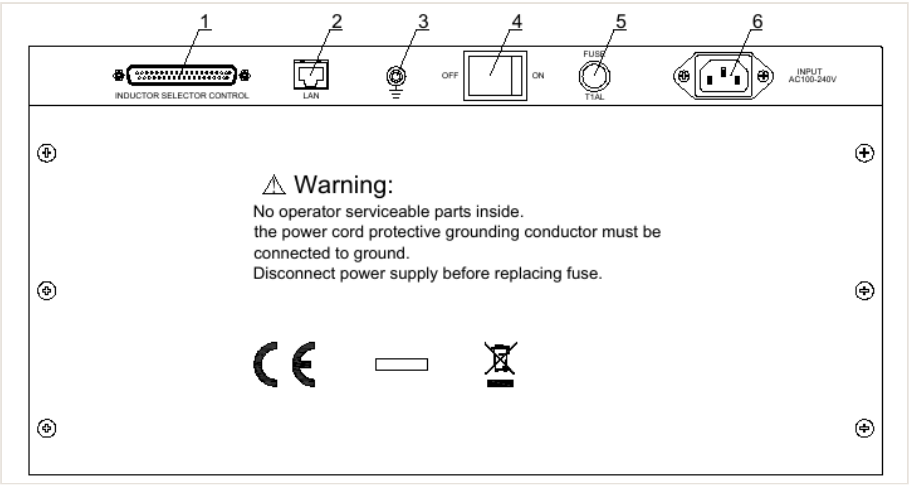
2.3 LAN setting



LAN mode controls the output inductance by remote command (§4.1), and requires the network parameters below to be configured first. Tap **LAN** to open this screen:

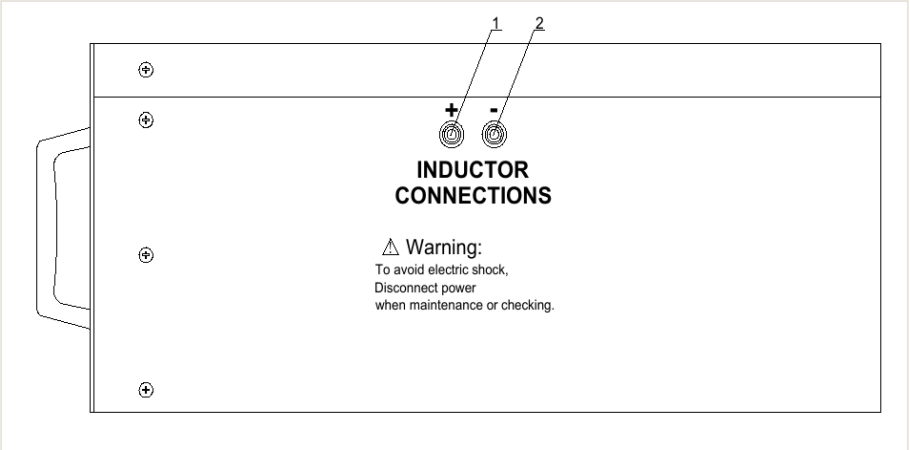
Field	Description
DHCP	ON: obtains an IP address automatically, if the connected router supports it. OFF: use the manually-entered address fields below
IP Address	Tap to open the numeric keypad and enter the unit's IP address (example default: 192.168.1.136)
Port	Tap to enter the TCP port (example default: 45454)
Netmask	Tap to enter the subnet mask (example default: 255.255.255.0)
Gateway	Tap to enter the default gateway (example default: 192.168.1.1)

2.4 Rear panel



Item	Description
1	Inductor Selector Control / HANDLER interface — 37-pin connector; connects to the TH530 mainframe's rear-panel Inductor Selector Control port, and carries the HANDLER-mode control signals (§4.2)
2	LAN — network interface, for LAN-mode remote control (§2.3, §4.1)
3	Ground terminal
4	Power switch
5	Fuse holder (§1.3)
6	AC power inlet

2.5 Right-side panel



Item	Description
1, 2	Inductor Connections test terminals (+/−) — connect to the TH530 mainframe's side-panel Inductor Connections terminals using the supplied inductor connection cable (red +, black −)

WARNING — HAZARDOUS VOLTAGE, AS LABELLED ON THE PANEL

To avoid electric shock, disconnect power before maintenance or checking these terminals.

NOTE — CONNECTING TO THE TH530 MAINFRAME

Connect the TH530-01's Inductor Connections terminals (§2.5) to the TH530 mainframe's side-panel Inductor Connections terminals using the inductor connection cable, and connect its rear-panel Inductor Selector Control connector (§2.4, item 1) to the mainframe's rear-panel Inductor Selector Control port, to allow the mainframe to select the inductance value.

CHAPTER 3

Specifications

3.1 Physical dimensions

Item	Specification
Dimensions (W×H×D)	483×222×532 mm
Weight	≈80 kg

3.2 Electrical specifications

Parameter	Specification
Inductance range	0.01–159.9 mH
Resolution	0.01 mH over 0.01–9.99 mH · 0.1 mH over 10.0–159.9 mH
Load error	±5% or ±0.002 mH, whichever is greater
Peak current	200 A maximum
Maximum pulse voltage	3000 V peak, terminal-to-terminal or either terminal to chassis

Relay-based inductance selection (§1.2) — switching speed and contact wear are not limiting factors for UIS avalanche testing, where the inductance value is set once per test setup rather than switched during a test.

CHAPTER 4

Remote Control

The TH530-01 is controlled remotely over its LAN interface (command set) or its HANDLER-style 37-pin control input — not simultaneously; the active mode is selected from the front-panel touchscreen (§2.1).

4.1 LAN interface & command set

Configure the network parameters first (§2.3), then connect over the configured IP address and port. The complete LAN command set is three commands:

Command	Description
`*IDN?`	Query instrument identification. Returns `<model>,<firmware>` — e.g. `TH530_01,V1.02`
`set <value>`	Set the output inductance. `<value>` is 0.01–159.9 (mH, unit implicit) — e.g. `set 10` sets 10 mH
`value?`	Query the current output inductance. Returns the value in mH — e.g. `10`
`manual:<index> <value>`	Set the inductance value assigned to shortcut button `<index>` (1–10) on the Manual-mode screen (§2.2). `<value>` is 0.01–159.9 (mH) — e.g. `manual:5 15` sets shortcut button 5 to 15 mH

All commands and returned data are ASCII.

4.2 HANDLER interface

Tap **Handler** on the Mode row (§2.1) to enable HANDLER-controlled operation; in this mode, the output inductance is set entirely by the 37-pin control input (§2.4, item 1) and cannot be changed from the touchscreen. Each pin is active-low; a pin's listed digit is applied to the stated decimal position (hundredths/tenths/units) of the output inductance when the pin is pulled low.

Pin	Function
1	Active low. Low range: hundredths digit = 0 (.00 mH). High range: reserved
2–8	Active low. Low range: hundredths digit = 1–7 (.01–.07 mH). High range: tens digit = 1–7 (10–70 mH)
9, 10	Active low. Hundredths digit = 8, 9 (.08, .09 mH) — low range only
11–20	Active low. Tenths digit = 0–9 (.0–.9 mH) — valid on both low and high range
21–30	Active low. Units digit = 0–9 (0–9 mH) — valid on both low and high range
31	Range select — low level: low range (<10 mH). High level: high range (10.0–159.9 mH)
32, 33	Reserved
34	Active low. Adds 80 mH to the output — high range only
35, 36	Ground
37	Supply

Worked examples

Target inductance	Range	Decomposition	Pins pulled low
3.52 mH	Low (<10 mH)	0.02 + 0.5 + 3 mH	31 (high), 3 (.02 mH), 16 (.5 mH), 24 (3 mH)
22.3 mH	High (≥10 mH)	0.3 + 2 + 20 mH	31 (high), 14 (.3 mH), 23 (2 mH), 3 (20 mH, tens digit)
128.3 mH	High (≥10 mH)	0.3 + 8 + 40 + 80 mH	14 (.3 mH), 29 (8 mH), 5 (40 mH, tens digit), 34 (+80 mH)

4.3 Using the HANDLER interface

1. Connect the 37-pin control cable from the host system to the TH530-01's rear-panel connector (§2.4, item 1).
2. On the TH530-01 touchscreen, tap **Handler** on the Mode row.
3. Drive the pin combination for the required inductance, per §4.2; the output inductance updates accordingly and can no longer be changed from the touchscreen while Handler mode is active.

APPENDIX

Warranty & Related Documents

A.1 Warranty

Techmize warrants this instrument to be free from defects in material and workmanship for a period of **two (2) years** from the date of shipment. During the warranty period, Techmize will repair a product that proves defective, provided it has been used within the specified operating conditions. A warranty card is required to claim warranty service.

Repair must be carried out by qualified technical personnel; do not replace internal modules or components without authorization. Damage resulting from unauthorized repair or component replacement is not covered by the warranty, and the repair cost is borne by the user. After any repair, the instrument must be recalibrated before further use, to avoid affecting measurement accuracy.

Protect the instrument from direct sunlight and humidity, and use it only within the environmental conditions of §1.4. For extended non-use, store the instrument sealed in its original factory packaging.

A.2 Related documents

- TH530 Series Datasheet (Techmize) — covers the TH530 mainframe and lists the TH530-01 as an optional accessory
- TH530 Series Operation Manual (Techmize) — the TH530 mainframe, documented as a separate, standalone unit

A.3 Contacting Techmize

For technical support, accessories, calibration or service, contact Techmize directly or through your authorized Techmize distributor.

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