Time Electronics
Calibration, Test and Measurement

User Manual

1053
Inductance Decade Box

Version 1.2
11-22

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This also applies to any schematics, drawings and diagrams contained herein.

This manual provides operating and safety instructions for the Time Electronics product. To ensure correct operation and safety, please follow the instructions in this manual.

Time Electronics reserves the right to change the contents, specifications and other information contained in this manual without notice.

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1 Introduction



A precision decade inductance box suitable for filter design, experimental, general purpose substitution, and DC to DC converter design. The 1053 is housed in a fully screened robust metal case and is both compact and durable, making it ideal for laboratory or field use.

Inductance is set by four easy-to-read dials that are divided into 4 decades, and provide 1 mH, 10 mH, 100 mH, and 1 H steps. The maximum setting is 11.11 H. The unit features custom wound, high permeability ferrite core inductors that ensure insignificant influence from external magnetic fields and maximum stability.

The front panel safety terminals are compatible with 4 mm shrouded plugs, as well as standard plugs, bare wires, and spade terminals.

Features

- 1 mH to 10 H
- 3 % accuracy
- High stability
- In-line readout
- Compact and robust design
- Safety terminals
- Fully screened

2 Specifications

Range / Resolution ..... 0 to 10 H / 1mH steps.

Decade	1 mH	10 mH	100 mH	1 H
Accuracy at 1 kHz	± 3 %	± 3 %	± 3 %	± 3 %
Max current per decade	30 mA	70 mA	100 mA	150 mA
Average resistance per step	0.1 Ω	0.5 Ω	3.4 Ω	20.5 Ω
Typical Q Factor at 1 kHz	75	175	280	250

Residual resistance ..... Less than 0.2 Ω.

Residual inductance ..... Less than 1 µH.

Voltage rating ..... Maximum 30 V AC RMS (non-switching).
Subject to max current rating.

Case Isolation ..... Maximum 500 V peak.

Temperature coefficient ..... 1 %/°C.

Connections ..... 2 x 4 mm active safety terminals. A third safety terminal is to enable the case to be earthed or connected to either output.

Dimensions ..... W 248 x H 62 x D 102 mm.

Weight ..... 0.8 kg.

Operating temperature ..... -10 ºC to +50 ºC.

Operating humidity ..... < 90 %.

Options ..... Calibration certificates:
Traceable (factory) and accredited (ISO 17025).

Country of origin ..... United Kingdom.

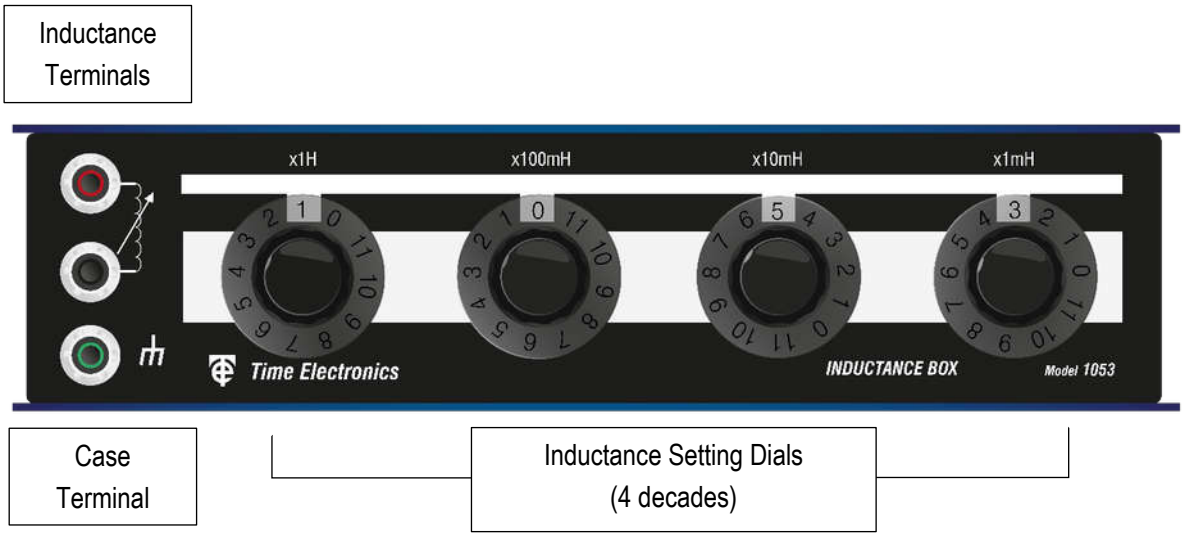
3 Operation

3.1 Safety Precautions



Observe proper safety operational guidelines when working with high voltages. To minimize shock hazard connect the case terminal to an electrical ground. Always take precautions to avoid and prevent contact with live components. Handle the unit with care and use as per the instructions in this manual.

3.2 Front Panel Controls and Connections



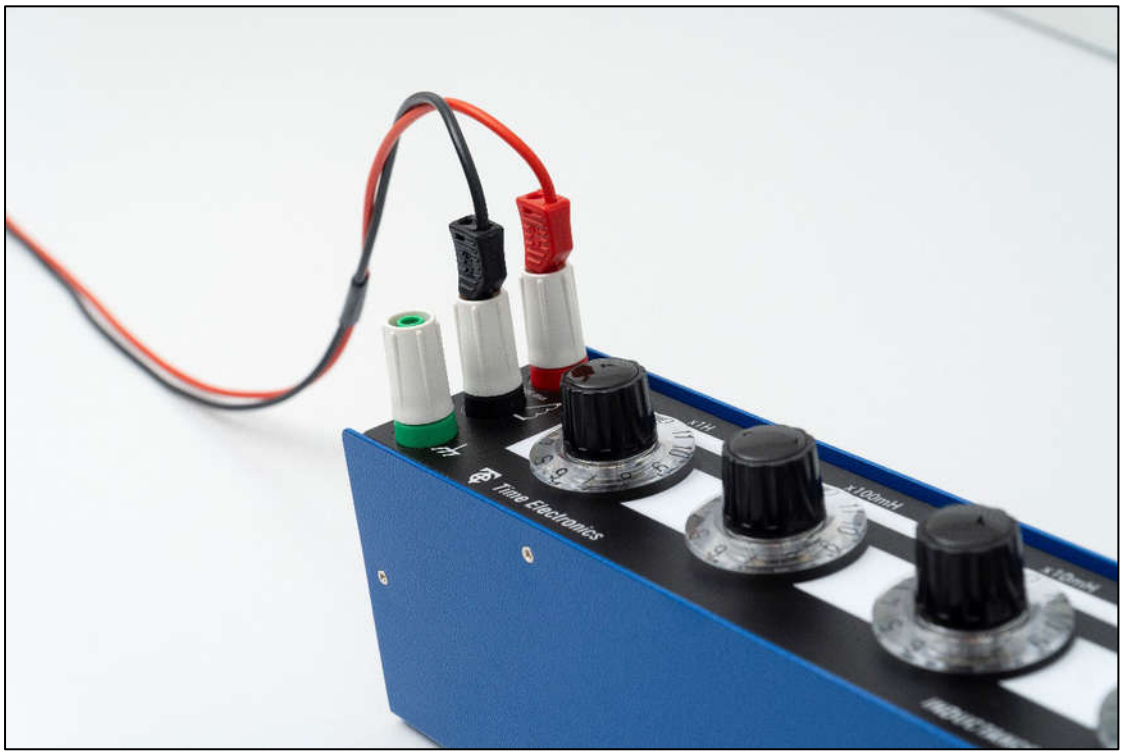
- **Inductance Terminals:** Inductance is connected via the safety terminal binding posts that are suitable for twisted stripped wire compression connection, spade terminals, or by 4 mm shrouded or normal plug insertion.

- **Case Terminal:** The case terminal is isolated from the two active inductance terminals. When connected to ground/earth, it may be used as a guard or shield connection, this can help to reduce unwanted electrical noise pickup, and help maintain the case at a safe voltage in certain modes of use.

- **Inductance Setting Dials:** Used for selecting the required inductance by setting the dial to the value of the decade range. Each dial can be set from 0 to 11.
  The value is clearly displayed in the white setting window below the decade range.

3.3 Operating Instructions

3.3.1 Connections



Connection to the decade box is via 4 mm safety terminal posts, using 4 mm shrouded or standard plugs. Alternatively, crocodile clips or stripped wire connections can be used.

Whatever method is used, the connection must be tight to the terminal posts to avoid introducing unwanted instability to the inductance reading.

The red and black active terminals connect to the inductance elements, and the green terminal is connected to the case for screening purposes.

Do not connect to an AC supply above 30 V RMS.

For certain applications, the user may want to connect the case terminal to either of the active terminals. This can be done, but the case would then be at the same potential as the active terminals. The user should be aware that this could be hazardous and safety precautions must be taken to prevent electric shock.

3.3.2 Setting Inductance



Use the front panel dials to set the required values according to the decade ranges. The selected value shown in the white setting window under the range arrow. This enables precise setting with a clear unambiguous indication.

For example, to set 4.582 H:

- Set the 1 H dial to 4.
- Set the 100 mH dial to 5.
- Set the 10 mH dial to 8
- Set the 1 mH dial to 2.

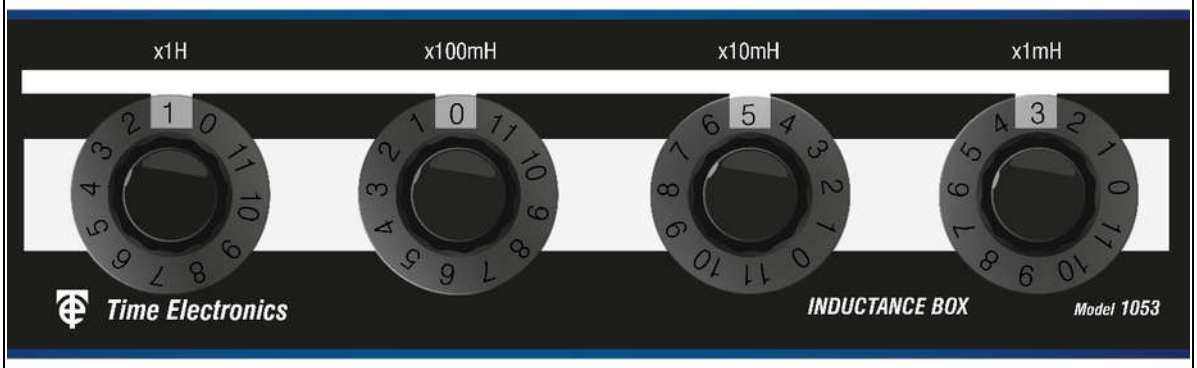
For a quick reference to the setting values of the 1053, please see the Inductance Setting Table on the following page.

Note: All inductance boxes have a residual inductance, meaning that when the dials are set to zero a small inductance remains. If you are making precision measurements or recalibrating the instrument, this residual value must be subtracted from all measurements.

Typical values of residual inductance are shown in the specifications.
For precise values relating to your specific unit, refer to calibration certificate (if ordered).

3.4 Inductance Setting Table

The below table shows the settings of each inductance decade using the dials.



1 H Decade		100 mH Decade		10 mH Decade		1 mH Decade	
Dial	**H**	**Dial**	**H**	**Dial**	**H**	**Dial**	**H**
0	0 H	0	0 H	0	0 H	0	0 H
1	1 H	1	100 mH	1	10 mH	1	1 mH
2	2 H	2	200 mH	2	20 mH	2	2 mH
3	3 H	3	300 mH	3	30 mH	3	3 mH
4	4 H	4	400 mH	4	40 mH	4	4 mH
5	5 H	5	500 mH	5	50 mH	5	5 mH
6	6 H	6	600 mH	6	60 mH	6	6 mH
7	7 H	7	700 mH	7	70 mH	7	7 mH
8	8 H	8	800 mH	8	80 mH	8	8 mH
9	9 H	9	900 mH	9	90 mH	9	9 mH
10	10 H	10	1 H	10	100 mH	10	10 mH
11	11 H	11	1.1 H	11	110 mH	11	11 mH

4 Warranty and Servicing

Warranty

Time Electronics products carry a one-year manufacturer's warranty as standard.

Time Electronics products are designed and manufactured to the highest standards and specifications to assure the quality and performance required by all sectors of industry. Time Electronics products are fully guaranteed against faulty materials and workmanship.

Should this product be found to be defective, please contact us using the below details. Inform us of the product type, serial number, and details of any fault and/or the service required. Please retain the supplier invoice as proof of purchase.

This warranty does not apply to defects resulting from action of the user such as misuse, operation outside of specification, improper maintenance or repair, or unauthorized modification. Time Electronics' total liability is limited to repair or replacement of the product. Note that if Time Electronics determine that the fault on a returned product has been caused by the user, we will contact the customer before proceeding with any repair.

Product Registration

You can register your product at: www.timeelectronics.com/contact/product-registration. Registering your product will enable us to maintain a record of purchase for your warranty. You can also use the web form to provide feedback about our products and services.

Calibration and Repair Services

Time Electronics offers repair and calibration services for all the products we make and sell. Routine maintenance by the manufacturer ensures optimal performance and condition of the product. Periodic traceable or accredited calibration is available.

Contacting Time Electronics

Online:
Please visit www.timeelectronics.com and select Technical Support from the Contact links. From this page you will be able to send information to the Time Electronics service team who will help and support you.

By phone:
+44 (0) 1732 355993

By email:
mail@timeelectronics.co.uk

Returning Instruments

Prior to returning your product please contact Time Electronics. We will issue a return merchandise authorization (RMA) number that is to accompany the goods returning. Further instructions will also be issued prior to shipment. When returning instruments, please ensure that they have been adequately packed, preferably in the original packing supplied. **Time Electronics Ltd will not accept responsibility for units returned damaged.** Please ensure that all units have details of the service required and all relevant paperwork.

Send the instrument, shipping charges paid to:

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Tonbridge, Kent, TN9 1RA.
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Web Site: www.timeelectronics.com

Disposal of your old equipment



1. When this crossed-out wheeled bin symbol is attached to a product it means the product is covered by the European Directive 2002/96/EC.
2. All electrical and electronic products should be disposed of separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities.
3. The correct disposal of your old appliance will help prevent potential negative consequences for the environment and human health.
4. For more detailed information about disposal of your old appliance, please contact your city office, waste disposal service or return to Time Electronics.