

# L2000

## 4-TERMINAL PROBE

### Instruction Manual

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L2000A980-02 13-09H

**Test Equipment Depot**  
  
 1-800-517-8431  
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#### Warranty

Warranty malfunctions occurring under conditions of normal use in conformity with the Instruction Manual and Product Precautionary Markings will be repaired free of charge. This warranty is valid for a period of one (1) year from the date of purchase. Please contact the distributor from which you purchased the product for further information on warranty provisions.

#### Introduction

Thank you for purchasing the HIOKI Model L2000 4-TERMINAL PROBE. To obtain maximum performance from the device, please read this manual first, and keep it handy for future reference.

### Overview

The L2000 4-TERMINAL PROBE allows lead parts and other measurement objects to be connected by cable and then measured. Various shaped parts can be measured with the four terminals.

### Inspection and Maintenance

When you receive the device, inspect it carefully to ensure that no damage occurred during shipping. If damage is evident, or if it fails to operate according to the specifications, contact your dealer or Hioki representative.

#### Preliminary Checks

- Before using the device for the first time, verify that it operates normally to ensure that no damage occurred during storage or shipping. If you find any damage, contact your dealer or Hioki representative.
- Before using the device, make sure that the insulation on the probes is undamaged and that no bare conductors are improperly exposed. Using the device in such conditions could cause an electric shock, so contact your dealer or Hioki representative for repair.

#### Maintenance and Service

- To clean the device, wipe it gently with a soft cloth moistened with water or mild detergent. Never use solvents such as benzene, alcohol, acetone, ether, ketones, thinners or gasoline, as they can deform and discolor the case.
- If the device seems to be malfunctioning, contact your dealer or Hioki representative. Pack the device so that it will not sustain damage during shipping, and include a description of existing damage. We do not take any responsibility for damage incurred during shipping.

### Safety Information

This manual contains information and warnings essential for safe operation of the device and for maintaining it in safe operating condition. Before using it, be sure to carefully read the following safety precautions.

#### **DANGER**

**This device is designed to comply with IEC 61010 Safety Standards, and has been thoroughly tested for safety prior to shipment. However, mishandling during use could result in injury or death, as well as damage to the device. However, using the device in a way not described in this manual may negate the provided safety features. Be certain that you understand the instructions and precautions in the manual before use. We disclaim any responsibility for accidents or injuries not resulting directly from device defects.**

#### Safety Symbols

	In the manual, the  symbol indicates particularly important information that the user should read before using the device. The  symbol printed on the device indicates that the user should refer to a corresponding topic in the manual (marked with the  symbol) before using the relevant function.
	Indicates DC (Direct Current).

The following symbols in this manual indicate the relative importance of cautions and warnings.

	<b>DANGER</b> Indicates that incorrect operation presents an extreme hazard that could result in serious injury or death to the user.
	<b>WARNING</b> Indicates that incorrect operation presents a significant hazard that could result in serious injury or death to the user.
	<b>CAUTION</b> Indicates that incorrect operation presents a possibility of injury to the user or damage to the device.
	<b>NOTE</b> Indicates advisory items related to performance or correct operation of the device.

### Specifications

Measurable frequency range	DC to 5 MHz (depending on the frequency of the instrument to be connected.)
Maximum rated voltage	±42 V <sub>peak</sub> (AC+DC)
Maximum rated current	±1 A <sub>peak</sub> (AC+DC)
Measurable terminal diameter	5 mm (0.20") or less
Overall length	Approx. 1,000 mm (39.37") (excluding connection terminals)
Mass	Approx. 260 g (9.2 o.z)
Cable used	50 Ω coaxial cable
Structure	4-terminal structure
Terminal processing	Gold-plated
Operating temperature and humidity	0°C to 40°C (32 to 104°F), 80%RH or less (non-condensating)
Storage temperature and humidity	-10°C to 50°C (14 to 122°F), 80%RH or less (non-condensating)
Operating environment	Indoors, Pollution degree 2, altitude up to 2000 m (6562-ft.)
Applicable Standards (Safety)	EN61010

### Operating Precautions

Follow these precautions to ensure safe operation and to obtain the full benefits of the various functions.

#### Instrument Installation

	Exposed to direct sunlight		In the presence of corrosive or explosive gases
	Exposed to high temperature		Exposed to strong electromagnetic fields Near electromagnetic radiators
	Exposed to water, oil, chemicals, solvents, or other substances		Exposed to high humidity or condensation
	Exposed to high levels of particulate dust		Subject to vibration

#### **DANGER**

**To avoid electric shock, do not remove the device's case. The internal components of the device carry high voltages and may become very hot during operation.**

#### **WARNING**

**Do not attempt to modify, disassemble or repair the device; as fire, electric shock and injury could result.**

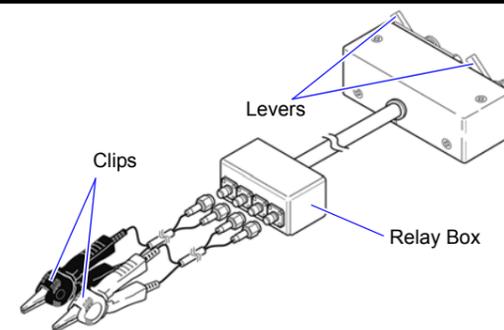
#### **CAUTION**

- Do not slant the device or place it on top of an uneven surface. Dropping or knocking down the device can cause injury or damage to the device.
- To avoid damage to the device, protect it from physical shock when transporting and handling. Be especially careful to avoid physical shock from dropping.
- Keep the cables well away from heat sources, as bare conductors could be exposed if the insulation melts.

#### NOTE

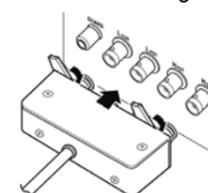
For details on a device to be connected, refer to the instruction manual of the device to be connected.

### Names of Parts



### Connection

With the surface on which the model name is printed facing up, connect the test fixture directly to the measurement terminals (UNKNOWN terminals) of the device to be connected, and then secure the test fixture in position with the levers on the left and right.

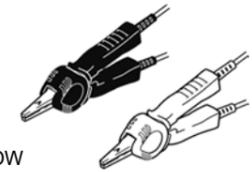


### Open and Short Compensation

Perform open and short compensation to increase the measurement accuracy.

#### Open compensation procedure

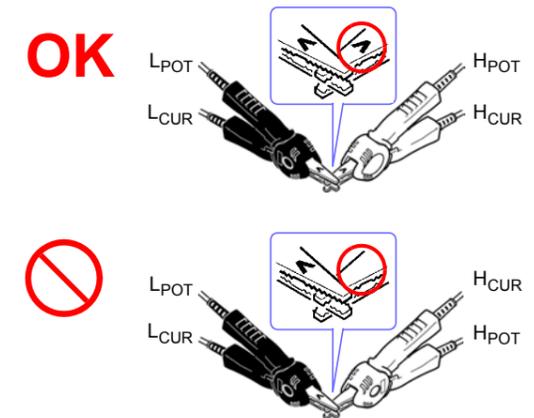
Create an open state between HIGH and LOW, and then perform open compensation.



Allow the same space between HIGH and LOW as for a test sample.

#### Short compensation procedure

Short-circuit the terminals with the V marks on the clips aligned as shown in the diagram, and then perform short compensation.



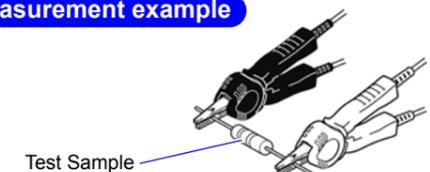
#### NOTE

For the detailed operating procedure, refer to the instruction manual of the device to be connected.

### Measurement Procedure

Clamp the clips at the tips of the probes onto the test sample and then perform measurement.

#### Measurement example



#### NOTE

- Note that dirt on the contact surfaces of the electrodes and test sample may result in a poor contact and the inability to perform measurement accurately.
- Open compensation and measurement of high impedance elements are susceptible to the influence of externally induced noise and stray capacitance, so we recommend using guarding; for example, connecting a metal plate to the GUARD terminal and carrying out the compensation or measurement on the metal plate. (For details on guarding, refer to the instruction manual of the connected device.)
- The probe tips are connected to the relay box by SMA connectors, so correct measurement may not be possible if the SMA connectors are not securely connected or if the wiring is incorrect.

