PP007-WR-1 ☐
PP007-WR-2 ☐
PP007-WS-1 ☐
PP007-WS-2… ☐

Instruction Manual
LeCroy PP007-WR / PP007-WS Passive Probe

Revision D – July 2004

Warranty

LeCroy warrants this oscilloscope accessory for normal use and operation within specification for a period of one year from the date of shipment. Spare parts, replacement parts and repairs are warranted for 90 days.

In exercising its warranty, LeCroy, at its option, will either repair or replace any assembly returned within the warranty period to the Customer Service Department of an authorized service center. However, this will be done only if the product is determined by LeCroy's examination to be defective do to workmanship or materials, and the defect is not caused by misuse, neglect, accident, abnormal conditions of operation, or damaged resulting from attempted repair or modifications by a non-authorized service facility.

The customer will be responsible for the transportation and insurance charges for the return of products to the service facility. LeCroy will return all products under warranty with transportation charges prepaid.

This warranty replaces all other warranties, expressed or implied, including but not limited to any implied warranty of merchantability, fitness or adequacy for any particular purposes or use. LeCroy shall not be liable for any special, incidental, or consequential damages, whether in contract or otherwise.

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PK007-OM-E Rev D 07/04

CE

Safety Information

This symbol appears on the product: 

This refers you to additional information contained in this manual. The corresponding information in the manual is similarly denoted.

To avoid personal injury and to prevent fire or damage to the probe or any products connected to it, review and comply with the following safety precautions.

Connect to properly grounded instruments. This probe is to be only used with test instruments with input connectors which the BNC shield (ring) is connected to earth ground.

Connect the probe properly:

Connect the probe to the measurement instrument before connecting probe input to test circuit. Do not disconnect probe from test instrument while the input is connected to test circuit.

Do not connect the probe ground terminal to any point in the test circuit which is at a potential other than earth ground.

Do not apply any potential to the input which exceeds the maximum ratings of the probe.

Comply with the voltage derating curve. When measuring high frequency signals, be sure to comply with the voltage versus frequency derating curve found on page 8.

Do not use in wet or explosive atmospheres.

For indoor use only. This probe is intended for indoor use and should be operated in a clean, dry, environment.

Do not use the probe if any part is damaged. All maintenance should be referred to qualified service personnel.

Avoid physical injury. The probe tip is extremely sharp. Use care when handling to prevent injury, including accidental skin puncture.

Use of the probe and or the test instrument it is connected to in a manner not specified by the manufacturer may impair the protection mechanisms.

Introduction

The PP007-xx is a miniature high impedance passive probe. Its high input resistance and low capacitance make it ideal from general purpose probing of signals with frequency content from DC through several hundred MHz. The PP007 has a large selection of connection accessories, both supplied standard with the probe and available from LeCroy as optional accessories.

The PP007-xx is available in two models, differing only in the design of the compensation network.

- The PP007-WR is designed for use with LeCroy WaveRunner 6000 series oscilloscopes.
- The PP007-WS is designed for use with LeCroy WaveSurfer 400 series oscilloscopes.

All of the standard and optional accessories are interchangeable between all models

Specifications

Electrical Characteristics

Attenuation	÷10 ±1%
Input Resistance	10 MΩ ±1%
Input Capacitance	9.5 pF
Input Impedance	(see plot on page 5.)
Compensation Range	10 – 20 pF
Bandwidth	500 MHz (-3 dB)

Electrical Ratings

Maximum Input Voltage	Measurement category I: 400 V rms, 1250 V transient overvoltage (see voltage derating curve on page 5) Measurement category II: 300 V rms CAT II
Pollution Degree	2

Measurement category I is for measurement performed on circuits not directly connected to a mains supply.

Measurement category II (CAT II) is for measurement performed on circuits directly connected to a low voltage installation. This refers to local distribution level, applicable to equipment connected to the mains (AC power source) through a power cable.

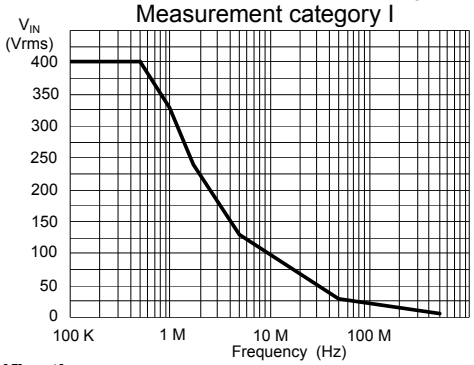
Pollution Degree 2 refers to an operating environment where normally only dry non-conductive pollution occurs. Occasionally a temporary conductivity caused by condensation must be expected.

Specifications (continued)

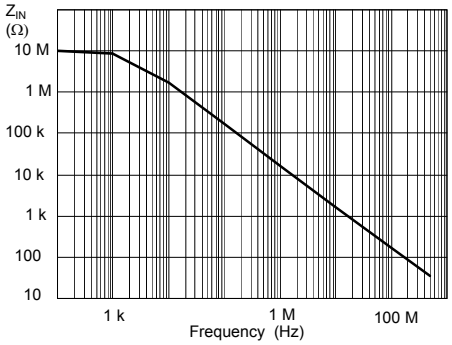
General Characteristics

Operating Temperature	0^{o} to $+50^{o}$ C
Storage Temperature	-40^{o} to $+71^{o}$ C
Altitude, Operating	up to 2000 m (6560 ft)
Cable Length	1.3 m
Weight (probe only)	42 g

Max. V_{IN} versus Frequency,
Measurement category I



Typical Input Impedance



Certifications

This probe is designed to conform to 73/23/EEC + amendment 93/68/EEC Low Voltage Directive (LVD) per the following standards:

CEI/IEC 61010-031:2002-01 Safety requirements for electrical equipment for measurement control and laboratory use:
Part 031: Safety requirements for hand-held probe assemblies for electrical measurement and test.

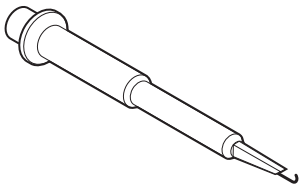
Connectivity Accessories

LeCroy provides over 30 individual accessories for the PP007-xx probe, which enable reliable connections to any physical requirement. In addition to those provided with the standard probe, several optional varieties are available either individually, or grouped in sets related to specific application needs.

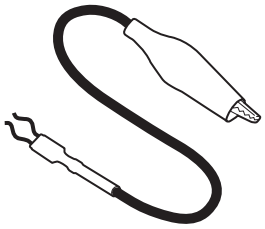
The PK007 series of connectivity accessories are compatible with any LeCroy 2.5 mm PP0x7 series probe.

Accessories are shown with the LeCroy part number followed by the description.

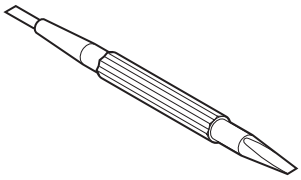
Standard Accessories



1
PK007-001
Sprung Hook



2
PK007-002
Standard Ground Lead



3
PK007-003
Adjustment Tool

4 5
PK007-004 Rigid Tip, 0.5 mm
PK007-005 Spring Tip, 0.5 mm

6
PK007-007
Insulating Cap

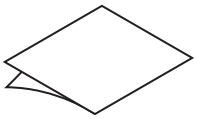
7, 8, 9, 10, 11
PK007-008 IC Cap, 0.5 mm pitch, (green)
PK007-008 IC Cap, 0.65 mm pitch, (blue)
PK007-010 IC Cap, 0.8 mm pitch, (gray)
PK007-011 IC Cap, 1.0 mm pitch, (brown)
PK007-012 IC Cap, 1.27 mm pitch, (black)

Standard Accessories (continued)

12
PK007-006
Color Coding Rings (set)

13
PL007-013
Ground Blade

14
PK007-016
Ground Spring



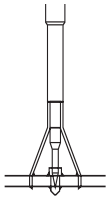
15
PK007-014
Copper Pad

16
PK007-015
PCB Adapter

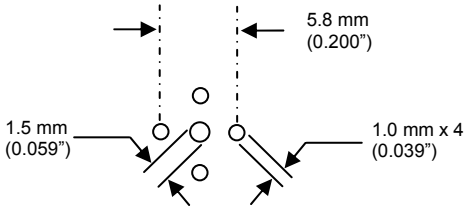
(Not shown)
PP007-OM-E
Instruction Manual

Use of PCB Adapter

The PCB adapter (LeCroy P/N PK007-015) is intended to be designed into and permanently installed in circuit boards to provide a reliable, high frequency test point which eliminates the need to hand hold the probe.



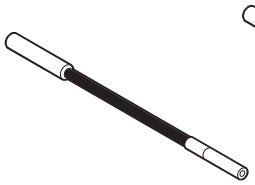
Probe connected using PCB Adapter



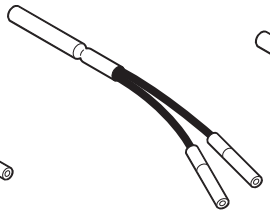
PC Board hole size and pattern

Optional Accessories

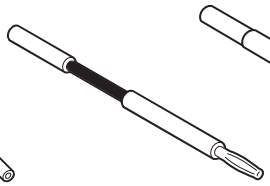
Input Adapters and Clips



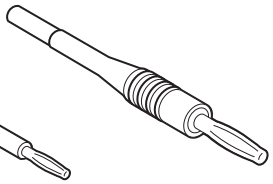
17
PK007-017
Single Lead Adapter



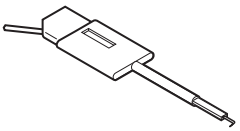
18
PK007-018
Dual Lead Adapter



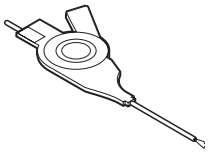
19
PK007-022
Adapter, 2 mm plug



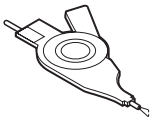
20
PK007-023
Adapter, 4 mm plug



21
PK007-019
Pico Hook



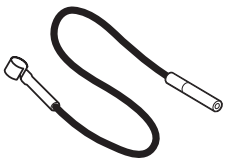
22
PK007-020
Micro Clip, Long



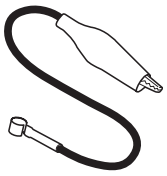
23
PK007-021
Micro Clip, Short

24
PK007-031
BNC Adapter
(For low voltage use only ≤42 V pk AC + DC)

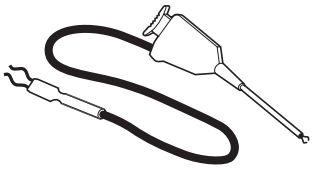
Ground Leads



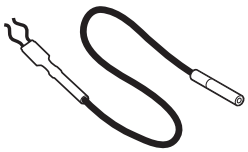
25
PK007-024
Probe Tip Ground Lead w 0.8 mm Socket



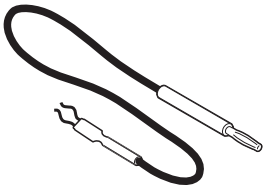
26
PK007-025
Probe Tip Ground Lead with Alligator Clip



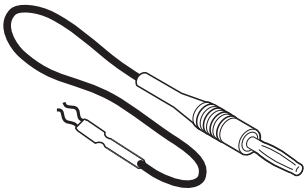
28
PK007-026
Ground Llead with mini clip



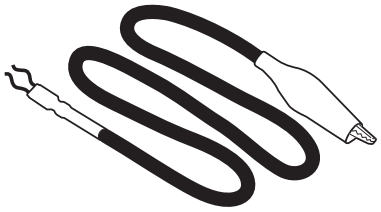
29
PK007-027
Ground Lead with 8 mm socket



30
PK007-028
Ground Lead with 2 mm plug



31
PK007-029
Ground lead with 4 mm plug



32*
PK007-030
High Frequency Compensated Ground Lead

*The PK007-030 High Frequency compenated ground lead allows operation with long ground lead wiith minimum signal distortion.

Probe Connectivity Kits

The following kits containing an assortment of probe connection accessories can be ordered directly from LeCroy. Refer to the illustrations on pages 6-9 for identification.

PK701 Basic Adapter Kit replaces the common standard accessories, with 2 each of designators 1, 2, 4, 5 and 14; plus one adjustment tool (designator 3).

PK702 Advanced Adapter Kit contains a large assortment of accessories: 1 each of the designators 1, 2, 3, 5, 7, 8, 9, 10, 11, 13, 14, 15, 18, 21, 25, 29, 32; 2 each of designators 4, 12, 22, 23, 24; and 5 each PCB adapter 16.

PK703 SMD Adapter Kit contains an assortment useful for attaching to surface mounted ICs and components: 1 each of designators 14, 17, 18, 22, 23, 25, 28, 29, 32; and 2 each of designators 5, 6, 7, 8, 9, 10, 11, 13, 15.

PK704 Micro Clip Kit adapts the probe for use with 0.5 mm IC lead clips. It contains 1 each of designators 16, 17, 18; and two of each micro clip, designators 22 and 23.

Use and Maintenance

This probe is a high quality, precision instrument. To maintain accuracy and signal fidelity, mechanical shock should be avoided, as well as damage to the cable through excessive bending.

To achieve the small 2.5 mm tip size, the input tip diameter is narrower than those in larger probes. Avoid placing excessive force sideways on the tip.

Should the tip become damaged, it may be replaced by the user using the procedure listed on the last page.

Other maintenance and component replacement should be referred to qualified personnel.

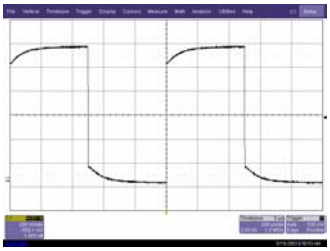
Cleaning

The outside of the probe should cleaned with a soft cloth dampened with either deionized / distilled water or isopropyl alcohol. Allow the surface to dry completely before returning the probe to service. Never immerse the probe in any liquid.

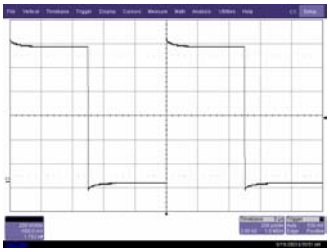
Probe Compensation

Proper compensation of the probe is required to assure good amplitude accuracy in the dynamic portions of the waveform being measured. LF compensation matches the probe to differences in oscilloscope input capacitance. The LF compensation should always be checked and adjusted as needed when first connecting a passive probe to the oscilloscope input. HF compensation matches time constants within the probe to compensate for normal component tolerances. It is typically not necessary to adjust HF compensation unless the probe is being used with an oscilloscope with large differences in input characteristics than the oscilloscope model it was designed for.

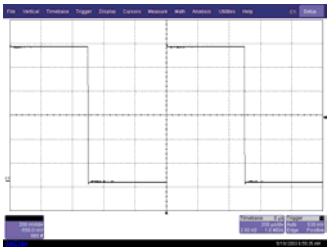
LF compensation is performed by connecting the input of the probe to a low frequency square wave, such as the oscilloscope calibrator signal set to 1 kHz. The compensation is adjusted by rotating the adjustment accessible through the small hole in the center of the housing near the BNC connector. Use the tool supplied with the probe for this adjustment.



Undershoot



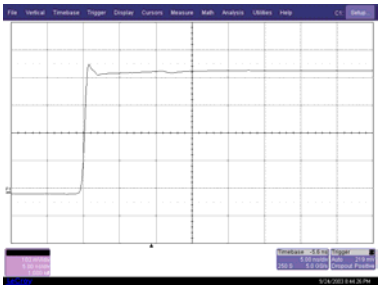
Overshoot



Correct adjustment

Should HF compensation be required, access the adjustments by sliding the black plastic cover off the compensation housing near the BNC connector. A pulse generator with low overshoot and a 300 ps risetime is the required signal source, along with a set of attenuators. The probe must be connected to a terminated probe tip to BNC adapter.

Some overshoot and ring will be present at some settings of V/Div. Adjust both trimmers for the overall best response on all ranges.

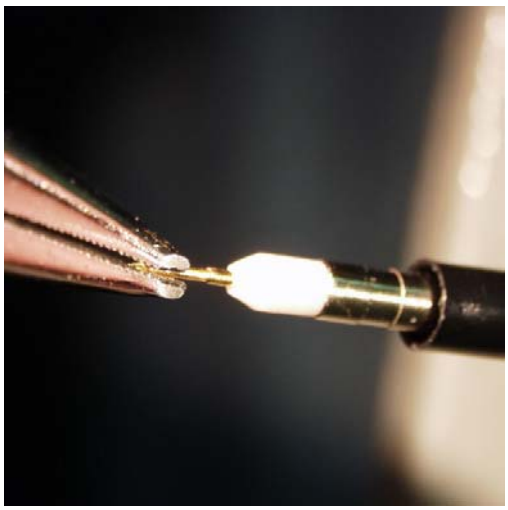


Typical optimum HF adjustment

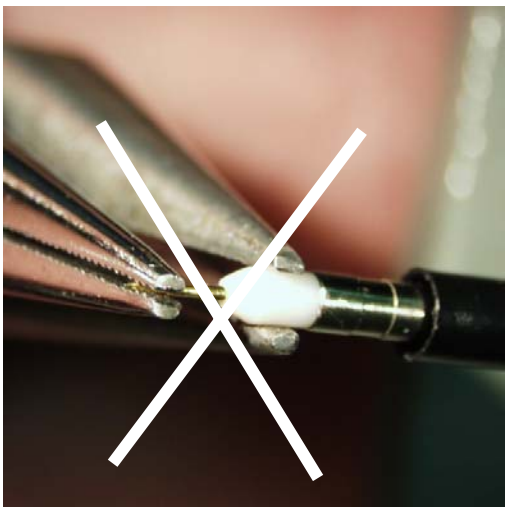
Tip Selection and Exchange

The PP007-xx probe is supplied with two tip styles. The spring tip, which is installed when the probe is shipped, combines a sharp point with on-axis compliance. This provides reliable connection under a wide range of physical interconnect situtations. A rigid tip is also supplied. While lacking the on-axis compliance feature of the spring tip, the rigid tip has a larger diameter and is more robust when exposed to physical stress at the tip. The user should select the proper tip for their application needs.

To change the or replace it when damaged, carefully grip the outer most portion of tip and pull straight out, along the axis of the probe, using needle nose pliers. Do not attempt to grip the plastic insulator with pliers when removing the tip, as this will squeeze the tip, which will make it difficult or impossible to remove. Do not grip the outer gold plated tube which the tip slides into. With the tip removed, align the replacement tip with the hole and begin the insertion with the pliers. The tip may be fully seated by placing the probe against a hard surface and gently applying pressure.



To remove tip, grip the spring-loaded portion of the tip, beyond the outer sleeve, and pull straight out.



Do not apply pliers to the plastic insulator.