



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

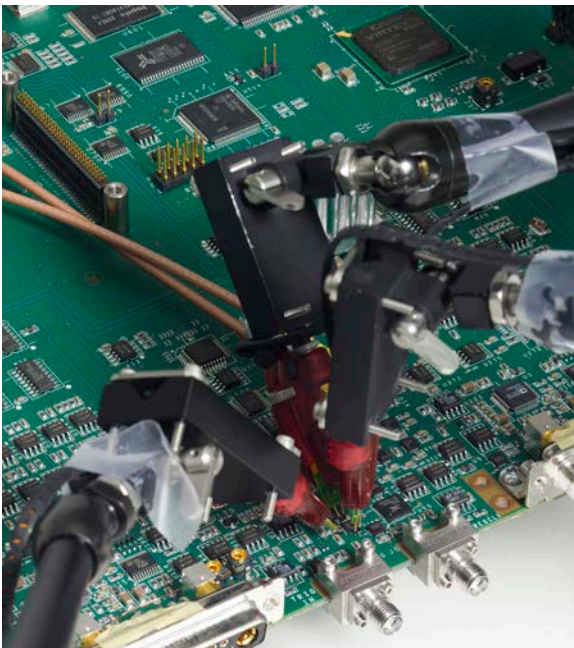
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





Operator's Manual

WaveLink Series Differential Probe (13-25 GHz)





TELEDYNE LECROY
Everywhereyoulook™

700 Chestnut Ridge Road
Chestnut Ridge, NY, 10977-6499
Tel: (845) 425-2000, Fax: (845) 578 5985
teledynelecroy.com

WaveLink Series Differential Probe (13-25 GHz) Operator's Manual

© 2014 Teledyne LeCroy. All rights reserved.

Unauthorized duplication of Teledyne LeCroy documentation materials other than for internal sales and distribution purposes is strictly prohibited. However, clients are encouraged to distribute and duplicate Teledyne LeCroy documentation for their own internal educational purposes.

Teledyne LeCroy and other product or brand names are trademarks or requested trademarks of their respective holders. Information in this publication supersedes all earlier versions. Specifications are subject to change without notice.

WARRANTY

Teledyne 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, Teledyne LeCroy, at its option, will either repair or replace any assembly returned within its warranty period to the Customer Service Department or an authorized service center. However, this will be done only if the product is determined by Teledyne LeCroy's examination to be defective due to workmanship or materials, and the defect is not caused by misuse, neglect, accident, abnormal conditions of operation, or damage 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. Teledyne 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. Teledyne LeCroy shall not be liable for any special, incidental, or consequential damages, whether in contract or otherwise.

WL-HBW-A-OM-E Rev C
921475-00 Rev B

TABLE OF CONTENTS

Introduction	1
Modular Advantage	2
Modular Probe Components	4
Platform/Cable Assembly	4
Differential Amplifier Small Tip Modules	7
Solder-in Interconnect Leads	10
Positioner Tip (Browser).....	11
Complete Probe System (PS).....	12
Probe Operation	14
Overview	14
System Calibration	14
De-Embedding Probes.....	15
Handling the Probe	16
Connecting the Platform/Cable Assembly, Amplifier Module, and Interconnect Lead...	16
Connecting the Probe to a Teledyne LeCroy Oscilloscope.....	18
Operation with a Teledyne LeCroy Oscilloscope.....	19
Connecting the Probe to the Test Circuit.....	22
Positioning of the Input Leads.....	27
AutoColor ID and Power Control Indicators.....	28
AutoZero.....	29
Accessory Use	29
Positioning Tools	29
Probe Deskew Fixtures.....	38
Care and Maintenance	39
Cleaning.....	39
Replacing Damping Resistors on the Solder-in Interconnect Lead	39
Correctly Replacing Carbon Composite Resistive Pogo-Pin Tips in Dxx05-PT.....	42
Service Strategy.....	46

WaveLink Series Differential Probe (13-25 GHz)

Returning a Product for Calibration or Service.....	46
Returning a Product to a Different Country	48
Consumables and Replacement Parts	48
Service Options	53
Functional Test	54
Functional Test Overview	54
Test Setup	54
Performance Verification	58
Performance Verification Overview	58
Required Test Equipment	59
Preliminary Procedure	61
Verification Procedure	62
DC Frequency Attenuation Accuracy	64
Connecting SI Interconnect Leads to the Fixture.....	66
Quick Functional Check.....	68
Performance Verification Test Record.....	70
Reference Material	72
Specifications	72
Regional Service Centers	72
Safety Instructions	73
Certifications.....	74
Probe Input Impedance and Loading.....	77
Differential Mode and Common Mode	81
Differential Mode Range and Common Mode Range	81
Common Mode Rejection Ratio	83
Offset	84
Dynamic Range	84
Index	85

Introduction

Teledyne LeCroy's WaveLink 13-25 GHz Differential Probes utilize the latest design techniques and components to achieve very high bandwidth, exceptional system (probe with oscilloscope) rise times, low electrical noise, and high impedance over a wide frequency range. This is possible through the use of a high bandwidth traveling wave (distributed) amplifier with high gain and low noise, interconnect lead and tip designs that provide high impedance over a broad range of frequencies, which reduces loading on the device under test, and lead/tip construction that enables a nearly ideal terminating resistor to be located as close to the circuit as possible for superior performance.

The WaveLink Series of High Bandwidth Differential Probes also utilize digital filtering to optimize the system frequency response. The design of the WaveLink probe amplifier is such that there is a very wide bandwidth response that exceeds the oscilloscope bandwidth. At time of initial shipment, each probe undergoes a rigorous calibration and performance verification process that results in a stored response file on-board the probe. When the probe is connected to a Teledyne LeCroy oscilloscope, the probe and oscilloscope responses are optimized to each other to provide a probe + oscilloscope response identical to that of the raw oscilloscope channel. Teledyne LeCroy has provided this capability since the introduction of the first WaveLink probes in 2003. All that is left for the operator is to de-embed the probe loading from the circuit using Teledyne LeCroy's Virtual Probe software option, if desired. Since the Teledyne LeCroy probe impedance is very high across the passband, this may not even be necessary.

Teledyne LeCroy's WaveLink 13-25 GHz Differential Amplifier Small Tip Modules utilize either a Dxx05 or Dxx05-A amplifier. The two amplifier series differ only in the Input Dynamic Range specification – Dxx05 permit a 1.6Vp-p absolute signal swing and Dxx05-A permit a 2.0Vp-p signal swing with specifications guaranteed and 2.4Vp-p max operating window. Otherwise, the operation of the unit is identical, and this Operator's Manual is used for either series. The same tips and leads are compatible with both amplifier series.

To learn more about this probe series, **Contact Teledyne LeCroy for Support.**

NOTE:

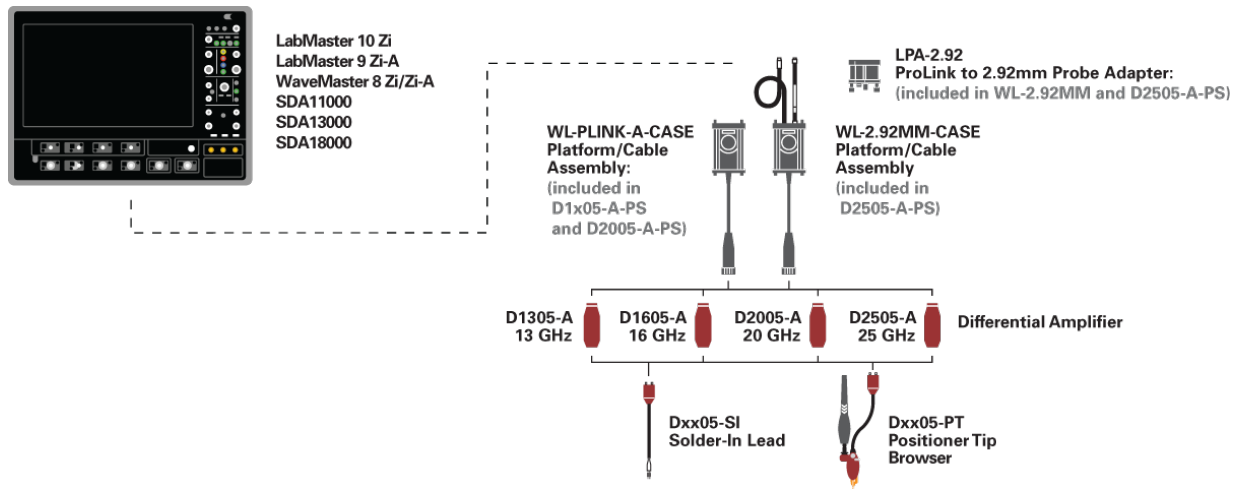
- A Certificate of Calibration is supplied with each probe indicating the system meets the specifications with those components listed in the Certificate.
- Download the latest version of X-Stream software to run your WaveLink probe with maximum performance.

WaveLink Series Differential Probe (13-25 GHz)

Modular Advantage

These probes use a pioneering modular design first introduced by Teledyne LeCroy's initial WaveLink product releases. The modular design consists of a **Platform/Cable Assembly, Differential Amplifier Small Tip Module with Solder-in Leads, or Positioner Tip (Browser)**.

You may order nearly any combination of Platform/Cable Assembly and Amplifier Module (supplied with Interconnect Leads) depending on the oscilloscope you have and your requirements. At time of shipment, Teledyne LeCroy serializes the individual components and calibrates them as a system. To achieve maximum performance and warranted specifications, the components should be used together, as serialized. If additional Interconnect Leads or other components are purchased, you may return the serialized system to Teledyne LeCroy for re-calibration to ensure performance.



WaveLink Dxx05 Probe Family

Standard Accessories	WL-PLINK-A-CASE WL-2.92MM-CASE	Dxx05-A	Dxx05-A-PS	Dxx05-PT-KIT
Amplifier System				
Amplifier	-	1 each	1 each	-
Solder-in Lead Set	-	2 each	2 each	-
Spare Damping Resistors for SI Tip	-	5 each	5 each	-
Tip Retaining Clip for SI Leads	-	2 each	2 each	-
Adhesive Tape	-	1 set	1 set	-
Ground Lead	-	1 each	1 each	-
Ground Clip	-	1 each	1 each	-
Instruction Manual	-	1 each	1 each	-
Accessory Info Sheet & Quick Start Guide	-	1 each	1 each	-
Positioner Tip with Accessories				
Positioner Tip (Browser)	-	-	1 each	1 each
Replacement Pogo Pins for Dxx05-PT	-	-	1 set	1 set
Positioner Tip Probe Guides	-	-	1 each	1 each
XYZ Positioner	-	-	1 each	1 each
Adhesive Tape for XYZ Positioner	-	-	1 set	1 set
Browser Wand for PT Tip	-	-	1 each	1 each
Interlock Pieces for PT Tip	-	-	1 each	1 each
Swivel for PT Tip	-	-	1 each	1 each
Platform/Cable Assembly Kit				
Platform/Cable Assembly	1 each	-	1 each	-
Freehand Probe Holder	1 each	-	1 each	-
Probe Deskew Fixture	1 each	-	1 each	-
Platform/Cable Assembly Mounting Clip	1 each	-	1 each	-
Probe Cable Clamp	2 each	-	2 each	-
ESD Wrist Strap	1 each	-	1 each	-
Performance Verification Certificate	1 each	-	1 each	-
ProLink to 2.92mm Probe Adapter (WL-2.92MM-CASE and D2505-A-PS only)	1 each	-	1 each	-
Deluxe Soft Carrying Case	1 each	-	1 each	-

WaveLink Series Differential Probe (13-25 GHz)

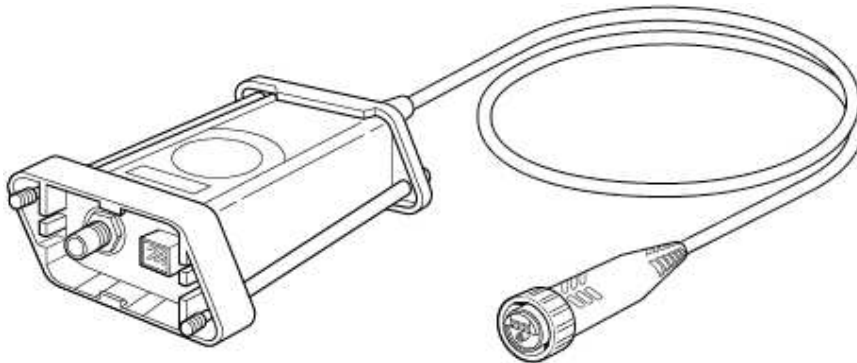
Standard Accessories	WL-PLINK-A-CASE WL-2.92MM-CASE	Dxx05-A	Dxx05-A-PS	Dxx05-PT-KIT
Foam Insert for Carrying Case	1 each	-	1 each	-
Protective Storage Case	1 each	-	1 each	-
Plastic Tray for Storage Case	1 each	-	1 each	-

NOTE: While the amplifiers can be used with either platform/cable assembly, system bandwidth is limited to the lowest bandwidth component. System calibration is required for all interconnected components to guarantee system performance. Typically, a customer purchases a single Platform/Cable Assembly that matches the Amplifier Module bandwidth rating.

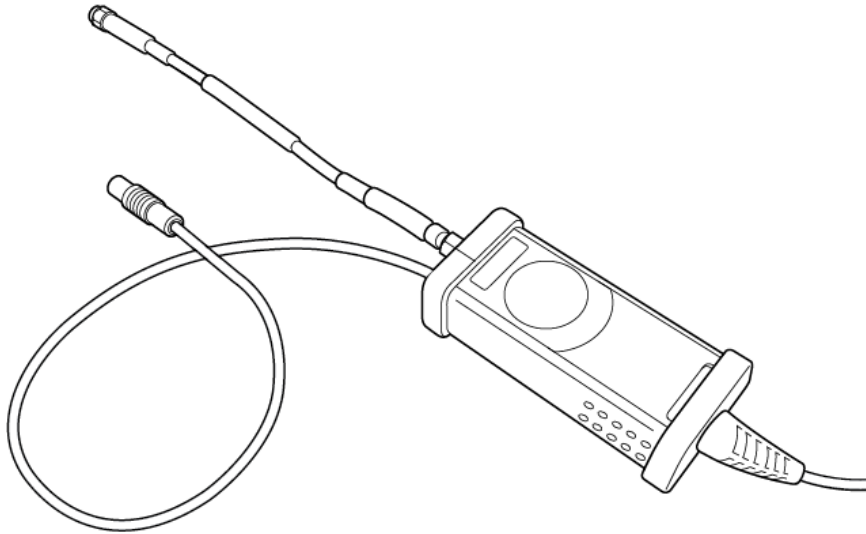
Modular Probe Components

Platform/ Cable Assembly

This piece forms the foundation of the probe and provides an attachment for the probe amplifier to the oscilloscope. There are two different platform/cable assemblies available depending on whether you are connecting to ProLink inputs currently used on ≥ 4 GHz Teledyne LeCroy WaveMaster 8 Zi/Zi-A models, or to 2.92mm inputs used for 25-36 GHz signals on Teledyne LeCroy WaveMaster 8 Zi-A, LabMaster 9 Zi-A, and LabMaster 10 Zi models.



Platform/cable assembly provided with WL-PLINK-A-CASE



Platform/cable assembly provided with WL-2.92MM-CASE

The Platform/Cable Assembly performs the following important functions:

- It provides power to the probe amplifier from the oscilloscope.
- It communicates to the oscilloscope the identifying characteristics of the amplifier that is connected to the probe so that the oscilloscope channel can be set to the correct probe attenuation value automatically. Software prompts you to specify the type of tip connected to the amplifier when this occurs.
- It transmits the amplifier output signal along a well-defined low loss transmission line into the oscilloscope input, and terminates the probe appropriately at that point.

NOTE: Legacy WL-PLINK platform/cable assemblies are not compatible with the D1x05-A or D2x05-A 13+ GHz amplifier modules. Only the WL-PLINK-A or WL-2.92MM are compatible.

LPA-2.92 mm to ProLink Probe Adapter

This adapter provides a simple and effective method to convert a Teledyne LeCroy ProLink interface to a Teledyne LeCroy 2.92mm interface.



Teledyne LeCroy's 2.92mm interface utilizes a 2.92mm connector for the signal, and a LEMO connection for probe power and communication. This interface is used for >20 GHz and ≤36 GHz inputs on Teledyne LeCroy oscilloscopes.

Teledyne LeCroy's ProLink interface utilizes a blind-mate adapter (BMA) connector for the signal and 6-pin connection for probe power and communication.

In order to better leverage the complete probe system amongst all possible input types, the LPA-2.92 may be used to adapt a WL-2.92MM platform/cable assembly to a ProLink connection - saving you from having to purchase of an additional type of Platform/Cable Assembly. This adapter is included standard with the WL-2.92MM-CASE.

Differential Amplifier Small Tip Modules

This module contains the active amplifier circuitry and performs the important task of amplifying the low-level signal at the probe tip for transmission to the oscilloscope via the Platform/Cable Assembly.

For this 13-25 GHz probe series, Teledyne LeCroy utilizes advanced differential distributed (traveling wave) amplifier architecture to achieve superior high frequency broadband performance. A distributed amplifier uses a transmission line to provide inputs to a series of amplification stages. Another parallel transmission line is used to sum the outputs of each amplification stage. The two transmission lines are designed with specific delay and impedance characteristics to ensure that the amplification stages are summed correctly. Since the amplifier gain stages add rather than multiply (as in a typical cascade design), it is possible to achieve high gain over a wide frequency range with very low inherent noise. This provides the added benefit of a lower probe attenuation, which enables the oscilloscope to be operating in an input range which itself requires lower gain, and hence will typically have lower noise. In addition, higher bandwidths can typically be achieved with this amplifier architecture. Since a pure distributed amplifier provides insufficient low frequency response, an additional amplifier is integrated into the assembly for this purpose.

WaveLink Series Differential Probe (13-25 GHz)

This amplifier architecture provides the following:

- Very low probe only noise (≤ 18 nV/ $\sqrt{\text{Hz}}$). Much less than other, comparable bandwidth probes.
- Excellent system (probe and oscilloscope) rise times. In fact, the probe, when connected to WaveMaster 8 Zi-A, LabMaster 9 Zi-A, or LabMaster 10 Zi oscilloscopes of the same bandwidth, causes no reduction in bandwidth or rise time compared to the oscilloscope with a cable input.



Differential Amplifier Small Tip Module

The amplifier module is sold with a set of solder-in interconnect leads. See **Solder-in Interconnect Lead** (on page 10).

Amplifier Modules (includes solder-in interconnect leads)	Product Code
<p>13 GHz WaveLink</p> <p>13GHz, 2.0Vp-p, $\pm 2.5V$ Offset Range, and $\pm 4V$ Common Mode Range Amplifier Module with Dxx05-SI Solder-in Lead (Qty. 2). Also Includes: Replacement Resistors (Qty. 10), Tip Retaining Clips (Qty. 2), and Protective Storage Case.</p> <p>Must be ordered with a WL-PLINK-A-CASE Platform/Cable Assembly to achieve warranted calibration. If desired, this Amplifier Module may also be used with a WL-2.92MM-CASE Platform/Cable Assembly with a 13 GHz bandwidth limitation. All amplifier modules and platform/cable assemblies must be calibrated as a system at time of shipment.</p>	D1305-A
<p>16 GHz WaveLink</p> <p>16 GHz, 2.0Vp-p, $\pm 2.5V$ Offset Range, and $\pm 4V$ Common Mode Range Amplifier Module with Dxx05-SI Solder-in Lead (Qty. 2). Also Includes: Replacement Resistors (Qty. 10), Tip Retaining Clips (Qty. 2), and Protective Storage Case.</p> <p>Must be ordered with a WL-PLINK-A-CASE Platform/Cable Assembly to achieve warranted calibration. If desired, this Amplifier Module may also be ordered with a WL-2.92MM-CASE Platform/Cable Assembly with a 16 GHz bandwidth limitation. All amplifier modules and platform/cable assemblies must be calibrated as a system at time of shipment.</p>	D1605-A
<p>20 GHz WaveLink</p> <p>20GHz, 2.0 Vp-p, $\pm 2.5V$ Offset Range, and $\pm 4V$ Common Mode Range Amplifier Module with Dxx05-SI Solder-in Lead (Qty. 2). Also Includes: Replacement Resistors (Qty. 10), Tip Retaining Clips (Qty. 2), and Protective Storage Case.</p> <p>Must be ordered with a WL-PLINK-A-CASE Platform/Cable Assembly to achieve warranted calibration. If desired, this Amplifier Module may also be ordered with a WL-2.92MM-CASE Platform/Cable Assembly with a 20 GHz bandwidth limitation. All amplifier modules and platform/cable assemblies must be calibrated as a system at time of shipment.</p>	D2005-A
<p>25 GHz WaveLink</p> <p>25GHz, 2.0Vp-p, $\pm 2.5V$ Offset Range, and $\pm 4V$ Common Mode Range Amplifier Module with Dxx05-SI Solder-in Lead (Qty. 2). Also Includes: Replacement Resistors (Qty. 10), Tip Retaining Clips (Qty. 2), and Protective Storage Case.</p> <p>Must be ordered with a WL-2.92MM-CASE 25 GHz Platform/Cable Assembly to achieve warranted calibration.</p> <p>May also be used with a WL-PLINK-A-CASE Platform/Cable Assembly but will achieve lesser bandwidth. All amplifier modules and platform/cable assemblies must be calibrated as a system at time of shipment.</p>	D2505-A

Solder-in Interconnect Leads

The probe lead provides ability to access the signal on the device under test (DUT) without disturbing the operation of the DUT. The solder-in probe lead provides the highest possible performance at the expense of a non-movable installation. The design of the solder-in lead minimizes customer circuit loading with the probe connected by providing high probe AC loading and a wide frequency range where AC circuit loading is minimized.

The solder-in lead supplied with the kit consists of two small, pre-installed and pre-trimmed attenuating (damping) resistors connected to a flexible transmission line terminating in a connector mating with the amplifier. Because resistors and resistor lengths are small, this solder-in lead provides the maximum signal fidelity and minimum circuit loading at the highest frequencies. The resistors are soldered directly into the connection points of the circuit under test, providing a reliable, intermittence-free connection.

Five replacement damping resistors are provided with each solder-in lead. Resistors may be replaced in the field if the tip is damaged. See **Replacing Damping Resistors on the Solder-in Interconnect Lead** (on page 39) for more information.

NOTE:

- At initial product launch, there were two different solder-in leads - a D1x05-SI and a D2005-SI. The D2005-SI was used with the 20 GHz and the D1x05-SI was used with 13 and 16 GHz amplifiers.
- Now, these solder-in leads have been replaced with a universal Dxx05-SI used for all bandwidths (13-25 GHz). This lead can also be used as a replacement for the D1x05-SI and D2005-SI.

Teledyne LeCroy's solder-in probe lead uses resistors at the tip that are precisely pre-cut to the correct length. This design provides the following advantages:

- It locates the damping resistance of the probe tip as close to the DUT as possible.
- It eliminates the need for long lengths of wire between the DUT and the damping resistor, which impacts loading and frequency response. The resistors may still be spaced as desired to connect to a wide variety of circuits.
- It eliminates the need to precision cut and solder small lengths of wire to the end of the solder-in lead, and then solder these wires to the DUT.
- The damping resistors are easily replaced in the field to provide maximum serviceability and life of the solder-in probe lead.

Positioner Tip (Browser)

The **Positioner Tip (Browser)** provides the ability to access the signal on the DUT without permanently attaching a lead or other device to the DUT. The positioner tip combines high performance with quick access to a variety of probe points when it's used as a hand-held browser (using the **Wand** attachment) or as a fast and convenient method to re-position a fixed test point (using a positioner tool, like Teledyne LeCroy's **Freehand Positioner**, **XYZ Positioner** or **EZ Probe** . The carbon composite resistive pogo pin tips are adjustable from 0 to 3.5 mm (0 to 0.14") and have 0.55 mm (0.022") of Z-Axis compliance. Because of its thin form factor and spring-loaded tips, it is ideally suited for use with multiple probes in tight areas such as the back side of boards with ball-grid array packaged ICs.

The Positioner Tip supplied with the kit consists of two small, pre-installed carbon-composite resistive pogo-pin tips with crowned metal caps for solid connection to the circuit. The carbon composite resistive tips place the tip resistance as close to the circuit as possible. In addition, the nature of the material and design minimizes skin effect at higher frequencies, a common problem with a single conductive tip. The Positioner Tip provides the maximum signal fidelity and minimum circuit loading at the highest frequencies.

Care should be taken when using the Positioner Tip. While the carbon composite material in the tip is very strong, the high bandwidth nature of the probe means the diameter must be very small. Avoid lateral motion against the circuit trace with the tip, and do not exceed the pogo pin Z-Axis compliance.

NOTE: Some mechanical positioners (such as the EZ Probe) might have the capability to exert excessive Z-Axis compliance during setup, so be extra careful with these types of mechanical positioners.

Two replacement resistive tips are provided with the Positioner Tip. These tips may be replaced in the field if the tip is damaged. See **Correctly Replacing Carbon Composite Resistive Pogo-Pin Tips in Dxx05-PT** (on page 42) for more information.

WaveLink Series Differential Probe (13-25 GHz)



Positioner Tip (Browser) Kit

Positioner Tip (Browser) Kit (includes tip and accessories)	Product Code
WaveLink Dxx05-PT (20 GHz rating) Adjustable Positioner Tip Kit. For use with D1305-A, D1605-A, D2005-A, and D2505-A amplifiers. Includes XYZ Positioner Assembly with Mechanical Interconnects, Adhesive Kit, Connection Guides, Hand-held Wand, and replacement Carbon Composite Pogo-Pin Tips (Qty. 2).	Dxx05-PT-KIT

Complete Probe System (PS)

By design, the WaveLink probes are modular in nature. However, to make selection easy, a complete probe system is available for purchase. These probe systems are all-inclusive and contain the following items:

- Platform/Cable Assembly Kit
- LPA-2.92 to ProLink Adapter (25 GHz kits only)
- Amplifier System (with SI Lead Set)
- Positioner Tip (Browser) Kit

Just choose the appropriate bandwidth (13, 16, 20, or 25 GHz) for the probe system.

NOTE: The 25 GHz probe system Positioner Tip (Browser) is rated to 20 GHz (guaranteed) and 22 GHz (typical).



Complete Probe System (PS)

Standard Accessories	D1x05-A-PS	D2005-A-PS	D2505-A-PS
WL-PLINK-A-CASE Platform/Cable Assembly Kit	1 each	1 each	
WL-2.92MM-CASE Platform/Cable Assembly Kit			1 each
LPA-2.92 to ProLink Adapter			1 each
D1x05-A Amplifier System	1 each		
D2x05-A Amplifier System		1 each	1 each
Dxx05-PT-KIT Positioner Tip (Browser) Kit	1 each	1 each	1 each

Probe Operation

Overview

Teledyne LeCroy WaveLink probes are factory calibrated and performance verified on shipment. During factory calibration and performance verification, each probe amplifier has a response file created and stored on-board. When the probe is connected to your Teledyne LeCroy oscilloscope, the response file is read by your oscilloscope and a combined optimized probe + oscilloscope response is created for your particular oscilloscope and channel to which the probe is connected. The response is identical to that of the oscilloscope channel.

All that is left for the operator is to de-embed the probe loading from the circuit using Teledyne LeCroy's Virtual Probe software option, if desired. Since the Teledyne LeCroy probe impedance is very high across the passband, this may not even be necessary.

NOTE: With your probe set up and system turned on, allow for a 15-minute warm-up of your probe prior to use. A properly warmed-up probe ensures optimal measurements.

System Calibration

By design, the D1305-A, D1605-A, D2005-A, and D2505-A amplifier modules and interconnect leads deliver the specified performance when interchanged on a WL-PLINK-A or WL-2.92MM platform/cable assembly, or when an LPA-2.92-PLINK probe adapter is used.

Each configured probe is shipped with a Certificate of Calibration indicating that the system performance was validated and found to meet or exceed the warranted specifications with those models and accessories listed in the Certificate.

As only this configuration was validated, the certificate is only valid for the configuration indicated. This is why all modular probe components are serialized, calibrated, and tested as a system before being shipped from the Teledyne LeCroy factory, to ensure guaranteed performance.

A serial number is affixed to each module and the operator must ensure serial numbers on all modules match.

NOTE: If you do not verify that serial numbers on the modules match, performance is not guaranteed. If an incorrect, uncalibrated combination of amplifier modules and platform/cable assemblies is connected together, a warning will be displayed on the oscilloscope screen.

The interconnect tips are designed to keep response within a narrow range so they are interchangeable, and interconnect leads manufactured at the same time have nearly identical performance. Likewise, if a damping resistor on the solder-in lead is replaced using the procedure

for **Replacing Damping Resistors on the Solder-in Interconnect Lead** (on page 39), performance is still guaranteed. If an interconnect lead tip is damaged beyond field repair and requires factory replacement, Teledyne LeCroy recommends you return the probe platform/cable assembly and amplifier module to the factory for a complete calibration and test to ensure guaranteed performance. This is because there may be small differences in performance of interconnect leads supplied at different times.

If a positioner tip (PT) is purchased at time of original shipment of the other probe components, this is also calibrated and serialized with the other components. If it is purchased at a later date and you have provided Teledyne LeCroy with the original probe serial number the tip is used with, Teledyne LeCroy calibrates the positioner tip to your existing components and supplies a file on a USB memory stick for installation on your oscilloscope. Follow the instructions provided with the file and memory stick in order to load this file and ensure proper calibrated performance with your existing probe components.

Finally, if the carbon composite resistive pogo-pins need to be changed on your PT tip, see **Correctly Replacing Carbon Composite Resistive Pogo-Pin Tips in Dxx05-PT** (on page 42) for more information.

De-Embedding Probes

Teledyne LeCroy probes are calibrated at the factory using a Vector Network Analyzer (VNA) to measure a system (probe plus test fixture) frequency response. The test fixture is de-embedded from the measurement using Teledyne LeCroy's Eye Doctor tools so the remaining frequency response is due to the combination of the test signal and the probe loading on the test circuit. The system frequency response is then calculated for these remaining circuit elements.

Since the WaveLink probe impedance is high, the effect of probe loading is greatly reduced and the impact on circuit measurement is much lower than when using a probe with lower impedance. However, if you wish to de-embed the effect of probe loading on your circuit, you can also use Teledyne LeCroy's Virtual Probe option. This option allows you to select the probe tip from a list of supported tips. Your selection applies a corresponding s-parameter file that is derived from the equivalent circuit model of the tip.

Handling the Probe

The WaveLink series probe is a precision test instrument. Exercise care when handling and storing the probe. Always handle the probe by the platform/cable assembly. Avoid putting excessive strain on any cable or interconnect lead or exposing the probe cables to sharp bends.



ESD Sensitive: The tips of the probe are sensitive to Electrostatic Discharge (ESD). Avoid causing damage to the probe by always following anti-static procedures (wear wrist strap, etc.) when using or handling the probe.



Solder-in Tips: Prevent damage to the solder-in tips by carefully storing them in the plastic protective storage case when not in use.

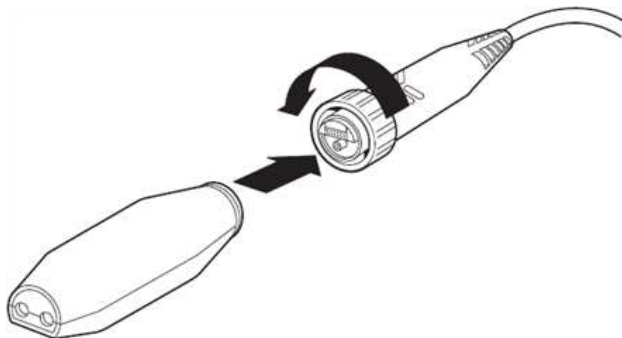
Positioner Tip: The PT tips are very small and are fragile. When not in use, store in the provided case.

Connecting the Platform/ Cable Assembly, Amplifier Module, and Interconnect Lead

Follow these instructions to properly connect the main probe components.

Connecting an Amplifier Module to a Platform/ Cable Assembly

Attach an Amplifier Module to the Platform/Cable Assembly by aligning the connectors of the module with the receptacles in the platform/cable assembly and pressing the two together. Be sure to finger-tighten the assembly by rotating the threaded collar onto the module.



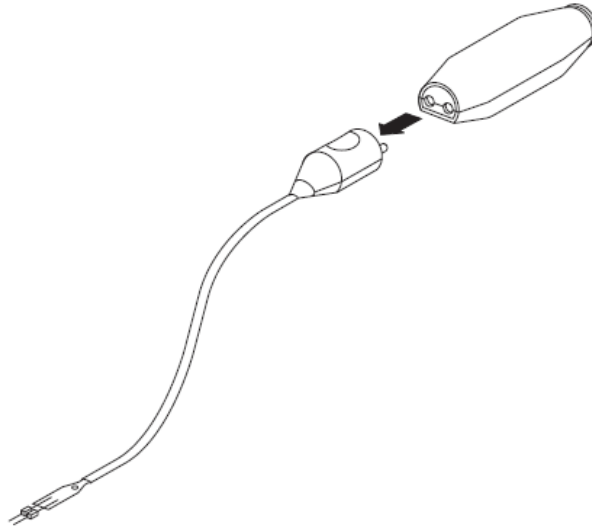
Connecting the Amplifier Module to the Platform/Cable Assembly



Do not use pliers or any other tools to tighten the collar. Remove the Amplifier Module by loosening the threaded collar from the module and pulling the two assemblies apart.

By design, the amplifier module works with the WL-PLINK-A or WL-2.92MM platform/cable assembly and either the Dxx05-SI Lead or Dxx05-PT Tip .

Connecting an Amplifier Module to an Interconnect Lead



Connecting a solder-in interconnect lead to an amplifier module. The positioner tip and other leads connect in the same manner.

Align the flat side of the lead with the flat side of the amplifier module and press together.

NOTE:

- Although interconnect leads for the D1305-A, D1605-A, D2005-A, and D2505-A mechanically mate with any module, they are only compatible with a Dxx05 or Dxx05-A. No damage results; however, performance may be reduced when switching leads between modules, and the response is not calibrated. Be sure to only use leads with serial numbers that match with the differential amplifier module.
- Different colors indicate different bandwidths and/or product classes. Avoid accidental interchanging by matching the color coding of the interconnect lead tip housing with the color of the corresponding amplifier module.

Connecting the Probe to a Teledyne LeCroy Oscilloscope

The WL-PLINK-A platform/cable assembly has been designed for use with the ProLink interface of Teledyne LeCroy's LabMaster 9 Zi-A, WaveMaster 8 Zi/Zi-A, SDA/DDA 8 Zi/Zi-A, WavePro 7 Zi/Zi-A, SDA/DDA 7 Zi/Zi-A, and other models that use the ProLink interface. The WL-2.92MM is for use with the 2.92mm interface of the LabMaster 10 Zi, LabMaster 9 Zi-A, and WaveMaster/SDA/DDA 8 Zi/Zi-A models.

Connecting a WL-PLINK-A to an Oscilloscope

Attach the WL-PLINK-A platform/cable assembly to the ProLink interface by aligning the connector with the input connector and pushing the interface toward the instrument.

A click is heard when the probe interface latches to the test instrument. The probe also uses thumbscrews to secure the interface to the instrument. **Do not overtighten the thumbscrews.**

Remove the platform/cable assembly from the instrument by unscrewing the thumbscrews and moving the interface up and down while pulling gently until a click is heard. This click indicates the platform/cable assembly is detached from the instrument.

Connecting a WL-2.92MM to an Oscilloscope

The WL-2.92MM Platform/Cable Assembly connection consists of a LEMO connector for power and communication and a 2.92mm signal input connector. Make corresponding connections (LEMO, 2.92mm, via included cable) to the corresponding connections on supported oscilloscopes.

Connecting a WL-2.92MM to an Oscilloscope using the LPA-2.92mm to ProLink Adapter

Some Teledyne LeCroy oscilloscopes utilize both ProLink and 2.92 mm inputs. In this case, a single WL-2.92MM Platform/Cable Assembly can be used for all types of high bandwidth inputs. Use the **LPA-2.92mm to ProLink Adapter** to connect the WL-2.92MM to a ProLink communication, power and signal interface.

Operation with a Teledyne LeCroy Oscilloscope

NOTE:

- Download the latest version of X-Stream software to run your WaveLink probe with maximum performance.
- Ensure your Windows updates are current.
- If utilizing the probe with an SDA 9000, 11000, 13000, or 18000 oscilloscope, download and install the most recent version of the Microsoft Core XML Services (MSXML) Service Pack before using your probe. Other supporting service packs may be required for MSXML to work properly.



Vertical dialog with labeled tab corresponding with your attached probe.

When the probe platform/cable assembly is connected to a probe amplifier module, and this assembly is then attached to an X-Stream oscilloscope's input, the oscilloscope recognizes the probe and activates the vertical channel functions in the user interface (shown previous). Refer to your oscilloscope's instruction manual for specific operation.