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# PLA3204

Active Logic Probe

User Guide

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E-mail: [service@rigol.com](mailto:service@rigol.com)

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# 1 Safety Requirement

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## 1.1 General Safety Summary

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Read the following safety precautions to avoid personal injury and to prevent damage to this product or any product connected to this product. To prevent possible hazards, be sure to use this product in accordance with the regulations.

- **Connect or Disconnect the Equipment Properly.**

Connect the probe output terminal to the instrument and connect the ground lead to earth ground before connecting the probe to the circuit under test. Disconnect the probe input terminal and the probe ground lead from the circuit under test before disconnecting the probe from the instrument.

- **Observe All Terminal Ratings.**

To avoid fire or electric shock, please observe all ratings and markings on the product. Before making any connections to the product, consult the User Guide of the product for more details about ratings.

- **Do Not Operate with Suspected Failures.**

If you suspect that there is damage to the product, have it inspected by RIGOL authorized personnel before further operations. Any maintenance, adjustment or replacement especially to circuits or accessories must be performed by RIGOL authorized personnel.

- **Avoid Exposed Circuitry.**

Do not touch exposed circuits and components after the power is connected.

- **Do Not Operate in Wet Conditions.**

For indoor use only. To avoid short circuit inside the instrument or electric shock, never use the product in a humid environment.

- **Do Not Operate in an Explosive Atmosphere.**

To avoid personal injuries or damage to the instrument, never operate the instrument in an explosive atmosphere.

- **Keep Product Surfaces Dry and Clean.**

## 1.2 Safety Notices and Symbols

### Safety Notices in this Manual:



#### **WARNING**

Indicates a potentially hazardous situation or practice which, if not avoided, will result in serious injury or death.



#### **CAUTION**

Indicates a potentially hazardous situation or practice which, if not avoided, could result in damage to the product or loss of important data.

### Safety Notices on the Product:

- **DANGER**

It calls attention to an operation, if not correctly performed, could result in injury or hazard immediately.

- **WARNING**

It calls attention to an operation, if not correctly performed, could result in potential injury or hazard.

- **CAUTION**

It calls attention to an operation, if not correctly performed, could result in damage to the product or other devices connected to the product.

### Safety Symbols on the Product:



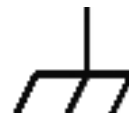
**Hazardous  
Voltage**



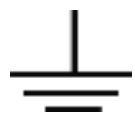
**Safety Warning**



**Protective Earth  
Terminal**



**Chassis Ground**



**Test Ground**

## 1.3 Environmental Considerations

The following symbol indicates that this product complies with the WEEE Directive 2012/19/EU.



The equipment may contain substances that could be harmful to the environment or human health. To avoid the release of such substances into the environment and

avoid harm to human health, we recommend you to recycle this product appropriately to ensure that most materials are reused or recycled properly. Please contact your local authorities for disposal or recycling information.

You can click on the following link <https://int.rigol.com/services/services/declaration> to download the latest version of the RoHS&WEEE certification file.

## 2 Document Overview

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This manual gives you a quick overview of the technical specifications and basic operation methods of the PLA3204 Active Logic Probe.

**TIP**

For the latest version of this manual, download it from RIGOL official website (<http://www.rigol.com>).

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## 3 General Inspection

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### 1. Inspect the packaging

If the packaging has been damaged, do not dispose the damaged packaging or cushioning materials until the shipment has been checked for completeness and has passed both electrical and mechanical tests.

The consigner or carrier shall be liable for the damage to the instrument resulting from shipment. RIGOL would not be responsible for free maintenance/rework or replacement of the instrument.

### 2. Check the probe

In case of any mechanical damage, missing parts, or failure in passing the electrical and mechanical tests, contact your RIGOL sales representative.

### 3. Check the accessories

Please check the accessories according to the packing lists. If the accessories are damaged or incomplete, please contact your RIGOL sales representative.

## 4 Product Overview

As a high-performance 4-channel active logic probe, PLA3204 connects digital signals from the system under test to RIGOL MHO/DHO5000 series digital oscilloscope via its USB Type-C connector, enabling the logic analyzer function.

PLA3204 contains 4 data channels and 8 ground channels. On the label of the probe head, all data channels are marked with numbers for you to identify different channels. In addition, PLA3204 comes standard with 4 signal leads and 2 ground leads for flexible connections to the signal under test and the reference ground.

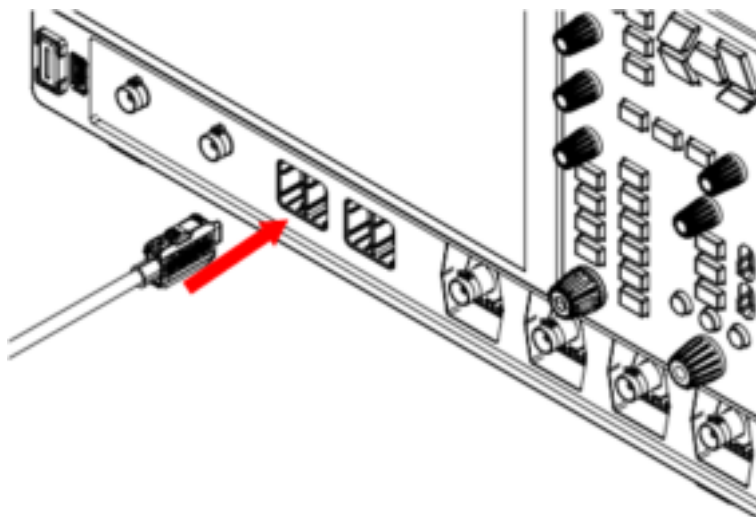


**Figure 4.1 PLA3204 Active Logic Probe**

## 5 To Use the Probe

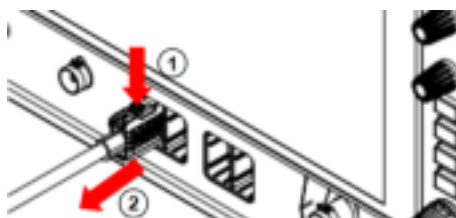
### 1. Connect PLA3204 to the Oscilloscope.

Connect the Type-C connector of the PLA3204 probe to the front-panel digital signal input terminal of the oscilloscope, as shown in the figure below. Each MHO/DHO5000 oscilloscope can connect up to four PLA3204 probes.



#### CAUTION

Before disconnecting the logic probe from the oscilloscope, press the buckle of the connector and then pull out the connector, as shown in the figure below. Pulling or dragging the cable without releasing the buckle may damage the terminator.



#### NOTE

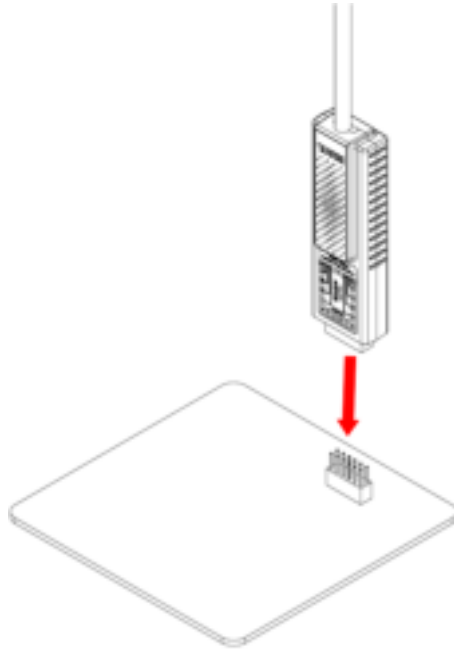
After PLA3204 is connected to the oscilloscope's digital channels, the channel indicator light is on. Group indicator lights I, II, III, and IV indicate that the logic probe is connected to the 1st, 2nd, 3rd, and 4th daughter cards respectively. When connected to MHO/DHO5000, it is displayed as I. Probe indicator lights A, B, C, and D indicate that the logic probe is connected to the 1st, 2nd, 3rd, and 4th digital input channel of the oscilloscope respectively.

### 2. Connect PLA3204 to Signal under Test.

You can connect any number ( $\leq 4$ ) of signals under test to each PLA3204 probe as required. Note that the amplitude of the input signal cannot exceed the maximum working voltage range of the probe. To cater to different applications, the

following three methods are provided to connect the PLA3204 to the signal under test.

- Method 1: connect the PLA3204 to the double row pin header on the DUT, as shown in the figure below.

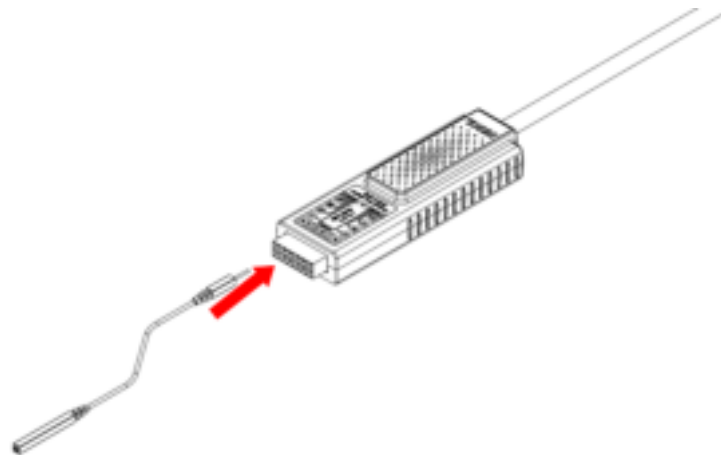


- Method 2: connect the signals under test to the leads separately. You can easily identify the corresponding channel of each signal by the color marker band on each lead.

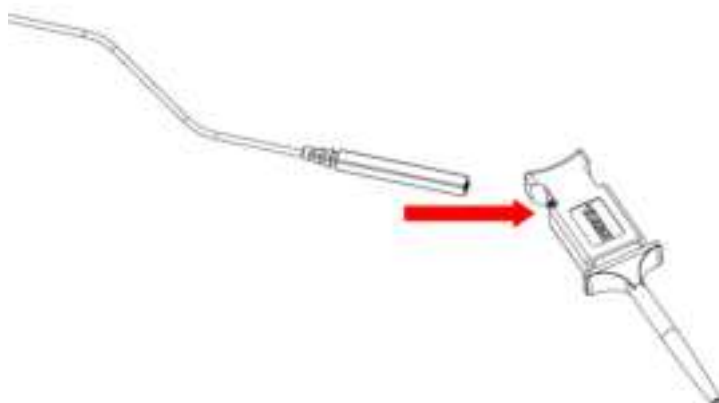


#### TIP


The crosstalk or ground bounce during use may be caused by the fact that the channels share a single ground lead. It is recommended to add a ground lead to the signal lead for each channel and twist them together. The ground lead should be as close as possible to the corresponding signal lead.



- Method 3: on the basis of Method 2, connect a grabber clip to the lead and use the metal hook of the clip to connect the signal under test, as shown in the figure below.



### 3. Set the Probe.

Press the front-panel  key of the oscilloscope to enter the LA setting menu. In this menu, you can set the threshold level, waveform size, and channel label as well as calibrate the probe. For details, refer to your oscilloscope user guide.



#### CAUTION

When the probe is connected to the oscilloscope for the first time or when the changes of the ambient temperature are above 5°C, it is recommended to use the **ProbeCalibration** function in the LA setting menu to perform zero calibration for the probe. Do not connect signals to the PLA3204 input terminals in calibration.

### 4. Function Inspection.

Follow the instructions to connect the PLA3204 probe to the oscilloscope and set the probe. Connect the logic signals to the probe. After finishing the operations above, the signal under test will be displayed on the corresponding digital channel on the oscilloscope screen. If no signal is displayed, adjust the oscilloscope to select proper general settings (e.g. trigger mode and time base). If the problem still persists, please check the electric connection and parameter settings again or use other probes (such as analog probes) to check the signal state of the test point.

## 6 Specifications

Technical specifications are valid when:

- The probe is calibrated at  $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$  ambient temperature
- The probe is powered by normal power supply
- The temperature and humidity of the environment in which the probe is located cannot exceed the limits of the stated environmental requirements.

**Table 6.1 Technical Specifications**

Technical Specifications	PLA3204
No. of Input Channels	4
Threshold Range	$\pm 15\text{ V}$
Threshold Accuracy	$\pm(100\text{ mV} + 3\% \text{ of }  \text{threshold setting} )$
Max. Input Voltage	$\pm 40\text{ V}$ (peak)
Max. Input Dynamic Range	$\pm 10\text{ V} + \text{threshold}$
Min. Voltage Swing	500 mVpp
Min. Detectable Pulse Width	5 ns
Input Impedance	$100\text{ k}\Omega \pm 1\%$
Input Capacitance	About 11 pF
Cable Length	About 120 cm
Lead length	About 25 cm
Operating Environment	$0^{\circ}\text{C}$ to $50^{\circ}\text{C}$ , 0 to 80% RH
Storage Environment	$-20^{\circ}\text{C}$ to $60^{\circ}\text{C}$ , 0 to 90% RH

## 7 Accessories

Accessories	Quantity
Lead	6
Probe Clip	6
Product Warranty Card	1

## 8 Care and Cleaning

### Care

Do not leave the probe and its accessories where it may be exposed to sunlight for long periods of time.



### CAUTION

**Do not expose the probe and its accessories to caustic liquids.**

### Cleaning

Clean the probe and its accessories according to the operating conditions.

1. Disconnect the probe from the oscilloscope or the power source.
2. Wipe the exterior surfaces of the probe and its accessories with a soft cloth dampened with a mild detergent or water solution.



### WARNING

**To avoid short circuits or personal injury caused by moisture, make sure that the probe is completely dry before use.**

## 9 Warranty

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RIGOL TECHNOLOGIES CO., LTD. (hereinafter referred to as RIGOL) warrants that the product mainframe and product accessories will be free from defects in materials and workmanship within the warranty period. If a product proves defective within the warranty period, RIGOL guarantees free replacement or repair for the defective product.

To get repair service, please contact your nearest RIGOL sales or service office.

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