

# RIGOL

## 用户手册 User's Guide



## PLA2216 有源逻辑探头 PLA2216 Active Logic Probe

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## 一般安全概要

- ✚ 正确的连接与断开探头。
- ✚ 遵循所有终端额定值。
- ✚ 电源接通后，请勿接触外露的线路和元件。
- ✚ 怀疑产品出故障时，请勿进行操作。
- ✚ 切勿开盖操作。
- ✚ 请勿在易燃易爆的环境下操作。
- ✚ 请勿在潮湿的环境下操作。
- ✚ 请保持产品表面干燥。
- ✚ 请注意搬运安全。

## 产品简介

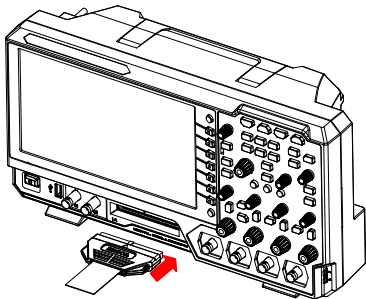
PLA2216 是一款高性能有源逻辑探头，可将待测系统上的数字信号连接至 **RIGOL** MSO5000 系列数字示波器，实现逻辑分析仪功能。

PLA2216 共有 16 个数字通道（D0-D15），分为两个通道组（D0-D7 和 D8-D15）。每个数字通道组均包含信号接口和地接口，并且在探头输入端的标签上，所有通道均用不同的数字清晰标示，以便于区分不同的通道。同时，PLA2216 标配 16 根探头输入端信号引线和 16 根接地引线，可用于灵活的连接被测信号和参考地。



## 逻辑探头的使用方法

1. 连接 **PLA2216** 至示波器：将 PLA2216 探头输出端连接至示波器前面板的数字信号输入端，如下图所示。



2. 连接被测信号至 **PLA2216**：用户可根据测试需求将任意数量 ( $\leq 16$ ) 的被测信号连接至 PLA2216 探头输入端。连接时需注意，输入信号的

幅度不能超过探头的最大工作电压范围。PLA2216 提供两种与被测信号的连接方式，以方便用户灵活探测信号。

- ◆ 方法一：用户可通过输入端引线单独连接各个被测信号。通过输入端引线上的通道标示以及探头输入端上的标签可方便地识别每个信号所对应的通道号，如图 1 所示。

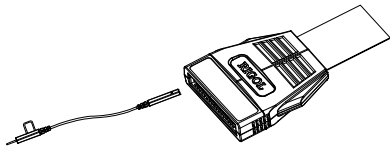


图 1

**注意：**使用过程中若出现串扰或地弹，可能是多通道共用地线导致。因此建议您尽可能为每通道的信号线配一根地线并双绞。

- ◆ 方法二：在方法一的基础上，将输入端引线与探头测试夹进行连接，然后通过测试夹内的金属钩连接被测信号节点，如图 2 所示。

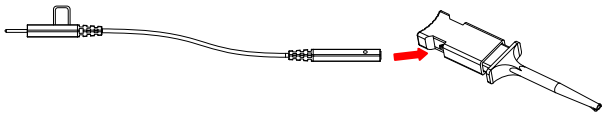


图 2

- 3. 设置探头：**按示波器前面板上的 **LA** 键进入数字通道设置菜单，用户可在该菜单下查看和设置如下参数：阈值电平 (D7-D0 与 D15-D8 分组阈值电平独立调节)、波形大小 (应用于所有通道，其中“大”选项只在屏幕活动通道数不多于 8 时可用) 和通道标签等。

**注意：**若探头第一次连接到该示波器或者环境温度变化 5℃ 以上，建议利用 LA 菜单下校准功能进行零点校准（按 **LA** → **阈值** → **校准**），校准时保持 PLA2216 输入端不接信号。

- 4. 功能检查：**完成上述操作后，被测信号将显示在示波器屏幕上相应的数字通道上。若看不到信号，请调节示波器选择合适的触发源、触发电平和触发方式等常规设置。若仍然看不到信号，请再次检查电气连接和参数设置，或尝试使用其他探头 (如模拟探头) 来验证测试点的信号状态。

## 探头指标

输入通道数	16
阈值范围	$\pm 15\text{ V}$
阈值精度	$\pm(100\text{ mV}+3\%$ 的阈值设置)
最大输入电压	$\pm 40\text{ V}$ (峰值)
最大输入动态范围	$\pm 10\text{ V}+$ 阈值
最小电压摆动	500 mVpp
最小可检测脉宽	5 ns
输入阻抗	约 101 k $\Omega$
输入电容	约 8 pF
探头主缆长度	约 90 cm
输入端引线长度	约 25 cm
操作环境	0 $^{\circ}\text{C}$ ~50 $^{\circ}\text{C}$ , 0~80%RH
存放环境	-20 $^{\circ}\text{C}$ ~60 $^{\circ}\text{C}$ , 0~90%RH

## 附件

编号	名称描述	数量
1	主线	1
2	引线	32 (2×16)
3	探头钩	32
4	中英文用户手册	1
5	PLA2216 包装盒	1



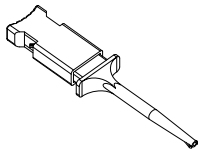
## 附件示意图



主线



引线



探头钩

## 联系我们

如您在使用此产品或本手册的过程中有任何问题或需求，可与 **RIGOL** 联系：

电子邮箱：[service@rigol.com](mailto:service@rigol.com)

网址：[www.rigol.com](http://www.rigol.com)



## General Safety Summary

- ✚ Connect and disconnect the probe properly.
- ✚ Observe all terminals ratings.
- ✚ Do not touch exposed connections and components after power on.
- ✚ Do not operate with suspected failures.
- ✚ Do not operate without covers.
- ✚ Do not operate in an explosive atmosphere.
- ✚ Do not operate in wet conditions.
- ✚ Keep product surface clean and dry.
- ✚ Pay attention to handling safety.

## Product Overview

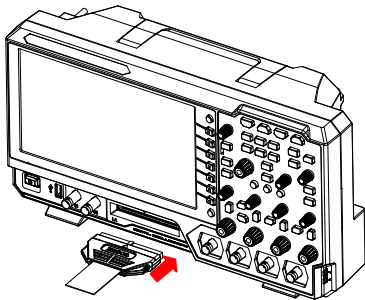
Being a high-performance active logic probe, PLA2216 connects the digital signals under test to the MSO5000 series digital oscilloscope to realize the logic analyzer function.

The 16 digital channels (D0-D15) of PLA2216 are divided into two channel groups (D0-D7 and D8-D15) each of which includes signal interfaces and ground interfaces. All the channels are marked with different numbers on the label of the probe input to identify different channels. PLA2216 provides 16 input signal leads and 16 ground leads to realize flexible connection of signals and reference ground.



## The Using Method of the Logic Probe

- 1. Connect PLA2216 to the oscilloscope:** connect the probe output to the digital signal input terminal at the front panel of the oscilloscope as shown in the figure below.



- 2. Connect the signals under test to PLA2216:** users can connect any number ( $\leq 16$ ) of the signals under test to PLA2216 probe input

according to the test need. Note that the amplitude of the input signal should not exceed the maximum working voltage range of the probe. PLA2216 provides two connection methods to realize convenient and flexible detection.

- ◆ Method one: users can connect the signals under test through the probe leads separately. You can easily identify the corresponding channel of each signal by the channel label on the probe leads and the label of the probe input, as shown in Figure 1.

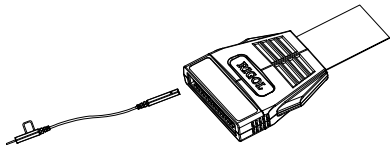


Figure 1

**Note:** If crosstalk or ground bounce occurs during use, it might be caused when channels share a single ground lead. So you are

recommended to add a ground wire to the signal lines of each channel and twist them.

- ◆ Method two: on the basis of method one, you can connect a grabber to each lead and connect it to the device under test as shown in Figure 2.

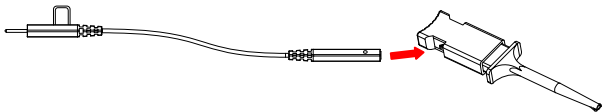


Figure 2

- 3. Set the probe:** press **LA** at the front panel of the oscilloscope to enter the digital channel setting menu. Users can view and set the following parameters under this menu: threshold level (the threshold levels of D7-D0 and D15-D8 can be adjusted independently), waveform size (applicable to all the channels; wherein, item Large is

only available when the number of active channels is no more than 8), channel label and so on.

**Note:** When the probe is connected to the oscilloscope for the first time or the temperature change is more than 5 degrees, you are recommended to calibrate the probe zero using the calibration function in the LA menu (press **LA** → **Threshold** → **Calibration**) and please disconnect all the connections to the PLA2216 input terminal during the calibration.

- 4. Function Check:** after finishing the above operations, the signal under test will be displayed on the corresponding digital channel on the oscilloscope screen. If no signal is displayed, please adjust the oscilloscope to select proper general settings (such as the trigger source, trigger level and trigger mode). If signal is still not displayed, please check the electric connection and parameter settings again or please try to use other probe (such as analog probe) to check the signal state of the test point.



## Probe Specifications

Input channels	16
Threshold range	$\pm 15$ V
Threshold accuracy	$\pm (100 \text{ mV} + 3\% \text{ of threshold setting})$
Max input voltage	$\pm 40$ V (peak)
Max input dynamic range	$\pm 10$ V + threshold setting
Min voltage swing	500 mVpp
Min detectable pulse width	5 ns
Input impedance	About 101 k $\Omega$
Input capacitance	About 8 pF
Cable length	About 90 cm
Lead length	About 25 cm
Operation environment	0 $^{\circ}$ C $\sim$ 50 $^{\circ}$ C, 0 $\sim$ 80%RH
Storage environment	-20 $^{\circ}$ C $\sim$ 60 $^{\circ}$ C, 0 $\sim$ 90%RH

## Accessories

<b>Item</b>	<b>Description</b>	<b>Quantity</b>
1	Main Cable	1
2	Lead	32 (2×16)
3	Grabber	32
4	Chinese and English User's Guide	1
5	PLA2216 Packing Box	1

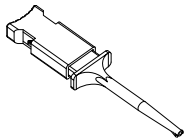
## Accessories Sketch Map



Main Cable



Lead



Grabber

## Contact Us

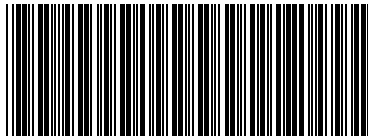
If you have any problem or requirement when using our products or this manual, please contact **RIGOL**.

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