

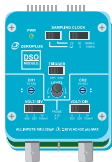


DSO

MODULE

Instruction Guide

01.Kit Content



DSO Module



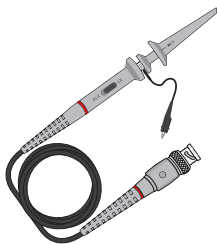
Instruction Guide



Single Channel Cable



Dual Channel Cable



Oscilloscope Probe



Adjustment Tool



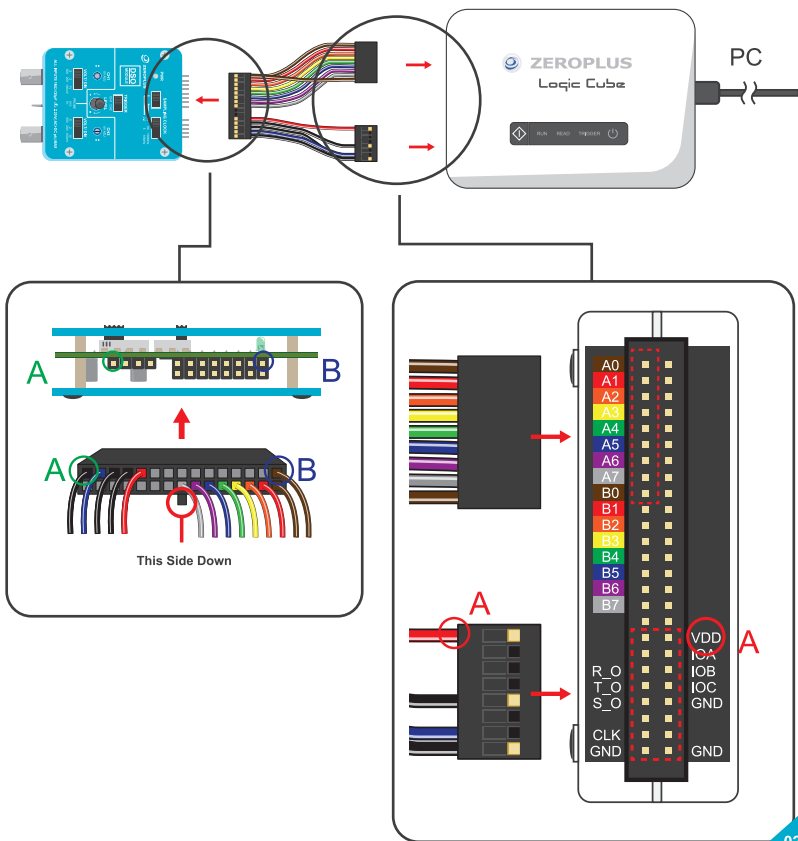
Identification Ring



Positioning Sleeve

02. Operation Steps

1. Take one of the single-channel dedicated cable. Follow the instructions below to insert to the DSO module and logic analyzer LAP-C respectively. Please note: the connection line to the right of the LAP-C is the VDD and control lines



03.Initial setting

1. DSO module initial setting: (Please refer to **Note 1: DSO module panel**)


- 4 CH1 VOLT/DIV select 2V /200mV
- ↓
- 7 SAMPLING CLOCK select 2.5MHz
- ↓
- 8 TRIGGER select CH1

2. Starting software

Install software of LAP-C and start it. (See LAP-C manual, we omitted this part here, do not repeat) **Please use the V3.14.03 version or newest version.**

3. Software initial setting: (Please refer to **Note 2: Software User Interface**)

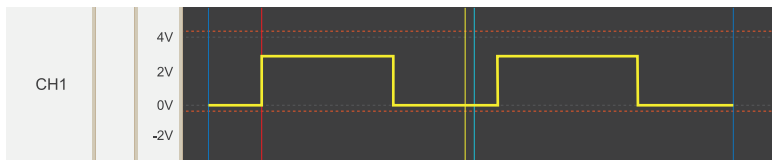
- 1 MSO(M) select Single channel.
- ↓
- 4 Memory select 2K.
- ↓
- 5 Sampling Frequency select 2.5MHz.
- ↓
- 7 Vertical Scale select 2V / DIV.
- ↓
- 10 Trigger Condition select Rising edge.
- ↓
- 11 Trigger Mode select Auto.

4. Press  start oscilloscope waveform display, CH1 will show a parallel line (the figure shown as below.) because at this time we did not enter the signal. If the time baseline is not on the 0V scale line, please adjust the CH1 0V ADJ with a adjustment tool to move the time baseline to 0V position.



5. Probe stick compensation correction

Please connect the oscilloscope probe to CH1, kindly adjust the switch of 1 X1 / X10 that in front of the probe to be X10, and hook the test hook to correction output terminal. A square wave of more than one cycle is displayed, as shown in the following figure.



Probe stick compensation correction

If the square wave is not very square, it may be phenomenon that a probe has been overcompensated or undercompensated. This will affect the oscilloscope measurement waveform error. Please use the adjustment tool to adjust the square wave to the most square.



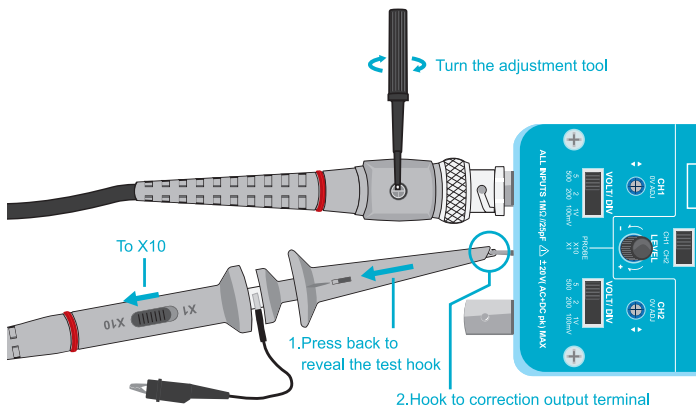
Overcompensated



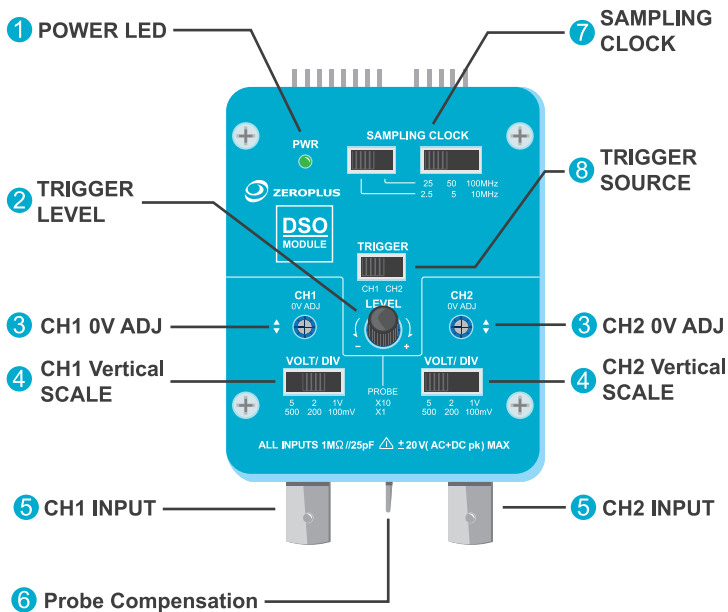
Compensated correctly



Undercompensated



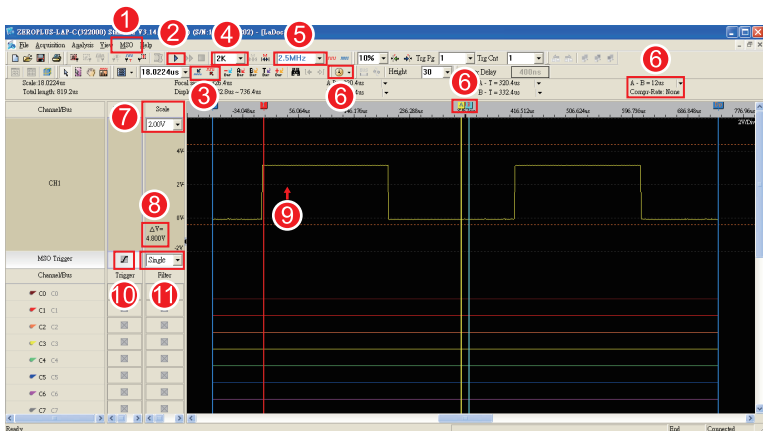
Note 1: DSO module panel



1. POWER LED

After connecting the DSO module and LAP-C, connect LAP-C with your computer, the power indicator (PWR) on the DSO module will be illuminated.

<p>2. <u>TRIGGER LEVEL</u></p>	<p>By manually adjusting the trigger level knob, you can change the trigger start point position of the displayed waveform.</p> <p>To "+" direction of rotation, the trigger point will move to the positive voltage position.</p> <p>To "-" direction of rotation, the trigger point will move to the negative voltage position.</p>
<p>3. <u>CH1 /2 0V ADJ</u></p>	<p>When the vertical 0V position of CH1 or CH2 is offset, you must adjust the knob with a adjustment tool to align it with the 0V scale line on the display screen.</p>
<p>4. <u>CH1 /2 Vertical SCALE</u></p>	<p>This switch can be set to CH1 or CH2 vertical scale. Its stalls are "VOLT/DIV" for the vertical scale factor. When the probe is (X10), the vertical scale is with 5V / DIV, 2V / DIV, 1V / DIV for choice. When the probe is (X1), the vertical scale has 500mV / DIV, 200mV / DIV, 100mV / DIV for choice.</p> <p>In general measurement of TTL or CMOS digital signals, usually vertical scale is set at 2V / DIV (probe X10) is more appropriate. Please kindly note that the setting of this switch must also be consistent with the vertical scale display on the software UI.</p>
<p>5. <u>CH1 /2 INPUT</u></p>	<p>Input the connector for the display waveform.</p>
<p>6. <u>Prob Compensation</u></p>	<p>The probe compensation outputs a square wave of about 2 kHz, 3.3 Vpp which is used to adjust the compensation of the probe to match the input circuit of the oscilloscope.</p>
<p>7. <u>SAMPLING CLOCK</u></p>	<p>This switch can select the oscilloscope sampling frequency including 100MHz, 50MHz, 25MHz, 10MHz, 5MHz, 2.5MHz, total of 6 for choice, each frequency can be in accordance with the test object of high frequency or low frequency signal to appropriately select higher sampling frequency or lower sampling frequency. Please note that the setting of this switch must also be consistent with the sampling frequency on the software UI.</p>
<p>8. <u>TRIGGER Source</u></p>	<p>This switch can select CH1 or CH2 as the trigger signal for the oscilloscope.</p>



1. Scope Mode

Click this MSO (M) to enter the oscilloscope mode. And it will display the waveforms of the DSO and LA logical channels simultaneously in real time.

MSO

Single DSO Analog Channel
Dual DSO Analog Channel
Close DSO Analog
Area Measurement...

According to LAP-C different number of channels of model number, below lists are the maximum number of DSO channels and LA channels can be provided.

MSO (M)	LAP-C 32xxx series	LAP-C 16xxx series
Oscilloscope single channel	DSO 1ch + LA 23ch	DSO 1ch + LA 7ch
Oscilloscope dual channel	DSO 2ch + LA 16ch	DSO 2ch

Measure	CH1
Vmax	3.31 V
Vmin	0.00 V
Vavg/High	3.28 V
Vbase/low	0.03 V
Vpp	3.31 V
Vamp1	3.25 V
Vrms	2.31 V
Vavg	1.85 V
+Overshoot	0.01%
-Overshoot	0.01%
Vmid	1.86 V
Frequency	2.44 KHz
Period	409.60 us
+Width	204.80 us
-Width	204.80 us
+Duty	50%
-Duty	50%
Rise time	0.40 us
Fall time	0.40 us


If the waveform sampling is stopped, click the "Waveform Measurement" function in MSO (M). Then the 19 waveforms of CH1 or CH2 are displayed as below.


2. Run/ Stop

Press  can capture the waveform continuously.

Press  stop capturing.

3. Zoom In/Out

Press  can zoom in the waveform.

Press  can zoom out the waveform.

Waveform zoom, is refer to the center of the window to zoom in or out, and can be operated when the waveform is sampling or paused.

4. Memory Depth



There are several kinds of memory depth: The depth of the size will affect the waveform display update rate, if select 2K- the fastest, if select 32K- relatively slow, the general recommended memory depth is 16K.

5. Sampling Clock



This switch can select the oscilloscope sampling frequency including 100MHz, 50MHz, 25MHz, 10MHz, 5MHz and 2.5MHz, total of 6 for choice. Each frequency can be in accordance with the test object of high frequency or low frequency signal to appropriately select higher sampling frequency or lower sampling frequency.

Please note that the setting of this Sampling Clock must also be consistent with the sampling frequency on the DSO module.

6. Time Cursor



Move the A-bar and B-bar pairs of cursors, you can read the displayed time value to measure. There are three numerical modes that can be selected: time, sampling point, and frequency.

7. Vertical Scale

This switch can be set to CH1 or CH2 vertical scale. Its stalls are "volts / per grid" for the vertical scale factor.

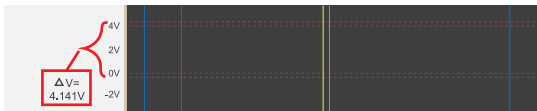
When the probe is (X10), the vertical scale is with 5V / DIV, 2V / DIV and 1V / DIV for choice.

When the probe is (X1), the vertical scale has 500mV / DIV, 200mV / DIV and 100mV / D for choice.

In general measurement of TTL or CMOS digital signals, usually vertical scale is set at 2V / DIV (probe X10) is more appropriate. Please kindly note that this setting must also be consistent with the vertical scale display on DSO.

8. Voltage Cursor

CH1 and CH2 respectively have a pair of horizontal axis cursor (two red dotted lines as shown in below). You could move this cursor to read the displayed voltage parameters for measurement. Such as measuring the peak-to-peak or DC voltage of the waveform.



9. Trigger Level

By manually adjusting the trigger level knob, you can change the trigger start point position of the displayed waveform.

To "+" direction of rotation, the trigger point will move to the positive voltage position,

To "-" direction of rotation, the trigger point will move to the negative voltage position.

The left side of the trigger point is the pre-trigger signal.

10. Trigger Condition



Any signal

Mining all signal period, it won't do any signal triggering decision.



Rising edge

Trigger on the rising edge of the waveform.



High level

Trigger on the high level of the waveform.



Falling edge

Trigger on the falling edge of the waveform.



Low level

Trigger on the low level of the waveform.



Any edge

Trigger on the rising or falling edge of the waveform.

11. Trigger Mode



Auto : The oscilloscope will automatically capture the signal regardless of whether the trigger condition.

Normal : The oscilloscope will capture the signal which is satisfied the trigger condition.

Single : The oscilloscope will capture the signal which is satisfied the trigger condition, but it only captures one time.

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