LAP-C Pro
LOGIC ANALYZER

Quick Start Guide

English

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0. Precautions

Users are advised to carefully review this section to avoid potential hazards to people, this product and other products connected to it.

- To protect the instrument and the Device under Test (DUT), grounding is required during signal acquisition.
- Follow the “Operating environment” recommendations from Table 2:1.
- Protect the logic analyzer from static discharge.
- Avoid direct impacts and rough handling.
- The logic analyzer is a pollution degree 2 instrument.

  Normally only dry, non-conductive pollution occurs. Occasionally a temporary conductivity that is caused by condensation must be expected. Temporary condensation occurs only when the product is out of service.
- Do not place heavy objects on the logic analyzer.
- As a Class A product, the LAP-C Pro may cause radio interference.
- Do not disassemble the logic analyzer as this will void the warranty and may affect its operation.

1. Introduction

1.1. Preface

This Quick Start Guide presents the Zeroplus* logic analyzer, its operation and software. The purpose of the Quick Start Guide is to help users understand and get familiar with the operations of the instrument and the software. Throughout the document, the instrument software is referred to as ZP-Logic and the instruments as LAP-C Pro.

Users are welcome to give us feedback by email or telephone. Thank you for purchasing our logic analyzer.

* Zeroplus and ZP are abbreviation of Zeroplus Technology Co., Ltd.

1.2. About document

This Quick Start Guide is organized as follows: First, the characteristics of the logic analyzer are presented, followed by installation and setup procedures.

NOTE：The updated software UI might differ from the illustrations herein.

1.3. Product Introduction

The LAP-C Pro is a multi-purpose PC-based logic analyzer. It has the largest memory capacity for the channels, higher sampling rate and more advanced functions.

But the LAP-C Pro is not only about GHz and Gb/Mb. The extensive protocol library consisting of more than 129 protocol decoders, direct streaming to disk, channel folding, user-friendly software and a host of other functions make efficient debugging.

1.4. Package Content

All items contained in the package are listed in Table 1:1。. If any of the items is missing or damaged, please contact your distributor as soon as possible.

Item	LAP-C Pro	LAP-C Pro	Detail
Channels	**16ch**	**32ch**	
Logic Analyzer	1	1	
USB flash drive (software)	1	1	
2 x 5 pin Probe (short)	2	4	10cm
2 x 5 pin Probe (long)	2	4	25cm
1 pin Probe (gray)	4	4	25cm
1 pin Probe (black)	1	1	25cm
Clip-on connector	20	40	
USB 3.0 cable; PC-to-LAP-C Pro	1	1	A to B type; 1.5 m

Table 1:1 LAP-C Pro package content

1.5. System Requirements

1.5.1. Operating System Requirements

The ZP-Logic supports operating systems for Microsoft only. See Table 1: 2 below for a list of supported operating systems. Please contact our Technical Support team if you have questions about past operating systems.

Supported OS	Versions
Windows 10	32- and 64-bit (Recommended)
Windows 8.1	32- and 64-bit (Recommended)
Windows 7	32- and 64-bit

Table 1:2 Supported operating systems

1.5.2. Hardware Requirements

Item	Value	Type
CPU	2 GHz	Minimum
Memory		
RAM	4 GB	Minimum
RAM	8 GB	Recommended
Hard disk	80 GB	Minimum
Interface		
	USB 3.0	Recommended support
	USB 2.0	Recommended compatibility
Display		
Display size	17”	Recommended
Display resolution	1,024 x 768	Minimum
Display card	8 Mb SDRAM	Recommended

Table 1:3 PC hardware requirements and recommendations

1.6. Product Specifications

1.6.1. Product Photo



Figure 1-1 Top view of the LAP-C Pro

1.6.2. Specifications

Item	Characteristic
Supported operating systems	See Table 1:
Acquisition Channels	16 or 32
Interface	USB 3.0 (2.0 compatible)
Sampling Frequency	
Internal (Timing)	2 GHz
External (State)	250 MHz (Dual-edge)
Memory/channel	4, 8, 16, 32, 64 , 128, 256, 512Mb or 1Gb
Trigger	
Trigger Channels	16 or 32
Trigger Events	Pattern / Edge / Pulse-width / Interval (Time)
Trigger Delay	Yes
Trigger Sequence Levels	256
Trigger Pass	1-65,535
Trigger Voltage	4 simultaneous levels; 1 for each of the 4 ports
Auxiliary Cursors	250
Protocol Triggers (HW)	I2C, I2S, SPI, SVID, UART, CAN2.0B
Software functions	
Languages	English, Chinese (Traditional), Chinese (Simplified)

Wavefrom & UI customization	Modify the appearance of channels, menus, traces, windows etc
State List & Waveform View	Present the samples as a list of 1s and 0s or as a waveform
DSO Connection	Connect to and import signals from DSOs
Files Comparison	Compare 2 files to quickly see the difference
Navigator	Instantly navigate the distant parts on the waveform
Memory View	See the memory status; read/written each address
Packet List	Breakdown of all packets in list form
Statistics	Table view the numbers & periods, satisfied conditions etc
Find Results	Set conditions, and look for the information which meets the requirements
Real-time Signal Activity	Live view of the activity of probe
Protocol Decoders	More than 129 free, built-in protocol decoders
Miscellaneous	
Power	USB 5 V
Dimensions	125 x 92 x 25 mm
Certifications	FCC/CE/WEEE/RoHS/REACH

Table 1:4 LAP-C Pro specifications

NOTE: The external sampling frequency requires the shortest probe, or the ground wire can be added to each channel with twisted.

1.6.3. Available Models

Model	Channels	Memory depths available
LAP-C Pro	16	64 and 128Mb /channel
LAP-C Pro	32	64, 128, 256, 512Mb or 1GMb /channel

Table 1:5 LAP-C Pro Available memory depths

1.6.4. Electrical Specifications

Item	Power Supply
Working Voltage (DC)	USB 5V
Working Current (MAX)	0.6A
Working Power (MAX)	3W

Table 1:6 LAP-C Pro power specifications

NOTE：Voltages that exceed the Working Voltage may damage the LAP-C Pro.

1.6.5. Probe Specifications

The following input channels are also available for the LAP-C Pro.

Item	Description
Signal Type	Single-ended
Channels (Max)	32 Signal + 4CK
Input Impedance	200 kohm
Capacitance	7 pF
Input Bandwidth (Max)	250 MHz
Trigger Level	User-defined
Trigger Level Range	-6 to 6 V
Trigger Level Resolution	10mV / STEP
Reference Level Accuracy	±100mV+5%Vth
Input DC V (Max)	±30 V

Table 1:7 LAP-C Pro input channel specifications

NOTE：The Input Bandwidth (Max) requires the shortest probe, or the ground wire can be added to each channel with twisted.

1.6.6. Overview of Port

Figure 1-2 shows the overview of port of the LAP-C Pro



Figure 1-2 LAP-C Pro, Overview of Port

Port	Number	Description
Signal in Channels	32/16	USB connections to probes for signal acquisition
CLK IN	4/2	External clock input for State mode acquisitions
T_O	1	Send output signal upon triggering
T_I	1	Trigger in
Pattern Generate	4	Output pattern
USB	1	Connection to the PC; both USB 3.0 and 2.0 are supported
EXPAND	1	Reserved

Table 1:8 LAP-C Pro, Overview of Port

In Fingure 1-3, cables are connected to the LAP-C Pro ports listed above.

32-signal in channel ports are on the left side of the product.



Figure 1-3 Cable connections to the LAP-C Pro

2. Installation and Setup

2.1. Software Installation

NOTE: For users who have internet access, we recommend that you download the latest version of the ZP-Logic software from our website: www.zeroplus.com.tw/logic-analyzer_en/

Close all other programs and connect the logic analyzer to the PC via USB.

Connect the flash drive for ZP-Logic Software activation.

Open the Setup.exe file manually.

The dialog box will be shown as Figure 2-1.



Figure 2-1 Main installation window

Choose the Application Setup as the option will install both the software and the instrument driver.

The Driver Setup is for driver reinstallation.

Before the installation starts, the user will be asked to read the License Agreement carefully. **“I accept the terms of the license agreement”** must be checked to continue. Next, enter **User and Company names** to continue.

Click “Next” throughout the installation to install the standard version is recommended, but options for customizing the installation are also available for the user.

Upon completion, **the user will be prompted to restart the computer**.

2.2. Hardware Setup

Connect the probe to the instrument; see Figure 2-2



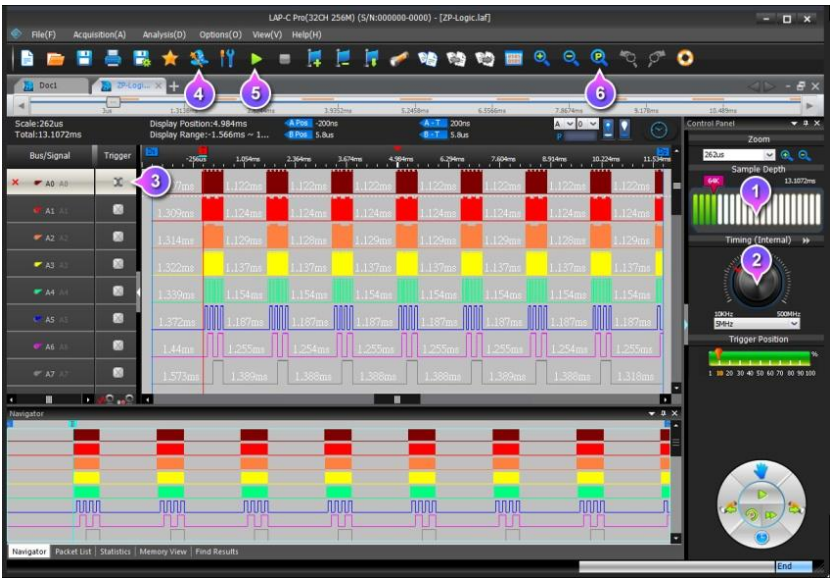
Figure 2-2 Probe connected to the LAP-C Pro

Connect the LAP-C Pro to the PC using the USB. The power lamp (in Figure 2-3) turns on when the power is been supplied.



Figure 2-3 Probe and USB cable connection

2.3. Quick Start the Software



1. Memory Capacity: Determine the amount of data to be acquired per channel

2. Sampling Rate: Determine how often the samples are taken

3. Column of Trigger: 6 trigger conditions include <Don't Care>, <High>, <Low>, <Rising Edge>, <Falling Edge> and <Either Edge>

4. Trigger Level: Set up with 4 different Trigger Levels (Port A, B, C and D) at a time

5. Signal capture: Capture the sample with using Sampling setting and Trigger condition

6. Display All: Show all data in the waveform view

2.4. Operating Environment and Maintenance

Please follow the instructions below when using, cleaning or storing your logic analyzer and probes. Please also see the Precautions chapter prior to operating the logic analyzer.

Type	Description
Cleaning	Clean with a soft, damp cloth; use a mild detergent if necessary
	Do not spray any liquid on the logic analyzer
	Do not immerse the logic analyzer in any liquid
	Do not use harsh chemicals or cleaners containing substances such as benzene, toluene, xylene and acetone etc.

Operating Environment		
Temperature (Working)	Min: 5° C	Max: 35° C
Temperature (Storage)	Min: -20° C	Max: 60° C
Rel. humidity (Working)	Min: 20%	Max: 85%
Rel. humidity (Storage)	-	Max: 90%
Altitude	-	Max: 2,000 m
Insolation	Avoid direct sunlight	
Working Environment	Use the logic analyzer in a dust-free, non-conductive environment	

Table 2:1 General advice for cleaning, operating and storing the logic analyzer

3. Contact ZEROPLUS

Sales Department	
Email	sales@zeroplus.com.tw
Phone	+886-2-6620-2225 with ext. #380 (For English service) #242 (For Japanese service)

Technical Support	
Email	service_2@zeroplus.com.tw

Table 3:1 ZEROPLUS Contact information