High Quality Professional Instruments




ZEROPLUS®

ZEROPLUS

www.zeroplus.com.tw

In November, 1997, Zeroplus Technology Co., Ltd was established by a group of engineers who have years of experience in MCU (Micro Controller Unit) programming. Focused on the design of the peripheral products of computer games, the company possesses the core technology in IC design. The edge of the company comes from the in-depth understanding of the industry. In addition to the know how, the company enjoys a vibrant interaction with business partners so that the company can fully grasp the trend of the industry and bring forth products that meet the needs of the market in advance.

In 2004, the business scope was extended to the electronic measure instruments. Applying the advanced MCU programming technology, the company successfully developed the latest patented measure instrument: PC-based logic analyzer. The unique and innovative technology was accredited by a number of patents granted. As of October, 2008, the number of patent application has reached 212, 11 of which are about PCT. The regions or countries where the company applied for patent include China, Japan, Canada, Taiwan, India, France, America, England, Singapore, Italy, Germany, and Korea. Of the 198 applications, 129 belong to PI(Invention patents) and 83 are UM(Utility model patents).

Since the release in 2005, the logic analyzer has been widely adopted by tens of dozens of public-listed technological manufacturers in the IC industry and the tertiary educational institutions. The excellent sale has made the logical analyzer the most popular in the market.

Innovative vision and a superior brand-the honored Taiwan Excellence Award

Zeroplus participated in the 14th contest of Taiwan Excellence with its self-developed logical analyzer for the first time and won the Taiwan Excellence Award, which proves that its RD(Research & Development) technology, quality management, marketing and brand name live up to the international standards and stand out the core value of Zeroplus—Innovative vision and a superior brand.

A must-have for every engineer—Zeroplus logic analyzer

"High Quality Professional Instruments" is the core value of Zeroplus. In order to provide products with excellent quality, we are insistent on every details of the programming process in order to constantly bring forth new products. We hold our faith that our logic analyzer is a must-have for every engineer. It is convinced that our product can effectively reduce the development time, cost and enhance the quality. Our logic analyzer is the best tool to assist researchers, students, and SOHO workers in the filed of electronics as well as the indispensable teaching material for electronic educational institutions.


TW.Pat.
206912

UK.Pat.GB
2411482


Singapore.Pat.
P-NO.111740


Korea Pat.
10-0747370

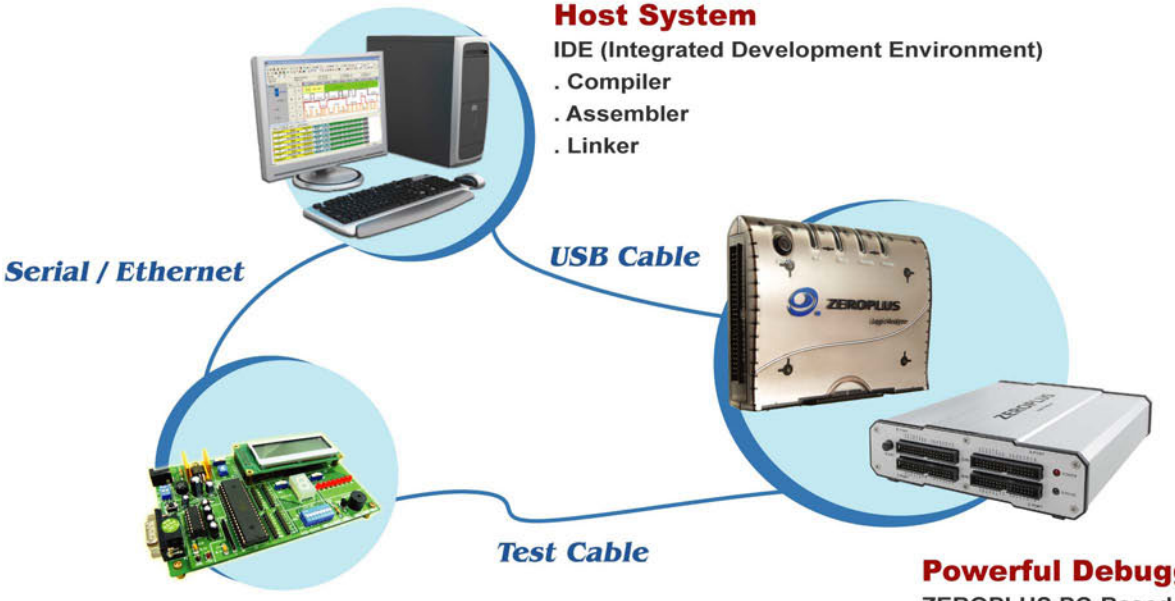

TW.Pat.
244266


TW.Pat.
271532


US. Pat.
7,392,434

FC CE RoHS

Product Application



Suitable for :

- Other prototyping digital systems.
- Professional development tools of the electronic hardware/software/firmware design engineers.
- Microcontroller development tools and development boards : PICxx/ 8051 / ARMx / Renesas / Freescale etc...
- FPGA / CPLD development tools.

Powerful Debugging Tool

ZEROPLUS PC-Based Logic Analyzer plus multi-protocol analyzer in one.

Basic Logic Application	• DIGITAL LOGIC • ARITHMETIC LOGIC	Digital Audio	• IIS • S/PDIF • PCM • ST
Memory	• SPI • IIC • 1-WIRE • SD 1.1/SDIO	Automotive	• CAN 2.0B • LIN 2.1 • FLEXRAY 2.1A
PC System	• USB 1.1 • MANCHESTER • UART • LPC-SERIRQ • PS/2 • LPC • MII	IC Interface	• SSI • JTAG 2.0 • MICROWIRE • MCU-51 DECODE
Others	• 7-SEGMENT LED • MOD • SIGNIA 6210 • HDQ • MILLER • CCIR656 • DSA • PM 1.1 • LCD1602 • PSB • IRDA • ST7669 • DMX512 • NEC PD6122 • LCD12864		

Protocol Analyzers

CAN 2.0B

Can Bus signal is widely used for all kind of products,especially in vehicle electron.It consists of two signal wires and a grounding wire, because of excellent network feature, the signal can make user reduce making cost and supply strong detecting error rules.

LIN 2.1

LIN(Local Interconnect Network) Bus is one kind of Bus interface ,the special electron through the low cost trend producing. After having the LIN Bus, there have factual need selection during control the lower equipments periphery, such as door panel control、rearview mirror control、auto periphery and no need high speed transmission ,HAD or ABS,door window control and so on.

FLEXRAY 2.1A

FLEXRAY is the vehicle signal which is commended by the Philips and Freescale , it owns the superior efficiency, it can replace the original CAN Bus to save the space of hardware according to the transmission.

USB 1.1

USB is a familiar interface, except for PC, Game Host and even part PDA supply USB interface for using. USB has hot-plugging feature, when USB device plug into Host, the Host can detect it, and the software marks it out, that is to say Plug and Play.

PS/2

PS/2 communication protocol is a bidirectional synchronous communication serial protocol, which is most used in communications between keyboards/mouse and PC.

MANCHESTER

Manchester Encoding (Bi-phase Encoding) is a synchronous clock encoding technique used by the physical layer to encode the clock and data of a synchronous bit stream. It always used in Electron Synthesis System and Transformer Coupling.

LPC

LPC Bus is developed by the INTEL company. (Low Pin Count), it is used to transmit the data on the computer mainboard, such as RAM,DMA and so on,or to use in the computer periphery equipment transmission. The Bus Clock Speed can reach to 33MHz, it needs 7 and 13 group channels to transmit data .

UART

UART (Universal Asynchronous Receiver/Transmitter) is an asynchronous transmitting and receiving interface and it was used very widely in PC ago such as Computer's Modem, Printer and so on. Until now, we still can find UART signal applying in auto control device and electronic product ,for example RS-232、RS-422 and RS-485.

SD 1.1

The SD is the abbreviation of Secure Digital and is one standard of memory card, it is widely used in the portable devices, such as digital cameras, PDA, mobile phones and multimedia players and so on.

LPC-SERIRQ

LPC-SERIRQ is one kind of LPC signals, it is used to be mainboard such as Memory, DMA, in order to convenient for control Application. it is also used to periphery instruments.

MII

MII is one kind of interface of ethernet technology specification IEEE802.3U, which is divided into MII Data Transmission and MII Management Message. We can find its application in the PC network card, ethernet Router or ARM micro-control (such as the ARM9 of EP93XX series).

MICROWIRE

MicroWire is a serial signal format defined by National Semiconductor, its hardware and the way of signal operation are the same to that of SPI. (Serial Peripheral Interface)

SSI

SSI (Serial Synchronous Interface) is used in the wireless communications transmission、servo power management 、ADC transition、DAC transition.

JTAG 2.0

The JTAG is normally used in the ISP(In System Programmable, ICP), the original design of JTAG is to start the ICP for the IC, it can simplify the processor and directly install the wafer on the circuit board.

IIS

IIS（Inter-IC Sound Bus or Integrated interchip Sound）is a bus designed by Philips for digital audio devices for transmitting stereo audio between devices, it is used to transmit the PCM sound of CD to DAC of CD player.

S/PDIF

S/PDIF is a digital audio interface, which is made by Sony and Philips in combination; it is widely used of digital audio transmission, for example, CD/DVD Sound, Laser DVD or other Electrical appliances.

ST

ST-BUS (Serial Telecom BUS) is an important bus communication protocol in communication device interior, which is defined by ZARLINK Semiconductor according to the requirements of telecom application. It can make the different signals (Audio, Video, Control Packet and other serial signal exchange) receive or break, and make signals exchange at the same time, in order to make the data exchange between Host end and E1 circuitry more convenience.

Protocol Analyzer

PCM
"The PCM is mainly used in the digital bit electron system , it divides into three processes which are Sampling , Quantization and Decoding. "

DIGITAL LOGIC
"The prime school practice is just to do the experiment of the simple circuit (the running-text ads) by using the IC of TTL series or COMS. However, with the help of the Digital logic module, it is easily to observe the reaction of the input/output of any logic gate."

ARITHMETIC LOGIC
The Arithmetical Logic Bus Module can help users start the relative research or development and quickly understand the input and output status of diversified Arithmetical Logic, meanwhile, it helps students quickly understand the function of diversified Arithmetical Logic.

IIC
IIC (Inter Integrated Circuit) Bus is used in electron and circuit system, it is usually used as signal format to communicate between Device and Device. IIC is a synchronous transmission; a group of IIC has two group s of pins ,they are SCL and SDA ， and the IIC signal content includes Start, Address, Command. Data, Read/Write, ACK/NACK and Stop.

SPI
SPI (Synchronous Peripheral Interface) is a 4-wire bus which communicates by Master-Slave mode. it consists of SCK 、MOSI(SDO) 、MISO (SDI) and SS(CS). SPI is mostly applied in LCD control, SD/MMC, Flash/EEPROM, etc.

1-WIRE
1-WIRE consists of one signal line and one ground line; it is used very widely as signal format of EEPROM communication.

HDQ
The bus is made by TI, at present the bus is mainly used to display and managed battery correlative applications, which include portable aptitude mobile telephone, PDA and mp3, etc.

MILLER
MILLER is the low speed Bus and is only used to the transmission work with single direction. Because of the low frequency ,it is mostly used in the aspects of the Passive, no-contact inductor device and RF ID. Such as : Access Protection Inductor Magcard .

LCD1602
LCD 1602 is a common Liquid Crystal Display interface, which is used for displaying 5*8 or 5*11 character font but doesn't support Chinese display. 1602 is mostly used of Engineering Calculator, Instrument Display Interface, DVD Player Display Interface and School Testing Teaching etc.

7-SEGMENT LED
7-segment Display is mostly used of digital display, and usual use of academe common practice stuff, instrument display Interface, elevator floor display,English characters and so on.

ST7669
ST7669 is one of the chips that developed by Sitronix company, it can be directly connected to micro processor and store data in internal RAM, no need additional frequency shock when chip read or write data, therefore, ST7669 can effectively reduce electricity consumption and space of periphery hardware.

MOD
"MOD Bus can simplify communicating transmission among PLC, Comparing to RS-232 、RS-485, its efficiency is much higher. It is widely applied in power controlling system, elevator, big printer platform and etc that equipped with PLC."

PSB
PSB (Plantronics Serial Bus) is one kind of the transmission formats used in the Bluetooth earphone. It is mainly used to control the key-press of Bluetooth earphone.

SIGNIA 6210
SIGIA6210 is one kind of serial Bus of SGN6210 which is developed by SIGNIA Tech.The SIGNIA6210 is usually used in the RF transmission module.

CCIR656
CCIR656 is also called ITU-RBT656, it is a kind of transmission mode, mainly applied in standard of transmission between digital video and film equipments(27MHz/s or 243MHz/s). it only use 8 signals(CCIR656 = CCIR601 + HSYNC + VSYNC + BLANK).

DMX512
DMX512 was created by USITT in 1990, it become trend of bus application quickly because of its convenience, high reliability and flexibility, except adjusting light. DMX512 is also applied in many other peripheral equipments gradually, so it is more convenient in controlling equipments.

DSA
DSA(Data strobe acknowledge) is mainly used in the signal transmission of products for CD player and jukebox, it is responsible for the communication of server processor , controlling the all actions ,such as play , pause , stop etc..

LCD12864
LCD12864 transmits the signal in parallel (8-line or 4-line) and serial way. It is necessary for users to select the suitable transmission way as their different requirements. LCD12864 is widely used for Meter Panel, Human-machine Operation Platform and Telephone etc.

Protocol List

Protocol Module	LAP-16064U	LAP-16128U	LAP-32128U-A	LAP-321000U-A	LAP-322000U-A	LAP-B(70256)	LAP-B(702000)	LAP-B(70256L)	LAP-B(702000L)
CAN 2.0B	Option	Option	Option	Free	Free	Free	Free	Option	Option
LIN 2.1	Option	Option	Option	Option	Free	Free	Free	Option	Option
FLEXRAY 2.1A	Option	Option	Option	Option	Option	Option	Option	Option	Option
UART	Free	Free	Free	Free	Free	Free	Free	Free	Free
USB 1.1	Option	Option	Option	Option	Option	Free	Free	Option	Option
PS/2	Option	Option	Option	Option	Free	Free	Free	Option	Option
MANCHESTER	Option	Option	Free	Free	Free	Free	Free	Option	Option
LPC	N/A	Option	Option	Option	Option	Option	Option	Option	Option
LPC-SERIRQ	N/A	Option	Option	Option	Option	Option	Option	Option	Option
MII	Option	Option	Option	Option	Option	Option	Option	Option	Option
MICROWIRE	Option	Option	Free	Free	Free	Free	Free	Option	Option
SSI	Option	Option	Free	Free	Free	Free	Free	Option	Option
JTAG2.0	Option	Option	Option	Option	Option	Option	Option	Option	Option
IIS	Option	Option	Option	Option	Free	Free	Free	Option	Option
S/PDIF	Option	Option	Option	Option	Option	Option	Option	Option	Option
ST	Option	Option	Option	Option	Option	Option	Option	Option	Option
PCM	Option	Option	Option	Option	Option	Option	Option	Option	Option
DIGITAL LOGIC	Option	Option	Option	Option	Option	Option	Option	Option	Option
ARITHMETIC LOGIC	Option	Option	Option	Option	Option	Option	Option	Option	Option

Protocol List

Protocol Module	LAP-16064U	LAP-16128U	LAP-32128U-A	LAP-321000U-A	LAP-322000U-A	LAP-B(70256)	LAP-B(702000)	LAP-B(70256L)	LAP-B(702000L)
IIC	Free	Free	Free	Free	Free	Free	Free	Free	Free
SPI	Free	Free	Free	Free	Free	Free	Free	Free	Free
1-WIRE	Option	Option	Free	Free	Free	Free	Free	Option	Option
SD1.1/SDIO	N/A	Option	Option	Option	Option	Option	Option	Option	Option
HDQ	Option	Option	Option	Free	Free	Free	Free	Option	Option
MILLER	Option	Option	Free	Free	Free	Free	Free	Option	Option
LCD1602	Option	Option	Option	Option	Option	Option	Option	Option	Option
7-SEGMENT LED	Free	Free	Free	Free	Free	Free	Free	Free	Free
IRDA	N/A	Option	Option	Option	Option	Option	Option	Option	Option
NEC PD6122	Option	Option	Option	Option	Option	Option	Option	Option	Option
CCIR656	Option	Option	Option	Option	Option	Option	Option	Option	Option
DSA	Option	Option	Option	Option	Option	Option	Option	Option	Option
LCD 12864	Option	Option	Option	Option	Option	Option	Option	Option	Option
PM 1.1	Option	Option	Option	Option	Option	Option	Option	Option	Option
DMX512	Option	Option	Option	Option	Option	Option	Option	Option	Option
ST7669	Option	Option	Option	Option	Option	Option	Option	Option	Option
MOD	Option	Option	Option	Option	Option	Option	Option	Option	Option
PSB	Option	Option	Option	Option	Option	Option	Option	Option	Option
SIGNIA 6210	Option	Option	Option	Option	Option	Option	Option	Option	Option

Protocol Analyzer

SD1.1/SDIO

```
SD 1.1_Initial :
BC  SystemFlag, SendFlag
call  delay80msus_sd
clr   bit_count
call  idle4ms_sd
call sync_sd
mov  a,#0x19   ; SD CMD = 0x19
call output_start_onebyte_sd
```

CLK

CMD

IIC

```
IIC AddressSet :
MOV  A,#0x76 ; IIC Address set 0X76
     MOV  Addressbit,A
     JMP
IIC DataSet :
MOV  A,#0x12 ; IIC Data Set 0X12
     MOV  Databit01,A
     MOV  Databit02,A
     JMP  IICDataInit2
```

SDA

SCL

MOD

```
OUTPUT_ADDRESS_MOD_RTU_1 :
TBRDP MOD_DATA
CALL  OUTPUT_MOD_RTU
DJZ   TABLE_LENGTH_MOD,$+3
JMP   OUTPUT_TABLE_MOD_RTU_1
CALL  OUTPUT_CRC_RTU_1
CALL  DELAY1MS_MOD_IDLE
MOV   A, 0X31 ; ADDRESS = 0X31
MOV   TABLE_LENGTH_MOD, A
```

MOD

USB1.1

```
FRAME_START:
MOV  A,#0X02
MOV  PTD,A
CALL  DELAY4667NS
MOV A, FRAME_LENGTH_TEMP
ADD  A, #0X01
MOV  TABLE_LENGTH_USB,A
MOV  A,0X080  ; Frame = 0x080
```

D+

D-

UART

```
UART DataBitLoop:
MOV  A,#0x41 ; UART DATA SET = 0x41
MOV  UARTDatabit1, A
MOV  UARTDatabit2, A
UART DataByteLoop1:
MOV  A, #0x42 ; UART DATA SET = 0x42
XOR  A, UARTDatabit2
JBS  STATUS,  Z , UARTDataByteOff
```

TX/RX

SPI

```
SPI Initial :
BC   SystemFlag,CheckKey
BC   SystemFlag,SendFlag
MOV  A,#0X12  ; Data = 0x12
MOV  IOCA,A
BC   STATUS,C
BC   PTF,PTF0
```

SCK

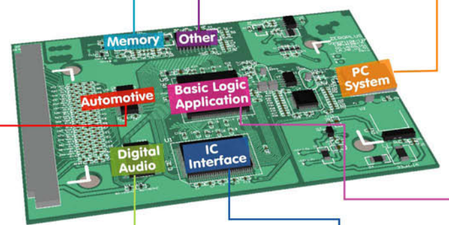
SDA

CAN 2.0B

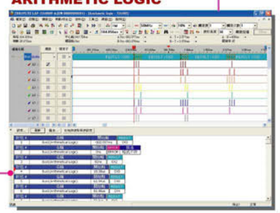
```
CAN 2.0B MainLoop :
Call  CAN_Init
Call  CAN_Start ;Start
mov   A,#0X55 ;
Basic_ID = 0X2A9(16) = 01010101011(2)
mov   CAN_ID, A
Call  CAN_ID_Loop
CAN_ID_Loop:
RLC   CAN_ID,#1
jbs   STATUS,C,CAN_IDBitHigh
jmp   CAN_IDBitLow
```

CAN_H

CAN_L



ARITHMETIC LOGIC



Half Adder

C=A · B

S=A⊕B+A⊕B

True Table

Co=CiAB+CiAB+CiAB+CiAB

=CiA+CiB+AB

S=CiAB+CiAB+CiAB+CiAB

=Ci⊕A⊕B

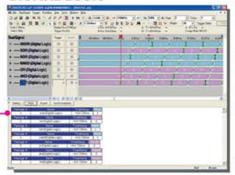
Function

Half Subtract

C=A · B

D=A⊕B+A⊕B

DIGITAL LOGIC



And Function Table / And Gate

OR Function Table / OR Gate

NAND Function Table / NAND Gate

NOR Function Table / NOR Gate

XOR Function Table / XOR Gate

XNOR Function Table / XNOR Gate

NOT Function Table / NOT Gate

FLEXRAY 2.1A

```
FLEXRAY 2.1 ModelInitial
BC   SystemFlag,CheckKey
call  crc24_flexray_a
mov   a,#(flexray_heard_nocrc*2)/256
mov   a,#(flexray_heard_nocrc*2)%256
call  output_heard_flexray
call  output_data_flexray
call  output_crc24_flexray
mov   a,0x005 ; Frame ID = 0x005
call  fes_output
call  dts_output
```

TXD

TXEN

LIN 2.1

```
LIN 2.1 FIELD :
BC   SystemFlag, CheckKey
BC   SystemFlag, SendFlag
MOV  A ,0X55 ; Field ID = 0X55
MOV  DEL1,A
DJZ  DEL1,$+3
JMP  $-2
DJZ  DEL2,$+3
```

LIN

IIS

```
IIS Initial :
BC   SystemFlag,CheckKey
     BC SystemFlag,SendFlag
     BC PTF,PTF0
     BS PTD,PTD1
     CALL DELAY400NS
MOV A,#0X080A ; IIS DATA = 0X080A
     MOV COUNT2,A
MOV A,#0X0C0E ; IIS DATA = 0X0C0E
     MOV COUNT1,A
     BC PTD,PTD1
```

SDA

SCLK

JTAG 2.0

```
JTAG 2.0 ModelInitial:
BC     SystemFlag,CheckKey
MOV          A,#0x01
MOV          gTMove0,A
CALL_JTAGINIT
CALL_JTAG_TAP_SLELogicReset
CALL_JTAG_SelectDRScan
CALL_JTAG_TAP_SLELogicReset
MOV A, 0x0FC          ; Data = 0xFC
BS     PTF,PTF0
```

TCK

TMS

SSI Bus

```
SSI Initial :
BC  SystemFlag,CheckKey
BC  SystemFlag,SendFlag
BC  PTF, PTF0
MOV  A, #HIGH(TABLE_SSI<<1)
MOV  HTBL, A
MOV  A, #LOW(TABLE_SSI<<1)
MOV  LTBL, A
TABLE_SSI:  0b 0x01 ; SSI DATA = 0X01
```

SLK

RD/TD

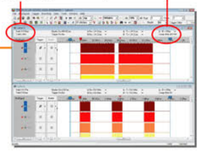
FEATURES & INTERFACE

Operating System

Windows 98SE/ME/2000/XP/Vista

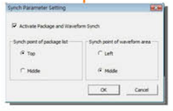
Waveform Compression

Compression as implied by the name is used to compress acquired data through a loss less compressor. The purpose of this compress is to get more data in limited memory than in actual memory.



Synch Parameter Setting

Moving the rolling bar, the package list and waveform will display synchronously.



Data Statictis Funtion

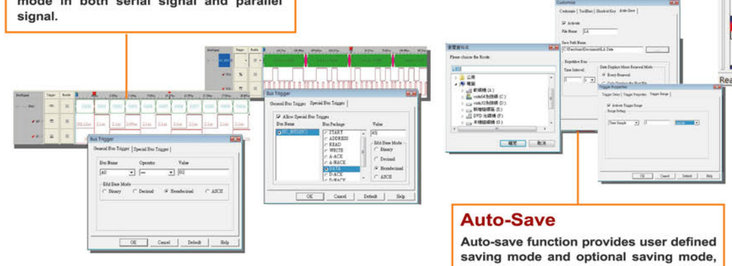
Positive Period/ Full Period /or user defined condition.

Package List

The packages not only display with waveform but also are collected to display synchronously in vertical version.

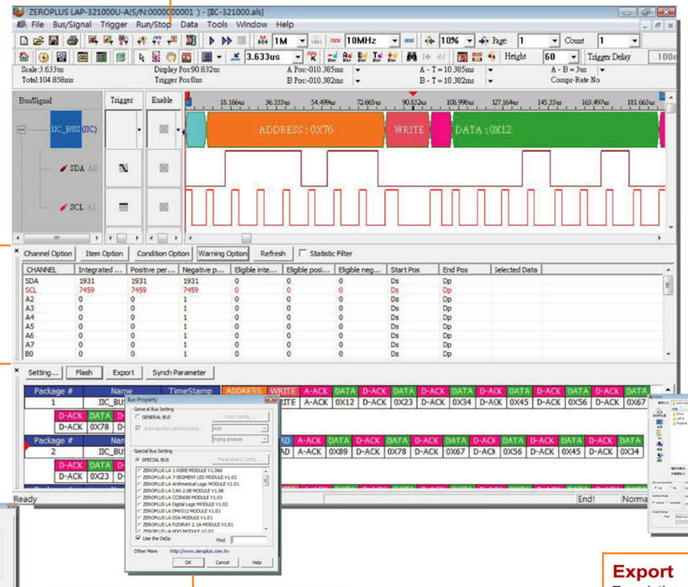
Set Trigger Condition

User defined trigger condition and setting mode in both serial signal and parallel signal.



Auto-Save

Auto-save function provides user defined saving mode and optional saving mode, Which includes both time mode and count mode.

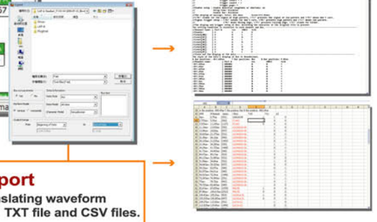


Protocol Analyzer Module

ZEROPLUS features 35 different multi-bus module from multi-media, automotive, IC interface, Memory to PC system.
IIC, UART, SPI, 1-WIRE ,HDQ ,CAN2.0B , IIS, PS/2, MICROWIRE.....

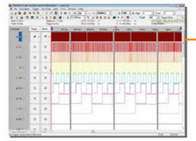
Export

Translating waveform into TXT file and CSV files.



Enable Function

The function of enable and enable-delay is to use an alterable judgment circuit of passing signals which filter useless signals in order to capture and store valuable data in the memory. Enable bar could also be used to indicate filtered signals.



Data Contrast

According to the acquiring data, the contrast function will analyze the contrast result and indicate the different between each other on the waveform and package list.

Software Upgrade

ZEROPLUS logic analyzer will automatically update the new version while connect on line.

Multi-Level Triggering

B-series provides 3 different kinds of triggering function: multi-level triggering, pulse width triggering and space time triggering.

LAP Logic Analyzer

PC-Based Logic Analyzer LAP-A Series

- Obtain 2006 Taiwan Excellence Awards, create excellent quality and innovate research and development technology
- Develop many patent technologies such as Compression, Trigger Page, Enable Delay, etc.
- Supply more than 40 protocol analyzer decoding functions and extend infinitely to advance the specification

TAIWAN EXCELLENCE 2006

LAP

LAP-16064U/LAP-16128U/
LAP-32128U-A/ LAP-321000U-A/LAP-322000U-A

Product Features

- **Protocol Analyzer Analysis**
  Supply more than 40 serial communication protocols such as IIC, UART, SPI, 1-Wire, HDQ, CAN, USB1.1, etc. and display with the human figure interface.

- **Waveform Compression**
  Create the patent function of data compression firstly, which is helpful for storing more data within the limited memory. (TW.Pat.206912) / (UK.Pat.2411482) / (SG.Pat.111740) / (KR.Pat.10-0747370) / (US.Pat.7,392,434)

- **Enable Delay Technology**
  Possess the function such as Enable, Enable Bar and Enable Delay, which can filter the useless data to make an effective sample analysis. These functions are similar to the filter (T.W. Pat. 1271532)

- **PC-Based Interface**
  Support Windows 98SE/ME/2000/XP/VISTA. It makes you study easy and take expediently. The transmission of the data and the supply of the power are supported by the USB2.0(1.1). It can be used in any place and makes your workplace zero-burden.

- **Trigger Page**
  Design various trigger functions to make users more handy when they analyze the waveform, for example, trigger count, trigger delay, trigger position, trigger page.(T.W. Pat. I244266)

- **Window Display and Human Operation Interface**
  Supply many handy functions such as Enclose, Display Waveform Width Automatically, Select An Analytic Range, Display All, Data Contrast, etc. which make users fascinated.

- **Data Application**
  It can save and print files and export waveform data into TXT and CSV formats, and then can be used agilely by users.

- **State Export Application**
  Match with oscillograph to display synchronization trigger.

LAP-A Series

Suitable: Entry level, students & engineers

LAP-16064U

[Specification]

- The Sampling Frequency of Time Sequence Measurement: 100Hz~100MHz
- The Sampling Frequency of State Analysis:100MHz
- Trigger Channel:16 CH.
- Memory Size:2Mbits.
- The memory size of each channel can reach to 64Kbits. With the patent compression technology, each channel can apture about 16Mbits data at best.

[Protocol Analyzer]

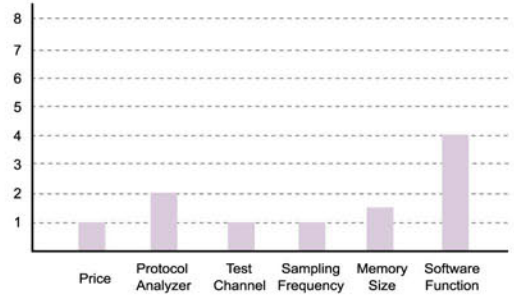
The common protocol analyzer signal decoding is supplied for students for free, such as UART, IIC, SPI and 7-SEGMENT LED.

[Features]

The LAP-16064U PC-based Logic Analyzer features powerful protocols analyzer capabilities for student and electronic engineers.Extremely portable and versatile design ,the logic analyzer unit features a Start button to begin sampling, and connects to a PC via USB1.1 and 2.0 power with full 480Mbps.

The patented waveform ZEROPLUS patented waveform compression technology increases the effective sample memory capacity far beyond the physical memory. All channels can achieve a compression rate up to 255× depending on the data content, allowing you to obtain considerably more sampling data.

Advantage Analysis



LAP-16128U

[Specification]

- The Sampling Frequency of Time Sequence Measurement: 100Hz~200MHz
- The Sampling Frequency of State Analysis:100MHz
- Trigger Channel:16 CH.
- Memory Size:4Mbits.
- The memory size of each channel can reach to 128Kbits. With the patent compression technology, each channel can capture about 32Mbits data at best.

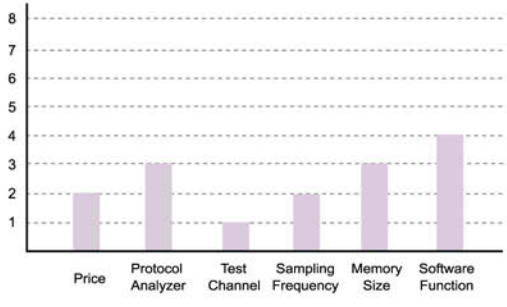
[Protocol Analyzer]

The common protocol analyzer signal decoding is supplied for students for free, such as UART, IIC, SPI and 7-SEGMENT LED.

[Features]

The software supports the operating system of Windows98SE, Windows ME, Windows 2000, Windows XP and Windows VISTA. And matched with many patent technologies of waveform compression and waveform data cut and copy, the software can give students a lot of convenience when they operate the software to do the special report.

Advantage Analysis



LAP-32128U-A

[Specification]

- The Sampling Frequency of Time Sequence Measurement: 100Hz~200MHz
- The Sampling Frequency of State Analysis:100MHz
- Trigger Channel:32 CH
- Memory Size:4Mbits
- The memory size of each channel can reach to 128Kbits. With the patent compression technology; each channel can capture about 32Mbits data at best.

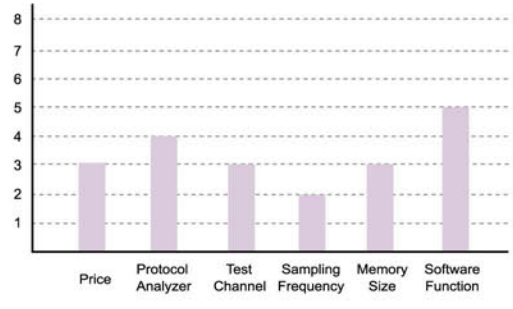
[Protocol Analyzer]

The common protocol analyzer signal decoding is supplied for students for free, such as UART, IIC, SPI, 7-SEGMENT LED, 1-WIRE, MICROWIRE, SSI, MANCHESTER and MILLRE.

[Features]

The software support the operating system of Windows98SE, Windows ME, Windows 2000, Windows XP and Windows VISTA, which is simple and easy to students, and it is used for the biggest benefit with many original creative invention technologies, such as waveform data compression, waveform Enable and Enable delay, waveform data cut and copy, and so on. The Enable, which is similar to the filter, can filter the unnecessary data, save the effective signal and export the waveform data into TXT or CSV formats. So the software is the best test tool for students to do the research report.

Advantage Analysis



LAP-A Series

Suitable: Professionl design, engineers

LAP-321000U-A

[Specification]

- The Sampling Frequency of Time Sequence Measurement:100Hz~200MHz
- The Sampling Frequency of State Analysis:100MHz
- Trigger Channel:32 CH
- Memory Size:32 Mbits
  The memory size of each channel can reach to 1Mbits. With the patent compression technology, each channel can capture about 255Mbits data at best.

[Protocol Analyzer]

The common protocol analyzer signal decoding is supplied for engineers for free, such as CAN BUS, UART, IIC, SPI, 7-SEGMENT LED, 1-WIRE, MICROWIRE, SSI, MANCHESTER, MILLRE, HDQ. We also offer the service of special customized protocol analyzer and create the analysis function of necessary protocol analyzer.

[Feature]

The patent function of waveform compression of Zeroplus has successfully achieved the invention patent of Taiwan, America, England, Korea, Singapore and so on. The waveform compression can use the limited memory to store the Max data quantity of 255 times. What's more, Logic Analyzer possesses many strong functions such as Enable Delay, Trigger Page, Package List of protocol analyzer, etc.. The software supports the operating system of Windows98SE, Windows ME, Windows 2000, Windows XP and Windows VISTA. So whether the engineers are in the company or at home, where there is a computer, using the USB2.0(1.1) interface to transmit data and supply power, you will feel comfortable.

LAP-322000U-A

[Specification]

- The Sampling Frequency of Time Sequence measurement:100Hz~200MHz
- The Sampling Frequency of State Analysis:100MHz
- Trigger Channel:32 CH
- Memory Size:64Mbits
- The memory size of each channel can reach to 2Mbits; With the patent compression technology, each channel can capture about 512Mbits data at best.

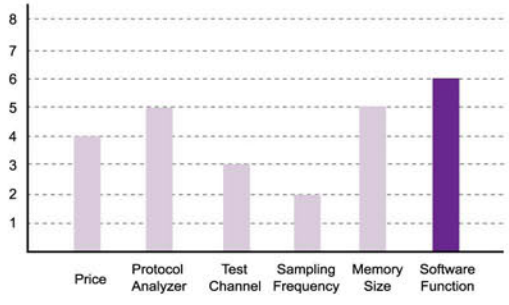
[Protocol Analyzer]

The common protocol analyzer signal decoding is supplied for engineers for free, such as CAN BUS, UART, IIC, SPI, 7-SEGMENT LED, 1-WIRE, MICROWIRE, SSI, MANCHESTER, MILLRE, HDQ. We also offer the service of special customized protocol analyzer and create the analysis function of necessary protocol analyzer.

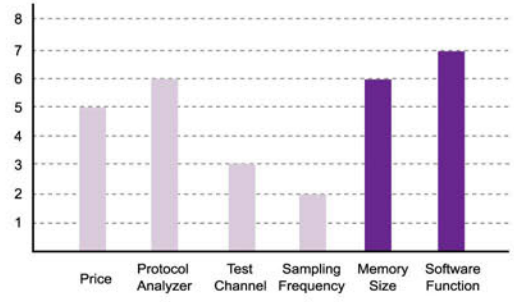
[Feature]

The LAP-322000U-A and LAP-321000U-A are almost the same; excepting for the RAM improvement, the most differency is that the LAP-322000U-A owns the function of protocol analyzer software trigger. when the engineers start to trigger before, they can contrapose the data of protocol analyzer to start setting value in the software. It can start hardware trigger, when the protocol analyzer data value is tenable for which engineers set up. what's more, The software supports the work system of Windows, user operation interface, the language of three types and so forth.

Advantage Analysis



Advantage Analysis



LAP-A Specification

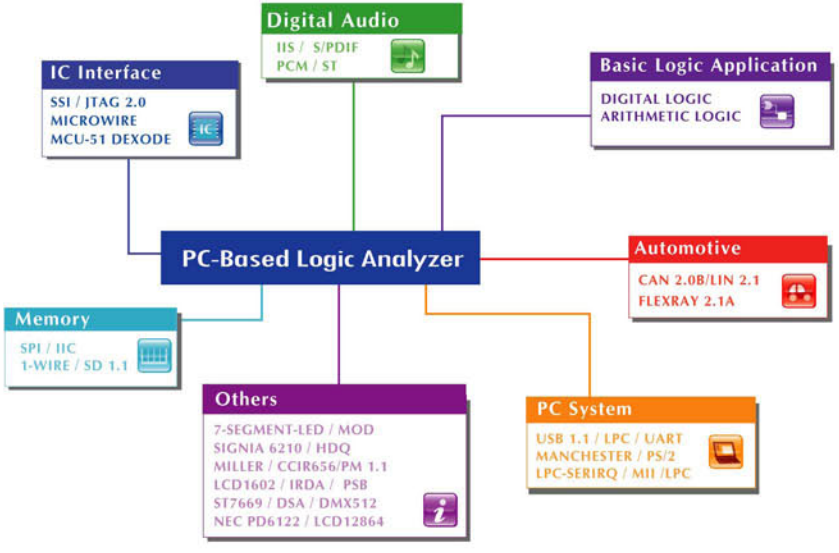
Product model		LAP-16064U	LAP-16128U	LAP-32128U-A	LAP-321000U-A	LAP-322000U-A
Operating System		Windows				
		98SE/ME/2000/XP/Vista				
Interface		USB2.0(1.1)				
Sample frequency	Internal (sequential)(asynchronous)	100Hz~100MHz	100Hz~200MHz	100Hz~200MHz	100Hz~200MHz	100Hz~200MHz
	External (status)(synchronous)	100MHz	100MHz	100MHz	100MHz	100MHz
Special Signal	Bandwidth	75MHz	75MHz	75MHz	75MHz	75MHz
	Trigger Voltage Range	-6V~+6V	-6V~+6V	-6V~+6V	-6V~+6V	-6V~+6V
	Trigger Voltage Analysis	±0.1V	±0.1V	±0.1V	±0.1V	±0.1V
Memory Depth	Memory	2Mbits	4Mbits	4Mbits	32Mbits	64Mbits
	Memory Depth (Per Channel)	64Kbits (Max 16Mbits for Compression)	128Kbits (Max 32Mbits for Compression)	128Kbits (Max 32Mbits for Compression)	1Mbits (Max 255Mbits for Compression)	2Mbits (Max 512Mbits for Compression)
Trigger	Trigger Method	Pattern/Edge	Pattern/Edge	Pattern/Edge	Pattern/Edge	Pattern/Edge
	Trigger Channel	16CH	16CH	32CH	32CH	32CH
	Pre-trigger/Post-trigger	YES	YES	YES	YES	YES
	Trigger Level	1 Level	1 Level	1 Level	1 Level	1 Level
	Trigger Count	1~65535	1~65535	1~65535	1~65535	1~65535
Software Functions	Operating Interface Language	Chinese (Simplified/Traditional) English	Chinese (Simplified/Traditional) English	Chinese (Simplified/Traditional) English	Chinese (Simplified/Traditional) English	Chinese (Simplified/Traditional) English
	Time Base Range	5ps~10Ms	5ps~10Ms	5ps~10Ms	5ps~10Ms	5ps~10Ms
	Vertical Sizing	1~5.5	1~5.5	1~5.5	1~5.5	1~5.5
	Enable Delay	YES	YES	YES	YES	YES
	Data Compression	Max. 16Mbits	Max. 32Mbits	Max. 32Mbits	Max. 255Mbits	Max. 512Mbits
	Width Display	YES	YES	YES	YES	YES
	Max Trigger Page	128~8192 Pages	128~8192 Pages	128~8192 Pages	16~8192 Pages	16~8192 Pages
	Trigger Delay	YES	YES	YES	YES	YES
	Infinite Increase Spacer Bar	YES	YES	YES	YES	YES
	Automatic Zoom In of Spacer Bar	YES	YES	YES	YES	YES
	Automatic Software Upgrade	YES	YES	YES	YES	YES
	Data Range Selectable	YES	YES	YES	YES	YES
	Data Counter	YES	YES	YES	YES	YES
	Bus Inquiry and Counter	YES	YES	YES	YES	YES
	Enable Bar	YES	YES	YES	YES	YES
	Bus Analyzer Module Plug-In	YES	YES	YES	YES	YES
	Bus package list	YES	YES	YES	YES	YES
Phase Errors		<1.5ns				
Power	Power	USB				
	Power at rest	1W				
	Power at work	2W				
Max. Voltage Input		±30V				
Voltage Resistance		500K /10pF				
Safety Certification		FCC / CE / WEEE / RoHS				
Product Dimension		130mm*100mm*30mm				

Standard Accessories

Logic Analyzer	1
Testing hook	16CH(20PCS)/32CH(36PCS)
Testing cables	16CH (8pin*2 / 2pin*1 / 1pin*1) 32CH (16pin*1 / 8pin*2 / 2pin*1 / 1pin*1)
USB Cable	1
Driver CD	1
Getting Started Guide	1
Tool box or portable bag	1

RoHS

Bus Fields of Application



Product Feature

Integrate data bit logic resolving project ; Save time cost effectively

- Using USB2.0 (1.1) to transmit data.
- The operating system to support computer has Window98SE / ME / 2000/XP/Vista.
- Testing channel has 70 channel, per channel has 2K~2MBit RAM size.
- All input signals in range of 0~100MHz can use 200MHz frequency to sample, which can get 5ns high resolution.
- External Synchronous State Analysis Frequency 150MHz.
- Supplying three status signals can match with other Instrument to use, for example scillograph.
- Supply communication protocol IIC, UARK, SPI, 1-Wire, HDQ, CAN BUS, UBS1.1, IIS for analysis displaying in DATA BUS and PACKAGE LIST, in order to upgrade work efficiency; New function continues to increase.
- Supply customer with communication protocol analysis software design service, helping create best test tools.
- Firstly create data compression patent function, matching 2^{32} =4,294,967,295 time hardware compression circuit, in order to make RAM deposit much more data (TW.Pat.206912) / (UK.Pat.2411482) / (SG.Pat.111740) / (KR.Pat.10-0747370) / (US.Pat.7,392,434).
- Have the Enable, Enable Bar and Enable Delay functions which are similar to the Filter, in order to achieve sampling best (TW.Pat.I271532).
- Design diversified Trigger function, in order to let user analyze waveform more handy for example Trigger Count, Trigger Delay, Trigger Position, Trigger Level, Trigger Page (TW.Pat.I244266).
- Better quality and Cost less is the best love of Electron Field and Science Unit.
- The software edition is auto-renewed through the wires, and you can take the new software easy to use forever.

LAP

LAP-B(70256) / LAP-B(702000)
LAP-B(70256L) / LAP-B(702000L)

TAIWAN EXCELLENCE 2006

LAP-B Series

Suitable: Professionl design, engineers

LAP-B(70256)

[Specification]

- The Sampling Frequency of Time Sequence measurement : 100Hz~400MHz
- The Sampling Frequency of State Analysis : Max150MHz
- Trigger Channel : 70CH
- Multi-Level Trigger : The trigger level can reach to 9 levels
- RAM Size : 17.5Mbits
- The RAM depth of every channel can reach to 1Mbits; with the patent compression technology, it can capture the capacity of data of 128Kbits x 4G at most.

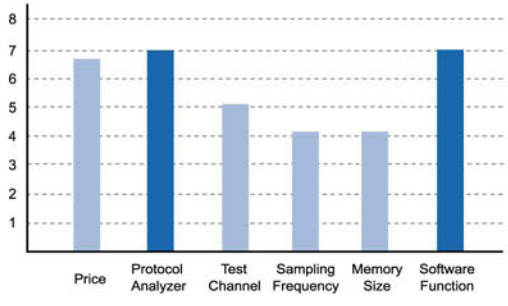
[Potocol Analyzer]

We are free to provide the protocol analysis decoding of CAN BUS, IIS, PS/2, LIN 2.1, UART, IIC, SPI, 7-SEGMENT LED, 1-WIRE, MICROWIRE, SSI, MANCHESTER, MILLRE, HDQ for engineers in common use .

[Features]

The LAP-B (70256) owns the function of 9-level trigger. When engineers check the complex signals, with the help of Multlevel developed by Zeroplus, engineers can set many conditions to do once trigger. Engineers can find the needed data from the multi-trigger and the development objects and Logic Analyzer can use the same computer, it can save the time of development and hardware equipments.

Advantage Analysis



LAP-B(702000)

[Specification]

- The Sampling Frequency of Time Sequence measurement : 100Hz~400MHz
- The Sampling Frequency of State Analysis : Max150MHz
- Trigger Channel : 70CH
- Multi-Level Trigger : The trigger level can reach to 16 levels.
- RAM size : 140Mbits
- The RAM depth of every channel can reach to 2Mbits; with the patent compression technology, it can capture the capacity of data of 1Mbits x 4G at most.

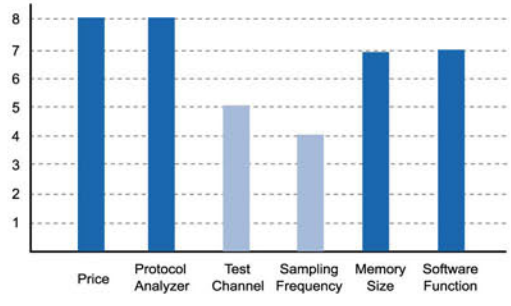
[Potocol Analyzer]

We are free to provide the protocol analysis decoding of CAN BUS, IIS, PS/2, LIN 2.1, UART, IIC, SPI, 7-SEGMENT LED, 1-WIRE, MICROWIRE, SSI, MANCHESTER, MILLRE,HDQ for engineers in common use.

[Features]

The LAP-B (702000) owns the RAM size 2Mbits, 16 levels Trigger function and Pulse Width Trigger ; it makes the users easy to find the waveform data of necessary analysis. When users open several files and windows to work, the strong contrast function can be applied to contrast waveform data before and after programme modification and let users shorten the checkout time. The LAP-B (702000) owns the Auto-save function which can meet the requirments of long time products of inspection, users don't fear the data to lose.

Advantage Analysis



LAP-B Series

Suitable: Professionl design, engineers

LAP-B(70256L)

[Specifications]

- Sampling Frequency of Time Squence Measurement : 100Hz~400MHz.
- Sampling Frequency of State Analysis : Max150MHz.
- Trigger Channel : 70CH
- The Multi-level trigger : The trigger level can reach to 9 levels
- Memory Size : 17.5Mbits
- The memory size of each channel can reach to 256Kbits, matched with the patent of compression technology; each channel can be captured about 128Kbits x 4G data at best.

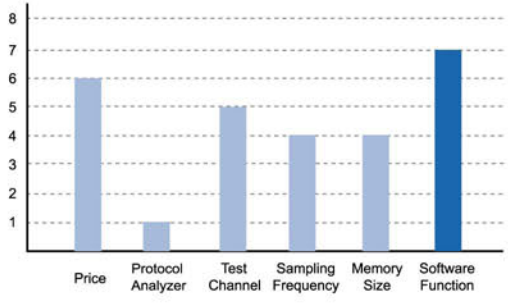
[Protocol Analyzer]

The common protocol analyzer decoding is supplied for engineers for free, such as IIC, UART, SPI and 7-SEGMENT LED. With the service of supplying the customize specialism protocol analyzer, we can make the protocol analysis function as your requirements.

[Features]

LAP-B (70256L) is designed for engineer to support the mult-channel; it has 9-level trigger function. When engineers check the complex signals, with the help of Multlevel developed by Zeroplus, engineers can set many conditions to do once trigger. And engineers can find the correct and required data from the results of the multi-level trigger.Matched with the flexible constrast function, LAP-B (70256L) can be used for producing to do the automatic test, which can reduce the cost of labour force.

Advantage Analysis



LAP-B(702000L)

[Specifications]

- Sampling Frequency of Time Sequence Measurement : 100Hz~400MHz
- Sampling Frequency of State Analysis : Max150MHz
- Trigger Channel : 70CH
- Multlevel trigger : The trigger level can reach to 16 levels
- Memory Size : 140Mbits
- The memory size of each channel can reach to 2Mbits, matched with the patent of compression technology; each channel can be captured about 1Mbits x 4G data at best.

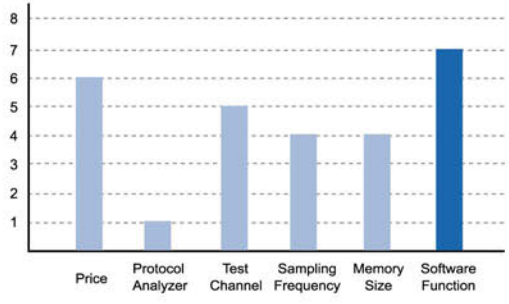
[Protocol Analyzer]

The common protocol analyzer decoding is supplied for engineers for free, such as IIC, UART, SPI and 7-SEGMENT LED. With the service for supplying the customized exclusive protocol analyzer, we can make the protocol analysis function as your requirements.

[Features]

LAP-B (702000L) is designed for engineer to support the mult-channel, the memory size of its each channel can reach to 2M and 16 level trigger function. Zeroplus main programmes can automatically upgrade the version through the network to use the latest software for free forever, and users can learn the latest software download news through the information tip column in the saftware interface.

Advantage Analysis



LAP-B Specification

Product model		LAP-B (70256)	LAP-B (70256L)	LAP-B (702000)	LAP-B (702000L)
Operating System		Windows 98SE/ME/2000/XP/Vista			
Interface		USB2.0(1.1)			
Sample rate	Internal Clock (Timing Mode)	100Hz~400MHz*			
	External Clock (State Mode)	Max 150MHz			
	Mix sampling	YES			
Threshold Voltages	Bandwidth	100MHz			
	Working Range	-6V~+6V			
	Accuracy	±0.1V			
Memory	Memory	17.5Mbits		140Mbits	
	Depth (Per Channel)	256Kbits (Max 128Kbits x 4G for compression)		2Mbits (Max 1Mbits x 4G for compression)	
Trigger	Condition	Pattern/Edge/Wide/AND/OR		Pattern/Edge/Wide/AND/OR	
	Trigger Channel	70CH		70CH	
	Pre/Post Trigger	YES		YES	
	WaveformTrigger Width	YES		YES	
	Trigger Level	9 Level		16 Level	
	Trigger Count	1~65535			
Bus / Protocol (Keep Increasing)	IIC / UART / SPI	Free	Free	Free	Free
	7-SEGMENT LED	Free	Free	Free	Free
	1-WIRE / HDQ / IIS	Free	Option	Free	Option
	CAN 2.0B / USB 1.1	Free	Option	Free	Option
	PS/2 / SSI	Free	Option	Free	Option
	MICROWIRE	Free	Option	Free	Option
	MANCHESTER	Free	Option	Free	Option
	LIN 2.1 / MILLER	Free	Option	Free	Option
	SIGNIA 6210 / S/PDIF	Option	Option	Option	Option
	JTAG 2.0 / ST7669 / MOD	Option	Option	Option	Option
	LPC / ST / LPC-SERIRQ	Option	Option	Option	Option
	LCD1602 / FLEXRAY 2.1A	Option	Option	Option	Option
	IRDA / SD 1.1 / DMX512	Option	Option	Option	Option
	CCIR656 / DSA	Option	Option	Option	Option
	MII / PCM	Option	Option	Option	Option
	Digital Logic Analyzer	Option	Option	Option	Option
Software Functions	Operating Interface Language	Chinese (Simplified/Traditional)/English			
	Enable & Enable Delay	YES			
	Data Compression	YES			
	Enable Bar	YES			
	Pulse Width Display	YES			
	Trigger Page	1~8192 Pages			
	Trigger Delay	YES			
	Infinite Increase Spacer Bar	YES			
	Automatic Zoom in of Spacer Bar	YES			
	Automatic Software Upgrade	YES			
	Package List	YES			
	Data Statictis	YES			
	Data Constrast	YES			
	Serial Bus Data Trigger	YES			
Phase Errors		<1.5ns			
Power		AC100~240V,50~60Hz			
Maximum Input Voltage		±30V			
Impedance		500KΩ/10pF			
Safety Certification		FCC/CE			

* When Sample rate is 400MHz,Compression and enable are disabled.

Package Contents

Item	Quantities
Logic Analyzer	1
BNC Cable 	1
AC Power Cable 	1
USB cable 	1
8-Pin Testing Cable 	8
1-PinTesting Cable (White)	4
2-Pin Testing Cable (Black)	4
Probes (test grabbers) 	36 pcs *2
Installation Guide 	1
Drive CD 	1
Recommended Tool Bag 	1

Our Coustomers

Consumer Electronics

- Quanta Computer, Inc.
- MSI Computer Corp.
- Sunplus Technology Co., Ltd.
- Inventec Corp.
- ASUSTek Computer, Inc.
- Mitac International Corp.
- Yamaha KHS Music Co., Ltd.
- Transcend Informational, Inc.
- Qisda Corp.
- Logitech, Inc.
- Cheng Uei Precision Industry Co., Ltd.
- TECOM Co., Ltd.

Control

- TECO Electric & Machinery Co., Ltd.
- Far Eastern Textile Co., Ltd.

IC Interface

- ATMEL Corp.
- Winbond Electronics Corp.
- SiliconMotion Technology Corp.
- ELAN Microelectronics Corp.
- RENESAS Technology Corp.
- Realtek Semiconductor Corp.
- Sonix Technology Co.,Ltd.
- Novatek Microelectronics Corp.
- Broadcom Corporation
- Mstar Semiconductor, Inc.

OPTICAL

- EVE LIGHT Technology
- Silicon Optronics, Inc
- Top Powersonic Co., Ltd.

Academic Research

- National Taipei University of Technology
- Southern Taiwan University
- National Chiao Tung University
- LUNGHWA University of Science and Technology
- I-SHOU University
- ACADEMIA SINICA
- Industrial Technology Research Institute
- Tamkang University
- National Tsing Hua University
- Minghsn University of Science and Technology

Automotive

- Industrial Technology Research Institute
- Automotive Research & Testing Center
- Hua-chuang Automobile Information Technical Center Co., Ltd.

Computer

- Unitech Electronics Co,. Ltd.

Other

- Secom Co., Ltd.

2009 Future Products

- PC Based MSO (Logic Analyzer + Oscilloscope in One)
- PC Based Oscilloscope.
- PC Based Signal Generator.
- PC Based Signal Generator + Logic Analyzer in One.
- PC Based Protocols Decoders (such as CAN decoder, LIN decoder, USB decoder….Distributors are welcome to advise us which decoders most important to them to develop in advance.)

Each product will be extended into many models.

ZEROPLUS TECHNOLOGY CO., LTD

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