Acute MSO2000 series

3-in-1 Analyzer
Logic Analyzer, Protocol Analyzer, Simple DSO

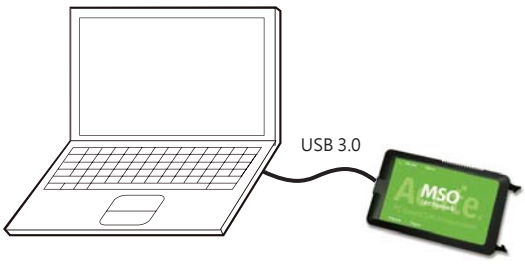
- PC-based, USB3.0 interface / power
- 8 / 16 Channels (display digital and analog waveforms of the same channel)
- Digital Inputs : 2 GHz Timing, 200MHz State Analysis (Max.)
- Analog Inputs : 200 MS/s (Max.), Bandwidth 40 MHz
- 8 Gb Memory (Max.)
- PC RAM storage for streaming mode
- Protocol Decode : BiSS-C, CAN 2.0B/CAN FD, DP_Aux[1], eSPI, I²C, I²S, MII, MIPI I3C 1.1, Serial Flash, SPI, SVID[2], UART (RS232), USB PD 3.1, USB1.1, ... (100+)
- Protocol Trigger I : I2C, MIPI I3C 1.1, SPI, UART (RS232)
- Protocol Trigger II : BiSS-C, CAN2.0B/CAN FD, DP_Aux[1], LIN2.2, SENT, USB PD 3.1,...
- Protocol Trigger III : DALI, MDIO, MIPI RFFE 3, MIPI SPMI 2, Modbus, PMBus, SMBus, USB1.1,...
- Protocol Trigger IV : eMMC 4.5, eSPI, MII, RGMII, RMII, SD 2.0 (SDIO 2.0), Serial Flash (SPI NAND), SVID[3]
- Protocol Analyzer I : I2C, MIPI I3C 1.1, SPI, UART (RS232)
- Protocol Analyzer II : BiSS-C, CAN2.0B/CAN FD, DP_Aux[1], HID over I2C, I2S, LIN2.2, USB PD 3.1
- Protocol Analyzer III : DALI, MDIO, MIPI RFFE 3, Modbus, PMBus, Profibus, PWM, SMBus, USB1.1
- Protocol Analyzer IV : eSPI, MII, RGMII, RMII, SVID[3]

Model	Channels	Sample Rate	Memory	Protocol Trigger/ Protocol Analyzer	Power Sequence Channels
MSO2008E	8	2 GHz	2 Gb	I	8
MSO2116E	16	2 GHz	4 Gb	I, II	16
MSO2116B	16	2 GHz	4 Gb	I, II, III	16
MSO2216B	16	2 GHz	8 Gb	I, II, III, IV	16 (128/ 8 sets cascaded)

Software Window

System Requirements

- USB 3.0 port
- Windows 7/8/10/11 (64-bit)
- PC RAM 16GB (recommended) or 8GB at least



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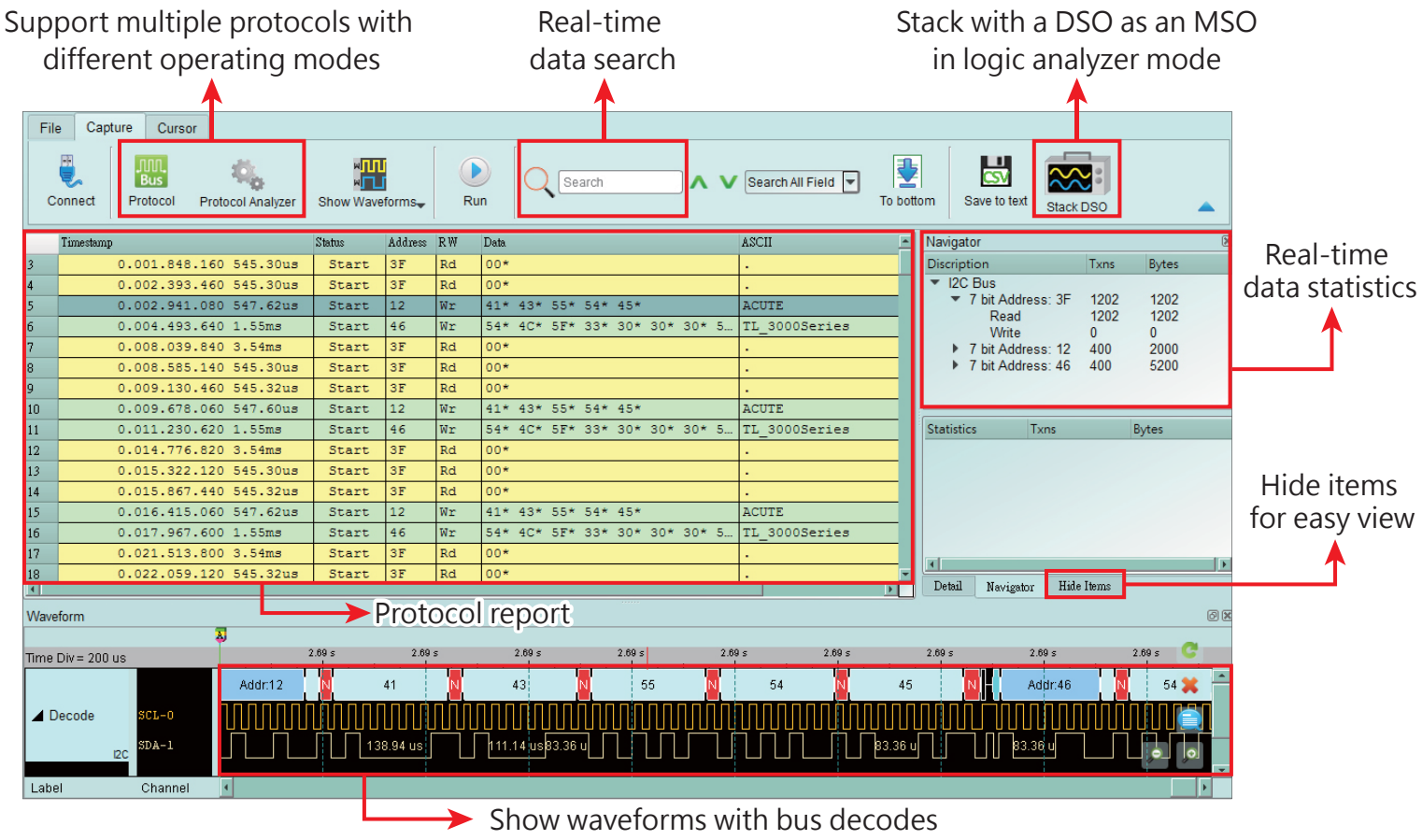
Protocol Analyzer:

It is hardware decoding, may log protocol data very long time if without waveforms.
Application timing: Preliminary protocol debug.



Protocol Analyzer

Show real-time protocol data
Application timing: massive protocol data with some idles in between

Protocol Logger

Like data logger, save massive data into SSD hard drive
Application timing: massive protocol data

Protocol Monitor

Like dash cameras, record protocol data by the device's memory only
Application timing: trigger event only happens in very long time

Packing List :

MSO2008/2116E

MSO2000B

8.5cm Lead Cable
MSO2216B only

18.5cm
Lead Cable

USB 3.0 cable

Grippers
Stack cable

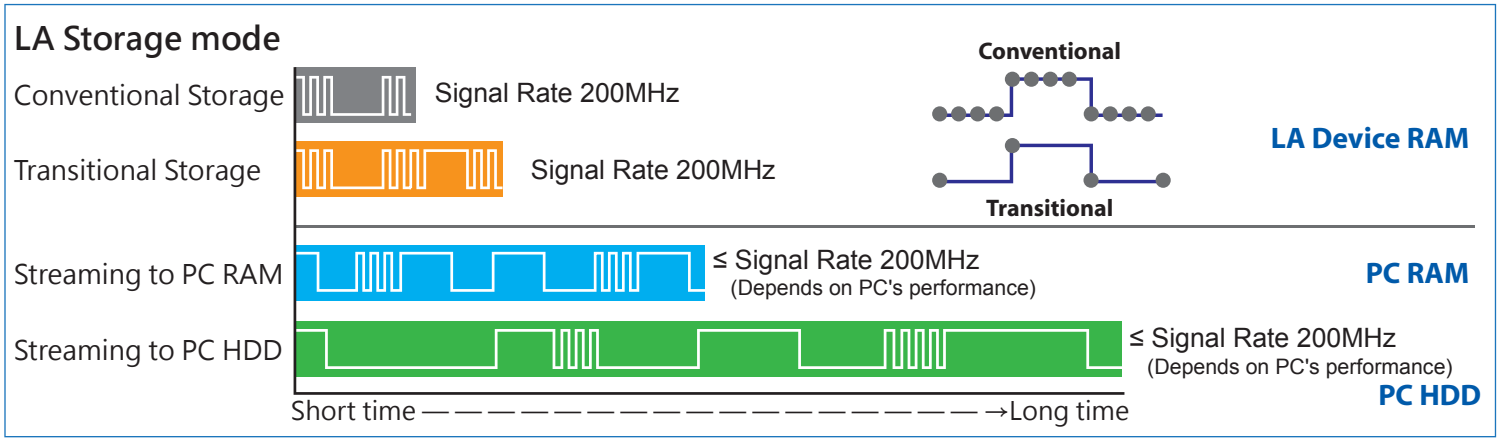
Handbag

Software and Manual Download links at: http://www.acute.com.tw

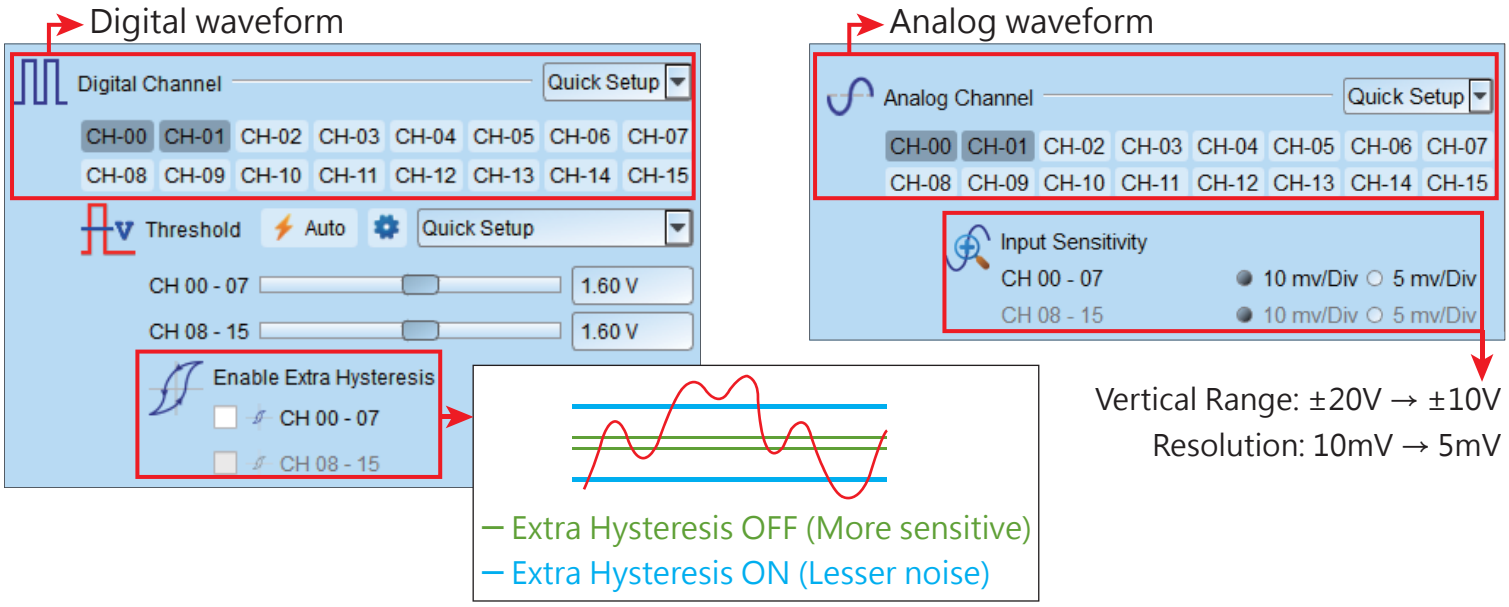
Logic Analyzer:

Built-in DSO to capture analog waveforms to compare with the digital waveforms.

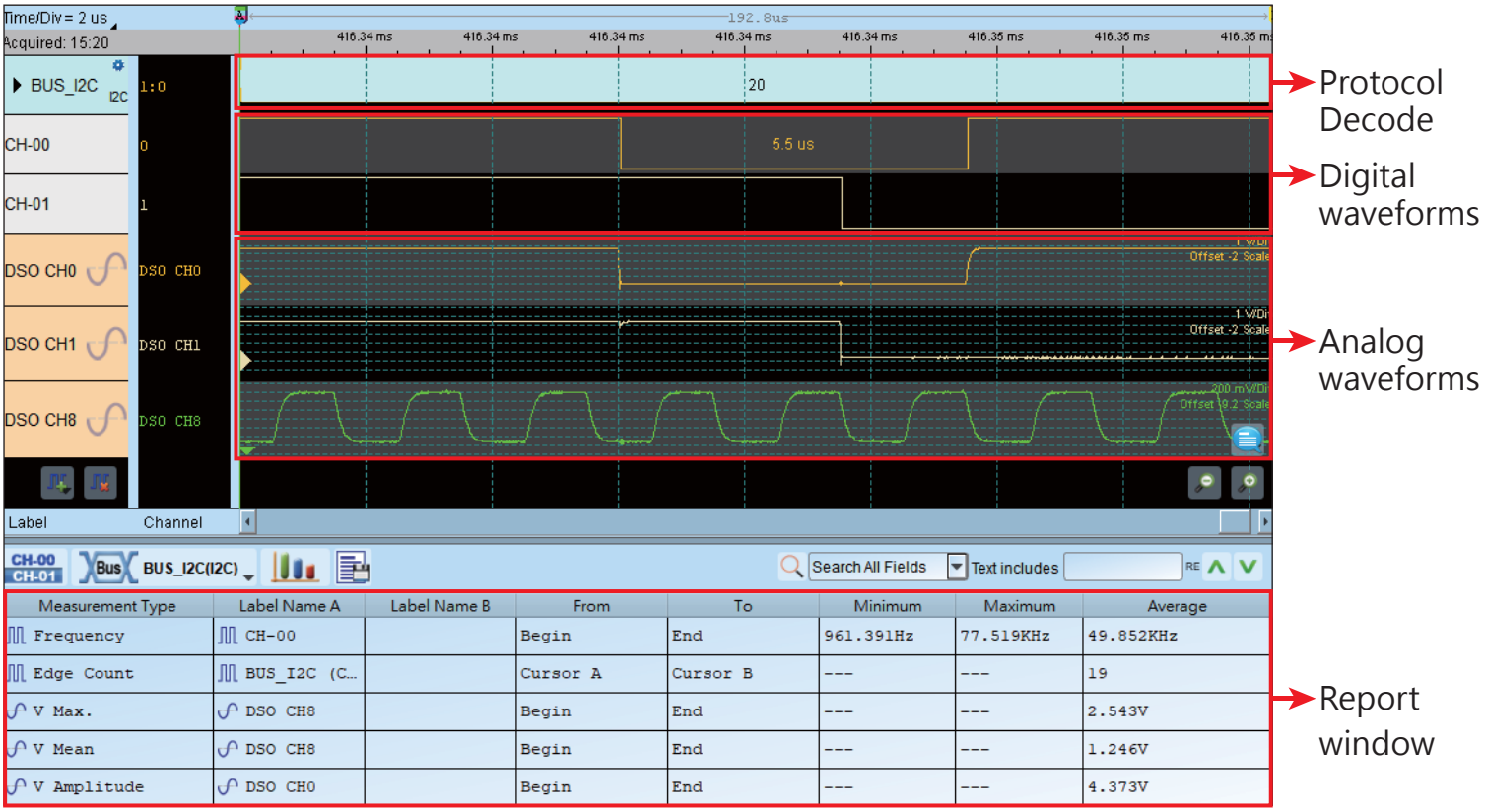
Provides multiple storage modes, users could select to have long time recording or precision acquisition.



Each channel supports both digital and/or analog waveforms measurements, voltage resolution can be changed between 2 levels for all channels at the same time.



Compare digital and analog waveforms at the same channel for statistics.



Measurement Type	Label Name A	Label Name B	From	To	Minimum	Maximum	Average
Frequency	CH-00		Begin	End	961.391Hz	77.519KHz	49.852KHz
Edge Count	BUS_I2C (C…		Cursor A	Cursor B	---	---	19
V Max.	DSO CH8		Begin	End	---	---	2.543V
V Mean	DSO CH8		Begin	End	---	---	1.246V
V Amplitude	DSO CH0		Begin	End	---	---	4.373V

MSO series

Model		MSO2008E	MSO2116E	MSO2116B	MSO2216B
Power	Power Source	USB bus-power (+5V)			
	Static Power Consumption	0.9W			
	Max Power Consumption	<3.9W	<6W		
Hardware Interface		USB 3.0			
Channels (Data / Clock / Ground)		8/1/23	16/1/23		
Total Memory		2 Gb	4 Gb		8 Gb
Analog Inputs	Group	I (CH0~7)	I, II (CH0~7, CH8~15)		
	Sampling Rate (by group)	200MHz/1CH, 100MHz/2CH, 50MHz/4CH, 25MHz/8CH	200MHz/2CH, 100MHz/4CH, 50MHz/8CH, 25MHz/16CH		
	Bandwidth	40MHz			
	ADC Bits	12			
Digital Inputs	Timing Analysis (Asynchronous)	Available channels (Conventional / Transitional Timing) - Memory per channel			
	2 GHz	(8/7) - 256Mb	(8/7) - 512Mb		(8/7) - 1Gb
	1 GHz	(8/8) - 256Mb	(16/14) - 256Mb		(16/14) - 512Mb
	500 MHz	(8/8) - 256Mb	(16/16) - 256Mb		(16/16) - 512Mb
	250 MHz and lower	(8/8) - 256Mb	(16/16) - 256Mb		(16/16) - 512Mb
	State Clock Rate (Synchronous, External Clock)	200MHz			
	Data Storage	Conventional Timing, Transitional Timing			
Channel to channel skew		< 1ns			
Threshold	Group	I (CH0~7 & CKI)	I, II (CH0~7 & CKI, CH8~15)		
	Range	+20V ~ -20V			
	Resolution	50mV			
	Accuracy	±100mV + 5%*Vth			
Input Voltage	Non-Destructive	over +/-42V DC & AC			
	Operation (Standard / High Resolution)	-20V ~ +20V / -10V ~ +10V			
	Sensitivity (1Vpp)	200MHz			
	Extra Hysteresis (On/Off)	560mV / 80mV			
Impedance		1MΩ//2pF			
Temperature	Operating / Storage	5℃~45℃ (41℉~113℉) / -10℃~65℃ (14℉~149℉)			
I/O port	Trig-In	TTL 3.3V (Rising / Falling)			
	Trigger pulse approval	> 8 ns			
	Trig-Out	TTL 3.3V, Pulse Width			
	Ref. Clock Input	10MHz, Vpp=3.3 to 5V			
	Ref. Clock Output	10MHz, TTL 3.3V			
	Connector type	MCX jack / female			
Trigger	Resolution	500ps			
	Channels	8	16		
	States	16			
	Events	16			
	Pre / Post	Yes			
	Pass Counter	Yes (0~1048575 times)			
	Digital	Channel, Pattern, Single / Multi Level, Width, Time-out, Setup/Hold Timing Violation, External, Manual			
	Analog	Rising / Falling, Activity			
	Protocol I	I2C, MIPI I3C 1.1, SPI, UART (RS232)			
	Protocol II	---	BiSS-C, CAN2.0B/CAN FD, DP_Aux[1], HID over I2C, I2S, LIN2.2, SENT, USB PD 3.1		
	Protocol III	---		DALI, LPC, MDIO, Mini/Micro LED, MIPI RFFE 3, MIPI SPMI 2, Modbus, PMBus, Profibus, SMBus, SVI2, USB1.1	
	Protocol IV	---			eMMC 4.5, eSPI, MII, RGMII, RMII, SVID[3], SD 2.0 (SDIO 2.0), Serial Flash (SPI NAND)
Protocol Analyzer	I	I2C, MIPI I3C 1.1, SPI, UART (RS232)			
	II	---	BiSS-C, CAN2.0B/CAN FD, DP_Aux[1], HID over I2C, I2S, LIN2.2, USB PD 3.1		
	III	---		DALI, MDIO, MIPI RFFE 3, Modbus, PMBus, Profibus, PWM, SMBus, USB1.1	
	IV	---			eSPI, MII, RGMII, RMII, SVID[3]
Software Features	Power Sequence	Input setup .CSV file for Timing Sequence and H/W Strap check.			
	Measurement	Digital or Analog waveforms			
	Zoom / Report Window	YES			
	Note editor	Edit notes on Waveform Window			
	Quick Bus Decode Setup	YES			
	Trigger / Auxiliary cursors	1/25			
	Data Logger	Saved to Hard Disk Drive			
	Protocol Decode	1-Wire, 3-Wire, 7-Segment, A/D Mux Flash, AccMeter, ADC, APML, AVSBus, BiSS-C, BSD, BT1120, CAN 2.0B/FD, CEC, Close Caption, CODEC_SSI, DALI, DMX512, DP_Aux[1], EDID, eMMC 4.5/MMC, eSPI, FlexRay, HD Audio, HDLC, HDQ, HID over I²C, I²C EEPROM, I²C, I²S (PCM, TDM), IrDA, ITU-R BT.656 (CCIR656), JTAG, JVC IR, LCD1602, LED_Ctrl, LIN 2.2, Line Decoding, Line Encoding, Lissajous, LPC, LPT, Math, M-Bus, MDDI, MDIO, MHL CBUS, Microwire, Mini/Micro LED, MIPI CSI LP, MIPI DSI LP, MIPI I3C 1.1, MIPI RFFE 3, MIPI SoundWire 1.2, MIPI SPMI 2, Modbus, NEC IR, PECI 3.0, PMBus, Profibus, PS/2, PWM, QEI, QI, QSPI, RC-5, RC-6, S/PDIF, SD 2.0 (SDIO 2.0), SENT, Serial Flash, Serial IRQ, SGPIO, Smart Card, SMBus (SBS, SPD), SMI, SPI, SPI-NAND, SSI, ST7669, SVI2, SVID[2], SWD, SWIM, SWP, UART (RS232), ULPI, UNI/O, USB 1.1, USB PD 3.1, Wiegand, ...			
	Line Decoding	Biphase Mark, Differential-Manchester, Manchester (Thomas, IEEE802.3), Miller, Modified Miller, NRZI, ...			
	Line Encoding	AMI(Standard, B8ZS, HDB3), Biphase Mark, CMI, Differential-Manchester, Manchester (Thomas, IEEE802.3), MLT-3, Miller, Modified Miller, NRZI, Pseudoternary, ...			
Dimension	L x W x H (mm³)	123 x 76 x 21			
Lead Cable	Data / CLK / NC / GND	8 / 1 / 8 / 23	16 / 1 / 0 / 23		
Grippers		10	20		
Stack cable	MCX to MCX (30cm)	1		2	

[1] Optional DP AUX adapter needed. [2] Upon request ONLY by users who have signed CNDA with Intel, SVID decode supported by all MSO models
[3] Upon request ONLY by users who have signed CNDA with Intel, SVID trigger & PA supported by MSO2216B ONLY.