Acute MSO2000 series

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



- PC-based, USB3.0 interface / power
- 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 1.2, Serial Flash, SPI, SVID[2], UART (RS232), USB PD 3, USB1.1, ... (100+)
- Protocol Trigger I : 10BASE-T1S[1], CAN2.0B/CAN FD, DP_Aux[1], I2C, MIPI I3C 1.2, UART (RS232),...
- Protocol Trigger II : DALI, MDIO, MIPI RFFE 3, MIPI SPMI 2, Modbus, PMBus, SMBus, USB1.1,...
- Protocol Trigger III : eMMC 4.5, eSPI, MII, RGMII, RMII, SD 2.0 (SDIO 2.0), SVI3[2], SVID[3]
- Protocol Analyzer I : 10BASE-T1S[1], CAN2.0B/CAN FD, DP_Aux[1], I2C, MIPI I3C 1.2, UART (RS232),...
- Protocol Analyzer II : DALI, MDIO, MIPI RFFE 3, Modbus, PMBus, Profibus, PWM, SMBus, USB1.1
- Protocol Analyzer III : eSPI, MII, RGMII, RMII, SVI3[2], SVID[3]

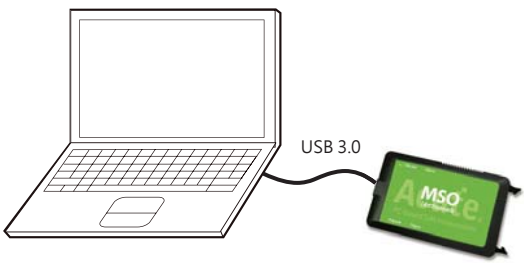
Model	Channels	Sample Rate	Memory	Protocol Trigger/ Protocol Analyzer	Power Sequence Channels
MSO2116E	16	2 GHz	4 Gb	I	16
MSO2116B	16	2 GHz	4 Gb	I, II	16
MSO2216B	16	2 GHz	8 Gb	I, II, III	16 (128/ 8 sets cascaded)

Software Window



System Requirements

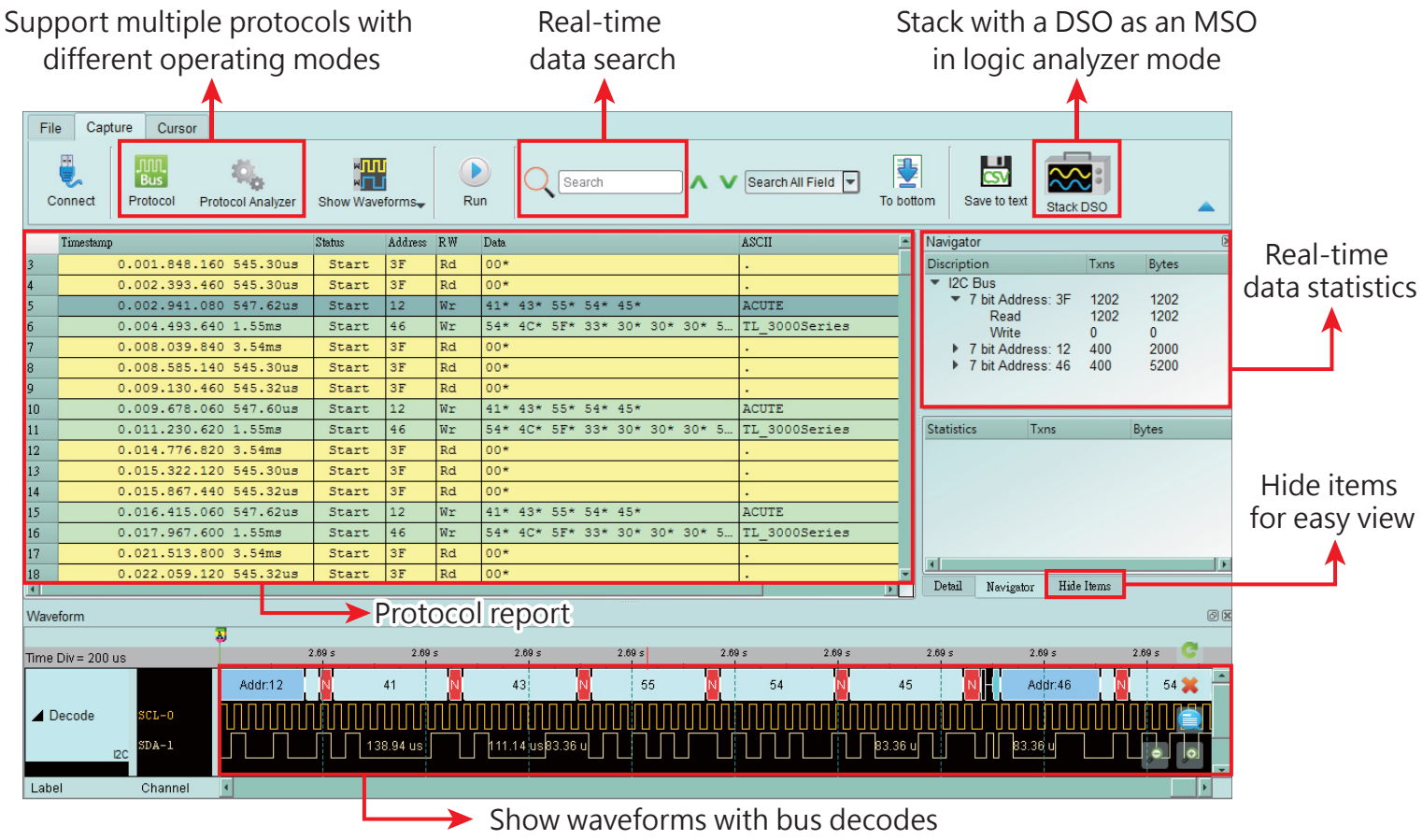
- USB 3.0 port
- Win 7, Win 8, Win 10, Win11
- PC RAM 16GB (recommended) or 8GB at least



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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: view real-time protocol data if many idles in between



Protocol Logger

Like data logger, save massive data into SSD hard drive
Application timing: save massive protocol data if not many idles in between



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 :



MSO2116E



MSO2000B



8.5cm Lead Cable
MSO2216B only



18.5cm
Lead Cable



USB 3.0 cable



Grippers



Stack cable



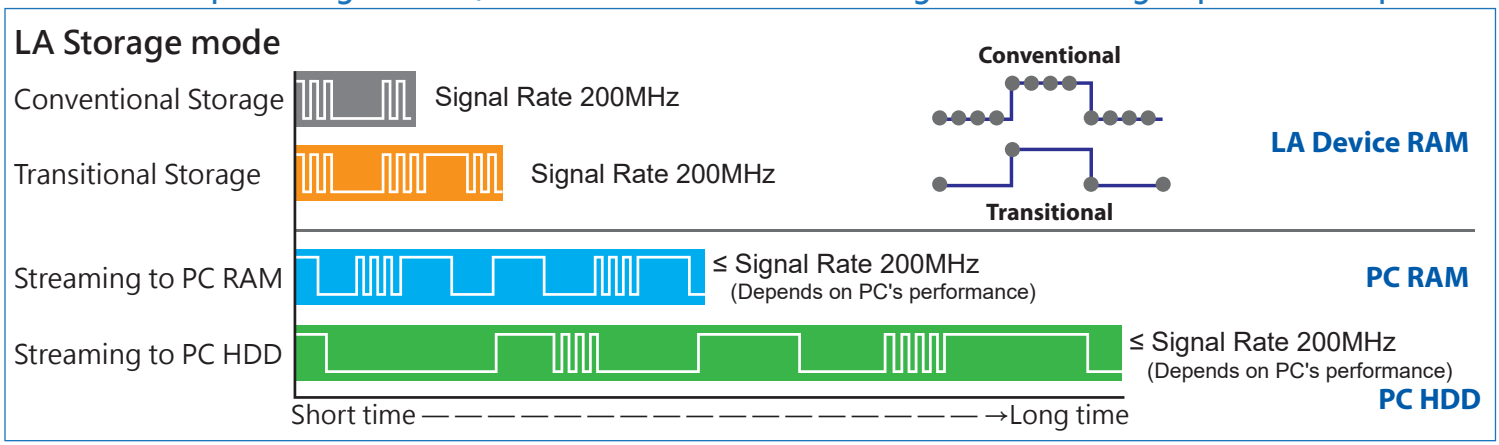
Handbag

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

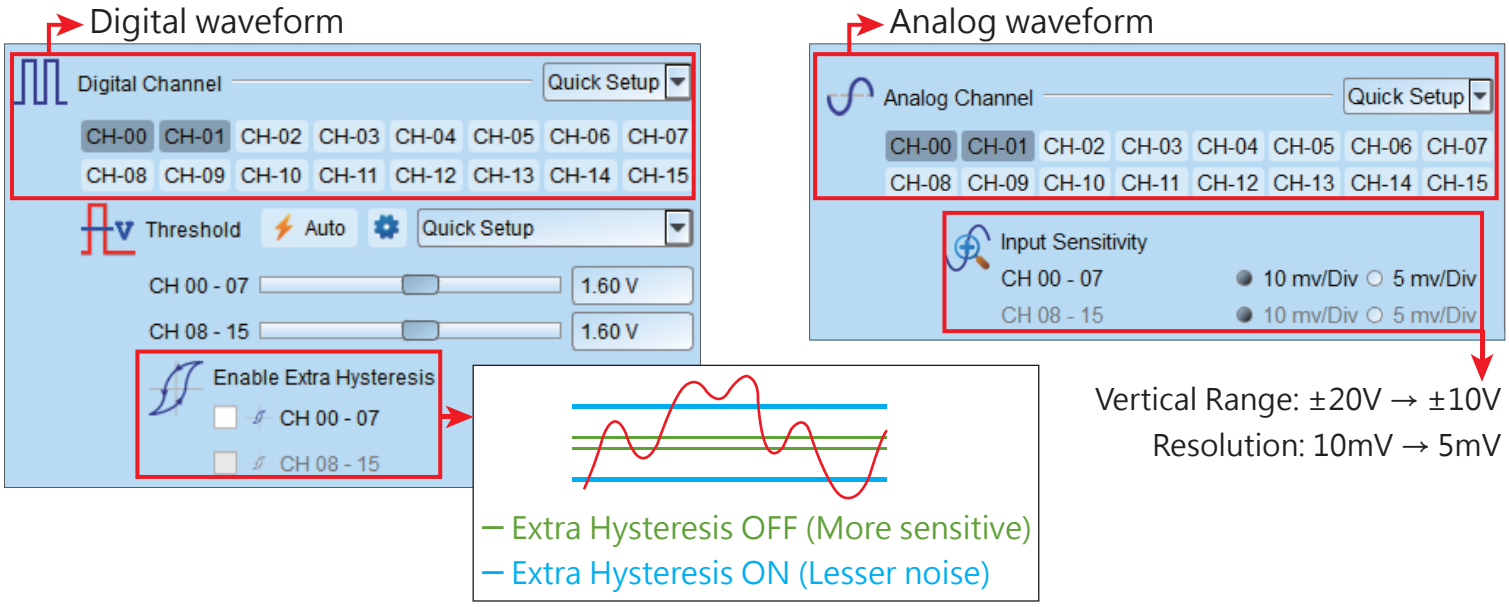
Logic Analyzer:

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

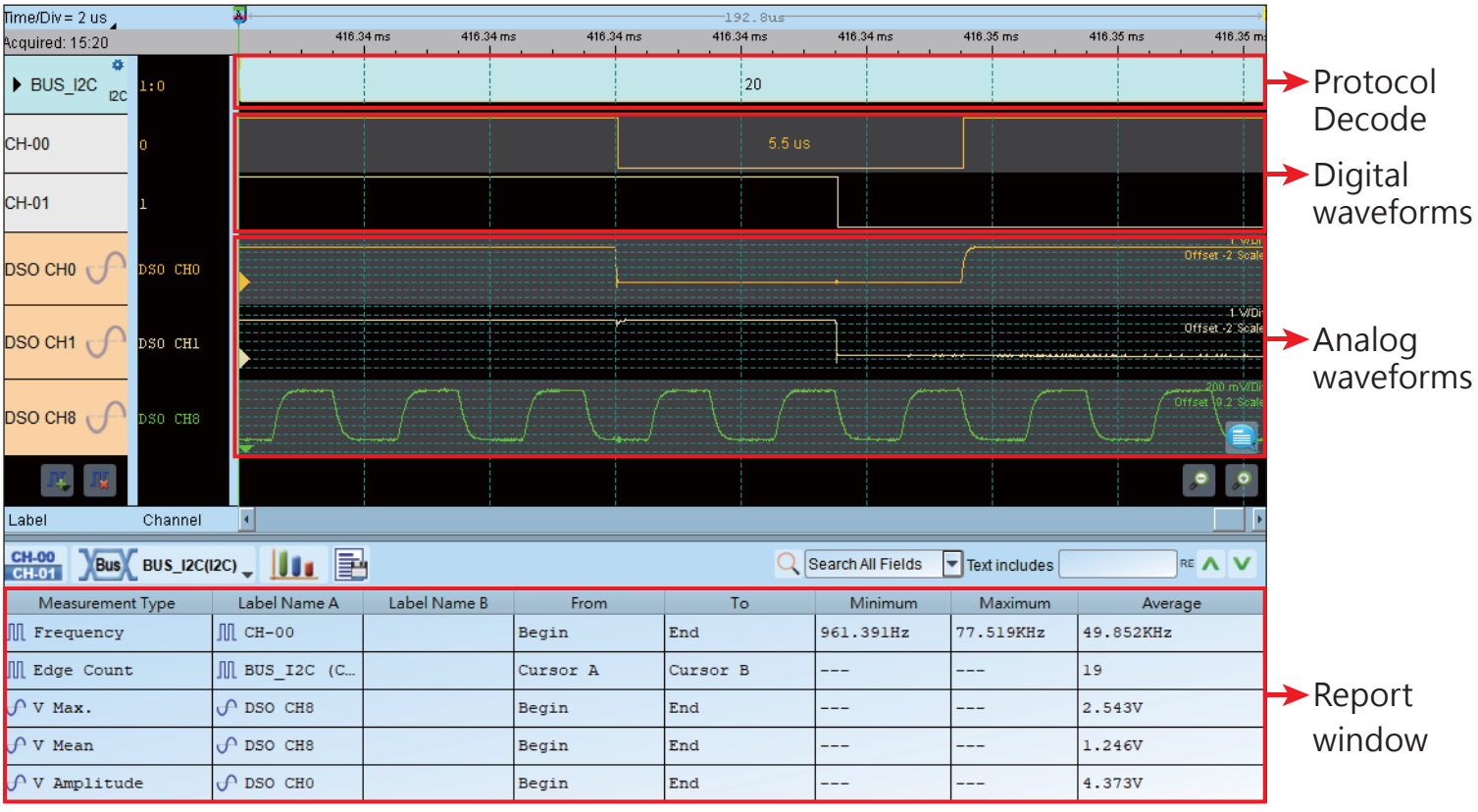
Provides multiple storage modes, users could select to have long time recording or precision acquisition.



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

MSO2000 series

Model		MSO2116E	MSO2116B	MSO2216B
Power	Power Source	USB bus-power (+5V)		
	Static Power Consumption	0.9W		
	Max Power Consumption	<6W		
Hardware Interface		USB 3.0		
Channels (Data / Clock / Ground)		16/1/23		
Total Memory		4 Gb		8 Gb
Analog Inputs	Group	I, II (CH0~7, CH8~15)		
	Sampling Rate (by group)	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) - 512Mb		(8/7) - 1Gb
	1 GHz	(16/14) - 256Mb		(16/14) - 512Mb
	500 MHz	(16/16) - 256Mb		(16/16) - 512Mb
	250 MHz and lower	(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, 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	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	10BASE-T1S[1], BiSS-C, CAN2.0B/CAN FD, DP_Aux[1], HID over I2C, I2C, I2S, LIN2.2, MIPI I3C 1.2, SENT, SPI, UART (RS232), USB PD 3		
	Protocol II	---	DALI, LPC, MDIO, Mini/Micro LED, MIPI RFFE 3, MIPI SPMI 2, Modbus, PMBus, Profibus, SMBus, SVI2, USB1.1	
	Protocol III	---		eMMC 4.5, eSPI, MII, RGMII, RMII, SVI3[2], SVID[3], SD 2.0 (SDIO 2.0), Serial Flash (SPI NAND)
Protocol Analyzer	I	10BASE-T1S[1], BiSS-C, CAN2.0B/CAN FD, DP_Aux[1], HID over I2C, I2C, I2S, LIN2.2, MIPI I3C 1.2, SPI, UART (RS232), USB PD 3		
	II	---	DALI, MDIO, MIPI RFFE 3, MIPI SPMI 2, Modbus, PMBus, Profibus, PWM, SMBus, USB1.1	
	III	---		eSPI, MII, RGMII, RMII, SVI3[2], 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, 8b10b decoding, 10BASE-T1S[1], A/D Converter, AccMeter, APML, AVSBus, BiSS-C, BSS, BSD, BT1120, CAN 2.0B/FD, CEC, Closed Caption, CODEC_SSI, DALI, DDC(EDID), DMX512, DP_Aux[1], eSPI, FlexRay, HD Audio, HDLC, HDQ, HID over I2C, HID over SPI, HTSensor, I2C, I2C(EEPROM), I2S, IOLink, IrDA, ISELED Digital RGB, ITU-R BT.656(CCIR656), J1850, JTAG, JVC IR, LCD1602, LED_CTRL, LIN2.2, Line Decoding, Line Encoding, LPC, LPT, Math, MBus, MCTP over I2C/I3C/SMBus[4], MDDI, MDIO, MHL-CBUS, Microchip SWI, MICROWIRE, MII / RMII / RGMII / GMII, Mini/Micro LED, MIPI CSI LP, MIPI DSI LP, MIPI I3C 1.2, MIPI RFFE 3, MIPI SoundWire 1.2, MIPI SPMI 2, MMC/eMMC 4.5, Modbus, M-PESTI, NEC IR, OA3p(PMD), OATC6 over SPI, PCM, PDM, PECI 3.0, PMBus, Profibus, PS/2, PWM, QEI, QI, QSPI, RC-5, RC-6, RT_SWI, SD 2.0 (SDIO 2.0), SDQ, SENT, Serial Flash, Serialized IRQ, SGPIO, Smart Card (ISO7816), SMBus (SBS SPD), SMI, S/PDIF, SPI, SPI NAND, SSI, ST7669, SVI2, SVI3[2], SVID[3], SWD, SWIM, SWP, TDM, UART (RS232), UFCS, ULPI, UNI/O, USB1.1, USB4/TBT3 SB Channel, USB PD 3, 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	16 / 1 / 0 / 23		
Grippers		20		
Stack cable	MCX to MCX (30cm)	2		

[1] Optional 10BASE-T1S / DP_Aux adapter needed. [2] Upon request by user who is approved by AMD. SVI3 decode, trigger and protocol analyzer are supported ONLY by MSO2216B.
[3] Upon request by user who has signed CNDA with Intel. SVID decode, trigger and protocol analyzer are supported ONLY by MSO2216B.
[4] MCTP over I²C/I3C/SMBus decode supports analysis of Ethernet / MCTP Control / NC-SI / PLDM packets.

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