

MSO series

Model	MSO2008W	MSO2116W	MSO2116B	MSO2216B	MSO2216B+
Power	Power Source: USB bus-power (+5V)				
	Static Power Consumption: <3.9W		0.9W		
Max Power Consumption		<6W			
Hardware Interface: USB 3.0					
Channels (Data / Clock / Ground)		8/1/23		16/1/23	
Total Memory		2 Gb		8 Gb	
Analog Inputs	Group: I (CH0~7)		I, II (CH0~7, CH8~15)		
	Sampling Rate in Group I or II		200MHz/1CH, 100MHz/2CH, 50MHz/4CH, 25MHz/8CH		
	Sampling Rate in Group I and II		Lower of Group I or II		
	Bandwidth		40MHz		
ADC Bits		12			
Timing Analysis (Asynchronous): Available channels (Conventional / Transitional Timing) - Memory per channel					
Digital Inputs	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)		150MHz		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		50mV		
	Resolution: ±100mV + 5%*Vth		over +/-42V DC & AC		
Input Voltage	Non-Destructive Operation (Standard / High Resolution)		-20V ~ +20V / -10V ~ +10V		
	Sensitivity (1Vpp)		150MHz		200MHz
	Extra Hysteresis (On/Off)		560mV / 80mV		
Impedance: 1MΩ/2pF					
Temperature: Operating / Storage: 5°C~45°C (41°F~113°F) / -10°C~65°C (14°F~149°F)					
I/O port	Trig-In: TTL 3.3V (Rising / Falling)		> 8 ns		
	Trigger pulse approval		TTL 3.3V, Pulse Width		
	Trig-Out		10MHz, Vpp=3.3 to 5V		
	Ref. Clock Input		10MHz, TTL 3.3V		
	Ref. Clock Output		MCX jack / female		
	Connector type		500ps		
	Resolution		8		
Trigger	Channels		16		
	States		16		
	Events		16		
	Pre / Post		Yes		
	Pass Counter		Yes (0~1048575 times)		
	Analog		Channel, Pattern, Single / Multi Level, Width, Time-out, External		
	Digital		Rising / Falling		
	Bus I		I2C		
	Bus II		CAN 2.0B/CAN FD, LIN2.2, SPI, UART (RS232)		
	Bus III		BiSS-C, DALI, DP_Aux ¹ , HID over I2C, I2S, I3C, MDIO, MIPI RFFE, Mini/Micro LED, MIPI CSI LP, MIPI DSI LP, MIPI RFFE, MIPI SPMI 2.0, Modbus, PMBus, Profibus, SMBus, SVI2, USB1.1, USB PD 3.0		
	Bus IV		eMMC 4.5, eSPI, MII, RGMII, RMII, SVID ³ , SD 2.0 (SDIO 2.0), Serial Flash (SPI NAND)		
	Protocol Analyzer		I2C		
	III		CAN 2.0B/CAN FD, LIN2.2, SPI, UART (RS232)		
	IV		BiSS-C, DALI, DP_Aux ¹ , HID over I2C, I2S, I3C, MDIO, MIPI RFFE, Modbus, PMBus, Profibus, PWM, SMBus, USB1.1, USB PD 3.0		
Power Sequence Measurement: Input setup .CSV file for Timing Sequence and H/W Strap check. 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					
Software Features: 1-Wire, 3-Wire, 7-Segment, A/D Mux Flash, AccMeter, ADC, APML, AVSBus, BiSS-C, BSD, BT1120, CAN 2.0B/FD, Close Caption, CODEC_SSI, DALI, DMX512, DP_Aux ¹ , EDID, eMMC 5.1/MMC, eSPI, FlexRay, HD Audio, HDLC, HDQ, HID over I2C, I2C, I2C EEPROM, I2S (PCM, TDM), I3C, 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 RFFE, MIPI SPMI 2.0, Modbus, NEC IR, PECL 3.0, PMBus, Profibus, PS/2, PWM, QEI, QI, RC-5, RC-6, S/PDIF, SD 2.0 (SDIO 2.0), Serial Flash, Serial IRQ, SGPIO, Smart Card, SMBus (SBS, SPD), SMI, SoundWire, SPI, SPI-NAND, SSI, ST7669, SVI2, SVID ² , SWD, SWIM, SWP, UART (RS232), ULPI, UNI/O, USB 1.1, USB PD 3.0, Wiegand, ...					
Line Decoding: Biphase Mark, Differential-Manchester, Manchester (Thomas, IEEE802.3), Miller, Modified Miller, NRZI, ...					
Line Encoding: AMI(Standard, 8B2S, HDB3), Biphase Mark, CMI, Differential-Manchester, Manchester (Thomas, IEEE802.4), MLT-3, Miller, Modified Miller, NRZI, Pseudoternary, ...					
Dimension: L x W x H (mm ³): 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 / B+ ONLY.

Acute MSO series

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

- PC-based, USB3.0 interface
- 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
- Bus Decode : BiSS-C, CAN 2.0B/CAN FD, DP_Aux¹, eSPI, I²C, I²S, I3C, MII, Serial Flash, SPI, SVID², UART (RS232), USB PD 3.0, USB1.1, ... (90+)
- Bus Trigger I : I2C
- Bus Trigger II : CAN 2.0B/CAN FD, LIN2.2, SPI, UART (RS232)
- Bus Trigger III : BiSS-C, DALI, DP_Aux¹, I3C, LPC, Modbus, PMBus, Profibus, SMBus, SVI2, USB1.1,...
- Bus Trigger IV : eMMC 4.5, eSPI, MII, RGMII, RMII, SD 2.0 (SDIO 2.0), Serial Flash (SPI NAND), SVID³
- Protocol Analyzer I : I2C
- Protocol Analyzer II : CAN 2.0B/CAN FD, LIN2.2, SPI, UART (RS232)
- Protocol Analyzer III : BiSS-C, DALI, DP_Aux¹, I3C, MIPI RFFE, Modbus, Profibus, SMBus, USB1.1,...
- Protocol Analyzer IV : eSPI, MII, RGMII, RMII, SVID³

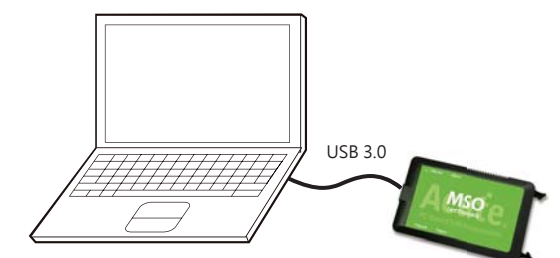
Model	Channels	Sample Rate	Memory	Bus Trigger/ Protocol Analyzer	Power Sequence	Cascade for more channels
MSO2008W	8	2 GHz	2 Gb	I	-	-
MSO2116W	16	2 GHz	4 Gb	I, II	-	-
MSO2116B	16	2 GHz	4 Gb	I, II, III	YES	-
MSO2216B	16	2 GHz	8 Gb	I, II, III, IV	YES	-
MSO2216B+	16	2 GHz	8 Gb	I, II, III, IV	YES	YES

Software Window



System Requirements

- USB 3.0 port
- Win 7, Win 8, Win 10 (64 bit)
- PC RAM 16GB (recommended) or 8GB at least



Acute

PC-based T&M Instruments

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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.

Support multiple protocols with different operating modes

Real-time data search

Stack with a DSO as an MSO in logic analyzer mode

The screenshot shows the software interface with several key areas highlighted:

- Protocol Analyzer Mode:** Indicated by a red box around the 'Protocol Analyzer' button in the top toolbar.
- Real-time data search:** A red box highlights the search bar and 'Search All Fields' dropdown.
- Stack with a DSO as an MSO:** A red box highlights the 'Stack DSO' button.
- Real-time data statistics:** A red box highlights the 'Statistics' panel on the right, showing transaction counts and bytes.
- Hide items for easy view:** A red box highlights the 'Hide Items' button in the bottom right of the data table.
- Protocol report:** A red box highlights the 'Protocol report' section at the bottom, showing a detailed view of the captured data.
- Show waveforms with bus decodes:** A red box highlights the waveform view at the bottom, which includes bus address and data decodes.

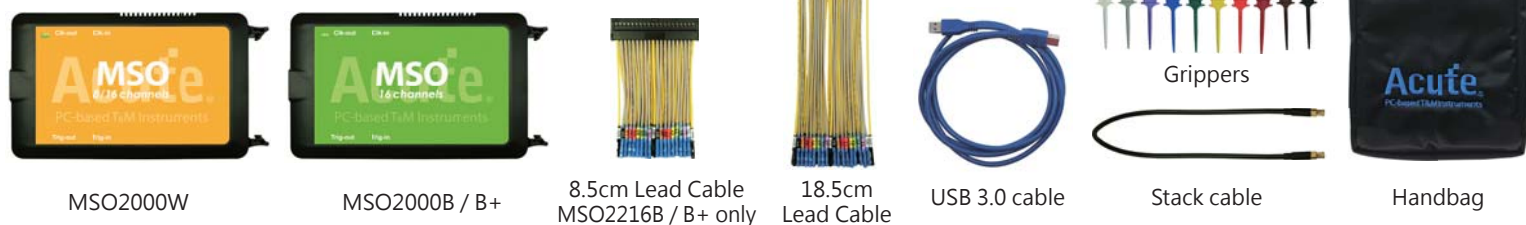
Show waveforms with bus decodes

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 :



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.

LA Storage mode

Conventional Storage: Signal Rate 200MHz
Transitional Storage: Signal Rate 200MHz
Streaming to PC RAM: ≤ Signal Rate 200MHz (Depends on PC's performance)
Streaming to PC HDD: ≤ Signal Rate 200MHz (Depends on PC's performance)
 Short time → Long time

Diagram illustrating storage modes and data flow:

- Conventional:** Data flows from the device to LA Device RAM.
- Transitional:** Data flows from the device to LA Device RAM, then to PC RAM.
- Streaming to PC RAM:** Data flows directly from the device to PC RAM.
- Streaming to PC HDD:** Data flows from the device to PC RAM, then to PC HDD.

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.

Digital Channel Settings: CH-00 to CH-15, Threshold, Auto, Quick Setup, Enable Extra Hysteresis (CH 00-07, CH 08-15).
Analog Channel Settings: CH-00 to CH-15, Input Sensitivity (CH 00-07, CH 08-15) with options for 10 mv/Div and 5 mv/Div.

Vertical Range: ±20V → ±10V
Resolution: 10mV → 5mV

— Extra Hysteresis OFF (More sensitive)
 — Extra Hysteresis ON (Lesser noise)

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

The screenshot shows a comparison of digital and analog waveforms on the same channel. The digital waveforms are shown in black, and the analog waveforms are shown in green. A report window is visible at the bottom, providing statistical data for various measurements.

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