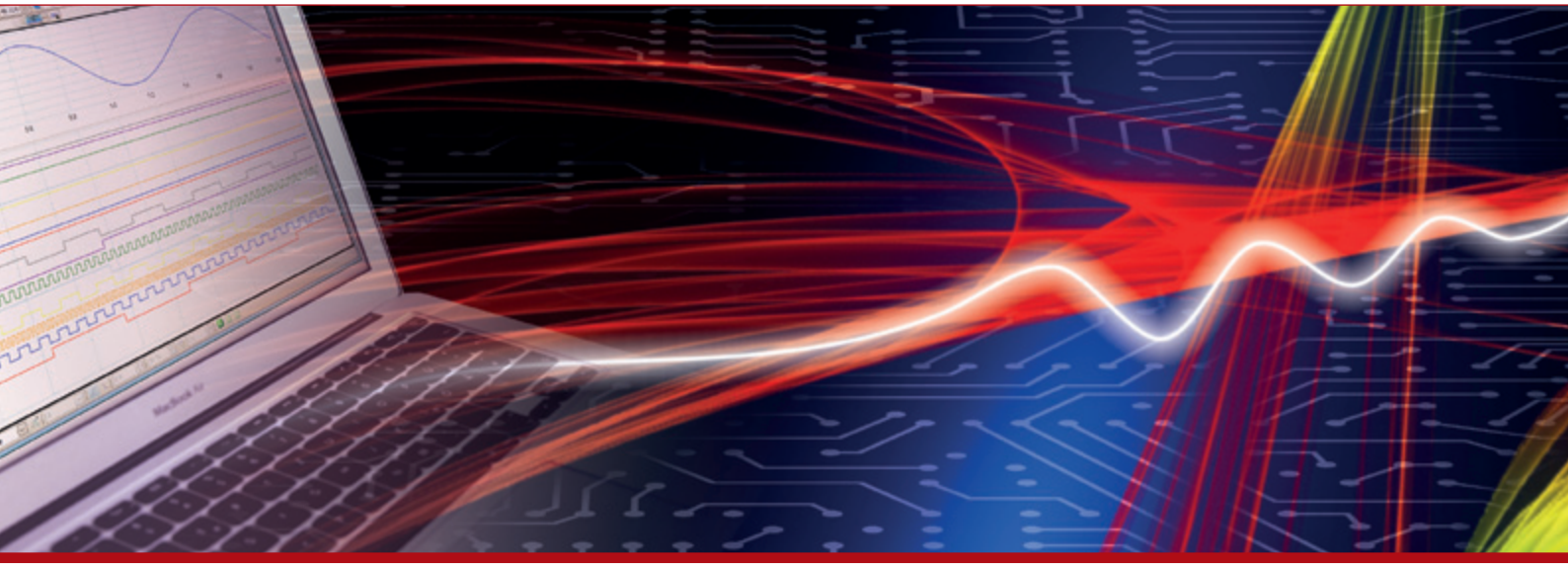
Product Datasheet - Technical Specifications



More information in our Web-Shop at ▸ **www.meilhaus.com**

Your contact

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TECHNICAL DATA SHEET

Logic MSO

Overview

The Logic MSO combines a high-performance logic analyzer with an oscilloscope in a compact, USB-based package specifically designed for embedded systems development. The hardware supports 200 MHz of bandwidth across all four analog channels simultaneously, with continuous gap-free recording on up to 20 digital channels for comprehensive signal analysis. Powered by the Logic 2 software with cross-platform support for Windows, macOS, and Linux, it offers advanced protocol decoding, signal integrity analysis, and embedded systems debugging capabilities, making it an ideal tool for engineers and developers requiring precise signal visualization and analysis.

⚠ Review the user manual and safety information carefully before using the device to ensure proper operation and prevent injury or equipment damage.

Performance Characteristics

General Specifications	2x100 Standard	2x100 Pro	4x100 Standard	4x100 Pro	4x200 Standard	4x200 Pro
Analog Channels	2	2	4	4	4	4
Analog Bandwidth	100 MHz	100 MHz	100 MHz	100 MHz	200 MHz	200 MHz
Max Analog Sample Rate	1.0 GS/s	1.0 GS/s	1.0 GS/s	1.0 GS/s	1.6 GS/s	1.6 GS/s
Vertical Resolution	9-bit (32µV/LSB)	12-bit (4µV/LSB)	9-bit (32µV/LSB)	12-bit (4µV/LSB)	9-bit (32µV/LSB)	12-bit (4µV/LSB)
Memory Depth per Channel	100 Mn Pts	1 Bn Pts	100 Mn Pts	1 Bn Pts	100 Mn Pts	1 Bn Pts
Waveform Update Rate	60 waveforms/sec live display, >50,000 waveforms/sec to memory					
Digital Channels	8 (expandable to 20)					
Protocol Analyzers	More than 60 protocols supported. View complete list					
Operating System Support	Windows (x86), macOS (x86, ARM), Linux (x86)					
Analog Vertical Specifications						
Input Impedance	1 MΩ || 16 pF					
Vertical Range	10 mVpp to 60 Vpp full scale					
Vertical Sensitivity	200 µV to full scale range					
Input Coupling	AC/DC selectable					
AC Cutoff Frequency	7 Hz					
Bandwidth Limiting	20 MHz or full bandwidth; independently selectable per channel					
Max Input Voltage at SMB Input	±30 V[1], derated at 20 dB/decade above 200 kHz[2]					
Max Input Voltage at 10:1 Probe Tip[3]	±300 V[1], derated at 20 dB/decade above 5 MHz; Not rated for transient prone environments					
DC Gain Accuracy	±2% of full scale range					
DC Offset Accuracy	±1% of offset ± 2 mV					
DC Measurement Accuracy	DC Gain Accuracy + DC Offset Accuracy					
Channel-to-Channel Isolation	≥ 50 dB					
DC Offset Range (1x Scale at SMB)	±2 V (<75 mV), ±20 V (≥75 mV, <7.5 V), ±30 V (≥7.5 V, <30 V)					
DC Offset Range (10x Scale at Probe)	±20 V (<750 mV), ±200 V (≥750 mV, <75 V), ±300 V (≥75 V, <300 V)					
Vertical Noise Floor	100 µVrms					
Analog Horizontal Specifications						
Time Base Range	20 ns to unlimited	20 ns to unlimited	20 ns to unlimited	20 ns to unlimited	12.5 ns to unlimited	12.5 ns to unlimited
Time Base Resolution	Continuous					
Calculated Rise Time	3.5 ns	3.5 ns	3.5 ns	3.5 ns	1.75 ns	1.75 ns
Time Resolution	1 ns	1 ns	1 ns	1 ns	0.625 ns	0.625 ns
Time Base Accuracy	±25 ppm					

1 Peak instantaneous voltage relative to input ground.

2 Derating can be relaxed – to 20dB/decade after 20MHz – if the oscilloscope controls are configured such that the full signal extents are entirely within the instrument's input dynamic range setting (i.e. the signal max/min are viewable on-screen).

3 When using the included Analog Probes (SKU: SAL-00245, SAL-00246, SAL-00247, SAL-00248)

General Specifications	2x100 Standard	2x100 Pro	4x100 Standard	4x100 Pro	4x200 Standard	4x200 Pro
Time Base Aging	±5 ppm at 25°C					
Channel-to-Channel Skew	≤1 ns typical					
Analog to Digital Delay	≤1 ns ±1 sample					
Horizontal Modes	Trigger, Free Run, Timer, History					
Digital Vertical Specifications[4]						
Number of Channels	8 (expandable to 20)					
Threshold Voltage	Selectable: 0.6 V to 3.1 V					
Input Voltage Range	±25 V					
Max Input Voltage at Digital Probe Input	±30 V, derated at 20 dB/decade above 20 MHz					
Input Impedance	≥200 kΩ					
Input Capacitance	≤3 pF					
Vertical Resolution	1 bit					
Digital Horizontal Specifications[4]						
Sample Rate	1.0 GS/s	1.0 GS/s	1.0 GS/s	1.0 GS/s	1.2 GS/s	1.2 GS/a
Minimum Pulse Width	5 ns					
Max Input Frequency	100 MHz square wave					
Channel-to-Channel Skew	≤1 sample, ≤2 ns					
Max Transition Rate	400 M transitions/sec					
Max Capture Duration	Limited only by available PC memory					
Trigger Specifications						
Trigger Sources	Any analog or digital channel[4]					
Trigger Modes	Auto, Normal, Single					
Noise Rejection	Adjustable trigger hysteresis: 2% (default), 0% to 100% of full scale range					
Holdoff Range	10 µs to 10 s					
Trigger Bandwidth	Internal trigger: matches analog bandwidth					
Trigger Sensitivity	Internal trigger: 5 mVpp, duty cycle >1%, frequency >10 Hz					
Trigger Level Range	Adjustable across full scale range					
Trigger Types	Edge, Pulse, Slope					

Physical Characteristics

Mechanical Specifications	
Pod Dimensions	4.5" × 4.5" × 1.8" (114 mm × 114 mm × 46 mm)
Pod Weight	3 lbs (1.36 kg)
Case Dimensions	14.5" × 10.5" × 3" (369 mm × 267 mm × 76 mm)
Total Weight	6 lbs (2.72 kg)
Operating Temperature (Logic MSO Pod)	0°C to +40°C
Operating Temperature (Included Power Supply)	0°C to +25°C
Storage Temperature	−20°C to +70°C
Power Requirements	USB-C PD 20V/1.5A (30W)

4 Using included Digital Probe (SKU: SAL-00243)

USB-C Auxiliary Ports

Logic analyzer, digital probes, can be connected to any of the 5 USB-C auxiliary ports on Logic MSO, 4 on the front and 1 on the back. The ports are USB-C compliant and will supply +5V to any connected device, however there is no USB data connection available.

Analog Front End

Calibration

Each AFE is calibrated across it's full operational range at the time of manufacture for operation at constant internal temperature of 50°C, which is maintained through active cooling using variable speed fans. The device calibration can be verified at any major testing lab using a documented procedure.

The QR code on the bottom of Logic MSO links to the manufacturing calibration certificate.

Mechanical Drawings

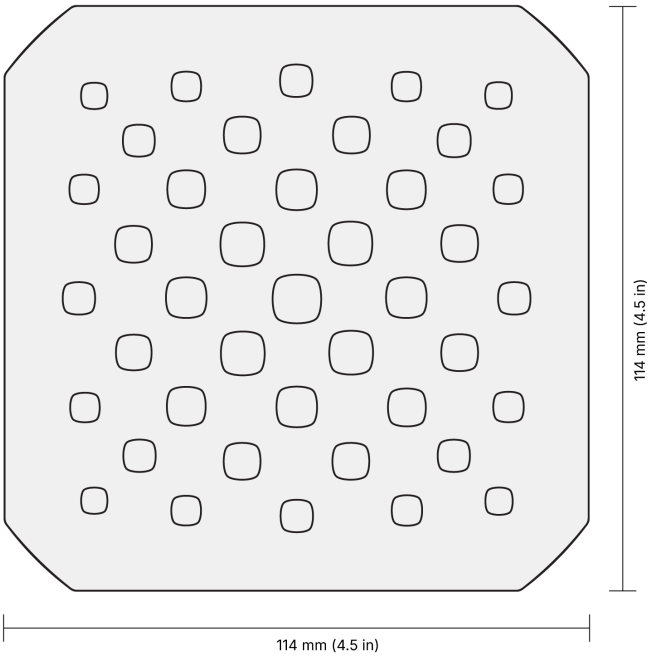

Figure 1: Logic MSO top-down view.

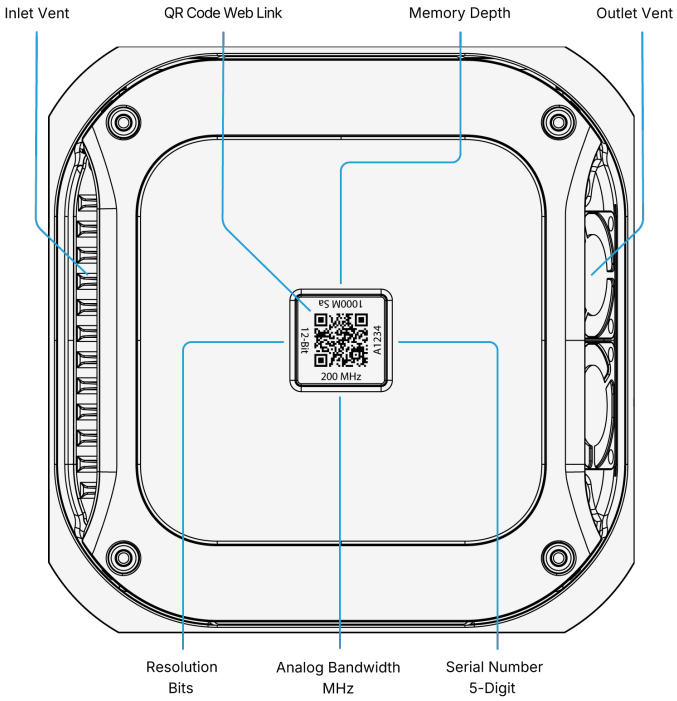

Figure 2: Logic MSO bottom view.

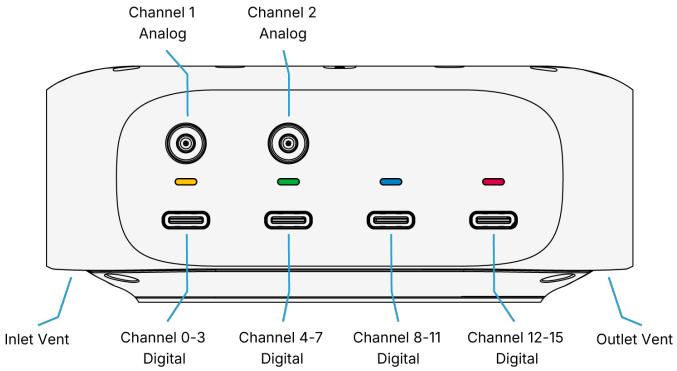

Figure 3: Logic MSO front view of 2 channel model.

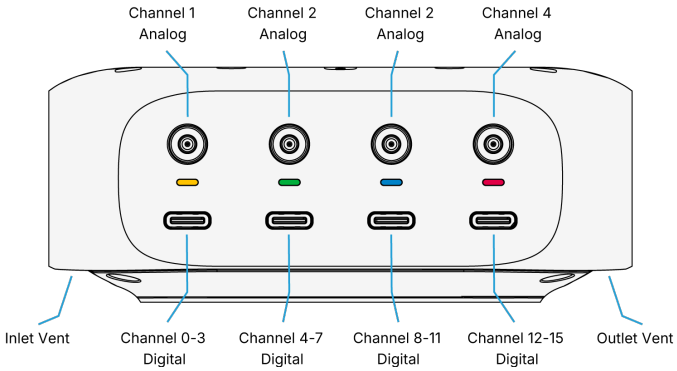

Figure 4: Logic MSO front view of 4 channel model.

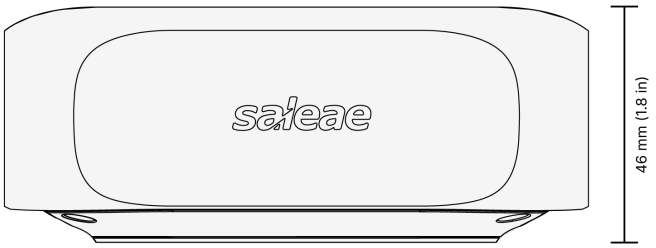

Figure 5: Logic MSO left and right side view.

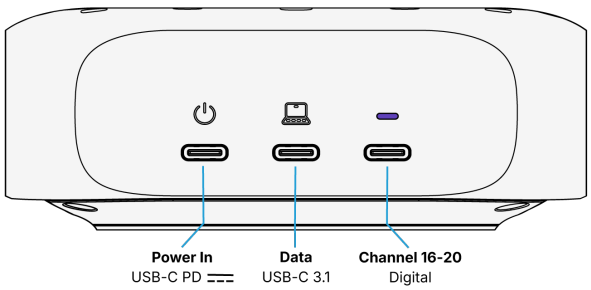

Figure 6: Logic MSO rear view.

Scan the QR code on the bottom of the Logic MSO for safety compliance, and use information.

Saleae Logic 2 Software

Logic MSO utilizes the Saleae Logic 2 software common to its line of Logic Analyzers and Mixed Signal Oscilloscopes. Logic 2 is a powerful, professional-grade software designed for embedded systems engineers, hardware developers, and electronics professionals. It provides advanced analog signal capture, digital signal capture and analysis capabilities with support for multiple protocol decodes and python script based automation. Support for user authored plugins for custom measurements and protocol decoders with strong community support vastly extend the software's core capability. Its intuitive user interface enables seamless acquisition of both analog and digital channels simultaneously, for both acquisition and decoding. The software features a modern user interface for real-time signal visualization, advanced triggering options, comprehensive export capabilities, and robust protocol analysis tools that facilitate rapid debugging and development of complex digital systems. Logic 2 supports Windows, macOS, and Linux platforms, offering cross-platform compatibility and flexible integration into diverse engineering workflows.

Logic 2 software, the Measurements API, Low Level Analyzer API, High Level Analyzer API, and Automation tools are available at no cost.

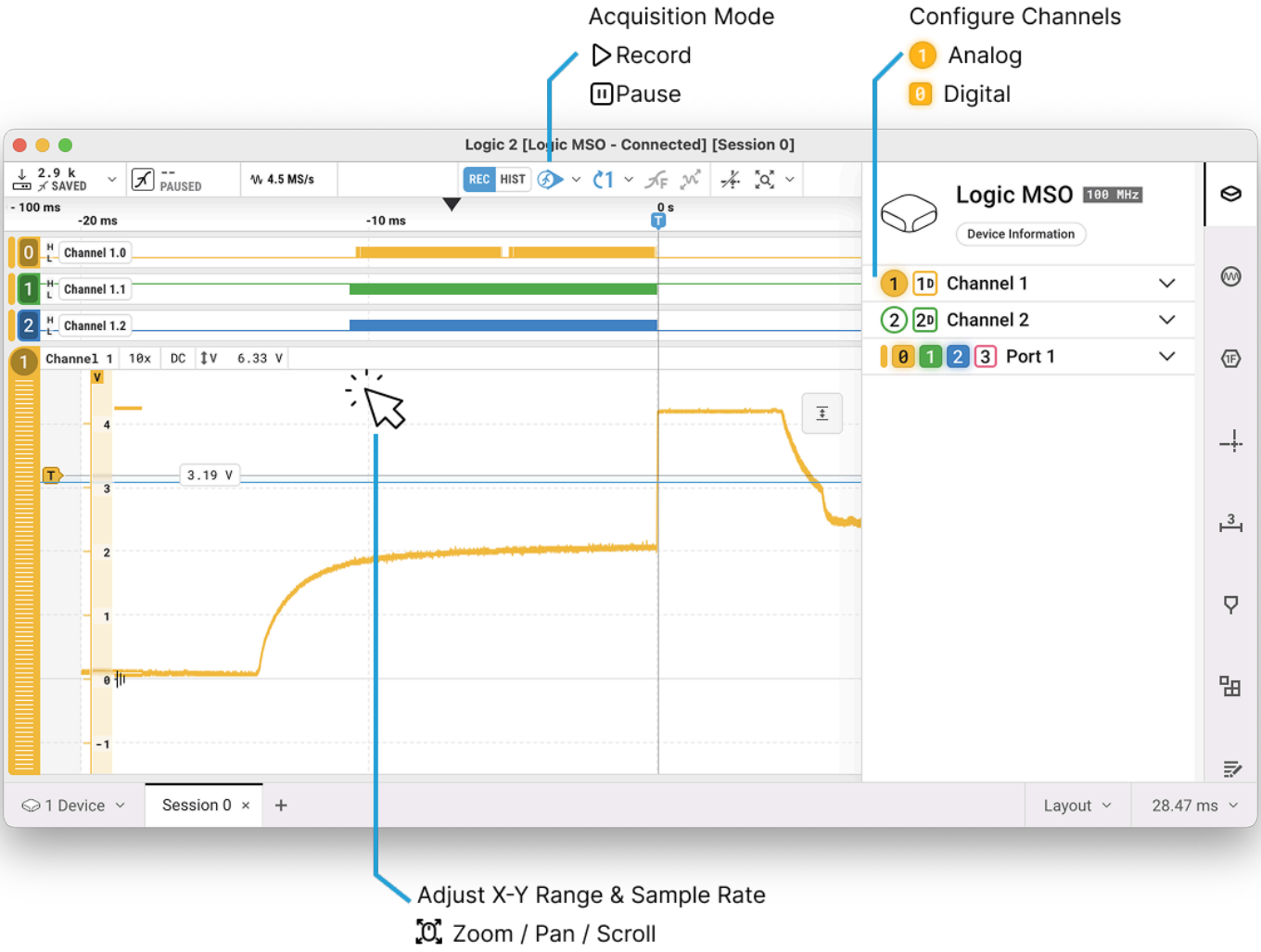

Figure 7: Logic 2 software graphical user interface.

Visit https://support.saleae.com/user-guide/using-logic to view the complete Logic 2 software guide.

Digital Protocol Decoders

Automotive			
CAN'	CAN-FD	CAN 2.0B	LIN'

ISO7816			
Audio			
MIDI’	I2S/PCM		
Power Delivery			
SMBus’	USBC-PD		
Wireless Communication			
APDU	MIPI DSI	MIPI RFFE	SIMCARD
Industrial			
Modbus RTU & ASCII’	DCC	DMX512’	Anybus CompactCom
SPI	BISS-C’	MBus	Quadrature
IoT			
1-Wire’	I2C’	I3C	I2S
SPI’	SWD’	Asynchronous Serial’	Atmel SWI’
IR Remote	DHT2x	Luos	PWM
Computing			
USB LS	USB FS	DisplayPort Aux	HD44780 LCD’
HDMI-CEC’	JTAG’	LPC	LPC Clockless
NAND	SD/MMC	SDIO	SDQ
Synchronous Parallel’	Gamecube Controller		

‘ Marked protocols are included in the **Saleae Logic 2** software and unmarked protocols are community contributed protocol analyzers available at https://support.saleae.com/community/community-shared-protocols

Getting Started

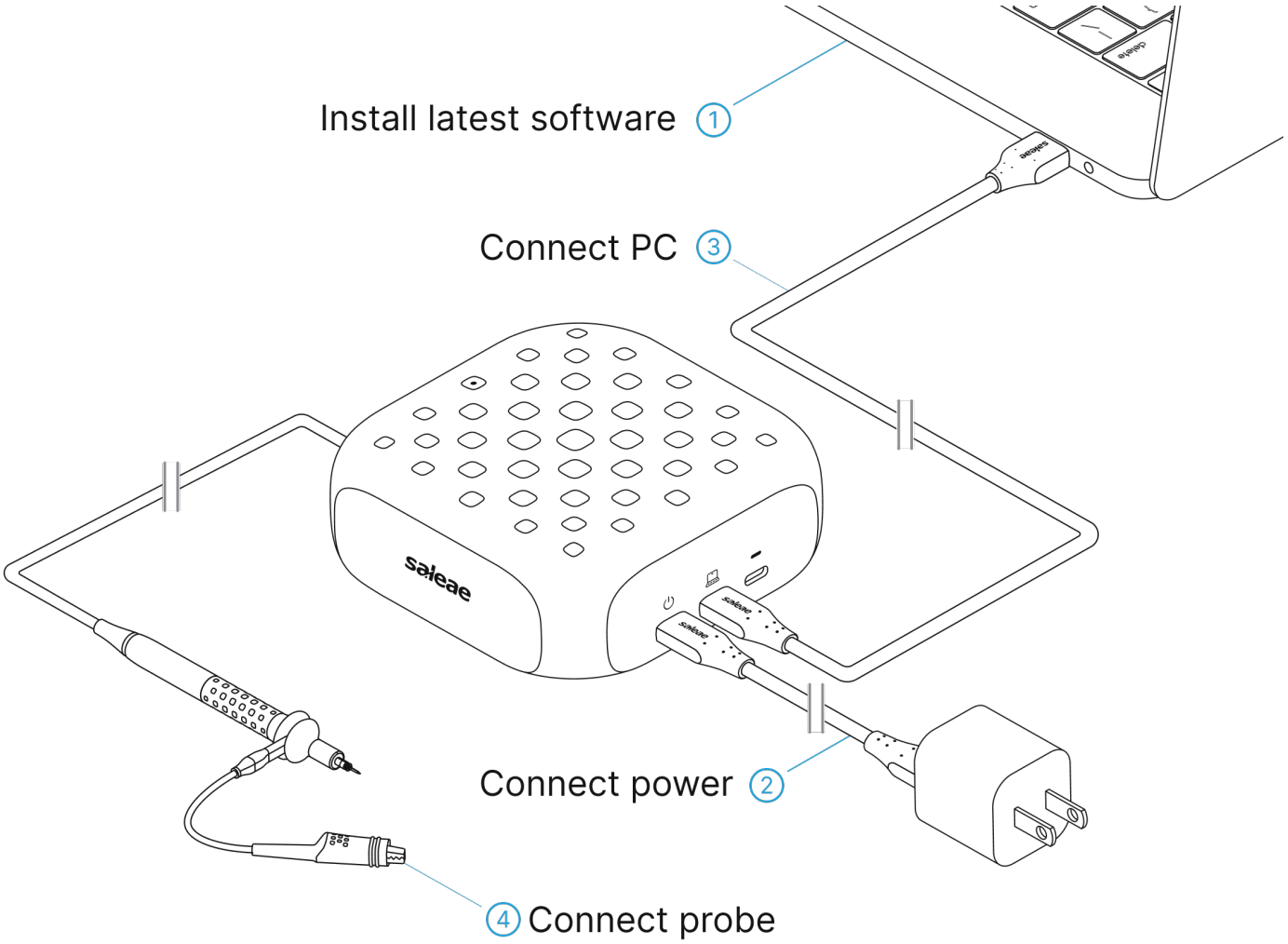

Figure 8: Logic MSO connected and ready to use.

0. Read the user manual. Understand and follow all safety warnings.
1. Download and install the Logic 2 software by visiting saleae.com/downloads.
2. Connect power with the USB-C to USB-C power cable and included wall adapter.
3. Connect the data cable with the USB-A side connected to the computer.
4. Attach the probes to the Logic MSO and the device under test.
5. Launch the Logic 2 software and press the (record) button to start acquisition.

Compliance and Certifications

Logic MSO complies with the applicable requirements of the following standards and directives.

Electromagnetic Compatibility

Standard	Test Limit
IEC 61326-1:2021 / EN 61326-1:2021	
CISPR 11:2015+A1:2016+A2:2019 EN 55011:2016+A1:2017+A11:2020+A2:2021	Group 1, Class A
IEC 61000-4-2:2008 / EN 61000-4-2:2009	4 kV CD, 8 kV AD
IEC 61000-4-3:2006 +A1:2007 +A2:2010 / EN 61000-4-3:2006 +A1:2008 +A2:2010	3 V/m 80 MHz – 1 GHz; 1.4 – 6 GHz 80 % AM (1 kHz)
IEC 61000-4-4:2012 / EN 61000-4-4:2012	1 kV 5/50 Tr/Th ns, 5 kHz or 100kHz
IEC 61000-4-5:2014+A1:2017 / EN 61000-4-5:2014+A1:2017	0.5 kV Line to Line, 1 kV Line to Ground, 1.2/50 Tr/Th µs
IEC 61000-4-6:2013 / EN 61000-4-6:2014	3 V (0.15 – 80 MHz), 80 % AM (1 kHz)
IEC 61000-4-8:2009 / EN 61000-4-8:2010	3 A/m (50 Hz, 60 Hz)
IEC 61000-4-11:2020 / EN IEC 61000-4-11:2020	0 % during half cycle, 0 % during 1 cycle, 0 % during 250 cycles, 70 % during 25 cycles

Safety Standards

Standard	Applied Amendments and Updates
IEC 61010-1:2010 / EN 61010-1:2010	AMD1:2016
IEC 61010-2-030:2023	
Canada: CAN/CSA-C22.2 No 61010-1-12	UPD1:2015; UPD2:2016; AMD1:2018; COR1:2019; UPD3:2023; UPD4:2024
Europe: EN 61010-1:2010	A1:2019
Japan: JIS C 1010-1	2019
United States of America: UL 61010-1	3rd Ed. Am. 1 Rev. Nov. 15, 2024

Logic MSO Models

Logic MSO Model	w/ US Power Supply	w/ EU Power Supply	w/ UK Power Supply	w/ AU Power Supply
4 Ch x 200 MHz • Pro	SAL-00228	SAL-00229	SAL-00230	SAL-00269
4 Ch x 200 MHz • Standard	SAL-00219	SAL-00220	SAL-00221	SAL-00266
4 Ch x 100 MHz • Pro	SAL-00216	SAL-00217	SAL-00218	SAL-00265
4 Ch x 100 MHz • Standard	SAL-00207	SAL-00208	SAL-00209	SAL-00262
2 Ch x 100 MHz • Pro	SAL-00204	SAL-00205	SAL-00206	SAL-00261
2 Ch x 100 MHz • Standard	SAL-00195	SAL-00196	SAL-00197	SAL-00258

Analog Probes

Description	SKU
200 MHz Oscilloscope Probe (fixed 10:1) • Yellow	SAL-00245
200 MHz Oscilloscope Probe (fixed 10:1) • Green	SAL-00246
200 MHz Oscilloscope Probe (fixed 10:1) • Blue	SAL-00247
200 MHz Oscilloscope Probe (fixed 10:1) • Red	SAL-00248

Analog Probe Accessories

Description	SKU
Oscilloscope Probe Accessory Kit	SAL-00249
Pulse Generator (for probe compensation)	SAL-00255
BNC to SMB Adapter for 3rd Party Probes	SAL-00256
SMB to BNC Adapter for 3rd Party Instruments	SAL-00257

Digital Probes

Description	SKU
Digital Probe, Single Ended	SAL-00243
Digital Probe, Differential	Coming Soon

Digital Probe Accessories

Description	SKU
Digital Probe Accessory Kit, Single Ended	SAL-00244
Digital Probe, Accessory Kit, Differential	Coming Soon

Power Adapters

Description	SKU
30W Power Adapter, USB-C • US (Type A)	SAL-00191
30W Power Adapter, USB-C • EU (Type C)	SAL-00192
30W Power Adapter, USB-C • UK (Type G)	SAL-00193
30W Power Adapter, USB-C • AU (Type I)	SAL-00194

Cables and Connectivity

Description	SKU
USB-A to USB-C Adapter	SAL-00270
Data Cable • USB 3.1 A-C • 0.5 Meter	SAL-00250
Data Cable • USB 3.1 A-C • 1.8 Meter	SAL-00251
Power Cable • USB 2.0 C-C • 0.5 Meter	SAL-00252
Power Cable • USB 2.0 C-C • 1.8 Meter	SAL-00254
Power Cable • USB 2.0 C-C • 3.0 Meter	SAL-00253

Support and Warranty

3-Year Warranty

Your new Logic MSO is covered against absolutely any malfunction, regardless of cause, for three years. Replacement units ship immediately, and shipping charges are on us.

180-Day Return Policy

Decide within 180 days that our products aren't for you, and return them for a full refund, including shipping. To arrange for a replacement or return, just contact us.