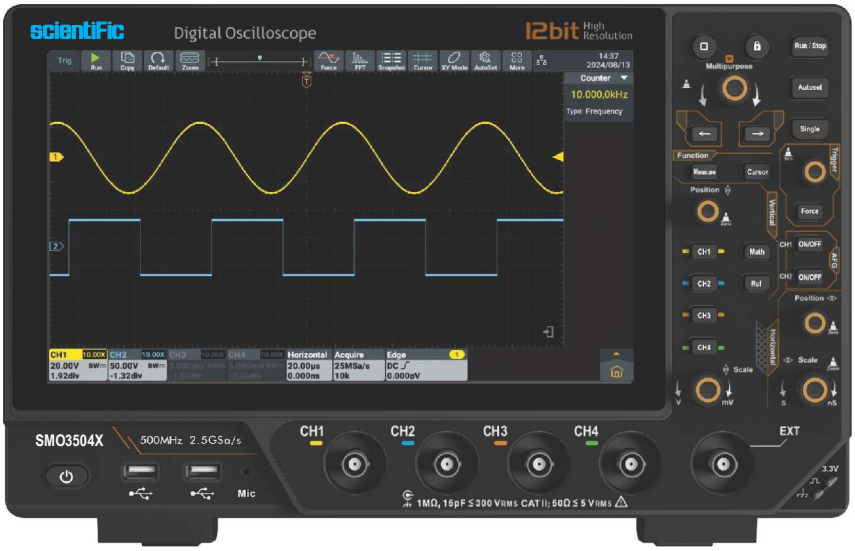
Digital Storage Oscilloscope
SMO3000X Series



Advance Features

- 100MHz ~ 500MHz bandwidth, 2.5GS/s real time sampling rate, higher storage, faster refresh rate.
- **12-bit ADC**, providing 16 times the measurement accuracy of a standard 8-bit oscilloscope, delivering better waveform details and more accurate small signal measurement
- 100M storage depth, up to 500,000wfms/s waveform refresh rate, ensuring clear signal capture.
- Vertical accuracy is 500μV/div~10V/div and time base range is 500ps/div ~1000s/div.
- Integrates oscilloscope, dual channel, 50MHz AFG (Optional), frequency counter, voltmeter, FFT spectrum analyze and protocol analyzer.
- Waveform cloning and Bode plot functions (AFG Models)
- 1M-point FFT analysis ensures accurate frequency component display.
- 50Ω impedance matching reduces, reflection, improves accuracy and minimizes interference .

Technical Specifications	SMO3102X	SMO3104X	SMO3202X	SMO3204X	SMO3352X	SMO3354X	SMO3502X	SMO3504X
Bandwidth	100MHz		200MHz		350MHz		500 MHz	
Channel	2	4	2	4	2	4	2	4
Rise Time	≤ 3.5ns		≤ 1.75ns		≤ 1.0ns		≤ 0.7ns	
Sample Rate (Max. Sampling Rate)	2.5GS/s							
Storage Depth	100M							
Acquire Mode	Sample, Peak, High Res, Average, Segmentation							
Waveform Refresh Rate	Max. 50,000 wfms/s							
Vertical Resolution	12 bits							
Vertical System Analog Channel								
Input Coupling	DC, AC, Ground							
Input Impedance	1MΩ ± 2% parallel with 15pF ± 5pF, 50Ω ± 2%							

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Probe attenuation coefficient	10μX~50kX, step by 1-2-5, support custom							
Maximum Input Voltage	1MΩ : ≤300Vrms							
Channel-Channel Isolation	50Hz : 100:1 ; 10MHz : 40:1							
Time delay between channel (typical)	150ps							
Vertical Sensitivity	500μV/div~10V/div (at input)							
Displacement	± 2V (500μV/div ~ 50mV/div) ± 20V (100mV/div~500mV/div) ± 200V (1V/div~10V/div)							
Single bandwidth	Full bandwidth							
Low Frequency (AC Coupling, -3dB)	≥ 10Hz (at BNC)							
DC Gain Accuracy	4% (≤ 1mV) : 3% (≥ 2mV)							
DC Accuracy (Average)	Delta Volts between any two averages of ≥16 waveforms acquired with the same scope setup and ambient conditions (ΔV) : (3%rdg + 0.05 div)							
Waveform inverted	Support							
Bandwidth Limit	20MHz, full bandwidth							
Horizontal System								
Scanning speed (S/div)	500ps/div~1000s/div, step 1-2-5							
Relay time accuracy	±1 ppm (typical, environment temperature is +25˚C)							
Time internal (ΔT) Measurement accuracy (CD-100MHz)	Single : ± (1 interval time + | time base accuracy | x reading + 0.6ns) Average > 16 : ± (1 interval time + | time base accuracy | x reading + 0.4ns)							
Sampling Rate Range	0.05Sa/s ~ 2.5GS/s							
Interpolation	Auto, Sinx/x,x							
Trigger System								
Trigger Source	CH1, CH2, CH3, CH4 EXT TRIG, AC Line							
Trigger Mode	Auto, Normal, Single							
Signal format and line /field frequency (Video Trigger Type)	Support, Stand NTSC, PAL and SECAM broadcast system							
Trigger Level Range	Internal : ± 5 divs from the center of the screen EXT. : ± 2V EXT/ 5 : ± 10V							
Trigger Level Accuracy (typical) the source is adapted to rising and falling time ≥ 20ns	Internal : ±0.3 divs EXT. : ± (10mV + 6% setting value) EXT/ 5 : ± (50mV + 6% setting value)							
Trigger Displacement	According to Record length and time base							
Trigger Hold off Range	100ns to 10s							
50% level setting (typical)	Input single frequency ≥ 50Hz							
Trigger Type								
Trigger Type	Edge, Video, Pulse, Slope, Runt, Window, Timeout, Nth, Logic, RS232/UART, I2C, SPI, CAN, LIN							
Trigger Source	CH1, CH2, CH3, CH4, EXT TRIG, AC Line							
Trigger Mode	Auto, Normal, Single							
Trigger Sensitivity	0.3div ~ 10div							
Edge Trigger	Couple	DC, AC, HF						
	Slope	Rising, Falling						

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Video Trigger	Modulation		Support standard NTSC, PAL and SECAM broadcast systems					
	Line Number Range		1-525 (NTSC) and 1-625 (PAL/SECAM)					
Pulse Trigger	Trigger Condition		Positive pulse : >, <, = Negative pulse : >, <, =					
	Pulse Width Range		30ns to 10s					
Slope Trigger	Trigger Conditions		Positive pulse : >, <, = Negative pulse : >, <, =					
	Time Setting		30ns to 10s					
Runt Trigger	Trigger Conditions		Positive pulse : >, <, = Negative pulse : >, <, =					
	Time Setting		30ns to 10s					
Windows Trigger	Trigger Conditions		Positive pulse : superamplitude entry, superamplitude exit and superamplitude time Negative pulse : superamplitude entry, superamplitude exit and superamplitude time					
	Time Setting		30ns ~ 10s					
Timeout Trigger	Slope		Rising, Falling					
	Idle Time		30ns ~ 10s					
The Nth Edge Trigger	Slope		Rising, Falling					
	Idle Time		30ns ~ 10s					
	Edge Number		1 ~ 128					
Logic Trigger	Logic Mode		AND, OR, XOR, XNOR					
	Input Mode		H, L, X, Rising, Falling					
	Output Mode		Goes True, Goes False, Is True > Is True < Is True =					
RS232/UART Trigger	Polarity		Normal, Inverted					
	Trigger Conditions		Start, Error, Check Error, Data					
	Baud Rate		Common, Custom					
	Data Bits		5bits, 6bits, 7bits, 8bits					
I2C Trigger	Trigger Condition		Star, Restart, Stop, ACK Lost, Address, Data, Addr/Data					
	Address Bits/Byte Lengh		7bits ----> 0 ~127 8bits ----> 0 ~ 255 10bits ----> 0 ~ 1023					
	Byte Length		1 ~ 5					
SPL Trigger	Trigger Conditions		Timeout, CS					
	Time out Value		30ns ~ 10s					
	Data Bits		4bits ~ 32bits					
	Edge		Rising, Falling					
CAN Trigger	Signal Type		CAN_H, CAN_L, TX, RX, DIFF					
	Trigger Conditions		Start, Type, Data, ID/Data, End, Lost, Error					
	Baud Rate		Common, Custom					
	Sample Point		0.5% ~ 95%					
	Frame Type		Data, Remote, Error, Overload					
LIN Trigger	Condition		Break, ID, ID/Data, Data Error					
	Baud Rate		Common, Custom					
Waveform Measurement								
Cursor Measurement	ΔV, ΔT, ΔT& ΔV between Cursor, Auto cursor, Support XY/FFT/ZOOM window based on screen percentage							

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Auto Measurement Chennel	Delay (1 ┼-2 ┼), Delay (1 ┼-2 ┼), Delay (1 ┼-2 ┼), Delay (1 ┼-2 ┼), Phase (1 ┼-2 ┼), Phase (1 ┼-2 ┼), Phase (1 ┼-2 ┼), Phase (1 ┼-2 ┼), FRR(1 ┼-2 ┼) , FRF (1 ┼-2 ┼), FFR (1 ┼-2 ┼), FFF (1 ┼-2 ┼), LRR (1 ┼-2 ┼), LRF (1 ┼-2 ┼), LFR (1 ┼-2 ┼) and LFF (1 ┼-2 ┼)							
Number	43 automatic measurements with upto 8 measurements displayed simultaneously							
Measurement Source	CH 1 ~ CH4							
Measurement Area	Primary time base, extended time base cursor area							
Mathematical operation	+,-,*,/,& &, || , ^, !, Tan, Intg, Diff, Sqrt, Lg, Ln, Exp, Abs, Sine, CoSin, User Defined Function, digital filter (low pass, high pass, band reject), FFY (Vrms, dBVrms, Radians, Degrees)							
Waveform Analysis								
Pass Fail								
Pass Fail	The signal under test is compared with a user defined rule (template), providing the number of passes, failure and the total number of tests. Pass/fail events can trigger immediate stop, buzzer and screenshot							
Source	CH1~CH4							
Type	Horizontal, Vertical and other measurement items							
Measurement	Data statistics : Pass, Fail and the total number							
Acquire Mode	All modes are supported except Zoom, XY, FFT and scroll							
Color Grade								
Color Grade	Provide three view of waveform intensity, color temperature level > 16,256 color scale display							
Source	CH1~CH4							
Waveform brightness	brightness							
Acquire Mode	Only basic waveform are supported							
Decode								
Decode Number	2, Both protocol type can be decoded and switched simultaneously							
Decode Type	RS232/UART/I2T, SPL, LIN, CAN							
RS232/UART	Decode RS232/UART bus TX/RX signals at speed up to 10 Mb/s (5 to 8 bits), supporting parity bit (odd parity, even parity, or no parity) and stop bit (1 to 2 bits) configuration. Source Channel : CH1~CH4							
I2C	Decode the I2C bus addresses (including or excluding the read/write bit) data and ACK, Source Channel : CH1~CH4							
SPI	Decode SPI bus MISO/MOSI data (4 to 32 bits). The mode supports timeout and chip select (CS). Source Channel : CH1~CH4							
CAN	Decode remote frames of CAN bus at speed up to 1 Mb/s (ID, byte count, CRC) as well as overload frames and data frames (Standard/extended ID, Control field, data, field, CRC, ACK), Supported CAN bus signal types include CAN_H, CAN_L, and differential. Source Channel CH1~CH4							
LIN	Decode LIN bus versions 1.X or 2.X, with speeds up to 10 kb/s. Decode and display synchronization, identifier, data and checksum. Source Channel : CH1~CH4							
Bode Plot								
Start Frequency	10Hz ~ 25MHz							
End Frequency	10Hz ~ 25MHz							
Points/Decade	10 ~ 100							
Amplitude	2mV ~ 6V							

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Waveform Measurement									
AFG (Optional)									
Channel		2							
Sample Rate		160MSa/s							
Vertical Resolution		14bits							
Maximum Frequency		50MHz							
Waveform		Standard : Sine Wave, Square Wave, Ramp Wave, Pulse Wave, Noise							
		Arbitrary : Butterworth, X^2 and EOG etc 28 built in waveforms							
Frequency Feature									
Sine Wave		1μHz ~ 50MHz							
Square Wave		1μHz ~ 20MHz							
Ramp Wave		1μHz ~ 1MHz							
Pulse Wave		1μHz ~ 10MHz							
Noise Wave (-3dB)		20MHz (Gaussian white noise)							
Arbitrary Wave (Except DC)		1μHz~10MHz							
Frequency Resolution		1μHz or 9 significant figures							
Frequency Stability		±25 ppm per year (0~40˚C)							
Amplitude Characteristic									
Output Amplitude	High Z :	2mVpp ~ 10 Vpp (≤ 10MHz) 2mVpp ~ 5 Vpp (≤ 50MHz)							
	50Ω	1mVpp ~ 5 Vpp (≤ 10MHz) 1mVpp ~ 2.5 Vpp (≤ 50MHz)							
Amplitude Accuracy		± (1% of setting + 1 mVpp) (typical 1kHz sine, 0V offset)							
Amplitude Resolution		1mVpp or 5 bits							
DC Offset Range (AC + DC)	High Z :	± 5Vpk ~ Amplitude Vpp/2 (≤ 10MHz) ± 2.5Vpk ~ Amplitude Vpp/2 (≤ 50MHz)							
	50Ω	± 2.5Vpk ~ Amplitude Vpp/2 (≤ 10MHz) ± 1.25Vpk ~ Amplitude Vpp/2 (≤ 50MHz)							
DC Offset Accuracy		±(1% of | setting| +1 mV + amplitude Vpp * 0.5%)							
Offset Resolution		1mVp							
Output Impedance		50Ω (Typical)							
Waveforms Characterstic									
Sine									
Bandwidth Flatness (1Vpp, relative 1kHz, 50Ω)		≤ 10MHz: ± 0.3dB ≤ 50MHz: ± 0.5dB							
Harmonic Distoration		Typical Value (0dBm) DC to 1MHZ : <-65dBc 1MHz ~ 50MHz : <-50dBc							
Total Harmonic distortion		< 0.2%, 10Hz ~ 20kHz, 1Vpp							
Non-harmonic distortion		Typical Value (0dBm) ≤ 10MHz : <70dBc > 10MHz: <70dBc + 6 c/sound interval							
Phase noise		Typical Value (0dBm, 10kHz offset) 10MHz : ≤110dBc/Hz							
Square									
Rising falling time		< 15ns							
Jitter		200ps + 25ppm							

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Overshoot	<5%							
Ramp								
Linearity	<the 1% of maximum output (typical value 1kHz, 1Vpp, symmetry 50%)							
Symmetry	0% ~ 100%							
Pulse								
Period	100ns ~ 1Ms							
Pulsewidth	≥64ns							
Overshoot	<5%							
Jitter	200ps + 25ppm							
Noise								
Type	Gaussian white noise							
Bandwidth (-3dB)	20MHz							
Arbitrary								
Bandwidth	10MHz							
Waveforms lenght	2 ~ 16384 points							
Sample Rate	160MSa/s							
Amplitude Accuracy	14bits							
Modulation Characteristic								
Modulation Type	AM, FM, PM, FSK							
AM								
Carrier	Sine, Square, Ramp, Arb(Except DC)							
Internal Modulation Waveform	Sine, Square, Ramp, Noise							
Internal Amplitude Modulation Frequency	2mHz ~ 20kHz							
Depth	0% ~ 100%							
FM								
Carrier	Sine, Square, Ramp, Arb (Except DC)							
Internal Modulation Waveform	Sine, Square, Ramp, Noise							
Internal Modulation Frequency	2mHz ~ 20kHz							
PM								
Carrier	Sine, Square, Ramp, Arb (Except DC)							
Internal Modulation Wavefrom	Sine, Square, Ramp, Noise							
Internal Phase Modulation Frequency	2mHz ~ 20kHz							
Phase Deviation Range	0° ~ 180°							
FSK								
Carrier	Sine, Square, Ramp, Arb (Except DC)							
FSK Rate	2mHz ~ 100kHz							
FSK Hopfreq	1μHz ~ Maximum frequency of corresponding carrier							
Sweep								
Carrier	Sine, Square, Ramp, Arb (Except DC)							
Min/Max Start/Stop Frequent	1μHz (Minimum)/Maximum frequency of corresponding carrier							
Type	Line, Log							
Sweep time	1ms ~ 500s ± 0.1%							
Trigger Source	Internal, Manual							

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Burst								
Waveforms	Sine, Square, Ramp, Pulse, Arb (Except DC)							
Carrier Frequency	1 μHz ~ Maximum frequency of corresponding carrier/2							
Trigger Source	Manual, Internal							
N-Cycle Trigger Cycle	1μs ~ 500s							
N periodicity	1 ~ 60000 (Max = Burst Period / Period)/ Infinite							
Voltage Range and Sensitivity (No Modulation Source)								
Input Resistance	1MΩ							
Counter								
Source	CH1, CH2, CH3, CH4, Follow Trigger							
Measurement type	Frequency, Period							
Statistic Parameter	Type, Max, Min, Avg							
Maximum Frequency	Maximum analog bandwidth							
Resolution	6 bits							
DVM								
Source	CH1, CH2, CH3, CH4							
Function	AC RMS, DC, AC + DC RMS							
Resolutioin	4 bits							
Limit warnings	Support upper and lower limit setting, over limit condition setting , over limit prompt							
Command								
Common Support	Supports the standard SCPI command set							
Error Message Definition	Error Message							
Support status reporting mechanism	Status Reporting							
Support for synchronization Machanisms	Synchronization							
General Technical Specification								
Display								
Display type	10.1 inch colored LCD (Liquid Crystal Display)							
Display Resolution	1024 (Horizontal) x 600 (Vertical) Pixels							
Display Colors	24 colors, TFT							
Grid	18 horizontal cells * 10 vertical cells							
Afterglow	Off, infinity, adjustable time (1 second, 2 seconds, 5 seconds)							
Brightness level	256 level							
Output of the Probe Compensator								
Output Voltage (Typical)	About 3.3V, with the Peak to Peak voltage ≥ 1							
Frequency (Typical)	1kHz Square							
Others								
Communication Interface	HDMI : USB device * 1 USB Host * 3 : Trig out (P/F) : Type-C power supply port ; LAN interface							
Power Supply	100V~240VACRMS, 50/60Hz, CAT II							

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Fuse	2 A, T class, 250V							
Touch Screen	Multi Touch Capacitive Screen							
Temperature	Working Temperature : 0˚C ~ 40˚C StorageTemperature : -20˚C ~ +60˚C							
Relative Humanity	≤ 90%							
Cooling Method	Fan cooling							
Dimension (L x W x H)	325mm x 78 mm x 160mm							
Weight	Approx 3.2 kg (without accessories)							
Accessories	Standard : Power Cord, USB Cable, Probe, Probe Adjust							

Subject to change

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