

SDS1000X SDS1000X+ Series Digital Oscilloscope



DataSheet-2016.05

SDS1102X
SDS1202X
SDS1102X+
SDS1202X+

Overview

SIGLENT's new SDS1000X/SDS1000X+ Series Super Phosphor Oscilloscopes are available in two bandwidths, 100 MHz and 200 MHz, have a sampling rate of 1 GSa/s and a standard record length of 14 Mpts. The most commonly used functions can be accessed with its user-friendly one-button design.

The SDS1000X/SDS1000X+ series employs a new generation of SPO technology. With its excellent signal fidelity, background noise is lower than similar products in the industry. It has a minimum vertical input range of 500 uV/div, an innovative digital trigger system with high sensitivity and low jitter, and a waveform capture rate of 60,000 frames/sec. It also employs not only the common 256-level intensity grading display function but also a color temperature display mode not found in other models in this class. Siglent's new oscilloscopes offering supports multiple powerful triggering modes including serial bus triggering and decoding. History waveform recording and sequential triggering allow for extended waveform records to be captured, stored, and analyzed. SDS1000X+ adds an integrated 25 MHz arbitrary waveform generator (standard), option for 16 digital channels. The features and high-performance of the SDS1000X/SDS1000X+ oscilloscopes cannot be matched elsewhere at this price.



Key Features

- 200 MHz, 100 MHz bandwidth models
- Real-time sampling rate up to 1 GSa/s
- New generation of SPO technology
 - Waveform capture rate up to 60,000 wfm/s (normal mode), and 400,000 wfm/s (sequence mode)
 - Supports 256-level intensity grading and color temperature display
 - Record length up to 14 Mpts
 - Digital trigger system
- Intelligent trigger: Edge, Slope, Pulse Width, Window, Runt, Interval, Time out (Dropout), Pattern
- Serial bus triggering and decode, supports protocols IIC, SPI, UART, RS232, CAN, LIN
- Video trigger, supports HDTV
- Low background noise, supports 500 μ V / div to 10V / div voltage scales
- 10 types of one-button shortcuts, supports Auto Setup, Default, Cursors, Measure, Roll, History, Display/Persist, Clear Sweep, Zoom and Print
- Segmented acquisition (Sequence) mode, dividing the maximum record length into multiple segments (up to 80,000), according to trigger conditions set by the user, with a very small dead time segment to capture the qualifying event.
- History waveform record (History) function, the maximum recorded waveform length is 80,000 frames.
- Automatic measurement function on 37 parameters, supports Statistics, Gating measurement, Math measurement, History measurement and Ref measurement
- Math function (FFT, addition, subtraction, multiplication, division, integration, differential, square root)
- High Speed hardware based Pass/ Fail function
- 16 Digital channels (MSO), Maximum waveform capture rate up to 500 MSa/s, Record length up to 14 Mpt/CH (Option for SDS1000X+ models)
- 25 MHz DDS arbitrary waveform generator, built-in 10 kinds of waveforms (Standard for SDS1000X+ models)
- Large 8 inch TFT-LCD display with 800 * 480 resolution
- Abundant interfaces: USB Host, USB Device (USB-TMC), LAN (VXI-11), Pass / Fail, Trigger Out
- Supports SCPI remote control commands
- Supports Multi-language display and embedded online help

Models and Key Specifications

| Model | SDS1102X SDS1102X+ | SDS1202X SDS1202X+ |
|----------------------------------|---|---------------------------|
| Bandwidth | 100 MHz | 200 MHz |
| Sampling Rate (Max.) | 1 GSa/s | |
| Channels | 2+EXT | |
| Memory Depth (Max.) | 7 Mpts/CH (Dual-Channel); 14 Mpts/CH (Single-Channel) | |
| Waveform Capture Rate (Max.) | 60,000 wfms/s (normal mode), 400,000 wfms/s (sequence mode) | |
| Trigger Type | Edge, Slope, Pulse width, Window, Runt, Interval, Dropout, Pattern, Video | |
| Serial Trigger | I ² C, SPI, UART/RS232, CAN, LIN | |
| Decode Type (Optional) | I ² C, SPI, UART/RS232, CAN, LIN | |
| DDS Waveform Generator | Single Channel, Max. Frequency up to 25 MHz, 125 MSa/s sampling rate, 16 Kpts wave length SDS1000X+ Supported (Standard); SDS1000X Not supported | |
| 16 Digital Channels (MSO Option) | Maximum waveform capture rate up to 500 MSa/s, Record length up to 14 Mpts/CH SDS1000X+ Supported (Optional); SDS1000X Not supported | |
| Logic Probe | SPL1016 (Optional) | |
| I/O | USB Host, USB Device, LAN, Pass/Fail, Trigger Out, 1 KHz Cal | |
| Probe (Std) | 2 pcs passive probe PP510 | 2 pcs passive probe PP215 |
| Display | 8 inch TFT-LCD (800x480) | |
| Weight | Without package 3.26 Kg; with package 4.25 Kg | |

Function & Characteristics

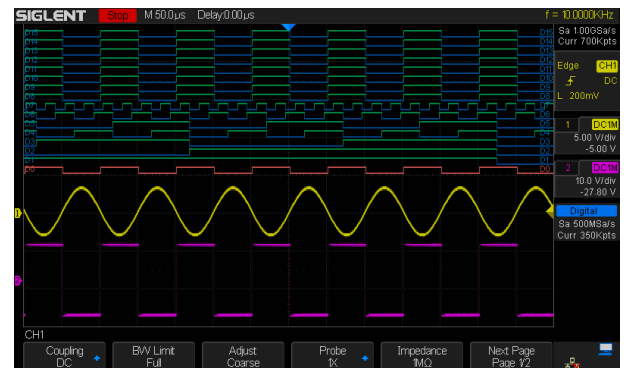
8 inch TFT-LCD display and 10 one-button menus



8-inch TFT-LCD display with 800 * 480 resolution

Most commonly used functions are accessible using 10 different one-button operation keys: Auto Setup, Default, Cursor, Measure, Roll, History, Persist, Clear Sweep, Zoom, Print

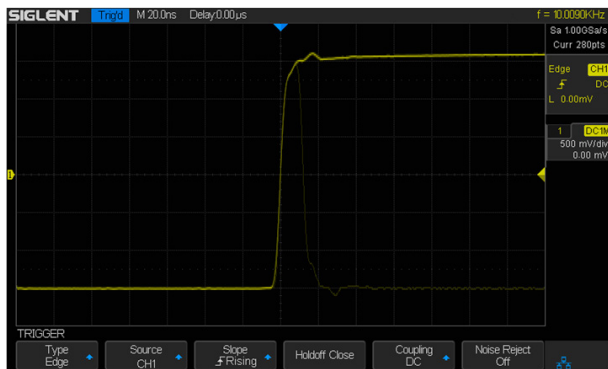
16 Digital Channels/MSO (Optional for SDS1000X+)



2 analog channels plus 16 digital channels enables users to acquire and trigger on the waveforms then analyze the pattern, simultaneously with one instrument.

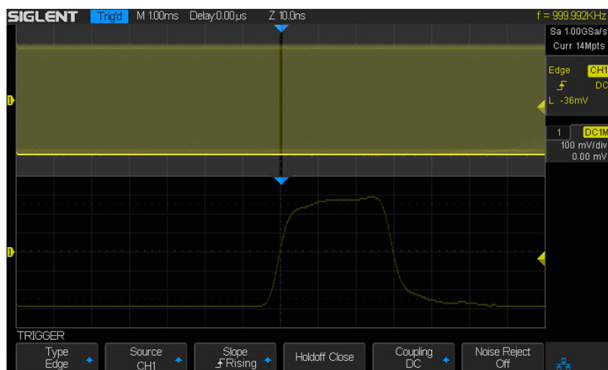
Characteristics

Waveform capture rate up to 400,000 wfms/s



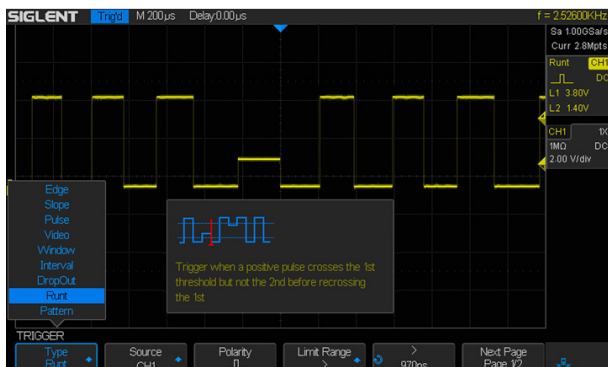
With a waveform capture rate of up to 400,000 wfms/s (sequence mode), the oscilloscope can easily capture the unusual or low-probability events.

Record length of up to 14 Mpts



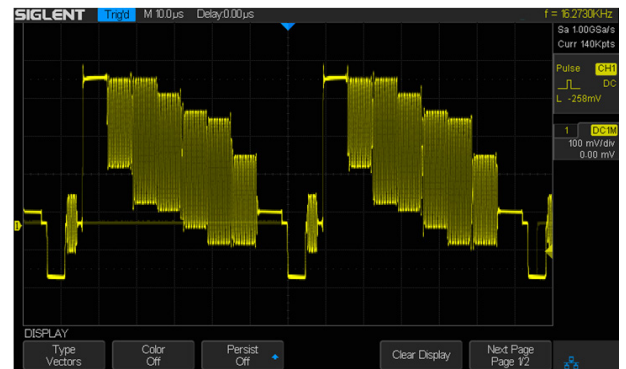
Using hardware-based Zoom technologies and record length of up to 14 Mpts, users are able to use a higher sampling rate to capture more of the signal, and then quickly zoom in to focus on the area of interest

Abundant trigger function



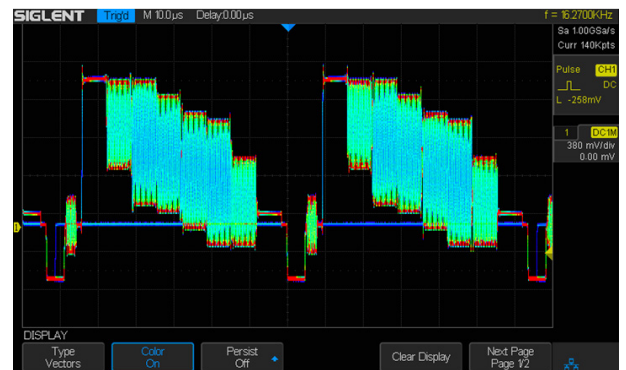
SDS1000X/SDS1000X+ has a wealth of trigger modes, including Edge, Slope, Pulse, Video, Windows, Runt, Interval, Time out (Dropout), Pattern, IIC, SPI, UART/RS232, LIN, CAN

256 intensity grading and color temperature display



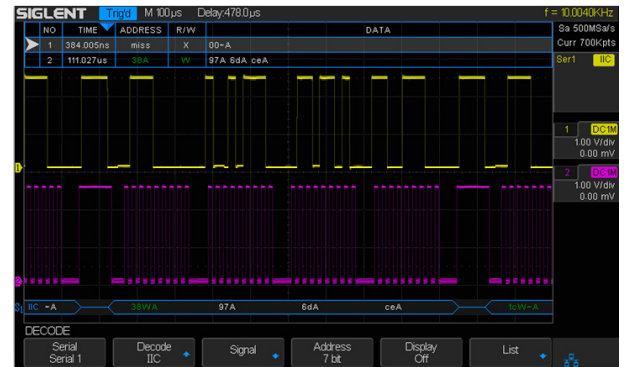
SPO display technology provides for fast refresh rates. The resulting intensity-graded trace is brighter for more often-occurring display points and dimmer in less-often-occurring points

↓ Color Temperature Display



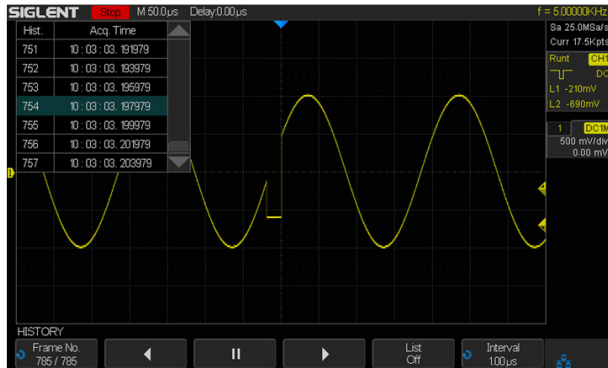
The color temperature display is similar to the intensity-graded trace except that the trace occurrence is represented by different colors (color "temperature") as opposed to changes in the intensity of one color. Red represents the most common occurrences or probabilities while blue is the least common points.

Serial bus decoding function (optional)



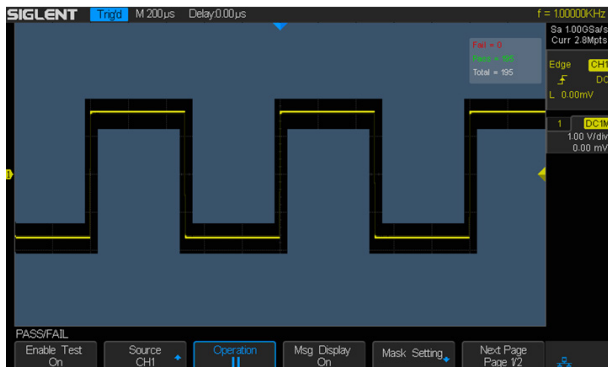
SDS1000X/SDS1000X+ displays the decoding through the events list. Bus protocol information can be quickly and intuitively displayed in table form.

History Waveforms (History) mode and segmented acquisition (Sequence)



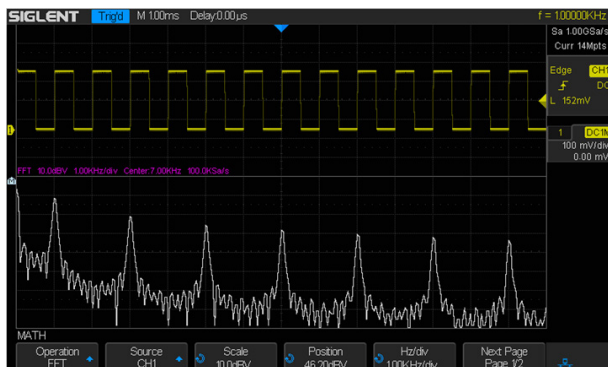
Playback history waveform to observe unusual events and locate the source quickly through the cursor or measurements, located on the keyboard Panel, this function is easily enabled. Segmented memory collection will store the waveform into multiple (up to 80,000) memory segments, each segment will store a triggered waveform and dead time information

Hardware-Based High Speed Pass/Fail Function



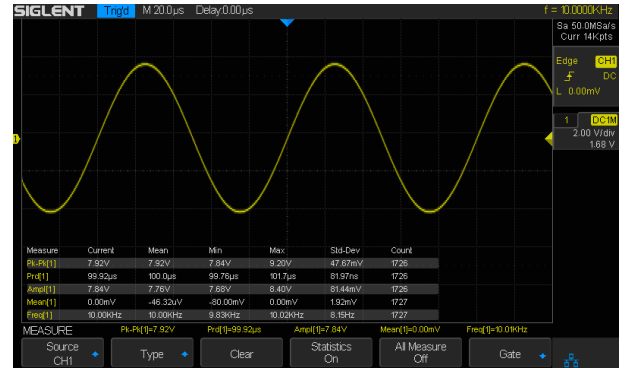
The SDS1000X/SDS1000X+ utilizes a hardware-based Pass / Fail function, performing up to 40,000 Pass / Fail decisions each second. With easy to generate user-defined test templates, the SDS1000X/SDS1000X+ compares the current measured trace to the template mask trace making it suitable for long-term signal monitoring or automated production line testing.

Advanced Math Function



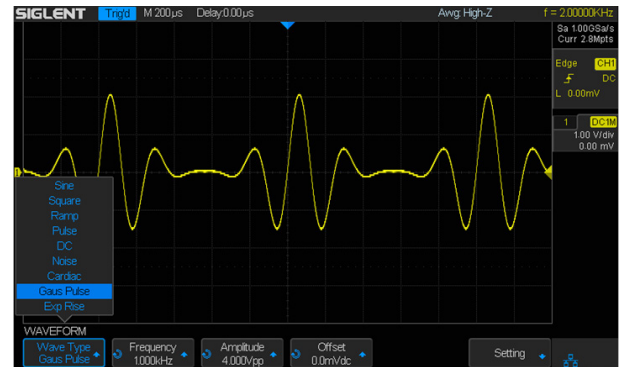
In addition to the traditional (+, -, X, /) operation, SDS1000X/SDS1000X+ oscilloscopes supports FFT, integration, differentiation, and square root operations.

Comprehensive statistical functions



Parametric statistical functions to display any parameters of the five measurements: current, average, minimum value, maximum value, and the standard deviation. The measurement count is also displayed. The maximum number of parameters that can be measured and simultaneously analyzed statistically is five. Supports Gating measurements, Math measurement, History measurement, Ref measurement.

Built-in 25 MHz function/arbitrary waveform generator (Standard for SDS1000X+ Models)



The SDS1000X+ has a built-in 25 MHz function / arbitrary waveform generator (standard), including 10 built-in waveforms plus 4 ARBs. The arbitrary waveforms can be accessed and edited by the EasyWave PC software

Complete connectivity



SDS1000X/SDS1000X+ supports USB Host, USB Device (USB-TMC), LAN(VXI-11), Pass/Fail and Trigger Out

Specifications

Acquire System

| | |
|------------------------|---|
| Sampling Rate | 1 GSa/s (Single-Channel), 500 MSa/s (Dual-Channel) |
| Memory Depth | Max 14 Mpts/Ch (Single-Channel), 7 Mpts/Ch (Dual-Channel) |
| Peak Detect | 1 ns |
| Average | Averages: 4,16, 32,64,128,256,512,1024 |
| Eres | Enhance bits: 0.5, 1, 1.5, 2, 2.5, 3 Selectable |
| Waveform interpolation | Sinx/x, Linear |

Input

| | |
|--------------------|--|
| Channel | 2 |
| Coupling | DC, AC, GND |
| Impedance | DC: (1 MΩ±2%) (18 pF ±2 pF) 50 Ω: 50 Ω±2% |
| Max Input voltage | 1 MΩ ≤400 Vpk(DC + Peak AC ≤10 kHz), 50 Ω ≤5 Vrms |
| CH to CH Isolation | DC~Max BW >40 dB |
| Probe attenuator | 1 X, 10 X, 50 X, 100 X, 500 X , 1000 X |

Vertical System

| | |
|----------------------------------|--|
| Bandwidth (-3 dB) | 200 MHz (SDS1202X/SDS1202X+) 100 MHz (SDS1102X/SDS1102X+) |
| Vertical Resolution | 8 bit |
| Vertical Scale (Probe 1X) | 500 μV/div - 10 V/div (1-2-5) |
| Offset Range (Probe 1X) | 500 μV ~ 150 mV: ± 1 V 152 mV ~ 1.5 V: ± 10 V 1.52 V ~ 10 V: ± 100 V |
| Bandwidth Limit | 20 MHz ±40% |
| Bandwidth Flatness | DC ~ 10%(BW): ± 1 dB 10% ~ 50%(BW): ± 2 dB 50% ~ 100%(BW): + 2 dB / -3 dB |
| Low Frequency Response (AC-3 dB) | ≤10 Hz (at input BNC) |
| Noise | ST-DEV ≤0.7 division (<1 mV/div) ST-DEV ≤0.3 division(<2 mV/div) ST-DEV ≤0.2 division(≥2 mV/div) |
| SFDR including harmonics | ≥35 dB |
| DC Gain Accuracy | ≤±3.0%: 5 mV/div ~10 V/div ≤±4.0%: ≤2 mV/div |
| Offset Accuracy | ±(1%* Offset+1.5%*8*div+2 mV): ≥2 mV/div ±(1%* Offset+1.5%*8*div+500 uV): ≤1 mv/div |
| Rise time | Typical 1.8 ns (SDS1202X/SDS1202X+) Typical 3.5 ns (SDS1102X/SDS1102X+) |
| Overshoot (500 ps Pulse) | <10% |

Horizontal System

| | |
|-----------------------|---|
| Time base Scale | 2.0 ns/div ~ 50 s/div |
| Channel Skew | <100 ps |
| Waveform Capture Rate | Up to 60,000 wfm/s (normal mode), 400,000 wfm/s (sequence mode) |
| Intensity grading | 256 Levels |
| Display Format | Y-T, X-Y, Roll |
| Time base Accuracy | ±25 ppm |
| Roll Mode | 50 ms/div ~ 50 s/div (1-2-5 step) |

Trigger System

| | |
|---------------------------------------|---|
| Trigger Mode | Auto, Normal, Single |
| Trigger Level | Internal: ± 4.5 div from the center of the screen EXT: ± 0.6 V EXT/5: ± 3 V |
| Hold-off Range | 80 ns ~ 1.5 s |
| Trigger Coupling | AC, DC, LFRJ, HFRJ, Noise RJ (CH1~CH2) |
| Coupling Frequency Response (CH1~CH2) | DC: Passes all components of the signal AC: Blocks DC components and attenuates signals below 5.8 Hz LFRJ: Blocks the DC component and attenuates the low-frequency components below 2 MHz HFRJ: Attenuates the high-frequency components above 1.27 MHz |
| Coupling Frequency Response (EXT) | DC: Passes all components of the signal AC: Blocks DC components and attenuates signals below 30 Hz LFRJ: Blocks the DC component and attenuates the low-frequency components below 300 Hz HFRJ: Attenuates the high-frequency components above 7 MHz |
| Trigger Accuracy (Typical) | Internal: ± 0.2 div EXT: ± 0.4 div |
| Trigger Sensitivity | CH1~CH2: DC~ Max BW 0.6 div EXT: 200 mVpp DC ~ 10 MHz 300 mVpp 10 MHz ~ BW frequency EXT/5: 1 Vpp DC ~ 10 MHz 1.5 Vpp 10 MHz ~ BW frequency |
| Trigger Jitter | <100 ps (CH1~CH2) |
| Trigger Displacement | Pre-Trigger: 0~100% Memory Delay Trigger: 0 to 10,000 div |

Slope Trigger

| | |
|-------------|-----------------|
| Slope | Rising, Falling |
| Limit Range | <, >, <>, >< |
| Source | CH1/CH2 |
| Time Range | 2 ns ~ 4.2 s |
| Resolution | 1 ns |

Edge Trigger

| | |
|--------|-----------------------------------|
| Slope | Rising, Falling, Rising & Falling |
| Source | CH1/CH2 /EXT/(EXT/5)/AC Line |

Pulse Trigger

| | |
|-------------|--------------|
| Polarity | +wid, -wid |
| Limit Range | <, >, <>, >< |
| Source | CH1/CH2 |
| Pulse Range | 2 ns ~ 4.2 s |
| Resolution | 1 ns |

Video Trigger

| | |
|-------------------|--|
| Signal Standard | NTSC, PAL, 720p/50, 720p/60, 1080p/50, 1080p/60, 1080i/50, |
| Source | 1080i/60, Custom CH1/CH2 |
| Sync | Any, Select |
| Trigger condition | Line, Field |

Interval Trigger

| | |
|-------------|-----------------|
| Slope | Rising, Falling |
| Limit Range | <, >, <>, >< |
| Source | CH1/CH2 |
| Time Range | 2 ns ~ 4.2 s |
| Resolution | 1 ns |

Dropout Trigger

| | |
|---------------|-----------------|
| Time out Type | Edge, State |
| Source | CH1/CH2 |
| Slope | Rising, Falling |
| Time Range | 2 ns ~ 4.2 s |
| Resolution | 1 ns |

Runt Trigger

| | |
|-------------|--------------|
| Polarity | +wid , -wid |
| Limit Range | <, >, <>, >< |
| Source | CH1/CH2 |
| Time Range | 2 ns ~ 4.2 s |
| Resolution | 1 ns |

Pattern Trigger

| | |
|-----------------|--------------------|
| Pattern Setting | Invalid, Low, High |
| Logic | AND, OR, NAND, NOR |
| Source | CH1/CH2 |
| Limit Range | <, >, <>, >< |
| Time Range | 2 ns ~ 4.2 s |
| Resolution | 1 ns |

Window Trigger

| | |
|-------------|--------------------|
| Window Type | Absolute, Relative |
| Source | CH1/CH2 |

Serial Trigger**I²C Trigger**

| | |
|------------------|--|
| Condition | Start, Stop, Restart, No Ack, EEPROM, 7 bits Address & Data, 10 bits Address & Data, Data Length |
| Source (SDA/SCL) | CH1, CH2 |
| Data format | Hex |
| Limit Range | EEPROM: =, >, < |
| Data Length | EEPROM: 1 byte Addr & Data: 1~2 byte Data Length: 1~12 byte |
| R/W bit | Addr & Data: Read, Write, Do not care |

SPI Trigger

| | |
|---------------------|------------|
| Condition | Data |
| Source (CS/CL/Data) | CH1, CH2 |
| Data format | Binary |
| Data Length | 4 ~ 96 bit |
| Bit Value | 0, 1, X |
| Bit Order | LSB, MSB |

UART/ RS232 Trigger

| | |
|-------------------|--|
| Condition | Start, Stop, Data, Parity Error |
| Source (RX/TX) | CH1, CH2 |
| Data format | Hex |
| Limit Range | =, >, < |
| Data Length | 1 byte |
| Data Width | 5 bit, 6 bit, 7 bit, 8 bit |
| Parity Check | None, Odd, Even |
| Stop Bit | 1 bit, 1.5 bit, 2 bit |
| Idle Level | High, Low |
| Baud (Selectable) | 600/1200/2400/4800/9600/19200/38400/57600/115200 bit/s |
| (Custom) | 300 bit/s ~ 334000 bit/s |

CAN Trigger

| | |
|---------------------------|--|
| Condition | All, Remote, ID, ID + Data, Error |
| Source | CH1,CH2 |
| ID | STD (11 bit), EXT (29 bit) |
| Data Format | Hex |
| Data Length | 1~2 byte |
| Baud Rate (Selectable) | 5k/10k/20k/50k/100k/125k/250k/500k/800k/1M bit/s |
| Baud Rate (Custom) | 5 kbit/s~1 Mbit/s |

LIN Trigger

| | |
|---------------------------|-------------------------------------|
| Condition | Break, Frame ID, ID+Data, Error |
| Source | CH1, CH2 |
| ID | 1 byte |
| Data Format | Hex |
| Data Length | 1~2 byte |
| Baud Rate (Selectable) | 600/1200/2400/4800/9600/19200 bit/s |
| Baud Rate (Custom) | 300 bit/s~20 kbit/s |

Serial Decoder (Optional)**I²C Decoder**

| | |
|-----------|--------------|
| Signal | SCL, SDA |
| Address | 7bit, 10 bit |
| Threshold | -4.5~4.5 div |
| List | 1~7 lines |

SPI Decoder

| | |
|-------------|---------------------|
| Signal | SCL, MISO, MOSI, CS |
| Edge Select | Rising, Falling |
| Idle | Low, High |
| Bit Order | MSB, LSB |
| Threshold | -4.5~4.5 div |
| List | 1~7 lines |

UART/ RS232 Decoder

| | |
|--------------|----------------------------|
| Signal | RX, TX |
| Data Width | 5 bit, 6 bit, 7 bit, 8 bit |
| Parity Check | None, Odd, Even |
| Stop Bit | 1 bit, 1.5 bit, 2 bit |
| Idle Level | Low, High |
| Threshold | -4.5~4.5 div |
| List | 1~7 lines |

CAN Decoder

| | |
|-----------|---------------------------|
| Signal | CAN_H, CAN_L |
| Source | CAN_H, CAN_L, CAN_H-CAN_L |
| Threshold | -4.5~4.5 div |
| List | 1 ~ 7 lines |

LIN Decoder

| | |
|---------------------------------------|----------------|
| LIN Specification Package Revision | Ver1.3, Ver2.0 |
| Threshold | -4.5 ~ 4.5 div |
| List | 1 ~ 7 lines |

| Measure System | | |
|-----------------------------------|---|---|
| Source | CH1, CH2, Math, Ref, History | |
| Number of Measurements | Display 5 measurements at the same time | |
| Measurement Range | Screen region, Gate region | |
| Measurement Parameters (37 Types) | | |
| Vertical (Voltage) | Max | Highest value in input waveform |
| | Min | Lowest value in input waveform |
| | Pk-Pk | Difference between maximum and minimum data values |
| | Ampl | Difference between top and base in a bimodal signal, or between max and min in an unimodal signal |
| | Top | Value of most probable higher state in a bimodal waveform |
| | Base | Value of most probable lower state in a bimodal waveform |
| | Mean | Average of all data values |
| | Cmean | Average of data values in the first cycle |
| | Stdev | Standard deviation of all data values |
| | Cstd | Standard deviation of all data values in the first cycle |
| | VRMS | Root mean square of all data values |
| | Crms | Root mean square of all data values in the first cycle |
| | FOV | Overshoot after a falling edge;(base-min)/Amplitude |
| | FPRE | Overshoot before a falling edge;(max-top)/Amplitude |
| ROV | Overshoot after a rising edge;(max-top)/Amplitude | |
| RPRE | Overshoot before a rising edge;(base-min)/Amplitude | |
| Level@X | the voltage value of the trigger point | |
| Horizontal (Time) | Period | Period for every cycle in waveform at the 50% level ,and positive slope |
| | Freq | Frequency for every cycle in waveform at the 50% level ,and positive slope |
| | +Wid | Width measured at 50% level and positive slope |
| | -Wid | Width measured at 50% level and negative slope |
| | Rise Time | Duration of rising edge from 10-90% |
| | Fall Time | Duration of falling edge from 90-10% |
| | Bwid | Time from the first rising edge to the last falling edge ,or the first falling edge to the last rising edge at the 50% crossing |
| | +Dut | Ratio of positive width to period |
| | -Dut | Ratio of negative width to period |
| | Delay | Time from the trigger to the first transition at the 50% crossing |
| | Time@Level | Time from trigger of each transition at a specific level and slope, include: Current, Max, Min, Mean, Std-dev |
| Delay | Phase | Calculate the phase difference between two edges |
| | FRR | Time between the first rising edges of the two channels |
| | FRF | Time from the first rising edge of channel A ,to the first falling edge of channel B |
| | FFR | Time from the first falling edge of channel A ,to the first rising edge of channel B |
| | FFF | Time from the first falling edge of channel A ,to the first falling edge of channel B |
| | LRR | Time from the first rising edge of channel A ,to the last rising edge of channel B |
| | LRF | Time from the first rising edge of channel A ,to the last falling edge of channel B |
| | LFF | Time from the first falling edge of channel A ,to the last rising edge of channel B |
| Cursors | Manual : Time X1, X2, (X1-X2), (1/ΔT) Voltage Y1, Y2, (Y1-Y2) Track: Time X1, X2, (X1-X2) | |
| Statistics | Current, Mean, Min, Max, Std-Dev, Count | |
| Counter | Hardware 6 bits counter (channels are selectable) | |

Math Function

| | |
|-----------------|---|
| Operation | +, -, *, /, FFT, d/dt, ∫dt, √ |
| FFT window | Rectangular, Blackman, Hanning, Hamming |
| FFT display | Full Screen, Split |
| Decoding number | 2 |

Built-in Function Generator (Standard for SDS1000X+)

| | |
|-----------------------|--|
| Channel | 1 |
| Max. Output Frequency | 25 MHz |
| Sampling Rate | 125 MSa/s |
| Frequency Resolution | 1 μHz |
| Frequency Accuracy | ±50 ppm |
| Vertical Resolution | 14 bits |
| Amplitude Range | -1.5 ~ +1.5 V (50 Ω) -3 ~ +3 V (High-Z) |
| Waveform Type | Sine, Square, Ramp, Pulse, DC, Noise, Cardiac, Gaus Pulse, Exp Rise, Exp Fall, Arb |
| Output impedance | 50 Ω±2% |
| Protection | Short-Circuit Protection |

Sine

| | |
|------------------------------------|---|
| Frequency | 1 μHz ~ 25 MHz |
| Offset Accuracy (100 KHz) | ±(0.3 dB*Offset Setting Value +1 mVpp) |
| Amplitude flatness (100 kHz, 5Vpp) | ±0.3 dB |
| SFDR | DC ~ 1 MHz -60 dBc 1 MHz ~ 5 MHz -55 dBc 5 MHz ~ 25 MHz -50 dBc |
| HD | DC-5 MHz -50 dBc 5 MHz - 25 MHz -45 dBc |

Square/Pulse

| | |
|---------------------------------|---------------------|
| Frequency | 1 μHz ~ 10 MHz |
| Duty Cycle | 20% ~ 80% |
| Rise/Fall time | < 24 ns (10% ~ 90%) |
| Overshoot (1kHz, 1Vpp, Typical) | < 3% |
| Pulse Width | > 50 ns |
| Jitter | < 500 ps + 10 ppm |

Ramp

| | |
|--------------------|--|
| Frequency | 1 μHz ~ 300 kHz |
| Linearity(Typical) | < 0.1% of Pk-Pk (Typical, 1 kHz, 1 Vpp, 100% Symmetry) |
| Symmetry | 0% ~ 100% (Adjustable) |

DC

| | |
|--------------|--------------------------------|
| Offset range | ±1.5 V (50 Ω) ±3 V (High-Z) |
| Accuracy | ±(offset *1%+3 mV) |

Noise

| | |
|-----------|-----------------|
| Bandwidth | >25 MHz (-3 dB) |
|-----------|-----------------|

Arbitrary Wave

| | |
|---------------|---------------------|
| Frequency | 1 μHz ~ 5 MHz |
| Wave Length | 16 Kpts |
| Sampling Rate | 125 MSa/s |
| Lead in | EasyWave and U-Disk |

Digital Channels (Optional for SDS1000X+)

| | |
|-----------------------------|--|
| No. of Channels | 16 |
| Max. Sampling Rate | 500 MSa/s |
| Memory Depth | 14 Mpts/CH |
| Min. Detectable Pulse Width | 4 ns |
| Level Group | D0~D7, D8~D15 |
| Level Range | -3 V~3 V |
| Logic Type | TTL, CMOS, LVCMOS 3.3, LVCMOS 2.5, custom |
| Skew | D0~D15: ±1 sampling interval Digital to Analog: ± (1 sampling interval +1 ns) |

I/O

| | |
|-----------|---|
| Standard | USB Host, USB Device, LAN, Pass/Fail, Trigger Out |
| Pass/Fail | 3.3 V TTL Output |

Display (Screen)

| | |
|--------------------|------------------|
| Display Type | 8 inch TFT-LCD |
| Display Resolution | 800×480 |
| Display Color | 24 bit |
| Contrast (Typical) | 500:1 |
| Backlight | 300 nit |
| Range | 8 x 14 divisions |

Display (Waveform)

| | |
|---------------|--|
| Display Mode | Dot, Vector |
| Persist Time | Off, 1 Sec, 5 Sec, 10 Sec, 30 Sec, Infinite |
| Color Display | Normal, Color |
| Screen Saver | 1 min, 5 min, 10 min, 30 min, 1 hour, Off |
| Language | Simplified Chinese, Traditional Chinese, English, French, Japanese, Korean, German, Russian, Italian, Portuguese |

Environments

| | |
|-------------------------------|---|
| Temperature | Operating: 10 °C~ +40 °C Non-operating: -20 °C~ +60 °C |
| Humidity | Operating: 85%RH, 40 °C , 24 hours Non-operating: 85%RH, 65 °C , 24 hours |
| Height | Operating: ≤3000 m Non-operating: ≤15,266 m |
| Electromagnetic Compatibility | 2004/108/EC Execution Standard EN 61326-1:2006 EN 61000-3-2:2006 + A2:2009, EN 61000-3-3:2008 |
| Safety | 2006/95/EC Execution Standard EN 61010-1:2010/EN 61010-2-030:2010 |

Mechanical








| | |
|------------|--|
| Dimensions | Length 340 mm Width 123 mm Height 184 mm |
| Weight | N.W: 3.26 Kg; G.W: 4.25 Kg |

Power Supply

| | |
|---------------|---------------------------------------|
| Input Voltage | 100 ~ 240 VAC, CAT II, Auto selection |
| Frequency | 50/ 60/ 400 Hz |
| Power | 50 W Max |

SDS1000X/SDS1000X+ Probes & Accessories

| Type | Model | Picture | Specifications |
|---------------------------------|---------|---|--|
| Passive Probe | PP470 |  | Bandwidth: 70 MHz, 1 X/10 X, 1 M/10 Mohm, 300 V/600 V |
| | PP510 | | Bandwidth: 100 MHz, 1 X/10 X, 1 M/10 Mohm, 300 V/600 V |
| | PP215 | | Bandwidth: 200 MHz, 1 X/10 X, 1 M/10 Mohm, 300 V/600 V |
| Logic Probe | SPL1016 |  | 16 Channel Logic Probe |
| Current Probe | CP4020 |  | Bandwidth: 100 KHz; Maximum continuous current 20 Arms; Peak current 60 A; Switching ratio: 50 mV/A; 5 mV/A; DC measurement accuracy: 50 mV/A (0.4 A-10 ApK) $\pm 2\%$; 5 mV/A (1 A-60 ApK) $\pm 2\%$; 9 V battery-powered |
| | CP4050 |  | Bandwidth: 1 MHz; Maximum continuous current 50 Arms; Peak current 140 A; Switching ratio: 500 mV/A; 50 mV/A; DC measurement measurement accuracy: 500 mV/A (20 mA-14 ApK) $\pm 3\% \pm 20$ mA; 50 mV/A (200 mA-100 ApK) $\pm 4\% \pm 200$ mA; 50 mV/A (100 A-140 ApK) $\pm 15\%$ max; 9 V battery-powered |
| | CP4070 |  | Bandwidth: 150 KHz; Maximum continuous current 70 Arms; Peak current 200 A; Switching ratio: 50 mV/A; 5 mV/A; DC measurement accuracy: 50 mV/A (0.4 A-10 ApK) $\pm 2\% \pm 5$ mV/A (1 A-200 ApK) $\pm 2\%$; 9 V battery-powered |
| | CP4070A |  | Bandwidth: 300 KHz; Maximum continuous current 70 Arms; Peak current 200 A; Switching ratio: 100 mV/A; 10 mV/A; DC measurement accuracy: 100 mV/A (50 mA-10 ApK) $\pm 3\% \pm 50$ mA; 10 mV/A (500 mA-40 ApK) $\pm 4\% \pm 50$ mA; 10 mV/A (40 A-200 ApK) $\pm 15\%$ max; 9 V battery-powered |
| | CP5030 |  | Bandwidth: 50 MHz; Maximum continuous current 30 Arms; Peak current 50 A; Switching ratio: 100 mV/A, 1 V/A; AC/DC measurement accuracy: 1 A ($\pm 1\% \pm 1$ mA); 100 mV/A ($\pm 1\% \pm 10$ mA); Standard DC 12 V/1.2 A power adapter |
| | CP5030A |  | Bandwidth: 100 MHz; Maximum continuous current 30 Arms; Peak current 50 A; Switching ratio: 100 mV/A, 1 V/A; AC/DC measurement accuracy: 1 A ($\pm 1\% \pm 1$ mA); 100 mV/A ($\pm 1\% \pm 10$ mA); Standard DC 12 V/1.2 A power adapter |
| | CP5150 |  | Bandwidth: 12 MHz; Maximum continuous current 150 Arms; Peak current 300 A; Switching ratio: 100 mV/A, 1 V/A; AC/DC measurement accuracy: 100 mV/A ($\pm 1\% \pm 1$ mA); 10 mV/A ($\pm 1\% \pm 10$ mA); Standard DC 12 V/1.2 A power adapter |
| | CP5500 |  | Bandwidth: 5 MHz; Maximum continuous current 500 Arms; Peak current 750 A; Switching ratio: 100 mV/A, 10 mV/A; AC/DC measurement accuracy: 100 mV/A ($\pm 1\% \pm 1$ mA); 10 mV/A ($\pm 1\% \pm 10$ mA); Standard DC 12 V/1.2 A power adapter |
| High Voltage Differential Probe | DPB4080 |  | Bandwidth: 50 MHz; Maximum input differential voltage 800 V (DC + Peak AC); Range selection (attenuation ratio): 10 X/100 X; Accuracy: $\pm 1\%$; Standard DC 9 V/1 A power adapter |
| | DPB5150 |  | Bandwidth: 70 MHz; Maximum input differential voltage 1500 V (DC + Peak AC); Range selection (attenuation ratio): 50 X/500 X; Accuracy: $\pm 2\%$; Standard 5 V/1 A USB power adapter |

| Type | Model | Picture | Specifications |
|--|----------------|---|--|
| High Voltage Differential Probe | DPB5150A |  | Bandwidth: 100 MHz; Maximum input differential voltage 1500 V (DC + Peak AC); Range selection (attenuation ratio): 50 X/500 X; Accuracy: $\pm 2\%$; Standard 5 V/1 A USB power adapter |
| | DPB5700 |  | Bandwidth: 70 MHz; Maximum input differential voltage 7000 V (DC + Peak AC); Range selection (attenuation ratio): 100 X/1000 X; Accuracy: $\pm 2\%$; Standard 5 V/1 A USB power adapter |
| | DPB5700A |  | Bandwidth: 100 MHz; Maximum input differential voltage 7000 V (DC + Peak AC); Range selection (attenuation ratio): 100 X/1000 X; Accuracy: $\pm 2\%$; Standard 5 V/1 A USB power adapter |
| High Voltage Probe | HPB4010 |  | Bandwidth: 40 MHz; Maximum measurement voltage DC: 10 KV; AC (rms) : 7 KV (sine) ; AC (Vpp) : 20 KV (Pulse); attenuation ratio 1:1000; Accuracy: $\leq 3\%$ |
| Isolated front end | ISFE |  | USB 5 V power supply, plug and play, the maximum input voltage 600 Vp-p, floating test. Work with oscilloscopes. |
| Demo board | STB Test Board |  | Optional accessories for experimental teaching and product demos |
| Deskew fixture | DF2001A |  | Deskew fixture for voltage and current probes |

Ordering information

| Product Description | Product Name |
|--|--------------|
| 100 MHz Two Channels | SDS1102X |
| 200 MHz Two Channels | SDS1202X |
| 100 MHz Two Channels, Built-In Waveform Generator (Standard), 16 Digital Channels (Option, *Requires SPL1016 & SDS-1000X-LA) | SDS1102X+ |
| 200 MHz Two Channels, Built-In Waveform Generator (Standard), 16 Digital Channels (Option, *Requires SPL1016 & SDS-1000X-LA) | SDS1202X+ |

Standard Accessories

USB Cable -1
 Quick Start-1
 Certification-1
 Passive Probe-2
 Power Cord -1
 CD (Included User Manual and EasyScopeX software)-1

Optional Accessories

| | |
|------------------------------------|---|
| I2C,SPI,UART/RS232,CAN,LIN Decoder | SDS-1000X-DC |
| 16 Channels MSO (Software) | SDS-1000X-LA |
| 16 Digital Channels Logic Probe | SPL1016 |
| Isolated Front End | ISFE |
| STB Demo Source | STB |
| High Voltage Probe | HPB4010 |
| Current Probe | CP4020/CP4050/CP4070/ CP4070A/CP5030/CP5030A/ CP5150/CP5500 |
| Differential Probe | DPB4080/DPB5150/DPB5150A/DPB5700/DPB5700A |



SDS1000X SDS1000X+ Series Digital Oscilloscope



About SIGLENT

SIGLENT is an international high-tech company, concentrating on R&D, sales, production and services of electronic test & measurement instruments.

SIGLENT first began developing digital oscilloscopes independently in 2002. After more than a decade of continuous development, SIGLENT has extended its product line to include digital oscilloscopes, function/arbitrary waveform generators, digital multimeters, DC power supplies, spectrum analyzers, isolated handheld oscilloscopes and other general purpose test instrumentation. Since its first oscilloscope, the ADS7000 series, was launched in 2005, SIGLENT has become the fastest growing manufacturer of digital oscilloscopes. We firmly believe that today SIGLENT is the best value in electronic test & measurement.

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