

SHS800X SHS1000X Handheld Digital Oscilloscope

Data Sheet

Rev. 01B
Feb. 2022



SHS820X/SHS1202X SHS810X/SHS1102X

Product Overview

SIGLENT's Handheld Digital Oscilloscopes include the SHS800X and SHS1000X models. Both feature 2 analog oscilloscope input channels and are available in 200 MHz and 100 MHz analog bandwidths, a single ADC with 1 GSa/s maximum sample rate, and a single memory module with 12 Mpts memory depth. When two channels are enabled, each channel has sample rate of 500 MSa/s and a standard record length of 6 Mpts. When only a single channel is activated, the maximum sample rate is 1 GSa/s and the maximum record length is 12 Mpts. For ease-of-use, the most commonly used functions can be accessed with its user-friendly front panel design.

The SHS800X series has two non-isolated scope channels and one isolated multimeter channel.

The SHS1000X series features full isolation between the two oscilloscope channels, one multimeter channel, power adapter and the USB host/device port. The full isolation makes it ideal for both laboratory and floating signal measurement because it reduces the risk of accidental short circuits.

The max voltage input to the analog scope inputs is CATIII 600 Vrms, CATII 1000 Vrms. And the max input for the multimeter is CATIII 600 Vrms, CATII 1000 Vrms.

The SHS series utilizes a new generation of SPO (Super-Phosphor Oscilloscope) technology that provides excellent signal fidelity and performance. It comes with a vertical input range from 2 mV/div to 100 V/div, and a max offset range up-to 400 V.

The innovative digital trigger system delivers high sensitivity and low jitter, and a waveform capture rate of up-to 400,000 frames/sec. The SHS also employs a 256-level intensity grading display function and a color temperature display mode for clarity and fast fault identification.

The SHS' have multiple powerful triggering modes including serial bus triggering as well as free decoding for IIC, SPI, UART, CAN, LIN bus types. The SHS models also include History waveform recording, and sequential triggering that enable extended waveform recording and analysis. Another powerful addition is the new 1 million point FFT math function that gives the SHS very high frequency resolution when observing signal spectra. The new digital design also includes a hardware co-processor that delivers measurements quickly and accurately without slowing acquisition and front-panel response.





























The SHS series feature built-in sample and measurement value recorders. The sample recorder can achieve a maximum sampling rate of 25 kSa/s, and can record for up to 22 hours at this sampling rate. The measurement value recorder can simultaneously record 4 sets of measurement values at a recording interval as low as 0.1s which delivers up-to 25 hours of continuous recording.

The SHS series integrates a 6000 count digital multimeter, isolated from the scope that can measure DC/AC Voltage, DC/AC Current, Resistance, Capacitance, Diodes, and Continuity.

A rechargeable 6900 mAh lithium battery supports up-to 5.5 hours (4 hours SHS1000X) of work without a charge.

The handheld oscilloscopes feature a sealed IP51 dust and drip-proof housing and has been tested to IEC60529 to guarantee the ruggedness that is needed to survive harsh environments. A rubberized surface with large keys also makes it easy to use in difficult environments.

Key Features

-  200 MHz, 100 MHz bandwidth models
-  Sample rate of 1 GSa/s (single-channel), Sample rate of 500 MSa/s (two-channels).
-  The Siglent SPO technology
 - Waveform capture rates up to 100,000 wfm/s (normal mode) and 400,000 wfm/s (sequence mode)
 - Supports 256-level intensity grading and color temperature display modes
 - Record length up to 12 Mpts
 - Digital trigger system
-  Intelligent trigger: Edge, Slope, Pulse Width, Window, Runt, Interval, Time out (Dropout), Pattern
-  Serial bus triggering and decoding (Standard) for IIC, SPI, UART, CAN, and LIN protocols
-  Video trigger/HDTV
-  Low background noise with voltage scales from 2 mV/div to 100 V/div
-  3 one-button shortcuts for Oscilloscope, Multimeter and Recorder functions
-  8 one-button shortcuts for: Run/Stop, Auto Setup, Default, Measure, Cursors, Display/Persist, Clear Sweep and Print. More function shortcuts available when combined with the shift button
-  Segmented acquisition (Sequence) mode, divides 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 (maximum recorded waveform length is 80,000 frames)
-  Automatic measurement function for 38 parameters as well as Measurement Statistics, Zoom, Gating, Math, History and Reference functions
-  1 Mpts FFT. Support Peaks and Markers
-  Math and measurement functions use all sampled data points (up to 12 Mpts)
-  Math functions (FFT, addition, subtraction, multiplication, division, integration, differential, square root)
-  Default key can be customized for user settings or factory "defaults"
-  Supports Multi-language display and embedded online help
-  Security Erase mode
-  Search and navigate function
-  Includes Recorder mode, including Sample and Measurement Loggers
-  6000 counts Digital Multimeter, Support DCV, ACV, DCI, ACI, Resistance, Diode, Capacitance, Continuity test.
-  True RMS AC Voltage/Current measurement multimeter
-  5.6-inch TFT-LCD display with 640 * 480 resolution
-  Interface types: Isolated USB Host, USB Device (MicroUSB -TMC)
-  Supports SCPI remote control commands
-  UL2054 certified lithium battery pack, 6900 mAh capacity, external charger
-  IP Rating: IP51
-  Compliance with UL61010-1, UL61010-2-030, UL61010-2-033

Models and Key Specifications

| Model | SHS810X | SHS820X | SHS1102X | SHS1202X |
|------------------------------|--|---------|--|----------|
| Bandwidth | 100 MHz | 200 MHz | 100 MHz | 200 MHz |
| Sample rate (Max.) | Two-channel share a single 1 GSa/s ADC. When two channels are enabled, each channel has a maximum sample rate of 500 MSa/s. When a single channel is active, that channel has a sample rate of 1 GSa/s | | | |
| Channels | 2 analog oscilloscope channels, 1 multimeter channel | | | |
| Memory depth (Max.) | 6 Mpts/CH (dual-channel mode) 12 Mpts/CH (single channel mode) | | | |
| Waveform capture rate (Max.) | 100,000 wfm/s (normal mode), 400,000 wfm/s (sequence mode) | | | |
| Trigger type | Edge, Slope, Pulse Width, Window, Runt, Interval, Dropout, Pattern, Video | | | |
| Serial Trigger and decoder | IIC, SPI, UART, CAN, LIN | | | |
| Data Logger(Recorder) | Sample Logger. The Max sample rate is 25 kSa/s, the Min sample rate is 1 Sa/s Measurement Logger. The Max interval is 10 minutes, the Min interval is 0.1second. The Max items of logging is 4 | | | |
| I/O | USB Host, USB Device | | | |
| Max input Voltage (Scope) | CAT II 300 Vrms Between BNC Signal and Protecting Earth CAT II 30 Vrms Between BNC GND and Protecting Earth CAT II 300 Vrms Between BNC Signal and BNC GND | | CAT III 600 Vrms, CAT II 1000 Vrms Between BNC Signal and Protecting Earth CAT III 600 Vrms, CAT II 1000 Vrms Between BNC GND and Protecting Earth CAT III 300 Vrms Between BNC Signal and BNC GND | |
| Max input Voltage (Meter) | CAT III 300 Vrms, CAT II 600 Vrms | | CAT III 600 Vrms, CAT II 1000 Vrms | |
| Probe | PP510 | PP215 | PB925 | |
| Display | 5.6-inch TFT-LCD (640x480) | | | |
| Weight | Without package 1.75 kg. With package 3.5 kg | | | |

Functions & Characteristics

Front panel and back panel



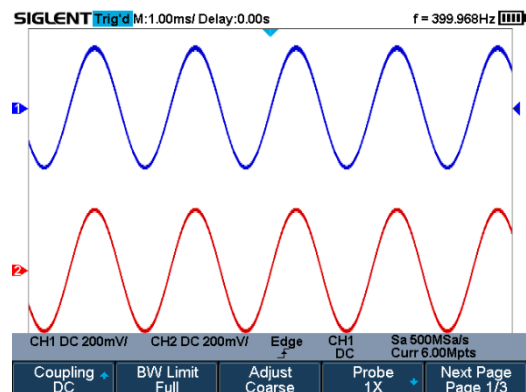
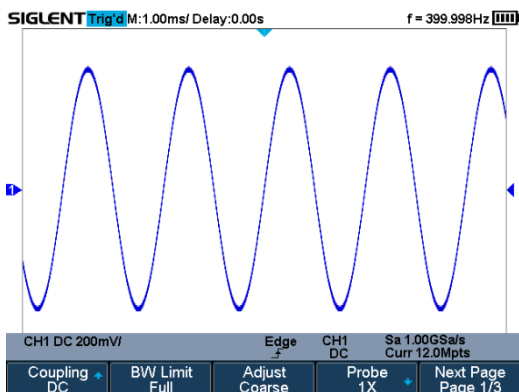
Front panel of the SHS800X series



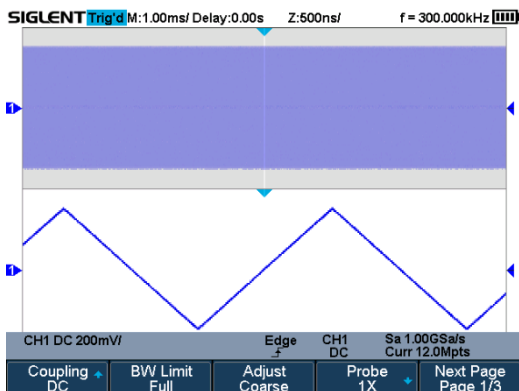
Rear of the SHS800X series

Large bright 5.6-inch TFT -LCD display with 640 * 480 resolution. The most commonly used functions are accessible using 8 different one-button operation keys: Run/Stop, Auto Setup, Default, Cursor, Measure, Display/Persist, Clear Sweep, and Print. More function shortcuts are available combined with the shift button.

When two channels are enabled, each channel has a maximum sample rate of 500 MSa/s. When a single channel is active, that channel has a sample rate of 1 GSa/s

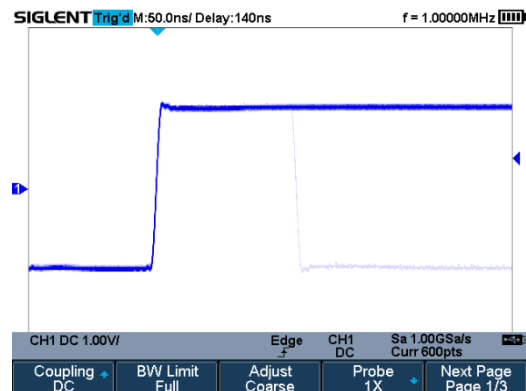


Record Length of up to 12 Mpts



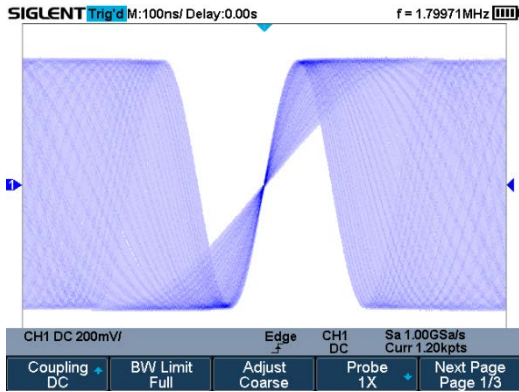
Using hardware-based Zoom technologies and max record length up to 12 Mpts, users can oversample to capture for longer periods at higher resolution and use the zoom feature to see more details within each signal.

Waveform Capture Rate up to 400,000 wfm/s

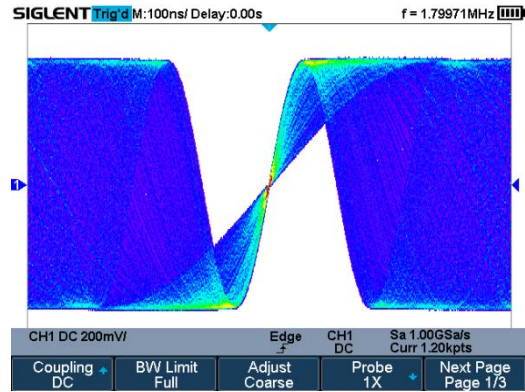


With a waveform capture rate of up to 400,000 wfm/s (sequence mode), the oscilloscope can easily capture unusual or low-probability events.

256-Level Intensity Grading and Color Temperature Display

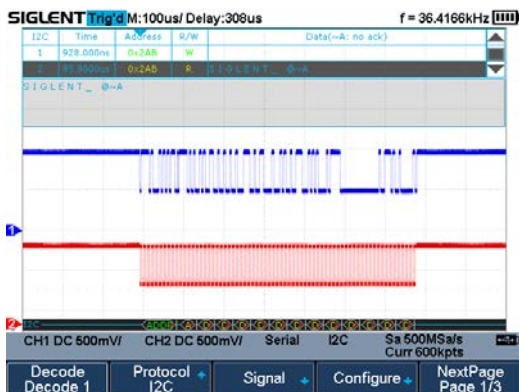


SPO display technology provides fast refresh rates. The resulting intensity-graded trace is brighter for events that occur with more frequency and dims when the events occur with less frequency.



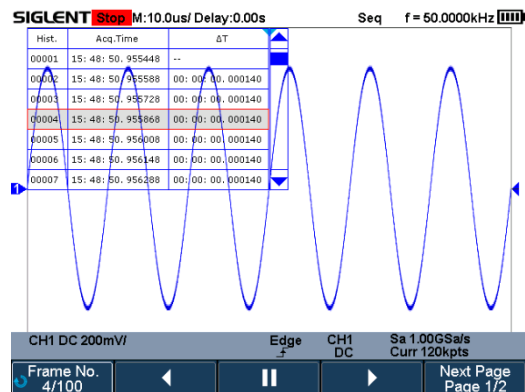
The color temperature display is similar to the intensity-graded trace function, but the trace occurrence is represented by different colors (color "temperature") as opposed to changes in the intensity of one color. Red colors represent events that occur more frequently, while blue is used to mark points that occur less frequently.

Serial Bus Decoding Function



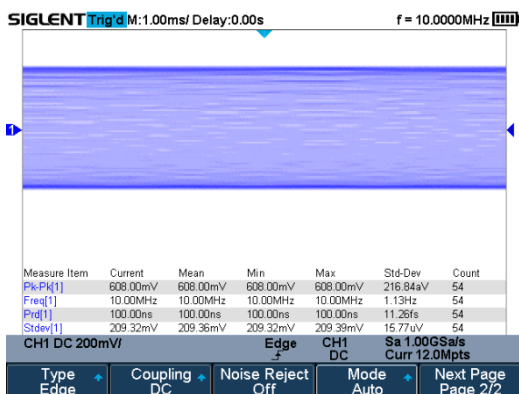
SHS800X/SHS1000X displays the decoding through the events list. Bus protocol information can be quickly and intuitively displayed in a tabular format.

History Waveforms (History) Mode and Segmented Acquisition (Sequence)



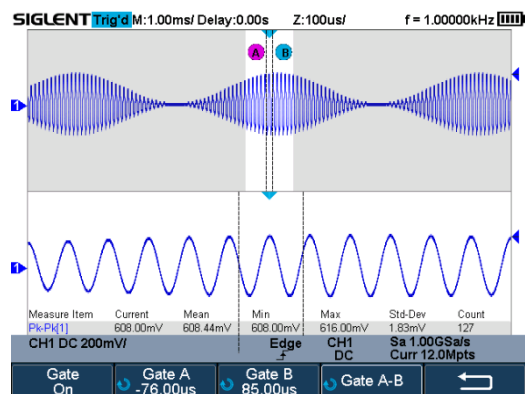
Playback the latest triggered events using the history function. Segmented memory collection will store trigger events into multiple (Up to 80,000) memory segments, each segment will store triggered waveforms and timestamps for each frame.

True measurement to 12 M points



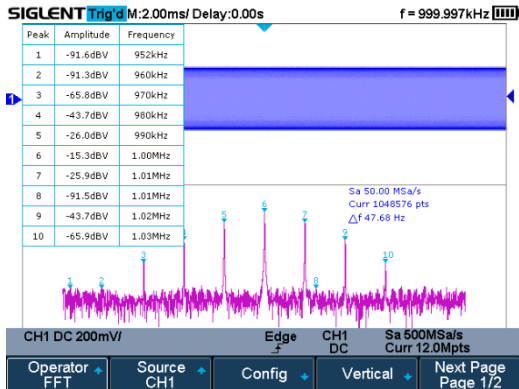
SHS800X/SHS1000X series can measure all sampled data points up to 12 Mpts. This ensures the accuracy of measurements while the math co-processor decreases measurement time and increases ease-of-use.

Gate and Zoom Measurement



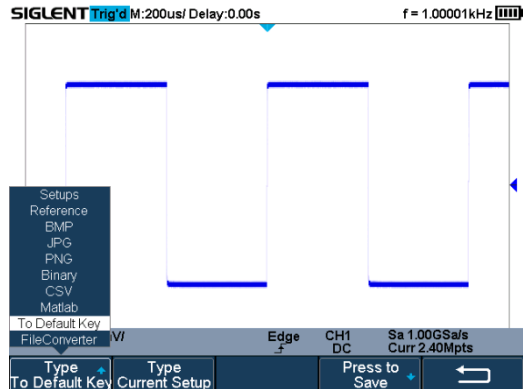
Through Gate and Zoom measurement, the user can specify an arbitrary interval of waveform data analysis and statistics. This helps avoid measurement errors that can be caused by invalid or extraneous data, greatly enhancing the measurements' validity and flexibility.

1M points used to calculate the FFT



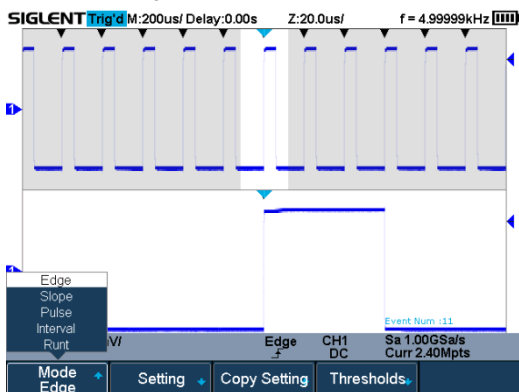
The new math co-processor enables FFT analysis of incoming signals using up to 1 M samples per waveform. This provides high-frequency resolution with a fast refresh rate. The FFT function also supports a variety of window functions so that it can adapt to different spectrum measurement needs. Support Peaks, Markers, a variety of numbers.

Customizable Default Key



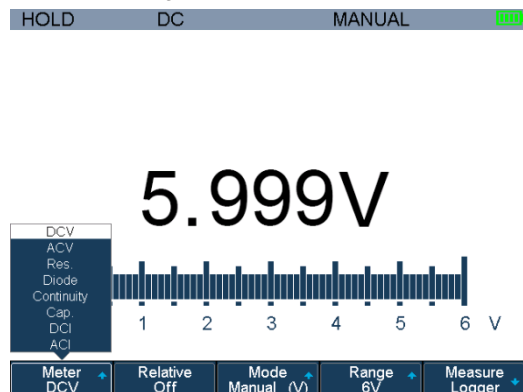
The current parameters of the oscilloscope can be preset to Default Key through the Save menu.

Search and Navigate



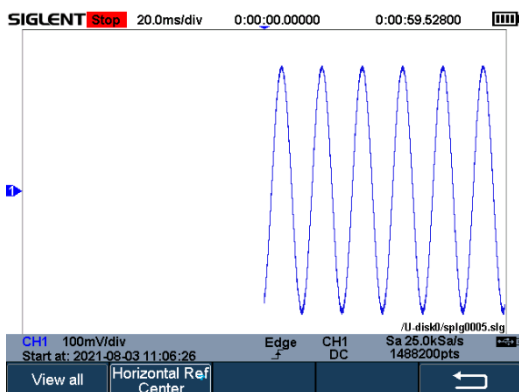
The SHS800X/SHS1000X series can search events specified by the user in a frame. It can also navigate by time (delay position) and historical frames.

6000 Counts Digital Multimeter



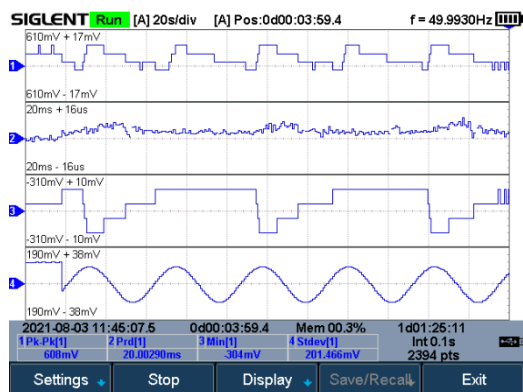
6000 count digital multimeter featured function of DCV, true RMS ACV, DCI, ACI, Diode, Resistance, Capacitance, and Continuity.

Sample Logger



The Sample Logger is the mode of logging the sampling points for a long time. For there are many sampling points to log, they are logged into the internal flash or external U disk in real-time. After stopping logging, the user can recall the sampling points on the oscilloscope, or analyze the saved data on the computer.

Measurement Logger



The measurement Logger is the mode of logging the measurement value for a long time. For the amount of measurement data is relatively small, to process quickly, the data is logged in memory. After stopping logging, the data can be saved into the internal flash or external U disk.

Adapter/Battery



Wall power using the supplied adapter



Battery powered

SHS800X/SHS1000X supports adapter power supply and battery power supply. After connecting the adapter, the battery enters into charging mode. The adapter provides a maximum 4 A output current.

SHS800X/SHS1000X uses a UL2054 certified lithium battery package. The battery capacity of 6900 mAh can guarantee long-term operation without an external power supply for up-to 5.5 hours (SHS800X) and 4 hours (SHS1000X). The battery supports an external charger to further meet the requirements of portability.

Connectivity



Right side of the SHS800X series



Left side of the SHS800X series

SHS800X/SHS1000X supports USB Host, USB Device (Micro USB -TMC).

Specifications

| Oscilloscope | | |
|------------------------|---|----------|
| Acquisition System | | |
| Model | SHS800X | SHS1000X |
| Sampling Rate (Max.) | 1 GSa/s (single channel), 500 MSa/s (two channels) | |
| Memory Depth (Max.) | Max 12 Mpts/Ch (single channel), 6 Mpts/Ch (two channels) | |
| Peak Detect | 2 ns | |
| Average | Averages:4,16, 32,64,128,256,512,1024 | |
| ERES | Enhance bits:0.5, 1.5, 2, 2.5, 3 | |
| Waveform interpolation | Sin(x)/x, Linear | |

| Input | | |
|-----------------------------------|--|--|
| Model | SHS800X | SHS1000X |
| Channels | 2 channels | |
| Coupling | DC, AC, GND | |
| Impedance | DC: (1 MΩ±2%) (14 pF ±2 pF) | |
| Max. Input voltage ^[1] | CAT II 300 Vrms Between BNC Signal and Protecting Earth CAT II 30 Vrms Between BNC GND and Protecting Earth CAT II 300 Vrms Between BNC Signal and BNC GND | CAT III 600 Vrms, CAT II 1000 Vrms Between BNC Signal and Protecting Earth CAT III 600 Vrms, CAT II 1000 Vrms Between BNC GND and Protecting Earth CAT III 300 Vrms Between BNC Signal and BNC GND |
| CH to CH Isolation | DC-Max BW: >40 dB | |
| Probe attenuation | 0.1X,0.2X,0.5X,1X,2X,5X,10X.....1000X,2000X,5000X,10000X,Custom | |

Notes [1]: According to IEC61010-1, a voltage higher than 30 Vrms is a dangerous voltage, necessary protection must be taken to prevent personal injury. Please read the user's manual for details.

| Vertical System | | |
|--|---|--|
| Model | SHS800X | SHS1000X |
| Bandwidth (-3 dB) ^[2] | ≥ 200 MHz (SHS820X) ≥ 100 MHz (SHS810X) | ≥ 200 MHz (SHS1202X) ≥ 100 MHz (SHS1102X) |
| Vertical Resolution | 8-bit | |
| Vertical Scale (Probe 1X) | 2 mV/div–100 V/div (1-2-5 sequence) | |
| Offset Range (Probe 1X) | 2 mV- 296 mV: ± 5 V 302 mV- 7.5 V: ± 80 V 7.6 V- 100 V: ± 400 V | |
| Bandwidth limit ^[2] | 20 MHz ± 40% | |
| Bandwidth Flatness ^[2] | DC- 10% (BW): ± 1 dB 10%- 50% (BW): ± 2 dB 50%- 100% (BW): + 2 dB/-3 dB | |
| Low-frequency response (AC coupling -3 dB) | ≤ 2 Hz (at input BNC) | |
| Noise/SNR | 2 mV/div: > 24 dB 5 mV/div: >25 dB ≥ 10 mV/div: > 35 dB P-P Noise ≤ 15 SDEV Spec | |
| SFDR including harmonics | ≥ 30 dB | ≥ 28 dB |
| CMRR | | > 100 dB DC > 50 dB to AC 1 MHz |
| DC Gain Accuracy | ≤ ± 3%: ≥ 10 mV/div ≤ ± 4%: < 10 mV/div | |
| Offset Accuracy | ± (1.5%* Offset+1.5%*8*div+5 mV) | ±(1.5%* Offset+1.5%*8*div+5 mV) |
| Rise time ^[2] | Typical 1.7 ns (SHS820X) Typical 3.5 ns (SHS810X) | Typical 2.0 ns (SHS1202X) Typical 3.5 ns (SHS1102X) |
| Overshoot (500 ps Pulse) ^[2] | typical 12% | typical 18% |

Notes[2]: The SHS series handheld oscilloscope featured 1 MΩ input impedance. Bandwidth and pulse response must be verified with an external 50 Ω adapter, to guarantee signal integrity at higher frequency.

| Horizontal System | |
|-----------------------|--|
| Timebase Scale | 1.0 ns/div-100 s/div |
| Channel Skew | < 300 ps |
| Waveform Capture Rate | Up to 100,000 wfm/s (normal mode), 400,000 wfm/s (sequence mode) |
| Intensity grading | 256 Levels |
| Display Format | Y -T, X -Y, Roll |
| Timebase Accuracy | ±25 ppm |
| Roll Mode | 50 ms/div-100 s/div (1-2-5 sequence) |

| Trigger System | |
|-----------------------------|--|
| Mode | Auto, Normal, Single |
| Level | Internal: ± 4.5 div from the center of the screen |
| Hold off range | 80 ns- 1.5 s |
| Coupling | AC DC LFRJ HFRJ Noise RJ |
| Coupling Frequency Response | DC: Passes all components of the signal AC: Blocks DC components and attenuates signals below 8 Hz LFRJ: Blocks the DC component and attenuates the low-frequency components below 2 MHz HFRJ: Attenuates the high-frequency components above 1.2 MHz |
| Accuracy (typical) | Internal: ± 0.2 div |
| Sensitivity | DC - Max BW: 0.8 div |
| Jitter | < 100 ps |
| Displacement | Pre-Trigger: 0 - 100% Memory Delay Trigger: 0 to 10,000 div |
| Edge Trigger | |
| Slope | Rising, Falling, Rising & Falling |
| Source | All channels |
| Slope Trigger | |
| Slope | Rising, Falling |
| Limit Range | < , > , < > , > < |
| Source | All channels |
| Time Range | 2 ns - 4.2 s |
| Resolution | 1 ns |
| Pulse Width Trigger | |
| Polarity | +wid , -wid |
| Limit Range | < , > , < > , > < |
| Source | All channels |
| 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, 1080i/60, Custom |
| Source | All channels |
| Sync | Any, Select |
| Trigger condition | Line, Field |
| Window Trigger | |
| Window Type | Absolute, Relative |
| Source | All channels |
| Interval Trigger | |
| Slope | Rising, Falling |
| Limit Range | < , > , < > , > < |
| Source | All channels |
| Time Range | 2 ns - 4.2 s |
| Resolution | 1 ns |
| Dropout Trigger | |
| Timeout Type | Edge, State |
| Source | All channels |
| Slope | Rising, Falling |
| Time Range | 2 ns - 4.2 s |
| Resolution | 1 ns |
| Runt Trigger | |
| Polarity | +wid , -wid |
| Limit Range | < , > , < > , > < |
| Source | All channels |
| Time Range | 2 ns - 4.2 s |
| Resolution | 1 ns |
| Pattern Trigger | |
| Pattern Setting | Invalid, Low, High |
| Logic | AND, OR, NAND, NOR |
| Source | All channels |

| | |
|------------------------|--|
| Limit Range | <, >, <>, >< |
| Time Range | 2 ns - 4.2 s |
| Resolution | 1 ns |
| Serial Trigger | |
| I2C Trigger | |
| Condition | Start, Stop, Restart, No Ack, EEPROM, 7-bits Address & Data, 10-bits Address & Data, Data Length |
| Source(SDA/SCL) | All channels |
| 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) | All channels |
| Data format | Binary |
| Data Length | 4-96-bit |
| Bit Value | 0, 1, X |
| Bit Order | LSB, MSB |
| UART Trigger | |
| Condition | Start, Stop, Data, Parity Error |
| Source(RX/TX) | All channels |
| Data format | Hex |
| Limit Range | =, >, < |
| Data Length | 1 byte |
| Data Width | 5, 6, 7, 8-bits |
| Parity Check | None, Odd, Even, Space, Mark |
| Stop Bit | 1, 1.5, 2-bits |
| Idle Level | High, Low |
| Baud Rate(Selectable) | 600/1200/2400/4800/9600/19200/38400/57600/115200/Custom bit/s |
| Baud Rate (Custom) | 300-5000000 bit/s |
| CAN Trigger | |
| Condition | Start, Remote, ID, ID + Data, Error |
| Source | All channels |
| ID | STD (11-bits), EXT (29-bit) |
| Data Format | Hex |
| Data Length | 1 -2 byte |
| Baud Rate | 5k/10k/20k/50k/100k/125k/250k/500k/800k/1M/Custom bit/s |
| LIN Trigger | |
| Condition | Break, Frame ID, ID+Data, Error |
| Source | All channels |
| ID | 1 byte |
| Data Format | Hex |
| Data Length | 1-2 byte |
| Baud Rate (Selectable) | 600/1200/2400/4800/9600/19200/Custom bit/s |
| Baud Rate (Custom) | 300 bit/s -20 Mbit/s |

Search

| | |
|--------------|---|
| Event | Edge, Slope, Pulse, Interval, Runt |
| Event Number | Y-T: 600 ROLL: No limitation Stop After ROLL: 600 |

Serial Decoder

| | |
|-----------------------|----------------|
| Decoders | 2 |
| I²C | |
| Signal | SCL, SDA |
| Address | 7, 10 bits |
| Threshold | -4.5 - 4.5 div |
| List | 1- 7 lines |
| SPI | |

| | |
|------------------------------------|--|
| Signal | SCL, MISO, MOSI, CS (2 channel scopes can only use 2 signal) identifiers |
| Edge Select | Rising, Falling |
| Idle Level | Low, High |
| Bit Order | MSB, LSB |
| Threshold | -4.5 - 4.5 div |
| List | 1- 7 lines |
| UART | |
| Signal | RX, TX |
| Data Width | 5,6,7,8 bits |
| Parity Check | None, Odd, Even, Space, Mark |
| Stop Bit | 1, 1.5, 2 bits |
| Idle Level | Low, High |
| Threshold | -4.5 - 4.5 div |
| List | 1- 7 lines |
| CAN | |
| 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 | |
| LIN Specification Package Revision | Ver1.3, Ver2.0 |
| Threshold | -4.5 - 4.5 div |
| List | 1- 7 lines |

| Measurement | | |
|------------------------|--|--|
| Source | All channels, All channels in Zoom, Math, All References, History | |
| Number of Measurements | Display 4 measurements at the same time. 5 measurements are displayed in the statistics table. | |
| Measurement Range | Screen or Gate region | |
| Measurement Parameters | 38 Types | |
| Vertical | Max | Highest value in input waveform |
| | Min | The lowest value of the 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 a 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 | Period | Time between the middle threshold points of two consecutive, like-polarity edges |
| | Freq | Reciprocal of period |
| | +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 |
| | +Duty | Time difference between the 50% threshold of a rising edge to the 50% threshold of the next falling edge of the pulse |
| | -Duty | Time difference between the 50% threshold of a falling edge to the 50% threshold of the next rising edge of the pulse |
| | Delay | Time from the trigger to the first transition at the 50% crossing |
| | Time@Level | Time from the trigger to each rising edge at the 50% crossing. When Statistics is Off, it shows the time from the trigger to the last rising edge at the 50% crossing. |

| | | |
|------------|---|--|
| | | When Statistics is On, it shows the Mean, Min, Max, Standard Deviation of time from the trigger to each rising edge at the 50% crossing in multiple frames (number = Count). The Current shows the time of the current frame from the trigger to the last rising edge at the 50% crossing. |
| Delay | Phase | Phase difference between two edges |
| | FRFR | Time from the first rising edge of channel A to the following first rising edge of channel B |
| | FRFF | Time from the first rising edge of channel A to the following first falling edge of channel B |
| | FFFR | Time from the first falling edge of channel A to the following first rising edge of channel B |
| | FFFF | Time from the first falling edge of channel A to the following first falling edge of channel B |
| | FRLR | Time from the first rising edge of channel A to the last rising edge of channel B |
| | FRLF | Time from the first rising edge of channel A to the last falling edge of channel B |
| | FFLR | Time from the first falling edge of channel A to the last rising edge of channel B |
| | FFLF | Time from the first falling edge of channel A to the last falling edge of channel B |
| Skew | Time of source A edge minus time of nearest source B edge | |
| 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, Stdev, Count | |
| Counter | Hardware 6-digit counter (channels are selectable) | |

Math

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

Recorder

| | |
|---|---|
| Sample Logger | |
| Source | CH1, CH2, CH1 & CH2 |
| Sample Rate | 1 Sa/s- 25 kSa/s (1-2-5 sequence) |
| Memory Depth | Internal memory 50 MB, Support External memory to 2 GB |
| Log Time with Max sample rate | Approx. 23 mins in single-channel mode, 11 mins in two channels mode with internal memory Approx. 22 hours in single-channel mode, 11 hours in two-channel mode with external memory |
| Data Format | Binary |
| Measurement Logger | |
| Source | Measurement, Meter, Measurement & Meter |
| Log Interval | 0.1 s- 10min |
| Number of simultaneous logging channels | 4 |
| Memory Depth | Approx.3.6 Msamples in single-channel mode, 900 ksamples in four-channel mode |
| Log Time with Minimum Interval | Approx.100 hours |
| Data Format | Binary |
| Export Data Format | Binary, csv, MATLAB |

Multimeter (DMM) ^[1]

| | | | |
|--|--------------------------------------|------------|-------------------------|
| Maximum Resolution | 6000 Counts | | |
| Maximum Input Voltage (SHS800X) | CAT III 300 Vrms CAT II 600 Vrms | | |
| Maximum Input Voltage (SHS1000X) | CAT III 600 Vrms CAT II 1000 Vrms | | |
| Maximum Input Voltage (For adapter SCD10A, SCD600MA) | CAT III 60 Vrms | | |
| Function | Range | Resolution | Accuracy ^[4] |
| DC Voltage | 60.00 mV | 10 uV | (± 1% ± 15 digit) |
| | 600.0 mV | 100 uV | (± 1% ± 5 digit) |
| | 6.000 V | 1 mV | |
| | 60.00 V | 10 mV | |
| | 600.0 V | 100 mV | (± 1.5% ± 5 digit) |
| 1000 V ^[3] | 1 V | | |
| AC Voltage (45 Hz ~ 400 Hz) | 60.00 mV | 10 uV | (± 1% ± 15 digit) |
| | 600.0 mV | 100 uV | (± 1% ± 5 digit) |
| | 6.000 V | 1 mV | |
| | 60.00 V | 10 mV | |
| | 600.0 V | 100 mV | (± 1.5% ± 5 digit) |
| 750 V ^[3] | 1 V | | |

| | | | |
|---|--|---------|--------------------|
| DC Current ^{[2] [5]} | 60.00 mA | 10 uA | (± 4% ± 10 digit) |
| | 600.0 mA | 100 uA | |
| | 6.000 A | 1 mA | (± 5% ± 5 digit) |
| | 10.00 A | 10 mA | |
| AC Current ^{[2] [5]} (45Hz ~ 400Hz) | 60.00 mA | 10 uA | (± 4 % ± 10 digit) |
| | 600.0mA | 100 uA | (± 5% ± 5 digit) |
| | 6.000 A | 1 mA | |
| | 10.00 A | 10 mA | |
| Resistance | 600.0 Ω | 0.1 Ω | (± 1% ± 5 digit) |
| | 6.000 kΩ | 1 Ω | |
| | 60.00 kΩ | 10 Ω | |
| | 600.0 kΩ | 100 Ω | |
| | 6.000 MΩ | 1 kΩ | |
| | 60.00 MΩ | 10 kΩ | (± 4% ± 5 digit) |
| Capacitance | 40.00 nF | 0.01 nF | (± 5% ± 50 digit) |
| | 400.0 nF | 0.1 nF | (± 5% ± 5 digit) |
| | 4.000 uF | 1 nF | |
| | 40.00 uF | 10 nF | |
| | 400.0 uF | 100 nF | |
| Diode | 0 ~ 2 V | | |
| Continuity | Continuous beep when resistance < 50 Ω | | |

Note: [1] The spec for DMM functions are calibrated and verified in Battery-Power mode, Temperature range [23°C ± 5°C], warm-up for 0.5 hour.

Note: [2] For rank A (ampere) range, the measurement time should be less than 10s, the interval time should be more than 15 minutes.

Note: [3] This spec is for SHS1000X only, The maximum input voltage is 600V (DC/AC) for the SHS800X series.

Note: [4] ± of reading % ± range error.

Note: [5] 60mA, 600mA specification along with adapter SCD600MA; 6 A, 10 A specification along with adapter SCD10A.

| I/O | |
|---------------------------|--|
| USB Host | 1 port, isolated type A plug, Full/Low speed, memory sticks only |
| USB device | 1 port, Micro USB-B, remote control only |
| Probe compensation output | 1 kHz, 0~5 V Square wave output |

| Display (Screen) | |
|--------------------|------------------|
| Display Type | 5.6-inch TFT LCD |
| Display Resolution | 640x480 pixels |
| Display Color | 24-bit |
| Contrast(Typical) | 500:1 |
| Backlight | 200 nits |

| Display (Waveform) | |
|--------------------|---|
| Range | 8 x 12 divisions |
| 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, Spain, Russian, Italian, Portuguese |

| Environmental | |
|---------------|--|
| Temperature | Operating: 0°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: ≤ 2000 m Non-operating: ≤ 5000 m |

| Standards | | | |
|--|--|--|------------------------------------|
| Electromagnetic compatibility | Meets EMC directive (2014/30/EU), meets or exceeds IEC 61326-1:2012/EN61326-1:2013 (Basic) | | |
| | Conducted disturbance | CISPR 11/EN 55011 | CLASS A group 1, 150 kHz-30 MHz |
| | Radiated disturbance | CISPR 11/EN 55011 | CLASS A group 1, 30 MHz-1 GHz |
| | Electrostatic discharge (ESD) | IEC 61000-4-2/EN 61000-4-2 | 4.0 kV (Contact) ,8.0 kV (Air) |
| Radio-frequency electromagnetic field Immunity | IEC 61000-4-3/EN 61000-4-3 | 10 V/m (80 MHz to 1 GHz) ; 3 V/m (1.4 GHz to 2 GHz) ; | |

| | | | |
|--------|---|------------------------------|--|
| | | | 1 V/m (2.0 GHz to 2.7 GHz) |
| | Electrical fast transients (EFT) | IEC 61000-4-4/EN 61000-4-4 | 2 kV (Input AC Power Ports) |
| | Surges | IEC 61000-4-5/EN 61000-4-5 | 1 kV (Line to line) |
| | Radio-frequency continuous conducted Immunity | IEC 61000-4-6/EN 61000-4-6 | 3 V, 0.15-80 MHz |
| | Voltage dips and interruptions | IEC 61000-4-11/EN 61000-4-11 | Voltage Dips: 0% UT during 1 cycle 40% UT during 10/12 cycles 70% UT during 25/30 cycles Voltage interruptions:0% UT during 250/300 cycles |
| Safety | UL 61010-1:2012/R:2018-11; CAN/CSA-C22.2 No. 61010-1:2012/A1:2018-11. UL 61010-2-030:2018; CAN/CSA-C22.2 No. 61010-2-030:2018. UL 61010-2-033:2020. | | |









Power Supply/Battery

| Model | SHS800X | SHS1000X |
|--------------------------|--|--|
| Power Adapter | | |
| Input | 100 ~ 240 Vrms 50/60 Hz, 1.2 A | 100 ~ 240 Vrms 50/60 Hz, 1.1 A |
| Output | 9 V, 4 A | 12 V, 4 A |
| Battery | | |
| Operating time | 5.5 hours | 4 hours |
| Charging time | 4 hours while the instrument is switched off | 4 hours while the instrument is switched off |
| Capacity | 6900 mAh | |
| Charging Protection | ≥ 55°C at Battery | |
| Power Consumption | | |
| Battery Mode | 9 W | 11 W |

Mechanical

| | |
|---------------------|---|
| IP Rating | IP51 |
| Dimensions | Length: 276 mm Width: 168 mm Height(Depth): 68 mm |
| Weight with Battery | Without package 1.75 Kg, With package 3.5 Kg |

Probes and Accessories

| Probe | Picture | Model | Specifications &Description |
|-------------------------|---|---------|--|
| Passive |  | PP510 | Bandwidth: 100 MHz, 1X/10X, 1 M/10 Mohm, 1X CATII 150 V, 10X CATII 300 V |
| | | PP215 | Bandwidth: 200 MHz, 1X/10X, 1 M/10 Mohm, 1X CATII 150 V, 10X CATII 300 V |
| High Voltage Passive |  | PB925 | Bandwidth: 250 MHz, 10X Fixed, 10 Mohm, CATIII 600 V, CATII 1000 V |
| Current Probe |  | CP4020 | Bandwidth: 200 KHz, Max. continuous current: 20 Arms Peak current: 60 A Switch Ratio: 50 mV/A, 5 mV/A, Accuracy: 50 mV/A (0.4 A -10 Apk) \pm 2%, 5 mV/A (1 A-60 Apk) \pm 2% 9 V battery source |
| |  | CP4050 | Bandwidth: 1 MHz, Max. continuous current: 50 Arms, Peak current: 140 A Switch Ratio: 500 mV/A, 50 mV/A 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 source |
| |  | CP4070 | Bandwidth: 300 kHz, Max. continuous current: 70 Arms, Peak current: 200 A Switch Ratio: 50 mV/A, 5 mV/A, Accuracy: 50 mV/A (0.4 A -10 Apk) \pm 2% , 5 mV/A (1 A -200 Apk) \pm 2% 9 V battery source |
| |  | CP5030 | Bandwidth: 50 MHz, Max. continuous current: 30 Arms, Peak current: 50 A Switch Ratio: 100 mV/A, 1 V/A, Accuracy: 1 V/A (\pm 1% \pm 1 mA), 100 mV/A (\pm 1% \pm 10 mA), DC 12 V/1.2 A power adapter |
| |  | CP5030A | Bandwidth: 100 MHz, Max. continuous current: 30 Arms, Peak current: 50 A Switch Ratio: 100 mV/A, 1 V/A, Accuracy: 1 V/A (\pm 1% \pm 1 mA), 100 mV/A (\pm 1% \pm 10 mA), DC 12 V/1.2 A power adapter |
| |  | CP5150 | Bandwidth: 12 MHz, Max. continuous current: 150 Arms, Peak current: 300 A Switch Ratio: 100 mV/A, 10 mV/A, Accuracy: 100 mV/A (\pm 1% \pm 10 mA), 10 mV/A (\pm 1% \pm 100 mA), DC 12 V/1.2 A power adapter |

| | | | |
|--------------------|---|------------------|--|
| |  | CP5500 | Bandwidth: 5 MHz, Max. continuous current: 500 Arms, Peak current: 750 A Switch Ratio: 100 mV/A, 10 mV/A, Accuracy: 100 mV/A ($\pm 1\% \pm 10$ mA), 10 mV/A($\pm 1\% \pm 100$ mA), DC 12 V/1.2 A power adapter |
| Differential Probe |  | DPB4080 | Bandwidth: 50 MHz, Differential Range: 800 V (DC + Peak AC), 100X/200X/500X/1000X, Accuracy: $\pm 1\%$, DC 9 V/1 A power adapter |
| |  | DPB5150 | Bandwidth: 70 MHz, Differential Range: 1500 V (DC + Peak AC), 50X/500X Accuracy: $\pm 2\%$, DC 5 V/1 A USB adapter |
| |  | DPB5150A | Bandwidth: 100 MHz, Differential Range: 1500 V (DC + Peak AC), 50X/500X, Accuracy: $\pm 2\%$ DC 5 V/1 A USB adapter |
| |  | DPB5700 | Bandwidth: 70 MHz, Differential Range: 7000 V (DC + Peak AC), 100X/1000X, Accuracy: $\pm 2\%$, DC 5 V/1 A USB adapter |
| |  | DPB5700A | Bandwidth: 100 MHz Differential Range: 7000 V (DC + Peak AC), 100X/1000X Accuracy: $\pm 2\%$ DC 5 V/1 A USB adapter |
| High Voltage |  | HPB4010 | Bandwidth: 40 MHz Differential Range: DC 10 kV, AC (rms): 7 kV (sine), AC (Vpp): 20 kV (Pulse) 1000X Accuracy: $\leq 3\%$ |
| Isolated front end |  | ISFE | Provides isolation between standard oscilloscope channels, isolation between the measured signal and ground. Uses USB 5 V power supply, plug and play. The maximum input voltage allowed is up to ± 600 Vpk. |
| Demo Board |  | STB-3 Test Board | Output signals including square, sine, AM, fast edge, pulse, PWM, I2C, CAN, LIN etc. Used in teaching and demonstrations. |

| | | | |
|-----------------------|---|-----------|--|
| Current Adapter |  | SCD600MA | Sampling Resistance: 0.5 Ω , Max. Working Current: 600 mA. |
| |  | SCD10A | Sampling Resistance: 5 m Ω , Max. Working Current: 10 A, 10 sec. |
| Smart Battery Charger |  | GSCH4000A | Input Voltage: 9-26 V DC, Output current: 0-4 A, Max output power: 40 W, Charging efficiency: >85%, Dimensions(L x W x H): 180 mm*92 mm*58 mm, Weight without battery: 235 g. |
| Carrying Bag |  | | Color: Black, Dimensions(L x W x H): 325 mm*310 mm*95 mm, Weight: 200 g. |

Ordering Information

| Ordering information | | |
|----------------------|---|---|
| Product Name | SHS820X 200 MHz | |
| | SHS810X 100 MHz | |
| | SHS1202X 200 MHz | Isolated Input |
| | SHS1102X 100 MHz | Isolated Input |
| Standard Accessories | USB Cable -1 | |
| | Quick Start -1 | |
| | Passive Probe -2 | |
| | Certification -1 | |
| | Power Adapter -1 | |
| | Battery -1 | |
| | SCD600MA current measurement adapter -1 | |
| | SCD10A current measurement adapter -1 | |
| | Carrying Bag -1 | |
| Optional Accessories | Isolated Front End | ISFE |
| | STB Demo Source | STB-3 |
| | High Voltage Probe | HPB4010 |
| | Current Probes | CP4020/CP4050/CP4070/ CP4070A/CP5030/CP5030A /CP5150/CP5500/CPL5100 |
| | Differential Probes | DPB1300/DPB4080/DPB5150/DPB5150A /DPB5700/DPB5700A |
| | Smart Battery Charger | GSCH4000A |



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, isolated handheld oscilloscopes, function/arbitrary waveform generators, RF/MW signal generators, spectrum analyzers, vector network analyzers, digital multimeters, DC power supplies, electronic loads and other general purpose test instrumentation. Since its first oscilloscope 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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