SHS800 Series

Handheld Digital Oscilloscope

SIGLENT®

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TEST INSTRUMENTS & POWER SUPPLIES
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SIGLENT TECHNOLOGIES CO.,LTD

SHS806/SHS810
SHS815/SHS820

Application Domain

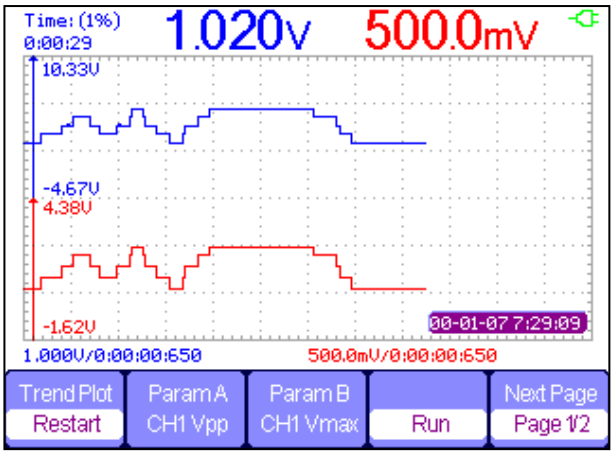
- Outdoor measure
- Circuit measure
- Wind power, PV power and other new energy equipment test
- Automotive electron, electric automobile test
- Electric power system,strong electricity test
- Industry scenes electric debug testing and measuring
- Education and science research
- Quality control

Features & Benefits

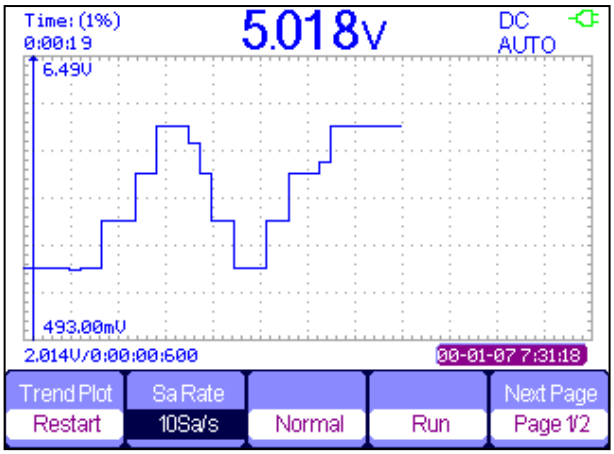
- Dual-input,combine oscilloscope, Multimeter and recorder (including TrendPlot and waveform Recorder) in one unit
- Input voltage: input voltage through BNC is up to CAT II 300V and CAT III 150V
  Standard probe: 10X CATII 300V and 1X CATII 150V
  Optional probe: 10X CAT II 1000V and 10X CAT III 600V
  Oscilloscope and multimeter safety grade is up to CAT II 600V and CAT III 300V
- 5.7 inch TFT color LCD display
- Max. 200MHz Bandwidth, 1GSa/s real-time sampling rate single channel, up to 50GSa/s equivalent sampling rate
- With 6000 dots display resolution Multimeter and provides measurements of DCV, ACV, DCI, ACI, Resistance, Diode, Capacitance and Continuity
- Support Scope TrendPlot, Meter TrendPlot and Scope Recorder
- Trigger modes :Automatic , Normal and Single
  Trigger types: Edge, Pulse, Video， Slope and Alternative
- 32 automatic measurements， 3 cursor measure modes
- 4 digital filter mode: Low pass,High pass, Band pass, Band limit
- Math functions: +, - , ×, ÷, FFT operations
- Multiple Language User Interface
- Standard configuration interface: USB Device,USB Host
- Support USB storage and update
- Rechargeable Li battery pack,compact,portable,fit for outdoor operation

TrendPlot

- Scope TrendPlot records scope measurement data, 800K points capacity, more than 18 hours recording time
- Meter TrendPlot records multimeter measurement data, 1.2M points recording length, recording time as long as 6000 hours at 0.05Sa/s
- Real-time saving measuring data,which can be outputted to U memery,used for second research and analying
- Two display modes, 'ALL' and 'NORMAL'; support zoom and cursor
- Support recording real time



Scope TrendPlot



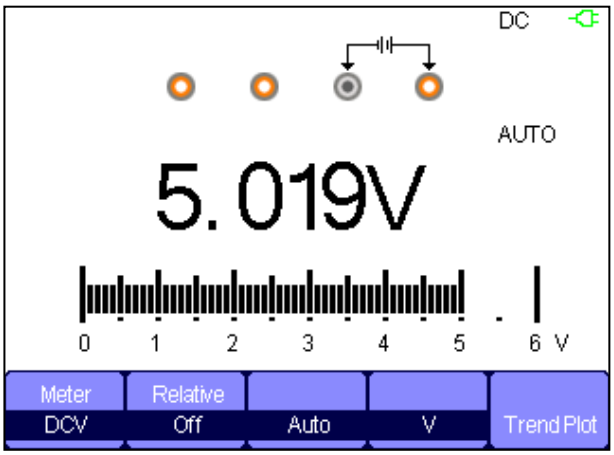
Meter TrendPlot

Scope Recorder

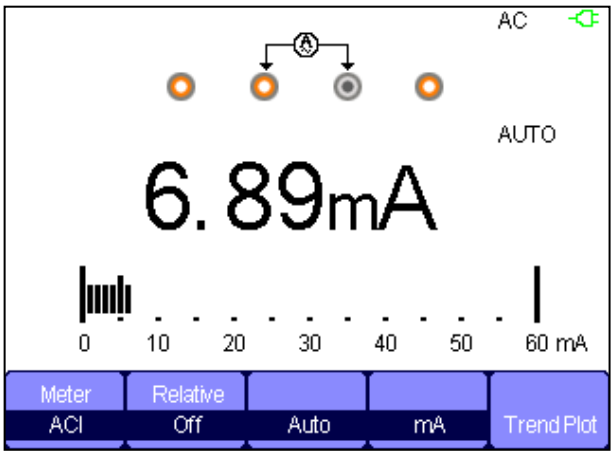
- Recording scope waveform continually in scan mode
- Support recording, replay and zoom function
- 7M points memory depth,18 hours recording time
- Maximum 4GB in USB storage mode, 3000hours recording time

Multimeter

- 6000 counts high percison Multimeter
- Providing measurements of DCV, ACV, DCI, ACI, Resistance, Diode, Capacitance, Continuity



DCV measurement



ACI measurement

Specification

Scope

Type	SHS806	SHS810	SHS815	SHS820
Bandwidth	60MHz	100MHz	150MHz	200MHz
Rise Time	≤ 5.8ns	≤ 3.5ns	≤ 2.3ns	≤ 1.7ns
Input Impedance	1MΩ±2% , 18pf±3pf			
Real Time Sampling Rate	Single Channel: 1GSa/s, Double Channels: 500MSa/s			500MSa/s
Equivalent Sampling Rate	50GSa/s			
Time Base Range	5 ns/ div ~ 50s/ div	2.5 ns/ div ~ 50s/ div		
Scan Range	100ms/ div ~ 50s/ div			
Vertical Sensitivity	2mV/div ~ 100V/div(1-2-5 step)			
Vertical Resolution	8 bits			
Trigger Types	Edge, Pulse, Video, Slope, Alternative			
Frequency Counter	6 bits			
Connection	USB Device, USB Host			
Math	+, -, * , /, FFT			
Oscilloscope Trend Plot	800K points			

Meter

Maximum Resolution	6000 counts		
DC Voltage	Range	Resolution	accuracy
	60.00 mV	10uV	(±1%±15digit)
	600.0mV	100uV	(±1%±5digit)
	6.000V	1mV	
	60.00V	10mV	
	600.0V	100mV	
	1000 V	1V	
AC Voltage（20Hz ~ 400Hz）	60.00 mV	10uV	(±1%±15digit)
	600.0mV	100uV	(±1%±5digit)
	6.000V	1mV	
	60.00V	10mV	
	600.0V	100mV	
	750 V	1V	(±1.5%±5digit)
DC Current [1]	60.00 mA	10uA	(±4%±5digit)
	600.0mA	100uA	
	6.000 A	1mA	(±5%±5digit)
	10.00 A	10mA	
AC Current[2]（20Hz ~ 400Hz）	60.00 mA	10uA	(±4%±10digit)
	600.0mA	100uA	(±4%±5digit)
	6.000 A	1mA	(±5%±5digit)
	10.00 A	10mA	
Resistance	600.0Ω	0.1Ω	(±1%±5digit)
	6.000KΩ	1Ω	
	60.00KΩ	10Ω	
	600.0KΩ	100Ω	
	6.000MΩ	1kΩ	

Resistance	60.00MΩ	10kΩ	(±4%±5digit)
Capacitance	40.00nF	0.01nF	(±4%±10digit)
	400.0nF	0.1nF	(±5%±5digit)
	4.000uF	1nF	
	40.00uF	10nF	
	400.0uF	100nF	
Diode	0 ~ 2V		
Continuity	<50Ω Buzzer sounds		

Note: [1], [2] For rank A range, the measurement time should be less than 10s, the interval time should be more than 15 minutes.

Technical Specifications

- Oscilloscope

Acquisition System		
Sampling Types	Real time, Equivalent	
Sampling Mode	Sampling, Peak detection, Average	
Average Times	4, 16, 32, 64, 128, 256	
Input System		
Input Coupling	AC, DC, GND	
Input Impedance	1MΩ±2% , 18pf±3pf	
Probe Attenuation Factor	1X, 10X	
Probe Attenuation Factors Set	1X, 5X , 10X, 50X , 100X , 500X , 1000X	
Max. Voltage From BNC (Reference BNC Cover)	CAT II CAT III	300 Vrms 150 Vrms
Standard Probe 1/10X	CAT II	150/300 Vrms
Optional Probe 10X	CAT II	1000 Vrms
Max. Floating Voltage From Multimeter Reference to Earth Ground	CAT II CAT III	600 Vrms 300 Vrms
Single Channel Common Mode Rejection Ratio	>100:1 50MHz	
Channel-to-Channel Isolation	>35 dB	

Horizontal System					
Real time Sample Rate		Single Channel :50Sa/s ~ 1GSa/s Double Channels: 50Sa/s ~ 500MSa/s			
Interaction Mode		x, Sinx			
Memory Depth	SHS806 SHS810 SHS815	Channel Mode	Sample Rate	Normal	Long Memory
		Single Channel	1GSa/s	40kpts	2 Mpts
		Double Channels	≤ 500MSa/s	20kpts	1 Mpts
	SHS820	Single Channel	≤ 500MSa/s	32kpts	Non-support
		Double Channels	≤ 250MSa/s	16kpts	Non-support
Display Mode		MAIN, WINDOW ZOOM, SCAN, X-Y			
Time Base Accuracy		±50ppm (measured over 1ms interval)			
Horizontal Scan Range		2.5ns/div ~ 50s/div (SHS820) 2.5ns/div ~ 50s/div (SHS815) 2.5ns/div ~ 50s/div (SHS810) 5.0ns/div ~ 50s/div (SHS806) Scan mode: 100ms/div ~ 50s/div (1-2.5-5 step)			

Vertical System

Vertical Sensitivity	2mV/div - 100V/div(1-2-5 step)
Channel Voltage Offset Range	2mV ~ 200mV : ±1.6V 206mV ~ 10V : ±40V 10.2V ~ 100V : ±400V
Vertical Resolution	8 bit
Channels	2
Analog Bandwidth	200MHz (SHS820) 150MHz(SHS815) 100MHz (SHS810) 60MHz(SHS806)
Lower Frequency(AC-3dB)	≤ 10Hz
DC Gain Accuracy	5mv/div-100v/div: ≤ ±3% 2mv/div: ≤ ±4%
DC Measurement Accuracy ≤ 200mv/div	±[3.0%*(| reading |+| offset |)+1% *|offset|+0.2div+2mV]
DC Measurement Accuracy > 200mv/div	±[3.0%*(| reading |+| offset |)+1% * |offset|+0.2div+100mV]
Rise Time	1.7ns Typical（SHS820） 2.3ns Typical（SHS815） 3.5ns Typical（SHS810） 5.8ns Typical（SHS806）
Vertical Input Coupling	AC, DC, GND
Math Operation	+, -, * , /, FFT
FFT	Window Mode: Hanning, Hamming, Blackman, Rectangular Sampling: 1024 points
Bandwidth Limit	20MHz (-3dB)

Trigger System

Trigger Types	Edge, Pulse Width, Video, Slope, Alternative
Trigger Source	CH1, CH2
Trigger Modes	Auto, Normal, Single
Trigger Coupling	AC, DC, LF Reject, HF Reject
Trigger Level Range	CH1, CH2: ±6 divisions from center of screen
Trigger Displacement	Pre-trigger: Memory depth/(2*sampling) Delay Trigger: 268.04div
Holdoff Range	100ns - 1.5s
Edge Trigger	Edge Type: Rising, Falling, Rising and Falling
Pulse Width Trigger	Trigger Modes: (> , < , =) Positive Pulse Width, (> , < , =)Negative Pulse Width Pulse Width Range: 20ns - 10s
Video Trigger	Support Signal Formats: PAL/SECAM, NTSC Trigger Condition : Odd Field, Even Field, All Lines, Line Num
Slope Trigger	(> , < , =) Positive slope, (> , < , =) Negative slope Time: 20ns-10s
Alternative Trigger	CH1 Trigger Type: Edge, Pulse, Video, Slope CH2 Trigger Type: Edge, Pulse, Video, Slope

X-Y Mode

X-Pole Input /Y-Pole Input	Channel 1 (CH1) / Channel 2 (CH2)
Sample Frequency	25KSa/s ~ 250MSa/s (1-2.5-5 step)

Measurement System	
Auto Measure (32 Types)	Vpp, Vmax, Vmin, Vamp, Vtop, Vbase, Vavg, Mean, Crms, Vrms, ROVShoot, FOVShoot, RPREShoot, FPREShoot, Rise time, Fall time, Freq, Period, + Wid, - Wid, + Dut, - Dut, BWid, Phase, FRR, FRF, FFR, FFF, LRR, LRF, LFR, LFF
Cursor Measure	Manual, Track and Auto

Control Panel Function	
Auto Set	Auto adjusting the Vertical system, Horizontal system and Trigger Position
Save/Recall	2 groups of referenced waveforms, 20 groups of setups,10 groups of captured waveforms internal save/recall function and USB flash driver storage function

Hard Ware Frequency Counter	
Reading Resolution	1Hz
Range	DC Couple, 10Hz to MAX Bandwidth
Signal Types	Applying to all Trigger signals(Except Video Trigger)

• Multimeter

Maximum Resolution	6000 counts
Measure Function	DCV, ACV, DCI, ACI, Resistance, Diode, Capacitance, Continuity
Max Input Voltage	AC(Vrms): 750V (AC frequency :20Hz~400Hz)DC :1000V
Max Input Current	AC (Vrms) : 10A (AC frequency :20Hz~400Hz)DC : 10A
Impedance	10MΩ

• Recorder

Scope TrendPlot	
Display	All, Normal
Record Size	800K points, more than 18 hours
Record Channel	2 channels
Cursor, Zoom	Support
Manual Mode	Support

Meter TrendPlot	
Display	All, Normal
Record Size	1.2M points
Record Channel	1 channel
Cursor, Zoom	Support
Manual Mode	Support

Scope Record	
Function	Record scope waveforms, Replay recorded waveforms
Acquisition Mode	Scan Mode
Time	Record mode: recording time Replay mode: replay time
Sets	Viewer: full screen, split screen ; Record mode: continuous, single Replay mode: point, frame ; Save mode: Internal memory
Default	Viewer: split screen; Record mode: continuous Replay mode: point ; Save mode: Internal memory
Record Size	Total: 7M points Single channel: 7M points single channel Double channels: 3.5M points per channel
Record Manual	Start, Pause, Stop, Continue
Replay Manual	Start, Pause, Stop, Continue, Previous, Next,

Generic Specification

Display System	
Display Mode	5.7 inch TFT color LCD
Resolution	320 horizontal by 234 vertical pixels
Display Color	24 bits
Display Contrast (Typical state)	150: 1
Backlight Intensity (Typical state)	300 nit
Waveform Display Range	8 x 12 div
Waveform Display Mode	Point, Vector
Persist	Off, 1 sec, 2 sec, 5 sec, Infinite
Menu Display	2 sec, 5 sec, 10 sec, 20 sec, Infinite
Screen-Saver	Off, 1min, 2min, 5min, 10min, 15min, 30min, 1hour, 2hour, 5hour
Waveform Interpolation	Sin(x), x
Color model	Normal , Invert
Language	Simplified Chinese, Traditional Chinese, English, Arabic, French, German, Russian, Spanish, Portuguese, Japanese, Korean, Italian

Power		
Line Power Adapter	Input voltage	100V-240V 50/60Hz
	Output voltage	9V 4A
Battery	7.4VDC, 5000mAh, persisting 5 hours	
Charge time	About 4 hours	

Environments	
Temperature	Operating: 0 ~ 40℃ Storage: -20℃~ 70℃
Cooling	Natural Cool
Humidity	85% RH, 40℃
Height	3000m
Electromagnetic Compatibility	2004/108/EC Directive Applicable standards EN 61326-1:2006 EN 61000-3-2:2006 + A2:2009/ EN 61000-3-3:2008
Safety	2006/95/EC Low Voltage Directive EN 61010-1:2010/EN 61010-031:2002+A1:2008

Mechanical		
Size	length	259.5mm
	width	163.2mm
	height	53.3mm
Weight	1.5Kg	

Ordering Information

Mode	Description
SHS820	200MHz，500MSa/s
SHS815	150MHz，1GSa/s
SHS810	100MHz，1GSa/s
SHS806	60MHz，1GSa/s
Standard accessories	
A 9V, 4A, power adapter	
Two 1X/10X oscilloscope probes	
Two test leads for multimeter	
Probe calibration accessory	
A USB data transmitting cable	
Quick start	
Certificate of calibration	
Optional probe	
100MHz high-voltage safety probe	CAT II 1000V,CAT III 600V
200MHz high-voltage safety probe	CAT II 1000V,CAT III 600V

SHS800 Series
Handheld Digital Oscilloscope

SIGLENT®

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, RF generators, digital multimeters, DC power supplies, spectrum analyzers, vector network analyzers, isolated handheld oscilloscopes, electronic load 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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