Hantek

Tablet1000 series

Tablet oscilloscope

Data Manual

2022.05

Warranties and Declarations

Copyright

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Product certification

Hantek certified Tablet1000 series oscilloscope to meet China's national industry standards and has passed the CE certification.

Contact us

If you have any questions when using the products of Qingdao Hantek Electronics Co., LTD., you can obtain service and support through the following ways:
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Website: http://www.hantek.com

1 Product features

Product features

- 7-inch industrial specification TFT-LCD, 800*480 multi-point full touch capacitive screen, completely get rid of mechanical keys, provide better operation experience.
- Number of channels: 4-channel tablet oscilloscope: 4 channels +1 AFG channel (1KHz channel without signal source function). 2-channel tablet oscilloscope: 2 channels +1 AFG channel (1KHz channel without signal source function).
- Analog channel bandwidth: The maximum is 250MHz.
- Maximum sampling rate: 4-channel tablet oscilloscope: 1GSa/s single channel, 500MSa/s double channel, 250MSa/s triple or quadruple channel. 2-channel tablet oscilloscope: 250MSa/s double channel, 125MSa/s single channel.
- Maximum storage depth: 4-channel tablet oscilloscope: 8Mpts (single channel), 4Mpts (double channel), 2Mpts (triple or quadruple channel). 2-channel tablet oscilloscope: 8Mpts (single channel), 4Mpts (double channel).
- Vertical sensitivity: 4-channel tablet oscilloscope: 2mV/div ~ 10 V/div.
  2-channel tablet oscilloscope: 10mV/div ~ 10 V/div.
- Product classification: 7-inch tablet oscilloscope only with oscilloscope function,7-inch tablet oscilloscope with oscilloscope + multimeter function, 7-inch tablet oscilloscope with oscilloscope + multimeter + signal source function.
- Basic trigger functions: edge, pulse width, video, slope, timeout.
- Up to 42 waveform parameters are automatically measured.
- Various mathematical operations: addition, subtraction, multiplication, division, FFT.
- Standard interface: USB interface.
- Standard 9V2A/5V3A/12v1.5A charger, data line interface input, can share a set of charging equipment with a mobile phone.
- 4-channel tablet oscilloscope: built-in 10000mAh removable lithium batteries; 2-channel tablet oscilloscope: built-in 5000mAh removable lithium batteries.
- With the design of a supporting stand, it can be used and put anywhere and save working space.
- Quick storage function, using one key to save waveforms to U disk or internal storage, convenient and fast.
- New man-machine interactive experience with touch, simple and clear UI, without complex operation, a professional instrument that everyone can easily use.
- 7-inch large screen display same as that of a desktop computer, which can be used on the desk or on one hand.
- Large screen, small volume, the net weight is less than 1Kg, share the charger with mobile phones, convenient to carry on business trips.

The new generation of TO1000 series handheld tablet oscilloscopes, using 7-inch industrial specification TFT-LCD800*480 resolution LCD, supporting multi-point capacitive touch operation; With three functions, which are oscilloscope, signal source

and multimeter; With 2 or 4 analog channels; Built-in signal source supports 25MHz standard waveform output; A variety of built-in arbitrary waves; The multimeter has data recording function, which can monitor and record voltage, current, resistance and other data changes for a long time and generate trend charts; Standard 9V2A/5V3A/12v1.5A charger, USB interface input, can share a set of charging equipment with a mobile phone; Powered by 2 or 4 18650 lithium batteries; With a supporting stand, able to use and place anywhere.

2 Technical indicators

All technical specifications are applicable to the Tablet1000 series oscilloscopes. For detail, check the end of this chapter. To verify that an oscilloscope meets the technical specifications, it must first meet the following conditions:

- The oscilloscope must have been operating continuously for at least 20 minutes at the specified operating temperature.
- If the operating temperature varies by more than 5 degrees Celsius, the "self-calibrate" operation must be performed, which can be find under the Utility menu.
- The oscilloscope must be within the ex-factory calibration period.

All technical specifications are guaranteed to meet requirements except those marked "typical".

Technical indicators

Model	Bandwidth	Sampling rate
TO1112 (C/D)	110 MHz	250MSa/S
TO1152 (C/D)	150 MHz	1GSa/S
TO1202 (C/D)	200 MHz	1GSa/S
TO1252 (C/D)	250 MHz	1GSa/S
TO1204 (C/D)	200 MHz	1GSa/S
TO1254 (C/D)	250 MHz	1GSa/S
TO1154 (C/D)	150 MHz	1GSa/S
TO1204AUTO	200 MHz	1GSa/S
TO1254AUTO	250 MHz	1GSa/S
TO1154AUTO	150 MHz	1GSa/S

Horizontal system

Horizontal scale range	2ns/div ~ 100s/div 1, 2, and 5 steps
Incremental time accuracy (Full bandwidth)	Single, "sampling" mode ± (1 sampling interval +100ppm× reading +0.6ns) > 16 times on average ± (1 sampling interval +100ppm× reading +0.4ns)

	Sampling interval = seconds/grid ÷200	
Time base accuracy	±50 ppm ± 5 ppm/year	
Time base delay range	Before trigger	≥1/2 screen width
	After trigger	1 s or 100 div(take the greater)
Time interval (△T)	Measurement	±(1 sampling interval)±(2 ppm x reading) ±50ps
Range of offset correction between channels	±100 ns	
Horizontal mode	YT	Default
	XY	X1= channel 1, Y1= channel 2, X2= channel 3, Y2= channel 4.
	SCAN	Time base ≥ 100ms/div. Enter or exit SCAN mode by adjusting the horizontal time base knob.
	ROLL	Time base ≥ 100ms/div. Enter or exit ROLL mode by adjusting the horizontal time base knob.

Vertical system

Series	TO1000 Series (1G sampling rate)	TO1112 Series (250M sampling rate)
Input coupling	DC, AC or grounded	
Input impedance	1MΩ±2%	
Input capacitance	18 pF ± 3 pF	
Vertical scale range	2mV/div~10V/div	10mV/div~10V/div
Vertical resolution	8bit	
Offset range	±1V(2mV/div~100mV/div) ±10V (200mV/div~1V/div) ±50V (2V/div~10V/div)	±1V(100mV/div) ±10V (1V/div) ±50V (10V/div)
Dynamic range	±5 div (8 bit)	
Bandwidth limitation	20MHz, each channel is independent.	
DC gain accuracy	± 3% FullScale	

Series	TO1000 Series (1G sampling rate)	TO1112 Series (250M sampling rate)
DC offset accuracy	<100 mV/div (±0.1 div±2 mV±1.5% offset) <1V/div (±0.1 div±2 mV±1% offset) >2V/div (±0.1 div±2 mV±1.0% offset)	
Isolation degree between channels	40dB, DC to the maximum rated bandwidth of each model	
Supporting probe attenuation coefficient	0.01X, 0.02X, 0.05X, 0.1X, 0.2X, 0.5X, 1X, 2X, 5X, 10X, 20X, 50X, 100X, 200X, 500X, 1000X, 2000X, 5000X, 10000X	

Collect

A series of	TO1000 Series (1G sample)	TO1112 Series (250M sample)
Sampling method	Real-time sampling	
Maximum analog channel sampling rate	1 GSa/s	250MSa/s
Collection mode	Normal, average, peak, high resolution	
Waveform interpolation	(sin x)/x	
Single sequence	Collection mode	Collection stop time
	Normal and peak	All channels perform single collection at the same time.
	Average	All channels perform collections for N times at the same time. N can be 2, 4, 8, 16, 32, 64, 128, or 256.
Maximum storage depth	8Mpts (single channel), 4Mpts (double channel), 2Mpts (triple and quadruple channels)	
Peak detection	Under all time base settings, capture burrs with a minimum of 8ns.	

Trigger

Model	Automatic, normal, single
Level	CH1 ~ CH4 or CH1 ~ CH2 ±4 degrees from the center of the display
Release inhibition range	8ns~10s

Trigger level accuracy	CH1 ~ CH4 or CH1 ~ CH2 0.2 grid x volt/grid in ± 4 degrees from the center display
Trigger sensitivity	±0.2div

Edge-triggered	
Slope	Rising edge, falling edge, double edge
Data source	CH1 ~ CH4 or CH1 ~ CH2

Pulse width trigger	
Polarity	Positive polarity, negative polarity
Condition	<, >, !=, =
Data source	CH1 ~ CH4 or CH1~ CH2
Pulse width range	8ns~10s

Video trigger	
Signal standard	NTSC, PAL, HDTV720p, HDTV1080p, HDTV1080i
Data source	CH1 ~ CH4 or CH1 ~ CH2
Synchronous	Scan lines, number of lines, odd field, even field, all fields

Slope trigger	
Slope	Up, down
Condition	Scan lines, number of lines, odd field, even field, all fields
Data source	CH1 ~ CH4 or CH1 ~ CH2
Time range	8ns~10s

Timeout trigger	
Data source	CH1 ~ CH4 or CH1 ~ CH2
Polarity	Positive polarity, negative polarity
Time range	8ns~10s

Measurement	
Cursor	The voltage difference between the cursors △Y The time difference between the cursors △X Reciprocal of △X in Hertz (1/△X)
Automatic measurement	Frequency, double peak, on average, maximum, minimum, period, top, median, bottom, amplitude, RMS, rising edge overshoot, rising edge preshoot, period RMS, cycle average, rise time, fall time, positive pulse width, negative pulse width, positive duty ratio,

	negative duty ratio, FRR, FFF, falling edge overshoot, falling edge preshoot, pulse width, FRF, FFR, LRR, LRF, LFR, LFF, maximum time, minimum time, positive phase difference, negative phase difference, variance, positive pulse number, negative pulse number, rising edge number, falling edge number, trigger count	
Mathematical operation		
Data source	CH1 ~ CH4 or CH1 ~ CH2	
Operator	+, -, ×, /, FFT	
FFT	Point	1024
	Window	Rectangle, Hanning, Hemming, Blackman, Bartlett, flat top
	Display	Display single or display all
	Vertical scale	dB, VRms
Storage		
Save/call out (non-volatile)	Save and call out, including images, references, CSV, binary, settings	
Save to external storage	Images, references, CSV, binary, settings	
Arbitrary waveform generator		
Channel number	1 channel arbitrary wave generator output (with signal generator function) 1 channel 1KHz output (without signal generator function)	
Sampling rate	200MSa/s	
Vertical resolution	12bit	
The highest frequency	25MHz	
Standard waveform	Sine wave, square wave, triangle wave, noise, DC	
Arbitrary waveform	Arb1, Arb2, Arb3, Arb4	
Sine wave	Frequency range	0.1 Hz ~ 25 MHz
Square wave/pulse	Frequency range	0.1 Hz ~ 10 MHz
	Duty ratio	0% ~ 100%

Triangle wave	Frequency range	0.1 Hz ~ 1 MHz	
	Symmetry	0% ~ 100%	
Noise	Bandwidth	> 25 MHz	
DC	Offset	±1.5V（50Ω）、±3V (high resistance)	
	Resolution	100μV	
	Precision	2% (1 KHz)	
Arbitrary wave	Frequency range	0.1 Hz ~ 10 MHz	
	Support upper computer download, and external memory calling out		
Amplitude	0mV~3Vpp (50Ω)		
	0mV~6Vpp (high resistance)		
Wavelength	4KSa		
Frequency resolution	0.1 Hz or 4 bits, take the greater one of the two		
Frequency accuracy	100 ppm (< 10 kHz) 50 ppm (> 10 kHz)		
Output impedance	50 Ω ± 2%		
Modulation	FM	Modulation waveform	Sine wave, square wave, triangle wave
		Modulation frequency	1Hz~50KHz
		Modulation deviation	0.1Hz~1KHz
	AM	Modulation waveform	Sine wave, square wave, triangle wave
		Modulation frequency	1Hz~50KHz
		Modulation depth	0% - 120%.
Burst	Type	Multi-period, infinite	
	Cycle number	1-2000000000	
	Trigger source	Manual	

Multimeter

Maximum resolution	4000 points
Measuring method	Voltage, current, resistance, capacitance, diode, on-off measurement
Maximum input voltage	AC:600V, DC: 600V
Maximum input current	AC: 10A, DC:10A
Input impedance	10MΩ

Multimeter gear

Measurement item	Range	Precision	Resolution
Direct current voltage	400mV	± (1% + 2)	100uV
	4.000V		1mV
	40.00V		10mV
	400.0V		100mV
	600.0V		1V
	Overload protection: 250V for the 400mv range, 600Vrms for the rest ranges.		
Alternating current voltage	4.000 V	± (1.2% + 5)	1mV
	40.00V		10mV
	400.0V		100mV
	600.0V	± (1.5% + 5)	1V
	Frequency range: 40Hz ~ 400Hz Frequency range of 400V and 600V range: 40Hz ~ 100Hz		
Direct current	40.00 mA	± (1% + 2)	10uA

Measurement item	Range	Precision	Resolution
	200.0 mA	± (1.5% + 2)	100uA
	4.000 A	± (1.8% + 2)	1mA
	10.00 A	± (3% + 2)	10mA
	Overload protection: self-recovery fuse 200mA/250V, no fuse for 4A and10A range		
Alternating current	40.00 mA	± (1.3% + 2)	10uA
	400.0 mA	± (1.8% + 2)	100uA
	4.000 A	± (2% + 3)	1mA
	10.00 A	± (3% + 5)	10mA
	Frequency range: 40Hz~400Hz; Self-recovery fuse: 200mA/250V, no fuse for 4A and10A range		
Resistance	400.0 Ω	±（1% + 3）	0.1 Ω
	4.000K Ω	±（1.2% + 5）	1 Ω
	60.00K Ω		10 Ω
	400.0K Ω		100 Ω
	4.000M Ω		1K Ω
	40.00M Ω	±（1.5%±3）	10K Ω
	Overload protection: 220V effective value		
Capacitance	40.00nF	±（3% + 5）	10pF
	400.0nF		100pF

Measurement item	Range	Precision	Resolution
	4.000uF		1nF
	40.00uF		10nF
	100.0uF		100nF
	Overload protection: 220V effective value		
Diode	0V ~ 1.0V		
On and off measurement	< 50 Ω		

Display	
Screen type	7 "TFT LCD
Display resolution	800 (horizontal) *480 (vertical) pixels
Display type	Point, vector
Waveform Brightness	Adjustable
Grid type	Solid line, dotted line, none
Grid brightness	Adjustable
Screen brightness	Adjustable
Afterglow	1S, 5s, 10S, 30s, Infinite, off

Interface	
Standard interface	USB Host and USB Device

Power supply	
Power supply	AC 100 ~ 240V, 50 ~ 60Hz; DC input 5V3A/9V2A/12v1.5A
Power	< 8 w

Quick charge	Support quick charge
Battery	3.7V 2600mAh *4 in parallel 3.7V 2600mAh *2 in parallel
Environment	
Operating temperature	0 ℃ ~ 50 ℃
Storage temperature	- 20 ℃ ~ 70 ℃
Humidity	≤+104℉(≤+40° C): relative humidity≤90% 106℉~122℉ (+41° C ~50° C): relative humidity≤60%
Cooling	Convection
Altitude	Operating and not operating: 3,000m (10,000 ft) Random vibration: 0.31g RMS at 50Hz to 500Hz, 10 minutes in each axial direction Not operating: 2.46g RMS at 5Hz to 500Hz, 10 minutes in each axial direction
Mechanical parts	
Oscilloscope size	248mm*176mm*54mm (length * width * height)
Weight	1.2kg (including batteries)

3 Order information and warranty period

Order information

Order information	Order no.
Host model	
250MSa/S, 110MHz, 2-channel oscilloscope	TO1112
250MSa/S, 110MHz, 2-channel oscilloscope + multimeter	TO1112C
250MSa/S, 110MHz, 2-channel oscilloscope + multimeter + signal source	TO1112D
1GSa/S, 150MHz, 2-channel oscilloscope	TO1152
1G Sa/S, 200MHz, 2-channel oscilloscope	TO1202
1G Sa/S, 250MHz, 2-channel oscilloscope	TO1252
1G Sa/S, 150MHz, 2-channel oscilloscope + multimeter	TO1152C
1G Sa/S, 200MHz, 2-channel oscilloscope + multimeter	TO1202C
1G Sa/S, 250MHz, 2-channel oscilloscope + multimeter	TO1252C
1G Sa/S, 150MHz, 2-channel oscilloscope + multimeter + signal source	TO1152D

Order information	Order no.
1G Sa/S, 200MHz, 2-channel oscilloscope + multimeter + signal source	TO1202D
1G Sa/S, 250MHz, 2-channel oscilloscope + multimeter + signal source	TO1252D
1G Sa/S, 150MHz, 4-channel oscilloscope	TO1154
1G Sa/S, 200MHz, 4-channel oscilloscope	TO1204
1G Sa/S, 250MHz, 4-channel oscilloscope	TO1254
1G Sa/S, 150MHz, 4-channel oscilloscope + multimeter	TO1154C
1G Sa/S, 200MHz, 4-channel oscilloscope + multimeter	TO1204C
1G Sa/S, 250MHz, 4-channel oscilloscope + multimeter	TO1254C
1G Sa/S, 150MHz, 4-channel oscilloscope + multimeter + signal source	TO1154D
1G Sa/S, 200MHz, 4-channel oscilloscope + multimeter + signal source	TO1204D
1G Sa/S, 250MHz, 4-channel oscilloscope + multimeter + signal source	TO1254D
1G Sa/S, 150MHz, 4-channel oscilloscope + multimeter + signal source	TO1154AUTO

Order information	Order no.
1G Sa/S, 200MHz, 4-channel oscilloscope + multimeter + signal source	TO1204AUTO
1G Sa/S, 250MHz, 4-channel oscilloscope + multimeter + signal source	TO1254AUTO
Standard accessories	
9V2A/5V3A/12V1.5A adapter	--
USB cable	--
Multimeter Pen *1 (only for TO1000C/D series)	--
Oscilloscope probe (one for 2-channel series, two for 4-channel series)	PP150B (110 MHZ) PP150B (150 MHZ) PP200 (200 MHz) PP250 (250 MHZ)
Crocodile clip (one for 2-channel series, two for 4-channel series)	HT324

Warranty period

The host machine is guaranteed for 3 years, not including probe and accessories.

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