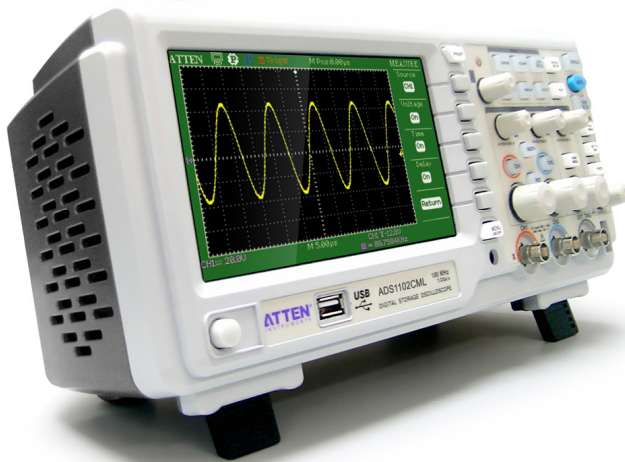


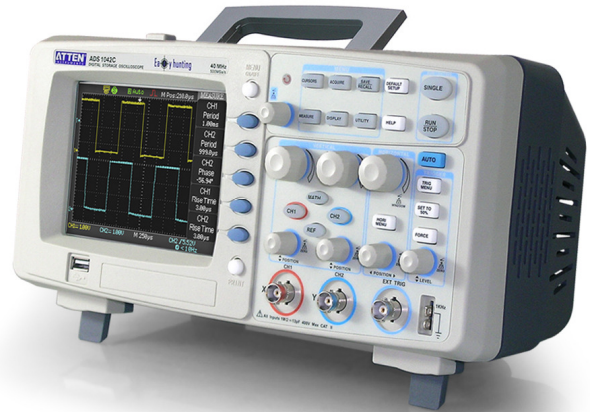
# ADS1000C, CL+, CAL, CML Series

DIGITAL STORAGE OSCILLOSCOPE

25MHz, 40MHz, 60MHz, 100MHz, 150MHz, 200MHz



ADS1000 CAL/CML/CL+



ADS1000 C Series

## FEATURES

- 500MSa/s & 1GSa/s Sampling Rate
- 2 Channels
- 7" Widescreen LCD Color Display (ADS1022C: 5.7 in)
- USB Host/Device: Support USB Printer and USB Flash Drive
- PictBridge Function
- Easyscope Software
- 12 Languages

## APPLICATIONS

- Industrial Power Design, Troubleshooting, Installation, and Maintenance.
- Electronics Design, Troubleshooting, Installation, and Maintenance
- Circuit Design & Debug
- Educational Lab & Training Institutions
- Repair & Service
- Production Test & Quality Inspection

## CHARACTERISTICS

- The highest Single real-time sampling rate can up to 1Gsa/s; Equivalent sampling rate is up to 50GSa/s.  
Memory Depth: C Series: 4Kpts  
CL+ / CAL Series: 40Kpts  
CML Series: 2Mpts
- Max recording length: 6Mpts
- The longest single recording time: 33.3h
- Trigger types: Edge, Pulse Width, Video, Slope, Alternative
- Unique Digital Filter function and Waveform recorder function
- Support Pass/Fail function.
- Thirty two parameters Auto measure function.
- Save/recall types: Setups, Waveforms, CSV file, Picture.
- Support Multilingual On-line help system
- Waveform Intensity and Grid Brightness can be adjusted.
- User Interface in 12 Language
- Standard Configuration Port:  
USB Host: Support USB flash driver save/recall function and update firmware;  
USB Device: Support PictBridge compatible printer and support PC remote control; RS232, Pass/ Fail output

- **ADS1022C**  
25MHz, 500MSa/s, 2 Channel
- **ADS1042CML**  
40MHz, 1GSa/s, 2 Channel
- **ADS1062CAL/CML**  
60MHz, 1GSa/s, 2 Channel
- **ADS1102CAL/CML**  
100MHz, 1GSa/s, 2 Channel
- **ADS1152CAL/CML**  
150MHz, 1GSa/s, 2 Channel
- **ADS1202CML**  
200MHz, 1GSa/s, 2 Channel
- **ADS1202CL+**  
200MHz, 500MSa/s, 2 Channel

MODEL INDEX	ADS1202CL+	ADS1202CML	ADS1152CAL/ CML	ADS1102CAL/ CML	ADS1062CAL/ CML	ADS1042CML	ADS1022C
<b>Bandwidth</b>	200MHz		150MHz	100MHz	60MHz	40MHz	25MHz
<b>Sampling Rate</b>	500MSa/s	1GSa/s					500MSa/s
<b>Equivalent Sampling Rate</b>	50GSa/s						10GSa/s
<b>Memory Depth</b>	32Kpts	5Kpts/CH	Single Channel: 2Mpts; Double Channels: 1Mpts CAL Series: Single Channel: 40Kpts; Double Channels:20Kpts				4Kpts
<b>Rise Time</b>	< 1.8ns		<2.3ns	<3.5ns	<5.8ns	<8.8ns	<14ns
<b>Input Impedance</b>	1MΩ  17pF	1MΩ  14Pf / 50 ohm	1MΩ  17pF				
<b>Sec/div Range</b>	2.5ns/div-50s/div				5ns/div-50s/div	10ns/div-50s/div	25ns/div-50s/div
	Scan: 100ms-50s/div						
<b>Display</b>	7" LCD Color (480*234)						5.7" LCD Color (320*234)

## FEATURES

### Abundant Trigger Function

ADS1000 series products have rich trigger modes: Edge, Pulse, Video, Slope and Alternative mode, which satisfy with users more extensive needs. Alternative trigger mode is usually used to observing two non-correlated signals at the same time and users can select different trigger mode for two channels, which is a kind reproduction that analog oscilloscope function in the digital oscilloscope.

### FFT Waveform Split Display Function

FFT waveform and its Channel waveform can display on split screen at the same time. In split display mode, the screen is divided into two parts and each part is divided eight divides in vertical direction. That is similar to under the entire screen pattern simultaneously to observe two waveforms. This way will make users observe waveforms to be clearer and convenient.

### Pop-up Menu Display Mode

The menu may hide as necessary make waveforms display on 18 divides full screen. Comparing with other same level digital oscilloscopes, this kind of pattern is more flexible, the user operation is more convenient and users can observe waveforms clearly.

### Display

ADS1000 series products use the 7" Wide Screen Color TFT LCD. The screen display parameter value and the waveform are clearer, stably and nature; That is also more advantageous to alleviate tiredness of users using the instrument extended periods at a time.

### Digital Filter Function

ADS1000 series provide a digital filter function, and users can use it setting upper limit and lower limit of frequency to reduce signal noise and filter error signal. So they can observe their interested signals distinctly, which will advance users' work efficiency consumedly.

### Waveform Recorder Function

Using this function, Users can continue record data of their need signals as the form of frame. Waveform recorder can record input waveform from CH1 and CH2, with maximum record length of 1500 frames. This record behavior can also be activated by the pass/fail test output, which makes this function especially useful to capture abnormal signals in long term without keeping an eye watching it.

### Pass/Fail Function

Users may use the Pass/Fail function which the ADS1000 series provides to carry on the product test. Through a series of setups, the oscilloscope can output the test result automatically which enhanced the product production efficiency greatly.

### Auto Measure Function

ADS1000 series can auto measure thirty two parameters, which is most in the same level digital oscilloscopes. Auto measure function can eliminate user error consumedly, and users will measure parameters what they need faster and more accurately using it. ADS1000 series also have all measurement function that displays all the waveform parameters on the screen according to measure kinds, and users can ready measure parameters value expediently making ADS1000 series the most perfect measure tools.

### Multi-country Language User Interface Display function

ADS1000 series product has 12 languages user interface display function: Simplified Chinese, Traditional Chinese, English, Arabic, French, German, Russian, Spanish, Portuguese, Japanese and Korean, which has further developed the ADS1000 series product for the international market

### Powerful EasyScope3.0 Software

EasyScope3.0 software is the powerful system software suitable for ADS1000 series products. This software can be compatible RS-232 and USB Device to realize communication between the computer and the oscilloscope, then realizes long-distance control. Simultaneously this software can automatic real-time refresh waveform data, provide waveforms measure data sampling data, screen images read storage and printing functions. In addition

EasyScope3.0 also has setups upload and download function. Most quickly basing on millisecond level interactive between PC and ADS1000 series make users to be easier to analyze, research waveforms and data.

### Cursor Survey Function

ADS1000 series cursor survey function has three kinds of modes: Auto manual mode, Track mode, Auto mode. The user may according to own need to choose the survey pattern nimbly, thus with ease read measure results from the top right of the screen or experience completely automatic intelligent design pattern.

Input	
Input Coupling	AC, DC, GND
Input Impedance	DC: $1\text{M}\Omega \pm 2\% \parallel 17\text{pF} \pm 3\text{pF}$ AC: $1.2\text{M}\Omega \pm 2\% \parallel 17\text{pF} \pm 3\text{pF}$ , $\leq 100\text{mV/div}$ $1.0\text{M}\Omega \pm 2\% \parallel 17\text{pF} \pm 3\text{pF}$ , $> 100\text{mV/div}$
Maximum Input Voltage	$\pm 400\text{V}$ PK-PK CATI
Ch to Ch Isolation (Both channels in same V/div setting)	$> 100: 1$ at 100MHz (ADS1202CML), $> 100: 1$ at 70MHz (ADS1152CAL/CML) $> 100: 1$ at 50MHz (ADS1102CAL/CML), $> 100: 1$ at 30MHz (ADS1062CAL/CML) $> 100: 1$ at 20MHz (ADS1042CML)
Probe attenuator	1X, 10X
Probe attenuator	1X, 10X, 100X, 1000X

Horizontal System						
Real Time Sampling Rate	Single Channel 1GSa/s; Double Channels 1GSa/s (ADS1202CML) Single Channel 1GSa/s; Double Channels 500MSa/s (ADS1000CAL/CML Series) Single Channel 500MSa/s; Double Channels 250MSa/s (ADS1022C / ADS1202CL+)					
Equivalent Sampling Rate	50GSa/s					
Measure Display Modes	MAIN, WINDOW, WINDOW ZOOM, Scan, X-Y					
Timebase Accuracy	$\pm 100\text{ppm}$ measured over 10ms interval					
Time Window	18 Divisions					
Horizontal Scan Range	ADS1202CML /CL+	ADS1152CAL/CML	ADS1102CAL/CML	ADS1062CAL/CML	ADS1042CML	ADS1022C
	2.5ns/div -50s/div			5 ns/div - 50s/div	10 ns/div - 50s/div	25ns/div - 50s/div
Scan: 100ms/div -50s/div (1-2.5-5 sequence)						

Vertical System						
Vertical Sensitivity	2mV-10V/div at input BNC (1-2-5 order) 2mV-5V/div (ADS1202CML / 1022C)					
Channel voltage offset range	2mV-200mV: $\pm 1.6\text{V}$ 206mV-10V: $\pm 40\text{V}$ in Fixed Gain Ranges & Variable Gain Ranges					
Vertical Resolution	8 bit					
Channels	2					
Analog Bandwidth (at input BNC)	ADS1202CML/CL+ 200MHz	ADS1152CAL/CML 150MHz	ADS1102CAL/CML 100MHz	ADS1062CAL/CML 60MHz	ADS1042CML 40MHz	ADS1022C 25MHz
BW Flatness	DC-10% of rated BW: $\pm 1\text{DB}$ 10%-50% of rated BW: $\pm 2\text{DB}$ 50%-100% of rated BW: $\pm 3\text{DB}$					
Lower frequency limit (AC -3dB)	$\leq 10\text{Hz}$ (at input BNC)					
Noise: Pk-Pk for 3K record	$\leq 0.6\text{Div}$ for average of 10Pk-Pk readings in fixed gain settings. $\leq 0.7\text{ Div}$ for average of 10 Pk-Pk readings, Variable gain settings					
SFDR including harmonics	$\geq 40\text{dB}$					
DC Gain Accuracy	$< \pm 3.0\%$ : 5mV/div to 5V/div in Fixed Gain Ranges $< \pm 4.0\%$ : typical for 2mV/div and Variable Gain Ranges					
DC Measurement Accuracy: All Gain settings $\leq 100\text{mV/div}$	$\pm [3\% \times ( \text{reading}  +  \text{offset} ) + 1\% \text{ of }  \text{offset}  + 0.2\text{div} + 2\text{mV}] + 0.2\text{div} + 2\text{mV}$					
DC Measurement Accuracy: All Gain settings $> 100\text{mV/div}$	$\pm [3\% \times ( \text{reading}  +  \text{offset} ) + 1\% \text{ of }  \text{offset}  + 0.2\text{div} + 100\text{mV}]$					
Rise time, Typical (using 500ps pulse)	ADS1202CML/CL+ $< 1.8\text{ns}$	ADS1152CAL/CML $< 2.3\text{ns}$	ADS1102CAL/CML $< 3.5\text{ns}$	ADS1062CAL/CML $< 5.8\text{ns}$	ADS1042CML $< 8.8\text{ns}$	ADS1022C $< 14\text{ns}$
Math operation	+, -, *, FFT					
FFT	Window mode: Hanning, Hamming, Blackman, Rectangular Sampling points: 1024					
Bandwidth limiter	20MHz $\pm 40\%$ Typical (Note: BW limited below 20MHz $\pm 40\%$ when using probe X1; 25MHz BW don't have this function)					

## Trigger System

Trigger Types	Edge, Pulse Width, Video, Slope, Alternative
Trigger Modes	Auto, Normal, Single
Trigger Sources	Ch1-2, EXT, EXT/5, AC Line
Trigger Coupling	AC, DC, LF rej, HF rej
Trigger Level Range	CH1, CH2: $\pm 6$ divisions from center of screen EXT: $\pm 1.2V$ EXT/5: $\pm 6V$
Trigger Level Accuracy (typical) applicable for the signal of rising and falling time $\geq 20ns$	Internal: $\pm(0.2 \text{ div} \times V/\text{div})$ (within $\pm 4$ divisions from center of screen) EXT: $\pm(6\% \text{ of setting} + 40 \text{ mV})$ EXT/5: $\pm(6\% \text{ of setting} + 200 \text{ mV})$
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

## Control Panel Function

Auto Set	Auto adjusting the Vertical, Horizontal system and Trigger Position
Save/Recall	Support 2 Group referenced Waveforms, 20 Group setups, 20 Group captured Waveforms internal Storage/Recall function and USB flash driver storage function.

## Hard Ware Frequency Counter

Reading resolution	6 Bytes
Accuracy	$\pm 0.01\%$
Range	DC Couple, 10Hz to MAX Bandwidth
Signal Types	Satisfying all Trigger signal (Except Pulse width trigger and Video Trigger)

## Acquisition System

Sample Types	Real time, Equivalent time			
Memory Depth	<b>ADS1202CML</b> : 5Kpts / CH, <b>ADS1202CL+</b> : Single Channel 32Kpts <b>ADS1000CAL</b> Series: Single Channel 40Kpts, <b>ADS1022C</b> : Single Channel 4Kpts ;			
	<b>Other models in ADS1000CML Series</b>			
	<b>Channel Mode</b>	<b>Sampling Rate</b>	<b>Short memory</b>	<b>Long Memory</b>
	Single Channel	1 Gsa/s	40kpts	No Support
	Single Channel	500MSa/s or lower	40kpts	2Mpts #
Double Channels	500MSa/s or lower	20kpts	1Mpts #	
Sample Mode	Sample, Peak Measure, Average			
Averages	4,16,32,64,128,256			

## Measure System

Auto Measure	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 mode, Track mode and Auto mode

# (only in ADS1000CML Series with Long Memory)

## GENERAL SPECIFICATIONS

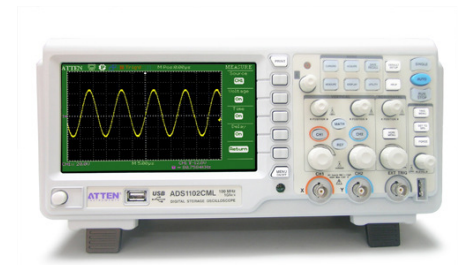
Display	
Display Mode	Color TFT 7in diagonal Liquid Crystal Display (ADS1022C: 5.7" Color LCD)
Resolution	480 horizontal by 234 vertical pixels
Display Color	64K color
Display Contrast (Typical state)	150:1
Backlight Intensity (Typical state)	300nit
Wave display range	8 x 18 div
Wave Display Mode	Point, Vector
Point, Vector	Off, 1 sec, 2 sec, 5 sec, Infinite
Menu Display	2 sec, 5 sec, 10 sec, 20 sec, Infinite
Skin	Succinct
Screen saver	1min, 2min, 5min, 10min, 15min, 30min, 1hour, 2hour, 5hour, off
Waveform Interpolation	Sin(x)/x, Linear
Color model	Normal , Invert
Language	English, French, German, Russian, Spanish, Simplified Chinese, Traditional Chinese, Portuguese, Japanese, Korean, Italian, Arabic
Interface	USB Host, USB Device, RS232, Pass/Fail output

Environments	
Temperature	Operating: 10°C to + 40°C Not operating: -20°C to +60°C
Humidity	Operating: 85%RH, 40°C, 24 hours Not operating: 85%RH, 65°C, 24 hours
Height	Operating: 3000m Not operating: 15,266m

Power Supply	
Input Voltage	100-240 VAC, CAT II, Auto selection
Frequency Scope	45Hz to 440Hz
Power	50VA Max

Mechanical			
Dimension	Length	Width	Height
	399mm	110.5mm	148.5mm
Weight	2.4 kg		

We pursue a policy of continuous development and product improvement. Thus the specifications and picture in this Spec sheet and control location on the front Panel may be changed.



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