

# FREETEST Digital Oscilloscope

## F2xMxD Series Summary



FreeTest Digital Oscilloscope is a wireless digital storage oscilloscope that connects mobile-phones with WIFI (currently supports Android) for test and measurement. It only needs a mobile phone + charging treasure size wireless oscilloscope to complete the test anytime, anywhere. Full dual-channel analog path with built-in high-energy-density lithium battery and full charge for up to 5 hours of independent test application. Small size, easy operation and flexible application scenarios. The interface is beautiful and supports gestures; WIFI connection allows you to bring your own lab all the time. Can meet the basic requirements of school experiments, home appliance repair, business travel / field testing, electronic engineering.

### Performance Indicators

- 2-analog channels
- Analog channel bandwidth : 40M~50M
- Real-time sampling rate : 160Msps ~ 200Msps
- Sampling accuracy : 8 bits
- Sampling depth : 3000 points/channel , 6000 points max
- Maximum data cache : 128Mb
- Horizontal scanning speed : 10nS/Div~10S/Div
- Vertical resolution : 7.5 bit
- Vertical sensitivity : 4mv/Div~10V/Div(x1probe)  
40mv/Div~30V/Div(x10probe)

- Horizontal sensitivity : 1nS/Div~10S/Div
- Input impedance  $\geq 1M\Omega \pm 2\%$  ;  
Equivalent capacitance  $\leq 20pF \pm 2pF$
- Measuring range :  $\pm 32V (X1) / \pm 300V (X10)$
- Tantalum capacitive screen, multi-touch (mobile phone) operation
- Coupling : AC/DC
- Low frequency response :  $\leq 10Hz$
- DC gain accuracy :  $\pm 2\%$
- DC Vertical accuracy :  $\pm 2\%$
- Frequency resolution  $\leq 0.1\%$
- Charging voltage : 5V DC
- Endurance : 5 hours ( 2800mAh ) / 7.5 hours ( 3600mAh )
- Charging time : about 7 hours
- Reference signal : 1KHz/3.3V
- Chinese and English menu
- **Two-in-one function:** use only CHA for higher sampling rate

### Feature

- Small size and light weight; length, width and height: 160mmx84mmx28mm, body weight about 600g.
- Support retina phone screen with resolution greater than 300ppi.
- WIFI Connection , IEEE802.11n & IEEE802.11b/g
- Support one key screenshot , video function.
- ARM® Thumb® Processor , 400M Frequency; Powerful digital signal processing capability.

### Application

- Teaching experiment
- Maintenance
- Outside field testing
- R&D and test of Electronic Engineering
- General application of laboratory

## Parameter

- Available : MAX/MIN/Mean/Freq/Vp-p/Avg
- Trigger Way: Rising/Descent edge trigger
- Trigger Mode : Auto、 Single、 Require、 Normal
- Trigger Source : CHA/CHB
- External triggering: non support
- Automatic Adjustment : Auto/Auto range
- Algorithm : FFT/CHA+CHB/CHA-CHB
- Storage Space: depending on the user's cell

phone

- Battery : 2800mAh/3600mAh
- Input Voltage :-32V~32V( x1 ) ,-300V~300V( x10 )
- Charging Connector : Micro-USB
- Monitor: color
- Screen Size: mobile phone display, consistent with mobile phone screen.Support One key screenshot.
- Support Video screen function.

## General safety summary

Read the following safety precautions carefully to avoid personal injury and prevent any product that is damaged or connected to this product. In order to avoid possible danger, please use this product in accordance with regulations.

- Avoid fire or personal injury.
- Use the appropriate power line. Please use only the power cord that is specially used for this product and is certified by the country or region in which it is located.
- Correctly connect and disconnect the connection correctly. Do not plug or connect the probe or test conductor to the voltage source. Before connecting the current probe or disconnecting

the current probe, please turn off the circuit under test.

- Compliance with all terminal ratings. To avoid fire or electric shock, observe all the ratings and markings on the product. Before you connect the product, please consult the product manual first to find out the detailed information about the rating.
- Do not operate in a wet environment.
- Do not operate in a flammable and explosive environment.
- please keep the surface of the product clean and dry.

## General examination

When you get a new FreeTest wireless oscilloscope, it is recommended that you check the instrument according to the following steps:

- Check the existence of damage caused by transportation;
- If it is found that the packing carton or foam plastic protective pad is seriously damaged, please keep it until the whole machine and accessories are tested by electrical and mechanical properties.
- Check the whole machine. If the appearance of the instrument is broken, the instrument is not working properly, or the performance test is not carried out, please contact us.
- If there is any damage to the instrument caused by transportation, please keep the packing. Inform the transport department or us that we will arrange maintenance or replacement.

## Functional examination

Perform a quick function check to verify that the equipment is running normally. Please follow the following steps:

- turn on the device power switch to see if the power indicator is on normal (the initial equipment may be insufficient and recharged for a period of time to try again).
- use the oscilloscope probe to connect the signal to the channel A or B, and connect the measuring terminal to the 1KHz reference output point (the other point is the grounding point).
- Turn on the mobile WIFI connection device, turn on the test software, and operate the test normally.

## Mechanical dimension of instrument



## Instrument interface description



### Interface Description

- LED-A:** The data acquisition lamp, green and flashing, represents the function of data acquisition.
- LED-S:** The battery indicator light is green. When the electricity is sufficient, the battery will always shine. The battery will flash slowly at 80%~30% and flash quickly when the battery is insufficient. Please charge it in time.
- POWER:** Power indicator light, red; often at work.
- CHARG:** The charging indicator is orange; it is always bright during charging and automatically extinguished after filling.
- Charging Port:** Charging interface, using Micro USB as charging interface, please use official accessories to charge.
- ON/OFF:** Switch, turn off the "OFF" side device and work on the "ON" side device (charging function is not affected by this switch, it is recommended to recharge the device when the equipment is

- closed).
- Status Reset:** Status Reset Key, if the device is unable to connect, use the slender object (toothpick and other non-metallic objects) to press the button for one second from the small hole.
- 1KHz:** Equipment calibration reference signal, frequency is 1KHz, the amplitude is about 3.3V.
- GND:** Reference ground for equipment calibration.
- Channel A/B:** Analog signal input channel, the input frequency range is: 0Hz to 10MHz, the input voltage range is: + 16V (X10 gear probe can be from the measuring end, that is, the probe end joint does not exceed the + 120V signal; attention: X10 measurement may lead to the decrease of measurement precision).

### More support :

Please scan the following two-dimensional code or access links to get more information. :



- a. FreeTest Introduction
- b. Datasheet
- c. Software usage description
- d. Latest APP
- e. Latest firmware
- f. Others

[www.fescale.com](http://www.fescale.com) / [www.fescale.com.cn](http://www.fescale.com.cn)

## Functional introduction

FreeTest is the world's leading mobile laboratory equipment research and development expert, and is committed to creating a new generation of electronic measurement equipment for the "industry 4" era. FreeTest is the laboratory equipment R & D center of Guangzhou flet Precision Electronic Technology Co., Ltd., the center is composed of a high quality and rich electronic industry practitioner, with 100% of undergraduate and above education. FreeTest wireless digital storage oscilloscope is the main product of FreeTest. After a long period of research and evolution, the third generation of wireless oscilloscopes have been introduced. With the extreme stability of the system performance and excellent signal acquisition function, it can help users to obtain the most real and detailed measurement results.

At the same time, the FreeTest wireless digital storage oscillograph is used by the oscilloscope body as the front end data acquisition device, and through the built-in Linux system and the WIFI connection with the mobile phone. The wireless bandwidth up to 150Mbps can seamlessly display the sample results before the customer's face; we also specially customize the custom for the user. The mobile phone operation software for Android system allows users to use the most popular and high-performance desktop mobile phones as the client to perform equipment operation and algorithm processing; at the same time, the user can introduce the most fluent and convenient display mode of user experience.

The biggest feature of FreeTest wireless digital storage oscilloscope is to use WIFI to connect the mobile phone for operation display; let the oscillograph, the traditional and important laboratory instrument, get a more humanized operating interface and have more possibilities. FreeTest has introduced commercial wireless measurements before the industry, and the mature multi-stage physical sampling architecture brings you higher measurement progress, stable wireless connection, and more than 20 meters of remote operation and results for you to get the distance.

Full dual channel analog sampling; FreeTest provides you with

the mainstream two independent sampling links, and has a multilevel physical distributary sampling function that is superior to the industry mainstream two level sub voltage all hardware automatic switching. The more precise signal carry selection provides you with more accurate sampling results.

The 1KHz/3.3V reference source; the mainstream digital voltage reference signal output based on the mobile test application optimization, provides you with more debugging possibilities in addition to accurate calibration signals.

The latest Android software technology automatically matches your mobile client. The display precision of your mobile phone determines the degree of the display of the waveform. It can support the highest 2K screen at present and bring you Retina Display's measurement display.

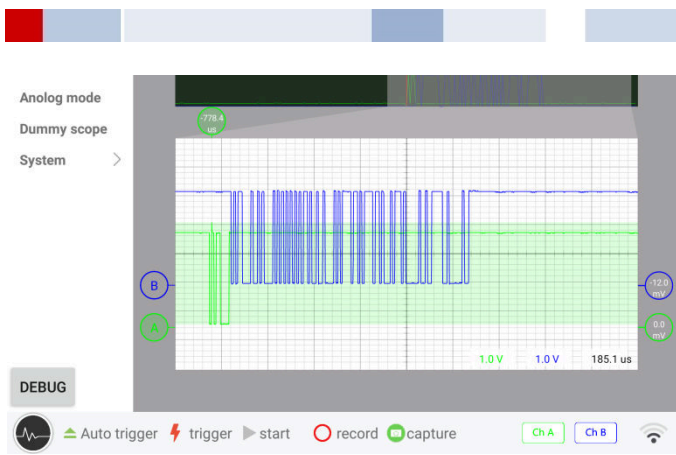
The WIFI connects to support the IEEE802.11n& IEEE802.11b/g protocol; the effective wireless communication distance is over 20 meters, but you can get the latest test results even if you are not in the laboratory. This function is especially suitable for Outfield measurement scenarios, such as vehicle measurement and maintenance, communication tower detection, UAV field test and maintenance, etc. So that you can keep the oscilloscope on your body at all times.

## FreeTest Wireless Digital Oscilloscope Using

FreeTest wireless oscilloscope is giving you a more free measurement environment, and speeds up every stage of debugging - from the quick discovery and capture of the exception events, to the search waveform records to find the concerned events, and then to the analysis of the event characteristics and device behavior.

## Remote high speed waveform capture

If you want to debug the design problem, you must first know the problem. Each design engineer will spend a lot of time looking for problems in the circuit. If there is no suitable debugging tool, this task will take a long time and be very troublesome.

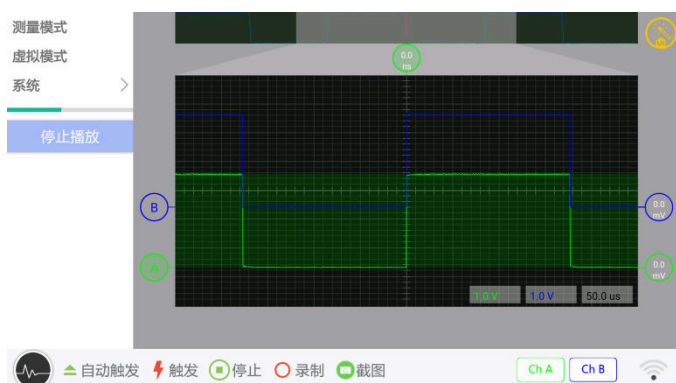


FreeTest can quickly understand the actual work of the device. This wave shape capture rate is more than 120000 wfms/s, and can quickly view the common problems of the digital system, such as the less amplitude pulse, the burr, the timing problem, and so on, with a very high probability. To adapt to a longer low probability trigger, the remote debugging support provided by FreeTest allows the customer to see the results at any time in the office and keep you better in the high-intensity debugging task.

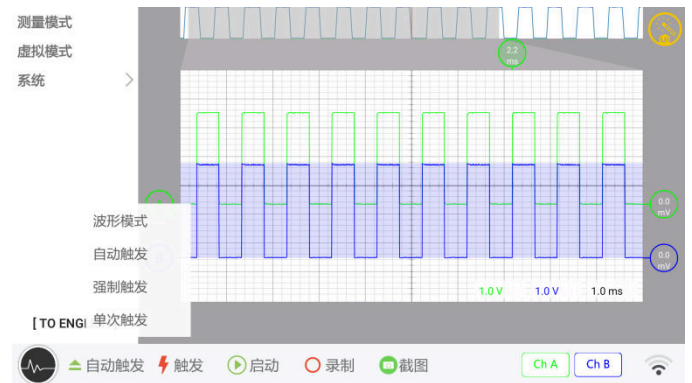


One button recording and one button screenshots are more convenient and valuable test letters.

It can be stored in your mobile phone or TF card. Large capacity storage media support a large number of screenshots and video storage.



### Trigger



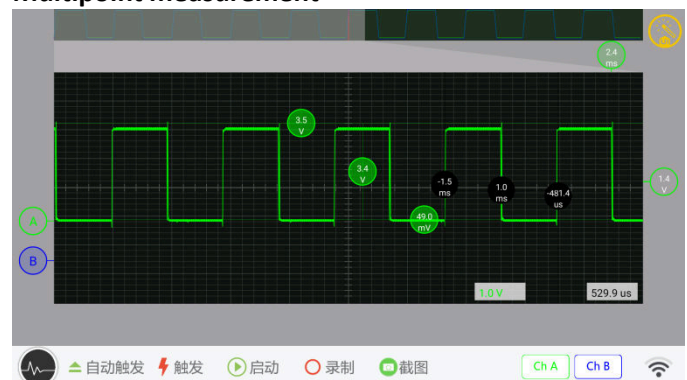
Finding equipment problems is only the first step, and then you must capture care events to determine the root cause. To achieve this goal, FreeTest provides a complete set of triggering functions, including rising edge triggers, drop edge triggers, automatic display triggers, and automatic range triggering to help you quickly find concerned events. You can capture many concerned events in one collection, even thousands of serial packets to further analyze, while maintaining high resolution to amplify the fine signal details.

### Gesture zoom and roll



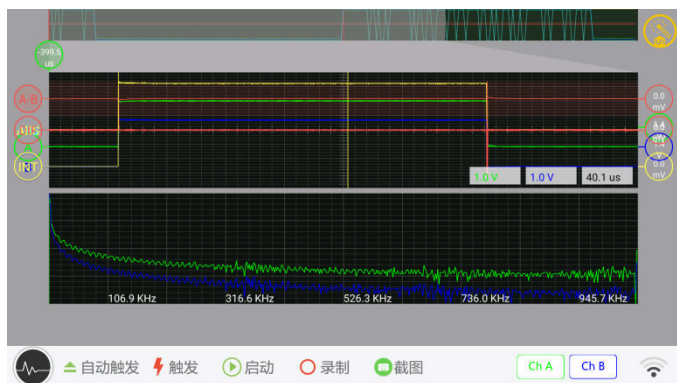
The display and operation interface of a pure capacitor screen can be arbitrarily zoomed through two fingers. The non step scaling factor allows you to amplify or narrow the picture of the time axis and the amplitude axis arbitrarily.

### Multipoint measurement



FreeTest supports multipoint measurement. As long as the finger is pulled down on the top of the screen, a measurement point can be selected for the current selected channel. The measurement points can be placed at the position of the waveform at will; the current amplitude reading can be automatically displayed in the measurement point.

### Mathematical operation



FreeTest supports a variety of common mathematical computations. Including: mathematical functions: additive, subtraction, multiplication, absolute value, reverse integral, differential, fast Fourier transform (FFT): support Hammin, triangel, and Blackma window functions.

### Automatic Measurement



FreeTest provides automatic measurement function, with only one button, you can see a variety of measurement parameters. Including: frequency, frequency, peak value, maximum, minimum, mean, RMS, etc.

### Li Saru figure (XY mode)

Li Saru's figure is a regular and stable closed curve synthesized by two harmonic frequencies in the direction perpendicular to each other. The lissara diagram can be used to measure the frequency ratio and phase difference of the two signals.

The FreeTest wireless oscilloscope supports Li Sharu waveform measurement of various waveforms, and provides the specific phase reading value. The phase measurement of the same

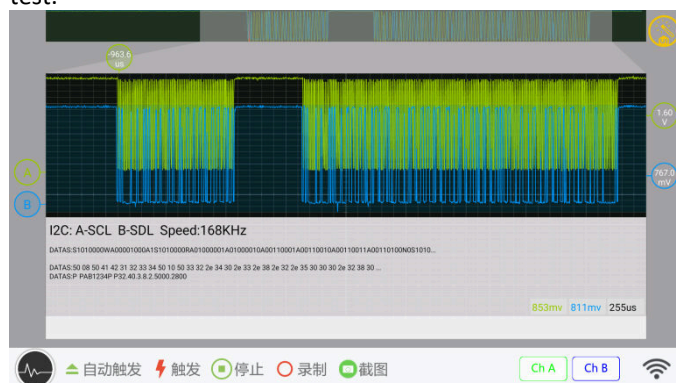
frequency signal can reach up to 1 degrees.



### Digital signal decoding ( UART/RS485/RS232/SPI/IIC )

FreeTest oscilloscope supports a variety of bus protocol analysis and decoding functions. TTL level, 232 level and 485 level serial communication protocol analysis and decoding, SPI bus signal analysis and decoding, I2C bus analysis and decoding, and other common protocols support.

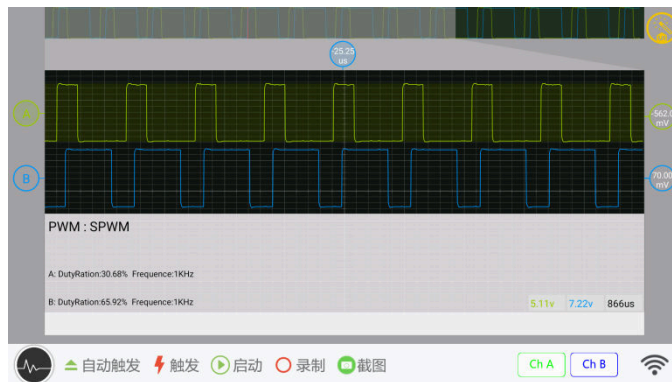
FreeTest specially optimizes the decoding speed of the common bus protocol, achieves the limit sampling utilization within the bandwidth range, and can achieve high automation test.



### PWM Pulse analysis function

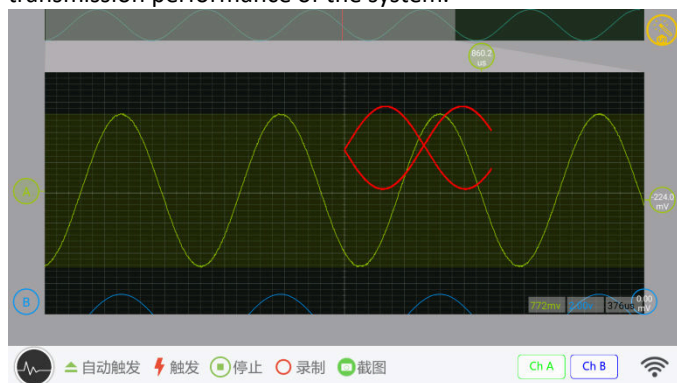
Pulse width modulation (PWM) is a very effective technique for digital transmission to control analog circuits. It is widely used in many fields from measurement, communication to power control and transformation; it is also a hot topic in people's research.

FreeTest analyzes PWM from a more professional perspective, the level range supports from 100mV to 120V, the recognition rate of the pulse width is 0.02%, supporting the frequency measurement function; giving you the accuracy of the speechless comparison.



### Eye map (signal integrity analysis)

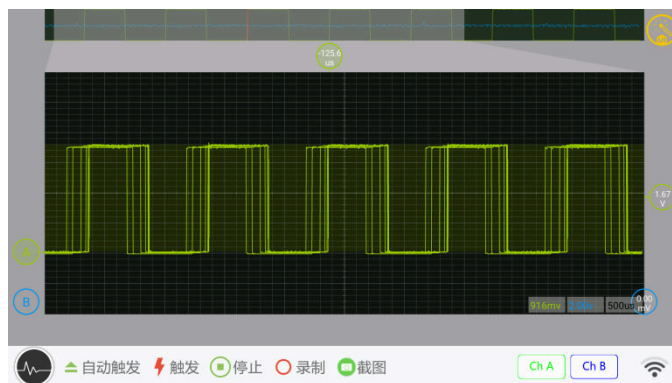
The eye diagram is due to the afterglow effect of the oscilloscope, which overlaps each waveform generated by the scanning, thus forming the eye diagram. The effect of cross code crosstalk and noise can be observed from the eye map, which embodies the characteristics of the whole digital signal and estimates the degree of the system, so the eye map analysis is the core of the signal integrity analysis. It can also be used to adjust the characteristics of the receiving filter in order to reduce the intersymbol interference and improve the transmission performance of the system.



### Afterglow mode

The persistence mode overlays multiple waveforms on the same picture, and more frequent data or updated waveforms show brighter colors than the old ones. This is very useful for finding burrs.

You can look for hidden rare incidents from a series of repetitive normal events.



### Connection mode of equipment

1、 The equipment body must be connected with the standard probe through the BNC interface.

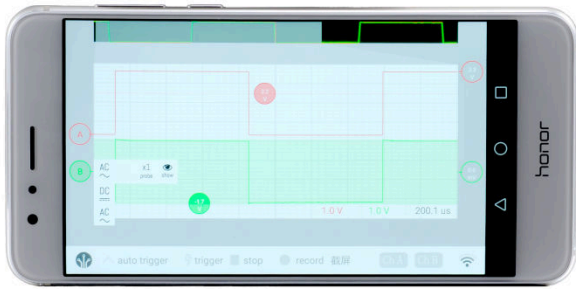


At this point, the POWER light is on. Wait for a minute, LED-A flickers, LED-S is shining or flashing, and the device is in normal working condition.

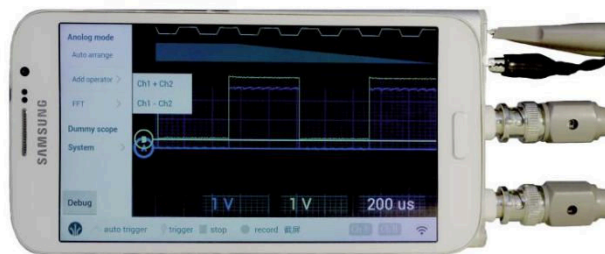


2、 See the switch on the front panel of the equipment to "ON".

3、 The mobile phone opens WIFI, opens the "Mobile Scope" APP, and clicks the WIFI icon to realize the connection.



4、 At this time, the sampling data can be displayed normally, and graphics scaling, parameter setting and other operations can be done through the mobile phone interface.



5、 Functional verification can be carried out by 1KHz standard square wave.

The waveform is a square wave with a ratio of 50% and an amplitude of 3.3V.



**FreeTest Wireless oscilloscope adaptable operation end (App : MobileScope)**

**APP Introduction**



MobileScope is a suitable operating terminal APP for the development of FreeTest wireless digital storage oscilloscope, which supports the Android system with the largest share of the mobile phone system, and can run smoothly in most of the Android smartphones. MobileScope is connected to the device by WIFI to display the perfect test data and provide a variety of measurement operations and waveform display modes. It is your trustworthy test operation platform.

**APP Parameters**

- Automatic setting: support
- Automatic range: support
- Reference signal: 1Khz

- Automatic measurement: frequency, peak value, maximum value, minimum value, mean value, RMS and so on.
- Sampling mode: waveform averaging, sample sampling and peak detection
- Mathematical functions: addition, subtraction, multiplication, absolute value, reverse, integral and differential.
- Fast Fourier transform (FFT): supporting window functions such as Hammin, trianl and Blackma.
- Cursor cursor: time cursor, amplitude cursor
- Transmission channel: communication interaction between terminal APP software and devices via WIFI
- Transmission rate: 16 frames per second
- WIFI transmission distance: the linear distance is greater than 20 meters
- Endurance time: battery life is more than 6 hours
- Display resolution: mobile phone display, consistent with mobile phone screen.
- Display true color: mobile phone display, consistent with mobile phone screen.
- Waveform screenshot: support
- Waveform recording: support
- Virtual oscillograph: support



■ **APP Provide**

To ensure product quality, FreeTest team will optimize and update App functions in time according to customer needs and user feedback. Users can access the following URLs for feedback: [www.fescope.com](http://www.fescope.com), we will follow up in time to ensure that MobileScope can provide you with a good test operation service.

■ **APP Update**

Users can view version information in MobileScope and check for updates:

Click on the "System" subdirectory "more" in the side operation bar to download and update the App.



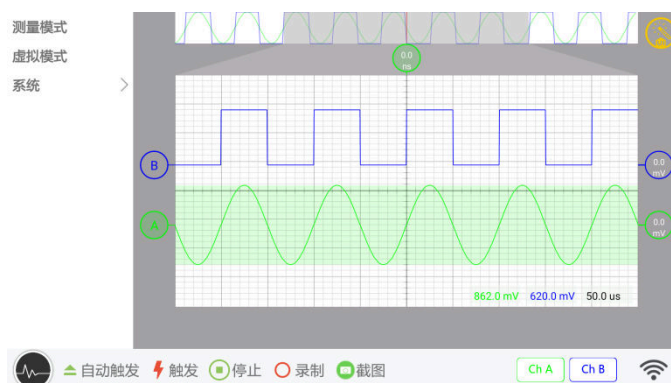
Users can also access the website [www.fescope.com](http://www.fescope.com) to download the latest version of MobileScope's Apk file.

■ **APP Instructions for installation and use**

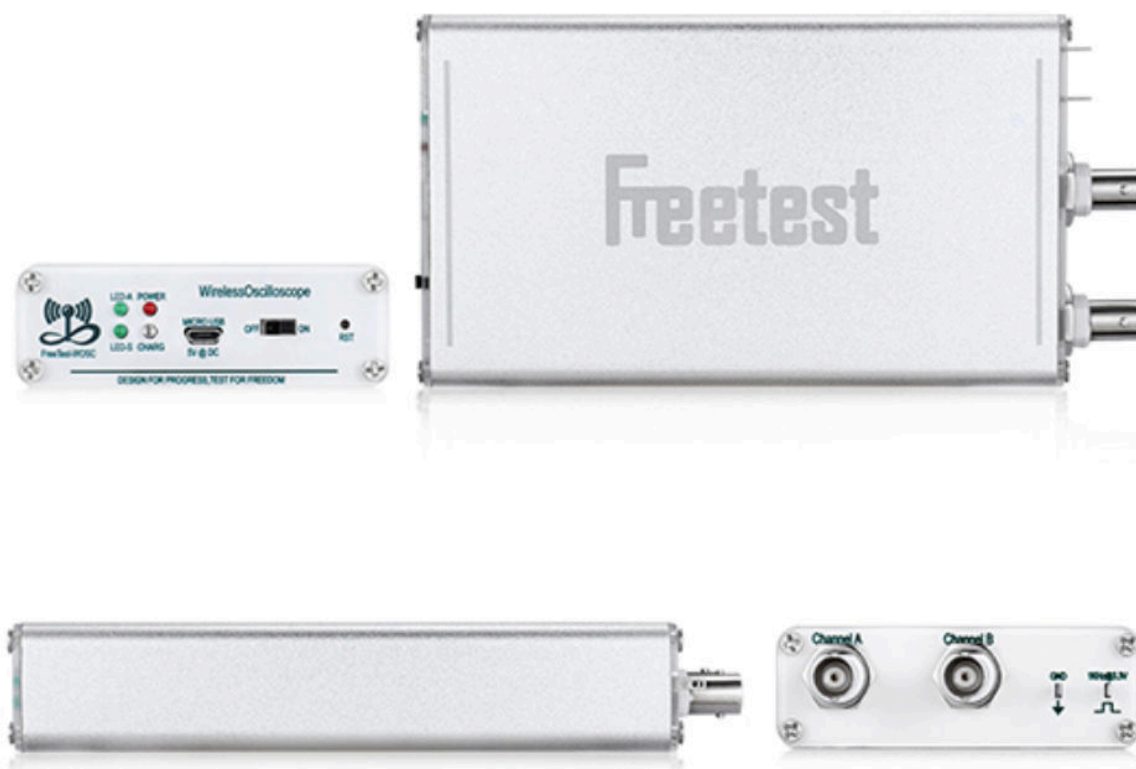
1. Download the latest version of APP's Apk file on the official website, open the Apk file in the mobile phone and install it in accordance with the relevant steps of the mobile phone, and install the icon of the MobileScope on the mobile desktop after installation, that is, the installation is successful.



2. Click the icon to enter MobileScope, click the WIFI button on the lower right corner to view the connection, and select the device WIFI to connect, then you can start the operation.



**Product photos**



## Product technical data

### ■ Acquisition system

#### Acquisition mode

- **Sampling:** collect the value of the sample.
- **Peak detection:** the sampling burrs of all scanning speeds are narrowed to 1.5 ns (1 GHz models), 2 ns (500 MHz model), 5 ns (200 MHz), 7 ns (100 MHz model), 8 ns (80 MHz model).
- **Average:** the average contains  $2^{512}$  waves.
- **Envelope:** minimum maximum envelope reflects the peak detection data of multiple acquisition. The number of optional waveforms of envelopes is 1 to 2000; infinity.
- **High resolution:** real time rectangle can reduce random noise and improve vertical resolution.
- **Scroll:** scroll the waveform from right to left on the screen, scanning speed below or equal to 40 ms/ lattices.

### ■ Waveform measurement

- **Cursor:** waveform and screen
- **Automatic measurement (Time domain):** 27 items, at any time, you can display up to 4 items on screen. Measurements include: cycle, frequency, rise time, descent time, positive duty cycle, negative duty cycle, burst width, phase, positive overshoot, negative overshoot, total overshoot, peak, peak, amplitude, height, low, maximum, minimum, average, cycle average, root mean square, periodic mean square, positive pulse number, negative pulse The number, the number of rising edges, the number of falling edges, the area and the area of the cycle.
- **Automatic measurement (Frequency domain):** 3 items, one of which can be displayed on screen at any time. Measurements include channel power, adjacent channel power ratio (ACPR) and occupied bandwidth (OBW).
- **Measurement statistics:** average, minimum, maximum and standard deviation.
- **Reference level:** user definable reference level is used for automatic measurement, which can be specified in percentage or unit form.
- **Strobe:** isolate specific events in the collection and measure them, using screen or waveform cursors.
- **Waveform histogram:** waveform histogram provides a set of data values to indicate the total number of hits in the user defined area on the display screen. Waveform histogram is not only an intuitive representation of hit distribution, but also a numeric array of measurable values.
- **Source:** Channel 1, channel 2, reference, mathematics
- **Type:** vertical, horizontal.
- **Waveform histogram measurement:** 12 items, at any time, 4 items can be displayed on the screen at most. The number of waves, the number of hits in the frame, the number of peak hits, the median, the maximum, the minimum, peak, peak, average, standard deviation, Sigma 1, Sigma 2, Sigma 3.

### ■ Waveform mathematics

- **Arithmetic:** the addition, subtraction, multiplication and division of the waveform.
- **Mathematical functions:** integral, differential, FFT.
- **FFT:** spectrum. The FFT vertical scale is set to linear RMS or dBV RMS, and the FFT window is set to rectangle, Hamming, Hanning or Blackman-Harris.
- **Spectrum Mathematics:** the addition and reduction of the spectral trace.
- **Advanced Mathematics:** defining a large number of algebraic expressions, including waveforms, reference waveforms, mathematical functions (FFT, integral, differential, logarithm, exponent, exponent, square root, absolute value, sine, cosine, tangent, arc, angle), scalar, up to two adjustable variables, and parametric measurements (cycles, frequencies) Delay, rise, decline, positive width, width, width, width, phase, positive duty ratio, negative duty cycle, positive overshoot, negative overshoot, total overshoot, peak peak, range, root mean square, root mean square, high, low, maximum, minimum, average, cycle average, area, area, and trend chart. For example,  $(\text{Intg}(\text{Ch1} - \text{Mean}(\text{Ch1})) \times 1.414 * \text{VAR1})$ .

### ■ Power supply

- **Power supply voltage:** 5V DC + 10%
- **Charging interface:** Micro USB
- **Power consumption:** less than 2W
- **Battery capacity:** 2800mAh/3600mAh

### ■ Physical characteristics

- **Appearance size:** length 160 mm, width 84 mm, thickness 28 mm.
- **Weight:** net weight of 600 grams
- **Application mode:** mobile handheld
- **Heat dissipation:** natural heat dissipation

## ■ EMC, Environment and Safety

### Temperature:

Working conditions: -10 C to +55 C (+14 F F to 131 F)

Non working status: -40, C to +71 +71 C (-40 F F to 160 F)

### Humidity:

Working condition: +40 C, 5% to 90% relative humidity +40 ~ C to +55 C, 5% to 60% relative humidity.

Non working state: maximum +40 C, 5% to 90% relative humidity +40 C to +55 C, 5% to 60% relative humidity +55 C to +71 C, 5% to 40% relative humidity, non condensing

### Altitude:

Working state: 3000 meters (9843 feet)

Non working state: 12000 meters (39370 feet)

### Laws and regulations:

EMC: EC Committee directive 2004/108/EC

Security: UL61010-1:2004, CAN/CSA-C22.2 No. 61010.1: 2004, low voltage instruction 2006/95/EC and EN61010-1:2001, IEC 61010-1:2001, ANSI 61010-1-2004, ISA 82.02.01

### Random vibration:

Non working status: 2.46 GRMS, 5 to 500 Hz, each axis 10 minutes, 3 coordinate axes (30 minutes).

Working state: 0.31 GRMS, 5-500 Hz, each coordinate axis for 10 minutes, 3 coordinate axes (30 minutes) conforming to IEC60068 2-64 and MIL-PRF-28800 third.

### To attack:

Working state: 50 G, half sine, 11 ms duration, three times per axis impact (total impact 18 times) conforming to the IEC 600682-27 and MIL-PRF-28800 third standards

### Noise emission:

Sound power level: 22 dBA (in line with ISO 9296 standard)

## Equipment accessories

Name	Quant
FREETEST Oscilloscope body	x1
40M probe	x2
Probe calibration kit	x1
Charger	x1
After sale and quality assurance	x1
Identification of toxic or harmful substances or elements	x1



■ List of equipment selection

FreeTest wireless oscilloscopes Selection list - Basic Edition				
Model	F28M6	F28M7	F21M6	F21M7
Bandwidth	20M	20M	25M	25M
Channels	2 Channels	2 Channels	2 Channels	2 Channels
Sampling Rate	80MSPS/Channel	80MSPS/Channel	100MSPS/Channel	100MSPS/Channel
Rising Time	8.0 ns	8.0 ns	7.0 ns	7.0 ns
TimeBase range	1nS/Div~10S/Div	1nS/Div~10S/Div	1nS/Div~10S/Div	1nS/Div~10S/Div
Vertical Resolution	8bit	8bit	8bit	8bit
Trigger Method	Rising/Descending edge	Rising/Descending edge	Rising/Descending edge	Rising/Descending edge
Sampling Method	Common sampling / peak detection / mean value	Common sampling / peak detection / mean value	Common sampling / peak detection / mean value	Common sampling / peak detection / mean value
Storage Depth	3K	3K	3K	3K
Input Coupling	AC/DC	AC/DC	AC/DC	AC/DC
Input Impedance	1MΩ±16pF±3pF	1MΩ±16pF±3pF	1MΩ±16pF±3pF	1MΩ±16pF±3pF
Vertical Sensitivity	4mv/Div~10V/Div(x1) 40mv/Div~30V/Div(x10)	4mv/Div~10V/Div(x1) 40mv/Div~30V/Div(x10)	4mv/Div~10V/Div(x1) 40mv/Div~30V/Div(x10)	4mv/Div~10V/Div(x1) 40mv/Div~30V/Div(x10)
Maximum Input Voltage	±32V ( X1 ) /±300V ( X10 )	±32V ( X1 ) /±300V ( X10 )	±32V ( X1 ) /±300V ( X10 )	±32V ( X1 ) /±300V ( X10 )
Probe Position	X1 ; X10	X1 ; X10	X1 ; X10	X1 ; X10
Charging Standard	MicroUSB 5V DC	MicroUSB 5V DC	MicroUSB 5V DC	MicroUSB 5V DC
Charging Time	7 Hours	7 Hours	7 Hours	7 Hours
Endurance Time	5.5 Hours	7.5 Hours	5.5 Hours	7.5 Hours

FreeTest wireless oscilloscopes Selection list - Two In One Edition				
Model	F28M6D	F28M7D	F21M6D	F21M7D
Bandwidth	40M	40M	50M	50M
Channels	2 Channels(80M)/ 1 Channel ( 160M )	2 Channels(80M)/ 1 Channel ( 160M )	2 Channels(100M)/ 1 Channel ( 200M )	2 Channels(100M)/ 1 Channel ( 200M )
Sampling Rate	80MSPS/Channel 160M Max	80MSPS/Channel 160M Max	100MSPS/Channel 200M Max	100MSPS/Channel 200M Max
Rising Time	5.5 ns	5.5 ns	5 ns	5 ns
TimeBase range	1nS/Div~10S/Div	1nS/Div~10S/Div	1nS/Div~10S/Div	1nS/Div~10S/Div
Vertical Resolution	8bit	8bit	8bit	8bit
Trigger Method	Rising/Descending edge	Rising/Descending edge	Rising/Descending edge	Rising/Descending edge
Sampling Method	Common sampling / peak detection / mean value	Common sampling / peak detection / mean value	Common sampling / peak detection / mean value	Common sampling / peak detection / mean value
Storage Depth	3K/6K	3K/6K	3K/6K	3K/6K
Input Coupling	AC/DC	AC/DC	AC/DC	AC/DC
Input Impedance	1MΩ±20pF±2pF	1MΩ±20pF±2pF	1MΩ±20pF±2pF	1MΩ±20pF±2pF
Vertical Sensitivity	4mv/Div~10V/Div(x1探头) 40mv/Div~30V/Div(x10探头)	4mv/Div~10V/Div(x1探头) 40mv/Div~30V/Div(x10探头)	4mv/Div~10V/Div(x1探头) 40mv/Div~30V/Div(x10探头)	4mv/Div~10V/Div(x1探头) 40mv/Div~30V/Div(x10探头)
Maximum Input Voltage	±32V ( X1 ) /±300V ( X10 )	±32V ( X1 ) /±300V ( X10 )	±32V ( X1 ) /±300V ( X10 )	±32V ( X1 ) /±300V ( X10 )
Probe Position	X1 ; X10	X1 ; X10	X1 ; X10	X1 ; X10
Charging Standard	MicroUSB 5V DC	MicroUSB 5V DC	MicroUSB 5V DC	MicroUSB 5V DC
Charging Time	7 Hours	7 Hours	7 Hours	7 Hours
Endurance Time	5.5 Hours	7.5 Hours	5.5 Hours	7.5 Hours