DIGITAL OSCILLOSCOPE

FNIRSI-138 Pro
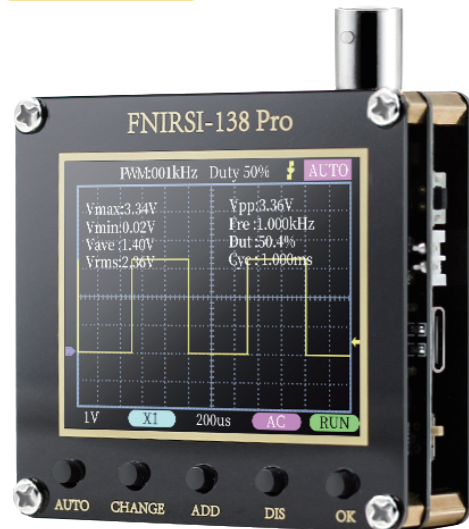
FNIRSI-138 Pro

USER MANUAL

NOTE

- Before using the product,Please read the manual carefully,in order to maximize the performance of the product
- Do not use this device in a flammable or explosive environment
- Used batteries and discarded instruments replaced by instruments cannot be disposed of with household waste.Please handle in accordance with relevant national or local laws and regulations
- When there is any quality problem with the instrument or when there is a question about using the instrument,You can contact "FNIRSI" online customer service or the manufacturer,We will solve it for you as soon as possible

PRODUCT INTRODUCTION

- "FNIRSI-138PRO" is a highly practical,cost-effective,A cost-effective handheld for the maintenance industry and the R&D education industry
- The oscilloscope has a real-time sampling rate of 2.5MS/s, a bandwidth of 200KHz, a complete touch,Send function (single, normal, automatic).It works perfectly for both periodic analog signals and aperiodic digital signals.Measures voltages up to ±400V
- Equipped with efficient one-key AUTO, the measured waveform can be displayed without cumbersome adjustment
- Equipped with a 2.4-inch high-definition LCD screen with a resolution of 320*240
- Built-in 1000mAh high-quality lithium battery, can be used continuously for about 4 hours after full charge


Panel And Button Introduction

❶ BNC probe interface

❷ RST reset switch

❸ Type-C interface

❹ 0N/0FF switch
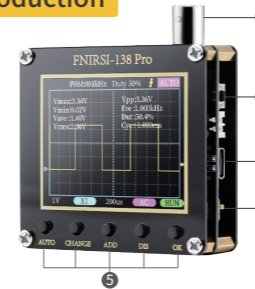
❺ Function button

Button	Operate	Function Description
AUTO	Short press	Automatic adjustment (frequency below 20Hz cannot be calibrated correctly)
AUTO	Long press	• Enter the automatic calibration confirmation interface → press the 0K button • Enter automatic calibration mode (long press AUTO again to cancel)
CHANGE	Short press	Toggle setting mode
CHANGE	Long press	Save key setting parameters
ADD	Short press	Move/change mode
ADD	Long press	Continuous movement
DIS	Short press	Move/change mode
DIS	Long press	Continuous movement
OK	Short press	Pause/Start Waveform
OK	Long press	• In the vertical voltage gear position, long press to switch X1/X10 • In other cases, long press to show/close detailed parameters
RST	Long press	Reset restart

*No key operation for 0.5 seconds, parameters will be automatically saved

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Icon Indication
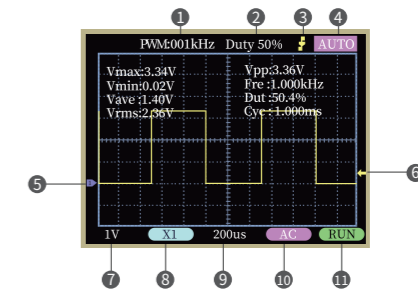
1. PWM square wave signal output frequency, the output range is adjustable from 1-80KHz
2. PWM square wave signal output duty cycle, the output range is 0-100% adjustable
3. Trigger edge indicator icon
4. Trigger mode indicator icon, Auto means automatic trigger, Single means single, Secondary trigger , Normal means normal trigger
5. Baseline indication icon, this icon indicates the position that the current position is 0V voltage
6. Trigger voltage indicator icon
7. Vertical sensitivity, indicating the voltage represented by a large grid in the vertical direction
8. 1X/10X mode indicator icon, this must be the same as the 1X/10X on the probe handle.The switch settings are the same. If the probe is in 1X gear, then the oscilloscope should also be set to1X gear, 1X measures ±40V voltage, 10X measures ±400V voltage
9. Horizontal time base, indicating the length of time represented by a large grid in the horizontal direction
10. Input coupling mode indication icon, AC means AC coupling, DC means DC coupling
11. Running pause indication icon, RUN means running, STOP means pause

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Parameter Index

Powered By	USB powered	lithium battery
Supply Voltage	5-6V	4-9V
Capacity	/	1000mAh
Sampling Rate	2.5MS/ s	
Bandwidth	200K	
Vertical sensitivity	10mV/Div-20V/Div (in 1-2-5 increments)	
Horizontal time base range	10μs/Div-50s/Div(in 1-2-5 increments)	
Voltage Range	X1:±40V (Vpp:80V)	X10: ±400V (Vpp :800V)
Trigger Modes	Auto/Nomal/Single	
Coupling Modes	AC/DC	
PWM output	3.3V	F.R:0~80kHz	Duty cycle: 0~100%
Show	2.4 in/ PPI:320*240	
Size	66*71.6*22.8mm	
Weight	53g (Without battery)	72g (Including battery)

*The size and weight are all measured manually, there are some errors, please refer to the actual product

Firmware Upgrade

1.Press the "OK" button to power on, you can enter the U disk upgrade mode

2.Use the Type-C cable to connect the Type-C port on the board to the computer, then the computer will pop up a U disk belonging to "FNIRSI-138 Pro"

3.Pull the firmware into the U disk, and the firmware upgrade is complete

*Note: Firmware upgrade is only supported on WIN10 computer system

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Analysis Of Common Problems

1、How to tell if the battery is fully charged?

A: When the battery is fully charged, the charging indicator will change from red to green

2、Why can't I see a waveform when testing the signal, but only see multiple lines jumping up and down?

A: The trigger mode can be set to "Auto", and then press the [AUTO] key again.If still If it is not resolved, it may be that the clip on the probe is not grounded, or the clip end of the probe is open circuited.

Please use a multimeter to check whether the probe is normal

3、Why does the tested waveform keep shaking left and right and cannot be fixed?

A: The trigger voltage needs to be adjusted, that is, the yellow arrow on the right.In trigger mode, press the up and down keys to adjust the trigger voltage. After adjusting the yellow pointer between the upper and lower part of the waveform, the waveform can be triggered and fixed

4、Why is there no waveform when measuring a battery or other DC voltage?

A: The battery voltage signal is a stable DC signal, and there is no curve waveform.When adjusting the vertical sensitivity in DC coupling mode, there will be an upward or downward offset line waveform.

If it is AC coupled, there is no waveform no matter how you adjust it

5、Why is the VPP peak-to-peak data below 600V+, not 220V or 310V, when measuring the 220V waveform of the mains?

A: Mains 220V is a symmetrical AC signal, the positive peak voltage (MAX) is +310V, and the negative peak voltage (MIN) is -310V, so the peak-to-peak value of VPP below is 620V.

The effective value (RMS) is the 220V voltage that is often said, and the mains voltage RMS fluctuates between 180~260V, so the peak-to-peak VPP is in the range of 507~733V

6、Why is the measured mains 220V waveform not a very standard sine wave, with distortion?

A: The mains power grid is generally polluted and contains more high-order harmonic components.The superposition of these harmonics on the sine wave will show a distorted sine, which is a normal phenomenon.

Generally, the mains waveform is distorted and has nothing to do with the oscilloscope itself

7、Why are the baseline (0V) and the left arrow (0V indicated) on the screen different in position when there is no signal input, and there is a relatively large offset?

A: Please unplug the probe and the USB cable, press the [AUTO] key to enter the calibration confirmation interface, and then click the [OK] button to enter the automatic calibration

NOTE

1.After receiving the device, please use it after it is fully charged

2.When using the oscilloscope, pay attention to the selection of the gear. The gear of the oscilloscope should be consistent with the gear of the probe

3.When measuring high voltage, it is forbidden to touch any metal part of the oscilloscope to avoid the risk of electric shock

4.Try not to perform high voltage test when charging

5.When calibrating, you need to unplug the BNC probe, or short-circuit the positive and negative poles of the probe

6.USB firmware upgrade, only supports WIN10 and above, it is forbidden to drag and drop files other than released firmware, otherwise it is very likely to cause irreversible consequences

7.Please use the voltage within the specification range for charging

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CERTIFICATE

Inspector:

Production Date:

QC Pass

FNIRSI