

Φορητός παλμογράφος 3-σε-1 FNIRSI 2C53P 4.3" με οθόνη αφής

FNIRSI · EAN 5907085527291

Machine translation from Polski. In case of doubt the manufacturer's original document prevails.

2C53P

Portable oscilloscope with a 3-in-1 touchscreen

User Manual

Information for Users

● This manual contains detailed information regarding the use of the product and important safety precautions. Please read this manual carefully and follow the instructions contained herein to ensure optimal performance of the product. ● Do not use the device in a flammable or explosive environment. ● Used batteries and obsolete devices should not be disposed of with municipal waste; please follow the appropriate national or local regulations regarding disposal. ● If you have any quality issues with the device or questions regarding its use, please contact us immediately, and we will address the matter as soon as possible.

1. Introduction to the Product

FNIRSI-2C53P is a three-in-one, dual-channel digital oscilloscope launched by FNIRSI, characterized by versatile functionality and high practicality, intended for the repair and research industry. The device combines an oscilloscope, multimeter, and signal generator. The oscilloscope features an FPGA+MCU+ADC hardware architecture with a sampling rate of 250 MS/s, an analog bandwidth of 50 MHz, a built-in high-voltage protection module, and supports peak voltage measurements up to ± 400 V. It also supports capturing, saving, and reviewing waveforms for further analysis. The multimeter function includes a 4.5-digit true RMS measurement of 19999, supporting AC/DC voltage and current measurements, as well as capacitance, resistance, diode, continuity, temperature measurements, and more. It is suitable for professionals, factories, schools, enthusiasts, and home use as an ideal multifunctional instrument. The built-in DDS signal generator can generate 12 types of waveform signals with a maximum output frequency of 10 MHz and adjustable frequency, amplitude, and duty cycle in steps of 1 Hz. The device is equipped with a 4.3-inch touchscreen with a resolution of 480 x 272, a built-in 4000 mAh lithium battery, and a standby time of up to 4 hours. Despite its small size, it offers users more advanced and

practical features while being very portable.

2. Panel Description

Channel 1 Interface Channel 2 Interface Signal Generator Output

Oscilloscope Oscilloscope

Functional

Switch

Charging Interface Multimeter Interface

Charging Button

Key Area

The illustration shows the appearance of the product.

3. SPECIFICATION

Tempered glass surface Tempered glass

surface + touchscreen made of glass GLASS +

Screen material

color IPS screen

Backlight

Backlight brightness can be adjusted. Power TYPE C (5 V/2 A)

Battery 4000 mAh lithium battery

Chinese, English, Russian, Japanese, Spanish, Portuguese, German,

Language

Korean

Product Dimensions $\approx 145 \times 98 \times 35$ mm

Weight ≈ 360 g

4. Introduction to Key Functions and Interface Operation

1.1 Oscilloscope Interface

1 2 3 4 5 6

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13 14 15 16

①Channel 1 Settings: Channel on/off, vertical voltage, probe factor, coupling type, and bandwidth limit to 20 M can be set. ②Channel 2 Settings: Channel on/off can be set.

⑧Channel 1 Waveform: Waveform signal

recorded by channel 1, vertical voltage, probe factor, coupling type, with a bandwidth limit of 20 M. ⑨Trigger Position Indicator Arrow X: refers

③Time Base: Refers to the large grid in the horizontal direction representing time length, consisting of the sampling frequency. ⑩Channel 2 Waveform: Waveform signal

recorded by channel 2.

④Trigger Settings: Trigger mode, trigger slope, and trigger channel can be set. □ Trigger Voltage Indicator Icon: Trigger threshold.

⑤Functional Signal Generator Indication: Backlight indicates that the functional signal generator is on, gray color indicates it is off. □ Cursor Operations.

⑥Run/Pause: Click this button to toggle between run and pause. □ Home Button.

⑦Power Indicator: Indicates system power. □ Start/Stop Button.

□ Auto Measurement Button. □ Menu Button.

1.2 Oscilloscope Menu Section

Coarse Adjustment/

Save X-Y Fine Adjustment

Action Image

Correction

Measure Calculation Afterglow

Save Cursor X-Y Image  % Micro

Measurement Cursor Afterglow Correction 50%

Click the Measure option to select the value Click Cursor to select X1-X2, Y1-Y2

Measure

Cursor

displaying

the measurement parameter to be

displayed. This is shown in the figure. Clicking the Save button will

Save

save the oscilloscope measurement page

in BMP format in the Screenshot file

folder on the device's USB memory. The

Screenshot file folder on the USB

device can choose to display 1+2, 1-2, 1*2, 1/2,

During saving, the

Calculation

FFT, -1, -2, |1|, |2|

image name will be displayed. Click the "Afterglow" option to select 1 Click Calibration, remove all probes, and

Afterglow

Correction

then enter calibration. Click X-Y to switch to displaying X-

X—Y Y. At this point, measurements, cursors,

Click on Image to go to the

Image

photo browsing interface. Click 50% to automatically adjust the voltage offset, trigger voltage, etc. to the appropriate

◆◆%

position. Click the accuracy/zoom adjustment option to adjust the speed of waveform scrolling.

1.3 Oscilloscope Parameters

Channel Two Channels Bandwidth 50MHz

Real-time Sampling Frequency

250MSa/s Storage Depth

Up to 64 kB

Time Base Range 10ns/div - 10s/div Vertical Sensitivity 10mv/div - 10v/div

Waveform Display Mode YT/XY/scroll Vertical Resolution 8 bits

Input Impedance 1MΩ Bandwidth Limit 20 MHz limit support

Probe Attenuation Ratio 1x/10x Input Coupling AC/DC

Trigger Type Rising/Falling Peak Voltage $\pm 400V$

8 Cells Automatic/

Trigger Level Range Trigger Mode Normal/Single
(positive/negative)

Period, Frequency, Peak Value,

Maximum Value, Minimum Value, Average Value,

Storage Location 13M Measurement Data

RMS Value,

Amplitude, Duty Cycle,

Pulse Width

2.1 Signal Generator Interface Description

①Signal Type Selection: There are 12 types of waveforms to choose from, including sine wave, square wave, triangular wave, half-wave, full wave, positive step wave, negative step wave, DC signal, exponential rise, exponential fall, multi-audio, and sync pulse. ②Waveform Selection: Clicking the [Previous] or [Next] button switches to display other waveforms to choose from. ③Run/Pause: Clicking this button toggles between starting the signal and pausing it. ④ Frequency: Specific parameters can be set by entering values using the buttons, up to [10 000 000] . To apply the settings, click the [Confirm] button. ⑤ Amplitude: Clicking this button allows you to set specific parameters by entering values, up to [3.3 V] . To apply the settings, click the [Confirm] button. Adjustments can also be made by sliding the slider on the right side. ⑥ Duty Cycle: Clicking this option allows you to set specific parameters by entering values, up to [100%] . To apply the settings, click the [Confirm] button. Adjustments can also be made by sliding the slider on the right side. ⑦ Value Input Area: Selecting the [Frequency] , [Amplitude] , or [Duty Cycle] option allows you to enter specific values that will be applied after clicking the [Confirm] button.

2.2 Signal Generator Parameters

Various Output Frequencies of Waveform Sine Wave: 10 MHz, other waveforms 5 MHz

Waveform Frequency 0-10MHz

Waveform Amplitude 0.1V-3.0V

Duty Cycle of Square Wave

100%

0-

3.1 Digital Multimeter Interface Description

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①Mode Switch: Switches to other modes.

②DC/AC switch: If the selected mode is V (voltage), mA (current in milliamperes), A (current), you can switch between DC and AC by pressing the DC/AC button. ③Measurement

parameters: Displays the current measurement mode and measured parameters. ④Data saving: Click to save the current measurement parameters. A maximum of five parameters can be saved, and exceeding this number will result in the earliest saved parameters being replaced by new ones. ⑤Displaying maximum/minimum values: The maximum and minimum values of the measured parameters will be displayed in a table, and the curve will show changes in measurement values over time. ⑥Start/Pause: While using the multimeter, you can stop or resume the measurement process. ⑦Connection guide: Selecting a mode will display tips for the appropriate connection points. 3.2 Gear description

●High current measurement: Connect the red probe to the 10 A socket and the black probe to the COM socket. *Note: Measuring current above 10 A will blow the fuse. Check the current intensity before measuring. ●Low current measurement: Connect the red probe to the mA socket and the black probe to the COM socket. *Note: Measuring current above 1 A will blow the fuse. Assess the current intensity before measuring, and if in doubt, first perform a measurement at the high current setting. ●Automatic measurement of voltage, resistance, capacitance, temperature, diodes/continuity: Connect the red probe to the first hole and the black probe to COM. Switch to the appropriate function setting depending on the measured parameter. ●Automatic range: Automatically detects only voltage and resistance. When measuring voltage, it automatically detects AC/DC voltage. ●Diode/continuity range: During continuity measurement, if the resistance value is less than 50 Ω , a beep will sound. When measuring diodes, the forward bias will be displayed on the screen. If the polarity of the test lead is reversed to the diode's polarity or the diode is damaged, the screen will display the message "OL." 3.3 Multimeter parameters

Accuracy

Function Range

DC Voltage 1.9999V/19.999V/199.99V/1000.0V $\pm(0.5\%+3)$

AC Voltage

1.9999V/19.999V/199.99V/750.0V $\pm(1\%+3)$

DC Current 19.999mA/199.99mA/1.9999A/9.999A $\pm(1.2\%+3)$

AC Current 19.999mA/199.99mA/1.9999A/9.999A $\pm(1.5\%+3)$

Resistance

19.999M Ω /1.9999M Ω /199.99K Ω /19.999K Ω / $\pm(1.5\%+3)$

1.9999K Ω /199.99 Ω $\pm(0.5\%+3)$

Capacitance

999.9 μ F/99.99 μ F/9.999 μ F/999.9nF/99.99nF/9.999nF

$\pm(2.0\%+5)$

Electric Capacitance

9.999mF/99.99mF

$\pm(5.0\%+20)$

Temperature

$-55\sim 1300^{\circ}\text{C}$ / $-67\sim 2372^{\circ}\text{F}$

$\pm(2.5\%+5)$

Diodes/ON-OFF

4.1 Settings interface

Language settings: 8 languages are available, including Chinese, English, German, Portuguese, Japanese, Spanish, Korean, and Russian. Brightness settings: Swipe left or right to adjust the display brightness. Sound settings: Swipe left or right to adjust the device volume. Theme settings: Switch between the device's yellow and blue themes. Startup settings: Automatically go to the appropriate function interface upon device startup. Selecting the ☐ None ☐ option will take you to the main menu upon startup. Auto power off: The device will automatically turn off if no operation is performed within the set time. Selecting the ☐ OFF ☐ option will disable the auto power-off function. USB sharing: Enable USB sharing to access the USB drive when connected to a computer. Screenshots can be found in the ☐ Screenshot file ☐ folder. Information: Displays brand information and the current version number. Restore factory settings: Restoring factory settings will reset all previous settings. 5. Software update

In the settings, after connecting to a computer, a USB drive will appear. Then place the firmware in the "Upgrade file" folder on the USB drive, disconnect the USB, turn off the device, and then restart it. The device will automatically go to the update page. After the update is complete, the device will automatically turn off. 6. Precautions

- When using both channels simultaneously, the grounding terminals of both probes must be connected together. It is strictly prohibited to connect the grounding terminals of both probes to different potentials, especially to different ends of high-power devices or 220 V, as this may damage the oscilloscope's mainboard by shorting the internal grounding lines of the mainboard, since both channels share a common ground. All oscilloscopes operate this way. - The oscilloscope's BNC connector can withstand a maximum input voltage of 400 V.

When using the 1X probe switch, it is strictly forbidden to apply a voltage exceeding 400 V.

● During charging, a separate charging head must be used. It is strictly forbidden to use power from other tested devices or a USB port, as this may cause a short circuit of the mainboard grounding line during testing, which may lead to damage to the mainboard. ●

Before using the product, check that the insulation near the housing and interfaces is not damaged. ● Grasp the protective device located behind the test probe with your fingers. ● When measuring a circuit, do not touch any input terminal ports. ● Before changing the range, disconnect the test probes and circuit connections. ● When the direct current voltage of the measured circuit exceeds 36 V or the alternating current voltage exceeds 25 V, users should exercise caution to avoid electric shock. ● When the battery level is low, a pop-up window will appear requesting to charge the battery in a timely manner to avoid affecting measurement performance. Download the user manual, app, and software.

Warnings and safety information

All information regarding operation and usage can be found in the user manual or on the product label. Before starting to use the products, familiarize yourself with its content and follow the guidelines contained therein. Also, review the following information before use:

User safety

1. Use measuring tools according to their intended purpose. Do not use measuring tools for tasks they were not designed for to avoid damage or incorrect measurement results. 2. Always ensure that the tool is in good technical condition before use. Damaged tools, such as cracked housings or damaged displays, may lead to incorrect measurements or accident risks. 3. Regularly calibrate measuring tools to ensure their accuracy and reliability of measurements. Incorrectly calibrated devices may lead to erroneous results.

Precautions

1. Use appropriate eye protection, especially when working with measuring tools that may emit radiation. 2. Keep measuring tools away from children and untrained individuals to prevent accidental damage or improper use. 3. Avoid using measuring tools in extreme temperature, humidity conditions, or in an atmosphere with high dust concentration, which may affect their accuracy and functionality. 4. When working with measuring tools, exercise caution not to damage delicate measuring components (e.g., sensors, probes).

Safe usage

1. Always ensure that the measuring tool is properly set up and secured to avoid measurement errors or damage. 2. Use measuring tools only in designated areas that provide adequate stability and minimize the risk of accidents, such as slippery or uneven surfaces. 3. Never perform measurements on live components or in conditions that may pose a safety hazard.

Usage guidelines in appropriate conditions

1. Store measuring tools in a dry, cool place, away from moisture and direct sunlight, which may damage the devices or affect their accuracy. 2. When using measuring tools, ensure they are well seated and not exposed to shocks or impacts that may lead to damage. 3. Avoid using measuring tools in places with extreme conditions, such as heavy vibrations, hot surfaces, dust, or moisture, unless the tool is designed for such conditions by the manufacturer.

Maintenance instructions

1. Regularly check the condition of measuring tools, especially measuring components (e.g., sensors, probes, displays) and batteries. 2. Follow the cleaning instructions provided by the manufacturer. Use appropriate cleaning materials (e.g., soft cloths) to avoid damaging delicate components. 3. Regularly perform calibration of measuring tools according to the manufacturer's recommendations to maintain measurement accuracy.

Safe disposal

1. Worn or damaged measuring tools should be disposed of in accordance with applicable environmental protection and electronic recycling regulations. 2. Do not throw measuring tools into regular waste containers, as they may contain environmentally harmful components. 3. Contact local authorities or recycling companies for information on proper disposal of worn measuring tools.

Declaration of Conformity

The products have been designed in accordance with the safety requirements specified in Regulation (EU) 2023/988 on general product safety, ensuring their compliance with applicable standards regarding the safety and health protection of users. SHENZHEN FNIRSI TECHNOLOGY CO., LTD

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Representative information:

ALTWAY (PL) Sp. z o.o.

Aleja Grunwaldzka 212, 80-266 Gdańsk, Poland

bok@altway.pl

Battery specifications:

Category: Portable

Type: Lithium-ion

Net weight (kg): 0.071 kg

Capacity (mAh): 4000

Power (kWh): 0.01

Environmental Protection

Used electronic equipment marked in accordance with the European Union directive must not be placed together with other municipal waste. It is subject to selective collection and recycling at designated points. By ensuring its proper disposal, you prevent potential negative consequences for the natural environment and human health. The waste collection system for used equipment complies with locally applicable environmental protection regulations regarding waste disposal. Detailed information on this can be obtained from the municipal office, waste management facility, or the store where the product was purchased. The product meets the requirements of the so-called New Approach directives of the European Union (EU) concerning issues related to user safety, health protection, and environmental protection, specifying hazards that should be detected and eliminated. This document is a translation of the original user manual created by the manufacturer. Detailed information about the distributor/manufacturer's warranty conditions is available on the website <https://serwis.innpro.pl/gwarancja>

The product should be regularly maintained (cleaned) by the user or through specialized service points at the user's cost and scope. In the absence of information about necessary periodic or service maintenance actions in the user manual, the user should regularly, at least once a week, assess the physical condition of the product against that of a physically new product. If any deviation is detected or identified, urgent maintenance (cleaning) or service steps should be taken. Failure to properly maintain (clean) and respond upon detecting a state of deviation may lead to permanent damage to the product. The warranty provider is not responsible for damages resulting from negligence. Importer:

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Safety Precautions

Before starting to charge, check that the device contacts are clean. Never leave the device unattended while in use and charging. Ensure that you can quickly disconnect the device from the power source in an emergency. Never expose the device to high temperatures. Charge the device in a dry and well-ventilated place away from flammable materials, maintaining a minimum distance of 1m from other objects. Never cover the device while charging. Never use a power supply, charging station, cables, etc., without the manufacturer's recommendation and certification. Take care of your property; the device is equipped with cells that are difficult to extinguish; equip yourself with a fire blanket.

LI-ION Battery

The device is equipped with a LI-ION (lithium-ion) battery, which, due to its physical and chemical structure, ages over time and with use. The manufacturer specifies the maximum operating time of the device under laboratory conditions, where optimal working conditions for the device exist, and the battery itself is new and fully charged. Actual operating time may differ from that declared in the offer and this is not a defect of the device but a characteristic of the product. To maintain maximum battery life, it is not recommended to discharge it below 3.18V or 15% of total capacity. Lower values, such as 2.5V for the cell, permanently damage it and this is not covered by the warranty. If the battery or the entire device is not used for more than one month, the battery should be charged to 50% and its charge level should be checked periodically every two months. Store the battery and device in a dry place, away from sunlight and negative temperatures.

LI-PO Battery

The device is equipped with a LI PO (lithium-polymer) battery, which, due to its physical and chemical structure, ages over time and with use. The manufacturer specifies the maximum operating time of the device under laboratory conditions, where optimal working conditions for the device exist, and the battery itself is new and fully charged. Actual operating time may differ from that declared in the offer and this is not a defect of the device but a product feature. To maintain the maximum lifespan of the battery, it is not recommended to discharge it below 3.5V or 5% of the total capacity. Lower values, such as 3.2V for the cell,

permanently damage it and this is not covered by the warranty. In case of discontinuing the use of the battery or the entire device for more than one month, the battery should be charged to 50% and its charge level should be checked periodically every two months. Store the battery and the device in a dry place, away from sunlight and negative temperatures.