

1.SAFETY REQUIREMENTS

1.1 Environmental Requirements

Precautions

- Avoid high temperatures, open flames, corrosive gases, humid or dusty environments to prevent equipment failure.
- Always place the device on a stable and solid surface. Do not place the device on soft surfaces such as carpets and blankets.
- Ensure the air intake is not blocked to avoid affecting the measurement values.

Keep away from the following items

- Heating devices: To avoid overheating or fire risks.
- Water sources, chemicals, solvents: Leaks may damage the equipment or cause fires.
- Strong magnetic devices: To prevent magnetic fields from interfering with the normal operation of the device.

Waste Disposal

Do not dispose of used batteries or equipment with household waste; handle it according to national or local regulations.

1.2 Equipment safety label



Charging



Professional recycling

2.PRODUCT OVERVIEW

2.1 Product introduction

FNIRSI-DS215H is a comprehensive and practical two-in-one dual-channel digital oscilloscope launched by FNIRSI, designed for the maintenance and R&D industries. It integrates an oscilloscope and a signal generator, adopts FPGA+MCU+ADC hardware architecture, and has the following features:

Oscilloscope function:

- Sampling rate: up to 250MSa/s.
- Analog bandwidth: 50MHz.
- High voltage protection: supports maximum $\pm 400V$ peak voltage measurement, safe and reliable.
- Waveform storage: supports screenshot saving and viewing, which is convenient for data analysis.

Signal generator function:

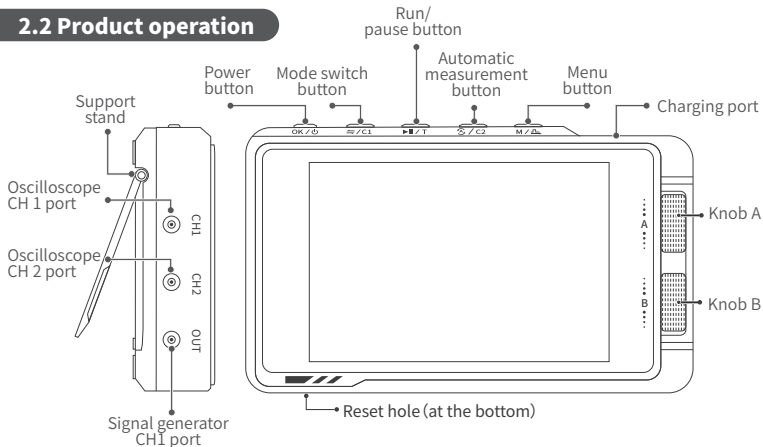
- Support 13 waveform outputs, frequency range 0-50KHz, step 1Hz..
- Output parameters (Freq, Amp, Duty cycle) are adjustable, flexible to meet various needs.

Portable design:

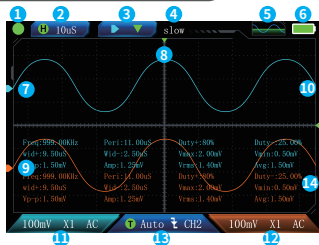
- Equipped with a 3.5-inch 480×320 resolution display, the picture is clear and intuitive.
- Built-in high-capacity rechargeable lithium battery (1500mAh), supports long standby (4 hours).
- Small and light, suitable for mobile use.

FNIRSI-DS215H is committed to providing users with powerful, flexible functions and portable operation experience, and is an ideal tool for maintenance and R&D work.

2.2 Product operation



2.3 Oscilloscope



①Run/Pause Indicator:

Press the Run/Pause button to switch, green for running, red for pause.

②Time Base:

A large horizontal grid represents the length of time, which is determined by the sampling rate.

③Mode Switch:

Press the mode switch button to switch the control time base, channel vertical sensitivity, horizontal trigger movement, channel waveform up and down movement, trigger level up and down movement, and cursor control of cursor opening.

④Fine/Coarse Adjustment:

Press the switch button to switch fine/coarse adjustment.

⑤Function Signal Generator Indicator:

Highlight means the function signal generator is turned on, and gray means it is not turned on.

⑥Battery Indicator:

Indicates the system battery.

⑦Channel 1 Waveform:

The waveform signal collected by channel 1.

⑧Trigger X position indicator arrow:

Indicates that this is the trigger point.

⑨Channel 2 waveform:

The waveform signal collected by channel 2.

⑩Trigger voltage indicator icon:

The trigger threshold.

⑪Channel 1 settings:

Long press the mode switch button to set the channel on/off, probe ratio, coupling type, and FFT.

⑫Channel 2 settings:

Long press the automatic measurement button to set the channel on/off, probe ratio, coupling type, and FFT.

⑬Trigger settings:

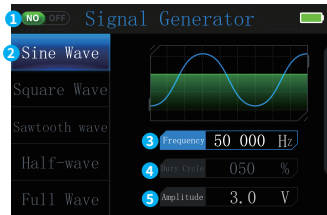
Long press the run/pause button to set the trigger mode, trigger edge, and trigger channel.

⑭Parameter measurement:

Displayed according to the measurement item selected in the settings.

Button/ Scroll Wheel	Operation	Function Description
OK / 	Short Press	Switch the coarse/fine adjustment scroll wheel (when not in other menus), confirm (in other menus)
	Long Press	Power on/off
 / C1	Short Press	Switch the scroll wheel function (when not in other menus/settings)
	Long Press	Open CH1 settings
 / T	Short Press	Switch pause/run
	Long Press	Open trigger settings
 / C2	Short Press	Automatic measurement
	Long Press	Open CH2 settings
M / 	Short Press	Open menu/return
	Long Press	Enter the signal generator interface
Scroll Wheel A	/	When not in other menus: up and down operation; when entering the menu: up and down selection
Scroll Wheel B	/	When not in other menus: left and right operation; when entering the menu: left and right selection

2.4 Signal Generator



① On/Off:

Short press the Run/Pause button to turn on/off the signal output.

② Signal Type Selection:

There are 13 waveforms: sine wave, rectangular wave, sawtooth wave, half wave, full wave, positive step wave, reverse step wave, exponential rise, exponential fall, DC signal, multi-tone, Sinker pulse, Lorentz wave.

③ Frequency:

Set the specific parameters by inputting buttons and knobs, with a maximum value of 50,000Hz.

④ Duty Cycle:

Set the specific parameters by inputting buttons and knobs, with a maximum value of 100%.

5 Amplitude:

Set the specific parameters by inputting buttons and knobs, with a maximum value of 3.0V.

Button/ Scroll Wheel	Operation	Function Description
OK / 	Short Press	Enter/exit parameter settings
	Long Press	Power on/off
 / C2	Short Press	Turn output on/off
M / 	Short Press	Enter/exit parameter settings
	Long Press	Return to oscilloscope interface
Scroll Wheel A	/	When not in parameter settings: switch signals; when in settings: add/subtract parameters
Scroll Wheel B	/	When not in parameter settings: switch parameters; when in settings: adjust parameters

2.5 Settings page and related operations

>Menu

50%

Measure-
ment

Save

Cursor

Calcula-
tion

>Menu

Aftergl-
ow

X—Y

Calibra-
tion

Image

Settings

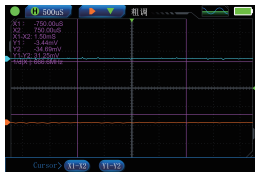
50%: Automatically adjust the bias voltage, trigger voltage, etc. to the appropriate position.

Measurement: Select the measurement parameter value to be displayed, as shown in the figure.

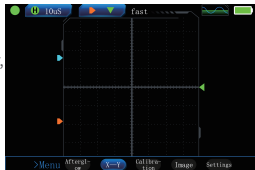


Save: Click Save to save the oscilloscope's measurement page in the Screenshot file folder in the machine's USB flash drive as a BMP format image. The image name will be displayed when saving.

Cursor: You can choose X1-X2, Y1-Y2 display.



X-Y: You can enter X-Y display, at this time, measurement, cursor, calculation are all useless.

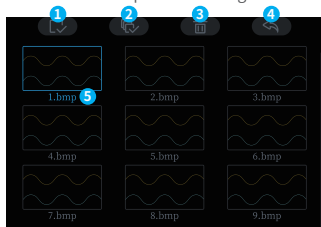


Calculation: You can choose 1+2, 1-2, 1*2, 1/2, -1, -2, |1|, |2| display.

Afterglow: You can choose 500mS, 1S, infinite display.

Calibration: Click Calibration, and enter calibration after confirming that all probes are unplugged and USB is not connected.

Picture:Enter the picture viewing interface.



① Button ⇐ / C1 Short press to enter the selection of deleting pictures.

② Button ▶|| / T Short press to select all pictures for deletion

③ Button ⌂ / C2 Short press to delete.

④ Button M / ↵ Short press to return.

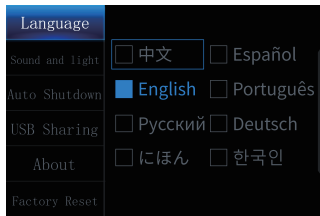
⑤ Currently selected picture.

⑥ Button OK / ⏻ Open picture/OK.

⑦ After opening the picture, scroll wheel 1 can view the picture up and down. Button ▶|| / T Short press to delete the picture.

Button/ Scroll Wheel	Operation	Function Description
OK / 	Short Press	Open image/confirm
 / C1	Short Press	Delete image selection
 / T	Short Press	Delete all images
 / C2	Short Press	Delete image selection
M / 	Short Press	Return
Scroll Wheel A	/	Select image up and down
Scroll Wheel B	/	Select image up and down

Settings: Enter the settings interface



USB sharing: After turning it on, you will enter the USB sharing interface. After connecting to the computer, a USB flash drive will pop up. You can get the screenshot in the [Screenshot file] folder. And you can put "LOGODS215H.jpg" (custom startup LOGO) in the [LOGO] folder.

Language settings: There are 8 languages to switch between: 中文, English, Deutsch, Português, にほんご, Español, 한국인, Русский.

Sound and light settings: Turn knob A to select brightness/volume, short press the switch button to confirm the selection, and turn knob B to adjust.

Auto shutdown: You can set auto shutdown to OFF, 15min, 30min, 1hour.

About: Display brand information and current version number.

Restore factory settings: Restoring factory settings will reset all previous settings.

3. TECHNICAL SPECIFICATIONS

3.1 Model parameters

Parameters	Specifications
Display	3.5-inch IPS high-definition color screen
Backlight	Brightness Adjustable
Power supply	TYPE-C (5V/1A)
Battery	1500mAh
Languages	中文, English, русский, 日本語, Español, Português, Deutsch, 한국어
Product size	≈66x110x19.5mm
Bare weight	≈138g

3.2 Oscilloscope parameters

Parameters	Specifications
Channel	Dual channel
Bandwidth	50MHz
Real-time sampling rate	250MSa/s
Storage space	14M
Time base range	20ns/div - 20s/div
Vertical sensitivity	10mV/div - 10V/div
Waveform display mode	Scroll
Vertical resolution	8 bits
Input impedance	1M Ω
Measurement data	Cycle, Freq, Vpp, Max, Min, Avg, RMS, Amp,Dduty cycle, Pulse width

Parameters	Specifications
Probe attenuation factor	1x/10x
Input coupling	AC/DC
Trigger type	Rising edge/Falling edge
Peak voltage	$\pm 400V$
Trigger level range	8 grids (positive and negative)
Trigger mode	Auto/Normal/Single

3.3 Signal Generator

Parameters	Specifications
Output waveform	Supports multiple waveform outputs
Waveform frequency	0-50KHz
Square wave duty cycle	0-100%
Waveform amplitude	0.1V-3.0V

4. OPERATING INSTRUCTIONS

4.1 Power on and language setting

Long press the OK button to power on, slide the roller A to select the language, press OK to confirm, and enter the oscilloscope interface.

4.2 Adjust oscilloscope parameters

Time base and vertical sensitivity adjustment

Slide roller B to adjust the time base, slide roller A to adjust the vertical sensitivity of CH1.

CH2 Vertical Sensitivity Adjustment

Press button $\Rightarrow / C1$, V turns yellow, slide roller B to adjust the vertical sensitivity of CH2.

Trigger and level cursor adjustment

- Press button $\Rightarrow / C1$ again, slide roller B to adjust the vertical trigger cursor, slide roller A to adjust the level cursor of channel one.
- Press button $\Rightarrow / C1$ again, slide roller B to adjust the vertical trigger cursor, slide roller A to adjust the level cursor of channel two.
- Press button $\Rightarrow / C1$ again, slide roller B to adjust the vertical trigger cursor, slide roller A to adjust the horizontal trigger level.

4.3 Scroll wheel sensitivity adjustment

During the adjustment process, click the OK button to switch the roller sensitivity for coarse and fine adjustment.

4.4 Long press function operation

- Long press the button  / C1 to modify the parameters related to CH1.
- Long press the button  / C2 to modify the parameters related to CH2.
- Long press the button  / T to modify the trigger related parameters.

4.5 Menu and signal generator operation

- Click the button  /  to call up the menu page, select through the roller, and press OK to set the parameters.
- Long press the button  /  to switch to the signal generator page.

4.6 Submenu adjustment

- Slide the roller A to switch the upper menu, slide the roller B to switch the submenu.
- Click the OK button to enter the submenu and modify the waveform parameters (Freq, Duty cycle, Amp).

5. QUICK START GUIDE

5.1 Quick measurement

- Connect the probe and check the connection: ground wire common ground, signal probe connected to signal source
- Click the auto-set button: button  / C2
- Click button five: enter the measurement function, button one selection, open the relevant measurement parameters
- Analyze and record data, Freq, Vpp, Overshoot, etc.

5.2 Measuring periodic signals

- Connect the probe and check the connection: ground wire common ground, signal probe connected to signal source
- Click the auto-set button: button  / C2
- Adjust the time base until the waveform display is stable (optional)
- Adjust the vertical sensitivity until the display is complete (optional)
- Trigger-related adjustments: trigger mode, edge, position, level
- Turn on the measurement function (consistent with automatic measurement)
- Analyze and record data (consistent with automatic measurement)

5.3 Measuring non-periodic signals

- Connect the probe and check the connection
- Trigger related adjustments: single/normal, other options
- Turn on the measurement function
- Analyze data and record data

5.4 Firmware upgrade

- With the power off, press the **M** /  button first, then press the power button.
- Use a Type-C cable to connect the Type-C port on the board to the computer. At this time, the computer will pop up a USB flash drive named "IAP".
- Pull the firmware into the USB flash drive. If the firmware upgrade is completed, the shutdown charging interface will be displayed.

Note: Firmware upgrade is only supported on computers with Windows 10 or newer version

6.TROUBLESHOOTING

6.1 Unable to boot

Possible causes:

- Battery exhausted.
- Loose or damaged battery connection

Solution:

- Check battery charge and charge if low
- If battery fails to charge or device still does not power on, try reinstalling or replacing the battery.

6.2 Screen does not display

Possible causes:

- Screen backlight off
- Display hardware malfunction.
- System software abnormality

Solution:

- Check and adjust the backlight brightness settings according to the manual.
- Try restarting the device to ensure the system returns to normal.
- If the screen still does not display properly, the display may need to be repaired or replaced.

6.3 Oscilloscope Cannot Capture Signals

Possible reasons:

- The oscilloscope input channel is not connected correctly.
- The input signal amplitude is too small or too large, exceeding the oscilloscope range.
- The trigger setting is incorrect.

Solution:

- Check whether the probe is correctly connected to the oscilloscope input channel.
- Adjust the vertical sensitivity and time base settings to ensure that the signal can be captured.
- Check whether the trigger mode is set correctly, such as selecting "rising edge" or "falling edge" trigger.
- Confirm whether the connection between the probe and the signal source is stable and the wiring is intact.

6.4 Signal Generator Cannot Output Signals

Possible reasons:

- The signal generator is not enabled.
- The signal generator hardware is faulty.
- The output frequency or amplitude setting is incorrect.
- The output clip interface is in the wrong hole position.

Solution:

- Check whether the signal generator is turned on and make sure the settings are correct (such as frequency, amplitude, duty cycle).
- If the settings are correct and the signal cannot be output, try restarting the device.
- If the fault persists, the signal generator may need to be repaired or replaced.
- Check whether the interface hole is inserted correctly.

7. MAINTENANCE AND CARE

Cleaning the outside of the device:

Frequency: Clean once a month, depending on the usage environment.

Method: Use a soft cloth to gently wipe the surface of the device. Avoid using chemical cleaners, especially those containing alcohol or strong acids or alkalis, to avoid damaging the casing or screen.

Check the battery and power:

Battery maintenance: For instruments with built-in batteries, check the health of the battery regularly. Avoid complete battery discharge. It is recommended to charge regularly and avoid not using the device for a long time.

Charging specifications: Use the official charger to charge, avoid overcharging or over-discharging, and ensure that the battery is in the appropriate operating voltage range.

Battery replacement: If the battery shows excessive attenuation (such as failure to charge normally or extremely fast discharge), it should be replaced in time.

Storage and Carrying:

Storage environment: The device should be stored in a dry and ventilated environment, avoiding high temperature, high humidity or drastic temperature changes. Avoid placing it in direct sunlight.

Carrying: Be careful to avoid falling when using, especially when carrying. It is recommended to use a protective case or a special bag for carrying.

Software Update:

- Regularly check whether the device has new firmware to update. The latest firmware can fix known bugs and improve device performance.

- When updating, make sure the operation steps are correct, use the officially released firmware files, and avoid power outages or other interference.

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8.CONTACT US

Any FNIRSI users who contact us with questions will receive our promise of a satisfactory solution, plus an extra 6-month warranty as a token of our appreciation for your support! By the way, we have created an exciting community, and we welcome you to contact FNIRSI staff to join.

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