



Intelligent Fault Diagnosis Instrument Manual

Preface

1. Instrument Purpose and Application Scope

This instrument is a dedicated device for MINER detection, connecting to MDS via SCSI interface to achieve analysis of key performance parameters of ASIC. It is mainly applied in the MINER maintenance field. It supports the detection of core components (hash boards, power supplies, fans) of mainstream brands (AntMiner, WhatsMiner, AvalonMiner, ElphapexMiner, SealMiner), quickly locking down the fault range. It is suitable for MINER training centers, professional repair sites, large-scale repair centers, international repair teams, large, medium and small-scale supercomputing mining farms, small repair shops, mobile repair sites, factory quality inspection, and detection, analysis and learning for entry-level users.

2. Reading the Manual Correctly

Before starting to use the product, please read this manual carefully. Following the instructions in the manual can effectively avoid potential dangerous situations and accidents. Do not ignore or skip any safety warnings, precautions or special operation requirements.

If you have read this manual, it is recommended that you keep it properly for future reference.

3. To users

Thank you very much for purchasing this product and for your recognition and support of it. We sincerely hope that you can enjoy the convenience brought by this product and that it becomes a reliable assistant in your work.

All the information contained in this manual is considered correct at the time of publication. As we continuously update and improve the product, the software, appearance and functions of your device may slightly differ from what is described in this manual. The accessories included in this document are provided "as is", and any changes in future versions will not be notified separately.

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1 Instrument Overview

1.1 Product Positioning

- a. Enhance the overall maintenance service capability and level within the industry.
- b. Eliminate the barrier of efficiently troubleshooting supercomputing server failures.
- c. Enable even an entry-level electronic repair engineer to perform full-function repairs on supercomputing servers.

1.2 Core Functions

1.2.1 Supercomputing Equipment Maintenance and Detection Function

This function primarily detects faults in key components of supercomputing equipment (power supply, hash board, control board, fan).

- a. Hash Board: Supports testing of hash boards from mainstream server brands including Antminer, Whatsminer, Avalon, Elphapex, Iceriver, Volcminer, covering air-cooled, water-cooled, and immersion-cooled models.
- b. Power Supply: Repair analysis for Whatsminer power supplies; fault detection and modular analysis for Antminer, Elphapex, and Avalon power supplies.
- c. Control Board: Modular fault analysis for Whatsminer, Antminer, Elphapex, and Avalon (this feature will be rolled out sequentially).
- d. Fan: Functional detection including voltage, current, speed control, RPM, and modulation response.
- e. Data Summary: Aggregates repair (test) data by model and displays it in report format.
- f. Free Updates: Regular free updates for supported product names, brands, and models.

1.2.2 Practical Auxiliary Functions

- a. 14-inch high-definition display.
- b. Wireless internet connectivity, connect and use immediately.
- c. An efficient and convenient browser enables you to search for learning materials

anytime.

- d. Six major human-computer interaction functions.
- e. Audio and video playback: Add color and entertainment to tedious and demanding repair work.
- f. WPS Office: Facilitates your daily maintenance report organization.

1.2.3 Product Advantages

- a. Simple Operation: Wiring methods and new product upgrades are achieved through touch screen human-computer interaction.
- b. Practical and Flexible: Fast testing speed, graphical fault interface display, helping you make accurate judgments and efficient repairs.
- c. One machine for multiple tests: Capable of testing multiple product names, brands, and models, as well as remote and irregular upgrades.
- d. Warning and Protection: Synchronous detection of voltage, current, and temperature, with reverse polarity connection warning (this function requires a recommended power supply).
- e. Two Major Components: Immediate testing and repair for the two major components of current supercomputing series (hash board, power supply).
- f. Fault Analysis: Based on test faults, analyzes the component reference designators that need replacement (suitable for entry-level repair engineers); combines AI algorithms to provide relevant reference schematics (suitable for senior engineers troubleshooting complex faults).
- g. Auxiliary Detection: Functions for fan, control board, power supply core board, and hash chip detection will be rolled out sequentially.

2 Technical Parameters and Specifications

Category	Specific Parameters
Dimensions (L × W × H)	325×195×40 mm
Weight	2 KG
CPU Processor	RK3588S 8nm,8-core 64-bit, max frequency 2.4 GHz
Memory	8 GB+128 GB
Display	14" Capacitive Touch Screen
Resolution Ratio	1920×1080
Operating System	Android 12
Browser	Google CH
Video	MP4, MKV, RMVB, FLV, AVI
Image	JPEG, BMP, GIF, PNG

3 Packing List and Unboxing Inspection

3.1 Unboxing Inspection

Accessories List

- a. Main Unit × 1
- b. Multi-function Expansion Board × 1
- c. Power Adapter × 1
- d. User Manual × 1
- e. Warranty Card × 1
- f. Protective Case × 1
- g. Cables × 10

Note: Cables for 30+ models and function detection are available for separate purchase on the official website .

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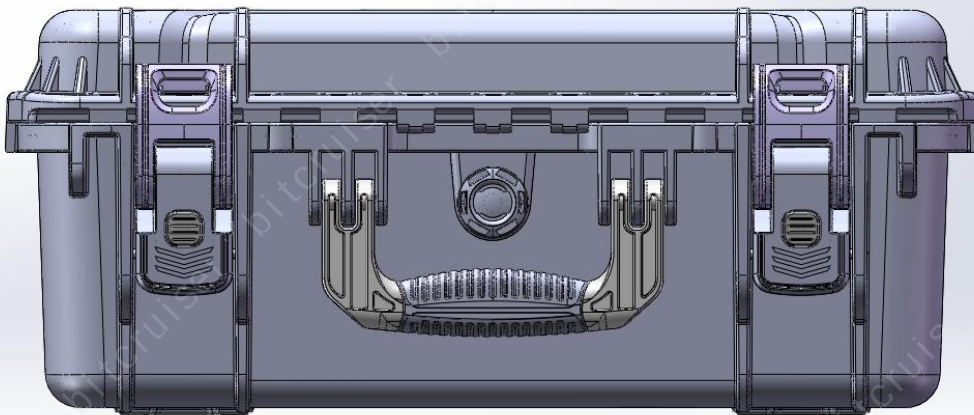


Fig 3.1 Instrument Safety Protection Box

4 Instrument Introduction and Interface Connection

4.1 Instrument Introduction

a. Front Side



Fig 4.1 Front View

b. Back Side

1. Adjustable Stand: Used to fix the instrument or adjust into a portable carry handle.
2. Multi-function Expansion Port: Facilitates connecting and replacing expansion boards to adapt to more models.
3. Power Switch: Controls the instrument's power on/off.

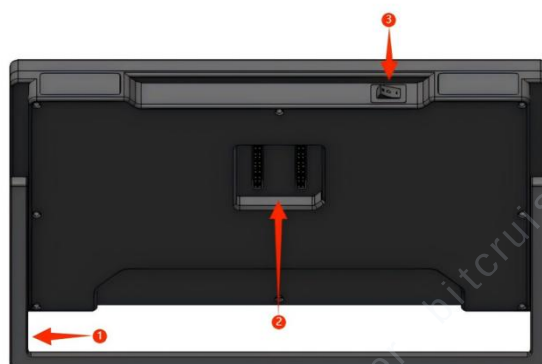


Fig 4.2 Back View

c. Bottom Side

1. FAN Fan Detection Interface.
2. 13V IN DC Power Input Interface, voltage range 12V-17V (for connecting non-standard power supplies).
3. 13V OUT Auxiliary Power Supply Interface for air-cooled equipment hash boards (12V-17V).
4. Hash Board Test Backup Interface.
5. DC 12V IN Power Input Interface for this instrument.

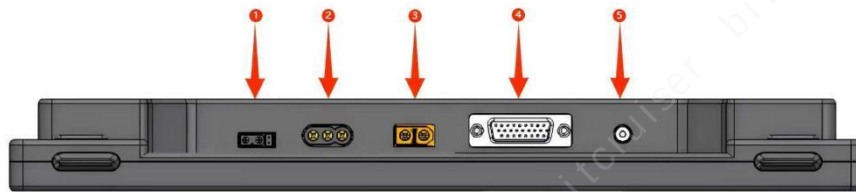


Fig 4.3 Bottom Interface View

d. Expansion Board

1. SW: Foot switch wiring port, used to control the start and stop of fault detection for the unit under test (see "Appendix II" for foot switch usage).
2. AVR: Adjustable DC power supply voltage regulation port, used to control the output voltage, current, and time parameters of the adjustable DC power supply when testing hash boards.
3. Test Interface: Use the corresponding test cable to connect from the data port of the unit under test to this interface.
4. Pull-Tab Design: Facilitates quick removal and replacement of the multi-function expansion board for easier operation.

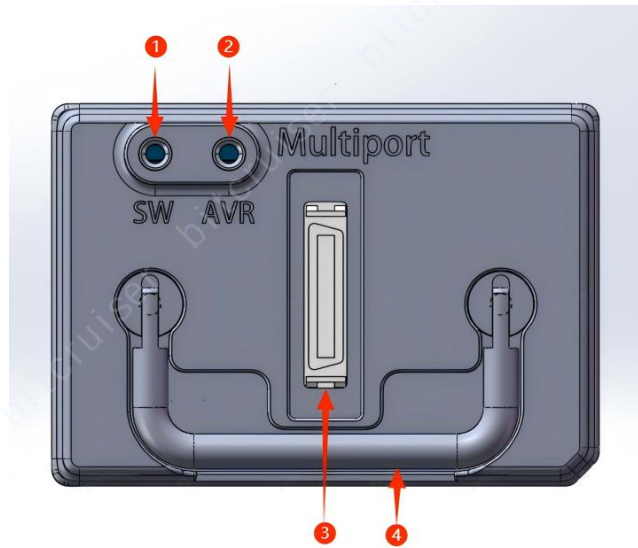


Fig 4.4: Multi-function Expansion Board Diagram

4.2 Preparation

4.2.1 Recommended Working Environment

Ensure a work surface ($LWH \geq 60\text{cm}40\text{cm}60\text{cm}$, load-bearing capacity $\geq 25\text{kg}$) is available. The area should be away from strong magnetic fields (e.g., large motors, transformers), sources of severe vibration (e.g. punch presses, fans), and direct sunlight. The ambient temperature should be maintained between 15°C and 30°C , with humidity between 45% and 85%.

4.3 Hardware Connection Steps

4.3.1 Introduction of multi-function expansion board

4.3.2 Hardware Connection for Hashboard Testing

The following uses a WhatsMiner hashboard as a connection example:

Step 1: Power on the instrument using the 12# wire.

Step 2: Prepare an adjustable DC power supply. Use the 19# wire to connect the voltage regulation control interface on the multi-function expansion board to the AVR voltage regulation interface on the adjustable DC power supply.

Step 3: Use the 9# wire to connect the output terminals of the adjustable DC power supply to the power input interface of the hashboard.

Step 4: Connect the foot switch to the foot control interface on the multi-function expansion board using the 20# wire. (Note: This step can be skipped if the foot switch is not used.)

Step 5: Use the 2# wire to connect the data port of the hashboard to the test interface on the multi-function expansion board.

The specific connection diagram is shown in Fig 4.5.

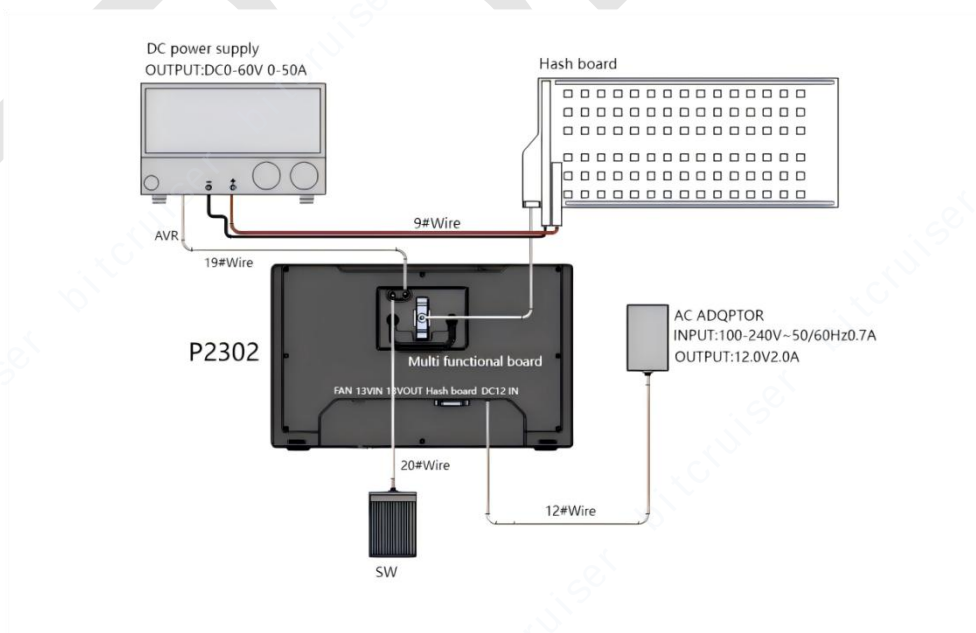


Fig 4.5 Hashboard Test Connection Diagram

For detailed startup and testing procedures, please refer to the "Hashboard Testing" section in the Operation Guide > Testing Procedures (Step-by-Step)

4.3.3 Hardware Connection for Power Supply Unit (PSU) Testing

The following uses an Avalon PSU3400-01 PLUS model power supply unit for the connection example:

Step 1: Power on both the test instrument and the power supply unit using their corresponding power adapters.

Step 2: Use the 5# wire to connect the voltage regulation interface of the PSU to the test interface on the multi-function expansion board (located on the rear of the instrument). The specific connection diagram is shown in Fig 4.6.

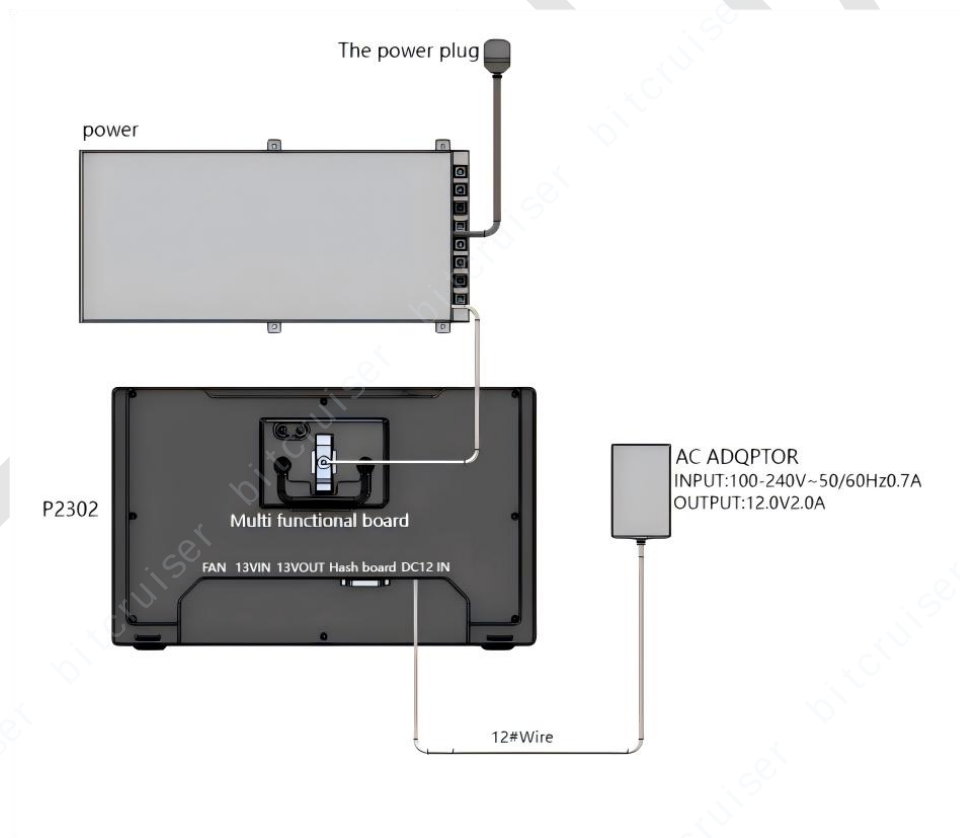


Fig 4.6 PSU Test Connection Diagram

For detailed startup and testing procedures, please refer to the "PSU Testing" section in the Operation Guide > Testing Procedures (Step-by-Step)

4.3.4 Hardware Connection for Fan Testing

The following uses a 12038 model fan for the connection example:

Step 1: Prepare an adjustable DC power supply. Set the output parameters (voltage and current) according to the fan's rated specifications.

Step 2: Use the 10# wire to connect the output terminals of the adjustable DC power supply to the 13V IN interface located at the bottom of the instrument.

Step 3: Use the 11# wire to connect the fan under test to the corresponding FAN interface on the multi-function expansion board (rear of the instrument) via the fan adapter board. The specific connection diagram is shown in Fig 4.7.

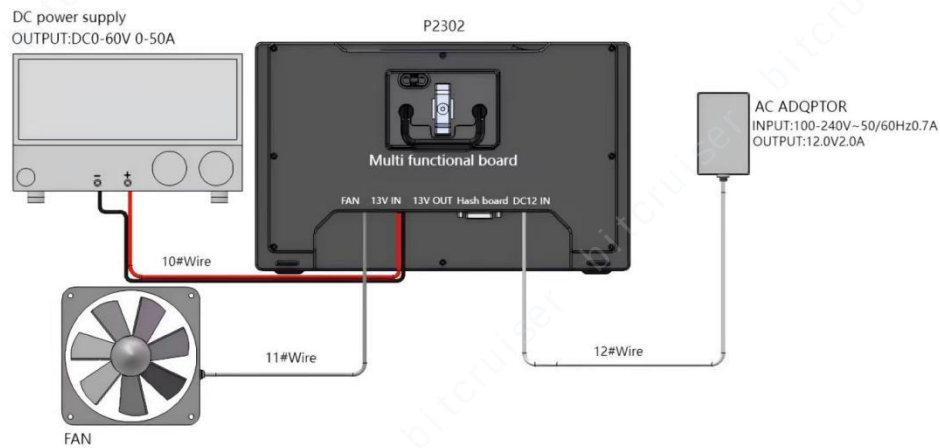


Fig 4.7 Fan Test Connection Diagram

For detailed testing procedures, please refer to the "Fan Testing" section in the Operation Guide > Testing Procedures.

5 Operation Guide

5.1 System Login

Ensure the instrument's power adapter is properly connected as described in Section 4.3.2, and verify the power switch is in the "O" (OFF) position. Toggle the power switch to the "—" (ON) position. The display will illuminate and show the startup screen.



Fig 5.1 Instrument HMI (Human-Machine Interface)

After 5 seconds, the screen will display the "LOGIN" page for the detection system.



Fig 5.2 Detection System Login Interface

5.1.1 Language Settings

Click "LOGIN" to access the system. A dialog box will prompt you to set the system language. Click "Yes" to enter the settings interface.



Fig 5.3 System Language Setting Dialog Box

The system defaults to English. Currently, it supports display in both Chinese and English. Support for additional languages will be added in the future to improve the user experience.

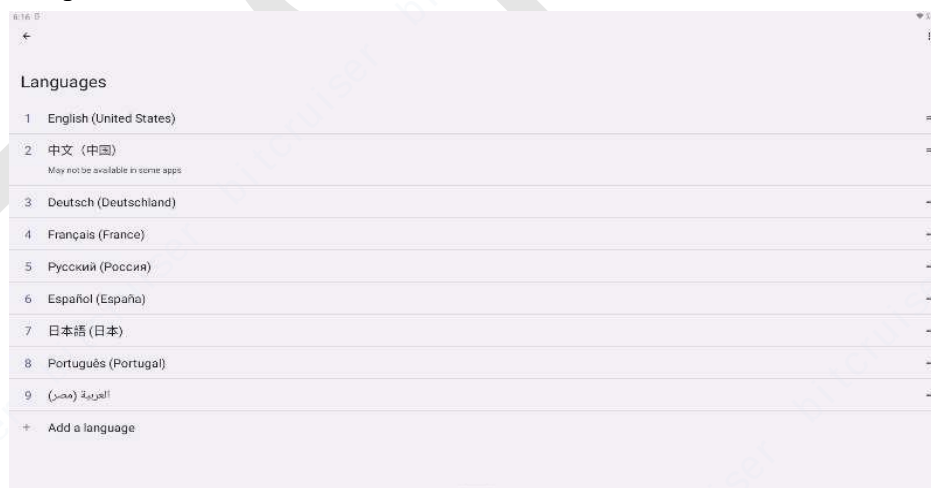


Fig 5.4 Language Settings Interface

5.1.2 Network Connection

Click the return icon in the upper-left corner. A dialog box will prompt you to connect to a Wi-Fi network. Click "Yes" to proceed to the Wi-Fi connection interface.

(Note: The system currently does not support offline testing. The detection system will be unavailable without an active Wi-Fi connection!)

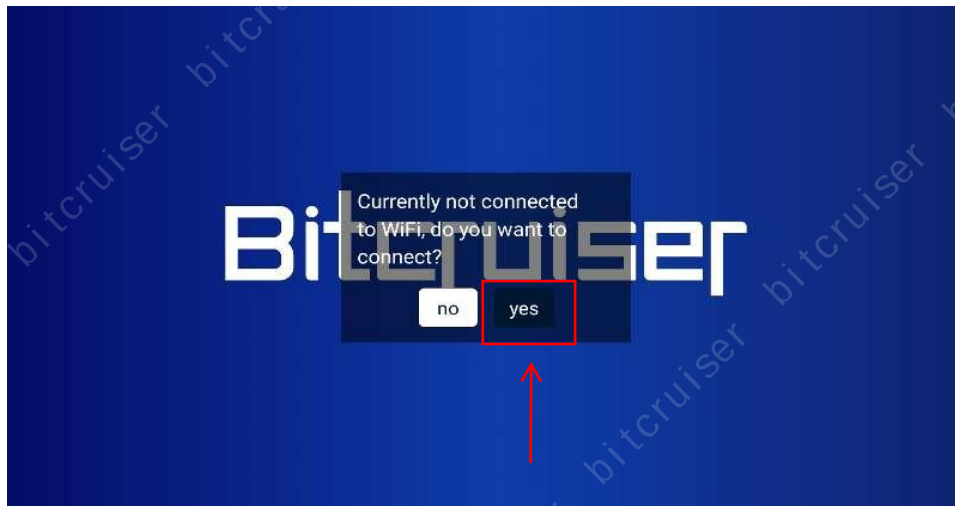


Fig 5.5 Usage Help Prompt Dialog Box

The system will automatically scan for available Wi-Fi networks. Select the desired SSID, enter the password, and click "Connect". A "Connected" status indicates a successful link.

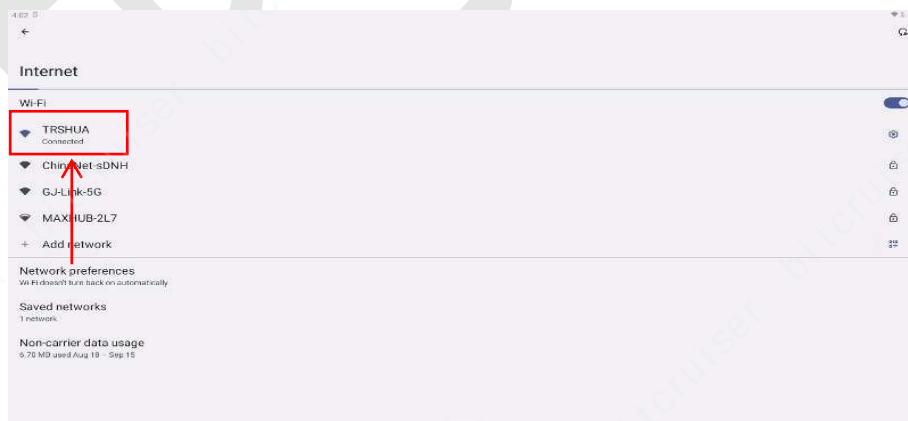


Fig 5.6 Wi-Fi Network Selection Interface

Click the return icon in the upper-left corner again. A prompt will appear asking if you wish to view the usage guide. You may choose to view it or ignore it based on your needs.

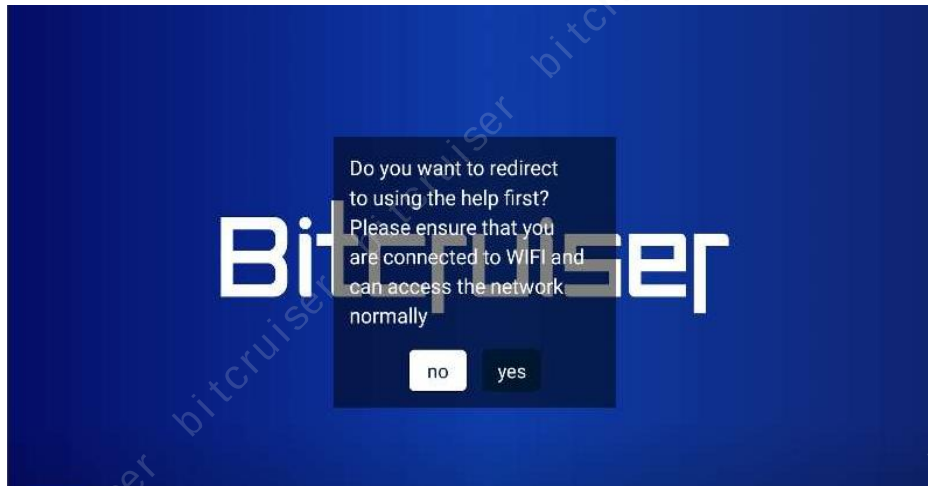


Fig 5.7 Usage Help Prompt Dialog Box

The device test selection interface will then be displayed. The system will automatically adjust the screen resolution for optimal display. A normal Wi-Fi icon in the upper-right corner indicates a successful connection, while a red Wi-Fi icon indicates a failed connection.

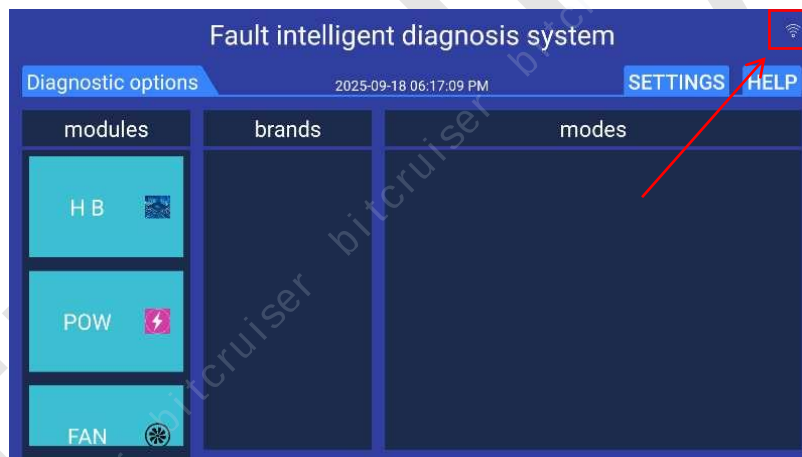


Fig 5.8 Wi-Fi Connected Status Icon

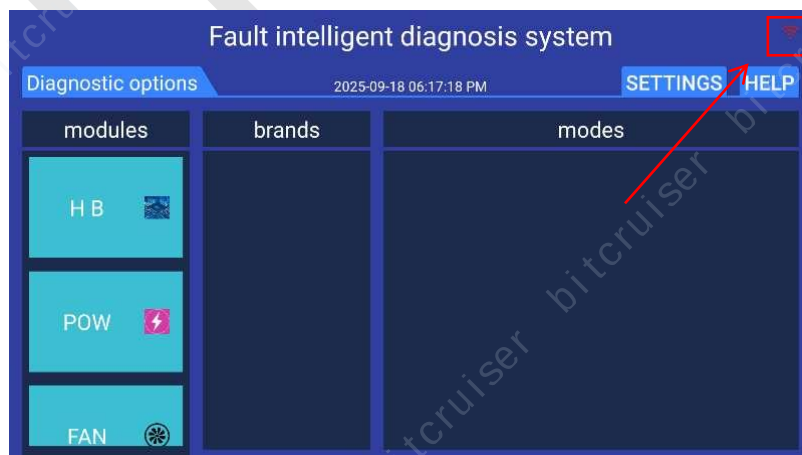


Fig 5.9 Wi-Fi Connection Error Icon

5.2 Product Testing

5.2.1 Test System Main Interface

After entering the Intelligent Fault Diagnosis System interface, the main screen shown in Fig 5.10 will be displayed.

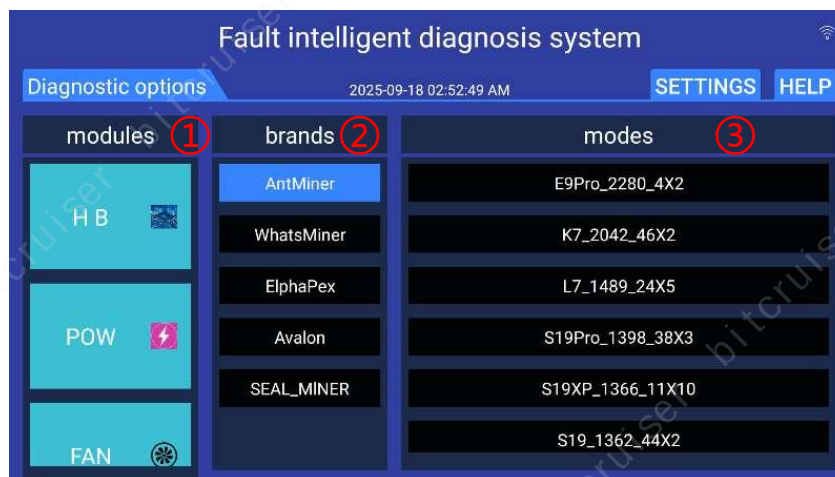


Fig 5.10 Diagnosis System Main Interface

1. Product Category: Supports malfunction detection for Hashboards (HB), Power Supply Units (POW), Fans (FAN), Control Boards (CB), and Servers(SRV).
2. Brand: Currently supports testing for brands including AntMiner, WhatsMiner, ElphaPex, Avalon, etc. (Support for additional brands will be added).
3. Model: Currently supports testing for various mainstream models such as the AntMiner S19 series, WhatsMiner M60 series, ElphaPex DG1 series, among others.

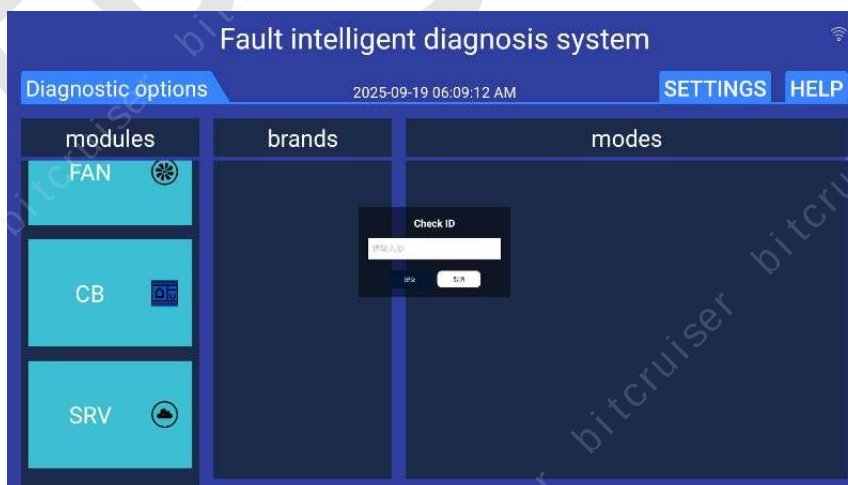


Fig 5.11 Check ID Login Interface

(Note: The appearance of this interface is normal. Please note that the CB and SRV testing functions are currently unavailable.)

5.2.2 Hashboard Testing Procedure

5.2.2.1 Antminer Hashboard Testing Procedure

The following illustrates the process using the S19_1398_38X2 model hashboard as an example:

As shown in Fig 5.12, tap "HB", then select "AntMiner", followed by "S19_1398_38X2". (The system supports mainstream models such as the Antminer S19, S19 XP, S19j Pro, S19j Pro+, S19k Pro, S21, etc.)



Fig 5.12 Antminer S19 Hashboard Model Selection

Hashboard Model Naming Convention Explanation:

Machine Model_Chip Model_Number of Chips

Using S19XP_1366_11X10 as an example:



S19XP indicates the machine model, 1366 indicates the model of the hash chip used, and 11X10 indicates the hashboard contains 11 groups of chips, with 10 chips per group.

(The naming convention for hashboards of other brands is similar.)

Within the model list, you can scroll vertically. The list can also be customized; long-press any model to drag it to the top. Furthermore, previously tested models are automatically pinned to the top of the selection list for quick access.

As shown in Fig 5.13, following this logic, the model S19_1398_38X2 used in this example is already auto-pinned at the top. Other mainstream Antminer hashboard models are pinned by default.

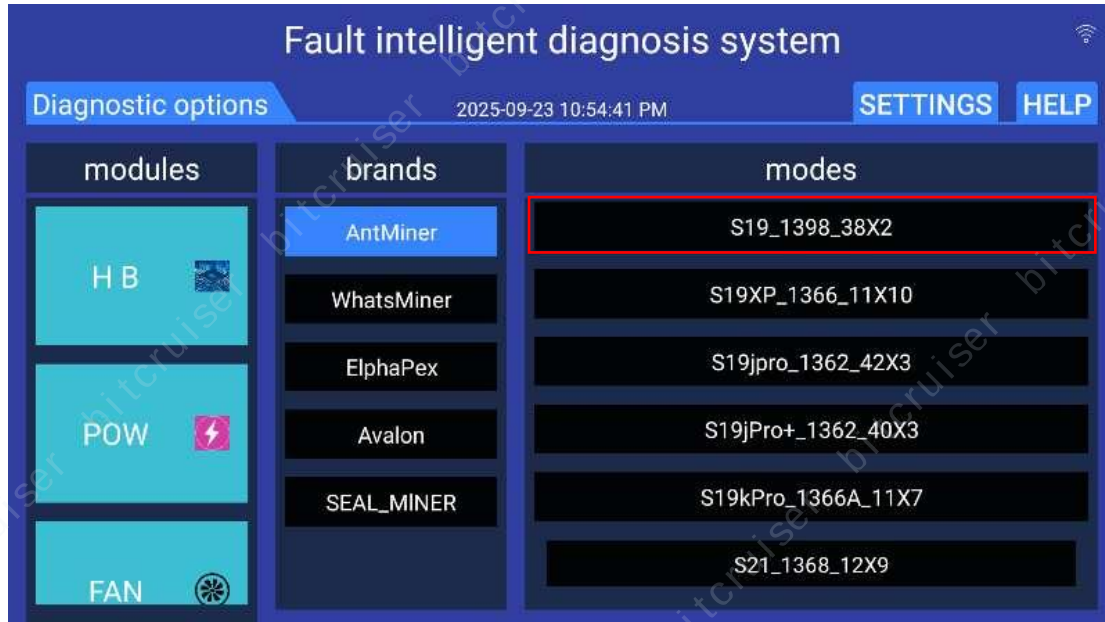


Fig 5.13 Ant force plate test commonly used models set the top

Among them , A0, P0, 0V, 1081, T are function codes, which respectively represent:

- 1.A0: Normal EEPROM IIC communication.
- 2.0V: Abnormal voltage of the 8th pin of the PIC single-chip microcomputer
- 3.P0: Normal IIC communication of the PIC single-chip microcomputer.
- 4.Red 1081: Indicates that the RX signal of the hashboard is not detected.
- 5.Red T: Indicates that the number of chips captured twice is not equal to the actual number of hashboards tested.

On the contrary, if the hashboard has a fault, as shown in Fig 5.19, this phenomenon is "Report 0", which indicates that the signal paths of chips 1-76 of the hashboard are abnormal.

(For the fault detection codes corresponding to functional errors, please refer to 7.2 Abnormal Handling of HashBoard Testing)

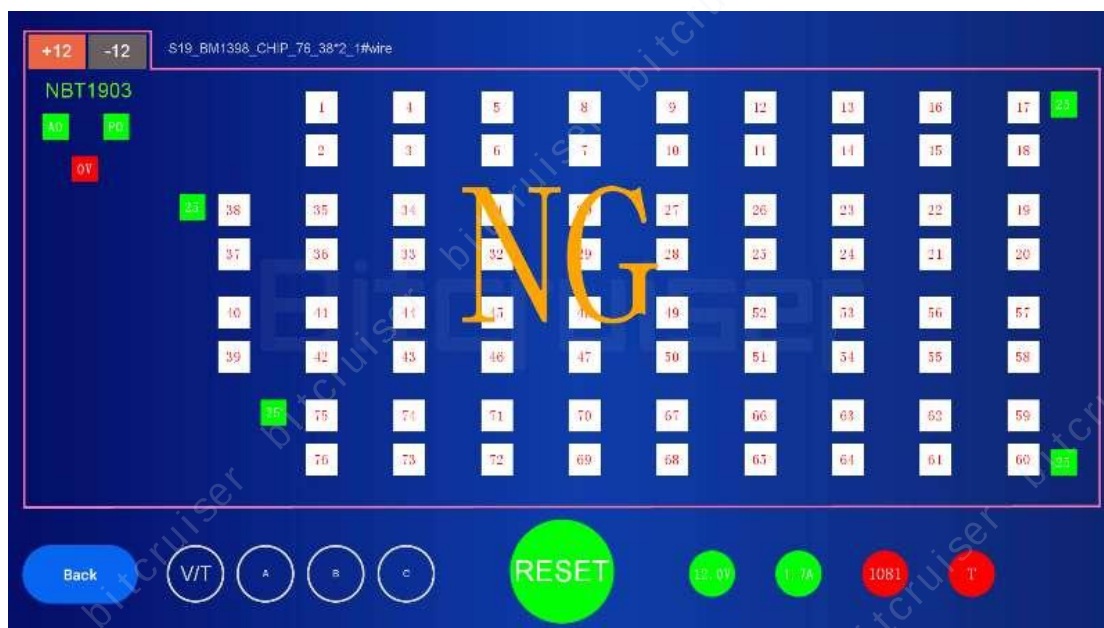


Fig 5.19 Schematic Diagram 1 of AntMiner HashBoard Test NG

Zoom—in Viewing and ERP Maintenance System Jump Function:

Click red-shaded 0V part number in the upper left corner to zoom in and view the detailed voltage value of the 8th pin of the PIC. Click any position on the interface again to exit the zoom-in viewing state. As shown in Fig 5.20.

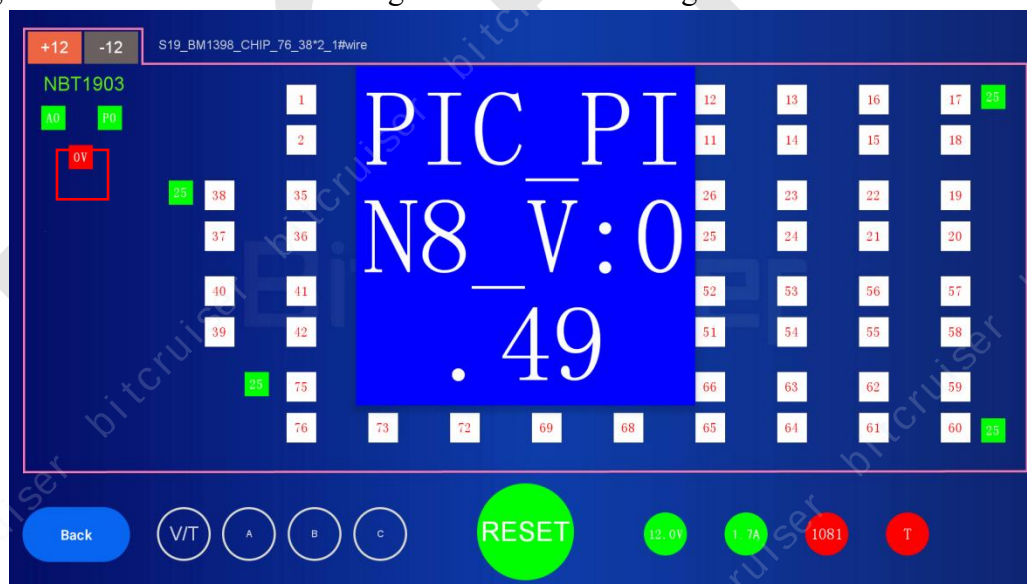


Fig 5.20 Zoom - in View of the 8th Pin Voltage of the PIC

Long-press the red fault button to jump to the ERP maintenance system interface to help quickly troubleshoot and maintain the equipment. If you need to return to the test interface, click "Exit" in the upper right corner. (Note: The maintenance idea jump function is currently only open for testing of some models and will be opened one by one later.)



Fig 5.21 Schematic Diagram of ERP Maintenance System Jump

As shown in Fig 5.22, the power supply voltage provided to the hashboard is "15.9V", which exceeds the optimal voltage range (12V-15V) set by the manufacturer for this model. The input voltage position displays a red abnormality, and the system detection result is "NG". (Note: It is necessary to connect the voltage according to the standard voltage range to ensure normal testing.)



Fig 5.22 Schematic Diagram 2 of AntMiner HashBoard Test NG

As shown in Fig 5.23, this model is taken as an example for explanation. At this time, the 43rd hash chip alarms abnormally. This phenomenon is "Report Number", which indicates that the signal paths of chips 1-42 are normal, and the signal paths of

chips 43-76 are abnormal. Therefore, T will display a red abnormality, and the system detection result will display "NG".

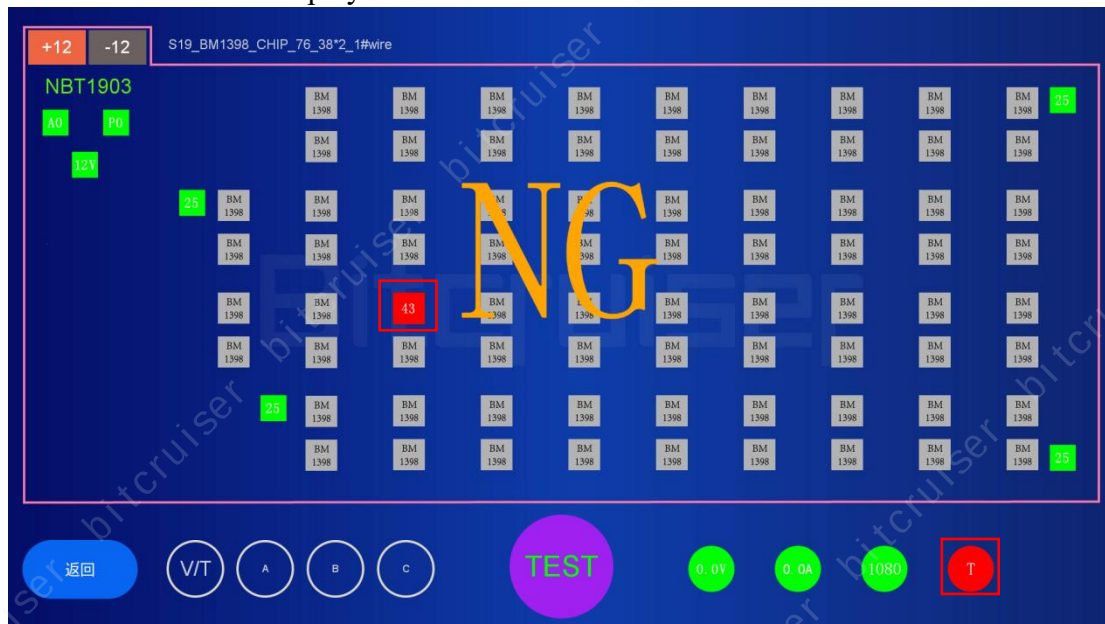


Fig 5.23 Schematic Diagram 3 of AntMiner HashBoard Test NG

As shown in Fig 5.24, when the input voltage of AntMiner hashboard exceeds 17.8V, the system will immediately interrupt the test, and an emergency prompt will pop up in the center of the screen. The input voltage status detection will give an alarm prompting to reduce the voltage to prevent the hashboard from being burned out.

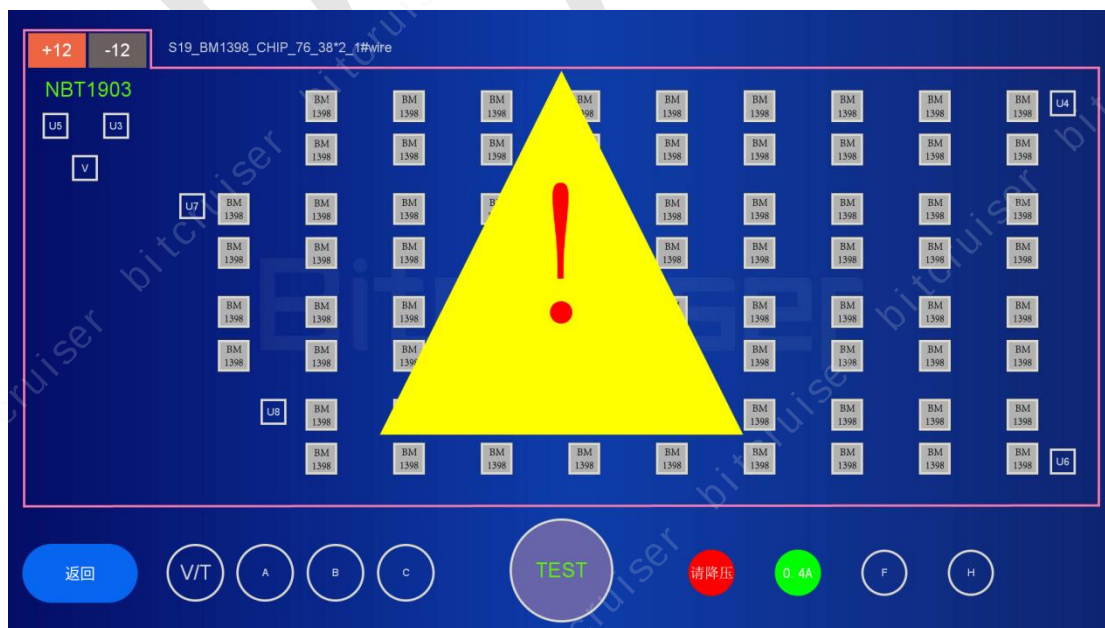


Fig 5.24 Schematic Diagram of Over-voltage Alarm for AntMiner HashBoard Testing

(V/T) Advanced Function Use:

Click V/T to switch attributes, and use the addition and subtraction buttons of A & B to adjust the voltage, current and output delay time. To use this function, the user needs to purchase the adjustable DC power supply and AVR voltage regulation wire recommended by the manufacturer. Connect the adjustable DC power supply to the test interface on the multi - function expansion board at the back of the instrument using the AVR voltage regulation wire. **(Note: Different models have different adjustment ranges and different adjustable attributes, which have been set at the factory.)** For details, please refer to the adjustable parameter types and ranges of each model's test interface.

5.2.2.2 WhatsMiner Hashboard Testing Process

The following takes the M56_1968_36X3X2 model as an example for testing explanation:

As shown in Fig 5.25, click "HB", then click "WhatsMiner", and then click "M56_1968_36X3X2" (supports mainstream WhatsMiner models such as M50, M50S, M50S +, M60, M60S, M60S +).

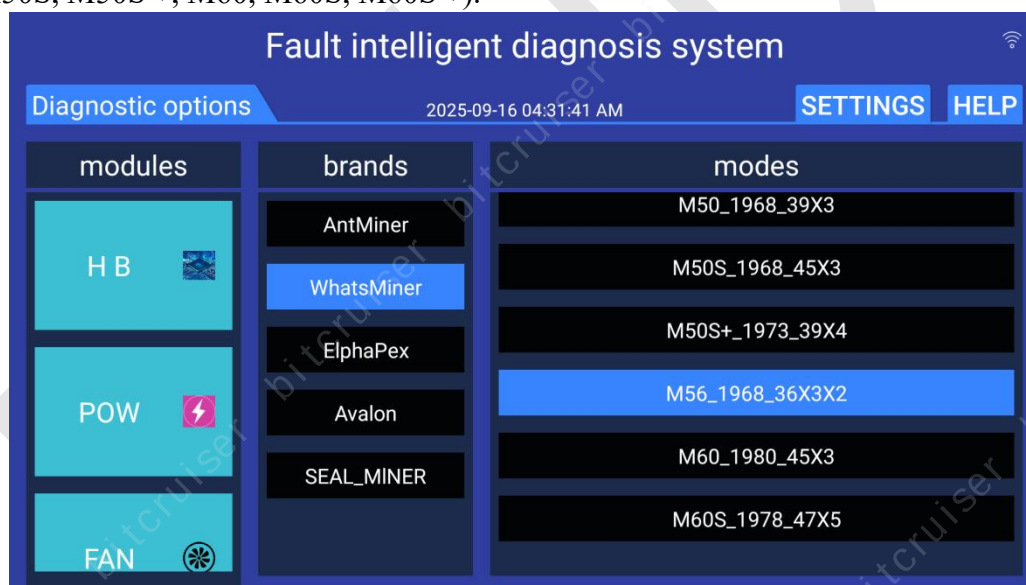


Fig 5.25 Model Selection for WhatsMiner M56 HashBoard Testing

Enter the testing interface as shown in Fig 5.26.

10. +22V and -22V indicate that the power supply voltage of the hashboard is 22V. Connect the red to positive pole and the black to negative pole.
11. UC1 represents the EEPROM designator, and UC2 represents the actual corresponding position of the temperature sensor.
12. The "3" in the figure represents the serial number of the chips of hashboard, ranging from 1 to 216, corresponding to the actual positions of the hashboard.

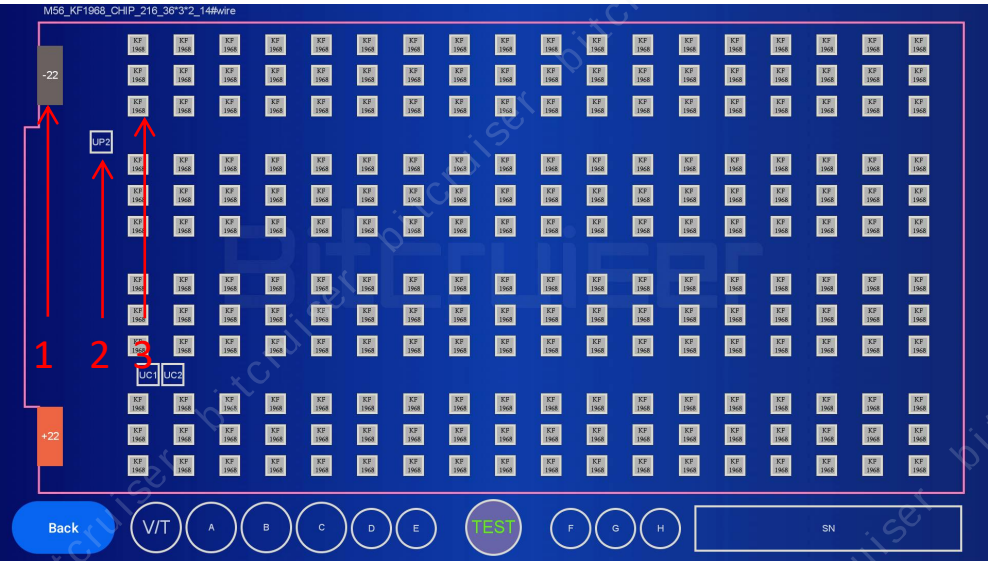


Fig 5.26 Schematic Diagram of WhatsMiner Testing Interface

The function buttons are shown in Fig 5.27. For the explanations of 1-9 and 11, please refer to the function button introduction in Section 5.2.2.1.

- 10. G: Indicates the RESET signal state of the hashboard.
- 12. SN: Displays the SN code of the hashboard.
- 13. Testing Type Naming Rule: M56_KF1968_CHIP_216_36*3*2_14# wire, where M56 represents the model name, KF1968 represents the chip model, CHIP_246 represents the number of chips, 36*3*2 means that the hashboard is divided into two parts, each part has 72 groups with 3 chips in each group, and 14# wire represents the wire number required for this model.

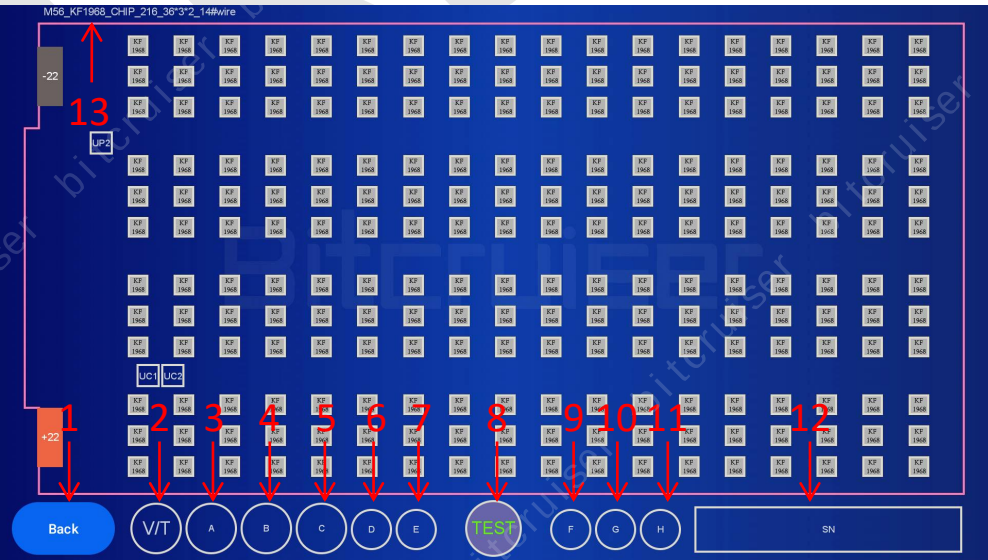


Fig 5.27 Schematic Diagram of Function Buttons for WhatsMiner Hashboard Testing

Officially start the test:

Click "TEST". The steps are the same as those in the AntMiner hashboard testing process in Section 5.2.2.1. The test results are shown in Fig 5.28.

1. Green 27: Indicates that the temperature sensor state is normal.
2. Green 1030: Indicates that the RESET signal is normal.
3. SN Code: Displays the SN number, batch number and BIN number of the device.

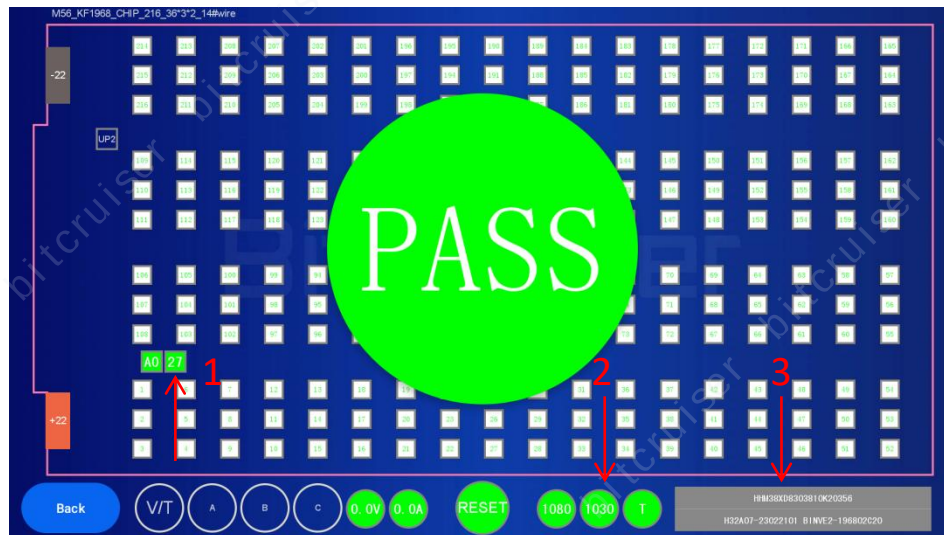


Fig 5.28 Schematic Diagram of WhatsMiner Hash Board Test PASS

Similarly, if a single board fails the test, the system will display "NG". As shown in Fig 5.29, the upper section of the chips is marked in red, indicating an abnormality. Just like the Antminer hashboard described in Section 5.2.2.1, this is the same "report 0" phenomenon.

1. This phenomenon indicates 'chip counting.' It means that the signal path is normal for chips 1–26, while chips 27–216 show signal path abnormalities.
2. Red 1081: Indicates that the RX signal of the hashboard was not detected
3. Red 1031: Indicates an abnormality in the device RESET signal.
4. Red T: Indicates that the number of chips detected in two consecutive scans does not match the actual number of chips on the tested hashboard.

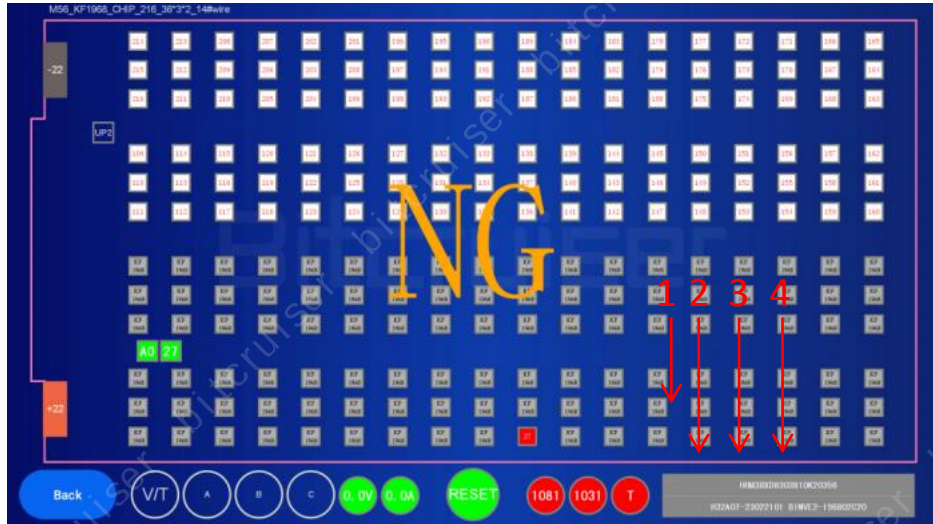


Fig 5.29 SMMiner Hashboard Test NG Diagram

5.2.2.3 DG series Hashboard Testing Procedure

The following test instructions use the DG1_L31_A2406 model as an example:

As shown in Fig 5.30, click 'HB,' then click 'ElphaPex,' and finally select 'DG1_L31_A2406' (supports major models such as DogMiner DG1, DG1+E, DG1+P, DGHydro1, and DG_Home1).

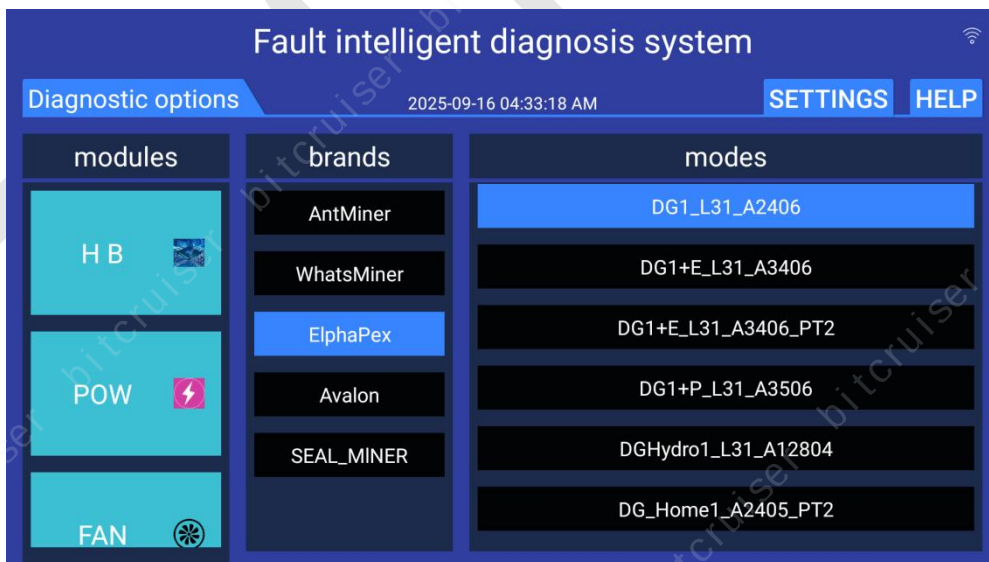


Fig 5.30 DogMiner DG1 Hashboard Test Model Selection

Enter the testing interface as shown in Fig 5.31.

1. The +13V and -13V indicate that the power supply voltage of this hashboard is 13V, with the red wire connected to the positive terminal and the black wire connected to the negative terminal.

2. 172 and 173 indicate the position numbers of the two temperature sensors, corresponding to their actual locations on the hashboard. 174 indicates the EEPROM position number.

3. These numbers represent the sequence numbers of the hashboard's computing chips, numbered from 1 to 144, corresponding to their actual positions on the hashboard.

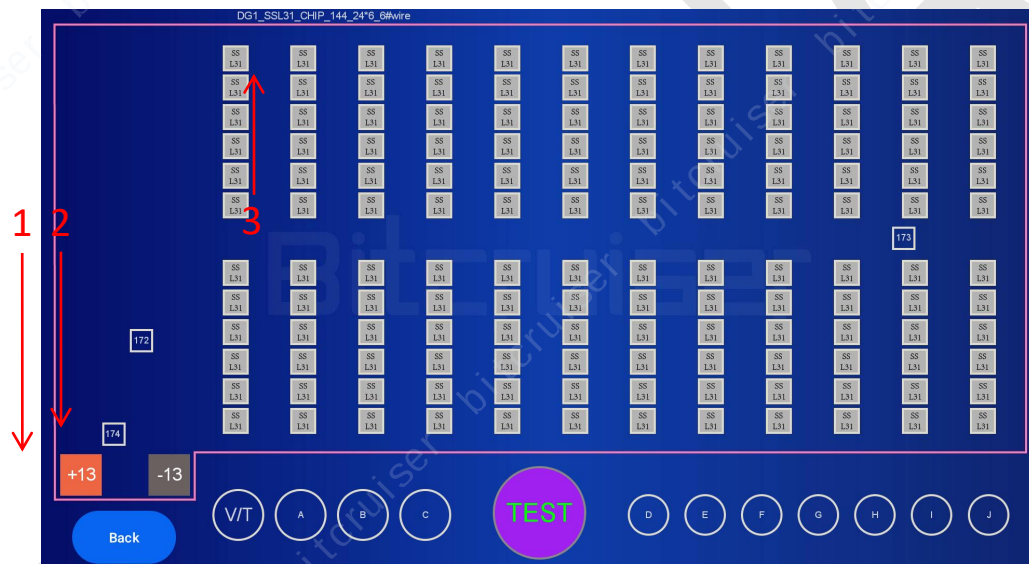


Fig 5.31 — Illustration of the Dog (DG) Testing Interface

12. I: Indicates the status of chip capture on the hashboard (green for normal, red for abnormal).

13. J: Checks whether the core values of the chips are normal (green for normal, red for abnormal).

14. Test type naming rule: DG1_SSL31_CHIP_144_24*6_6# wire, where DG1 represents the model name, SSL31 represents the chip model, CHIP_144 indicates the number of chips, 24*6 means the hashboard is divided into 24 groups, each containing 6 chips, 6# wire indicates the wire number required for this model.

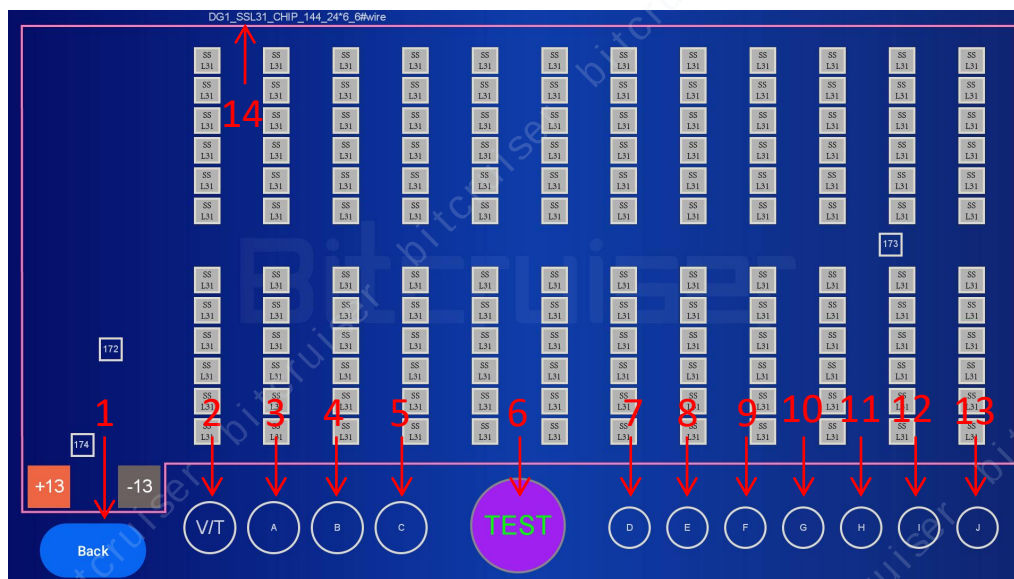


Fig 5.32 — Illustration of the Dog (DG) Hashboard Test Function Buttons

Officially start the test:

Click “TEST” and confirm whether to switch the test firmware, following the same procedure as in Section 5.2.2.1 for Ant hashboard testing. The test results are shown in Fig 5.33:

1. A0 indicates that the EEPROM status is normal.
2. U0 and U8 indicate that the two temperature sensors are functioning normally.
3. T1 indicates that the hashboard chip was successfully captured on the first attempt.
4. T2 indicates that the hashboard chip was successfully captured on the second attempt.
5. T3 indicates that the internal core values of the chip are normal.

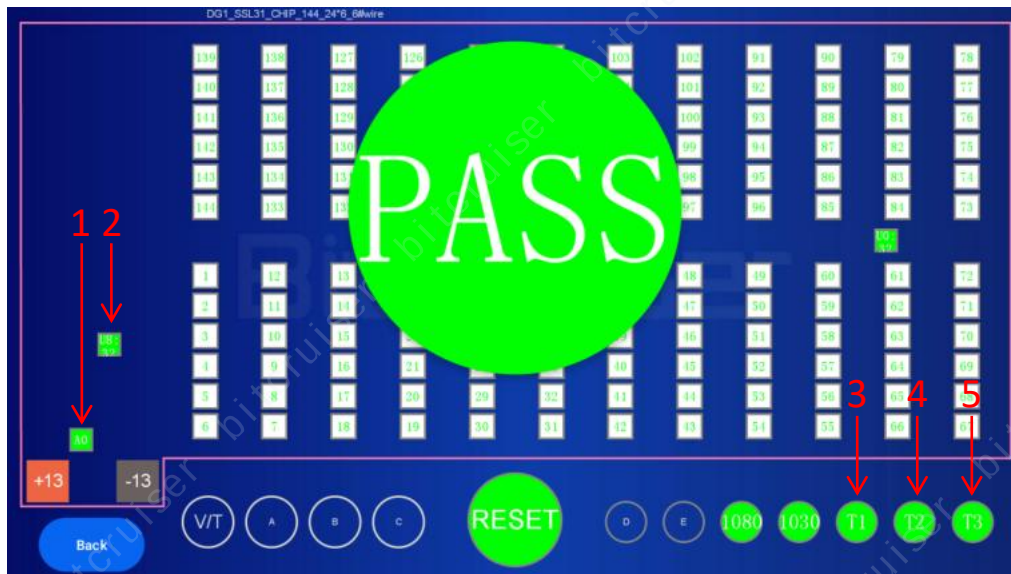


Fig 5.33 — Illustration of a Passed Dog (DG) Hashboard Test

If the hashboard test fails, the system displays “NG”, as shown in Fig 5.34.

1. When a hashboard chip is abnormal, it is displayed in red. An error showing 144:71 indicates that chip number 144 has an internal core value of 71, which deviates significantly from the standard value.
2. Red T3: Indicates that the internal core value of the hashboard chip is abnormal, displayed in red here.



Fig 5.34 — Illustration of a Failed Dog (DG) Hashboard Test

5.2.2.4 Avalon Hashboard Testing Process:

The following illustrates the testing process using the 1466_3198_44X4 model as an example:

As shown in Fig 5.35, click “HB”, then “Avalon”, and finally “1466_3198_44X4” (this supports multiple mainstream Avalon models).

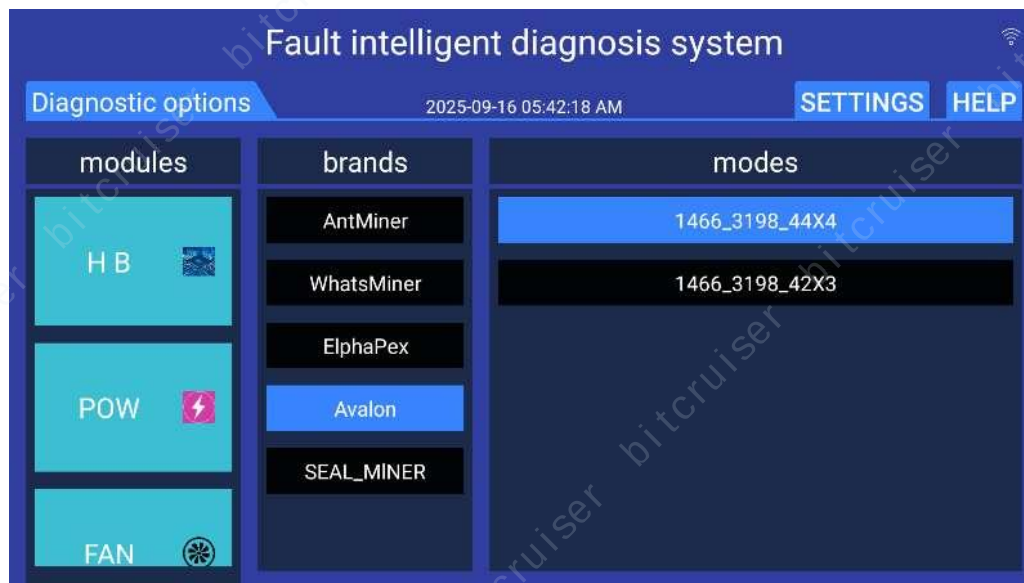


Fig 5.35 — Avalon Hashboard Test Model Selection

Enter the testing interface as shown in Fig 5.36.

1. +13V and -13V indicate that the hashboard's power supply voltage is 13V, with the red wire connected to the positive terminal and the black wire connected to the negative terminal.
2. VSR checks whether the input feedback voltage is normal.
3. These indicate the sequence numbers of the hashboard's computing chips, numbered from 1 to 176, corresponding to their actual positions on the hashboard.



Fig 5.36 — Illustration of the Avalon Testing Interface

The function keys are as shown in the 5.37 Items 1–12 are described in Sections 5.2.2.1 and 5.2.2.3.

13. The test type naming rule is 1466_A3198_CHIP_176_44*4_16# wire, where 1466 represents the model name, A3198 represents the chip model, CHI P_176 indicates the total number of chips, 44*4 means the hashboard is divide d into 44 groups with 4 chips in each group, and 16# wire specifies the wire number required for this model.



Fig 5.37 — Illustration of Avalon Hashboard Test Function Buttons

Officially start testing:

Click “TEST” and confirm whether to switch the test firmware, following the same procedure as in Section 5.2.2.1 for Ant hashboard testing. The test results are shown in Fig 5.38.

If the detection result displayed in the center of the screen shows “PASS”, it indicates that the single hashboard test is normal, with the chip temperature and voltage values within the calibrated range. At this point, each chip and position on the test interface is displayed in green.

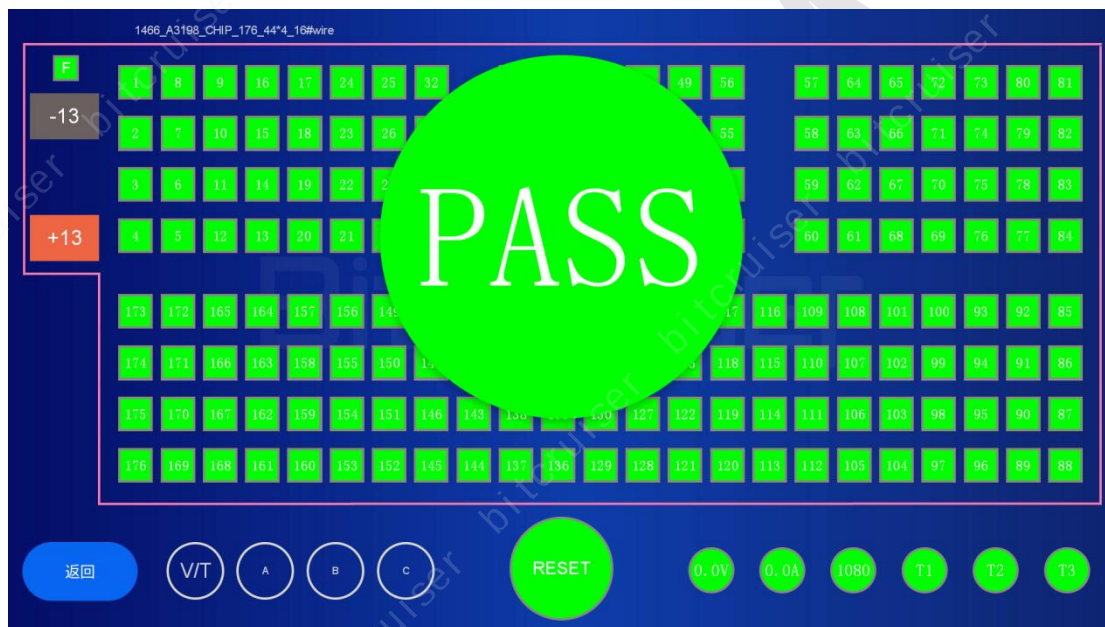


Fig 5.38 — Illustration of a Passed Avalon Hashboard Test

If a hashboard chip becomes abnormal, the corresponding sequence number will display an error, divided into five parts as shown in Fig 5.39.

1. Chip's temperature.
2. The 3.3V power supply voltage of the chip.
3. Chip's 1.8v volatage signal.
4. Chip's 0.8v volatage signal.
5. The chip sequence number.

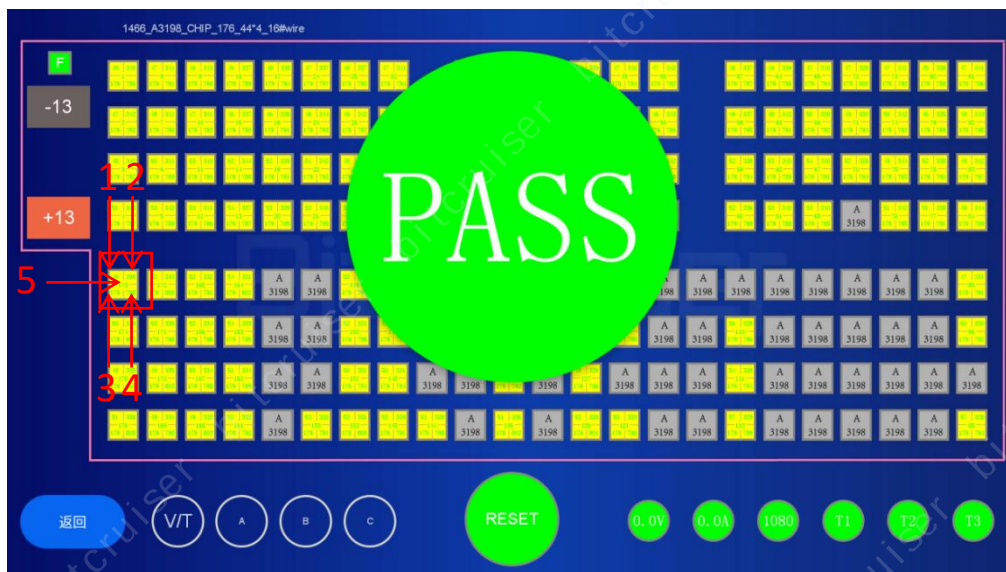


Fig 5.39 — Illustration of a Passed Avalon Hashboard Test (Part 2)

As shown in Fig 5.40.

1. The yellow color here indicates that the hashboard chip's 0.8V signal or temperature is slightly higher than the standard value
2. Here, the red color indicates that the hashboard chip's 3.3V voltage is higher than the standard value
3. The T3 indicator in the lower right corner is displayed in red, indicating an abnormal condition.

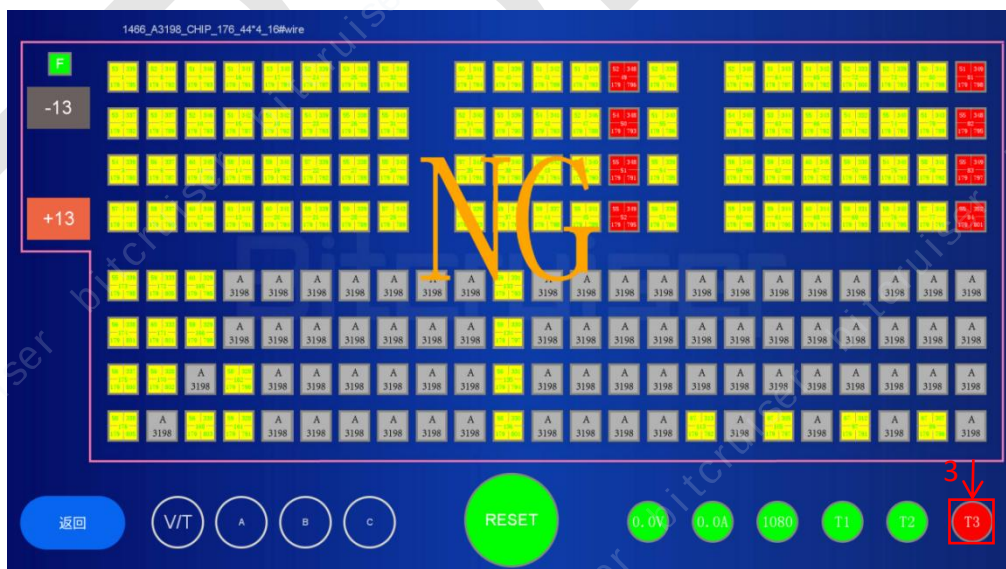


Fig 5.40 — Illustration of a Failed Avalon Hashboard Test (Part 1)

As shown in Fig 5.41.

1. the gray color here indicates that the hashboard chip's 3.3V voltage is slightly below the standard value.
2. Here, the blue color indicates that the hashboard chip's 3.3V voltage is lower than the standard value.
3. The T3 indicator is displayed in red, indicating an abnormal condition.

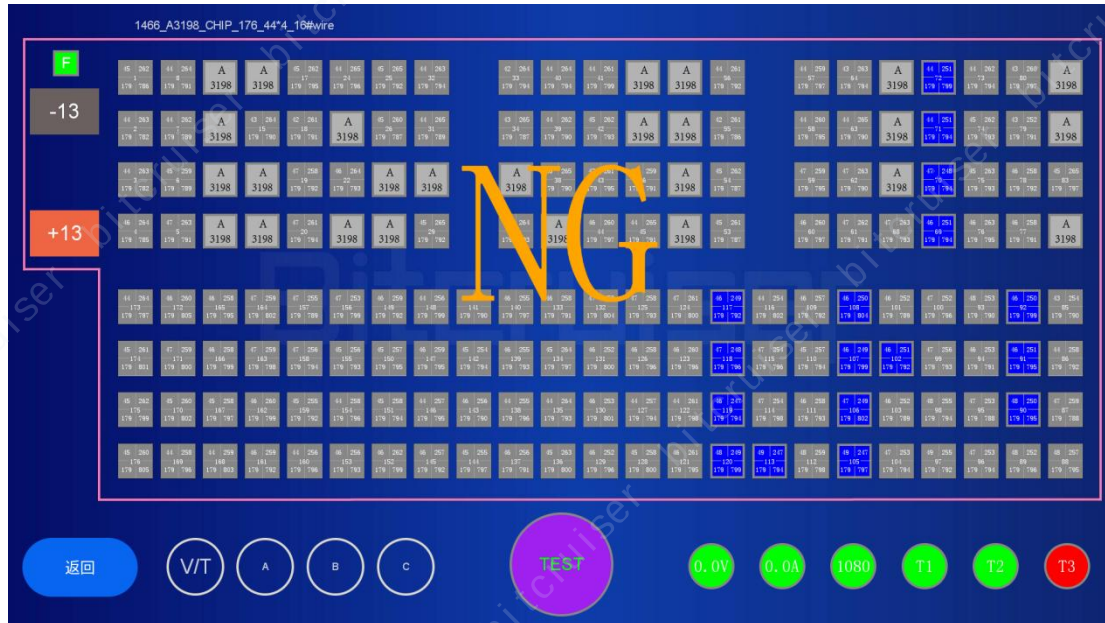


Fig 5.41 — Illustration of a Failed Avalon Hashboard Test (Part 2)

5.2.3 Power Supply Testing Process:

5.2.3.1 Avalon Power Supply Testing Process:

The following illustrates the testing process using the **PSU3400_01_PLUS** power supply model as an example.:

As shown in Fig 5.42, click **“POW”**, then **“Avalon”**, and finally **“PSU3400_01_PLUS”** (this supports multiple mainstream Avalon models, including PSU3400_01_PLUS, PSU3400_02, 03, 04, and PSU3400_1).

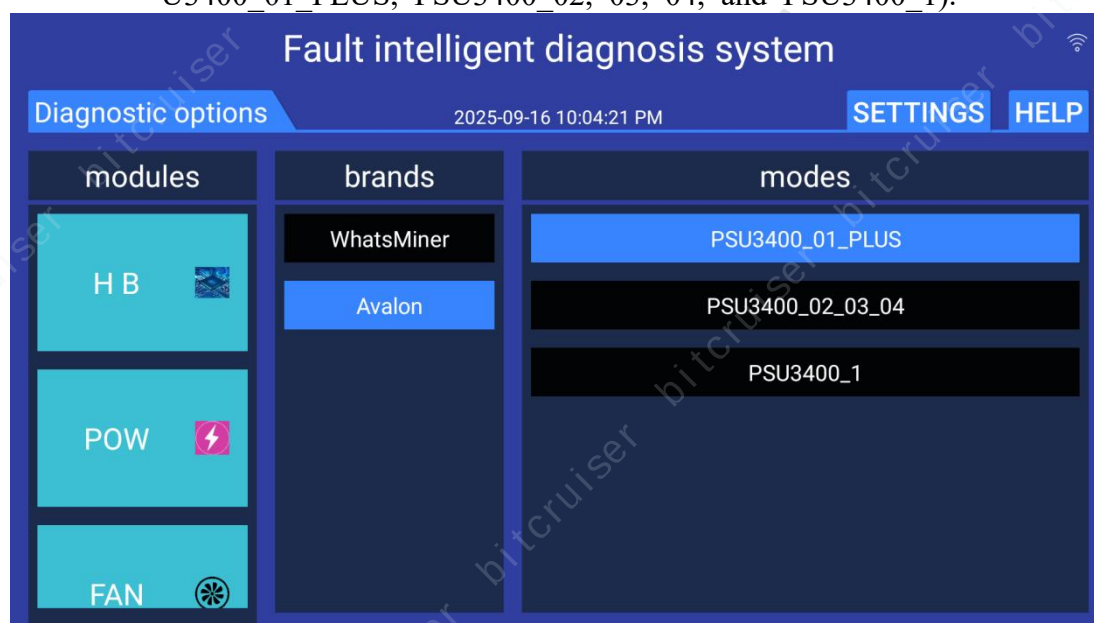


Fig 5.42 — Avalon Power Supply Test Model Selection

Explanation of power supply mode naming rule: Unlike hashboards, the power supply is an independent device, so the mode is directly represented by the power supply model for easier understanding.

Enter the testing interface as shown in Fig 5.43.

1. Preliminary Check: Detects device communication status, input voltage, current, power, ambient temperature, etc.
2. Secondary Check: Measures the output voltage, current, power, and maximum overload protection value actually supplied to the load by the tested power supply.
3. Data Calibration: This function is not yet available to external users.
4. Test Result: Displays the final functional test result of the power supply.
5. Test Type Naming Rule: PSU3400-01plus_5# wire, where PSU3400-01pl

us represents the power supply model, and 5# wire indicates the wire number required for this model.

6. Power Setting: Adjust the desired output power by sliding the yellow knob at the top. An electronic load must be connected to measure data. (Each slide step corresponds to approximately 45W; the actual power per step varies depending on the power supply model.)

7. Fault Code: When the power supply functional test result shows “NG”, the corresponding fault code for the specific functional error is displayed here (see Section 7.3 for power supply test abnormality handling).

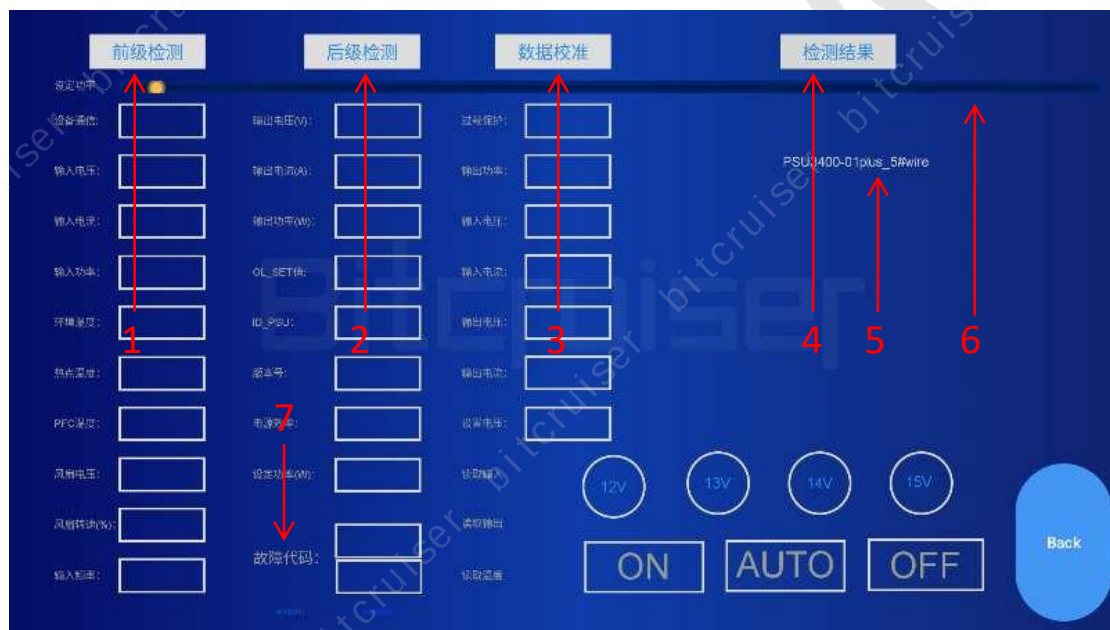


Fig 5.43 — Illustration of the Power Supply Testing Interface

The function buttons are shown in Fig 5.44.

1. Power supply output voltage selection button.
2. ON: Power output switch.
3. AUTO: Automatic test button.
4. OFF: Exit test button.
5. Back: Return button.



Fig 5.44 — Illustration of Avalon Power Supply Test Interface Function Button

S

Officially start the test:

Click “ON” and confirm whether to switch to the new firmware. If you want to test this power supply model, click “Yes”; if not, click “No” to return to the previous menu and select the correct model.

After the firmware switch is complete, click “ON” to turn on the power output, and set the desired output power using the yellow knob at the top. Then click the “AUTO” button. (Note: If testing with an electronic load, starting only “ON” without “AUTO” will not measure the secondary output data. To obtain correct measurements, start “ON” first and then “AUTO”). The system will automatically perform a voltage-adjusted output test from 12V to 15V, calculating the expected output power at each voltage and comparing it with the actual output power. If the values match, the power supply is functioning normally.

If the power supply is functioning correctly, the test result will display “PASS”. If there is a malfunction, the result will display “NG”. As shown in Fig 5.45, a red code 1111 at the device communication area indicates a signal path error between the power supply and the instrument. In this case, the “ON”

button cannot activate the output, and the test result shows “NG”. (Note: Check whether the test cables are intact and properly connected.)



Fig 5.45 — Illustration of a Failed Avalon Power Supply Test (Part 1)

As shown in Fig 5.46, the device communication is normal, and the power output switch is turned on, with an input voltage of 231V. However, without an electronic load connected, both the “ON” and “AUTO” buttons can be activated, but the power supply’s output voltage, current, and power remain at 0, and the corresponding data cannot be measured. The system displays a red error, and the test result shows “NG”. (Note: To correctly measure the power supply’s output data, an electronic load must be used.)



Fig 5.46 Avalon power supply test abnormality diagram 2

As shown in Fig 5.47, the device communication is normal, the input voltage is normal, the output power is set, and the electronic load is connected. Turn on the power output "ON" and "AUTO" automatic test, and the system tests at a 12-15V output voltage. At this time, the device input and output data are normal, but the electronic load power does not meet the standard. The input power is displayed in red, which is considered abnormal, and the test result is displayed as "NG". (Note: During the test, it is necessary to use a suitable electronic load)



Fig 5.47 Avalon power supply test abnormality diagram 3

As shown in Fig 5.48, when the power supply is turned on and the test is started with a 13V output voltage, the output power display is abnormally red because the set power is significantly different from the actual power supply output power, and the test result is displayed as "NG". (Note: During the test, the power supply output power must be set as required to avoid false alarms.)



Fig 5.48 Schematic diagram of Avalon power test anomaly 4

As shown in Fig 5.49, if you need to stop the test midway, click "OFF" to stop the test, the power supply device will enter the standby state, and the test interface will be displayed in gray standby as a whole



Fig 5.49 Schematic diagram of Avalon power test shutdown standby

5.2.3.2 WhatsMiner power supply test process

The following is a test description of the P463B model power supply as an example:

As shown in Fig 5.50, click "POW", then click "WhatsMiner", and click "GB1449" again (supports WhatsMinerGB1413, GB1449, P222X and other main stream models).



Fig 5.50 WhatsMiner power supply test model selection

The test interface is shown in Fig 5.51.

1. Pre-stage detection: detect the communication status, input voltage, current, power, etc. of the equipment.
2. Post-stage detection: detect the actual output voltage, current, power, etc. of the power supply.
3. Fault code: When the power function detects an abnormality, the corresponding location will display the fault code.
4. Test Results: The final power function test results are displayed here.
5. SN: Detect the SN code of the device and display it.
6. Test Type Name Rule: G1449-70021240A, which represents the model of this power supply.

The interface is divided into four main sections: 前级检测 (Pre-stage detection), 后级检测 (Post-stage detection), 故障代码 (Fault code), and 检测结果 (Test results). Each section contains various input fields and labels. Red arrows point from the numbered list items to specific fields: 1 points to Temp1, 2 points to ID_PSU, 3 points to IOUT, 4 points to the Test results section, 5 points to SN, and 6 points to the power supply model G1449-70021240A. The interface also includes buttons for ON, AUTO, OFF, and a Back button, as well as voltage selection buttons (22V, 23V, 24V, 25V).

Fig.51 Schematic diagram of WhatsMiner power supply test interface

The function buttons are shown in Fig 5.52, and the introduction of function keys 1-5 is shown in section 5.2.3.1.

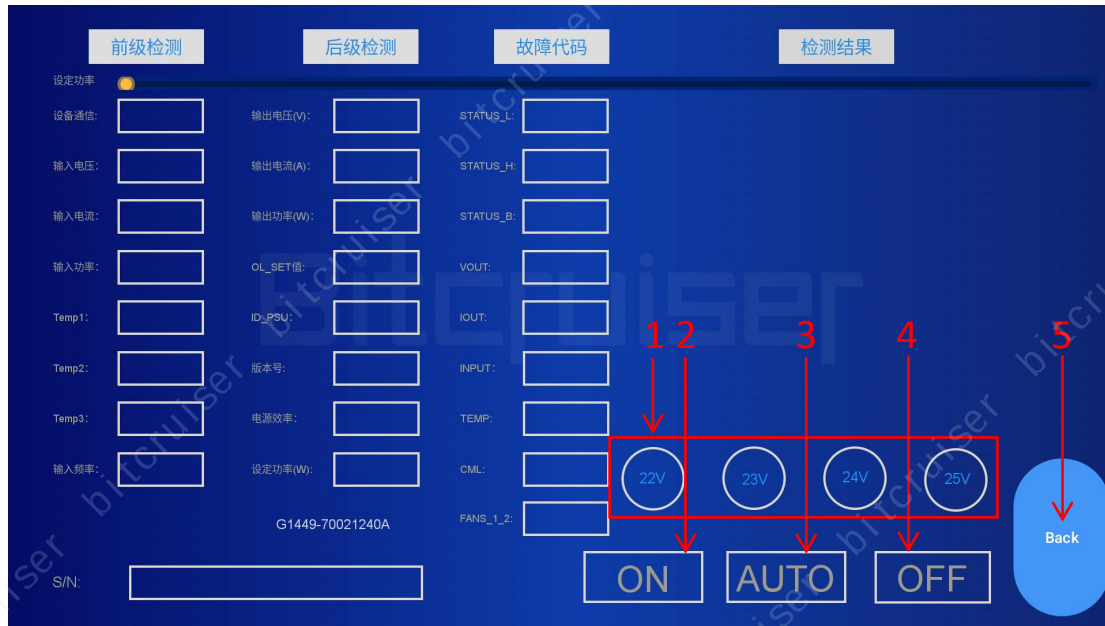


Fig 5.52 Schematic diagram of the function buttons of the WhatsMiner power supply test interface

Officially start testing:

Click "ON" to confirm whether to switch to the new firmware, click "Yes" if you need to test the power supply of the model, click "No" if you do not need to test the model, and return to the previous level to re-select the model to be tested.

After the test firmware switchover is complete, see Section 5.2.3.1 for the test steps. The test results are shown in Fig 5.53, when the communication status of the device is abnormal and the test result shows "NG". See section 5.2.3.1 for the workaround.



Fig.53 Schematic diagram of WhatsMiner power supply test anomaly 1

As shown in Fig 5.54, the equipment communication is normal, the power supply voltage of the power supply is 357V, and the calibrated voltage range of the three-phase alternating current is not reached. (Note: Three-phase 380V AC power within the correct range is required)



Fig5.54 Schematic diagram of WhatsMiner power supply test anomaly 2

As shown in Fig 5.55, the equipment communicates normally, the power supply under test is connected to three-phase AC, the power output "ON" is turned on, and the "AUTO" automatic voltage regulation test is turned on. The system detects that the input and output data of the equipment are normal, but the set power is very different from the actual power when the power supply is loaded, and the test result shows "NG". (Note: During the test, the power output power of the power supply needs to be set according to the requirements to avoid false alarms from the system.)



Fig. 5.55 Schematic diagram of WhatsMiner power supply test anomaly 3

As shown in Fig 5.56, if the test needs to be stopped midway, press "OFF" to stop the test, and the power supply enters the standby state



Fig 5.56 Schematic diagram of WhatsMiner power supply test shutdown standby

5.2.4 Fan Test Process

The following is an example of the 12038 model fan:

As shown in Fig 5.57, click "FAN", then click "TR", and then click "12038" again.

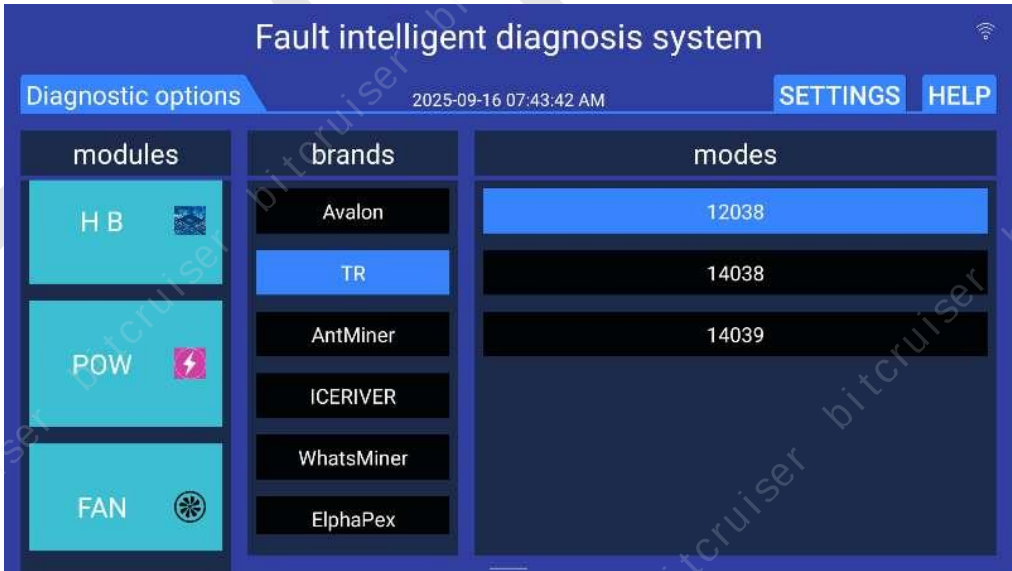


Fig 5.57 Fan test model selection

The test interface is shown in Fig 5.58. :

1. Voltage: The normal working voltage of the fan.
2. Current: The normal working current of the fan.
3. Rotation speed: the normal working speed of the fan.
4. Duty(%): Duty cycle display.°

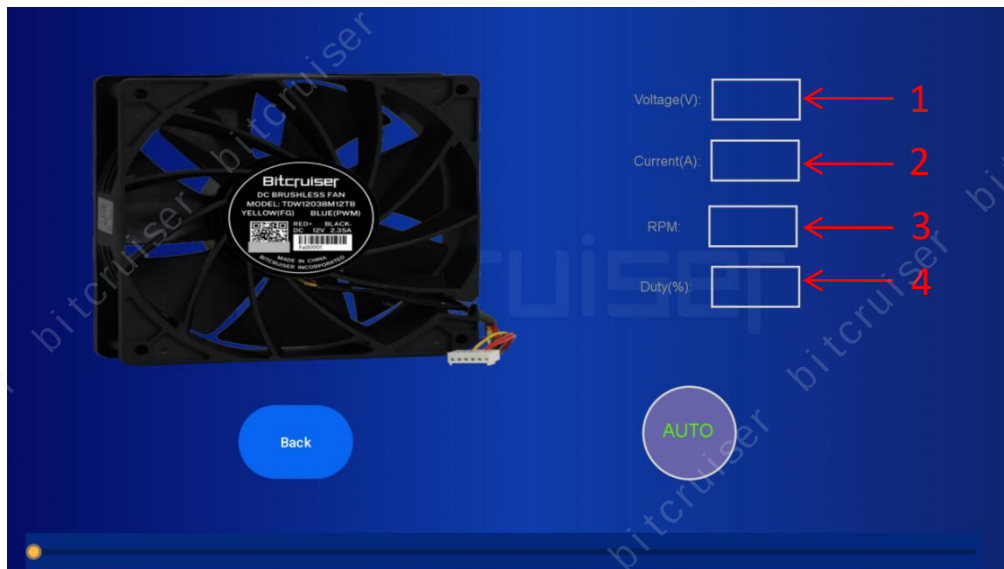


Fig 5.58 Schematic diagram of the fan test interface

The function buttons are shown in Fig 5.59.

1. Adjustment button: adjust the fan speed.
2. Back: Back key.
3. AUTO: Automatic test start button (0~25%~50%~75%~100% increase s tep by step).

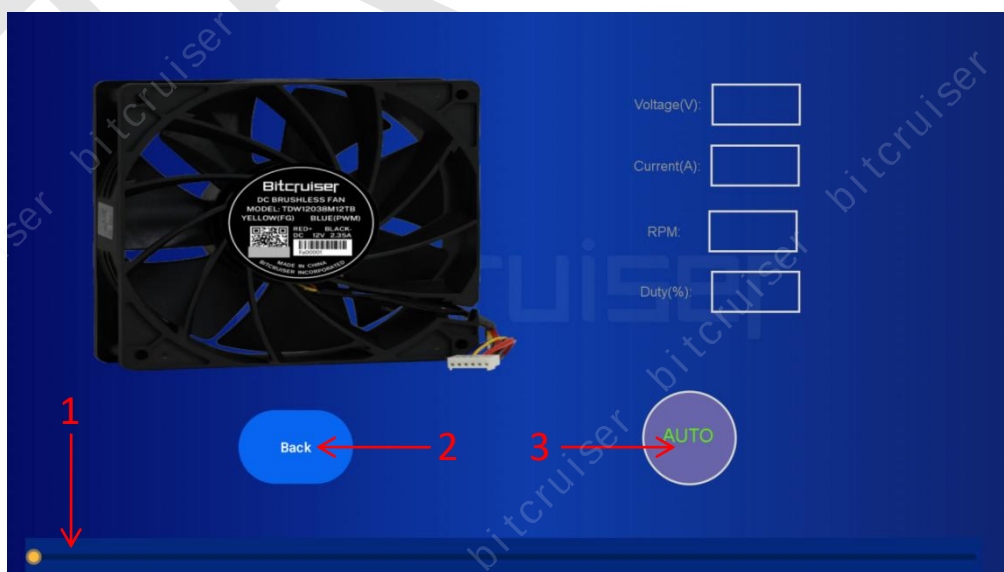


Fig.5.59 Schematic diagram of the button of the fan test function

Officially start testing:

Turn on the adjustable DC power output, slide the bottom button, the fan starts to rotate, and the right side displays the real-time voltage, current and rotation speed of the fan. Or click the automatic test button, the system adjusts the fan speed by itself, and gradually increases the duty value from 0~25%~50%~75%~100% step by step, and tests whether the working voltage and current of the fan at different speeds are normal.



Fig 5.60 Schematic diagram of the 50% Duty value of the fan AUTO test

When conducting fan operation tests, you need to use a professional fan test stand. The test bracket for the fan is shown in Fig 5.61.

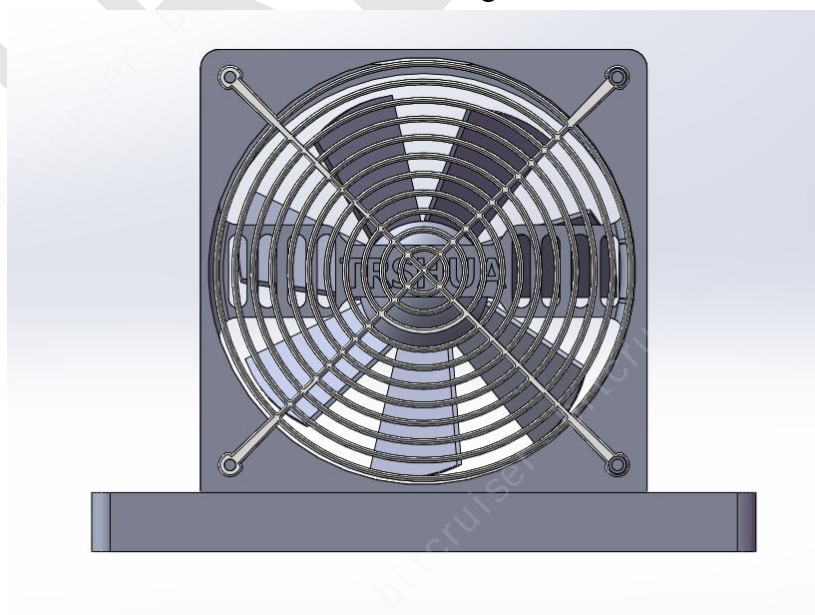


Fig.5.61 Schematic diagram of the special bracket for fan testing

Note: The fan must be fixed during the test, and a safe distance must be maintained, and do not touch or reach in your hand during the fan test, beware of accidents!

5.3 Data viewing and output

In the product test interface, swipe right from the left edge of the screen to enter the data statistics interface. In this interface, you can view the type, product name, and model of the tested product, as well as the total number of daily tests, the number of good products, and the number of defective products for each model.

ProductName/Brand/Model	Dailyre port	Pass	NG	TOTAL	PASS	NG
H B/AntMiner/S19_1398_38X2_a	3	2	1	D&	D&	D&
H B/AntMiner/S19_1398_38X2	2	1	1	5	3	2
				W/T	W/P	W/NG
				5	3	2
				M/T	M/P	M/NG
				5	3	2
				Y/T	Y/P	Y/NG
				5	3	2

Fig.5.62 Schematic diagram of the data statistics interface

In addition, the right half of the screen can also see the total number of his torical test data, including historical data of days, weeks, months, and years. A ll data will be automatically updated at 12 o'clock the next night. If you need to exit the interface, just swipe left on the right edge of the screen.

5.4 Remote System Upgrade

To upgrade the system, you need to confirm whether you are connected to the wireless network and that the network is in a stable state.

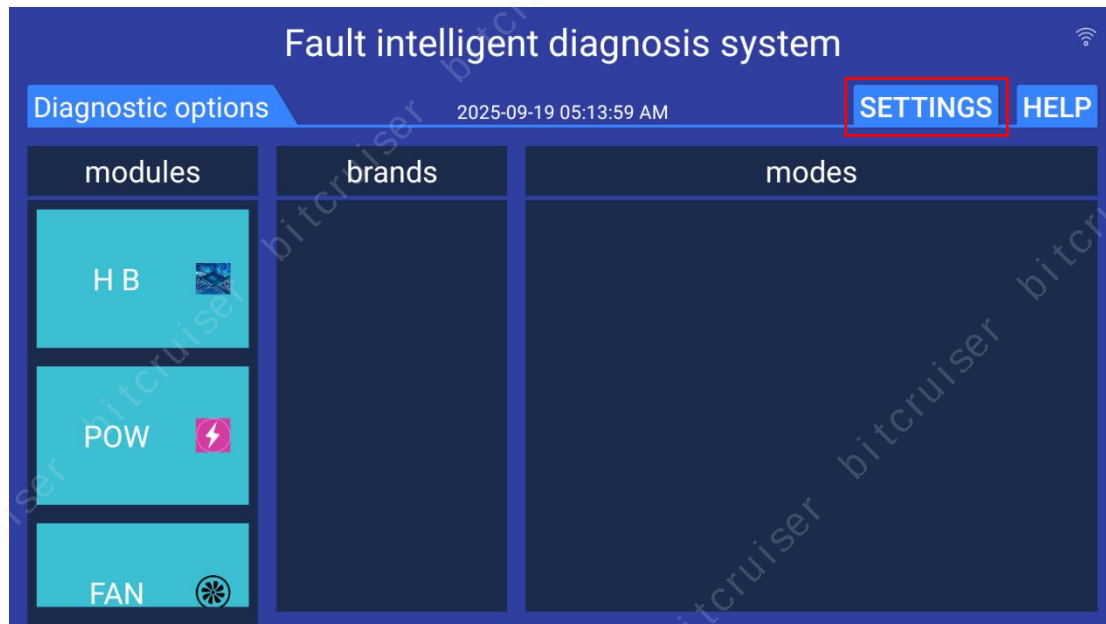


Fig 5.63 Schematic diagram of system setup entrance

Go to the settings interface, as shown in Fig 5.64.



Fig 5.64 Schematic diagram of the system settings interface

Introduction to the setting interface:

- 1.System language.
- 2.Wireless network.
- 3.Clear data.
- 4.Check the MEID number.

5.Exit the system.

6.Version updates.

7.Version number.

System update method:

In the system settings, if an update is available, the version number is marked (new). Clicking it prompts an update confirmation; select "Yes" to proceed. If already up-to-date, a message will show "Latest version installed".

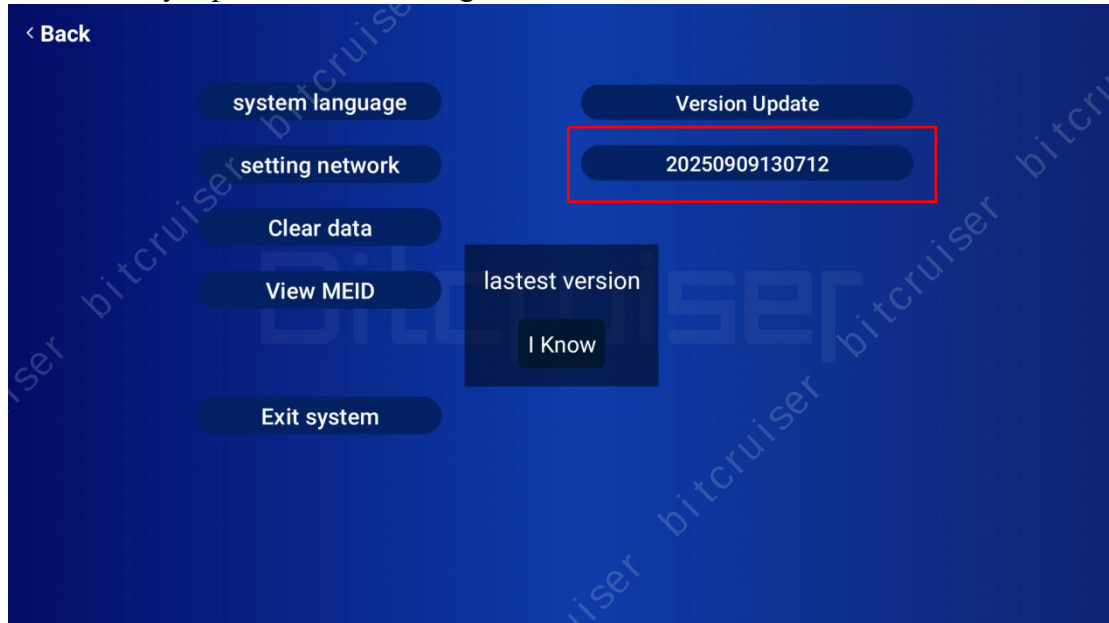


Fig. 5.65 No New System Version Prompt Window

Note: Do not turn off the power or perform any other operations during the update process to avoid data loss.

5.5 Use Help View

The Help option at the top-right corner of the Test System's main interface allows access to the electronic manual and provides assistance when needed.

(Note: Accessing the electronic manual online requires a wireless network connection.)

5.6 Shutdown

5.6.1 Shutdown steps

When tapping "Back" on the Test Interface, you must confirm that the product test has completely stopped. If the test is in progress, wait for the product test to finish before tapping "Back" to avoid damaging the equipment and system data.

To close the test software, simply swipe left to exit. After waiting for the software to close completely, toggle the main unit's power switch to the "O" position to cut off the main unit's power.

5.6.2 Emergency shutdown

When the instrument malfunctions (such as smoke emission, unusual odor, or sample short circuit), cut off the main unit's power immediately and terminate all operations.

After an emergency shutdown, investigate the cause of the abnormality. The instrument can only be powered on again after the fault has been completely eliminated.

6 Maintenance and Care

6.1 Daily Maintenance

1. Regularly clean the external dust of the equipment; a dry cloth can be used for wiping.
2. Never expose the equipment to high-temperature or humid environments.
3. Never place heavy objects on the equipment.
4. Regularly inspect the power cord and connectors to ensure they are not damaged or loose.
5. If the equipment is not in use for a long time, it is recommended to store it in the original packaging box.

6.2 Wear Parts

1. If there is poor wire contact, replace the wire in time.
2. When inserting the multi-function expansion board, align it with the polarization notch before insertion.

6.3 Storage

1. Storage Environment: Dry and well-ventilated, temperature ranging from 0°C to 40°C, relative humidity $\leq 60\%$.
2. Storage Handling: Disconnect all connections and cover with a dust cover.

7 Troubleshooting

7.1 Common Faults and Solutions

- Black screen on power-on

Causes: 1. Power adapter issue; 2. Power supply problem; 3. Screen damage/internal Fault

Solutions:

1. Check power adapter cable;
2. Verify normal power output;
3. Contact us if ineffective—do not disassemble

- Unresponsive test system

Causes: 1. Insufficient memory; 2. Software conflict

Solutions:

1. Restart to fix high temp memory usage;
2. Close other apps;
3. Update system firmware

- Unresponsive test buttons

Causes: 1. Mismatched test firmware; 2. Accidental button touch

Solutions:

1. Switch firmware per procedure;
2. Operate as required—no random taps

- Fluctuating test data

Causes: 1. Poor wire contact; 2. Loose expansion board

Solutions:

1. Check test wires for good connection/damage;
2. Verify multi-function expansion board installation/connection

- "Sensor Error" displayed

Causes: 1. Damaged multi-function expansion board; 2. Missing driver

Solutions:

1. Replace if damaged;
2. Reinstall stable driver

7.2 Abnormal Test Handling for Mining Board

If "NG" is displayed on the test interface, it may be due to:

- a. Wrong mining board model: Exit and reselect model.
- b. Poor/damaged test cable: Replace cable and retest.
- c. Damaged single chip or abnormal surrounding circuit: Repair per system prompt.

Fig. 7.1: Check the fault code table for the fault.

Fig. 7.1 Mining Board Fault Code Details Diagram

7.3 Power Test Abnormality Handling

- a. Common issues with PFC fault code are shown in Fig. 7.2.

Fig. 7.2 PFC Fault Code Details Diagram

- b. Common issues with S_MOS fault code are shown in Fig. 7.3.

Fig. 7.3 S_MOS Fault Code Details Diagram

7.4 Fan test exception handling

(To be updated)

8 Safety Precautions

- △ These prevent personal injury and damage to this product or connected products. To avoid potential hazards, use strictly as specified.
- △ Do not place in flammable, explosive, or humid environments to prevent fire, explosion, or electrical failure.
- △ Use the dedicated power cord. Ensure the plug and cord are intact to avoid circuit damage, preventing electric shock or short circuit.
- △ Keep the product away from water/liquids to avoid electrical failure or personal injury.
- △ Check the surrounding environment when using to prevent accidents.
- △ If overheating, unusual odor, or smoke occurs during use, immediately stop use and unplug.
- △ Unauthorized modification/repair is strictly prohibited. For repairs, contact our technicians or after-sales center.

9 Technical support and after-sales service

Service Commitment:

TRSHUA solemnly undertakes that all ex-factory products are strictly manufactured and inspected per national standards, ensuring each is fully functional and reliable. For sold products, we offer industry-leading first-class after-sales service. Within the warranty period, if TRSHUA confirms a product defect, free repair services will be provided. For specific warranty terms, users may refer to the product warranty card or contact TRSHUA's official after-sales service for details.

Repair Commitment:

TRSHUA solemnly undertakes that all products sent for repair (whether in or out of warranty) will be repaired using original parts. Debugging and inspection standards for repaired products strictly follow pre-factory standards. If product performance degradation is caused by objective factors (not defects), TRSHUA will fulfill the obligation to inform but assume no other additional obligations.

10 Appendix

Appendix 1: List of supporting wire types



Fig. 1# wire to 12# wire: Matching wire types correspond to the following respectively:

1#wire: Antminer Mining Board Test Wire	7#wire: P21 Power Voltage Regulator Wire
2#wire: Whatsminer Mining Board Test Wire	8#wire: VP-1232G Power Test Wire
3#wire: IceRiver Mining Board Test Wire	9#wire: 12V Power Output Red/Black Wire
4#wire: ElphaPex DG Home1 Test Wire	10#wire: 12V Power Input Red/Black Wire
5#wire: 2*9Pin-APW1215 Voltage Regulator Wire	11#wire: Fan Test Wire
6#wire: ElphaPex DG1 Test Wire	12#wire: 12V-2A Matching Power Adapter & Wire

Note: The factory only comes with a power adapter and a common brand hash board test cable as standard. The rest must be purchased separately!

Purchase website: <https://www.bitcruiser.com/>

FCC Warning

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC RF exposure statement:

The equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance between 20cm the radiator your body.

11 Back cover

Contact Us

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