8740

2-Wire Universal Cable Harness

User Manual

V2.01

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Chapter 1 Precautions

This instrument is designed for indoor use only and is not suitable for environments with high humidity or excessive dust. Improper use may result in electric shock. Please carefully review the following safety instructions to prevent accidents caused by incorrect or unsafe operation.

1.1 Safety Signs

The following safety symbols may appear in this manual or on the instrument itself:

- **Note**: Indicates that you should refer to the manual for important information.
- **Protective Ground Terminal**: This terminal must be properly grounded to prevent electric shock from power leakage. Ensure the instrument is grounded before use.
- **CAUTION**: This symbol warns that improper use could result in incorrect readings or damage to the instrument or Device Under Test (DUT).
- **WARNING**: This symbol warns that improper use could result in serious injury or even death.

1.2 No Unauthorized Modifications or Adjustments

Do not attempt to install unauthorized components, make modifications, or perform internal adjustments to the instrument without prior approval from the manufacturer. Doing so could increase the risk of damage or injury.

1.3 Protection Against Static Electricity

Avoid contact with objects that carry static electricity to prevent damage to the instrument.

1.4 Grounding

The power socket of this instrument includes a grounding terminal. Ensure

the instrument is properly grounded to prevent electrical shock when touching the casing.

1.5 Power Requirements

Use power cables that meet local standards, and ensure IEC320-compliant connectors are used. Verify that the grounding cable is properly connected. If the power plug includes a fuse, only use a T (Time-lag) 1.25 ampere fuse, and ensure the AC power supply falls within the 98V-132V or 195V-264V range at 50/60Hz.

1.6 Warm-Up Time

While the instrument can be used immediately after powering on, it is recommended to allow a 30-minute warm-up period to ensure accurate measurements within the specified tolerance.

1.7 Machine Malfunction

If the instrument malfunctions, return it to the manufacturer for repair by qualified professionals. This ensures both the accuracy and operational safety of the instrument.

1.8 Power Down When Not in Use

Switch off the instrument when it is not in use for extended periods.

1.9 Operating and Storage Conditions

- **Operating Conditions**: The instrument should be used in environments with temperatures between 15°C and 35°C and relative humidity under 70%. Accuracy may be affected if operated outside of this range.
- **Storage Conditions**: The instrument should be stored in temperatures ranging from 0°C to 70°C with relative humidity under 70%. For optimal performance and safety, avoid exposure to direct sunlight, high heat, high humidity, excessive dust, or unstable power supplies.

1.10 Emergency Procedures

In case of electric shock or if the instrument or DUT catches fire, immediately switch off the power and unplug the power cord.

Chapter 2. General Description

2.1 Package Contents and Accessories

The standard accessories included with the 8740 series cable tester package are as follows:

Item	Unit
8740 NAK Cable Tester	1
Power cable	1
Test report	1
TL-CB0006 Pin search probe	1
TL-CB0005 64 to 64 Pin cable	16
FX-000C16 Adapter board	16

Table 2.4.1.1 Package Contents and Accessories

2.2 Introduction to the 8740 K series

The 8740 K series Precision Two-wire Cable Tester offers 1024 testing points and comes in two models: NK and NAK, which differ based on whether AC voltage testing is supported.

The 8740 supports various testing functions, including:

- Open and short circuit detection
- Continuity resistance (Conductance)
- Component testing (resistance, capacitance, diode)
- Safety testing (AC high voltage/leakage current, DC high voltage/leakage current, insulation resistance)

- Intermittence open and short test

The tester supports RS-232, USB Host, Print, and Remote interfaces. It is suitable for testing cables, connectors, and finished products with combined cables and connectors, meeting the needs for multi-point testing across a wide range of applications.

2.3 Features

- Two-Wire Continuity Resistance Measurement: 100mΩ - 52Ω
- Testing Points: 1024 points
- Test Profiles: Supports over 500 Setting files
- Testing items:
  - Open and short circuit detection
  - Continuity resistance (Conductance)
  - Component testing (resistance, capacitance, diode)
  - Safety testing (AC high voltage/leakage current, DC high voltage/leakage current, insulation resistance)
  - Intermittence open and short test

2.4 Front and Rear Panel Functions

2.4.1 Front Panel

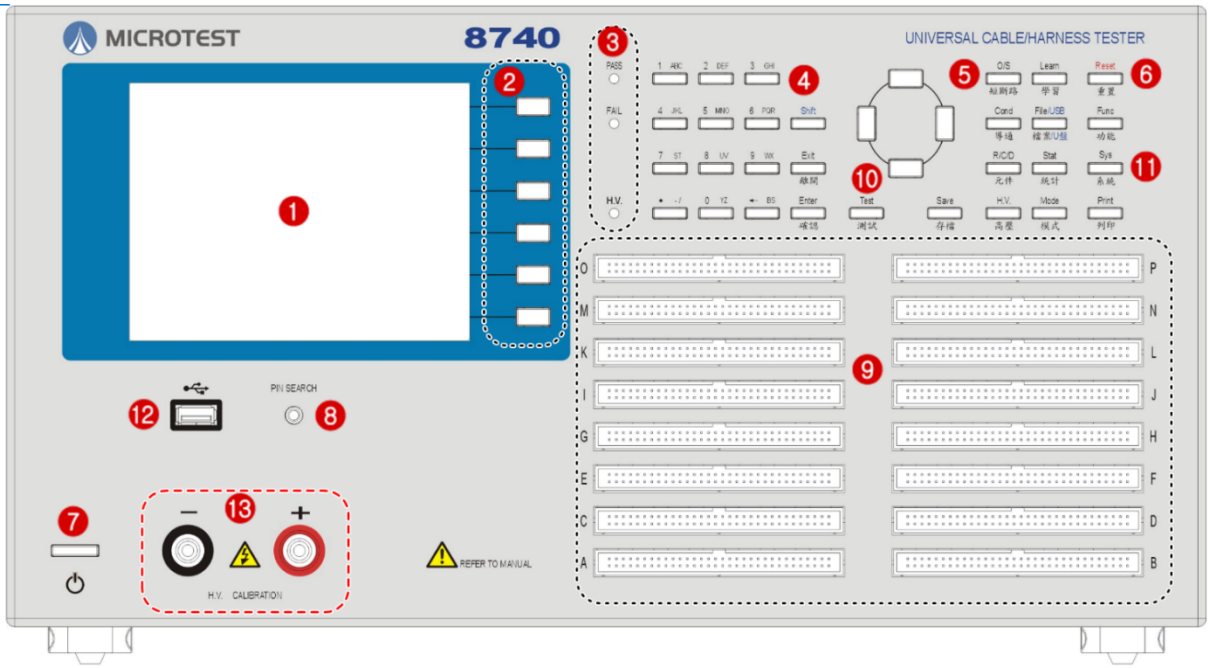


Figure 2.4.1 Front panel

(1) LCD display
(2) S1-S6 operation auxiliary buttons (Soft Key)

S1 Makes the backlight of the LCD brighter

S2 Makes the backlight of the LCD darker

S3 Increases the volume level

S4 Decreases the volume level

S5 Software version and update date display

S6 Switch between Chinese/English

(3) PASS & FAIL & HIPOT LED
(4) Control button (Edit Key) group

(5) Test shortcut button group
(6) System reset (Reset) button
(7) Power switch
(8) Pin search connector
(9) 1024Pin has 16 slots
(10) Test button [TEST]
(11) System button (Sys Key) group
(12) USB flash drive
(13) High voltage correction output connector

2.4.2 Rear panel

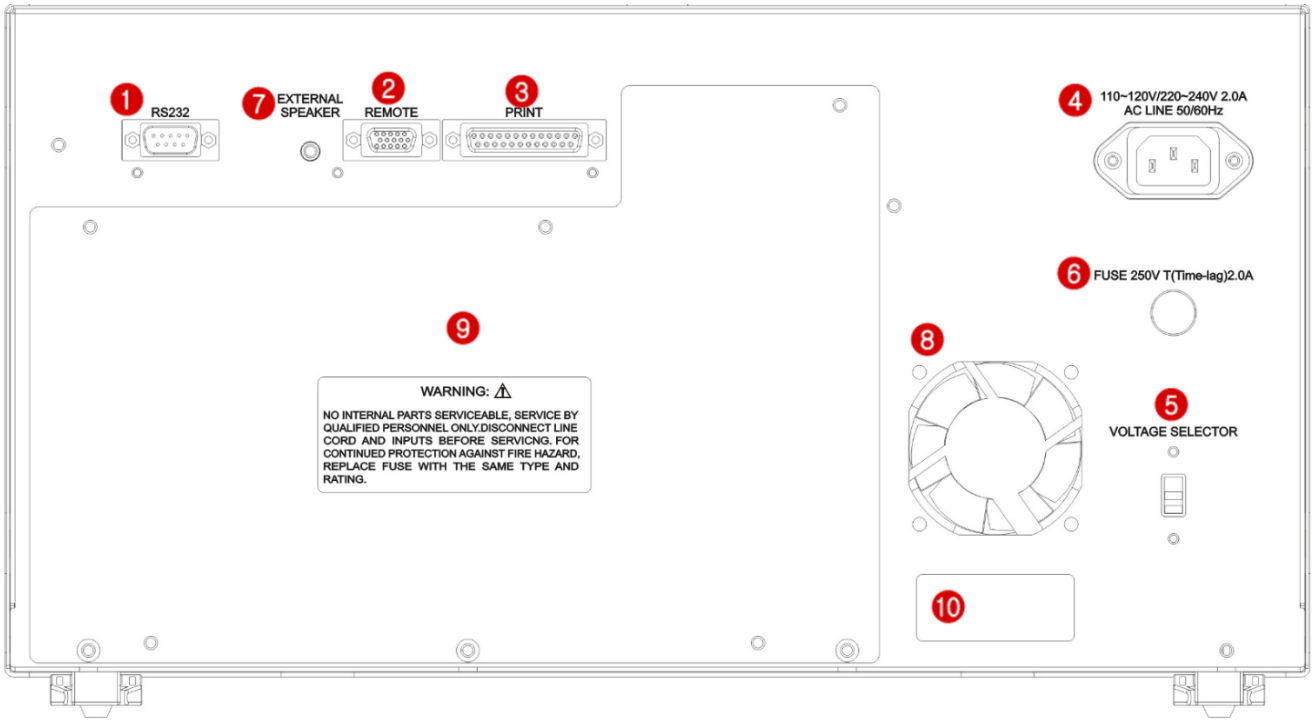


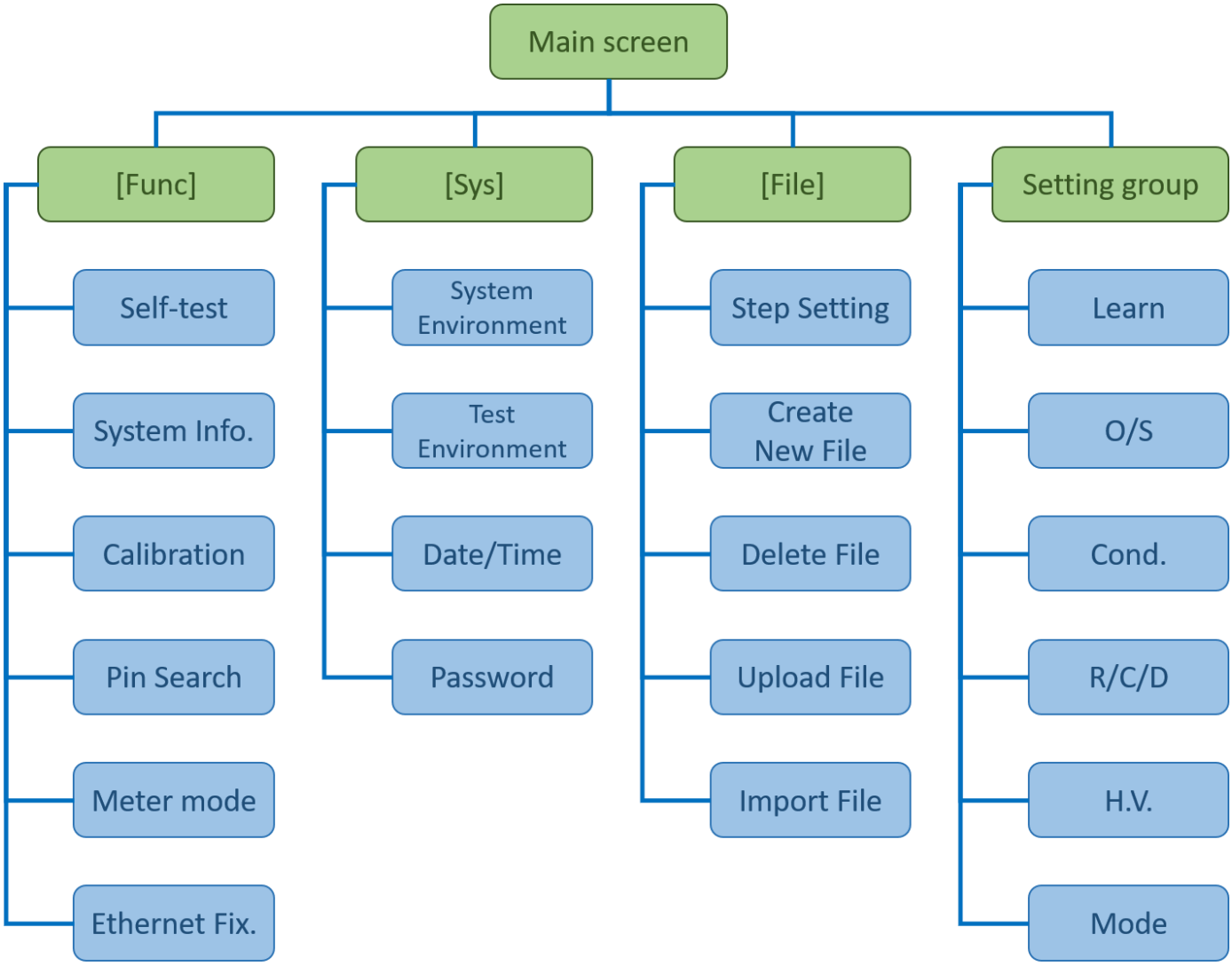
Figure 2.4.2 Rear panel

(1) Serial port (RS-232 Port)
(2) Remote control port (Remote Port)
(3) Printer Port
(4) AC power input (230/115 VAC)
(5) 115/230V switch
(6) Fuse holder 250V/T2A.
(7) Audio output socket

Note:

1. **Please confirm whether the AC input voltage setting is the same as the voltage used.**
2. **The input power must be grounded when using the machine.**

2.5 Menu Map


Main screen
[Func]
[Sys]
[File]
Setting group
Self-test
System Info.
Calibration
Pin Search
Meter mode
Ethernet Fix.
System Environment
Test Environment
Date/Time
Password
Step Setting
Create New File
Delete File
Upload File
Import File
Learn
O/S
Cond.
R/C/D
H.V.
Mode

2.6 Installation

(1) Please confirm the power of the power supply and that the power source connected is AC115V or 230V.
(2) Turn on the power; the system will execute the self-test program.
(3) When the execution of the self-test is completed, it will officially enter the 8740 system; the LCD display will be as follows:

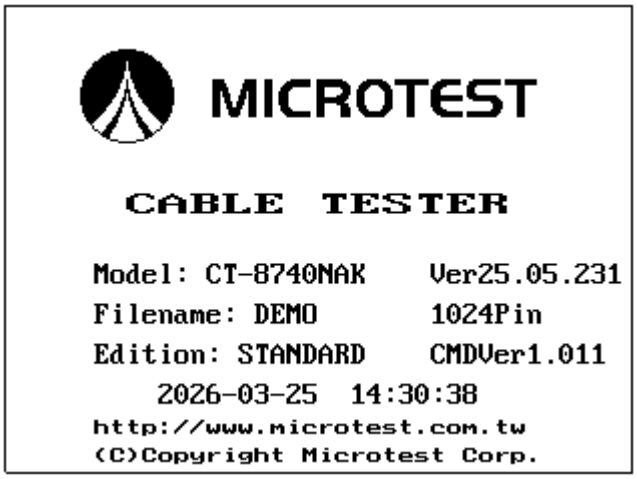


Figure 2.6.1 Main Screen

(4) To end the system, please press the [Power switch] to end.



Note:

1. **Self-test will be executed after powering on, which will take approximately 60-80 seconds.**
2. **Under the {READY} status, the operation buttons S1-S6 will have the following adjustment functions.**

S1	Makes the backlight of the LCD brighter
S2	Makes the backlight of the LCD darker
S3	Increases the volume level
S4	Decreases the volume level
S5	Software version and update date display
S6	Switch between Chinese/English

2.7 Button Instructions

(1) System (Sys Key) button group

[Func]: System function menu
[Sys]: System setting menu
[Print]: Print function menu

(2) Test shortcut (Fast Key) button group

[File]: File manager setting
[Learn]: Short circuit learning
[Stat]: Display test statistics data
[Mode]: Test mode setting
[O/S]: Short circuit table display
[Cond]: Conductance test edit
[Stat]: Statistics function
[R/C/D]: Resistor/Capacitor/Diode setting edit
[H.V.]: DC Insulation/AC HIPOT setting edit

(3) Control button (Edit Key) group

- **Alphanumeric Buttons**: Used to enter alphanumeric characters, including **0-9, A-Z,** and · **/**

Button name	Number of times pressed	LCD display
1	1	1
→	1	1
1	2	1A
→	1	1A
1	3	1AB

- **[BS] (←)**: Backspace – Deletes the last entered character.
- **Direction Buttons [←], [→], [↑], [↓]**: Used to move the cursor, including: Makes it easier to scroll through and edit data.
- **[Exit]**: Exits the current status and returns to the previous menu or status.

(4) **[Enter]**: Confirm button

(5) [TEST]: Start test button
(6) Soft Key S1-S6: Located to the right of the LCD, used for auxiliary operations/settings.
(7) [Reset]: System reset button; functions like a warm start.
(8) [Save]: Save as the file.
(9) [Shift]: Switch button function button.

2.8 Measurement Method

The measurement principle of the Two-wire testing machine is as follows:

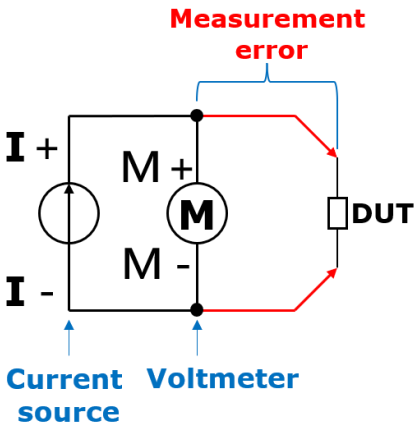


Figure 2.8.1 2-Wire measurement method

The definition of the connector is as follows:

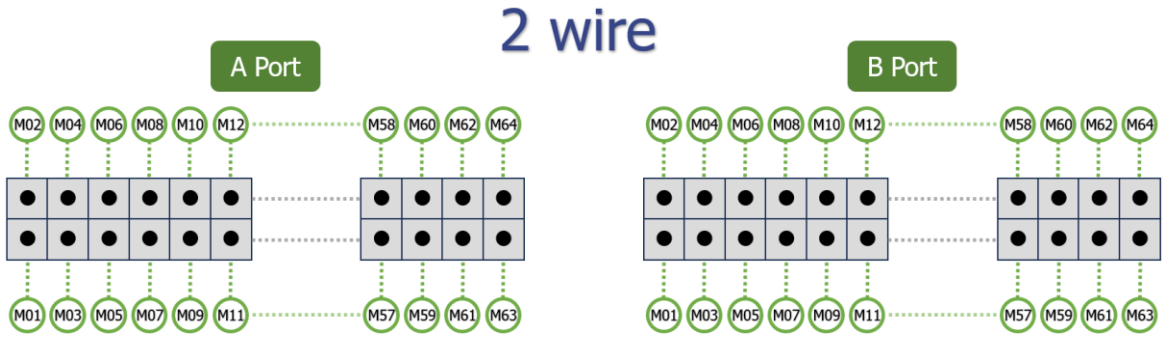


Figure 2.8.2 Definition of the connector

Chapter 3. Function and System Page

Overview

The function and system page overview includes key system functions such as **[Func]** (main system functions), **[Sys]** (system setup), and **[Print]** (print functions). Detailed descriptions of these settings are provided below:

3.1 Function

Provides the main function for the system; its operations and function descriptions are as follows:

(1) Press [Func].
(2) The LCD screen will display as follows:

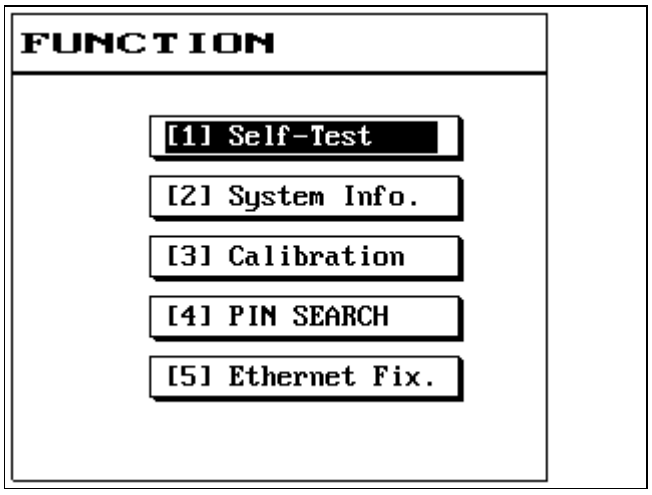


Figure 3.1.1 Function page

(3) Please use the [↑] or [↓] buttons to select the item needed.
(4) Press [Enter] to enter the selected item function.
(5) Press [Exit] to return to the previous screen.

3.1.1 Self-test

This function allows the setting for whether this machine will execute the self-test function immediately upon powering on.

(1) Press [Func]; please use [↑] or [↓] to select Self-Test and then press [Enter].
(2) The system will now execute the self-test function.
(3) The LCD screen will display as follows:

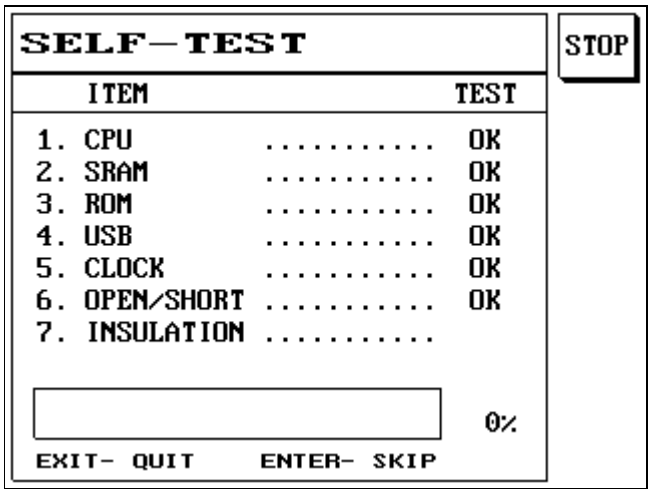


Figure 3.1.2 Self-test

(4) Press [Exit] to exit

3.1.2 System Info.

This item allows for the viewing of the 8740 machine and version information; it lists the machine's model number, test pins, total space used by files, and the total remaining space, etc. And it can perform system update.

(1) Press [Func]; please use [↑] or [↓] to select System Info and then press [Enter].
(2) The LCD screen will display as follows:

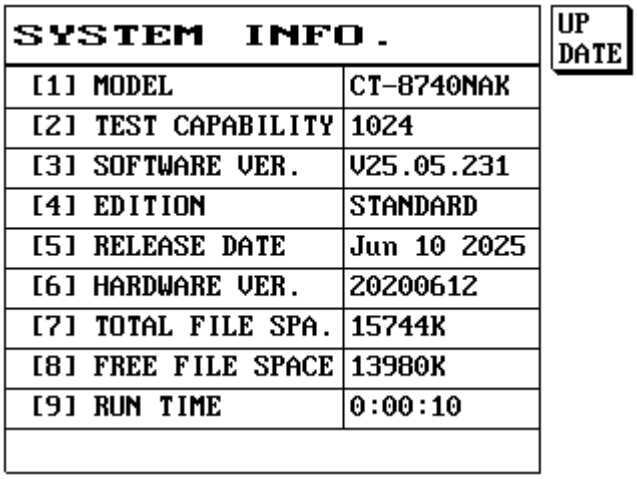


Figure 3.1.3 System information

3.1.3 Calibration

The password to access this function is **"0806"**, and it provides access to the following calibration options:

1. **DC High Voltage Calibration (DC H.V. CAL)**
2. **AC High Voltage Calibration (AC H.V. CAL)**
3. **Offset Calibration (O.S. CAL)**
4. **Internal Conduction Zero Adjustment (INT. COND. ZERO)**
5. **Current Fixture Calibration (Curr. Fix. CAL)**

(1) Press [Func].
(2) Please use [↑] or [↓] to select Calibration and then press [Enter].
(3) The LCD screen will display as follows:

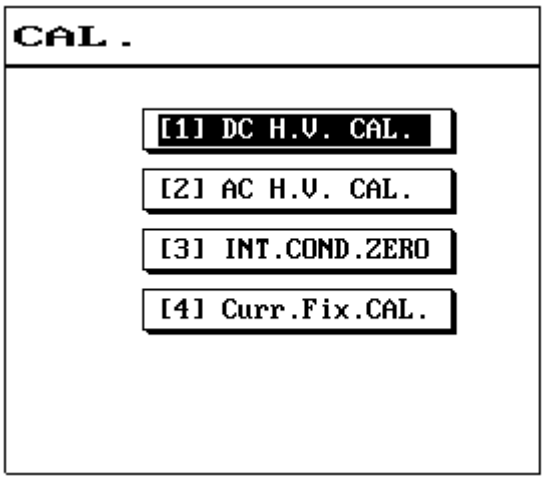


Figure 3.1.4 Calibration

(4) Press [Exit] to exit.

[1] DC H.V.CAL

The DC high voltage correction is used to adjust the READING (voltage reading) closest to the DC setting value.

(1) Press [Func].
(2) Please use [↑] or [↓] to select Calibration and then select DC H.V. CAL. and press [Enter].
(3) The LCD screen will display as follows:

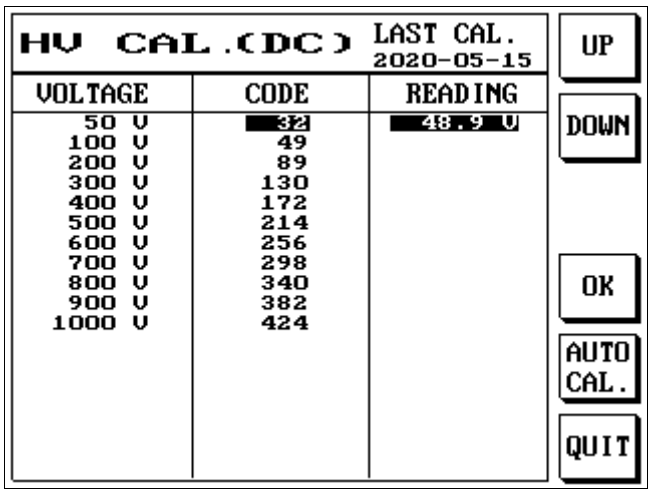


Figure 3.1.5 DC H.V.CAL

(4) Press S1 [UP] or S2 [DOWN] to adjust the READING (Voltage value) closest to

the Voltage column. Or S5[AUTO CAL.] for automatic adjustment.
(5) When setting is complete, please press S4 [OK].
(6) To cancel the set data, simply press S6 [QUIT].

[2] AC H.V. CAL

The AC high voltage correction is used to adjust the READING (Voltage value) closest to the AC setting value.

(1) Press [Func].
(2) Please use [↑] or [↓] to select Calibration and then select AC H.V. CAL. and press [Enter].
(3) The LCD screen will display as follows:

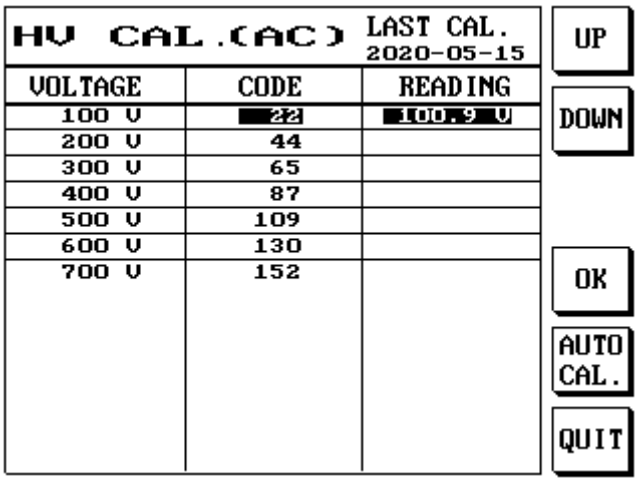


Figure 3.1.6 AC H.V. CAL

(4) Press S1 [UP] or S2 [DOWN] to adjust the READING (Voltage value) closest to the Voltage column. Or S5[AUTO CAL.] for automatic adjustment.
(5) When setting is complete, please press S4 [OK].
(6) To cancel the set data, simply press S6 [QUIT].

[3] O.S. CAL

The short-circuit correction function is to adjust the setting of Read (measurement value) that is most similar to the short-circuit judgment value.

(1) Press [Func].

(2) Please use [↑] or [↓] to select Calibration and then select AC H.V. CAL. and press [Enter].
(3) The LCD screen will display as follows:

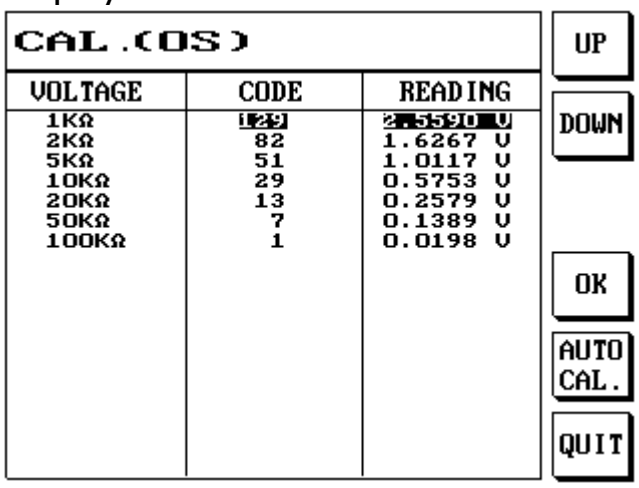


Figure 3.1.7 O.S. CAL

(4) Press S1 [UP] or S2 [DOWN] to adjust the READING (test value) closest to the Voltage column. Or S5[AUTO CAL.] for automatic adjustment.
(5) When setting is complete, please press S4 [OK].
(6) To cancel the set data, simply press S6 [QUIT].

[4] INT. COND. ZERO

This function can execute the internal resistance offset action of the machine.

(1) Press [Func].
(2) Please use [↑] or [↓] to select Calibration and then select INT. COND. ZERO and press [Enter].
(3) The LCD screen will display as follows:

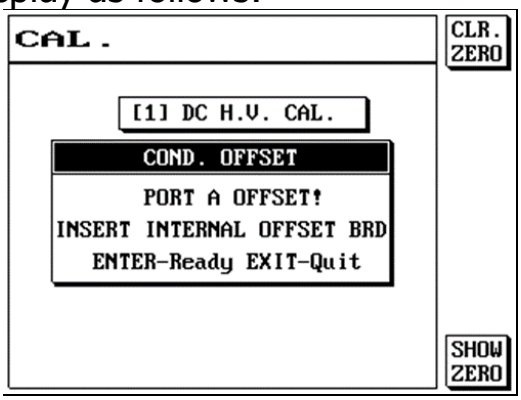


Figure 3.1.8 INT. COND. ZERO

(4) Press [Enter] to execute the internal resistance offset action (when you want to execute internal resistance offset, please first insert the INTERNAL OFFSET board).
(5) If PORT A (slot A) completed internal resistance offset, the LCD will display a message asking whether to continue to offset the internal resistance of PORT B (slot B). If the machine you purchased is 1024 pins, it will offset the internal resistance all the way to PORT P in sequence.
(6) Change the offset board to the COND OFFSET board, and repeat steps (4) and (5).
(7) Change the offset board to the 50Ω COND offset board for PORT A (slot A) for execution.

[5] Current Fixture Calibration

This function is an optionally purchased fixture calibration option.

(1) Press [Func].
(2) Please use [↑] or [↓] to select measurement parameter calibration, and then select constant current box calibration Curr. Fix. CAL and press [Enter].
(3) The LCD screen will display as follows:

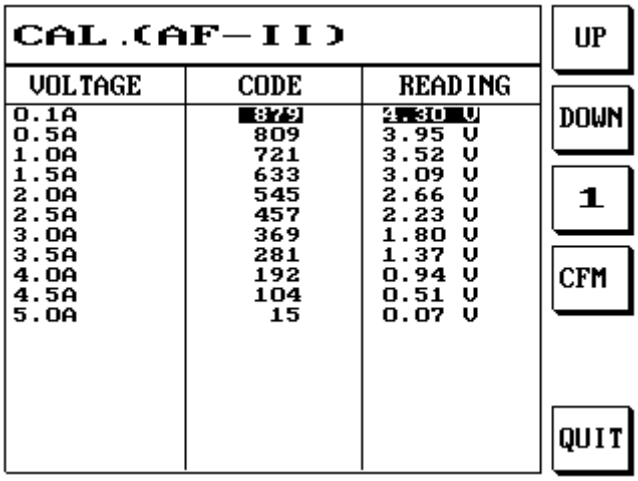


Figure 3.1.9 Current Fixture Calibration

(4) Press S1 [UP] or S2 [DOWN] to adjust the READING (test value) closest to the Voltage column.
(5) When setting is complete, please press S4 [OK].
(6) To cancel the set data, simply press S6 [QUIT].

3.1.4 Pin Search

This function can display which is the current output pin.

(1) Press [Func].
(2) Please use [↑] or [↓] to select pin search and then press [Enter].
(3) Connect the Pin search probe to the pin search socket, and use the probe to touch the pin you want to find out.
(4) The LCD screen will display as follows:



Figure 3.1.10 Pin Search

(5) **"A01"** in the figure refers to the first pin at the bottom-left corner of Port A.
(6) **"A01#"** in the figure refers to the first pin at the top-left corner of Port A.

3.1.5 Ethernet Fix.

This function requires the **F874004 RS-232 to Ethernet Converter**, which converts RS-232 communication from devices into LAN communication, enabling seamless integration into network environments.
This converter is suitable for applications such as industrial equipment communication and laboratory instruments where Ethernet connectivity is required.



Figure 3.1.11 F874004 RS-232 to Ethernet Converter

[1] Package contents



Figure 3.1.12 Package contents

Name	Qty
(1) F874004 RS232 to Ethernet Converter	1
(2) D-SUB 9 Pin Male to Female Extension Cable (RS-232)	1
(3) RJ-45 Cable	1
(4) 5V AC Adapter	1

Table 3.1.5.1 Package contents

[2] Connection

To connect the F874004 to the Microtest Cable Tester series, in addition to the original accessories, an Ethernet hub must be prepared to bridge the device and the computer.

An Ethernet hub is required to connect the device to a computer.

Without it, the connection will not be successful.

The connection steps are as follows:

1. Connect the provided **RS-232 Extension Cable**, **RJ-45 Cable**, and **5V AC Adapter** to their corresponding ports on the **F874004**.
2. Connect the other end of the **RS-232 Extension Cable** to the **Microtest Cable Tester**.
3. Connect the other end of the **RJ-45 Extension Cable** to the **Ethernet hub** (to be prepared separately), and then connect the **Ethernet hub** to the **Host** (PC, IPC, or PLC).
4. Connect the other end of the **5V AC Adapter** to a **power outlet** (110V/220V).

Please refer to the figure below,

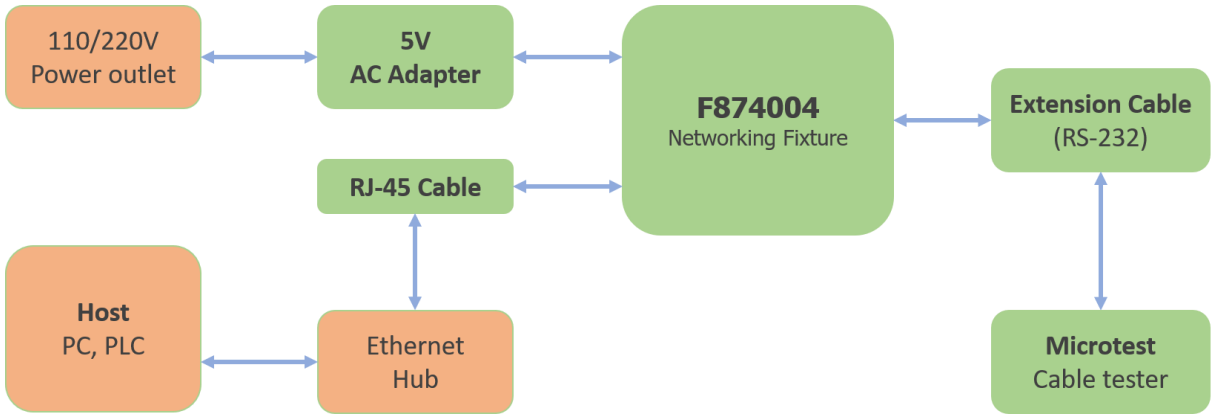


Figure 3.1.13 Connection

[3] Device Configuration and Setup

Follow the steps below to complete the configuration.

- **Obtain the Computer's IPv4 Address**

  Open the Command Prompt on your computer and type "**ipconfig**". This will display your computer's IPv4 Address. Refer to the example below:

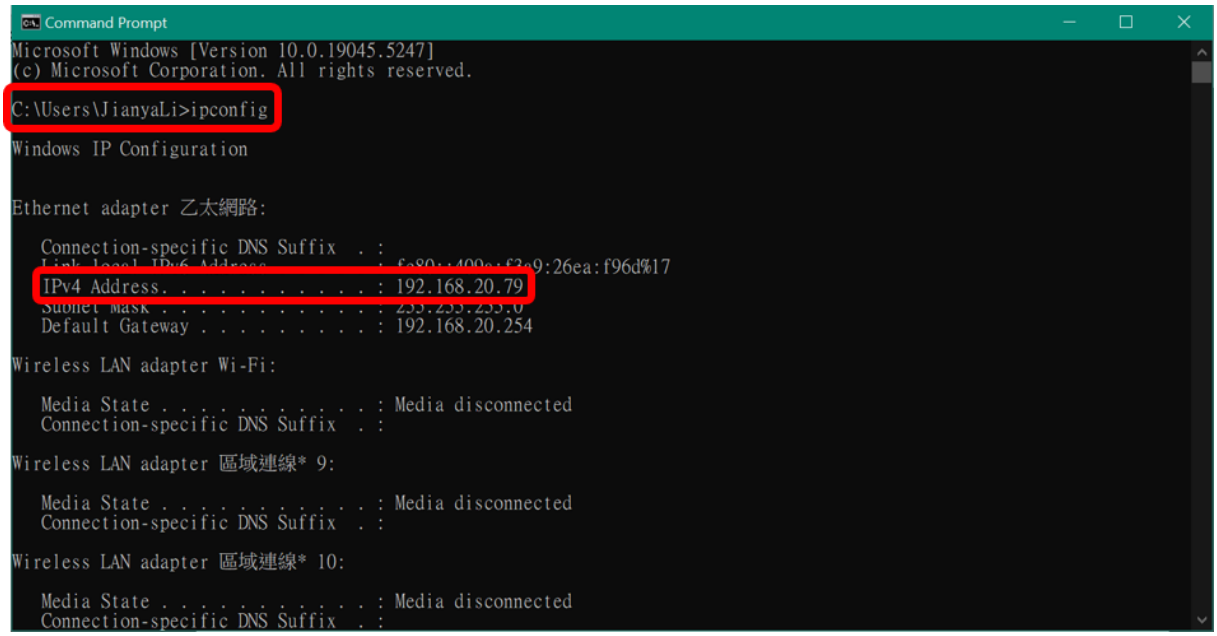


Figure 3.1.14 Obtain the Computer' s IPv4 Address

- **Set the Baud Rate**

  After connecting all devices, set the Baud rate to 115200. The path is as follows: SYS -> [1] System Env. -> [9] BaudRate

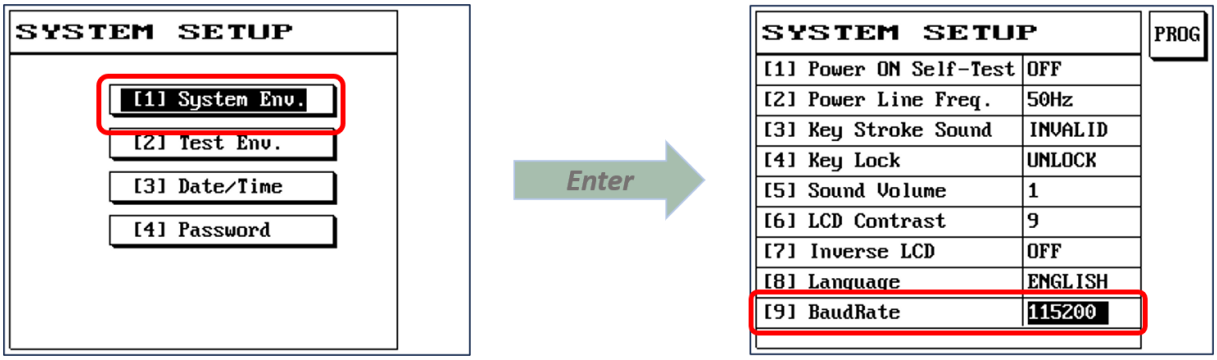


Figure 3.1.15 Set baud rate

- **Configure the Cable Tester to Ethernet Settings**

  Switch the Cable Tester to the Ethernet configuration page using the following path: **Func -> Ethernet Fix**

- **TCPC (TCP Client) Configuration**
  1. Enter the **IPv4 address** obtained earlier into the **[2] Server IP** column in the configuration table.
  2. For **[3] Server Port** column, choose a value between **1024** and

49151. Ensure the selected port number is consistent between the device and the computer.

3. For **[4] Host Address** column, choose any value between **1** and **254** for the last octet of the IP address.

Example configuration:

[1] Protocol : TCPC
[2] Server IP : 192.168.20.79
[3] Server port : 8234
[4] Host Address : 192.168.20.75

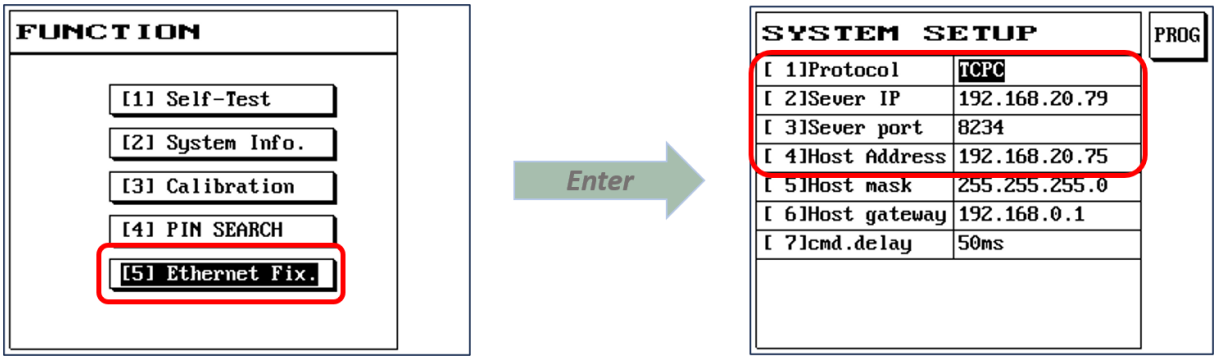


Figure 3.1.16 TPCP

- **TCPS (TCP Server) Configuration**
  1. Set the **[2] Server IP** column and the **[4] Host Address** column to the same value.
  2. For the **[3] Server Port** column, choose a value between **1024** and **49151**. Ensure the selected port number is consistent between the device and the computer.
  3. Ensure the IP addresses align with the desired LAN configuration and do not conflict with other devices on the network.

  Example configuration:

  [1] Protocol : TCPS
  [2] Server IP : 192.168.20.75
  [3] Server port : 8234
  [4] Host Address : 192.168.20.75

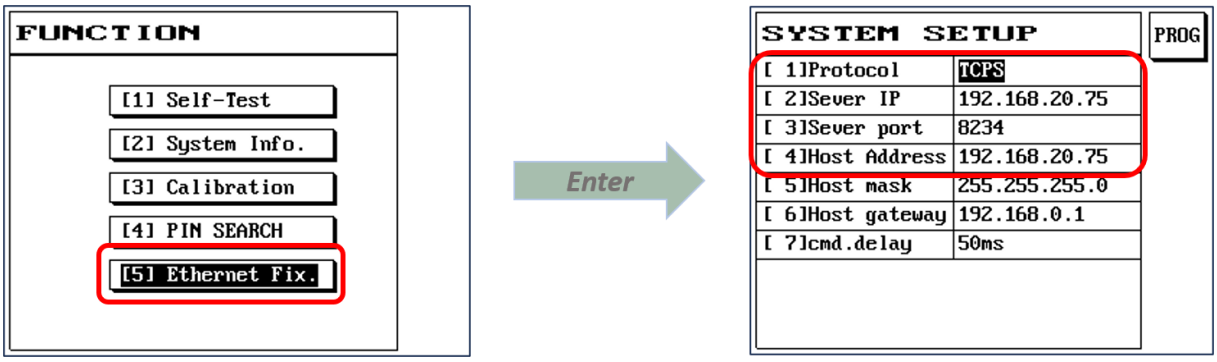


Figure 3.1.17 TPCS

TCPC (TCP Client) and TCPS (TCP Server) are communication protocols that configure the device's mode of operation. TCPC is used when the device initiates communication with a server, while TCPS is used when the device listens for incoming connections as a server.

[4] Connection Confirmation

To confirm the connection is working, open the Command Prompt on your computer and type "**ping + IP address**". Ensure that the packet loss (Lost) equals 0. Refer to the example below:

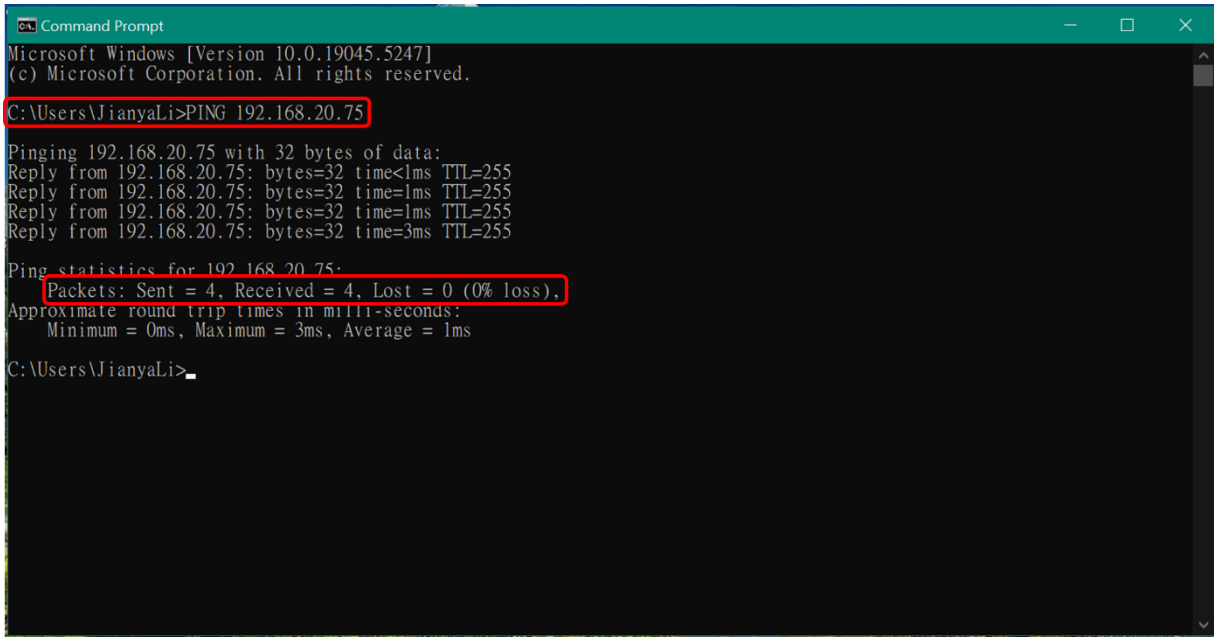


Figure 3.1.18 ping + IP address

After successful confirmation, you can proceed to use LAN communication to control the cable tester.

3.2 System Setup (SYS)

System setting includes system configuration and test related action settings; their operation and function descriptions are as follows:

(1) Press [Sys].

(2) The LCD screen will display as follows:

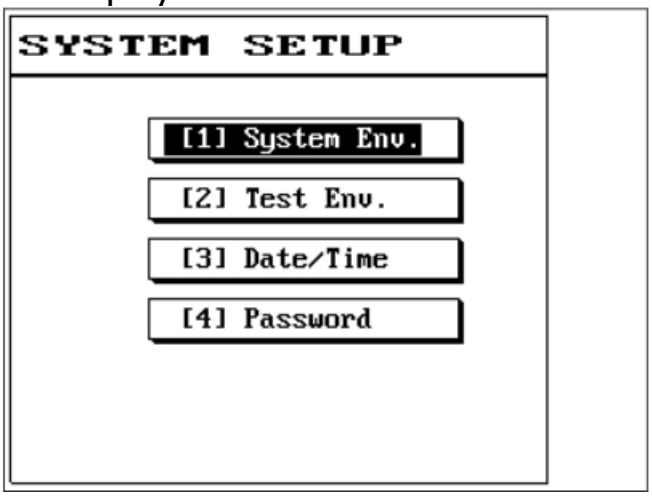


Figure 3.2.3.2.1 System page

(3) Please use [↑] or [↓] to select the item needed and then press [Enter].

(4) Press [Exit] to exit when completed.

3.2.1 System Environment

(1) The LCD screen will display as follows:

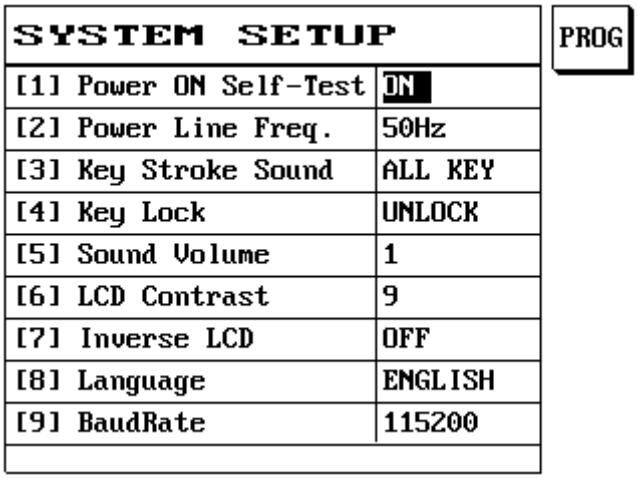


Figure 3.2.2 System Environment

(2) Use [↑] or [↓] to select the desired item.
(3) Press **S1[PROG]** to switch options, if necessary.
(4) Press **[Exit]** to exit once the operation is complete.

Description of Items [1] to [10]

[1] Power ON Self-Test

There are two options available, with the default set to **|On|**:

- **On**: Perform a power-on self-test.
- **Off**: Skip the power-on self-test.

[2] Power Line Frequency

Configure the input power frequency to **50 Hz** or **60 Hz**, depending on the local power standard.

[3] Key Stroke Sound

This tester allows you to enable or disable button sounds based on your preference. The default setting is **|ALLKEY|**.

- **ALLKEY: Play a sound whenever any button is pressed.**
- **DISABLE: No sound is played when buttons are pressed.**
- **VALID: Play a sound only when a valid button is pressed.**
- **INVALID: Play a sound only when an invalid button is pressed.**

[4] Key Lock

This device offers key lock protection to prevent unauthorized modifications to data. To activate this feature:

1. Go to **System Settings** and change the system password.
2. Navigate to **Key Lock** and select **|Lock|** to enable the function.
3. The **LCD screen** will display the following information.

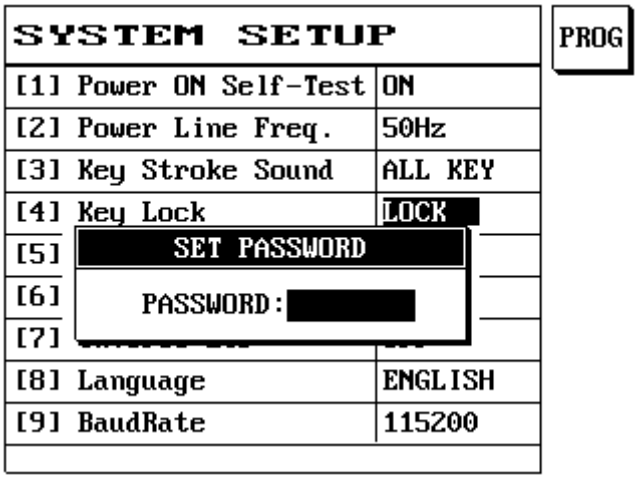


Figure 3.2.3 Key Lock

Note: A password is required to disable the key lock protection. Please refer to the User Manual for detailed instructions.

[5] Sound Volume

Press **S1[PROG]** to adjust the sound volume. (Range: 1 to 10)

[6] LCD Contrast

Press **S1[PROG]** to adjust the LCD brightness level. (Range: 1 to 20)

[7] Inverse LCD

Press **S1 [PROG]** to toggle the LCD display between normal and inverse modes.

[8] Language

Press **S1[PROG]** to switch between Chinese or English display.

[9] Baud Rate

Press **S1 [PROG]** to select the desired baud rate:
1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600, 115200, or 128000.

3.2.2 Test Environment

(1) The LCD screen will display the following:

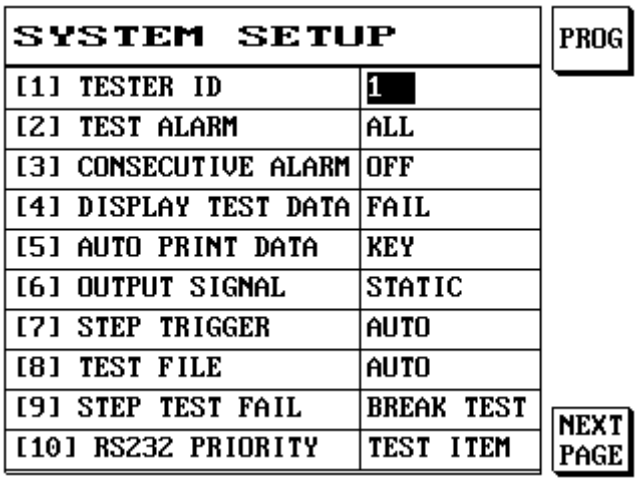


Figure 3.2.4 Test Environment 1-10

(2) **Use [↑] or [↓]** to select the desired item.
(3) Press **S1[PROG]** to switch options, if necessary.
(4) Press **[Exit]** to exit once the operation is complete.

Description of Items [1] to [10]

[1] TESTER ID

This option allows you to assign a unique ID to the tester.

[2] TEST ALARM

This function provides audible alarms for test results. There are four options available based on your needs:

ALL: A sound is emitted regardless of whether the DUT result is pass or fail.
NO: No sound is emitted, regardless of the DUT result.
PASS: A sound is emitted only when the DUT result is pass.
FAIL: A sound is emitted only when the DUT result is fail.

[3] CONSECUTIVE ALARM

This function emits a continuous alarm when errors occur during testing.
ON: Enables the consecutive alarm function.
OFF: Disables the consecutive alarm function.

[4] DISPLAY TEST DATA

This function allows you to configure the display and print format of test statistical data. There are three available options:

ALL: Display and print test data whether there are errors or not.
NO: Do not display and print test data, regardless of whether there are errors.
FAIL: Only display and print the steps where errors occurred.

[5] AUTO PRINT DATA

This function controls whether test data is printed automatically. There are two options available, with the default set to **|KEY|**:

KEY: Automatic printing is disabled. Use manual keys to control whether to print the test data.
AUTO: Automatic printing is enabled, and test data will print automatically.

[6] OUTPUT SIGNAL

This function configures the signal output mode, with three available modes: **STATIC**, **PULSE**, and **OFF**.

OFF: No signal output is provided through remote control.
STATIC: The remote control provides continuous output until the next test begins. If the PLC reception speed is uncertain, it is recommended to use this continuous mode. Note that all output signals are equipped with a **4.7K pull-up resistor** when sent to the PLC input.
PULSE: The remote control sends a pulse output of **200 ms**. Users can adjust the pulse width based on specific requirements.

[7] STEP TRIGGER

This function configures the step start mode. There are three available modes: **KEY**, **AUTO**, and **EXTERNAL**.

[8] TEST FILE

This function allows you to select the test mode: **SINGLE**, **MULTI-STEP**, or **AUTO**.
SINGLE: Executes the test using the current file (the {Current file} displayed on the main screen).
MULTI-STEP: Runs the test based on the selected step file.
AUTO: If step files are available, the step file test is executed. If no step files are present, the current file test is used.

[9] STEP TEST FAIL

This function defines how to proceed when a step file test fails. The available options are:

BACK FIRST: Returns to the first failed step and re-executes it.
REPEAT FIRST: Repeats the entire test from the first step.
BREAK TEST: Stops the test immediately upon failure.
TEST ALL: Continues to execute all remaining steps, even if a failure occurs.

[10] RS232 PRIORITY

This function allows you to prioritize the upload of test results through the **RS232** interface. You can select the upload order based on the **test item** or **multiple DUTs**. The selected option will be uploaded first.

TEST ITEM: Upload results in the order of individual test items.
MUL. DUT: Upload results based on multiple DUTs tested.

Description of Items [11] to [20]

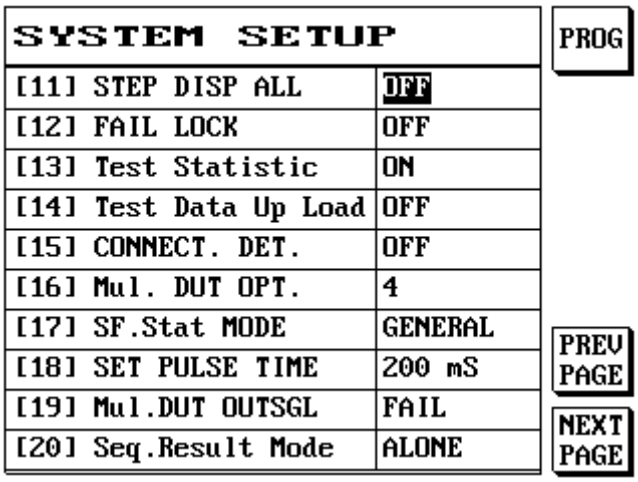


Figure 3.2.5 Test Environment 11-20

[11] STEP DISP ALL

This function controls whether to display the step number during step file testing.

ON: Enables this function. Ensure that **[20] Seq. Result Mode** is set to **|MERGE|.**
OFF: Disables this function.

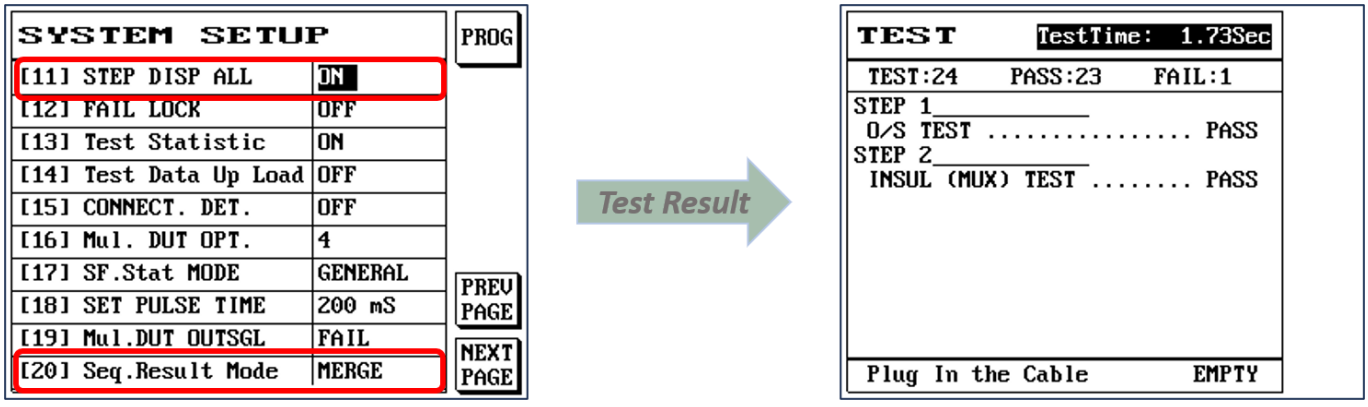


Figure 3.2.6 STEP DISP ALL

[12] FAIL LOCK

This function locks the keys when a test fails. There are four unlock options: **OFF**, **REMOTE**, **EXIT**, and **P.W**.

- **OFF**: Disables the lock function.
- **REMOTE**: Unlock by shorting **pins 9 and 10** on the REMOTE

connector.

- **EXIT**: Unlock by pressing the **EXIT** button.
- **P.W**: Unlock by entering the **password**.

[13] TEST Statistic

This function allows you to select the test result statistics mode. There are three options: **ON**, **OFF**, and **SHIELD**.

- **ON**: Cumulative statistics.
- **OFF**: Statistics are recorded during the test session but cleared when the session ends.
- **SHIELD**: Statistics are neither displayed nor recorded

[14] Test Data Up Load

This function allows you to select whether to upload the test results.

- **OFF**: Do not upload the test results.
- **USB STORE**: Save the test result file to a USB flash drive.
- **TO PC USB**: Transmit the test results to a computer terminal via the RS232 interface.

[15] CONNECT. DET

This function tests each step file sequentially and ends the test when a **PASS** result is achieved. If the test passes, the final result is **PASS**; if all step files fail, the final result is **FAIL**.
When this function is enabled, item "[9] STEP TEST FAIL" will be disabled.

[16] Mul. DUT OPT

This function sets the maximum number of DUTs for multi-DUT testing.

- **4**: Supports up to 4 DUTs.
- **14**: Supports up to 14 DUTs (**F874001 Multiple DUT Testing Expand Box** is required for use with REMOTE signal output).

[17] SF. Stat MODE

This function configures how statistics are recorded after testing.

- **General**: Statistics are recorded once the test is completed.
- **Empty**: Statistics are recorded only after the DUT is removed, and the short-circuit breaker is in an empty state.
- **Multi-DUT (MUL.DU)**: Statistics are recorded for multiple DUTs after the test is completed.

[18] SET PULSE TIME

This function sets the pulse hold time for **REMOTE signal output** when pulse mode is used. The time range is **1–1000 seconds**.

[19] Mul. DUT OUTSGL

This function configures the output signal based on the test result for multiple DUTs.

- **PASS**: Outputs a signal when the test result is **PASS**.
- **FAIL**: Outputs a signal when the test result is **FAIL**.

Note: If **[16] MUL. DUT OPT** is set to **14**, an external **F874001 Multiple DUT Testing Expansion Box** is required to display the test signals for 14 DUTs.

[20] Seq. Result Mode

This function configures how the test results for each step are output. This function is only effective when **[11] STEP DISP ALL** is set to **ON**.

- **MERGE**: Outputs and displays the result of each step individually.
- **ALONE**: Only displays the result of the latest step.

Description of Items [21] to [30]

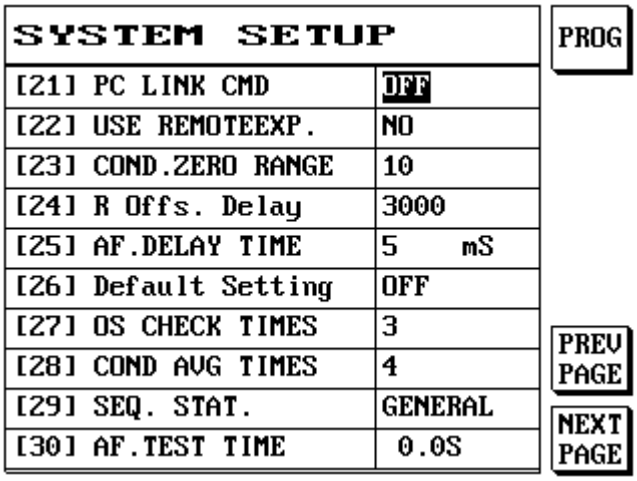


Figure 3.2.7 Test Environment 21-30

[21] PC LINK CMD

This function controls the use of the connection with official software via RS-232.

- **ON**: Used with official connection software.
- **OFF**: Not used with official connection software.

When enabled, a string of test parameters will be appended to the data at the end of the test result upload via RS-232.

[22] USE REMOTEEXP.

This function controls the use of the remote expansion box.

- **ON**: Enable the remote expansion box.
- **OFF**: Disable the remote expansion box.

This function must be enabled when connecting the **F874001 Multiple DUT Testing Expansion Box**.

[23] COND.ZERO. RANGE

This function sets the limit range for conduction zeroing between **1 to 45 ohms**. If the offset value exceeds the specified limit, the **COND Zeroing** function will be disabled.

[24] R Offs. Delay

Sets the zeroing delay time for resistance (R) measurement. The range is

3000 µs to 60000 µs.

[25] A/VF. DELAY TIME

Sets the output delay time for the current box. The range is **1 ms to 1000 ms**.

[26] Default Setting

This function controls whether to reset the system to its default settings.

- **ON**: Resets the system to default settings.
- **OFF**: Does not reset the system to default settings

[27] OS CHECK TIMES

When an O/S test fails, the device will automatically re-test. If the number of re-tests reaches the specified limit, the final test result will be determined as **FAIL**. The range is **1 to 1000**.

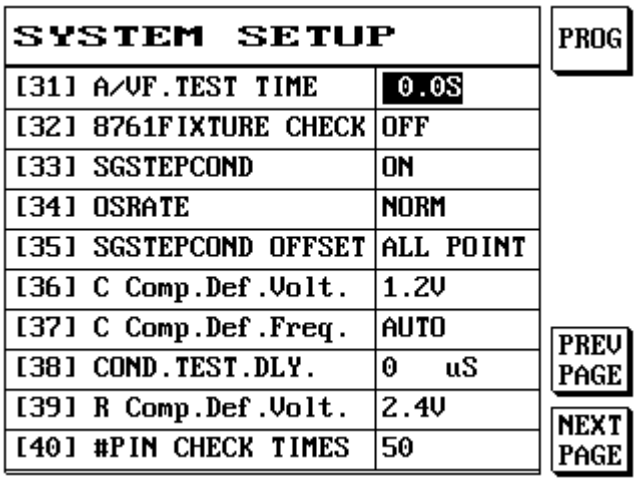
[28] COND AVG TIMES

This function sets the number of averages for conduction resistance testing. The range is **1 to 99**.

[29] SEQ. STAT

This function configures how statistics are recorded after multiple steps testing.

- **General**: Statistics are recorded once the test is completed.
- **Multi-DUT (MUL.DU)**: Statistics include multiple DUTs after the test is completed.



[30] A/VF. TSET TIME

This function is only effective when a current box is connected. It sets the continuous measurement time. The range is **0.0s to 60.0s**.

- **0.0s**: Single measurement.
- **0.1s~60.0s**: Multiple measurements with averaged results.

Description of Items [31] to [40]

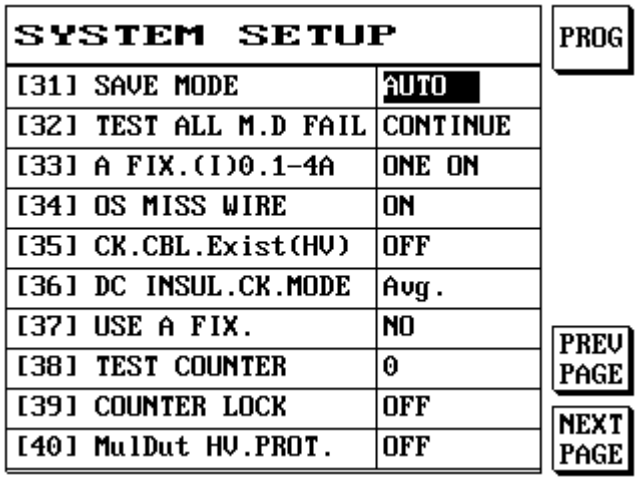


Figure 3.2.8 Test Environment 31-40

[31] SAVE MODE

- **AUTO:** Saves when the exit button on the setting screen is pressed.
- **MANUAL:** The save button must be pressed for saving.

[32] TEST ALL M.D FAIL

This function sets the behavior when a failure occurs during multi-DUT testing.

- **Fail Continue**: If a DUT fails, testing will continue with the remaining DUTs.
- **All Fail Stop**: If all DUTs fail, the test will stop.

[33] A FIX. (I) 0.1-4A

This function controls the current output mode.

- **ALL ON**: All channels output current simultaneously.
- **ONE ON**: A single fixed channel outputs current.

[34] OS MISS WIRE

This function enables or disables OS miss wire detection.

- **ON**: Enables the OS miss wire detection function.
- **OFF**: Disables the OS miss wire detection function

[35] CK. CBL. Exist (HV)

This function checks whether the DUT has been removed before the high voltage test completed.

- **ON**: Gives a warning if the DUT is removed before the high voltage test is completed; the DUT must include a short-circuit breaker.
- **OFF**: Disables the warning function.

[36] DC INSUL. CK. MODE

This setting defines the data acquisition logic for the DC insulation measurement:

- **IMM (Immediate):** The tester performs a single-point sampling at

the end of the test duration to determine the final result.

※ Ideal for: High-speed production testing or DUTs with stable insulation characteristics.

- **AVG (Average)**: The tester performs multiple sampling points throughout the test duration and calculates the arithmetic mean to determine the result.

※ Ideal for: Situations where insulation values fluctuate or the test environment is susceptible to electromagnetic interference, ensuring a more stable and reliable Pass/Fail judgment.

[37] USE A FIX

This setting defines the communication protocol and hardware compatibility for the connected DC Bias Current Source:

- **No**: Disabled. No external current box is connected.
- **I:** First Generation**.**
- **II**: Second Generation.

[38] TEST COUNTER

This function provides a warning when the number of tests reaches the specified limit. Setting the value to **0** disables this function. The range is **0–999999**.

[39] COUNTER LOCK

This function locks the keys when the counter is completed. There are four unlock options: **OFF**, **REMOTE**, **EXIT**, and **P.W**.

- **OFF**: Disables the lock function.
- **REMOTE**: Unlock by shorting pins 9 and 10 on the REMOTE connector.
- **EXIT**: Unlock by pressing the EXIT button.
- **P.W**: Unlock by entering the password.

[40] MulDut HV.PORT.

This function ensures that other DUTs are protected from high voltage damage during multi-DUT high voltage testing.

Description of Items [41] to [50]

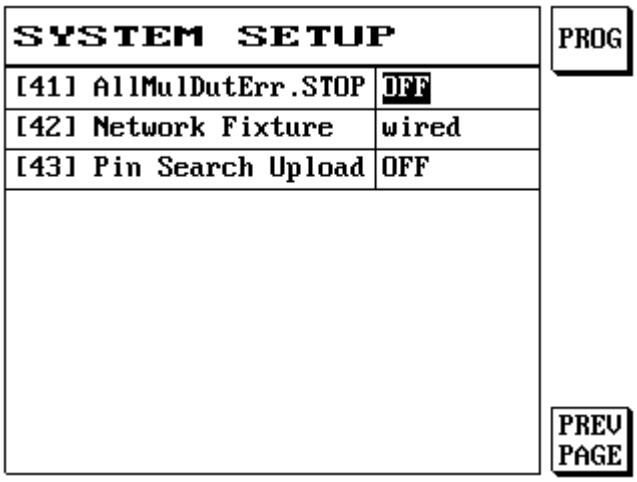


Figure 3.2.9 Test Environment 41-43

[41] AllMulDutErr.STOP

This function stops all testing if the DUT being tested fails across all test items during multi-DUT testing.

For example: If there are 3 DUTs and all test items for **DUT1** fail, **DUT2** and **DUT3** will not be tested.

[42] Network Fixture

This function allows you to select the network-enabled fixture.

- **Wired**: F874004
- **Wireless**: FX-CB0001

[43] Pin Search Upload

This function enables or disables the output of pin search results via the **RS-232 interface**.

3.2.3 System Date/Time

This function allows you to adjust the system's **year, month, day, hour, minute, and second**.

1. **Press [Sys]** to access the system menu.
2. **Use [↑] or [↓]** to select **[3] Date/Time**.
3. The LCD screen will display the following format: **MM/DD/YY**.

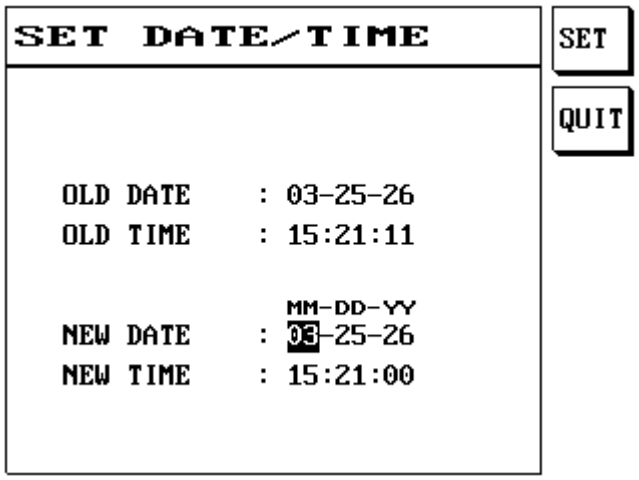


Figure 3.2.10 Time setting

4. Input the correct date and time, then press **S1 [SET]** to save.
5. **Press [Exit]** to exit the menu.

Note: Time is set in **24-hour format**.

3.2.4 Changing the System Password

This tester provides key lock protection to prevent unauthorized modification of data.

1. **Press [Sys]** to access the system menu.
2. **Use [↑] or [↓]** to select this item and press **[Enter]**.
3. The LCD screen will display the following options.

4. **First-time password setup:**
   (1) Enter the new password directly.
   (2) If a password was previously set, you must first enter the original password and press **[Enter]**.
5. **Password confirmation:**
   (1) Enter the new password again and press **[Enter]**.
   (2) The screen will display **{Successfully set}** once the password is confirmed.
6. Upon successfully setting the new password, the system will automatically return to the function menu.
7. **To change the password,** repeat the steps above

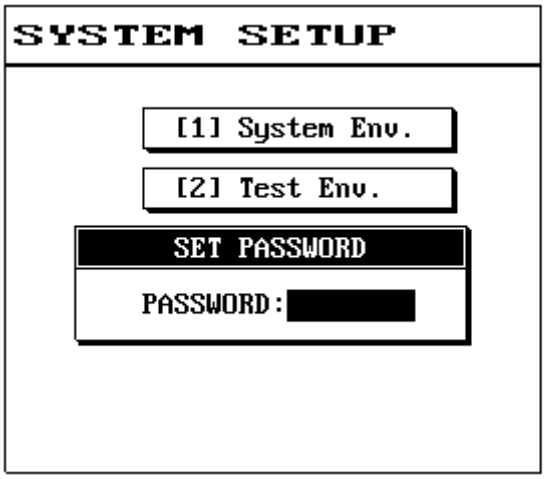


Figure 3.2.11 System Password

(1) If you are setting the password for the first time, enter the new password directly. If you have previously set a password, then you must first enter the original password and press [Enter].
(2) Then enter the new password again and press [Enter]; the screen will display {Successfully set} at this time.
(3) Once the new password was successfully set, it will automatically return to the function menu.
(4) To change the password, please repeat the setting steps described above.

3.3 Print

This tester provides direct printer output, making it easy for you to print out the data needed; its operation and function descriptions are as follows:

(1) Select the data or screen needed.
(2) Simply press [Print].

3.4 Statistic

This function allows viewing of the test result statistical data, including: total number of tests, number of passes, number of fails and cause of failure analysis, which searches for the number of fails in each item category.

(1) Press [Stat].
(2) The LCD screen will display as follows.

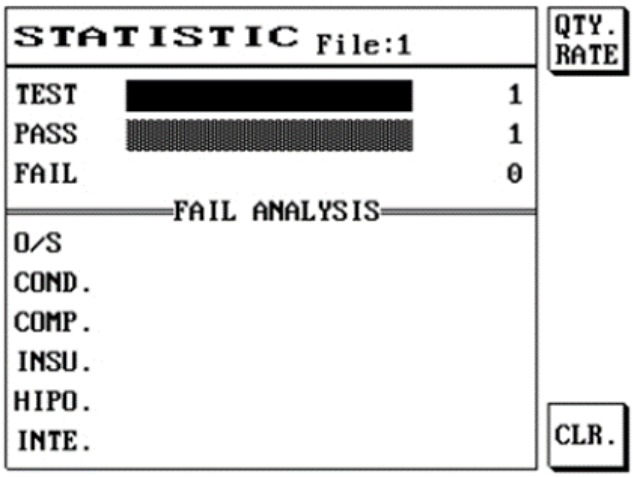


Figure 3.4.3.4.1 Statistic-Number

(3) Press S1 [QTY.RATE] to display the statistical data using percentages.
(4) The LCD screen will display as follows.

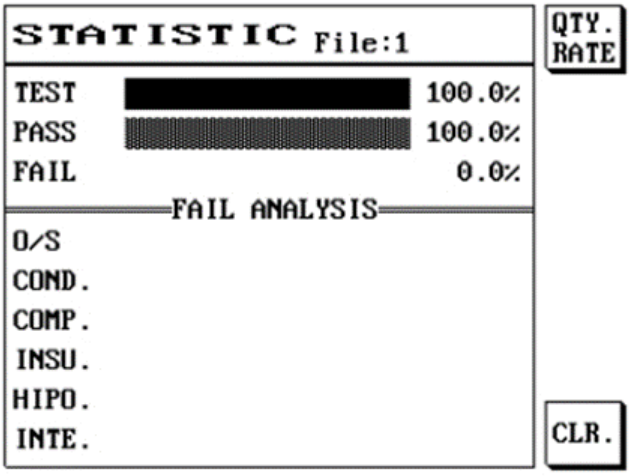


Figure 3.4.3.4.2 Statistic-Percentage

(5) Press S6 [CLR] to clear all current statistical data.

(6) Press [Exit] to exit when completed.

3.4.1 O/S Page Overview

Press [O/S] and then press S6 [O/S EDIT] to enter TEST MODE page.

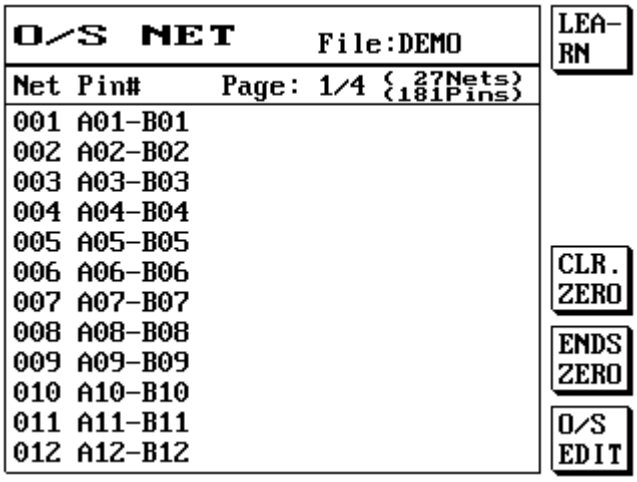


Figure 3.4.3 O/S Page

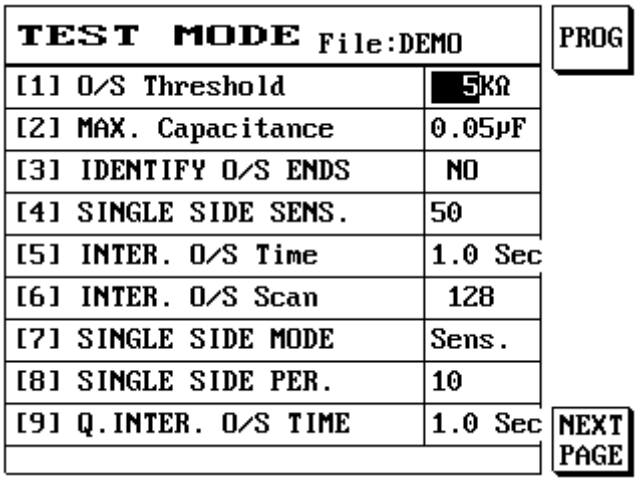


Figure 3.4.4 O/S Edit page 1/2

Description of Items [1] to [9]

[1] O/S Threshold:

Available options include 2K, 5K, 10K, 20K and 100K; other functions are used to determine the short circuit value. If it is set as 2K, cables with resistance under 2K are considered to be short-circuited and with resistance

above 2K are considered to be open circuit.

[2] Max. Capacitance:

Can be set between 0.05u-5u; this value should be set to a great number when the cables are longer in order to have stable tests.

[3] IDENTIFY O/S ENDS:

This is able to display the index display for the A Port or B Port short circuit.

[4] SINGLE SIDE SENS:

This act when the cable type is set as unilateral; it is considered short circuit when the test value is higher than the value set here.

[5] INTER. O/S TIME:

Unlimited when set to 0; the test will only stop when the DUT is removed. When a value is set, it is the number of seconds to test.

[6] INTER. O/S Scan:

128/256/512/1024 items can be set.

Sets test point upper limit; if set as 128, the test will scan from PIN1 (A01) to PIN128 (B64). To reduce test time.

[7] SINGLE SIDE MODE:

Sensitivity Sens.: Uses single side test sensitivity as the standard value; when the test value is greater than the standard value, the test result is FAIL.

Percentage Perc.: Uses the capacitance value learned as the standard value; when the test value is greater than the percentage range of the standard value, the test result is FAIL.

[8] SINGLE SIDE PER.:

The percentage setting value for the percentage mode of the single side test mode.

[9] Q.INTER. O/S TIME:

Sets test time, 0 means repeat test and the result is determined as PASS when DUT is removed.

[10] SINGLE SIDE Scan:

The max pins to be scanned of Single side

Press S6(NEXT PAGE).
The LCD will display the following screen:

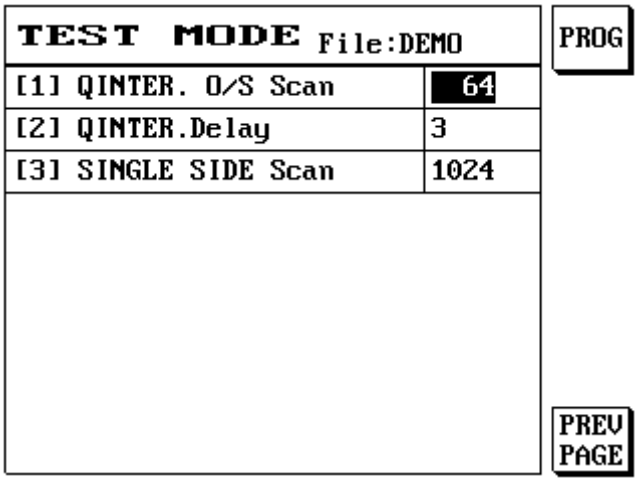


Figure 3.4.5 O/S Edit page 2/2

Description of Items [1] to [3]

[1] QINTER. 0/S Scan:

Sets test point upper limit; if set as 128, the test will scan from PIN1 (A01) to PIN128 (B64). To reduce test time.

[2] QINTER. Delay:

The capacitance of the DUT itself causes the test to be unstable;

increasing the delay time will increase the test stability.

[3] SINGLE SIDE Scan:

The max pins to be scanned of Single side.

3.4.2 Mode Page Overview

(1) Press [Mode]
(2) The LCD screen will display as follows:

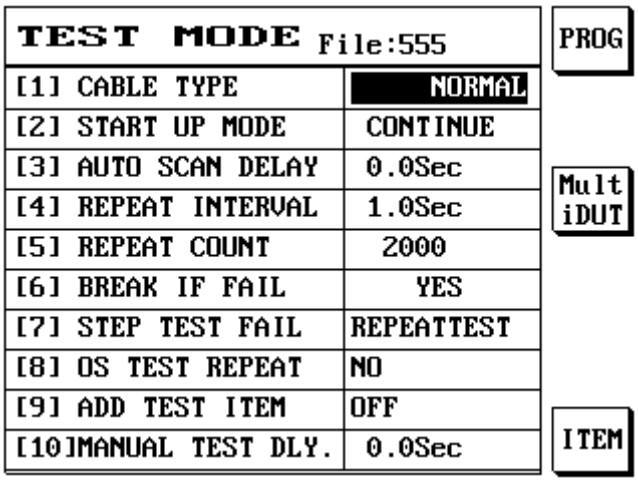


Figure 3.4.6 Mode page

[1] CABLE TYPE:

- **NORMAL**

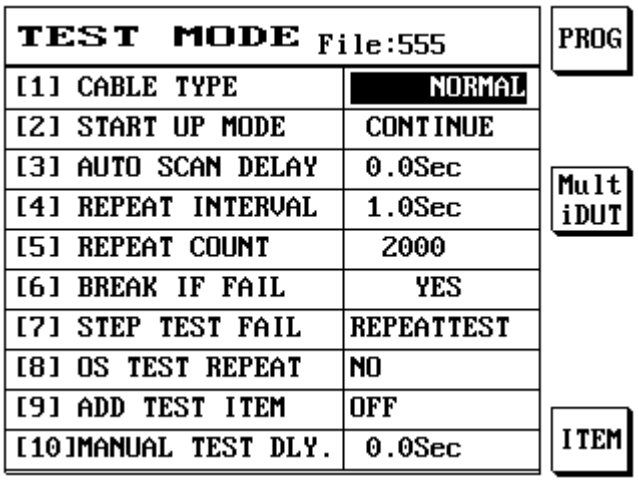


Figure 3.4.7 Cable type - Normal

Press [Learn]; the LCD screen will display as follows:

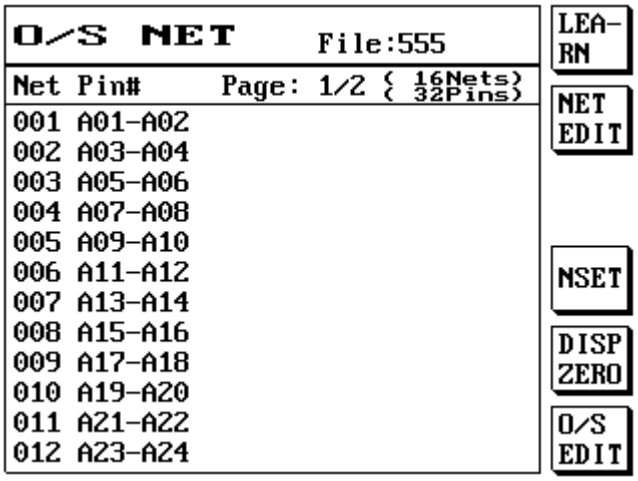


Figure 3.4.8 Cable type normal - O/S net

When performing the cable test, press [TEST] and the LCD screen will display as follows:

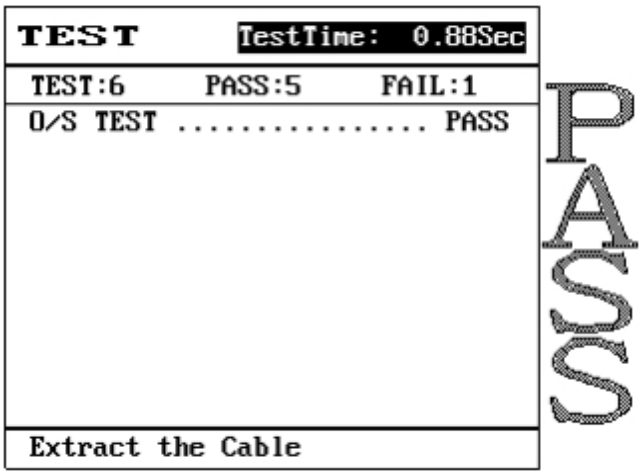


Figure 3.4.9 Cable type normal - Result

From the LCD display screen, we can find out the total number of tests and the number of passes and fails.

- **{SINGLE STEP}.**

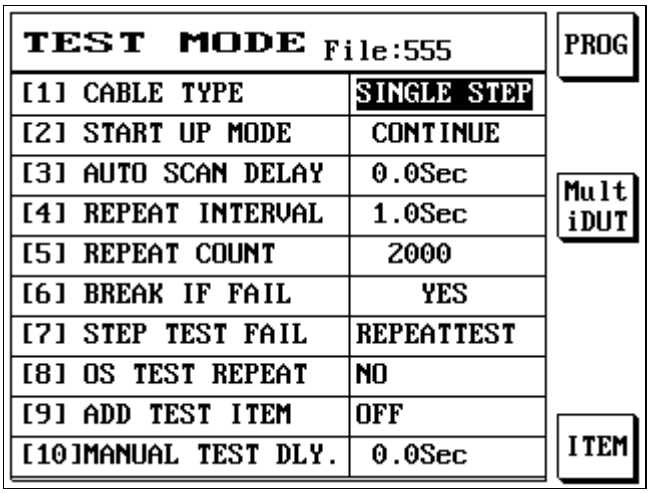


Figure 3.4.10 Cable type - Single Step

Press [Learn]; the LCD screen will display as follows:

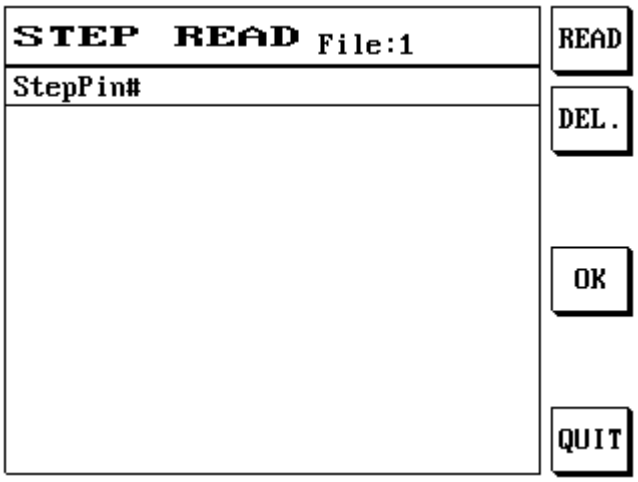


Figure 3.4.11 Cable type Single step - O/S net 1/2

Use the automatic pin search probe to specify the short circuit pin to test; example is as follows:
When using the PIN SEARCH probe on the panel, touch the relative position (A01) specified by the cable and the LCD will display that pin.

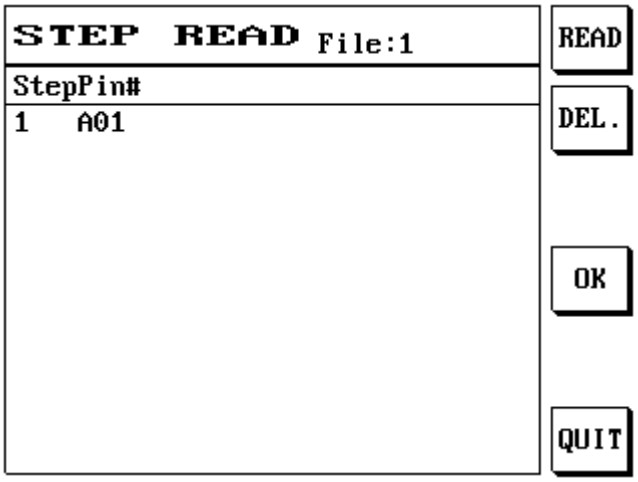


Figure 3.4.12 Cable type Single step - O/S net 2/2

Place the probe sequentially on the pins specified by the cables (A03, A05, A07) and also press S1 [READ]; press S4 [OK] when completed.
When performing the cable test, press [TEST] and the LCD screen will display as follows:

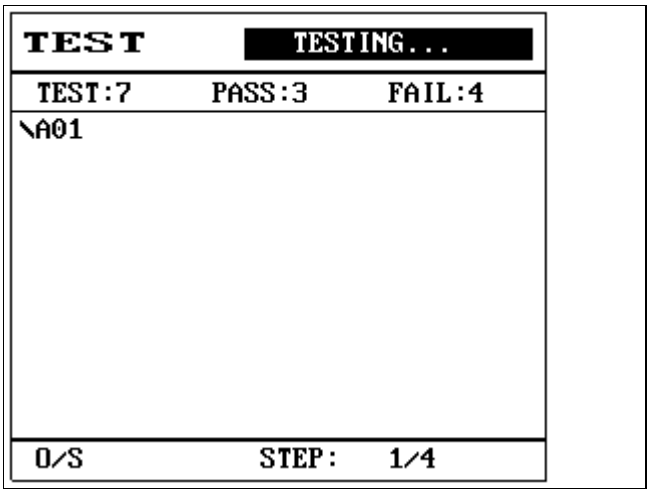


Figure 3.4.13 Cable type Single step - Result 1/3

Please use the automatic pin search probe and place it on A01; the LCD screen will display as follows:

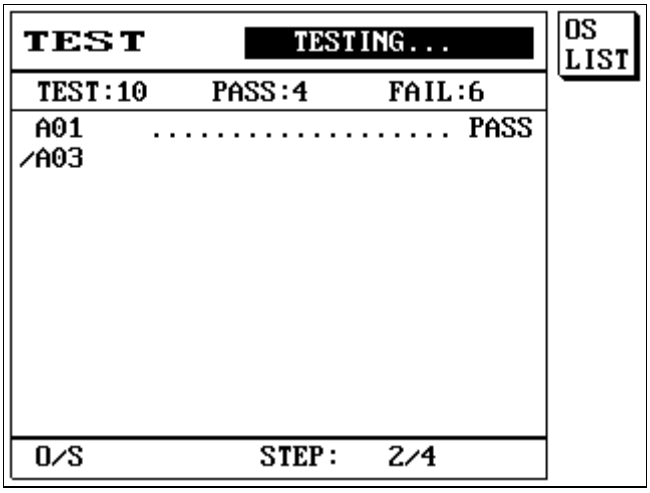


Figure 3.4.14 Cable type Single step - Result 2/3

The automatic pin probe must be placed on A03, A05, and A07 sequentially in order to complete the cable test action.

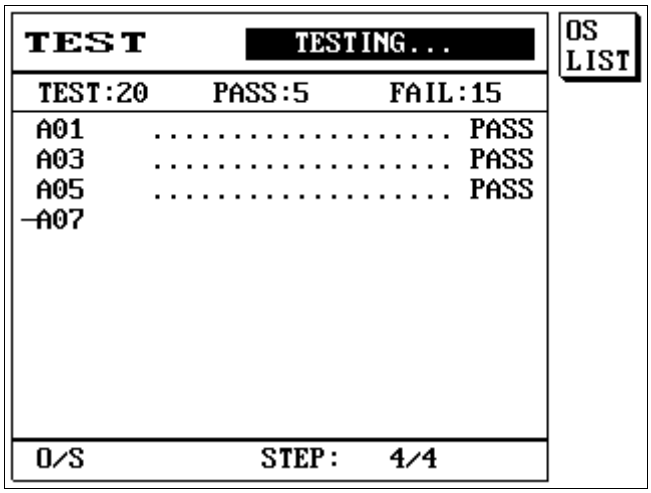


Figure 3.4.15 Cable type Single step - Result 3/3

Since we initially have 4 steps preset, so for the test of each DUT, steps 1 to 4 of the step test must be completed successfully in order for it to pass. A maximum of 128 test steps can be set.

- **{SINGLE SIDE}**

Press [Learn] when there is no DUT, the LCD screen will display as follows:

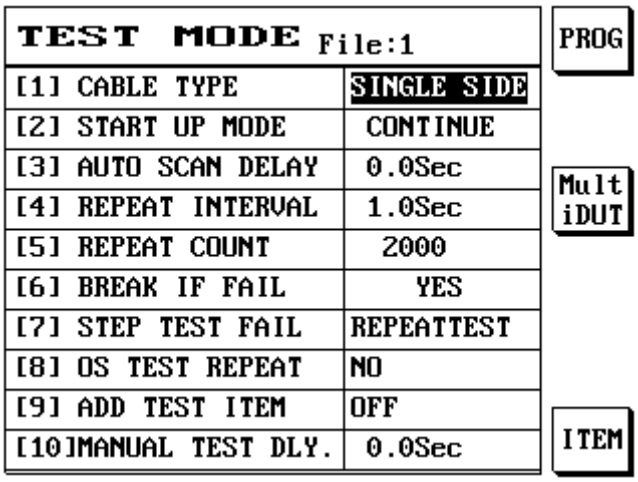


Figure 3.4.16 Cable type - Single side

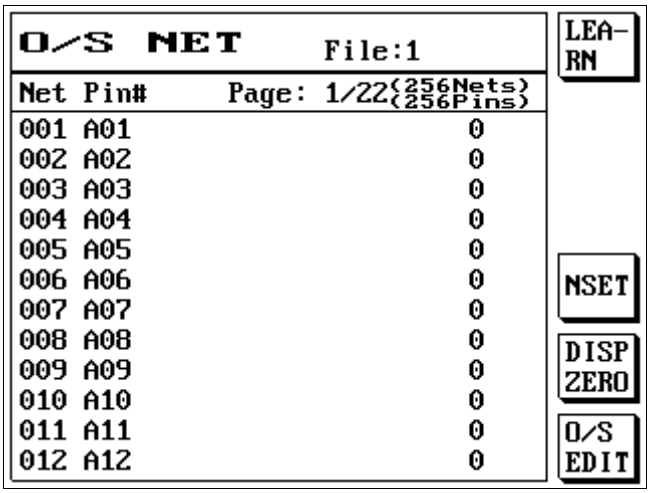


Figure 3.4.17 Cable type Single side - O/S net 1/2

The value displayed at the right of the screen is the unilateral test sensitivity; press S5 O/S ZERO and then press LEARN and the value will change to zero. S4 is the CLR.ZERO value.
Press [Learn] after inserting the DUT, the LCD screen will display as follows:

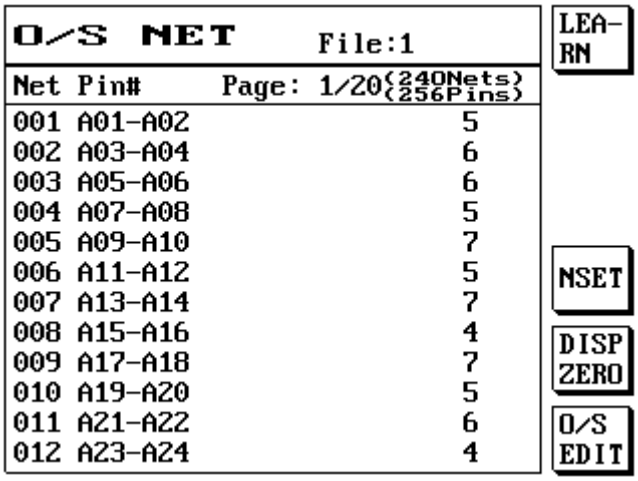


Figure 3.4.18 Cable type Single side - O/S net 2/2

When test mode is being set, enter the value needed for the **SINGLE SIDE SENSE**.
P.S Use 80-90% of the minimum value learned as the setting value.

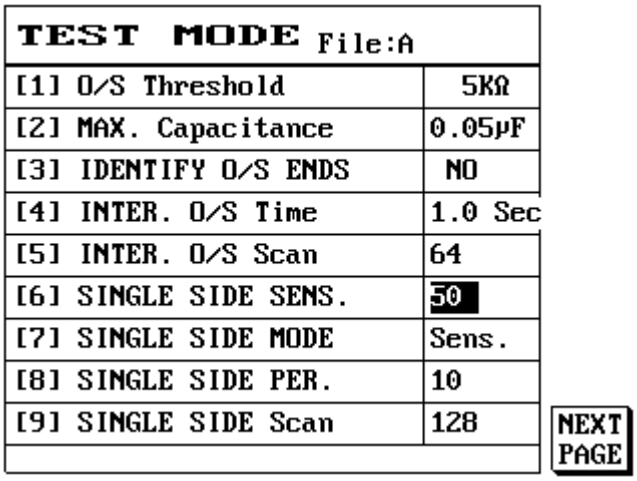


Figure 3.4.19Cable type Single side- sense setting

When performing the cable test, press [TEST] and the LCD screen will display as follows:

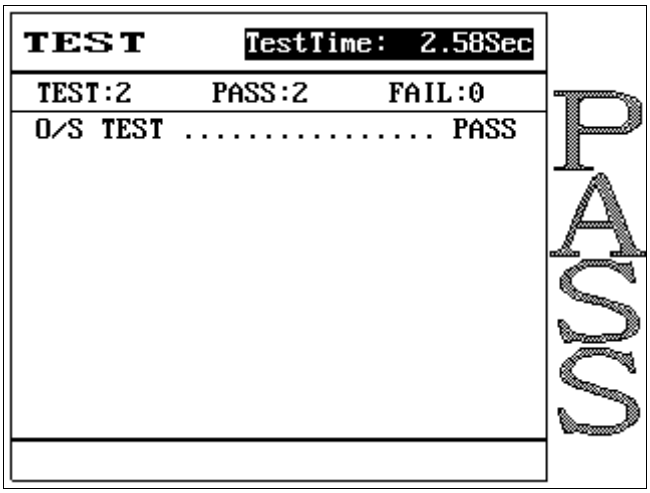


Figure 3.4.20 Cable type Single side - Result

From the LCD display screen, we can find out the total number of tests and the number of passes and fails.

[2] START UP MODE:

AUTO SCAN: Starts test after the DUT is inserted.
MANUAL: Press the Test button after the DUT is placed to start the test.
CONTINUE: Continuous tests are performed after the Test button is pressed.

[3] AUTO SCAN DELAY:

This is only effective when Automatic is selected as the test start method;

its function is to wait a few seconds before starting the test after the DUT is inserted.

[4] REPEAT INTERNAL:

The cable activation mode is the repeat test interval of repeat test.

[5] REPEAT COUNT:

This is only effective when Continuous is selected as the test start method; it allows setting of the number of times to test.

[6] BREAK IF FAIL:

If errors occur during test, there are three options displayed at all times: {Stop test}, {Do not test high voltage} and {Finish all tests}.

[7] STEP TEST FAIL:

REPEATTEST: When the cable type is point test and this step test fails, repeat this step test.
BACK FIRST: When the cable type is point test and this step test fails, return to the first step test.

[8] OS TEST REPEAT:

YES: Continue test when short-circuit test fails; determines test result as FAIL when DUT is removed.
NO: Determines test result as FAIL when short-circuit test fails.

[9] ADD TEST ITEM

Can selected OPEN/SHORT, CONDUCTANCE, COMPONENT, AC HIPOT, DC INSUL, Q. COND, INTERM O/S, Q. INT. OPEN to test one more time.

[10] MANUAL REST DELAY:

When the test button is pressed, delay in the length of time set and then

start test.

3.4.3 Multi-Dut

The steps for setting up Multi-DUT pin configuration are as follows:

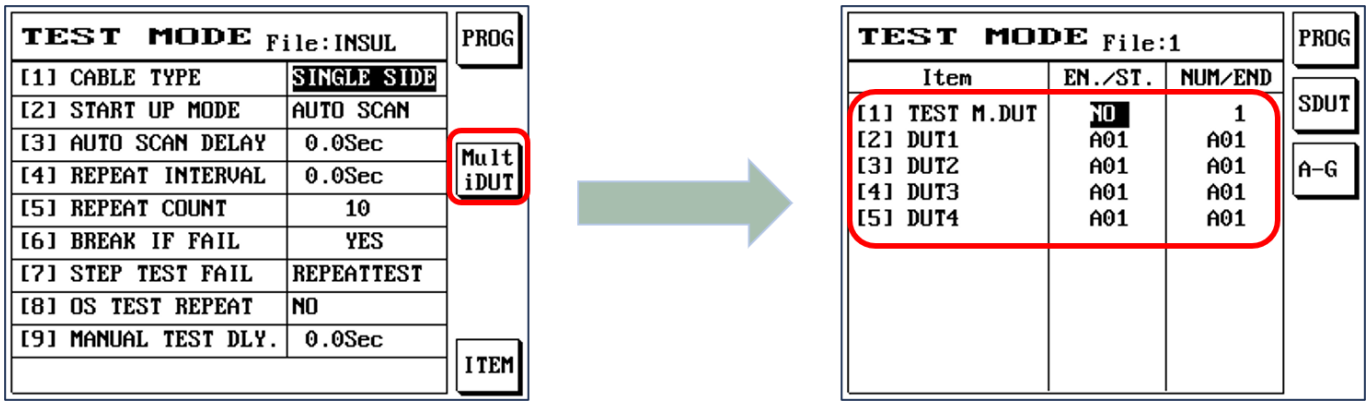


Figure 3.4.21 Multi - DUT Settings

1. **Press [MODE]** to enter the mode settings menu.
2. **Select S3 [MultiDUT]** to access the Multi-DUT settings page.
3. **[1] TEST M. DUT**: Enable the Multi-DUT function and select the number of DUTs.
4. **Configure the pins** for each DUT.
5. The test result for each DUT will be displayed in the **upper-right corner of the screen**.

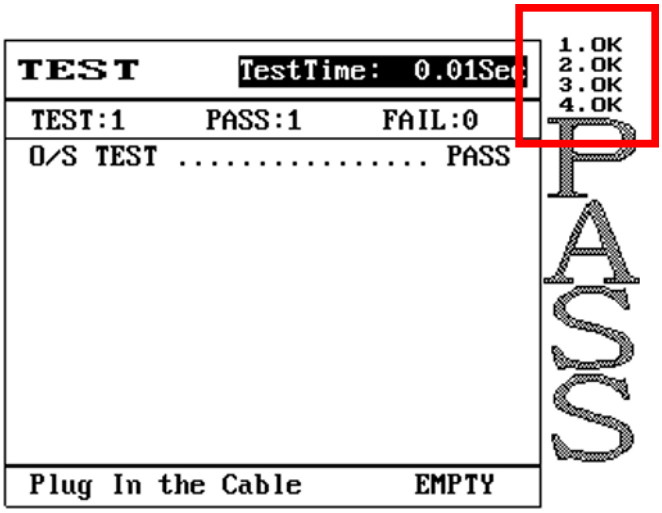


Figure 3.4.22 Multi - DUT test result

Note:

- There are **4-DUTs** and **14-DUTs** modes available for selection.

To configure this setting, navigate to: **SYS → [2] Test Env. → [16] Mul. DUT OPT**

- When selecting **14 DUTs**, you must connect the **F874001 Multiple DUT Testing Expand Box** to enable Pass/Fail signals.

3.4.4 Item

To configure items for testing, follow these steps:

1. **Press [Mode]**, then select **[Item]** to enter the item configuration page.
2. **Use [↑] or [↓]** to navigate to the item you want to set.
3. **Press S1 [Item Selection]** to toggle whether the selected item will be included in the test.

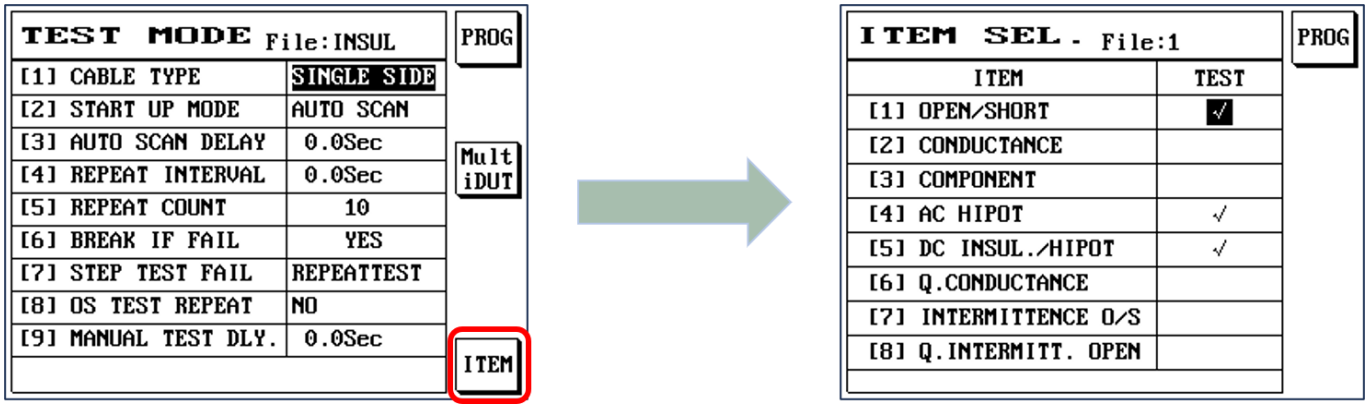


Figure 3.4.23 Test item select

Chapter 4. Integrated Test Mode

This mode allows for automated testing with tailored configurations for different test items. Using **programmable settings**, various conditions can be assigned to different tests, enabling simultaneous and automatic execution to meet diverse requirements and achieve optimal efficiency.

4.1 Test Condition Setting

This section explains how to configure control standards and testing conditions for the DUT (Device Under Test). It covers essential settings such as **Open/Short (O/S), Conductance (Cond), R/C/D (Resistance, Capacitance, Diode), HIPOT** and **Intermittent O/S, COND, OPEN.**

4.1.1 OPEN/SHORT Circuit Table

Learn & Edit

The OS circuit table for the product can be obtained through **learning.**

Learning:

- Connect the DUT to the device.
- Press the **Learn** button or select **Learn (S1)** on the O/S page to learn the circuit configuration of the DUT.

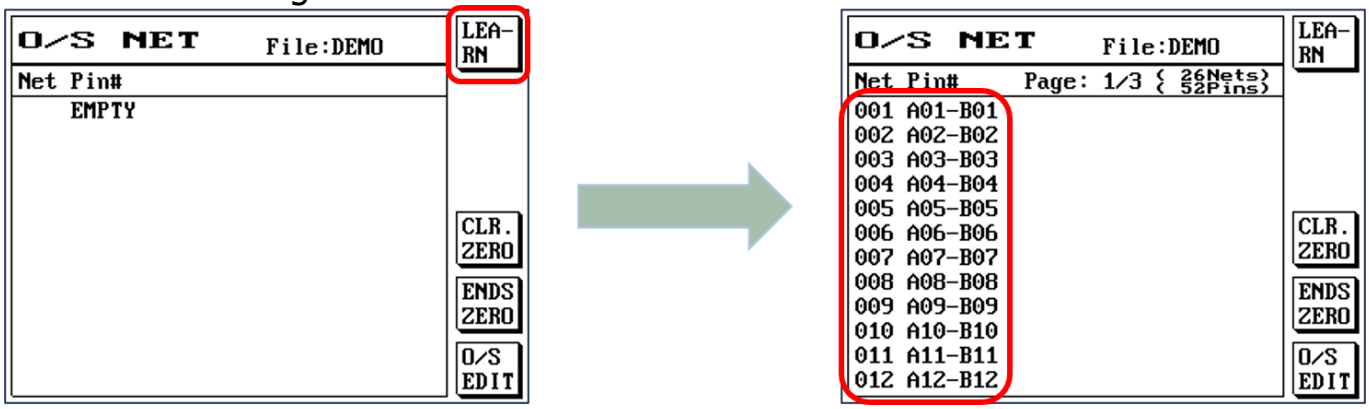


Figure 4.1.1 Learn

4.1.2 Conductance

Press the **COND** button to access the **Conductance settings** page. This page allows you to configure various parameters related to conduction resistance, including the settings for **intermittence O/S.**

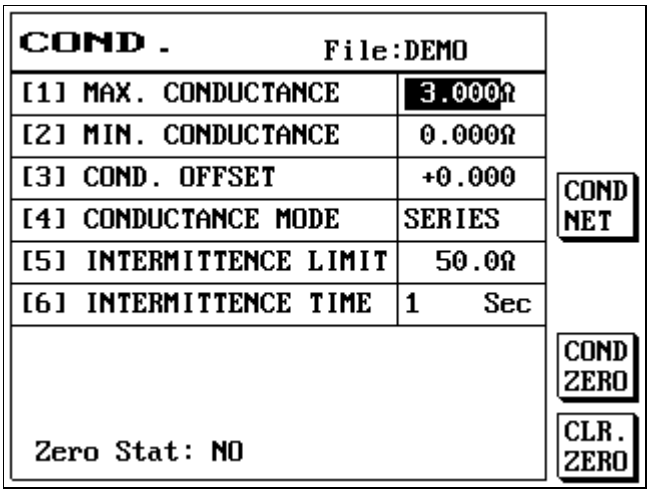


Figure 4.1.2 Conductance

(1) Maximum conductance value:
Use the number buttons to enter the desired upper limit for the cable's conductance.

(2) Minimum conductance value:
Use the number buttons to enter the desired lower limit for the cable's conductance.

(3) Conductance adjustment value:
Enter a resistance value to adjust the resistance of the fixture as needed.

(4) Conductance mode:
Use **S1 [Item Selection]** to switch between the following modes:

- **Serial**
- **Radiation**
- **Composite**

(5) Intermittence limit:
Enter a resistance value to serve as the threshold for determining the test result.

(6) Intermittence time:
Enter a time value to define the duration required for the test to continue. The valid range is **0.00 to 60.00 seconds**.

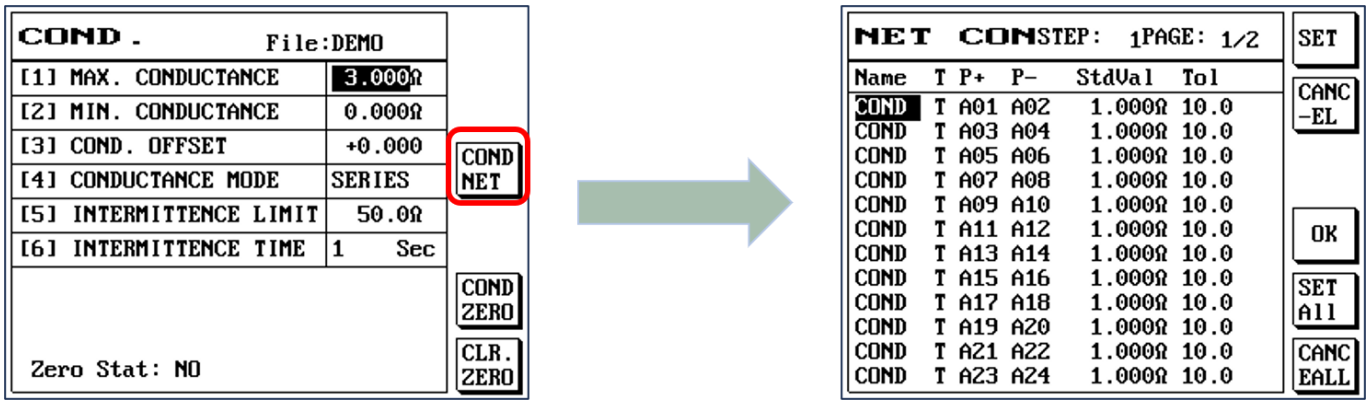


Figure 4.1.3 Cond. net selects 1/2

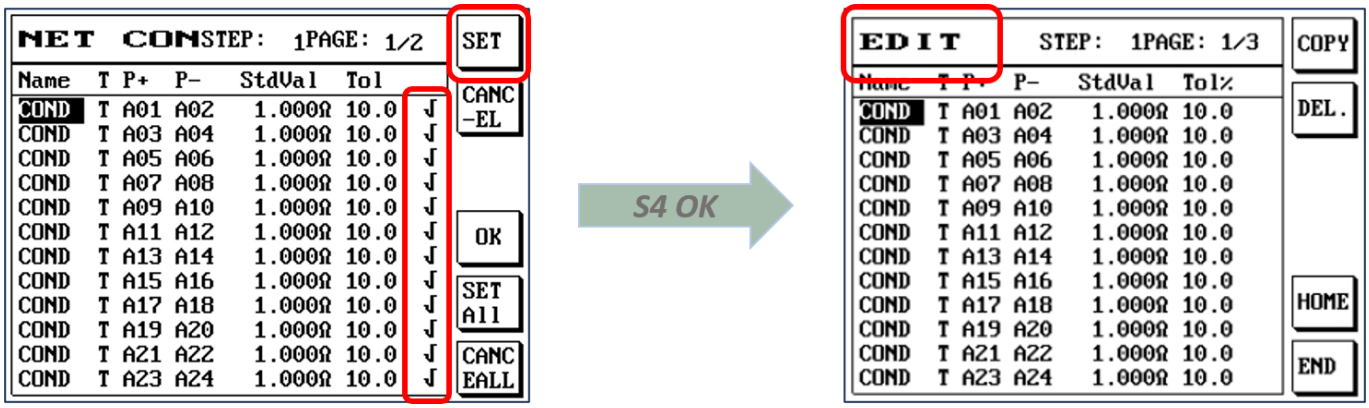


Figure 4.1.4 Cond. net selects 2/2

1. **Press S3 [COND NET]** to enter the **NET CON** page.
2. **Press S1 [SET]** to select the desired test point.
3. After selecting, **press S4 [OK]** to transfer the selected test point to the **R/C/D page** for further configuration.

(7) COND ZERO:

After inserting the offset fixture, press **S5 [COND ZERO]** to perform the offset operation. The **zero status** will display **"Yes"** at the bottom of the screen, indicating that the offset is applied.

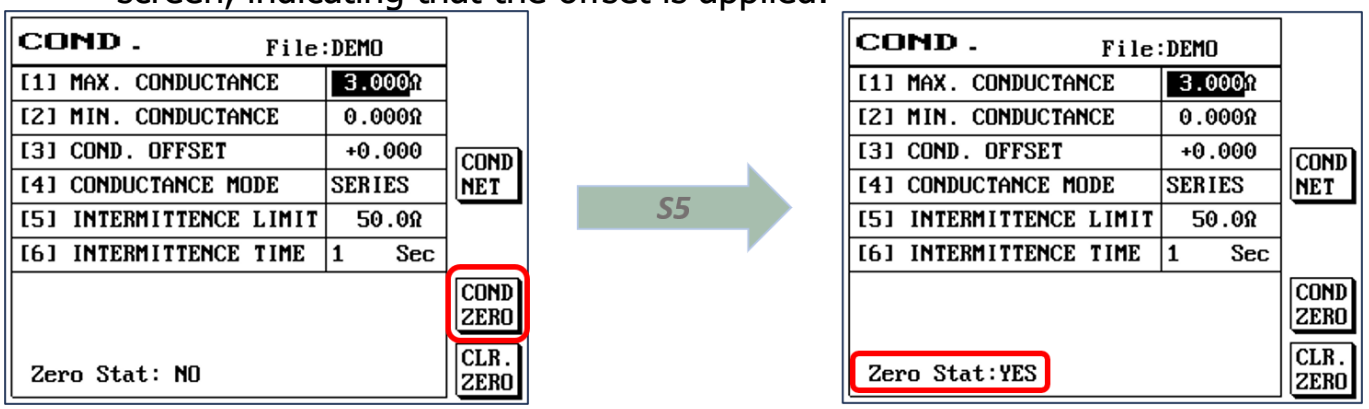


Figure 4.1.5 Cond. zero

(8) CLR. ZERO:

Press **S6 [CLR ZERO]** to clear the previous conduction offset value. The **zero status** will display **"No"** at the bottom of the screen, indicating that the offset has been cleared.

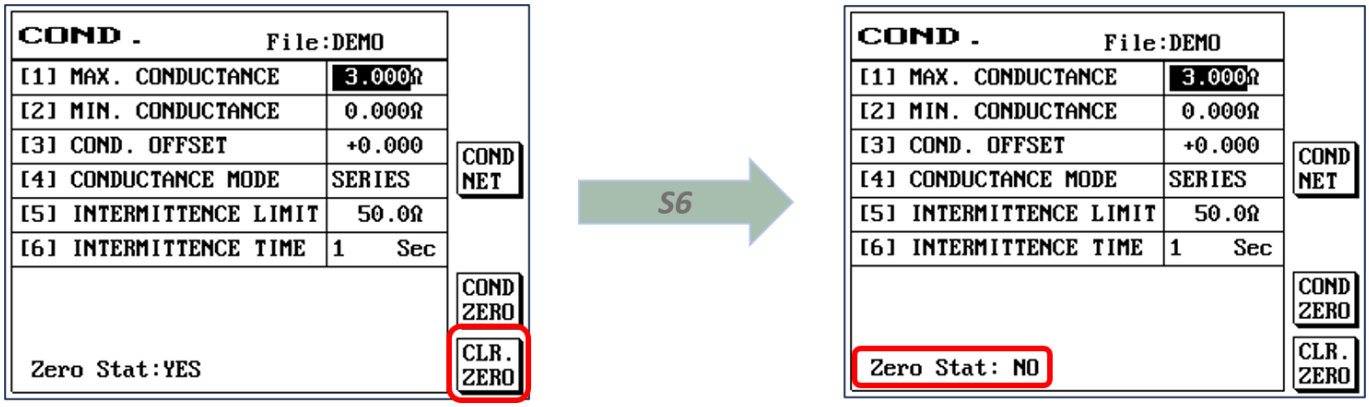


Figure 4.1.6 Cond. clear zero

Note: Short circuit according to the minimum resistance value of the DUT's NET for offset fixture.

4.1.3 R/C/D Component Setting Edit

Press the [R/C/D] button and the screen will display as follows:

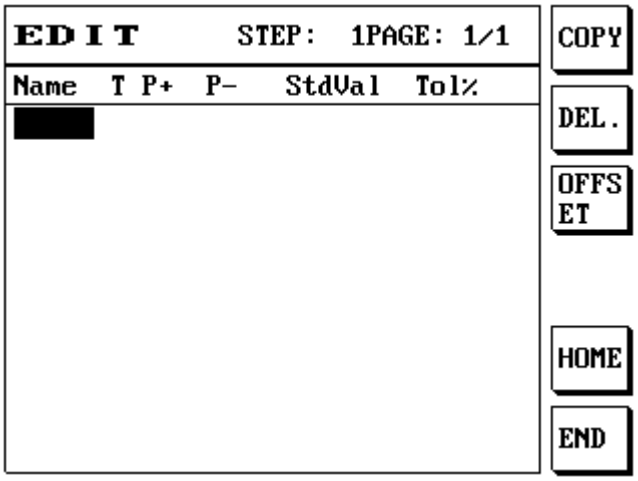


Figure 4.1.7 R/C/D page

Column	Description
Name	Please enter the name for the resistance test group set.
T	Test item type; **R:** Resistance, **C:** Capacitance, **D:** Diode, **V:** Voltage drop, **T:** Conduction.
P+	Positive pin setting
P-	Negative pin setting.

StdVal	Standard value setting.
Tol%	Tolerance; set the percentage (%), **≤ or ≥**.

Table 4.1.3.1 R/C/D page

(1) **Copy**

To copy the previous setting.

- Move the cursor to an empty location and press **S1 (Copy)** to duplicate the previous setting.

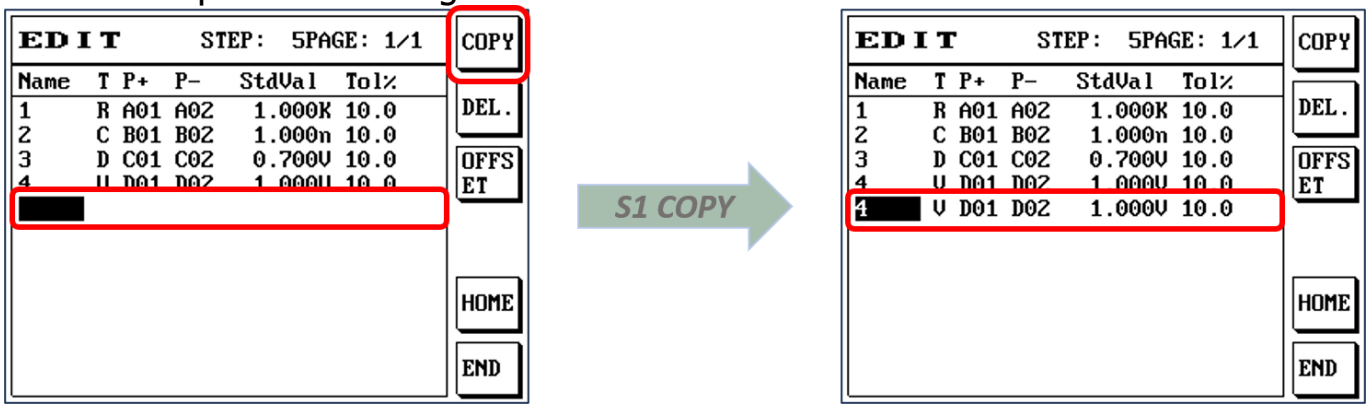


Figure 4.1.8 R/C/D Setting

(2) **Delete**

To delete the selected setting.

- Move the cursor to the setting that needs to be deleted and press **S2 (DEL.)** to remove it.

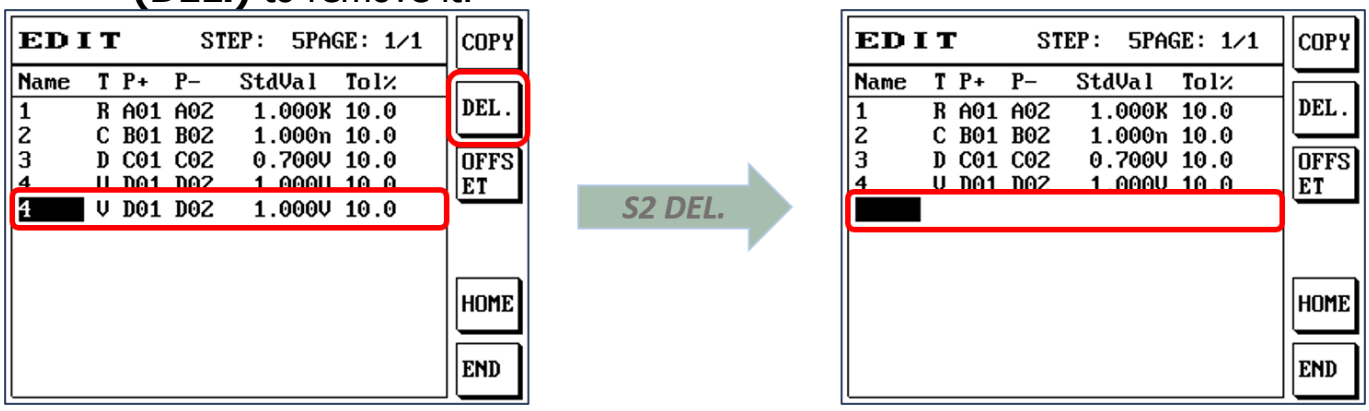


Figure 4.1.9 R/C/D delete

(3) **Offset**

To adjust the offset value.

- Move the cursor to the setting that the offset value needs to be adjusted, then press **S3 (OFFSET)** and use the numeric keys to enter the value.

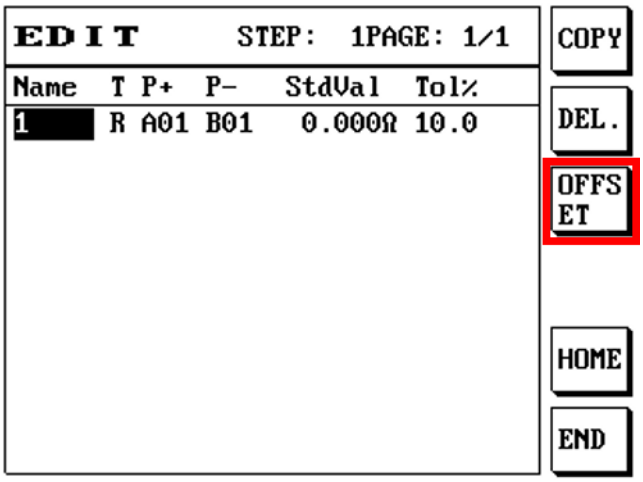


Figure 4.1.10 R/C/D offset

(4) After entering the name and pressing **Enter**, the cursor will automatically move to the **T column**. Use the following keys to select the desired test parameter:

- **S1**: R (Resistor)
- **S2**: C (Capacitor)
- **S3**: D (Diode)
- **S4**: V (Voltage Drop)
- **S5**: T (Conduction)
- **S6:** Makes all configured items the same as the selected column.

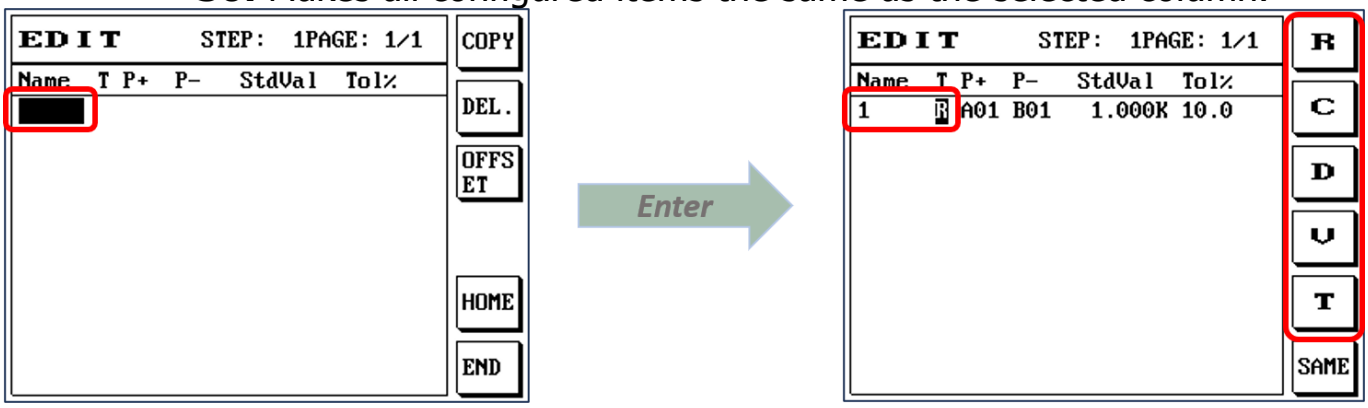


Figure 4.1.11 R/C/D test item 1/2

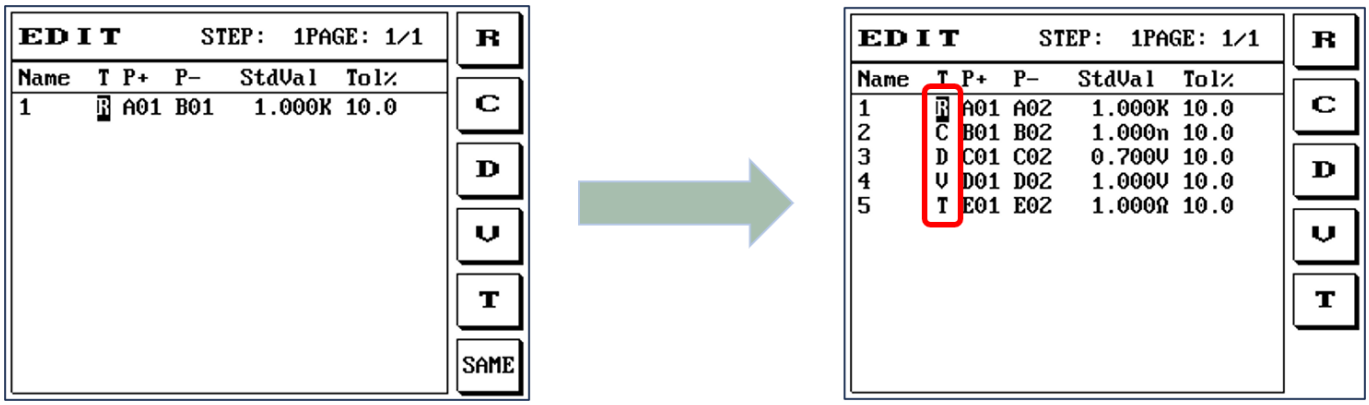


Figure 4.1.12 R/C/D test item 2/2

(5) The + and - pins must be set in the **P+** and **P-** columns. The pins can be entered using one of the following methods:

Manual Setting:

1. Press **S1–S4** to select the port. Press **S5** to switch pages for selecting additional ports if needed. port.
2. Use the **numeric keys** to enter the pin number.

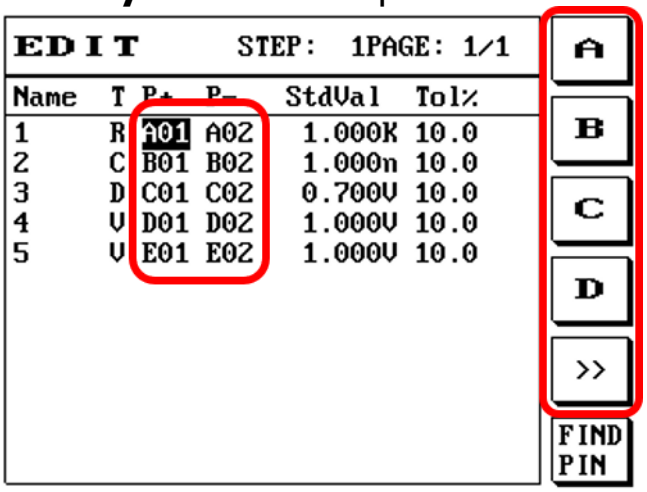


Figure 4.1.13 R/C/D pin sets

S6 FIND PIN Function:

1. Insert the **Pin Search Probe** (included as an accessory) into the **PIN SEARCH** port on the front panel.
2. Touch the probe to the desired pin location.
3. Press **S6 FIND PIN** to automatically enter the detected pin into the P+ or P- column.

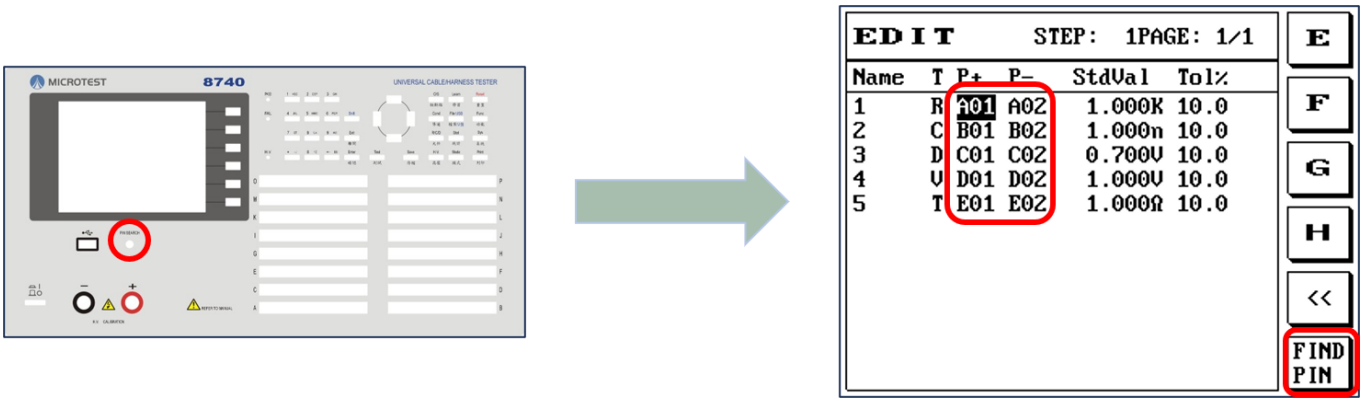


Figure 4.1.14 R/C/D find pin

(6) After moving the cursor to the standard value column, enter the actual test value manually or use the following functions:
S1 [MEAS STEP] – Measures the current step only.
S2 [MEAS ALL] – Measures all steps.

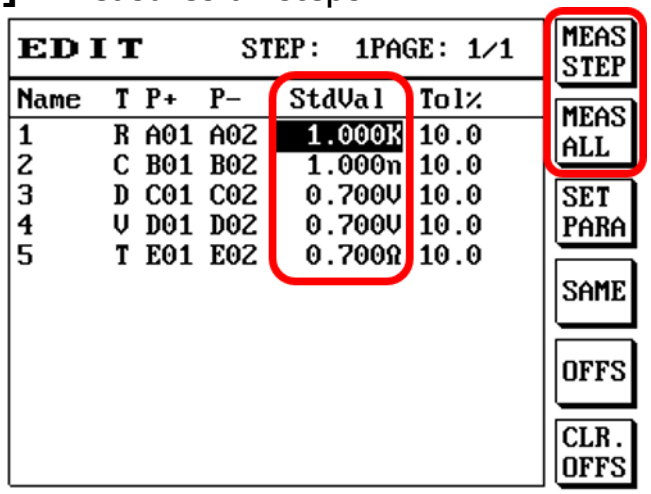


Figure 4.1.15 R/C/D measure

(7) When the component is resistance or capacitance, press S6 [CLR.OFFS] to offset; the LCD screen will display as follows:

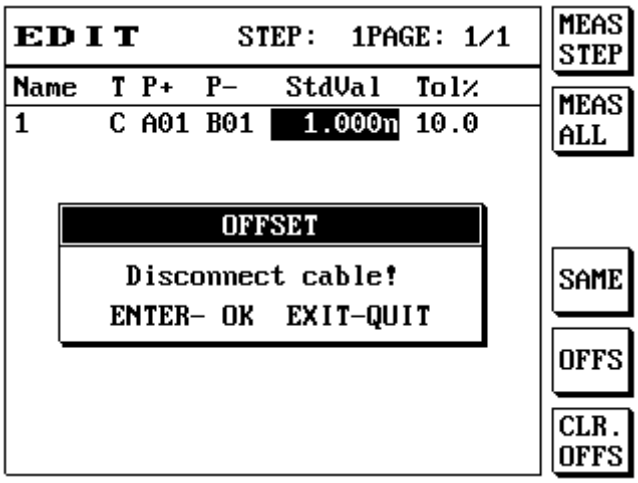


Figure 4.1.16 R/C/D offset

(8) Press [Enter] to perform the offset action.

(9) Press S6 [ALL SAME] to clear the data used for resistance or capacitance offset.

(10) When the component is resistance, press SHIFT+S6 [CLR.OFFS] to display the data for resistance offset; the LCD screen will display as follows:

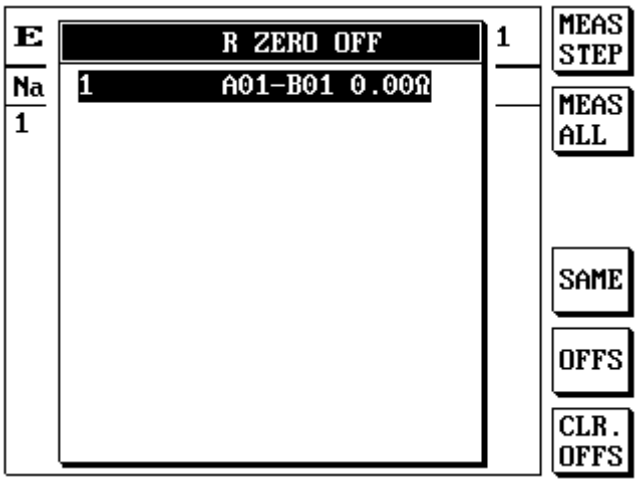


Figure 4.1.17 R/C/D clear offset

(11) When the component is diode or current leakage, press S3 [SET PARA] to perform parameter setting; the LCD screen will display as follows:

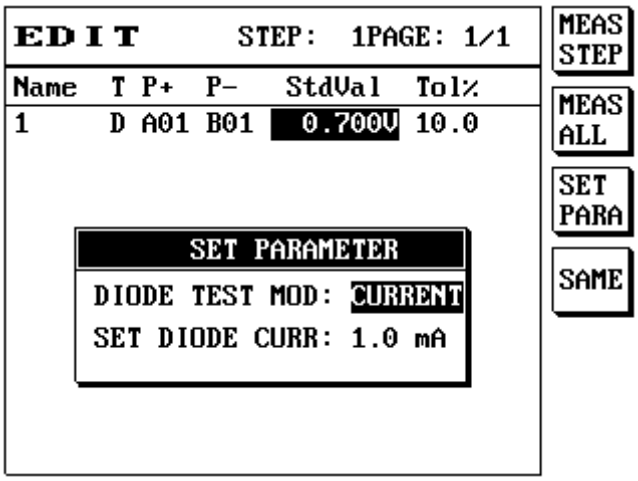


Figure 4.1.18 Set parameter

4.1.4 High Voltage Setting Edit (HV)

The High Voltage (HV) function is used to configure DC insulation/HIPOT and AC HIPOT test conditions, including test voltage, frequency, and specification limits.

Press the **[HV]** key to access the High Voltage setting screen. The LCD displays the parameter configuration interface.

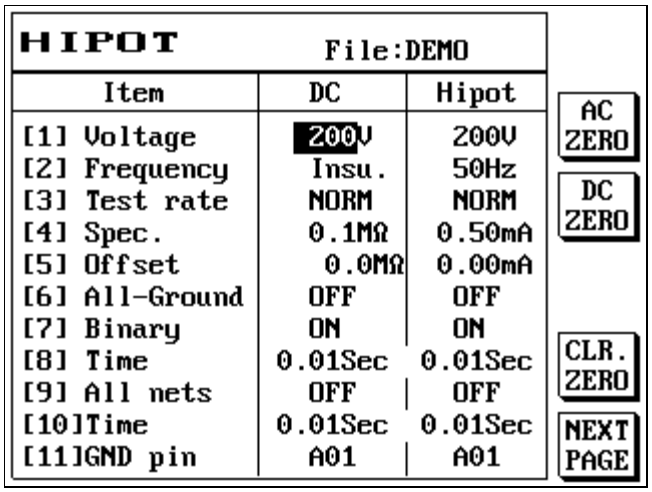


Figure 4.1.19 H.V page 1/3

Use the direction keys to select the desired parameter.
Enter the required specification value according to the test standard.

AC Offset AC ZERO:
Used to deduct the small leakage current of the internal loop of the tester and

on the test fixture in order to measure more precise AC HIPOT leakage current.

DC Offset DC ZERO:
Used to deduct the equivalent insulation value of the internal loop of the tester and the text fixture in order to test higher DC IR insulation.

Beware when using the two functions above:

- The AC/DC offset must be **less than 1/4** of the test value and **not less than 1:1** in the worst case (i.e., the offset equals the test signal size).
- In poor environments, maintaining a stable offset for extended periods is challenging.
- The offset function can help assess fixture terminal conditions, useful for production engineers in stage analysis.

(1) Voltage

Set the test voltage value for DC insulation and AC HIPOT; the DC voltage is 50V-1000V (NK/NAK), and the AC voltage is 100V-700V (NAK).

(2) Frequency

Set the test frequency; only the AC part can be set (50/60Hz), DC insulation: switches between HIPOT and insulation, which is switching the test specification type. The HIPOT test specification is uA and the insulation test specification is MΩ.

(3) Test rate

Slow: Test method that uses a stable test value as top priority.
Normal: Test method that finds a balance between stable test value and test speed.
Fast: Test method that saves gear changing time under known test specification conditions.

The following requirements must be followed for fast test speed:

1. Test speed fast is a test method designed to be used specifically when the insulation value of the DUTs are within fixed range and saves time by not jumping sections, and has the goal of gaining highest capacity.
2. The machine's measurement capability is constrained by a 1μA minimum current sensitivity. Therefore, the test voltage must be sufficient to

maintain this current level for accurate readings.

For example:

To measure **100MΩ**, a minimum test voltage of **100V** is required (100V / 100MΩ = 1μA).

If your target resistance exceeds this ratio (e.g., trying to test 100MΩ at only 10V), the machine will be unable to detect the current, leading to measurement errors.

3. Make suitable adjustments for the test time according to the DUT.

(4) Spec

Define the parameters for DC Insulation/ HIPOT and AC HIPOT tests.
DC insulation/ HIPOT specification can be set between 0.1MΩ to 1000MΩ/ 0.1uA to 1000uA.
AC HIPOT specification can be set between 0.01mA to 5mA.

Note: The maximum test voltage is limited to 650V if the setting is below 5MOhm or above 200uA.

(5) Offset

Set a value to be automatically deducted from the test results

(6) All-Ground

Ground pin must be set for this mode to perform insulation test for non-grounded cable to specified grounded cable; its advantage is that the test speed is fast, but its disadvantage is that insulation test is not performed between non-grounded cables.

Step	A	B	C	D	E	F	G	H
1	+	–	–	–	–	–	–	–

Table 4.1.4.1 All ground test method

(7) Binary

This mode is similar to quick categorization; if there are 8 test pins DUT A B C

D E F G H, when test is performed for each cable or pin, it has to be tested 7 times sequentially in order to determine whether the DUT passed. But if the quick test method is used, the first time A B C D and E F G H are divided into two groups for testing, and the second time A B E F and C D G H are divided into two groups for testing, and the third time A C E G and B D F H are divided into two groups for testing, then the test only needs to be performed three times to confirm whether the DUT passed. Therefore if the DUT has 128 pins, if test is performed for every cable or pin, the test has be performed 127 times, but with the quick test method the test only has to run 8 times. However, the disadvantage is that it cannot find out which are the error pins and the cable segment resistance will be slightly lower than the actual value because the cable segments were tested in parallel.

Step	A	B	C	D	E	F	G	H
1	+	+	+	+	−	−	−	−
2	+	+	−	−	+	+	−	−
3	+	−	+	−	+	−	+	−

Table 4.1.4.2 Binary test method

(8) Time

Set the DC insulation and AC voltage continuation time for [6] All-Ground and [7] Binary; the continuation time can be set between 0.01Sec-60Sec.

(9) All nets

This all nets method involves applying high voltage to a single pin while grounding all others, repeated N-1 times. While this approach is slower due to its sequential nature, it provides the highest accuracy by identifying the exact insulation and leakage current values for each individual pin.

Step	A	B	C	D	E	F	G	H
1	+	-	-	-	-	-	-	-
2	-	+	-	-	-	-	-	-
3	-	-	+	-	-	-	-	-
4	-	-	-	+	-	-	-	-
5	-	-	-	-	+	-	-	-
6	-	-	-	-	-	+	-	-
7	-	-	-	-	-	-	+	-
8	-	-	-	-	-	-	-	+

Table 4.1.4.3 All nets test method

(10) Test time

Set the DC insulation and AC voltage continuation time for [9] All nets; the continuation time can be set between 0.01Sec-60Sec.

(11) Ground pin

Ground pin set

Select S6 [NEXT PAGE] and the LCD screen will display as follows:

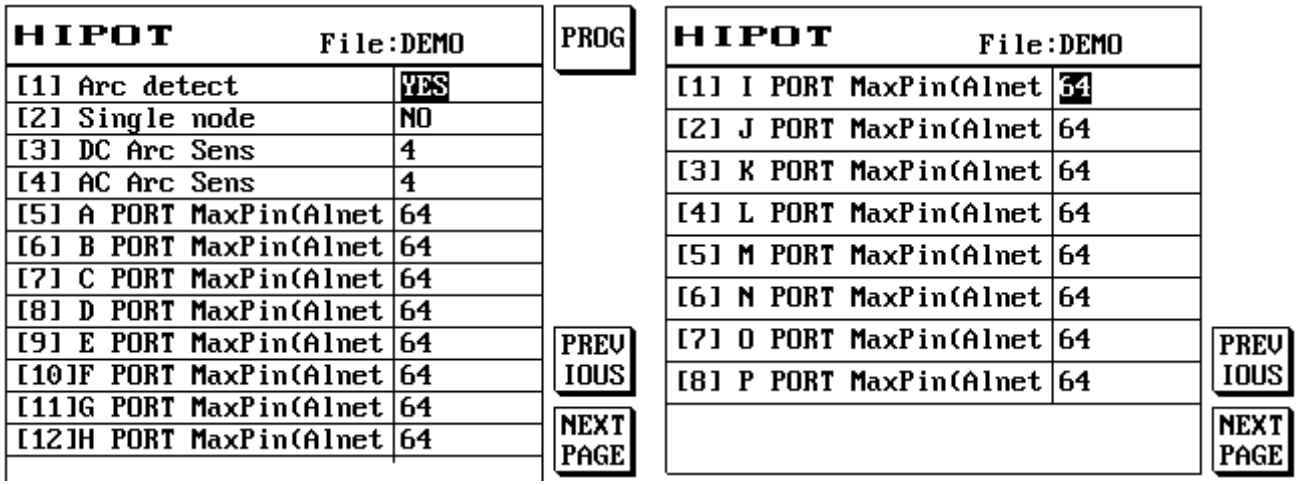


Figure 4.1.20 H.V page 2/3

(1) Arc detect

Set whether to enable arc detection.

(2) Single node

Set whether to test for empty pins; it is mainly used to test tests with no circuits.

(3) DC arc Sens

Set the DC arc detection sensitivity; the lower the value the more sensitive it is, the higher the value the less sensitive it is.

ARCING LEVEL	Peak current (uA)	ARCING LEVEL	Peak current (uA)
1	40	25	992
2	79	26	1032
3	119	27	1072
4	159	28	1111
5	198	29	1151
6	238	30	1191
7	278	31	1230
8	317	32	1270
9	357	33	1310
10	397	34	1349
11	437	35	1389
12	476	36	1429
13	516	37	1468
14	556	38	1508
15	595	39	1548
16	635	40	1587
17	675	41	1627
18	714	42	1667
19	754	43	1707
20	794	44	1746
21	833	45	1786
22	873	46	1826
23	913	47	1865
24	952	48	1905

Table 4.1.4.4 Arcing level

(4) AC arc Sens

Set the AC arc detection sensitivity; the lower the value the more sensitive it is, the higher the value the less sensitive it is.

(5) A (B, C, D, E, F, G, H…N, O, P) PORT MaxPin (Allnet)

Set the end pin of A (B, C, D, E, F, G, H…N, O, P) PORT.

Select S6 [NEXT PAGE] and the LCD screen will display as follows:

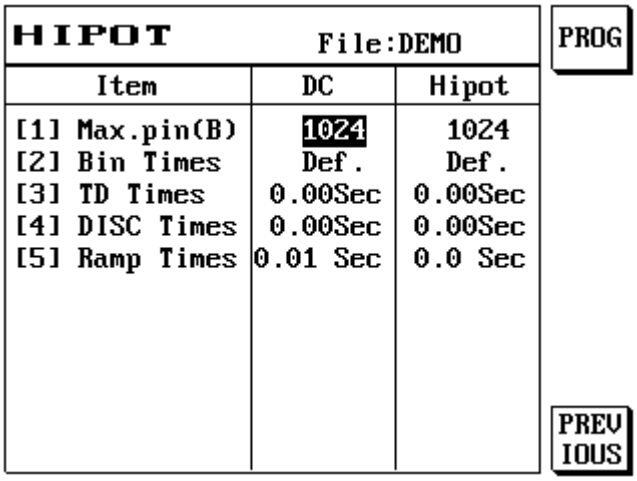


Figure 4.1.21 H.V page 3/3

[1] **Max .Pin(Binary):**

Set the maximum number of pins for the quick binary test.

[2] **Bin Times:**

Binary quick test times, the corresponding point to the high voltage is different in each time. If 8 point is 3 times, the 1st high voltage corresponding point is +-+-+-+-, the 2nd time is ++--++--, and the 3rd time is ++++----. The default binary test for the 128-point model is 7 times.

[3] **TD Times:**

Users can set to wait for a period of time after the high voltage climbs to the specified voltage before performing the test; this is mainly to allow the DUT charging time constant to stabilize before measuring the insulation value. This way more consistent data can be measured.

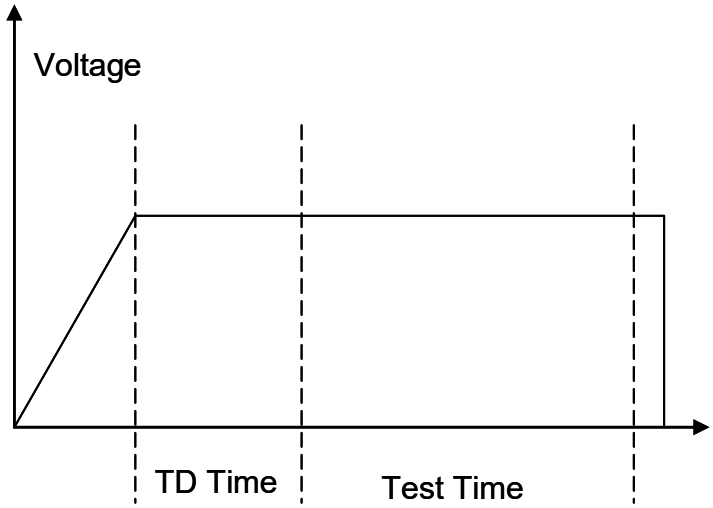


Figure 4.1.22 Test delay time

[4] **DISC Times**

Increase discharge time.

[5] **Ramp Times**

Setting DC Insulation and AC Hipot Ramp time.

4.2 Comprehensive Test Implementation

After the settings above are completed, comprehensive test implementation can be performed. Since the operating procedures are different, it can be divided into two types: Real Time Test and Existed Test; individual descriptions are as follows:

4.2.1 Real-time Test

This part set the test conditions saved in the main memory as the test condition and performs test to DUTs in real time. It is the most commonly used test method. Its step descriptions are as follows:

(1) First check whether the test condition settings are correct.
(2) Press [Mode] to display the test mode setting screen.
(3) Check and confirm whether the test mode settings are correct, and change

according to your needs.
(4) After confirming there are no errors, press [EXIT] to exit and return to the main screen.
(5) Press [TEST] to start testing.
(6) When the test is complete or if the test needs to be interrupted, please press [EXIT] to exit.

4.2.2 Existed Test

You can load Existed Files saved in the memory to the main memory to perform testing; instructions are as follows:

(1) Press [File].
(2) Please use [↑] or [↓] to move the cursor to select the file name to load.
(3) After confirming, press [Enter]; the tester will start loading the selected file into the main memory
(4) At this time the LCD screen will return to the main screen and the name of the file you selected will be displayed for current file; file loading has been completed at this time.
(5) Please press [EXIT] to exit and return to the main screen.
(6) Press [Mode] to display the test mode setting screen.
(7) Check and confirm whether the test mode settings are correct, and change according to your needs.
(8) After confirming there are no errors, press [EXIT] to exit and return to the main screen.
(9) Press [TEST] to start testing.
(10) When the test is completed or if the test needs to be interrupted, please press [EXIT] to exit.

4.3 File Management

You can execute select old file/delete old file/file sorting actions to make it easier to manage and use the files; instructions are as follows:

4.3.1 Select File

Select file loads files saved on the permanent memory to the main memory so that they can be used for other purposes, including testing, editing, and printing etc. Instructions are as follows:

(1) Press [File].
(2) The LCD screen will display as follows.

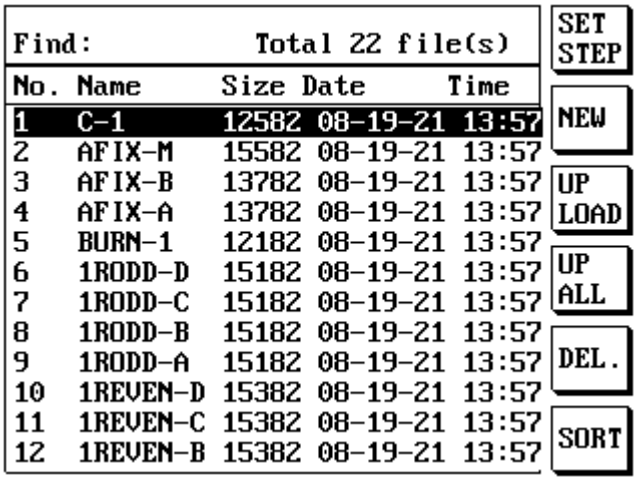


Figure 4.3.1 File page

(3) Please use [↑] or [↓] to move the cursor to select the file name to load.
(4) Press [Enter] to execute the load file action.
(5) The tester will start loading the selected file into the main memory.
(6) At this time the LCD screen will return to the main screen and the name of the file you selected will be displayed for current file; file loading has been completed at this time.

4.3.2 Multi-Step Setting

When you need to perform multiple test steps to a DUT, you can set the test steps that need to be performed using step test to simplify your test process and reduce your test time.

(1) Press [File] and then press S1 [SET STEP].
(2) The LCD screen will display as follows:

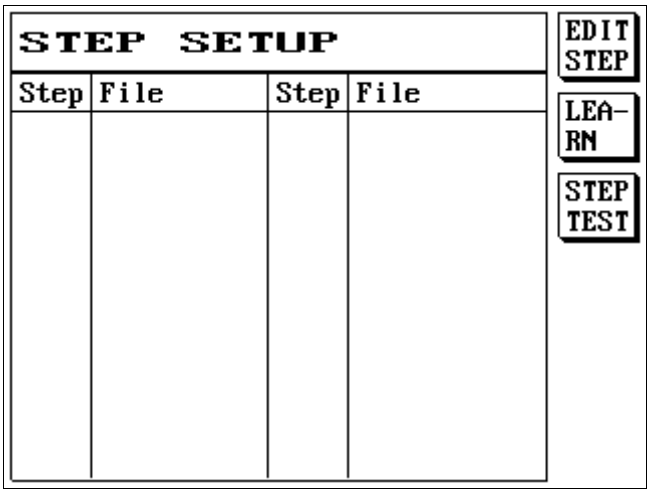


Figure 4.3.2 Multi-Step page

(3) You can press S1 [EDIT STEP]; the LCD screen will display as follows:

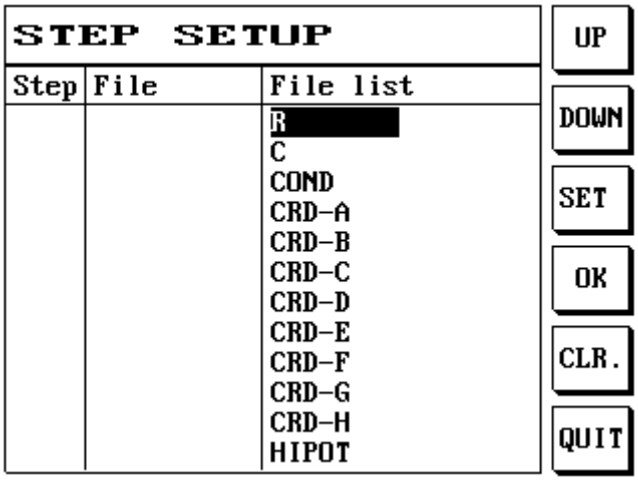


Figure 4.3.3 Multi-Step select file 1/4

(4) Use [↑] or [↓] to move the cursor to select and set the test steps needed to be performed to the DUT.
(5) For example: We selected the three files EX1, EX2 and EX3.
(6) Use [↑] or [↓] to move the cursor to EX1, and then press S3 [SET].
(7) The LCD screen will display as follows:

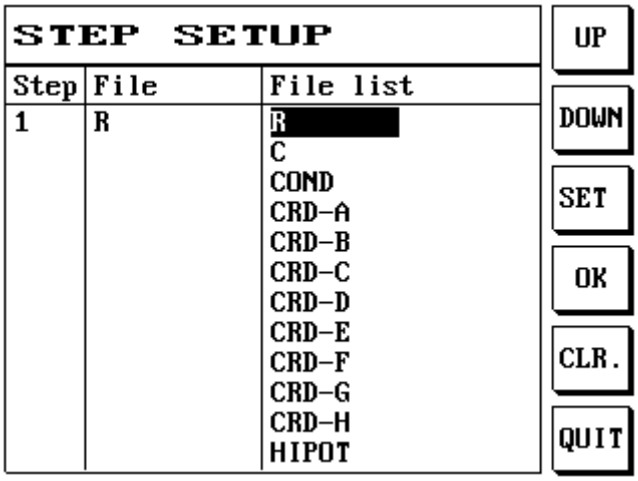


Figure 4.3.4 Multi-Step select file 2/4

And then use [↑] or [↓] to move the cursor to EX2, and then press S3 [SET].

(8) The LCD screen will display as follows:

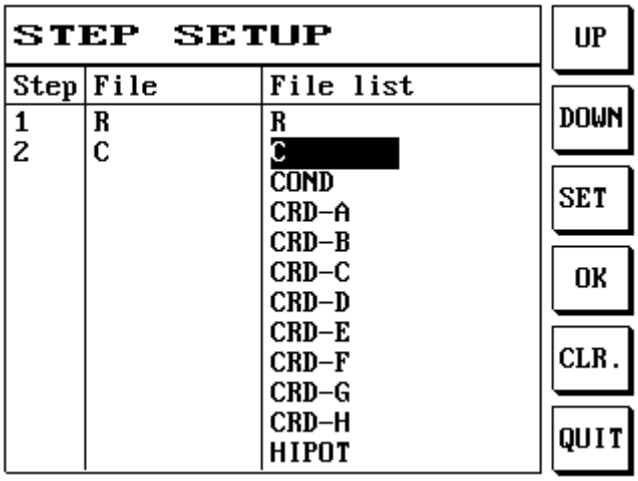


Figure 4.3.5 Multi-Step select file 3/4

(9) Continue to use [↑] or [↓] to move the cursor to EX3, and then press S3 [SET].

(10) The LCD screen will display as follows:

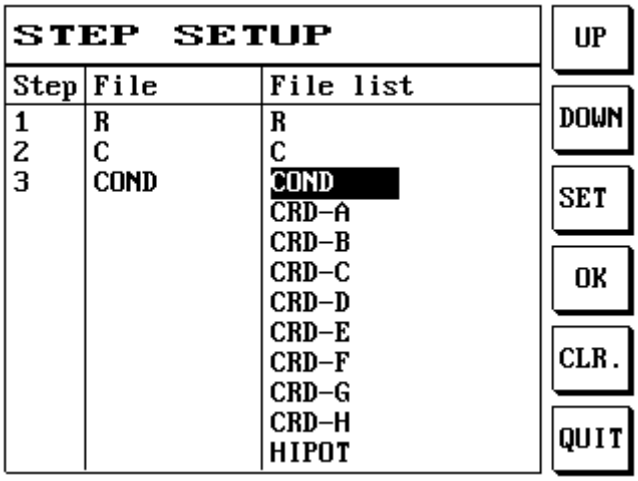


Figure 4.3.6 Multi-Step select file 4/4

(11) Please press S4 [OK] and the LCD screen will display as follows:

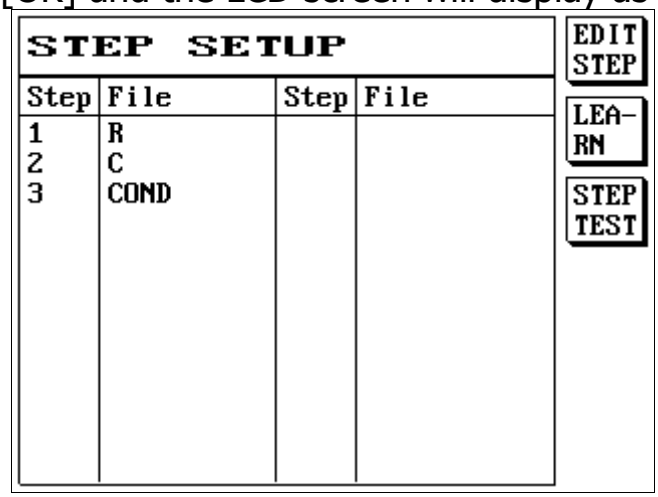


Figure 4.3.7Multi-Step select file finish

(12) This way step test setting is complete; S2 [LEARN] can also be used for setting.

(13) For example: Put the DUT in place and press S2 [LEARN]; the LCD screen will display as follows:

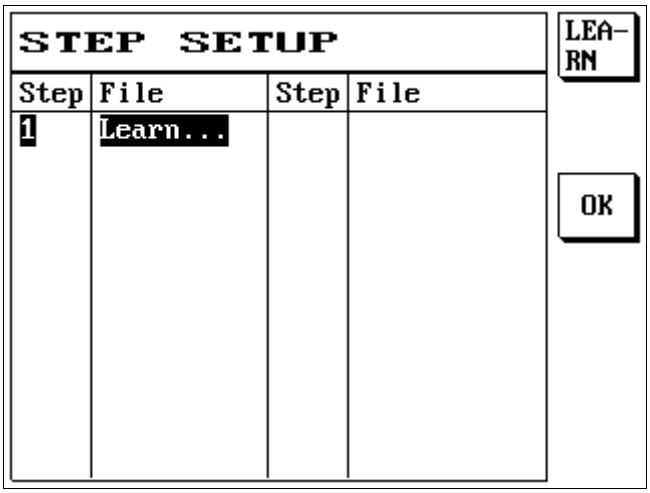


Figure 4.3.8 Multi-Step learn 1/3

(14) Press S1 [Learn] and the 1st step setting will be generated; the LCD screen will display as follows:

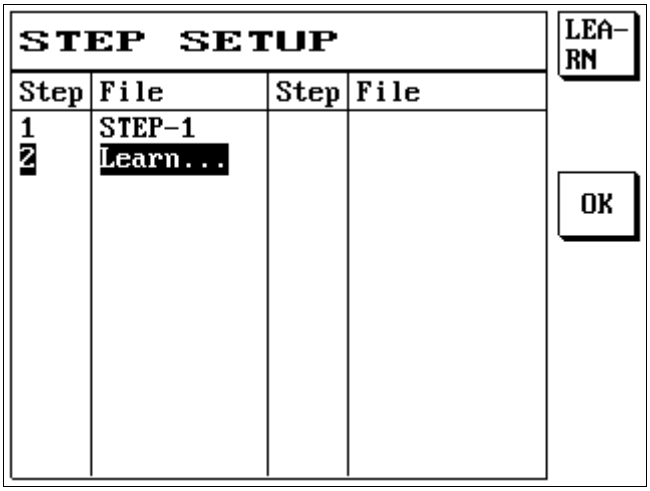


Figure 4.3.9 Multi-Step learn 2/3

(15) And so on; we can set the 1st, 2nd...step. Assume we have set a total of five test steps, once setting is completed, press S3 [OK] and the LCD screen will display as follows:

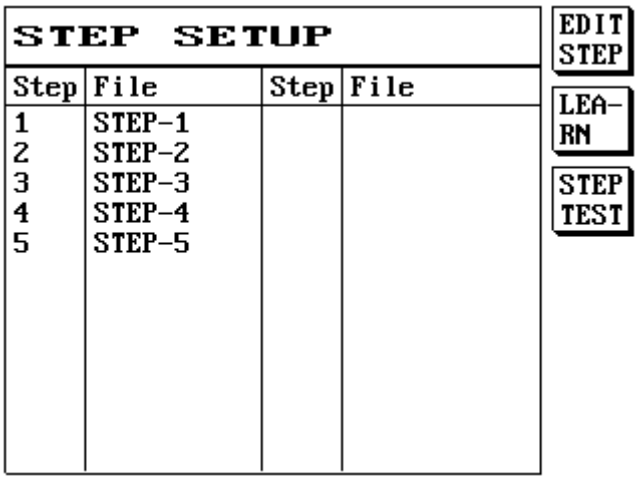


Figure 4.3.10 Multi-Step learn 3/3

(16) This also completes the setting for step test.

(17) Press S3 [Step Test] or [TEST] and the LCD screen will display as follows:

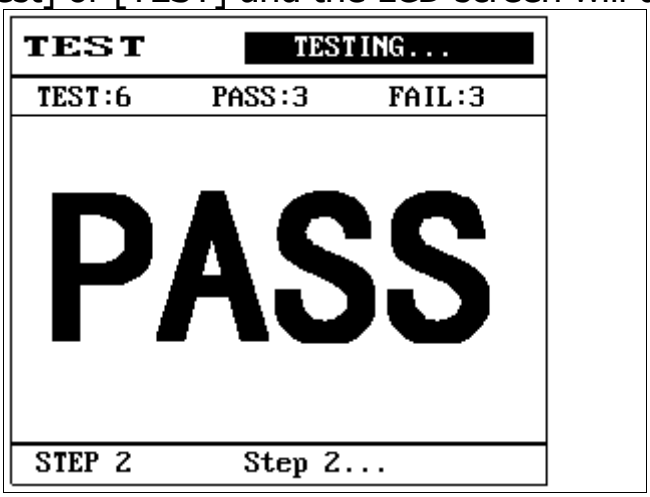


Figure 4.3.11 Multi-Step test 1/3

(18) Performs the 1st test step; the LCD screen will display as follows:

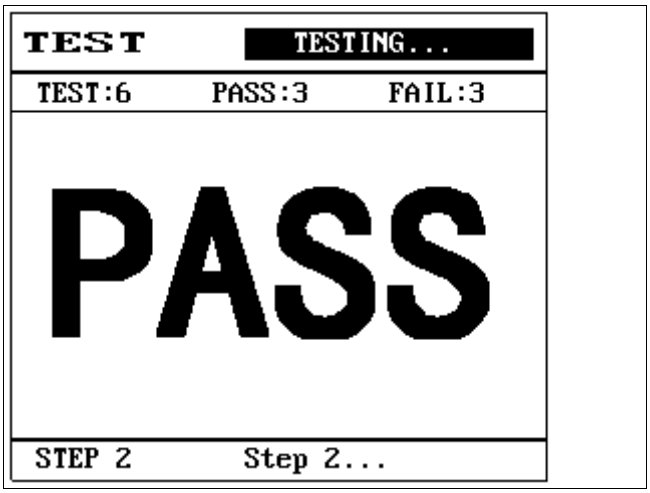


Figure 4.3.12 Multi-Step test 2/3

(19) First step PASS, the LCD screen will display {wait for test step 2}.

(20) And so on until all five steps set are completed, then the LCD screen will display as follows:

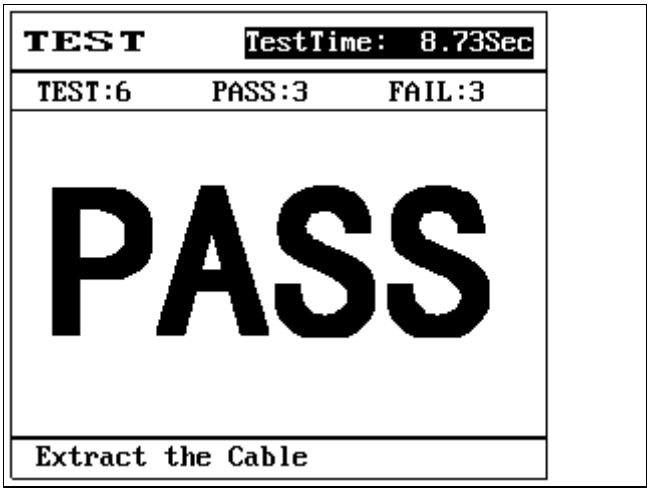


Figure 4.3.13 Multi-Step test 3/3

(21) This completes the step test.



Note:

1. **When each test step is completed, the machine will scan for short circuits (O/S). The machine will only perform the next test step after the short circuit (O/S) status changes.**
2. **If you want the machine to perform the next test step without waiting for the short circuit (O/S)**

status change, please set the [test start method] in the file test mode of that test step as |continuous|.

4.3.3 Create New File

The function to create a new file in the permanent memory; its instructions are as follows:

(1) Press [File].
(2) Press S2 [NEW] to perform the create new file action.
(3) The LCD screen will display as follows:

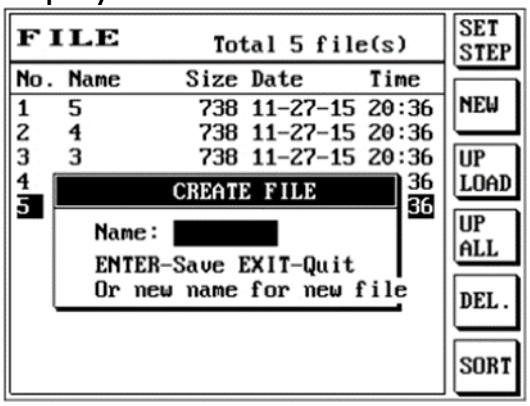


Figure 4.3.14 Create new file

(4) Enter file name
(5) Confirm the file name you want to create and press [Enter] to complete the create new file action.

4.3.4 Upload File

Upload file uploads the selected single file to the USB flash drive; its instructions are as follows:

(1) Press [File] and use [↑] or [↓] to move the cursor to select the file name to upload, and insert the USB flash drive into the front panel.
(2) Press S3 [UPLOAD] to execute the upload file action.
(3) The LCD screen will display as follows:

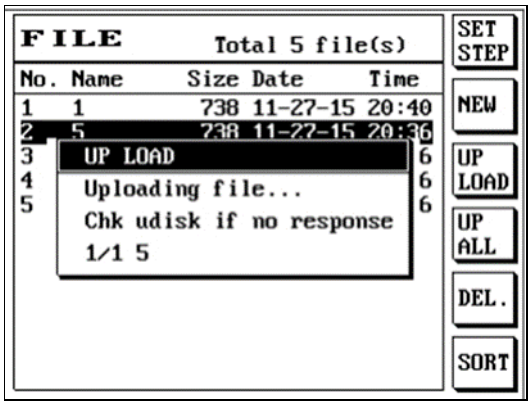


Figure 4.3.15 Upload file

(4) Confirm the file name you want to upload and press [Enter] to complete the upload file action.

4.3.5 Upload All

Upload all uploads all the files to the USB flash drive; its instructions are as follows:

(1) Press [File].
(2) Press S4 [UP ALL] to execute the upload all files action.
(3) The LCD screen will display as follows:

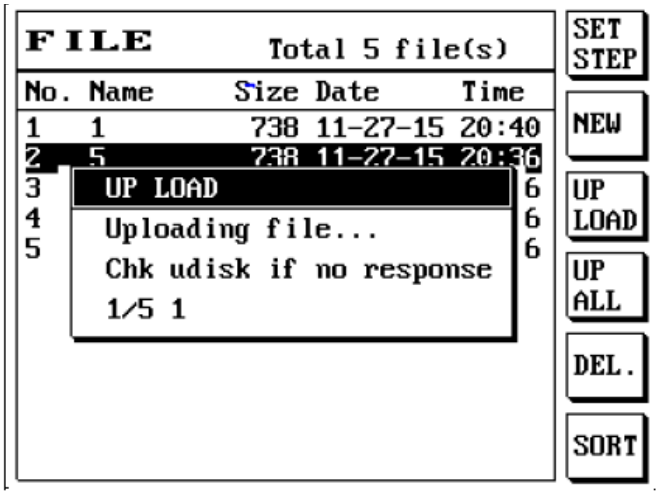


Figure 4.3.16 Upload all

4.3.6 Delete File

Delete file permanently deletes files saved on the permanent memory in order to avoid using up precious permanent memory; its instructions are as follows:

(1) Press [File] and use [↑] or [↓] to move the cursor to select the file name to

delete.

(2) Press S5 [DEL.] to execute the delete file action. [SHIFT] + S5 [DEL.] deletes all files.

(3) The LCD screen will display as follows:

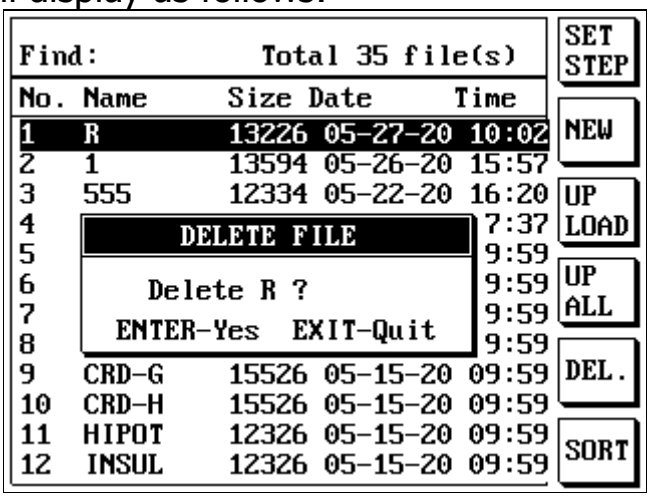


Figure 4.3.17 Delete file

(4) Confirm the file name you want to delete and press [Enter] to complete the delete file action.

4.3.7 Sort File

Sort file sorts the files according to four rules (); its instructions are as follows:

(1) Press [File].

(2) Press S6 [SORT] to execute the file sort action.
The LCD screen will display as follows:

(3)

1. Unsorted files.

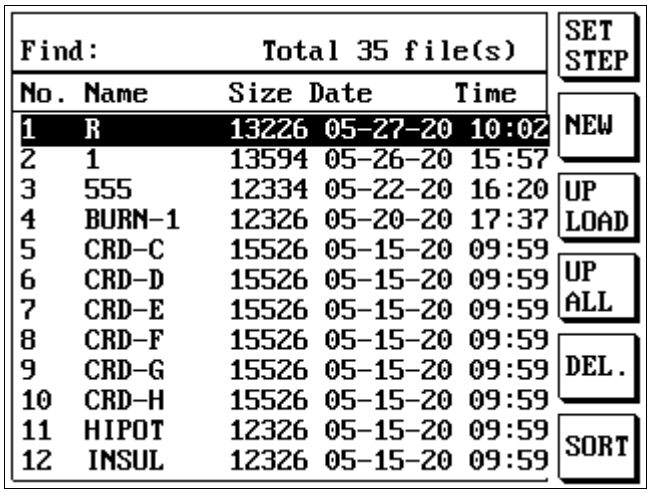


Figure 4.3.18 Sort file

2. Press S6 [SORT] to execute the file sort action.

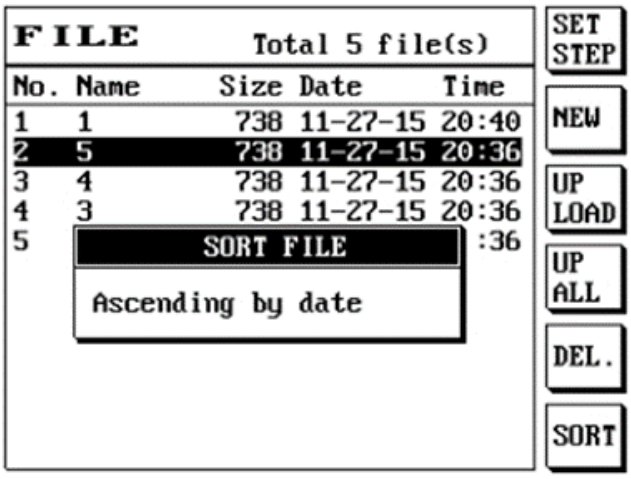


Figure 4.3.19 Ascending by date 1/2

3. File order after sorting.

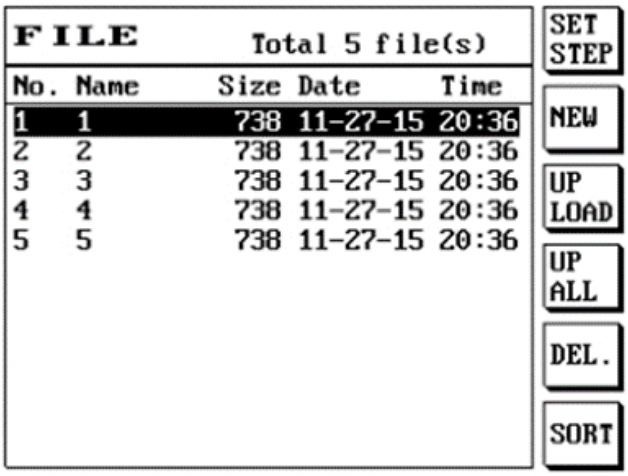


Figure 4.3.20 Ascending by date 2/2

4.3.8 Import File

Import file imports files on the USB flash drive to the tester; its instructions are as follows:
(1) Press [SHIFT] + [File].
(2) The LCD screen will display as follows:

1. Enters the import file screen.

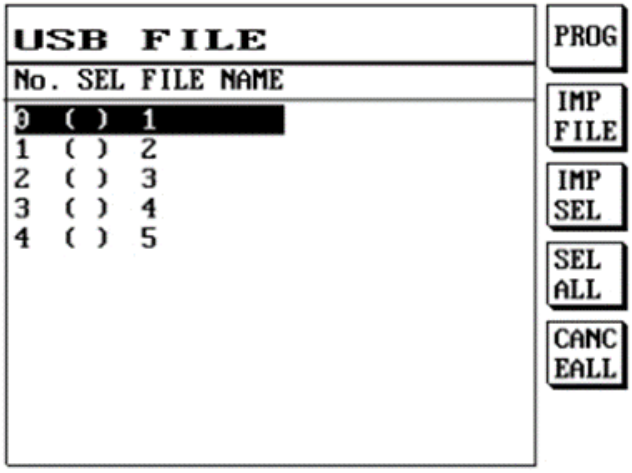


Figure 4.3.21 Import file 1/3

2. Press S1 [PROG] or S4 [SEL ALL] to select the file to import; on the other hand you can press S5 [CANCEALL] to cancel the selected files.

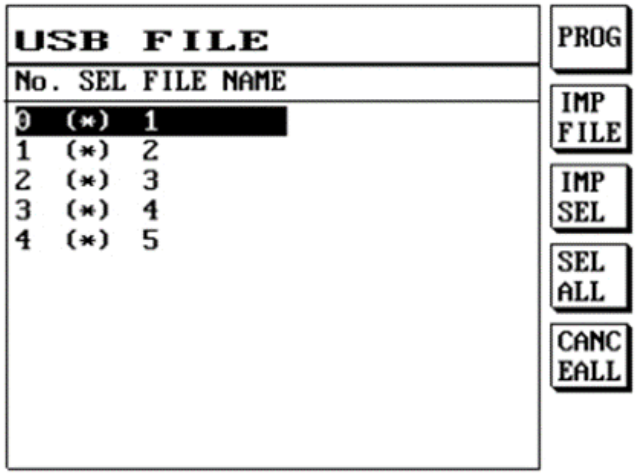


Figure 4.3.22 Import file 2/3

3. Press S1 [IMP SEL] to import the file currently selected (highlighted) using the up and down buttons; the file will be imported whether it was selected or not. Press S3 [IMP SEL] to import the file selected using S1 [PROG] or S4 [SEL ALL].

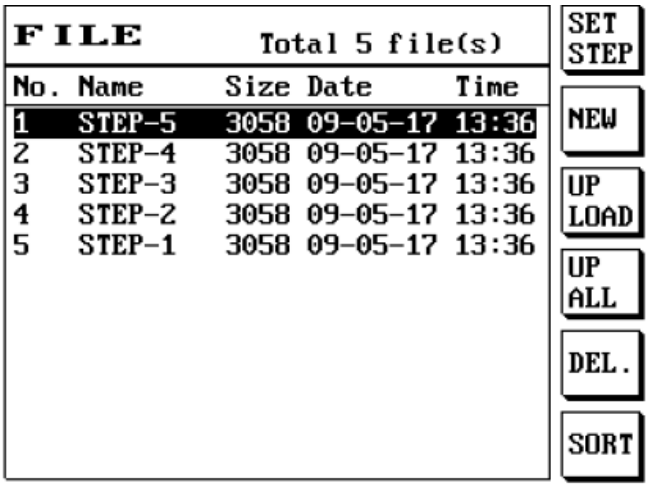


Figure 4.3.23 Import file 3/3

Chapter 5. APPENDIX A Cable Wiring Configuration

1. RS-232C CABLE

Baud Rate : 115200bps

Character Length : 8bits

Stop Bit : One Bit

Parity : Non-Parity

Character : ASCII Character

Function	Machine	Controller
RxD	Pin2	Pin3
TxD	Pin3	Pin2
GND	Pin5	Pin5

2. PRINTER CABLE

25-PIN connector (male)	36-PIN connector (male)	Signal
1	1	STROBE
2	2	DATA 0
3	3	DATA 1

4	4	DATA 2
5	5	DATA 3
6	6	DATA 4
7	7	DATA 5
8	8	DATA 6
9	9	DATA 7
10	10	ACKNLG
11	11	BUSY
13	13	SLCT
18 - 25	19 - 30, 33	GND

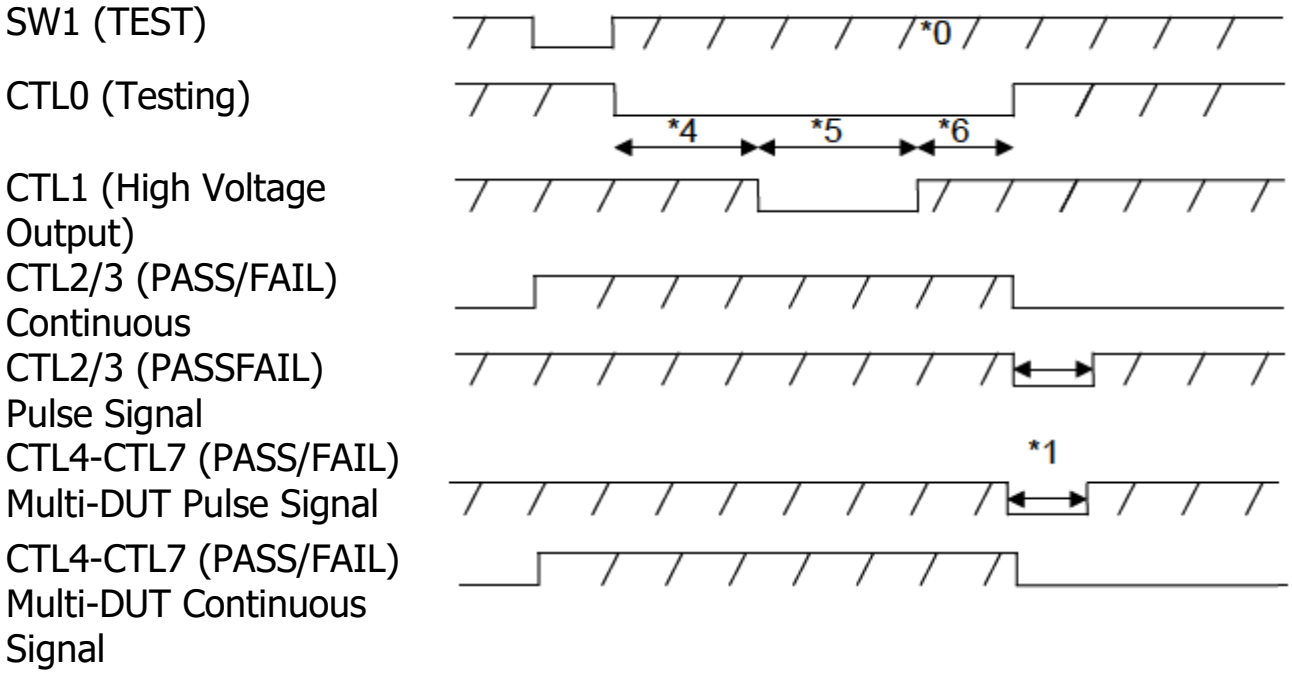
3. REMOTE CABLE

The definition of the 15-PIN connector is as described below; ***CTL[7:0] is open collector output and requires an external pull-up resistor to provide high potential.***

PIN	Signal Name	Reference Potential	Single DUT	MultiDUT signal	Pull-up Resistor
1	CTL0	EGND	Testing	Testing	Must use 4.7K ~ 10KΩ
2	CTL1	EGND	High voltage testing	High voltage testing	Must use 4.7K ~ 10KΩ
3	CTL2	EGND	PASS Status	Total PASS	Must use 4.7K ~ 10KΩ
4	CTL3	EGND	FAIL Status	Total FAIL	Must use 4.7K ~ 10KΩ
5	CTL4	EGND		DUT 1 FAIL/PASS	Must use 4.7K ~ 10KΩ
6	CTL5	EGND		DUT 2 FAIL/PASS	Must use 4.7K ~ 10KΩ
7	CTL6	EGND		DUT 3 FAIL/PASS	Must use 4.7K ~ 10KΩ
8	CTL7	EGND		DUT 4 FAIL/PASS	Must use 4.7K ~ 10KΩ
9	EGND	EGND	The internal isolated power reference potential and GND has an insulation relationship of >2GΩ.		

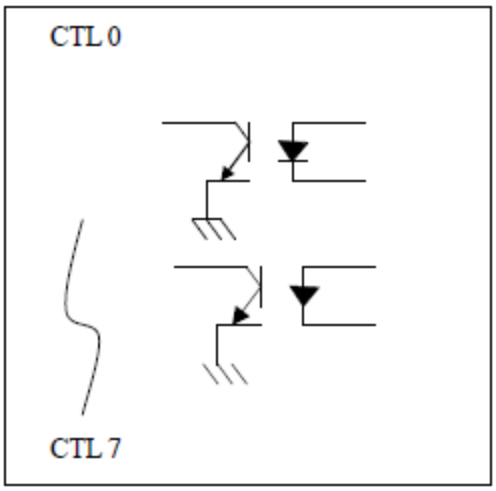
10	SW1	EGND	Test can be started when EGND + SW1 short-circuits (Panel Test).
11	SW2	EGND	Exits when EGND+ SW2 short-circuits (Exits Panel).
12	RESET	EGND	Machine reset when RESET+ EGND short-circuits (Panel Reset).
13	+5D	EGND	The internal isolated power's 5V 0.2A output capability must not short-circuit with the external power.
14	+12D	GND	The internal 12V requires the use of a REMOTE extension cable. Connect EGND and GND.
15	EGND		The internal isolated power reference potential and GND has an insulation relationship of >2GΩ.

4. REMOTE Output Waveform



*0 Output high potentials require pull-up resistors to achieve; the voltage can reach a maximum of 30V.
*1 Pulse holding time output can be set to 1ms-1000ms.
*2 Activate test when there is low potential.
*3 Hold until the next round of testing has started.
*4 The length of this interval is set according to the pretest items of the high voltage test.
*5 There is the only output when AC/DC high voltage is enabled.
*6 The length of this interval is set according to the post-test items of the high voltage test.
The above is the output waveform for a single test file when defined as all tests completed; details are set according to the test file.

5. CTL0 - CTL1 internal circuit diagram is as shown in the figure below:



Chapter 6. APPENDIX B Test Range and Functions

Item	Symbol	Test range	Tolerance	Minimum test voltage
Resistance	R	0.1Ω ~ 1.99Ω	±20%	
		2.00Ω ~ 4.99Ω	±10%	
		5.00Ω ~ 49.99Ω	±5%	
		50.00Ω ~ 99.99KΩ	±2%	
		100.0KΩ ~ 199.9KΩ	±5%	
		200.0KΩ ~ 499.9KΩ	±10%	
		500.0KΩ ~ 999.9KΩ	±10%	
		1.00MΩ ~ 2.00MΩ	±10%	
Capacitance	C	1pF ~ 19.99pF	±20%	
		20pF ~ 39.99pF	±10%	
		40pF ~ 3uF	±5%	
Conductance	COND	0.1Ω ~ 52.0Ω	±(1%+0.01Ω)	
Insulation resistance	IR	1MΩ ~ 1.99MΩ	±10%	50V
		2.00 MΩ ~ 4.99 MΩ	±10%	50V
		5.00 MΩ ~ 9.99 MΩ	±10%	50V
		10.00 MΩ ~ 19.99 MΩ	±10%	50V
		20.00 MΩ ~ 49.99 MΩ	±10%	50V
		50.00 MΩ ~ 99.99 MΩ	±10%	100V
		100.0 MΩ ~ 199.9 MΩ	±10%	200V
		200.0 MΩ ~ 499.9MΩ	±20%	500V
		500 MΩ ~ 1000.0MΩ	±20%	1000V
Diode	D	0.6 ~ 6.8V	±25%	
		>=7.0V	---	
O/S Threshold	O/S	2KΩ - 50KΩ	±10%	
		100KΩ	±20%	
Intermittence test		100mΩ - 2KΩ	±10%	

Single side test		1pF-999pF	±20%	
HIPOT leakage current		0.02mA ~ 0.0499mA	±50%	
		0.05mA ~ 0.099mA	±20%	
		0.1mA ~ 0.199mA	±20%	
		0.2mA ~ 0.499mA	±20%	
		0.5mA ~ 4.99mA	±10%	

Chapter 7. APPENDIX C Technical specifications

Item		content
Advanced functions		Programmable continuous testing
		Automatic pin search
		Self- diagnosis
		Self-correction offset
Basic accuracy		±5%
Test scan mode		Switchable automatic/short circuit scan
Test signal source		
O/S		5Vdc
Cond		35mA
DC IR/HIPOT & AC HIPOT		Voltage range
Model	8740-NK	50-1000VDC, 10V Resolution
	8740-NAK	50-1000VDC /100-700VAC, 10V Resolution
HV output accuracy		±5% accuracy
Display/sound device		320x240 resolution graphic LCD display
		Pass/Fail LED, sound, screen display
Test pin		Max 1024 independent measurement contacts
		HV Calibration Output (Positive/Negative)
		Automatic pin search terminal
Control panel		System/quick edit function button group
Interface		RS-232 communication port
		Printer port (Only support EPSON TM-U220PB)
		Remote control port

	USB port (test result/test setting file/system update) USB Disk Detailed Supported Specifications: Speed USB 2.0, File System: FAT32, Capacity 32G Bytes and below (including 32GB).
Memory device	Built-in 2048KB SRAM
	A maximum of 500 set of test setting files can be saved.
	Built-in CR2032 battery
Power supply	AC 115/230V Switchable Voltage Input±10%
	60/50Hz