



μCore
Electronics



UCE-CT220L FAULT LOCATOR USER MANUAL

UCORE ELECTRONICS
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1. Introduction

V-I test method is widely used in the World for PCB repairing. Fault detection can be done without energizing PCB boards.

32 different test conditions can be created with different combinations of test voltage, source resistance and frequency values.

The fact that the product has two channels allows simultaneous comparison of two different cards.

Specifications:

- Display: 4.3 inch 480 × 272 pixel color LCD with Touch screen
- Channels Number: 2 (A and B)
- Waveform: Sine wave
- Test Frequencies: 10Hz, 100Hz, 500Hz, 2000Hz
- Open circuit Voltage: ±5V, ±10V, ±20V
- Source Resistance: 1kΩ, 10kΩ
- Storage: internal 8MB USB disk for storing waveform image and firmware upgrade (bootload)
- Power Consumption: 5W
- Dimensions: 169 x 83 x 31 mm
- Weight: 295gr

Package List:

- 1 pc UCE-CT220L Tracer
- 2 pcs BNC to 4mm banana cable
- 2 sets multimeter pen (red and black), and with needle high-voltage cap
- 2 pcs Crocodile Clips
- 1 pc touch pen
- 1 pc USB cable

2. Before The Test

Some rules must be followed before fault detection.

- The PCB to be measured **must** be powered off.
- **Make sure that the capacitors on the PCB are discharged.** High voltage charged capacitors can damage the device.

3. Turning on or turning off

To turn on the device, plug the USB cable into any USB socket whose output voltage is 5V, 2A. Energy sources such as computer, adapter and external power bank may be used as power source.

To turn off the device, disconnecting power supply will be sufficient. When the device is energized, the main menu in figure 1 is displayed.

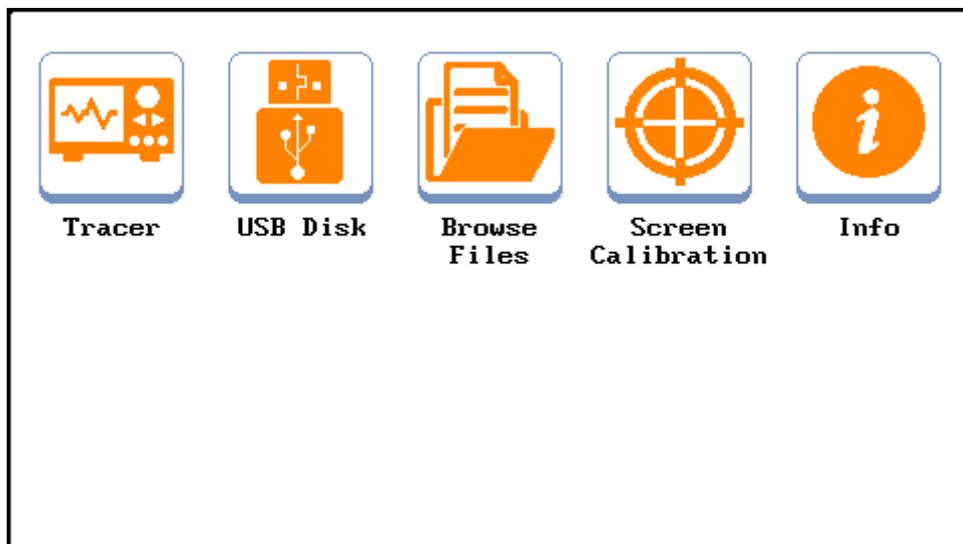


Figure 1. Main Menu

4. Device Introduction

The device works by applying a current-limited AC signal across two points of a component. The current flow causes a vertical trace deflection, while the applied voltage causes a horizontal deflection. Together they form a unique V-I signature that represents the overall health of the device under test.

The signature of all analog components is a combination of one or more of the four basic signatures: resistance, capacitance, inductance, and semiconductor. Each of these components reacts differently to the applied AC test signal. For this reason, recognizing the four basic signatures on the oscilloscope display is a key to understanding analog signature analysis.

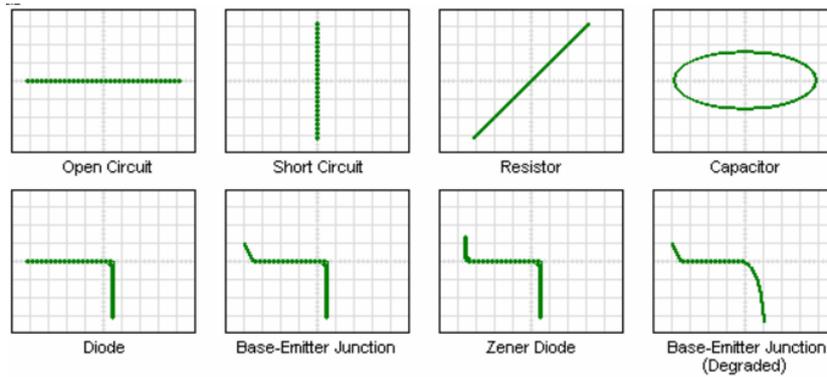


Figure 2. Component characteristics in XY mode (horizontal trace voltage, vertical trace current)

The UCE-CT220L is designed to diagnose the failures in all types of electronic circuit boards. The product is provided with two channels and allows the comparison of the defective cards with the intact boards. All V-I impedance curves consist of 2 thousand different points per channel.

The following components can be tested with this device.

Passive components: resistance, capacitor, coil

Diodes: general purpose, zener, varistor

Transistor: NPN, PNP, bipolar, darlington, JFET, MOSFET, UJT

Triggered components: SCR, TRIAC, relay

Optoelectronics: LED, photo-transistor, optocoupler

Integrated circuits: digital, analog

For accessing to Test mode, 'Tracer' icon in the 'Main Menu' should be selected. The view of Test mode is seen in the Figure 3.

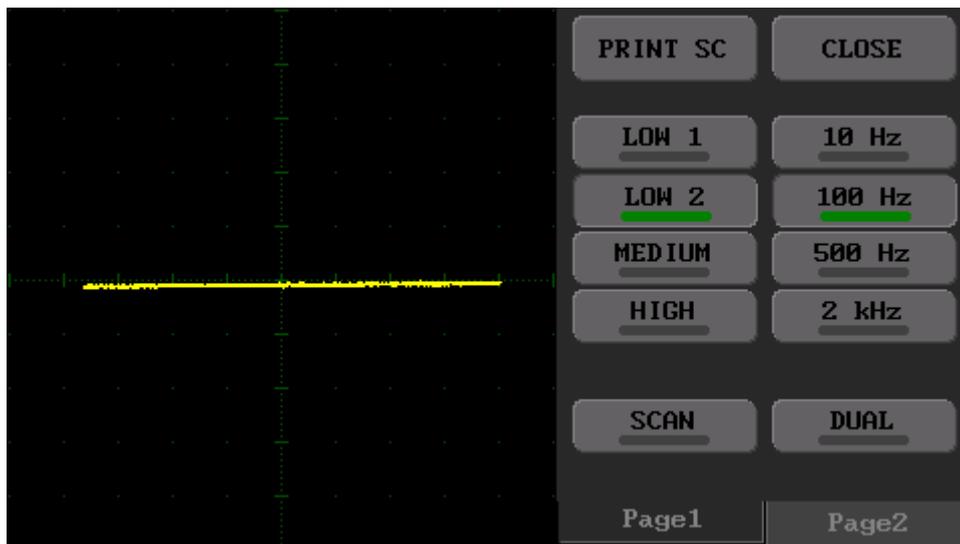


Figure 3. Test Mode overview (Page1)

The screen consists of two parts. On the left side is the I-V impedance curve and on the right side there is the menu area. The menu area consists of two parts: Page1 and Page2.

PRINT SC: Available in both menu. The screen image is saved in internal memory in bmp format.

CLOSE: Available in both menu and it is used to return to the Main Menu. In addition, when 'CLOSE' button is pressed, device data is stored in memory.

Page1: This is the menu where test voltages and test frequencies are adjusted. The scan mode and dual-channel operation mode settings are also available in this menu (Figure 3).

Open Circuit Test Voltages:

- LOW 1: ±5V
- LOW 2: ±5V
- MEDIUM: ±10V
- HIGH: ±20V

'LOW 1' and 'LOW 2' level has the same open-circuit voltage. In 'LOW 1' level x-axis rate is 0.625V/div, this value is 1.25V/div in 'LOW 2'. 'LOW 1' level is ideal for observing the diode forward voltage drop. Also the 10 Hz test frequency in 'LOW 1' level is suitable for large-capacity capacitor tests.

Test Frequencies:

- 10Hz: Suitable for large capacity capacitors.
- 100Hz: Suitable for active components (integrated, diode, transistor, etc.).
- 500Hz: Suitable for active components.
- 2kHz: Suitable for coils and low capacity capacitors.

In tests performed at low frequency (10Hz), the display update value is 2.5Hz in dual channel mode and 5Hz in single channel mode. Each channel is sampled for 2 periods, so the display update value causes it to be one-fourth (in dual channel mode) of the test frequency. At other levels, this value is constant and is 20Hz.

SCAN: Scans the Test Voltage levels per second. If you press and hold for longer than 2 seconds, the related level is canceled. Canceled levels are marked in red. If you want to be reactivated again, it is held for 2 sec. (Figure 4).

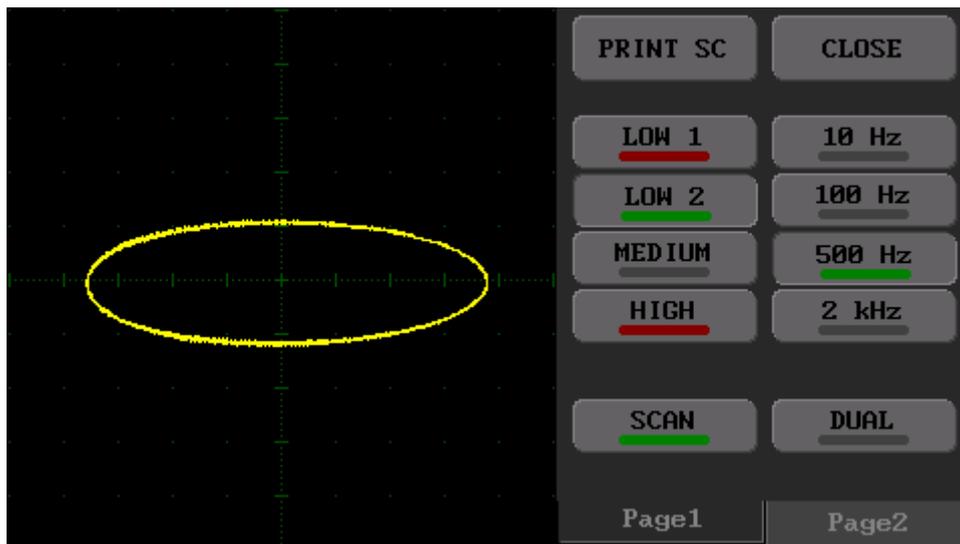


Figure 4. Scan Mode overview (LOW 1 ve HIGH levels canceled)

DUAL: Allows simultaneous use of A (yellow color) and B (red color) channels. If a single channel is used, only channel A is active.

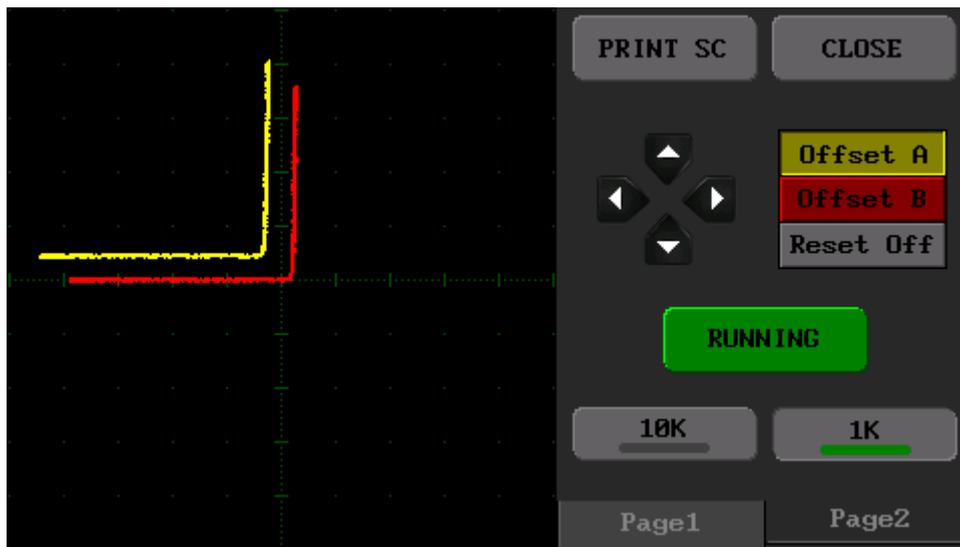


Figure 5. Test Mode genel overview (Page2)

Page2: In this menu, offset settings and source resistance are set (Figure 5).

Offset adjustment: I-V impedance curves can be positioned horizontally and vertically when needed. Press the '**Offset A**' button to change the position of the Channel A and position using the 4-way button on the left. Similarly, to change the position of Channel B, press the '**Offset B**' button to change the position of the 4-way button. If you want to reset the position setting, press the '**Reset Off**' button.

RUNNING (HOLD): Used to freeze the screen at runtime. Pressing the button again to continue.

Source resistance adjustment

10K: Connects a 10K resistor to the voltage source to limit the current.

1K: Connects a 1K resistor to the voltage source to limit the current.

5. USB Disk

When the 'USB Disc' button from the main menu is selected, oscilloscope connects to computer as a USB disc. Device is listed in computer's 'Devices and drivers' section (Figure 7). The internal memory access would be available via USB Disc. Thus, the saved files can be transferred to PC platform. To end up the USB Disk connection and switch backward to the main menu, the 'DISCONNECT' button on the screen should be clicked (Figure 6).

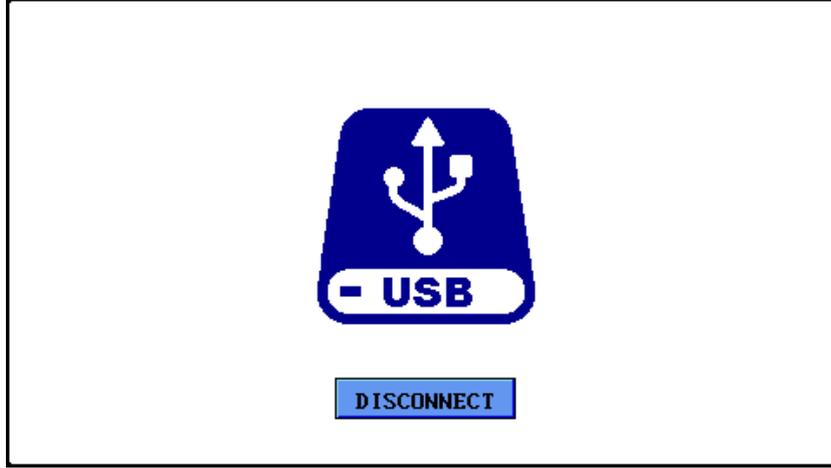


Figure 6. USB Disk LCD screen overview

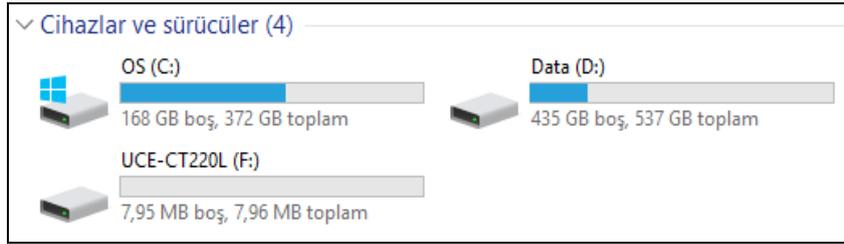


Figure 7. Devices and drivers

6. File Browse

The file browse menu is a menu where screen images recorded in the internal memory can be viewed again. In the main menu, by selecting 'Browse Files' button, users gain access to this menu (Figure 8). On the left side of the screen, there is a list of saved screen captures. The file to be processed would be selected by clicking its name from the list. If user would like to view the file, '**OPEN**' button should be clicked. If user would like to delete the file, '**DELETE**' button should be clicked. To delete the whole files or format the internal memory; '**FORMAT**' button should be clicked, but to complete format, user should click the '**FORMAT**' button one more time. To return to the main menu, the '**CLOSE**' button should be clicked.

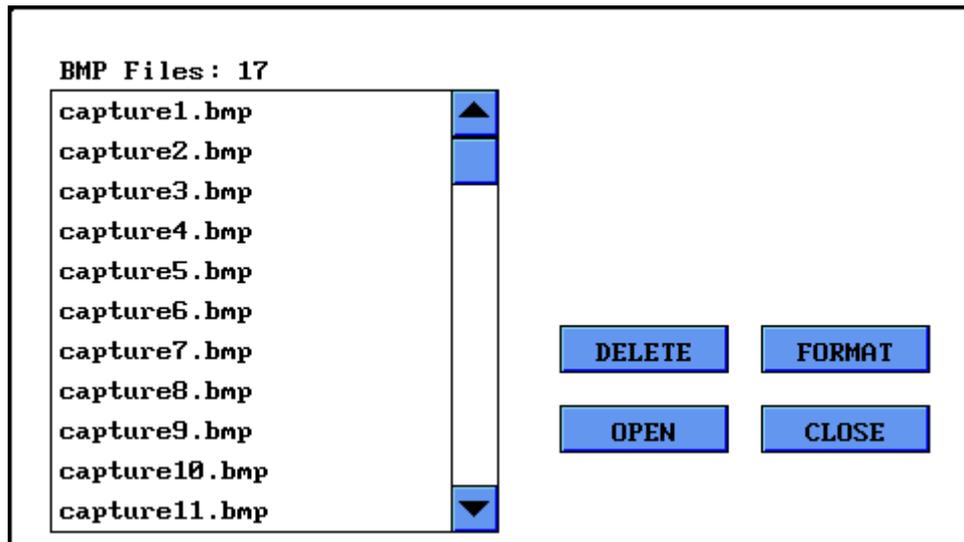


Figure 8. Browse file menu

7. Screen Calibration

When a more precise touch is needed, you may do touch panel calibration. To do this click '**Screen Calibration**' and pass to the following display. Press in the middle of crosshair icon on the display with the pen. After four points, if the calibration is successful, the 'smiley face' symbol appears on the display and the program returns to settings menu. If the calibration is unsuccessful, the program prompts you to go back and repeat calibration.

Tip: Use medium-hard touches instead of light touches when performing the calibration.

Note: After updating software, screen calibration is required again. Right after the updating, in the first start-up, the screen calibration menu appears automatically.

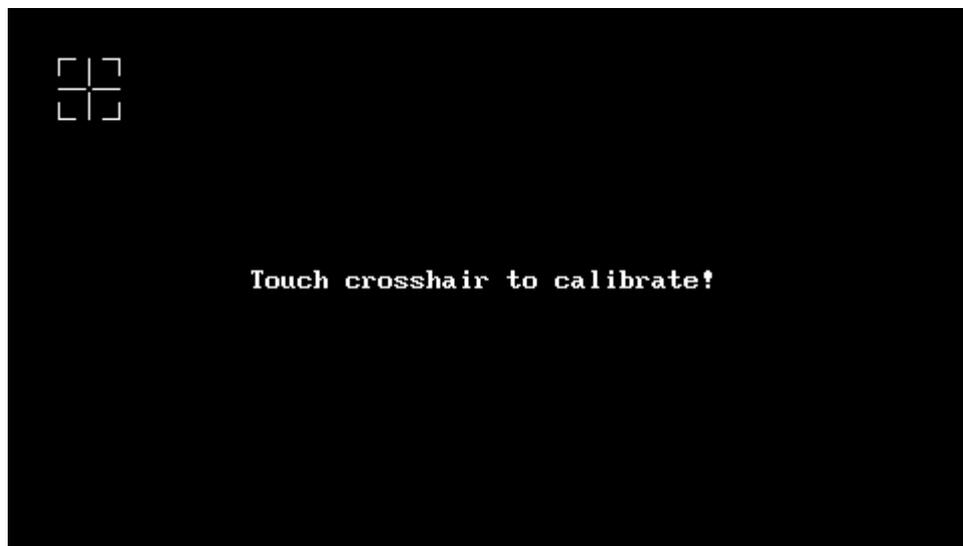


Figure 9. Screen Calibration