



MADE FOR LIFE



WCT-700 UNDERGROUND WIRE TRACER & CIRCUIT FINDER INSTRUCTION MANUAL

Preface

Thank you for purchasing our WCT-700 Underground Wire Tracer and Circuit Finder. In order to use this product safely and correctly, please read this manual thoroughly. After reading this manual, it is recommended to keep the manual in an easily accessible place, preferably close to the device, for future reference.

Limited Warranty and Liability

Jonard Tools guarantees that the product is free from any defect in material and workmanship within one year from the purchase date. This warranty does not apply to damages caused by accident, negligence, misuse, modification, contamination or improper handling. The dealer shall not be entitled to give any other warranty on behalf of Jonard Tools. If you need warranty service within the warranty period, please contact Jonard Tools directly.

Jonard Tools will not be responsible for any special, incidental or subsequent damage or loss caused by using the device.

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I. OVERVIEW










The WCT-700 Underground Wire Tracer and Circuit Finder can be used to detect the path of low-voltage cables buried underground or inside walls, test and diagnose opens, shorts and other problems occurring at cabling, and detect if the tested cable is energized. The transmitter can display corresponding voltages (voltage of energized cable: $\geq 8V$), and the receiver can simultaneously display the signal strength, transmitter code, transmitter power level, low battery, etc.

II. ACCESSORIES

- WCT-700 Transmitter 1 pc
- WCT-700 Receiver 1 pc
- Dual In-line Test Leads (red + black)..... 1 pair
- Alligator Clips (red + black) 1 set
- Lantern-tip Test Probe (red + black)..... 1 pair
- AC Polarized Plug Wire..... 1 pc
- Instruction Manual 1 pc
- 1.5V AA Alkaline Battery..... 6 pcs
- 1.5V AAA Alkaline Battery 6 pcs


III. SAFETY INFORMATION

3.1 ELECTRICAL SYMBOLS

	AC (Alternating Current)
	DC (Direct Current)
	Warning
	High Voltage
	Double Insulated
	Grounding
	Conforms to European Union standards
	UKCA certification mark
CAT III	Applicable to test and measure the circuit connected with the power distribution part of building's low-voltage MAINS installation.
	Do not place equipment and its accessories in the trash. Dispose of them properly, according to the local regulation.

III. SAFETY INFORMATION

3.2 SAFETY INSTRUCTIONS AND PRECAUTIONS

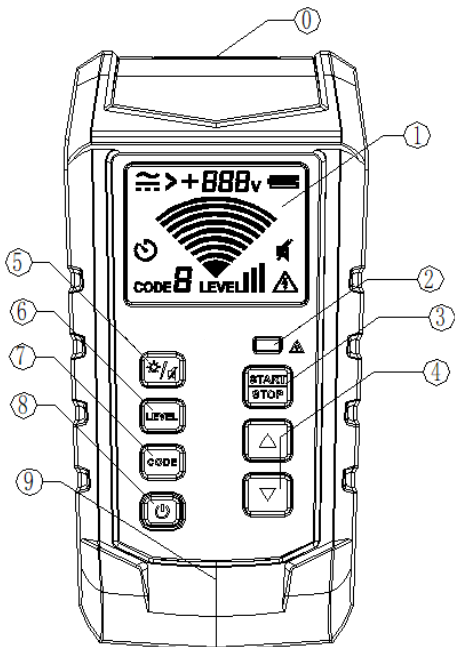
-  **WARNING:** To avoid electric shock, fire, or personal injury, read through the user manual, especially the safety information below.
- After reading the “**Safety Information**”, keep it and the user manual along with the device in a proper place for future use.
- To ensure safe use, the user must adhere to the safety instructions and warning affixed to the product. Failure to follow the operating instruction may compromise or lose the protection provided by the device.
- Check the device and the test leads before use. The insulation of the test leads should not be damaged or broken. If the test leads are damaged, replace them immediately.
- If any problem is found, such as a bare test lead, damaged casing, abnormal display, damaged accessories, etc., stop using the device immediately.
- For safety, do not alter the internal wiring of the device to avoid damaging it and to prevent safety risks.
- Do not use or keep the device in places with high temperature and high humidity. If the device gets damp, its performance may degrade.
- Do not use the device without the cover closed well, otherwise it may present a risk of electric shock.
- Ensure the user’s hands, shoes, clothing, ground, circuits and components are dry.
- When the device is performing a measurement, do not contact it with bare wire, connectors, unused input terminals, or circuits under testing.
- Use caution when working with voltage over 30V (DC/AC), and grip the test leads behind the finger guards to avoid electric shocks.
- Set the device to maximum range if the measured range is unknown. The measured signal cannot exceed the specified limit, to prevent electric shocks or damage to the device.
- Do not apply overvoltage or excess current between terminals, or between any terminal and earth ground.
- Remove the test leads from the device before opening the battery cover.
- Disconnect the test leads from the measured circuit after each measurement operation is completed.

- During CAT III/CAT IV measurements, ensure the test lead shield is pressed firmly in place to avoid a risk of electric shock. In CAT II measurement locations, the test lead shield can be removed to perform testing on recessed conductors such as wall outlets.
- If the low battery symbol appears on the LCD, replace the battery immediately to ensure measurement accuracy.
- Measure the known intrinsic voltage of the device before use to ensure the device functions normally.
- Check the batteries before use or replacement. The batteries must be installed according to the correct polarity.
- Turn off the power after measurement is completed. If the device is not used for a long time, remove the batteries from it to avoid leakage. If battery leakage occurs, stop use immediately.
- Battery acid is a high-alkalinity substance and can conduct electricity. If battery acid contacts your skin or clothing, clean it using a large amount of water immediately. If battery acid gets in your eyes, rinse your eyes with a large amount of water and get medical treatment immediately.
- Do not dismantle, short the batteries, or ignite them. Do not charge nonchargeable batteries, otherwise it may pose a risk of explosion.
- Power off the device before cleaning or maintenance. Disconnect the connected measured cable or other accessories from the device and all measured objects.
- Do not immerse the device into water or other liquids.
- To clean, wipe the device case with damp cloth and mild detergent. Do not use abrasives or solvents.
- Calibration or maintenance must be performed by qualified repair personnel or a designated repair department.
- If the device is equipped with a replaceable fuse, adhere to the following operating instructions:
 1. Power off the Device before replacing the fuse and disconnect the connected measured cable.
 2. Use only the fuse with designated type and current rating. Do not use wrong or repaired fuses, nor connect the fuse block to prevent fires.

NOTE: It is normal that weak sparks may occur periodically when the WCT-700 is used as a voltage device to measure external voltage.

IV. TRANSMITTER COMPONENTS

4.1 TRANSMITTER APPEARANCE



- | | |
|--|--------------------------|
| 0. Input/Output Terminal | 5. Backlight/Mute Button |
| 1. LCD Screen | 6. Level Button |
| 2. ELV Indicator Light | 7. Code Button |
| 3. Start/Stop Signal Transmission Button | 8. Power Button |
| 4. Up/Down Button | 9. Buzzer |

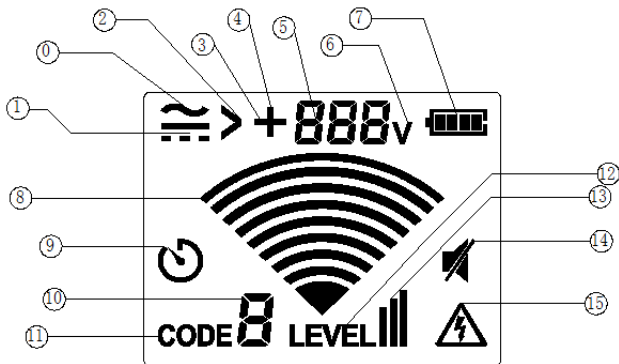
IV. TRANSMITTER COMPONENTS

4.2 DESCRIPTION OF COMPONENTS

0	Input/Output Terminal: Used to connect with multiple accessories (i.e., AC polarized plug) for signal measurement/output.
1	LCD Screen with backlight
2	ELV Indicator Light: If the voltage of the input port exceeds the specified voltage when the transmitter is powered off, the LED lights up red and its brightness increases as the voltage rises.
3	Button for Starting/Stopping Signal Transmission: When there is no signal emitted, short press this button to start signal transmission, short press again to stop signal transmission.
4	Up/Down Button (Enabled when transmission is stopped and the CODE and LEVEL are set): When the CODE symbol flashes, short press the UP/DOWN button to set the CODE to 0, 1, 2, 3, 4, 5, 6 or 7. The default code is 5. When the LEVEL symbol flashes, short press the Up/Down button to set the LEVEL I , II , and III). The default level is III .
5	Backlight/Mute Button: Short press to turn on/off the Backlight; long press to turn on/off the Mute mode.
6	LEVEL Button (Enabled when transmission is stopped): Short press to enter/exit the LEVEL setting.
7	CODE Button (Enabled when transmission is stopped): Short press to enter/exit the CODE setting.
8	Power Button: Long press this button for >1s to turn on the transmitter; or long press >1s in power-on state to turn off the transmitter.
9	Buzzer: Buzzer is located here and may sound during testing.

IV. TRANSMITTER COMPONENTS

4.3 DESCRIPTIONS OF DISPLAY

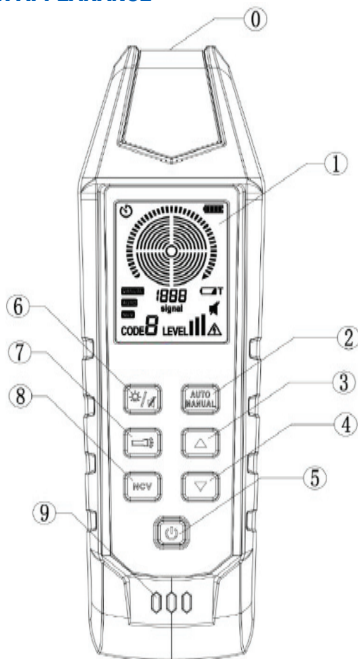


Component	Description
0	The symbol “~” appears when the input/output port is connected with AC power supply.
1	The symbol “≡” appears when the input/output port is connected with DC power supply.
2	The symbol “>” appears when the input/output port is connected with an AC/DC power supply greater than 480V.
3	When the input/output port is connected with DC power supply, and the red input port is connected with DC negative pole and the black port is connected with positive pole, the symbol “-” appears.

Component	Description
4	When the input/output port is connected with DC power supply, and the red input port is connected with DC positive pole and the black port is connected with negative pole, the symbol “+” appears.
5	The actual measured voltage (when the input voltage is $\geq 8V$).
6	Voltage symbol
7	Battery power level (including 4 levels).
8	When a signal is emitted, this dynamic symbol will be refreshed cyclically.
9	Auto-off (APO symbol)
10	This is the current code value. When setting the code, the current set code (code value: 0~7) will be displayed. The default code is 5.
11	This is the code symbol. It flashes when setting code.
12	This symbol denotes the level of the transmission power. It flashes when setting the power level.
13	This is the current power level. When setting the power, the current set power level (▣▣, ▣, and ▣) will be displayed.
14	This symbol appears when the buttons are set in mute mode.
15	If input voltage greater than 25V is applied to the port, this symbol will be displayed; if greater than 480V, it will flash.

V. RECEIVER COMPONENTS

5.1 RECEIVER APPEARANCE



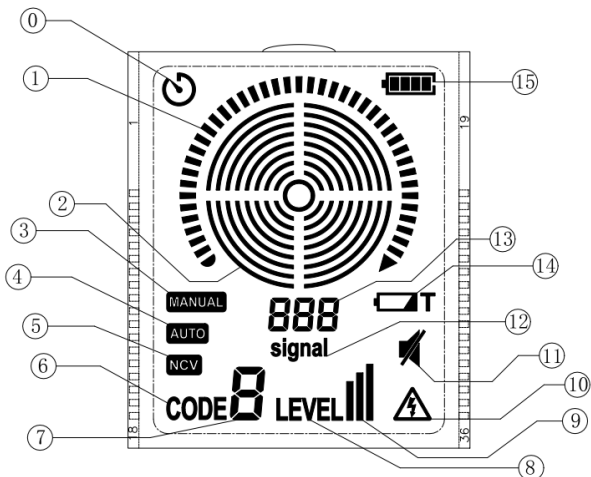
- | | |
|----------------------------------|--------------------------|
| 0. Cable Tracking End/NCV Sensor | 5. Power Button |
| 1. LCD Screen | 6. Backlight/Mute Button |
| 2. Auto/Manual Button | 7. Flashlight Button |
| 3. Up Button | 8. NCV Button |
| 4. Down Button | 9. Buzzer |

5.2 OPTIONS OF COMPONENTS

0	Cable Tracking End and NCV Detector Sensor
1	LCD screen with backlight
2	Auto/Manual Button (Enabled in Cable Tracking Mode): Short press this button in cable tracking mode to switch between AUTO and MANUAL modes (Default mode: AUTO).
3	UP Button (Enabled in Cable Tracking Mode and MANUAL setting): In MANUAL mode (in cable tracking mode), short press this button to increase the reception sensitivity (0~8). When the sensitivity is at 8, short press to switch to AUTO mode.
4	DOWN Button (Enabled in Cable Tracking Mode): 1. In AUTO mode (in cable tracking mode), short press this button to switch to MANUAL mode (Default: Position 6). 2. In MANUAL mode (in cable tracking mode), the reception sensitivity (8~0) can be decreased.
5	Power Button: Long press this button for >1s to turn on the receiver; or long press >1s in power-on state to turn off the receiver.
6	Backlight/Mute Button: Short press to turn on/off the Backlight; long press to turn on/off the Mute mode.
7	Flashlight Button: Short press to turn on/off the Flashlight
8	NCV Button: 1. Cable tracking mode is the default mode after boot-up. Short press this button to switch to NCV mode. 2. In NCV mode, short press to switch to AUTO mode (in cable tracking mode).
9	Buzzer: Buzzer is located here and may sound during testing.

V. RECEIVER COMPONENTS

5.3 DESCRIPTIONS OF DISPLAY



Component	Description
0	Auto-off (APO symbol)
1	Analog bar graph
2	Sensitivity level
3	MANUAL mode (in Cable Tracking Mode)

Component	Description
4	AUTO mode (in Cable Tracking Mode)
5	NCV mode
6	CODE symbol (displayed in Cable Tracking Mode)
7	Transmitter code (0~7). This code is displayed in Cable Tracking Mode
8	LEVEL symbol (displayed in Cable Tracking Mode)
9	Transmitter power level (Ddisplayed in Cable Tracking Mode)
10	This symbol means non-contact voltage (NCV) is sensed. NCV signal is sensed in cable tracking mode or in NCV mode.
11	This symbol appears when the buttons are set in mute mode.
12	A signal symbol (displayed in Cable Tracking Mode)
13	Relative signal amplitude (displayed in Cable Tracking Mode)
14	The symbol means the transmitter is in low battery state (displayed in Cable Tracking Mode)
15	Battery power level (including 4 levels)

VI. SETTINGS

6.1 WCT-700T SETTINGS

6.1.1 CODE SETTING

1. The default code is 5 when the transmitter is powered on.
2. The transmitter is in powered-on state by default (transmission is not started by the transmitter). Short press the START/STOP button to stop transmission when transmission is started by the transmitter. When the CODE button is short pressed, the CODE symbol will flash for 0.5s, as shown in **Figure 6.1.1a**.

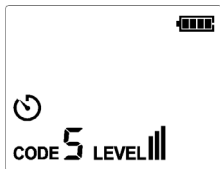


Figure 6.1.1a

3. When the CODE symbol flashes, short press the Up/Down button to set the CODE to 0, 1, 2, 3, 4, 5, 6 or 7, as shown in **Figures 6.1.1b** and **6.1.1c**. The default code is 5.

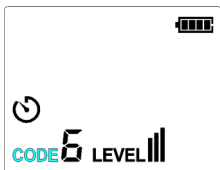


Figure 6.1.1b – CODE Increasing

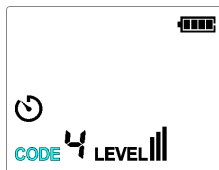


Figure 6.1.1c – CODE Decreasing

4. Short press the CODE, LEVEL (6.1.2 LEVEL Setting), or START/STOP button to exit the CODE setting.

6.1.2 LEVEL SETTING

1. The default code is  when the transmitter is powered on.
2. The transmitter is in the powered-on state by default (transmission is not started by the transmitter). Short press the START/STOP button to stop transmission when transmission is

started by the transmitter. When the LEVEL button is short pressed, the LEVEL symbol will flash for 0.5s, as shown in **Figure 6.1.2a**.

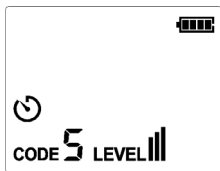


Figure 6.1.2a

- When the LEVEL symbol flashes, short press the Up/Down button to set the level to , , or . The default level is , as shown in **Figure 6.1.2b**.



Figure 6.2.1b – LEVEL Increasing/Decreasing

- Short press the LEVEL, CODE (6.1 CODE Setting), or START/STOP button to exit the LEVEL setting.

6.1.3 BUTTON SETTINGS

- Short press the Backlight/Mute button to turn the Backlight on/off. Long press to turn Mute mode on/off.
- Short press the START/STOP button to turn the signal transmission on/off.
- When the transmitter transmits a signal, the functions activated by short pressing the CODE, LEVEL, UP and DOWN buttons are disabled.
- When the transmitter does not transmit signal, the functions can be activated by short pressing the CODE, LEVEL, UP and DOWN buttons are enabled.
- After the transmitter powers on normally, the START/STOP and Backlight/Mute buttons can be used normally in any mode and situation.
- Long press the power button for >1s to enable the button function.

6.1.4 DESCRIPTIONS OF TONE

1. When the button function is enabled and the transmitter is not muted, the tone is a high-pitched short sound (about 200ms).
2. When the button function is disabled and the transmitter is not muted, the tone is a low-pitched short sound (about 150ms).
3. In mute mode, all buttons are muted.

VI. SETTINGS

6.2 WCT-700R SETTINGS

6.2.1 AUTO/MANUAL MODE SETTING (in Cable Tracking Mode)

1. The default mode is AUTO scanning mode when the receiver powers on.
2. The receiver is in the powered-on state by default. Short press the AUTO/MANUAL button to switch to MANUAL scanning mode (reception level mode is 6), as shown in **Figures 6.2.1a** and **6.2.1b**.

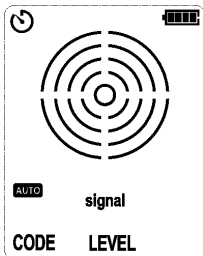


Figure 6.2.1a – Auto Mode

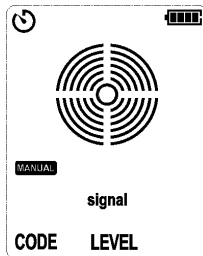


Figure 6.2.1b – Manual Mode

3. In AUTO scanning mode, short press the DOWN button to switch to MANUAL mode (default reception sensitivity: 6).
4. When the receiver is in MANUAL scanning mode and its reception sensitivity is 8, short press the UP button to switch to AUTO mode.

6.2.2 ADJUST THE RECEPTION SENSITIVITY IN MANUAL MODE

1. Power on the receiver and then enter MANUAL mode (default reception sensitivity: 6), as shown in **Figure 6.2.1b**.
 2. In MANUAL mode, short press the UP button to adjust the sensitivity from 0 to 8. When the sensitivity is 8, short press the UP button to switch to AUTO mode.
 3. In MANUAL mode, short press the DOWN button to adjust the sensitivity from 8 to 0. In AUTO mode, short press the DOWN button to switch to MANUAL mode.
- NOTE:** The LEVEL and CODE shown on the WCT-700R are data points sent from WCT-700T. They cannot be adjusted on the WCT-700R.

6.2.3 NCV MODE SWITCHING

1. The receiver is in powered-on state: In AUTO or MANUAL mode (in cable tracking mode), short press the NCV button to switch to NCV mode. In NCV mode, short press the NCV button to switch to AUTO mode (cable tracking mode). As shown in **Figures 6.2.3a, 6.2.3b and 6.2.3c**.

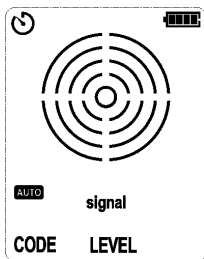


Figure 6.2.3a – Auto Mode

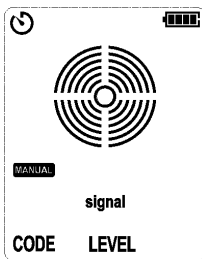


Figure 6.2.3b – Manual Mode

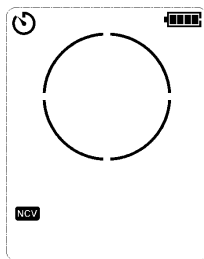


Figure 6.2.3c – NCV Mode

6.2.4 BUTTON SETTINGS

1. The Flashlight button, Backlight/Mute button and NCV button can be used in any mode or situation.
2. Short press the Flashlight button to turn on/off the Flashlight.
3. Short press the Backlight/Mute button to turn on/off the Backlight; long press to turn on/off the Mute function.

4. In AUTO scanning mode (cable tracking mode), the functions of the AUTO/MANUAL and DOWN buttons are enabled.
5. In MANUAL scanning mode (in cable tracking mode), the functions of the AUTO/MANUAL, UP and DOWN buttons are enabled.
6. Long press the power button for >1s to enable the button function.

6.2.5 DESCRIPTIONS OF TONE

1. When the button function is enabled and the receiver is not muted, the tone is a short high-pitched sound (about 200ms).
2. When the button is disabled and the receiver is not muted, the tone is a short low-pitched sound (about 150ms).
3. In mute mode, all buttons and signal sounds are muted.

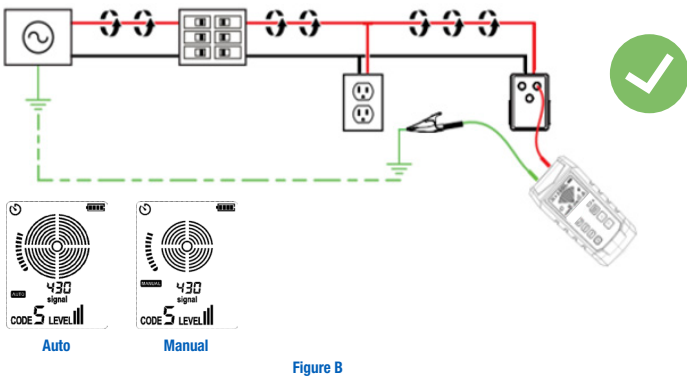
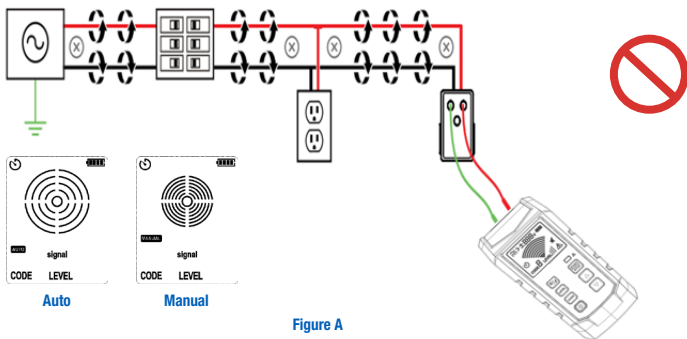
VII. KEY APPLICATIONS

NOTE: read the user manual carefully before performing cable tracking.

Perform the connection through independent grounding to avoid counteracting the electromagnetic field generated around the conductor via the signal produced by the transmitter (the electromagnetic field is detected by the receiver). The clearer the signal, the easier the cable can be tracked. Connect the transmitter with two adjacent conductors of the same circuit (i.e., the live and neutral wires of Romex cable). The signal is transmitted through the first conductor in one direction and returns through the second conductor in the opposite direction. Thus, the two opposite-direction electromagnetic fields around the adjacent conductors will counteract mutually. The electromagnetic fields in opposite directions mutually counteract, which leads to difficulty in tracking cable, or even inability to track. See **Figure A** on next page for reference.

To avoid the counteraction effect, the cable should be independently grounded. The red test lead of the transmitter shall be connected to the live wire of the circuit tracked, and the black to the independent grounding, i.e., water pipe, grounding spike, metal structure of building, or grounding connection of outlet at other circuits. Note that the independent grounding is not the grounding end of any outlet at the circuit to which the measured conductor belongs. If the live wire is energized and the transmitter is connected to the independent grounding correctly, the LCD of the transmitter will display the AC or DC symbol of corresponding voltage and power supply. For DC, the polarity “+” or “-” will be displayed. For independent grounding,

the electromagnetic fields around live wire are not counteracted by the opposite-direction signal of the loop of the adjacent conductors (live or neutral wire). The signal is transmitted through the independent grounding, and therefore, the intensity of the signal generated is the strongest. See the **Figure B** for reference.



7.1 TRACKING ENERGIZED AND DE-ENERGIZED CABLES

7.1.1 CONNECT TEST LEADS TO THE TRANSMITTER

1. Connect the black and red test leads to the transmitter (no need to consider the polarity).
2. Connect the outlet converter to the outlet and connect the red test lead to the energized live wire (at the load side of the system). Signal is generated only between the power supply and the load side connected to the transmitter, as shown in **Figure 7.1.1a**.

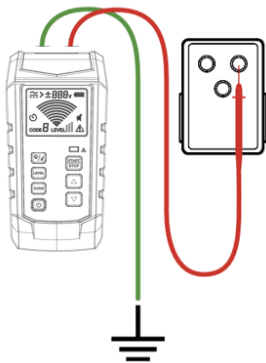


Figure 7.1.1a – Correct Connection of Independent Grounding

3. Connect the black test lead to the independent grounding surface (metal structure of building, metal water pipe, or grounding wire of independent circuit).

NOTE: If applied to a GFCI-protected circuit, this method will trigger the GFCI. See “**Special Applications**”. For the tracking method, see **Section 8.1 “Track the Cable of GFCI-Protected Circuit”**.

7.1.2 SETTINGS OF THE WCT-700T TRANSMITTER

1. Power on the transmitter.
2. Test and confirm if the connection of test leads is correct. For circuits with voltage over 30V AC/DC, the warning symbol will light up, as shown in **Figure 7.1.2a**.

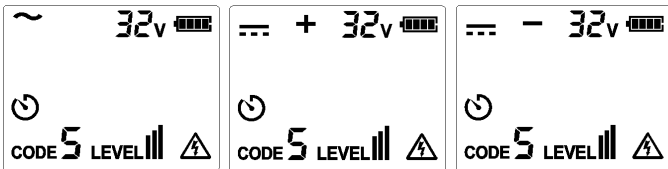


Figure 7.1.2a – Voltage Over 30V

For a de-energized circuit with voltage below 30V AC/DC, the warning symbol will turn off, as shown in **Figure 7.1.2b**.

NOTE: Perform connection through the above-mentioned independent grounding.

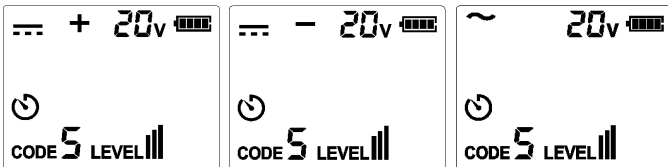


Figure 7.1.2b – Voltage Below 30V

- For most applications, the default transmission strength is (default code: 5). As shown in **Figure 7.1.2c**, the level shown on the LCD is .

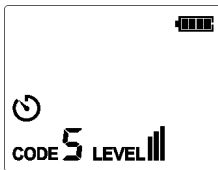


Figure 7.1.2c

NOTE: To locate the cable more accurately, set the transmission strength to or , as shown in **Figures 7.1.2d** and **7.1.2e**, to limit the level of the signal generated by the transmitter.

For specific operating method, see “**6.1.2 LEVEL Setting**”. Relatively low signal level can reduce the coupling of adjacent cables and metal objects, which avoids incorrect readings caused by ghost signals. Relatively low signal levels also help prevent the receiver from being oversaturated due to the large covering area of a strong signal. The signal strength is only applicable for strict and precise tracking and is not suitable for wall or deeply buried cable.

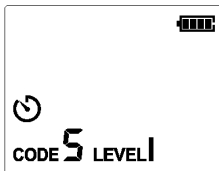


Figure 7.1.2d

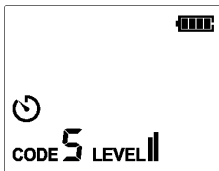



Figure 7.1.2e

7.1.3 USE OF WCT-700R RECEIVER (in Automatic Scanning Mode)

The automatic scanning mode is used to detect the conductor at a relatively far distance between the conductor and the receiver. This mode can automatically adjust the reception sensitivity according to the current signal strength, to prevent the signal from being saturated or from being too weak. The precision of automatic scanning mode is lower than that of manual mode. This function detects if tracking signals occur and tracks the path of the conductor rapidly. Switch to manual mode to locate the cable more precisely.

The receiver indicates the signal strength through 3-digit readings, analog indication, and sound.

1. Power on the transmitter, and it will enter automatic scanning mode (default mode).
2. Use the sensor to scan the target area, identify signals, and start tracking the detected cable.
3. For best results when tracking an energized conductor, align the dot on the top of the sensor to the direction of the conductor, as shown in **Figure 7.1.3a**. If not aligned properly, signals may not be detected, or the code may be wrong. To check the direction of the cable, rotate the receiver 90°, as shown in **Figures 7.1.3b** and **7.1.3c**. The signal strength reaches its maximum when the cable is aligned with the dot on top of the unit. According to the differences of detected signals, the receiver automatically detects if the cable is energized (“”), which will be displayed on the LCD. No need to perform manual setting.

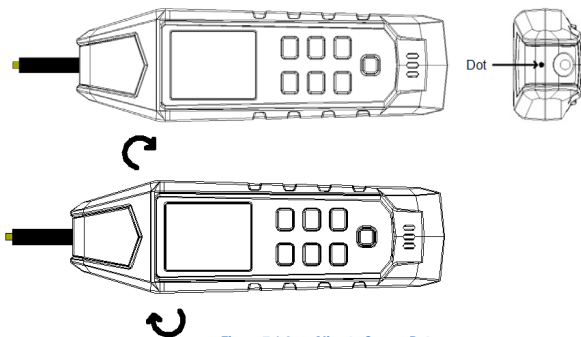


Figure 7.1.3a – Align to Sensor Dot

NOTE: For best results, make sure that the distance between the receiver and the transmitter as well as its test leads are at least 3 ft apart. This will greatly reduce signal interference.

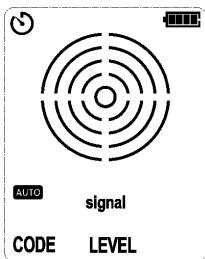


Figure 7.1.3b – No Signal Detected

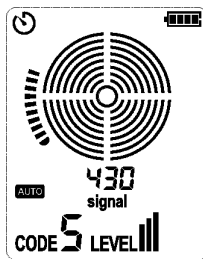


Figure 7.1.3c – Signal Detected

7.1.4 USE OF WCT-700R RECEIVER (in Manual Scanning Mode)

Use the manual tracking mode to locate cables or faults accurately. The receiver indicates the signal strength through 3-digit reading, analog indication and sound.

1. Short press the AUTO/MANUAL (mode) button, and the LCD will show MANUAL, as shown in **Figure 7.1.4a**.
2. Use the sensor to scan the target cable to identify the maximum signal level. During cabling tracking, adjust the sensitivity regularly so that the signal strength maintains at a certain range (i.e., 300~600), as shown in **Figure 7.1.4b**. The sensitivity can be increased or decreased by pressing the UP or DOWN button. If the signal strength is too high, set the transmission level to **II** or **I**. For specific settings, see “**6.1 WCT-700T Settings**”.
3. For best results, when tracking energized conductor, align the dot (on the top of the sensor) to the direction of the conductor, as shown in **Figures 7.1.4a** and **7.1.4b**. If not aligned properly, the signal may not be detected, or the code may be wrong. To check the direction of the cable, rotate the receiver for 90° regularly. The signal strength reaches its maximum when the cable is aligned with the dot on top of the sensor. The receiver automatically detects if the cable is energized (“**⚡**”), which will be displayed on the LCD.

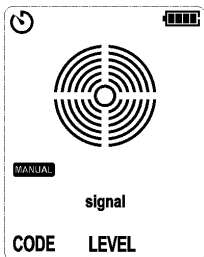


Figure 7.1.4a – No Signal Detected

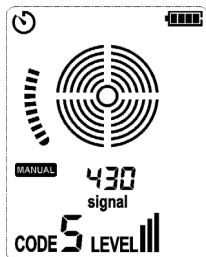


Figure 7.1.4b – Signal Detected

7.2 IDENTIFYING CIRCUIT BREAKER AND FUSE (Energized and De-energized)

For locating circuit breakers, connecting to live and neutral wires directly can be done, since the conductors at the panel of the circuit breaker are independent. If the distances between conductors are at least several inches apart, there is no risk of signal interference. However, if cable tracking is needed aside from the identification of circuit breaker, the cable being tracked will require independent grounding. Connecting to live and neutral wires directly will not trigger the GFCI-protected circuit, as shown in **Figures 7.2a** and **7.2b**.

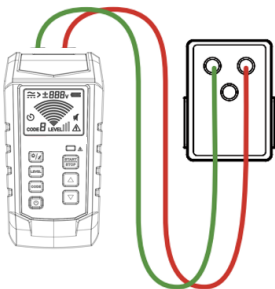


Figure 7.2a – Simple Connection

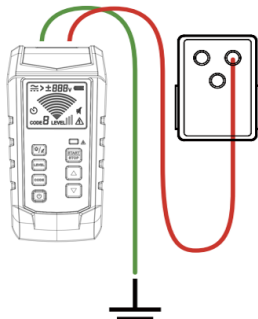


Figure 7.2b – Independent Grounding (Preferred Choice)

7.2.1 CONNECT TEST LEADS

1. Connect the transmitter through simple connection or independent grounding.
2. Through simple connection: Connect the test leads to live or neutral wire directly. Since signals counteract mutually, cables cannot be tracked when locating the circuit breaker.
3. Through independent grounding: Connect the red test lead to the energized live wire at the load side of the system. Signal is generated only between the power supply and the outlet connected with transmitter.
4. Connect the black test lead to independent grounding, i.e., metal structure of building, metal water pipe, or grounding wire of independent circuit.

7.2.2 SETTINGS OF WCT-700T TRANSMITTER

1. Power on the transmitter.
2. Test and confirm if the connection of the test leads is correct. For circuits with voltage over 30V AC/DC, the warning symbol will light up. For de-energized circuits with voltage below 30V AC/DC, the warning symbol will turn off.

NOTE: Perform connection through the above-mentioned independent grounding.

3. For most applications, the default transmission strength is **■■■** (Default code: 5). As shown in **Figure 7.2.2a**, the level shown on the LCD is **■■■**.

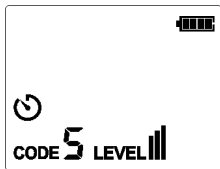


Figure 7.2.2a

NOTE: To locate the cable more accurately, set the transmission strength to **1**, to limit the level of the signal generated by the transmitter. Relatively low signal levels can reduce coupling with adjacent cables and metal objects, which avoids incorrect reading caused by ghost signals. Relatively low signal levels also help prevent the receiver from being oversaturated due to strong signals.

7.2.3 USE OF WCT-700R RECEIVER

1. Power on the receiver and then short press the AUTO/MANUAL button to switch to manual mode, as shown in **Figure 7.2.3a**.

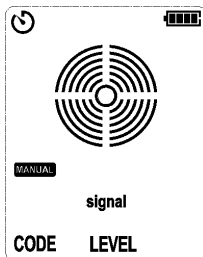


Figure 7.2.3a - No Signal Detected

2. Align the dot on the top of the receiver to the circuit breaker, as shown in **Figure 7.2.3b**.
3. Scan all circuit breakers in random sequence. Scan the circuit breakers multiple times to observe the signal strength displayed on the LCD, until a circuit breaker panel with the strongest signal is identified. During scanning, the sensitivity needs to be adjusted repeatedly, to prevent the accuracy from being affected by high strength signals, as shown in **Figure 7.2.3c**.

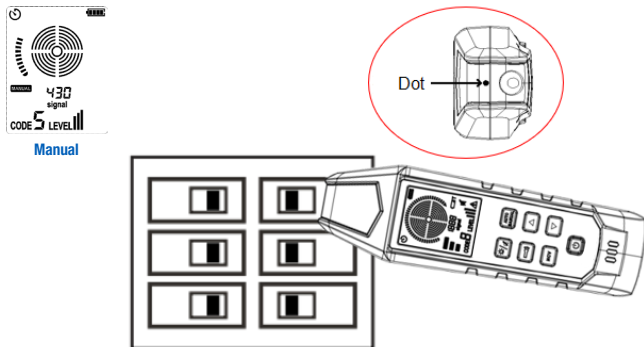


Figure 7.2.3b – Align the Dot to the Circuit Breaker

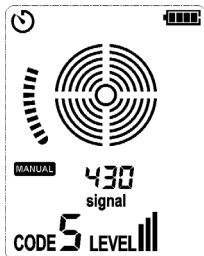


Figure 7.2.3c – Signal Detected

NOTE: Since the designs, heights and internal contact structures of circuit breakers are different, the accuracy of identifying circuit breakers may be affected. To obtain reliable results, open the circuit breaker panel to scan the conductor instead of the circuit breaker. During scanning, if more than one signal is found, keep scanning the indicated circuit breakers until only one circuit breaker is correctly identified. The receiver automatically detects if the cable is energized (“ Δ ”), which will be displayed on the LCD, and there is no need to perform manual settings. The reception sensitivity can also be adjusted by pressing the UP/DOWN button.

7.3 NCV MODE AND PASSIVE TRACKING

Without the use of transmitter, the NCV (Non-Contact Voltage) mode can be used to test if the cable is energized or to track cables. If the voltage is 80V~1000 V AC (50~60Hz), the receiver can detect and track the energized cable, without current flowing through it.

NOTE: For safety, use a tester to confirm that the circuit is de-energized before performing on a circuit.

NCV MODE: Power on the receiver.

In cable tracking mode, short press the NCV button (In NCV mode, short press the NCV button to switch to AUTO mode under cable tracking mode) to switch to the NCV detection function.

For passive tracking, the sensor is used to scan the target area to identify the highest signal level. To test if the cable is energized, move the sensor of the receiver to the cable, as shown in **Figures 7.3.1a** and **7.3.1b**.

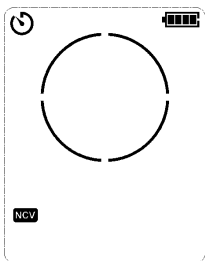


Figure 7.3.1a – Voltage Not Detected in NCV Mode

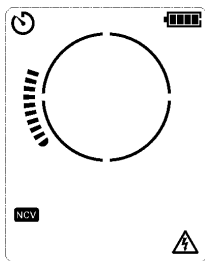


Figure 7.3.1b – Voltage Detected in NCV Mode

VIII. SPECIAL APPLICATIONS

8.1 TRACK THE CABLE OF A GFCI-PROTECTED CIRCUIT

When connecting the WCT-700T transmitter to a GFCI-protected circuit, connect the transmitter to the energized GFCI-protected circuit using independent grounding, to trigger GFCI protection. For GFCI-protected circuits, use the methods below: For de-energized GFCI-protected outlets which will not be triggered, connect the test leads to the contact point of the outlet, in de-energized sensor mode.

METHOD 1: Bypass a GFCI-protected circuit to avoid triggering GFCI (applicable to energized GFCI-protected outlets only).

1. Remove the protective outlet panel.
2. Use alligator clips to connect the red test lead to the connection screw between the energized live wire and the outlet.
3. Connect the black test lead through independent grounding.
4. Perform tracking according to the instructions in the sections about automatic and manual scanning modes.

METHOD 2: To avoid triggering GFCI, independent grounding is not used (applicable to GFCI-protected outlet and circuit breaker).

1. Connect the test lead of transmitter to neutral and live wire.
2. Perform tracking in automatic or manual scanning mode.

Note: This method will cause signal coupling and reduce the signal strength. If the signal is too weak or cannot be tracked, use Method 3 below.

METHOD 3: Switch off the circuit power of the GFCI-protected circuit breaker.

1. Connect the transmitter to the conductor according to the instructions in the **Cable Tracking Mode** section.
2. Perform tracking in automatic or manual scanning mode.

8.2 IDENTIFY BREAKPOINTS/OPENS

Even though the cable is on the wall, ground or ceiling, the breakpoint of the conductor can be identified accurately in precise tracking mode.

1. Make sure the cable is de-energized.
2. Connect the transmitter and perform tracking according to the steps described in the Automatic or Manual Scanning Mode sections.
3. For best results, use the black test lead to ground all parallel de-energized cables.

If a metal conductor is connected, the tracking signal generated by the transmitter will be transmitted along the cable. Track the cable to identify the fault until the signal is stopped. To verify the location of the fault, move the transmitter to the other end of the cable to perform tracking. If the signal is stopped at the same location, then the location of the fault is found.

Alternatively, connect two WCT-700T transmitters (set different codes on them) to both ends of the cable, respectively. If the signal is in the same location, the code is updated to the other receiver after the receiver passes above the breakpoint, in which case the location of the fault is found. See below in **Figures 8.2.1a** and **8.2.1b**.

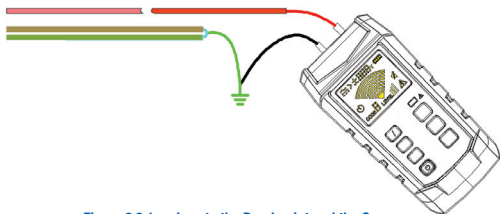
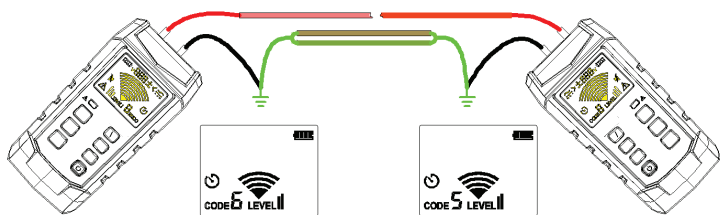


Figure 8.2.1a – Locate the Breakpoint and the Open



**Figure 8.2.1b – Locate the Breakpoint and the Open via Multiple Transmissions
(with the codes set to different values)**

NOTE: If the location of the fault is not found, decrease the LEVEL value of the transmitter, and proceed as mentioned above. If the fault is not found after decreasing the LEVEL, then the fault may be a high-resistance breakpoint. In this case, the cable may be a partial open circuit. The breakpoint can be found if the impedance is less than $50k\Omega$. Such breakpoints will impede current, but the tracking signal can still be transmitted through the breakpoint. Such breakpoints cannot be detected by test devices unless the cable is an open circuit. To locate the breakpoint and the open via multiple transmissions, decrease the LEVEL value (i.e., set to level II or I to avoid mutual interference) of the transmitter appropriately according to the situation.

8.3 IDENTIFY SHORTS

A shorted cable will trigger the circuit breaker. To correct the fault, disconnect the cable, and ensure that the conductors at the both ends of the cable are isolated from each other and from other conductors or loads.

If there are residual charges at the circuit, disconnect the power before testing.

1. Connect the test leads of the transmitter to the circuit, as shown in **Figure 8.3.1a**.
2. Power on the transmitter and confirm the LEVEL value is set to **III**.
3. Set the receiver to automatic or manual scanning mode. Track the cable to identify the fault until the signal stops. To verify the location of the fault, move the transmitter to the other end of the cable to perform tracking. If the signal is stopped at the same location, then the location of the fault is found.

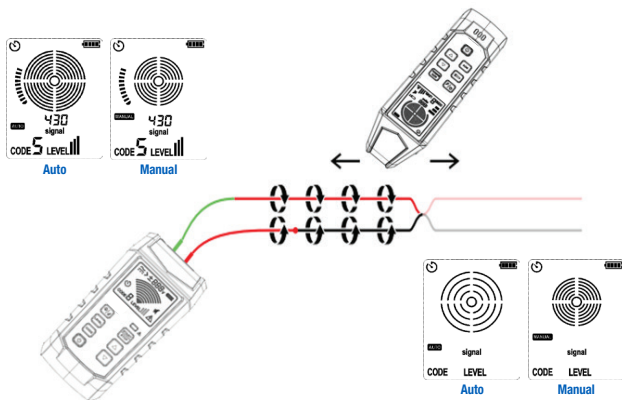


Figure 8.3.1a – Identify Shorts by Tracking the Cable

NOTE: This method is affected by the signal counteraction effect. The signal will be relatively weak. If the location of the fault is not found, decrease the LEVEL value of the transmitter and then proceed as mentioned above. If the fault is not found after decreasing the LEVEL, then circuit is not completely shorted. Typically, the short can be found when the impedance is less than 20Ω .

8.4 TRACK CABLES IN METAL PIPES

The receiver cannot penetrate metal pipes to pick up the signal of the cable. Metal wire grooves will shield the tracking signal completely.

NOTE: The receiver can detect the cable in non-metal wire grooves. For these applications, see “7.1 Track Energized and De-energized Cables” for reference.


To track the cable in a metal pipe:

1. Track in automatic or manual scanning mode.
2. Open the junction box. Use the sensor of the receiver to detect which cable in the junction box has a signal.
3. Move to the next junction box according to the circuit. Note: If the signal is applied to the wire groove directly, the signal will be sent through all pipe branches, thus the specific path of the wire groove cannot be tracked.


8.5 TRACK SHIELDED CABLES

If following the standard instructions, the receiver cannot track the signal of a shielded cable. To track a shielded cable effectively, perform the following steps.

8.5.1 GROUND THE FAR END OF SHIELDED CABLE

1. The default LEVEL is  after the transmitter is powered on.
2. Disconnect the grounding of the closest end of shielded cable and use a test lead to connect the shielded layer of the terminal (V+ port) of the transmitter.
3. Connect the second output (COM) of the transmitter to independent grounding.
4. Set the receiver to automatic or manual scanning mode to track the shielded cable.
5. See **Figure 8.5.1a** on next page for reference.

8.5.2 DISCONNECT THE FAR END OF SHIELDED CABLE FROM THE GROUNDING

1. Set the LEVEL to  when the transmitter is powered on.
2. Disconnect the grounding of the near end of shielded cable and use the test lead to connect the shielded layer to the terminal (V+ port) of the transmitter.
3. Connect the second output (COM) of the transmitter to independent grounding.
4. Set the receiver to automatic or manual scanning mode to track the shielded cable.
5. See **Figure 8.5.2a** on next page for reference.

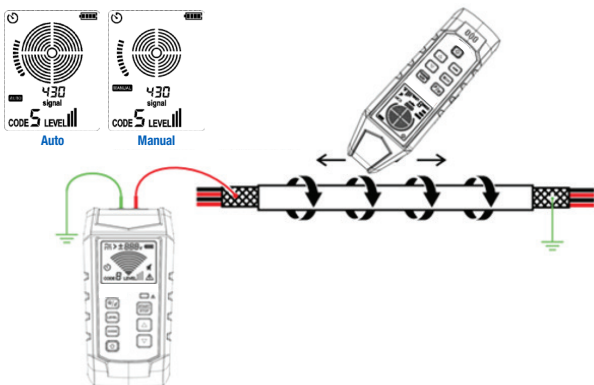


Figure 8.5.1a – Track Shielded Cable (with its far end grounded)

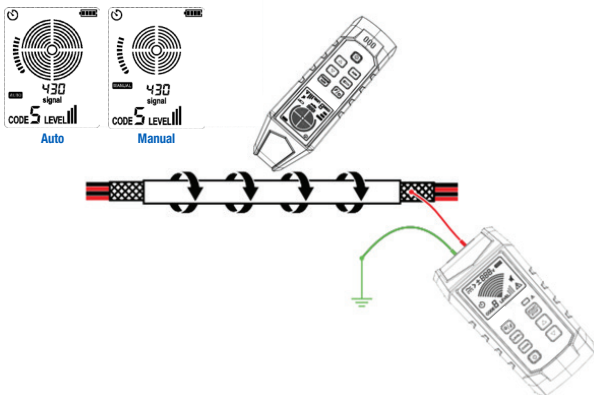



Figure 8.5.2a – Track Shielded Cable (with its far end disconnected from grounding)

8.6 TRACK GROUNDING WIRE

The WCT-700 can track energized or de-energized cables buried in ground, and the tracking method is same as that of locating the cable on wall or ground. Perform tracking by using independent grounding. The default LEVEL is  after the transmitter is powered on, as shown in **Figure 8.6.1a**.

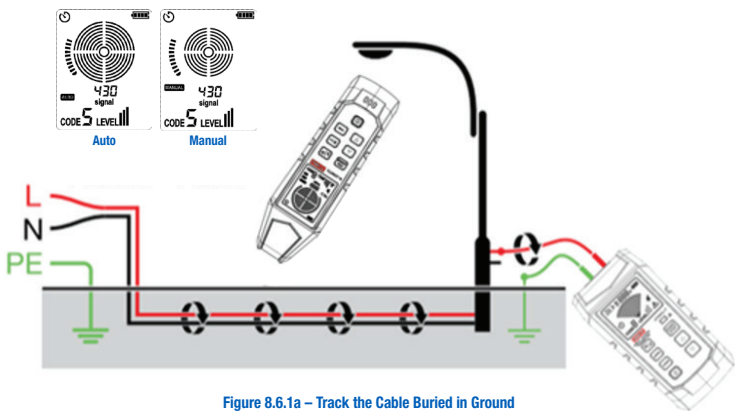


Figure 8.6.1a – Track the Cable Buried in Ground



8.7 TRACK LOW-VOLTAGE WIRE AND DATA CABLE

The WCT-700 can track data cable, video cable, and thermostat cable. For information about tracking shielded data cable, see **Section 7.4 Track Shielded Cable**. Track data, video, and thermostat cable:

1. Connect the transmitter using independent grounding, see **Section 6.1**.
2. Set the receiver to automatic or manual scanning mode to track the cable.

8.8 IDENTIFY THE SPECIFIC CABLE IN A CABLE HARNESS

Identify the specific cable in cable harness.

1. Connect the transmitter. If connected to an energized cable, make sure that the transmitter is connected to the load side.
2. Select cable tracking mode for the receiver.
3. Test one cable each time or use multiple WCT-700T transmitters with different codes. A maximum of 8 transmitters can work simultaneously and decrease the LEVEL to  or  to reduce crosstalk. Pull away each cable from the other cables in the cable harness, and then use the sensor to contact each of these cables. The strongest signal represents the correct cable.
4. Use the UP and DOWN buttons to adjust the receiver sensitivity if needed.
5. See **Figure 8.8.1a** for specific application.

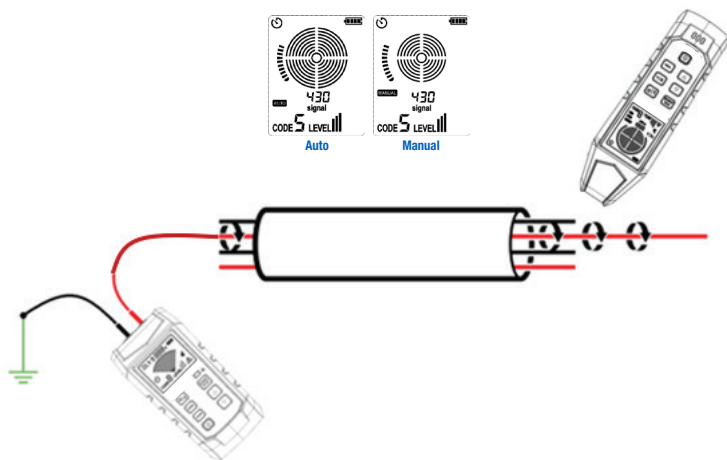


Figure 8.8.1a – Identifying the Specific Cable in Cable Harness

8.9 DRAW A CIRCUIT DIAGRAM USING THE CONNECTION OF TEST LEADS

Drawing a circuit diagram for the connection of test leads is only applicable to de-energized circuits.

1. Set the circuit breaker to OFF position.
2. Set the transmitter and the receiver according to the instructions of automatic or manual scanning mode in **Section 7.1**.
3. Scan the outlet panel and the cable connected with load using the receiver's sensor.
4. According to the indication of the receiver, all cables, outlets, and loads with relatively strong signals are connected to the circuit breaker.
5. **See 8.9.1a** for specific application.

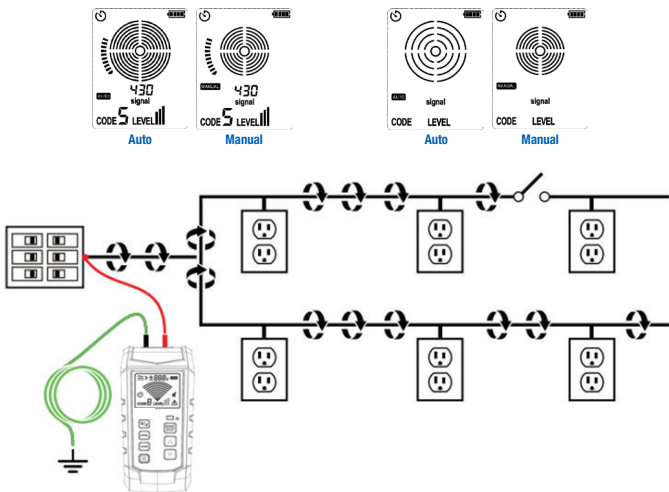


Figure 8.9.1a – Drawing a Circuit Diagram Using the Connection of Test Leads

8.10 TRACK THE CIRCUIT BREAKER IN THE SYSTEM WITH THE ILLUINATION DIMMER

The dimmer will make many electrical noises, including signals with multiple frequencies. In a few cases, such noises, typically called “ghost” signals, are misread by the receiver as the signal generated by the transmitter. Thus, the receiver may provide an incorrect reading. When locating the circuit breaker or fuse in the system with the dimmer, turn off the dimmer (disconnect the light switch), to effectively prevent the receiver from indicating a wrong circuit breaker or fuse.

IX. EXTERNAL VOLTAGE MEASUREMENT AND ELV FUNCTION (WCT-700T)

9.1 EXTERNAL VOLTAGE MEASUREMENT

1. When the transmitter is in power-on state. Regardless of whether the transmitter transmits signal or not. Some sources will interfere when transmitting the signal. If the voltage source is sensitive to the source of interference, stop transmitting the signal immediately.
2. Connect the red test cable with probe (or the red of polarized plug) to the terminal (V+ port) of the transmitter.
3. Connect the black test cable with probe (or the black of polarized plug) to the terminal (COM port) of the transmitter.
4. When the voltage is 8V~480V DC/AC (50/60Hz), and the measured voltage is DC voltage and the positive pole is connected to V+ port, then the polarity of the port will be displayed. The polarity of the V+ port will appear as “+”, as shown in **Figure 9.1a**.

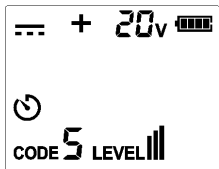


Figure 9.1a – DC Voltage Measurement

5. When the voltage is 8V~480V DC/AC (50/60Hz), and the measured voltage is DC voltage and the positive pole is connected to COM port, then the polarity of the port will be displayed. The polarity of V+ port will appear as “-”, as shown in **Figure 9.1b**.

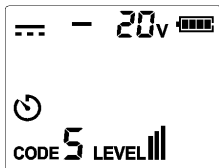


Figure 9.1b – DC Voltage Measurement

6. When the voltage is 8V~480V DC/AC (50-60Hz), and the measured voltage is AC voltage, then the display will appear the same as **Figure 9.1c**.

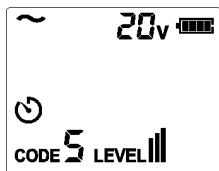


Figure 9.1c – AC Voltage Measurement

7. When the voltage is 8V~480V DC/AC (50/60Hz), and the measured voltage is greater than 30V, then the display will appear the same as **Figures 9.1d, 9.1e and 9.1f**.

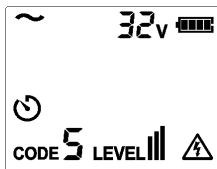


Figure 9.1d – DC Voltage (>30V) Measurement

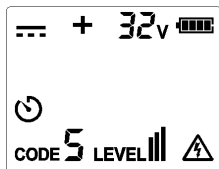


Figure 9.1e – DC Voltage (<-30V) Measurement

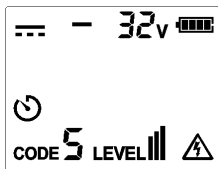


Figure 9.1f – AC Voltage (>30V) Measurement

8. When the voltage is 8V~480V DC/AC (50/60Hz), and the measured voltage is greater than 480V, then display will appear the same as **Figures 9.1g, 9.1h** and **9.1i**.

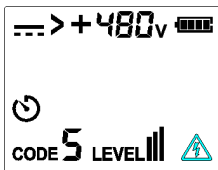


Figure 9.1g – DC Voltage (>480V) Measurement

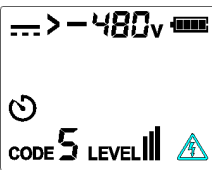


Figure 9.1h – DC Voltage (<-480V) Measurement

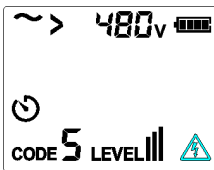


Figure 9.1i – AC Voltage (>480V) Measurement

9.2 ELV FUNCTION

If voltage (>25V) is applied to the port when the transmitter is in poweroff state, the ELV indicator light will illuminate, and the brightness will increase as the voltage rises. Do not exceed 480V DC or AC 50-60Hz.

X. TECHNICAL SPECIFICATIONS

10.1 TRANSMITTER SPECIFICATIONS

CHARACTERISTICS	WCT-700T
Working frequency	33kHz
Identification range of external voltage	8~480V
Identification range of external voltage	DC/AC: 50-60Hz
Measurement accuracy of external voltage	2.5% ± 3 degrees
Strength of external voltage	480V DC/AC

CHARACTERISTICS	WCT-700T
Overvoltage rating	CAT III 480V
Display	Segmented LCD (TN translucent)
Battery	6 x 1.5V AA (LR06)
Power consumption	≤600mA Ipp (Peak)
Fuse	F0.6A 600V
Operating temperature	0~40°C; Max. 80%RH (non-condensing)
Storage temperature	-20~60°C; Max. 80%RH (non-condensing)
Operating altitude	≤2000m
External dimensions	189 mm x 96 mm x 48 mm
Drop resistance	1 m
Button life	10000 times
Weight (excluding batteries)	389g
Weight (including batteries)	528g
Backlight	Supported (white)
CODE (Code value)	0, 1, 2, 3, 4, 5, 6 and 7; Default code: 5
Level of signal strength	1, 2 and 3; Default level: 3

CHARACTERISTICS	WCT-700T
Single pole testing	Supported (Support testing in energized condition; Maximum 480V)
Dual pole testing	Supported (Support testing in energized condition; Maximum 480V)
ELV indicator light	<ol style="list-style-type: none">1. Without batteries: If external voltage applied is >25V, the ELV LED emits weak light and its brightness increases as voltage rises (light up constantly), otherwise, the ELV LED emits weak light or lights off.2. WCT-700T is in power-on state with batteries installed: the ELV LED lights off3. WCT-700T is in power-off state with batteries installed: If external voltage applied is >25V, the ELV LED emits weak light and its brightness increases as voltage rises (light up constantly), otherwise, the ELV LED emits weak light or lights off.
Certification	CE Certified EMC: EN IEC 61326-1: 2021 LVD: EN 61010-1:2010 + A1:2019, EN IEC: 61010-2-033: 2021 +A11:2021 RoHs

X. TECHNICAL SPECIFICATIONS

10.2 RECEIVER SPECIFICATIONS

CHARACTERISTICS	WCT-700R
Working Frequency	33kHz
Locating depth	Related to the medium and the method use
Tracking mode for single pole	About 0~2.5m (use separate loop wire for 2.5m)
Tracking mode for dual poles	About 0~0.5m
Grid voltage identification	About 0~0.4m
NCV	Voltage identification range: 80~1000V, 50Hz/60Hz (approach the measured cable)
Display	Segmented LCD (TN translucent)
Battery	6 x 1.5V AAA (LR03)
Power consumption	About 30mA (excluding backlight & flashlight) About 65mA (excluding backlight) Maximum 95mA (including backlight)
Operating temperature	0~40°C; Max. 80%RH (non-condensing)
Storage temperature	-20~60°C; Max. 80%RH (non-condensing)
Operating altitude	≤2000m
External dimensions	226 mm x 68 mm x 38 mm
Button life	10000 times

CHARACTERISTICS	WCT-700R
Weight (excluding batteries)	287g
Weight (including batteries)	354g
Indication for running out of power (for transmitter)	Supported
Backlight	Supported (white)
Flashlight	Supported
CODE (code value)	0, 1, 2, 3, 4, 5, 6 and 7
Levels of signal strength of transmitter	Level 1, Level 2, and Level 3
Reception sensitivity (Manual adjustment)	Including 9 levels
Index range of signal strength	0~999
Analog bar range of signal strength	0~43
Receive multiple transmission signals	Supported (A receiver can receive signals generated by maximum 8 transmitters at the same time)
Certification	CE Certified EMC: EN IEC 61326-1: 2021 LVD: EN 61010-1:2010 +A1:2019, EN IEC: 61010-2-033: 2021 +A11:2021 RoHs

XI. MAINTENANCE

11.1 BATTERY REPLACEMENT (WCT-700T)


1. Make sure that the transmitter is powered off and that all test leads are removed and disconnected from all circuits.
2. Use a screwdriver to loosen the screws at the battery compartment.
3. Remove the battery cover.
4. Install the batteries.
5. Install the battery cover and fasten it with the screws.

11.2 BATTERY TYPE AND THRESHOLD (TRANSMITTER)

Battery type: AA LR06 alkaline battery

Battery state: 6 batteries of the same type


Battery threshold: The battery symbol displays different levels of battery power (including 4 levels):

>8V to 9V: Level 4 " " is displayed.

>7.2V to ≤8V: Level 3 " " is displayed.

>6.6V to ≤7.2V: Level 2 " " is displayed.

>6.2V to ≤6.6V: Level 1 " " is displayed.

≤6.2V: The batteries run out of power. The symbol " " flashes three times (flashing frequency: 2Hz) and the transmitter powers off. (There is an accuracy error of about 5% with the voltage of the critical point between levels).

11.3 FUSE REPLACEMENT (WCT-700T)

Dismantle the battery compartment (See **11.1 Battery Replacement**), loosen the batteries at the rear cover (as shown in **Figure 11.3**), remove the rear cover, use a tool to take off the fuse, and install a new same-type fuse.

1. Make sure that the transmitter is powered off and that all test leads are removed and disconnected from all circuits.
2. Use screwdriver to loosen the screws at the battery compartment.
3. Remove the battery cover and take out the batteries.

4. Loosen the screws at the rear cover.
5. Remove the rear cover and take out the fuse.
6. Install a new fuse.
7. Install the rear cover and fasten it with the screws.
8. Install battery cover and fasten it with the screws.

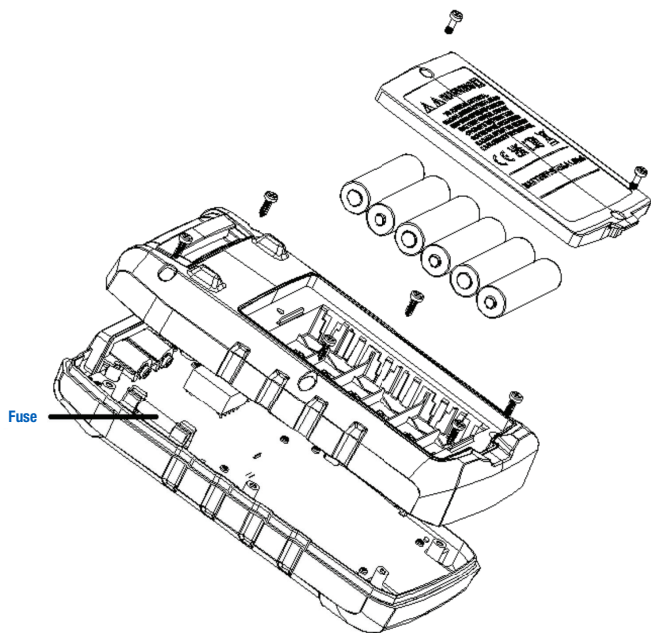


Figure 11.3 – Fuse Replacement

11.4 BATTERY REPLACEMENT (WCT-700R)

The batteries are fixed by a screw, which prevents damage to the batteries in case the receiver falls. 6 AAA alkaline batteries must be used.

NOTE: Batteries are not preinstalled.

1. Make sure that the receiver is powered off and disconnected from all circuits.
2. Use screwdriver to loosen the screw at the battery compartment.
3. Remove the battery cover.
4. Install the batteries.
5. Install the battery cover and fasten it with the screw.

11.5 BATTERY TYPE AND THRESHOLD (RECEIVER)

Battery type: AAA LRO3 alkaline battery

Battery state: 6 pieces of batteries of the same type (connected in series)


Battery threshold: The battery symbol displays different levels of battery power (including 4 levels):

>8V to 9V: Level 4 "" is displayed.

>7.2V to ≤8V: Level 3 "" is displayed.

>6.6V to ≤7.2V: Level 2 "" is displayed.

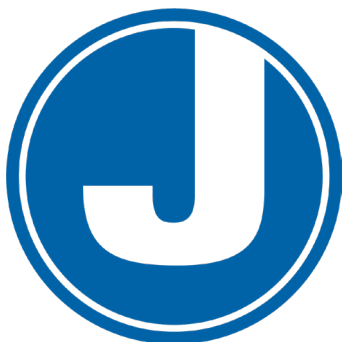
>6.2V to ≤6.6V: Level 1 "" is displayed.

≤6.2V: The batteries run out of power. The symbol "" flashes three times (flashing frequency: 2Hz) and the transmitter powers off. (There is an accuracy error of about 5% with the voltage of the critical point between levels).

WARNING: Cancer and reproductive harm. See www.P65Warnings.ca.gov for more information.

The contents in the Instruction Manual are subject to change without further notice.

NOTES



MADE FOR LIFE