

# SureTrace™, SureTrace™ Plus, SureTrace™ Pro Circuit Tracers

## Instruction Manual

61-950EU



61-946EU

61-948EU



# Table of Contents

Introduction .....	3
Contacting IDEAL INDUSTRIES, INC.....	3
Safety Information.....	4
Warnings .....	4-5
Cautions .....	5
Symbols .....	6
Operation .....	7-10
61-946EU .....	7
61-948EU.....	8
61-950EU.....	9
61-950EU ISC-950.....	10
Identification and description of operating controls and functions.....	11-22
TR-946 .....	12
TR-948.....	13
TR-950.....	14
RC-946.....	15-16
RC-948.....	17-18
RC-950.....	19-20
Test Lead Kits.....	21
ISC-950.....	22
Kit Descriptions/Contents.....	23
Theory of Operation.....	24
Remote Return Path.....	25
Applications.....	26
Pre-Test Operation.....	26
Locating Circuit Breakers & Fuses.....	26
Tracing Wires.....	27
Tracing Low Voltage and Data Cable.....	28
Finding Opens .....	28
Finding Shorts.....	29
Higher Voltages (3 Phase WYE or DELTA Systems).....	30
Tracing Underground .....	31
Sorting Bundled Wires.....	32
Wiring Verification.....	32
Inductive/Amperage Sensing Clamp.....	33
Reading AC/Amperage.....	33
Tracing Conduit.....	34
Tracing Industrial Control Circuits.....	34
Charging the Inductive Clamp.....	35
Battery Replacement .....	35
Fuse Replacement.....	35
Maintenance & Service.....	36
Specifications.....	36
Safety .....	37
EMC .....	37
Warranty .....	38

## Introduction

The IDEAL® 61-946EU SureTrace™, 61-948EU SureTrace™ Plus and 61-950EU SureTrace™ Pro Circuit Tracers are tools that are used to find Opens, Shorts, Splicing errors, conductor locations behind walls and underground, as well as identifying fuses and breakers. The transmitter emits a specific signal onto an electrical conductor and the receiver senses the presence and strength of that signal allowing its location to be traced or identified. An inductive sensing clamp (ISC-950) can be used to induce a specific signal on to electrical conductors when the transmitter cannot be connected to the conductors.



Arc Flash and Shock Hazard, Proper PPE Required. Follow all safety procedures, wear proper PPE in accordance to NFPA 70E. Read and fully understand the instruction manual prior to using this product. Failure to comply can result in serious injury or death.

## Contacting IDEAL INDUSTRIES, INC.

To contact IDEAL INDUSTRIES, INC., call one of the following telephone numbers:

### IDEAL Industries USA Customer Service

- Phone Number: 800-435-0705
- Email: [contactus@idealindustries.com](mailto:contactus@idealindustries.com)

### IDEAL Industries Canada Customer Service

- Phone Number: 905-683-3400
- Email: [ideal\\_Canada@idealindustries.com](mailto:ideal_Canada@idealindustries.com)

### IDEAL Industries EMEA

- Phone Number: +44 (0)1925 444 446
- Email: [eur.sales@idealindustries.com](mailto:eur.sales@idealindustries.com)

### IDEAL Industries Australia




- Phone Number: +61 3 9562 0175
- Email: [InfoAUS@idealindustries.com](mailto:InfoAUS@idealindustries.com)

Or visit the IDEAL Electrical Website at [www.idealind.com](http://www.idealind.com)

To register your product, find manuals, watch videos, simply scan the QR code.




## Safety Information

   **Warning** - Identifies conditions and actions that could result in possible death or serious injury if the hazard is realized.

 **Caution** - Identifies conditions and actions that could result in meter damage, equipment under test damage or data loss if the hazard is realized.



### **WARNING**

Arc Flash and Shock Hazard, Proper PPE Required. Follow all safety procedures, wear proper PPE in accordance to NFPA 70E and follow the guidelines below and the instructions in this manual when operating the meter. Failure to comply can result in serious injury or death.

-  Choking Hazard, Small Parts. Keep Away from Children. Sharp Objects Hazard, This is not a toy. It is not for use or play by children. Keep Away from Children. Failure to do so can result in serious injury.
- Only experienced or technically competent consumers should use this equipment. When in doubt, call an experienced electrician to make any and all necessary repairs or installations. At all times, perform any necessary work on a de-energised circuit that has had its circuit breaker turned off and has been locked out.
- Use the tracer only as specified in this manual or protection provided by the tracer can be compromised.
- Before using or connecting the tracer, visually inspect it to ensure the cases are not cracked and the back case is securely in place. Do not use if the tracer appears damaged.
- Before using the test leads, inspect carefully for damaged insulation, exposed metal or cracked probes. Check test leads for continuity. Do not use leads if they appear damaged.
- Use only approved test leads which meet IEC/EN 61010-031 and have a rating of CAT III 600V or better. Do not use improvised connections that could present a safety hazard.
- When using the probes, keep fingers behind the finger guards on the probes.
- Connect the common test lead before connecting the live test lead. When disconnecting test leads, disconnect the live test lead first.
- This tracer is intended for use by qualified electricians.
- Follow NFPA 70E
- Standards for Electrical Safety in the Workplace when using this tracer.
- Do not use without the batteries correctly in place and the battery door closed and secured.
- Do not use tracer if it operates incorrectly as protection may be compromised. When in doubt, have the tracer serviced.
- Measure a known circuit to ensure the tracer works normally.
- Do not apply the Non-Contact Voltage sensing tip directly on uninsulated hazardous live conductors

 **WARNING**

Arc Flash and Shock Hazard, Proper PPE Required. Follow all safety procedures, wear proper PPE in accordance to NFPA 70E and follow the guidelines below and the instructions in this manual when operating the meter. Failure to comply can result in serious injury or death.

- Arc Flash and Shock Hazard, Proper PPE Required. Follow all safety procedures, wear proper PPE in accordance to NFPA 70E and follow the guidelines below and the instructions in this manual when operating the meter. Failure to comply can result in serious injury or death.
- Have the Tracer serviced only by qualified service personnel.
- Do not use the Tracer around explosive gas, dust, or vapor, or during electrical storms, or in wet environments.
- Do not apply more than the rated voltage, as marked on the Transmitter, between the terminals or between any terminal and earth ground.
- To avoid false readings that can lead to electrical shock and injury, replace the batteries as soon as the low battery indicator () appears or the battery LED illuminates.
- Remove the test leads from the circuit prior to removing the battery door.
- Voltages exceeding 30VAC RMS or 60VDC pose a shock hazard so use caution.
- Always ensure that test leads are secured so that they cannot be accidentally snagged or tripped over.
- Do not work alone so that assistance can be rendered in an emergency. Use extreme caution when working around bare conductors or bus bars. Contact with the conductor could result in electric shock.
- Adhere to local and national safety codes. Individual protective equipment must be used to prevent shock and arc blast injury where hazardous live conductor are exposed.
- Never operate the Tracer with the back cover removed or the case open.
-  Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

 **CAUTION**

Tracer damage, equipment under test damage or data loss can occur if the following guidelines are not adhered to.

- Use the proper terminals, function, and range for the tracing/measurement application.
- Clean the case and accessories with a damp cloth and mild detergents only. Do not use abrasives or solvents. Make sure the tracer is completely dry before use.

 **CAUTION:**

The TR-946 transmitter is rated for 0 to 480 Volts AC 50 or 60 Hz or DC. The TR-948 and TR-950 transmitters are rated for 0 to 600 Volts AC 50 or 60 Hz or DC. It is not compatible with non-sinusoidal or distorted waveforms as are found at the output of variable frequency drives, dimmer switches or in the presence of harmonically distorted waveforms. Connecting to these sources will damage the transmitter. Shipboard inverters can also cause damage to the transmitter.



## Operation 61-946EU

1. Magnetic Hanging Strap Clip
2. Test Lead Terminals
3. LED Indicators
4. On/Off Button
5. Support Kickstand
6. Battery Cover
7. Main Display (LCD)
8. Sensitivity Level Select
9. Mute Button
10. Back-light Button
11. On/Off Button
12. Protective Rubber Overmoulding



## Operation 61-948EU

1. Magnetic Hanging Strap Clip
2. Test Lead Terminals
3. LED Indicators
4. Indicates live voltage
5. AC/DC Voltage, Polarity and Continuity Indicators
6. PPE Level Indicator
7. On/Off Button
8. Support Kickstand
9. Battery Cover
10. Main Display (FFSTN)
11. TightSight® Bottom Display
12. Sensitivity Level Select
13. Mute Button
14. NCV Button
15. On/Off / Flashlight Button
16. Protective Rubber Overmoulding



## Operation 61-950EU

1. Magnetic Hanging Strap Clip
2. Test Lead Terminals
3. LED Indicators
4. Live Voltage Indicator
5. AC/DC Voltage, Polarity and Continuity Indicators
6. PPE Level Indicator
7. On/Off Button
8. Support Kickstand
9. Battery Cover
10. Main Display (OLED)
11. TightSight® Bottom Display
12. Sensitivity Level Select
13. Mute Button
14. NCV Button
15. On/Off / Flashlight Button
16. Protective Rubber Overmoulding



## Operation 61-950EU Inductive Clamp ISC-950

1. Inductive / AC current Sensing Clamp
2. Bi-coloured LED Indicator (GREEN Battery charged, RED Battery charging)
3. On/Off button
4. Main Display (FFSTN)
5. TightSight® Bottom Display
6. Magnetic Hanging Strap Clip
7. Protective Rubber Overmoulding
8. Tactile Barrier
9. USB Type C Charging Port



## Introduction Features/Capabilities

The IDEAL® 61-946EU, 61-948EU Plus and 61-950EU Pro TightSight® Circuit Tracers are tools that are used to find Opens, Shorts, Splicing errors, conductor location behind walls and underground, as well as identifying fuses and breakers. Works on 3-Phase systems. The transmitter emits a specific signal onto the electrically conductive conductor and the receiver senses the presence and strength of that signal. Additionally, the 61-950EU clamp induces a signal on conductors and measures and displays AC amperage values.

Model #61-946EU  
SureTrace™



Model #61-948EU  
SureTrace™ PLUS



Model #61-950EU  
SureTrace™ PRO





### Key Features

- Numeric value and variable audible tone for easy-to-understand tracing
- Super-bright displays and TightSight® for easy-viewing on models 61-948EU and 61-950EU
- Worklights, models 61-948EU and 61-950EU
- Peak detecting bar graph for instantaneous signal strength indication
- Identifies breakers and fuses
- Patent pending automatic continuity check (TR-948 & TR-950)
- Pinpoints opens and shorts
- Traces wires behind walls
- Can be used on de-energised/energised circuits from 0-480V or 0-600V AC/DC\*
- Will not affect GFCI's or other sensitive equipment on the line
- Low battery indication
- CAT III-480V safety rating ETL Listed 61-946EU
- CAT III-600V safety rating ETL Listed 61-948EU and 61-950EU
- Certain Circuit Breaker Confirmation
- Live voltage level and value indication\*
- DC Polarity Indication and closed circuit indication\*
- 2 Meter Drop Protection
- Inductive clamp induces signal without direct connection (ISC-950)



\*Model Specific

## Transmitter Callout Features TR-946

- 1. Output Jacks** – Polarized, 4mm standard banana plug type.
- 2. Power Indicator** – When the transmitter is On, the LED  illuminates indicating that a signal is being produced.
- 3. Line Energised Indicator** – The transmitter continuously monitors the voltage across its output terminals. If greater than 30 volts AC or 40 volts DC is present, the  LED indicator illuminates. The transmitter also communicates the line voltage state to the receiver.  
(CertainCircuit™)

### **WARNING**

Arc Flash and Shock Hazard, Proper PPE Required. When the Line Energised Indicator is not illuminated, check for the presence of dangerous voltage with a measuring device to verify voltage levels prior to working on the circuit that the transmitter leads are connected to. Failure to comply can result in serious injury or death.

- 4. Low Battery Indicator** – When the low battery indicator  flashes, the batteries must be replaced
- 5. Power Button** – Depress the  button to switch power on and enable the transmit function. Depress again to conserve battery power when not in use.
- 6. Operating Voltage Range** – Operates on energised/de-energised circuits from 0 to 480V AC/DC.
- 7. Battery Compartment** – Holds (6) AA batteries.
- 8. Safety** – Rated for use in CAT III 480V environments. Incorporates a high-energy, fast-acting ceramic fuse (F-950).





## Additional Notes

- The transmitter's signal does not affect sensitive, electronic equipment on the circuit when placed on the 120 volt supply.
- In a closed circuit, because the transmitter generates a small test current, its signal can be detected upstream through the feeder panel and the distribution transformer. The strength of the signal is reduced as it passes through the transformer in inverse proportion to the turns ratio of the transformer.
- Can be used on GFCI protected circuits.
- Auto power off after 2 hours on the transmitter and 10 minutes on the receiver.

### **CAUTION**



- The transmitter is rated for 0 to 480 Volts AC 50 or 60 Hz or DC. It is not compatible with non-sinusoidal or distorted waveforms as are found at the output of variable frequency drives, dimmer switches or in the presence of harmonically distorted waveforms.
- Connecting to these sources will damage the transmitter.
- Shipboard inverters can also cause damage to the transmitter.

## Transmitter Callout Features TR-948

- 1. Output Jacks** – Polarized (for DC Voltage), 4mm standard banana plug type.
- 2. Power Indicator** – When the transmitter is On, the  LED illuminates indicating that a signal is being produced.
- 3. Line Energised Indicator** – The transmitter continuously monitors voltage across its output terminals. If greater than 30 volts AC or volts DC is present, the  LED indicator illuminates. The transmitter also communicates the line voltage state to the receiver.

### **WARNING**


Arc Flash and Shock Hazard, Proper PPE Required. When the Line Energised Indicator is not illuminated, check for the presence of dangerous voltage with a measuring device to verify voltage levels prior to working on the circuit that the transmitter leads are connected to. Failure to comply can result in serious injury or death.

- 4. Low Battery Indicator** – When the low battery indicator  flashes, the batteries must be replaced.
- 5. Power Button** – Depress the  button to switch power on and enable the transmit function. Depress again to conserve battery power when not in use.
- 6. AC Voltage or DC/Polarity Indicators**
- 7. AC or DC Voltage Level Indication**
- 8. PPE Level Indication**
- 9. Operating Voltage Range** – Operates on energised/de-energised circuits from 0 to 600V AC/DC.
- 10. Battery Compartment** – Holds (6) AA batteries.
- 11. Safety** – Rated for use in CAT III 600V environments. Incorporates a high-energy, fast-acting ceramic fuse (F-950).
- 12. Continuity Indicator** - Patent pending automatic continuity check

### **Additional Notes**

- The transmitter's signal does not affect sensitive, electronic equipment on the circuit when placed on the 120 volt supply.
- In a closed circuit, because the transmitter generates a small test current, its signal can be detected upstream through the feeder panel and the distribution transformer. The strength of the signal is reduced as it passes through the transformer in inverse proportion to the turns ratio of the transformer.
- Can be used on GFCI protected circuits.
- Auto power off after 2 hours on the transmitter and 10 minutes on the receiver.

### **CAUTION**

- The transmitter is rated for 0 to 600 Volts  50 or 60 Hz or DC. It is not compatible with non-sinusoidal or distorted waveforms as are found at the output of variable frequency drives, dimmer switches or in the presence of harmonically distorted waveforms.
- Connecting to these sources will damage the transmitter.
- Shipboard inverters can also cause damage to the transmitter.





## Transmitter Callout Features TR-950

- Output Jacks** – Polarized (for DC Voltage), 4mm standard banana plug type. Including ground for outlet testing.
- Power Indicator** – When the transmitter is On, the LED illuminates indicating that a signal is being produced.
- Line Energised Indicator** – The transmitter continuously monitors voltage across its output terminals. If greater than 30 volts AC or 30 volts DC is present, the ⚡ LED indicator illuminates. The transmitter also communicates the line voltage state to the receiver.



### WARNING

Arc Flash and Shock Hazard, Proper PPE Required. When the Line Energised Indicator is not illuminated, check for the presence of dangerous voltage with a measuring device to verify voltage levels prior to working on the circuit that the transmitter leads are connected to. Failure to comply can result in serious injury or death.

- Low Battery Indicator** – When the low battery indicator flashes,  the batteries must be replaced
- OLED High Visibility Display** – (see display details below)
- Battery Compartment** - (6) AA batteries and a Ceramic Fuse (F-950)
- Power Button** – Press  button to switch on and transmit signal. Press again to turn off to conserve battery power when not in use.
- Safety** – CAT III 600V, with high-energy, fast acting ceramic fuse.
- Operating Voltage Range** 0 - 600 V AC/DC Energised/ De-energised circuits
- Auto Power Off** – after 2 hours

## TR-950 OLED High Visibility Display

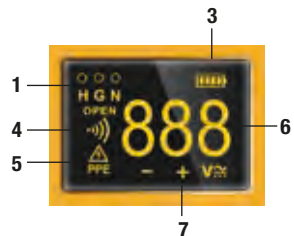
- Wiring Condition Test Result Display**
- Intentionally left blank**
- Low Battery Indicator**
- Continuity Indicator** (accompanied by brief audible beep)
- PPE Indicator** (illuminates at 30 volts AC/DC and above.)
- Measured Voltage Level**
- AC /DC Voltage and DC Polarity Indicators**

## Additional Notes

- The transmitter's signal does not affect sensitive, electronic equipment on the circuit when placed on the 120-volt supply.
- In a closed circuit, because the transmitter generates a small test current, its signal can be detected upstream through the feeder panel and the distribution transformer. The strength of the signal is reduced as it passes through the transformer in inverse proportion to the turn's ratio of the transformer.
- Can be used on GFCI protected circuits.

## CAUTION

The transmitter is rated for 0 to 600 Volts AC 50 or 60 Hz or DC. It is not compatible with non sinusoidal or distorted waveforms as are found at the output of variable frequency drives, dimmer switches or in the presence of harmonically distorted waveforms. Connecting to these sources will damage the transmitter. Shipboard inverters can also cause damage to the transmitter.







## Receiver Callout Features RC-946

### 1. Signal Sensing Tip

2. **LCD Display** – See next page for features.

### 3. Sensitivity Mode:


Depress this button to select the sensitivity mode\*:

Mode	RC-946	Antenna Strength
4		highest sensitivity (default mode)
3		high-medium sensitivity
2		medium-low sensitivity
1		lowest sensitivity for breakers

\* See Additional Notes on next page for guidelines on mode selection.

- 4. **Mute Button** – Depress this button to turn the sound On/Off. If On is selected, a variable pitch/tone is produced - directly proportional to the signal strength.
- 5. **Back-Light** – Depress to turn back-light on or off.
- 6. **Power Button** – Depress to switch power on and enable operation. Depress again to conserve battery power when not in use.
- 7. **Battery Compartment** – Holds (4) AA batteries.
- 8. **Safety** – Rated for use in Cat III-480V environments.







### RC-946 LCD Display

- 1. Bright, 2-digit LCD display. (Non-Rotating)\_Displays the powered line status received from the transmitter.
- 2. "0-99" numeric indication of signal strength.
- 3. Low Battery Indicator ()
- 4. Peak detector shows instantaneous changes.
- 5. Muted Indication
- 6. Energised Line Indicator (CertainCircuit™) appears if greater than 30V AC or 40V DC is present
- 7. Sensitivity Level

### **WARNING**

Arc Flash and Shock Hazard, Proper PPE Required. When the Line Energised Indicator is not illuminated, check for the presence of dangerous voltage with a measuring device to verify voltage levels prior to working on the circuit that the transmitter leads are connected to. Failure to comply can result in serious injury or death.



- Sensitivity mode selection – general guidelines:
  - Start out at maximum sensitivity () until the receiver finds the circuit under test. If the receiver is too sensitive, then reduce the sensitivity using the  button until the receiver's display does not peg at "99" continuously.
  - Use  mode for tracing: (a) in closed circuits while using the outlet plug adapter, (b) in open circuits, (c) underground, (d) and anywhere else more signal detection is needed.
  - Use  mode to reduce the level of sensitivity if the highest sensitivity range has signal saturation (display is pegging at "99" continuously).
  - Use  mode for tracing and when previous mode has signal saturation of "99."
  - Use  mode for (a) identifying circuit breakers and fuses, (b) pinpointing individual wires from a bundle, (c) and when previous mode has signal saturation.

## Receiver Orientation





- The indication of received signal intensity depends on how the receiver is pointed in relation to the source of the signal. If the receiver is pointed away from the signal source then there will be a low value indicated on the receiver. If the receiver is rotated about the axis of main antenna sensitivity, the signal varies in strength as the antenna is pointed at and then away from the circuit being traced.
- Therefore, rotate the receiver over the wire being traced until the highest reading is Displayed. If during tracing, the signal is reduced, the wire may have changed directions (e.g. from horizontal travel across a wall to vertical travel up a wall). Rotate the receiver to find the strongest signal again.
- Use the back of the receiver to sweep the wall or floor and determine the circuit's general location. Use the nose of the receiver to pinpoint its location.
- Steel conduit attenuates (weakens) the signal radiating from the wires inside the conduit. Aluminum conduit significantly attenuates the signal. So, the receiver should be set at a higher sensitivity and may need to be placed closer to the circuit to obtain a stronger signal detection.

NOTE: In environments where switching noise may be present, the receiver may exhibit periodic degradation and may require removal of the noise source.

## Receiver Callout Features RC-948

- Super Bright Display** – See below for details.
- Sensitivity Mode:**

Depress this button to select the select the sensitivity mode\*:


Mode	RC-948	Antenna Strength
4		highest sensitivity (default mode)
3		high-medium sensitivity
2		medium-low sensitivity
1		lowest sensitivity for breakers

\* See Additional Notes on next page for guidelines on mode selection.

- Sensitivity Level Setting**
- Mute Button** – Short press this button to turn the sound On/Off. If On is selected, a variable pitch/tone is produced – directly proportional to the received signal strength.
- NCV Function** – Press to select Non-Contact Voltage  
Note: Do not apply the Non-Contact Voltage sensing tip directly on uninsulated hazardous live conductors.
- Power Button** – Long press to switch power on and enable operation. Long press again to conserve battery power when not in use.
- Battery Power** – On the RC-948, remaining battery life is continuously displayed on the main screen.
- Work-Light** – Short press power button to turn work light on or off while the transmitter is powered on.
- Battery Compartment** – Holds (4) AA batteries.
- Safety** – Rated for use in Cat III-600V environments.

### 11. TightSight® Display

#### RC-948 Display

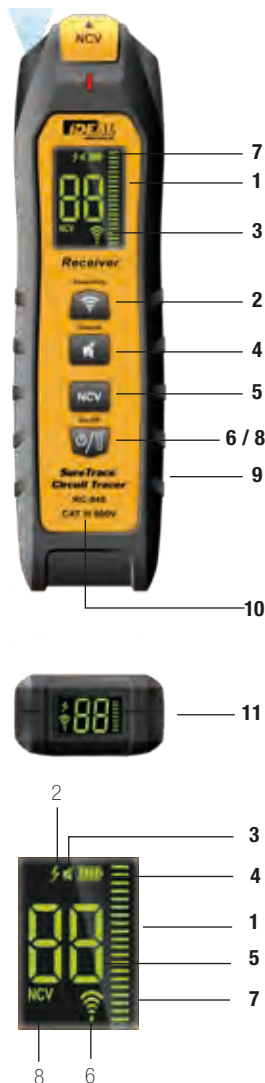
- Super-bright FFSTN display** (180° rotating).
- Energised Line Indicator** (CertainCircuit™) appears if greater than 30V AC or 30V DC is present
- Mute indication.**
- Low Battery Indicator** ()
- “0-99” numeric indication of signal strength.**
- Displays the sensitivity setting.**
- Peak detector** shows instantaneous changes in signal strength.
- NCV Indicator** - EF is displayed instead of signal strength









#### WARNING

Arc Flash and Shock Hazard, Proper PPE Required. When the Energised Line Indicator is not illuminated, check for the presence of dangerous voltage with a measuring device to verify voltage levels prior to working on the circuit. Failure to comply can result in serious injury or death.

Arc Flash and Shock Hazard, Proper PPE Required. Do not apply the Non-Contact Voltage sensing tip directly on uninsulated hazardous live conductors. Failure to comply can result in serious injury or death.



- Sensitivity mode selection – general guidelines:
  - Start out at maximum sensitivity () until the receiver finds the circuit under test. If the receiver is too sensitive, then reduce the sensitivity using the  button until the receiver's display does not peg at "99" continuously.
  - Use  mode for tracing: (a) in closed circuits while using the outlet plug adapter (b) in open circuits, (c) underground, (d) and anywhere else more signal detection is needed.
  - Use  mode to reduce the level of sensitivity if the highest sensitivity range has signal saturation (display is pegging at "99" continuously).
  - Use  mode for tracing when previous mode has signal saturation of "99."
  - Use  mode for (a) identifying circuit breakers and fuses, (b) pinpointing individual wires from a bundle, (c) and when previous mode has signal saturation.
- Receiver Orientation
  - The indication of received signal intensity depends on how the receiver is pointed in relation to the source of the signal. If the receiver is pointed away from the signal source then there will be a low value indicated on the receiver. If the receiver is rotated about the axis of main antenna sensitivity, the signal varies in strength as the antenna is pointed at and then away from the circuit being traced.
  - Therefore, rotate the receiver over the wire being traced until the highest reading is displayed. If during tracing, the signal is reduced, the wire may have changed directions (e.g. from horizontal travel across a wall to vertical travel up a wall). Rotate the receiver to find the strongest signal again.
  - Use the back of the receiver to sweep the wall or floor and determine the circuit's general location. Use the nose of the receiver to pinpoint its location.
  - Steel conduit attenuates (weakens) the signal radiating from the wires inside the conduit. Aluminum conduit significantly attenuates the signal. So, the receiver should be set at a higher sensitivity and may need to be placed closer to the circuit to obtain a stronger signal detection.





NOTE: In environments where switching noise may be present, the receiver may exhibit periodic degradation and may require removal of the noise source.

## Receiver Callout Features RC-950

### 1. High Visibility Display

### 2. Sensitivity Mode:

Depress this button to select the sensitivity mode\*:

Mode	RC-950	Antenna Strength
4		highest sensitivity (default mode)
3		high-medium sensitivity
2		medium-low sensitivity
1		lowest sensitivity for breakers

\* See Additional Notes on next page for guidelines on mode selection.

### 3. Sensitivity Level Setting

### 4. Mute Button

Short press this button to turn the sound On/Off. If On is selected, a variable pitch/tone is produced – directly proportional to the received signal strength.

### 5. NCV Function

Press to select Non-Contact Voltage  
Note: Do not apply the Non-Contact Voltage sensing tip directly on uninsulated hazardous live conductors.

### 6. Power Button

Long press to switch power on and enable operation. Long press again to conserve battery power when not in use.

### 7. Battery Power

On the RC-950, remaining battery life is continuously displayed on the main screen.

### 8. Work-Light

Short press power button to turn work light on or off while the transmitter is powered on.

### 9. Battery Compartment

Holds (4) AA batteries.

### 10. Safety

Rated for use in Cat III-600V environments.

### 11. TightSight® Display

#### RC-950 Display

### 1. High Visibility OLED display (90° rotating).

### 2. Energised Line Indicator (CertainCircuit™ Indication) appears

if greater than 30V AC or 30V DC is present.

### 3. Mute indication.

### 4. Low Battery Indicator ()

### 5. Signal Strength Indicator "0-99"

### 6. Sensitivity Level Setting

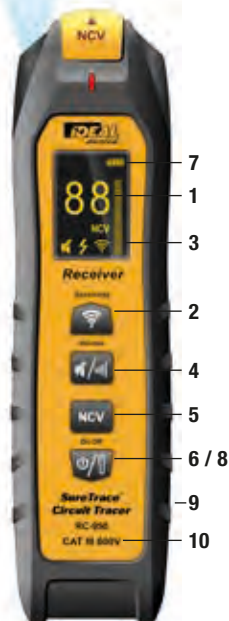
### 7. Peak detector shows instantaneous changes in signal strength.







### 8. NCV Indicator - EF is displayed instead of signal strength.

### WARNING

Arc Flash and Shock Hazard, Proper PPE Required. When the Energised Line Indicator is not illuminated, check for the presence of dangerous voltage with a measuring device to verify voltage levels prior to working on the circuit. Failure to comply can result in serious injury or death.

Arc Flash and Shock Hazard, Proper PPE Required. Do not apply the Non-Contact Voltage sensing tip directly on uninsulated hazardous live conductors. Failure to comply can result in serious injury or death.



- Sensitivity mode selection – general guidelines:
  - Start out at maximum sensitivity (  ) until the receiver finds the circuit under test. If the receiver is too sensitive, then reduce the sensitivity using the  button until the receiver's display does not peg at "99" continuously.
  - Use  mode for tracing: (a) in closed circuits while using the outlet plug adapter, (b) in open circuits, (c) underground, (d) and anywhere else more signal detection is needed.
  - Use  mode to reduce the level of sensitivity if the highest sensitivity range has signal saturation (display is pegging at "99" continuously).
  - Use  mode for tracing and when previous mode has signal saturation of "99."
  - Use  mode for (a) identifying circuit breakers and fuses, (b) pinpointing individual wires from a bundle, (c) and when previous mode has signal saturation.

## Receiver Orientation

- The indication of received signal intensity depends on how the receiver is pointed in relation to the source of the signal. If the receiver is pointed away from the signal source then there will be a low value indicated on the receiver. If the receiver is rotated about the axis of main antenna sensitivity, the signal varies in strength as the antenna is pointed at and then away from the circuit being traced.
- Therefore, rotate the receiver over the wire being traced until the highest reading is Displayed. If during tracing, the signal is reduced, the wire may have changed directions (e.g. from horizontal travel across a wall to vertical travel up a wall). Rotate the receiver to find the strongest signal again.
- Use the back of the receiver to sweep the wall or floor and determine the circuit's general location. Use the nose of the receiver to pinpoint its location.
- Steel conduit attenuates (weakens) the signal radiating from the wires inside the conduit. Aluminum conduit significantly attenuates the signal. So, the receiver should be set at a higher sensitivity and may need to be placed closer to the circuit to obtain a stronger signal detection.

NOTE: In environments where switching noise may be present, the receiver may exhibit periodic degradation and may require removal of the noise source.

### Test Lead Kit used on 61-946EU & 61-948EU

A complete test lead kit is supplied for use with the transmitter:

1. EU/UK Outlet Plug Lead and Adapter for plugging into standard 240VAC outlets.
2. Two Alligator Clips for connecting directly to bare wires and grounding points.
3. Two 90 cm (3 ft) Leads for use with above clips.






### Test Lead Kit for 61-950EU

A complete test lead kit is supplied for use with the transmitter:

1. EU/UK Outlet Plug Lead and Adapter for plugging into standard 240VAC outlets.
2. Two Alligator Clips for connecting directly to bare wires and grounding points.
3. Two 90 cm (3 ft) Leads for use with above clips.
4. One 7.7 m (25 ft) remove return path lead.
5. USB-A to USB-C charging cable



## Inductive Sensing Clamp Callout Features ISC-950

- 1. Power On Indication** – When the clamp is turned on with a long press of the power button , both displays will illuminate indicating the clamp is on and transmitting the tracing signal. Amperage will be displayed when the clamp is placed over a single energised conductor with an amperage load of up to 620 A AC.
- 2. Low Battery Indicator** – When the low battery indicator appears , the batteries need to be recharged.
- 3. Power Button** – Depress the  button to switch power on and enable the transmit function. Depress again to conserve battery power when not in use.
- 4. Main Display (FFSTN)** for AC Amperage, battery level and APO (Auto Power Off)
- 5. USB Type-C Charging Port**
- 6. Tactile Barrier** (When measuring, keep fingers behind the tactical barrier.)
- 7. Safety** – Rated for use in CAT III 600V environments.
- 8. Bottom TightSight® Display**



### Additional Notes

- The transmitter's signal does not affect sensitive, electronic equipment on the circuit when placed on the 120 volt supply.
- In a closed circuit, because the transmitter generates a small test current, its signal can be detected upstream through the feeder panel and the distribution transformer. The strength of the signal is reduced as it passes through the transformer in inverse proportion to the turns ratio of the transformer.
- Can be used on GFCI protected circuits.
- Auto power off after 30 minutes.
- ISC-950 is capable of inducing a signal on energised/de-energised lines. For energised lines, signal tracing capabilities may be degraded at higher loads.

### CAUTION

- The inductive clamp is rated for 0 to 600 Volts AC 50 or 60 Hz. It is not compatible with non-sinusoidal or distorted waveforms as are found at the output of variable frequency drives, dimmer switches or in the presence of harmonically distorted waveforms.
- Connecting to these sources will damage the inductive clamp.
- Do NOT exceed the working frequency

### WARNING

Arc Flash and Shock Hazard, Proper PPE Required. Do NOT place the inductive clamp around exposed metal conductors. ALWAYS clamp over insulated conductors only. Failure to comply can result in serious injury or death.

## KIT DESCRIPTIONS AND CONTENTS

### 61-946EU Contents:

- TR-946 Transmitter
- RC-946 Receiver
- TL-948 Lead Set
- Soft Case
- Instruction Manual
- 10 AA Batteries



### 61-948EU Plus Contents:

- TR-948 Transmitter
- RC-948 Receiver
- TL-948 Lead Set
- Hard Case
- Instruction Manual
- 10 AA Batteries



### 61-950EU Pro Contents:

- TR-950 Transmitter
- RC-950 Receiver
- ISC-950 Inductive Clamp
- TL-950 Lead Set
- Hard Case
- Instruction Manual
- 10 AA Batteries
- USB-A to USB-C charging cable



### ISC-950 Includes:

- ISC-950 Inductive Clamp
- C-950 Soft Case
- USB-A to USB-C charging cable



## Theory of Operation

The tracer consists of a transmitter and a receiver. The transmitter produces a unique signal onto the circuit to be traced. The receiver detects this unique signal when placed in the proper orientation to the wires being traced or breakers being identified. The receiver provides a numeric value and a variable pitch/tone that increase as the signal becomes stronger. The transmitter sends a 32.768 kilohertz, fixed-amplitude, time-modulated signal that injects a voltage onto the circuit to be traced, which then induces an electromagnetic field onto the circuit.

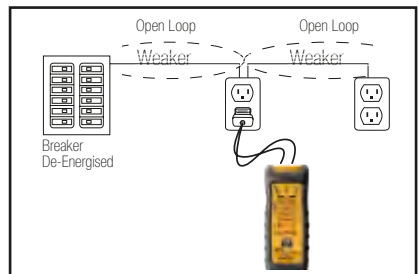
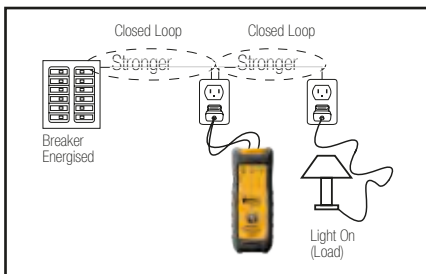
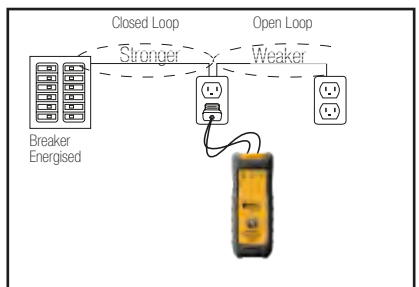
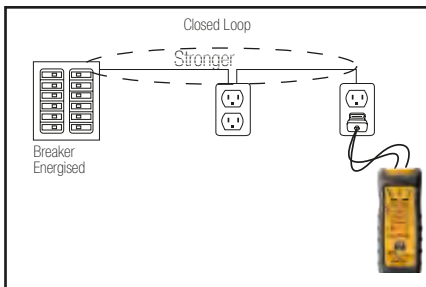
An inductive clamp (ISC-950) can also be used to induce a traceable signal onto the circuit when a transmitter cannot be directly connected to the conductors. This clamp induces a signal onto the circuit when clamped around a single conductor and the receiver detects/displays the signal information the same way as it does with a signal from the transmitter. This clamp is also capable of measuring and displaying 0 to 600 A AC when clamped around a single conductor. (see Using the Inductive/ Sensing Clamp section for details). The clamp (ISC-950) is included with the 61-950EU SureTrace Pro and is also sold as a separate accessory that is compatible with all past and present IDEAL SureTrace Circuit Tracer models.

Whether the circuit is open or closed greatly affects the strength of the electromagnetic field.

In an open circuit, no current can flow, so the electromagnetic field produced is much weaker.

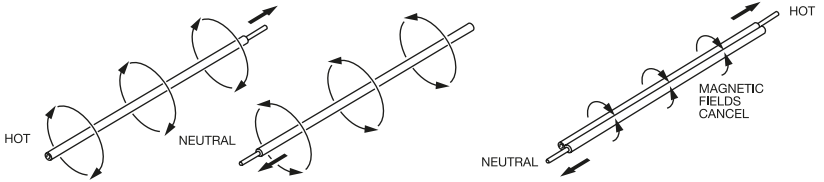
However, in a closed circuit, the injected voltage induces a current flow, which produces a much stronger electromagnetic field. This is the optimal method for tracing as this much stronger signal allows the receiver to detect it from a greater distance away from the circuit being traced.

### Here are some examples of Open/Closed Circuits:



## Remote Return Path

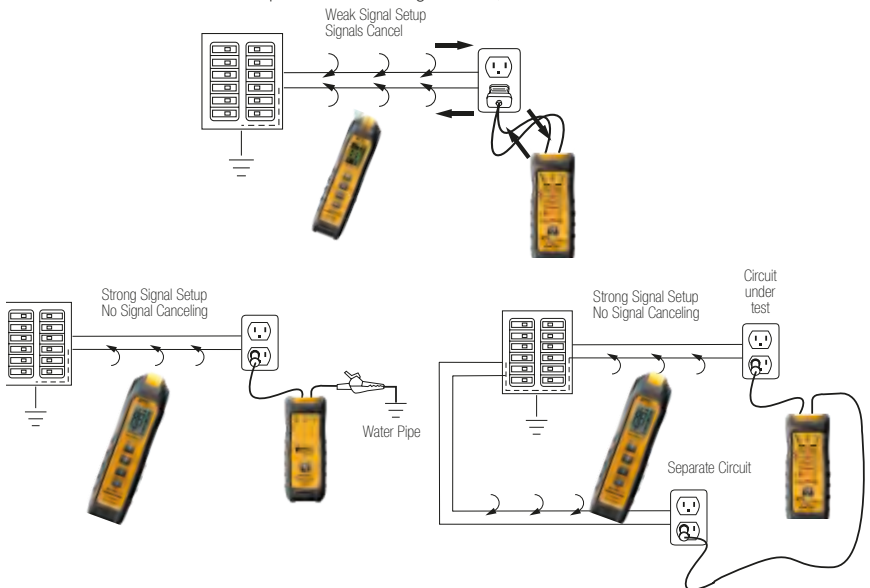
Electromagnetic fields radiate counter-clockwise in relation to the current flow. For example, current flows out on a live conductor and returns on the neutral. This change in opposite current flow also creates opposing magnetic fields. So, when these two opposing conductors are close together, the two magnetic fields tend to cancel each other out. This canceling effect diminishes the circuit's ability to radiate the transmitter's strong signal making it more difficult for the receiver to detect the signal.



To avoid the canceling effect of the opposing magnetic fields and optimize the transmitted signal, the conductor to be traced should be separated from the return conductor by utilizing a remote return path.

The simplest method is to use an extension cord to connect to a remote return path, such as a neutral from another circuit. When identifying breakers, the live and neutral are already separated at the electrical panel so the use of the AC outlet adapter is sufficient.

If unsure that the remote return path chosen is a good one, use a multimeter to measure the



resistance between the circuit neutral and the remote return path. If  $>100\Omega$ , a different return path should be selected.





## Applications

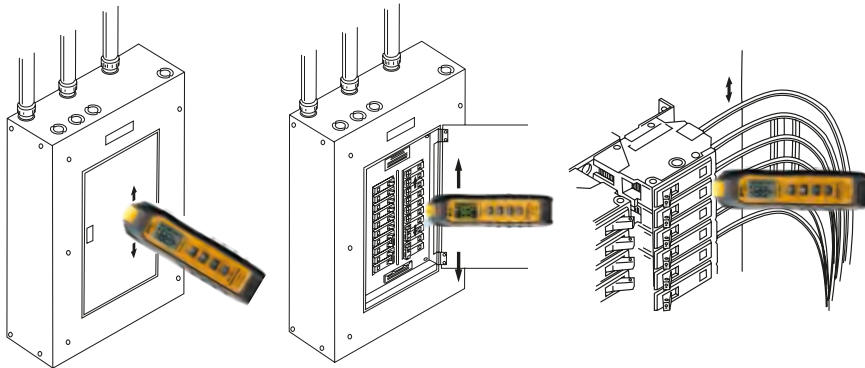
### Pre-test Operation Polarity Test (61-950EU)

Prior to finding a breaker or tracing a circuit, it is good practice to test the receiver by holding it near the powered transmitter or inductive clamp. A numeric indication of "99" and strong audible sound ensures that it is working properly.

### Locating Circuit Breakers and Fuses


Applications include identifying the breaker that protects the circuit under test, finding the correct breaker to de-energize the circuit, and labeling a breaker panel.

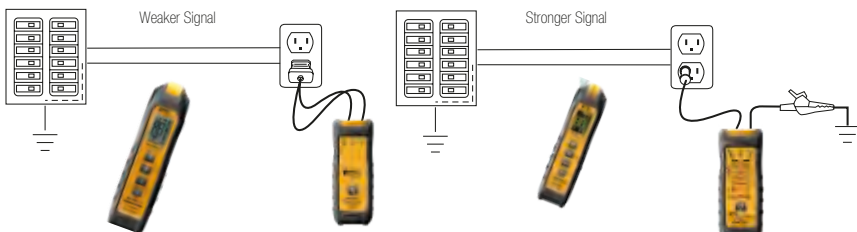
- 1) Connect the transmitter to the circuit that needs to be identified and power it on. The procedure is the same whether the circuit is energised or de-energised. But, a much stronger signal is produced using an energised (closed) circuit.
- 2) Turn on the receiver and go to the panel.
  - a) If more than one panel exists, set the receiver to  mode and touch the nose to each panel cover until the panel with the strongest signal is identified. Should be set at max sensitivity setting to start finding the panel.
  - b) If the receiver is detecting more than one panel with a strong signal, reduce the sensitivity range and repeat the step above.
- 3) Open the panel cover, set the receiver to Breaker  mode. The receiver should be positioned on its side to orientate the antenna properly.
- 4) Orient the receiver  $90^\circ$  to the panel with the display facing sideways. Keep this orientation as you scan all breakers on the panel. Slide the nose of the receiver down each breaker in the panel. The breaker with the highest numeric reading is the correct breaker. If two or more breakers have the same numeric values, tip the nose of the receiver up and then down at  $45^\circ$  angles and note the numeric values on each of the questionable breakers. Only the correct breaker will show a strong signal in all positions. Or, pull the panel cover, and place the nose on each of the individual live wires for a more certain determination.
- 5) When the correct breaker is tripped (opened), the signal will drop significantly. And, the  will disappear from the receiver's display. The  LED on the transmitter will also turn off.



## Tracing Wires

Applications include finding the locations of cable runs and identifying other devices and loads on the circuit.

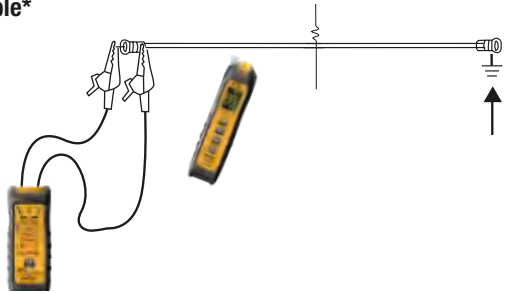
- 1) Connect the transmitter to the circuit to be traced and power it on.
  - a) For optimal tracing, leave the circuit energised to create a closed loop.
  - b) If the circuit is de-energised, then connect transmitter to the neutral and ground conductors to create a closed loop.
- 2) Turn on the receiver and use the default maximum sensitivity (  ).
- 3) Starting several feet from the transmitter, use a linear sweeping motion and the back of the receiver to find the strongest signal location behind the wall, above the ceiling, or under the floor.
  - a) If the signal is too strong, reduce the sensitivity range.
  - b) If the signal is too weak, utilize a remote return path for the transmitter. Then, reduce the sensitivity range on the receiver and repeat step #3.
- 4) Continue following the highest reading until the end of the circuit is found.



## Tracing Low Voltage and Data Cable\*

Applications include tracing coax, twisted pair, Cat 5, alarm and telephone wire.

Follow the instructions for Tracing Wires behind walls using the de-energised method and a remote ground for a return path.

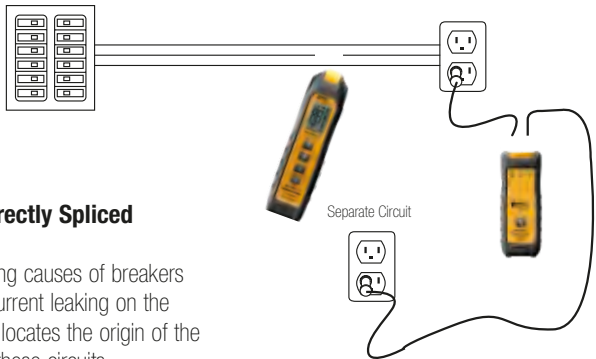


## Finding Opens

Applications include locating dead circuits, finding the source of an open (broken point) in a live/neutral/ground conductor, and determining the end of a circuit run.


- 1) Connect the transmitter to the open circuit and power it on.
- 2) Turn on the receiver and use the default maximum sensitivity.
- 3) Starting several feet from the transmitter, use a sweeping motion and the back of the receiver to find the strongest signal location behind the wall, above the ceiling or under the floor.
  - a) If the signal is too strong, reduce the sensitivity range.
  - b) If the signal is too weak, connect one lead of the transmitter into the open conductor and connect the other lead to a remote return path. Then, repeat step #3.
- 4) Continue following the highest reading until the signal starts to fall off. This is the location of the open. Reduce the sensitivity range and use the nose of the receiver to pinpoint the open on the circuit.

If the open is not found after tracing the length of the run, the conductor may be capacitively coupled. This condition causes a signal bleed-off onto the other adjacent conductors. To remove this effect, ground the adjacent conductors and minimize the distance between the transmitter connection and the open.



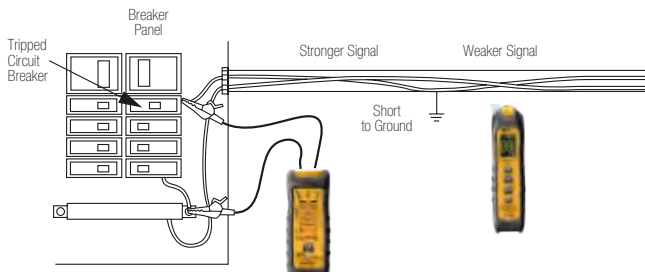
## Finding Shorts and Incorrectly Spliced (Shared) Neutrals

Applications include determining causes of breakers tripping, fuses blowing, and current leaking on the ground conductor. The tracer locates the origin of the ground fault or dead-short in these circuits.

- 1) Use a continuity check to determine which conductors are shorted. (See note below for specific methods when using the TR-946 vs. the TR-948 or TR-950.)
- 2) Connect the transmitter to the shorted circuit and power it on.
  - a) One lead should be connected to the faulted conductor and the other lead to ground.
  - b) If the ground fault is in metallic conduit, then the conduit is the ground.
  - c) If possible, ground the adjacent conductors.
- 3) Turn on the receiver and use the default maximum sensitivity (  ).
- 4) Starting several feet from the transmitter, use a linear sweeping motion and the back of the receiver to find the strongest signal location behind the wall, above the ceiling, or under the floor.
  - a) If the signal is too strong, reduce the sensitivity range.
  - b) If the signal is too weak, connect one lead of the transmitter into the open conductor and connect the other lead to a remote return path. Then, repeat step #3.

Note: By definition, a short is a connection between two conductors. Determining which two conductors are shorted typically requires the use of a MultiMeter with a continuity function when using the TR-946. The models TR-948 and TR-950, which are part of the 61-948EU and 61-950EU kits include a patent pending automatic continuity function to aid in determining which two conductors are shorted. Simply clip one alligator clip to one of the suspect conductors and attach the other clip to various conductors until you hear a short beep and see the red LED light up confirming continuity. Then start your scan out on the branch circuit to locate the unintended short such as a shared neutral, neutral to ground bond, or possibly a live to neutral fault.

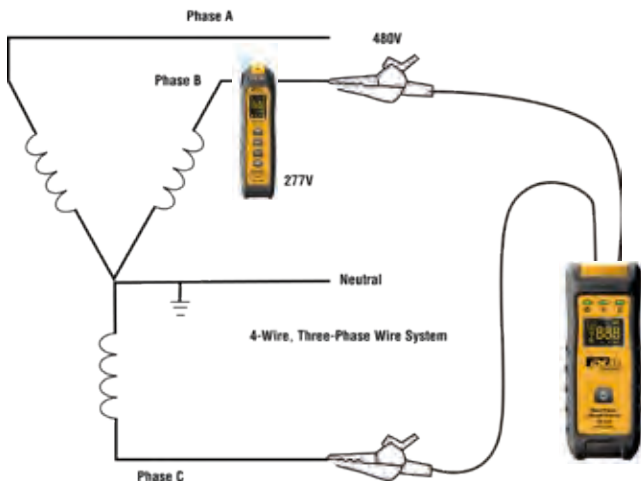
- 5) Continue following the highest reading until the signal starts weakening. This is the point of the fault as the signal flows to ground instead of continuing strongly down the shorted conductor. Reduce the sensitivity range and use the nose of the receiver to pinpoint the source of the fault.



### Higher Voltages (3 Phase WYE or DELTA Systems)


When using the alligator clips to attach the transmitter to live voltage that is greater than 120 VAC use the following method. Install the alligator clips to the ends of the 3 foot leads. Do not plug them into the transmitter. Using appropriate PPE procedures, attach the alligator clips to any two of the 3 live phases. Next, plug the safety leads into the terminals on the transmitter, polarity is not important. Now turn the transmitter on and note if the line energised light illuminates. Proceed with your tracing or fuse or breaker identification. To disconnect, turn the transmitter off, and remove the terminals from the transmitter. Next, using appropriate PPE procedures disconnect the alligator clips from the energised conductors..

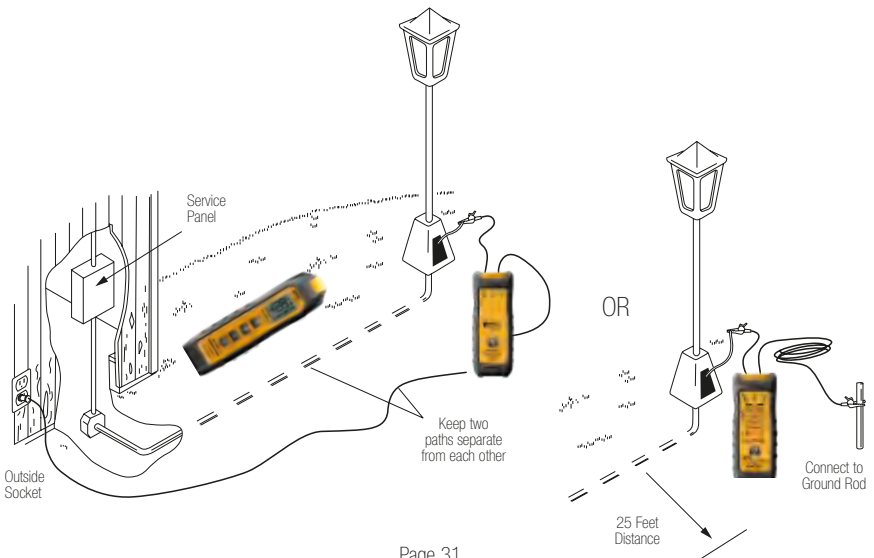
Please view the video, "Exposed Hot Conductor Safety Tip Video" at <http://idealcircuit-tracer.com/>.



## Tracing Underground

These circuit tracers are not underground cable locators. But, in some environments they can be used to trace buried cables, conduit, or metal pipe.

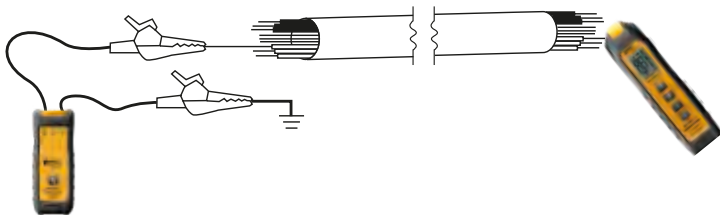
- 1) Connect the transmitter to be traced and power it on.
  - a) If possible, create a closed circuit by attaching a load at the end of the circuit or past the area you need to trace.
  - b) If possible, ground the adjacent conductors to eliminate capacitive-coupling effects that can cause signal bleed-over.
  - c) Utilize a remote return path to maximize the signal produced.
- 2) Turn on the receiver and use the maximum sensitivity default (  ).
- 3) Holding the receiver at waist level and flat (display skyward) in respect to the earth use a sweeping straight line motion perpendicular to the buried cable and center yourself on the highest reading. Next, rotate the receiver through a full 360 degrees and note the orientation of the highest reading. Mark this spot and move about 10 feet in the direction you expect the cable to be buried. Repeat the side to side scan, center over the highest reading and repeat the 360 degree rotation to ensure that you are over the cable. Repeating this sequence of scans will help ensure that you are tracking the location of the cable. For very precise location finding, place the receiver just above ground level and follow this procedure over a shorter distance and the back of the receiver to find the strongest signal underground.
  - a) If the signal is too strong, reduce the sensitivity range.
  - b) If the signal is too weak, then check the quality of the ground connections ( $<100\Omega$ ) and repeat step #3.
- 4) Continue following the highest reading until the end of the circuit is found.



## Sorting Bundled Wires

Applications include identifying a specific circuit amongst several circuits in a filled conduit, sorting wires in a wire harness, identifying coax cable and twisted pair cable in a termination box.

- 1) Connect the transmitter to the circuit to be traced and power it on.
  - a) Clip one test lead to the known end of the wire to be traced or identified.
  - b) Clip the other test lead to a remote return path.
- 2) Turn on the receiver and set it to the least sensitivity (👁️).
- 3) Go to the other end of the wire run and sort out the individual wire using the nose of the receiver.
  - a) If the signal is too strong, separate the wires more from the bundle when testing.
  - b) If the signal is too weak, then increase the sensitivity range on the receiver and repeat step #3.
- 4) Continue sorting until the wire with the highest reading is identified.

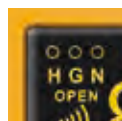


## Wiring Verification (TR-950 Only)

The TR-950 will display the Open Hot (live) indication when turned on and not plugged into a socket. Immediately after being inserted into an energised socket, the TR-950 will perform a wiring condition test to check and indicate the results of the test which are displayed in the upper left corner of the screen.

### Wiring Condition Display Indications

Wiring Condition	Display Indication			Text Displayed
	H	G	N	
Correct Wiring	●	●	●	<b>OK</b>
No Ground	●	☀️	●	<b>OPEN</b>
Reverse Polarity	☀️	●	☀️	<b>REV</b>
Open Live	☀️	☀️	☀️	<b>OPEN</b>
Open Neutral	●	●	☀️	<b>OPEN</b>
Live Ground Reversed	☀️	☀️	●	<b>REV</b>



Legend	
●	ON
☀️	Reverse Condition
☀️	Open Condition
H	Live
G	Ground
N	Neutral

Notes:

- 1) Will not detect two live wires in a circuit.
- 2) Will not detect a combination of defects.
- 3) Will not detect reversal of grounded and grounding conductors.

## Using the Inductive / Amperage Sensing Clamp (ISC-950)



### WARNING

Arc Flash and Shock Hazard, Proper PPE Required. Do NOT use the Inductive Clamp on live circuits while charging. Failure to comply can result in serious injury or death.


Arc Flash and Shock Hazard, Proper PPE Required. Do NOT place the inductive clamp around exposed metal conductors. ALWAYS clamp over insulated conductors only. Failure to comply can result in serious injury or death.

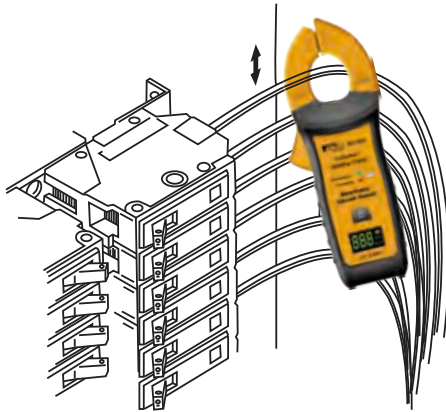
### Identifying downstream loads from a breaker

1) Remove the panel cover and clamp the ISC-950 around the live wire of the energised (closed) circuit. (As shown in the diagram below.)

- To maximize the signal, close the far end of the circuit by plugging in and turning on a work light or other load into the furthest outlet; hence, make a complete loop.

2) Turn the ISC-950 on.

3) Set the receiver to the highest sensitivity mode (  ) and trace the circuit to the furthest outlet while identifying all outlets and loads connected to the circuit. If the receiver is saturated, reduce the sensitivity range.



## Reading AC Amperage

The ISC-950 clamp is capable of measuring and displaying 0 to 600 A AC when clamped around a single conductor (as shown in the diagram above). It can be used as a stand alone clamp meter to measure AC amperage on a conductor as well as to measure amperage on the conductors being traced or being used to identify breakers while using the tracer receiver.

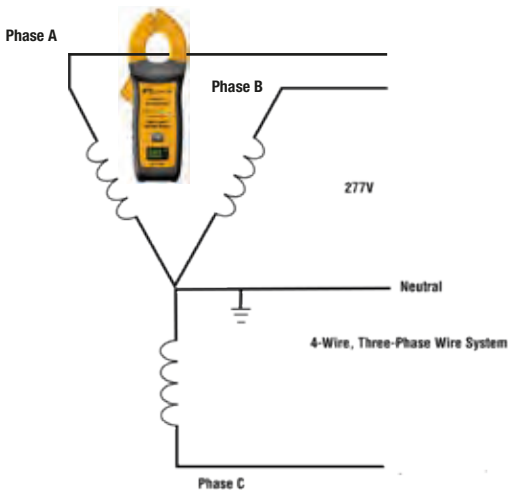
## Tracing Conduit

- 1) Clamp around the metallic conduit to be traced. If possible, ground the far end of the conduit to close the loop. This can be created using the 25' lead and alligator clips to clip onto the end of the conduit or electrical box with one clip and a remote neutral or water pipe with the other alligator clip.
- 2) Turn the ISC-950 on by long pressing the On-Off button.
- 3) Set the receiver to the highest sensitivity mode (📶) and trace the conduit. If the receiver is saturated, reduce the sensitivity range.



## Tracing Industrial Control Circuits

- 1) Ensure that the circuit is energised (closed at the panel) at a minimum. To maximize the signal, close the other end of the circuit by turning on a load, such as a motor or pump.
- 2) Clamp around the live wire of this energised (closed) circuit.
- 3) Set the receiver to the highest sensitivity (📶) mode and trace the circuit to the other end. If the receiver is saturated, reduce the sensitivity mode.



## Charging the Inductive Clamp ISC-950

The ISC-950 uses two internal Li-ion batteries that can power the unit for up to 2 hours when fully charged. Use the supplied 120 volt (or 220 volt) wall charger and USB Type-C charging cable to charge the unit via the USB charge point located under the protective rubber cap. The bi-coloured LED indicator illuminate red while charging and will illuminate green when the battery is fully charged. Replaced rubber cap once charging is complete to protect the terminal from dirt and impact damage. Any USB Type-C and charger with a 5 volt and minimum 2-amp rating can be used to recharge the batteries.



### WARNING

Arc Flash and Shock Hazard, Proper PPE Required. Do NOT use the Inductive Clamp on live circuits while charging. Failure to comply can result in serious injury or death.

## Battery Replacement (Transmitters and Receivers)

Note: Use only good quality alkaline batteries for maximum operating life. Always replace with a complete set of new batteries of the same type. Remove batteries as soon as they become exhausted to avoid damage due to leakage. Remove the batteries for storage lasting longer than 1 month or when the unit will be used infrequently.

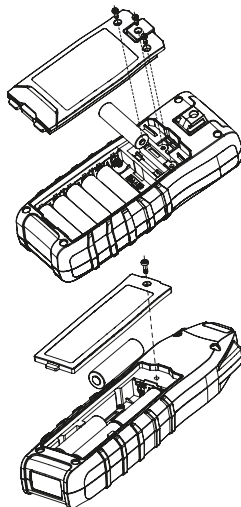
### Transmitter:

Ensure that the test leads are removed from the output jacks and the circuit under test.

- 1) Remove the battery cap by loosening the screw.
- 2) Replace batteries with (6) new AA batteries.
- 3) Re-fit cap and re-tighten the screw.

### Receiver:

- 1) Remove the battery cap by loosening the screw.
- 2) Replace batteries with (4) new AA batteries.
- 3) Re-fit cap and re-tighten the screw.



## Fuse Replacement (TR-946, TR-948 & TR-950)

If the following symptoms are exhibited, the internal protection fuse should be checked and replaced:

- The transmitter appears to power up normally but signal output is zero, or greatly diminished.
- When connected to a live circuit, the ⚡ indicator does not light.
- The receiver still indicates a strong reading when placed in close proximity to the transmitter, but no output signal is found.



### WARNING

To avoid personal injury or damage to the transmitter, use only the IDEAL fuse specified in this manual.

Ensure that the test leads are removed from the output jacks and the circuit under test.

- 1) Remove the battery cap and batteries as described above.
- 2) Unscrew the (6) retaining screws from the rear section of the case and remove.
- 3) The fuse is located at the connector end. Replace with IDEAL part #F-950.
- 4) Replace the case rear section and screws, batteries and battery cap.

## Maintenance

Clean the case with a damp cloth and mild detergent. Do not use abrasives or solvents. Keep away from liquids and ensure the tracer is completely dry before use.

## Service and Replacement Parts

This unit has no user-serviceable parts except for the fuse in the transmitter. For replacement parts or to inquire about service, contact IDEAL Customer Service at 800-435-0705 or visit our website, [www.idealind.com](http://www.idealind.com).

## Specifications:

### Transmitter

Operating Frequency:	32.768 kHz, fixed-amplitude, time-modulated signal
Current Output of Signal:	82 mA rms to 50 Ohms
Voltage Output of Signal:	4V rms (330 mW)
Operating Voltage:	0 – 480V AC/DC TR-946 or 0-600V AC/DC TR-948
Fuse:	0.5 amp 600V Fast Acting Ceramic Fuse 6.35 x 31.8mm
Battery Power:	1.5V x (6) AA batteries (NEDA 15A, IEC LR6)
Battery life:	20 hours open circuit testing / 6 hours short circuit tracing.
Indicators:	On/Off, Line energised, Low battery

### Receiver

Sensing:	Electromagnetic
Signal response:	Numeric display and Audible beep
Battery Power:	1.5V x (4) AA batteries (NEDA 15A, IEC LR6)
Battery life:	20 hours minimum

### Inductive Sensing Clamp (ISC-950)

Operating Frequency:	32.768 kHz, fixed-amplitude, time modulated signal
Battery Power:	2 x 3.7V Li-ion batteries for ISC-950
Battery life:	2 hours
Indicators:	On/Off, Full Batteries, 0-600 A AC Battery level, Auto Power Off (APO) after 30 minutes

CAUTION: The transmitter is designed to work on 0-480 volts DC and 50 or 60 hertz AC (TR-946) or 0-600 volts DC and 50 or 60 hertz AC (TR-948 & TR-950). Signals other than these such as VFD output, speaker drivers, PWM signals are NOT compatible with the transmitter and may damage it.

## Circuit Tracer Kits

Operating Temperature:	32°F (0°C) to 122°F (50°C)
Storage Temperature:	-4°F (-20°C) to 140°F (60°C) (without batteries installed).
Humidity (Operating):	95% R.H. max
Dimensions (W x H x D)	TR-946, -948, -950: 7.5 x 3.0 x 2.25 in. (195 x 75 x 58 mm) RC-946, -948, -950: 8.75 x 2.375 x 1.25 in. (225 x 60 x 34 mm)
Weight:	61-946EU: 3.0 lbs. (1.4 kg); 61-948EU: 4.5 lbs. (2.1 kg) 61-950EU: 5.5 lbs. (3.1 kg)
Accessories Included:	Receiver, Transmitter, test lead kit, soft case or hard case, batteries, instruction manual.
Operating Altitude:	6562 ft.

*Specifications subject to change.*

## **Safety**



Conforms to UL STD 61010-1, 61010-2-030, Certified to CSA STD C22.2# No. 61010-1, 61010-2-030 (For RC-946, RC-948, TR-946 and TR-948)  
Conforms to UL STD 61010-1, 61010-2-033, Certified to CSA STD C22.2# No. 61010-1, 61010-2-033 (For RC-950 and TR-950)  
Conforms to UL STD 61010-1, 61010-2-032, Certified to CSA STD C22.2# No. 61010-1, 61010-2-032 (Only for ISC-950)

Overvoltage CAT III 600V (61-948EU). Overvoltage CAT III 480V (61-946EU). Any voltages exceeding the defined maximum voltage measurement categories described above are outside the normal use of the equipment and protection cannot be guaranteed.

Pollution Degree Class 2

## EMC

Complies with the following: UKCA/CE-EMC; EN IEC 61326-1; FCC Part 15B

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

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



Double Insulation

Instrument has been evaluated and complies with insulation category III (overvoltage category III). Pollution degree 2 in accordance with EN 61010-1. Indoor use.

## Disposal of waste electrical and electronic equipment



In order to preserve, protect and improve the quality of the environment, protect human health and utilize natural resources prudently and rationally, the user should return unserviceable product to relevant facilities in accordance with statutory regulations. The crossed-out wheeled bin indicates the product needs to be disposed separately and not as municipal waste.

Disposal of used batteries/accumulators!



The user is legally obliged to return used batteries and accumulators. Disposing used batteries in the household waste is prohibited! Batteries/accumulators



containing hazardous substances are marked with the crossed-out wheeled bin. The symbol indicates that the product is forbidden to be disposed via domestic refuse. The chemical symbols for the respective hazardous substances are Cd = Cadmium, Hg = Mercury, Pb = Lead. You can return used batteries/accumulators free of charge to any collecting point of your local authority, our stores, or where batteries/accumulators are sold. Consequently you comply with your legal obligations and contribute to environmental protection.

## Warranty Statement:

This tester is warranted to the original purchaser against defects in material and workmanship for two years from the date of purchase. During this warranty period, IDEAL INDUSTRIES, INC. will, at its option, replace or repair the defective unit, subject to verification of the defect or malfunction. This warranty does not apply to defects resulting from abuse, neglect, accident, unauthorized repair, alteration, or unreasonable use of the instrument. Your original receipt from an authorized distributor of IDEAL INDUSTRIES, INC. is your proof of purchase and date of purchase.

Any implied warranties arising out of the sale of an IDEAL product, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited to the above. The manufacturer shall not be liable for loss of use of the instrument or other incidental or consequential damages, expenses, or economic loss, or for any claim or claims for such damage, expenses or economic loss.

State laws vary, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Register your product and access more information at <http://www.idealind.com/us/en/product-registration>.

Scan the barcode on the right to see the complete IDEAL T&M Product Line

