

# SURETEST™

## CIRCUIT ANALYZER

**Your IDEAL Branch Circuit Troubleshooting Solution.** Designed to test voltage drop and circuit integrity, while saving you time and money.



### Identify...

- Improper polarity
- Excessive voltage drop
- H-N-G conductor impedance
- False (Bootleg) grounds
- GFI trip times and trip current

### Locate...

- Poor quality loose connections

Scan here for  
more details and  
informational videos



# PROPER POLARITY? SHOW IT!

## STEP 1: PLUG THE SURETEST™ CIRCUIT ANALYZER INTO AN OUTLET

1. The circuit analyzer defaults to the polarity screen at startup.
2. This screen can indicate:
  - Proper Polarity
  - Reversed Polarity
  - Open Neutral
  - Open Ground
  - False or Bootleg Ground



## STEP 2: IDENTIFY ANY POTENTIAL PROBLEMS

Three bright lights indicate proper polarity.

Alternating flashing lights indicate reversed H - N Polarity.

No light indicates open N or G.

FG Indicates false ground. Determine the location of the short and correct.

An open ground indicates an ungrounded outlet or a resistance of more than  $3\Omega$ . Correct as necessary. Get immediate indication of a False Ground, which simple polarity testers will not show.

## STEP 3: TAKE CORRECTIVE ACTION

Hot and Neutral reversed, power is on the Neutral



The Circuit Analyzer will indicate False or Bootleg grounds which simple polarity checkers will miss.



# CIRCUIT INTEGRITY? CHECK IT!

## STEP 1: PLUG THE SURETEST™ CIRCUIT ANALYZER INTO AN OUTLET



Plug the Circuit Analyzer into an outlet.



The startup screen will display if the polarity is correct.

It will power itself on and begin running basic tests.

## STEP 2: DETERMINE THE VOLTAGE DROP VALUE

Press the down arrow to access the voltage drop menu.



The first screen displays a 9.2% voltage drop with a 15 amp load.



The second screen displays a 12.2% voltage drop with 20 amps applied.



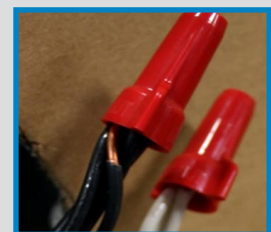
The third screen displays a 7.3% voltage drop at 12 amps.

## STEP 3: CHECK EACH RECEPTACLE FOR VOLTAGE DROP

Values of less than 5% are generally good. Higher values may require attention.

Start at the furthest outlet from panel and work your way back towards the panel. A distinct change in value between two outlets narrows the search to being at or between those two outlets.

Excessive voltage drop can be caused by a bad splice, too long a conductor, or an undersized conductor for the length of run.

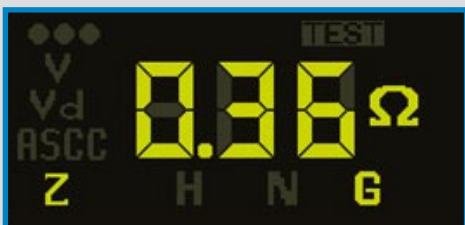




# LOOSE CONNECTIONS? FIND THEM!

## STEP 1: PLUG THE SURETEST™ CIRCUIT ANALYZER INTO AN OUTLET

1. Plug the Circuit Analyzer into the furthest outlet on the branch circuit, OR the outlet in question.
2. Scroll down to the impedance screen.
3. Note the impedance of each conductor.



## STEP 2: ANALYZE

# 2

If one conductor's impedance is noticeably different from the others, that could mean:

- A: There is a bad connection somewhere in the circuit on that conductor.
- B: A different size of conductor was used than the others. (Rarely, but it does happen.)

If both conductors show high impedance  $>0.25\Omega$  then:

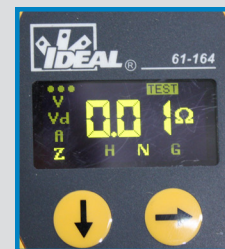
- A: It could be the gauge of the conductor or
- B: The length of the run.

## STEP 3: FIX IT

# 3

Look for a significant change from one outlet to the next. Typically, the issue will be in one of those two outlets. Check all wire terminations for a secure contact.

In the readings below we can see that the Hot is much higher than the Neutral. The issue is likely a bad splice somewhere on the Hot conductor.





### 1 STEP 1: PLUG THE SURETEST™ CIRCUIT ANALYZER INTO AN OUTLET

Plug the Circuit Analyzer into a GFCI outlet.



Scroll down to the GFCI screen.

Choose between 6mA or 30mA leakage current.



### 2 STEP 2: RUN THE TEST



Press the test button.

GFI current will be applied for a maximum of 6500 milliseconds but should trip much faster.

When the GFI trips, power is turned off and the SureTest™ Circuit Analyzer screen goes blank.

### 3 STEP 3: NOTE THE TRIP TIME AND CURRENT. RESET THE GFCI OUTLET BUTTON

The Circuit Analyzer will power back on and display the time in milliseconds it took to trip the GFI, and the applied trip current.

Verify GFCI status by comparing values to manufacturers' performance tables.



# LINE VOLTAGE ISSUES?

# CHECK THEM!

## STEP 1: PLUG THE SURETEST™ CIRCUIT ANALYZER INTO AN OUTLET BOX

1. Plug the Circuit Analyzer into the outlet in question.
2. Scroll down to the voltage screen.
3. Note the line voltage.



## STEP 2: ANALYZE

# 2

Next, press the right arrow key and note peak voltage, neutral to ground voltage and frequency.

Neutral to ground.



Peak voltage.



## STEP 3: Note:

# 3

These should read about:

120VAC

0.5 volts or less

170 volts peak

60.0 Hz



IDEAL® 61-164

020 EL  
V  
Vd  
R  
Z  
163 A  
ELL ASCC1 ASCC2

# BRANCH CIRCUIT CURRENT? MEASURE IT!

GFCI

## STEP 1: PLUG THE SURETEST™ CIRCUIT ANALYZER INTO AN OUTLET

1. Plug the Circuit Analyzer into the outlet in question.
2. Scroll down to the ELL screen.
3. Press the right arrow key for Estimated Load on Line.

ASCC means:

Available  
Short  
Circuit  
Current

## STEP 2: ANALYZE ELL (ESTIMATED LOAD ON TIME)

1. Observe the current value.
2. The large number is the real time current.
3. The smaller number is the maximum current measured while plugged in.

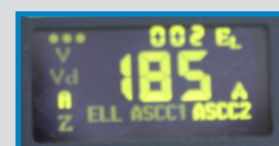


## STEP 3: ANALYZE ASCC1 AND ASCC2

1. Press the right arrow key
2. ASCC1 is how much current will flow if you shorted Hot to Neutral



3. ASCC2 is how much current will flow if you shorted Hot to Neutral AND Ground. Less resistance in parallel means even more current will flow.





# SURETEST™

## CIRCUIT ANALYZER

### ACCESSORIES



61-179



61-175



61-182



61-183



61-176

Scan here for more details and informational videos



Super-bright OLED displays

Easy to access/toggle between functions

Tests GFCIs and EPDs for proper operation



Part No.	Description
61-164	SureTest™ Circuit Analyzer 120V H-N-G

## ACCESSORIES

### INCLUDED

Part No.	Description
61-179	Nylon Carrying Case
61-182	1' Extension Cord

### OPTIONAL

Part No.	Description
61-175	Ground Continuity Adapter <i>For checking grounding of cabinets etc.</i>
61-176	Isolated Ground Adapter <i>For determining whether receptacle has an isolated ground.</i>
61-183	1' Extension Cord <i>For connection to circuits other than outlets.</i>



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[www.idealind.com](http://www.idealind.com)

**IMPORTANT:** This circuit analyzer is intended for use by qualified electricians. Follow the NFPA 70E Standard for Electrical Safety in the Workplace when using this tester. Always consult the instruction manual provided with the tester for operational limitations and procedures associated with a specific tester.

Visit [IDEALCircuit-Analyzer.com](http://IDEALCircuit-Analyzer.com) for informational videos.