



# SNT - Step and Touch Monitor Kit

Transmission Line Crew Safety Instrument



## Continuously Monitor and Alarm Step and Touch Potentials



### Utility Tested & Field Proven

An innovation of Bonneville Power Administration, the SNT Instrument has been helping ensure the safety of line crews since 2003.



# Step and Touch Monitor Kit

The **Step and Touch (SNT) instrument** continuously monitors and alarms step and touch potentials caused by ground potential rise. When used properly, the SNT can enhance the safety of transmission line crews.

The SNT-02 kit is a complete easy-to-use solution: drive the ground rod about 15 feet from the tower, mount the instrument on the rod, and connect the probe to the tower using a standard hot stick.

## Alarm Ranges

The SNT provides audible and visual alarm warnings if the probe voltage is in a dangerous range. The SNT also alarms Lost Probe Connection and Low Battery.

Range	Instrument Actions
0 – 100 V	Green LEDs flash
101 – 499 V	Yellow LEDs flash, beeps every second
500+ V	Red LEDs flash rapidly, beeps rapidly

## Probe Options

The SNT kit includes two hot-stick-compatible probe clamps. The clamp probe works is suited for round rods and aluminum structures. The magnetic probe works well on flat steel surfaces.



The SNT-02 kit includes:  
Instrument, user guide, carrying case,  
battery charging adapters, ground rod,  
magnetic probe and clamp probe end



# Step and Touch Monitor Kit

## Step and Touch Potential

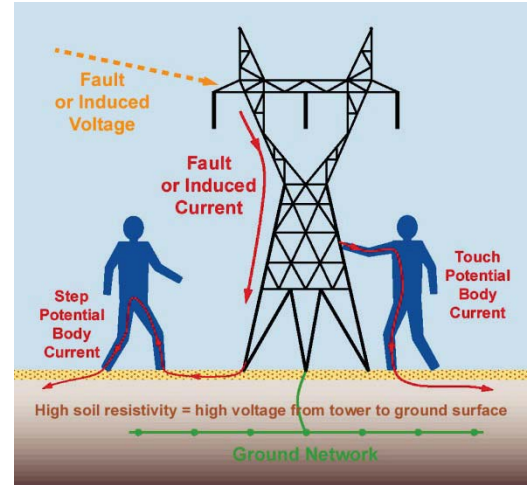
Step and touch potential awareness is important for anyone working on high-voltage power transmission systems. In a typical SNT application, the transmission line is de-energized and is bonded to the tower to be safe to work on. However, the transmission line itself acts as a very large antenna, and can pick up large amounts of energy which must be shunted to earth ground. And if the tower ground is faulty, a dangerous condition can result.

### Step Potential: Voltage between the feet of a person

When current is flowing from the tower to the earth ground, a voltage gradient will occur based on the resistivity of the soil, resulting in a potential difference between two points on the ground. This is called a Step Potential as it can cause voltage between a person's feet.

### Touch Potential: Voltage between an energized object and feet of a person

If the ground connection between the tower and the soil is high resistance (common with some soil conditions), the tower itself, and any conductive item touching the tower, can be energized. Touch potential is the voltage between the energized object and the feet of a person in contact with the object.



## Monitoring Step and Touch Potential with the SNT

As power transmission systems become increasingly complex and power corridors crowded, it becomes more common for parallel energized lines to couple energy (via electromagnetic induction) to de-energized lines. Further, with the sophisticated power control needed to manage green energy, power levels on various lines can vary dramatically during a work shift.

The SNT-02 kit provides an easy-to-use method to continuously monitor and alarm step-and-touch potential. Simply drive the special ground rod about 15 feet from the tower, mount the instrument on the rod, and connect the probe to the tower using a standard hot stick.

Common Practice	Better Practice
Measure step and touch potential before beginning work.	Measure step and touch potential before <i>and continuously during</i> work.
Use a voltage meter to measure potential.	Use the SNT to monitor <i>and alarm</i> the potential.



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## Specifications

<b>Full Scale Voltage 50 Hz to 60 Hz</b>	999 Vrms sine wave with < 5% Total Harmonic Distortion
<b>Absolute Max Probe Voltage</b>	5000 Vrms sine wave with < 5% Total Harmonic Distortion
<b>Step Voltage Response</b>	95% rise time < 1 second. During probe check, step response may be up to 4.5 seconds.
<b>Accuracy</b>	1% typical at 500 V (3.5% from -30°C to +50°C)
<b>Probe Impedance</b>	20 MΩ
<b>Voltages Displayed</b>	10 to 999 Vrms
<b>Standard Alarm Voltage Ranges (others can be programmed by the factory as an option)</b>	0 to 100 – Green LEDs slow flash 101 to 499 – Yellow LEDs flash, beeps every second 500 plus – Red LEDs flash rapidly, beeps rapidly
<b>Audio Alert</b>	90 dB at 2 feet
<b>Displays</b>	<b>Voltage Display</b> 3 digit voltage using bright seven segment displays <b>Threshold Warning</b> Three high intensity Green LEDs Five high intensity Yellow LEDs Eight high intensity Red LEDs <b>Check Probe &amp; Battery Low</b> Blue LED's
<b>Probe Connection Check</b>	Performed every 60 seconds. Duration is 3.5 seconds, during which time the probe voltage is not sampled.
<b>Battery Life</b>	60 hours typical. Low battery is indicated by LED, very low battery activates fault mode (flashing LEDs and audible alert).
<b>Battery Type</b>	Ni-MH, 500 charge cycles typical
<b>Ingress Protection</b>	Designed for IP64
<b>Instrument Weight</b>	907 grams (2 pounds)
<b>Kit Weight</b>	10K grams (22 pounds) includes instrument and case
<b>Case Size (HxWxL)</b>	19.1 cm × 39.6 cm × 50.2 cm (7.5 in × 15.6 in × 19.75 in)

## Ordering

SNT Kit Part Number: SNT-A020

To order, contact Delta Computer Systems, Inc.:

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