

Operators Manual

# True RMS Voltstik

Radio Linked Multiple Reading Voltmeter



Model 8-133  
Sensor Transmitter Meter



Model 8-121  
Ampstik/Voltstik Receiver Display



# Operators Manual

## True RMS Radio Voltstik

### Radio Linked Multiple Reading Voltmeter

Available Stock Codes:			
8-133 50HZ	8-133 50HZ (EU)	8-133 50HZ 869	8-133 50HZ AUS
8-133 60HZ	8-133 60HZ 869	8-121	8-121 EURO
8-121 AUS	8-121 869	8-121 FRG	

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# Safety Information

The True RMS Voltstik is designed for use with a suitable universal hot stick. All precautions appropriate for the line voltage should be taken. The hot stick should be considered the sole voltage isolation device. For safety purposes the face plate, battery cover and entire Voltstik Transmitter should be considered to be at the same potential.

# Specifications

The True RMS Voltstik has been developed specifically for measurement of AC voltage in the electrical utility industry. The True RMS feature allows accurate measurement of voltage even when the nominal waveform is distorted or when harmonics are present. This instrument can be used remotely with any hotstick and universal chuck adapter. The case is water resistant and will withstand high physical impact. The following specifications apply:

Kit Number	6-133 Kit (Includes both 8-133 Voltstik & 8-121 Receiver)
Range of Operation	
Voltage	0 - 37kV
Frequency	
50Hz Calibrated	47 to 53Hz
60Hz Calibrated	57 to 63Hz
Resolution	1 Volt
Accuracy	± 1% ± 2 Volts
Mechanical	
Operation Controls	Single Button Operation
Weight	
8-133 Voltstik Assembly	5.77 lbs, 2.62 kg
8-121 Receiver	1.4 lbs, 0.64 kg
Display	Five Digit Display
Type of Reading	Four Readings
Housing	Shock and Water Resistant Molded Urethane
Hotstick Mounting	Universal Chuck Adapter (hotstick not included)
Battery	9 Volt (one each in Transmitter & Receiver)
Battery Life	Five days continuous use
Operating Temperature	-30° to +60° C (-22° to +140 ° F)
Radio	
Frequency Region One	869.58MHz
Frequency Region Two	916.48MHz
Frequency Region Three	916.48MHz
Power	1 milliwatt
Range	50 Feet (15.24 Meters)

## FCC Statements

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference received.
- (2) This device must accept any interference received. Including interference that may cause undesired operation.

## Instructions to the User

The user is cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate equipment.

## Low and High Temperature Applications

The Alkaline Battery limits the operation of the Radio Voltstik from -20°C (-4°F) to 54°C (129°F). By substituting a Lithium long-life battery, the unit can operate from -30°C (-22°F) to 60°C (140°F).

Nine volt Lithium batteries are the same long-life batteries used in smoke detectors. They sell by the brand names UltraLife and Energizer.

Note:

Alkaline operating time reduced to 25% at -20° C (-4°F)

Lithium operating time reduced to 75% at -20° C (-4° F)

## DECLARATION OF CONFORMITY

TRADE NUMBER:	SensorLink Corporation
MODEL NUMBER:	8-121
COMPLIANCE TEST REPORT NUMBER:	B60123D1
COMPLIANCE TEST REPORT DATE:	10 February 2006
RESPONSIBLE PART (IN USA):	SensorLink Corporation
ADDRESS:	1360 Stonegate Way, Ferndale WA 98248 USA
TELEPHONE:	(360)595-1000

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 the unit does cause harmful interference to radio or television reception, please refer to your user's manual for instruction on correcting the problem.

I the undersigned, hereby declare that the equipment specified above conforms to the above requirements.

Place: Whatcom County

Signature:



Date: April 17, 2006

Full Name:

Gary Hielkema

Position:

President

# Voltstik Functions

## 1 Turning on the Voltstik

Both the Probe and the Receiver need to be powered on to take a measurement.

**Turn on the Voltstik Transmitter.** Press and release the switch on the Probe. The LED on the Probe will flash once a second for a few seconds, indicating that it is powered on and in the Voltage measurement mode. It will continue with a single blink every two seconds. Pressing and releasing the switch a second time will put the Probe into a mode that is reserved for a future application of this product. This mode is depicted by a double blink every two seconds, and will not allow the Probe to send voltage information to the receiver. To return to the Voltage measurement mode, press and release the switch on the Probe. Mate the Probe and the Resistor, and screw them together. Make sure that the probe is securely screwed into the resistor but do not over tighten.

**Turn on the Ampstik/Voltstik Receiver.** Press and release the on/off/hold switch on the Receiver. The receiver is designed to operate with both the Radio Ampstik as well as the Voltstik. Choose the mode for the Radio Voltstik by pressing and releasing the button when the Voltstik mode is shown. The Display will display "noSiG" until the radio in the Probe communicates to it. Once the Probe is communicating, the actual voltage will display on the receiver.



## 2 RUN Mode (Default Mode)

### The reading continuously changes as the voltage changes

The unit is immediately in the RUN mode after powering on. The receiver will display the real-time voltage of the line. The display updates three times every second.

## 3 To HOLD a Reading

The Receiver will store the reading in memory. Press and release the button when the desired reading is displayed. After three seconds, the receiver will return to the RUN mode. The Receiver can hold up to four readings. All held readings will be stored in the Receiver's memory until they are erased, or until the receiver is powered off.

## 4 To review a HELD Reading

Press and hold the control switch on the Receiver and scroll until HELD appears on the display. The number of the reading that is being viewed will flash in the upper left corner of the display. Press and release the control switch to scroll to the next reading. Repeat this to scroll through all the readings.



### **ERASE Mode - Clearing the stored measurements**

You must first go to the ERASE mode to clear the stored readings before taking further readings. Press and hold the control switch on the Receiver Display, the ERASE option will appear: release the control switch. After running the ERASE mode, all of the data will be cleared, and the Display will be in the RUN mode. The data will also clear when the OFF mode is selected. If the instrument has four readings in its memory and another attempt is made to take a reading, the display will show **"FULL"**.

## **6 Turning the instruments OFF Manually**

*Receiver:*

Press and hold the control switch on the Receiver Display and scroll to the OFF option. Release the control switch.

*Voltstik Probe:*

Press and hold the control switch until the LED goes to solid GREEN. Release the control switch.

## **7 Automatic OFF**

*Receiver:*

One hour passes with the voltage being less than 1000 Volts

One hour passes without the button being pushed

*Voltstik Probe:*

One hour passes with the voltage being less than 1000 Volts

## **Operating Instructions:**

A. Phase to Ground, Page 7

B. Phase to Phase, Page 11

## High Voltage Operation

This instrument is designed to operate in high voltage fields. However, difficulty may be experienced when excessive corona to the instrument occurs. This may occur when the line voltage is greater than 37 kV.

**NOTE:** The Voltstik may lock-up if it is used on conductors with higher voltages than its rating. If this occurs, the unit will transmit only the last measurement read. The unit will have to be returned to the factory for evaluation and repair to ensure unit integrity and safety.

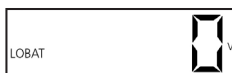
## Battery Replacement

The Voltstik is powered by two 9V batteries, one in each unit.

When the battery in the probe is low the Receiver will display the following:



When the battery in the receiver is low it will display "LOBAT" and the measurement until the battery fails:



**Probe:** Remove the two thumbscrews on the faceplate. Pull the battery out of the compartment and separate the battery from the battery connector. Install a fresh battery and reinsert the battery in its compartment. Reinstall the cover by gently pressing it into place. Take care to avoid overtightening the thumbscrews. Always reuse the thumbscrews provided.

**Receiver Display:** Loosen the thumb screw, located on the front middle of the unit. *\*DO NOT unscrew the four screws on the corners of the front panel.\** Remove the old battery. Snap the fresh battery to the connector and insert into the battery slot. Replace the cover plate. Be sure the antenna fits into the hole in the rear of the case. Tighten the thumb screw.

## Cleaning

The Voltstik can be cleaned by wiping with a small amount of alcohol on a rag.



# Making a Phase to Ground Measurement

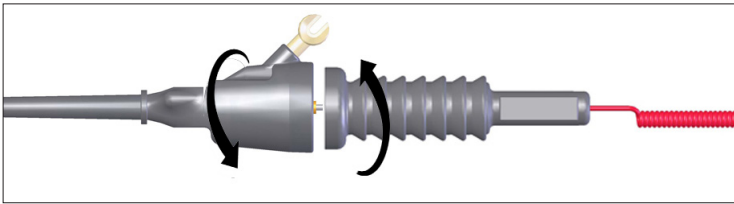
## Turning the Instrument on:

1. Push the button on the Receiver to turn it on.
2. Push the button on the receiver again when it is showing "V V V" to place the display in Volt mode. The receiver will then display "noSIG" or "0" if the probe is already on.
3. Push and release the button on the Probe to turn on the instrument. The radio in the probe will then transmit to the receiver and it should display "0" after a few seconds.

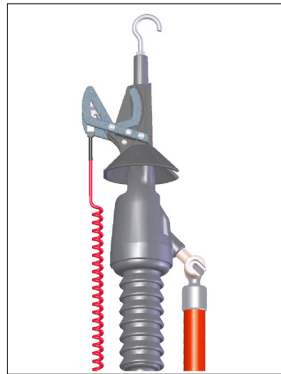
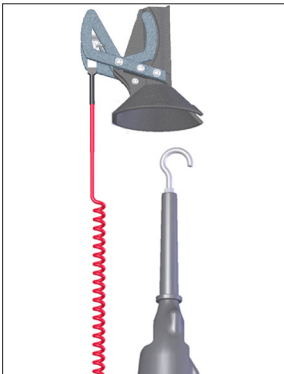


## Assembling the Instrument:

4. Assemble Voltstik Probe and Resistor. Make sure that the probe is securely screwed into the resistor but do not over tighten.



5. Slide the AutoClamp into place on the shaft of the probe. Be sure the coiled cable is not tangled; this will impair the ability to smoothly stretch and retract the cable.

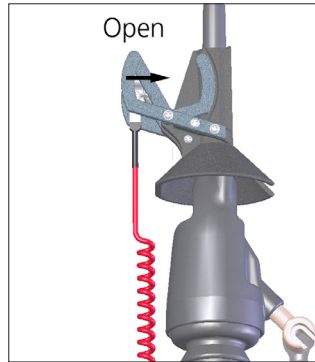
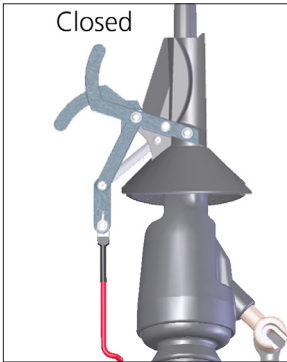


### Attaching the hotstick:

6. Attach the Voltstick to a universal hotstick. Tighten the bolt to make sure the instrument is well secured to the hotstick.

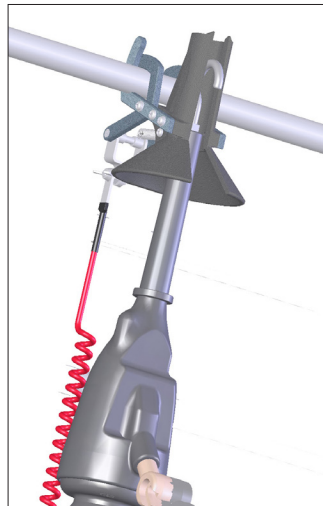
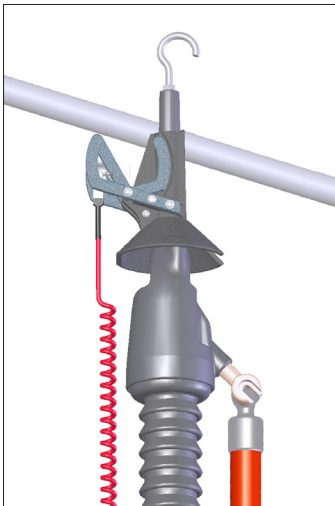
### Preparing the AutoClamp:

7. Open the arms of the AutoClamp into the open position. The spring should be in the stretched position when the clamp is open.



### Connecting to the Neutral:

8. Guide the base of the arms on the AutoClamp to the cable, neutral or ground, and force the conductor to apply pressure to the moving arms of the clamp. The moving arms of the clamp should quickly close making a secure connection with the cable.
9. Turn the Probe until the hook is in line with the slot of the AutoClamp, pull down through the slot to separate the head unit from the AutoClamp.



### Making contact with the first Phase:

10. Take the Probe up to the first phase and make good contact with the conductor.



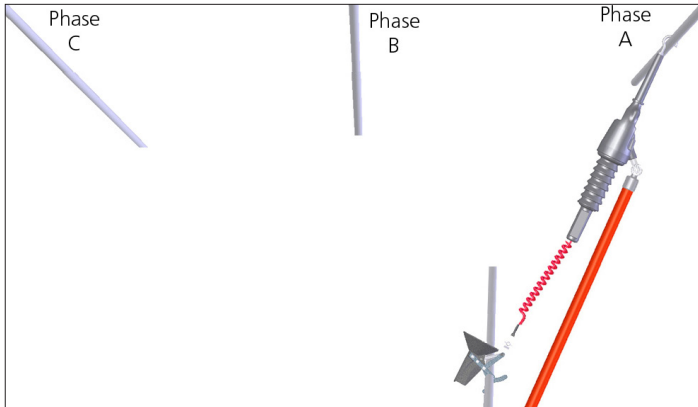
*Be sure to only approach the phase you are intending to measure. Make sure that all parts of the Voltstik stay out of the air gap that surrounds the adjacent phases, failure to do so could result in damage to the instrument and/or a phase to phase fault, endangering the user and surroundings.*



*Extreme caution must be taken when working in compact areas. In this situation the seam between the Probe and the Resistor should be treated as if it possesses the same voltage potential as the contact end of the Probe.*



*Maintain All Personnel a minimum of six feet (two meters) away from the extension cable.*



### Holding a reading:

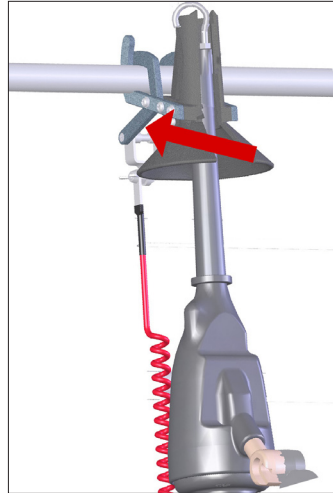
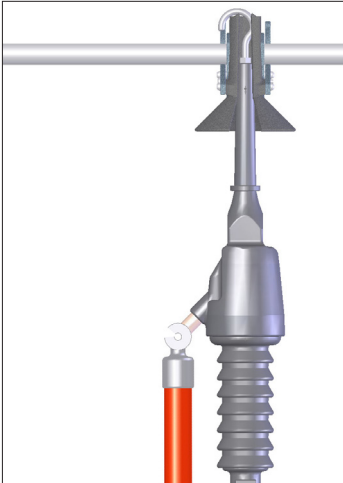
11. When a quality contact with the phase is made, press and release the button on the Receiver to store the first reading. See page four.

### (Optional) Measuring the next Phase(s):

12. Remove the Probe from the first phase and move it to the next phase making good contact with the conductor.
13. The Voltstik can store up to four readings. To do this repeat steps 10, 11 and 12.

### Removing the AutoClamp:

14. When your last measurement has been held, remove the Probe from the phase and return to the AutoClamp. Place the hook of the Probe so it will slide directly up into the AutoClamp. Push the Probe all the way into the clamp; then turn the head unit 90 degrees so that the hook on the Probe will grasp the side of the Auto Clamp when pulling down; push against the wire; and pull straight down.



# Making a Phase to Phase Measurement

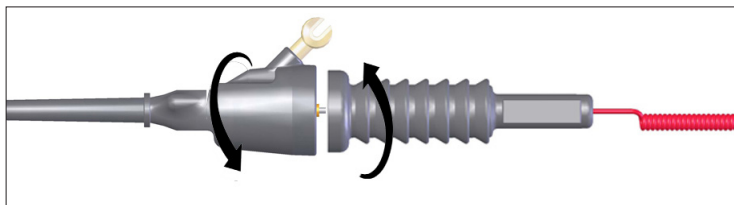
## Turning the Instrument on:

1. Push the button on the Receiver to turn it on.
2. Push the button on the receiver again when it is showing "V V V" to place the display in Volt mode. The receiver will then display "noSIG" or "0" if the probe is already on.
3. Push and release the button on the Probe to turn on the instrument. The radio in the probe will then transmit to the receiver and it should display "0" after a few seconds.

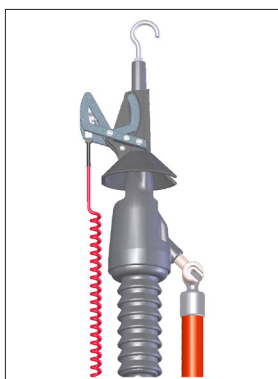
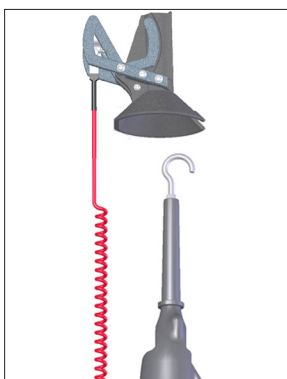


## Assembling the Instrument:

4. Assemble Voltstik Probe and Resistor.



5. Slide AutoClamp into place on the shaft of the Probe. Be sure the coiled cable is not tangled; this will impair the ability to smoothly stretch and retract the cable.

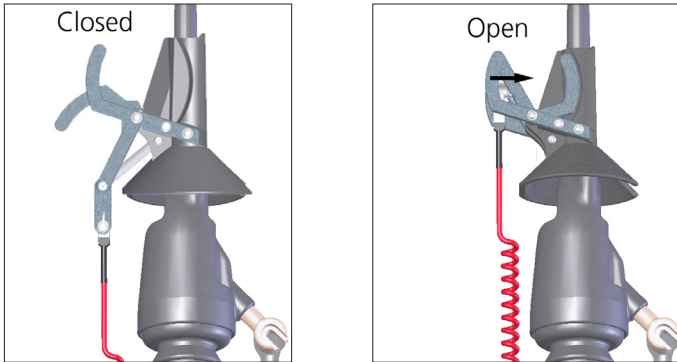


### Attaching the hotstick:

6. Attach the Voltstick to a universal hotstick. Tighten the bolt to make sure the instrument is well secured to the hotstick.

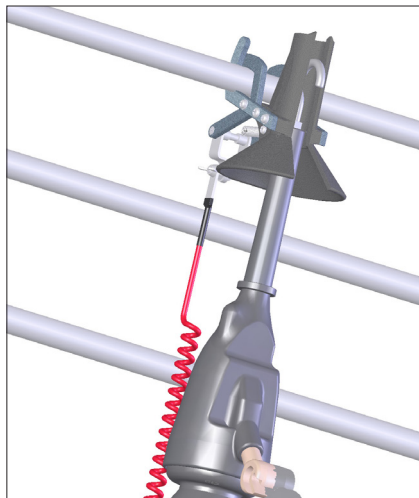
### Preparing the AutoClamp:

7. Open the arms of the AutoClamp into the open position. The spring should be in the stretched position when the clamp is open.



### Connecting to the Reference Phase:

8. Using the hotstick, approach the phase with the instrument. Guide the base of the arms on the AutoClamp to the cable and force the conductor to apply pressure to the moving arms of the clamp. The moving arms of the clamp should quickly close, making a secure connection with the cable.
9. Turn the Probe until the hook is in line with the slot of the AutoClamp, pull down through the slot to separate the Probe from the AutoClamp. See page 15 if the Finger of the Probe binds to the Autoclamp.



## Making contact with the first Phase:

10. Take the Probe up to the first phase and make good contact with the conductor.



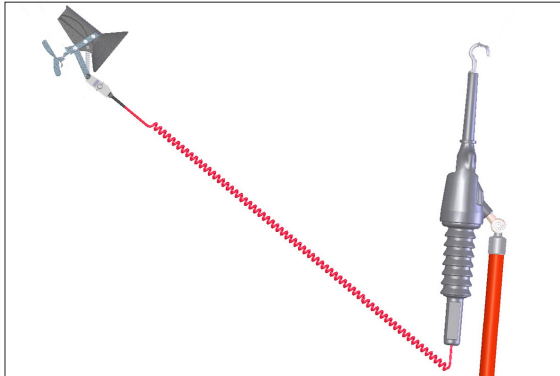
*Be sure to only approach the phase you are intending to measure. Make sure that all parts of the Voltstik stay out of the air gap that surrounds the adjacent phases, failure to do so could result in damage to the instrument and/or a phase to phase fault, endangering the user and surroundings.*



*Extreme caution must be taken when working in compact areas. In this situation, the seam between the Probe and the Resistor should be treated as if it possesses the same voltage potential as the contact end of the Probe.*



*The Red Wire is energized in this application. Maintain All Personnel a minimum of 6 feet (2 meters) away from the extension cable.*



## Holding a reading:

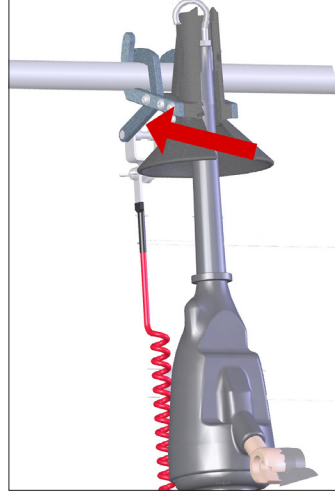
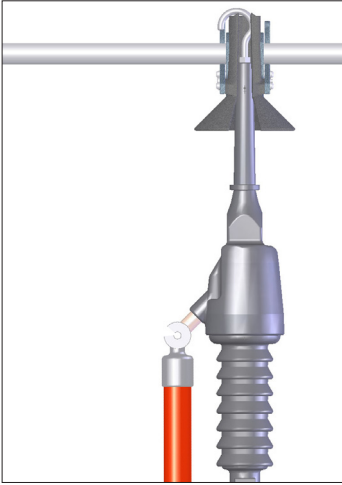
11. When a quality contact with the phase is made press and hold the button on the Receiver to store the first reading. See page four.

## (Optional) Measuring the next Phase(s):

12. Remove the Probe from the first phase and move it to the next phase making good contact with the conductor.
13. The Voltstik can store up to four readings. To do this repeat steps 10, 11 and 12.

### Removing the AutoClamp:

14. Remove the Probe from the phase and return to the AutoClamp. Place the Probe hook so it will slide directly up into the AutoClamp. Push the Probe all the way into the clamp; then turn the head unit 90 degrees so that the hook on the Probe will grasp the side of the Auto Clamp when pulling down; push against the wire; and pull straight down.



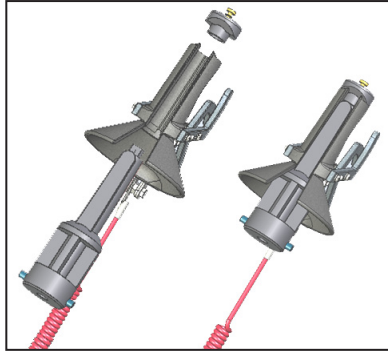


# Phase to Ground Measurement on Underground Bushing

Optional equipment required. Contact SensorLink for order details.

## Setting up the Voltstik:

1. Remove the hook from the Voltstik Probe
2. Screw the Bushing Probe onto the end of the Voltstik Probe
3. Unscrew the top of the Auto Clamp Adaptor\*
4. Insert the body of the Auto Clamp Adaptor into the Auto Clamp
5. Attach the top of the Auto Clamp Adaptor
6. Dock the Bushing Probe to the Auto Clamp Adaptor by matching up the nubs on the Auto Clamp Adaptor to the open slots on the Bushing Probe, and rotate the Voltstik Probe to get the nubs into the notch

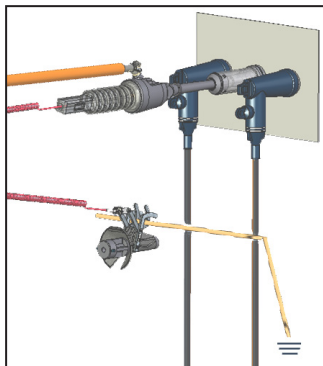


## Taking the Measurement:

1. Uncover the dust cover or elbow from the bushing to be measured
2. Press the Auto Clamp onto an exposed bare ground wire, or if able to, securely clamp the Extension Cable directly to the bare grounded cable\*
3. Rotate the Voltstik and release it from the Auto Clamp
4. Insert the Bushing Probe into the desired bushing

## Recovering the Auto Clamp:

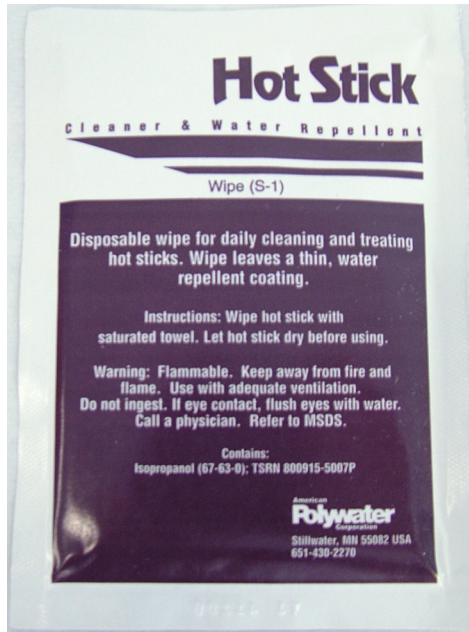
1. Remove the Voltstik and Bushing Probe from the bushing
2. Align the Bushing Probe into the Auto Clamp Adaptor
3. Rotate the Auto Clamp off of the ground wire
4. Pull the Auto Clamp off of the ground wire



\*Using the Auto Clamp Adaptor is not required if the end of the Extension Cable can securely clamp to a bare grounded cable.

# Probe and AutoClamp Maintenance

The shaft of the probe and the AutoClamp is treated at the factory with a silicon based hot stick wipe from Polywater Corporation. A sample of this product is shipped with every Voltstik. If the Probe and AutoClamp bind when applying the Auto Clamp to a line, wipe the shaft of the Probe with the silicon based hot stick wipe.



## SensorLink Corporation Warranty

SensorLink warrants each instrument it manufactures to be free from defects in materials and workmanship under normal use and service for the period of one year after date of shipment. Within this period, SensorLink agrees to repair or replace, at SensorLink's option, any instrument that fails to perform as specified. This Warranty shall not apply to any instrument that has been:

- 1 Repaired, worked on, or altered, including removal of the front panel, by persons unauthorized by SensorLink in such a manner as to injure, in SensorLink's sole judgment, the performance, stability, or reliability of the instrument;
- 2 Subjected to misuse, negligence, or accident; or
- 3 Connected, installed, adjusted, or used otherwise than in accordance with the instructions furnished by SensorLink.

This Warranty is in lieu of any other warranty, expressed or implied. SensorLink reserves the right to make any changes in the design or construction of its instruments at any time, without incurring any obligation to make any change whatever in units previously delivered.

If a failure occurs, contact the manufacturer for a Return Authorization and instructions for return shipment. This warranty constitutes the full understanding of the manufacturer and buyer, and no terms, conditions, understanding, or agreement purporting to modify or vary the terms hereof shall be binding unless hereafter made in writing and signed by an authorized official of SensorLink.

# Quality Assurance Certification

## True RMS Voltmeter

### Models 8-133 and 8-121

SensorLink certifies that its calibration measurements are traceable to the National Institute of Standards and Technology (NIST), to the extent allowed by the Institute's calibration facility, and to the calibration facilities of other International Standards Organization members.

This document certifies the following True RMS Radio Voltmeter was tested at the SensorLink High Voltage Laboratory, Ferndale, WA, USA to the appropriate standard and comply with the requirements of that standard.

Sensor Transmitter Volt Meter; Model 8-133; Serial Number \_\_\_\_\_

Radio Ampstik/Voltstik Receiver; Model 8-121; Serial Number \_\_\_\_\_

I hereby certify that the True RMS Voltmeter listed above has passed all tests defined in the SensorLink standard . I also certify that I have reviewed the standard and test procedure and that they are sufficient in determining compliance with the standard.

Signed \_\_\_\_\_

Date \_\_\_\_\_

Form No: SALE-Manual Template Voltstik-012 REV: V01  
Date: 11/19/2013  
Manual Stock Code No: DOPM-813-001



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