Operators Manual

Ampstik®+
Slip-on Ammeters

SensorLink®

Pad-mounted current measurement
Ampstik®+, Model 8-024-PLUS, Wide Jaw Sensor Opening

Overhead current measurement
Ampstik®+, Model 8-020-XT PLUS, Standard Sensor Opening

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Available Stock Codes:			
8-020-XT PLUS 50HZ	8-020-XT PLUS 60HZ	8-020-XT PLUS EURO	8-020-XT PLUS FRG
8-024-PLUS-50HZ	8-024-PLUS-60HZ	8-024-PLUS-EURO	

SPECIFICATIONS

Model Number	8-020-XT Plus	8-024-Plus
Range of Operation		
Voltage Phase to Phase	0-500 kV	0-500 kV
Current	0.5-5000 A	0.5-5000 A
Sensor Opening	Standard	Wide Jaw
Opening Width	2.5 in, 6.35 cm	4 in, 10.16 cm
Dimensions	13.96 in x 5.5 in x 1.92 in 35.46 cm x 13.97 cm x 4.88 cm	17.04 in x 8.95 in x 1.93 in 43.28 cm x 22.73 cm x 4.9 cm
Weight	1.75 lbs, 0.79 kg	2.6 lbs, 1.18 kg
Type of Reading	Four readings	
Resolution		
Amps .5-99.9A	0.1A	
Amps 100-1999A	1A	
Amps 2000-5000	0.01kA	
Accuracy	± 1%, ± 2 Counts	
Frequency	Actual frequency marked on unit	
50 Hz Calibrated	47 to 53 Hz	
60 Hz Calibrated	57 to 63 Hz	
Mechanical		
Operating Temperature	-22° to +140° F, -30° to +60° C	
	Shipped with Alkaline battery. Lithium battery required for temperatures below -4° F (-20° C)	
Display	3.5 Digit display	
Backlight	Automatic ambient light sensor	
Housing	Fire resistant and waterproof polycarbonate & silicone	
Hotstick Mounting	Universal chuck adapter. Hot stick not included.	
Battery	9V Alkaline or Lithium	
Durability	Drop tested to 10'	
Testing Standards	IP65, CE DoC available upon request	

Safety Information

⚠️ Read all safety and instruction statements before using the product. Failing to follow the safety guidelines can cause severe injury or death.

⚠️ Ampstik+ units are designed for use on live, overhead lines with 0 to 500KV. All procedures appropriate for the line voltage are to be taken, including proper work techniques, equipment, and Personal Protection Equipment.

⚠️ The Ampstik+ should be used only by certified personnel who have been trained for live-line, high voltage work by their organization.

⚠️ The hot stick length must be the correct for line voltage per minimum approach distances stated in published OSHA regulations and/or provided by the utility.

⚠️ The cover plate, chuck, and entire Ampstik+ are to be considered at the same potential. Putting the cover plate, chuck, or other parts of the Ampstik+ within the air gap of adjacent phases or ground could cause a phase to phase or phase to ground fault.

⚠️ The hot stick should be considered the sole isolation device.

⚠️ Do not force the arms of the Ampstik+.

⚠️ Do not alter the product in any manner.

THEORY OF OPERATION

The True RMS Ampstik+ has been developed specifically for measurement of AC current in environments of up to 500 kV for the electrical utility industry. The True RMS feature allows accurate measurement of current even when the nominal waveform is distorted or when harmonics are present. This may be the case with Y connected transformer neutral leads and distribution to many industrial customers using SCR controllers and other switching devices. This instrument can be used remotely with any hot stick and universal chuck adapter. It has no moving parts and does not require clamping onto the wire. The Polycarbonate housing is water resistant and will withstand high physical impact.

Take a Measurement in RUN Mode

When in RUN MODE, the reading continuously changes as the current on the conductor changes. The unit is immediately in the RUN mode after powering on. To place the instrument into the RUN mode from a different mode, press and hold the control switch and scroll to the option RUN, then release the control switch to engage the option.

Step 1: Attach the unit to a hot stick with a universal chuck adapter.

Step 2: Power on the unit by pressing and releasing the control switch.

STARTUP TEST
The Ampstik+ conducts a startup test to verify the sensor and circuitry is functioning correctly. The following screens will display during the test:

$$- \ - \ -$$

If the test detects a failure, the display will show FAIL and a corresponding code as per below. See page 13 for the failure code chart.

$$^1 \ \textbf{FAIL}$$

If the test determines the unit is functioning properly, it will move to normal mode and is ready to take the first measurement. The display will show:

$$\textbf{0.0}$$

Step 3: Take a measurement. Place the Ampstik+ on the conductor as shown below, with the conductor positioned anywhere below the measurement lines on the arms of the unit. If the conductor cannot be placed below the bump-outs, readings are taken but the accuracy may be lessened.

Step 4: Observe the readings being displayed on the unit.

Take a Measurement in HOLD Mode

When in HOLD mode, the unit will automatically measure and hold up to four unique current readings

Step 1: Attach the unit to a hot stick with a universal chuck adapter.

Step 2: Power on the unit by pressing and releasing the control switch.

STARTUP TEST
The Ampstik+ conducts a startup test to verify the sensor and circuitry is functioning correctly. The following screens will display during the test:
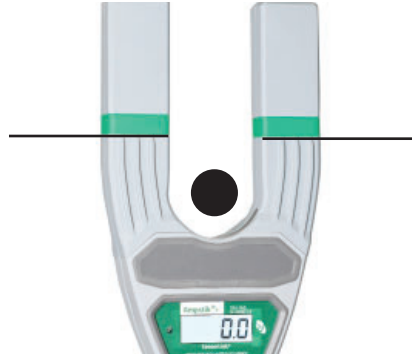
> – – –

If the test detects a failure, the display will show FAIL and a corresponding code as per below. See page 13 for the failure code chart.

> [1] **FAIL**

If the test determines the unit is functioning properly, it will move to RUN mode and is ready to take the first measurement. The display will show:

> **0.0**

Step 3: Place the instrument into the RUN mode. Press and hold the control switch and scroll to the HLD option; release the control switch on this option. The Ampstik+ is now in the HOLD mode and the word HOLD will appear on the bottom left corner of the display.

> HOLD

Step 4: Take a measurement. Place the Ampstik+ on the conductor as shown below, with the conductor positioned anywhere below the measurement lines on the arms of the unit. If the conductor cannot be placed below the measurement line, readings are taken but the accuracy may be lessened.
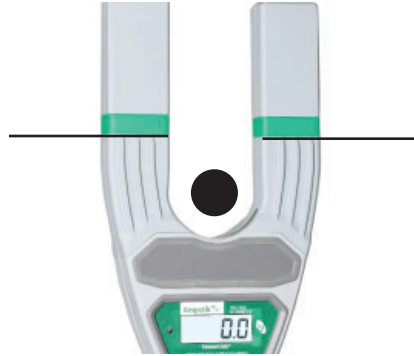
Step 5: Hold the unit on the conductor for 2-4 seconds and then remove from the line. The measurement has been taken and the unit is ready to take the next reading. Each reading is numbered and displayed on the top left of the display.

1

65.5

HOLD

Step 6: Repeat steps 4 & 5 to acquire up to three more readings. If the Ampstik+ has four readings in memory and another attempt is made to take a reading the display will show "- - -".

Viewing Stored Measurements

The reading held will display one at a time.

Step 1: Scroll through the readings. Press and release the control switch to move to the next reading. The number of the reading being viewed will flash.

1 3
2 4

72.0

HOLD

Deleting Stored Measurements

Measurements will clear when the unit is powered off, returned to RUN mode, or deleted manually.

Step 1: Press and hold the control switch until the DEL option appears and release the switch. All data has now been cleared.

Display Resolution of the Measurements

The unit will display to .1A in RUN mode and .3A in HOLD mode.

The display resolution changes on the following ranges:

XX.X	0-99.9Amps 0.1Amp resolution
XXXX	100 to 1999 Amps 1Amp resolution
X.XX	2000 to 5000 Amps 2.00 kAmps 10 Amp resolution (2 decimal places indicates kAmp range)

Powering off the unit

Step 1: Press and hold the control switch until the OFF option appears and release the switch. The unit is now powered off.

The Ampstik+ will power itself off after approximately 20 minutes of inactivity.

Backlight

The Backlight on the Ampstik+ is designed to automatically power on when the ambient light is low. This helps users view the display in low-light situations. The light sensor is located on the front of the unit.

The user may see some flicker if the backlight is on when under artificial lighting

By default, the Ampstik+ will start in Auto on/off mode on each power on. The modes may be changed manually during use of the unit. The unit will return to the measurement mode the unit was in before the backlight change.

Backlight: auto on/off
Press the control switch until the following screen appears:

```
┌──────────────┐
│    b-A       │
└──────────────┘
```

The backlight will now automatically power on when light is dimished and power off when light is brighter.

Backlight: Always on
Press the control switch until the following screen appears:

```
┌──────────────┐
│    b-1       │
└──────────────┘
```

The backlight will stay on until the unit is powered off and restarted, or the backlight option is manually changed.

Battery life will dimish faster when the backlight option is always on.

Backlight: Always off
Press the control switch until the following screen appears:

```
┌──────────────┐
│    b-0       │
└──────────────┘
```

The backlight will stay off until the unit is powered off and restarted, or the backlight option is manually changed.

Battery Replacement

The Ampstik+ is powered by a single 9V battery. The battery should be replaced when the "LO BAT" indication shows on the display. To change the battery, loosen the screw on the battery cover at the rear of the unit. Pull the battery out of the compartment and install a fresh battery. Secure the cover by closing and tightening the screw on the battery cover.

Cleaning

The Ampstik+ can be cleaned by wiping with a silicone hot stick wipe to remove sand, salt, and dirt.

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, resulting in a lost reading when in HOLD mode or require the power to be cycled.

Troubleshooting the Ampstik Plus

Unit will not power on
Verify there is a fresh 9V battery in the unit.

Backlight Flicker
Due to the refresh rate of the light, some users may see flicker if the backlight is on when under artificial lighting.

Fail Codes
The unit will not enter into measurement mode if the self-test has any of the below failures. The unit will need to be returned to SensorLink for repair evaluation.

FAIL CODE "1": Break to the main current sensor
FAIL CODE "2": Break to a current sensor component
FAIL CODE "3": Circuit failure
FAIL CODE "4": Circuit failure

Incorrect readings
Verify if the inaccuracy is occurring in one location, or multiple locations. If a single location, take a second ammeter to the location and verify the measurement. Contact us if the unit proves to be out of tolerance.

Calibration Mode (not a standard use mode)
If no|Yes|FAC is scrolling through on the display, the unit has been put into CAL mode. Exit by pressing and holding the switch when NO appears on the display. This will restart the unit. Erroneously entering entering this mode will not effect the units calibration.

Service and Repair Questions

Please contact SensorLink or an authorized agent for the return process of product for evaluation, repair, calibration, and verification.

SensorLink Corporation
Tel: (360)595-1000
Fax: (360)595-1001
E-mail: info@sensorlink.com
Web: www.sensorlink.com

SENSORLINK CORPORATION
LIMITED WARRANTY

What Does This Warranty Cover?
This warranty covers the following with respect to new, non-custom SensorLink products (the "Product"):
- Defects in materials
- Defects in workmanship
- Damages occurring during shipping from SensorLink if shipped under FOB Freight Allowed shipping terms

How Long Does This Warranty Last?
This warranty runs for twenty-four (24) months from the date of invoice by SensorLink.

What SensorLink Will Do:
If a defect in materials or workmanship or shipping damages as described above occurs within the warranty period, SensorLink will, at its election, repair or replace the Product at no charge or provide a refund.

What This Warranty Does Not Cover:
This warranty does not cover or apply to:
- Any defects or damages caused directly or indirectly by misuse, abuse, disassembly, alteration, negligence, accident, act of God, improper voltage, or improperly or incorrectly performed maintenance or repair
- Any defects or damages caused by any connection, installation or use of the Product not in compliance with the instructions and specifications for its use
- Any defects or damages caused by any alterations, modifications or repairs not made by SensorLink
- Third party products connected to the Product or in which the Product is installed
- Any Product purchased by the user in used condition
- Any custom Product produced by SensorLink
- Any Product repaired or calibrated by any party other than SensorLink

No Other Warranties:
OTHER THAN THE WARRANTIES PROVIDED HEREIN, SENSORLINK MAKES NO EXPRESS OR IMPLIED, ORAL OR WRITTEN WARRANTIES WITH RESPECT TO THE PRODUCT AND ALL SUCH WARRANTIES ARE EXCLUDED BY AGREEMENT AND SHALL NOT BE IMPLIED BY LAW, CUSTOM, USAGE, TRADE PRACTICE, COURSE OF DEALING OR COURSE OF PERFORMANCE. ALL WARRANTIES IMPLIED BY LAW, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHICH CANNOT BE EXCLUDED BY LAW ARE LIMITED TO THE DURATION OF THE WARRANTY. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

Limitation On Damages:
SENSORLINK SHALL IN NO EVENT BE LIABLE FOR DEATH, INJURIES TO PERSONS OR PROPERTY OR FOR INCIDENTAL, CONTINGENT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING FROM USE OF THE PRODUCT. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

How Do You Get Warranty Performance?
In order to be eligible under this warranty, you must promptly contact SensorLink upon discovery of a possible defect, supply a copy of this warranty along with proof of purchase, and request a return material authorization (RMA). If you do not contact SensorLink within the twenty-four (24) month warranty period, your rights under this warranty will terminate. All warranty correspondence should be directed to:

SensorLink Corporation
1360 Stonegate Way
Ferndale, WA 98248
(360) 595-1000

SensorLink will begin its inspection of the Product within five (5) business days of receipt and will contact you when its inspection is complete. If the inspection uncovers a defect, SensorLink will repair or replace the Product and pay for the cost of shipping the Product back to you. Alternatively, SensorLink may issue you a refund of your original purchase price.

If the inspection does not uncover a defect, or the defect resulted from causes not within the scope of the warranty, then the Product will be replaced only at your request and at your expense and you must bear all costs of shipping the Product. Additionally, you will be responsible to reimburse SensorLink for its evaluation expenses and Product verification fee. You may obtain SensorLink's current fees by calling the number listed above.

How Does State Law Apply?
This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Choice of Law:
This warranty, including without limitations the rights and responsibilities granted hereunder, shall be governed and construed in accordance with the laws of the State of Washington, without regard to the conflicts of law provisions thereof.

Severability:
If any provision of this warranty is held unenforceable or illegal, or otherwise limited in its application, by a court or other authority with competent jurisdiction, such provisions shall be modified to the minimum extent required such that the rest of the warranty will continue in full force and effect in accordance with its terms.

Entire Agreement:
This writing embodies the entire limited warranty of SensorLink, and no other warranties are given beyond those set forth herein. No oral agreements or understandings shall be binding on SensorLink. SensorLink neither assumes, nor authorizes, anyone (including without limitation SensorLink agents, employees or contractors) to assume or create for it other obligations or liabilities or modify in any way any item or provision of this warranty.

Quality Assurance Certification
True RMS Ammeter Models
8-020-XT Plus, 8-024-Plus

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 Ammeter was tested at the SensorLink High Voltage Laboratory, Ferndale, WA, USA to the appropriate standard and comply with the requirements of that standard.

Serial Number: _____

Model Number: _____

I hereby certify that the True RMS Ammeter listed above has passed all tests defined in the SensorLink standard.

Signed: _____

Date: _____

These products proudly made in the USA.

SensorLink® Corporation

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