Operators Manual

Amp Litewire

High Voltage Ammeter Probe

SensorLink®

Operators Manual
Amp Litewire
Fiber Optic Coupled Ammeter Probe

Available Stock Codes:			
8-01503 XT 50HZ	8-01503 XT 60HZ	8-01503 XT EURO	
8-01603 50HZ	8-01603 60HZ	8-01603 EURO	
6-02603			

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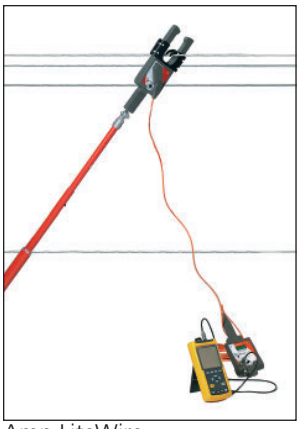
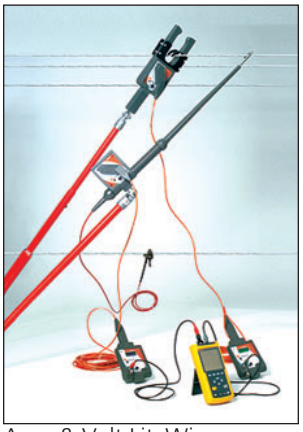


Amp LiteWire



Amp & Volt LiteWire

THEORY OF OPERATION

The Amp Litewire is a two-piece, True RMS ammeter with a fiber optic link between the high voltage amp sensor transmitter and the analog output at ground potential. The amp sensor transmitter is mounted on a hotstick (insulated pole) and slipped over a low or high voltage line. A fiber optic cable connects the amp sensor transmitter to a receiver unit at ground potential, which provides the analog output.

The instrument has no moving parts and does not require clamping onto the wire. The housings are water resistant and will withstand high physical impact.

The analog output is the unique feature of this instrument. It is a reproduction of the high voltage current waveform that will display up to the 50th harmonic, but available as a 0-2 volt AC signal at ground. This allows the use of many sophisticated low voltage instruments, such as scopes, waveform acquisition recorders, analyzers, and other analysis instruments which would previously not be usable at high voltage.

The fiber optic cable is physically rugged while providing the high speed data path required for digital waveform transmission from the sensor to the display unit. It also is the high voltage insulator between the two units.

The Amp Litewire may be used with the Volt Litewire to maintain power systems and troubleshoot power problems.

SAFETY INFORMATION

The Litewire is designed for use when attached to a suitable universal hot stick. All precautions appropriate for the line voltage should be taken. The sensor transmitter unit of the Litewire is not designed to be a high voltage insulator. The sensor transmitter should not bridge between conductors or between a conductor and ground. Be careful not to allow the universal chuck adaptor or the metal parts of the hotstick to bridge between high voltage and ground or between two high voltage points.

The fiber optic cable is a high voltage insulator and will isolate equipment and personnel in the same manner as a fiber glass hot stick. Visually inspect and clean the fiber with a non-abrasive hot stick wipe. The fiber should be replaced if the visual inspection reveals a flaw of a void or a hole in the finish of the fiber. The fiber should also be tested to determine its electrical insulation properties. If a fault is observed, the fiber should be replaced.

SPECIFICATIONS

Model Number	8-01503 XT	8-01603	6-02603
Sensor Opening	Standard	Wide Jaw	Standard for Powermetrix
Opening Width	2.5" 6.35 cm	3.86" 9.84 cm	3.86" 9.84 cm
Weight	4.8 lbs 2.18 kg	6.0 lbs 2.73 kg	6.0 lbs 2.73 kg
Range of Operation			
Current	1-2000 A	1-2000 A	1-2000 A
Phase to Phase Voltage	up to 433 kV	up to 433 kV	up to 433 kV
Phase to Ground Voltage	up to 250 kV	up to 250 kV	up to 250 kV
Accuracy	±1 %, ±0.1 millivolt		
Phase Angle	±1°		
Resolution	0.1 millivolt		
Frequency			
50Hz Calibrated	47 to 53 Hz		
60Hz Calibrated	57 to 63 Hz		
Analog Output	1 millivolt RMS per Amp		
Output Connector	BNC. No DC offset voltage.		
Output Impedance	50 ohms minimum		
Frequency Response	3000 Hz or to the 50th harmonic		
Fiber Optic Cable			
Standard Length	40 ft, 12.19 m		
Isolation	100 kV per Foot, 150 kV max		
Mechanical			
Ambient Temperature	-22° to +140° F, -30° to +60° C Lithium battery required for use below -4°F (-20° C)		
Housing	Shock and Water resistant molded urethane		
Hotstick Mounting	Universal Chuck Adaptor (hot stick not included)		
Battery	9 volt, one per Transmitter and Receiver		
Battery Life	Minimum six hours of continuous use		

OPERATING INSTRUCTIONS

The Litewire is controlled by the single push button switch located on the front panel of each unit, and is operated as follows:

1. **Connecting the Fiber Optic link**
   - Clean fiber optic cable per instructions on page 10
   - Work with one end at a time
   - Uncover the male connector dust cover on the fiber optic cable
   - Uncover the dust cap on the female receiver, located on the face of the unit
   - Line-up the male connector and insert into the female receiver
   - Push and twist to lock into place
   - Repeat the process on the opposite end of the fiber for the other unit

2. **Attach unit to the hot stick**
   Attach the sensor transmitter to a universal hot stick (Insulated Pole)

3. **Attach the Strain Relief Strap**
   To prevent strain on the fiber optic cable, wrap the velcro securely around the handle of the Transmitter as shown below:

4. **Press and release the switch button on the transmitter**
   The LED on the transmitter should be on and solid green.
   The LED on the receiver should now flash every two seconds, indicating the transmitter and receiver are communicating

5. Press and release the switch button on the receiver
   The green LED should be on and solid green

6. Connect to the analyzer
   An analog replica of the current waveform is available at the BNC connector. This signal may be read with any instrument that is capable of reading 0-2 volt AC. The unis has an output impedance of 50 ohms. A portable oscilloscope, waveform recorder, or power analyzer may be used. You will need the following equipment to output to an analog device:
   (1) Amp Litewire: 8-015 XT02 Narrow Jaw or 8-01602 Wide Jaw
   (1) 7-011-CABL

7. Hanging the Unit
   A detachable hook, ordered separately, is available to allow the amp sensor transmitter and its hot stick to hang temporarily from overhead wires.
   **The unit should never be left unattended while hanging.
   **The receiver unit should never be allowed to hang free.

8. Communications
   Once hung, the transmitter unit is reading and communicating to the receiver. The LED will flash every half second when the current is greater than approximately 1 Amp.

9. Powering the unit OFF
   Press and release the switch button to turn off both the transmitter and receiver.

10. Auto Power OFF
    The Transmitter unit will automatically turn itself off if current more than 1A is not detected for approximately 30 minutes. The Receiver unit will also power off after 30 minuntes if it does not receive more than 1A input for approximatley 30 minutes. This feature is designed to save battery power. If an automatic time-out occurs, the units will have to be manually restarted.

TROUBLESHOOTING GUIDE

Why is there no data output to the analyzer?

This may indicate the amp sensor transmitter is not communicating. Troubleshoot the communications:

a. The LED on the recever should be flashing when the transmitter and receiver are correctly communicating

b. Make sure the amp sensor transmitter is powered on

c. Make sure the battery in the amp sensor transmitter has 8.5VDC or greater

d. Check the fiber end and ferule for dirt. See page nine and ten for the fiber optic cable handling and cleaning instructions

e. Replace the Fiber Optic Cable

Why is my unit not powering on?

a. Verify that there are fresh 9V Batteries in each unit

Why is the LED on the receiver flashing?

a. When the current is lower than approximately one amp the LED on the receiver will flash every two seconds.

b. When the current is greater than approximately one amp the LED on the receiver will flash every half second.

Why is the LED on the unit red?

a. The battery voltage is low. Replace the battery.

Why did my unit power off?

a. The battery voltage is too low

b. The units will automatically power off after approximately 30 minutes of no current (<1A) being sensed.

Fiber Optic Cable Handling Guidelines

Male Connector
(End of Cable)

Female Receiver
(Mounted on Instrument)

Guide One:
Do not touch the ceramic ferrite end of the male connector.

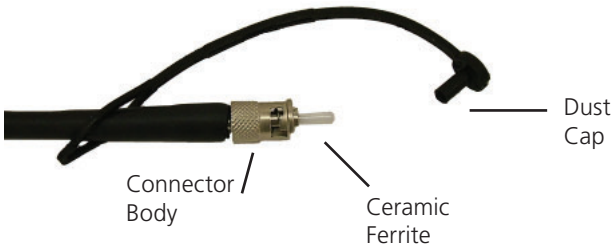
Guide Two:
Cover the fiber optic connector when not in use. Unprotected connector ends are most often damaged by impact, such as hitting the floor. The provided tethered boot will protect the connector's polished ferrule end from impact damage that might crack or chip the polished surface. Please contact Sensorlink Corporation for a replacement if the provided boot is lost or broken.

Guide Three:
The fiber end face and ferrule must be absolutely clean before it is inserted into a transmitter or receiver. Dust, lint, oil (from touching the fiber end face), or other foreign particles obscure the end face, compromising the integrity of the optical signal being sent over the fiber. See page ten for cleaning instructions.

Guide Four:
Residue can build up in the boot. It is important that the connector is thoroughly cleaned before mating, even if it was cleaned before the protection boot was installed. The fiber core is 62.5 microns, about half the size of a sheet of paper. Fiber optic connectors need to be clean and some debris cannot be seen by the naked eye. It is recommended the connectors are cleaned each time they are mated. See page ten for cleaning instructions.

Cleaning

The fiber optic cable should be cleaned and handled in the same manner as a fiberglass hot stick. It is critically important for fiber optic connectors to be free of dust and dirt to maintain optimum performance. Cleaning should be done as often as possible in dusty and dirty environment. A simple and effective way to guarantee cleanliness is to clean the ends of your fiber optic cables each time they are disconnected.



Recommended Equipment:

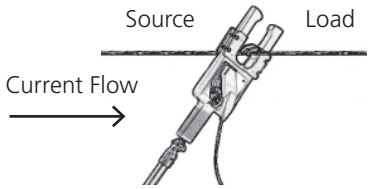
Kimwipes® or any lens-grade, lint-free tissue. The type sold for eyeglasses work quite well.
Denatured alcohol. Note: Use only industrial grade 99% pure isopropyl alcohol. Commercially available isopropyl alcohol is for medicinal use and is diluted with water and a light mineral oil. Industrial grade isopropyl alcohol should be used exclusively.
Canned dry air.
(Optional) Microscope

Recommended Process:

1. Fold the tissue twice so it is four layers thick.
2. Saturate the tissue with alcohol.
3. Clean the sides of the connector ferrule. Place the connector ferrule in the tissue. Apply pressure to the sides of the ferrule. Rotate the ferrule several times to remove all contamination from ferrule sides.
4. Move to a clean, saturated part of the tissue. Put the tissue against the end of the connector ferrule. Put your fingernail against the tissue so that it is directly over the ferrule.
5. (Optional) Use the microscope to verify the quality of the cleaning. If it isn't completely clean, repeat the steps with a clean tissue. Repeat until you have a cleaning technique that yields good, repeatable results.
6. Mate the connector immediately. If not possible, be sure to replace protective boot.
7. Air can be used to remove lint or loose dust from the connectors. Never insert any liquid into the ports.

Directional Properties

The Amp sensor on the Litewire is direction sensitive. In order to insure proper phase relationship when comparing to a voltage reference, place the Amp Litewire so the face of the instrument is facing the load. The proper phase angle should be 0 to ±90° when measuring the fundamental. When the sensor is positioned in an improper orientation the phase angle will read ±91° to ±180°.



BATTERY LIFE & REPLACEMENT

The Litewire is powered by two 9V batteries, one in the transmitter unit and one in the receiver unit. The batteries have gotten critically low when the LED on the unit turns red.

To replace the battery, remove the four screws on the battery cover at the rear of the unit. Carefully insert a screwdriver blade in the notch and pry the cover out, being careful not to damage the cover seal. Pull the battery out of the compartment and separate the battery from the battery connector. To avoid breaking the battery leads do not pull on the battery only. Install a fresh battery and reinsert the battery in its compartment. Do not pinch the wires between the battery and compartment; put wires in slot above the battery. Reinstall the cover by gently pressing it into place while pulling out on the edges of the compartment, and reinstall the four cover screws. Take care to avoid overtightening the screws. Always reuse the screws provided and do not damage or lose the o-ring seal on each screw.

Amp Litewire Diagram

1. Female Fiber Optic Ends
2. ON/OFF Switch
3. Universal Chuck Adaptor
4. Amp Sensor/Transmitter
5. Fiber Optic Cable
6. Male Fiber Optic Ends
7. BNC Output
8. Receiver Adaptor

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
Fiber Optic Coupled Ammeter
Model 8-01503 XT, 8-01603, or 6-02603

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 Model 8-01503 XT, 8-01603, or 6-02603 was tested at the SensorLink Corporation 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 Model 8-01503 XT, 8-01603, or 6-02603 Amp Litewire has passed all tests defined in the SensorLink Corporation 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 AMP LW-016 REV: V02
Date: 10/2018
Manual Stock Code No: M050-004-001

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