

Operators Manual

Qualstik PLUS

Live-Line Power Quality Survey Meter

Operators Manual Qualstik Plus

Live-Line Power Quality Meter

Available Stock Codes:			
8-061 XT PLUS 50HZ	8-061 XT PLUS 60HZ	8-061 XT PLUS EURO	8-061 XT PLUS FRG
8-062 PLUS 50HZ	8-062 PLUS 60HZ	8-062 PLUS EURO	

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Theory of Operation

The Qualstik*Plus* live-line power quality survey meter has been developed specifically for measurement of three important items of power quality in the electrical utility industry. These are:



- True RMS Amps
- True Power Factor (Leading or Lagging)
- Total Harmonic Distortion Amps
- Direction of Current flow

The current is measured by SensorLink Corporation's patented Amp sensor. This sensor is based on magnetic field induction pickup. Magnetic field sensing is recognized as the most reliable method of sensing current, due to large

signals and low noise coupling into the sensor. In order to satisfy Ampere's Law, the Qualstik*Plus* design uses a special air core inductor configuration, which simulates the required closure. A large U shaped inductor provides the primary magnetic field sensing, and small inductors near the opening of the sensor provide detection of the magnetic field moving in or out of the open part of the sensor and compensate for this leakage.

Power factor sensing requires two sensors. The Ampstik sensor described above senses the current. The voltage is measured by the electric field sensor, which directly couples to the line being measured, and is in the bottom of the Amp sensor. The magnitude of the voltage is unknown, but the waveform is precise. By comparing the current and voltage waveforms an accurate power factor can be calculated.

The Total Harmonic Distortion Amps (THD A) is a measurement of the percentage of non-sixty/fifty cycle current as compared to the total current and is shown on the meter display as a number from 00 % to 100 %.

The direction of current flow is determined by measuring the relative phase angle of volts and current.

This instrument can be used remotely with any hotstick and universal chuck adapter. The instrument has no moving parts and does not require clamping onto the wire. Direct connections to a bare conductor are required to insure power factor measurement accuracy. The case is water-resistant and will withstand high physical impact.

Specifications

Model Number	8-061 XT PLUS	8-062 Plus
Sensor Type	Narrow Jaw	Wide Jaw
Sensor Opening	2.5 inches, 6.35 cm	3.86 inches, 9.8 cm
Weight	2.8 lbs, 1.3 kg	3.8 lbs, 1.76 kg
Measurements		
Amps	1 - 2000A	5 - 2000 A
Power Factor	.01 - Lagging to .01 - Leading	.01 - Lagging to .01 - Leading
THD Amps	1 - 100%	1 - 100%
Current Flow	Amps In or Amps Out	Amps In or Amps Out
Accuracy		
Amps	±1%± 2 counts	±1%± 2 counts
Power Factor	±1count (.7 Lead to Lag)	±1count (.7 Lead to Lag)
THD Amps	±1%	±1%
Resolution		
Amps		
1 - 99 Amps	.1 Amp	.1 Amp
100 - 2000 Amps	1 Amp	1 Amp
Power Factor	1%	1%
THD Amps		
0.1% to 10%	0.1%	0.1%
> 10%	1%	1%
Range of Operation		
Voltage	600 V to 500 KV	600 V to 500 KV
Current	1-2000 A	5-2000 A
Frequency		
50Hz Calibrated	47 to 53 Hz	
60Hz Calibrated	57 to 63 Hz	
Mechanical		
Battery	9 Volt Alkaline or Lithium	
Display	Graphics Display	
Hotstick Mounting	Universal Chuck Adapter	
Temperature Range	-20 to 54 ° C	
Type of Readings	Eight	
ECC Standards	Successfully passed international tests indicated by CE	

QualstikPlus Operations

SAFETY:

⚠ The QUALSTIKPLUS Power Quality Meter is designed and **must** be used 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 e-field probe, face plate, battery cover, chuck, and entire QualstikPlus should be considered to be at the same potential. Putting the face plate, battery cover, chuck, or other parts of the QualstikPlus within the air gap of adjacent phases or ground could cause a phase to phase or phase to ground fault.

To turn on the QualstikPlus:

Press the function button. The following sequence of screens will appear on the display while the unit is powering on:



The QualstikPlus is now ready to measure Amps, Power Factor, THD Amps and the direction of current flow.

Taking a measurement:

- 1 Place the QualstikPlus on a conductor carrying at least one amp of AC current, as depicted in the picture on page two. It is essential you make contact between the conductor and the voltage sensor, which is the V-shaped plate between the jaws. Measurement begins as soon as the QualstikPlus is in position and is stable. Take no longer than four seconds to adjust the QualstikPlus' position once the conductor is within its jaws.
- 2 Leave the QualstikPlus in position to measure for at least two seconds for normal magnitude currents, or for four seconds if the current is below eight amperes. While the QualstikPlus is taking a measurement it will display the word, "Sampling".
- 3 Remove the QualstikPlus from the conductor. It holds the reading and displays it as follows:



The QualstikPlus is capable of locking the display to the ATHD reading or PF reading, as well as able to continuously toggle the two readings. To get the unit to toggle between the two readings, press the on/off switch once. The ATHD and PF readings will now rotate in the display every two seconds. At any time you may press the on/off switch to lock the display to either the ATHD or PF reading.



Taking multiple measurements:

To take up to seven more readings, simply follow steps one through three over again. The number in the box in the lower left side of the display will indicate what reading you are taking.

Viewing the multiple measurements:

Press and hold the control switch down until you see the following screen:



When the switch is held down, the selector will continuously scroll through the menu options at the bottom of the screen. To view any of the readings, release the switch when that option is highlighted with the cursor.

Deleting measurements:

Press and hold the control switch down until you see the main screen with the "OFF", "CLR" and "1-8" menu options. Release the switch when the cursor scrolls over the "CLR" option. All data is now deleted.

Troubleshooting an Error Message:

FULL

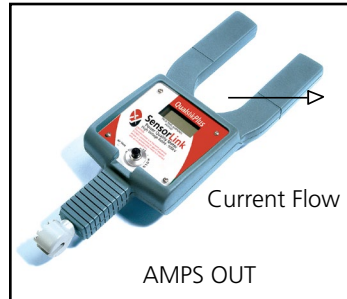
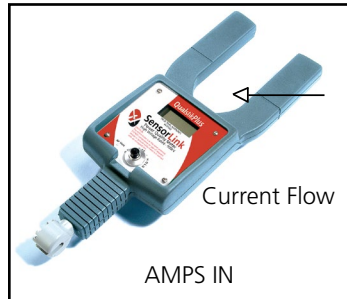
1. If the QualstikPlus has eight sets of readings in its memory and another attempt is made to take a reading, the display will show the above screen. You must clear the data with the "CLR" option before any further readings may be taken.

Error - - Use
U - Sensor Contact

Error
Minimize Arcing

2. If the QualstikPlus does not have a good connection to the line, the unit will toggle between the above messages. If you receive this message, try taking the measurement again, being sure to get a proper connection with the line and voltage sensor of the QualstikPlus. Make sure the voltage sensor is in contact with the current source and not arcing.
3. If the instrument **turns off**, and will not power-on, replace the battery. The QualstikPlus will power off when the battery voltage drops too low. See the Battery Replacement instructions.

Direction of current flow Illustration



Current Flow means the direction of flow from the source to the load.

Amps In indicates that the direction of current is flowing from the source In to the face of the QualstikPlus.

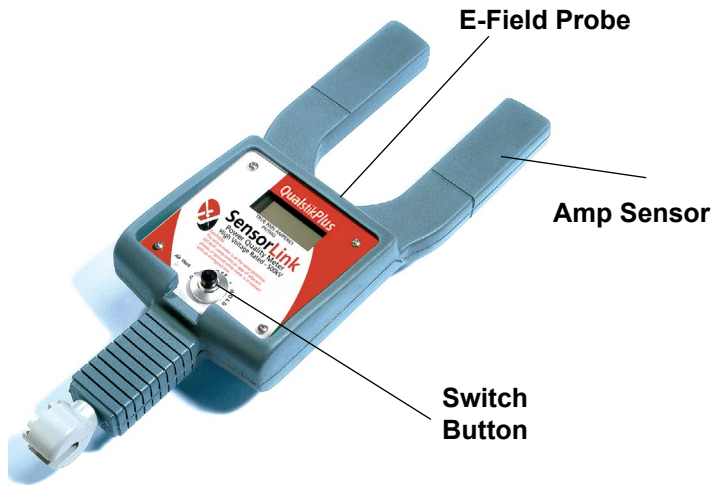
Amps Out indicates that the direction of current is flowing from the source out of the face of the QualstikPlus.

Battery Replacement

The Qualstik will switch itself off when the battery voltage drops too low. For accurate operations, have a spare 9V battery for replacement. The Qualstik is powered by a single 9V battery. 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 wires* between battery and compartment, put wires in the 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.

Cleaning

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



E-Field Probe

Amp Sensor

Switch Button

SensorLink® Corporation Warranty

SensorLink Corporation 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 Corporation agrees to repair or replace, at SensorLink Corporation'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 Corporation in such a manner as to injure, in SensorLink Corporation'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 Corporation.

This Warranty is in lieu of any other warranty, expressed or implied. SensorLink Corporation 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 Corporation.



Soft Carrying Case

Each Qualistik is shipped with a soft carrying case.
Part #8019



Optional Hard Carrying Case

Upgrade to an optional Hard Carrying Case.
May be requested at the time of order.
Part #7044

Quality Assurance Certification

Qualstik Meter

Model 8-061 XT PLUS and 8-062 PLUS

SensorLink Corporation certifies that its calibration measurements are traceable to the United States National Bureau of Standards, to the extent allowed by the Bureau's calibration facility, and to the calibration facilities of other International Standards Organization members.

This document certifies the following Qualstik Meter 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
Numbers _____

Model
Numbers _____

I hereby certify that the Qualstik Meter listed above 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 QUALSTIK-007 REV: V01

Date: 11/19/2013

Manual Stock Code No: DOPM-806-003



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