Amcorder

Operators Manual

Model 920
Recording Ammeter

SensorLink®

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Model 920
Table of Contents

SPECIFICATIONS

Model Number	6-920-3
Type	Recording Ammeter Kit
	3 Amcorders
	IrDA Serial Cable
	Softlink Software
	Universal Hotstick Adaptors
	Soft Carrying Case
Range of Operation	
Voltage	69 kV
Current	1 to 1000 A
Resolution	
Amps 1.0 to 99.9 A	0.1 A
Amps 100 to 1000 A	1 A
Accuracy	
Amps	± 1% of Reading Plus 2 Counts
Frequency	
50 Hz	50 or 60 Hz
Mechanical	
Weight	1.5 lbs (0.68kg)
Sensor Opening	up to 1.3 in (up to 3.3cm)
Dimensions	9.8 in x 4.8 in x 3 in (24.77 cm x 12.07 cm x 7.62 cm)
Housing	Shock and water resistant molded urethane
Operating Temperature	-4 to +140˚ F (-20 to +60˚ C)
Storage Temperature	-40 to +158˚ F (-40 to +70˚ C)
Hotstick Mounting	Shotgun Style Hotstick (Hotsticks not included)
	Switch Stick Adaptor (Hotsticks not included)
Battery	9 Volt Alkaline
Indoor/Outdoor Use	
Relative Humidity	90% Non - Condensing
Altitude	3000 m
Software Requirements	Softlink
Processor	100 Mhz or Higher (200 Mhz Recommended)
RAM	32 MB (64 MB Recommended)
Drive Space	15 MB to Load Software, 10 MB Operating Space
Data Collection Space	64,000 Data points
EC Standards	Successfully passed international test standards indicated by CE

Safety

The Amcorder is designed for use with a suitable shotgun style hotstick. 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 cover plate, chuck, and entire Amcorder should be considered to be at the same potential. Putting the cover plate, chuck, or other parts of the Amcorder within the air gap of adjacent phases or ground could cause a phase to phase or phase to ground fault.

Powering the Unit

The Amcorder powers on and begins taking recordings when the battery is properly placed into the battery compartment.

Cleaning

Clean the Amcorder by wiping with a small amount of alcohol on a rag.

Battery

Replacing the battery

Changing the Battery: The Amcorder requires one 9V Alkaline battery. Remove the screw at the base of the unit and remove the cover plate. Snap the battery to the connector , and insert into the battery slot. Replace the cover plate.

Expected Battery Life: The expected life of the battery in an Amcorder is varied by how often the Amcorder samples the line to collect data and the ambient temperature. Fresh non-rechargeable batteries are required so the reliability and life of the battery can be easily predicted. Predicting the life of rechargeable batteries is uncertain, especially after several recharges. The standard 9-volt Alkaline and Lithium batteries were chosen because they are inexpensive and are readily available throughout the world. The Lithium batteries recommended are commonly referred to as long-life smoke detector batteries and sell by the brand names UltraLife and Energizer.

The following Table indicates the expected battery life at 68° F or 20° C

Sample Interval (Seconds)	Expected Life of a 9-volt Alkaline Battery (Days)	Expected Life of a 9-volt Lithium Battery (Days)
60	180	360
30	120	240
15	75	180
10	60	120
5	28	60
1	7	14

Alkaline operating time reduced to 25% at -4° F or -20° C
Lithium operating time reduced to 75% at -4° F or -20° C
Lithium operating time reduced to 50% at -40° F or -40° C

PLEASE NOTE: Once a fresh battery is inserted, the user has five minutes to start downloading the data before the Amcorder resets itself. The Amcorder will only save the logged data in its flash ram for 5 minutes. **We recommend that you do not remove the battery until you have downloaded all of the data.** A new battery should be placed into the Amcorder before it is deployed on the line to ensure the reliability of the battery life.

Low Temperature Applications

The Alkaline Battery and the IrDA transceiver are two components that limit the operation of the Amcorder to down to -4F / -20C. By substituting a Lithium long-life battery the Amcorder can collect data down to -40. Because the IrDA cable doesn't perform at these low temperatures, when collecting the data from the Amcorder the temperature needs to be above -4F/ -20C.

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

Installation

Attaching the Amcorder to a line with a shotgun style hotstick:

Step 1: Attach the Shotgun adapter to the Amcorder

Step 2: Grasp the Amcorder with the hot stick

Step 3: Place the Amcorder on the conductor

Step 4: Pull down on the unit to insure that the urethane springs are securely holding the Amcorder on the conductor

Step 5: Release the hot stick

Urethane
Springs

Shotgun
Adapter

Urethane
Carabineer

Removing the Amcorder from the line with a shotgun style hotstik:

Step 1: Attach the hot stick to the unit

Step 2: Disengage the line clasp

Step 3: Push against the urethane carabineer; it requires 15lbs of pressure on the carabineer to remove the Amcorder from the line

Installation...continued

Attaching the Amcorder to a line with a switch stick style hotstick:

Step 1: Attach the Switch Stick receiver to the Amcorder

Step 2: Attach the Switch Stick adapter the switch stick

Step 3: Insert the adapter into the receiver and then twist until the adapter locks into the receiver

Step 4: Place the Amcorder on the conductor

Step 5: Pull down on the unit to insure that the urethane springs are securely holding the Amcorder on the conductor

Step 6: Unscrew the switch stick to release the Amcorder

Switch Stick Receiver

Urethane Springs

Urethane Carabineer
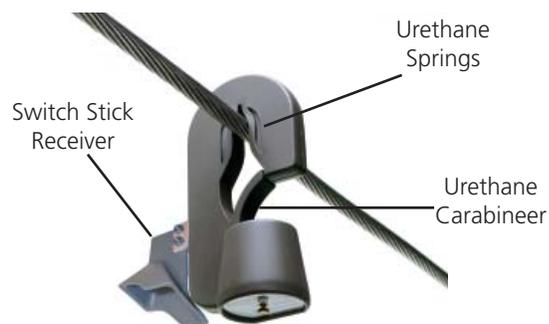
Removing the Amcorder from the line with a switch stick style hotstik:

Step 1: Insert the adapter into the receiver and then twist until the adapter locks into the receiver

Step 2: Disengage the urethane springs and push against the urethane carabineer. It requires 15 lbs. of pressure on the carabineer to remove the Amcorder from the line.

Switch Stick Adapter

Softlink for Amcorder

SoftLink is a program application that allows the user to download, view, graph and import data from their Amcorder. In order for a PC running SoftLink to communicate with an Amcorder, the Amcorder must be powered on, with the IR port on the unit in-line with the IrDA Transceiver that is connected to the PC.

System Requirements

SoftLink installs on all computers running Windows 98, Windows 2000, XP, XP-Pro and Vista. Softlink requires Microsoft .NET 3.5; if it is not already installed, the following installation process will install it.

Installation

Step 1: Place the SoftLink Install CD in your computer's CD Drive
Step 2: Softlink Installation Wizard will automatically load and display on your PC. If you need to launch the install manually, go to the Start Menu, select RUN, and type :\SETUP.EXE, OR - Click on browse, open the drive that your CD is located, and double click on file titled SETUP
Step 3: You must agree to the licensing agreement to proceed with the download
Step 4: A dialog box will appear to let you know when the download is complete Shortcut paths will automatically load during the install.
To open the Amcorder program, click on the Start Menu. Under programs, select SensorLink and then Softlink.

Install IrDA Driver

If this is the first time Softlink has been installed, install the driver for the IrDA dongle that came with your Amcorder kit. For more information on this install, please reference the IrDA manufactures' documentation available on their CD.

QUICK START GUIDE
[ACT-IR224UN-LN115GENERAL SETUP PROCEDURE]
1. Make sure USB dongle is NOT plugged into PC until you have installed the driver.
2. From "Add or Remove Program", make sure there is no driver named: "PL-2303 USB-toSerialn for Win2WXP or from "Programs and Features" for Windows Vista to check if "PL-2303 Vista Driver Installer" exists in PC. If exists, please remove it first.
3. Insert the installation CD and it will install driver into PC automatically. If you find it not AUTORUN, especially in Vista, make sure the "AUTORUN" option under "Control Panel=* AUTOPLAY" has been selected. Otherwise please browse the CD and run ACT-IR224UN-LNl lB-Setup-vl .l.6-071220.exe manually.
4. A welcome screen for PL-2303 Driver installer will show up. Click "Next" to continue.
5. When this Installation completes, click "Finish" to close the Wizard window.
6. Now plug ACT-IR224UN-LN115 adapter into USB port. It will lead you to a "Found New Hardware" procedure to complete the installation
7. For details of the procedure, please refer to Chapter of "Installation" in the IrDA manufactures manual.

Spreadsheet Toolbar

Connect IrDA

The Connect IrDA icon on the "Communicate" group of the Spreadsheet tab refers to establishing connection from the computer to the IrDA dongle. The behavior of this icon will change depending on the legacy of the IrDA.

If using the Actisys model ACT-IR224UN-LN115 (IrDA to USB dongle), Softlink will automatically make the connection and this icon will then disappear. If using other IrDA devices, connect the IrDA device to the computer, point it at the recorder and then select the Connect icon. This process will need to be repeated when the USB port, or the IrDA dongle, change.

Download

To download data from a recorder, follow the subsequent steps:

Step 1: Connect the IrDA cable to the PC.
Step 2: Position the Recorder so that the IrDA Port, located at the bottom of the unit, is facing the IrDA Port on the PC.
*Ensure that only one Recorder is communicating by standing the other Recorders on their base.
Step 3: Open Softlink from either the Desktop or Start Menu. Softlink will automatically load.
Step 4: When SoftLink has found the device, the data will automatically transfer into the spreadsheet.
Step 5: Continue this process for the remaining Recorders that need to be downloaded.

Setup

To setup the parameters of the recorder, point the IrDA dongle at the Recorder and make the desired changes. The following describes the parameters of the recorder setup:

Name: Identify the Recorder with up to 16 alpha-numeric characters and symbols.

Description: Describe the Recorder with the description you wish, up to 46 characters in length. For example, you might want to provide the Recorder's service location, "Corner of Barnes Road and Valley Highway 9, Acme, WA".

Sample Interval: Indicate how often you want the Recorder to sample the current. Battery life expectancy depends on these settings. See page four.

Log Interval: Indicate how often you want the Recorder to log data. It averages all samples taken since the previous logging and logs the result. Typical sample and log interval synchronization are one minute and 15 minutes, respectively. The log interval must exceed the sample interval.

How many Log intervals are available in the Amcorder? 64,000 Varcorder 32,000

Synchronization: Selecting the "Clear all logged data from the Recorder… and synchronize logging to the hour" box will cause the Recorder to synchronize itself to the computers clock. When multiple Recorders are setup and synchronized using the same log interval and the same computer, they will all log at the same time.

Clock is Synchronized: The time clock on the Recorder is synchronized if the "clear all data…and synchronize to the hour" box was selected during setup.

Clock is Set: If the Recorder is not synchronized before hanging on the line, the log times will be set, even though not evenly aligned to the hour.

Clock is Unset: If the Recorder's battery fails prior to any Softlink communication.

Legacy: Older version Recorders cannot be synchronized. To achieve log-time accuracy with these units, take them down before the battery fails, and download all data before re-hanging the unit. All log times prior to the first download are accurate to within a log interval, as long as the battery has not failed.

Unlock – Lock

Data in the spreadsheet is locked to protect from unintended changing of the data.
To Unlock the data in the spreadsheet, select the Unlock button.

The Unlock button will change to Lock and the data may now be changed or deleted.

Trouble Shooting IrDA Communication:

If the unit is having problems communicating, try the following:
- Position the IrDA transceiver three feet away from the Varcorder.
- Examine the IrDA connection to the PC, and reconnect, if necessary.
- Verify that the battery has greater than 5 Volts with a Voltmeter. If low, replace.
- Use the "connect" Icon and establish IrDA connection from the computer to the Recorder.
- IrDA dongles are not universal. Using an IrDA dongle not supported by Softlink may not work. The IrDA dongle you received with your kit has been tested to work with the Recorders.
- Try restarting Softlink, by first exiting and then restarting.
- Try restarting your computer and then re-enter softlink.

Graph Toolbar

Softlink automatically graphs the data as it downloads. Select the Graph Tab at the top of the Softlink window. All the individual Recorder data is present.

Zoom In on a Portion of the Graph

Use the mouse to click and drag, creating a box around the section of the graph to be enlarged. To scroll through all the data, use the mouse wheel.

Zoom Out

To zoom out to the original size graph, select the Zoom All icon.

Full Screen

To extend the graph to fit the entire screen and hide the toolbar, select the Full Screen icon.

Line Style

To change the Line Style in the graph (only available on New Graphs made by the user) select the Line Style icon. There are two styles, thick and thin. Select the Line Style button again to return to the previous line style.

New (Custom Graph)

To create a new custom graph
Step 1. Select the New Button.
Step 2. Select the data desired in the new graph.
Step 3. Select the desired functions in the new graph
Step 4. To change the name of the custom graph, Type the new name in the Rename field.

Setup Amcorder: Battery and Operation

Battery Issues: The Recorder is designed to easily have a fresh 9-volt alkaline or lithium battery replaced each time it is setup and deployed. A fresh battery has greater than 9.2 VDC. As alkaline batteries have a short shelf life, care should be taken to make sure that fresh batteries are used.

What happens if the battery drops below five volts? The Recorder will stop operating when the battery fails to supply more than five volts. All the logged data is safely stored in flash memory. When a fresh battery is put into the Recorder, the user has five minutes to start downloading the data. The data will have accurate date and time stamps. The old data will be overwritten if the download is not started within five minutes.

When does the Recorder start logging data? The process starts as soon as the battery is placed in the Recorder. The process restarts when the "Clear all logged data from the Recorder… and synchronize logging to the hour" box is selected and uploaded to the Recorder.

What are the Sample Interval and Log Interval? The Sample Interval is how often the Recorder reads the current on the conductor. The Recorder will hold the sample current readings until it reaches the Log Interval, at which time the Recorder will take and average the sample measurements. This average becomes the logged data point.

How many days will the Recorder Log Data? The length of the Log Interval determines the length of time the Reocrder will take to use all of the available logged data points. See the below chart for the number of days it will take to fill an Recorder with data, based on various Log Intervals. Note that in most cases the Recorder is limited by battery life more than the recording capacity.

Log Interval (seconds)	Log Interval (Minues)	Days Recording Until Full
1800	30	1333*
900	15	666*
600	10	444*
300	5	111
60	1	40
30		22
5		3.7
*Exceeds expected battery life		

What is the expected battery life of a Recorder? The Sample Interval and the ambient temperature determine the expected battery life of a Recorder. Fresh, non-rechargeable, batteries are required so the reliability and life of the battery can be easily predicted. Predicting the life of rechargeable batteries is uncertain, especially after several recharges. The standard 9-volt Alkaline and Lithium batteries were chosen because they are inexpensive and are readily available throughout the world. The Lithium batteries recommended are commonly referred to as long-life smoke detector batteries and sell by the brand names UltraLife and Energizer. The Table on page four indicates the expected battery life at 68° F or 20° C.

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.

Quality Assurance Certification
Model 920
True Reading RMS Amcorder

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 920 was/were 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 Model 920 Amcorder(s) have/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 _____

SensorLink Softlink Version _____