

# Life•line Meter Application System Manual AT32670201



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### 1.0 Overview:

Management of hazards such as the release of chemical, radiological or biological agents requires timely information from sensors and detectors. Viewing meter readings while wearing Level A protection suits and gloves can be extremely cumbersome. The practice of transmitting readings by voice to incident command centers can be subject to security risks. Automatic wireless transmission of meter readings to incident command centers is a widely sought solution to these problems.

The solutions offered by Safe Environment Engineering provide a one stop total systems integration package for incident response agencies seeking the capability to communicate sensor data gathered on-site to an individual in an incident command center or anywhere in the world having an internet connection.

The Safe Environment Instrumentation Solution includes the following elements:

- Wireless data transmitters that can be physically attached to a variety of existing chemical, physiological or radiological sensors.
- Custom wired or infrared interconnections between the sensors and data transmitters that allow the capture of readings that appear on meter displays in a digital format.
- A wireless delivery system that can route data to any Internet connected computer.
- A software suite that remotely receives wireless data and includes realtime meter displays, settings for visible and audible alarms and charting components for visualizing trends.
- A variety of data sharing, alerting, visualization and messaging tools for data distribution among applications capable of using the Common Alerting Protocol (CAP).

The wireless software suite is built on a common operational platform (Microsoft .NET) that can be readily customized to provide archival data storage, data aggregation and data re-transmission. Sensor measurements can also be joined with GPS positional information and posted on map displays.

### 2.0 Installation:

The Lifeline Meter Applications are delivered in as an executable (.exe) file format for use with any Windows Operating System.

### 2.1 Lifeline Gateway:

The Lifeline Gateway bridges the data acquired from a meter's medium distance Wi-Fi radio (LINC) through cellular to any computer having Internet access. The Lifeline Gateway is sealed and operates on fully charged batteries for at least 8 hours.

The Lifeline Gateway is also a local "Hot Spot" for wireless Wi-Fi equipped computers to gain access to the Internet for research or other library information.



Lifeline Gateway



Lifeline Gateway Controls

To turn on the Lifeline Gateway insure that the antenna are attached and toggle the power switch. An indicator on the cell status panel will glow blue when the unit is on. The cellular signal strength and Mesh indicators will turn on as soon as both networks are verified and operational.

**Battery Charger** 

Ethernet Port



Battery Charger Receptacle



Power Plug

# 2.2 LINC Battery Installation:

Remove the 4 screws that hold on the LINC cover and insert a fully charge battery.





Install fully charged battery

### 3.0 Turning On/Off the LINC:

Press and hold the Hold ON/OFF Button for 2 seconds until the Power LED illuminates Yellow. Press and hold the Hold ON/OFF Button for 3 seconds to power off the LINC.



### 3.1 Low Battery/Charging Indicator:

A red Batt light indicates a low battery condition. The battery should be recharged or replaced. When charging the indicator will be yellow until fully charged when it will turn off.





Low Battery LED

Battery Charging Indicator

### 3.2 Data Indicator:

The green Data LED indicator lets the LINC user know that meter data is successfully getting back to the monitoring application.



### 3.3 WiFi Indicator:

The Green WiFi LED indicator shows the status of the LINC's connection to a Lifeline Gateway or wireless local area network. If the LED is solid it indicated a connected condition if it is flashing it is not connected.



### 3.4 GPS Indicator:

The Blue GPS LED indicator provides confirmation of valid GPS acquisition.



# 4.0 Starting the Monitoring Software:

On the desktop double click the Icon for the meter you wish to view.



### 4.1 Sample Monitoring Application Opening Screen (Drager meter shown)



- **Chemical Name** Chemical abbreviation of the monitored substance. In the case of radiation, indication of what is being detected.
- **Concentration** The amount of the substance being monitored.
- CAP Message Status Field Allows quick setting of the alert status for CAP messages. This status will be transmitted to all configured alerting services. Possible values are Actual, Exercise, System, Test or Draft.
  - o "Actual" Actionable by all targeted recipients
  - "Exercise" Actionable only by designated exercise participants; This mode also can be used with the SEE training simulator.
  - "System" For messages that support alert network internal functions and the default value during normal operation
  - o "Test" Technical testing only, all recipients disregard
  - "Draft" A preliminary template or draft, not actionable in its current form
- LINC Battery Status The state of the LINC battery indicated as either OK or Low.

Battery voltage in operational range
 Low Battery Alarm

- Current Battery Status Text indicating the current battery status.
- GPS State Text indicating either GPS OK or GPS OFF
- **Status Bar** Text indicating different tasks the application is performing. Common messages Include:
  - Communications link has connected
  - Connecting to 192.168.x.x on Port 8023
  - Disconnected at HH:MM:SS AM/PM
  - Failed to connect to the meter: Timeout
  - Reading Post Success
  - Not enough data to parse GPS data
- **Total Number of Samples** The total samples taken from the meter since the start of the current wireless link. If link is lost and re-established this number will reset.
- **Total Time Sampling** The total amount of time the application has been acquiring samples.
- Signal Strength Current signal strength of the LINC.
- Communications Processing Indicator This indicator has 3 states:
  - Orey The application is idle
  - Green The application is processing data from the meter
    - Red The wireless link is disconnected and data is not processing
- **Connection Indication** The communications globe has 2 states:



A wireless link has been established with the meter.



The wireless link with the meter is broken and the application is attempting to re-establish.

The network connection is disconnected

- Total Time Sampling How long active samples have been accumulated
- Source Meter Identifier for the currently connected meter.
- User Identification Field Field to type a user's name and/or ID.
- Incident Identification Field Field to type Incident name and/or ID.
- Alarm Notification If high or low threshold limits are exceeded the display box for that chemical turns red.



If the monitor application is hidden by another display it is immediately displayed on top of any other application.

• Units of Measure - Units of measure used for each reading

### 4.1.1 Sample Strip Chart (iTX meter shown)



- **Concentration Scale** The maximum resolution set between zero and the High Limit alert limit (see Appendix A).
- Concentration Level The averaged concentration level measured in μg/m<sup>3</sup> for the given Interval Resolution.
- Alarm Threshold Limit The alarm threshold limits for High and Low are the levels that the alarm will automatically be set off.
- **Time Interval** How many minutes of sample viewing is displayed on the chart. This interval window can be set from 1 to 10 minutes.

### 4.1.2 iTX Strip Chart – Chart All



The Chart All Tab allows all the strip charts to be viewed simultaneously. Depending on the number of substances being monitoring resizing the display is advised for easy viewing.

### 4.1.3 iTX Strip Chart – Settings

The following choice boxes appear in each meters monitor application chart screen:

🚨 Cl	nart Settings	
¢	Load My Chart Save My Chart	Load My Chart loads a saved chart Save My Chart saves the current Chart Restore Defaults returns to the default settings
	Restore Defaults	



Each selection will copy the chart area into the clipboard.

The "As Text" choice copies the data points into the clipboard as text in a tabulated format and can be pasted into a wordpad document and printed.





Prints the selected chart area.



Palette selection choose one of the colors from a drop down menu to set the color scheme for the chart.

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Zoom – Press this to set a manual zoom area. Drag the mouse outwards from the click to center the data around the selection frame. Press again to turn off the zoom.



Legend Box – Select to show or hide the legend.

# 4.2.0 CAP Alert Tab

By default, the CAP settings are hidden.

	🐮 TestDrager -	Safe Environme	nt Engineering	Version (2.2.1	.2) LibVer	sion (3.6.3.1)		
	File Edit Run	Admin Help						
	X-am 7000 Meter	Chart All CAP Alert	Communication	Settings CH4	IBUT 02	H2S NH3		
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snow								
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	STATU	S Syste	em 🎽	IF TEST	ING S	SET TEST		
	N/A		a 11 11			User ID		Incident
	4.5V		Dongle Signal					
	Communication	link to Monitor has	connected	# Samples: 2	36 Run '	Time (hh:mm:ss): 00	0:05:54 192.168.1	.79:5005

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	🕵 ITE_Xam700	0_200 - Sat	e Environ	ment Engineerir	ng Versio	on (2.3.1.3) L	ibVersion (16.2.1.10)	)		- 🗆	$\times$	
	File Edit Run	Admin	Help									
	X-am 7000 Meter	Chart All	CAP Alert	RadResponder	GPS	SEECAM	Data Input Settings	Meter Settings	Training Log	InterOperability	C + +	
	SimpleView	Auto	Send				Send CAP A	Alert Messag	je Email		^	CAP Send Button
		Aler	t Section	ı			Er	mail				
	Sender					Recei	ver(s)					
	Type Upda	te ~	Categ	gory Other	~	Email S	ender CAP@safe	env.com	Port 80			CAP Alert E-
	Urgency Imme	diate 🗸	] Certa	inty Observed	~	Email S	Server	Passv	word	••		mail Setup
	Scope Restr	icted ~	]				Area (	lation ()				CPS
/	Severity Unkn	own ~	Se	t Red Alerts to Se	evere	Descripti	Alea (	iation 0)				Coordinates
	Date 2017	02-25T12:	- 21:28-08:00			Circl	le 34 042063 -118 2	67007.0				and Description
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CAP Alert		🗌 Туре	In Your (	)wn Headline.		Iden	tifier SEE7593_201	70225122128_9	59			
Information	Date Expires	2017-02-	26T12:21:2	8-08:00		•						
	Contact Info					Not	e					
Check to replace	Description					E	vent Reading					
data feed with	Source	Drager X	am 7000,IT	E_Xam7000_200	0.xml,ITE	_Xam7000_2	00,ITE_Xam7000_20	0,ITE_Xam7000_	_200			
manual Head Line	Instruction	Sensors:	5,Battery:84	%,SignalStrength	:-40						~	
	ID=7593	Sys	tem	✓ Trainin	ig 🔽 (	Jse Average	of 3 readings Stat	tus				
	84%			۵ 😫	Llear	D	Incident					
	4.3V	-4(	) dBm		Useri	0	incident					
	GPS OK Rea	iding Pos	st Succes	s:31 # Samp	oles: 32			Run(dd:hh:mr	m:ss): 00:00:00	:49		

Unchecking the SimpleView box will display the full CAP message interface.

- **CAP Alert E-mail Setup** CAP Alerts can be sent to E-mail recipients. Similar to other E-mail programs the Outgoing Server, password and Port number is needed to send an E-mail. Multiple E-mails can be sent by inserting a comma between addresses. Setup information is retained.
- **GPS Coordinates and Description** Coordinates obtained from the associated GPS are displayed in this section as aWGS-84 coordinate pair with a zero radius area indicating a point. Users can type in an Area description for further information detail.
- **CAP Send Button** Depressing the CAP Send Button will send on-demand CAP information to E-mail recipients and/or other WEB Services selected on this page.
- CAP Alert Message Information CAP Alerts must contain basic additional information to insure the message transferred to other sources have sufficient information to produce actionable results.
  - **Identifier** A unique message identification string that is generated each time new CAP information become available.
  - **Sender** Identifies the originator of the alert. This must be an Internet domain name.
  - o Date Sent Represents the date and time an alert message is sent

- **Status** Denotes the handling of the Alert. Mandatory values are Actual, Exercise, System , Test or Draft.
- **Message Type** Denotes the nature of the Alert. Mandatory values are Alert, Update, Cancel, Ack or Error.
- Source Provides necessary information on what and where the Alert comes from. Four elements complete the Source filed, the meter/sensor manufacturer and model number, the unique open file for the meter/sensor being monitored, the MAC address of the LINC being communicated with and the IP address of the computer hosting the application.
- **Scope** Denotes the intended distribution of the Alert. Mandatory fields are Public, Restricted or Private.
- Category Denotes the category of the event comprising the Alert. Mandatory values are Geo, Met, Safety, Security, Rescue, Fire, Health, Env, Transport, Infra or CBRNE.
- **Event** Lifeline is a meter/sensor monitoring applications, therefore, the Event is hardcoded as a Reading.
- **Urgency** Denotes the urgency of the Alert. Mandatory values are Immediate, Expected, Future, Past or Unknown.
- **Severity** Denotes the severity of the Alert. Mandatory values are Extreme, Severe, Moderate, Minor or Unknown.
- **Certainty** Denotes the certainty of the Alert. Mandatory values are Observed, Likely, Possible, Unlikely or Unknown.
- Date Expires It may be desired to have the CAP data sent to other systems retained on those systems for evaluation, analysis or other analytical work. The Date Expires tell other systems how long to store the data. Minimum expires value is one day.
- Headline Meter/sensor data is populated in this field. Four designators are included for each substance being monitored, substance name (periodic name), substance concentration, units and a green, yellow (where appropriate) or red indicator reflecting a "good", "warning" or "alarm" state (as defined in the setting windows).
- Info Description Used for meter/sensor probe type.
- **Instruction** Used for indication of the number of sensors/substances being monitor and indication of remaining usable battery voltage of the LINC.

#### 4.3.0 GPS Tab

The GPS Tab provides location information specific to a LINC including the number of seen relative satellites, coordinates, accuracy and elevation. The user can also pick from different map services (Google, Bing) and from different map types (Road, Satellite or Both).



- **Detailed GPS Information** This information includes coordinates (in decimal degrees), Accuracy (Dilution of Precision DOP) and Elevation.
- Map Services and Type Map services include no map (Default), Google or Bing. Also provided is a selection for viewing roads, satellite overlay or both.

- **Number of Satellites** The Green and Grey boxes indicate the number of satellites used in calculating the location coordinate and the number of satellites seen by the GPS receiver.
- **GPS OK** GPS OK is indication can be viewed from any tab and indicates a coordinate lock.

### 4.3.0 Interoperability Tab (password protected)

	Restricts Red Alerts to the selected services to one per Connect Status application run.	
	🕄 ITE_Xam7000_200 - Safe Envirolment Engineering Version (2.3.1.) LibVersion (16.2.1.10) - 🗆 🗙	
	File Edit Run Admin Help	
	X-am 7000 Meter Chart All CAP Alert RedResponder GPS SERCAM Data Input Settings Meter Settings Training Log InterOperability C++	
	Only Send One Alarm To Services Until Restart.	Additional
Live CAP Fee to IP Address	Tcplp Stream Settings       Additional Services Check To Send         IP Address:       Port:       Send         127.0.0.1       8200       AckRequired         Connected       Triage         TcpStream Two IP       Connected         Connected       Connected         Connected       Cient Key	<ul> <li>Alerting Services</li> </ul>
	Name Name	
MyStateUSA Server I <u>nterfac</u>	MystateUSA       Automatic       Use Demo       Email         Usemame       Password       Group       ContactPhone       (661) 295-5500         Lifeline	
Sensor Server Interface (supports MultiMeterVie wer)	Sensor Server Post Choices       In Background (slower connections)       Tum Off Array       SyncPostTimeout       Image: SyncPostTimeout       I	
	ID=7593 System Training Use Average of 3 readings Status	
	User ID Incident	
	4.3V -31 dBm	
	GPS OFF Timeout error. No data activity, retrying the connection. #Samples: 37 Run(dd:hh:mm:st	

- **Restricts Red Alerts** Prevents multiple alert notifications from the same incident
- Live CAP Feed to IP Address Streaming CAP sent to a TCP/IP address with a given Connect Status – Grey check marks will populate these boxes when the connection is active.
- Additional Alerting Services Nuparadigm and Zingerang are WEB middleware services providing database services to acquired Lifeline CAP data. Large database manipulation provides statistical and analytical utilization of the data to provide many metrics to users wishing to view trends or looking for specific queries of data sets. Rules can also provide data routing to multiple additional services. Triage is a feed to the DOE Triage server for posting radiological incident information.
- **MyStateUSA** MyStateUSA is an interoperability service that provides both rules based information routing and notification services. This WEB service receives Lifeline CAP data and routes, reports and and/or alerts subscribed recipients using many different reporting tools such as cell phones, E-mails or through other partner programs to Emergency Alerting Systems (such as Amber Alerts).

• Sensor Server Interface – Enables posting data to a central server for data sharing, storage, and real-time multi-party data display. Either web posting OR UDP sends are supported. Selecting either Post URL or UDPSend will transmit Candidate alerts, and selecting Readings will stream sensor readings as well. Asynchronous and SyncPostTimeout settings are additional settings that may be needed for poor communication conditions.

# 5.0 Getting Connected with the LINC:

Locate the Number on the side of the LINC:



Select Open from the File menu:

<u>File Run A</u> dn	nin <u>H</u> elp
Open	RAID-M S
Save	
Save As	
E <u>x</u> it	

Highlight the xml file with the same Serial Number as the LINC and click open:

Open		-				? ×
Look jn:	C SafeEnv R	aid-M Monitor	-	G 💋	• 📰 🧐	
Recent Desktop My Documents My Computer	알 122.xml 알 154.xml 알 160.xml 알 5afeEnvMor	itor.xml				
My Network	File <u>n</u> ame:				•	<u>O</u> pen
Places	Files of type:	XML Files (*.xml)				Cancel

### Select Start from the Run menu:

File	Run	Admin	Help
RAII	St	art	AID-M S
	St	ор	

To Stop Select Stop from the Run menu:

File	Run	Adr	nin I	Help
RAID-N	Sta	art	itatus	Libra
	Sto	pp		

# 6.0 Help:

Application and contact information:



### Appendix A

### Administration Setting and Logging

Administration settings, Communication settings, and Logging functionality are hidden behind 3 password protected Tabs. The Settings Tab provides meter binding information and alarm threshold configuration. The Communication tab controls connections to specific meters and other services. Since these values typically do not need changing they have been password protected to eliminate inadvertent change. Logging is also provided to view statistical data and count information.

1.0 Password Generator:

The Password Generator is a date driven tool that will change daily to insure a relatively high level of security and to eliminate the need for memorized lists.

The Password Generator application can be found in the c:\Program Files\PwGenerator folder or on the Desktop of some computers:



Double clicking on the PasswordGenerator icon will generate the password of the day.

Password Generator	×
Sunday , June 03, 2012 💌	
IDMKAP	
IDMKAP	

Please make note of the Password. In our example the password is IDMKAP (the password is not case sensitive). The password will be necessary to unlock the Administrative privileges of the application.

Enter the password into the Unlock Key and select OK:

Please Enter Unlock Key							
	You must enter in in order to use the	the unlock code se features.					
	ок	Cancel					

The Admin window will activate 4 additional options – Data Input Setting, Meter Settings, Training, Log and Interoperability Tabs:

Admin Help
Unlock
Settings Tab
Log Tab

:

₹aid-M	Raid-M Status	Library A	Library B	Chart All	CAP Alert	RadResponder	GPS	SEECAM	Nerve	Blister	Toxic	Data Input Settings	Meter Settings	Training	Log	InterOper	sbility
_								Raid-	м								
	F	RAID Sub	stance P	anel								- ر					
L				Nerve	9												
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						Library						x					
ctivity	ID S	ystem	n ~	Trainin	g 🗹 Use	Average of 3 read	dings	Status									
N	/A 1	a 11 1															
-					User ID	In	cident										

### Appendix B

#### **Data Input Settings**

The Data Input Setting window provides general network for the LINC and connected meter:

LINC IP Addres (used on meters embedded LINC	LINC URL or Network ss IP Address Communications with Port Group Number Cs)	
	SafeEnvMontor - Safe Environment Engineering Version (4.1.1.16) LibVersion (16.2.1.17)     I I CAP Admin Help Raid-M Raid-M Status Library A Library B Chart All CAP Alert RadResponder GPS SEECAM Nerve Bliste Toxic Data Input Settings Meter Settings Trai LINC Settinge Meter's IP Address Port No Data Timer Poll Rate (ms) Stagger CMDs (ms) Group Identification	Minimize Lifeline Settinas
GPS Settings	192.168.Insert. Insert       8023       30       Wat NDT       2000       0       0       0         Separate LINC IP       Bat Port       Bat Timeout       License       CompMac       SourceFile Identification         23       30       ChkBatVott       74E50B06C15C       74E50B06C15C       6         GPS. Default TCP. Optional UDP Serial or MCListen       Visibility (Task Bar Icon)       Visibility (Task Bar Icon)	
Connect to an instrument via serial	IP       Port:       Connected         Get GPS       Log GPS       GPS Retry 60 €         Use MCListener       DMS Fmt       Stale GPS 60 €         Serial       com1       4800 ∨ N.8.1	Setup if Meter is uses a Log File
Tetra Land Mobile Radio Connection Settings	Virtual Communications Settings       Databits       Stopbits       RowControl       ReadTimeout       ByteCountThreshold         Com3       9600 <ul> <li>none</li> <li>8</li> <li>1</li> <li>None</li> <li>0</li> <li>1</li> <li>ØRTS</li> <li>DTR</li> <li>Use Serial Direct Connection. Not WiFi.</li> <li>SPP</li> <li>20001</li> <li>MegaSend</li> <li>WatBeforeRead</li> <li>500</li> <li>Tetralntval</li> <li>30</li> <li>TetraSSID</li> <li>0123456</li> <li>TestTetraSend</li> <li>Data Not Headline</li> <li>Match</li> <li>SeporaOrMotorola</li> <li>TetraComm ver=4.1.1.1</li> <li>Testing</li> <li>Wrap</li> <li>JustClient</li> <li>SDSClient</li> <li>Coalhost:5006</li> <li>Configure</li> <li>Save Settings</li> <li>Communication</li> <li>C</li></ul>	To Connect a — Meter via a Serial Port
Configure and Save Setting	Activity ID System C Training Use Average of 3 readings Status User ID Incident GPS OFF Background work finished, manual start. # Samples: Run Time (hh:mm:ss):	

- **LINC URL or IP Address** The Identification or Address on the LINC case. This is also the network address of the wireless radio in the device.
- Network Communications Port A network port that allows data to be exchanged with the wireless device (default 8023)
- LINC IP Address This feature is used for meters that have been modified to have embedded wireless LINCs as well as Ethernet connections.
- **Group Identification** This allows LINCs to be grouped together so that they can be sorted in applications such as the MultiMeterViewer.
- Visibility Feature that allows Life•line to run minimized in the Task Bar.
- **GPS Settings** The Identification or Address of the LINC's GPS. This can also be used to acquire GPS data from other devices such as meters that have their own embedded GPS (IP or Serial) (default GPS Port 8024)

- **Tail File** Life•line can read log files of some meters. This feature sets up these parameters.
- Virtual Communications Settings To configure Life•line to communicate directly to a meter via a serial port without the use of a LINC.
- **Tetra Settings** Facilitates communication via the Tetra Land Mobile Radio system.
- Save Settings All display data is saved to the current open xml file.

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• **Configure** – Activates all changed settings and returns the application to the faceplate view.

### Appendix C

#### **Meter Settings**

The Meter Settings Tab is where Sensor and Alarm thresholds are set.



- Meter Faceplate Emulation Button The order the data is received from the meter must match the order setup within the application to insure the display is accurate. This button will show an emulation of the meter's faceplate and correlating sensor position.
- Sensor/Probe Labels The pull down will let you select what sensor/probe should be placed in its corresponding position.
- Low and High Limit These fields allow for setting of Low and High alarm thresholds (when the display turns Red and returns an audible alarm). The High is typically the Immediately Dangerous to Life or Health (IDLH) limit and the Low is where a threshold should not go below (typically only used for Oxygen).

- **Retry beep** If communications are lost an audible beep will sound every time the systems retries to reconnect. This feature turns the beep on or off.
- Enable Siren Alarm This feature allows turning On or Off of the audible alarm annunciator.
- Audio Annunciation Adds audible notifications for alarm status changes.
- Save Settings All display data is saved to the current open xml file.
- **Configure** Activates all changed settings and returns the application to the faceplate view.

# Appendix D

### Logging

Logging provides some statistical information to the viewer of the raw data acquired by the application along with information on timing intervals of the data messaging.

	ITE_Xam700 File Edit Rur	0_200 - Sa Admin	fe Environn Help	nent Engineerin	g Versio	n <mark>(2.3.1.3)</mark> L	ibVersion (16.2.1.10)	)		-		×	
	X-am 7000 Meter	Chart All	CAP Alert	RadResponder	GPS	SEECAM	Data Input Settings	Meter Settings	Training	Log	InterOper	ab 🕕 🕨	
Minimum	4:23:37.399 PM 032,M., '5FJ, Nol 4:23:37.924 PM 4:23:37.932 PM 4:23:38.556 PM 4:23:38.500 PM 4:23:38.900 PM 4:23:38.900 PM 4:23:38.915 PM 032,M., '5FJ, Nol 4:23:40.009 PM 4:23:40.009 PM 4:23:40.400 PM	msg: 0 PC NMEAct=0 Update S Update A Dataln:0= Reading gps data sgPGGA msg: 0 PC NMEAct=0 Dataln:0= Reading gps data scPCCA	bost GPS Msg SingleChart timer, =0 1=0 2=20. Post Succes: 0,173259.00, 5st GPS Msg =0 1=0 2=20. Post Succes: pump status 0,172250.00, 1,7250.00, 1,725	: LastGPGGA=[\$ ner, skipping add skipping adding a 9 3=0 4=0 s. msg: 0 DataRece 3402.550981750 : LastGPGGA=[\$ 9 3=0 4=0 s. msg: 0 DataRece 2402.65292555	GPGGA, ing a Nal a NaN. sived.GP 47,N,118 GPGGA, sived.GP	173259.00,3 N. S data proce 16.0783481 173259.00,3 S data proce	402.54351401577.N. ssing 1 strings. 598.W.1.05,2.44,003 402.55098175047.N. ssing 1 strings.	33,M032,M,.*5F 11816.07834815	95.W.1.05	,2.44,00 ,2.44,00	333,M,-	<u>^</u>	Raw Data
Data Exchange Interval	4:23:40.415 PM 4:23:40.415 PM 032,M,,*5F], Not	: \$GPGGA : msg: 0 Pc NMEAct=0 Save	,173259.00,3 ost GPS Msg ☑ Sc	3402.563783555 : LastGPGGA=[\$ croll History	88,N,118 GPGGA, 0	16.0873603 173259.00,3	821,W,1,05,2,44,003; 402.56378355588,N,1	33,M,-032,M,,*5F 11816.08736038	21.W.1.05	,2.44,00 rs 🗌	333,M,-	÷	Total Number of Samples
Average Data —	Min Ir	iterval					0	Count			16	^	Standard
Exchange	Avg In	iterval				1	510 :	std. dev.					Deviation
Interval	Max Ir	iterval				1	563 had Sada	Errors				<	Error
	ASynchronou	s [Errors To	PostCount]	0:2 Parameter Fielde			Last Sender a		rag Optimiz	vation Of	f		Count
Maximum Data	Update Me	eters 🖻							og optimi			~	
Exchange Interval	ID=7593	Sys		Training	User II	Jse Average D	of 3 readings Stat	tus					
	4.5V GPS OK Rea	ading Po:	st Success	s:15 # Samp	les: 16			Run(dd:hh:m	m:ss): 00	:00:00:	25	.:1	

- **Total Number of Samples** The total samples taken from the meter since the start of the current wireless link. If link is lost and re-established this number will reset.
- Min Interval Minimum data exchange interval in milliseconds.
- Avg Interval Average data exchange interval in milliseconds.
- Max Interval Maximum data exchange interval in milliseconds.
- **Errors** Error count number.
- Std. dev. Standard deviation.
- Raw Data The raw data received by the application.

### Appendix E

### Creating a New Meter File from an Existing Meter

This step involves opening an existing file, making the changes necessary then saving it as a different name.

1) Double Click the icon of the instrument you want to modify. If you are using the short cuts data is already preloaded otherwise select File and Open to select a template you will use to modify.

😵 SEE iTX wifi - Safe Environment Engine	ering Version (2.0.1.0) LibVersio	n (3.4.3.76)	
<u>File E</u> dit <u>R</u> un <u>A</u> dmin <u>H</u> elp			
iTX Meter Chart All CAP Alert Communication	ettings LEL 02 CO H2S		
Network Settings			
Meter's IP Address 192.168.3.117	Port 8023 Timeou	ıt (s) 60 🔹 Stale GPS Sec	60 😂
Read Bat Voltage TSecs 30	Battery Port 23	GPS Retry	40 🗢
Таї		Browse Wait (ms)	0
1 di			
Sensors & Alarms	View Meter		Note: Leave box blank to omit test
	Label	Low Limit	High Limit
Convert			10
Sensor I			
6 mm 2	02	19.5	23.5
Sensor 2	02		
Sensor 3	NUNE		
Sensor 4	NUNE		
Sensor 5	C0 💌		35
Sensor 6	H2S 💌		10
☑ Enable Siren Alarm Test Alarms Cor	nfigure Polling Rate (ms) 1500 🗘		
	Save Settings		
		User ID	Incident
			FIS CAP 001
4.5V Dongle	Signal	#Conveloped Due Time #	
, Dackyround Work linished, manual start.		# Samples: Run Lime (I	m.mm.ss): 192.166.3.117.6023

2) Open the Setting Tab as described in Appendix A and B.

#### 3) Make the necessary changes.

For this example we will change the setting for a LINC using local WiFi to a connection using Ethernet or a cell card.

- 1) Change the Meters IP Address to the appropriate address provided to you by your Lifeline Agent.
- 2) Change Port Number
- 3) Change the Battery Port Number

SEE iTX wifi - Safe Environment Engineering Version (2.0.1.0) LibVersion	(3.4.3.76)	
Eile Edit Run Admin Help		
iTX Meter Chart All CAP Alert Communication Settings LEL 02 CO H2S		
Network Settings		
Meter's IP Address 1aware.safeenv2.com Port 9014 Timeout (s	s) 🙃 🗢 Stale GPS Sec 🙆 😂	
🔽 Read But Voltage TSecs 30 🤤 Battery Port 10014	GPS Retry 40 😂	
Tail 🔽 Unicode	Browse Wait (ms) 0	
Sensors & Alarms	Note: Leave	box blank to omit test
Label	Low Limit High	Limit
Sensor 1		10
Sensor 2	19.5	23.5
Sensor 3 NONE		
Sensor 4 NONE		
Sensor 5 🔟 💌		35
Sensor 6 H2S 💌		10
Enable Siren Alarm     Test Alarms     Configure     Polling Rate (ms)     1500		
Save Settings		
	User ID	Incident
4.5V Dongle Signal		EIS_CAP 001
Background work finished, manual start.	# Samples: Run Time (hh:mm:ss) :	192.168.3.117:8023



4) Select File then Save As



5) Create a new File name and then Save

Save As			? 🗙
Save in:	C SafeEnv IndSci ITX6 Monitor	💌 🔇 🎓 📂 💷-	
Recent Desktop My Documents	<ul> <li>2AWARE_iTX.xml</li> <li>CAP Alert.xml</li> <li>CAPAlert.xml</li> <li>CAPAlert.xml</li> <li>LACRM7_117_iTX.xml</li> <li>LASD 140.xml</li> <li>LASDHM 1 140.xml</li> <li>LASDHM 1 141.xml</li> <li>LASDHM 1 143.xml</li> <li>LASDHM 141.xml</li> <li>LASDHM 141.xml</li> <li>LASDHM 143.xml</li> <li>LASDHM 143.xml</li> <li>LASDHM 143.xml</li> <li>Quantas.xml</li> </ul>	<ul> <li>SafeEnvMonitor.xml</li> <li>SEE iTX wifi.xml</li> <li>SEE iTX.xml</li> <li>SEE iTX.segpsmp.xml</li> <li>sffditx.xml</li> <li>Squad105_1HAZMAT_iTX150.xml</li> <li>Squad105_2HAZMAT_iTX150.xml</li> <li>Squad129_1HAZMAT_iTX200.xml</li> <li>Squad129_2HAZMAT_iTX200.xml</li> <li>Squad851_iTX_100_xml</li> <li>Squad851_iTX_100_WiFi 3 gas.xml</li> <li>Squad851_iTX_100_WiFi.xml</li> </ul>	
My Network	File name:     SEE iTX wifi.xm       Save as type:     XML Files (*.xml)		<u>Save</u> Cancel

### Appendix F

### Using a Single Meter without a Gateway

With specially programmed LINCs it is possible to connect to a Lifeline system LINC (and thus a single meter) without using a Gateway by reconfiguring the wireless radio in a laptop. This is done by setting your wireless connection to ad hoc mode on the appropriate settings. The exact procedure will vary depending on the wireless network hardware and client software on your laptop, but it should be similar to the following steps shown using the built-in Windows Zero Configuration utility. (For Windows 7 and later simply select the LINC from the network list)

1) Go to the Control Panel and open Network Connections. Then right click on Wireless Network Connections and select Properties.



2) Click on the Wireless Networks tab at the top of the screen. Be sure that the "Use Windows to configure my wireless network settings" box is checked.



3) Click on Add under the list of Preferred Networks and configure as shown.

Check	Association Authentication C	onnection	
	Network name (SSID):	YCDHMH	Se
$\mathbf{N}$	Connect even if this netw	vork is not broadcasting	/
	Wireless network key		
	This network requires a key f	for the following:	
	Network Authentication:	Open 🔽	
	Data encryption:	Disabled 💌	
	Network key:		
$\backslash$	Confirm network key:		
	Key index (advanced): 1	A V	
	The key is provided for m	e automatically	
	This is a computer-to-comp	uter (ad hoc) network; wireless	

4) Under the Connection tab be sure that the "Connect when this network is in range" box is checked. Now click on the OK button. If you get a warning about using an unsecured network click "Continue Anyway".

Wireless network properties	×
Association Authentication Connection          Automatic connection         Whenever this network is detected, Windows can connect to it automatically.         Connect when this network is in range	
OK Cancel	

5) Now, return to the Wireless Network Connection Properties box and select the General tab. For ad hoc connections the wireless radio generally needs to be manually set to a specific channel matching the device or computer to which you are connecting. Here we will configure the radio to channel 3 under the B/G settings (the settings programmed on your specific LINC may be different). Click on the configure button next to your wireless card.

🕹 Wireless Network Connection Properties 🛛 🔹 🏹
General Wireless Networks Advanced
Connect using:
Intel(R) PRO/Wireless 2915ABG Net Configure
This connection uses the following items:
✓ 중 AEGIS Protocol (IEEE 802.1x) v3.4.9.0
WINTransport      Security Research (TCR/IP)
Internet Protocol (TCP/IP)
Install Uninstall Properties
Description
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.
<ul> <li>Show icon in notification area when connected</li> <li>Notify me when this connection has limited or no connectivity</li> </ul>
OK Cancel

6) Set the ad hoc or general radio settings to be B/G channel 3 and click the OK button. You may not have separate settings for your ad hoc connections on your wireless adapter so you might have to manually set the radio to the correct band and channel.

tel(R) PRO/Wireless 2915ABG Network Connection <mark>?</mark> 🔀
General Advanced Driver Resources
int <sub>e</sub> l.
The following properties are available for this network adapter. Click the property you want to change on the left and select a new value on the right.
Property: Value:
Ad Hoc Channel Intel Throughput Enhance Nixed mode protection Power Management S Description:
Band and Channel selection for Ad Hoc networks.
Hardware Version:     1.0.15       MAC Address:     00:13:CE:8A:D2:32
OK Cancel

7) Because we are not connecting to an access point, we will also need to set the network connection to a static IP address in the same network domain as the LINC. In this example we will be using 192.168.15.2 for the laptop address.

Again on the General tab of the Wireless Network Connection Properties box find the line in the center window for Internet Protocol (TCP/IP), double click it and configure it as shown, then click OK.



8) Finally, return to the Network Connections window we started with in step 1, right click again on the wireless connection, but this time select "View available wireless networks". Ensure that your meter LINC is turned on. The Wireless Network Connection display will open. The connection you have just made should display as Connected, or if not double click on the correct connection.

