

**VIKING PRODUCT MANUAL**

COMMUNICATION &amp; SECURITY SOLUTIONS

## *Analog Line-Sharing Device for IP PBX's, VoIP Phone Systems*

The **LS-911** Line Seizure device offers a cost-effective, reliable method of handling 911 emergency calls for IP PBX's and networked phone systems. Designed to be hooked up to an FXO port, it lets you enjoy the advantages of conventional analog 911 service, including traceability and 911 call-back, without having to dedicate an analog line exclusively for this purpose.

The analog line, normally used by a fax machine, card reader or other analog device, is disconnected in the event of a 911 call, and the **LS-911** intelligently handles the priority emergency call in the shortest time possible after reconnection to the phone line.



A special 911 recall feature maintains the availability of the line in the event the emergency call is disconnected, so 911 personnel can call back to reestablish the connection.

### Features

- Routes both incoming and outgoing calls
- Gives priority to emergency devices
- Incoming calls routed to one of two ports by distinctive ring or quick callback
- Status LED displays mode of operation
- Provides a busy signal to the phone port when an emergency device is in use
- Store-and-forward and rerouting dialer functions available
- Emergency callback function maintains line availability for 911 callback
- Normal and fast dialing speeds

### Applications

- IP PBX or VoIP Phone System sharing analog phone line with:
  - Fax machine
  - ATM
  - Card reader
- Emergency phone (ie: Viking **1600A Series**) sharing line with above devices

### Specifications

**Power:** 120VAC / 12VDC 500mA UL listed adapter provided

**Dimensions:** 133mm x 89mm x 44mm (5.25" x 3.5" x 1.75")

**Shipping Weight:** .9 kg (2 lbs)

**Environmental:** 0° C to 32° C (32° F to 90° F) with 5% to 95% non-condensing humidity

**Talk Battery:** 32V DC

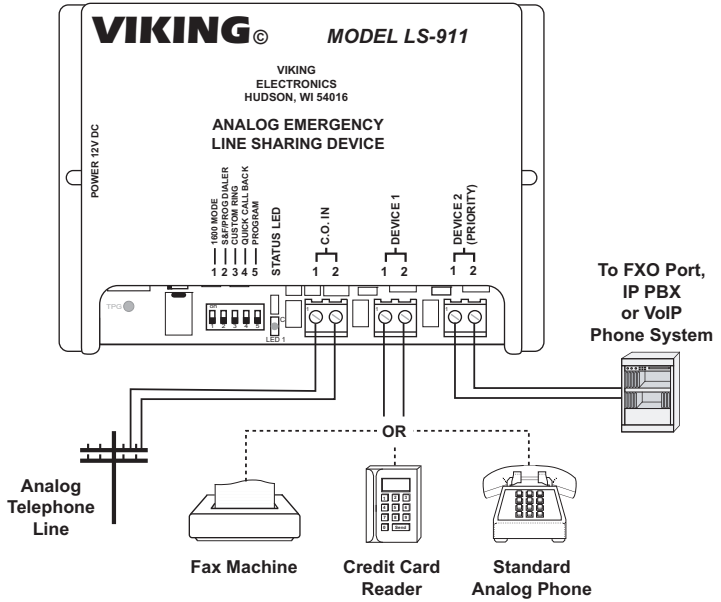
**Connections:** 6 screw terminals

**www.vikingelectronics.com**  
**Information: (715) 386-8861**

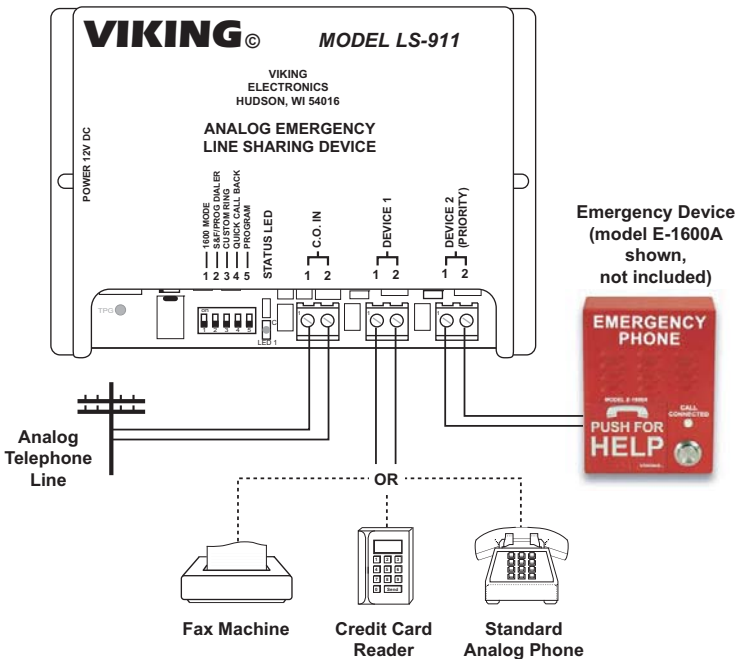
# Installation

**IMPORTANT:** Electronic devices are susceptible to lightning and power station electrical surges from both the AC outlet and the telephone line. It is recommended that a surge protector be installed to protect against such surges.

## A. Analog 911 Service for Networked Phone System



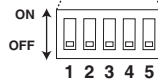
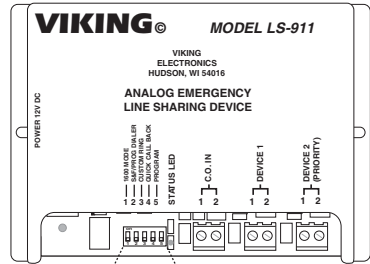
## B. Analog Emergency Phone Application



## A. DIP Switch Programming

**Note:** For a description of dipswitch function, see the Operation section. With the 1600 mode DIP switch OFF, the LS-911 looks to DIP switch 2 to determine how the dialer operates. DIP switch 1 takes precedence over DIP switch 2, however, so that if DIP switch 1 is on, the unit does not dial, but just produces ringback for 12 seconds until it gives the line to the 1600 so it can dial the number programmed in its memory. See **Operation** section J for a description.

Switch	Position	Description
1	OFF	1600 mode disabled
1	ON	1600 mode enabled
2	OFF	Store-and-forward dialer
2	ON	Re-routing dialer
3	OFF	Custom ring disabled
3	ON	Custom ring enabled
4	OFF	Quick callback disabled
4	ON	Quick callback enabled
5	OFF	Run mode
5	ON	Program mode



**Note:** DIP Switches are shown in factory default settings.

## B. Touch Tone Programming

<b>Step 1</b>	Move DIP switch 5 to the PROGRAM position (ON).
<b>Step 2</b>	Go off-hook on the DEVICE 2 (PRIORITY) port. A double beep will indicate that programming has been entered. <b>Note:</b> If the DEVICE 2 (PRIORITY) port is connected to an IP PBX or VoIP phone system and it is not easy to go off-hook on this port, you can unplug the LS-911 from the FXO port and plug an analog telephone into the DEVICE 2 (PRIORITY) port for the purpose of touch tone programming. When finished with programming, remove the analog telephone and plug the LS-911 back into the FXO port.
<b>Step 3</b>	Program as shown in section C.
<b>Step 4</b>	To exit touch tone programming, hang up the DEVICE 2 (PRIORITY) phone.
<b>Step 5</b>	Move DIP switch 5 to the RUN position (OFF).

## C. Quick Programming Features

Description	Enter Digits	+ Location
Re-routing dialer number (1-32 digits*) .....	1-32 digits	+ #00
To add a * at any point in the dialing string .....	**	
To add a # at any point in the dialing string .....	*#	
Set dialing speed to normal (120ms on/off, factory setting) .....	*1	
Set dialing speed to fast (50ms on/off) .....	*2	
Normal re-routing dialer (factory setting) .....	*3	
Hot line re-routing dialer .....	*4	
To add a four second pause at any point in the dialing string* .....	*7	
To add a one second pause at any point in the dialing string* .....	*8	
911 callback timer (1-9 minutes, 0=10 seconds, factory set to 2 minutes) .....	1 digit	+ #10
Clear re-routing dialer phone number from memory and set all programming features back to factory settings .....	###	

\* The \*\*, \*#, \*7 and \*8 entries each add a single digit to the dialing string.

## A. LED Status

LED Status	Operation
Lit Up	Power is applied and no recent call activity.
Flash	Phone line is in use by DEV 1 or DEV 2, DEV 2 is in the program mode or Recent Activity or 911 Call Back timers are running.
Flash after DEV 2 (PRIORITY) hang up	The LED will continue to flash until the 911 Call Back timer has elapsed.
Flash after DEV 1 hang up	LED will continue to flash until the Recent Activity timer has elapsed.
Flash after Ring	In the Quick Call Back Mode, the LED will continue to flash for 20 seconds.

## B. Outbound Calls with No Recent Call Activity

When there has been no recent call activity, the Status LED will be lit solid, and both ports are connected to an internally generated 32V DC talk battery. If Device 1 goes offhook, the phone line will be switched to the DEV 1 port. If Device 2 goes offhook, the phone line will be connected to the DEV 2 (PRIORITY) port.

## C. Outbound Calls with Recent Call Activity

If Device 1 goes offhook and the DEV 2 (PRIORITY) port is not actually in use or being reserved by the 911 Call Back Timer (see section **E** below) the phone line will be switched to the DEV 1 port. Otherwise, Device 1 gets a busy signal.

If Device 2 goes offhook and Device 1 was using the line within 12 seconds previously, it is necessary to check the line to make sure it's ready to accept a new call. This is because after an incoming CO call is disconnected, it can take the Central Office up to 12 seconds to provide dial tone to the line, allowing the user to make another call. If an automatic dialer like the **LS-911** tries to dial before the CO is ready the call will not go through. For this reason the **LS-911** is capable of interrogating the line for dial tone to make sure that the phone line is ready for the emergency call (see Section D below). The procedure the **LS-911** follows in this situation depends on the operational mode selected by the user. See sections **G, H, I** and **J** for a more complete description.

In any operational mode, if a call is ringing in on the phone line but has not been answered yet and Device 2 goes off hook, the **LS-911** intentionally answers and hangs up the ringing call before proceeding.

## D. Line Interrogation

Line interrogation applies to the Store-and-Forward, Re-Routing Dialer and Hot Line Re-Routing Dialer Modes. When there has been recent phone line activity and Device 2 goes off hook for an emergency call, the **LS-911** interrogates the phone line for dial tone to make sure any previous calls have been disconnected and the phone line is ready to accept the emergency call. There is no phone line interrogation in the 1600 Mode.

The **LS-911** interrogates by seizing the phone line and listening for dial tone for two seconds. If it detects dial tone, it proceeds with the emergency call according to its programmed mode of operation (see sections **G, H, I** and **J**). If it doesn't detect dial tone, it releases the line, waits two seconds, and tries again. If it has not detected dial tone in eight tries it gives up and produces a fast busy that continues until Device 2 hangs up.

## E. 911 Call Back Timer

This is a timer programmable from 1 to 9 minutes or to 10 seconds, factory set to 2 minutes. While it's running, it keeps the line switched to the DEV 2 (PRIORITY) port after an emergency call has been disconnected. This is to facilitate callback by the 911 service in the event of accidental disconnection, with the return emergency call ringing the DEV 2 (PRIORITY) port. If Device 2 calls the 911 service while the 911 Call Back Timer is running, the call is allowed to proceed as it would normally, with line interrogation activated if necessary in any mode but the 1600 mode.

## F. Recent Activity Timer

When Device 1 or Device 2 hangs up from a call, a 12 second Recent Activity Timer is started. The Recent Activity Timer also starts on power up and when Device 2 hangs up from the programming mode. The **LS-911** uses this timer to track recent call activity as any call activity can affect whether the line is ready to accept dialing for an emergency call. The Recent Activity Timer is not used by the 1600 or Re-Routing Dialer modes.

## G. Store-and-Forward Dialer Mode (DIP Switches 1 and 2 OFF)

When Device 2 goes offhook to make a call, the response depends on whether there has been recent call activity or not. If both Device 1 and Device 2 have been on hook for 12 seconds or more, the Recent Activity Timer has elapsed and the **LS-911** immediately gives the phone line to the DEV 2 (PRIORITY) port and the touch tones dialed by the user go directly out on the phone line. If the Recent Activity Timer is running from recent call activity, simulated dial tone is heard until the user starts dialing. The **LS-911** stores up the digits until dialing stops, then starts producing simulated ringback tones while interrogating the line for dial tone as described above in section D. If dial tone is detected, the **LS-911** seizes the phone line and dials the touch tone string dialed by the user, then connects the DEV 2 (PRIORITY) port to the line so the emergency call can proceed. If dial tone is not detected by line interrogation or if the user doesn't enter any touch tones in 10 seconds the **LS-911** produces fast busy as an error indication.

## H. Re-Routing Dialer Mode (DIP Switch 1 OFF, 2 ON and \*3 Programmed)

In this mode, the **LS-911** always waits for the user to finish dialing, even if there has been no recent call activity. This is because, once the dialing is finished, the **LS-911** does not redial the digits dialed by the user, but instead reroutes the call using a phone number stored in its memory. **Programming** section C describes how to program this number.

The Re-Routing Dialer Mode would ordinarily be used when an additional digit or digits must be dialed in addition to 911 to reach emergency services.

When Device 2 goes offhook, the **LS-911** produces simulated dial tone until the user starts dialing. It stores up the digits until dialing stops, then starts producing simulated ringback tones while interrogating the line for dial tone as described in section D. If dial tone is detected, the **LS-911** seizes the phone line and dials the touch tone string stored in its memory in the "#00" memory location, then connects the DEV 2 (PRIORITY) port to the line so the emergency call can proceed. If dial tone is not detected by line interrogation or if the user doesn't enter any touch tones in 10 seconds, the **LS-911** produces fast busy as an error indication.

## I. Hot Line Re-Routing Dialer Mode (DIP Switch 1 OFF, 2 ON and \*4 Programmed)

In cases where the phone system just hands the 911 call over to the DEV 2 (PRIORITY) port without redialing the number dialed by the user, the **LS-911** can operate as a Hot Line Dialer. It skips the period of up to 10 seconds of simulated dial tone before dialing starts and looks at the Recent Activity Timer. If there has been no recent call activity, The **LS-911** seizes the phone line, waits 1 second, dials the phone number programmed in its "#00" memory location and then switches Device 2 to the phone line. If there has been recent call activity, it starts producing simulated ringback tones while interrogating the line for dial tone as described in section D. If dial tone is detected, the **LS-911** seizes the phone line and dials the touch tone string stored in the "#00" memory location, then connects the DEV 2 (PRIORITY) port to the line so the emergency call can proceed. If dial tone is not detected by line interrogation the **LS-911** produces fast busy as an error indication.

## J. 1600 Mode (DIP Switch 1 ON)

In the 1600 mode, the **LS-911** is used with a Viking **1600A Series** emergency phone connected on the DEV 2 (PRIORITY) port as Device 2. The dialing is done by the **1600A Series** phone rather than the **LS-911**, and the dial tone interrogation feature of the **LS-911** is not used. When the **1600A Series** phone's call button is pushed, the **LS-911** starts a 12-second timer designed to delay dialing until the Central Office is ready to receive it. In the meantime, a single ringback is heard in the **1600A Series** phone's speaker to indicate the call is proceeding. When the pause time is up, the **LS-911** switches the line to the DEV 2 (PRIORITY) port and the **1600A Series** phone dials the number programmed in its memory. The operation of the **LS-911** and the **1600A Series** phone must be synchronized so the **1600A Series** phone starts dialing just after the **LS-911** gives it the line. This is done by inserting pauses in the **1600A Series** phone's dial string.

- Notes:**
- 1. During the 12 seconds of pause time, the **LS-911** provides two simulated ringback tones to DEV 2. When a **1600A Series** phone is used on the DEVICE 2 port, only the first of the two simulated ringback tones will be heard through the speaker of the **1600A Series** phone. This is because the **1600A Series** phones are designed to turn off the speaker during the majority of the 12 second pause time. Users at the **1600A Series** phone will hear 10 seconds of silence between the first simulated ringback tone and the digits dialed by the **1600A Series** phone once connected to the line.*
  - 2. The **LS-911** does not interrogate the phone line for dial tone in the 1600 Mode.*
  - 3. The Recent Activity Timer never runs in the 1600 Mode. The DEVICE 2 port is always switched to the phone line after the 12 second pause time, regardless of recent call activity or lack of recent activity.*
  - 4. In 1600 Mode, a call ringing in on the phone line could potentially "call crash" with an emergency call going out on the DEVICE 2 port. The **LS-911** intentionally answers and hangs up a ringing call when the DEVICE 2 port goes off hook, but if a new call starts ringing in during the 12 second pause time before DEVICE 2 is connected to the phone line, the new ringing call will crash with the device on the DEVICE 2 port once the pause time expires. This potential does not exist in the other 3 operational modes as the line interrogation feature will answer and hang up any inbound calls before the DEVICE 2 port is connected to the phone line.*

## K. Custom Ring (DIP Switch 3 ON)

Custom Ring Switching relies on "Distinctive" or "Custom Ring" services provided by your local telephone company as a way of routing incoming calls. Any call with a custom ring cadence will be routed to the DEV 2 (PRIORITY) port. Inbound calls with standard ring cadence will be routed to the DEV 1 port. The **LS-911** accepts both double and triple ring cadences as custom.

## L. Quick Call Back Mode (DIP Switch 4 ON)

To use the Quick Call Back mode, call into the **LS-911** from another phone line, listen for a single ring back tone and hang up. Wait 6 seconds, then call back into the **LS-911** within 20 seconds. The **LS-911** will route the incoming call to the DEV 2 (PRIORITY) port instead of defaulting to the DEV 1 port.

**Note:** *When the DEVICE 2 port hangs up from an incoming call that was routed to the DEVICE 2 port by way of Quick Call Back, the 911 Call Back Timer does not run.*

### **M. Touch Tone Programming Mode (DIP Switch 5 ON)**

To enter touch tone programming, move Dipswitch 5 to the ON position and go off hook on the DEV 2 (PRIORITY) port. See **Programming** section **B. Touch Tone Programming**.

### **N. Inbound Calls with DIP Switches 3 and 4 OFF**

If all non-emergency inbound calls should be routed to the DEVICE 1 port, set Dip switches 3 and 4 to the OFF position.

### **O. Non-Working Telephone Line**

Obviously, the telephone line must work properly in order for the emergency calls to go through. The **LS-911** does not automatically detect if there is a problem with the phone line and in most modes will connect the DEV 2 (PRIORITY) port to a phone line that is dead and will leave the device on the dead phone line until the 911 Call Back Timer expires. DEV 2 will hear silence when this occurs. It can be difficult to determine what type of problem there is when DEV 2 goes silent after being activated. The lack of a working phone line to the **LS-911** can be detected by going off hook on the DEV 1 port. If a constant clicking sound is heard on the DEV 1 port instead of dial tone (about 3 clicks per second), the phone line is dead or not connected properly.

# Warranty

**IF YOU HAVE A PROBLEM WITH A VIKING PRODUCT, CONTACT: VIKING TECHNICAL SUPPORT AT (715) 386-8666**

Our Technical Support Department is available for assistance Monday 8am - 4pm and Tuesday through Friday 8am - 5pm central time. So that we can give you better service, before you call please:

1. Know the model number, the serial number and what software version you have (see serial label).
2. Have your Technical Practice in front of you.
3. It is best if you are on site.

## RETURNING PRODUCT FOR REPAIR

The following procedure is for equipment that needs repair:

1. Customer must contact Viking's Technical Support Department at 715-386-8666 to obtain a Return Authorization (RA) number. The customer MUST have a complete description of the problem, with all pertinent information regarding the defect, such as options set, conditions, symptoms, methods to duplicate problem, frequency of failure, etc.
2. Packing: Return equipment in original box or in proper packing so that damage will not occur while in transit. Static sensitive equipment such as a circuit board should be in an anti-static bag, sandwiched between foam and individually boxed. All equipment should be wrapped to avoid packing material lodging in or sticking to the equipment. Include ALL parts of the equipment. C.O.D. or freight collect shipments cannot be accepted. Ship cartons prepaid to: **Viking Electronics, 1531 Industrial Street, Hudson, WI 54016**
3. Return shipping address: Be sure to include your return shipping address inside the box. We cannot ship to a PO Box.
4. RA number on carton: In large printing, write the R.A. number on the outside of each carton being returned.

## RETURNING PRODUCT FOR EXCHANGE

The following procedure is for equipment that has failed out-of-box (within 10 days of purchase):

1. Customer must contact Viking's Technical Support at 715-386-8666 to determine possible causes for the problem. The customer MUST be able to step through recommended tests for diagnosis.
2. If the Technical Support Product Specialist determines that the equipment is defective based on the customer's input and troubleshooting, a Return Authorization (R.A.) number will be issued. This number is valid for fourteen (14) calendar days from the date of issue.
3. After obtaining the R.A. number, return the approved equipment to your distributor, referencing the R.A. number. Your distributor will then replace the product over Viking using the same R.A. number.
4. The distributor will NOT exchange this product without first obtaining the R.A. number from you. If you haven't followed the steps listed in 1, 2 and 3, be aware that you will have to pay a restocking charge.

## TWO YEAR LIMITED WARRANTY

Viking warrants its products to be free from defects in the workmanship or materials, under normal use and service, for a period of two years from the date of purchase from any authorized Viking distributor. If at any time during the warranty period, the product is deemed defective or malfunctions, return the product to Viking Electronics, Inc., 1531 Industrial Street, Hudson, WI., 54016. Customer must contact Viking's Technical Support Department at 715-386-8666 to obtain a Return Authorization (R.A.) number.

This warranty does not cover any damage to the product due to lightning, over voltage, under voltage, accident, misuse, abuse, negligence or any damage caused by use of the product by the purchaser or others. This warranty does not cover non-EWP products that have been exposed to wet or corrosive environments. This warranty does not cover stainless steel surfaces that have not been properly maintained.

**NO OTHER WARRANTIES.** VIKING MAKES NO WARRANTIES RELATING TO ITS PRODUCTS OTHER THAN AS DESCRIBED ABOVE AND DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTIES OR MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

**EXCLUSION OF CONSEQUENTIAL DAMAGES.** VIKING SHALL NOT, UNDER ANY CIRCUMSTANCES, BE LIABLE TO PURCHASER, OR ANY OTHER PARTY, FOR CONSEQUENTIAL, INCIDENTAL, SPECIAL OR EXEMPLARY DAMAGES ARISING OUT OF OR RELATED TO THE SALE OR USE OF THE PRODUCT SOLD HEREUNDER.

**EXCLUSIVE REMEDY AND LIMITATION OF LIABILITY.** WHETHER IN AN ACTION BASED ON CONTRACT, TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR ANY OTHER LEGAL THEORY, ANY LIABILITY OF VIKING SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF THE PRODUCT, OR AT VIKING'S OPTION, REFUND OF THE PURCHASE PRICE AS THE EXCLUSIVE REMEDY AND ANY LIABILITY OF VIKING SHALL BE SO LIMITED.

IT IS EXPRESSLY UNDERSTOOD AND AGREED THAT EACH AND EVERY PROVISION OF THIS AGREEMENT WHICH PROVIDES FOR DISCLAIMER OF WARRANTIES, EXCLUSION OF CONSEQUENTIAL DAMAGES, AND EXCLUSIVE REMEDY AND LIMITATION OF LIABILITY, ARE SEVERABLE FROM ANY OTHER PROVISION AND EACH PROVISION IS A SEPARABLE AND INDEPENDENT ELEMENT OF RISK ALLOCATION AND IS INTENDED TO BE ENFORCED AS SUCH.

## FCC REQUIREMENTS

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the side of this equipment is a label that contains, among other information, a product identifier in the format US:AAAEQ##TXXXX. If requested, this number must be provided to the telephone company.

The REN is used to determine the number of devices that may be connected to a telephone line. Excessive REN's on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of the REN's should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total REN's, contact the local telephone company. For products approved after July 23, 2001, the REN for this product is part of the product identifier that has the format US:AAAEQ##TXXXX. The digits represented by ## are the REN without a decimal point (e.g., 03 is a REN of 0.3). For earlier products, the REN is separately shown on the label.

The plug used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. If your home has specially wired alarm equipment connected to the telephone line, ensure the installation of this LS-911 does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer.

If the LS-911 causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make the necessary modifications to maintain uninterrupted service.

If trouble is experienced with the LS-911, for repair or warranty information, please contact:

**Viking Electronics, Inc., 1531 Industrial Street, Hudson, WI 54016 (715) 386-8666**

If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

Connection to Party Line Service is subject to State Tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

**WHEN PROGRAMMING EMERGENCY NUMBERS AND (OR) MAKING TEST CALLS TO EMERGENCY NUMBERS:**

Remain on the line and briefly explain to the dispatcher the reason for the call. Perform such activities in the off-peak hours, such as early morning or late evenings.

It is recommended that the customer install an AC surge arrester in the AC outlet to which this device is connected. This is to avoid damaging the equipment caused by local lightning strikes and other electrical surges.

## PART 15 LIMITATIONS

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## Product Support: (715) 386-8666

Due to the dynamic nature of the product design, the information contained in this document is subject to change without notice. Viking Electronics, and its affiliates and/or subsidiaries assume no responsibility for errors and omissions contained in this information. Revisions of this document or new editions of it may be issued to incorporate such changes.