SENSAPHONE® Model 4100
User's Manual

Version 5.41

PHONETICS, INC.

Every effort has been made to ensure that the information in this document is complete, accurate and up-to-date. Phonetics, Inc. assumes no responsibility for the results of errors beyond its control. Phonetics, Inc. also cannot guarantee that changes in equipment made by other manufacturers will not affect the applicability of the information in this manual.

1 YEAR LIMITED WARRANTY

PLEASE READ THIS WARRANTY CAREFULLY BEFORE USING THE PRODUCT.

THIS LIMITED WARRANTY CONTAINS SENSAPHONE'S STANDARD TERMS AND CONDITIONS. WHERE PERMITTED BY THE APPLICABLE LAW, BY KEEPING YOUR SENSAPHONE PRODUCT BEYOND THIRTY (30) DAYS AFTER THE DATE OF DELIVERY, YOU FULLY ACCEPT THE TERMS AND CONDITIONS SET FORTH IN THIS LIMITED WARRANTY.

IN ADDITION, WHERE PERMITTED BY THE APPLICABLE LAW, YOUR INSTALLATION AND/OR USE OF THE PRODUCT CONSTITUTES FULL ACCEPTANCE OF THE TERMS AND CONDITIONS OF THIS LIMITED WARRANTY (HEREINAFTER REFERRED TO AS "LIMITED WARRANTY OR WARRANTY"). IF YOU DO NOT AGREE TO THE TERMS AND CONDITIONS OF THIS WARRANTY, INCLUDING ANY LIMITATIONS OF WARRANTY, INDEMNIFICATION TERMS OR LIMITATION OF LIABILITY, THEN YOU SHOULD NOT USE THE PRODUCT AND SHOULD RETURN IT TO THE SELLER FOR A REFUND OF THE PURCHASE PRICE. THE LAW MAY VARY BY JURISDICTION AS TO THE APPLICABILITY OF YOUR INSTALLATION OR USE ACTUALLY CONSTITUTING ACCEPTANCE OF THE TERMS AND CONDITIONS HEREIN AND AS TO THE APPLICABILITY OF ANY LIMITATION OF WARRANTY, INDEMNIFICATION TERMS OR LIMITATIONS OF LIABILITY.

1. **WARRANTOR**: In this Warranty, Warrantor shall mean "Dealer, Distributor, and/or Manufacturer."

2. **ELEMENTS OF WARRANTY**: This Product is warranted to be free from defects in materials and crafts-manship with only the limitations and exclusions set out below.

3. **WARRANTY AND REMEDY**: One-Year Warranty — In the event that the Product does not conform to this warranty at any time during the time of one year from original purchase, warrantor will repair the defect and return it to you at no charge.

This warranty shall terminate and be of no further effect at the time the product is: (1) damaged by extraneous cause such as fire, water, lightning, etc. or not maintained as reasonable and necessary; or (2) modified; or (3) improperly installed; or (4) misused; or (5) repaired or serviced by someone other than Warrantors' authorized personnel or someone expressly authorized by Warrantor's to make such service or repairs; (6) used in a manner or purpose for which the product was not intended; or (7) sold by original purchaser.

LIMITED WARRANTY, LIMITATION OF DAMAGES AND DISCLAIMER OF LIABILITY FOR DAMAGES: THE WARRANTOR'S OBLIGATION UNDER THIS WARRANTY IS LIMITED TO REPAIR OR REPLACEMENT OF THE PRODUCT, AT THE WARRANTOR'S OPTION AS TO REPAIR OR REPLACEMENT. IN NO EVENT SHALL WARRANTORS BE LIABLE OR RESPONSIBLE FOR PAYMENT OF ANY INCIDENTAL, CONSEQUENTIAL, SPECIAL AND/OR PUNITIVE DAMAGES OF ANY KIND, INCLUDING BUT NOT LIMITED TO ANY LABOR COSTS, PRODUCT COSTS, LOST REVENUE, BUSINESS INTERRUPTION LOSSES, LOST PROFITS, LOSS OF BUSINESS, LOSS OF DATA OR INFORMATION, OR FINANCIAL LOSS, FOR CLAIMS OF ANY NATURE, INCLUDING BUT NOT LIMITED TO CLAIMS IN CONTRACT, BREACH OF WARRANTY OR TORT, AND WHETHER OR NOT CAUSED BY WARRANTORS' NEGLIGENCE. IN THE EVENT THAT IT IS DETERMINED IN ANY ADJUDICATION THAT THE LIMITED WARRANTIES OF REPAIR OR REPLACEMENT ARE INAPPLICABLE, THEN THE PURCHASER'S SOLE REMEDY SHALL BE PAYMENT TO THE PURCHASER OF THE ORIGINAL COST OF THE PRODUCT, AND IN NO EVENT SHALL WARRANTORS BE LIABLE OR RESPONSIBLE FOR PAYMENT OF ANY INCIDENTAL, CONSEQUENTIAL, SPECIAL AND/OR PUNITIVE DAMAGES OF ANY KIND, INCLUDING BUT NOT LIMITED TO ANY LOST REVENUE, BUSINESS INTERRUPTION LOSSES, LOST PROFITS, LOSS OF BUSINESS, LOSS OF DATA OR INFORMATION, OR FINANCIAL LOSS, FOR CLAIMS OF ANY NATURE, INCLUDING BUT NOT LIMITED TO CLAIMS IN CONTRACT, BREACH OF WARRANTY OR TORT, AND WHETHER OR NOT CAUSED BY WARRANTORS' NEGLIGENCE.

WITHOUT WAIVING ANY PROVISION IN THIS LIMITED WARRANTY, IF A CIRCUMSTANCE ARISES WHERE WARRANTORS ARE FOUND TO BE LIABLE FOR ANY LOSS OR DAMAGE ARISING OUT OF MISTAKES, NEGLIGENCE, OMISSIONS, INTERRUPTIONS, DELAYS, ERRORS OR DEFECTS IN WARRANTORS' PRODUCTS OR SERVICES, SUCH LIABILITY SHALL NOT EXCEED THE TOTAL AMOUNT PAID BY THE CUSTOMER FOR WARRANTORS' PRODUCT AND SERVICES OR $250.00, WHICHEVER IS GREATER. YOU HEREBY RELEASE WARRANTORS FROM ANY AND ALL OBLIGA-TIONS, LIABILITIES AND CLAIMS IN EXCESS OF THIS LIMITATION.

INDEMNIFICATION AND COVENANT NOT TO SUE: YOU WILL INDEMNIFY, DEFEND AND HOLD HARMLESS WARRANTORS, THEIR OWNERS, DIRECTORS, OFFICERS, EMPLOYEES, AGENTS, SUPPLIERS OR AFFILIATED COMPANIES, AGAINST ANY AND ALL CLAIMS, DEMANDS OR ACTIONS BASED UPON ANY LOSSES, LIABILITIES, DAMAGES OR COSTS, INCLUDING BUT NOT LIMITED TO DAMAGES THAT ARE DIRECT OR INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUEN-TIAL, AND INCLUDING ATTORNEYS FEES AND LEGAL COSTS, THAT MAY RESULT FROM THE INSTALLATION, OPERATION, USE OF, OR INABILITY TO USE WARRANTORS' PRODUCTS AND SER-VICES, OR FROM THE FAILURE OF THE WARRANTORS' SYSTEM TO REPORT A GIVEN EVENT OR CONDITION, WHETHER OR NOT CAUSED BY WARRANTORS' NEGLIGENCE.

YOU AGREE TO RELEASE, WAIVE, DISCHARGE AND COVENANT NOT TO SUE WARRANTORS, THEIR OWNERS, DIRECTORS, OFFICERS, EMPLOYEES, AGENTS, SUPPLIERS OR AFFILIATED COMPANIES, FOR ANY AND ALL LIABILITIES POTENTIALLY ARISING FROM ANY CLAIM, DEMAND OR ACTION BASED UPON ANY LOSSES, LIABILITIES, DAMAGES OR COSTS, INCLUDING BUT NOT LIMITED TO DAMAGES THAT ARE DIRECT OR INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUEN-TIAL, AND INCLUDING ATTORNEYS FEES AND LEGAL COSTS, THAT MAY RESULT FROM THE INSTALLATION, OPERATION, USE OF, OR INABILITY TO USE WARRANTORS' PRODUCTS AND SER-VICES, OR FROM THE FAILURE OF THE WARRANTORS' SYSTEM TO REPORT A GIVEN EVENT OR CONDITION, WHETHER OR NOT CAUSED BY WARRANTORS' NEGLIGENCE, EXCEPT AS NECES-SARY TO ENFORCE THE EXPRESS TERMS OF THIS LIMITED WARRANTY.

EXCLUSIVE WARRANTY: THE LIMITED WARRANTY OR WARRANTIES DESCRIBED HEREIN CON-STITUTE THE SOLE WARRANTY OR WARRANTIES TO THE PURCHASER. ALL IMPLIED WAR-RANTIES ARE EXPRESSLY DISCLAIMED, INCLUDING: THE WARRANTY OF MERCHANTABILITY AND THE WARRANTY OF FITNESS FOR A PARTICULAR USE AND THE WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE AND THE WARRANTY OF NON-INFRINGEMENT AND/OR ANY WAR-RANTY ARISING FROM A COURSE OF DEALING, USAGE, OR TRADE PRACTICE.

It must be clear that the Warrantors are not insuring your premises or business or guaranteeing that there will not be damage to your person or property or business if you use this Product. You should maintain insurance coverage sufficient to provide compensation for any loss, damage, or expense that may arise in connection with the use of products or services, even if caused by Warrantors' negligence. The warran-tors assume no liability for installation of the Product and/or interruptions of the service due to strikes, riots, floods, fire, and/or any cause beyond Seller's control, further subject to the limitations expressed in any License Agreement or other Agreement provided by Warrantors to purchaser.

The agreement between the Warrantors and the Purchaser, including but not limited to the terms and conditions herein shall not be governed by the Convention for the International Sale of Goods. Where applicable, the Uniform Commercial Code as adopted by the State of Delaware shall apply.

4. **PROCEDURE FOR OBTAINING PERFORMANCE OF WARRANTY**: In the event that the Product does not conform to this warranty, the Product should be shipped or delivered freight prepaid to a Warrantor with evidence of original purchase.

5. **LEGAL REMEDIES AND DISCLAIMER**: Some jurisdictions may not allow, or may place limits upon, the exclusion and/or limitation of implied warranties, incidental damages and/or consequential damages for some types of goods or products sold to consumers and/or the use of indemnification terms. Thus, the exclusions, indemnification terms and limitations set out above may not apply, or may be limited in

their application, to you. If the implied warranties can not be excluded, and the applicable law permits limiting the duration of implied warranties, then the implied warranties herein are to be limited to the same duration as the applicable written warranty or warranties herein. The warranty or warranties herein may give you specific legal rights that will depend upon the applicable law. You may also have other legal rights depending upon the law in your jurisdiction.

6. **CHOICE OF FORUM AND CHOICE OF LAW**: In the event that a dispute arises out of or in connection with this Limited Warranty, then any claims or suits of any kind concerning such disputes shall only and exclusively be brought in either the Court of Common Pleas of Delaware County, Pennsylvania or the United States District Court for the Eastern District of Pennsylvania.

Regardless of the place of contracting or performance, this Limited Warranty and all questions relating to its validity, interpretation, performance and enforcement shall be governed by and construed in accordance with the laws of the State of Delaware, without regard to the principles of conflicts of law.

Effective date 05/01/2004
PHONETICS, INC. d.b.a. SENSAPHONE
901 Tryens Road
Aston, PA 19014
Phone: 610.558.2700 Fax: 610.558.0222
www.sensaphone.com

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CHAPTER 1
INTRODUCTION

The Sensaphone Model 4100 is an electronic watchman. It monitors specific environmental and operating conditions at your business facility or remote property. The Model 4100 is equipped with sensors that automatically monitor the following conditions:

■ AC electrical power—checks for power failure and records the total amount of time the power was off.

■ High/low temperature

■ High sound levels—such as smoke or burglar alarms.

■ Battery—the condition of its battery back-up.

Dry contact sensors can be wired to the inputs to monitor a variety of conditions including:

■ Intrusion into premises

■ Water leaks or floods

■ Temperature in remote locations

■ Humidity

■ Equipment operation

When an alarm condition occurs, the Sensaphone® Model 4100 will call out to 4 user-programmed phone numbers to advise key personnel of the condition. You may also call in to the unit at any time to obtain a status report. The unit works with either pulse or touch-tone phone systems. There is an output terminal on the 4100 that can be used in combination with the FGD-0012 Output Controller to activate an alarm horn or light. Whenever an alarm condition occurs, the alarm horn/light will be activated.

The Sensaphone Model 4100 has nonvolatile memory. When AC power and the battery backup fail, the unit will still retain all of its programmed parameters, except for the time, the security code, and the power-off time accumulator.

ABOUT THIS MANUAL

This manual describes the features and operation of the Sensaphone model 4100. It provides explanations, illustrations, and examples to simplify its installation and programming.

Read this manual over at least once and experiment with the examples before starting your actual programming. If there are any questions or problems that arise upon installation or operation, please contact:

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PHONETICS, INC.

901 Tryens Road

Aston, PA 19014

Phone: 610.558.2700   FAX: 610.558.0222

www.sensaphone.com

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CHAPTER 2
INSTALLATION

This chapter provides information on how to install the Sensaphone Model 4100. Please read the entire chapter before starting installation.

Within the packaging will be a Warranty Registration Card. Please take the time to fill this out and mail. The One Year Limited Warranty is explained in the back of this manual.

> **CAUTION**: The Model 4100 is a sensitive electronic device. Do not install the Model 4100 near strong electrostatic, electromagnetic or radioactive fields.

OPERATING ENVIRONMENT

The Model 4100 should be installed and operated in a safe environment. Do not place the unit where it can be exposed to fumes or corrosive vapors. The vapors may damage the unit, thus voiding the warranty. The temperature range that the 4100 can operate in is 32° F to 120° F.

MOUNTING

The Model 4100 is designed to be wall mounted using 4 bolts. Drill holes to mount the enclosure according to the diagram below (9" apart horizontally; 7" apart vertically):
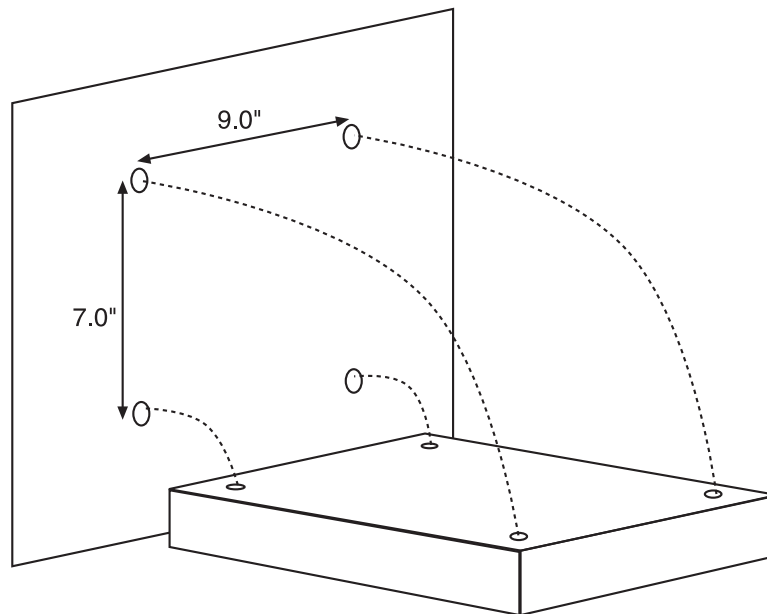
Figure 1: Wall mount

POWER SURGE PROTECTION

The Sensaphone 4100 can be damaged by power surges and lightning through the telephone line and the 110 VAC power supply. Although the Model 4100 has built-in surge protection, we recommend that additional protection be obtained for the unit and for any electronic equipment that is attached to your power supply and telephone lines. Power surge protection is especially important if you live in a lightning-prone area. The ISOTEL Surge Protector Model IB-4 is available through Phonetics, Inc. See Appendix B.

POWER SUPPLY AND BACKUP BATTERY

The 4100 is provided with an AC power transformer. After mounting the unit, plug the transformer into any standard 110 VAC outlet. The unit will say "Hello" and state any present alarms.

The Model 4100 is equipped with a replaceable rechargeable 2.2 Amp-hour gel-cell electrolyte battery. The battery is recharged whenever the AC transformer is plugged into an outlet and the battery jumper is installed on terminals 15 and 16 (see below). Complete recharge will take approximately 48 hours. During that interval, a status report may give the "Battery Condition Low" alarm message.

BATTERY CONNECTION

A metal jumper is attached to terminal 16 *(marked BATTERY)* and the screw below it. See Figure 2A. Remove the metal jumper and attach it to both BATTERY terminal screws *(terminals 15 and 16)*. (See Figure 2B) This will connect the rechargeable battery to the 4100. When the unit is in operation, this jumper must be connected to terminals 15 and 16 to ensure battery backup during a power failure.
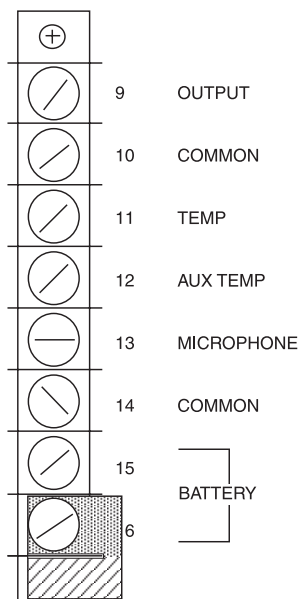
Figure 2A: Battery disconnected   Figure 2B: Battery connected
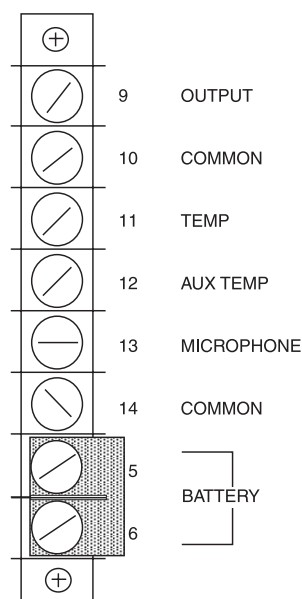
For storage or shipping purposes, return the jumper to the original position.

TURNING THE MODEL 4100 ON

The ON and OFF keys on the Model 4100 keypad are used to activate and deactivate the unit. To turn the unit ON, press the ON key. The system ON light will begin to glow. The unit will say "Hello," or beep if it is already on.

When the unit is ON, it is able to receive incoming calls and automatically dial out in the event of an alarm on one of the monitored conditions. The red light will glow as long as the unit is on.

When you press OFF, the 4100 will say "Have a good day," and the system ON light will stop glowing. All functions are disabled except the battery backup. The batteries will still discharge if the AC transformer is unplugged from the 110 VAC outlet.

It is not recommended that the unit be turned OFF unless absolutely necessary. (See "Disconnecting the Model 4100" later in this chapter.) Full power is still consumed by the unit even though it cannot be programmed or interrogated. Also, the unit cannot dial out with an alarm.

STRAIN RELIEF

A strain relief clamp is provided in the Model 4100 enclosure to prevent wiring from being pulled from the circuit board or damaged when passing through the enclosure. To use the strain relief, thread wires through the clamp and clear rubber bushing. Position the bushing in the clamp and tighten the screws on either side so that the wiring does not move.
See Figure 2:
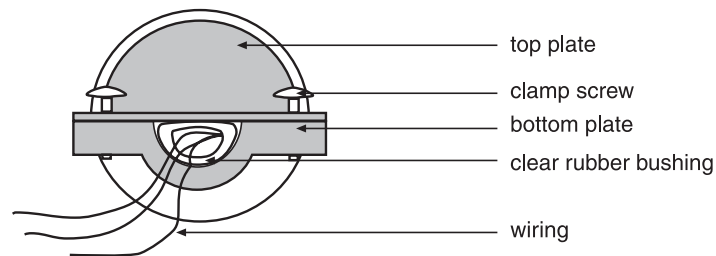
Figure 2: Strain relief clamp

PHONE LINE INSTALLATION

The Sensaphone Model 4100 will operate with all standard analog telephone systems that accept pulse or tone dialing. The Sensaphone Model 4100 cannot be used on an extension line to dial its own telephone number. Also, it may not be installed on a party line or pay telephone line.

Certain private telephone systems and public switching equipment may not accept Sensaphone dialing or may generate an unacceptable ring signal. In those cases, a dedicated line may be required for the 4100. Consult the supplier of your telephone system if you encounter problems.

If you do not have a modular telephone extension at the Model 4100's location, you must contact your local telephone company to have one installed (there may be a charge for this service). If you have four-pin jacks, adapters are available to convert them to the modular plugs. Contact your local telephone company or electronics parts store.

> **CAUTION**: Never install telephone wiring during a lightning storm. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface. Use caution when installing or modifying telephone lines.

The telephone line is wired to terminal screws 1 and 2 *(marked PHONE)* and threaded through the strain relief clamp. To install the telephone line with your phone system, plug the provided modular telephone jack into any standard RJ11 phone outlet. See Figure 3:
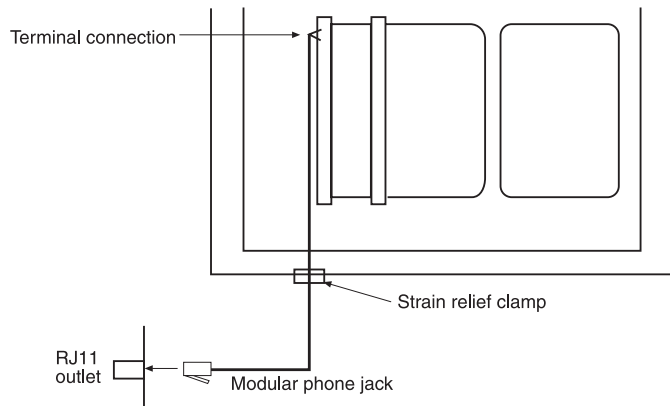
Figure 3: Installing the telephone line

You may also use the 4100 on the same line with a telephone. To do this, simply install a splitter in your RJ11 phone outlet and plug both the 4100 and the telephone into it. It is not necessary to hook up a telephone for the Model 4100 to operate.

TEMPERATURE SENSORS

The Model 4100 is provided with one 2.8K Remote Temperature Assembly (25' wire) pre-wired to the TEMP screw (#11) and COMMON (#10). It is used to monitor temperature. The Model 4100 evaluates the measurement to see if it exceeds the user-programmed high and low limits. The temperature reading is also given in the status report.

THE MICROPHONE

The 4100 is provided with a microphone on a 25' cable to monitor high sound level at your location. It is pre-wired to screw terminals 13 and 14. The microphone will continuously listen for a high sound level that increases approximately 10 decibels over the normal sound level at a frequency of about 1000 Hertz or more. (**NOTE**: The sensitivity of the microphone can be changed. See Chapter 4, "Sound Alarm Monitoring Sensitivity.") If this sound level exists for 8 consecutive seconds or longer (such as with a smoke alarm or burglar alarm), the Model 4100 will dial out with an alarm message.

> **NOTE**: The location of the audible alarm in relation to the microphone is extremely important. Normally, the 4100 and the audible alarm must be in the same room. The maximum distance can vary considerably depending on the alarm, the acoustics, and the size of the room.

During an alarm dial out, the microphone allows four 4-second intervals to listen-in to the Model 4100's location.

During a call in for a status report, the microphone allows you to listen to on-site sounds for the user-programmed time interval.

ALERT INPUTS

The Sensaphone Model 4100 can monitor up to 4 dry contact inputs. (The fourth input is the AUX TEMP terminal. See page 11 for details). Each input connection consists of two terminal screws. One marked: INPUT 1 (screw #3), INPUT 2 (screw #4), INPUT 3 (screw #5), or AUX TEMP (screw #12). The other marked: COMMON (screws #6, #10, or #14). See figure 4:
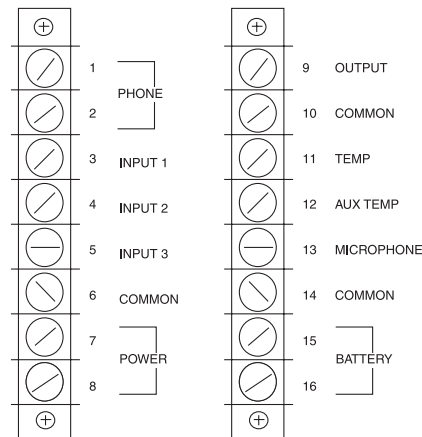
Figure 4: Alert inputs

An alert input can be used with any normally open (N.O.) or normally closed (N.C.) device. **Open** is when there is no contact and **closed** is when a contact exists. The Model 4100 will adapt to N.O. or N.C. sensors when the unit's ID number is programmed (see Chapter 3,"Unit ID Number," or Chapter 4, "Configure Input Normality"). You must determine what type of sensor will be connected to each alert input.

NOTE: Before wiring, you may disable the input to prevent accidentally tripping an alarm. See Chapter 4, page 25.

After you have selected the sensor, loosen the screw of the alert input and COMMON. Two wire leads are used to connect any monitoring sensor. Fasten one lead to an input screw and the other lead to a COMMON. Tighten both screws. (See Figure 6.) If the input was not disabled, the Model 4100 may recite its "Alert Condition exists" message as you connect the sensor. If it does, just press any key to stop it. Re-enable the input after wiring. See Figure 6 for a diagram on connecting a sensor to an alert input.
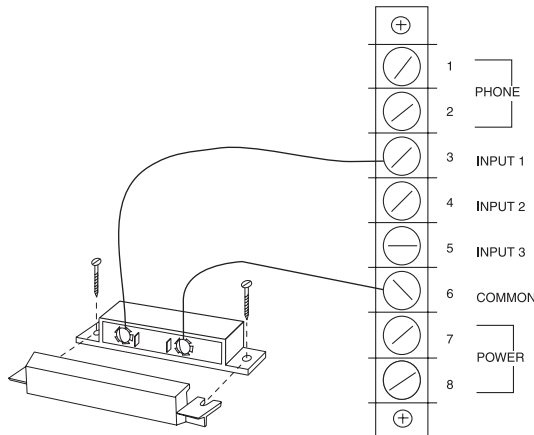
Figure 6: Connecting a sensor to an alert input

Any N.O. or N.C. sensor can be attached to the Model 4100 using 22-gauge wire. The sensor can be several hundred feet from the unit, as long as the total resistance of the circuit is not greater than 50 ohms. Use wire appropriate for the application. **Do not use sensors, switches, or relays that supply any voltage or current to the Model 4100.**

NOTE: Be aware of where you are placing the wires that lead from the sensors to the unit. Avoid running the wires near electrical devices that use high voltage or current such as motors, heavy machinery, etc. This voltage may be inductively coupled into the sensor wiring and could result in damage to the Sensaphone's circuitry. Try to place wires at least 6 inches from other electrical wiring or devices.

MULTIPLE SENSORS

The Model 4100 may have more than one sensor connected to the same alert input. However, the normal condition for each sensor on the same alert input must be identical (either all N.O. or all N.C.).

To wire more than one normally closed sensor on one input, they must be connected in series. Connect one lead from the first sensor to the screw of the alert input. Next, take the other lead from the first sensor and connect it to one lead from the next sensor. Continue connecting sensors end-to-end until you have connected all of your sensors. Take the second lead from the last sensor and connect it to a COMMON screw on the Sensaphone. See Figure 7. Multiple N.C. inputs are typically magnetic reed switches to monitor the security of windows and doors.

INPUT   COMMON

Multiple normally-closed
sensors wired in series.

Alert condition occurs
when a normally
closed switch is
opened.
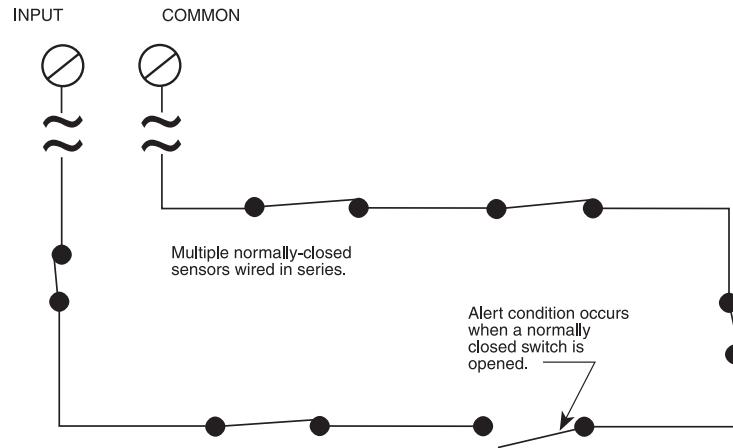
Figure 7: Multiple normally closed sensors

To wire several normally open sensors to one alert input, connect them in parallel. To do this, take one lead from each sensor and attach it to the input terminal screw. Then, take the second lead from each sensor and attach each to a COMMON screw. See Figure 8.

Multiple N.O. inputs are typically TEMP°ALERTs to monitor the temperature in several different locations simultaneously.

INPUT   COMMON

Alert condition occurs
when switch closes.
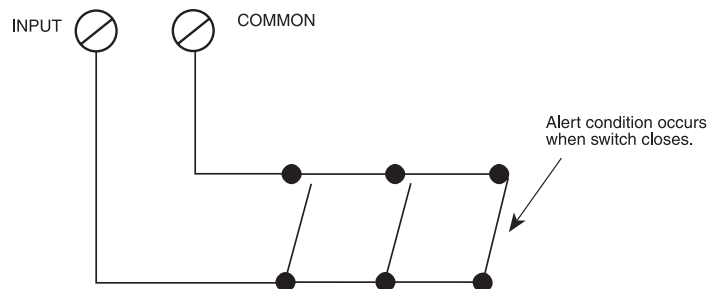
Figure 8: Multiple normally open sensors wired in parallel

AUXILIARY TEMPERATURE / ALERT INPUT 4

The auxiliary terminal, marked AUX TEMP (screw #12) on the terminal strip, is a dual purpose terminal. It can function as either a status-only temperature input, or as a fourth dry contact input. If the AUX TEMP input is used as a temperature input, it is only used in a status report and WILL NOT initiate a dial out process. If the AUX TEMP input is used as a fourth dry contact input, it WILL initiate a dial out process.

To use the terminal as a status-only temperature input, wire one lead of the remote temperature sensor (FGD-0005) to the AUX TEMP screw and the other lead to a COMMON. If you use the terminal with a remote temperature sensor, you cannot attach a dry contact sensor.

To use the AUX TEMP terminal as a fourth dry contact input, wire any N.O. or N.C. dry contact sensor to it as described in the previous "Alert Inputs" section. The Model 4100 will adapt to N.O. or N.C. sensors when the unit ID number is programmed. The unit will dial-out with the message "Alert condition four exists." If you use the terminal as a fourth dry

contact, you cannot attach a remote temperature sensor.

OUTDOOR WIRING

When wiring sensors outdoors, DO NOT let your wiring run freely in open air. This will surely damage your Sensaphone during a lightning storm. Depending on how far your outdoor wiring must travel, serious consideration should be given to using shielded wire inside a metal conduit. The shield and conduit should both be connected to earth ground. This will prevent any lightning induced voltage from damaging your Sensaphone.
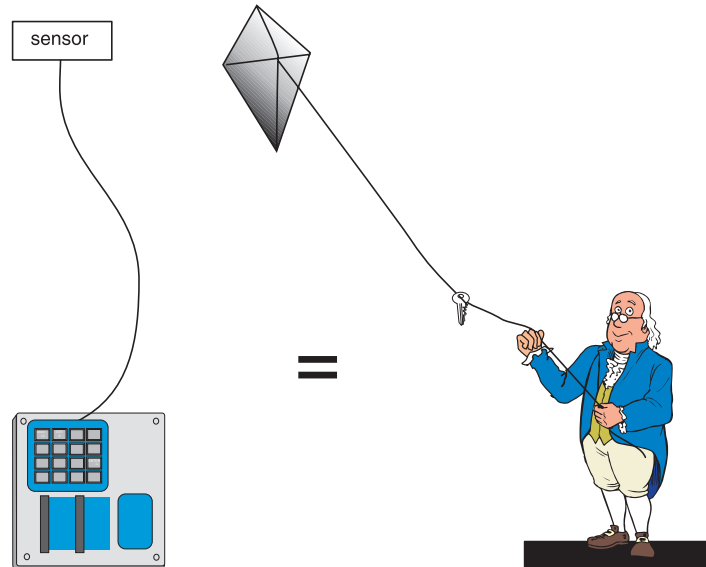
Figure 9: Outdoor Wiring Illustration

DISCONNECTING THE MODEL 4100 (FOR SEASONAL USE OR STORAGE)

If you plan to employ the Sensaphone as a seasonal watchdog (i.e. only during the winter or summer months), you must disconnect all wires from the unit completely to avoid damage to the circuitry when the unit is not in use. If the unit is unplugged but left in place with all the sensors still wired, the wires act as antennae that draw in any stray "electrical noise" from such devices as fans, blowers, microwaves, etc.

To preserve your unit during the off season, simply remove the sensor wires at the screw terminals (you may want to mark the wires to avoid confusion during rewiring), unplug the unit, disconnect the battery jumper, and store in a safe place.

FCC REQUIREMENTS

PART 68 - The Sensaphone® Model 4100 complies with Part 68 of the FCC rules. On the inside cover of the unit enclosure there is a label that contains, among other information, the FCC Registration Number and the Ringer Equivalence Number (REN) for this equipment. You must, upon request, provide this information to your local telephone company.

The REN is useful to determine the quantity of devices that you may connect to your telephone line and still have all of those devices ring when your telephone number is called. In most, but not all areas, the sum of the RENs of all devices connected to one line should not exceed five (5.0). To be certain of the number of devices that you may connect to your line, you may want to contact your local telephone company to determine the maximum REN for your calling area.

This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs.

Should the Model 4100 cause harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But if advanced notice is not practical, the telephone company may temporarily discontinue service without notice and you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC. The telephone company may make changes in its facilities, equipment, operations, or procedures where such action is reasonably required in the operation of its business and is not inconsistent with the rules and regulations of the FCC that could affect the proper functioning of your equipment.

If you experience trouble with this equipment, please contact:

> PHONETICS, INC.
> 901 Tryens Road
> Aston, PA 19014
> 610.558.2700
> Fax: 610.558.0222

for information on obtaining service or repairs. The telephone company may ask that you disconnect this equipment from the network until the problem has been corrected or until you are sure that the equipment is not malfunctioning.

PART 15 - This equipment has been tested and found to comply with the limits for a Class B 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.

CANADIAN DEPARTMENT OF COMMUNICATIONS STATEMENT

Notice: The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the Load Number of all the devices does not exceed 100.

The Load Number for the Sensaphone 4100 is 72.

CHAPTER 3
COMMUNICATIONS PROGRAMMING

This chapter explains the keyboard functions for the communications operations for the Model 4100. This includes programming, interrogation, and/or resetting of:

■ Dial-out telephone numbers

■ Special dialing

■ Tone or pulse dialing

■ Rings until answer & Telephone Answering Device compatibility

■ Listen-in time

■ Security code

■ Unit ID number

■ Local voice mute

■ Pre-programmed communications features:

■ Call delay time

■ Intercall delay time

■ Voice repetitions

■ Maximum number of calls

All programming is done using the local keypad. Below is a representation of the Model 4100 keypad.
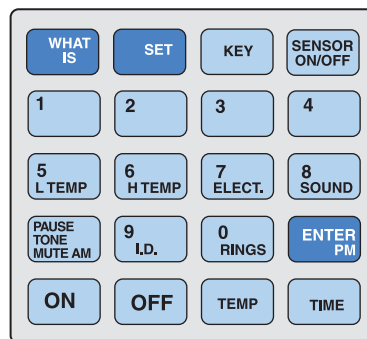
Model 4100 keypad

DIAL-OUT TELEPHONE NUMBERS

The Sensaphone Model 4100 can store up to 4 phone numbers, 32 digits each. These are the numbers that will be called during an alarm dialout. The numbers are dialed sequentially 1 through 4. Therefore, program the first number you want called as Phone #1, the second one as Phone #2, and so on.

A pause, pound, or asterisk can be added to the phone number to access different phone or beeper systems. See "Special Dialing" in this chapter for further explanation.

IMPORTANT: It is recommended that you do not program the Sensaphone Model 4100 to dial out to telephone numbers that will be answered by an answering machine. Such alarms will not be acknowledged and the unit will continue to dial indefinitely.

Instruct key people at each telephone number about the Model 4100 and about what actions they should take if called with an alarm. If necessary, instruct switchboard operators to handle alarm and acknowledgment calls. Do not have the alarm call answered by a person who is unable to acknowledge the alarm or to take prompt, effective action to deal with the situation. If appropriate, conduct periodic drills to familiarize personnel with the operation of the unit.

In some areas, municipal services (i.e. police, fire, medical) will not respond to automatic voice messages. Check with your local municipal services.

To program a dialout Phone number:

1. Press the SET key
2. Press a number key (1-4) of the Phone number you want to set
3. Enter the phone number using the number keys
   The Model 4100 will recite the numbers as you press them.
4. Press ENTER. The 4100 will say "Enter."

SET **1** (phone number) **ENTER PM**
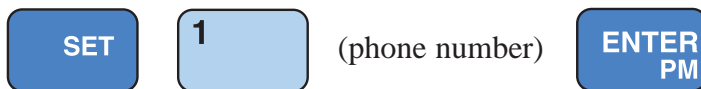
To interrogate a dialout Phone number:

1. Press the WHAT IS key
2. Press the number key (1-4) of the Phone number you want to play back
   The Model 4100 will recite the programmed phone number. If there is no number programmed, the 4100 will say "No number."

WHAT IS **1**

NOTE: This command also indicates whether the input (1-4) is enabled or disabled. If the 4100 says "Off" before reciting the phone number, it means that the input has been disabled. See Chapter 4, "Enable/Disable Inputs."

To erase a Phone number:

1. Press the SET key
2. Press the number key (1-4) of the Phone number you want to erase
3. Press ENTER. The 4100 will say "Enter."

SET **1** **ENTER PM**
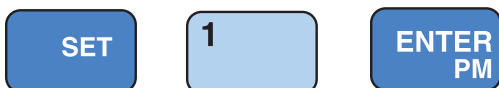
TONE OR PULSE DIALING

The Sensaphone will normally dial out to a Phone number using pulse. However, you can switch to Touch-Tone™ by inserting TONE as the first digit of the Phone number.

To set a TONE-dialed Phone number:

1. Press the SET key
2. Press the number key (1-4) of the Phone number you want to set
3. Press the TONE key
   The 4100 will beep.
4. Enter the digits of the Phone number using the number keys
   The 4100 will recite the digits as you press them.
5. Press ENTER. The 4100 will say "Enter."

SET   **1**   **PAUSE TONE MUTE AM**   (phone number)   **ENTER PM**
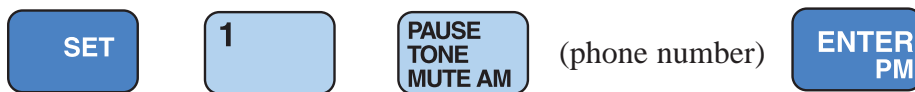
When you interrogate, the tone will be represented by a beep at the beginning of the Phone number. **NOTE**: TONE is counted as one digit toward the total 32 digits allowed.

SPECIAL DIALING

The Model 4100 has provisions for special dialing sequences. There are three keys that represent special functions when used within a Phone number. The PAUSE key represents a 4-second pause in dialing. It is used mainly when you must first dial an access number, such as 9, to reach an outside line. The SET key represents the pound (#) tone and the WHAT IS key represents the asterisk (*) tone. A pound or asterisk tone may be required when calling some phone or beeper systems.

To incorporate a PAUSE:

1. Press the SET key
2. Press the number key (1-4) of the Phone number
3. Press the TONE key (if applicable)
   The 4100 will beep.
4. Enter the access digit (i.e. 9)
   The 4100 will recite the digit.
5. Press the PAUSE key
   The 4100 will beep.
6. Enter the Phone number using the number keys
   The 4100 will recite the digits as you press them.
7. Press ENTER. The 4100 will say "Enter."

SET   **1**   **PAUSE TONE MUTE AM**   (access number)   **PAUSE TONE MUTE AM**   (phone number)   **ENTER PM**
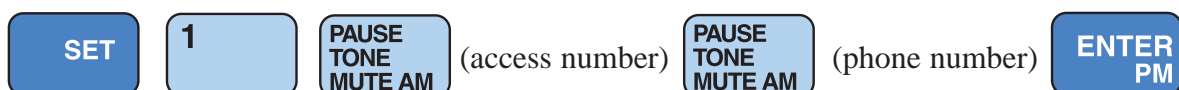
To incorporate a pound or asterisk tone:

1. Press the SET key
2. Press the number key (1-4) of the Phone number
3. Press the TONE key (if applicable)

   The 4100 will beep.

4. Enter the Phone number using the number keys

   The 4100 will recite the digits as you press them.

4.1. Position the pound or asterisk tone within the Phone number where required by pressing the SET or WHAT IS key. The 4100 will beep.

4.2. Enter the remaining digits of the Phone numbers (if any).

5. Press ENTER. The 4100 will say "Enter."

| SET | 1 | PAUSE TONE MUTE AM | (phone number) | SET | or | WHAT IS | (remaining number) | ENTER PM |
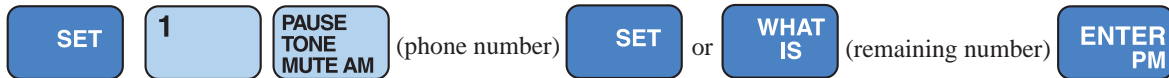
> **NOTE**: Each pause, pound (#) or asterisk (*) tone is counted as one digit toward the total of 32 digits allowed.

Below is an example of a dialout phone number calling to a beeper. Note that more than one pause may be needed. It is advisable to test a phone number dialing to a beeper more than once.

Beeper example:

| SET | 1 | PAUSE TONE MUTE AM | (phone number) | PAUSE TONE MUTE AM | PAUSE TONE MUTE AM | (Sensaphone's phone number 4-digit code) | ENTER PM |
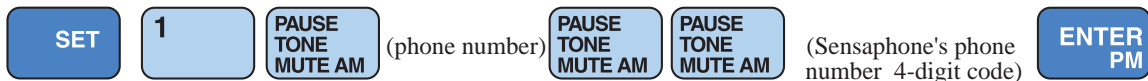
RINGS UNTIL ANSWER & TAD COMPATIBILITY

The rings until answer is the number of rings that must occur before the Model 4100 answers the phone when you call in for a status report. This value can be from 1 to 79. The default value is 4.

To program rings until answer:

1. Press the SET key
2. Press the RINGS key
3. Using the number keys, enter a value

   The 4100 will recite the digits as you press them

4. Press ENTER. The 4100 will say "Enter."

| SET | 0 RINGS | (enter value) | ENTER PM |

TAD Compatibility stands for Telephone Answering Device Compatibility. This means that the Model 4100 can be used on the same telephone line with telephone answering devices, such as answering machines and modems. In normal operation (see NOTE below), when your phone is called, the answering machine will always answer first and take a message. The TAD feature provides a method for you to bypass the answering machine and access the 4100 when you call in for a status report. This feature is used in conjunction with RINGS UNTIL ANSWER.

To use TAD:

1. Program the rings until answer (see above) to a greater number than the rings until answer on your answering device. For example, 4100 rings = 5, device rings = 3.

2. Press the SENSOR ON/OFF key

3. Press the TAD key
    The 4100 will say "On." (If the 4100 says "Off," repeat steps 2 and 3.)

4. Using the above example, when you call in, let the phone ring twice and then hang up. The 4100 recognizes that a call was made and activates a 3-minute internal timer. This allows you 3 minutes to call back and get the unit instead of the answering machine.

5. Call back within 3 minutes. The 4100 will override the answering device on the callback and answer the phone on the first ring.

| SENSOR ON/OFF | 0 RINGS |

NOTE: When you are calling the unit back to acknowledge an alarm and the TAD is enabled, the Sensaphone will answer on the first ring. See Chapter 5, "Alarm Acknowledgement.."

To interrogate rings until answer and TAD:

1. Press the WHAT IS key

2. Press the RINGS/TAD key

    If TAD is enabled, the 4100 will simply recite the rings until answer value. (Above example: "Five.") If TAD is disabled, the 4100 will say "Off" and then recite the rings until answer value. (Above example: "Off. Five.")

| WHAT IS | 0 RINGS |

LISTEN-IN TIME

The listen-in time is the amount of time you can listen to sounds at the unit site during a status call in. The programmable range is 1 to 199 seconds. The default value is 10 seconds. NOTE: The microphone is also used to monitor high sound level. See Chapter 4, "High Sound Alarm Enable/Disable."

To program the listen-in time:
1. Press the SET key
2. Press the SOUND key
3. Using the number keys, enter the seconds
   The 4100 will recite the numbers as you press them.
4. Press ENTER

   The 4100 will say "Enter."

SET **8 SOUND** (enter seconds) **ENTER PM**
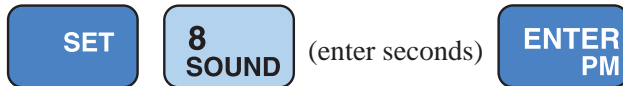
To interrogate:
1. Press the WHAT IS key
2. Press the SOUND key

   If the High Sound Alarm is ON (see page 30), the 4100 will recite the listen time in seconds programmed. If the High Sound Alarm is OFF, the 4100 will say "Off," and then will recite the time in seconds programmed.

WHAT IS **8 SOUND**

THE SECURITY CODE

The security code is a 4-digit number that you may program to prevent unauthorized access to the Model 4100's programming. Locally, when the security code is employed, it will lock the keyboard, not allowing the programmed parameters to be changed or the unit to be turned off. You may only interrogate the unit using the WHAT IS key. You must unlock the keyboard to program the unit.

To program the security code:
1. Press the SET key
2. Press the KEY button
   The 4100 will say "Enter security code."
3. Using the number keys, enter up to 4 digits
   The 4100 will recite the digits as they are pressed.
4. Press ENTER
   The 4100 will say "Enter."

SET **KEY** (enter security code) **ENTER PM**
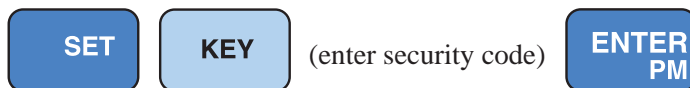
The keyboard is now locked. Anyone who tries to alter the programming will receive the message: "Error two."

NOTE: Unauthorized personnel are prevented from changing any of the Model 4100's programming. However, they are not stopped from using WHAT IS to find out any information. Additional protection may be necessary.

To unlock the keyboard:

1. Press the WHAT IS key

2. Press the KEY button
    The 4100 will say "Enter security code."

3. Using the number keys, enter the digits of the programmed code
    The 4100 will recite the digits as they are pressed.

4. Press ENTER

    If the correct code is entered, the 4100 will say "OK." If the wrong code is entered, the 4100 will say "Error two."

WHAT IS	KEY	(enter security code)	ENTER PM
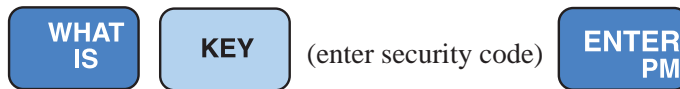
THE UNIT ID NUMBER

The Model 4100 unit ID number can be up to 32 digits long. It is usually the telephone number where the unit is installed. The ID should be programmed AFTER all the sensors are wired to the unit in their normal state. Programming the ID number establishes the normal condition of the alert input in the Model 4100's memory.

To program the ID number:

1. Press the SET key

2. Press the ID# key

3. Using the number keys, enter up to 32 digits for the ID number
    The 4100 will recite the digits as they are pressed.

4. Press ENTER
    The 4100 will say "Enter."

SET	9 I.D.	(enter number)	ENTER PM

To interrogate:

1. Press the WHAT IS key

2. Press the ID# key
    The 4100 will say "This is telephone number," then recite the ID number and provide a status report. (See Chapter 5, "Status Report," for more information.)

WHAT IS	9 I.D.

To delete the ID number:

1. Press the SET key
2. Press the ID# key
3. Press ENTER
   The 4100 will say "Enter." When interrogating the ID number, the 4100 will say "no number."

[SET] [9 I.D.] [ENTER PM]
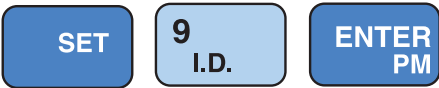
LOCAL VOICE MUTE

When the Model 4100 dials out with an alarm, it recites the alarm message over the phone and at the monitor site. The local voice mute command is programmed within the ID number. It allows you to mute the voice at the monitor site during alarm dialouts and status call-ins.

To locally mute the Model 4100:

1. Press the SET key
2. Press the ID# key
3. Press the MUTE key
   The 4100 will beep.
3. Using the number keys, enter up to 32 digits for the ID number
   The 4100 will recite the digits as they are pressed.
4. Press ENTER. The 4100 will say "Enter."

[SET] [9 I.D.] [PAUSE TONE MUTE AM] (enter number) [ENTER PM]

When you interrogate the ID number, the 4100 will say "Hello, this is telephone number," and then beep to indicate that the mute is programmed. It will then continue with the rest of the status report.

TIME

The Model 4100 has a built-in clock. The power-up time is 12 AM. The clock will keep time from 12 AM until you program the current time. It will then keep time from your programmed time. If the AC power fails, the clock will continue to keep time until the battery backup fails. It will then reset to 12 AM when power is restored. An incorrect time is a good indication that the power has failed and the battery has been expended.
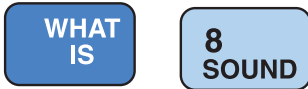
To program the time:

1. Press the SET key
2. Press the TIME key

3. Using the number keys, enter the correct time
    The 4100 will recite the digits as they are pressed.

4. If the time is AM, press the AM key
    The 4100 will beep.

4.1 Then press ENTER. The 4100 will say "Enter."

5. If the time is PM, just press ENTER/PM.

| SET | TIME | (enter number) | [PAUSE TONE MUTE AM] | ENTER PM |
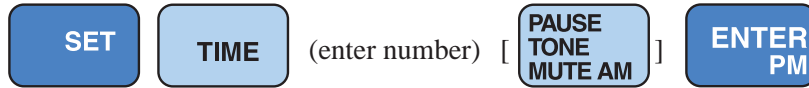
To interrogate the time:

1. Press the WHAT IS key

2. Press the TIME key
    The 4100 will recite the time.

| WHAT IS | TIME |

PRE-PROGRAMMED COMMUNICATIONS FEATURES

The following communications features are pre-programmed at the factory. The values cannot be reprogrammed by the user.

CALL DELAY TIME—The call delay time is the length of time that the Model 4100 will wait after an alarm is recognized before it starts the dialout sequence. The Model 4100 will wait 30 seconds after an alarm condition exists before it makes a phone call. This time is only for the first call.

INTERCALL DELAY TIME—If the alarm is not acknowledged on the first call, the intercall delay time is the amount of time that the Model 4100 waits before dialing the next Phone number. The Model 4100 waits 1 minute before dialing the next Phone number in the sequence if the alarm is not acknowledged.

VOICE REPETITIONS—The voice repetitions is how many times the Model 4100 will repeat the alarm message per phone call when it dials out. The Model 4100 will recite the alarm message 4 times per phone call.

CHAPTER 4
ALARM PROGRAMMING

This chapter explains the monitoring capabilities and keyboard commands to program the monitoring functions of the Model 4100. This includes:

- Enable/disable inputs
- Input recognition time
- Configure input normality (The ID Number)
- Enable/disable temperature input
- Temperature limits
- AC power monitoring enable/disable
- AC power recognition time
- High sound monitoring
- Disable high sound alarm
- De-sensitize sound monitoring

ENABLE/DISABLE INPUTS

This function allows you to enable or disable an input (1-3, AUX TEMP) from dialing out during an alarm. An enabled input will respond to an alarm and allow dialout. A disabled input will not initiate a dialout. This command is useful while you are wiring your inputs (see pages 9-10), or at any other time you would like the alarms to be ignored. The default setting for all inputs is enabled *(on)*.

To enable/disable inputs:

1. Press the SENSOR ON/OFF key
2. Press the number of the input to enable/disable (1, 2, 3, or 4 for AUX TEMP)
   The unit will say "Off" to indicate disabled or "On" to indicate enabled.
3. Repeat key sequence to change

To interrogate:

1. Press the WHAT IS key
2. Press the number of the input (1-4)
   If the input is enabled, the 4100 will recite the Phone number programmed for that digit. If it is disabled, the unit will say "Off" and then recite the Phone number.

CONFIGURE INPUT NORMALITY

Inputs must be configured as normally open or normally closed. The default for all inputs is open. See Chapter 2, "Alert Inputs," for further explanation on wiring inputs. It is useful to disable inputs prior to wiring to prevent an alarm dialout. After this is done, the Model 4100 must initialize the inputs as normal. Do this by programming the unit's ID number. When the ID number is set, the Model 4100 looks at the 4 inputs and establishes the present open/closed state as normal. Any change from that is an alarm. The ID number is also (usually) the unit phone number. This number is recited during a status report and alarm dialout report.

To set the status of the inputs as normal:

1. Disable the input
2. Wire the input
3. Program the ID#
4. Enable the input.

The inputs are now considered normal. If a normally closed input becomes open, an alarm will occur. If a normally open input becomes closed, an alarm will occur.

Interrogating the ID number:

1. Press the WHAT IS key
2. Press the ID# key
   The Model 4100 will say "Hello, this is ..." followed by a recitation of the programmed ID number and a status report.

See Chapter 5, page 34 for a more detailed description of the status report.

INPUT RECOGNITION TIME—The input recognition time is the length of time an input must have an alarm continuously before the Model 4100 will recognize the condition. If an alarm exists and then clears within the recognition time, it is never considered an alarm. Inputs 1, 2, and 3 have a recognition time of 200 milliseconds. If the alarm exists for 200 milliseconds, the Model 4100 will recognize it as an alarm and initiate a dialout. The recognition time for the AUX TEMP/input 4 is 3 seconds.

TEMPERATURE LIMITS

The temperature limits are the high and low readings at the temperature sensor that will cause the Model 4100 to dial out with an alarm message. The range of the temperature input to measure temperature is -20° F to 150° F.

To program the high temperature limit:

1. Press the SET key
2. Press the HIGH TEMP key
   The 4100 will say "Enter high temperature limit."

3. Using the number keys, enter the value for the high temperature limit
    The 4100 will recite the digits as they are pressed.

4. Press ENTER. The 4100 will say "Enter."

SET   6 H TEMP   (enter value)   ENTER PM

To program the low temperature limit:

1. Press the SET key

2. Press the LOW TEMP key
    The 4100 will say "Enter low temperature limit."

3. Using the number keys, enter the value for the low temperature limit
    The 4100 will recite the digits as they are pressed.

4. Press ENTER. The 4100 will say "Enter."

SET   5 L TEMP   (enter value)   ENTER PM

NOTE: Do not set the limits too close the normal room temperature. Minor changes in temperature would cause frequent and unnecessary alarm dialouts.

To interrogate the temperature limits:

1. Press the WHAT IS key

2. Press the HIGH TEMP key to check the high temperature limit. Press the LOW TEMP key to check the low temperature limit.

If the high or low temperature alarm is enabled (see below), the 4100 will recite the programmed limit in degrees. If the high or low temperature alarm is disabled, the 4100 will say "Off" and then recite the programmed limit in degrees.

WHAT IS   6 H TEMP   (or)   5 L TEMP

ENABLE/DISABLE TEMPERATURE INPUTS

This feature allows you to enable or disable the dialout for the high and low temperature alarms. When a high or low temperature alarm is enabled, it will cause a dialout for an alarm. When a high or low temperature alarm is disabled, it will not cause a dialout. The default is enabled (on).

To enable/disable the high temperature alarm:

1. Press the SENSOR ON/OFF key

2. Press the HIGH TEMP key

The 4100 will say "Off" to indicate that the high temperature alarm is disabled, or "On" to indicate that it is enabled.

3. Repeat key sequence to change

SENSOR ON/OFF   **6 H TEMP**

To enable/disable the low temperature alarm:

1. Press the SENSOR ON/OFF key

2. Press the LOW TEMP key
The 4100 will say "Off" to indicate that the high temperature alarm is disabled, or "On" to indicate that it is enabled.

3. Repeat key sequence to change

SENSOR ON/OFF   **5 L TEMP**

To interrogate:

1. Press the WHAT IS key

2. Press the HIGH TEMP key to check the high temperature alarm. Press the LOW TEMP key to check the low temperature alarm.

If the high or low temperature alarm is enabled, the 4100 will recite the programmed limit in degrees (see Temperature Limits above). If the high or low temperature alarm is disabled, the 4100 will say "Off" and then recite the programmed limit in degrees.

WHAT IS   **6 H TEMP**   (or)   **5 L TEMP**

AC POWER MONITORING ENABLE / DISABLE

The Model 4100 monitors AC power failure. This command enables or disables the power failure detection feature. When enabled, the Model 4100 will monitor power and dial out if a valid failure occurs (see AC POWER RECOGNITION TIME below). When disabled, the Model 4100 will not dial out for a power failure alarm. The default setting is enabled (on).

To enable/disable the AC power failure alarm:

1. Press the SENSOR ON/OFF key

2. Press the ELECT key
The 4100 will say "Off" to indicate that the power alarm is disabled, or the 4100 will say "On" to indicate that the power alarm is enabled.

3. Repeat key sequence to change.

SENSOR ON/OFF   **7 ELECT.**
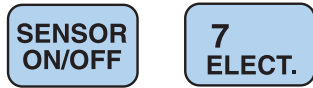
To interrogate:

1. Press the WHAT IS key
2. Press the ELECT key

If the power alarm is enabled, the 4100 will simply recite the programmed power recognition time (see below). If the power alarm is disabled, the 4100 will say "Off" and then recite the programmed recognition time.

WHAT IS   **7 ELECT.**
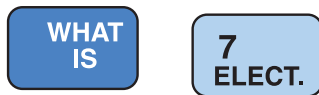
AC POWER FAILURE RECOGNITION TIME

The power recognition time is the length of time that a power failure must exist continuously before the Model 4100 will recognize it as an actual alarm and start the dialout sequence. The default setting is 100 seconds. You may program the power recognition time from 1 to 199 seconds.

To program the power recognition time:

1. Press the SET key
2. Press the ELECT key
3. Using the number keys, enter the number of seconds
   The Model 4100 will recite the digits as they are pressed
4. Press ENTER
   The Model 4100 will say "Enter."

SET   **7 ELECT.**   (enter seconds)   **ENTER PM**
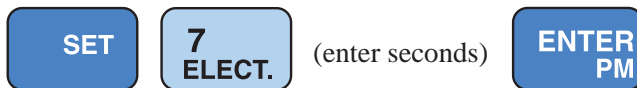
To interrogate:

1. Press the WHAT IS key
2. Press the ELECT key

If the power alarm is enabled (see AC Power Monitoring), the 4100 will recite the programmed power recognition time. If the power alarm is disabled, the 4100 will say "Off" and then recite the programmed power recognition time.

WHAT IS   **7 ELECT.**

POWER-OFF TIME ACCUMULATOR

Each time the AC power fails, the Sensaphone accumulates the time in its memory. It then will state the total amount of time that the power has failed in its status report. The off-time accumulator will calculate the length of power failure for 255 minutes and 59 seconds. After that, the unit will reset to 0. If the AC power and the battery back-up fail, the accumulator will reset to 0. To manually reset the power-off time, press **OFF**, and then **ON**.

HIGH SOUND ALARM ENABLE / DISABLE

The Model 4100 monitors sound through the built-in microphone. When the current sound level suddenly exceeds the normal sound level, the high sound alarm causes the Model 4100 to dial out. The increased sound level must exist for at least eight seconds. The default for the high sound alarm is enabled (on). The microphone is also used to listen in to on-site sounds. See Chapter 3, "Listen-In Time," for settings.

> **NOTE**: Disabling the sound alarm does not affect listen-in capability.

To enable/disable the high sound alarm:

1. Press the SENSOR ON/OFF key

2. Press the SOUND key
   The 4100 will say "Off" to indicate disabled. The 4100 will say "On" to indicate enabled.

3. Repeat key sequence to change.

To interrogate:

1. Press the WHAT IS key

2. Press the SOUND key

If the high sound alarm is enabled, the 4100 will recite the listen-in time programmed. If the high sound alarm is disabled, the 4100 will say "Off" and then will recite the listen-in time programmed.

SOUND ALARM MONITORING SENSITIVITY

This command allows you to change the sensitivity of the sound monitoring feature. This is useful to desensitize the Model 4100 if it is installed in an area with a relatively high sound level, or where loud noises occur but are not associated with an alarm. Also, this feature allows you to increase sensitivity in situations where you want to monitor lower sound

levels. The sensitivity range for sound alarm monitoring is 0 to 62 and is changed in increments of 2. The value 2 makes the microphone the MOST sensitive to sound changes. (**NOTE**: The value 0 is invalid.) The value 62 makes the microphone the LEAST sensitive to sound. The default value is 8.

To increment the sound alarm sensitivity by 2:

1. Press the SENSOR ON/OFF key
2. Press the ID# key
   The 4100 will recite a number value. When the value reaches 62, the next value is set to 0. **NOTE**: Do not use 0. Set to the value 2.
3. Repeat key sequence to change.

SENSOR ON/OFF   9 I.D.
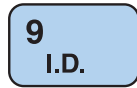
There is no interrogation command for this parameter.

CHAPTER 5
CALL-IN COMMANDS

The following two functions are call-in commands. This means that to utilize them you must call the Model 4100 to execute the command. These features are: alarm acknowledgment and the status report. You may use either a pulse (rotary) or touch-tone phone.

ALARM ACKNOWLEDGMENT

When the Model 4100 dials out with an alarm message, it will request acknowledgment before hanging up. Acknowledgment indicates to the unit that the alarm message has been received. Upon acknowledgment, the Model 4100 will cease the dialout sequence.

There are three ways that an alarm can be acknowledged: locally, by touch-tone phone, or by callback acknowledgment.

1. Local acknowledgment: To acknowledge an alarm locally, press any key on the keypad. Avoid pressing the OFF key because that will disable the unit.

2. Touch-tone acknowledgment: This method can only be used on a touch-tone telephone. At the end of the alarm dialout message, the Model 4100 says "Indicate you have received warning message ..." You have 5 seconds to enter the code "555."

To do this, press the number key 5 on the touch-tone phone keypad three times. The Model 4100 will say: "Warning message received by telephone number *(last number dialed)*." The unit will then hang up and stop the dialout sequence.

If you enter the wrong code or did not enter it within 5 seconds, the 4100 will say: "Dial telephone number (programmed unit phone number) within 60 seconds." The 4100 will hang up. The alarm will not be acknowledged. You have 60 seconds to call the unit back to acknowledge the alarm. Hang up, get a dial tone and dial the 4100's phone number.

3. Callback acknowledgment: This feature allows you to call in to the Model 4100 from a touch-tone or pulse phone to acknowledge the alarm.

To use callback acknowledgment, call the unit back within 60 seconds after receiving the alarm call. If you have TAD enabled (see Chapter 3, "Rings Until Answer & TAD Compatibility"), the Model 4100 will answer the phone on the first ring before the answering device. If TAD is disabled, the phone **must ring 10 times**. This is a precaution against a random alarm acknowledgment. When the 4100 answers the callback, it will give a status report, then say "Warning message received by ..." and recite the telephone number that it last dialed. It will stop the dialout sequence for this alarm.

STATUS REPORT

The status report feature allows you to call in to the Model 4100 and check the temperature, alarm and power status. The unit will answer after the programmed rings until answer. If any alarm conditions exist, the alarm message will be recited. You can also listen in to on-site sounds.

The following is an example of what the unit will recite during a status report:

Hello

This is telephone number 555-1234 (User-programmed unit phone number)

The time is 12:15 PM (Current time)

Alert condition OK (Alarm status. Other responses: 1 EXISTS, 2 EXISTS, 3 EXISTS, 4 EXISTS)

The temperature is 70 degrees (Current temperature)

OK (Temperature alarm condition. Other responses: The temperature is high/low.)

> **Two** (Says this only if a remote temperature sensor is attached to the AUX TEMP input.)

> **The temperature is 70 degrees** (Says this only if a remote temperature sensor is attached to the AUX TEMP input.)

The electricity is ON (Power status. Other response: OFF)

Battery condition OK (Backup battery condition. Other responses: Battery condition low, replace battery.)

Sound level OK (Sound level status. Other response: HIGH)

> **NO NUMBER** (Says this only if no dialout phone numbers have been programmed.)

Listen to the sound level for 10 seconds (User-programmed listen-in time)

The Model 4100 repeats the status report once more and then hangs up.

Have a good day.

CHAPTER 6
THE OUTPUT

The Model 4100 has one TTL, low current signal output. It is used to control a relay device such as a horn or light and is primarily to be used for additional local indication or warning. The output can sink a maximum of 10 mA and source a maximum of 1 mA.

When the Model 4100 begins the dialout alarm sequence, the output will be switched ON. When the alarm is acknowledged, the output is switched OFF. We recommend that you use the Ouptut Controller (FGD-0012) that was specifically designed for use with the Model 4100. The Output Controller provides one dry contact output and a manual override switch for the output signal and LED status. See Appendix B for accessory information.

WIRING THE OUTPUT CONTROLLER

To wire the Output Controller to the 4100:

1. Wire **OUT** on the Output Controller side terminal block to the **OUTPUT** terminal (screw #9) on the 4100.
2. Wire **G** to **COMMON** (screw #10).
3. Wire **12VDC** to the **BATTERY** terminals (screws #15 and #16).

WIRING AN OUTPUT DEVICE TO THE OUTPUT CONTROLLER

An output device can be wired to the Output Controller as either **normally open** or **normally closed**. Wire a normally open device to the Output Controller terminals **1** and **2**. Wire a normally closed device to the Output Controller terminals **1** and **3**. The relay can switch up to 2 A at 30 VDC or 1 A at 110 VAC. Two examples follow.

External AC/DC Power Supply
− +

4100 TERMINAL BLOCK

OUTPUT

COMMON

BATTERY

OUT G 12VDC

1 2 3

CM001 OUTPUT CONTROLLER
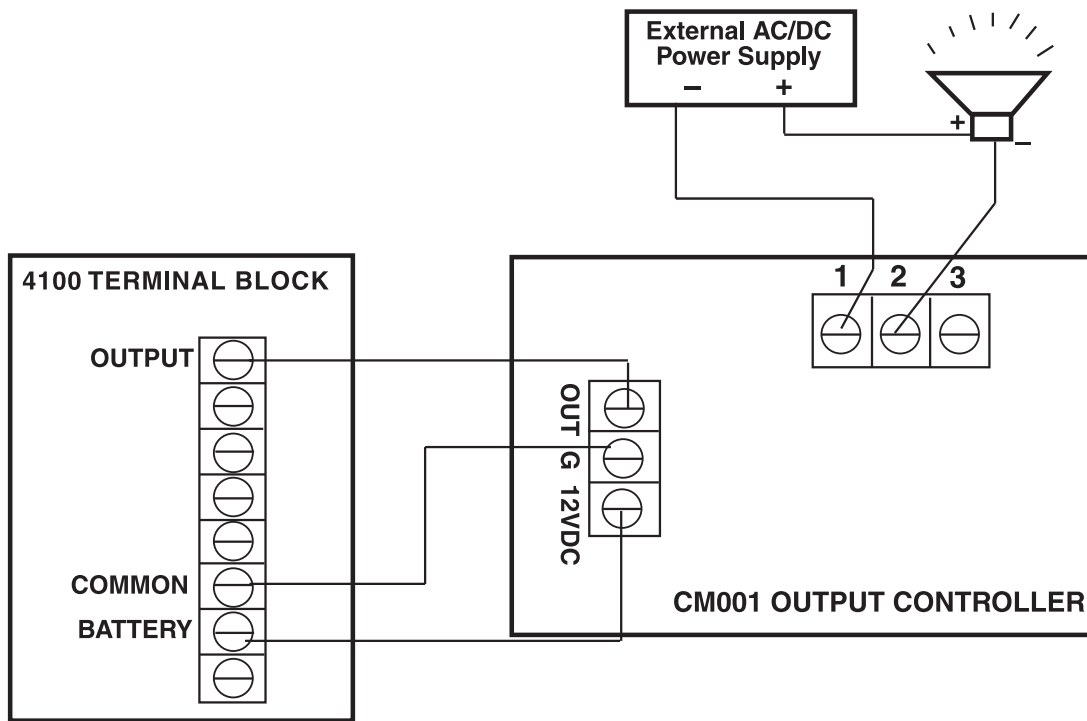
OUTPUT DEVICE POWERED FROM AN EXTERNAL POWER SUPPLY

12VDC OUTPUT DEVICE
− +

4100 TERMINAL BLOCK

OUTPUT

COMMON

BATTERY

OUT G 12VDC

1 2 3

CM001 OUTPUT CONTROLLER
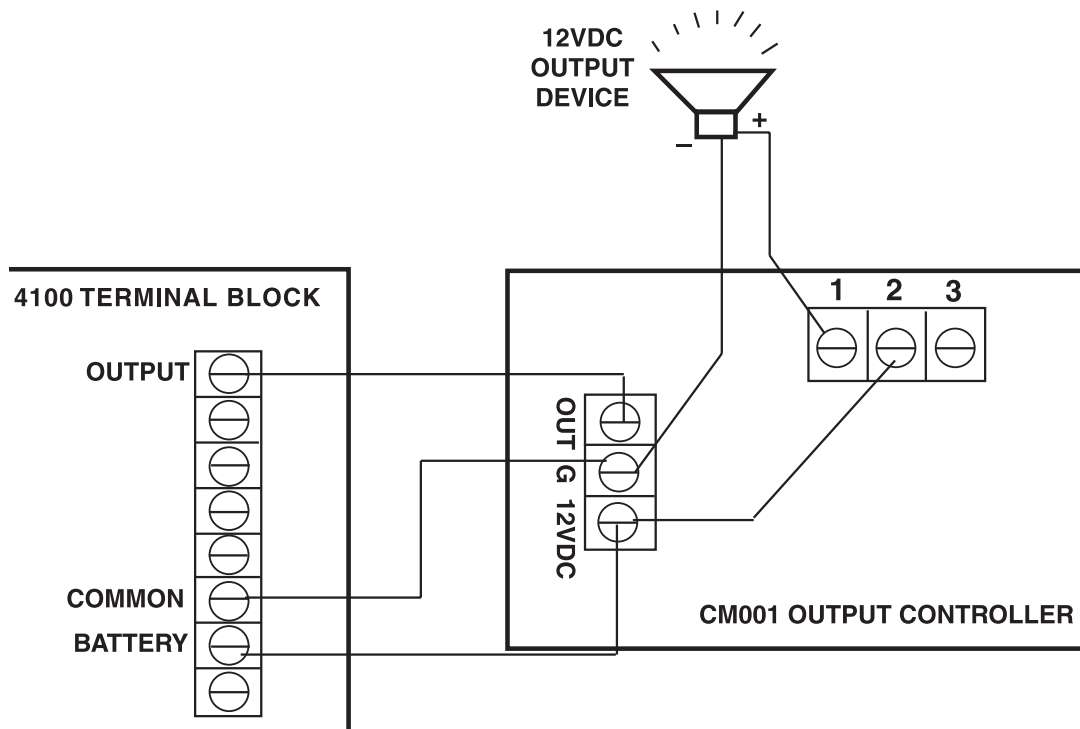
OUTPUT DEVICE POWERED FROM SENSAPHONE

CHAPTER 7
PROGRAMMING SUMMARY

After the Model 4100 has been completely installed, you are ready to begin programming the unit. The following is a recommended sequence for the programming commands. Refer to the programming chapters 3 and 4 for explanation on how to use each command. This section is intended to help you understand the commands and organize your programming.

MONITORING FUNCTIONS

1. Disable inputs 1-3, 4 (AUX TEMP). This action will allow you to wire the dry contact inputs without tripping an alarm dialout.

2. Wire inputs 1-4. See INSTALLATION.

3. Configure inputs as normally opened or normally closed. This command determines what will be the normal or alarm state for each input 1-4. When you set the ID number, the present open/closed state of your sensors will be considered normal. For example, if you have input 1 wired as a closed input, setting the ID number will make it normally closed. If the input is opened, an alarm will result.

4. Enable inputs 1-4. The inputs are now operational and monitoring chosen conditions.

5. Disable high/low temperature inputs. This will allow you to set limits without causing an alarm dialout.

6. Set high and low temperature limits. Be careful not to set the temperature limits too close to normal room temperature to avoid dialouts for minor/temporary changes in temperature.

7. Enable temperature inputs. The temperature inputs are now operational.

8. Enable or disable AC power monitoring. The Model 4100 is capable of monitoring AC power failure. This feature is built-in, no external wiring is required. You can enable or disable the power detection. When enabled, the Model 4100 will dial out for a power failure. When disabled, the 4100 will not dial out if a power failure occurs.

9. Power recognition time. This is the length of time a power failure must exist before the 4100 considers it an alarm.

10. Enable or disable high sound level alarm. The Model 4100 monitors sound through the built-in microphone. When the current sound level suddenly exceeds the normal sound level, the high sound alarm causes the Model 4100 to dial out. When disabled, the 4100 will not dial out for high sound.

11. Sensitize/desensitize sound monitoring. This command allows you to make the micro phone more sensitive or less sensitive to sound at the unit location. This helps to eliminate false sound alarms if the sound level is normally high.

COMMUNICATIONS FUNCTIONS

The Model 4100 is now prepared for alarm monitoring. Next, you must program your phone numbers and related dialing specifications.

1. Dialout telephone numbers. The Model 4100 can dial up to 4 phone numbers, 32 digits each. These phone numbers are dialed sequentially, so program the first number you want called as Phone #1, the second as Phone #2, etc.

2. Tone or pulse dialing. The Model 4100's phone numbers can be dialed out in either Tone or pulse. This feature is programmed directly into your dialout Phone numbers.

3. Special dialing. The 4100 is capable of dialing out to some special phone and beeper systems that require pound (#) or asterisk (*) tones as part of the phone number. Remember that each # or * counts as one digit toward the total of 32 digits.

4. Rings until answer. This parameter determines how many times the 4100 will allow the phone to ring before answering. For example, if you set this to 4, the 4100 will wait 4 rings and then answer when you call in. This feature is also used in conjunction with the Telephone Answering Device (TAD) compatibility.

5. TAD compatibility. The Model 4100 can operate on the same phone line as other telephone answering devices such as a modem or answering machine. Enable this feature only if an answering device in on the same phone line as the 4100. See pages 18 -19 for more information.

6. The unit ID number. This 32-digit number should be programmed as the unit phone number. Programming this number also establishes the normal condition of the alert inputs.

7. Local voice mute. This parameter allows you to mute the local voice when the Model 4100 dials out for an alarm or is called for a status report. When the mute is on, the dialout alarm messages and call-in status messages will not be heard at the monitor site. When the mute is off, the Model 4100 will repeat the message locally as well as over the phone.

8. Time. This command allows you to set the 4100's built-in clock.

9. Listen-in time. The Model 4100 allows you to listen in to sounds at the monitor site through its built-in microphone when you call in for a status report. This parameter allows you to determine the amount of time for sound monitoring.

10. Security code. You may program a 4-digit security code to prevent unauthorized access to the 4100's programming. The security code locks the keyboard for programming but allows interrogation.

CHAPTER 8
OPERATION

After installation and programming have been completed, the Model 4100 is fully operational. This chapter explains the sequence of events that occur during an alarm dialout to illustrate how the Model 4100 operates. Part One outlines the basic dialout sequence. Part Two provides a sample programming strategy and details how the 4100 responds in common monitoring applications.

PART ONE: THE ALARM DIALOUT SEQUENCE

There are 3 stages to a complete alarm event: 1) Alarm Recognition, 2) Dialout, 3) Acknowledgment. Note that not all alarm conditions that are sensed by your sensors will go through each stage. For example, some may not meet the recognition time. Others may be acknowledged locally before dialout is started. Refer to Part Two of this chapter for detailed examples.

Alarm Recognition:

1. A sensor wired to one of the alert inputs (1-3, or AUX TEMP if used as a 4th dry contact), or one of the built-in sensors (high/low temperature, sound, AC power) detects an alarm condition.

2. The condition must last long enough to meet the recognition time. (**NOTE**: AC power is programmable from 1 to 199 seconds. Inputs 1, 2, and 3 are preprogrammed to recognize an alarm at 200 milliseconds. The AUX TEMP/Input 4 is preprogrammed to recognize after 3 seconds.)

3. If the condition lasts the recognition time, the 4100 considers it a valid alarm and begins the dialout alarm sequence. Go to Dialout.

4. If the condition does not last the recognition time, the 4100 will not consider it a valid alarm. The 4100 will not dial out.

Dialout:

1. The 4100 waits 30 seconds (30-second call delay time on first call only. Waits 60 seconds between subsequent calls) after the alarm is recognized before dialing Phone #1. During this time (if local voice mute is OFF), the 4100 will recite an alarm message locally to indicate which input is in alarm. If on-site personnel acknowledge the alarm within the first 30 seconds, the unit will not dial out.

2. The 4100 dials Phone #1. Immediately, it will begin reciting its dialout alarm message. It repeats the message four times. After the fourth recitation, the unit requests acknowledgment.

   NOTE: The 4100 **DOES NOT** wait until the phone is answered to begin repeating its alarm message. It is reciting its message when the line is busy, while the phone is still ringing, or when the call is not answered. If you do not answer the phone until a later ring, it is possible for you to miss hearing the alarm message. Also, if you have an

answering machine, the 4100 will be talking during your outgoing message, so you will not get the full alarm message when the machine begins to record incoming messages.

Below is an example of what the 4100 says during an alarm call:

"Hello, this is telephone number 555-5674. Alert condition one exists.
(4-second listen in time)

Hello, this is telephone number 555-5674. Alert condition one exists.
(4-second listen in time)

Hello, this is telephone number 555-5674. Alert condition one exists.
(4-second listen in time)

Hello, this is telephone number 555-5674. Alert condition one exists.
(4-second listen in time)

Hello, this is telephone number 555-5674.

Indicate you have received warning message."

Acknowledgment:

1. The 4100 will wait 5 seconds for the touch-tone acknowledgment code "555" to be entered. If the code is entered within 5 seconds the 4100 will say:

   "Warning message received by telephone number 555-1111."

   The alarm has been acknowledged and the dialout will CEASE.

2. If the 4100 does not receive the touch-tone code within 5 seconds, it recites the following and then hangs up:

   "Dial telephone number 555-5674 within 60 seconds."

   If the call was answered, the receiver must call the unit back within 60 seconds to acknowledge the alarm. If local voice mute is off, the unit will beep locally during the 60-second wait time.

3. When you call the unit back to acknowledge the alarm, the unit waits 10 rings before answering to protect against random acknowledgment. If you have an answering device on the same line as the 4100 and you have TAD enabled, the 4100 will answer on the first ring. When it answers, the 4100 will recite a status report and then say:

   "Warning message received by telephone number (last number dialed). Have a good day."

   The unit will hang up. The alarm has been acknowledged and the dialout sequence stopped.

4. If the call was not answered, was received by an answering machine or FAX, or was not acknowledged by the receiver within 60 seconds, the 4100 will continue the dialout sequence. It waits 60 seconds before dialing the next phone number. It will dial Phone #2 and repeat the message, dial Phone #3 and repeat the message, dial Phone #4 and repeat the message, dial Phone #1 again, etc. until the alarm is acknowledged.

5. The alarm may also be acknowledged locally by pressing any key on the keypad at any time before or during the dialout sequence to stop the dialout. If acknowledged locally, 4100 will state in the status report:

   "Warning message received by telephone # (ID#)."

   NOTE: It is important that your dialout Phone numbers will be answered by responsible humans *(not answering devices)* who will be able to acknowledge the call and take appropriate action to correct the situation.

Acknowledging the alarm does not correct the alarm situation! The alarm condition will still exist until the sensor is restored to its normal state.

PART TWO: SAMPLE PROGRAMMING STRATEGY

An example programming strategy is outlined below. The communications and monitoring programming are charted to give you a reference for the sample 4100. Next, possible alarm situations that you may encounter in your own application are given to explain the process by which the 4100 will respond.

This section does not provide all the possible circumstances that you may encounter, but it should give you an understanding of how the many features of the 4100 interplay. Refer to Chapters 3, 4, and 5 for instructions on how to program the 4100. See Chapter 6 for a summary of the programming.

Communications programming

Dialout Phone Numbers:

Phone 1: 555-1111 (tone)

Phone 2: 555-1222 (pulse)

Phone 3: 555-1333 (tone)

Phone 4: 555-1444-1234 (beeper)

Rings until answer: 5

Listen-in time: 10 seconds

Security code: 6453

Unit ID number: 555-5674

Local voice mute: OFF

TAD: Disabled

Monitoring programming

INPUT	CONDITION	SENSOR	ENABLED/DISABLED	OPEN/CLOSED
Input 1	water seepage	water detection sensor	enabled	N.C.
Input 2	humidity	humidistat	enabled	N.O.
Input 3	intrusion	magnetic reed switch	enabled	N.C.
AUX/4	temperature	Temp°Alert	enabled	N.O.

LOW TEMP	low temperature 60°F	disabled
HIGH TEMP	high temperature 90°F	enabled
SOUND	high sound level	enabled
AC Power	power failure, recognition time: 180 sec	enabled

EXAMPLES

Each example is divided into three parts: Alarm Recognition, Dialout, and Acknowledgment. Alarm Recognition refers to the events that occur when the monitored condition changes to exceed acceptable limits. The sensor's normality changes state (i.e. normally open to closed) and the 4100 recognizes the condition. Dialout enumerates what happens during the dialing sequence when an alarm condition exists. Acknowledgment illustrates how an alarm is acknowledged.

EXAMPLE 1:

Alarm Recognition:

A water main breaks and begins gushing water into the basement of your building. The water detection sensor placed on the floor detects this and trips an alarm. Input 1 is enabled, so the unit enters the dialout sequence.

Dialout:

1. The Model 4100 waits 30 seconds (preprogrammed call delay time). During this time, the unit recites the message: "Alert condition one exits." (Local mute disabled.)

2. After 30 seconds, the unit dials Phone #1 (555-1111).

3. The unit receives no answer and hangs up.

4. The 4100 waits one minute (preprogrammed intercall delay time) and then dials Phone #2 (555-1222)

5. The call is answered.

6. The 4100 recites the following message four times:

   "Hello. This is telephone number 555-5674.
   Alert condition one exists."
      (4-second listen in time)

7. After the fourth repetition, the 4100 will request acknowledgment:

   "Hello, this is telephone number 555-5674.
   Indicate you have received warning message."

Acknowledgment:

1. You received the alarm call at a rotary (pulse) phone, so you cannot enter the 555 code to acknowledge the alarm.

2. After 5 seconds, the 4100 says:

   "Dial telephone number 555-5674 within 60 seconds."

3. You call the unit back within 60 seconds. After 10 rings (TAD disabled), the 4100 answers and says:

    "Hello, this is telephone number 555-5674.
    The time is 1:15 AM.
    Alert condition one exists.
    The temperature is 70 degrees.
    OK.
    The electricity is ON.
    Battery condition OK.
    Sound level OK.
    Listen to sound level for 10 seconds (listen).
    Warning message received by telephone number 555-1222.
    Have a good day."

4. Once the alarm has been acknowledged, the dialout sequence is stopped.

    NOTE: The 4100 will not dial out for alert condition one until after the sensor is returned to its normal state (N.C.) and is re-tripped.

EXAMPLE 2:

Alarm recognition:

Input #2 is monitoring humidity in the greenhouse. The humidifier malfunctions causing the moisture level to drop below programmed safe levels, endangering delicate ferns. The condition causes the humidistat to trip an alarm. The alert on input #2 causes the 4100 to dial out.

Dialout:

1. After the 30-second call delay time, the 4100 dials Phone #1 (555-1111).

2. The call is answered. The 4100 repeats the following alarm message:

    "Hello. This is telephone number 555-5674.
    Alert condition two exists."
        (4-second listen in time)

3. After the fourth repetition, the 4100 requests acknowledgment:

    "Hello, this is telephone number 555-5674.
    Indicate you have received warning message."

Acknowledgment:

1. The call is to a touch-tone phone. You enter the code "555" within the 5 second time limit. The 4100 says:

    "Warning message received by telephone number 555-1111."

2. The unit will then hang up. The alarm has been acknowledged and the dialout sequence stopped.

    NOTE: The 4100 will not dial out for alert condition two until after the sensor is returned to its normal state (N.O) and is re-tripped.

EXAMPLE 3:

Alarm Recognition:

A magnetic reed switch monitors entry and exit on the back door of a warehouse. After hours, one of your employees returns to the warehouse to complete some unfinished work. He accidentally trips the alarm on the back door. To prevent an unnecessary dialout, he locally acknowledges the alarm by pressing a key on the keypad.

EXAMPLE 4:

Alarm Recognition:

You are monitoring the temperature in your greenhouse using a Temp°Alert wired to the AUX TEMP input. (**Note**: The Temp°Alert is a dry contact sensor. It is not the same as a remote temperature sensor and does not provide an exact temperature reading.) The temperature rises above the set high limit on the sensor and triggers an alarm. The condition lasts longer than 200 milliseconds, so the 4100 recognizes it as a valid alarm. It recites the alert message locally for 30 seconds. The alarm is not acknowledged, so it continues with the dialout sequence.

Dialout:

1. The unit dials Phone #1. It recites its message and requests acknowledgment. It does not receive the touch-tone code within five seconds. The unit requests callback acknowledgment and hangs up.

2. The unit waits 60 seconds but does not receive callback acknowledgment.

3. The unit dials Phone #2 and repeats the alert message-acknowledgment request. It receives no touch-tone acknowledgment or callback acknowledgment.

4. The unit dials Phone #3 and repeats the alert message-acknowledgment request. Again, it receives no acknowledgment.

5. The unit continues and dials Phone #4. This call is to a beeper. The 4100 sends the touch-tone code 1234 to the beeper. You read the code 1234 on your beeper and know to call the 4100 back. Although you cannot hear the recitation, the 4100 repeats its alarm message and requests acknowledgment.

Acknowledgment:

1. Since you received the message on a beeper, you have 60 seconds to call the unit back to acknowledge the alarm and stop the unit from dialing the next number.

2. You manage to get to a phone and call the unit back but not within 60 seconds. The unit waits 10 rings and then answers (TAD disabled).

3. The 4100 provides a status report and then says:

   "Warning message received by telephone number 555-1111.
   Have a good day."

4. Because you did not call within 60 seconds, the unit dialed the next number, Phone #1. When it receives the callback, it always indicates that the message was received by the last dialed number.

5. The alarm is acknowledged and the dialout sequence stopped. The unit will not dial out for an alarm on AUX/input 4 until the condition is cleared and the sensor re-tripped.

EXAMPLE 5:

Alarm Recognition:

The 4100 is installed in an unheated telecommunications switching station. The temperature at night drops below the programmed low temperature limit (60°F). The built-in temperature sensing has been disabled, so the unit does not dial out. (If you called into the unit for a status report, the unit would indicate that a low temperature condition exists.)

EXAMPLE 6:

Alarm Recognition:

A frayed wire sparks and sets off a small fire. The smoke alarm goes off and produces a loud, high-pitched squeal. The 4100 is positioned near the smoke alarm. The noise causes a high sound alarm. The condition lasts the recognition time. For 30 seconds the 4100 recites the high sound alarm message locally and then begins the dialout.

Dialout:

1.   The 4100 dials Phone #1 and repeats the following alarm message four times:

    "Hello, this is telephone number 555-5674.
    Sound level high."
        (4-second listen in time)

2.   Then it requests acknowledgment:

    "Hello, this is telephone number 555-5674.
    Indicate you have received warning message."

3.   The unit does not receive a response.

4.   The 4100 dials Phone #2 and recites the above alarm message-acknowledgment request. Again, the unit does not receive a response.

5.   The 4100 dials Phone #3 and the call is answered.

Acknowledgment:

1.   You received the call at Phone #3 but were unable to enter the touch-tone code within 5 seconds. So, you call the unit back within 60 seconds to acknowledge the alarm. The 4100 provides a status report and says:

    "Warning message received by telephone number 555-1333.
    Have a good day."

2.   The unit hangs up. The dialout is stopped. The unit will not dial out again for a high sound alarm until the condition is cleared and re-tripped.

EXAMPLE 7:

Alarm Recognition:

The building power blacks out at 7:25 AM. One minute later (7:26 AM) the power is restored. Because the power failure did not last for 180 seconds (programmed recognition time), the 4100 does not recognize it as a valid alarm. There is no alarm, therefore there is no dialout.

APPENDIX A
CHECKING YOUR 4100 FOR PROPER OPERATION

We recommend that you test your Sensaphone weekly to be sure it is functioning properly. This will ensure that when a problem arises the Sensaphone will be ready to alert the appropriate personnel. Phonetics, Inc. provides a blank test log for your use at the end of this manual.

There are several tests that can be performed:

1) Call the unit and listen to the Status Report. This will test the unit's ability to answer the phone and speak a message. It will also verify that all of the inputs are reading properly, the alarm conditions are OK, the electricity is on, the microphone is functioning, and the battery is OK.

2) Create an alarm on each input and allow the unit to contact all programmed telephone numbers. This will make sure that the Sensaphone is programmed properly. It will also prepare personnel to respond appropriately when they receive a call from the Sensaphone.

3) Test the battery by unplugging the AC adapter and making sure that the Sensaphone continues to function. Press WHAT IS, then STATUS on the keypad, and listen to the status report. Make sure the report states that "the electricity is off" and "battery condition OK." Keep the AC adapter unplugged so that a Power Failure alarm occurs. Allow the unit to dial all programmed telephone numbers while running on battery backup. Plug in the AC adapter after the unit has finished dialing all of the telephone numbers.

4) If you are using your Sensaphone to listen for a smoke alarm, then be sure to test the smoke alarm to make sure that the Sensaphone picks up the audible signal and triggers a high-sound-level alarm. Allow the unit to dial all programmed telephone numbers.

5) Keep a log of your tests, noting the date and whether the 1104 passed in each category tested. An example of such a log is shown below. *(See "Test Log" at the end of this manual.)*

1104 Test Log			
Date	Inputs	Dialout	Call-in	Tested by
7/1/04	Pass [X] Fail [ ]	Pass [X] Fail [ ]	Pass [X] Fail [ ]	Bob H
7/15/04	Pass [X] Fail [ ]	Pass [X] Fail [ ]	Pass [X] Fail [ ]	Alex G.
7/22/04	Pass [X] Fail [ ]	Pass [X] Fail [ ]	Pass [X] Fail [ ]	Bob H.
	Pass [ ] Fail [ ]	Pass [ ] Fail [ ]	Pass [ ] Fail [ ]	

APPENDIX B
TROUBLESHOOTING

Problems with the Model 4100 can range from simply making sure the unit is plugged in to lightning damage. This appendix is provided to help you pinpoint and solve functioning problems. It is divided into the common areas where problems occur.

They are:

Communications / Dialout problems

Incorrect temperature readings

Microphone problems

Monitoring problems

The following pages describe problems in these areas, possible causes and solutions. If the unit still does not work after you have tried the following solutions, call our Technical Service Department at 610-558-2700 or follow the guidelines for sending the unit in for repair.

Communications / Dialout Problems:

Problem	Possible Cause	Solution
Unit won't dial out.	Phone number incorrectly programmed.	See Chapter 3.
	Incorrect tone/pulse selection.	See Chapter 3.
	Incompatible phone line.	The Model 4100 must be hooked up to a standard 2-wire analog phone line, NOT a digital extension to a phone system. If the unit won't dial out and it is not the two previous problems, try hooking the unit up to a phone line that you know is standard (such as a residential or home phone). If it works, then there is an incompatibility with the other phone system. If this does not work, call Sensaphone Technical Service Department.
Unit won't answer phone.	Incorrect programming of rings until answer.	When used on a proper extension line, some phone systems won't let the phone ring past 4 rings. If rings until answer is greater than 4, you cannot get to the unit. Try setting the rings to less than 4 (see Chapter 3). If it still does not work, then the phone line may be incompatible (see below).
	Incompatible phone line.	The Model 4100 must be hooked up to a standard 2-wired analog phone line, NOT a digital extension to a phone system. If you cannot call into the unit, try hooking it up to a phone line that you know is standard (such as a residential or home phone). If you can call in, then there is an incompatibility with the other phone system. If you still cannot call in, call Sensaphone Technical Service Department.

Incorrect temperature readings:

Problem	Possible Cause	Solution
Temperature reads -20°.	Temperature sensor is either disconnected or has broken wires.	Check wires to temperature sensor and connect or replace wiring.
Temperature reads 150°.	Temperature sensor wires touching or shorted.	Verify and correct wiring.
Temperature inaccurate.		Remove the remote temperature sensor. Move the sensor to a different location.

Microphone Problems:

Problem	Possible Cause	Solution
False high sound alarms.	Remote microphone too close to high sound, unit too sensitive for environment.	Move assembly or adjust sound sensitivity. See Chapter 4.
Sound alarm not tripping.	Remote microphone not close enough to high sound, unit not sensitive enough.	Move remote microphone closer or adjust sound sensitivity. See Chapter 4.

Monitoring Problems:

Problem	Possible Cause	Solution
Alarm status of alert input incorrect.	Incorrect input normality.	Reset input normality. See Chapter 4, "Configure Input Normality."
False power out alarms.	Power recognition time too short.	It is common for the power to have brief interruptions. To prevent a false alarm, increase the power failure recognition time. See Chapter 4.
Does not recognize power failure.	Battery incorrectly installed or no good.	Make sure the battery jumper is properly connected to the battery terminals. See Chapter 2. To verify proper battery function, unplug unit and verify continued operation running on battery only. If the unit does not work, the battery may need servicing. Contact Sensaphone Technical Service Dept.
Unit does not recognize any alarm.	Inputs disabled for alarm.	Enable the inputs for alarm. See Chapter 4.

Battery drains prematurely.	Unit turned off and unplugged.	The battery is still drained and the unit consumes full power when the unit is shut off and unplugged. If you are not using the unit, disconnect the battery jumper. See Chapter 2.
Unit does not seem to respond properly.	Various causes.	Try starting from scratch. Disconnect the battery jumper and unplug the unit. Allow the unit to rest for a few minutes. Plug the unit back in and reconnect the battery jumper. If the unit still does not work, call Sensaphone Technical Service.

APPENDIX C
ACCESSORIES

The sensors listed are the most commonly used input devices for the Sensaphone Model 4100. However, there is a nearly unlimited variety of sensor/switch input devices available at commercial or industrial electrical supply houses, providing a device to monitor virtually any condition that might be required for your business or residential needs.

Contact Phonetics, Inc. at 610.558.2700 for more information.

MODEL NUMBER	SENSOR/SWITCH
FGD-0006	Magnetic Reed Switch
FGD-0007	Passive Infra-Red Detector
FGD-0010	50' two-conductor #22AWG shielded Accessory Cable
FGD-0012	Output Controller
FGD-0013	Spot Water Detector
FGD-0022	Temp° Alert
FGD-0023	ISOTEL Surge Protector
FGD-0027	Humidistat
FGD-0049	Smoke Detector with Built-in Relay
FGD-0054	Power-Out Alert™
FGD-0056	Zone Water Detector with Water Rope
FGD-0063	10 ft. Water Rope for FGD-0056
FGD-0100	Remote Temperature Sensor
FGD-0101	Weatherproof Temperature Probe
FGD-0200	Phonecell SX3e Cellular Phone

APPENDIX D
ERROR MESSAGES

There are four possible error messages that the Sensaphone Model 4100 will give you if you make a detectable error in programming.

ERROR 1   Keys pressed in wrong order.

ERROR 2   Wrong keyboard lock code or no code entered.

ERROR HIGH   A value entered was too high.

ERROR LOW   A value entered was too low.

The model 4100 cannot detect all errors, especially ones dependent upon your programming. For example, it has no way of recognizing whether you have programmed the correct telephone numbers. Work carefully and check each entry by using **WHAT IS.**

APPENDIX E
APPLICATIONS

There are many ways to apply the Sensaphone Model 4100 to your needs. Listed below are some of the ways our customers have used the model 4100, employing the built-in sensors for power failure, high sound level, and temperature, as well as the additional sensors listed in Appendix C.

PURPOSE	LOCATION	SENSORS/INPUTS
Security	Residences Vacation Homes Mobile Homes Businesses Offices Buildings	Magnetic Reed Switches Passive Infrared Motion Detectors
Temperature	Residences Offices Factories Refrigerators HVAC Systems Greenhouses Animal Buildings Poultry Buildings Fans/Blowers Computer Rooms Telecom Rooms	Remote Temperature Sensors Temp•Alert™ Temperature Switches Power Failure Alarm
Fire	Residences Offices Factories Refrigerators HVAC Systems Animal Buildings Poultry Buildings Computer Rooms Telecom Rooms	Smoke/Fire Alarm
Humidity	Laboratories Test Chambers Factories Greenhouses	Humidistats

PURPOSE	LOCATION	SENSORS/INPUTS
Fumes/Gases	Mines Factories Laboratories Boats/Ships Chemical Plants Fan Ventilators Animal Buildings	Fume/Gas Alarm * Power Failure Alarm
Liquid Leaks and Levels	Boats/Ships Pumps/Valves Basements Storage Tanks Computer Rooms Water Treatment Facilities	Water Detection Sensor Power Failure Alarm

*not available from Phonetics, Inc.

APPENDIX F
RETURNING UNIT FOR REPAIR

In the event that the Model 4100 does not function properly and you cannot reprogram it, we suggest that you do the following:

1) Carefully write down your observations of the Model 4100's malfunctioning.

2) Call Sensaphone Technical Service at 610-558-2700 if any instructions are not clear or if you have any questions.

If the unit must be sent to us for servicing, do the following:

1) Unplug the AC power supply from the wall outlet, disconnect the battery jumper at screws numbered 15 and 16, and disconnect all sensors from the alert inputs. Insert the jumper under screw number 16 and hanging over the post screw beside it. Tighten screw number 16 to hold the jumper in place during shipping. Do not try to unscrew or tighten the post screw.

2) Carefully pack unit into its original container or a sturdy shipping box. Be certain to use sufficient cushioning material to avoid damage in transit.

3) To avoid processing delays, be sure to include the following:

  a) Your name, address, and phone number

  b) Model and Serial numbers

  c) A letter explaining the Model 4100's problem

4) Address package to:

SERVICE DEPARTMENT

PHONETICS, INC.

901 TRYENS ROAD

ASTON, PA 19014

5) Ship prepaid and insured via UPS or US Mail to ensure a traceable shipment with recourse for damage or replacement in the event of loss or accident.

Test Log

Date	Inputs		Dialout		Call-In		Battery				Tested By
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	

Date	Inputs		Dialout		Call-In		Battery				Tested By
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	