

SENSAPHONE 2000

User's Manual

Version 4.1.2

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Written and produced by Sensaphone

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Important Safety Instructions

Your Sensaphone 2000 has been carefully designed to give you years of safe, reliable performance. As with all electrical equipment, however, there are a few basic precautions you should take to avoid hurting yourself or damaging the unit:

Read the installation and operating instructions in this manual carefully. Be sure to save it for future reference.

Read and follow all warning and instruction labels on the product itself.

To protect the Sensaphone 2000 from overheating, make sure all openings on the unit are not blocked. Do not place on or near a heat source, such as a radiator or heat register.

Do not use your Sensaphone 2000 near water, or spill liquid of any kind into it.

Be certain that your power source matches the rating listed on the AC power transformer. If you're not sure of the type of power supply to your facility, consult your dealer or local power company.

Do not allow anything to rest on the power cord. Do not locate this product where the cord will be abused by persons walking on it.

Do not overload wall outlets and extension cords, as this can result in the risk of fire or electric shock.

Never push objects of any kind into this product through ventilation holes as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock.

To reduce the risk of electric shock, do not disassemble this product, but return it to Sensaphone Customer Service, or another approved repair facility, when any service or repair work is required. Opening or removing covers may expose you to dangerous voltages or other risks. Incorrect reassembly can cause electric shock when the unit is subsequently used.

If anything happens that indicates that your Sensaphone 2000 is not working properly or has been damaged, unplug it immediately and follow the procedures in the manual for having it serviced. Return the unit for servicing under the following conditions:

1. The power cord or plug is frayed or damaged.
2. Liquid has been spilled into the product or it has been exposed to water.
3. The unit has been dropped, or the enclosure is damaged.

4. The unit doesn't function normally when you're following the operating instructions.

Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.

Do not use the telephone to report a gas leak in the vicinity of the leak.

CAUTION

To reduce the risk of fire or injury to persons, read and follow these instructions:

1. Use only the following type and size battery: 6V 3.4AH sealed lead-acid rechargeable battery
2. Do not dispose of the battery in a fire. The cell may explode. Check with local codes for special disposal instructions.
3. Do not open or mutilate the battery. Released electrolyte is corrosive and may cause damage to the eyes or skin. It may be toxic if swallowed.
4. Exercise care in handling the battery in order not to short the battery with conducting materials such as rings, bracelets, and keys. The battery or conductor may overheat and cause burns.

FCC Requirements

Part 68: The Sensaphone 2000 complies with Part 68 of the FCC rules. On the back of the unit 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 REN's 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 units provided by the telephone company. Connection to party lines is subject to state tariffs.

Should the Sensaphone 2000 cause harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice isn't practical, the telephone company may temporarily discontinue ser-

vice 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 they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

If you experience trouble with this equipment, or you need information on obtaining service or repairs, please contact:

Sensaphone
901 Tryens Road, Aston, PA 19014
610.558.2700
Fax: 610.558.0222

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 A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, 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.

Telephone Consumer Protection Act

The FCC Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic device, including FAX machines, to send a message unless such message contains, in a margin at the top or bottom of each transmitted page or on the first page of the transmission, the date and time it is sent and an identification of the business or other entity, or other individual sending the message, and the telephone number of the sending machine or such business, other entity, or individual. (The telephone number provided may not be a 900 number or any other number for which charges exceed local or long-distance transmission charges.)

To comply with this law, you must enter the following information into

your Sensaphone 2000:

Date & Time as shown in the System Programming section of this manual.

Name and telephone number to identify the source of the FAX transmission as shown in the System Programming section of 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 craftsmanship 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

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 Ringer Equivalence Number (REN) 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 Ringer Equivalence Numbers of all the devices does not exceed 5.0. For Sensaphone 2000, the Ringer Equivalence Number is 0.3.

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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 warrantors 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

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Chapter 1: Introduction

Welcome to the Sensaphone 2000 by Sensaphone. The 2000 is a powerful monitoring, alarm, and data logging system. It can monitor equipment and environmental conditions using 8 universal inputs, plus built-in power failure detection. The Sensaphone 2000 also features a programmable output and a wide variety of communication options: user recordable voice, fax, modem, numeric pager, alphanumeric pager, and internet e-mail. In addition, you can generate a web page based on the information in your 2000 and post it on the internet at a programmable time interval.

The Sensaphone 2000 is a fully programmable environmental monitoring system for unattended or remote applications. The unit will monitor and alarm on (8) universal inputs including: N.O./N.C. contact, 2.8K & 10K thermistor, 4–20mA, 0–5V, run time accumulator, and pulse count. The unit will also monitor AC power and battery condition. The unit also includes a relay output which may be controlled manually through the software, remotely via touch-tone telephone, or automatically using programmable high and low setpoints. On the front of the unit are LED indicators to show the operating status. Each input (including power) has a red status LED indicating the alarm status of the input. There is also a green LED for Battery status, a green LED for System-On status and amber LEDs for Phone and Output status.

The unit can be programmed via a local serial port or remotely by modem using an IBM compatible computer with the Windows operating system and the included Manager 2000 software package. All programming is stored in nonvolatile memory. The manager 2000 software also permits the user to upgrade the internal firmware using the Flash Upgrade feature on the Diagnostic screen. The unit is capable of performing data logging of the (8) universal inputs, power and battery voltage. The data logging is stored in nonvolatile memory. A real-time clock is also included to time stamp logged data and to schedule reports. The unit is capable of sending automatic reports on a programmable time basis (i.e. Send a report every x hours starting at time $xx:xx$). Reports may be sent via fax or e-mail, and will be sent to all destinations programmed to receive reports. The report comprises a cover page and the unit data, which includes the current conditions of each input, power status and battery condition. If the data logger is enabled and programmed to be sent with reports, a data log report will also be sent at this time. You have the additional option of retrieving the data logger information locally or remotely on demand. You can

also have the 2000 call your PC and upload the entire datalogger and eventlogger, storing the information in the Sensaphone 2000 database.

The unit comes in an aluminum enclosure with tabs for wall or panel mounting. Terminal connections for inputs are easily accessible from the front of the unit. The unit is powered via a plug-in adapter and a 6V 3.4AH rechargeable battery is built-in to keep the unit running for up to 10 hours in the event of a power failure. Circuitry in the unit will maintain proper charging of the battery system. The unit is capable of alarming via voice, alphanumeric pager, numeric pager, fax or e-mail. You also have the capability to program a call list for each input as well as four time zones to assign telephone numbers to. You can even monitor the input values in real-time through the local port or on-line via modem.

Programming Interface

Manager 2000 Windows-programming software is included to allow quick and easy access to all of the unit's programmable parameters. Sophisticated features such as realtime input monitoring, graphical bar and gauge displays, polling of multiple units and a database to store and query data logger information, all combine to provide a complete monitoring system. Internet options for creating web pages and delivering e-mail are also included. The Programming and Operation chapters provide step-by-step instructions on how to use all of the unit's features.

Technical Support

If any questions arise upon installation or operation of the Sensaphone 2000, please contact Sensaphone Technical Service Department at the number shown below and have the following information:

- Date of purchase _____
- Serial number _____

Technical support is available from 8:00 AM to 5:00 PM, EST.

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About This Manual

This manual comprises the instructions and commands necessary to install and program the Sensaphone 2000. Additional summary and application chapters are included to help you speed programming and to understand Sensaphone 2000's features. You should thoroughly read this manual to establish a basic understanding of the system and keep it as a reference.

Chapter 2: Installation

This chapter provides information to install the Sensaphone 2000. Please read the entire chapter before starting.

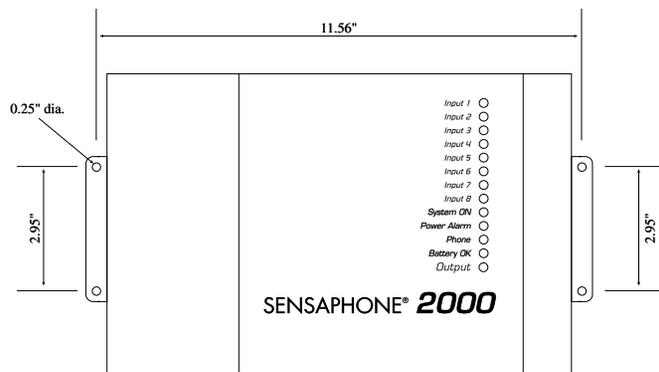
OPERATING ENVIRONMENT

The Sensaphone 2000 should be mounted and operated in a clean, dry environment. The unit is microprocessor controlled and as a result it should not be installed near devices that generate strong electromagnetic fields. Such interference is typically generated by power switching equipment such as relays or contactors. A poor operating environment may result in unwanted system resets and/or system lockup. The temperature range the unit can operate in is 32°F to 122°F (0°C to 50°C). If the unit needs to operate below freezing, a strip heater should be installed nearby.

MOUNTING THE UNIT

When you receive the unit, carefully remove it from the box. Mounting tabs with holes are provided on the left and right sides of the enclosure (see figure below). Mount the unit in a position that allows easy access to the input terminal block, battery compartment, on/off switch and the programming port. Also, there must be a power outlet and telephone jack close to the unit.

CAUTION: The Sensaphone 2000 is a sensitive electronic device. Personnel and work area should be grounded before coming into contact with this device. Do not install the Sensaphone 2000 near strong electrostatic, electromagnetic, magnetic or radioactive fields.



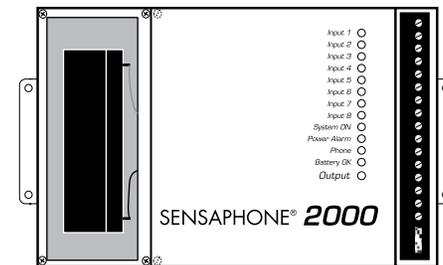
Mounting Dimensions

POWER SURGE PROTECTION

The Sensaphone 2000 can be damaged by power surges and lightning through the telephone line and the power supply. Although the unit has built-in surge protection, we strongly 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.

BATTERY BACKUP

The Sensaphone 2000 includes an internal UPS that automatically switches to battery backup in the event of an AC power failure. The battery in the Sensaphone 2000 is a 6 Volt 3.4AH rechargeable gel cell. This battery will keep the unit operating for approximately 10 hours when fully charged and under normal operating conditions. Note: The unit will not turn on unless AC power is connected, regardless of the condition of the back-up battery.



SERVICE LIFE

Over time and with periodic use, the battery will begin to lose its capacity, resulting in less overall backup time. Under normal operating conditions, three or four years of dependable service life can be expected or between 200 and 1000 charge/discharge cycles, depending on the average depth of discharge, number of discharge cycles, and operating temperature. Eventually, battery replacement will be required to maintain a dependable level of service.

REPLACING THE BATTERY

The battery in the Sensaphone 2000 can be replaced by following the instructions listed below. Be sure to read all safety messages and follow the instructions in order as listed. Several tools will be required to change the battery:

- New 6V battery (Sensaphone part #BAT-0006)
- Philips head screwdriver
- Needle-nose pliers

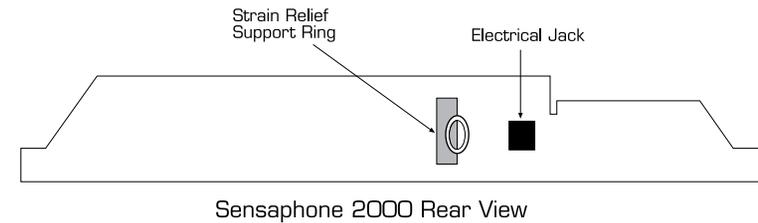
CAUTION: REPLACE BATTERY ONLY WITH A 6V 3.4AH GEL CELL BATTERY.

WARNING: TURN THE POWER SWITCH OFF AND DISCONNECT THE AC POWER CORD AND TELEPHONE LINE FROM THE UNIT.

- Step 1) Locate the power switch on the front side of the unit and turn the 2000 off.
- Step 2) Disconnect the power cord from the back of the unit.
- Step 3) Disconnect the phone line from the front of the unit.
- Step 4) Remove the two screws on the left side that secure the battery cover. Carefully remove the battery cover by sliding it to the left.
- Step 5) Slide the battery out. There will be a red wire (positive) and a black wire (negative) connected to the battery. Using needle nose pliers, remove the connector with the black wire from the battery first. Gently wiggle it off.
- Step 6) Using needle nose pliers, remove the connector with the red wire from the battery.
- Step 7) Attach the connector with the red wire to the positive terminal of the NEW battery.
- Step 8) Attach the connector with the black wire to the negative terminal of the NEW battery.
- Step 9) Slide the battery in to the compartment and replace the cover. Secure the cover with the two screws.
- Step 10) Re-attach the power cord and telephone line.
- Step 11) Turn the Power Switch back on.

Turning the Sensaphone 2000 on

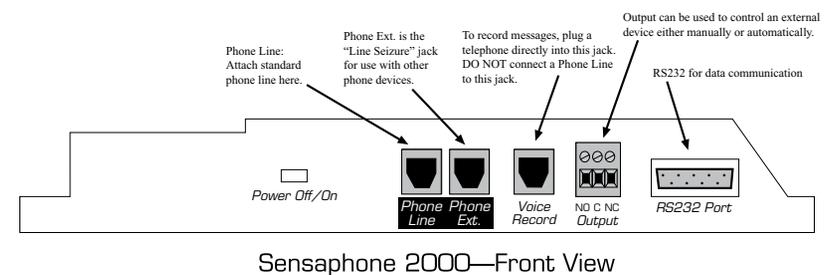
Thread the power supply cord through the strain relief ring next to the power jack, and plug it in. Then plug the transformer into a 115VAC 60Hz outlet. The ring anchors the cord, protecting the plug and jack. Slide the power switch to ON to start the unit. The System-On LED should glow steadily.



It is important to note that when the unit is turned off, all programming is retained in non-volatile memory via the internal 3V lithium battery. The rechargeable battery is not in use when the power switch is off.

TELEPHONE LINE

Connect the Sensaphone 2000's PHONE LINE jack to a standard 2 wire analog phone line. The unit dials using pulse or tone, with loop start only. The Sensaphone 2000 will recognize ringer frequencies from 16 to 60 Hz and will operate with all standard analog telephone systems that accept pulse or tone dialing.



CAUTION: Do NOT connect the unit's VOICE RECORD jack to a live telephone line as this will cause permanent damage to the unit.

Certain private telephone systems and public switching equipment may not accept the unit's dialing or may generate an unacceptable ring signal. In those cases, a dedicated line may be required for the unit.

Consult the supplier of your telephone system if you encounter problems.

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.

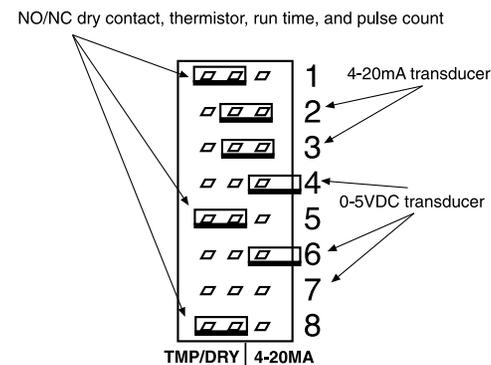
Line Seizure

Line seizure gives the 2000 unit the ability to “seize” the telephone line when it needs to dial out. For example, if an emergency occurs which puts the 2000 in alarm mode, the unit will be able to dial out even if a telephone has been left off the hook. To the right of the PHONE LINE jack is another labeled PHONE EXT. This jack can be used to share a phone line with other devices (telephone, fax machine, modem) and to give the 2000 priority in the event of an emergency. To make use of this feature you must have all the extension devices originate from the PHONE EXT. jack. Whenever the unit must make an alarm phone call, the unit will disconnect any current phone calls and seize the line for its own use. The unit will continue to seize the line until the alarm has been acknowledged.

INPUT CONFIGURATION

The Sensaphone 2000 can accept analog and digital inputs over the range 0-5VDC. It can also accept current from 4-20mA transducers. The input load for current transducers is 220 Ohms.

To set the input configuration, adjust the jumpers located just below the terminal block. Needlenose pliers are recommended for moving shunts. There is one for each input so that each input can be individually configured. For thermistors, N.O./N.C.(normally open/normally closed) dry contacts, run time and pulse count, set the jumper to the left (marked TMP/DRY). For current transducers set the jumper to the right (marked 4-20mA). For 0-5VDC transducers, remove the jumper or simply hang it off one pin for storage purposes. See the figure below.



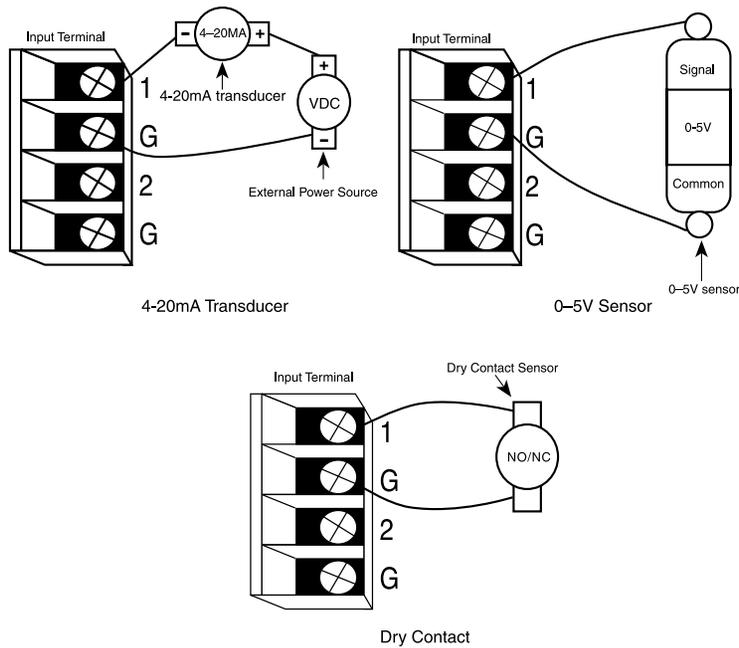
WIRING SENSORS AND TRANSDUCERS

Thermistors: The unit will accept 2.8K and 10K thermistors. These should be wired to an input terminal and the adjacent ground terminal. For compatible thermistors check the thermistor data in the appendices. 2.8K Thermistor temperature range: -125°F to 124°F (-87°C to 51°C); 10K Thermistor temperature range: -90°F to 200°F (-68°C to 93°C).

Dry Contacts: Only contacts which have no voltage or current applied may be used. Connect the contact to an input terminal and an adjacent ground terminal. Do NOT try to monitor a contact that switches 120VAC. This will permanently damage the unit.

4-20mA: A 4-20mA transducer requires you to have an external DC power supply for the transducer. Make sure the input is configured for 4-20mA.

Connect the positive wire of your transducer to the positive terminal of your DC power supply. Connect the negative terminal of the transducer to an input terminal on the Sensaphone 2000. Connect the negative terminal from your power supply to the adjacent ground terminal on the 2000.



The different sensor types connected to the terminal block.

LED INDICATORS

The LEDs provide on-site alarm and status information. Listed below are descriptions of how the LEDs work.

Inputs 1–8 and Power:

LED Off: Input OK

LED Blinking: Unacknowledged alarm exists

LED On: Acknowledged alarm exists

Battery:

LED On: Battery condition OK

LED Blinking: Battery condition low

LED Off: Battery very low

System-On:

LED On: System power on

LED Off : System power off

Phone:

LED On: Unit is communicating on the phone line

LED Off: Unit is not using the phone line

Output:

LED On: The output relay is ON

LED Off: The output relay is OFF

Chapter 3: Communications

This section describes how to install and configure the Sensaphone 2000 Windows Software for your computer and modem.

INSTALLING AND STARTING THE SOFTWARE

Minimum requirements

- 486 or better computer (Pentium recommended)
- 10 MB of free disk space
- 32 MB or more of RAM
- CD ROM drive
- Microsoft Windows™ 98, ME, NT, 2000 or XP
- Monitor
- Mouse
- Modem

Installation

The Manager 2000 software is easy to install. Make sure that all Windows applications are closed before attempting to run Setup. If you encounter problems during installation, please call Sensaphone Technical Support at (610)558-2700.

The Sensaphone 2000 Software for Windows will install to a directory named *C:\S2000*, unless you choose to change the directory name.

Windows™ 98 (or greater) Installation

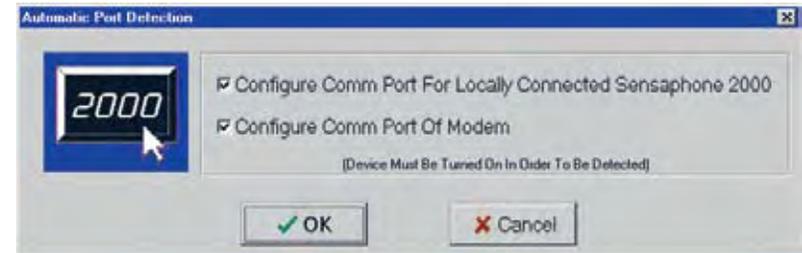
1. Start Windows.
2. Insert the Sensaphone 2000 CD ROM. The installation program should run automatically. Follow the prompts as directed. Be sure to also install the Borland database when prompted.

If the software does not install automatically, then click the *Windows Start* button, and select *Run* and type in *d:/setup.exe*. Click *OK*. Follow the prompts as directed. Be sure to install as well the Borland database when prompted.

3. Reboot your computer when the installation is complete.

Running the Software

To run the software, double-click the 2000 icon. When the software runs for the first time a configuration screen will appear. This will automatically configure your modem settings and local serial port if selected. If you have an external modem, make sure it is ON before you proceed. If you would prefer to configure the software manually, you may do so after installation. When you start the software you'll see the main menu and toolbar. These menus and tools will allow you to open new 2000 units, communicate with existing 2000 units, observe real-time input values and numerous other features. Pictured below is the Automatic Port Detection firm.



Automatic Port Detection screen

Sensaphone 2000 Menu Bar

The menu bar at the top of the window lists menu commands for selecting a unit, configuring your communication ports, sending and receiving programming, enabling automatic features and other functions. You can choose these commands by clicking them with the mouse. Many frequently used commands are also available as tools on the Toolbar.



Menu Toolbar

The following table briefly describes each menu. Shortcut keys that you can use to display each menu are included in parentheses next to the menu names.

Menu name	Functions under this menu...
File (Alt, F)	Adding new units, opening units, closing units, loading data, saving data, deleting data, printing information, exiting.
Config (Alt, C)	Communications Setup, Communications Status, Advanced Comm Setup, Options
Program (Alt, P)	Inputs, Destinations, System, Reporting, Output
Functions (Alt, U)	Data Logging, Auto Answer, View Events, Diagnostics
Polling (Alt, O)	Unit Schedule, Enable, Internet Options
Window (Alt, W)	Cascade, Tile, Arrange Icons, Minimize all
Help (Alt, H)	About, Help

Communications Setup

The software will communicate to your 2000 through your computer's local serial port or through your modem. These communication paths must be properly configured for a connection to be established. (If you ran the auto-configure option at start-up, you may skip over this section.) To configure the communications settings manually, click on *Configuration>Communications Setup*.

Local Port Configuration

Select the appropriate serial port to communicate with the 2000. This must be a serial port on your computer that is unused and can be connected to the Sensaphone 2000's RS232 port.

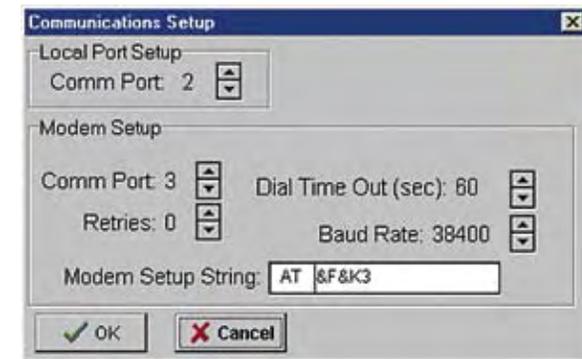
Modem Setup

Select the serial port that communicates with your modem and select the maximum baud rate of your modem. This will typically be all that is required to configure your modem; however, additional options have been included and are described below.

Retries: This is the number of times Manager 2000 will attempt to call a Sensaphone 2000 if it encounters a busy signal or is unsuccessful at making a connection during any manual attempt to call out.

Dial Time Out: If a modem connection is not established with a Sensaphone 2000 before this time expires, Manager 2000 software terminates the call.

Modem Setup String: Manager 2000 allows you to enter a setup string using the AT command set. These are usually only needed if you are having trouble getting your modem to connect to a Sensaphone 2000 unit. See your modem Operator's Manual for a list of AT commands supported by your modem. Note that Manager 2000 software will send the "AT" part of the command automatically.



Communications Setup form

Communication Status

The Communication Status screen provides information regarding communication performance, communication errors and text descriptions of communication activity in real time. The screen is useful for troubleshooting communication problems. The parameters for error thresholds and packet timing are adjustable in the Advanced Comm Setup menu.

Communication Status form

Advanced Comm Setup

The Advanced Comm Setup form can be used to tune and customize the communication performance of Manager 2000. Typically you will not need to change these parameters for any reason.

advanced comm setup

Listed below is a description of each of the parameters on the form:

Status Level: This parameter determines which messages will appear in the display on the Communication Status form. There are eight levels of messages:

- Level 0: Messaging disabled
- Level 1: Adds significant events and errors
- Level 2: Adds modem events, writes to unit & file messages
- Level 3: Adds packet errors, advanced modem messages, download messages
- Level 4: Adds notification of read from unit

- Level 5: Adds packet data
- Level 6: Adds notification of input status polling
- Level 7: Adds polling packet data

Packet Retries: Information flows back and forth between Sensaphone 2000 and your PC in data “packets.” Both automatically check for packet transmission errors. When a bad packet is detected, it gets sent again. Packet Retries determines how many times a packet is sent before a communication error is logged.

Error Threshold: Determines how many consecutive errors will result in a disconnect.

CPU Usage Level: This parameter determines how much processor time is devoted to running the Manager 2000 program. The value can be set between 0 and 9, where a setting of 9 allocates the highest amount of processor time to the Manager 2000 software. If you will be running other programs concurrently with Manager 2000 you may want to set this parameter to a lower number (7 or 8 typically) to provide additional processor time to other applications. Note that setting this value to a lower number will slow communications with your Sensaphone 2000.

Retry Time Out: This is the amount of time Manager 2000 will wait for a response from a Sensaphone 2000 unit before it decides to make another request.

Packet Time Out: The amount of time before the PC gives up and determines that an individual modbus request has timed out. Decreasing this parameter will not increase performance, but increasing the parameter may remove occasional errors.

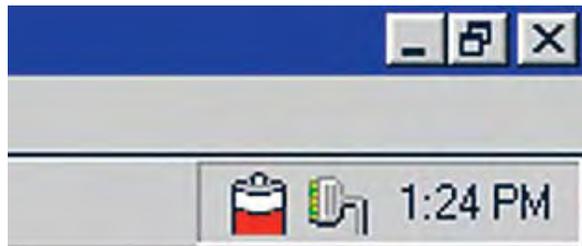
Options

The Options form (under the Configuration menu) allows you to customize the display to your taste.



options screen

You can have the Toolbar and/or the Statusbar be displayed or hidden. You can elect to see the commands as icons with text or as icons only. The Statusbar can be placed at the far right end of the Toolbar *only* if you choose “Buttons have Icons Only” in the Tool Bar box. Otherwise it appears on the bottom right of your screen. (See figure below.)



statusbar (at far right of Toolbar)

The On-Line Timeout, if selected, will automatically disconnect you from the Sensaphone 2000 when there is no mouse movement for the duration of time you specify. The range is 1 minute to 24 hours and the default, when you turn on this feature, is 1 hour.

In the section titled *Incoming Alarm Notification*, you can enable a feature which will play a WAV file when an alarm is received and you can also choose to print alarms. A WAV file is a recorded audio message that Windows can play through your sound card. To make a WAV

file play when an alarm is received, check the box labeled *Audible Notification of Incoming Alarm Call*. A default sound file is included, called *S2KAlarm.wav*, which says “Sensaphone 2000 Alarm exists.” You can click the *Play* button (arrow) to preview the sound file. If you would like to select a different WAV file, click the “...” button and locate another. If you do not have a sound card you can choose to have your computer beep instead by checking the *Beep PC Speaker* option. You can also elect to have incoming alarm information print out automatically by checking the *Print Event Log* button.

Chapter 4: Programming

The Sensaphone 2000 software provides access to all of the unit's programming through point-and-click menus. The unit can be programmed either locally through the serial port or remotely via modem. When you are finished programming, the Sensaphone 2000 Windows software provides the option to save the unit's programming on your computer for backup purposes. You must save this programming information in order to view the programming off-line for any unit. Once you save the programming for a particular unit, you may copy the same information into another unit if desired. A default programming file (defaults.s2k) is included in case you want to restore the unit to factory default settings.

SETTING UP NEW UNITS

When a new unit is added you will be prompted to fill in a Unit Data form. This form holds the unit's description and phone number as well as password information. Sensaphone 2000 features two-level password access: one for programming and one for status. Status-only access allows you to view input values and programming but does not allow you to change any parameters. This is useful if you want to allow multiple users to view the information for this unit but do not want them to be able to change anything.

If this is the first time the unit is being accessed you *must* set up both passwords.

When other users add this unit to their computer you can give them the status password and/or the programming password depending on your requirements. When logging in using the status password the software will automatically send the password during the initial connect sequence. When logging in using the program password you will be prompted to enter the password after connecting. You may also allow the software to automatically log in with the programming password by clicking the "Save program password to disk" box.

Note that if you do not enter a programming password, a default password of "S2000" will be entered for you.

New Unit Data Form

Procedure

1. Click the *Open* button on the Toolbar,  then click the "New" button on the "Open Connection" form. Or, from the menu bar choose *File*, then *New Unit*.
2. Fill in the Unit Description and Phone Number. This sets up a record that the software will reference whenever you want to communicate with or check information about this unit.
3. Enter a status password. If this the first time the unit is being set up, you must also enter a programming password, too, or you will not be able to program the unit.
4. From Login Access Level, select the type of password access you wish to log in with: status or programming.
 - * The **status** password allows viewing access only. No programming changes will be possible. The status password is automatically saved to your hard disk and will be entered for you when you attempt to communicate with the unit.
 - * The **programming** password allows full access to all parameters. By clicking the "Save program password to disk" box, the software will automatically enter the programming password for you when you attempt to communicate with the unit.
5. Click on *OK* to add the new unit to your computer's database.

COMMUNICATING WITH THE SENSAPHONE 2000

This section describes the procedure for communicating with a Sensaphone 2000 unit.

Note: the 2000 can only communicate with one person at a time. This means that if someone is logged on through the RS232 port, the unit will NOT answer a call, nor will it make any calls until the connection is closed. Conversely, if someone is on-line using the modem, you cannot log on through the RS232 port.

Choose *Local* or *Modem* communication.



Connection form

Local Communication

For Local communication you must connect one of your computer's serial COM ports to the 2000's RS232 port.

1. Click the Open button on the Toolbar. The "Open Connection" form will appear.
2. Choose the unit you want to connect with from the text box.
3. Select "Local" Connection Mode.
4. Click on Connect.

Your PC will connect locally to the Sensaphone 2000 unit. If a local connection is not established, see the Troubleshooting section of this manual.

Modem Communication

For Remote communication you must have a modem and a telephone line connected to your computer.

1. Click the Open button on the Toolbar. The "Open Connection" form will appear.
2. Choose the unit you want to connect with from the text box.

3. Select "Modem" Connection Mode.

4. Click Connect.

Your PC will instruct the modem to dial the Sensaphone 2000 unit using the phone number from the Unit Data form. The Sensaphone 2000 will answer the call and establish a connection with your modem. If a remote connection is not established, see the Troubleshooting section of this manual.

Off-line Communication

Off-line communication provides a method of viewing the programming in a unit without being connected. You can also query, view or print information from the Data Logger or Event Logger while off-line. For Off-line communication you must have a data file saved for the unit selected. This can only be created after you have finished programming a unit while on-line and saved the programming. The Manager 2000 software will prompt you to save when you exit, or you can save by clicking *File>Save Data* from the menu bar. A "File Save" box will appear so that you can enter a file name for that unit. Do not change the *.s2k* extension because the software uses this to identify Sensaphone 2000 data files.

MANAGING UNIT PROGRAMMING FILES

The programming parameters of a Sensaphone 2000 unit should be saved to a Data File in your computer. There are several reasons for this:

1. In order to view a unit's programming off-line, you need to save the unit's programming in a Data File.
2. Once you save the programming for a particular unit, you may copy the same information into another unit.
3. It's a good idea to have a backup copy of a unit's programming in case the unit gets damaged.

The Manager 2000 Windows software allows you to view saved Sensaphone 2000 unit information without being connected to a unit. You may view a unit's programming, or view a unit's downloaded Data Logger or Event Logger. In order to view a unit's programming, you need to save the unit's programming in a Data File while still on-line.

To create a Data File:

While you are on-line, choose "File" from the main menu, then select "Save Data." Enter a file name, then click "OK."

This will create an Offline Data File.

To view a Data File Off-line:

1. Click the "Open" button on the Toolbar. The "Open Connection" form will appear.
2. Choose a unit from the text box.
3. Click Edit on the "Open Connection" form. The name of the last Off-Line Data File that was created or saved appears in the lower left corner of the Unit Data form. Click "OK" to accept the file or click the Browse button next to the filename to select another file.
4. Under Connection Mode, select "Off-line."
5. Click "Connect."

The Manager 2000 software will display the programming parameters as if you were connected with a unit. You can view these parameters, but you can't change them.

To delete a Data File:

Choose "File" from the main menu, then select "Delete Data File." Select the file you wish to delete and click "OK."

To load an existing Data File into a Sensaphone 2000 Unit:

1. Establish an on-line connection with a Sensaphone 2000 (either Local or via Modem).
2. Choose "File" from the main menu, then select "Load Data."
3. Select the Data File you wish to load, then click "OK."

The selected Data File will be loaded into the Sensaphone 2000. All existing programming in the unit will be overwritten.

SYSTEM PROGRAMMING

The System form includes the global system parameters that apply to the unit in general. You must be online with the unit to program the System parameters. Once you are online, choose *Program* from the main menu, then select *System*. You can also access the System programming from the Toolbar button labeled *System*. 

Below is a list of the parameters, their default settings and the range of programming for each parameter.

System Settings form

SYSTEM IDENTIFICATION

Unit Phone Number

The Unit's Phone Number is the identification number of the Sensaphone 2000 and can be up to 16 digits long. This is automatically filled in from the information you provided when setting up the unit on your computer. This number must be programmed to be the same as the telephone number where the unit is installed. The Unit's Phone Number serves several purposes:

1. When using your PC and Manager 2000 software to remotely program a Sensaphone 2000, this is the number your modem will dial to contact the unit.
2. It's the first thing spoken by Sensaphone 2000 during any voice call: "Hello, this is (Unit Phone Number)."
3. When Sensaphone 2000 sends a cover page with a Fax transmission or alerts an alphanumeric pager, the Unit's Phone Number is sent as part of the information.

Unit Description

The Unit Description is the text description of the Sensaphone 2000. It can be up to 32 characters long. This is automatically filled in from the information you provided when setting up the unit on your computer. When Sensaphone 2000 sends a cover page with a Fax

transmission or alerts an alphanumeric pager, the Unit Description is sent as part of the basic information.

CLOCK:

Unit Date & Time

The date and time are automatically programmed into a new unit, based on your computer's date and time. This will occur the very first time you go online. If you are in a different time zone you will need to correct the time accordingly.

Auto Daylight Savings

This instructs Sensaphone 2000 to automatically correct the time twice a year for daylight savings.

Programmable settings: On, Off

Default setting: On

DIALOUT SETTINGS:

Dialing Method

The Dialing Method parameter lets you program whether Sensaphone 2000 will dial out in Pulse or Tone. The default setting is Tone.

Dialing Prefix

The "Dialing prefix" box on the System Settings screen is for email prefixes only. If for instance the 2000 is on an office phone system where it had to dial a "9" to get an outside line, entering a "9" here will force the 2000 to dial "9" before dialing the email server phone number.

To enter a specific prefix for dialout types other than email, go instead to the Dialout Destination screen (see "Destinations" section later in this chapter) and enter the prefix with the phone number in the Destination column, following the instructions under "Special Dialing Codes." You must enter each prefix manually for each individual phone number that requires one.

Voice Repetitions

The number of times Sensaphone 2000 repeats the alarm message during a dial out alarm call.

Programmable range: 0–10

Default setting: 3

Maximum Calling Rounds

The maximum number of times Sensaphone 2000 will dial through a list of destinations to attempt to deliver either an alarm or a report.

Programmable range: 0–100 calling rounds

Default setting: 100 calling rounds

Alpha Pager Speed

This is the baud rate of the data connection between Sensaphone 2000 and your alphanumeric pager service.

Programmable settings: 300, 1200, 2400

Default setting: 1200

ACCESS:

Acknowledgment Code

This is the code used to acknowledge an alarm via Touch-Tone telephone.

Programmable range: 0–999999 from 1 to 6 digits long. Note: When using an acknowledgment code with leading zeros, all digits must be included. If the acknowledgment code is 000888, simply entering "888" will NOT acknowledge the alarm.

Default setting: 555

Voice Password

Sensaphone 2000 allows you to record input and ID voice messages. These messages are protected by the voice password. The voice password must be entered on a Touch-Tone phone keypad in order to record voice messages.

Programmable range: 0–999999 from 1 to 6 digits long.

Default setting: 555

Slave ID

This is the modbus address of the Sensaphone 2000 unit. It is set by default and should not be changed unless you are using multiple units that might have the same, and therefore conflicting, ID numbers. The Slave ID can be set to any number between 1 and 247. It should never be set to "0," as this will keep you from communicating with the unit.

Passwords

This command allows you to change Sensaphone 2000's programming and status passwords. You can only change these if you are on-line and have logged on using the programming password.

INCOMING CALLS:

Rings Until Answer

This is the number of times Sensaphone 2000 will let the phone ring before it answers an incoming call.

Programmable range: 1–15 rings

Default setting: 1 ring

Carrier Wait Time

The Carrier Wait Time is the amount of time Sensaphone 2000 will wait for a modem connection when it receives an incoming call.

NOTE: Do not set this parameter too short, otherwise a modem connection may never be established.

Programmable range: 10–60 seconds

Default setting: 35 seconds

E-mail Delivery Settings

These parameters allow you to select between using the Sensaphone e-mail service (fee required) and your own PC to deliver Sensaphone 2000 e-mail. If you have internet access on your computer see Chapter 9 for information on setting up your computer as an e-mail host. Note that if you will not be sending e-mail from your Sensaphone 2000, you can disregard this section.

- Select "Use Default Server Phone #" if you will be using the Sensaphone e-mail server.
- Select "Custom Phone #" if you will be configuring your own computer as an e-mail host. Enter the telephone number of your computer in the space provided. This is the number the 2000 will call when it needs to send an e-mail.

INPUTS

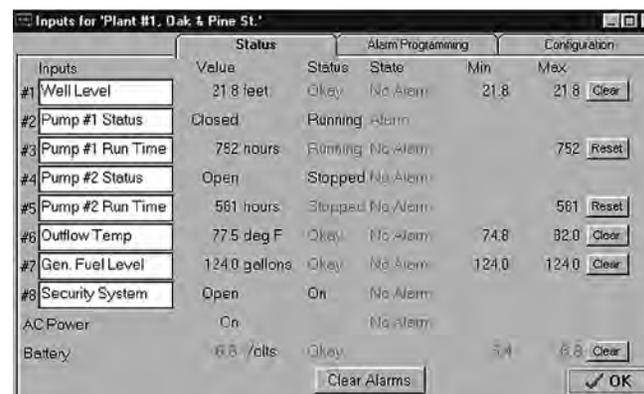
The Sensaphone 2000 monitors 8 universal inputs, power, and battery condition. You must be on-line with the unit to program the Input parameters. Once you are on-line, choose "Program" from the main menu, then select "Inputs." You can also access Input programming from the Toolbar button labeled *Inputs*. 

There are 3 tabs on the Inputs form:

Status, Alarm Programming, and Configuration.

Status tab

The Status tab shows the name, value, units of measure, status, alarm state, and Min/Max values for all of the inputs.



Inputs	Value	Status	State	Min	Max	
#1 Well Level	21.8 feet	Okay	No Alarm	21.8	21.8	Clear
#2 Pump #1 Status	Closed	Running	Alarm			
#3 Pump #1 Run Time	752 hours	Running	No Alarm		752	Reset
#4 Pump #2 Status	Open	Stopped	No Alarm			
#5 Pump #2 Run Time	561 hours	Stopped	No Alarm		561	Reset
#6 Outflow Temp	77.5 deg F	Okay	No Alarm	74.8	82.0	Clear
#7 Gen. Fuel Level	124.0 gallons	Okay	No Alarm	124.0	124.0	Clear
#8 Security System	Open	On	No Alarm			
AC Power	On		No Alarm			
Battery	6.8 volts	Okay		5.4	6.8	Clear

Inputs Status tab

Listed below is a description of the information found on the Status tab of the Inputs form:

Input Name

This field will allow you to type in a 16 character description for each input.

Value (with units)

This is the real time state or value of each input. If a unit of measure has been selected for the input, it will also be displayed here. If you choose Pulse Count or Run Time as your Input Types and double click on their respective Values, you will pop up a small screen on which to preset the values for each.

Display range for 0–5V, 4–20mA, and Temperature input types: -99,999.9 to 99,999.9

Display range for Pulse Count and Run Time: 0 to 999,999. You can choose hours, minutes, or seconds for time measurement, under the Configuration tab. When the limit of 999,999 is reached, the value will return to zero.

Status

This is the current status of each input with respect to that input's alarm programming. For any input that displays a numeric value, (temperature, 4–20mA, 0–5VDC, pulse count, or time accumulator) the Status column will display either Okay, High, or Low. For N.O./N.C. inputs, the Status Column will display either Open, Closed, or the label selected for that input from the Configuration tab.

State

The actual alarm state of the input. There are 5 possible alarm states: No Alarm, Waiting, Alarm, Outstanding, and Cleared.

Definitions:

No Alarm (green)—A digital input is in its normal position or an analog input is within the programmed alarm limits.

Waiting (yellow)—A digital input is in the alarm position or an analog input has gone outside of the programmed alarm limits but the input's alarm recognition time has not expired.

Alarm, Alarm High, Alarm Low (red)—A digital input has remained in the alarm position or an analog input has remained outside of the programmed alarm limits for the length of the alarm recognition time. An unacknowledged alarm exists.

Cleared (purple)—An alarm has been acknowledged, but the input is still in the alarm position or is still outside of the programmed alarm limits.

Outstanding (pink)—An unacknowledged alarm exists but the input has returned to its normal position or back to within the programmed alarm limits.

Min & Max

The highest and lowest values an input has reached. Digital inputs have no Min or Max values, while other inputs may have only a Max.

Clear Alarms

The button marked “Clear Alarms” will, when pressed, clear all set alarms.

Note: To clear an individual alarm, double click on it in the “State” column.

CONFIGURATION TAB

The Configuration tab shows the name, type, high and low table values, calibration setting, and label/units or all of the inputs.

Inputs	Input Type	Table Low	Table High	Cal.	Label/Units
#1 Room Temp	2.8k F.	0.0	125.0	-0.7	deg F
#2 Pressure	4-20mA	0.0	600.0	0.0	psi
#3 Tank Level	0-5 Volt	0.0	1500.0	0.0	inches
#4 Generator	Run Time				minutes
#5 Input 5	N.O.				none
#6 Input 6	N.O.				none
#7 Input 7	N.O.				none
#8 Input 8	N.O.				none
AC Power					
Battery					

Configuration tab

Listed below is a description of the information found on the Configuration tab of the Inputs form:

Input Type

This can be one of eight types: Normally Open (N.O.), Normally Closed (N.C.), 0–5V, 4–20mA, 2.8K thermistor, 10K thermistor, Pulse count or Time Accumulator.

Table Low & Table High

An important feature that Sensaphone 2000 offers is the ability to create a unique linear table for each 4–20mA or 0–5V analog input. The Table Low & Table High fields are used to define the upper and lower analog display limits for 4–20mA and 0–5V input types. For example, suppose you're using a 4–20mA transducer to measure the depth of water in a 75 foot well. Simply enter a Table Low of 0, and a Table High of 75 and the Sensaphone 2000 will scale the input to read between 0 and 75.0. The Table Low & Table High fields are also used to set the upper and lower limits for the bar and gauge monitors found on the Monitor form.

Programmable ranges

Table Low: -99,999.9 to 99,999.9

Table High: -99,999.9 to 99,999.9

Default settings:

Table Low value: 0

Table High value: 100

Calibration

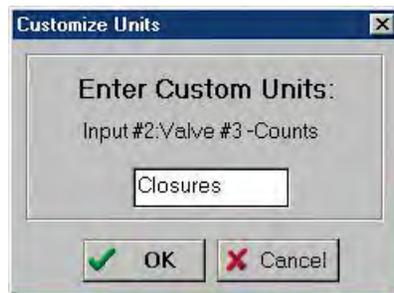
To compensate for minor variances in sensor accuracy, an offset may be programmed for each input. For example, if input #3 is sensing temperature and is reading 2.5 degrees too high, then the calibration for input #3 should be set at -2.5 to obtain an accurate reading. Digital inputs (N.O. and N.C.) cannot be calibrated.

Programmable range: +/-999.9 units

Default setting: 0.0

Label/Units

This field lets you identify the input value using specific units of measure and/or a description of the input condition. Several selections for dry contacts are listed with an O: or C: next to them to differentiate the "Open" contact label from the "Closed" contact label. The label/unit that is selected will also be spoken during a voice telephone call (except for "Custom"). You may choose from any of the selections provided or pick "Custom" to create your own label (except for RunTime and N.O/N.C.). Select "Custom" and a "Customize Units" box like the one below will pop up.



Customize Units box

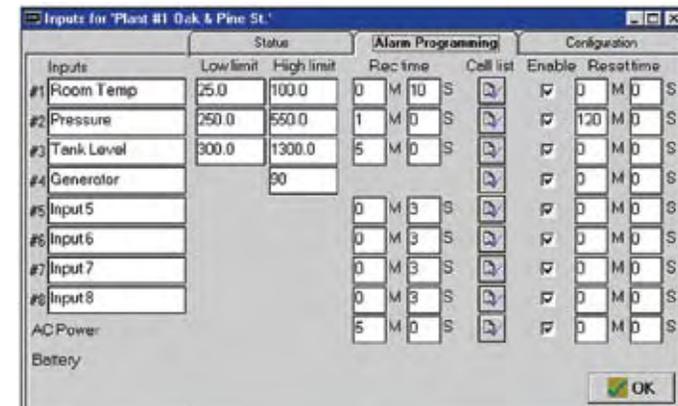
Note that for N.O. and N.C. input types, units of NONE will result in the unit speaking "open" or "closed" during a status report.

Selectable units of measure: none, degrees F, degrees C, inches, feet, gallons, liters, psi, gpm, volts, amps, hours, minutes, seconds

Default setting: none

ALARM PROGRAMMING TAB:

The Alarm Programming tab shows the name, high and low alarm limits, alarm recognition time, call list, dialout enable status, and alarm reset time for all of the inputs.



Alarm Programming tab

Listed below is a description of each of the programming options found on the Alarm Programming tab of the Inputs form:

Inputs Name

This field will allow you to type in a 16 character description for each input.

Alarm Low Limit

This is the value which will cause the unit to make alarm dialouts on an input low condition.

0–5V, 4–20mA, and Temperature:

Programmable range: -99,999.9 to 99,999.9

Default setting: 0

Pulse Count and Run Time Accumulator:

N/A

Alarm High Limit

This is the value which will cause the unit to make alarm dialouts on an input high condition.

0–5V, 4–20mA, and Temperature:

Programmable range: -99,999.9 to 99,999.9

Default setting: 100

Pulse Count and Run Time Accumulator:

Programmable range: 0 to 999,999

Default setting: 1,000

NOTE: Regarding thermistors, the actual programmable range will depend upon the type of thermistor, as follows: 2.8K thermistor temperature range, from -125°F to 124°F (-87°C to 51°C); 10K thermistor temperature range, from -90°F to 200°F (-68°C to 93°C).

Recognition Time

This is the time required for an out of tolerance condition to become an alarm. The input must remain above or below the alarm limit continuously for the entire time in order to become an alarm.

0–5V, 4–20mA, and Temperature:

Programmable range: 0 seconds–270 minutes

Default setting: Inputs 1–8: 3 seconds

AC Power:

Programmable range: 0 seconds–270 minutes

Default setting: 5 minutes

Pulse Count and Run Time Accumulator:

N/A

Call List

Click this button to display the list of destinations the unit will call to deliver an alarm message for each input. Sensaphone 2000 will call the destinations in numerical order. Place a check next to each destination you want Sensaphone 2000 to call for an alarm on the currently selected input.

Default setting: All

Alarm Enable/Disable:

This will enable or disable the dialout for this input.

Default setting: Enabled

Alarm Reset Time:

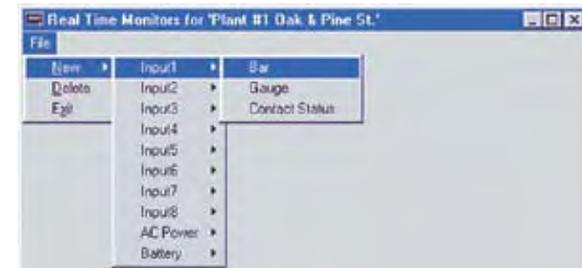
This is the time allowed for an acknowledged alarm's fault condition to be corrected before the unit resets (reactivates) the alarm and begins the dialout process all over again. The default setting for this parameter is 0 minutes and 0 seconds, meaning that the alarm reset feature is disabled.

Programmable range: 0 min, 0 sec to 270 min, 0 sec

Default setting: 0 min, 0 sec (disabled)

MONITORS

The Manager 2000 software provides the user with the ability to monitor all of a Sensaphone 2000's inputs in real-time graphical form. You must be on-line with a unit to monitor its inputs. Once on-line, you can access real-time input monitoring from the Toolbar button labeled *Monitors*. 



Monitors screen

Displaying Input Monitors

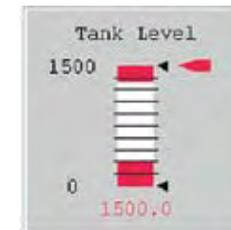
To display a monitor, from the Monitor menu choose *File>New*, then select the desired input and monitor type. More than one monitor may be displayed for each input.

Delete Input Monitors

To delete a monitor, select it by clicking on it. Next, choose *File>Delete* from the Monitor menu.

Monitor Types

There are 3 types of input monitors: Bar, Gauge, and Contact Status. Below is a view of each and an explanation of its features.



Bar monitor

Bar Reading:

This is the real-time value of the input. This number is white if the input status is OK, but will change to red if the input goes above or below the programmed alarm limits.

Low Limit

The lowest possible reading of the monitor. This is taken from the *Table Low* field on the Configuration tab of the Inputs form.

High Limit

The highest possible reading of the monitor. This is taken from the *Table High* field on the Configuration tab of the Inputs form.

Low Alarm Limit

(lower red zone) The low alarm limit for this input. This is taken from the *Low Limit* field on the Alarm Programming tab of the Inputs form.

High Alarm Limit

(upper red zone) The high alarm limit for this input. This is taken from the *High Limit* field on the Alarm Programming tab of the Inputs form.

Minimum Input Reading

(lower black triangle) This is the lowest value reached by this input. This is taken from the *MIN* field on the Status tab of the Inputs form.

Maximum Input Reading

(upper black triangle) This is the highest value reached by this input. This is taken from the *MAX* field on the Status tab of the Inputs form.



Gauge monitor

Gauge Reading:

This is the real-time value of the input. This number is white if the input status is OK, but will change to red if the input goes above or below the programmed alarm limits.

Low Limit

The lowest possible reading of the monitor. This is taken from the *Table Low* field on the Configuration tab of the Inputs form.

High Limit

The highest possible reading of the monitor. This is taken from the *Table High* field on the Configuration tab of the Inputs form.

Low Alarm Limit

(lower red zone) The low alarm limit for this input. This is taken from the *Low Limit* field on the Alarm Programming tab of the Inputs form.

High Alarm Limit

(upper red zone) The high alarm limit for this input. This is taken from the *High Limit* field on the Alarm Programming tab of the Inputs form.

Minimum Input Reading

(lower black triangle) This is the lowest value reached by this input. This is taken from the *MIN* field on the Status tab of the Inputs form.

Maximum Input Reading

(upper black triangle) This is the highest value reached by this input. This is taken from the *MAX* field on the Status tab of the Inputs form.



Contact Status monitor

Contact Status Monitor:

The Contact Status monitor displays a different graphic depending on the Label/Units selected for a particular input. The displayed graphics are as follows:

Input Label/Units	Input OK graphic	Input ALARM graphic
none	[check mark]	[red X]
OK/Fault	[check mark]	[red X]
On/Off	[Light Bulb - ON]	[Light Bulb - OFF]
Running/Stopped	[Traffic Light - GREEN]	[Traffic Light - RED]
AC Power	[Light Bulb - ON]	[Light Bulb - OFF]

DESTINATIONS

Sensaphone 2000 will call up to 32 telephone numbers or e-mail addresses (both referred to as destinations) to report alarm conditions or send reports. Destinations can be voice calls, fax machines, computers with modems running Sensaphone 2000 software, e-mail addresses, numeric pagers, or alphanumeric pagers. You must be online with the unit to program the Destination parameters. Once you are online, choose *Program* from the main menu, then select *Destinations*. You can also access the Destination programming from the toolbar button labeled *Destinations*.



Name	Destination	Call Zones				Call Mode	Dial Type	Inter-call Delay	Send Report
		1	2	3	4				
1 John Smith	(212)555-5566	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Until Ack	Voice	30	<input type="checkbox"/>
2 Steve Jones	(301)555-8978	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Inform	Pager	30	<input type="checkbox"/>
3 Barbara Kelly	345-1122-A-0504099	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Until Ack	Alpha	30	<input type="checkbox"/>
4 Jim Halio	JHalio@AOL.com	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Inform	E-Mail	30	<input checked="" type="checkbox"/>

Next Page Page 1 of 8 Edit Zones OK

Dialout Destinations form

The Dialout Destinations form allows you to program information for up to 32 destinations. The parameters and their options are listed below.

Name:

This field allows you to program a description (16 characters max) for each destination. The name will appear on faxes and e-mail transmissions whenever an alarm or report is sent to the destination. If you are entering a fax destination be sure to use the name of person who you intend to receive the fax.

Destination:

The actual telephone number or e-mail address Sensaphone 2000 dials to deliver its report or alarm message. The Destination field can be up to 64 characters long for e-mail addresses and 32 digits for all other Dial Types and may consist of numbers, letters, and special dialing codes.

Numeric Pagers

The Sensaphone 2000 can send alarm messages to numeric pagers. It will automatically send its telephone number and the alarm input number when dialing to a numeric pager. All you have to do is enter

the telephone number of your pager.

Example: (301)565-2300

Note: If your pager service is answered by a voice-prompted message you will need to enter additional programming. See the Special Dialing codes section below.

Alphanumeric Pagers

The Sensaphone 2000 can dial alphanumeric pagers to send alarm messages. The Sensaphone 2000 will send the unit description, telephone number, input name and input value. To program an alphanumeric pager destination, enter the phone number followed by the letter A and then the pager ID.

Example: 1-610-555-4593 A 0504099

E-mail

The Sensaphone 2000 can send alarm messages and reports via e-mail. For this to work, you must designate an e-mail host. You can use your own computer as an e-mail host, or you can use the Sensaphone e-Mail Server (subscription fee required). If you presently have internet access and you would like to use your own computer, see Chapter 9. If you prefer to use the Sensaphone E-Mail Server, simply fill out the email registration card that came with your unit or contact Sensaphone.

In the "Destination" field, enter the e-mail address.

Example: JHalio@AOL.com

Special Dialing Codes:

Sometimes, when dialing out on certain phone systems, Sensaphone 2000 may need special instructions to access an outside phone line, to contact numeric pagers, or to use alphanumeric pager services. The following dialing codes give Sensaphone 2000 instructions on how to send the phone digits when dialing the phone number. Each code is counted as one digit toward the total of 32 digits. The dialing codes are:

P = two-second pause. A two-second pause can be placed anywhere within the phone number by typing the letter P (upper or lower case). The pause takes up one digit and may be used more than once. This is typically required when a pager service is answered by a voice prompted message. You must add enough pauses to get past the voice message. In this case you must enter the number you wish to be displayed on your pager.

Example: 555-2233 PP 444-8877#

POUND (#) or ASTERISK (*): When dialing to a numeric pager, a pound sign (#) or an asterisk (*) may be used within the phone number. An asterisk (*) typically is displayed as a dash (-) on most pagers.

Example: 1 # 6105554591 PP 986033 #

W = wait for answer. This code instructs Sensaphone 2000 to wait until the call is answered before continuing. The “W” code takes up one digit and may be used only once. The “W” code is typically used in the middle of a dialout number when calling a numeric pager. The Sensaphone 2000 will wait for the pager company to answer the call before sending the number to be displayed on the pager. Note that the 2000 automatically waits for the call to be answered after the last digit in the telephone number is dialed.

Example: 1-610-555-4593 W 610-558-2000

(pager company phone #) W (number to display on numeric pager)

Note that digits following “W” to numeric pagers will automatically be dialed as touch-tones.

I= send alarm input #. This code instructs Sensaphone 2000 to send the input numbers that have an alarm to a numeric pager. The “I” code takes up one digit and may be used only once in the phone number. Note that this is only required if you must insert additional dialing codes (such as pauses) to make your pager work.

Example: 555-2233 PP 444-8877 I

Special Alphanumeric Pager Dialing Codes

A = alphanumeric pager ID (required)

C = alphanumeric character password (optional)

A = alphanumeric pager ID: The “A” dialing code is used ONLY for alphanumeric pager destinations. It is placed between the pager company’s telephone number and a particular pager’s ID number by typing the letter A (upper or lower case). It instructs Sensaphone 2000 to wait until a connection is made to the alphanumeric pager service’s computer system before transmitting the ID number for a particular pager.

Example: 1-610-555-4593 A 0504099

C = alphanumeric character password: The “C” dialing code is used ONLY for alphanumeric pager destinations and only if your particular pager system requires a character password. This password may be required for Sensaphone 2000 to access the pager service’s computer system. If required, it is placed between the pager company’s telephone number and the required character password in the dialout

sequence by typing the letter C (upper or lower case). The character password must precede the pager ID number.

Example if character password required:

1-610-555-4593 C 000000 A 0504099

(pager company phone #) C (character password) A (pager ID #)

The alphanumeric character password is optional and is, in general, reserved for future services. Length of the password, when used, may be different in some systems. Consult your pager service for more information.

Call Zones:

Sensaphone 2000 is capable of assigning different destinations to specific calling groups (zones) to accommodate work shift schedules. There are 4 Call Zones to choose from. To include a destination in a Call Zone, check the appropriate box. To set up Call Zones, click on the “Edit ones” button and the following form will appear:

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
12 AM - 8 AM	Zone 1	Zone 1					Zone 3
8 AM - 5 PM		Zone 2	Zone 2	Zone 2	Zone 2	Zone 2	Zone 3
5 PM - 12 AM	Zone 1					Zone 3	Zone 3

Edit Zones form

The Edit Calling Zones form divides up the 7 day week into 21 blocks of time. To change the start and end time for each block, drag the horizontal divider bars up or down as needed. To reassign a block of time to a different Call Zone, click inside the block until it matches the color of the desired zone. To change the color of a zone, double click on the zone’s color square at the bottom of the form. Select a new color from the palette, then click the OK button.

Alarm Call Mode:

The three selections for destination Alarm Call Mode are Disabled, Until Acknowledged, and Inform.

Disabled:

Destinations programmed with Alarm Call Mode Disabled will never be called. This is simply a way to disable dialing to this destination if necessary.

Until Acknowledged:

Destinations programmed with Alarm Call Mode "Until Acknowledged" will continue to be called until one of them acknowledges the alarm. Once acknowledged, the remaining destinations will not be called.

Example: An alarm occurs and the Sensaphone 2000 is programmed to call destinations #1,#2, and #3 and all 3 destinations are Alarm Call Mode "Until Acknowledged." The unit will call destination #1, if the alarm isn't acknowledged, it will call #2. If destination #2 doesn't acknowledge, then the unit will call destination #3. If the alarm still hasn't been acknowledged, Sensaphone 2000 will call destination #1 again. This process will continue until one of the destinations acknowledges the alarm.

Note: Fax, E-mail and Modem destinations cannot be programmed as "Until Acknowledged" call modes.

Inform:

Destinations programmed with Alarm Call Mode "Inform" will be called until the alarm message has been successfully delivered one time, regardless of acknowledgment. If a transmission to an "Inform" destination was successful, that destination will not be contacted again. Sensaphone 2000 will only make additional attempts to contact an Alarm Call Mode "Inform" destination if that destination hasn't successfully received its transmission (for example, due to a "no answer," "busy signal," "no carrier" response). If a transmission fails to reach a destination after the last calling round is completed, the failure is recorded in the Event Log. Calls to priority "Inform" destinations are useful for providing records of alarm events.

Example: The Sensaphone 2000 used in the above example is monitoring the heating system in a school. The first three destinations are set as Alarm Call Mode "Until Acknowledged" and programmed to call maintenance personnel. In addition, destination #4 is programmed

to call the school's fax machine and is set as Alarm Call Mode "Inform." Sensaphone 2000 will call the maintenance personnel as described above so that they can fix the boiler, and will also send a fax to the school office informing them of the problem.

Important: Destinations programmed as Alarm Call Mode "Inform" cannot acknowledge alarms.

Dial Type:

This is used to specify the type of call Sensaphone 2000 will make to a particular destination. The available dialout types are: Fax, Voice, E-mail, Pager, Alpha Pager, and Modem.

Fax - This instructs Sensaphone 2000 to send a fax transmission to either a fax machine or a PC with the ability to receive a fax directly.

E-mail - This instructs Sensaphone 2000 to deliver a message to the E-mail address programmed in the destination field.

NOTE: For "E-Mail" Dial Types, *only* e-mail addresses may be programmed in the destination field, NOT telephone numbers. Sensaphone 2000 will contact an e-mail host as designated on the System screen.

Numeric Pager - This instructs Sensaphone 2000 to dial a numeric pager and leave the unit's ID number and alarm input numbers on the display. This will happen automatically just by entering the pager's telephone number in the destination field. If you want to change the information that is sent to your pager or you are having trouble receiving the page, you may use the special dialing codes to customize the dialout to your pager.

NOTE: When dialing to a numeric pager it is sometimes necessary to combine codes. Certain pager systems vary and you must adjust accordingly. To test your pager system, use an extension telephone on the same line as the SENSAPHONE 2000 unit and listen in during the Sensaphone 2000's dial-out to confirm that your pager service is reached without a problem. If you must add a pause, use the letter P to insert a two second pause whenever necessary.

Alpha Pager - This instructs Sensaphone 2000 to deliver a text message to an alphanumeric pager.

Modem - This instructs Sensaphone 2000 to call a modem attached to a computer running Manager 2000 software. The software must be in Answer Mode.

When the Manager 2000 software receives the alarm call, it will download the unit's Event Log, execute an alarm query, and display the result on the screen. You may also have the computer print a copy of the alarm event as well as play a recorded message when an alarm is received. See *Configuration*, followed by *Options* from the Main Menu for more information.

Important: The Unit Description on your computer must match the Unit Description stored in your Sensaphone 2000 for Alarm and Report call-in features to work properly.

Intercall Delay:

The intercall delay is the amount of time Sensaphone 2000 will wait after completing a call before calling the next destination. The delay is in seconds, with a default of 30.

Note: A 30-second delay is too short to allow a call back if a pager is being called. Increase the delay time enough to accommodate your pager.

Send Report:

Sensaphone 2000 can be programmed to automatically send reports to selected destinations. Check this box to include this destination when sending reports.

Note: Reports may only be sent to Fax, E-mail, or Modem destinations.

DATALOGGING

Sensaphone 2000's built-in Data Logger can log and store information on all 8 universal inputs, AC power and backup battery voltage. You must be on-line with the unit to program the Datalogging parameters. Once you are on-line, choose "Functions" from the main menu, then select Data Logging. You can also access the Data Log programming from the Toolbar button labeled *Data Log*. 

Note that whenever you change any parameters on the Data Log form the datalogger in the Sensaphone 2000 will be reset. If you need to make changes to your programming, be sure to "Retrieve Data" first.

Data Log form

Below is a list of Data Log programming parameters, their default settings and the range of programming for each parameter.

Interval:

Time between data logs.

Programmable range:

Minimum: 0 hours, 0 minutes, 1 second

Maximum: 199 hours, 59 minutes, 59 seconds

Default Setting:

0 hours, 0 minutes, 10 seconds

Warning

Setting the Data Logger interval to just a few seconds will produce large amounts of data. If you download this data regularly you will quickly begin to fill your hard disk. Care must be taken to evaluate your system and needs to avoid this situation.

Use Start Time:

Checking this box will make the Sensaphone 2000 start its Data Logger at the time indicated in the Start Time box. If this box is not checked, Datalogging will begin immediately.

Start Time

Sensaphone 2000 can be programmed to begin Datalogging at a particular time of day. When Sensaphone 2000's internal clock reaches the programmed Start Time, the unit will begin Datalogging the selected input values at the programmed interval. The Start Time function is

used to delay the start of Datalogging. Once Datalogging has begun, the Start Time programming is ignored.

Default Setting: 12:00:00AM

Inputs Being Logged:

This selects which inputs Sensaphone 2000 will log. The unit's data logger can store 32,768 samples. Every time the unit logs input data, it uses one sample for each checked box. For example, if inputs 1-5 are selected, 5 samples are used up every time Sensaphone 2000 logs data. The more inputs you select, the fewer samples are left available. Below is a table showing the number of Data Samples available vs. the number of Inputs Being Logged. Once the Sensaphone 2000 has filled its Data Logger, it will begin overwriting the oldest Data Log samples with new ones.

# of Inputs Being Logged	Data Samples Available
1	32,768
2	16,384
3	10,922
4	8,192
5	6,553
6	5,461
7	4,681
8	4,096
9	3,640
10	3,276

Start/Stop datalogging:

To start Datalogging, click on this button.

Default setting: Stopped

NOTE: Any changes to the Data Log Programming form will RESET the datalogger.

RESET NOW Button

This button will reset the Data Logger (i.e., delete the records) in the 2000. If the Data Logger was just received, a RESET within 5 minutes of downloading will only delete the records just downloaded. The 2000 will retain any data that was logged during the download period. After 5 minutes have passed since the download, clicking the RESET button will delete ALL records in the 2000.

Downloading the Data Logger

To view a Sensaphone 2000's Data Log samples, the unit's Data Logger must first be downloaded to your PC. You must be on-line with a unit to download its Data Logger. Once you are online, choose "Functions" from the main menu, then select Datalogging. You can also access the Data Logger from the *Data Log* Toolbar button.

To download the Data Logger, click "Retrieve Data."

Every time a unit's Data Logger is downloaded, the Manager 2000 software adds the new information to that unit's database in your PC. It also checks for and filters out duplicate Data Log records.

Viewing the Data Logger (on-line):

Once the Data Logger has been downloaded, it can be viewed. To view the Data Logger, click the "View Database" button on the Data Log Programming form. The following form will appear.

Log Time	Room Temp	Pressure	Tank Level
06:25:04PM 04/08/1997	77.9	702.5	1149.5
06:25:05PM 04/08/1997	77.9	702.5	1149.5
06:25:06PM 04/08/1997	77.9	702.5	1149.5
06:25:07PM 04/08/1997	77.9	702.5	1149.5
06:25:08PM 04/08/1997	77.9	702.5	1149.5

Data Log Viewer

Viewing the Data Logger (off-line):

To view a unit's downloaded Data Logger off-line, follow the instructions for "Offline Communication" and "To View A Data File Offline" earlier in this chapter.

Below is a list of programming parameters for viewing the Data Logger:

Input selection

You must choose which inputs to display. To display a Data Log record for an input, click on the input's button to highlight it.

From Date and To Date

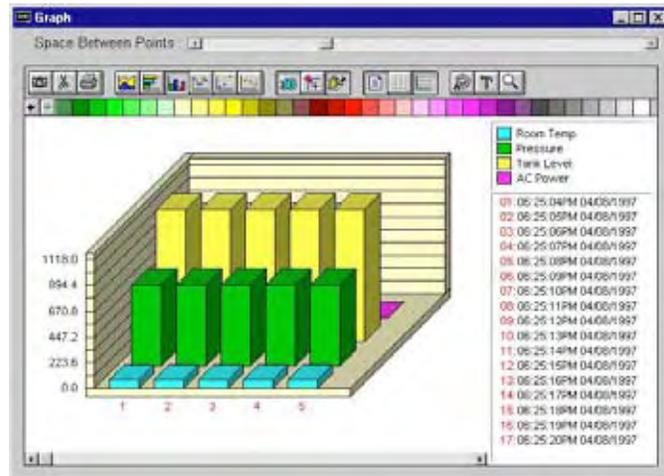
Selects a range of Data Log records by time.

Query

Searches the Data Log database and displays the information that corresponds to the selected time period and selected inputs.

Graph

Once the Data Log records have been displayed, they may be viewed in graph form by clicking the "Graph" button. The graph will show all inputs selected in the query. If too many samples are selected for graphing, the software gives you the option to average values. Otherwise, you will have to perform a smaller query to avoid averaging. The graph has many features that allow you to display the data graphically, including line graphs, bar charts and three-dimensional views. Experimentation is the best way to learn about all of the available options. A sample graph follows.



Sample graph

Reset

Deletes Data Log records for the current Sensaphone 2000 unit from your PC. It will reset all the information in the database for the selected unit.

Print

Once the Data Log records have been displayed, they may be printed by clicking this button.

Export

Once the Data Log records have been displayed, the displayed information may be saved as a comma-delimited file. This file can then be used in a spreadsheet such programs as Lotus 123 or Microsoft Excel.

EVENT LOGGER

Sensaphone 2000 keeps track of important system events with its built-in Event Logger. Each Sensaphone 2000 unit stores the last 500 system events. System events include alarms, incoming and outgoing phone calls, and alarm acknowledgments. See Appendix A for a complete list of events stored by the Event Logger. Once the Event Log is full, the oldest record is overwritten by the newest.

Downloading the Event Logger:

To view Sensaphone 2000's Event Log, the unit's Event Logger must first be downloaded to your PC. You must be online with the unit to download the Event Log. Once you are online, choose "Functions" from the main menu, then select "View Events." You can also access the Event Logger from the Toolbar button labeled *Events*.



The following event log form will appear:

Event Log Viewer

To download the Event Logger, click “Download Events.”

Every time a unit's Event Logger is downloaded, the Manager 2000 software adds the new information to that unit's database in your PC. It also checks for and filters out duplicate Event Log records. The downloaded Event Logger can then be viewed off-line.

Viewing the Event Logger:

Once the Event Logger has been downloaded, it can be viewed on the form called “Event Viewer.”

Below is a list of programming parameters for viewing the Event Logger:

Date & Time	Unit Name	Event Description
4/8/97 6:25:23 PM	Plant #1, Oak & Pini Datalogger:	Download.
4/8/97 6:25:05 PM	Plant #1, Oak & Pini Datalogger:	Reset.
4/8/97 6:25:02 PM	Plant #1, Oak & Pini Datalogger:	Reset.

Event Viewer form

Unit selection:

Since the MANAGER 2000 software can contain Event Log information for multiple Sensaphone 2000 units, you must choose which unit's Event Log you wish to display. Look at the Event Log Viewer. In the window labeled “Available Units” is a list of all Sensaphone 2000 units currently recognized by your PC. Highlight a unit by clicking on the unit name, and use the four add/remove buttons (>, >>, <, <<) to select the desired unit(s) as follows:

- ‘add’ ([>]) - Adds the unit to the “Selected Units” list.
- ‘add all’ ([>>]) - Adds all units to the “Selected Units” list.
- ‘remove’ ([<]) - Removes the unit from the “Selected Units” list.
- ‘remove all’ ([<<]) - Removes all units from the “Selected Units” list.

Event types:

Select here the types of events to display: All Events or Alarms Only.

Query Times:

Selects a range of event times to display. “Inc.All” will include all event times in the Sensaphone 2000, with a “To” date stretching into the future. “To Now” resets the “To” time to the exact moment you click on the button.

View:

Displays the selected Event Log records.

Reset Event Logger:

Deletes all Event Log records from your PC's database.

REPORTS

Sensaphone 2000 can send periodic reports to selected Fax, E-mail, or Modem (*see below*) destinations. Reports may include either the current status of all inputs, stored Data Logger information, or both. You must be on-line with the unit to program Report parameters. Once you are on-line, choose “Programming” from the main menu, then select “Reports.” You can also access the Reports programming from the Toolbar button labeled *Reports*.



Reports form

Alternatively, you can have the 2000 call your PC and send the entire datalogger and eventlogger to it. The data will be stored in the Sensaphone 2000 database. For this method of reporting, set the Destination Dial Type to “Modem.” You must have your computer running the Sensaphone 2000 software with Answer Mode enabled. Note also that the Unit Description on your computer must match the Unit Description stored in your Sensaphone 2000.

Below is a list of Report programming parameters, their default settings and the range of programming for each parameter.

Current Status:

To send the current status of all inputs with the report, check this box.

Data Logger:

To send information stored in Sensaphone 2000’s Data Logger, check this box. If this box is checked, you must select the number of Data Log records to send with the report. Sensaphone 2000 will send the number of records requested beginning with the most recent record and follow in order of newest to oldest. (Note: A data Log record is a

time slice of whatever inputs were being logged.) When Sensaphone 2000 sends Data Logger information with a report, it DOES NOT erase the information from the unit.

Use Start Time:

Sensaphone 2000 can be programmed to begin sending reports at a particular time of day. When Sensaphone 2000’s internal clock reaches the programmed Start Time, the unit will begin sending reports to the selected destinations. The Start Time function is used to delay the start of reporting. Once reporting has begun, the Start Time programming is ignored.

Note: To disable the Start Time function, leave the Start Time at the default setting of 12:00:00AM. Sensaphone 2000 will begin sending reports after the first Report Interval has expired.

Default Setting: 12:00:00AM

Report Interval:

Time between reports.

Programmable range: Minimum: 0 hours, 1 minutes

Maximum: 10,000 hours, 0 minutes

Default Setting: 24 hours, 0 minutes

Chapter 5: Status Report and Voice Messages

The Sensaphone 2000 provides a voice status report via telephone using its own internal voice in combination with your recorded input messages. This allows you to set up a custom system that fully describes the unit's location, the input having a problem, its current value and units of measure. The messages may be recorded either at the unit by plugging a telephone into the Voice Record jack, or remotely by calling the unit. This section will describe how to program identification and input messages along with some examples. In addition, obtaining a status report both locally and remotely will be discussed.

Playing/Recording Messages using the Voice Record Jack

To play and record messages using the Voice Record jack you will need a simple single-line Touch-Tone telephone. Plug this telephone directly into the 2000's Voice Record jack. (DO NOT connect the Voice Record jack to a telephone line or to a digital telephone system. This will permanently damage the unit). When you plug the telephone into the jack and lift the handset, the unit will recite a status report. At the end of the status report, the unit will say "Enter Password." This is the voice password. Enter the voice password using the telephone keypad buttons. If the voice password is entered correctly, Sensaphone 2000 will say "OK." If not, the unit will beep then say "ERROR," and you will have to hang up the phone and try again.

Once the voice password is accepted, Touch-Tone commands are used to record and play back messages as well as listen to a status report. The commands are listed below:

<u>Play Command</u>	<u>Record Command</u>	<u>Erase Command</u>	<u>Message Description</u>
* 1	# 1	##1	Input Message #1
* 2	# 2	##2	Input Message #2
* 3	# 3	##3	Input Message #3
* 4	# 4	##4	Input Message #4
* 5	# 5	##5	Input Message #5
* 6	# 6	##6	Input Message #6
* 7	# 7	##7	Input Message #7
* 8	# 8	##8	Input Message #8
* 9	# 9	##9	Identification (ID) Message
**			Status Report

To record a message, press the [#] key followed by the message number you want. For example, to record the ID message, press [#] then 9. After you hear the start beep, begin speaking into the phone. You have until the second beep to complete your message. You have six (6) seconds of recording time for the ID message and four (4) seconds for each of the eight input messages.

To play back a message, press the [*] key followed by the message number you want. For example, to play the ID message, press [*] then 9.

To request a complete status report, press the [*] key twice.

Note: Since the unit can only communicate with one device at a time, it will not answer any calls nor make any calls while you are on-line in local voice mode.

Local Status Report

To receive a voice status report at the unit, plug a telephone into the Voice Record jack. After a few seconds the unit will begin reciting a status report. At the end of the report it will ask for a password. The password is the Voice Password required to change voice messages and acknowledge alarms. If entered correctly, the unit will allow you to use the Touch-Tone commands to record/listen to messages and acknowledge alarms. When finished simply hang up.

Status Report

To receive a voice status report remotely, call the unit and after you hear the unit beep, press any Touch Tone within three (3) seconds. The unit will then recite a status report. If the unit starts its modem tone sequence, simply wait until it finishes. A status report will begin as soon the tones finish. At the end of the report it will ask for a password. The password is the Voice Password required to change voice messages and acknowledge alarms. If entered correctly, the unit will allow you to use the Touch-Tone commands to record/listen to messages and acknowledge alarms. When finished simply hang up. The unit will disconnect itself automatically if no Touch-Tone commands are received within ten (10) seconds.

Sample Status Report

Hello, this is (Unit Phone Number)

Input one (recorded message #1), (input value), (units), (alarm status)

Input two (recorded message #2), (input value), (units), (alarm status)

Input three (recorded message #3), (input value), (units), (alarm status)

Input four (recorded message #4), (input value), (units), (alarm status)

Input five (recorded message #5), (input value), (units), (alarm status)

Input six (recorded message #6), (input value), (units), (alarm status)

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Input seven (recorded message #7), (input value), (units), (alarm status)

Input eight (recorded message #8), (input value), (units), (alarm status)

The electricity is On/Off

Battery condition 6.8 volts, OK/Low/Very Low

Chapter 6: Operation

After installation and programming have been completed, Sensaphone 2000 is fully operational. This chapter explains how Sensaphone 2000 operates.

PART ONE: ALARM DIALOUT AND ACKNOWLEDGMENT

There are 3 stages to a complete alarm event: 1) Alarm Recognition, 2) Alarm Notification, 3) Acknowledgment. Note that not all alert conditions will go through each stage. For example, some may not meet the recognition time.

Alarm Recognition

- 1) Sensaphone 2000 monitors 8 inputs plus power failure. When the status of an input changes or exceeds user-programmed limits, it causes an alert condition.
- 2) If the alert condition lasts long enough to meet its programmed recognition time, the alert condition becomes an alarm and Sensaphone 2000 begins the alarm notification sequence.

Alarm Notification

Sensaphone 2000 can make 6 types of phone calls: Voice, Fax, E-mail, Modem, Beeper, and Alphanumeric pager.

Dialout Note: Call Progress

Sensaphone 2000 monitors call progress when dialing out. If Sensaphone 2000 dials out and encounters a busy signal or no answer within 30 seconds, the unit hangs up, waits the programmed intercall delay time, and then dials the next phone number.

Alarm Call Mode: Until Acknowledged vs. Inform

Until Acknowledged:

Destinations programmed with Alarm Call Mode “Until Acknowledged” will continue to be contacted until one of them acknowledges the alarm.

Note: Fax and E-mail destinations cannot be programmed as “Until Acknowledged.”

Inform:

Destinations programmed with Alarm Call Mode “Inform” will be contacted until the alarm message has been successfully delivered one

time. If a transmission to Alarm Call Mode "Inform" destination was successful, that destination will not be contacted again.

Important: Destinations programmed as Alarm Call Mode "Inform" CANNOT ACKNOWLEDGE ALARMS.

Alarm Dialout - Voice

When dialing out to a destination programmed as "voice," Sensaphone 2000 waits for the phone to be answered, then recites its user-recorded identification message, then the message identifying the input that has gone into alarm.

Below is an example of what Sensaphone 2000 might say during a typical 'voice' dialout:

"Hello, this is (user recorded ID message)"
"The electricity is off"

"Hello, this is (user recorded ID message)"
"The electricity is off"

"Hello, this is (user recorded ID message)"
"The electricity is off"

"Enter acknowledgment code."

In this example, the number of Voice Message Repetitions was set to three.

Note: If the call reaches an answering machine, the message will be recorded, but Sensaphone 2000 will be talking over your outgoing message, so you will probably lose part of the first alarm message repetition.

Alarm Dialout - Beeper

When dialing out to a destination programmed as "Beeper," Sensaphone 2000 leaves a number (usually the unit's own phone number) on the display of a numeric beeper.

IMPORTANT: When dialing out to a phone number programmed as "Beeper," Sensaphone 2000 DOES NOT speak a voice message. It calls the beeper company or service, enters the number to be displayed on the beeper, then hangs up.

Alarm Dialout - Alphanumeric Pager

When dialing out to a destination programmed as "Alpha," Sensaphone 2000 leaves a text message up to 80 characters long on the display of an alphanumeric pager.

IMPORTANT: When dialing out to a phone number programmed as "Alpha," Sensaphone 2000 DOES NOT speak a voice message. It calls the pager company or service, transmits the information to be displayed on the pager, then hangs up.

Alarm Dialout - Modem

When dialing out to a destination programmed as "Modem," Sensaphone 2000 waits for the phone to be answered by a modem, establishes a data connection, then transmits its alarm message.

IMPORTANT: When dialing out to a phone number programmed as "Modem," Sensaphone 2000 DOES NOT speak a voice message. It is expecting the call to be answered by a PC running Sensaphone Manager 2000 Windows software. Once a connection is established, the Sensaphone 2000 transmits the alarm information, then hangs up.

Alarm Dialout - Fax

When dialing out to a destination programmed as "Fax" Sensaphone 2000 waits for the phone to be answered by a fax machine, establishes a connection, then faxes its alarm message.

IMPORTANT: When dialing out to a phone number programmed as "Fax," Sensaphone 2000 DOES NOT speak a voice message. It is expecting the call to be answered by a fax machine. Once a connection is established, the Sensaphone 2000 faxes the alarm information, then hangs up.

Alarm Dialout - E-mail

When dialing out to a destination programmed as "E-mail," Sensaphone 2000 will call the e-mail server as selected on the system programming screen. Once connected, the unit delivers its alarm message to the E-mail address programmed in the destination field.

IMPORTANT: When dialing out to a phone number programmed as E-mail, Sensaphone 2000 DOES NOT speak a voice message. It is expecting the call to be answered by an e-mail server system. Once a connection is established, the Sensaphone 2000 E-mails the alarm message, then hangs up.

ALARM ACKNOWLEDGMENT

Alarm Acknowledgment - Voice Dialout

Repeated below is the same example of what Sensaphone 2000 might say during a typical "voice" dialout:

"Hello, this is (user recorded ID message)"
 "The electricity is off"
 "Hello, this is (user recorded ID message)"
 "The electricity is off"
 "Hello, this is (user recorded ID message)"
 "The electricity is off"
 "Enter acknowledgment code."

Sensaphone 2000 will now wait 5 seconds for the Touch-Tone acknowledgment code (and acknowledgment ID if chosen) to be entered. After the last digit of the acknowledgment code has been received, Sensaphone 2000 will respond by saying: "Alarm Acknowledged." The alarm has been acknowledged and the unit will hang up. Once the alarm has been acknowledged, the dialout process stops.

If the Touch-Tone acknowledgment code is not received, the Sensaphone 2000 will offer you a second chance to enter it, responding with: "beep," "error," "Enter acknowledgment code." If the acknowledgement code is still not received, then the Sensaphone 2000 will respond by saying: "beep," "error," "goodbye." The alarm has not been acknowledged. Sensaphone 2000 will hang up and wait for a callback acknowledgment. This waiting period is called the "intercall delay time." During this time you may call the unit back from a Touch-Tone phone. Wait for the unit to beep. Then hit any key on the phone, and the unit will give a voice report. Once you receive the complete report, enter the code to acknowledge the alarm (and acknowledgment ID if chosen). NOTE: An alarm cannot be acknowledged using a pulse (rotary) telephone.

Alarm Acknowledgment - Beeper Dialout

Sensaphone 2000 will dial out to your beeper service and leave a number on the display of your beeper. (See Programming Section) The unit will then hang up without speaking a voice message and wait for callback acknowledgment. This waiting period is called the "intercall delay time." During this time you may call the unit back from a Touch-Tone phone to receive a report of the alarm condition

and acknowledge the alarm by entering the acknowledgment code (and acknowledgment ID if chosen).

NOTE: An alarm cannot be acknowledged using a pulse (rotary) telephone.

Below is an example of what Sensaphone 2000 will say when you call it back to acknowledge a typical alarm:

"Hello, this is (user recorded ID message)"
 "The electricity is off"
 "Hello, this is (user recorded ID message)"
 "The electricity is off"
 "Hello, this is (user recorded ID message)"
 "The electricity is off"
 "Enter acknowledgment code."

Sensaphone 2000 will now wait 5 seconds for the Touch-Tone acknowledgment code to be entered. After the last digit of the acknowledgment code has been received, Sensaphone 2000 will respond by saying: "Alarm Acknowledged." The alarm has been acknowledged and the unit will hang up. Once the alarm has been acknowledged, the dialout process stops.

If the Touch-Tone acknowledgment code is not received, Sensaphone 2000 will offer you a second chance to enter it, responding with: "beep," "error," "Enter acknowledgment code." If the acknowledgement code is still not received, then the Sensaphone 2000 will respond by saying: "beep," "error," "goodbye." The alarm has not been acknowledged. Sensaphone 2000 will hang up and wait for a callback acknowledgment. This waiting period is called the "intercall delay time." During this time you may call the unit back from a Touch-Tone phone. Wait for the unit to beep. Then hit any key on the phone, and the unit will give a voice report. Once you receive the complete report, enter the code to acknowledge the alarm (and acknowledgment ID if chosen). NOTE: An alarm cannot be acknowledged using a pulse (rotary) telephone.

TIP: When Sensaphone 2000 is programmed to make calls to beepers, make sure the intercall delay time is long enough to give the person carrying the beeper some time to get to a phone to call the unit back.

Alarm Acknowledgment - Alphanumeric Pager Dialout

Sensaphone 2000 will dial out to your alphanumeric pager service and leave a message on the display of your pager. (See Programming

Section, Chapter Four, for dialing to beepers/pagers). The unit will then hang up without speaking a voice message and wait for callback acknowledgment. This waiting period is called the “intercall delay time.” During this time you may call the unit back from a Touch-Tone phone to receive a report of the alarm condition and acknowledge the alarm by entering the acknowledgment code (and acknowledgment ID if chosen).

Note: An alarm cannot be acknowledged using a pulse (rotary) telephone.

Below is an example of what Sensaphone 2000 will say when you call it back to acknowledge a typical alarm:

“Hello, this is (ID message)”
Input 1, closed, alarm exists

“Hello, this is (ID message)”
Input 1, closed, alarm exists

“Hello, this is (ID message)”
Input 1, closed, alarm exists

“Enter acknowledgment code.”

Sensaphone 2000 will now wait 5 seconds for the Touch-Tone acknowledgment code to be entered. After the last digit of the acknowledgment code has been received, Sensaphone 2000 will respond by saying, “Alarm Acknowledged.” The alarm has been acknowledged and the unit will hang up. Once the alarm has been acknowledged, the dialout process stops.

If the Touch-Tone acknowledgment code is not received, Sensaphone 2000 will respond by saying: “beep,” “error,” “goodbye.” The alarm has not been acknowledged. Sensaphone 2000 will hang up and wait for a callback acknowledgment. This waiting period is called the “intercall delay time.” During this time you may call the unit back from a Touch-Tone phone. Wait for the unit to beep. Then hit any key on the phone, and the unit will give a voice report. Once you receive the complete report, enter the code to acknowledge the alarm (and acknowledgment ID if chosen). **NOTE:** An alarm cannot be acknowledged using a pulse (rotary) telephone.

TIP: When Sensaphone 2000 is programmed to make calls to alphanumeric pagers, make sure the intercall delay time is long enough to give the person carrying the pager some time to get to a phone to call the unit back.

Alarm Acknowledgment - Automatic (Max Calls)

Sensaphone 2000 has the ability to acknowledge itself by using the Max Calls function. The unit keeps a count of the number of phone calls it makes for a particular alarm. Once the number of calls made reaches Max Calls, Sensaphone 2000 will acknowledge the alarm and stop the dialout process.

Acknowledgement ID

The ID feature is useful to identify who has acknowledged an alarm when that acknowledgment was performed on a return call to the unit. The feature allows the user to key in a two-digit Touch-Tone ID code right after entering the alarm acknowledgment code. The ID code is then stored in the Event Log so that users would be able to identify who acknowledged the alarm. For example: A 2000 unit calls John's pager and leaves an alarm message, then continues calling the programmed destination numbers. John finally gets to a telephone and is the first to call in to the unit. When he acknowledges the alarm, he enters 555-21. The number 21 is John's Acknowledgment ID. The Event Log would show that ID #21 had acknowledged the alarm. (See following figure.)

Date & Time	Unit Name	Event Description
03/24/2000 8:57:47 AM	Chestnut Street Plant	Alarm detected, Input #1: High Water.
03/24/2000 8:57:47 AM	Chestnut Street Plant	Dialing "Until Acknowledged" destination 1: John Smith(40).
03/24/2000 8:57:57 AM	Chestnut Street Plant	Voice call answered.
03/24/2000 8:58:26 AM	Chestnut Street Plant	No acknowledgment received on outbound call.
03/24/2000 8:58:27 AM	Chestnut Street Plant	Hanging up.
03/24/2000 8:59:20 AM	Chestnut Street Plant	Dialing "Inform Only" destination 2: Steve Jones(40).
03/24/2000 8:59:39 AM	Chestnut Street Plant	Numeric pager connect.
03/24/2000 8:59:40 AM	Chestnut Street Plant	Message delivered.
03/24/2000 8:59:40 AM	Chestnut Street Plant	Hanging up.
03/24/2000 9:00:03 AM	Chestnut Street Plant	Inbound phone call received.
03/24/2000 9:00:07 AM	Chestnut Street Plant	Giving voice report.
03/24/2000 9:00:21 AM	Chestnut Street Plant	Alarm Cleared, Input #1: High Water.
03/24/2000 9:00:23 AM	Chestnut Street Plant	Acknowledgment received, ID=21
03/24/2000 9:01:18 AM	Chestnut Street Plant	Hanging up.
03/24/2000 9:01:37 AM	Chestnut Street Plant	Inbound phone call terminated.

Event Log showing Acknowledgment ID

PART TWO: REPORT DIALOUT

The unit is capable of sending automatic reports on a programmable time basis, (i.e. Send a report every x hours starting at time xx:xx). Reports may be sent via fax or e-mail only, and will be sent to all destinations programmed to receive reports. Reports cover the unit data, which includes the current conditions of each input, power status, and battery condition. If the Data Logger is enabled and programmed to send with reports, a Data Log report will also be sent at this time.

PART THREE: CALL-IN STATUS

Using PC with Manager 2000 Windows Software: At any time the unit is idle (not dialing out or communicating locally), you can call into it using a modem. Sensaphone 2000 will answer after its programmed "Rings To Answer," connect, and go on-line. At this point you have entered an on-line session identical to the local programming session, and may program the unit as necessary.

Voice Mode

You can also call into the Sensaphone 2000 using a Touch-Tone telephone. After answering, Sensaphone 2000 will beep once. Immediately press any key on your Touch-Tone keypad to get a voice status report. If the Sensaphone 2000 doesn't receive a Touch-Tone signal within a few seconds, it will attempt to make a data (modem) connection. If a data connection isn't made after the programmed "Carrier Wait Time," Sensaphone 2000 will again switch to voice mode and recite a status report. Immediately following the status report, Sensaphone 2000 prompts you for a voice-mode password. This password allows you to use Touch-Tone commands to both listen to and record the unit's voice messages.

To listen to a recorded alarm message:

1. Press the [*] key on your phone.
2. Press the corresponding input number key: 1–8, or press 9 to listen to the ID message.

Sensaphone 2000 will recite the corresponding message.

To record a message remotely:

1. Press the # key on your phone.
2. For an input alarm message, press the corresponding input number key: 1–8, or press 9 to record the ID message.

After the beep, say your message clearly. The input alarm messages may be up to 4 seconds long. The ID message can be up to 6 seconds long. Sensaphone 2000 will beep at the end of the allotted time.

Below is an example of a voice status report:

"Hello, this is 610-555-2000" (ID number)
 "This is the Sensaphone 2000 in lift station 21." (*user-recorded ID message*)
 "Input 1, jockey pump #1 overload, closed, OK"
 "Input 2, jockey pump #2 overload, closed, OK"
 "Input 3, main pump overload, closed, OK"
 "Input 4, wet well level, 8.9 feet, OK"
 "Input 5, dry well sump pump, Off, OK"
 "Input 6, exit flow, 746.9 gpm, OK"
 "Input 7, wet well air temperature, 54.4 degrees fahrenheit, OK"
 "Input 8, waste grinder motor overload, closed, OK"
 "The electricity is On"
 "Battery voltage 6.8 volts, OK."
 "Output is OFF"
 "Goodbye"

Auto Answer Mode

Auto Answer Mode allows your PC to receive calls from your Sensaphone 2000 unit(s). When this mode is enabled, your modem will answer any calls that it receives. These calls may be alarms, when the destination type is set to *Modem*, which you want logged on your computer; or they can be e-mail calls when your computer is used as an E-mail Host (*see Chapter 9*). When the software receives an alarm message, it will display it on your screen immediately, as well as update the Event Log for that particular unit. When using these features, your computer and modem must remain ON continuously.

To enable Auto Answer Mode select *Functions* from the main menu, then *Auto Answer*, or click on the *Answer Mode* icon in the toolbar.



Note that Auto Answer Mode can only be enabled if you are not online with a unit.

Chapter 7: Polling

Polling occurs when a PC automatically calls a remote Sensaphone 2000 with a modem at a predetermined time and retrieves information. Your Sensaphone 2000 Software can be programmed to connect with your Sensaphone 2000 unit on a time schedule, to retrieve the Data Log and Event Log, or to create a web page. The downloaded Event and Data Log information will be stored in a database in the computer for viewing at a later time. The concept is similar to setting an alarm clock to download a unit's Data Logger and Event Log.

Polling is a useful feature for users who need to save more data than the Sensaphone 2000 is capable of holding. The unit's Data Logger can hold 32,768 input readings. This means that if one input is being logged, the Sensaphone 2000 can store up to 32,768 data samples; but if 10 inputs are being logged, the unit can only store up to 3,276 data samples. Once the Sensaphone 2000 has filled its Data Logger, it will begin overwriting the oldest data samples with new ones. If it is important to you to save all of your data samples, and you intend to log more data than the Sensaphone 2000 can store, YOU MUST DOWNLOAD YOUR DATA.

By polling on an automated, periodic basis, it is possible to log large quantities of data to your computer without overwriting (losing) any data. It is also a time saver since the unit can be programmed to perform the data collection in the middle of the night when your computer is typically doing nothing. As an added benefit, telephone rates are typically reduced during these hours.

Once the data has been downloaded you can choose to view it using the Data Log or Event Log View options, or export the data to another application for data processing or archiving purposes.

To manually download Sensaphone 2000 Data Log information to your PC, simply press *Retrieve Data* on the "Datalogging" programming form while on line with the unit. The contents of the Data Logger will be transferred to a database in your PC.

The process is the same for downloading the Event Log. While on-line with the unit, press *Download Events* on the "Event Log Viewer" form and the unit's Event Log is saved to your PC.

Setting Up a Polling Schedule

To set up a polling schedule, click on the *Schedule* button from the toolbar of the Control Center screen. The following form will appear:

The screenshot shows the 'Polling Schedule' window. At the top, it displays 'Current Time: 11/28/00 01:47 PM' and 'Time until Next Poll: Polling disabled'. Below this is a table with columns for 'Unit Description', 'Next Poll', 'Poll Interval', and 'Action'. The table contains three rows: 'Christal Street Plant' with a weekly interval and 'Dating Print/Reset' action; 'Plant #1, Oak & Pine St.' with a 3-hourly interval and 'Web' action; and 'West Side Station' with a monthly interval and 'Events Datalog/Reset' action. At the bottom of the window are buttons for 'Add Poll...', 'Edit Poll...', 'Delete Poll...', and 'Ok'.

Unit Description	Next Poll	Poll Interval	Action
Christal Street Plant	11/28/00 12:00 AM	Weekly	Dating Print/Reset
Plant #1, Oak & Pine St.	11/28/00 12:00 AM	3 hour(s)	Web
West Side Station	11/28/00 12:00 AM	Monthly	Events Datalog/Reset

Polling Schedule form

Click on the *Add Poll* button to add a unit to the polling schedule. The Edit Poll screen will appear as shown below:

The screenshot shows the 'Edit a poll' dialog box. It has a 'Select' dropdown menu currently showing 'Plant #1, Oak & Pine St.', with 'Cancel' and 'Ok' buttons. Below this are fields for 'First Poll' with 'Date' set to '12/18/2000' and 'Time' set to '12:00:00AM'. To the right is an 'Actions' section with checkboxes for 'Update WebStatus', 'Download EventLog', 'Download DataLog', 'Print', and 'Reset'. Below the actions is an 'Interval' section with a 'Select' dropdown menu set to 'Daily'. At the bottom are 'Port Type' radio buttons for 'Local' and 'Modem'.

Edit Poll form

Select a unit by clicking the *Down* arrow in the unit selection box. Choose a date and time for the first poll. Next, select a polling interval, which will determine how often the software will connect with the selected unit. The polling interval options are: poll once, daily, weekly, monthly, and custom. The options are explained below:

- Poll Once—The software will connect with the selected unit at the time and date specified by the first poll information and then stop.
- Daily—The software will connect with the selected unit every day at the time specified in the first poll fields.
- Weekly—The software will connect with the selected unit at the time and date specified by the first poll information, then schedule the next poll for the same day and time the following week.

- Monthly—The software will connect with the selected unit at the time and date specified by the first poll information, then schedule the next poll for the same date and time the following month.
- Custom—The software will connect with the selected unit at the time and date specified by the first poll information, then schedule the next poll by adding the amount of time specified in the custom time field to the time of the previous poll.

After selecting the polling interval, choose features from the Actions section. Check “Update Web Status” if you wish to create a web page displaying the current input readings of your Sensaphone 2000 (See Internet Web Page chapter for more information). Next select which information you would like to download—the Event Log and/or the Data Log. You may choose to *Reset the Data Log* after downloading it to minimize the time of the call during the subsequent polls. Note, however, that this will delete information in the Sensaphone 2000's Data Logger, preventing another user from connecting to the unit to retrieve the Data Log information. You may also choose to print either log by checking the *Print* boxes after each.

Select whether you want to have the unit polled through the modem or local serial port.

When you have finished programming the polling information, click *OK*.

General Set Up

Next, click on the *Setup* tab of the Polling Schedule form. The screen shown below will appear.

Polling Setup Tab

This screen contains general polling setup parameters. The *Polling Enabled* option is, generally speaking, the polling on/off switch. If you

enable it, all units in the polling schedule will be called at their respective times. If you disable it, polling is turned off and no units will be called. Polling may also be enabled by clicking on the *Polling Mode* icon on the toolbar, or you can select *Polling>Enable* from the menu bar. If you check the *Enable polling on application startup* box, polling will be enabled every time the Sensaphone 2000 software is run. If you do not check this box, polling will be disabled at startup until you enable it manually. Checking this box is useful if you want your computer to restart the polling process after it has rebooted for some reason such as loss of power or operating system malfunction.

You may adjust the number of times the software tries to connect to a unit if it happens to fail the first time. Enter the number in the *Retry Attempts* box. The default setting is 3.

You may also select how long to wait before retrying by entering the time in minutes in the *Failure Delay* box. The default time is 5 minutes. When you have finished setting these parameters, click *OK*.

Polling Results

The Results tab on the Polling Schedule form will store general polling related information regarding polling failures, attempts, etc. You can choose to view *All* polling result messages or only the *Failure* messages. You can also *Print* the messages on the Results form. Clicking the *Clear* button will delete all result messages.

Note: Polling will not occur if the Polling Schedule screen is open.

Unit Desc	Date/Time	Status
Chestnut Street Plant	11/26/00 02:11 PM	Get Datalog from unit Ok
Plant #1, Oak & Pine St.	11/26/00 02:12 PM	Get Webstatus from unit Ok
Plant #1, Oak & Pine St.	11/26/00 02:13 PM	FTP finished Ok
West Side Station	11/26/00 02:14 PM	Get Eventlog Datalog from unit Ok

Polling Results Tab

Changing the Polling Schedule

If you wish to change the polling schedule of a particular unit, simply click on the next scheduled poll from the Schedule tab and then click the *Edit Poll* button. Make your changes, then click *OK*. The Polling Schedule form always shows the current polling schedule and updates its information after each poll.

Deleting a Poll

If you wish to remove a poll from the polling schedule, open the Schedule tab, click on the next scheduled poll to highlight it and then click the *Delete Poll* button.

Chapter 8: Web Page Creation

The screenshot shows a Netscape browser window with the following content:

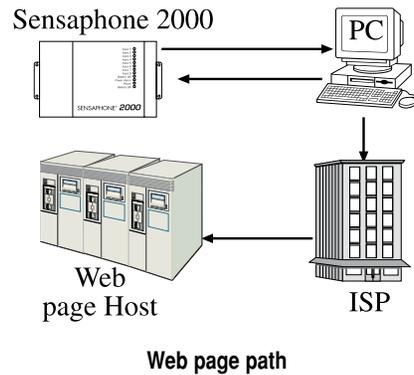
Phonetics, Inc. Plant #1, Oak & Pine St.
Report Time: 12/4/2000 2:13 PM

Input	Value	Status	State	Min	Max
Well Level	21.8 feet	Ok	No Alarm	21.8	21.8
Pump #1 Status	Closed	Running	Alarm		
Pump #1 Run Time	752 hours	Running	No Alarm		752
Pump #2 Status	Open	Stopped	No Alarm		
Pump #2 Run Time	581 hours	Stopped	No Alarm		581
Outflow Temp	77.5 deg F	Ok	No Alarm	74.8	82.0
Gen. Fuel Level	124.0 gallons	Ok	No Alarm	124.0	124.0
Security System	Open	On	No Alarm		
AC Power	ON	On	No Alarm		
Battery	6.8 Volts	Ok	No Alarm	6.4	6.8

Sensaphone® Remote Monitor Systems by Phonetics
When you need to know EVERYTHING

Sample Web Page

The Sensaphone 2000 software can generate a web page based on the information in your 2000 and post it on the internet at a programmable time interval. The web page can be created in both standard HTML and WML formats; the latter allows viewing on an internet-capable cell phone. The web page will include input and alarm information. If you have more than one Sensaphone 2000, a separate web page will be created for each. The web page is created every time a Sensaphone 2000 unit is polled. In this scenario your host computer would contact one or more Sensaphone 2000s, retrieve the I/O status and alarm information, then create the web page. The software then uploads the web page to a specified server and directory on the world wide web. Most internet service providers allocate several megabytes of space on their server for their subscribers to place their own web pages as part of the internet service contract. Contact your internet service provider for information. Note that a typical Sensaphone web page only uses about 60K of storage space.



Requirements

The Web Page feature requires that you have a computer running Windows 95, 98, ME, NT, or 2000. Internet providers which use proprietary software, such as America OnLine, cannot be used. Your internet service provider must support File Transfer Protocol (FTP).

Internet Access Settings

Select your method of accessing the internet by clicking on the *Internet* icon from the Sensaphone Toolbar. The Internet Options screen will appear. The program supports two methods of accessing the Internet: Dialup, or Always-On LAN connection (DSL, T1, Cable modem, etc.).

- Dialup: If you connect to the internet using a dialup modem, then select "Dialup (RAS)" from the *Type* menu.



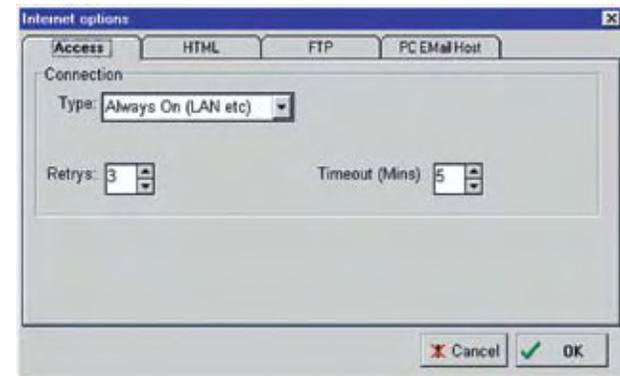
Internet Options Access tab (Dialup RAS)

Select the service provider you want to use from the *PhoneEntry* pull-down menu. Most users will only have one service provider set up through Microsoft Dialup Networking (MDN), and so will only have one choice in the pulldown menu.

Note: You must have your MDN internet account Username and Password saved in order for the Sensaphone 2000 software to automatically log in.

Select the number of times the software will attempt to dial up to your internet provider. If the number of *Retrys* is reached, then the software will abort the current process. Set the *Timeout* to the amount of time allocated to deliver an e-mail or web page including retries. If this time is exceeded, the software will abort the call.

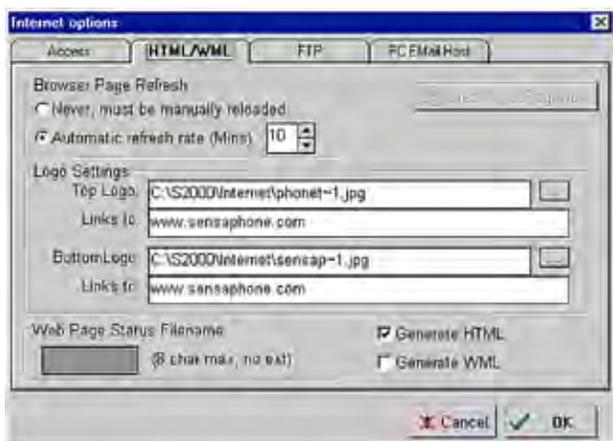
- Always-On (LAN etc): If your internet access is available all of the time, continuously, then choose "Always On (LAN etc)" for your access type. Here, since the connection is continuous once established, the options are limited to number of retries and timeout.



Internet Options tab (Always On)

HTML Web Page formatting

The Sensaphone 2000 web page that is created can be programmed to refresh automatically, updating the data, at specific intervals. It will also contain a top and bottom Sensaphone logo which can be changed based on your preferences. In addition, you can have the logos be active links to other world wide web addresses. The web page can be created in both HTML and WML formats. The WML format is specifically for use with internet-capable cell phones. The HTML/WML tab is where you specify these elements of your page.



HTML Formatting tab

Browser Page Refresh

If you select “Never, must be reloaded manually,” the data on your Web Status page will not refresh automatically. You must click “Reload” on your browser to manually reload it.

If you select “Automatic Refresh Rate,” the browser will update the web page at the interval in minutes you specify. Note that this is independent of the actual polling interval over which new Sensaphone 2000 data is being collected. If the Sensaphone 2000 hasn't been polled, then the web page isn't going to change and, as a result, the refresh will simply reload the old page. It is recommended that you set the web page refresh to a time interval that matches the polling interval.

Logo Settings

The software places a Sensaphone logo at the top of the page, and a Sensaphone logo at the bottom.

Select the browse [...] buttons to change either of these to a logo of your choice. The file must be in one of the following formats: JPEG, GIF, or PNG. Type an http address in the “Links to:” box if you want the logo to perform as a live link on the web page.

Web Page Filename

The web page filename is based on the first eight characters of the Unit Description of your Sensaphone 2000. If you prefer, you can rename the web page just by typing a new file name in the box. The

only limitation is that it must be eight characters or less and only alphanumeric characters can be used.

Note: The program will automatically attach the .htm or .wml extension so don't enter that as part of the filename.

The web page can be created in both HTML and WML formats. The WML format is specifically for use with internet-capable cell phones. You can have the web page generated in one or both formats. If both formats are selected, they will both be uploaded to the web server.

WML Filename exception

When generating a wireless web page for cell phones, if the webpage filename is specified as either “index” or “default”, the wml filename will be changed to the following to avoid browser conflicts:

filename “index” will be saved on the web server as
“wapindex.wml”

filename “default” will be saved as “wdefault.wml”

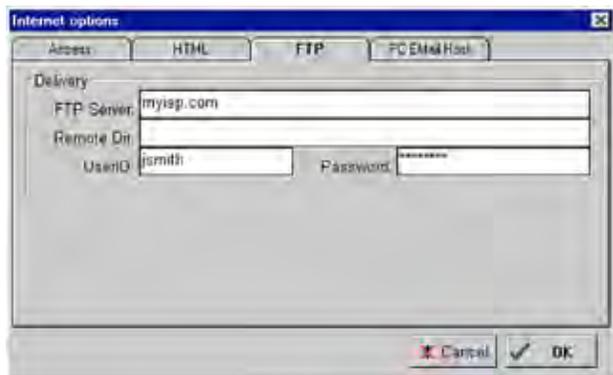
“Create Now” button

To create a web page immediately, click the Create Now button. This will make the Sensaphone 2000 software instantly create the web page, and FTP (deliver) the files to your ISP. Be sure to have all of your web page programming (Access, HTML, FTP) completed before clicking this button.

Note: You can only use the “Create Now” button while online with the Sensaphone 2000. If your connection to the Sensaphone 2000 is via modem and your internet access is also via modem, then you will have to disconnect from the Sensaphone before the web page can be delivered.

Web Page Delivery (FTP)

Your web page will be uploaded to an internet server using FTP (File Transfer Protocol). Your service provider will have to provide you with the FTP Server name and remote directory. Often this information is available from your ISP's home page. Click on the FTP tab of the Internet Options form to fill out the necessary FTP parameters.



FTP tab

The FTP Server: the host name of the FTP server for your ISP.

Remote Dir: The remote directory is the folder within the web site where the pages will upload.

UserID: Your user name for your internet account.

Password: the log-in password you need to access the folders and files in your internet account.

Once you've filled out the FTP information, click *OK* to close the form.

Viewing the Web Page

To view the page that the Sensaphone 2000 creates, you need to know its web address. This address corresponds to the Server name, plus the directory, plus the filename of the web page. It will look similar to:

<http://www.myisp.com/~jsmith/webpage.htm>

Note: In order to view the page, you must have every one of the address components correctly typed in your browser. For instance, if the page address is "htm" and you type in "html", you will not see the page. The same sensitivity and accuracy applies to both upper and lower case characters.

Updating the Web Page

Using the Polling feature of the Manager 2000 software, you can have your web page update at a fixed time interval. To do this, schedule a poll for Web Status at a fixed time interval (e.g. hourly, daily, etc...). Every time the poll takes place the web page will be updated. See the Polling chapter for information on setting up a polling schedule.

Frequently Asked Questions

Can I create web pages for more than one Sensaphone 2000?

Yes. Every time you poll a 2000 unit the software can create a new web page for that unit. Each unit will have its own web page address based on the unit name. If you repoll the same unit, the software simply overwrites the old web page with the new information.

Do I need a separate internet account for each Sensaphone 2000?

No. Generally you can put as many web pages on one account as you like. Internet providers allocate a certain amount of storage for web pages. Since the Sensaphone 2000 web pages are relatively small (60K) you can put many on one site.

Can I use the web page or email server features on a computer with Windows 3.1?

No. The web page and email server features require Microsoft Windows 95, 98, ME, NT, or 2000.

Why can't I find my webpage?

Chances are you're just typing the wrong address or you're not entering the correct upper and lower case letters in your Username or web page Filename. Typically your webpage will be located at some subdirectory of the main ISP's address which will be based on your Internet Account Username. For example, if you had an internet account with Voicenet and your Username was JSmith, your webpage would be located at www.voicenet.com/~JSmith/unitname.htm. The unitname would correspond to the first eight characters of the Unit description in your Sensaphone 2000. Note that the unitname and Username are case sensitive.

How do I find out what Internet settings to use?

You can typically find this information in one of the following places:

- (1) In the original internet account information provided by your ISP;
 - (2) On your ISP's website in the Tech Help, FAQ, or Support section;
- or
- (3) Call or email your ISP for the required information.

Why can't I FTP a web page to my America Online account?

America Online requires proprietary software to upload files to their server.

Can I program my Sensaphone 2000 through the web page?

No. You can only view information on the web page.

Can I acknowledge alarms through the webpage?

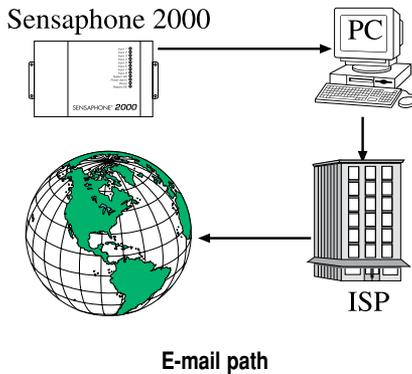
No. You can only view alarm and input information on the web page.

How long does it take to poll for web status and deliver (FTP) the web page?

If your Internet access is via dialup, then the whole process takes about 2¹/₂ minutes.

Chapter 9: E-mail Host Option

The Sensaphone 2000 software can be used as an e-mail server to receive and forward e-mail messages from one or more Sensaphone 2000s. This means if you have a computer with internet access, you can use it to receive e-mail calls from your Sensaphone 2000 and forward them over the internet yourself.



Requirements

The E-mail Host feature requires that you have a computer running Windows 95, 98, ME, NT or 2000. Internet access must be available using either an always-on connection (DSL, cable modem, T1) or a dial-up connection. The Internet Access parameters described in Chapter 8 must also be set up.

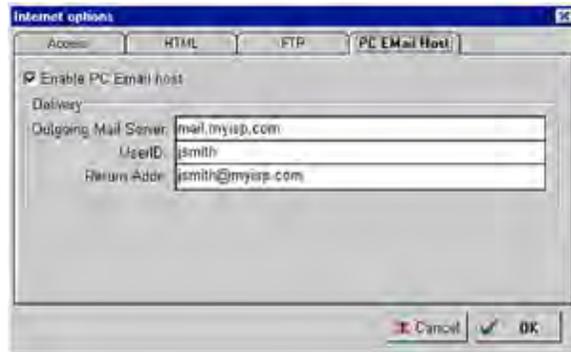
You must have a telephone line and modem to receive e-mail calls from your Sensaphone 2000.

How Does It Work?

Each Sensaphone 2000 has a telephone number it calls when it delivers e-mail. By assigning the e-mail telephone number to your own modem, your computer becomes an e-mail server. When your Sensaphone 2000 needs to send a report or alarm message to an e-mail address, it will dial your computer and send the message. Your computer will then log on to the internet and forward the e-mail message to the designated party.

PROGRAMMING

To set up your computer as an e-mail server, click the *Internet* icon on the Manager 2000 toolbar. The Internet Options screen will appear. To set up your computer as an e-mail server, you need to program the *Access* and *PC Email Host* parameters. Instructions on programming the Access parameters are located in Chapter 8. Click on the “PC Email Host” tab:



Internet Options (PC Email Host)

Check the “Enable PC Email host” box to enable this feature.

In the Delivery section fill in the following:

Outgoing Mail Server: This is the address of your Mail Server. As shown, it usually is an address such as “mail.myisp.com”.

UserID: This is the name on your e-mail user account, such as “jsmith” in the email address “jsmith@myisp.com”.

Return Address: This is the address of your account as mentioned above. It is used as the return address to all e-mails that pass through the server and will appear as the “From:” address on all e-mails sent by 2000 units.

When you’ve finished filling out the information, click OK to close the form.

Programming the E-Mail Telephone Number

The Sensaphone 2000 will call your computer when it needs to send an e-mail. To program this telephone number into the 2000, go online with your 2000 and select *Programming*, then *System* from the Main Menu, or click on the *System* icon from the toolbar. The following screen will appear:



System Settings form (Email Delivery Settings)

On the bottom righthand side of the screen is a section labeled “Email Delivery Settings.” Click in the box for “Custom Phone #” and enter the telephone number of your computer modem. Click *OK*.

Note: If the Sensaphone 2000 must dial a “1” or an area code to reach your computer, this must be programmed accordingly.

Auto-Answer Mode

The Manager 2000 software must run in auto-answer mode to receive e-mail calls from your Sensaphone 2000 unit(s). To activate auto-answer mode, select *Functions*, then *Auto Answer* from the Main Menu, or click on the *Answer Mode* icon on the toolbar. This will tell your modem to answer incoming calls from your Sensaphone 2000 units.

Frequently Asked Questions

Why don't I receive my e-mail?

There are four parameters that must be correctly set up for you to receive e-mail from a Sensaphone 2000:

- (1) Program a Sensaphone 2000 destination as *e-mail* and provide a valid e-mail address.
- (2) Set the e-mail telephone number in the *Email Delivery Settings* section of the System screen to use a custom telephone number.
- (3) Set up the Internet Access screen and *Enable the PC Email Host* feature and program all of the parameters.
- (4) Put the Manager 2000 software in *Answer mode*.

Can I receive e-mail from more than one unit?

Yes. You can receive e-mail from as many 2000 units as you want.

Can my computer be used for polling and e-mail at the same time?

Yes. The Manager 2000 program will switch between tasks as necessary.

How long does it take to receive an e-mail call on my computer and deliver it over the internet?

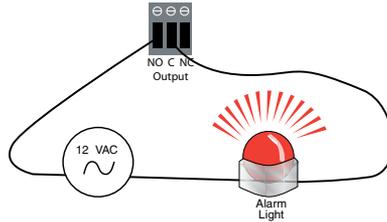
If your internet service is via dialup, then it takes about 1½ minutes to process an alarm e-mail. Reports may take longer depending on how much data is being sent.

Why won't it work with America Online?

E-mail can be sent to AOL addresses, but because America Online requires proprietary software to use their service they cannot be used as an outgoing e-mail server.

Chapter 10: Output Control

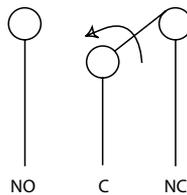
This version of the Sensaphone 2000 includes a relay output that can be used to control a light, siren, or other low voltage device. The output is a Form-C Normally Open/Normally Closed mechanical relay and is rated for 1A 30VAC or 1A 24VDC. A sample wiring diagram is shown below:



The output connector is located on the front of the unit next to the serial port and is labeled “Output”. When connecting wires to the output terminal block be sure to strip a 1/2” of wire insulation before inserting the wire (see figure below):



The output has three terminals labeled NO (Normally Open), C (Common), and NC (Normally Closed). The three terminals make a single-pole, double-throw switch. The diagram below shows how the terminals connect internally when the output is OFF. When the output is turned ON the C contact switches from the NC position to the NO position.



The output can be programmed to operate in either manual mode or any of 3 automatic modes (Alarm Condition, Unacknowledged Alarm, or Custom Value). The different operating modes are described below:

Manual Mode: The output can be operated by using the Sensaphone 2000 Software or via touch-tone command during a voice call-in.

Alarm Condition: The output will turn ON when any of the selected inputs is in alarm, regardless of acknowledgement. (Note: The alarm must be enabled and the alarm recognition time must have expired).

Unacknowledged Alarm: The output will turn on when any of the selected inputs has an unacknowledged alarm. (Note: The alarm must be enabled and the alarm recognition time must have expired).

Custom Values: The output can be programmed to turn on and turn off based on custom values for a single input channel.

Setting the Output Mode

To program the Output Mode, click on the *Output* button from the toolbar or select *Programming*, then *Output* from the main menu. The following screen will appear:



Manual Output Mode

To select Manual Mode click the circle labeled *Manual*. In this mode you can click the *Turn On* or *Turn Off* button at the top of the screen to activate/deactivate the output. For control using a touch-tone telephone see section titled “Touch-Tone Control”.

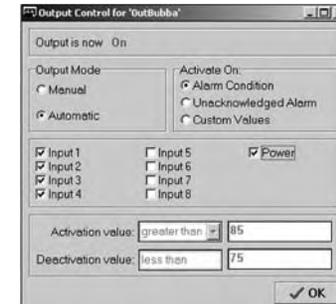
Alarm Condition and Unacknowledged Alarm Mode

To select one of these modes click the circle labeled *Automatic* from within the *Output Mode* section of the screen. Next, click the circle for either *Alarm Condition* or *Unacknowledged Alarm* from the *Activate On* section of the screen. Next, select the Input(s) that you would like to have control the output. For example, if you select inputs 1-4 and Power, the output will turn on whenever one or more of these inputs goes into alarm (see figure below).

Custom Values Mode

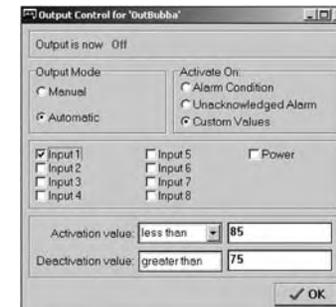
To select this mode click the circle labeled *Automatic*, then *Custom Value*. Next, click one of the *Inputs* or *Power* to be the output control source. Choose if you would like the output to Turn On (Activate) when the value is *Greater Than* or *Less Than* a particular value by clicking the drop down selection. Next, enter the numeric value at which the output should *Activate* (turn on).

Now enter the value when the output should *Deactivate* (turn off). If your input source is a contact type, than you can choose to have the output *Activate* when the input is *Open* or *Closed* or if it is set to *Power* you can have the output *Activate* when the power is *On* or *Off*.



Touch-Tone Control

If the output is set to Manual mode you can control it using touch-tone commands over the telephone. To do this call the unit and enter a touch-tone after the beep. The unit will begin speaking its *Status Report*. At the end of the status report the unit will say “Enter Password” – *press 555* - this is the default password to enter *Touch-tone programming Mode*. The commands for controlling the output are listed below:



To switch the Output ON: * # 1

To switch the Output OFF: * # 0

To recite the Output Status: * # *

The unit will respond “on” or “off” after each command is entered. If the unit

is programmed for one of the Automatic Modes and you enter one of the commands to turn the output on or off, the unit will respond by saying "error". The Output Status command can be used in any mode.

APPENDIX A: Checking Your Sensaphone 2000 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. This manual includes a test log template at the back, which you can fill in.

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 the inputs are reading properly, the alarm conditions are OK, the electricity is on, and that the batteries are OK.
2. Create a test alarm on an 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. Check the battery voltage by logging on to the unit and viewing the Inputs screen. The battery voltage should be about 6.6V. The screen should also indicate that the AC Power is OFF. Reconnect the AC Adapter when finished.
4. Test the internal modem by calling the Sensaphone from a computer and logging on.

APPENDIX B: System Events List

EVENT LOGGER - List of System Events

Startup completed
Unit reset by user
Data Logger reset
Data Logger started
Data Logger stopped
Data Logger downloaded
Data Logger full
Diagnostic - hardware reset
Diagnostic - reset program RAM
Diagnostic - reset all RAM
Password attempt successful for status only
Password attempt successful for programming access
Password attempt failed
Alarm detected
Alarm reset time expired - alarm detected
Alarm detected but not configured
Alarm acknowledged by max calls
Alarm acknowledged by 15 calls to phone 1
Alarm acknowledged by inbound phone call
Acknowledgment request received
No acknowledgment received on outbound call
Dialing "Until Acknowledged" phone number
Dialing "Inform" phone number
Phone busy
No answer
Voice call answered

Modem connect
Fax connect
E-mail connect
Numeric pager connect
Alpha pager connect
Message delivered
Hanging up
Inbound phone call received
Giving voice report (for inbound calls)
Inbound phone call terminated

APPENDIX C: Engineering Specifications

Electrical

Power Requirements:

120VAC 60Hz 10W (UL listed power supply)

Power Surge Protection:

17V Metal Oxide Varistor and solid state transient protection

Battery System:

(1) 6 Volt 3.4AH Rechargeable sealed lead-acid battery (included)

Battery Charging:

Precision voltage controlled charging system

Battery Backup time:

10 hrs

Inputs

Input Channels:

8 universal, AC Power and battery

Input Types:

Normally Open/Normally Closed contact, 2.8K thermistor [temperature range: -125°F to 124°F (-87°C to 51°C)], 10K thermistor [temperature range: -90°F to 200°F (-68°C to 93°C)], 4–20mA current loop, 0–5V analog voltage

Input Conditioning:

Open Contacts see 5VDC, closed contacts see 0.5mA, Thermistors, see 5VDC through 27K Ohms, 4–20mA inputs, see 220 Ohms to ground, 0–5V analog inputs see 5M Ohms

Input Fault Protection:

35V over/under voltage protection

Input Resolution:

12 bits

Output

Type:

1 Form-C Normally-Open/Normally-Closed Relay

Rating:

1 Amp 30VAC or 1 Amp 24 VDC

Datalogging

Number of Channels:

Inputs 1–8, AC Power & Battery backup (selectable)

Total Number of Samples: 32,768

Sampling Rate:

Programmable from 1 second to 200 hours

All samples include date and time.

Communication

Phone Line Connection:

RJ11 jack for connection to the public switched telephone network; pulse & tone dialing

Communication Types:

Voice, Fax, E-mail, modem, alphanumeric pager, numeric pager

Dialing Parameters:

Calls up to 32 destinations (telephone numbers or E-mail addresses)

32 digit telephone numbers and 64 character E-mail addresses

Time between calls programmable from 10 seconds to 60 minutes

Maximum number of calling rounds programmable from 1 to 100

Programmable call list per input

Alarm acknowledgment via touch tones or callback

Call progress monitoring to detect dial tone, busy signals & ringback

Modem:

Data throughput 14,400 bps, 14,400 bps Fax

Protocols: V.32bis, V.32, V.22bis, V.22A/B, V.23, V.21, Bell 212A & 103

Speech Technology:

(8) User-recorded voice alarm messages (4 seconds each) and (1) Identification message (5 seconds); 53 seconds of pre-recorded speech; 2.7KHz bandwidth, selectable speech for units of measure

Phone Line Surge Protection:

275V Metal Oxide Varistor

Programming

Programming Connection:

RS232 DB9 Female DCE; 38,400 baud

Programming Method:

local or remote PC with Sensaphone 2000 Software for Microsoft Windows (included)

Data Retention:

2 years typical (lithium battery backed static RAM)

Visual Indicators

Input Alarm Status:

1 red LED for each channel

AC Power Alarm:

1 red LED

System On:

1 green LED

Battery Condition:

1 green LED

Phone Line Off-hook:

1 amber LED

Output:

1 amber LED

Environmental

Operating Temperature Range:

32°–122° F (0°–50° C)

Humidity:

0–90% RH, non-condensing

Physical

Enclosure:

Durable aluminum enclosure with integral mounting brackets for wall-mounting or panel mounting

Dimensions:

12.1"W x 7.2"H x 1.6"D

Weight:

4 lbs.

Approvals

FCC Part 68

FCC Part 15 Class A

Warranty

One year parts and labor warranty.

Specifications subject to change without notice.

E-mail delivery requires additional service fees.

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Sensaphone
901 Tryens Road
Aston, PA 19014
Phone: 610.558.2700 Fax: 610.558.0222
www.sensaphone.com

APPENDIX D: Thermistor Tables

2.8K Thermistor Data

<u>Degrees Celsius</u>	<u>Resistance (Ohms)</u>
-50	187,625
-40	94,206
-30	49,549
-20	27,180
-10	15,491
0	9,142
10	5,572
20	3,498
30	2,256
40	1,491
50	1,009
60	697
70	490
80	351

10K Thermistor Data

<u>Degrees Celsius</u>	<u>Resistance (Ohms)</u>
-50	441.3K
-40	239.8K
-30	135.2K
-20	78.91K
-10	47.54
0	29.49K
10	18.79K
20	12.25K
30	8,194
40	5,592
50	3,893
60	2,760
70	1,990
80	1,458
90	1,084
100	816.8
110	623.5
120	481.8
130	376.4
140	297.2
150	237.0

APPENDIX E: RS232 Specifications

DB9 Socket Configuration: DCE Female

Start/Stop Protocol: None

Port Speed: 38,400 bps

Communications Protocol: 8 data bits, no parity, 1 stop bit

RS232 Pin Assignment

<u>Pin</u>	<u>Signal</u>	<u>Symbol</u>	<u>Direction</u>
2	Received Data	RD	from Sensaphone
3	Transmitted Data	TD	to Sensaphone
5	Signal Ground	SG	N/A

APPENDIX F: Troubleshooting

In the event that a problem is encountered, this section will assist you in determining the cause, so that you can return the unit to its usual monitoring routine with minimal interruption.

Most problems with the Sensaphone 2000 are easy to identify and can be quickly corrected, and are found under the following general headings:

- Data Communications
- Dial-Out
- Temperature Monitoring
- General Problems

If you have tried the solutions outlined in this section and are not satisfied with the results, call Sensaphone Customer Service at (610)558-2700, or follow the guidelines for shipping the Sensaphone 2000 to Sensaphone for service (see Appendix H).

PROBLEM	CAUSE	SOLUTION
I. Data Communications 1. The Sensaphone 2000 won't communicate with my computer through the RS232 port.	<p>The wrong Comm Port may be selected in Manager 2000.</p> <p>The cable is connected to your computer's parallel port.</p>	<p>Change the Comm Port in the Communications Setup Screen.</p> <p>Connect the cable to one of your PC's serial ports.</p>
PROBLEM	CAUSE	SOLUTION
2. The Sensaphone 2000 won't communicate with my computer using the modem.	<p>The slave ID in the unit does not match the Slave ID in Manager 2000.</p> <p>The Sensaphone 2000 is on the phone communicating with someone else.</p> <p>The wrong Comm Port is selected for your modem.</p> <p>The Sensaphone 2000 is connected to an incompatible telephone line.</p> <p>The unit is on-line with a computer through the RS232 port and therefore won't answer a call.</p>	<p>On the "Open Connection" screen, click on the EDIT button. On the left corner click on the box labeled "Recover from Unit Reset." Click OK and then try to connect again.</p> <p>Wait until the phone LED goes off or turn the Power switch OFF and then ON.</p> <p>Change the Comm Port setting on the Communications Setup screen. On the "Open Connection" form, click on MODEM and then SETUP.</p> <p>The Sensaphone must be connected to a standard (2-wire Analog) telephone line, and not to a digital extension to a phone system.</p> <p>Close the on-line session through the RS232 port.</p>

<p>The Rings Until Answer is set too high. As a result, the Manager 2000 software is timing out before the 2000 answers the call.</p>	<p>Increase the Dial Time Out on the Communications Setup form or reduce the number of Rings Until Answer in the 2000.</p>
<p>II. Dial-Out</p> <p>1. The Sensaphone 2000 fails to dial out.</p>	<p>Close the on-line session through the RS232 port.</p> <p>Verify destination telephone numbers: Is a "1+area code" required? Does your telephone line require a "9" to reach an outside line?</p> <p>Check call zone programming for your destinations.</p> <p>Enable the Alarm Call Mode.</p>

PROBLEM	CAUSE	SOLUTION
<p>2. The Sensaphone 2000 continues to dial out and I can't get on-line because it's always busy.</p>	<p>Recognition time is too long. An alarm condition does not remain in effect long enough to become a valid alarm.</p> <p>Max Calling Rounds" is set to "zero."</p>	<p>Shorten the recognition time for the alarm or extend the amount of time the alarm exists. An unacknowledged alarm exists only when the red LED blinks on the front panel.</p> <p>Increase calling rounds to a number greater than zero.</p>
<p>3. The Sensaphone 2000 continues to dial out and I can't get on-line because it's always busy.</p>	<p>The destination intercall times are programmed too short. The unit will wait the intercall time between calls and then dial the next number. If this value is too short, the opportunity to call in will be very short.</p>	<p>Extend the length of the intercall time for each destination.</p>

III: Temperature Monitoring

1. The temperature reading is -58° F or -50° C.	The temperature sensor has become disconnected or has broken wires.	Examine the wires to the temperature sensor and connect or replace the wiring.
2. The temperature is reading 176° F or 80° C.	The temperature sensor wires are touching or have shorted. The shunt for setting the input type is not installed in the TMP/DRY position.	Verify and correct wiring. Move the shunt to the correct position.
3. The temperature reading is incorrect when using a 10K thermistor.	The Sensaphone 2000 is compatible with a specific type of 10K thermistor. Since there are several types available, you must make sure that you are using the correct type. Otherwise incorrect readings will occur. The table in Appendix C shows the temperature vs. resistance curve for acceptable models.	Verify the temperature vs. resistance curve of your sensor and/or replace the sensor as necessary.

PROBLEM

CAUSE

SOLUTION

IV. General Problems

1. The alarm status of an input is incorrect.	Incorrect input normality.	Change the input normality on the input configuration form.
2. The Sensaphone 2000 starts dialing as soon as I turn it on.	The shunt for setting the input type is in the wrong position. The unit has an unacknowledged alarm and is still trying to deliver its message. Even if the alarm condition no longer exists, the unit will continue to dial and deliver its message until it is finally acknowledged.	Confirm that the input shunt is in the correct position for your sensor. Acknowledge the alarm by: a) Going online with a PC and clearing the alarm; b) Calling the unit back with a telephone and giving the Touch Tone acknowledgement code; or c) Plugging a telephone into the Local Voice jack and giving the Touch Tone acknowledgement code.

APPENDIX G: Accessories

The sensors listed below are available from Sensaphone and represent the most commonly used input devices. Other dry contact sensors, designed for more specialized applications, may also be used. Commercial or industrial electrical supply houses can provide devices to monitor virtually any condition. For further information, contact Sensaphone Customer Service at 610-558-2700.

<u>MODEL NUMBER</u>	<u>SENSOR / SWITCH</u>
FGD-0006	Magnetic Reed Switch
FGD-0007	Passive Infra-Red Detector
FGD-0010	50' 2-conductor #22AWG shielded accessory Cable
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-0052	Humidity Transmitter
FGD-0053	24V Power Supply for Humidity Transmitter
FGD-0054	Power-Out Alert™
FGD-0056	Zone Water Detector w/Water Rope
FGD-0063	10' Water Rope for FGD-0056
FGD-0100	Remote Temperature Sensor
FGD-0101	2.8K Weatherproof Temperature Probe
FGD-0102	10K Weatherproof Temperature Probe
FGD-0103	10K Indoor Decorator Zone Temperature Sensor
FGD-0104	10K Outdoor Air Weatherproof Temperature Sensor
FGD-0105	10K Immersion Temperature Sensor

APPENDIX H: Returning the Unit for Repair

In the event that the Sensaphone 2000 does not function properly, we suggest that you do the following:

- 1) Record your observations regarding the 2000's malfunction.
- 2) Call the Technical Service Department at 610-558-2700 prior to sending the unit to Sensaphone for repair.

If the unit must be sent to Sensaphone for Servicing, please do the following:

- 1) Turn the power switch Off, disconnect all wiring and unplug the unit.

NOTE: You can retain your wiring configuration by removing the terminal block before packing and shipping the unit. Insert the tip of a small screwdriver into the space between the block and the base into which it plugs, being careful not to damage the silver pins (see Illustration). Gently pry up the block—it's a single unit so you will have to pry at each end and near the center to free it incrementally. Remove the block with your wiring still attached to the screws. (When the unit is returned to you, simply align the pins and carefully refit the block to the unit.)

Carefully insert a screwdriver into the spaces between the terminal block and the base and gently pry up the block.



Terminal Block

- 2) Carefully pack the unit to avoid damage in transit. Use the original container (if available) or a sturdy shipping box.

- 3) To avoid shipping delays, you must include the following information :

- a) Your name, address and telephone number.
- b) A note explaining the problem.

- 4) Ship your package to the address below:

SERVICE DEPARTMENT
Sensaphone
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.

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