

# SENSAPHONE®

## *APPLICATION NOTE*

### **Application:**

**Monitoring Smallpox Vaccine Storage Refrigerators**

### **Functions:**

**Data Logging, Alarm Notification of Power or Equipment Failure**

### **Sensaphone Model:**

**Sensaphone 2000**

### **OVERVIEW:**

According to the Centers for Disease Control, smallpox vaccine must be stored in refrigerators between 2° and 8° Celsius (36° to 46° Fahrenheit). If the refrigerators containing the vaccine stop working or lose power, it's critical that health care personnel are notified so they can take steps to keep the vaccine from spoiling.

## MONITORING EQUIPMENT

The Sensaphone 2000 monitoring system is an ideal notification device for vaccine storage facilities. It's designed to quickly deliver alarm messages in the event of power or equipment failure. Sensaphone 2000 provides continuous temperature monitoring of up to 8 refrigerators, so it has enough capacity to handle large storage facilities. It will make alarm telephone calls if the temperature in any refrigerator goes out of its programmed range. The Sensaphone 2000 also monitors its own AC power supply. In the event of a power failure, it will run on its battery backup and make alarm phone calls delivering the message "the electricity is off."

The Sensaphone 2000 can call up to 32 different phone numbers in the event of an alarm. In addition to delivering custom user recorded voice messages, the Sensaphone 2000 can send alarm messages directly to fax machines, numeric, and alphanumeric pagers.

## TEMPERATURE SENSING

In order to monitor temperature inside refrigerators, temperature sensors must be installed inside each refrigerator and wired back to the Sensaphone 2000's inputs. A weatherproof temperature probe (*Sensaphone Part # FGD-0101*) is recommended for refrigeration environments. The temperature probe should be placed inside the refrigerator and the sensor wires run out the hinged side of the door (*See Figure 1*). The sensor wires are small enough for the compartment seal to be maintained when the door is closed. Installing the temperature sensor through the back of the refrigerator is not recommended and may void the appliance manufacturer's warranty.

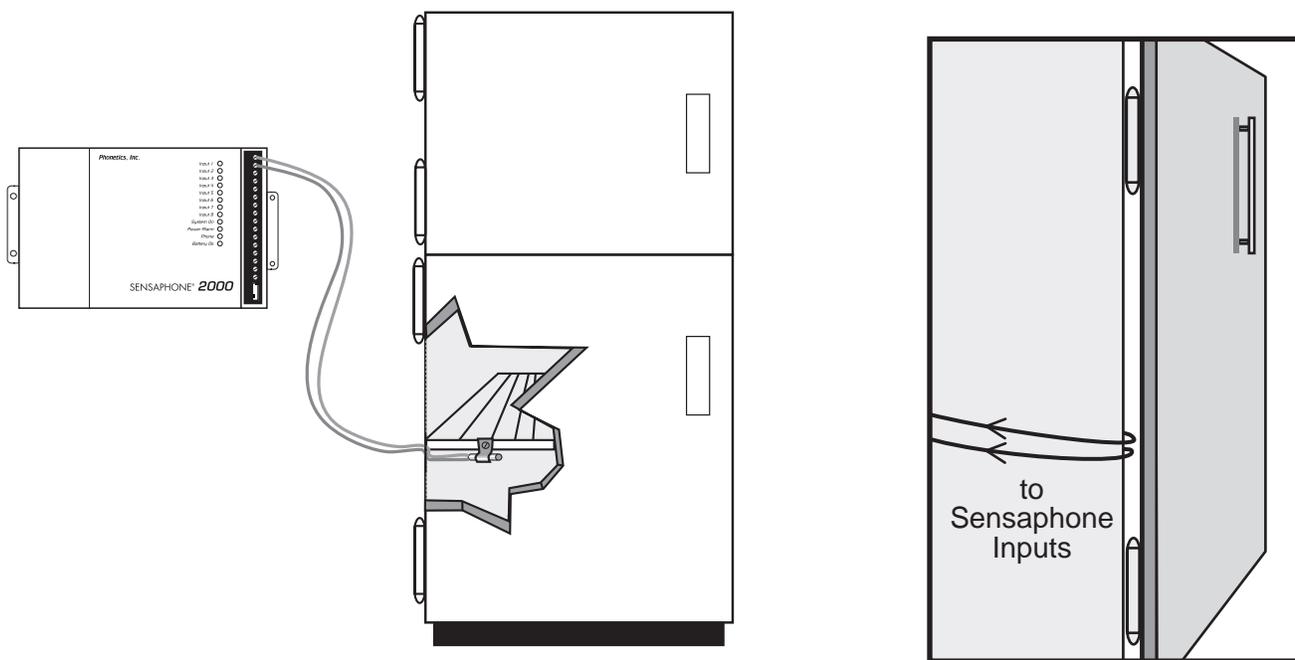


Figure 1: Temperature probe wiring, behind refrigerator door

## OTHER RECOMMENDED EQUIPMENT

We recommend the use of an ISOTEL surge protection device (*Sensaphone Part # FGD-0023*) to protect the Sensaphone 2000's AC power and telephone circuits from damage caused by lightning strikes and other unexpected power surges.

**Note:** The ISOTEL surge protector has an on/off switch that controls its 4 AC power supply plugs. Federal guidelines for vaccine storage specify that refrigeration equipment NOT be plugged into a switched device. Therefore plugging the refrigerator into the ISOTEL surge protector is not recommended. The ISOTEL surge protector should only be used to protect the Sensaphone monitoring equipment (*See Figure 2*).

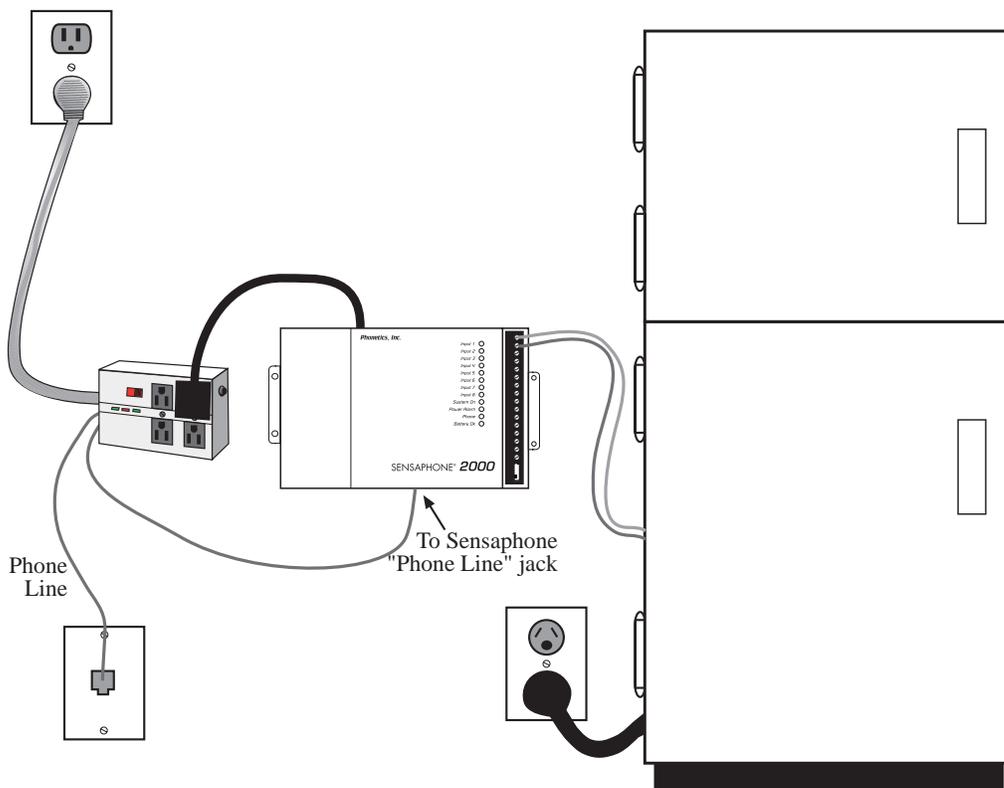


Figure 2: Power Wiring

## TRACKING ALARM RESPONSE EVENTS

The Sensaphone 2000 keeps track of important system events with its built-in Event Logger. Each alarm event and notification sequence is recorded for viewing and verification. Each Sensaphone 2000 unit stores the last 500 system events. These include alarms, incoming and outgoing phone calls, and alarm acknowledgments.

## LOGGING STORAGE TEMPERATURES

Recording the temperature of the refrigerator compartments is an added benefit of the Sensaphone 2000. The unit's built-in Data Logger can log and store information on all 8 universal inputs, AC power and backup battery voltage. The Sensaphone 2000 has enough on-board memory to store 32,000 samples. Records are downloaded for permanent storage using the included Sensaphone Manager 2000 programming software.

## **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: (6) C-cell Rechargeable Nicad batteries (not included)

Battery Charging: Precision voltage controlled charging system

Battery Backup time: 10–15 hrs

### **Inputs**

Input Channels: 8 universal, AC Power and battery

Input Types: Normally Open/Normally Closed contact, 2.8K thermistor [temperature range: -58°F to 176°F (-50°C to 80°C)], 10K thermistor [temperature range: -60°F to 300°F (-50°C to 150°C)], 4-20mA current loop, 0-5V analog voltage

Input Conditioning: Open Contacts see 5VDC, closed contacts see 0.5mA, Thermistors, see 5VDC through 10K 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: 10 bits

### **Datalogging**

Number of Channels: Inputs 1-8, AC Power & Nicad 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 & 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 DB25 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

## **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: 3 lbs. (4 lbs. with batteries)

Environmental Operating Temperature Range: 32°-122° F (0°-50° C)

Humidity: 0-90% RH, non-condensing

## **Approvals**

FCC Part 68

FCC Part 15 Class A

## **Warranty**

One year parts and labor warranty.

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