

# ENGINEERING SPECIFICATIONS

## SENSAPHONE® 2000

### I. General

The automatic dialer shall be a self-contained microprocessor controlled system capable of monitoring 8 input channels. The system shall also contain one programmable relay output. The system shall be integrated in construction and shall be installed and configured for operation by the user via Microsoft Windows® compatible software provided at no charge. In addition, the software shall provide the ability to produce an internet web page and function as an e-mail server for the system. Voice message recording shall be accomplished via local or remote touch-tone phone. Input channels shall be capable of monitoring analog or digital signals utilizing 10-bit resolution. The system shall include a ten hour rechargeable battery for backup power.

Upon detection of any alarm or status change, the system shall commence dialing telephone numbers from a list associated with the particular alarm condition(s) or combination thereof, and deliver the alarm message via a custom voice message, fax, e-mail, modem, numeric pager or alphanumeric pager. The voice alarm message shall be delivered in digitized human voice using messages recorded by the user. The system will continue to call telephone numbers in succession until a positive acknowledgment of the alarm message is received. Acknowledgment can be accomplished from a voice phone call, a modem phone call, or by a callback from either a telephone or a computer with modem. Upon answering, the system shall attempt a data connection. If a connection is made the system shall allow remote access to programming and operation. If a data connection is not made, the system shall recite a voice status report and allow access to remote voice message programming.

The system shall be FCC registered for direct connection to the telephone network. The system shall have a one year warranty from the manufacturer. The system shall be a Sensaphone 2000 by Phonetics, Inc.

### II. I/O Channel Attributes and Features

#### A. Inputs

The system shall come standard with 8 universal input channels. The input resolution shall be 10-bit with scalable lookup tables. All analog input values shall read to one decimal place. All input channels shall be user-configurable as:

1. NO or NC digital dry contact, using 0.5mA loop current
2. 4–20mA analog, using custom look up table
3. 0–5V analog, using custom look up table
4. Temperature from thermistor, using 2.8K or 10K devices
5. Run time accumulator
6. Pulse count

The system shall have the following built-in monitoring features:

1. AC power failure detection
2. Low battery detection

All monitored channels, including built-in monitoring features, shall allow local and remote data programming of pertinent operational data including, but not limited to:

1. Input type (NO/NC, 4–20mA and 0–5V analog, thermistor, run time, pulse count)
2. Units of measure (degrees F, degrees C, inches, feet, psi, volts, amps, pounds, gallons)
3. High and Low limits (-99,999.9 to +99,999.9)
4. Input recognition time (0 seconds to 270 minutes)
5. Alarm reset time (0 seconds to 270 minutes)
6. Alarm call list for each channel
7. Enable/Disable for each channel to dialout for alarm

#### B. Output

The system shall come standard with one relay output. The output shall be a dry contact relay capable of switching up to 30 Volts AC/DC at up to 1 Amp of current. The output shall be fully programmable to operate on any one of the following options:

1. Output ON when any of the selected inputs has an unacknowledged alarm, OFF when all selected inputs (alarms) are acknowledged
2. Output ON when any of the selected inputs is in an alarm state, OFF when all selected inputs have returned to a normal state
3. Output ON when a single selected input is Greater-Than/Less-Than or Equal-To a high or low set point, OFF when it is Greater-Than/Less Than or Equal-To a separate high or low set point
4. Manual control of the output using the 2000 software or by calling the unit using a touch-tone telephone and entering a touch-tone command

### **III. Communications Features**

#### A. Communication Methods

The system shall be able to communicate alarms and other status information using the following methods.

1. Programmable voice
2. Fax
3. Modem
4. Numeric pager
5. Alphanumeric pager
6. Internet E-mail

#### B. Telephone Specifications

The system shall connect to a standard 2-wire telephone line using pulse or tone dialing methods, with loop start only. The system shall recognize ringer frequencies from 16 to 60 Hz. No leased or dedicated lines shall be required. Call progress detection shall ensure that the alarm dialout is not hindered by no-answers or busy signals.

### C. Line Seizure Feature

The system automatically seizes control of the phone line to make an alarm phone call when the alarm occurs. All other calls, including current calls, will disconnect and all extensions will be disabled. Extensions will remain cut off until the alarm is acknowledged.

### D. Communications Interface

The system shall have a built-in 14,400 bps modem to allow remote data communication and programming via computer. The system shall have a built-in RS232 serial port for the purpose of local communication and programming via computer. Both communication interfaces shall accept standard Modbus protocol.

### E. Destinations (Telephone Numbers and E-mail Addresses)

The system shall be capable of contacting up to 32 destinations (36 digit telephone numbers /64 character e-mail addresses). There shall be a capability to group the destinations into multiple lists to create calling schedules based on weekdays, weeknights and weekends. In addition, individual input alarms may be programmed to contact specific destinations.

### F. Voice Messages

The system shall have the ability to record, store and reproduce voice messages and to use those messages to articulate the location and status of the monitored channels. In absence of user-recorded voice messages, the system shall articulate channel status using the internally resident vocabulary. All digitized speech message data shall be stored in nonvolatile memory. Such nonvolatile memory shall be capable of protecting speech memory for at least 10 years of complete power outage.

There shall be one recorded identification message for the system, and one recorded alarm message for each input channel. Message length shall be 4 seconds per input and 6 seconds for system identification.

### G. E-Mail Server Programming

The software shall be capable of functioning as an e-mail server for the purpose of receiving e-mail calls via telephone and forwarding e-mail messages via the internet, from one or more units. The host PC shall be required to have internet access through a dialup connection or continuous service via cable modem, DSL, T1, etc.

### H. Web Status Programming

The software shall be capable of polling units via telephone or serial port to automatically retrieve the input values and alarm status, and create a web page for each unit. The software shall automatically upload the web page to an internet server immediately following each poll. The software shall allow scheduled polling times to be programmed for each unit. The host PC shall be required to have internet access through a dialup connection or continuous service via cable modem, DSL, T1, etc. Storage space on a web server that supports FTP shall also be required.

## **IV. Programming**

### A. Local Programming

The system shall have a built-in RS232 port for the purpose of locally programming all system data using an IBM® PC or compatible with Windows® 98 or greater, and Sensaphone 2000 programming software (included). All operational data, system setup and configuration data, and all information regarding the status of monitored input channels shall be accessible. In addition, voice messages may be recorded and reviewed using a standard touch-tone telephone.

## B. Remote Programming

The system shall have a built-in 14,400 bps modem for the purpose of remotely programming and communicating all system, configuration, and input data using an IBM® PC or compatible with modem, Windows® 98 or greater, and Sensaphone 2000 programming software (included). A user-programmable security password shall protect the system from unauthorized tampering. Voice messages may be recorded or reviewed via a phone call using a standard touch-tone telephone.

## V. System Features

### A. Power

The system shall be provided with a UL/CSA listed 9VDC 600mA power transformer that the user may plug into a 115V AC outlet,  $\pm 10\%$ , 60Hz. Typical power consumption shall be 10 Watts.

### B. Battery Backup

The system shall include a 6 volt 3.4 AH sealed lead-acid rechargeable battery. The battery shall support approximately 10 hours of continued system operation in the absence of AC power. (Actual battery backup performance is dependent upon the age of the battery, ambient temperature, and the charge condition.) The unit shall include an integrated battery charging circuit. The battery charging shall be intelligent with micro-processor guided precision voltage control.

### C. Local Visual Indication

Each input shall have a corresponding LED that will indicate the alarm and acknowledgment status of each input. The system shall also have LEDs to indicate System On, Battery Condition, Phone Line status, and output status.

### D. Data Log

The system shall be capable of logging the values of all input channels, the battery voltage and the AC power status. Items to be stored shall be selectable to maximize memory usage. Up to 32,000 total samples can be stored in the unit's nonvolatile memory. The time between logs shall be user-programmable. The system shall have the capability to send the datalog information via fax or e-mail on a time-programmable basis. Datalog information may also be retrieved via computer and modem, by using the polling option of the Sensaphone 2000 Windows® software.

### E. Security

The system shall allow the user to program a data password to prevent unauthorized local or remote access to programming.

### F. Field Upgrades

The system shall be designed using flash memory technology to permit field firmware upgrades. Such upgrades shall be performed using a personal computer either on-site or remotely via modem. Firmware upgrades shall be available from the manufacturer's website ([www.sensaphone.com](http://www.sensaphone.com)).

## VI. Remote Operation Features

### A. Status Report

The system shall allow the user to call into the unit at any time using any standard telephone to obtain a full status report of all monitored channels. The status report shall be articulated using the resident voice-synthesized English vocabulary, in combination with digitized user-recorded voice messages.

## B. Data Status Report

The system shall allow the user to call into the unit with a computer, modem and the Sensaphone 2000 software package. The system shall allow interrogation and programming access to system parameters and status. The real time input status can also be displayed graphically. Real time status snap shots can also be automatically transmitted to E-mail or Fax destinations on a time schedule.

## C. Voice Acknowledgment

An alarm on any monitored channel may be acknowledged remotely by pressing tones on a touch-tone telephone keypad or by calling the system back within a specified time period.

## D. Data Acknowledgment

An alarm on any monitored channel may be acknowledged remotely by the user via a computer, modem and the Sensaphone 2000 software. Alarms may be acknowledged manually by calling into the unit or they may be acknowledged automatically using the alarm-answer mode of the Sensaphone 2000 software package.

## VII. Enclosure and Environmental

### A. Enclosure

The system shall be housed in a durable aluminum enclosure with integral mounting brackets for wall or panel mounting. The dimensions shall be 12.1”W x 7.2”H x 1.6”D. The weight shall be 4 lbs.

### B. Electrical Protection

Power and telephone connections shall have internal spike and surge protection using metal oxide varistors. All input channels shall have fault protected input circuits.

### C. Additional Electrical Surge Protection

Additional Power and Telephone line surge protection shall be available from the manufacturer. When so installed, the system shall be fully warranted against any damage caused by transient surges entering the system through Power or Telephone lines.

### D. Environmental

The system shall function over an operating temperature range of 32°F–122°F at up to 0–90% RH, non-condensing. The system may be stored within the temperature range of 0°–130°F.

### E. Maintenance

The system manufacturer shall have in-house service facilities and technical assistance available during normal business hours, Monday–Friday 8am–5pm(EST).

Specifications subject to change without notice.

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