SENSAPHONE®

IMS-4000

User's Manual

Version 2.4.8

PHONETICS, INC.

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Important Safety Instructions

Your IMS-4000 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 IMS-4000 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 IMS-4000 near water, or spill liquid of any kind into it.
- Be certain that your power source matches the rating in the specifications of this manual. 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 IMS-4000 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.
- To reduce the risk of fire or injury to persons, read and follow these instructions:
    1. Use only the specified type and size batteries.
    2. Do not dispose of the batteries in a fire. The cell may explode. Check with local codes for possible special disposal instructions.
    3. Do not open or mutilate batteries. Released electrolyte is corrosive and may cause damage to the eyes or skin. It may be toxic if swallowed.
    4. Exercise care in handling batteries 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 IMS-4000 complies with 47 CFR, Part 68 of the rules. On the back of the unit there is a label that contains, among other information, the Certification 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.

The applicable certification jack USOC for this equipment is: RJ11C. The facility interface code (FIC) for this equipment is: 02LS2.

A compliant telephone cord and modular plug are provided with equipment. This equipment is designated to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68 compliant. See Installation Instructions for details.

This equipment may not be used on coin service units provided by the telephone company. Connection to party lines is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

Should the IMS-4000 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 service without notice and you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC. The telephone company may make changes in its facilities, equipment, operations, or procedures where such action is reasonably required in the operation of its business and is not inconsistent with the rules and regulations of the FCC that could affect the proper functioning of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

If you experience trouble with the Sensaphone IMS-4000, or you need information on obtaining service or repairs, please contact:

Phonetics, Inc.
901 Tryens Road, Aston, PA 19014
610.558.2700
Fax: 610.558.0222

If the equipment is causing harm to the telephone network, 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 *(Host only)*

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 IMS-4000:

- Date and Time as described in the Unit Properties section of the Software Manual.
- Name and telephone number to identify the source of the FAX transmission, as shown in the Unit Properties section of the Software Manual.

General Requirements for all Automatic Dialers *(Host only)*

When programming emergency numbers and (or) making test calls to emergency numbers:

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

Canadian Department of Communications Statement *(Host only)*

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 IMS-4000, the Ringer Equivalence Number is 0.3.

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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.

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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**: Three-Year Warranty — In the event that the Product does not conform to this warranty at any time during the time of three years 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.

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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.

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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.

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Chapter 1: Installation

Introduction

Congratulations on your purchase of the Sensaphone IMS-4000 Infrastructure Monitoring System. This one-of-a-kind solution will change the way you think about computer room and network monitoring. The system is designed to be a comprehensive method of ensuring 100% up-time of your computer systems. By monitoring all aspects of your computer room, including environmental conditions and network equipment, the system will keep you informed of the status of your infrastructure. Monitored conditions can include temperature levels, humidity levels, line voltage, leak detection, server response , UPS systems, and more. The system allows the computer professional to be notified immediately of any detected problems. Notification can occur via voice telephone call, pager, e-mail, or fax. An internal battery backup system insures that the unit will continue to run if main power fails. The system also includes the ability to remotely perform diagnostic tests via Touch-Tone commands or e-mail. And with the IMS-4000 PowerGate, you can also remotely reboot equipment.

Features

The IMS-4000 series of products includes the following key features:

- Expandable architecture permitting up to thirty-one IMS-4000 Nodes to be used with each IMS-4000 Host.
- Eight sensor inputs per Host to monitor environmental conditions and/or alarm contacts from other computer equipment such as UPS systems.
- 10BASE-T Ethernet port for inter-operation with other IMS-4000 equipment and network devices.
- RS-232 serial port for local configuration.
- Internal battery backup for uninterrupted performance.
- Microphone for detecting audible alarms such as smoke detectors.
- Compact design allows rack-mount, wall-mount, or tabletop installation.
- ConsoleView software to program and manage your IMS-4000 system.

Technical Support

If any questions arise upon installation or operation of the IMS-4000, please contact the Sensaphone Technical Service Department at 610.558.2700 and have the following information available:

- Date of purchase _____
- Serial number _____

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

About This Manual

This manual comprises the instructions and commands necessary to install and program the IMS-4000. Additional summary and application chapters are included to help you speed programming and to understand IMS-4000's features. You should thoroughly read this manual to establish a basic understanding of the system and keep it as a reference.

HOST INSTALLATION and CONFIGURATION

Physical Description

The IMS-4000 Host is housed in a 17"w x 1.75"h x 10"d enclosure, which is 1 EIA rack-mount space high.

Front Panel Layout

The front panel contains connections for eight sensor inputs, microphone input, Ethernet port, serial port, and status LEDs. See figure below:

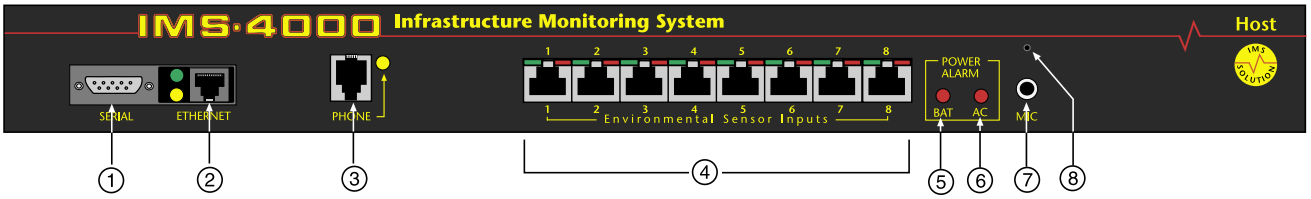


Figure 1: Front Panel Layout of the IMS-4000 Host

1 Serial Port
2 Ethernet port (10/100Base-T)
3 Phone line
4 Sensor Inputs (8)
5 Battery Power Alarm LED
6 AC Power Alarm LED
7 External Microphone Input
8 Internal Microphone

Serial Port

The RS-232 serial port is used to configure network settings. The port operates at 9600 baud, no parity, and 1 stop bit.

RJ-45 10/100BASE-T Ethernet Port

This jack is for connecting to your network so that the IMS-4000 Host can communicate with the IMS-4000 Nodes and ping selected network servers and/or services. Two LEDs indicate received data (green) and transmitted data (yellow).

Phone Jack

Connect the IMS-4000's Phone jack to a standard 2-wire analog phone line. The unit dials using touch-tones, with loop start only. The IMS-4000 will recognize ringer frequencies from 16 to 60 Hz and will operate with all standard analog telephone systems that accept tone dialing.

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.

Sensor Inputs

The sensor inputs are designed to interface with IMS-4000 series sensors (*See Chapter 6*). The use of RJ-45 jacks for sensor inputs allows the use of existing structured cabling to connect remote sensors.

Since the sensor produces an analog signal, it must connect directly to the Host or Node. The path from the sensor to the IMS unit CANNOT pass through a network Hub or Switch.

Sensor Input LEDs

Each sensor input has two LEDs (red and green) to indicate the present status of the input. The key below describes the multiple modes of operation.

Mode 0: No sensor at input
- Green: OFF
- Red: OFF

Mode 1: Sensor present—No alarms
- Green: ON
- Red: OFF

Mode 2: Alarm detected but has not exceeded recognition time
- Green: FAST BLINK
- Red: FAST BLINK

Mode 3: New alarm exists and not yet acknowledged
- Green: SLOW BLINK
- Red: SLOW BLINK

Mode 4: Input is in normal range, but alarm is still unacknowledged
- Green: ON
- Red: SLOW BLINK

Mode 5: Alarm has been acknowledged, but input is still out of range
- Green: SLOW BLINK
- Red: ON

Mode 6: Sensor in trouble
- Green: QUICK FLASH
- Red: QUICK FLASH

AC Power and Battery LEDs

The AC Power and Battery alarm status is indicated by two red LEDs. Their modes of operation are described below.

Mode 1: No Alarm
LED: OFF
Mode 2: Alarm detected but has not exceeded recognition time
LED: FAST BLINK
Mode 3: New Alarm exists and not yet acknowledged
LED: SLOW BLINK
Mode 4: Alarm has been acknowledged but input is still out of range
LED: ON

Microphone Jack

The Host unit comes with a built-in microphone. Directly below the built-in mic is a separate jack for connecting an optional condenser microphone to sense audible alarms, such as smoke detectors.

When an external microphone is connected, the internal microphone is disabled.

Rear Panel

The rear panel is where the main power switch is located. The main power cord attaches to the IEC320 connector. The unit can be powered from 90–260VAC 47–63Hz.

ON/OFF Switch

The on/off switch connects main power and battery power to the system. Note that the system will only turn on when main power is present. When main power fails, the internal battery will automatically supply power to the unit.

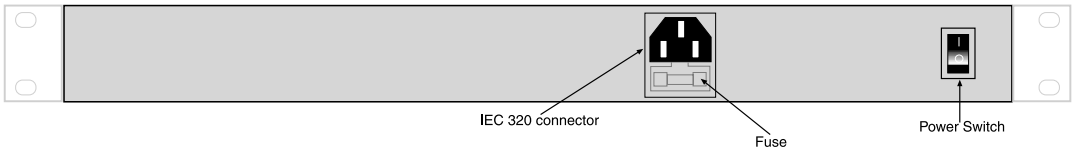


Figure 2: Rear Panel of the IMS Host

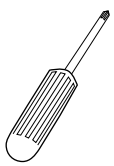
Installation

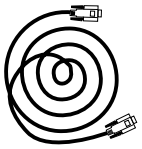
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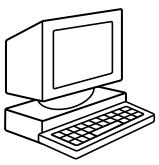
- Operating environment
- Rack, wall, and tabletop installation
- Connecting sensors

Parts Required

Phillips Screwdriver	9 pin F/F null modem cable	Dumb terminal or PC w/9 pin com port







Operating Environment

Before you install the IMS-4000 Host be sure that your operating environment meets the physical requirements of the equipment.

Operating Temperature:	32º–122º Fahrenheit (0º–50º C)
Humidity:	5–90 %RH, non-condensing
Power:	90–260VAC 47/63 Hz outlet within 6'
Rack Requirements:	Standard 19' equipment rack with supplied mounting bracket hardware. Requires 1.0 EIA rack mount space.
Tabletop requirements:	Flat area which can support an enclosure 17" wide by 10" deep by 2" high.

Rack Mount Installation

The IMS-4000 Host can be rack mounted using the included rack mount brackets. Follow the steps below:

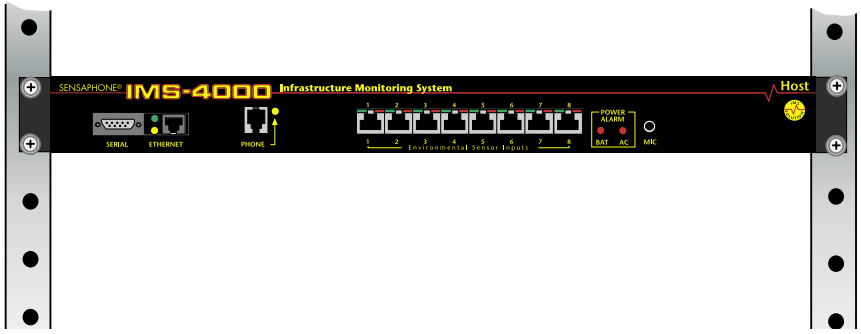


Figure 3: Rack-mounted Host Unit

Wall Mount Installation

The IMS-4000 Host can be wall mounted using the optional wall mount brackets. Follow the steps below:

1) Attach the optional wall mount brackets to the sides of the IMS-4000 using the eight black #6-32 screws. A Phillips screwdriver will be required. (Order part # IMS-4501 Universal Wall Mount Kit)
2) Attach the unit to the wall using two screws per side. Tighten the screws with a Phillips screwdriver.
3) Plug the power cord into a 90-260VAC outlet.

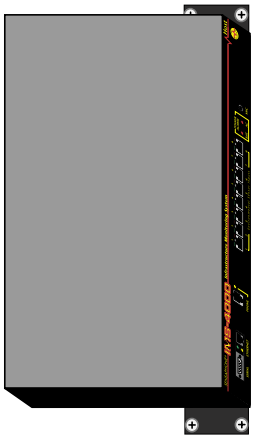


Figure 4: Wall-mounted Host Unit

Tabletop Installation

The IMS-4000 Host can be installed on a tabletop or shelf. Follow the steps below:

1) Attach the four self-adhesive rubber feet to the four corners on the bottom of the IMS-4000.

2) Place the unit on a tabletop or shelf and connect the power cord into a 90-260VAC outlet.

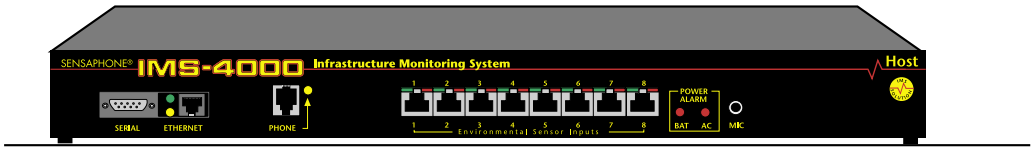


Figure 5: Tabletop-mounted Host Unit

Power On Self Test (POST)

When the power switch is turned on, the red and green input LEDs will begin a blinking pattern to indicate that the unit is booting up and performing internal diagnostic tests. The unit will also beep once, 25 seconds after power is applied. When the LEDs stop blinking, the unit is fully booted and operational. The boot and Power On Self Test take approximately 2 minutes.

Connecting Sensors

The IMS-4000 Host has eight sensor inputs. Each input can accept any sensor type. Sensors are available to monitor the following:

- Temperature
- Humidity
- Water detection
- AC voltage
- Alarm contacts from external equipment
- Smoke
- Security
- Motion

All IMS-4000 sensors connect to the Host using standard RJ-45 cables. This makes it easy to connect sensors directly to the unit. Simply plug one end of the cable into the sensor and the other end into one of the sensor inputs on the Host.

Another benefit of using RJ-45 connectors is that you can easily locate sensors at distant locations within your facility by using your existing structured cabling. For example: Suppose you have an

IMS-4000 installed in room A and you want to install a sensor in room B. If your existing cabling infrastructure has an unused cable path between room A and room B, then you simply use an RJ-45 interconnect cable to connect the IMS-4000 to the patch panel in room A, and an RJ-45 interconnect cable from the wall jack in room B to the sensor.

CAUTION: The sensor produces an analog signal which *must* connect directly to the Host or Node. The path from the sensor to the IMS unit CANNOT pass through a network Hub or Switch.

Network Configuration

The IMS-4000 Host has a serial port on the front panel which is used to configure network settings and security options. A dumb terminal or terminal emulation software is required to get online and set up the configuration. The port is male DTE, so you will need to use a null modem cable. Terminal communication settings must be set to:

- 9600 baud, no parity, 8 data bits, 1 stop bit

To get online with the IMS-4000, connect your terminal to the serial port and press <*RETURN*>. A menu will appear which will guide you through the setup.

```
Sensaphone IMS-4000 Host Unit V1.0.0.0

 Enter Password ()>
        {The DEFAULT PASSWORD for a New Unit is "ims4k"}
 1. Display Enterprise status
 2. Display Network and Option configuration
 3. Configure Network settings
 4. Configure Enterprise Name
 5. Configure Web Server
 6. Configure Remote Access Server
 7. Enable Two-Way E-mail Responder
 8. Enable Microphone Listen-In
 9. Enable default Master Administrator Account (temporarily)
 0. Enable data modem
 A. Configure SNMP
 B. Change Admin Password
 C. Reset To Factory Defaults
 D. Display Statistics
 E. Reboot
 F. Logout
 Enter option->
```

If you select **Option 1** you will see the IP address and status of the Host and all associated nodes. A sample is shown below:

```
Enterprise Status
Unit                 Type IP           Status
IMS-4000 Monitor     Host 10.1.4.10    Ok
NY_Node              Node 10.1.4.17    Ok

Press any key to return to main menu
```

Option 2 will display the network configuration for the Host as well as web server, RAS, and two-way email settings. A sample of Option 2 is shown below:

```
Network and Option Configuration
   Physical Address              00:D0:C9:37:40:86
   IP Address                    10.1.4.10
   Subnet Mask                   255.255.255.0
   Default Gateway               10.1.4.1
   DNS Server                    10.1.2.111
   Enterprise name               U.S. Widgets Inc.
   Web Server                    Enabled
   Web Server Security           Disabled
   Remote Access Server          Enabled
   RAS IP Port Address           0.0.0.0
   Two-Way E-mail Responder      Enabled
   Microphone Listen-in          Enabled
   Datamodem                     Enabled
   SNMP RO community             public
   SNMP RW community             private
   SNMP Agent                    Enabled
   Allow remote configuration    Disabled

   Press any key to return to main menu
```

Option 3 will allow you to set all pertinent network settings listed under Option 2.

> **NOTE:** You can remotely reconfigure the Host network settings using the IMS-4000 ConsoleView software if the *Allow Remote Configuration* option is set to Y. However, the Host must *initially* be configured via the serial port before any remote configuration is possible.

Option 4 allows you to configure or reconfigure the Enterprise name.

Option 5 allows you to configure the Web server. When Web security is enabled, a *Profile Username* & *Password* must be entered to view the web page. A sample of the Web configuration menu is shown below:

```
Configure Web Server
1. Enable Web Server: Y/N
2. Enable Web Status Security: Y/N
3. Enable Web Programming option: Y/N
4. Enable Web Programming Security: Y/N
5. Return to main menu
```

Option 6 allows you to configure the RAS (Remote Access Server). This can be used to provide remote access to your network via a dial-up connection to the IMS-4000 Host. Note that there are serious security risks associated with enabling this feature. A sample of the RAS menu is shown below:

```
Configure Remote Access Server
   1. Enable/Disable RAS Support
   2. RAS IP address
   3. Return to main menu
Enter option->
```

Option 7 allows you to Enable or Disable the two-way email feature.

Option 8 allows you to monitor on-site sound through either the built-in or an external microphone.

Option 9 *(Enable default Master Administrator Account (temporarily)* should only be used in the event that no Master Administrator accounts can be accessed (e.g. the password(s) were forgotten). Enabling this feature will temporarily load the default Master Administrator account (username: *admin*, password: *ims4k*). This temporary account will unload if any one of the following occurs: (1) Any of the Master Administrator accounts is edited, (2) A new Master Administrator account is created, or (3) The system reboots.

Option 0 allows you to disable all inbound modem communications. This feature is provided for users who cannot have a device with a modem connected to their network.

Option A allows you to program the SNMP Read-Only and Read-Write community strings.

```
Configure SNMP
  1. Read-Only community string
  2. Read-Write community string
  3. Enable SNMP Agent
  4. Return to main menu
Enter option ->
Press ENTER to accept new setting or ESC to cancel
Enter SNMP Read-Only community string (public) >
Configure SNMP
  1. Read-Only community string
  2. Read-Write community string
  3. Enable SNMP Agent
  4. Return to main menuEnter option ->
Press ENTER to accept new setting or ESC to cancel
Enter SNMP Read=Write community string (private) >
Configure SNMP
  1. Read-Only community string
  2. Read-Write community string
  3. Enable SNMP Agent
  4. Return to main menu
Enter option ->
```

Option B allows you to change the Local Configuration password.

Option C allows you to reset all settings to their default values.

Option D will display statistics.

Option E will save all changes and reboot the system. A reboot is required for changes to take effect.

Option F will save all changes and logout, but the changes will not be activated until the system reboots.

Local Configuration Definitions

Password: This is the password which protects access to the local configuration parameters. The default password in a new unit is “ims4k.”

IP: This is the IP address assigned to the IMS-4000 on your network. This address is provided by you or your network administrator. It is formatted as a standard dotted decimal number.

Mask: This is the subnet mask which distinguishes the portion of the IP address that is the network ID from the portion that is the station ID.

Gateway: A TCP/IP network must have a gateway to communicate beyond the LAN identified by the network ID. A gateway is a computer or router that is connected to two different networks and can move TCP/IP data from one to the other. If your TCP/IP network has more than one LAN or if you are connecting to the Internet, you will need to know the IP address of the gateway that will transfer TCP/IP data in and out of your LAN. A single LAN that is not connected to other LANs does not require a gateway setting.

DNS: The DNS server is used to translate site names into actual numeric network addresses. Enter the IP address of the DNS server for your network.

Enable Web: Setting this to “**Y**” will enable the web page feature of the IMS-4000. Set this to "**N**" if you do not want the unit to produce a web page.

Enable Web Password: Setting this to “**Y**” will require a valid user-name and password to be entered in order to view the web page.

Enable RAS: Setting this to “**Y**” will enable Remote Network Access during a dial-up connection.

RAS IP: This is the IP address assigned to the remote computer calling in to the host.

Enable 2-Way E-mail: Setting this to “**Y**” will enable the 2-way email feature. With this feature enabled you can send commands to the IMS-4000 via e-mail and receive responses back. Set this to "**N**" to disable this feature.

Enterprise Name: The Enterprise name will appear at the top level of the IMS-4000 ConsoleView software whenever a user logs in to an IMS Host. It provides identification consistency among multiple users and allows for future Enterprise features.

Enable Microphone Listen-In: Enabling this feature will allow users to listen in through the microphone on the front panel of the unit when dialing the unit in Voice mode. Disabling this feature will prevent the microphone from being accessed during a telephone call.

Battery Maintenance

The IMS-4000 Host includes an internal UPS that automatically switches to battery backup in the event of an AC power failure. The battery in the IMS-4000 Host is a 12V 2.9AH gel cell. This battery will keep the unit operating for approximately 3.5 hours when fully charged and under normal operating conditions.

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. Eventually, battery replacement will be required to maintain a dependable level of service.

Replacing the Battery

The battery in the Host 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:

- small flathead screwdriver
- needle-nose pliers
- ¼" nut driver

CAUTION: REPLACE BATTERY ONLY WITH A 12V 2.9AH GEL CELL BATTERY.

WARNING: DISCONNECT THE AC POWER CORD FROM THE BACK OF THE UNIT. THERE IS A RISK OF ELECTRICAL SHOCK UNLESS YOU DISCONNECT THE CORD.

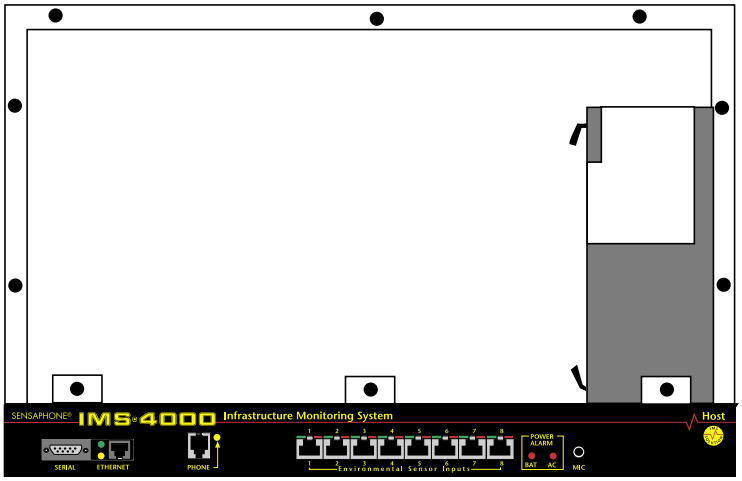


Figure 6: Battery location

Step 1) Locate the power switch on the rear of the unit and turn the IMS-4000 off.

Step 2) Disconnect the power cord from the back of the unit.

Step 3) Remove the IMS-4000 from the rack.

Step 4) Remove all of the screws in the top cover. Carefully remove the top cover.

Step 5) Locate the battery on the right side. 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) Using the nut driver, remove the four nuts which hold down the battery bracket. Remove the bracket and battery.

Step 8) Install the new battery and replace the bracket.

Step 9) Attach the connector with the red wire to the positive terminal of the battery.

Step 10) Attach the connector with the black wire to the negative terminal of the battery.

Step 11) Replace the top IMS-4000 cover and secure with the screws.

Step 12) Re-install in rack.

Step 13) Re-attach the power cord.

Step 14) Turn the Power Switch back on

IMS Host Specifications

Operating Specifications

Temperature	32–122° F
Humidity	5–90% RH non-condensing
Power Supply	90–260VAC 50/60Hz
Power Consumption	25 Watts
Power Connection	IEC 320
Dimensions	1.75"h x 9.5"d x 19"w
Backup Battery	12V 2.9AH Sealed Gel Cell
Backup Time	3.5 Hours

Communications Specifications

Ethernet	10/100 Base-T, 10/100Mbps
RS-232	DB9, 9600bps, DTE
Modem	33.6Kbps
Fax	Group 3, 14.4Kbps
Voice Processor	Yes

Environmental Monitoring

Internal Monitoring	AC Power (True RMS Voltage, Backup Battery Level, Sound Level (in dB)
Number of Sensor Ports	8
Sensor Types	Temperature, Humidity, Water, Power, Infrared Motion, Smoke, Dry Contacts
Sensor Input Connector	RJ-45
Sensor Cables	CAT-5, 568B
Cable Length	1000'
Visual Indicators	LEDs, Normal and Alarm
External Microphone	3.5mm jack, electret condenser

NODE INSTALLATION & CONFIGURATION

Physical Description

The IMS-4000 Node is housed in a 9.6"w x 1.75"h x 7"d enclosure, which is 1 EIA rack-mount space high.

Front Panel Layout

The front panel contains connections for eight sensor inputs, microphone input, Ethernet port, serial port, and power LED. See figure below:

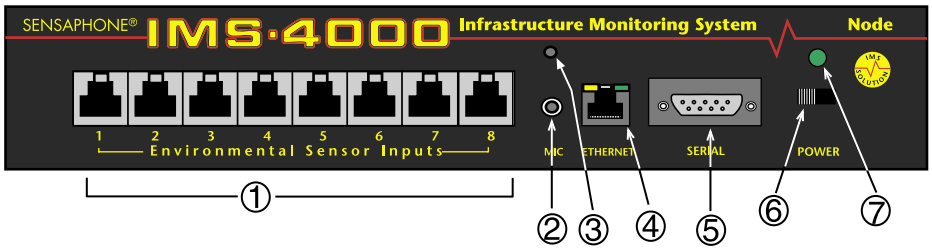


Figure 7: Front Panel Layout of the IMS-4000 Host

1 Sensor Inputs
2 Microphone Jack
3 Internal Microphone
4 Ethernet Port (10/100BASE-T)
5 Serial Port
6 Power Switch
7 Power LED

Sensor Inputs

The sensor inputs are designed to interface with IMS-4000 series sensors (*See Appendix C*). The use of RJ-45 jacks for sensor inputs allows the use of existing structured cabling to connect remote sensors.

Microphone

The Node unit comes with a built-in microphone. Directly below the built-in mic is a separate jack for connecting an optional condenser microphone to sense audible alarms, such as smoke detectors.

When an external microphone is connected, the internal microphone is disabled.

RJ-45 10/100BASE-T Ethernet Port

This jack is for connecting to your network so that the IMS-4000 Node can communicate with the IMS-4000 Host and ping selected network servers and/or services. Two LEDs indicate Link Status (left) and Receive Date status (right).

Serial Port

The RS-232 serial port is used to configure network settings. The port is DB9 male DTE and operates at 9600 baud, no parity, and 1 stop bit. A DB9 female–female null modem cable is required to configure network settings.

ON/OFF Switch

The on/off switch connects main power and battery power to the system. In the event that main power fails, the backup battery system will automatically power the system.

Rear Panel

The rear panel is where the main power cord exits the unit. A 120VAC/60Hz to 8VAC adapter provides main power to the unit.

Battery Compartment

The battery compartment is located below the top panel. The unit requires (1) 6V 3.4AH rechargeable battery (included). To remove or replace the battery, remove the top cover with a small flat-head screwdriver. {Note: Earlier versions of the node used six (6) C-size 2000mAHr Ni-Cad batteries. These units can be identified by their black network jack or via software—they will be running firmware version 2.xx or earlier.}

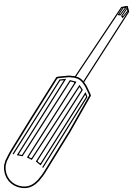
Installation

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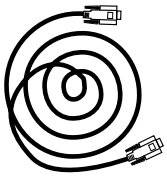
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- Connecting sensors
- Replacing batteries

Parts Required

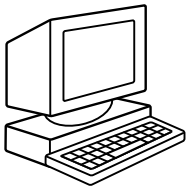
Phillips Screwdriver



DB9 F/F null modem cable



Dumb terminal or PC w/DB9 serial port



Operating Environment

Before you install the IMS-4000 Node be sure that your operating environment meets the physical requirements of the equipment.

Operating Temperature:	32º–122º Fahrenheit (0º–50º C)
Humidity:	5–90 %RH, non-condensing
Power:	120VAC 60 Hz outlet within 6'
Rack Requirements:	Standard 19' equipment rack with supplied mounting bracket hardware. Requires 1.0 EIA rack mount space.
Tabletop requirements:	Flat area which can support an enclosure 10" wide by 8" deep by 2" high.

Battery Replacement

The IMS-4000 Node uses one (1) 6V 3.4AH rechargeable battery (included) for backup power in the event that main power fails. The unit will constantly recharge the battery whenever the power switch is turned on and the unit is plugged into a power supply.

In the event you need to replace the battery, be sure to use battery part # BAT-0006 (see Appendix C: Accessories) to ensure compatibility.

To install the new battery, first slide the power switch to the OFF position and disconnect the power adapter. Next, remove the top cover of the unit by removing the six screws using a small flat-head screwdriver. Remove the wire connectors from the old battery and replace it with the new one. Reconnect the wires to the new battery and reattach the top cover.

> **Note:** Earlier versions of the Node used six (6) C-size 2000mAhr ni-cad batteries. If you have one of these you must use C-size ni-cads to replace them.

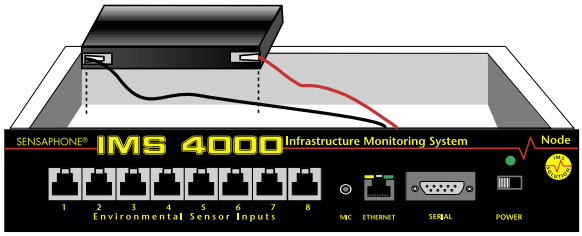


Figure 8: Battery replacement in the Node unit

Rack Mount Installation

The IMS-4000 Node can be rack mounted using the included rack mount brackets. Follow the steps below:

1) Attach rack-mount brackets to the Node with a Phillips screwdriver.
2) Attach the unit to the equipment rack using two pan-head screws per side. Tighten the screws with a Phillips screwdriver.
3) Plug the power adapter into a power outlet.

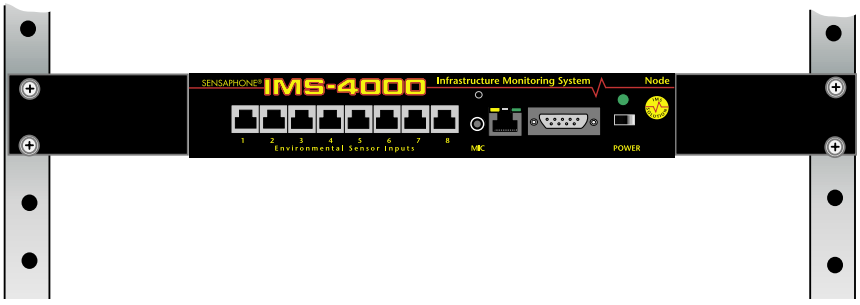


Figure 9: Rack-mounted Node Unit

Wall Mount Installation

The IMS-4000 Node can be wall mounted using the optional wall mount brackets. Follow the steps below:

1) Attach the optional wall mount brackets to the sides of the IMS-4000 using the eight black #6-32 screws. A Phillips screwdriver will be required. (Order part # IMS-4501 Universal Wall Mount Kit)

3) Attach the unit to the wall using two screws per side. Tighten the screws with a Phillips screwdriver.

4) Plug the power cord into a 120VAC 60Hz outlet.

NOTE: An international version is available for 220V/50Hz operation. (Order part # IMS-4003.)



Figure 10: Wall-mounted Node Unit

Tabletop Installation

The IMS-4000 Node can be installed on a tabletop or shelf. Follow the steps below:

1) Attach the four self-adhesive rubber feet to the four corners on the bottom of the IMS-4000.

2) Place the unit on a tabletop or shelf and connect the power cord into a 120VAC 60Hz outlet.

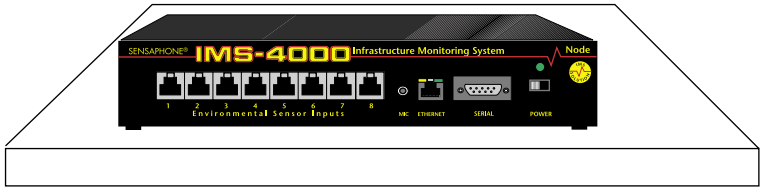


Figure 11: Tabletop-mounted Node Unit

Connecting Sensors

The IMS-4000 Node has eight sensor inputs. Each input can accept any sensor type. Sensors are available to monitor the following:

- Temperature
- Humidity
- Water detection
- AC voltage
- Alarm contacts from external equipment
- Smoke
- Security
- Motion

All IMS-4000 sensors connect to the Node using standard RJ-45 cables. This makes it easy to connect sensors directly to the unit. Simply plug one end of the cable into the sensor and the other end into one of the sensor inputs on the Node.

Another benefit of using RJ-45 connectors is that you can easily locate sensors at distant locations within your facility by using your existing structured cabling. For example: Suppose you have an IMS-4000 Node installed in room A and you want to install a sensor in room B. If your existing cabling infrastructure has an unused cable path between room A and room B, then you simply use an RJ-45 interconnect cable to connect the IMS-4000 Node to the patch panel in room A, and an RJ-45 interconnect cable from the wall jack in room B to the sensor.



The sensor produces an analog signal which must connect directly to the Host or Node. The path from the sensor to the IMS unit CANNOT pass through a network Hub or Switch.

Network Configuration

The IMS-4000 Node has a serial port on the front panel which is used to configure network settings and security options. A dumb terminal or terminal emulation software is required to get online and set up the configuration. The port is male DTE, so a DB9 female–female null modem cable will be required. Terminal communication settings must be set to:

- 9600 baud, no parity, 8 data bits, 1 stop bit, no flow control

To get online with the IMS-4000 Node, connect your terminal to the serial port and press *<RETURN>*. A menu will appear which will guide you through the setup.

```
Sensaphone IMS Node Unit         Version: 2.38
Main Menu
   1. Display Network configuration
   2. Configure Network settings
   3. Display system statistics
   4. Reset to factory defaults
   5. Reboot
   6. Logout
Enter option->
```

To display the present Network Configuration settings select **Option 1**. To program the Network settings select **Option 2**. Note that the Node must have network visibility of the Host for the IMS-4000 system to function properly. For Network changes to take effect you must reboot the unit (option 5). A typical sample is shown below:

```
Network Configuration
   Physical Address          00:07:F9:00:10:18
   Parent Host IP address    10.1.2.47
   Node IP Address           10.1.4.17
   Subnet Mask               255.255.255.0
   Default Gateway           10.1.4.1
   DNS Server                10.1.2.111
   Node name                 48th Floor Chicago
Allow remote configuration   N
Press any key to return to main menu
```

NOTE: You can remotely reconfigure the Node network settings using the IMS-4000 ConsoleView software if the *Allow Remote Configuration* option is set to Y. However, the Node must *initially* be configured via the serial port before any remote configuration is possible.

Option 3 will display operating statistics of the Node. This information may be useful for troubleshooting. A sample is shown below:

```
Statistics
Running (hrs)        0           Disk free (KB)         209
Ram free (KB)        7136        Error mask             0
IP alarms            0           Input alarms           0
Pkt rcvs             24          Pkt xmts               4
Pkt errs             0           Ack timeouts           0
Clock timeouts       0           Socket closes          0
Socket errors        0           Socket connects        1
Avg Pkt RTT (ms)     20          Input Prog timeout     0
DSP proc starts      1           IP proc starts         1

Press any key to return to main menu
```

Option 4 will reset the Node to factory default settings. All programming and network settings will be deleted.

Option 5 will reboot the system. You must reboot for new Network settings to take effect.

Option 6 will logout without rebooting.

Local Configuration Definitions

Parent Host IP Address: This is the IP address of the IMS-4000 Host that this Node is associated with.

Node IP Address: This is the IP address assigned to the IMS-4000 on your network. This address is provided by you or your network administrator. It is formatted as a standard dotted decimal number.

Subnet Mask: This is the subnet mask which distinguishes the portion of the IP address that is the network ID from the portion that is the station ID.

Default Gateway: A TCP/IP network must have a gateway to communicate beyond the LAN identified by the network ID. A gateway is a computer or router that is connected to two different networks and can move TCP/IP data from one to the other. If your TCP/IP network has more than one LAN or if you are connecting to the Internet, you will need to know the IP address of the gateway that will transfer TCP/IP data in and out of your LAN. A single LAN that is not connected to other LANs does not require a gateway setting.

DNS Server: The DNS server is used to translate site names into actual numeric network addresses. Enter the IP address of the DNS server for your network.

Node Name: This name will appear in the IMS-4000 ConsoleView Software. In systems with many Nodes, the Name is useful for identifying one node from another.

Node Specifications

Operating Specifications

Temperature	32–122° F
Humidity	5–90% RH non-condensing
Power Supply	120VAC 60Hz
Power Consumption	10 Watts
Dimensions	1.8"h x 7.0"d x 9.6"w
Backup Battery	(1) 6V 3.4AH sealed rechargeable
Backup Time	3.5 Hours

Communications Specifications

Ethernet	10/100 Base-T, 10/100Mbps
RS-232	DB9, 9600bps, DTE

Environmental Monitoring

Internal Monitoring	AC Power, Backup Battery Level, Sound Level (in dB)
Number of Sensor Ports	8
Sensor Types	Temperature, Humidity, Water, Power, Infrared Motion, Smoke, Dry Contacts
Sensor Input Connector	RJ-45
Sensor Cables	CAT-5, 568B
Cable Length	1000'
External Microphone	3.5mm jack, electret condenser

Chapter 2: IMS-4000 Software

Introduction

This chapter is designed to help you program and use the IMS-4000 to its fullest potential. The IMS-4000 system helps you maintain, monitor, expedite and control the things that affect your information infrastructure.

Help

The IMS-4000 ConsoleView Software provides an extensive Help system to supplement the documentation. Use IMS-4000 Help to access information about commands and dialog boxes. Online help is also available simply by selecting Help from the main menu.

IMS-4000 Quick Start Guide

This section presents a useful shorthand guide to configuring your IMS-4000 System for the first time. More detailed information on the processes covered can be found in the sections that follow.

Install Units and Configure Network Settings

Install the IMS-4000 Host and Node(s). Configure the Network settings through the serial port on the front of the units. A terminal or terminal-emulation program can be used. Set the terminal settings for 9600bps (8, N, 1). The default password is "ims4k."

Install Software and Log In to Host

Install the IMS-4000 software from your CD-ROM or other media. Double-click on the IMS-4000 icon on your desktop. The IMS-4000 ConsoleView screen will appear. From the main menu select *Enterprise*, then *Add Enterprise Group*. See below:



Figure 1: Add Group

Right-click on the words *IP Unknown* below the enterprise name and select *Set IP Address*. Enter the IP address for your IMS-4000 Host and click *OK*. The software will prompt you for a username and password to log in.

Default Username and Password

For new units, the default username is **admin** and the default password is **ims4k**. The software will now attempt to connect to your IMS-4000 Host. A progress bar will show the software retrieving information from the Host.

> **Note**: Do not save the default username and password, because it will be deleted automatically once a Master System Administrator profile is configured.

Configure the Unit Properties for the Host and Node(s)

Right-click on the word *Host* and select *Unit Properties*. Step through each tabbed page and enter the relevant information for your application. The *Numeric Unit ID* should be set to the Host's telephone number. Most Alphanumeric pagers work best when set to 1200bps.

The Host can synchronize its clock each night to a time server. To use this feature the IMS-4000 must have network access to a server which supports one of the following: Network Time Protocol - NTP (RFC-1035), Time Protocol - TP (RFC-868), or Daytime Protocol - DP (RFC-867). Enter the IP Address of a Time Server which supports any one of these protocols.

Expand the menus below the Host by clicking the *plus* sign next to the word *Host*. Any nodes associated with the Host should appear. Right-click on the Node names and select *Node Properties*. Configure the Node Properties for each Node.

Configure Input Templates

Environmental input programming Templates are used to load user specified defaults each time a new sensor is connected to a Host or Node. By properly configuring the Templates before you plug in your sensors, you can minimize the amount of programming required to set up your sensors. To configure the Templates, click the *plus* box next to the word *Settings* to expand the options under this heading. Next, expand the *Input Templates*. This will list all of the different sensor types. Right-click on each of the sensor names to bring up the individual Template programming screens. An example is shown below:

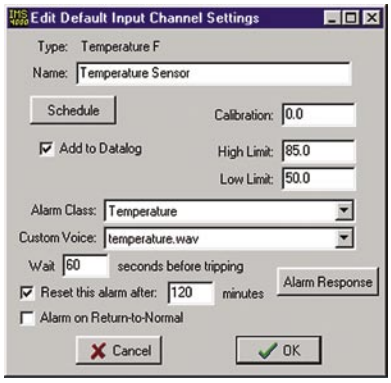


Figure 2: Default Input Channel Settings

Connect Environmental Sensors to Host and Node(s)

Once you've configured the Input Templates, connect your sensors. This will automatically load the template programming for each sensor. All sensors connect to the Host and Node via RJ45 connectors. This allows you to use your existing structured cabling for wiring sensors throughout your infrastructure.

Note: IMS sensors are not IP devices and cannot connect to Hubs or switches.

After connecting your sensors, customize the input alarm parameters for each sensor.

Configure User Profiles and Contacts

Program the User Profiles and Contacts to control who has access to the IMS-4000 and who gets contacted when an alarm occurs. Each user must have a *Username*, *Password*, and *User Code*. Right-click on *Profiles* and select *Add New Profile*. Enter information for each user. Click the *Permissions* button and be sure to set up at least one Master System Administrator account. To set

up alarm contact information, right-click on the profile name and select *Add New Contact*. You can have up to eight contacts per user. The User Profile screen is shown below:



Figure 3: User Profile

Configure IP Alarms

Program the IP addresses for each network device you want to monitor. Expand the Host menu by clicking the *plus* sign next to the name of your host. Next, right-click on *IP Alarms* and select *Add New IP Alarm*. Enter the information to configure the network device you wish to monitor. Be sure to enable the alarm. The IMS unit will ping/connect to the IP address and port you select about once per minute. The IP Alarm programming screen is shown below:

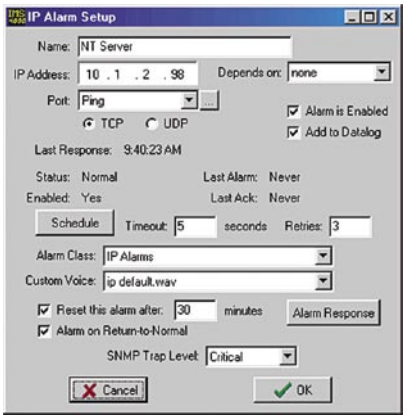


Figure 4: IP Alarm Setup screen

Record and Assign Voice Messages

Custom voice messages can be used to identify your IMS Hosts/Nodes, PowerGates, Input sensors, IP alarms, and PowerGate outlets. Voice messages must first be recorded on your computer and then uploaded to the IMS Host. Use the CustomVoice Manager screen to record and upload your voice messages. To access the CustomVoice Manager screen, expand the *Host* menu and select *Voice*. Note that Voice messages should be recorded at 8Khz, 8bit, mono, to keep the file size small. See the detailed section on Recording and Uploading Voice Messages later in the manual for more information. Voice messages are assigned to elements of your IMS unit on the respective screens as listed below:

IMS Host Identification message	- Host Unit Properties Screen
IMS Node Identification message	- Node Unit Properties Screen
Input Sensor message	- Input Channel Setup Screen
IP Alarms message	- IP Alarm Setup Screen
PowerGate messages	- PowerGate Setup Screen

Software Installation and Hardware Requirements

This section describes how to install and configure the IMS-4000 ConsoleView Software for your enterprise.

Hardware and Software Requirements

Minimum Requirements:

Intel Pentium processor or equivalent

30 MB of free disk space

32 MB of RAM (64 MB RAM recommended)

Graphics card and monitor compatible with Microsoft Windows® 95, 98, NT, 2000, or XP

Microsoft Windows® 95, 98, NT, 2000, or XP

Mouse

Soundblaster-compatible sound card, microphone and speakers

Windows-compatible phone modem and/or RS-232 ports

Software Installation

The IMS-4000 ConsoleView Software setup program makes installation quick and easy. 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.

Installing from the CD

1. Start Windows.
2. Insert IMS-4000 CD-ROM
3. Select *Start>Run* and type in *D:\Setup.exe* and click *OK*.

   Note: If your CD-ROM is installed on a drive letter other than D, substitute the appropriate letter.
4. Follow the prompts until the installation is finished.

The IMS-4000 ConsoleView Software for Windows will install to a directory named *C:\Program Files\IMS4000*, unless you choose to change the directory name. The installation program will give you three installation choices: Typical, Compact, or Custom. For new installations choose *Typical*.

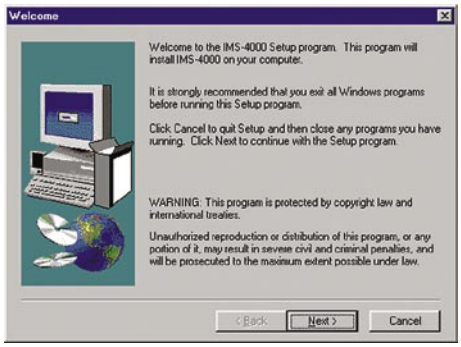


Figure 5: Installation screen

Starting the IMS-4000 ConsoleView Software

Double-click the IMS-4000 icon to start the IMS-4000 ConsoleView Software. The software will automatically try to connect to all IMS-4000 Hosts that have been configured. If this is the first time you are running the software, you will need to create an Enterprise Group and add a Host within each Enterprise. (See *Configuring Hosts and Nodes*)

Configuring Hosts and Nodes

Setting Up An Enterprise

An Enterprise Group comprises an IMS-4000 Host, any IMS-4000 Nodes connected to that Host, and all of the environmental inputs connected to these units, regardless of proximity to the Host.

> **Note:** Before setting up your Enterprise software, you must have locally configured your Host and Node units—which is where you assign the Host its IP address. If you have not done this, the ConsoleView software will not be able to locate your Host. If you are connecting to your Host through a dialup connection, be sure to establish a PPP connection before running the software. (See *Remote Login via Dialup*) See the sections in your Host and Node Manuals on Local Configuration.

To get started, double-click on the IMS-4000 software icon. This will bring up the IMS ConsoleView Screen.

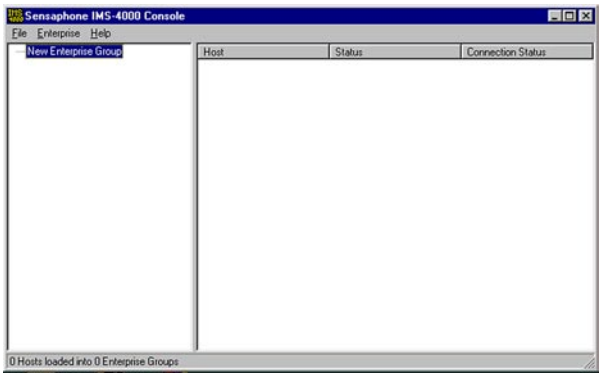


Figure 6: IMS ConsoleView screen

Adding an Enterprise Group

From the ConsoleView menu, click on *Enterprise* and select *Add Enterprise Group*. In the left-hand column, a *New Enterprise Group* will appear. When you connect to the host, the Enterprise Name will update.

Deleting an Enterprise Group

If at any time you wish to delete an Enterprise group, click to highlight the Enterprise Group you would like to delete, select *Enterprise* from the main menu and choose *Delete Enterprise Group*.

Adding a Host

Right-click on the words *IP Unknown* below the enterprise name and select *Set IP Address*. Enter the IP address for your IMS-4000 Host and click *OK*. The software will prompt you for a username and password to log in. For new units, the default username is **admin** and the default password is

ims4k. The software will now attempt to connect to your IMS-4000 Host. A progress bar will show the software retrieving information from the Host.

Default Username: admin

Default Password: ims4k

Note: **Do not save the default username and password**, because it will be deleted automatically once a Master System Administrator profile is configured.



Figure 7: Entering the Host address

To see the programming, inputs, and accessories associated with the host, click in the box beside your enterprise group. The tree hierarchy will appear beneath the Host.

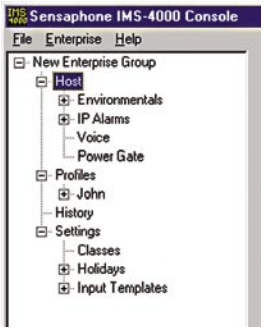


Figure 8: Host Tree

Connecting to a Host

If you have a Host set up already, you can connect to it in one of two ways: Either right-click on the Host and select *Connect* from the dropdown menu, or double-click on the Host in the hierarchy. Both methods will bring up the prompt form where you type in your *username* and *password* to connect to the Host.

Deleting a Host

To delete a Host, right-click on the Host you would like to delete and select *Delete Host* from the contextual menu.

Setting the Unit Properties for the IMS Host

To set the global properties of your IMS-4000, right-click on the Host name and select *Unit Properties.* On the *System Info* tab, enter the *Unit Name, Description* and *Location.* These parameters will be used when sending alarms to identify the unit. Check the *Auto-Connect on Startup* box if you want the IMS software to connect automatically with the unit at startup. See Figure below.



Figure 9: System Info tab

Next, select the *Phone Settings* tab. Enter the telephone number of the Host in the *Numeric Unit ID* field. The *Numeric Unit ID* will appear on alarm messages delivered to numeric pagers and fax machines.



Figure 10: Phone Settings tab

Select a custom voice message to identify your Host by clicking the arrow in the *Custom Voice* field and selecting a voice file. Custom voice messages can be recorded and uploaded to the Host on the *Custom Voice Manager* screen. The Host Custom Voice message is the first message spoken during a voice call. This message should describe the name and location where the Host is installed.

Enter the number of *Dialout Attempts* you want the IMS to make when an alarm occurs. Dialout attempts is the number of times the IMS will try to call each contact.

Select the Alphanumeric Pager speed *(Alpha Page Speed)* for your paging provider. Typically, 1200 bps will work fine with most pagers.

If your phone system does not produce a dial tone when you first lift the receiver, uncheck the box marked *"Check for dial tone."*

Set the *"Rings until Answer"* number. This will determine how many times the line must ring before the IMS-4000 will answer.

Set the *"Intercall Delay."* This is the time the unit waits between outgoing phone calls. During this period the unit will answer any incoming calls. To acknowledge an alarm via callback you must set

this value to at least *1* minute. When set to 0 the unit will dial back-to-back calls without the possiblity of calling in to acknowledge an alarm. The Intercall Delay can be set from 0–60 minutes.

Test Dial Tone: The IMS-4000 can be programmed to test periodically for dialtone to ensure that the telephone line is alive in the event that the unit has to dial out for an alarm. If the unit determines that a dialtone is not present, it will send a diagnostic alarm via e-mail and/or SNMP to profiles that are set up to receive diagnostic alarms (i.e. diagnostic class). Check to enable, then enter the test interval, in hours, in the *every X hours* box.

Finally, select the *Clock Settings* tab. To set the time in the IMS Host, click the button labeled *Set to Current PC Time*. Next, select the *Host's Time Zone* according to its location. If you would like the unit to synchronize its time on a daily basis, enter the IP address of a compatible time server.

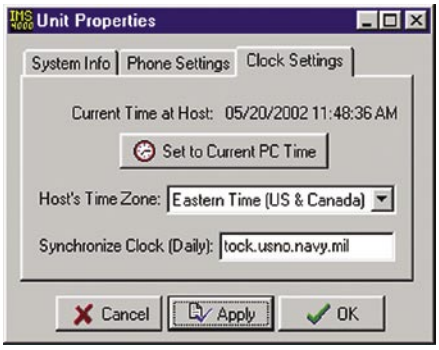


Figure 11: Clock settings tab

The IMS-4000 can be programmed to synchronize its clock to a reference time server every night at midnight. To use this feature the IMS-4000 must have network access to a server which supports one of the following time code protocols:

Network Time Protocol - NTP (RFC-1035)

Time Protocol - TP (RFC-868)

Daytime Protocol - DP (RFC-867)

Click the *Clock Settings* tab. Enter the name or IP address of the time server in the *Synchronize Clock* field. To disable this feature, delete the name or IP address.

Note: After setting the time zone, you must reboot for the new settings to take effect.

Adding a Node

Once the node has been connected to the network and the Local Configuration has been performed, it will automatically start communicating with the Host. From the IMS Consoleview the Node will appear within the tree. See figure below.

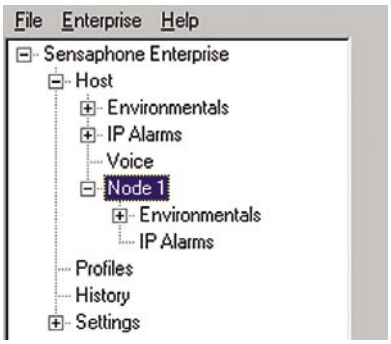


Figure 12: Structure tree with Node

The Node name will appear in green when host-to-node communications are working properly. If a communications problem occurs, the node name will initially turn yellow, to indicate that pending node trouble exists. If the problem persists for several minutes, the node name will turn red and a trouble alarm will be dispatched to Users who are members of the diagnostic class.

Deleting a Node

To delete a Node, right-click on the Node name in the tree and select *Delete This Node.*

Changing Host Network Settings using ConsoleView

You can remotely change the Host network settings using the ConsoleView software if the *Allow Remote Configuration* option is set in the Local Configuration options. However, before doing so consider the following:

If you have any Nodes associated with the Host, they will stop communicating with Host if you change the IP address. So be sure to change the parent Host IP Address in the NODE *before* actually changing it in the Host itself.

To change the network settings in the Host using ConsoleView, right-click on the unit name and select *Network Settings*. The first tab is titled *Ethernet Settings*, click the *Modify* button to bring up the Network Setup screen.

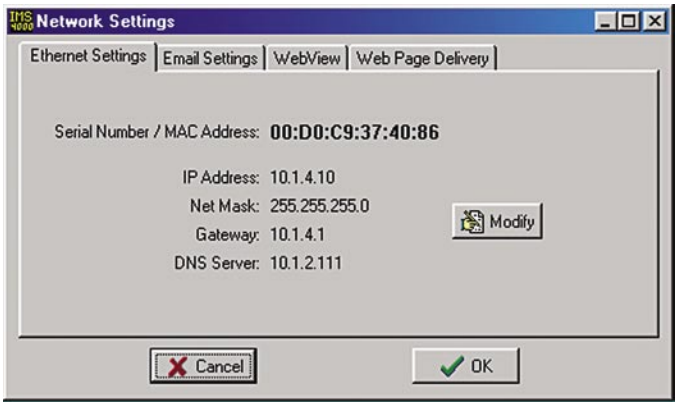


Figure 13: Host Network Settings

NOTE: If the *Modify* button is grey (inactive) then the unit either does not have the *Allow Remote Configuration* option set, or the unit's firmware does not support this feature and requires upgrading.

Enter the new network parameters and click *OK*. A warning message will appear telling you that the unit must reboot. Click *OK* to proceed with the change. You will be disconnected while the unit reboots. If you changed the Host's IP address, it will automatically change in ConsoleView as well, so that the software will connect to your host using the new IP address.

Setting the Unit Properties for the Node

To set the Properties of your IMS-4000 Node, right-click on the Node name and select *Node Properties*. The Node Name will be copied from the node itself as programmed during the network configuration procedure. Enter the *Location* and *Description* in the fields provided. These parameters will be used to identify the unit when sending alarms. Set the *Custom Voice* file to identify the Node when speaking over the telephone. (See *Recording and Uploading Voice Messages* for information on creating custom voice messages.)

In normal operation information is periodically passed between the Node and Host. This information mainly consists of current Input values and IP Alarm status. The amount of data transferred during this update is about 700 bytes. You can choose how often information is updated from the Node by selecting either periodic updates (Auto Send) or by selecting Update on a Percent Change basis. This can be used to control network traffic. When you enable the *Auto Send Status Updates* box, the Node will send an update (700 bytes) to the Host based on the *Interval* you program. When you choose the *Send Update on Change* option, the Node will only send an update when a sensor value increases or decreases by *x%* as programmed. You can even choose to enable both options for more flexibility.

Note that if an alarm is detected, the Node will transmit this information to the Host **immediately**. The Node Properties screen is shown below:

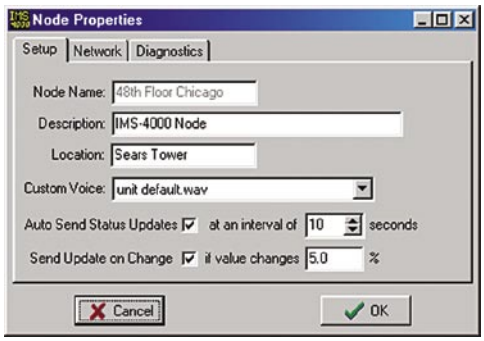


Figure 14: Node Properties Setup Tab

Sample Application:

1) Suppose you are concerned about network traffic generated by Node-to-Host communication but want to view input values that are no more than 20 minutes old.
=>You can enable the *Auto Send* option and enter an interval of 1200 seconds (20 minutes). This will limit Node-to-Host data transfers to no more than 700 bytes every 20 minutes.

2) Suppose that in addition, if the temperature changes by more than 3 degrees Fahrenheit (about 4% at room temperature) you want to see this update immediately.
=> You can enable the *Send Update on Change* option and enter a value of 4%. This will instruct the Node to send an update if the temperature changes by +/- 4% since the last update.

Changing Node Network Settings

You can remotely change the Node network settings using the ConsoleView software if the *Allow Remote Configuration* option is set in the Node Local Configuration options. However, before doing so consider the following:

If you change the parent Host IP address in the Node, then the Node will no longer be in contact with the Host until the Host's IP address also changes.

To change the network settings, right-click on the Node Unit Name and select *Node Properties*. Click on the *Network* tab. Click on the *Modify* button to bring up the Network Setup screen.

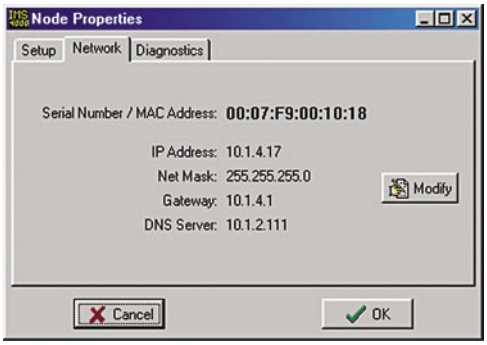


Figure 15: Node Network Settings

NOTE: If the *Modify* button is grey (inactive) then the unit either does not have the *Allow Remote Configuration* option set, or the unit's firmware does not support this feature and requires upgrading.

Enter the new network parameters and click *OK*. The Node will reboot and temporarily disconnect from the Host.

Configuring Environmental Inputs

Each host or node can have up to 8 external sensors connected. The host or node will automatically identify what sensor type is connected to each input. To program the environmental input parameters expand the host or node tree by clicking the plus box next to the host/node name.

Channel Setup

Next, click in the plus box beside Environmentals to expand the tree below it. Choose the input you would like to configure and right-click on the sensor name.

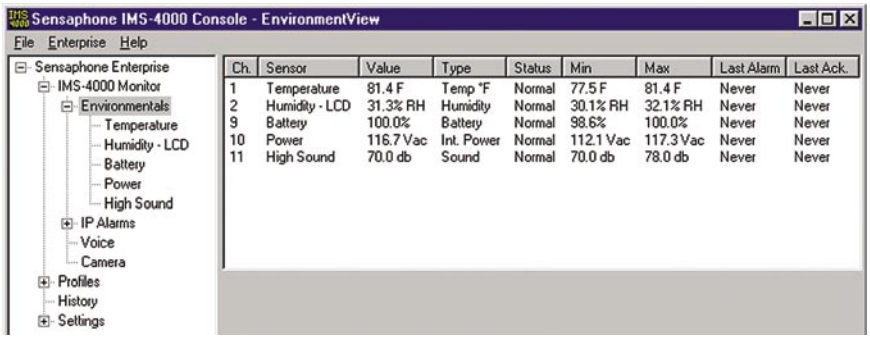


Figure 16: Environmental Input Channels

The *Channel Setup* screen will appear.

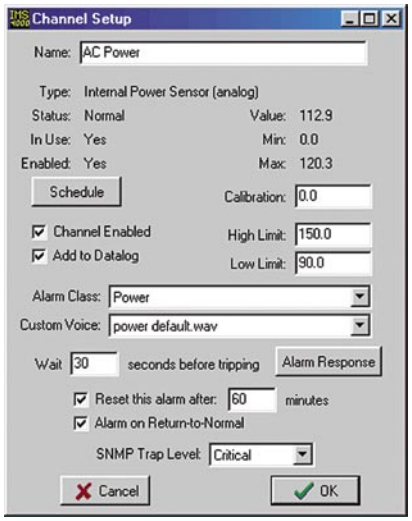


Figure 17: Channel Setup screen

Set up the parameters for your environmental input on this screen.

Name: Enter a name which describes what the sensor is monitoring. (ex: Mail Server, Data Center Rack #3, …)

Type: The sensor type is determined automatically when the sensor is plugged into the host or node.

Status: The status indicates if the sensor is presently within alarm limits. For devices such as Water Sensors or Smoke Detectors a Normal condition indicates that there is no water or smoke detected.

In Use: This indicates that a valid sensor is plugged into the channel.

Enabled: This indicates if the channel is currently enabled for alarm monitoring. If it is disabled, the IMS-4000 will not send alarm messages. A channel can be enabled or disabled based on a 7-day + holiday time schedule.

Schedule: Click this button to bring up the Edit Schedule screen. This screen allows you to set times when the channel is enabled or disabled. The blue line indicates days/times when the channel is enabled.

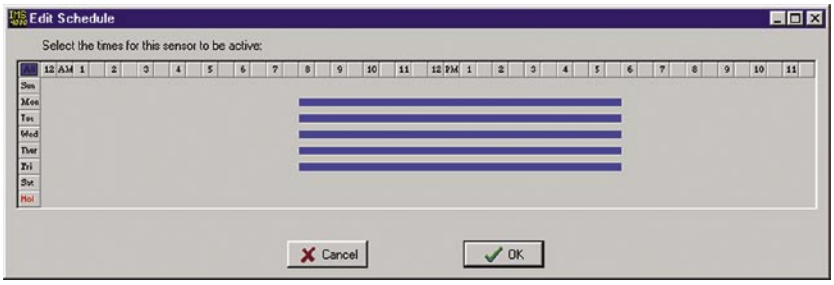


Figure 18: Sensor Schedule screen

The schedule example above enables the sensor Mon-Fri 8AM to 5PM.

Editing the schedule:

- Click on the All button in the top left corner of the grid to enable/disable the entire week.
- Click on the day buttons down the left side of the grid to enable/disable entire days
- Click on the hour buttons across the top of the grid to enable/disable entire hours
- Drag the mouse over portions of the grid to enable/disable specific hours/days

Channel Enabled: This box provides a simple means to enable or disable a sensor channel.

Add to Datalog: Click this box to store the value or status of the channel in the datalogger.

Value: This is the current value of the sensor connected to the channel. (only valid for analog sensor types).

Min: This is the minimum value reached by the sensor since it was connected to the unit.

Max: This is the maximum value reached by the sensor since it was connected to the unit.

Calibration: Enter a positive or negative offset in this field to calibrate the sensor value.

High Limit: Enter the sensor high alarm limit in this field. When the value exceeds this limit for the duration of the recognition time, and if the channel is enabled, an alarm will be tripped.

Low Limit: Enter the sensor low alarm limit in this field. When the value falls below this limit for the duration of the recognition time, and if the channel is enabled, an alarm will be tripped.

Alarm Class: Click the drop down arrow and select the appropriate class for this sensor/channel. If you prefer you can create your own classes on the Class Setup screen.

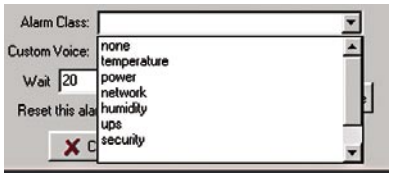


Figure 19: Alarm Class dropdown menu

Custom Voice: Click the drop down arrow and select the custom voice message you would like assigned to this sensor/channel. Voice messages can be recorded on your PC and uploaded into the IMS-4000 on the Custom Voice Manager screen (See Recording and Uploading Voice Messages).

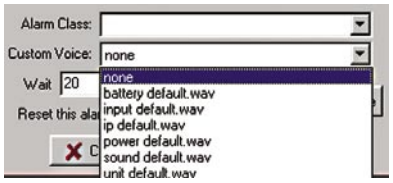


Figure 20: Custom Voice dropdown menu

Wait (Recognition) Time: This is the time required for a fault condition to qualify as an alarm event. The sensor/channel must remain beyond the limits or in a fault condition continuously for this entire period of time in order to become an alarm.

Reset Time: This is the time allowed for an acknowledged alarm's fault condition to be corrected before the IMS-4000 resets (reactivates) the alarm and begins the message delivery process all over again. The minimum reset time is 30 minutes.

Alarm on Return to Normal: This feature makes the unit send a message (or messages) when a condition has moved within its programmed alarm limits or has gone from an alarm state to a Normal state. The person who acknowledged the alarm—in addition to all *Inform Only* contacts in the alarm class—will receive the message.

SNMP Trap Level: When sending alarm messages via SNMP, this sets the priority of the SNMP trap. The choices are *Major* or *Minor*.

Alarm Response via the PowerGate, PowerGate2, or Camera

PowerGate

When an alarm occurs, you can have PowerGate or PowerGate2 outlets automatically turn ON, turn OFF, or CYCLE power to a device. *Cycling* will switch an outlet OFF for 10 seconds and then switch it back ON. To set up a PowerGate, click the *Alarm Response* button on the Channel Setup Screen. A sample Alarm Response screen is shown below.

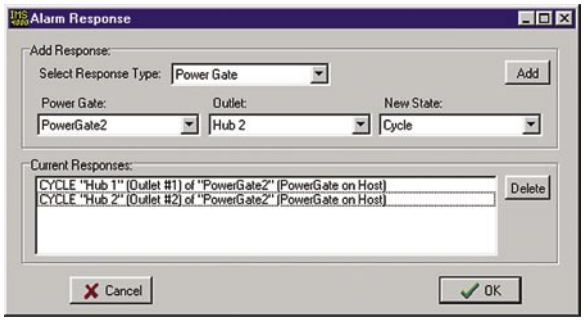


Figure 21: Alarm Response screen for PowerGate

Select Response Type: Choose "PowerGate."

PowerGate: Choose the specific PowerGate you're programming.

Outlet: Choose the PowerGate outlet you want to program for alarm response.

New State: Select the action you want to have occur: On, Off, Cycle.

Click the *Add* button to add this response to the list of current responses; click *Delete* to remove an action. Repeat for as many outlets as you wish to program.

Camera Snapshots on Alarm

Camera images may be sent to one or more users when an Environmental or IP alarm occurs. Up to four alarm responses (PowerGate or Camera Snapshot) may be programmed per input. To configure this feature choose *Alarm Response* from the *Properties* screen for the chosen input. The following screen will appear.

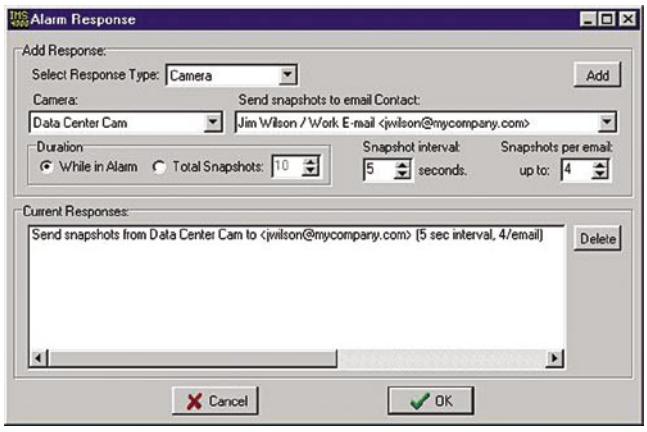


Figure 22: Camera Alarm Response

Click the down arrow in the *Response Type* menu and choose *Camera*. Select the name of the camera from which you would like to receive snapshots. Next, select the E-mail address where you would like the snapshots to be sent. There are two options to determine the *Duration* over which snapshots will be sent. If you choose *While in Alarm* you will receive snapshots continuously until

the input goes back to normal. If you choose *Total* you will receive a fixed number of snapshots once the alarm is detected. You can also select the time between snapshots in the *Snapshot Interval* field, and you can choose the maximum number of *Snapshots Sent per E-mail*. Camera snapshots will not work if a *User Login* is required in the camera.

Note: the E-mail messages sent via Alarm Response operate independent of Profile *Class* and Contact *Schedule*.

High Sound Alarms

The IMS-4000 measures the sound level with the built-in microphone on the front panel. This can be useful in detecting audible alarms in close proximity to the unit. To detect alarms at a distance from the unit, you can plug an external condenser microphone into the mic jack. Note that the audible alarm must be more than just a periodic beep. Only alarms that produce a loud, steady or pulsing signal (for example, smoke detector alarms) will be recognized by the IMS-4000.

The unit is programmed to trip an alarm if the sound level increases by a programmed number of decibels. On the High Sound programming screen this parameter is listed as "Change in dB." The default setting is 30db. This means that if the audio level increases more than 30 dB for the duration of the recognition time, an alarm will be tripped.

To verify that your audible alarm is capable of tripping an alarm we recommend that you perform several tests to check the decibel increase at the IMS unit. The test should involve tripping your audible alarm and checking the measured level within the ConsoleView Software. Using the data obtained from your testing, you can then set the *Change in db* parameter appropriately.

If you are not concerned about High Sound alarms or if the unit is installed in a generally noisy environment that could easily trip false alarms, we recommend you disable the High Sound alarm monitoring via the Schedule.

Realtime Strip Chart

A realtime Strip Chart will show continuous values for sensors which provide an analog value. Just click on the sensor name and the chart will appear.

The high and low scale of the chart is based on the Min and Max values. To reset Min/Max values, click on the Reset button to the right of the chart.

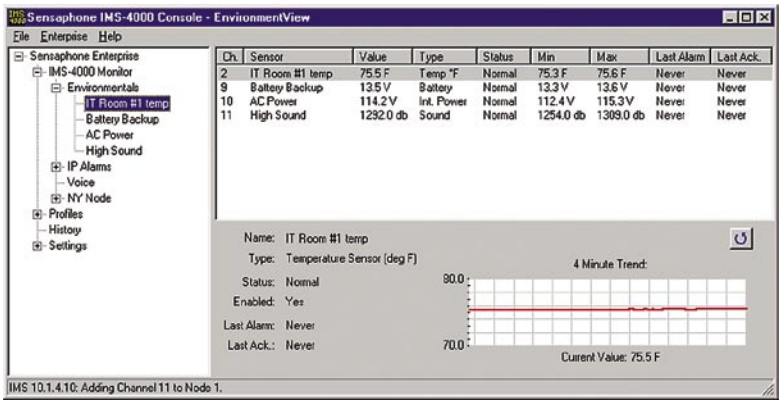


Figure 23: Programmed Environmental Sensors

Environmental Input Alarm Logic

Each environmental input will automatically detect the type of sensor connected (temperature, humidity, power, motion...). Analog sensors will include high and low alarm limit programming options while two-state sensors (Normal/Alarm) will simply have a recognition time. In order for an alarm to be dispatched, the sensor must meet the following criteria:

a) It must be Enabled—as configured through the schedule.

b) It must have exceeded the programmed high or limit, continuously, for the duration of the wait (recognition) time. For two-state sensors it must be in the Alarm state, continuously, for the duration of the wait (recognition) time.

c) It must be a member of a Class.

d) There must be one or more User Profiles which include this Class.

Once the alarm is dispatched, the alarm delivery process begins. (See *Alarm Delivery and Acknowledgment* for details.)

Additionally, there is an option to re-trigger the alarm if it remains beyond the High/Low limits (or in an alarm state) too long. This programmable time period is called the Alarm Reset Time. This parameter can be set from 30 to 3600 minutes.



DO NOT set the Alarm Reset Time too short, otherwise you will continue to dispatch the same alarm over and over resulting in numerous phone calls.

Trouble Alarms

The IMS-4000 monitors the presence of all connected sensors to insure the reliability of the system. When a sensor is removed from a Host or Node for more than a minute, a trouble alarm is generated. All trouble alarms are a part of the Diagnostic class, so any User who wishes to receive sensor Trouble Alarm, System Diagnostic or Fault Alarms can do so by including the Diagnostic class in their user Class List.

Removing/Changing a Sensor

Since the Host and Node monitor the presence of sensors, you must be careful when removing them to prevent a trouble alarm from occurring. The following procedure is recommended:

a) Disable the sensor you wish to change/remove by clearing its schedule.

b) Disconnect the sensor from the Host or Node.

c) Login to the Host or Node and expand the Environmentals to display all of the inputs. Right click on the sensor to be removed and select Delete.

A new sensor can now be connected to the empty channel.

Special Notes

To reset a Smoke detector alarm, you must momentarily disconnect it from the Host or Node, and then reconnect it. This will silence the alarm and return it to normal operating condition.

Configuring Templates

Environmental input programming *Templates* are used to load user-specified defaults each time a new sensor is connected to a Host or Node. By properly configuring the Templates before you plug in your sensors, you can minimize the amount of programming required to set up your sensors. To

configure the *Templates*, click the plus box next to the word *Settings* to expand the options under this heading. Next, expand the *Input Templates*. This will list all of the different sensor types.

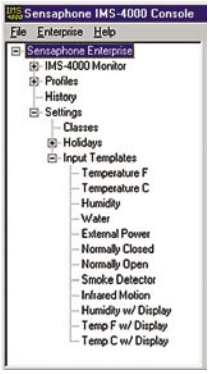


Figure 24: Template Types

Right-click on each of the sensor names to bring up the individual *Template* programming screens. An example is shown below.

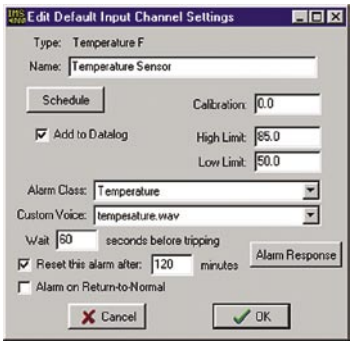


Figure 25: Template

Configuring IP Alarms

IP Alarm Setup

Each host or node can monitor up to 64 IP addresses through pinging and port availability. In addition, IP dependencies can be programmed to prevent multiple alarm messages from being sent when common network paths are down.

Programming Alarm Parameters

To program the IP Alarm parameters, expand the Host or Node by clicking the plus box next to the host/node name. Next, expand the IP Alarms. To configure a new IP Alarm, right-click on *IP Alarms* and select *Add New IP Alarm*. Next, right click on the New IP Alarm and select *Setup*. The IP Alarm Setup screen will appear.

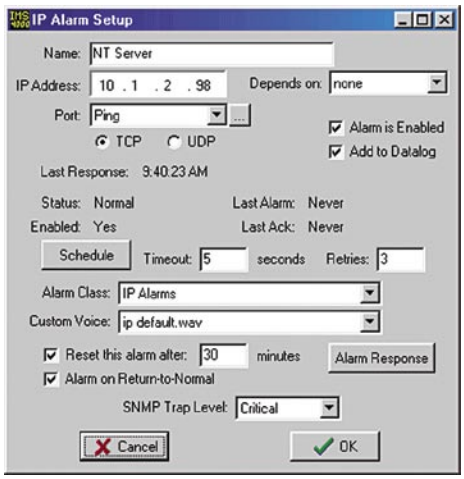


Figure 26: IP Alarm Setup screen

Name: Enter a name which describes the IP address and port to be monitored.

IP Address: Enter the numeric IP address of the device to be monitored.

Port: Enter the port number to be monitored.

Dependency IP: This is the IP address that must be responding for the monitored IP address to have a chance at responding. Or in other words, the monitored IP address is dependent upon the Dependency IP address to function.

Alarm is Enabled: Unchecking this box will disable the IP alarm.

Add to Datalog: Click this box to store the value or status of the channel in the datalogger.

Last Response: This is the date/time that the IP device last responded.

Last Alarm: This is the date/time that the last IP alarm occurred for this IP address.

Last Ack: This is the date/time that the last IP Alarm for this channel was acknowledged.

Status: The status indicates if the IP Address is presently responding or not. A Normal status indicates that the IP device is responding within the limits of the timeout and retry parameters. A Ping Timeout status indicates that the IP device is not responding within the timeout and retry parameters. An IP Route Down status indicates that the dependency IP is not responding and therefore the monitored IP address cannot be reached.

Enabled: This indicates if the IP Address is currently enabled for alarm monitoring. If it is disabled, the IMS-4000 will not send alarm messages. An IP Alarm can be enabled or disabled based on a 7-day + holiday time schedule.

Schedule: Click this button to bring up the Edit Schedule screen. This screen allows you to set times when the IP Alarm is enabled or disabled. The blue line indicates days/times when the channel is enabled.

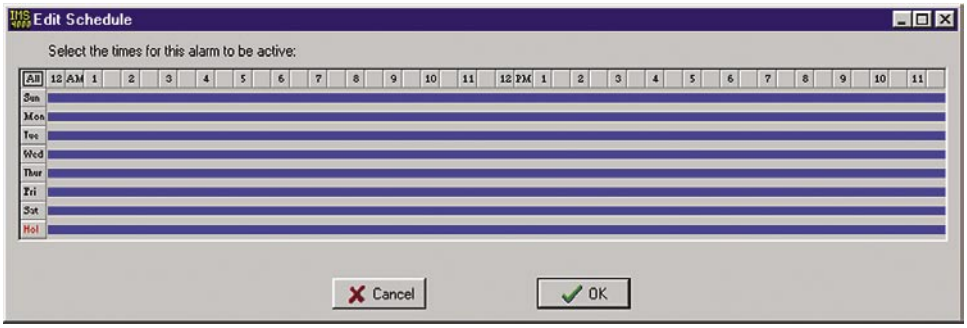


Figure 27: IP Schedule screen

The schedule example above enables the IP alarm 24 hours a day, including holidays.

Editing the schedule:

- Click on the *All* button in the top left corner of the grid to enable/disable the entire week.
- Click on the *day* buttons down the left side of the grid to enable/disable entire days
- Click on the *hour* buttons across the top of the grid to enable/disable entire hours
- Drag the mouse over portions of the grid to enable/disable specific hours/days

Timeout: If the monitored IP address does not respond within this period of time, then the ping is considered a failure. If the number of consecutive failures exceeds the number of Retries then a Ping Timeout alarm is tripped.

Retries: This is the number of times the monitored IP address is pinged after a failure, before a Ping Timeout alarm is tripped.

Alarm Class: Click the drop-down arrow and select the appropriate class for this type of alarm. If you prefer you can create your own classes on the Class Setup screen to group certain types of alarms.

Custom Voice: Click the drop-down arrow and select the custom voice message you would like assigned to this IP Alarm. Voice messages can be recorded on your PC and uploaded into the IMS-4000 on the Voice screen.

Reset Time: This is the time allowed for an acknowledged alarm's fault condition to be corrected before the IMS-4000 resets (reactivates) the alarm and begins the message delivery process all over again. The minimum reset time is 30 minutes.

Alarm on Return-to-Normal: When this feature is enabled, the unit will send a message (or messages) when an IP device goes from a Ping Timeout state to a Responding state. The person who acknowledged the alarm—in addition to all Inform Only contacts in the alarm class—will receive the Return-to-Normal message.

SNMP Trap Level: When sending alarm messages via SNMP, this sets the priority of the SNMP trap. The choices are *Major* or *Minor*.

Note: See the previous section, "Alarm Response via the PowerGate, PowerGate2, or Camera" for information on responses to alarms via PowerGates or Cameras.

Alarm Logic

Network devices are monitored by the IMS-4000 by pinging/connecting to programmed IP addresses about once a minute. The unit will only attempt to ping/connect to devices which are *Enabled* by the *Schedule*. Each time the network device responds, the IMS-4000 updates the *Last Response* time. A time limit for responding is assigned to each IP Alarm to determine if the device is functioning properly. This time limit is called the ping *Timeout*. If a network device does not respond within this time period, the IMS-4000 will count this as a ping failure. You can program the IMS-4000 to try to ping/connect to the network device several times before tripping an alarm. The ping *Retries* determines how many times the IMS-4000 will try to ping/connect to the device before sending an alarm. An alarm will only occur if the device fails to respond to consecutive ping attempts. Once a successful response is received, the failure counter will reset. For example: If the ping *Retries* is set to 3, then the IMS-4000 must fail to ping/connect to the device 4 times in a row (initial attempt + 3 retries) to trip an alarm. If the device were to respond after the second attempt, then the failure counter would reset, thus requiring four subsequent successive failures to trip an alarm. Once an alarm is recognized, the *Last Alarm* time will be updated.

A dependency device (IP address) can be programmed for each IP Alarm. This is used to prevent numerous alarms from occurring when common network infrastructure problems arise. If the dependency device fails, then all IP alarms that have this dependency will be temporarily disabled from sending alarms until the dependency device returns to normal (e.g. starts responding to ping/connect requests). When an IP Alarm's dependency is not responding, the status for the IP Alarm will be shown as "IP route down." It is recommended that the dependency device be programmed such that it will go into alarm before any other devices. You can achieve this by setting the number of *Retries* for the dependency device to a lower value than the IP Alarms which rely on this device.

In summary, for an IP Alarm to be dispatched, the following criteria must be met:

a) The IP Alarm must be enabled—as configured through the schedule.

b) It must have failed to respond to consecutive ping/connect requests and exceed the number of retries.

c) It must be a member of a class.

d) There must be one or more user profiles which include this class.

Once the alarm is dispatched, the alarm delivery process begins. If any of the contacts are programmed as *Until Acknowledged*, then the *Last Ack* time will update when the alarm has been acknowledged. In the case where all contacts are set to *Inform Only*, the *Last Ack* time will update immediately after the alarm occurs.

Additionally, there is an option to re-dispatch the alarm if it remains in an alarm state too long. This programmable time period is called the *Alarm Reset Time*. This parameter can be set from 30 to 3600 minutes. For example: Suppose the *Alarm Reset Time* is set to 180 minutes. Now suppose an IP device has stopped responding and trips an alarm which results in all programmed users receiving their respective messages. If the IP device continues to remain unresponsive for 180 minutes, then the alarm will be dispatched again and everyone will be contacted once more.



DO NOT set the *Alarm Reset Time* too short, otherwise you will continue to dispatch the same alarm over and over resulting in numerous phone calls, e-mails, etc.

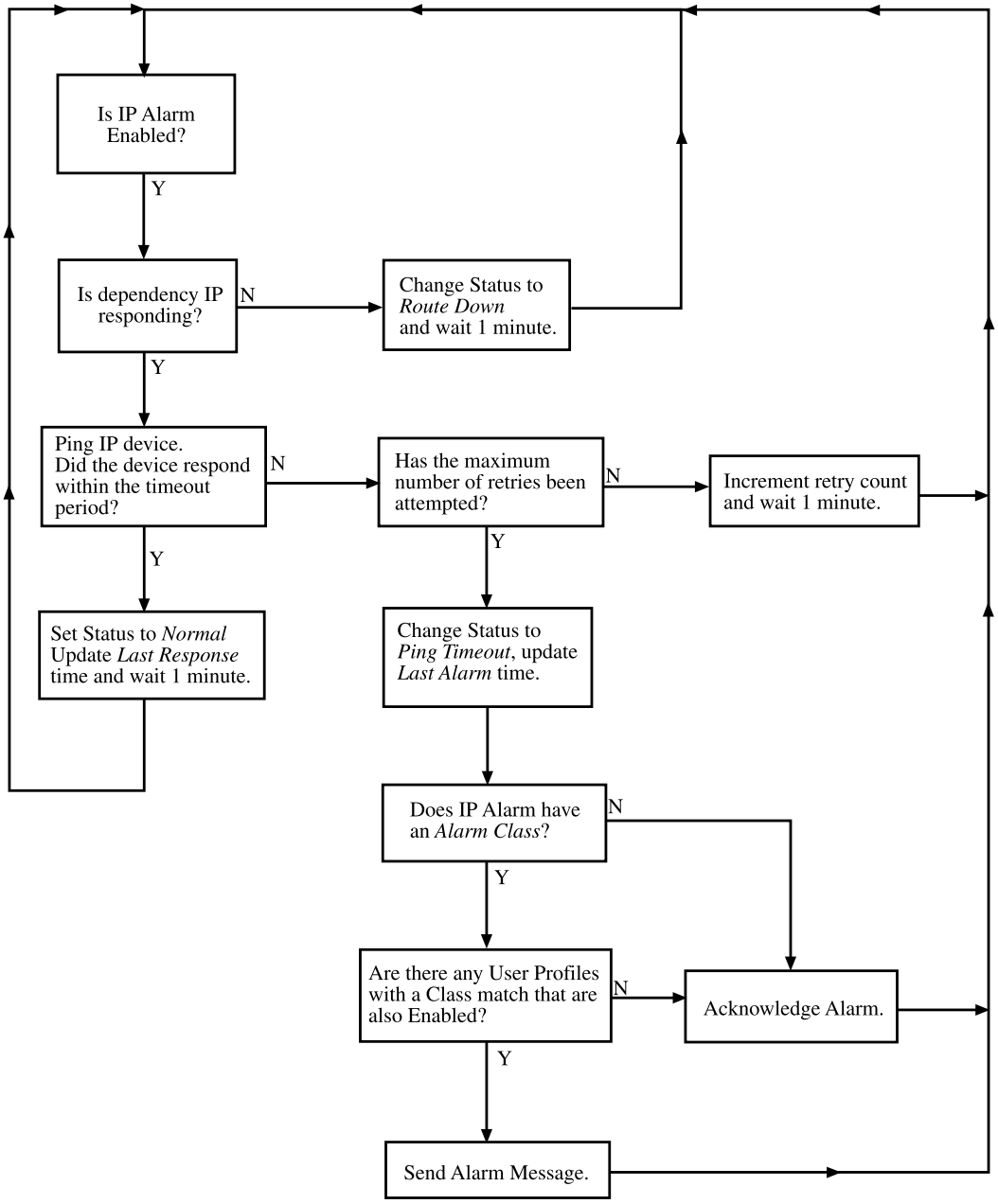


Figure 28: IP Alarm Flowchart

Removing an IP Alarm

Expand the IP Alarms and right-click on the IP Alarm you wish to remove. Choose *Delete this IP Alarm*, and it will be removed.

Input/Alarm Classes

Classes are used to associate environmental inputs and IP alarms with people. Each input sensor or IP address must be assigned to a *Class*. Each person or *User Profile* selects classes for which they have responsibility. To view the list of Classes, expand the *Settings* menu, then right-click on Classes and select *Properties*. Several classes have been pre-defined in the IMS-4000 to give you a starting point. The default *Classes* are:

- (Diagnostic)
- Temperature
- Humidity
- Water
- Power
- Other
- Smoke
- Security
- Backup Battery
- High Sound
- IP Alarms

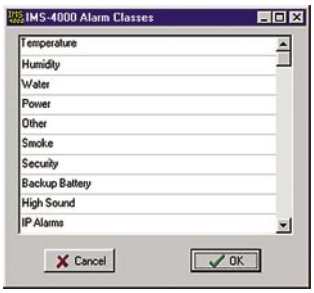


Figure 29: Setup Classes

You can have up to 64 classes in the IMS-4000. To add Classes, just type in a new class name in the Class table list and click OK. The class programming screen is shown above. Note that the *Diagnostic* Class does not appear in the list shown above. This is because it is a special case, reserved for system faults, trouble alarms, and diagnostic alarms. The *Diagnostic* class cannot be edited or deleted. Any user who wishes to receive these types of alarms should include the *Diagnostic* class in their *Profile Class list.*

Configuring User Profiles and Contacts

Configuring User Profiles

The User Profile section controls who has access to the IMS-4000 and who gets contacted when an alarm occurs. The User Profile programming screen describes attributes of the user including: name, title, company, dept, username, password, user code, time zone, classes, etc.

When an alarm occurs the IMS-4000 will check the list of User Profiles to see who should be contacted. Users whose class list includes the class of the alarm will be contacted. Each user can have up to 8 contact destinations (phone numbers, e-mail addresses, …). Up to 64 different User Profiles can be created. The IMS-4000 can contact users using 6 different methods: voice, pager, alphanumeric pager, fax, e-mail, and snmp trap.

The order of Profiles contacted can be changed. To move a Profile up or down in the list, click and hold the Profile you wish to move and drag it to its new location, then release the mouse button. The Profile should now display in its new location.

Adding a Profile

Right click on *Profiles* and select *Add New Profile*. The following screen will appear:

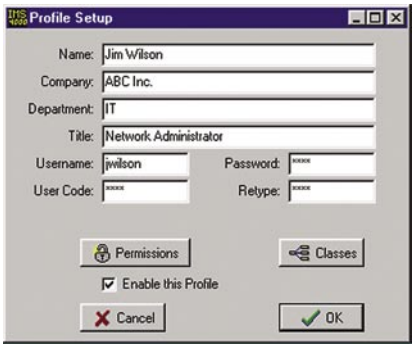


Figure 30: User Profile screen

The Name, Company, Department, and Title information are used to identify the user on reports that the unit sends.

The *Username*, *Password*, and *User Code* are used for security purposes.
You must have a Username and Password to:

- go online with the unit
- request two-way e-mail features
- access other features of the unit.

The User Code is a four digit number that is required to request a voice status report and to acknowledge alarms. When the IMS-4000 receives a call, it will request the User Code. If a valid User Code is entered, the unit will match this code to the User's Class List and report the status of all Environmental Inputs and IP Alarms which correspond to the selected Classes. Voice Status reports check User permission, and a user can only receive information on items that he has permission to receive. This includes environmental and IP alarm status, PowerGate switching, ping requests, and microphone listen-in. (See “Permissions” section.)

The “Enable This Profile” option provides a convenient way to temporarily enable or disable a User Profile. When a Profile is disabled (unchecked), no alarms or reports will be sent to that user, and the user will not be permitted to log on to the system.

Clicking the *Permissions* button will bring up the Permission screen.

Permissions

Each user profile has a programmable security level for each device (host/nodes) in the system. To set the Security Access level click the *Permissions* button. There are three access levels: Master System Administrator, Site Administrator, and User. The restrictions for each security level is as follows …

	Master System Admin	Site Admin	User
Add user profiles	Yes	No	No
Disable user profiles	Yes	No	No
Edit unit properties	Yes	No	No
Edit e-mail settings	Yes	No	No
Edit Node properties	Yes	No	No
Update firmware	Yes	No	No
Configure data logger	Yes	No	No
Add/delete classes	Yes	No	No
Add/delete holidays	Yes	No	No
Edit default input templates	Yes	No	No
Delete sensors	Yes	Yes	No
Disable IP alarms	Yes	Yes	No
Reset min/max	Yes	Yes	No
Other programming changes	Yes	Yes	No
Add camera	Yes	Yes	No
Acknowledge alarms	Yes	Yes	Yes
Switch a PowerGate outlet	Yes	Yes	Yes
Online via local PC	Yes	Yes	Yes
Call in via voice	Yes	Yes	Yes
Call in via modem	Yes	Yes	Yes
Visit password protected Web	Yes	Yes	Yes

To configure a profile as a Master Administrator simply check the box at the top of the screen.

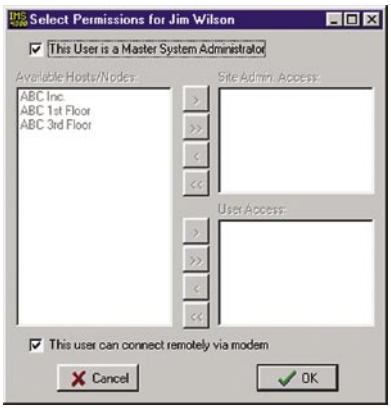


Figure 31: Permissions screen

To configure profiles for Site Administrator or User security levels, select the appropriate Host or Node(s) and click the arrow to copy the Host/Node(s) into the appropriate list. The double arrow >> will copy all units to the list while the single arrow > will copy just the selected unit to the list. Checking the box *"This user can connect remotely via modem"* at the bottom of the screen, allows the user listed at the top of the page to dial in to the system using a modem.

In addition to controlling programming access when using the IMS ConsoleView Software, permissions also have an effect during a telephone call. In voice mode the unit will recite only menus and status information for devices that the user has permission to hear. The associated Classes for each user will also control the content of voice reports. The same applies to two-way e-mail. A user can only receive information or send commands if they have the proper permissions and Class associations.

Examples:

1. If a User that has no Permissions on a particular Node, then the user will not be able to receive any Voice or e-mail reports that contain information about that Node.
2. If a User has permissions on a particular Host/Node unit but none of the environmental sensors are in his class, then he will not receive any information about the environmental sensors.

Classes

Clicking the *Classes* button will bring up the Select Classes screen.

Selecting Classes

The User can choose to receive alarm reports from one or more Classes. The list on the left displays all Available Classes. The list on the right shows Selected Classes for this profile. The Arrow Buttons are used to select or deselect classes. See the following Arrow Button definitions and the following figure:

>	Move the *highlighted* class on the left *to the right*
>>	Move *all* classes on the left *to the right* (select all)
<	Move the *highlighted* class on the right *to the left*
<<	Move *all* classes on the right *to the left* (deselect all)

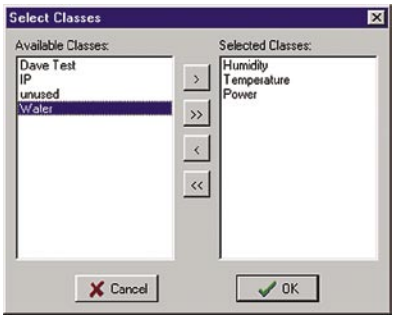


Figure 32: Class Selection screen

Deleting a Profile

From the hierarchy on the ConsoleView screen, right-click on the profile you wish to delete and select *Delete This Profile* in the contextual menu.

Contacts

The Contacts are the actual telephone numbers, e-mail addresses, pager numbers, etc… that the IMS-4000 will contact when an alarm occurs. You can have up to 8 Contacts per User Profile. Each Contact can have its own Schedule so that you can have certain Contacts be Enabled during daytime hours and others Enabled during nighttime hours. Only Contacts which are Enabled when the alarm occurs, will be contacted.

The order of Contacts can be changed at any time. To move a Contact up or down in the list, click and hold the Contact you wish to move and drag it to its new location, then release the mouse button. The Contact should now display in its new location.

Adding Contacts

To add a Contact, right-click on the User Profile you wish to add a contact to and select *Add New Contact*. An entry called New Contact will appear below the User Profile. Right-click on the New Contact and select *Setup*. The following screen will appear:

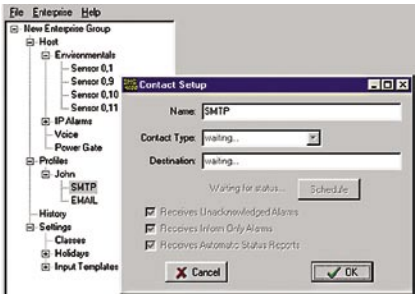


Figure 33: Contact Setup Screen

Enter a Name which describes the contact, like “Jim’s Cell,” “Acme Inc. Fax,” or “Jim at home.”

Select the Contact Type using the drop down arrow. The choices are: Voice, Numeric Pager, Alpha Pager, Fax, Email, and SNMP.

Destination: Enter the Telephone Number, E-mail Address, or Server Name/Address for the contact.

Voice Calls

For most voice calls you can simply enter the telephone number of the person you want called. Consider the location of the IMS-4000 Host when entering the number. If an area code is required to call from the Host to your telephone, be sure to include it.

Examples:
no area code required: 555-1234
Area code required: (610)-555-1234
1 + area code required: 1-(610)-555-1234

You can also include additional codes within the telephone number. Listed below are the special code letters and a description of each:

p = 2-second pause
w = wait for answer
b = blind dialing (makes the unit dial and start speaking the message without requesting that a key be pressed)
! = flashes the phone line (momentary hang-up and reconnect, useful in some PBX systems)

These codes can be useful if you want to call an extension within a business. For example, suppose your office was answered by an auto-attendant, but you know that if you dialed the extension the call would be transferred. In this case you can program the telephone number, insert a w to wait for the auto-attendant to answer, and then add the extension you want dialed.

Example: 555-1234-w-170 {Extension 170 will be dialed after the auto-attendant answers}

Numeric Pager Calls

The IMS-4000 can send alarm messages to numeric pagers. It will automatically send its ID telephone number when dialing to a numeric pager. All you have to do is enter the telephone number of your pager. Be sure to include the (area code) or 1 + (area code), as necessary.

Example: (301)565-2300

If your pager service is answered by a voice-prompted message, or if your pager service allows only a few seconds to enter a number before disconnecting, you will need to enter the telephone number differently. In this case, enter the pager telephone number + two or more pauses + the Host ID telephone number + #.

Example: (301)565-2300-pp-844-1900-#

Alphanumeric Pager Calls

The unit can dial alphanumeric pagers to send alarm messages. The IMS-4000 uses industry standard TAP protocol, which is supported by most pager systems. The IMS-4000 will send the type of alarm, the name of the Host or Node, the Input name, the current value, the programmed high or limit, and the time of the alarm. To program an alphanumeric pager destination, enter the pager service data/modem phone number followed by the letter A and then the pager ID.

Example: (610)555-4500-A-0504099

Contact your pager company if you do not know the data/modem telephone number or the pager ID for your alphanumeric pager.

Fax Calls

Enter the telephone number of the fax machine.

E-mail

Enter the e-mail address.

SNMP

Enter the SNMP server IP address in numeric form (e.g. 192.168.0.1)

Schedule

Click the Schedule button to bring up the Schedule screen for this Contact. Choose the times you want the Contact to be enabled by adjusting the blue bars. Areas where the blue bar appears indicates the day and time the Contact is Enabled.

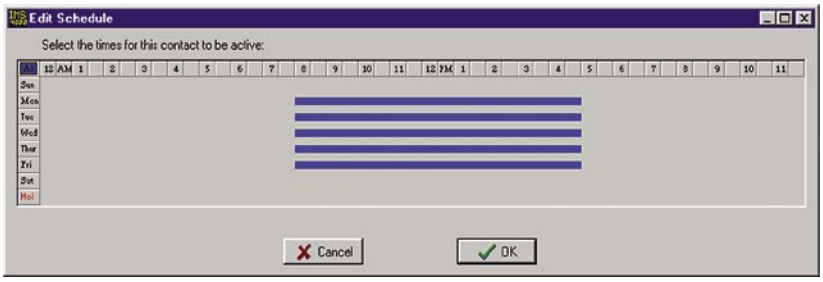


Figure 34: Contact Schedule screen

For example, the schedule above enables the contact Mon-Fri 8AM to 5PM.

Editing the schedule:

- Click on the All button in the top left corner of the grid to enable/disable the entire week.
- Click on the day buttons down the left side of the grid to enable/disable entire days
- Click on the hour buttons across the top of the grid to enable/disable entire hours
- Drag the mouse over portions of the grid to enable/disable specific hours/days

Alarm Delivery Options

There are additional options which appear on the Contact Setup screen depending upon the type of call. For alarm delivery you **must** select either *Receives Unacknowledged Alarms* or *Receives Inform Only Alarms* or both.

Receives Unacknowledged Alarms: This option applies only to voice and pager calls. When selected the IMS-4000 will call this contact until the alarm has been acknowledged or until the number of call attempts has been exhausted. If the alarm is acknowledged by another user, this contact will stop being called.

Receives Inform-only Alarms: This means that the alarm message is for information purposes only. Once the alarm message has been delivered, the IMS will stop calling this contact. This selection is useful for insuring that a record of an alarm is sent. When this option is checked, the IMS-4000 will always send an alarm message to this contact.

Note: If no "Until Acknowledged" contacts are selected to receive an alarm message, the IMS Host will self-acknowledge the alarm.

Saving and Loading Programming

The programming in your IMS-4000 can be saved to a file. This gives you the ability to back up your programming or copy the same programming to another IMS-4000 unit. Note that the file you save will not include custom voice files or settings entered through the serial port (network parameters, web settings, two-way e-mail, RAS, etc.). To save your programming to a file, right-click on the name of your host and select *Save Programming*.

To load a programming file into your IMS-4000, right-click on the name of your host from the menu tree and select *Load Programming*. Select a programming file to load and click the *Load* button. Your unit will have to restart for the new programming to take effect. When the unit restarts, you will be logged off. After 10 or so seconds reconnect to the unit.

Reconnecting

At times your PC and IMS-4000 Host units may become disconnected. This may happen due to a system restart or other communication-related problem. You can reconnect to an IMS-4000 using the *Reconnect* command. To reconnect to a unit, click on *File* from the main menu and select *Reconnect*. Highlight the IP address of the unit you want to reconnect with and then click the *Reconnect* button.

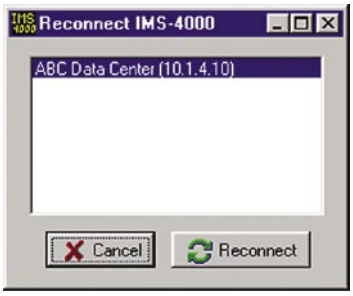


Figure 35: Reconnect Screen

Recording and Uploading Voice Messages

Custom voice messages can be assigned to many aspects of your IMS system. Voice messages are used during call-in status reports and alarm dial-out. This allows the system to identify and describe exactly where the problem is located, which equipment is affected, or which network device is not functioning. You can assign custom voice messages to the following:

IMS-4000 Host {See Host Properties}
IMS-4000 Node {See Node Properties}
Each Environmental Input {See Channel Setup}
Each IP Alarm {See IP Alarm Setup}
Each PowerGate Device {See PowerGate Setup}
Each PowerGate Outlet {See PowerGate Setup}

Recording Voice Messages

To record voice messages, click on the word *Voice* from the menu tree. This will display the CustomVoice Manager screen shown below.

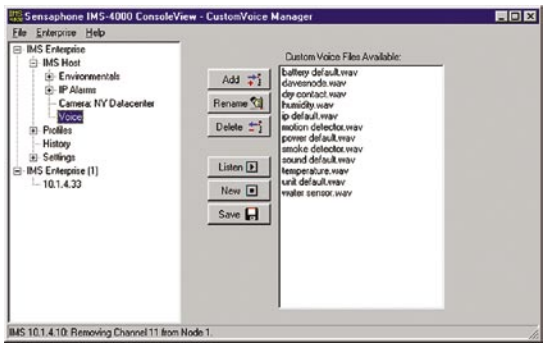


Figure 36: Custom Voice Manager

Click on the *New* button. This will display the MS Windows Sound Recorder program shown below.



Figure 37: Sound Recorder screen

For the voice messages to play back correctly you must set the recording format to PCM, 8KHz, 8 bit, mono. To set these parameters click *File,* then *Properties*. Next, click the *Convert Now* button. In the Format field select "PCM." In the Attributes field select "8,000 Hz, 8 Bit, Mono 8 KB/s." See the following screen.

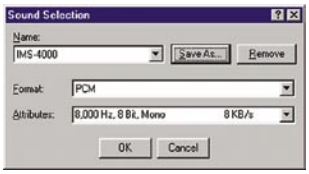


Figure 38: Sound Specifications screen

Next, save this recording format by typing "IMS-4000" in the Name field and click *Save As*. Click *OK* on each screen until you get back to the Sound Recorder main screen.

To record a message, click the button with the Red circle. To play a message, click the right arrow (Play) button. Trim off any silence before and after the message to ensure that the voice report flows smoothly. Messages can be trimmed by sliding the message position bar and selecting *Edit* from the main menu, and then either *Delete Before Message Position* or *Delete After Message Position*. It's important to minimize the length of the file to keep the message file size small and also to ensure that the message plays back smoothly when inserted into the message phrases. Once you're satisfied with your message, save it by clicking *File,* then *Save*. Enter a name for the voice file and click *OK*. Continue this process until you've recorded all of the messages required. Next, upload your voice messages into the IMS-4000 by clicking the *Add* button on the IMS-4000 CustomVoice Manager.

Select the message you would like to upload then click *OK*. The new voice message will be loaded into the IMS-4000 and will appear in the list.
The window to the right displays all of the voice message file names stored in the IMS-4000.

To change the file name of a voice message click *Rename*. Enter a new file name and click OK.

To *delete* a voice message, highlight the message and click the *Delete* button.

To *listen* to a voice message, highlight the message and click the *Listen* button.

Note: You must have a sound card and speakers/headphones to hear the audio.

To save voice messages from your IMS-4000 onto your computer, highlight the file name and click the *Save* button. Select the folder on your computer where you would like the file saved and click OK. This feature is useful to create a backup of the voice messages or to copy voice messages from one IMS-4000 Host to another.

Holiday Setup

The IMS-4000 allows you to program recurring or non-recurring holidays that you can use within your schedule programming. These schedules are used to enable or disable monitoring of Environmental and IP Alarms, and also to enable/disable times when users will receive alarm calls.

To see which holidays are currently programmed, expand the Settings menu by clicking the plus sign next to the word *Settings*, then expand the Holidays menu by clicking the *plus* sign next to the word *Holidays*. See sample below:



Figure 39: Holiday List

To view the programming of a particular holiday, right-click on the holiday name and select *Properties*.

To program a new Holiday, expand the Settings menu and right-click on the word *Holidays*, then select *Add New Holiday*. The new holiday programming screen will appear as shown below:



Figure 40: New Holiday

Enter a name for the holiday. Select the month, day, and year for the holiday. Finally, select whether the holiday is recurring. Click *OK* when finished.

Alarm Message Pop-Ups

While online with one or more IMS-4000 units through the ConsoleView Software, you can have an alarm message pop up on your computer screen whenever an alarm occurs. This could be an environmental or IP alarm on any Host or Node. You can configure this feature to display a general message indicating the Unit and Channel names, or you can associate a custom message with each input. The custom message can be displayed as plain text or HTML. The custom messages can be stored either on the local workstation or a drive that is regularly mapped to the workstation.

Activating Alarm Pop-Ups

Click on *File*, then *Options* from the main menu in the ConsoleView Software. The following screen will appear.

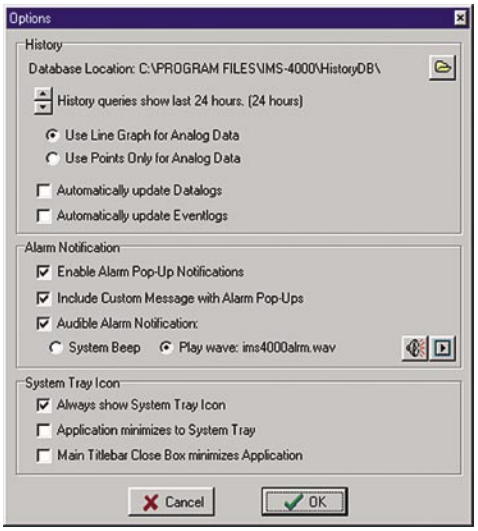


Figure 41: Options Screen

Within the section titled “Alarm Notification” click in the box to *Enable Alarm Pop-Up Notifications*. This will activate the Alarm Message Pop-Up feature. When an alarm occurs, a message will appear that simply displays the Unit and Channel names. If the user has permission to acknowledge the alarm, an Alarm Acknowledgment box will also appear. A sample message is shown below.



Figure 42: Simple Alarm Popup

Enabling Custom Pop-Up Messages

To have custom messages pop up, you must enable this feature. Select *Options* from the main menu. Click in the box labeled *Include Custom Message with Alarm Pop-Ups*. Next, you must select where your custom messages will be stored *(see below)*.

Setting Pop-Up Text Location

When using custom pop-up messages you must specify where these messages will be located. To do this, right-click on the name of your host within the menu tree and select *Alarm Pop-Up Notice Location*. Select the drive and folder where the messages will be stored.

Editing Pop-Up Custom Message

To edit the custom message for a particular environmental input or IP alarm, right-click on the chosen input and select *Edit Alarm Pop-Up Message*. The following screen will appear.

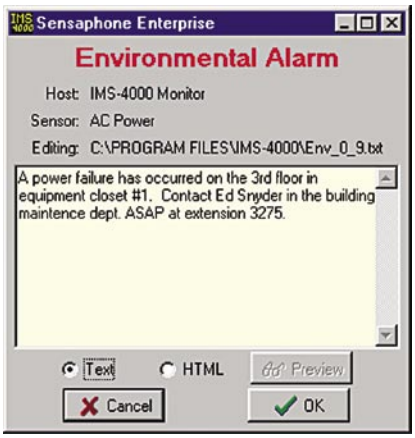


Figure 43: Edit Popup Screen

Messages can be displayed as text or HTML. Select the type of message you want to enter and type your message into the text area. This window will scroll to accommodate lengthy actions. Note that using HTML, you can embed web links in the message for more advanced actions. To test your HTML code, click the *Preview* button. To return to the edit screen click the *Edit* button. See samples below.

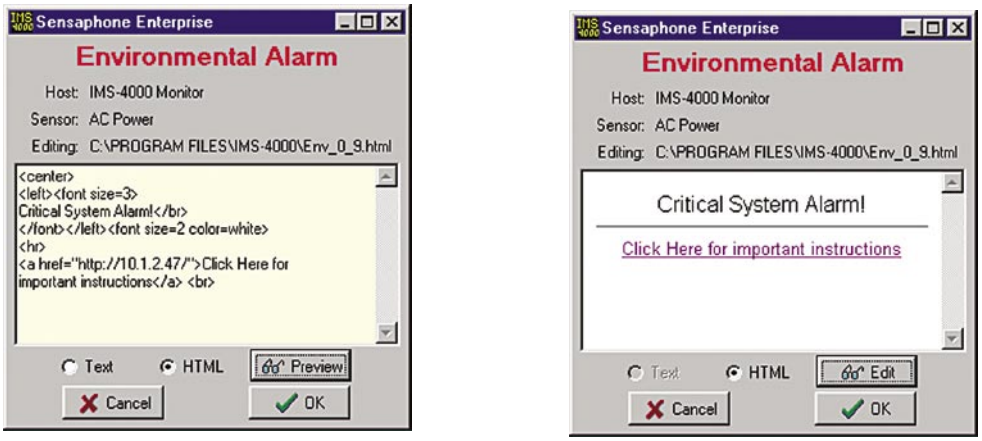


Figure 44: HTML Edit Screen and HTML Preview Screen

Audible Alarm Notification

The ConsoleView Software can optionally beep or play a custom Wave file whenever an alarm is detected. To utilize this feature, click *File*, then *Options* from the main menu. Under the Alarm Notification section select *Audible Alarm Notification*. Next, select either *System Beep* or *Play Wave*. If you selected *Play Wave,* then you must select the Wave file to be played. Click on the speaker button to choose a Wave file. After you've made your choice, you can preview it by clicking the *Play* button. See sample screen below:



Figure 45: Alarm Notification screen

E-Mail Setup and Two-Way E-Mail Commands

The IMS-4000 can send alarm messages via e-mail using SMTP as well as respond to commands via e-mail. See the Two-Way E-mail section for more information on sending commands.

To set up the e-mail parameters right click on the Host name and select *Network Settings*. Select the *Email Settings* tab to see the following screen:

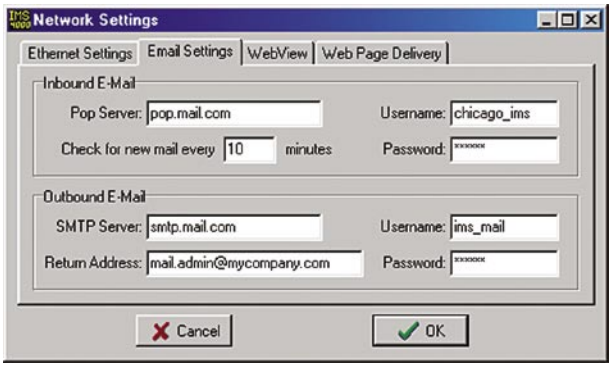


Figure 46: E-mail Settings tab

To have the unit send e-mail, you need to set the *SMTP Server* name and the *Return e-mail Address, Username* (if required) and *Password* (if required). To have the unit respond to Two-Way e-mail commands you must also set the *POP Server* name, e-mail account *Username* & *Password*, and the *Mail Check Interval*.

SMTP Error messages

If your e-mail settings are incomplete or incorrect there are some messages that will appear in the Event History log which may be helpful.

The “Invalid Configuration” message will appear if you don’t have both the SMTP Server name and Return Address programmed. These are the minimum programming requirements to send e-mail. If you have at least these two items programmed and the IMS-4000 is unable to deliver the message, then you will get the message “SMTP Server not Responding,” which essentially means that you have one or more of the following problems:

(a) The wrong SMTP server name programmed.

(b) The wrong username programmed.

(c) The wrong password programmed.

(d) A username is programmed but none is required.

(e) A password is programmed but none is required.

(f) All of the e-mail settings are programmed properly but the unit cannot reach your SMTP server for network routing reasons.

(g) The unit cannot reach your DNS server and thus cannot look up the SMTP server IP address.

(h) The DNS server IP address is programmed incorrectly in the IMS Network Configuration settings.

Two Way E-Mail

The IMS-4000 Host has the ability to send and receive standard pop/smtp e-mail. In addition to using e-mail as a method of delivering outbound alarm messages, e-mail can also be used for remote access into the IMS-4000. A set of commands is available that can be sent to a 4000, within an e-mail, that will cause the 4000 to reply back to the sending e-mail address. Commands are available to inquire status, perform network ping and IP trace-route, and control outlets on a PowerGate.

> **Note**: Two-way e-mail is dependent upon User permissions. This means that the user can only receive information on items for which he has permission. *(See "Permissions" section)*

In order to have the IMS respond to e-mail commands you must first obtain an e-mail address for your IMS-4000 from your internet provider, configure the e-mail settings for your IMS Host (see e-mail setup), and have Two Way E-mail enabled (see Host Local Configuration in the Host Installation Manual).

> **Note**: The *username* and *email* address used in two-way e-mail commands must match a *Profile Username* and *Contact*. The response will be sent to the specified e-mail address.

Requesting a Status Report

To request a status report, send an e-mail message to your IMS-4000 Host with the following information:

```
To: <e-mail address of your IMS-4000>
Subject: ims4000

username: <valid profile username>
email: <your e-mail address>
command: status
```

Requesting an IP Ping

To request an IP ping, send an e-mail message to your IMS-4000 Host with the following information:

```
To: <e-mail address of your IMS-4000>
Subject: ims4000

username: <valid profile username>
email: <your e-mail address>
command: ping xxx.xxx.xxx.xxx
```

Requesting a Trace Route

To request an IP trace-route, send an e-mail message to your IMS-4000 Host with the following information:

```
To: <e-mail address of your IMS-4000>
Subject: ims4000

username: <valid profile username>
email: <your e-mail address>
command: traceroute xxx.xxx.xxx.xxx
```

Requesting a PowerGate Outlet Command

To request a PowerGate Outlet command, send an e-mail message to your IMS-4000 Host with the following information:

```
To: <e-mail address of your IMS-4000>
Subject: ims4000

username: <valid profile username>
email: <your e-mail address>
command: powergate "<PowerGate Name>" "<Outlet Name>" on/off/cycle
```

For example:

```
To: ims4000@mycompany.com
Subject: ims4000

username: jsmith
email: jsmith555@aardvark.net
command: powergate "Gear Rack #1" "Netgear switch #3" cycle
```

Requesting a Picture from a Camera

You can receive an e-mail with an attached picture from any camera configured in the IMS-4000. The picture will be captured when the IMS-4000 receives the e-mail request.

To receive a picture, send an e-mail message to your IMS-4000 Host with the following information:

```
To: <e-mail address of your IMS-4000>
Subject: ims4000

username: <valid profile username>
email: <your e-mail address>
command: camera <camera name>
```

For example:

```
To: ims4000@mycompany.com
Subject: ims4000
username: jsmith
email: jsmith@aardvark.net
command: camera NY Datacenter
```

Requesting Help

You can receive a brief overview of how to use and format two-way e-mail commands, by requesting help.

Send an e-mail message to your IMS-4000 Host with the following information:

```
To: <e-mail address of your IMS-4000>
Subject: ims4000
username: <valid profile username>
email: <your e-mail address>
command: help
```

For example:

```
To: ims4000@mycompany.com
Subject: ims4000
username: jsmith
email: jsmith@aardvark.net
command: help
```

Configuring a Video Camera

The IMS-4000 is compatible with the following network cameras.

Axis:	
205	241Q
206	241S
206M	2100
206W	2120
210	2400 Server
211	2400+
213PTZ *(unable to PTZ in Console View)*	2420
	2460 DVR *(no Quad View as on Web page; clicking on image switches image to next camera)*
Panasonic:	
KX-HCM8	BL-C10A
KX-HCM10	KX-HCM280

These are all network video cameras that allow you to view live streaming video or capture images to e-mail when an alarm occurs. The camera or server connects to your network via an RJ-45 jack and supports 10/100 Mbit networks. Up to 128 cameras or servers may be associated with each Host or Node. The IMS-4000 ConsoleView Software allows you easily to click and view live video wherever your camera is installed.

When an Axis Camera Server is used, up to four cameras can be viewed at the same time. You can view a single camera by clicking on the video image you want to display. If you click again, it will return to the quad image. You can also capture a still image from either the quad or single camera display by right-clicking and choosing *Capture Image.*

The first step is to get the camera running on your network. This process is independent of the IMS-4000. Follow the instructions included with the camera to get it set up. Once the camera is

properly set up, go into the IMS-4000 ConsoleView Software. Cameras are added to the IMS by expanding the *Settings* menu and right-clicking on the word *Cameras*. Choose *Add Camera*. This will bring up the Camera Setup screen (see below). Enter the IP address, port number, and security settings (if required) of the camera according to how it has been configured on your network. See sample screen below:

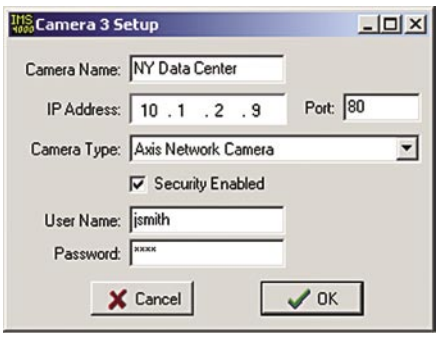


Figure 47: Camera Setup

Select the camera type by clicking on the drop-down arrow and selecting the camera. Click *OK* when Finished.

Up to 128 cameras can be configured in an IMS system. These can be a mix of Axis cameras, Axis camera servers, and Panasonic devices. Once the camera(s) have been configured they can then be associated with a particular Host or Node so that links for these cameras will appear within the menu tree for the chosen unit. You can associate a camera with more than one device if desired. To associate one or more cameras, right-click on *Cameras* within the menu tree for the selected host or node. See screen sample below.

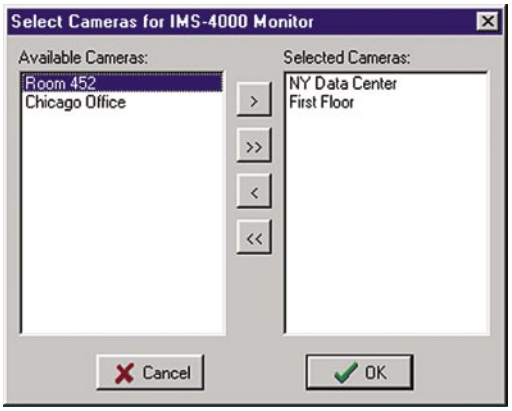


Figure 48: Associating Cameras

The window on the left lists all cameras programmed into the system. The window on the right lists cameras associated with the selected Host or Node. To move a single camera to the other window, highlight the camera and click the single left/right arrow. To move all cameras to a new window, simply click the double arrows. This will copy all listed cameras to the other window.

If you click on *Cameras* you will see thumbnails of all associated cameras. To view a large image of a particular camera, simply click on the image.

> ***Caution**: The Panasonic and Axis cameras are Ethernet devices. They should be connected to your Ethernet network only. They do not connect directly to your IMS-4000 Host or Node unit. Connection of either the Panasonic or Axis Cameras directly to your IMS-4000 may cause undesirable results.*

Web Page

The IMS-4000 will produce a web page which includes:

- The status of all Environmental Inputs and IP Alarms.
- The ability to program most parameters.
- Links to view logged data for each Input and IP alarm.
- Links to view historical alarm information for each Input and IP alarm.
- Graphs of the last 24 hours of logged data.
- The present state of all PowerGate outlets.
- Links to Live images from cameras.

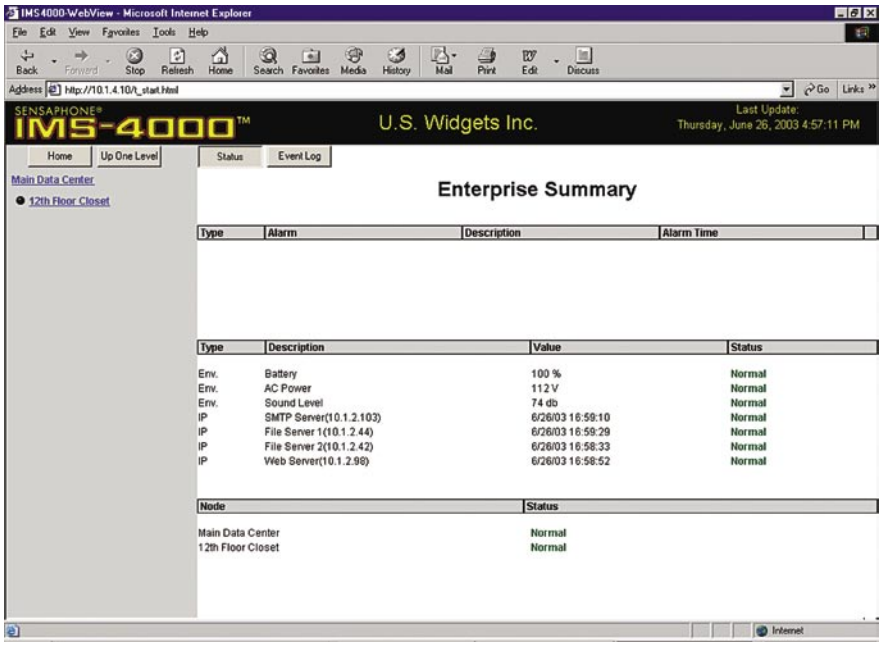


Figure 49: IMS Web page

The Web Page must be enabled through the Local Configuration process via the Host's serial port. Optionally, the web page can also be password protected. You can program most parameters through the web page if the Web Page Programming option is enabled. This can be secured with the same permissions options as with the ConsoleView software. To gain access to the programming screens, you must log in on the web page.

To view the Web Page, simply type in the Host's IP address in your web browser.

Graphs

Anything you are data-logging, you can also graph. Graphs represent the last 24 hours of logged data for the particular Environmental/IP element you choose to view.

To view a graph on your Web Page:

1) Select the Unit.

2) Select Environmental/IP alarms

3) Select a specific environmental or IP from the displayed list (Ex: AC Power)

4) Click the *Graph* button.

The summary will be replaced by a graph for the chosen Environmental/IP item. (See following figure.)



Figure 50: Graph of AC Power

Updating the Web Page

You can enable Automatic Updates of the data and select the interval between updates by right-clicking on the Host and selecting Network Settings. Click on the WebView tab. Check the *Automatic Refresh* box and enter the number, in seconds, between updates, in the *Update Every* box.

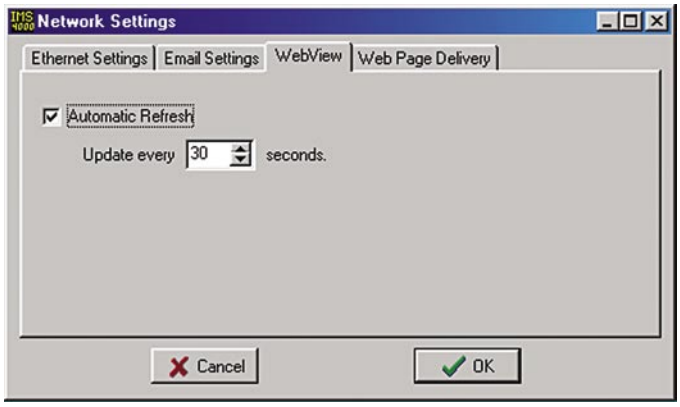


Figure 51: Web Page Refresh Enabled

Remote Web Page

The IMS-4000 can send a copy of its web page to another web server via FTP (File Transfer Protocol), so that the web page can be viewed on another network (for example, on the Internet). To configure the unit to FTP the web page, right-click on the Host and select *Network Settings*. Next, click the tab labeled *Web Page Delivery*. A sample screen is shown below.

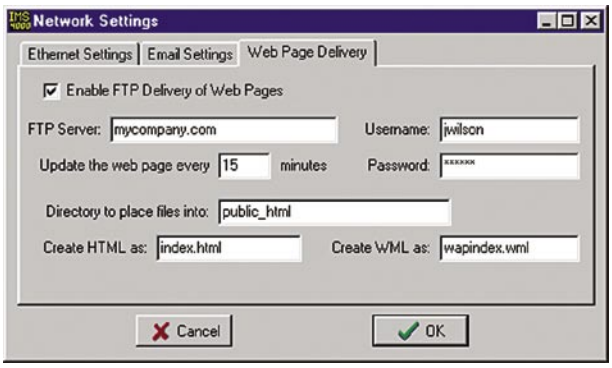


Figure 52: Web FTP screen

Click the *Enable FTP Delivery* box and fill in the necessary information for your FTP server. Your service provider will have to provide you with the FTP Server name and sub directory where your files will be uploaded. You will also be required to enter your *username* and *password*. You can set how often you want the web page to be updated by entering an interval time in the *Update* box. Enter a file name for the web page (e.g. ims4k.html). When you've finished, click *OK*. Listed below are definitions of the FTP programming parameters.

FTP Server: the host name of the FTP server for your service provider.

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

Username: Your user name for your web account.

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

Update Interval: This time period determines how often the web page is uploaded.

Create HTML as: This is the file name given to your web page.

Create WML as: This is the file name given to web pages to be viewed with wireless phones. If no name is programmed, the unit will not ftp any wml files.

Viewing the Remote Web Page

To view the remote web page that the IMS-4000 uploaded, you need to know its web address. This address corresponds to the Server name, plus the directory, plus the file name of the web page. It will look something like this: http://www.mycompany.com/jwilson/ims4k.html

Note: Data Log and Event Log information are NOT available via the remote web page.

History

The IMS-4000 stores both datalog and eventlog history internally. The datalog is a time-stamped collection of input values that can be used to view and graph environmental conditions over time. It can also store the status of IP devices. The user can choose which inputs or IP alarms are stored and specify the overall sampling rate. Care should be taken to select the number of inputs and sampling rate accordingly, since large amounts of data can potentially be logged. The more data being logged, the faster the history log will fill up.

The eventlog contains time-stamped messages that describe activities performed by the unit such as alarm detection, user logins, telephone calls, and alarm acknowledgement. The eventlog history is useful when you want to review the historical events monitored and performed by the IMS-4000.

When a user goes online, information for both the datalog and eventlog history is automatically retrieved and stored in a database on a user-specified hard disk. This can be a drive on your own computer or a network server. While the program defaults to saving the history database on your local drive, if the system will be used by many users it may be advantageous to store the database on a network drive. To specify the drive for saving History information click *File*, then *Options* from the main menu. A sample screen is shown below:

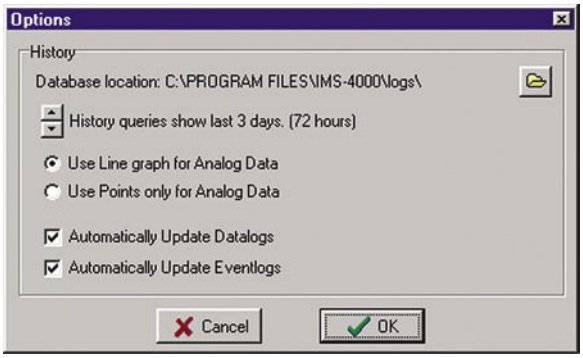


Figure 53: History Options

To change the location for storing the History database, click the folder button on the right side of the screen and choose a new location. The location you select will be displayed to the left.

Use the up or down buttons to select the amount of history to be viewed when accessing the *History* option through the right-click menus in the ConsoleView software. This provides a quick view of the history for a particular Input or Profile. The default time is 24 hours (1 day). Clicking the arrows will increase or decrease the data time by days.

Analog input values will automatically be graphed when viewing *History* through the right-click menus of the ConsoleView software. You can choose to have the graphed data displayed as a line graph or simply show the discrete data points.

You can also deselect the *Automatically Update* buttons if you don't want the Datalog or Eventlog to download each time you connect. If you are using a dialup connection, you may want to disable these functions to speed up the software loading process. (You can manually download the logs as desired by right-clicking on *History* in the menu tree.)

Datalog History

The IMS-4000 can log up to 62,500 samples of environmental and IP Alarm history. When the log fills, it will overwrite the oldest data first. Environmental data will display the actual value, while IP Alarm data will display either *Normal, Timed Out*, or *IP Down*. All stored history is logged at the same interval as programmed on the History programming screen. To set up the Datalog History, right-click on *History* from the IMS menu tree and select *Properties*. Enter the Interval time and click the *Enable* box. This will start the Datalog feature. The Datalog will store Environmental and IP Alarm values if datalogging is enabled on their respective programming screens.

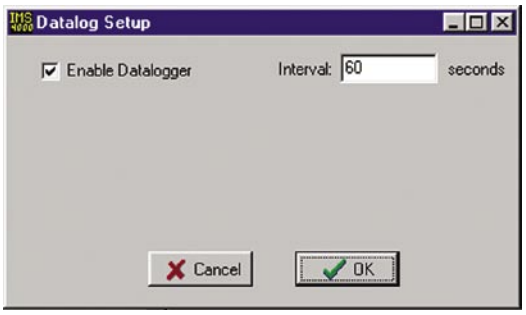


Figure 54: Datalog Setup Screen

Viewing History

Datalog History can be viewed through the ConsoleView software or via the IMS web page. It can be viewed through the ConsoleView software in two ways: There is the quick view which can be displayed by right-clicking on an input or profile and selecting *History*, or you can perform a query on the entire history database using the HistoryView program (right-click on *History* in the menu tree and select *HistoryView,* or from the main menu select *File*, then *HistoryView*).

History QuickView

You can display a quick view of an input or profile by simply right-clicking on the item and selecting *History*. This will provide an event listing and graph of the input over the last 24 hours (default). You can change the amount of history displayed to several hours or several days by changing the setting on the *Options* screen under the *File* menu. A sample is shown below:

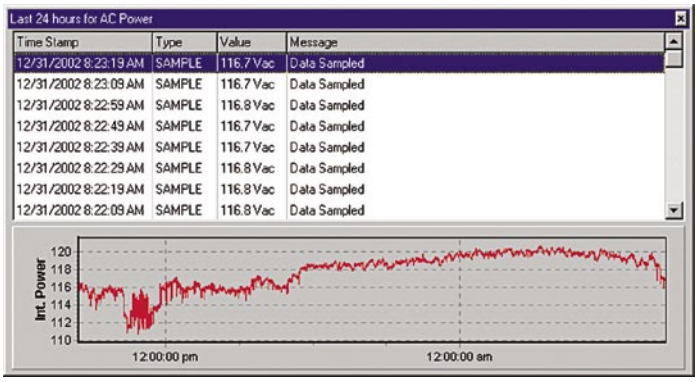


Figure 55: AC Power History

Querying the History Database with HistoryView

The HistoryView program allows you to query the entire History database for all IMS units. There are filters to select Samples, Alarms, System messages, or User Logins. You can view data from an IMS Host and its associated Nodes combined, or individually. You can also graph sampled data.

To begin, run the HistoryView program by right-clicking on *History* in the menu tree and select *HistoryView*, or from the main menu select *File*, then *HistoryView*. The first screen will prompt you to select an IMS Host. Click in the box next the Host you want to Query. The program will then load the associated nodes and input names. Next, select the Host or Nodes that you want to query information on, then select any filters that you want to apply. If you select *All* you will see all events and data samples for the selected units. If you select *Samples* or *Alarms* you must then choose one or more Environmental Inputs or IP Alarms.

Note: the number that precedes each Environmental and IP description corresponds to the unit number to which they're connected (0 being the Host and 1-31 being the associated Nodes).

If you double-click on an item in the Environmental or IP Alarm box, all of the listed items will become selected and/or deselected. Last, select a time frame to perform the query and click *View*. The selected data will now be displayed. See sample screen below:

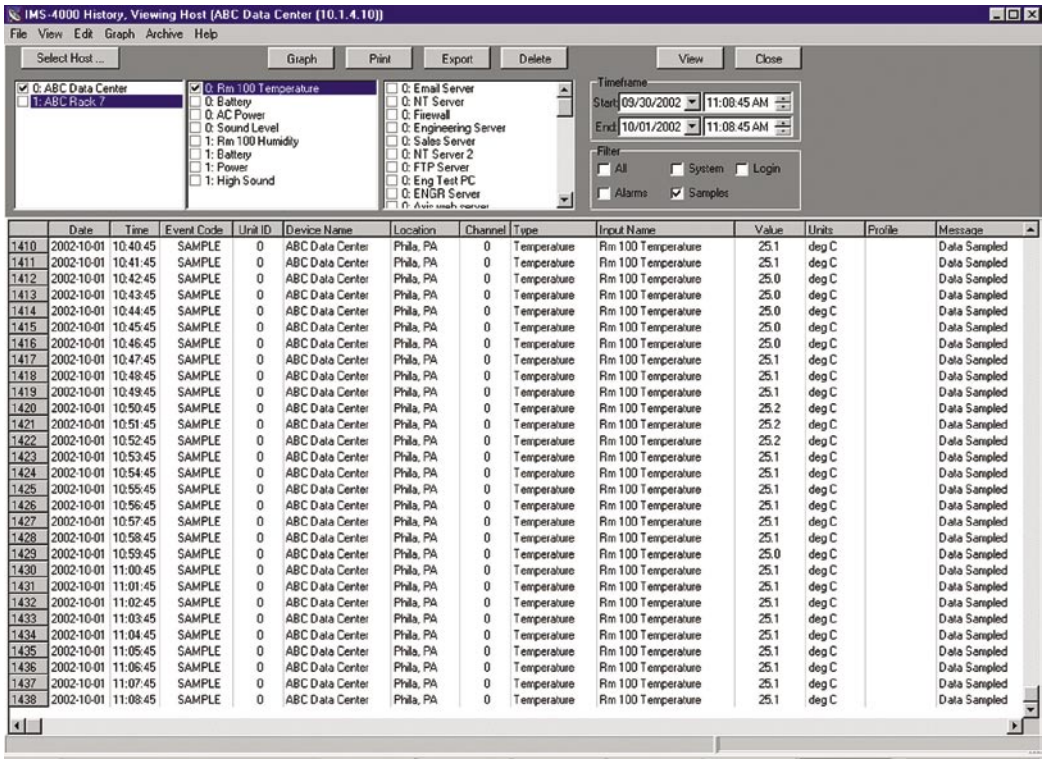


Figure 56: History Viewer

Graphing

Graphing data is possible when the selected query contains only Samples.

If you click on the *Graph* button, all of the points in the query will be displayed as a line graph. There are also options (from the *Graph* menu above) to format and display the data as a bar or area graph. You can have up to eight items displayed on the graph at once. To view different parts of the graph use the arrows on the bottom and sides to adjust the position. A graph can be printed by clicking the *Print* button at the top of the screen. You can copy the graph to the Windows clipboard by clicking the *Copy* button. This allows you to paste the graph into other applications. The *Zoom In* and *Zoom Out* buttons let you view the data with more or less detail. The *Reset* button restores the original view of the graph. When finished, click the *Close* button to return to the grid.

Printing Data

You can print the data viewed in the grid by clicking the *Print* button. Printing defaults to an Arial 5 pt. font in order to fit one line of data across one line of an 8.5" x 11" sheet of paper printed in landscape mode. You may choose different fonts and type sizes.

Exporting Data

The *Export* button allows you to save the queried data in the grid to a file format which can be easily imported into other applications. Options include the ability to save the file in CSV format, formatted text (prn), and tab delimited (txt) format. Note: The exported data will represent *only* what you've selected to query.

Click on *File* and select *Export Field Names* from the submenu if you want the field titles (Date, Time, Event Code, etc.) to be included with the data when you export.

Copying to the Clipboard

You can highlight and copy selected cells within the grid to the Windows clipboard. To highlight the data simply click-and-hold the left mouse button and drag the mouse over the cells you wish to highlight, then either right-click and select Copy, or click *Edit* from the main menu and select *Copy*. To select all of the data in the grid, right-click within the grid and choose *Select All* from the contextual menu, or click *Edit* from the main menu and choose *Select All* from the submenu. This will highlight all of the data in the grid. You can then perform the Copy function as previously described.

Deleting Data

The *Delete* button will remove the queried data displayed in the grid from the database.

TheViewer Menu offers you other features as well to customize your report.

Archiving

As the history database grows it will begin to take longer to perform a query. It is recommended that the database be periodically archived to keep the size reasonable and to permit satisfactory performance of the HistoryView program. Archiving may be done as often as necessary for performance reasons but it *must* be done when the database reaches its physical limit. To find out how big the database is for a particular unit, select *Database Statistics* under the *Archive* menu. The size of the database and percent full will appear in the status bar along the bottom of the grid. A warning message will appear when the database reaches 80% of its capacity.

To archive the history database select *Archive* from the main menu and then choose *Select database to archive*. Locate the history.db file for the unit you wish to archive and click *Open*. Next, enter the date range to archive (typically one or more months or a quarter). Click the *Archive* button. The archived data will be stored in a file that includes the "from" and "to" date range in a yr/mn/dy format.

After archiving it's recommended that you Pack the history database (history.db) to delete the old data and reduce the file size. To do this select *Pack Database* from the *Archive* menu. Note that the *Pack Database* function can only be executed while offline with the IMS unit. To run *HistoryView* while not connected, click *File*, then *Run* from the *ConsoleView* main menu.

To view archived data, you will need to restore an archived database. To do this, choose *Select archive to restore* from the *Archive* menu. Next, choose the archive file you wish to restore and click *Open*. Next, click the *Restore* button. The archived data will be copied into the history database and a query can be performed.

Manually Forcing History Downloads

You can manually force full history downloads at any time. As previously stated, if you're on a dialup connection, you may choose to disable auto updates, and need to download the data periodically. To do this, go to your main IMS menu and right-click on History in the tree diagram.

Select Force Full Eventlog Download to manually download the Eventlog or *Select Full Datalog Download* to manually download the current datalog.

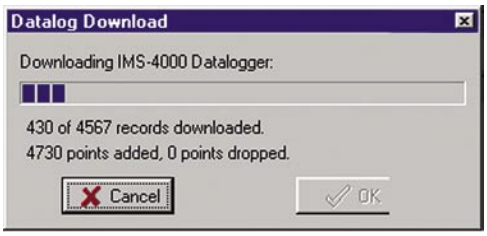


Figure 57: A manual Datalog Download in progress

Updating Firmware

From time to time Firmware updates will become available to add features or improve the performance of your IMS-4000. Most Firmware updates will be included as part of a complete IMS-4000 installation upgrade. Check the IMS-4000 website (www.sensaphone.com/support-4000.html) for the latest information on updates. If you register your unit you will always be informed of the latest features, enhancements, and corrections.

To check the version of Firmware in your IMS-4000, right-click on the *Hostname* and select *Version Info*. The following screen will appear.

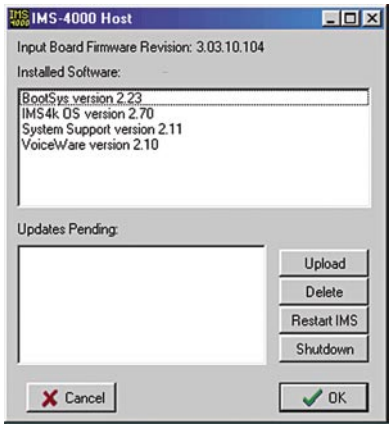


Figure 58: Version Info Screen

The IMS-4000 unit firmware comprises four files: *BootSys version, IMS4k OS version, System Support version,* and *VoiceWare version.* This screen includes functions to upload new firmware and restart the system. Always follow the instructions included with the new firmware files prior to installing any new versions. (Note that the Node firmware is installed separately on the Node Diagnostics screen.)

Chapter 3: Operation

After installation and programming have been completed, the Sensaphone IMS-4000 is fully operational. This chapter explains how the IMS-4000 operates.

Alarm Delivery and Acknowledgment

The IMS-4000 can be programmed to contact specific users when an alarm occurs. A user may be contacted depending on whether the alarm has already been acknowledged by another user, or regardless of acknowledgement by other users. This allows flexibility in configuring your system for the way you want alarms handled. When a user does not wish to be contacted if someone else has already acknowledged the alarm, then we call this contact type an "Until Acknowledged" contact. "Until Acknowledged" means that a user is on the call list until the alarm is acknowledged, and once acknowledgement is received, this user is removed from the list. If a user always wants to be contacted when an alarm occurs, we call this contact type "Inform Only." This means that this user will always receive notification of the alarm, regardless of acknowledgement by other users.

Alarm Acknowledgment

Alarms can be acknowledged six ways:

1) By entering your *Usercode* using a touch-tone telephone when prompted during a Voice telephone call.
2) By calling in to the unit and entering your *Usercode* via touch-tone phone when prompted. Only alarms that are in the User's *Class* can be acknowledged. Note that the *Intercall Delay* must be set to a minute or more to allow time to call in to the unit.
3) By logging-in to the IMS-4000 and clicking the *Alarm Acknowledgment* button on the status screen for the Input in alarm. See sample below:

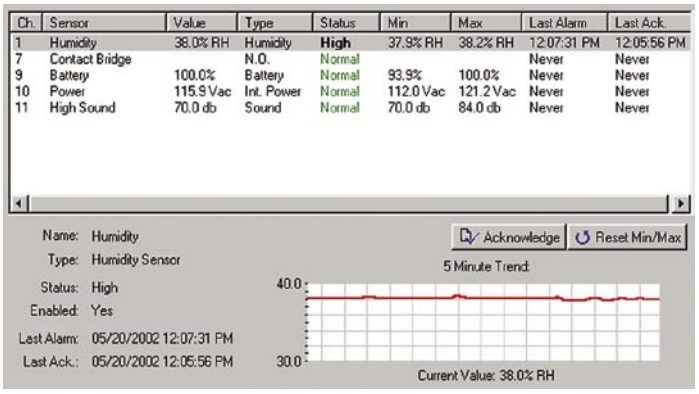


Figure 1: Alarm Acknowledgment button

4) By clicking the *Ack* button next to the input on the IMS web page.

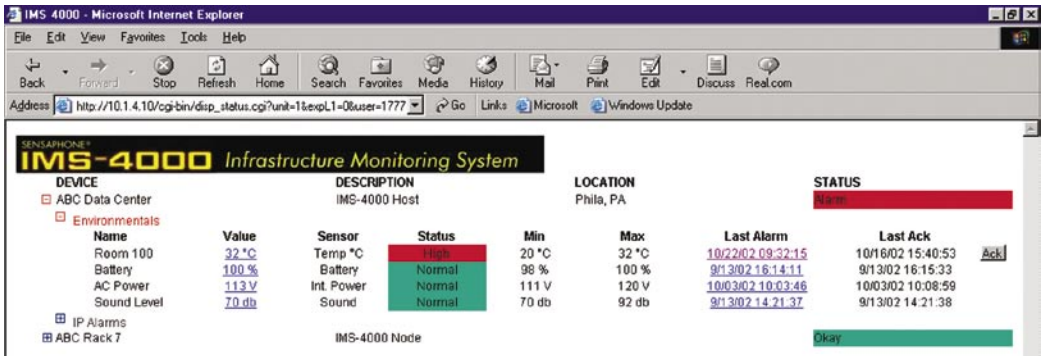


Figure 2: Web page acknowledgment

5) By SNMP Management software.

6) By the IMS-4000 itself. If there are no *Until Acknowledge* contacts in the call list or if the maximum number of calling rounds has been exhausted, the IMS-4000 will self-acknowledge the alarm.

Alarm Delivery Logic

When an alarm occurs, the IMS-4000 will check for Class matches between the input or IP alarm and the User Profiles. When matches are found, the IMS-4000 will then check to see if the associated User Profile is enabled and then check the schedule of each of the Contacts for the profile. Those Contacts that are active at the time will then be called depending on whether they are enabled to receive Inform Only calls or receive Unacknowledged Alarm calls or both. Those contacts enabled for Inform Only will always receive the alarm message, regardless of whether the alarm has been acknowledged or the input or IP alarm returns to Normal. Contacts set to receive Unacknowledged Alarms will *only* receive calls if the alarm has not been acknowledged. Note that alarms can only be acknowledged during a voice call or by logging in via the IMS Consoleview Software. If there are NO calls of the Unacknowledged type, then the IMS-4000 will acknowledge the alarm immediately after starting the alarm delivery process. It is not recommended that you set pager calls to Unacknowledged unless there are also voice calls being made, the reason being that the only method of acknowledgment in this case will be to log in to the unit via the IMS Consoleview software. Voice Contacts that are enabled for both Inform Only and Unacknowledged will *always* receive the alarm message, but in addition will have the opportunity to acknowledge alarms by entering their Usercode via touch-tones (if the alarm hasn't already been acknowledged).

As long as an alarm remains unacknowledged AND it has Unacknowledged Contacts to be called, the IMS-4000 will continue to call these contacts until an acknowledgment is received OR the maximum dial attempts is reached. Alarms are acknowledged during a voice call by entering the User Code when prompted.

Sample Alarm Messages

Sample E-mail alarm message

```
Subject:          IMS-4000 Alarm
   Date: Thu, 28 Mar 2002 10:59:47  -0500
   From: ims4000@abcwidgets.com

FROM:    ABC Widgets Inc.
         IMS-4000 Host
         Boston, MA
```

```
ALARM MESSAGE:
High temperature ALARM at ABC Widgets Inc.
CH1: Server room temperature is now 90.3 Deg F
Level crossed limit of 85.0 Deg F
on Thursday 28 March 2002, 10:24:32 AM EST
```

Sample Fax message

```
***************** IMS-4000 ALARM REPORT  *****************
TO:      John Smith
         CIO
         ABC Widgets Inc.
         Information Technology
FAX NUMBER: 7779992233
FROM: ABC Widgets Inc.
      IMS-4000 Host
      Boston, MA
PHONE NUMBER:  7779992000
ALARM MESSAGE:
High temperature ALARM at ABC Widgets Inc.
CH1: Server room temperature is now 90.3 Deg F
Level crossed limit of 85.0 Deg F
on Thursday 28 March 2002, 10:24:32 AM EST
```

Sample Alphanumeric Pager Message

```
*IMS4000 ALARM* High temperature ALARM at ABC Widgets
Inc. CH 1: Server room temperature is now 90.3 Deg F
on Thursday 28 March 2002, 10:24:32 AM EST
```

Voice Status Report and Touch-Tone Commands

The IMS-4000 is capable of delivering a spoken status report when called via telephone. The status report can provide information on both environmental conditions and IP alarms. In addition, you can ping devices over the telephone and switch PowerGate outlets.

User Specific Reports

The status report is customized based on your *User Code*. Only callers with a valid *User Code* can hear a Status Report. Alternatively, the unit is also capable of matching the calling number to one of the *Contact Numbers*, using Caller-ID (if available). When the unit receives Caller-ID information it searches all of the *Contact Numbers* to try to find a match to a particular user. If a match is found the unit customizes the report based on the *User Profile*.

The unit creates a custom report based on the *Classes* that the User has selected. Only inputs for which there is a Class match between the user *Class List* and the input *Alarm Class* will be reported. For example, if a user had selected temperature and humidity in their *User Class List*, then only inputs with *Alarm Class* temperature and humidity will be reported.

Sample Status Report

To receive a status report, call the unit. When it answers wait for the beep. Immediately after hearing the beep, press any touch-tone. The unit will begin speaking and request your *User Code*. If the unit receives a valid User Code it will continue with several menu options. A sample of the main menu is shown below:

"Hello, this is the IMS-4000 at the *IT Dept of XYZ Company*

"Enter your user code:"

To hear the environmental status, press **1**.

To hear the IP status, press **2**.

To ping an IP device press **3**.

To check the status of a PowerGate outlet, press **4**.

To switch an outlet on a PowerGate, press **5**.

To turn on the microphone, press **6**.

To disconnect, press **7**.

To repeat this menu, press **8**.

If the caller had selected option 1 they would get a sub-menu asking if they would like to hear an environmental alarm summary report or a full environmental status report. The alarm summary only reports on inputs that are currently beyond their limits, or are in an alarm condition and have a *class* match. The full report provides status on **all** inputs that have a *class* match. A sample of a full environmental status report is listed below. Items in italics are custom messages recorded by the user.

Environmental sensors at the *IT Dept of XYZ Company*

Channel 1, *temperature in the server room*, is 76.4 degrees Fahrenheit, OK

Channel 2, *temperature in rack B*, is 82.7 degrees Fahrenheit, too high

Channel 3, *humidity in the server room*, is 33.9%, OK

Channel 6, *water under server room floor*, OK

Channel 7, *smoke alarm in the server room*, OK

Channel 9, battery, is 100.0%, OK

Channel 10, power, is 116.3 volts, OK

Channel 11, Sound level, OK

Note: The Voice menus are intelligent, such that they will only recite menu options if there is relevant content. For example, if there are no IP Alarms programmed then the IP Alarm menu option will be skipped, or if there is no PowerGate connected, then this menu option will be skipped; or if the User has no Environmental sensors in his class, then these will be skipped.

Voice Alarm Dialout

The IMS-4000 can call and deliver an alarm message in spoken English. After dialing, the unit will begin speaking "IMS-4000 Alarm Message, Press any key to continue." If the unit receives a touch-tone, it will recite the alarm message. When it finishes speaking the message it will request acknowledgement (if the call type is *Until Acknowledged*; if the call type is *Inform*, the unit will just speak the alarm message and disconnect). A sample Voice Alarm call is shown below:

"IMS-4000 Alarm Message, press any key to continue"
"IMS-4000 Alarm Message, press any key to continue" {call is answered and a 5 is pressed}
"IMS-4000 Alarm Message. The temperature is High *at the IT Dept of XYZ Company*."
"Channel 1, *temperature in the server room*, is 81.5 Degrees Fahrenheit"
"Level exceeded limit of 80 Degrees Fahrenheit at 7:45PM."
"Enter User Code:" {valid User Code is received}
"Alarm Acknowledged. Goodbye."

Performing an IP Ping via Telephone

The IMS-4000 allows you to perform an IP Ping during a voice call-in to the Host. After dialing the unit, press a touch-tone after the beep. The unit will request your *User Code*. Next, listen to the menu choices. Option 3 will allow you to enter an IP address in numeric dot-quad format. Use the ***** key for a dot. A sample IP Ping is shown below:

"Hello this is the IMS-4000 at *the IT Dept of XYZ Company*."
"Enter your User Code:" {valid User Code is received}
"To hear the environmental status, press **1**."
"To hear the IP status, press **2**."
"To ping an IP device press **3**." {3 is received}
"Enter IP address, Use the star key for dot. Press pound (#) when finished."
{user enters 10.1.4.17}
"Pinging now..."
"10.1.4.17 is not responding"

Call-in Alarm Acknowledgment

If you receive an alarm message on your pager or in your voice mail, you can still acknowledge the alarm by calling the unit back and entering your User Code. Note that the Intercall Delay must be set to at least *1* minute in order for the unit to answer a call.

When you call in to the unit, wait for the beep and then press a button on your touch-tone telephone. If there are unacknowledged alarms in the User's class, the unit will say "Unacknowledged alarms exist. To hear the alarms, press 9." If you press 9, the IMS will announce all unacknowledged alarms that are in the User's class. When the unit finishes announcing all of the alarms, it will say "Enter your user code." If the user code is entered correctly the unit will say "Alarm acknowledged" and it will acknowledge all of the alarms announced, and stop dialing all contacts programmed as "Until Acknowledged" type.

Remote Login via Dialup

You can remotely connect to the IMS-4000 via modem using Windows Dial-up Networking. This is a standard utility included with the Windows operating system. Follow the instructions below according to your installed operating system to set up Dial-up Networking.

Windows 95 and 98

To configure Dial-up Networking, double-click on *My Computer* from the desktop or click the *Start* button and select *Programs>Accessories>Communications>Dialup Networking*. Click on *Make New Connection*. Follow the prompts to configure this connection. You will need to enter a name

("IMS-4000," for example), choose your modem, and enter the telephone number of your IMS-4000. When you're finished, an icon should appear with the name you provided. Double-click on this icon. Enter a *Username* and *Password* which matches a Profile Username and Password in your IMS-4000. Click *Connect* to have your modem dial up your IMS-4000.

Note: If Dialup Networking is not listed it may not be installed on your computer, in which case you will need to use your Windows installation CD to add it.

Windows 2000

To configure Dial-up Networking, double-click on *My Computer* from the desktop or click the *Start* button and select *Settings>Control Panel*. Double-click on the icon called *Network and Dialup Connections*. Double-click on *Make New Connection*. Follow the prompts to create a new connection. For the Network Connection Type choose *Dial-up to Private Network*. Enter the telephone number of your IMS unit and assign a name to the connection ("IMS-4000," for example). When prompted to enter your *Username* and *Password* be sure to enter information which matches a Profile Username and Password in your IMS-4000.

Note: If Dialup Networking is not listed it may not be installed on your computer, in which case you will need to use your Windows installation CD to add it.

Windows XP

To configure Dial-up Networking, double-click on *My Computer*, then select *My Network Places*, then View Network Connections. Select *Create a New Connection* or click on the *Start* button, then *Programs>Accessories>Communications>New Connection Wizard*. Follow the prompts to create a new connection. On the Network Connection Type screen, select *Connect to the Network at my Workplace*. For the network connection choose *Dial-up*. Enter a name for the connection ("IMS-4000," for example) and the IMS-4000 telephone number when prompted. Finish the setup. When prompted to enter your *Username* and *Password* be sure to enter information which matches a Profile Username and Password in your IMS-4000.

Communicating with your IMS-4000

Double-click on the Dial-up Networking icon you just created above. This should make your computer dial your IMS-4000 and connect. Once a connection is established, run the IMS-4000 ConsoleView Software by double-clicking on the IMS-4000 icon on your desktop. At this point you should be communicating with your IMS-4000. To disconnect, close the IMS-4000 Software and then disconnect the Dial-up Networking connect

Chapter 4: SNMP (Simple Network Management Protocol)

The IMS-4000 Host contains an SNMP agent that supports all three current versions of SNMP (v1, V2c, and V3), over both UDP and TCP transports. Read and write access to most of the IMS-4000 parameters is provided along with the ability to send traps when alarms occur. A complete SNMPv1 MIB is provided on the IMS-4000 CD.

The SNMP agent can be enabled or disabled from the local configuration options while directly connected to the IMS-4000 via RS-232. The SNMP community strings are also configured through the local configuration. See Chapter 1 for details.

Through the SNMP protocol, most of the programming parameters and status information can be accessed. The following is a summary of the IMS-4000 items that can be fully accessed through SNMP:

- Edit Environmental input programming
- Edit IP Alarm programming
- Edit System programming (unit info, e-mail setup, Web FTP setup, phone settings)
- Enable/Disable Datalogging
- Edit the Datalog interval
- Edit/add Classes
- Edit Environmental input template programming
- Edit Camera setup
- Edit PowerGate programming and switch outlets
- Acknowledge alarms
- View Network and Security configuration parameters
- View system diagnostic information

Some parameters of the IMS-4000 involve complex data structures and cannot be accessed through the SNMP protocol. The following operations ***cannot*** be performed through SNMP:

- Add or delete IP alarms
- Add or delete Profiles or Contacts
- Delete a sensor
- Delete a Node
- Delete a PowerGate device
- Configure the system clock
- Modify time schedules
- Edit alarm response programming sequences
- Modify classes on Environmental Inputs, IP Alarms, or Profiles

The various values that can be retrieved from an MIB are called *MIB variables*. Each MIB variable is named by an Object Identifier (OID), which usually has a name in the form of numbers separated by periods (“.”), like this: .1.3.6.1.x.x.xxxx.x.x.x.x... OIDs for all MIB variables can be determined by browsing the MIB.

Below are some examples of the more common OIDs in the IMS-4000:

Name: .iso.org.dod.internet.private.enterprises.sensaphone

Sensaphone OID: .1.3.6.1.4.1.8338

Host Environmental Input Values: .1.3.6.1.4.1.8338.1.1.1.1.8.1.1.7.(input number)

Example: host environmental input #3: .1.3.6.1.4.1.8338.1.1.1.1.8.1.1.7.3

Node Environmental Input Values: .1.3.6.1.4.1.8338.1.1.1.(N+1).8.1.1.7.(input number)
{where N is the node number.}

Example: node 5, environmental input #6: .1.3.6.1.4.1.8338.1.1.1.6.8.1.1.7.6

Chapter 5: PowerGate

Physical Description

The IMS-4000 PowerGate is housed in a 17"w x 1.75"h x 10"d enclosure, which is 1 EIA rack-mount space high.

Front Panel Layout

The front panel contains a 15 Amp breaker, Output LEDs, the serial port and power indicator. See figure below:

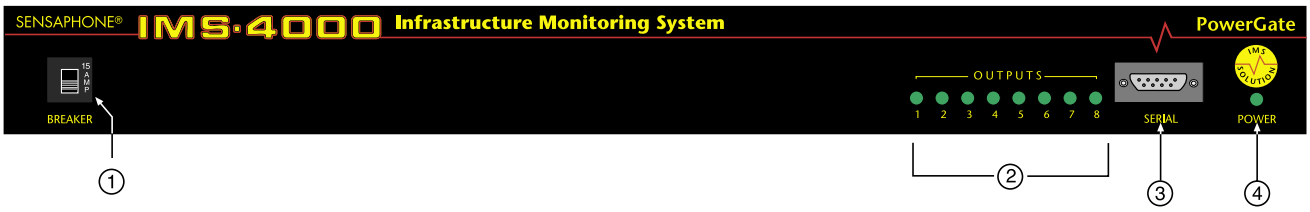


Figure 1: Front Panel Layout of the IMS-4000 PowerGate

1. 15 Amp Breaker
2. Output LEDs
3. RS-232 Serial port
4. Power Indicator LED

Rear Panel

The rear of the PowerGate contains the eight power outlets and the AC power cord.

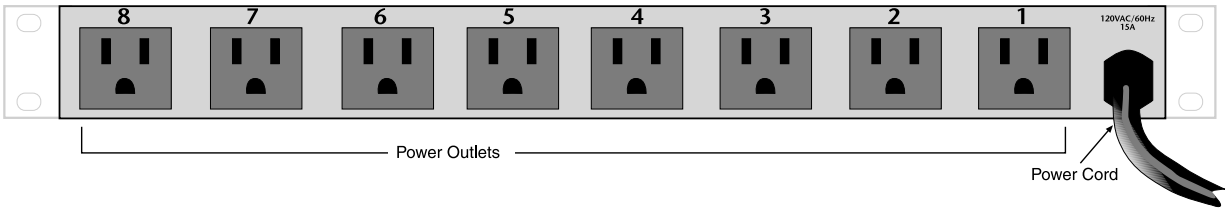


Figure 2: Rear Panel of the IMS PowerGate

LEDs

The power LED will come on whenever the PowerGate is plugged into a live 120VAC outlet.

The eight output LEDs indicate if the corresponding outputs on the rear are on or off. The eight outputs can supply up to 15 Amps total current (all outlets combined).

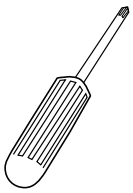
Installation

This section provides information on:

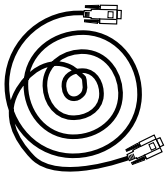
- Operating environment
- Rack, wall, and tabletop installation
- Connecting sensors

Parts Required

Phillips Screwdriver



9 pin F/F null modem cable



Operating Environment

Before you install the IMS-4301 PowerGate be sure that your operating environment meets the physical requirements of the equipment.

Operating Temperature:	32º–122º Fahrenheit (0º–50º C)
Humidity:	5–90 %RH, non-condensing
Power:	120VAC 60 Hz outlet within 6'
Rack Requirements:	Standard 19' equipment rack with supplied mounting bracket hardware. Requires 1.0 EIA rack mount space.
Tabletop requirements:	Flat area which can support an enclosure 17" wide by 10" deep by 2" high.

Rack Mount Installation

The IMS-4301 PowerGate can be rack mounted using the included rack mount brackets. Follow the steps below:

1) Attach the rack-mount brackets to the PowerGate with a Phillips screwdriver.

2) Attach the unit to the equipment rack using two pan-head screws per side. Tighten the screws with a Phillips screwdriver.

3) Plug the power cord into a 120VAC outlet.



Figure 3: Rack-mounted PowerGate Unit

Wall Mount Installation

The IMS-4301 PowerGate can be wall mounted using the optional wall mount brackets. Follow the steps below:

1) Attach the optional wall mount brackets to the sides of the IMS-4301 using the eight black #6-32 screws. A Phillips screwdriver will be required. (Order part # IMS-4501 Universal Wall Mount Kit)
2) Attach the unit to the wall using two screws per side. Tighten the screws with a Phillips screwdriver.
3) Plug the power cord into a 120VAC outlet.

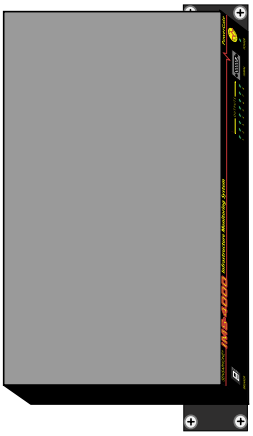


Figure 4: Wall-mounted PowerGate Unit

Tabletop Installation

The IMS-4301 PowerGate can be installed on a tabletop or shelf. Follow the steps below:

1) Attach the four self-adhesive rubber feet to the four corners on the bottom of the IMS-4301.
2) Place the unit on a tabletop or shelf and connect the power cord into a 120VAC outlet.

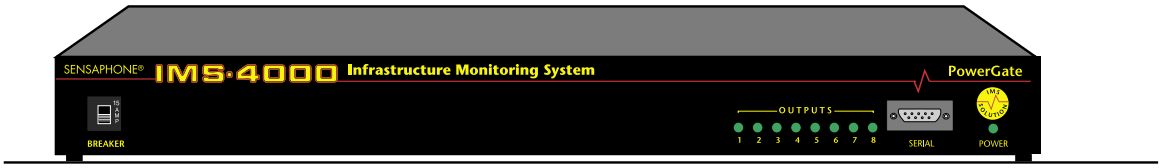


Figure 5: Tabletop-mounted PowerGate Unit

Connection to IMS-4000 Host or Node

The PowerGate connects to an IMS-4000 Host or Node using the 9-pin null modem cable (included). Connect the cable to the RS-232 port on the PowerGate and connect the other end to the RS-232 port on the Host or Node. The PowerGate will automatically be recognized by the system and appear in the IMS-4000 ConsoleView software.

Operation

Plugging In Equipment

Attach the power cord from each device to be switched into one of the outlets on the back of the PowerGate. Be sure to support heavy cables with tie wraps or some other method to prevent the unit from bending down (See the figure below). Too much weight in the rear may cause permanent damage to the enclosure.

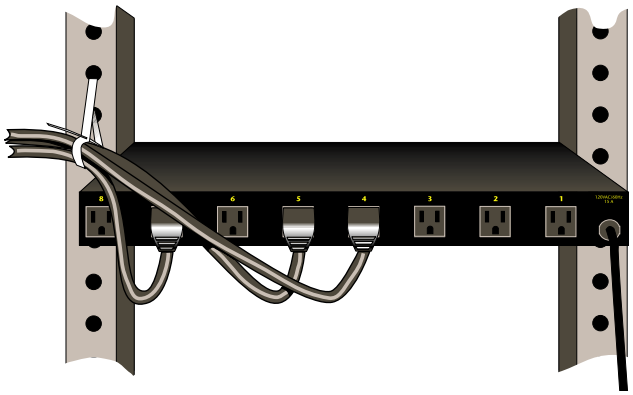


Figure 6: Cable Support

Each outlet provides 115VAC 60Hz. To ensure that the maximum power will be available, be sure to plug the PowerGate itself into a circuit which can supply at least 15 Amps. The total of all devices connected to the PowerGate cannot exceed 15Amps.

PowerGate Setup via the IMS ConsoleView Software

The PowerGate will automatically be recognized by the IMS Host or Node. Within the IMS tree structure an entry called *PowerGate* will appear within the submenu of the Host and/or Node. To expand the Host or Node submenus you must click the box with the plus sign next to the appropriate Host or Node. The figure below shows the menu location of a PowerGate connected to a Host.

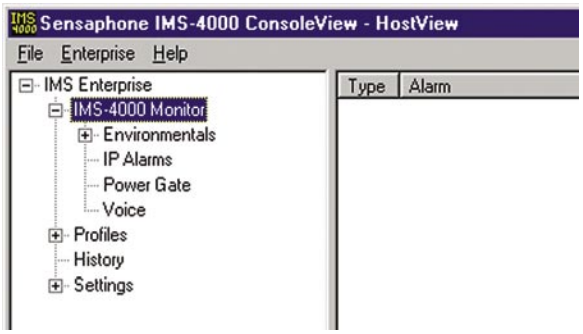


Figure 7: PowerGate in Hierarchy

To assign labels to the PowerGate, right-click on *PowerGate*. The following screen will appear:

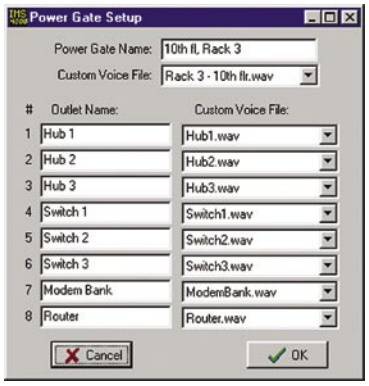


Figure 8:PowerGate Setup

Assign a name to the PowerGate that describes its location. Also, assign labels to each outlet which describes the device plugged into that outlet. This information will be critical when it comes time to reboot a device. You can also assign voice messages to the PowerGate and each outlet. The voice messages will allow you to control equipment via telephone using touch-tones. Use the Voice Message programming screen to record your messages.

Switching Outlets using the IMS ConsoleView Software

To switch an outlet from the IMS ConsoleView Software, left-click on the word *PowerGate* within the menu tree. The screen below will appear. Click on the "name" or number of the outlet(s) you wish to switch. In the figure, outlet 5 is selected. Multiple outlets can be switched at the same time by holding down either the Shift key (to select a continuous block) or the Control Key (to select a discontinuous assortment of outlets). After making your selections, click the *On*, *Off* or *Cycle* button to execute the command. When *Cycle* is selected, the outlet will be switched Off for 10 seconds and then will automatically switch back On. When you select *Off* or *Cycle*, an additional prompt appears to confirm that you really want to remove power from the selected device. Note that the PowerGate will switch each outlet after a short delay, but the PowerGate2 will switch all selected outlets simultaneously.

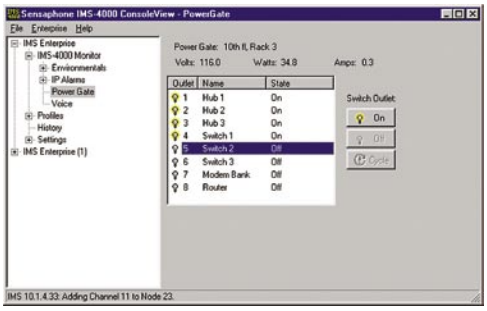


Figure 9: Switching Outlets

Automatic Outlet Switching

The IMS-4000 allows you to program an *Alarm Response* whenever an environmental or IP Alarm occurs. An *Alarm Response* is an action that occurs automatically whenever an alarm occurs. Using the PowerGate you can automatically turn On, Off, or Cycle equipment whenever an Environmental or IP alarm occurs. See *Configuring Environmental Inputs and Configuring IP Alarms* in the IMS-4000 Software Configuration Manual for details.

Switching Outlets via Telephone

The IMS-4000 allows you to switch PowerGate outlets using a touch-tone telephone. To do this simply call the unit and enter the voice menu system. You must have a valid user code and the appropriate permissions to execute this command.

Switching Outlets via Email

See the *Two-Way E-Mail Commands* section in the Software Configuration manual.

IMS PowerGate Specifications

Operating Specifications

Temperature	32–122° F
Humidity	5–90% RH non-condensing
Power Supply	120VAC 60Hz
Current Consumption	100mA + output load
Over-Current Protection	15A Breaker
Dimensions	1.8"h x 10.0"d x 17.3"w

Chapter 6: PowerGate2

Physical Description

The IMS-4000 PowerGate2 is housed in a 17.5"w x 1.75"h x 12.3"d enclosure, which is 1 EIA rack-mount space high.

Front Panel Layout

The front panel contains eight power inputs corresponding to the eight outlets on the rear, eight 15 Amp breakers, power LEDs, a serial port and one power indicator LED. See figure below:



Figure 1: Front Panel Layout of the IMS-4000 PowerGate2

1. Power Inputs
2. 15 Amp Breakers
3. RS-232 Serial port
4. Power Indicator LED

Rear Panel

The rear of the PowerGate2 contains the eight power outlets and the AC power cord.

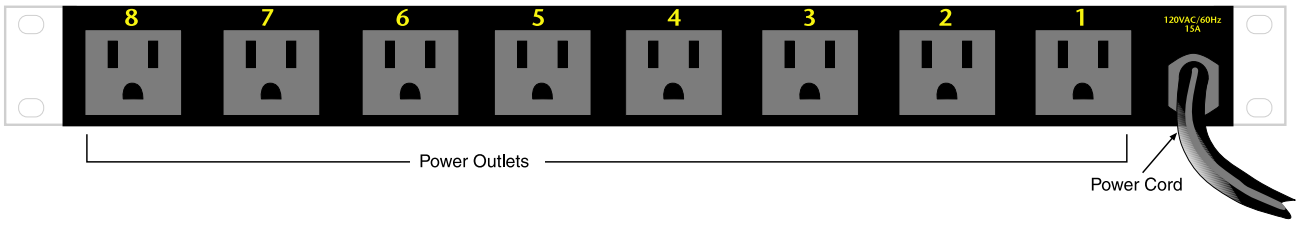


Figure 2: Rear Panel of the IMS PowerGate2

LEDs

The power LED will come on whenever the PowerGate2 is plugged into a live 120VAC outlet.

The eight output LEDs on the front panel indicate if the corresponding outlets on the rear are on or off. Note that the LEDs *will only turn on if power is present at the outlet*, which means that if no power is connected to the input, the LED will not turn on.

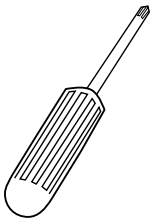
Installation

This section provides information on:

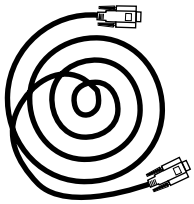
- Operating environment
- Rack, wall, and tabletop installation

Parts Required

Phillips Screwdriver



9 pin F/F null modem cable



Right-angle input power cable (1 included)*



*For additional right-angle power input cables, order part # IMS-4413.

Operating Environment

Before you install the IMS-4302 PowerGate2 be sure that your operating environment meets the physical requirements of the equipment.

Operating Temperature:	32º–122º Fahrenheit (0º–50º C)
Humidity:	5–90 %RH, non-condensing
Power:	120VAC 60 Hz outlet within 6' Multiple 15A 120VAC outlets for powering equipment
Rack Requirements:	Standard 19' equipment rack with supplied mounting bracket hardware. Requires 1.0 EIA rack mount space.
Tabletop requirements:	Flat area which can support an enclosure 17" wide by 10" deep by 2" high.

Rack Mount Installation

The IMS-4302 PowerGate2 can be rack mounted using the included rack mount brackets. Follow the steps below:

1) Attach the rack-mount brackets to the PowerGate2 with a Phillips screwdriver.

2) Attach the unit to the equipment rack using two pan-head screws per side. Tighten the screws with a Phillips screwdriver.

3) Plug the power cord into a 120VAC outlet.

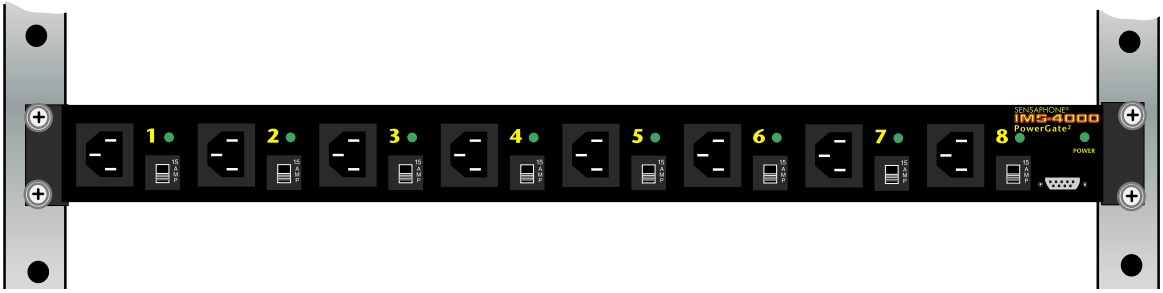


Figure 3: Rack-mounted PowerGate2 Unit

Wall Mount Installation

The IMS-4302 PowerGate2 can be wall mounted using the optional wall mount brackets. Follow the steps below:

1) Attach the optional wall mount brackets to the sides of the IMS-4302 using the eight black #6-32 screws. A Phillips screwdriver will be required. (Order part # IMS-4501 Universal Wall Mount Kit)

2) Attach the unit to the wall using two screws per side. Tighten the screws with a Phillips screwdriver.

3) Plug the power cord into a 120VAC outlet.

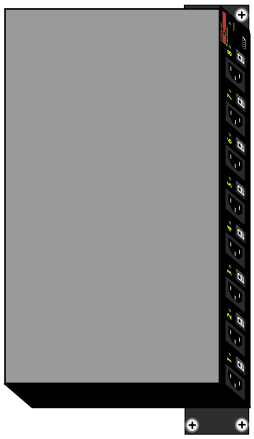


Figure 4: Wall-mounted PowerGate2 Unit

Tabletop Installation

The IMS-4302 PowerGate2 can be installed on a tabletop or shelf. Follow the steps below:

1) Attach the four self-adhesive rubber feet to the four corners on the bottom of the IMS-4302.

2) Place the unit on a tabletop or shelf and connect the power cord into a 120VAC outlet.

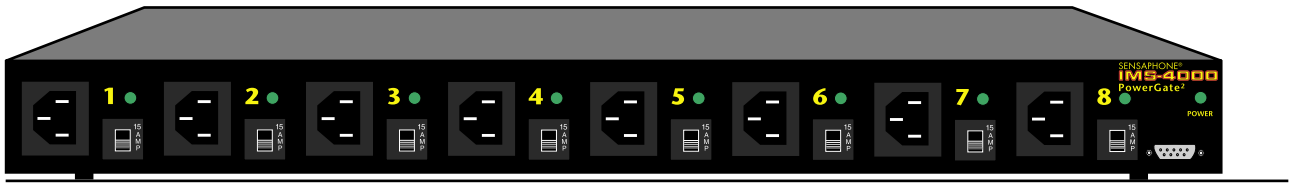


Figure 5: Tabletop-mounted PowerGate2 Unit

Connection to IMS-4000 Host or Node

The PowerGate2 connects to an IMS-4000 Host or Node using the 9-pin null modem cable (included). Connect the cable to the RS-232 port on the PowerGate2 and connect the other end to the RS-232 port on the Host or Node. The PowerGate2 will automatically be recognized by the system and appear in the IMS-4000 ConsoleView software.

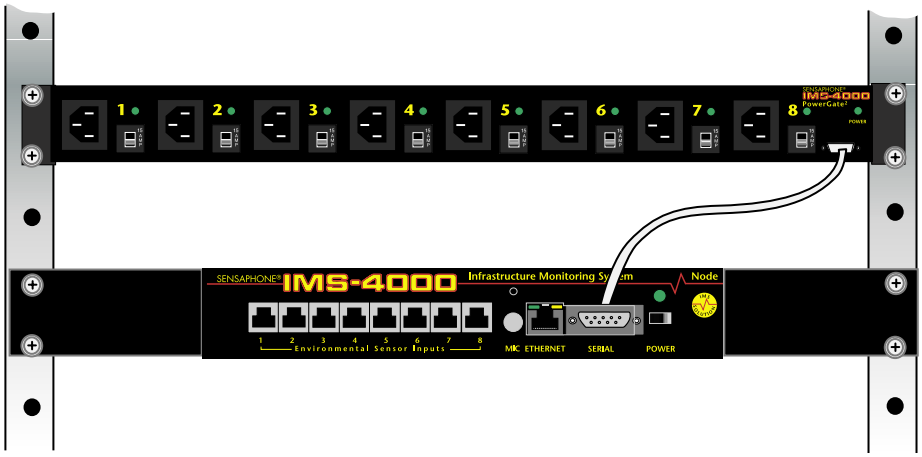


Figure 6: PowerGate2 to Node connection

Operation

The PowerGate2 switches power from each power input on the front of the unit to the corresponding outlet on the back (e.g., power input 1 goes to outlet 1). Each PowerGate2 circuit can switch up to 15A of current. Be sure the power source can supply the current required for your equipment. Do not connect several power inputs to one 15A circuit and then try to turn on several high-current devices, as this will surely trip a breaker in your electric service panel.

Connect Input Power

Attach a power cable to a power input on the front of the PowerGate2 and plug the other end into a 120VAC 15A outlet or into an outlet on your PDU. One right-angle power cable is included. (Additional cables are available by ordering part # IMS-4413.) Continue adding as many power cables as your application requires.

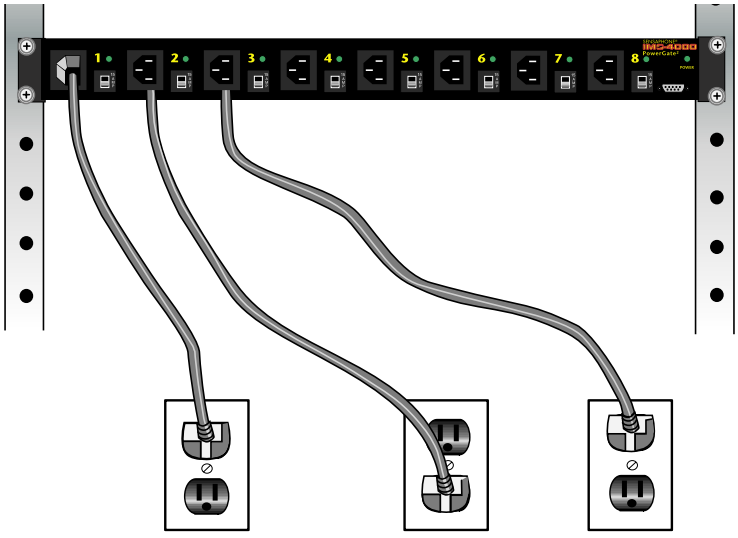


Figure 7: PowerGate2 Power Inputs 1-3 plugged in

Plugging In Equipment

Attach the power cord from each device to be switched into one of the outlets on the back of the PowerGate2. Be sure to support heavy cables with tie wraps or some other method to prevent the

unit from bending down (See the figure below). Too much weight in the rear may cause permanent damage to the enclosure.

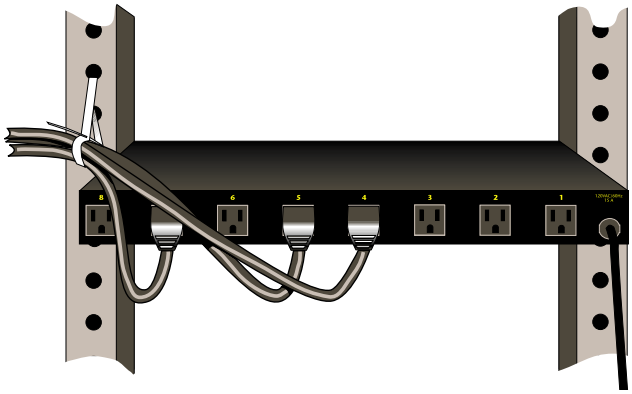


Figure 8: Cable Support

Each outlet will pass the connected power through from the corresponding power input. Note that the PowerGate2 is designed for 120VAC circuits only. Each outlet is limited to 15 Amps max via breakers mounted on the front panel.

Latched Power to Outlets

The PowerGate2 design features latching power circuits. Each outlet remains latched ON as long as power is applied to the corresponding input. This holds true even if main power to the unit is removed. This allows you to pass power from a UPS through the PowerGate2 to your equipment, without worrying about the PowerGate2 losing power.

PowerGate2 Setup via the IMS ConsoleView Software

The PowerGate2 will automatically be recognized by the IMS Host or Node. Within the IMS tree structure an entry called *PowerGate2* will appear within the submenu of the Host and/or Node. To expand the Host or Node submenus you must click the box with the plus sign next to the appropriate Host or Node. The figure below shows the menu location of a PowerGate2 connected to a Host.

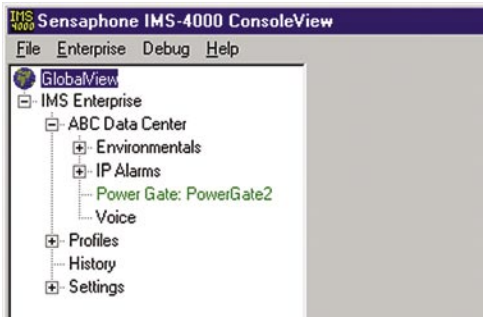


Figure 9: PowerGate2 in Hierarchy

To assign labels to the PowerGate2, right-click on *PowerGate2*. The following screen will appear:

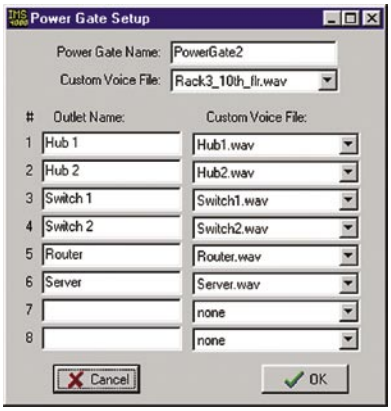


Figure 10: PowerGate2 Setup

Assign a name to the PowerGate2 that describes its location. Also, assign labels to each outlet which describes the device plugged into that outlet. This information will be critical when it comes time to reboot a device. You can also assign voice messages to the PowerGate2 and each outlet. The voice messages will allow you to control equipment via telephone using touch-tones. Use the Voice Message programming screen to record your messages.

Switching Outlets using the IMS ConsoleView Software

To switch an outlet from the IMS ConsoleView Software, left-click on the word *PowerGate2* within the menu tree. The screen below will appear. Click on the "name" or number of the outlet you wish to switch. In the figure, outlet 5 is selected. Multiple outlets can be switched at the same time by holding down either the Shift key (select a continuous block) or the Control Key (to select a discontinuous assortment of outlets). After making your selections, click the *On*, *Off* or *Cycle* button to execute the command. When *Cycle* is selected, the outlet will be switched Off for 10 seconds and then will automatically switch back On. When you select *Off* or *Cycle*, an additional prompt appears to confirm that you really want to remove power from the selected device. Note that the PowerGate2 will switch all selected outlets simultaneously.

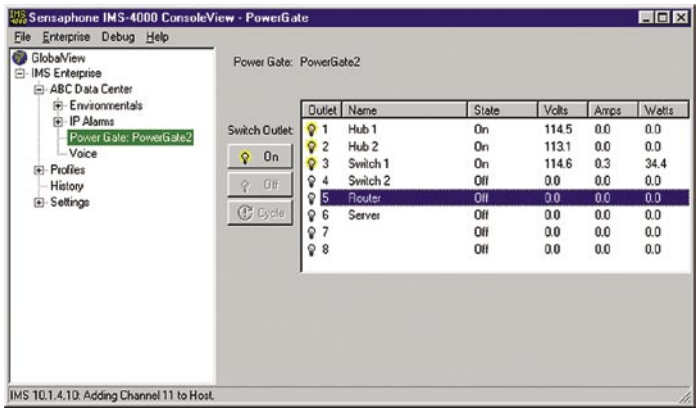


Figure 11: Switching Outlets

Automatic Outlet Switching

The IMS-4000 allows you to program an *Alarm Response* whenever an environmental or IP Alarm occurs. An *Alarm Response* is an action that occurs automatically whenever an alarm occurs. Using the PowerGate2 you can automatically turn On, Off, or Cycle equipment whenever an

Environmental or IP alarm occurs. Up to eight actions can be applied for each alarm response. The PowerGate2 will perform all automated switching simultaneously. See *Configuring Environmental Inputs and Configuring IP Alarms* in the IMS-4000 Software Configuration Manual for details.

Switching Outlets via Telephone

The IMS-4000 allows you to switch PowerGate2 outlets using a touch-tone telephone. To do this simply call the unit and enter the voice menu system. You must have a valid user code and the appropriate permissions to execute this command.

Switching Outlets via Email

See the *Two-Way E-Mail Commands* section in the Software Configuration chapter.

IMS PowerGate2 Specifications

Operating Specifications

Main Power Supply	120VAC 50/60Hz, 1 Amp
Main Power Cord	9' Cable with NEMA 5-15P plug
Channel Input Power	120VAC 50/60Hz, 15 Amp max.
Channel Input Connectors	(8) IEC60320 Type C14
Channel Circuit Breakers	(8) 15Amp
Channel Output Power	120VAC 60Hz, 15 Amp max.
Channel Output Connectors	(8) NEMA 5-15R receptacle
Number of Channels	8
Serial Control (RS232-DTE)	Connects to IMS Host or Node via null modem cable
Chassis Dimensions	(1U) 1.75"w x 17.5"h x 12.3"d
Indicator Lights	1 Power LED and eight (8) Outlet Status LEDs
Operating Temperature	32-122° F (0-50° C)
Operating Humidity	5-90% RH non-condensing

Chapter 7: IMS-4000 Sensors

IMS-4810 Room Temperature Sensor

Installation Instructions



Introduction

The IMS-4810 temperature sensor is designed to connect to the IMS-4000 Host or Node and monitor indoor temperatures. The electrical connection between the sensor and IMS-4000 is made via RJ-45 patch cable (not included). The sensor may be mounted either on a wall or to a single-gang electrical box.

Package Contents

(1) IMS-4810 Temperature sensor
(2) Plastic drywall anchors
(2) #6 Metal tapping screws
(1) 1/16" hex key

Cabling

The temperature sensor connects to the IMS-4000 Host or Node via an RJ-45 cable (e.g. CAT5 cable). The connection from the sensor to the Host or Node can utilize your existing network wiring infrastructure. For example, the sensor may be installed in another room or another floor. Connect the sensor to your structured wiring network via an RJ-45 jack. At the other end, connect a patch cable from your structured wiring patch panel directly to the Host or Node environment input.

Caution: The IMS sensors are not TCP/IP devices and therefore should not be connected directly to any wiring infrastructure that is connected to network equipment such as a hub, router, or switch. Sensors use RJ-45 plugs and cables similar to those used with Ethernet devices.

Mounting

The temperature sensor can be mounted directly on a surface or attached to a single-gang electrical box. Consideration should be given to cable routing before attaching the sensor to the wall. Will the cable go through the wall (cable hidden) or will it run down the wall (cable visible)? Once this has been determined, run the cable to the location where the sensor will be installed.

Electrical box installation

Bring the RJ-45 cable through the electrical box. Remove the sensor cover by turning the two hex screws on the bottom of the sensor housing clockwise. Bring the cable through the back of the sensor and connect the cable to the jack as shown in Figure 1. Attach the sensor to the electrical box

using the appropriate screws. Secure the sensor cover by turning the two hex screws on the bottom of the cover counterclockwise.

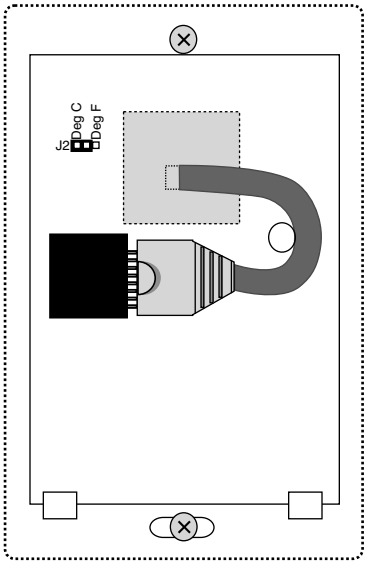


Figure 1: 4810 with Cable exiting through back of enclosure

Hidden cable surface installation

Bring the RJ-45 cable through the wall at the mounting location. Remove the sensor cover by turning the two hex screws on the bottom of the sensor housing clockwise. Bring the cable through the back of the sensor and hold the sensor housing against the wall. Use a pencil to mark the hole locations at the top and bottom of the housing. Remove the sensor from the wall. Install the drywall anchors (if necessary) to the wall. Bring the cable through the back of the sensor and connect it to the jack as shown in Figure 1. Attach the sensor to the wall using #6 tapping screws. Secure the sensor cover by turning the two hex screws on the bottom of the cover counterclockwise.

Visible cable surface installation

Remove the sensor cover by turning the two hex screws on the bottom of the sensor housing clockwise. Hold the sensor housing against the wall. Use a pencil to mark the hole locations at the top and bottom of the housing. Install the drywall anchors (if necessary) to the wall. Attach the sensor to the wall using #6 tapping screws. Connect the cable to the jack as shown in Figure 2. Secure the sensor cover by turning the two hex screws on the bottom of the cover counterclockwise.

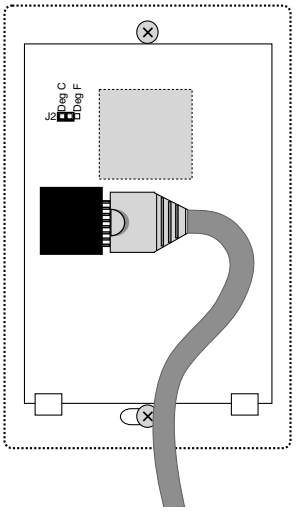


Figure 2: 4810 with Cable exiting out enclosure bottom

Configuration

All IMS Solution sensors are auto-configured when you plug them into the Host or Node. When a new sensor is plugged into the Host or Node, the configuration is set to the factory default via the *Sensor Template.* If you have modified these templates, the configuration will be set to the modified configuration. When a sensor is removed, or the connection is disrupted, the configuration data remains intact but the sensor will go into trouble status and generate a trouble alarm. When the sensor is plugged in again, or the connection is re-established, configuration data remains unchanged and the sensor returns to normal operating condition.

Caution: Removing a sensor for less than 60 seconds does not produce a trouble alarm. Removing or unplugging a sensor for more than 60 seconds or plugging in a different sensor at any time will cause a trouble alarm.

Fahrenheit/Celsius Selection

The IMS-4810 can provide temperature readings in either degrees Fahrenheit or Celsius. To select one or the other, remove the sensor cover by turning the two hex screws on the bottom of the sensor housing clockwise. Locate the black jumper (see Figure 3) marked J2. Install the jumper in the "Deg F" position for Fahrenheit or the "Deg C" position for Celsius. Secure the sensor cover by turning the two hex screws on the bottom of the cover counterclockwise.

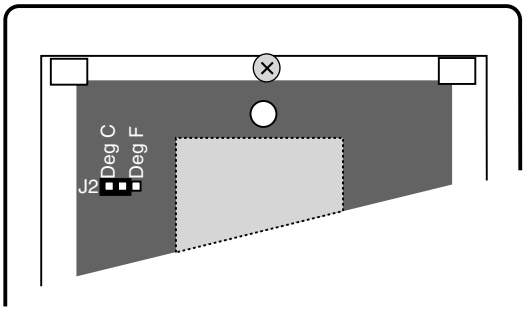


Figure 3: Jumper location (set for Degrees Celsius)

Sensor Template *(factory default)*

Input Name:	Temperature
Low Temperature Limit:	50º F
High Temperature Limit:	85º F
Recognition Time:	60 Seconds
Reset Time:	0 Seconds
Data Logging:	Active
Voice:	temperature.wav
Input Class:	Temperature

Specifications

Range:	5–122 degrees F (-15 to 50 degrees C)
Humidity:	5–90 %RH
Sensor type:	solid state ic
Accuracy:	+/- 3 degrees F
Connector:	RJ-45
Housing:	white plastic

IMS-4811 Room Temperature Sensor with display (Fahrenheit)

Installation Instructions



Introduction

The IMS-4811 temperature sensor is designed to connect to the IMS-4000 Host or Node and monitor indoor temperatures. The electrical connection between the sensor and IMS-4000 is made via RJ-45 patch cable (not included). The sensor may be mounted either on a wall or to a single-gang electrical box.

Package Contents

(1) IMS-4811 Temperature sensor
(2) Plastic drywall anchors
(2) #6 Metal tapping screws
(1) 1/16" hex key

Cabling

The temperature sensor connects to the IMS-4000 Host or Node via an RJ-45 cable (e.g. CAT5 cable). The connection from the sensor to the Host or Node can utilize your existing network wiring infrastructure. For example, the sensor may be installed in another room or another floor. Connect the sensor to your structured wiring network via an RJ-45 jack. At the other end, connect a patch cable from your structured wiring patch panel directly to the Host or Node environment input.

Caution: The IMS sensors are not TCP/IP devices and therefore should not be connected directly to any wiring infrastructure that is connected to network equipment such as a hub, router, or switch. Sensors use RJ-45 plugs and cables similar to those used with Ethernet devices.

Mounting

The temperature sensor can be mounted directly on a surface or attached to a single-gang electrical box. Consideration should be given to cable routing before attaching the sensor to the wall. Will the cable go through the wall (cable hidden) or will it run down the wall (cable visible)? Once this has been determined, run the cable to the location where the sensor will be installed.

Electrical box installation

Bring the RJ-45 cable through the electrical box. Remove the sensor cover by turning the two hex screws on the bottom of the sensor housing clockwise. Bring the cable through the back of the sensor and connect the cable to the jack as shown in Figure 1. Attach the sensor to the electrical box using the appropriate screws. Secure the sensor cover by turning the two hex screws on the bottom of the cover counterclockwise.

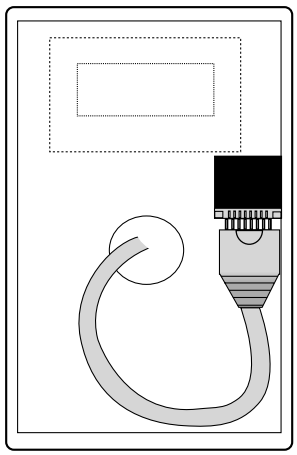


Figure 1: 4811 with Cable exiting through back of enclosure

Hidden cable surface installation

Bring the RJ-45 cable through the wall at the mounting location. Remove the sensor cover by turning the two hex screws on the bottom of the sensor housing clockwise. Bring the cable through the back of the sensor and hold the sensor housing against the wall. Use a pencil to mark the hole locations at the top and bottom of the housing. Remove the sensor from the wall. Install the drywall anchors (if necessary) to the wall. Bring the cable through the back of the sensor and connect it to the jack as shown in Figure 1. Attach the sensor to the wall using #6 tapping screws. Secure the sensor cover by turning the two hex screws on the bottom of the cover counterclockwise.

Visible cable surface installation

Remove the sensor cover by turning the two hex screws on the bottom of the sensor housing clockwise. Hold the sensor housing against the wall. Use a pencil to mark the hole locations at the top and bottom of the housing. Install the drywall anchors (if necessary) to the wall. Attach the sensor to the wall using #6 tapping screws. Connect the cable to the jack as shown in Figure 2. Secure the sensor cover by turning the two hex screws on the bottom of the cover counterclockwise.

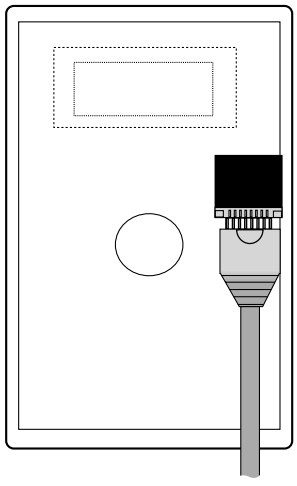


Figure 2: 4811 with Cable exiting out enclosure bottom

Configuration

All IMS Solution sensors are auto-configured when you plug them into the Host or Node. When a new sensor is plugged into the Host or Node, the configuration is set to the factory default via the *Sensor Template.* If you have modified these templates, the configuration will be set to the modified configuration. When a sensor is removed, or the connection is disrupted, the configuration data remains intact but the sensor will go into trouble status and generate a trouble alarm. When the sensor is plugged in again, or the connection is re-established, configuration data remains unchanged and the sensor returns to normal operating condition.

Caution: Removing a sensor for less than 60 seconds does not produce a trouble alarm. Removing or unplugging a sensor for more than 60 seconds or plugging in a different sensor at any time will cause a trouble alarm.

Sensor Template *(factory default)*

Input Name:	Temperature
Low Temperature Limit:	50º F
High Temperature Limit:	85º F
Recognition Time:	60 Seconds
Reset Time:	0 Seconds
Data Logging:	Active
Voice:	temperature.wav
Input Class:	Temperature

Specifications

Range:	32–95 degrees F
Humidity:	5–90 %RH
Sensor type:	solid state ic
Accuracy:	+/- 3 degrees F
Connector:	RJ-45
Housing:	white plastic

IMS-4812 Mini–Temperature Sensor (Fahrenheit)

Installation Instructions

Introduction



The IMS-4812 Mini Temperature Sensor is designed to connect to the IMS-4000 Host or Node and monitor temperatures in tight locations (for example, inside equipment racks). The electrical connection between the sensor and IMS-4000 is made via the attached RJ-45 patch cable. The sensor may be secured inside equipment using double-sided tape (included) or with tie-wraps.

Cabling

The Mini-Temperature Sensor comes with an attached 7' cable with an RJ-45 plug on the end. If the sensor is close to the IMS-4000 Host or Node, you can plug the sensor directly to an IMS environmental input. If the cable is too short you can use the included RJ-45 adaptor and a longer patch cable to extend the length. For applications where the sensor may be far from the IMS unit, you may utilize your existing network wiring infrastructure. For example, the sensor may be installed in another room or another floor. Connect the sensor to your structured wiring network via an RJ-45 jack. At the other end, connect a patch cable from your structured wiring patch panel directly to the Host or Node environment input.

Caution: The IMS sensors are not TCP/IP devices and therefore should not be connected directly to any wiring infrastructure that is connected to network equipment as a hub, router, or switch. Sensors use RJ-45 plugs and cables similar to those used with Ethernet devices.

Mounting

The temperature sensor may be mounted directly on a surface using double-sided tape (included) or it may be secured to equipment using tie-wraps. The choice depends on your application.

Configuration

All IMS Solution sensors are auto-configured when you plug them into the Host or Node. When a new sensor is plugged into the Host or Node, the configuration is set to the factory default via the *Sensor Template.* If you have modified these templates, the configuration will be set to the modified configuration. When a sensor is removed, or the connection is disrupted, the configuration data remains intact but the sensor will go into trouble status and generate a trouble alarm. When the sensor is plugged in again, or the connection is re-established, configuration data remains unchanged and the sensor returns to normal operating condition.

Caution: Removing a sensor for less than 60 seconds does not produce a trouble alarm. Removing or unplugging a sensor for more than 60 seconds or plugging in a different sensor at any time will cause a trouble alarm.

Sensor Template *(factory default)*

Input Name:	Temperature
Low Temperature Limit:	50º F
High Temperature Limit:	85º F
Recognition Time:	60 Seconds
Reset Time:	0 Seconds
Data Logging:	Active
Voice:	temperature.wav
Input Class:	Temperature

Specifications

Range:	5–140 degrees F
Humidity:	5–90% RH
Sensor type:	solid state ic
Accuracy:	+/- 3 degrees F
Connector:	7' cable w/RJ-45 plug
Housing:	black plastic
Housing dimensions:	2.13" l x 0.6" d x 1.38" h

IMS-4813 Room Temperature Sensor with display (Celsius)

Installation Instructions



Introduction

The IMS-4813 temperature sensor is designed to connect to the IMS-4000 Host or Node and monitor indoor temperatures. The electrical connection between the sensor and IMS-4000 is made via RJ-45 patch cable (not included). The sensor may be mounted either on a wall or to a single-gang electrical box.

Package Contents

(1) IMS-4813 Temperature sensor
(2) Plastic drywall anchors
(2) #6 Metal tapping screws
(1) 1/16" hex key

Cabling

The IMS-4813 temperature sensor connects to the IMS-4000 Host or Node via an RJ-45 cable (e.g. CAT5 cable). The connection from the sensor to the Host or Node can utilize your existing network wiring infrastructure. For example, the sensor may be installed in another room or another floor. Connect the sensor to your structured wiring network via an RJ-45 jack. At the other end, connect a patch cable from your structured wiring patch panel directly to the Host or Node environment input.

Caution: The IMS sensors are not TCP/IP devices and therefore should not be connected directly to any wiring infrastructure that is connected to network equipment such as a hub, router, or switch. Sensors use RJ-45 plugs and cables similar to those used with Ethernet devices.

Mounting

The temperature sensor can be mounted directly on a surface or attached to a single-gang electrical box. Consideration should be given to cable routing before attaching the sensor to the wall. Will the cable go through the wall (cable hidden) or will it run down the wall (cable visible)? Once this has been determined, run the cable to the location where the sensor will be installed.

Electrical box installation

Bring the RJ-45 cable through the electrical box. Remove the sensor cover by turning the two hex screws on the bottom of the sensor housing clockwise. Bring the cable through the back of the sensor and connect the cable to the jack as shown in Figure 1. Attach the sensor to the electrical box using the appropriate screws. Secure the sensor cover by turning the two hex screws on the bottom of the cover counterclockwise.

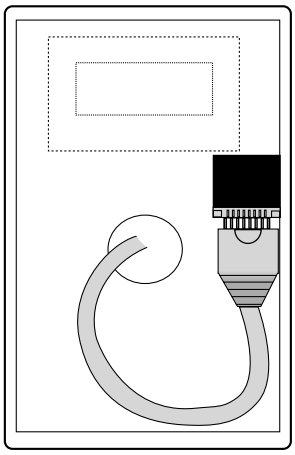


Figure 1: 4813 with Cable exiting through back of enclosure

Hidden cable surface installation

Bring the RJ-45 cable through the wall at the mounting location. Remove the sensor cover by turning the two hex screws on the bottom of the sensor housing clockwise. Bring the cable through the back of the sensor and hold the sensor housing against the wall. Use a pencil to mark the hole locations at the top and bottom of the housing. Remove the sensor from the wall. Install the drywall anchors (if necessary) to the wall. Bring the cable through the back of the sensor and connect it to the jack as shown in Figure 1. Attach the sensor to the wall using #6 tapping screws. Secure the sensor cover by turning the two hex screws on the bottom of the cover counterclockwise.

Visible cable surface installation

Remove the sensor cover by turning the two hex screws on the bottom of the sensor housing clockwise. Hold the sensor housing against the wall. Use a pencil to mark the hole locations at the top and bottom of the housing. Install the drywall anchors (if necessary) to the wall. Attach the sensor to the wall using #6 tapping screws. Connect the cable to the jack as shown in Figure 2. Secure the sensor cover by turning the two hex screws on the bottom of the cover counterclockwise.

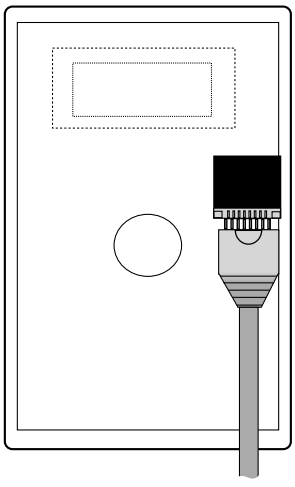


Figure 2: 4813 with Cable exiting out enclosure bottom

Configuration

All IMS Solution sensors are auto-configured when you plug them into the Host or Node. When a new sensor is plugged into the Host or Node, the configuration is set to the factory default via the *Sensor Template.* If you have modified these templates, the configuration will be set to the modified configuration. When a sensor is removed, or the connection is disrupted, the configuration data remains intact but the sensor will go into trouble status and generate a trouble alarm. When the sensor is plugged in again, or the connection is re-established, configuration data remains unchanged and the sensor returns to normal operating condition.

Caution: Removing a sensor for less than 60 seconds does not produce a trouble alarm. Removing or unplugging a sensor for more than 60 seconds or plugging in a different sensor at any time will cause a trouble alarm.

Sensor Template *(factory default)*

Input Name:	Temperature
Low Temperature Limit:	10º C
High Temperature Limit:	27º C
Recognition Time:	60 Seconds
Reset Time:	0 Seconds
Data Logging:	Active
Voice:	temperature.wav
Input Class:	Temperature

Specifications

Range:	0 to 35 degrees C
Humidity:	5–90 %RH
Sensor type:	solid state ic
Accuracy:	+/- 3 degrees F
Connector:	RJ-45
Housing:	white plastic

IMS-4820 Room Humidity Sensor

Installation Instructions



Introduction

The IMS-4820 humidity sensor is designed to connect to the IMS-4000 Host or Node and monitor indoor humidity levels. The electrical connection between the sensor and IMS-4000 is made via RJ-45 patch cable (not included). The sensor may be mounted either on a wall or to a single-gang electrical box.

Package Contents

(1) IMS-4820 Humidity sensor
(2) Plastic drywall anchors
(2) #6 Metal tapping screws
(1) 1/16" hex key

Cabling

The humidity sensor connects to the IMS-4000 Host or Node via an RJ-45 cable (e.g. CAT5 cable). The connection from the sensor to the Host or Node can utilize your existing network wiring infrastructure. For example, the sensor may be installed in another room or another floor. Connect the sensor to your structured wiring network via an RJ-45 jack. At the other end, connect a patch cable from your structured wiring patch panel directly to the Host or Node environment input.

Caution: The IMS sensors are not TCP/IP devices and therefore should not be connected directly to any wiring infrastructure that is connected to network equipment such as a hub, router, or switch. Sensors use RJ-45 plugs and cables similar to those used with Ethernet devices.

Mounting

The humidity sensor can be mounted directly on a surface or attached to a single-gang electrical box. Consideration should be given to cable routing before attaching the sensor to the wall. Will the cable go through the wall (cable hidden) or will it run down the wall (cable visible)? Once this has been determined, run the cable to the location where the sensor will be installed.

Electrical box installation

Bring the RJ-45 cable through the electrical box. Remove the sensor cover by turning the two hex screws on the bottom of the sensor housing clockwise. Bring the cable through the back of the sensor and connect the cable to the jack as shown in Figure 1. Attach the sensor to the electrical box using the appropriate screws. Secure the sensor cover by turning the two hex screws on the bottom of the cover counterclockwise.

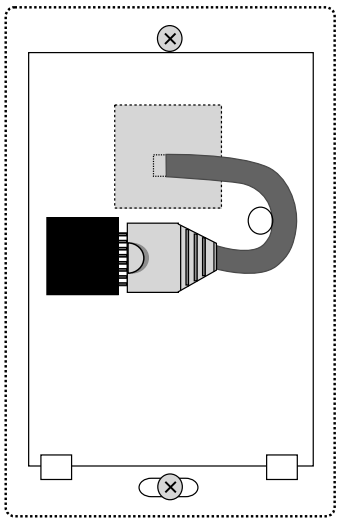


Figure 1: 4820 with Cable exiting through back of enclosure

Hidden cable surface installation

Bring the RJ-45 cable through the wall at the mounting location. Remove the sensor cover by turning the two hex screws on the bottom of the sensor housing clockwise. Bring the cable through the back of the sensor and hold the sensor housing against the wall. Use a pencil to mark the hole locations at the top and bottom of the housing. Remove the sensor from the wall. Install the drywall anchors (if necessary) to the wall. vBring the cable through the back of the sensor and connect it to the jack as shown in Figure 1. Attach the sensor to the wall using #6 tapping screws. Secure the sensor cover by turning the two hex screws on the bottom of the cover counterclockwise.

Visible cable surface installation

Remove the sensor cover by turning the two hex screws on the bottom of the sensor housing clockwise. Hold the sensor housing against the wall. Use a pencil to mark the hole locations at the top and bottom of the housing. Install the drywall anchors (if necessary) to the wall. Attach the sensor to the wall using #6 tapping screws. Connect the cable to the jack as shown in Figure 2. Secure the sensor cover by turning the two hex screws on the bottom of the cover counterclockwise.

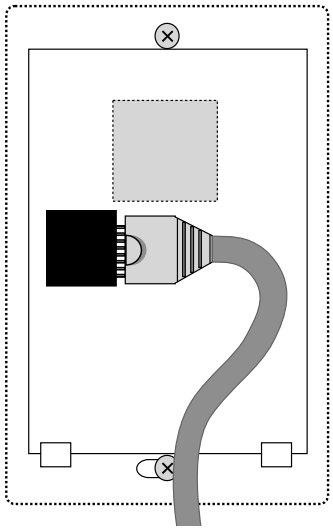


Figure 2: 4820 with Cable exiting out enclosure bottom

Configuration

All IMS Solution sensors are auto-configured when you plug them into the Host or Node. When a new sensor is plugged into the Host or Node, the configuration is set to the factory default via the Sensor Template. If you have modified these templates, the configuration will be set to the modified configuration. When a sensor is removed, or the connection is disrupted, the configuration data remains intact but the sensor will go into trouble status and generate a trouble alarm. When the sensor is plugged in again, or the connection is re-established, configuration data remains unchanged and the sensor returns to normal operating condition.

Caution: Removing a sensor for less than 60 seconds does not produce a trouble alarm. Removing or unplugging a sensor for more than 60 seconds or plugging in a different sensor at any time will cause a trouble alarm.

Sensor Template *(factory default)*

Input Name:	Humidity
Low Limit:	20%
High Limit:	60%
Recognition Time:	60 Seconds
Reset Time:	0 Seconds
Data Logging:	Active
Voice:	humidity.wav
Input Class:	Humidity

Specifications

Range:	0–100% RH
Temperature:	32–122º F (0–50º C)
Accuracy:	+/- 5%
Connector:	RJ-45
Housing:	white plastic

IMS-4821 Room Humidity Sensor with display

Installation Instructions



Introduction

The IMS-4821 humidity sensor is designed to connect to the IMS-4000 Host or Node and monitor indoor humidity. The electrical connection between the sensor and IMS-4000 is made via RJ-45 patch cable (not included). The sensor may be mounted either on a wall or to a single-gang electrical box.

Package Contents

(1) IMS-4821 Humidity sensor
(2) Plastic drywall anchors
(2) #6 Metal tapping screws
(1) 1/16" hex key

Cabling

The humidity sensor connects to the IMS-4000 Host or Node via an RJ-45 cable (e.g. CAT5 cable). The connection from the sensor to the Host or Node can utilize your existing network wiring infrastructure. For example, the sensor may be installed in another room or another floor. Connect the sensor to your structured wiring network via an RJ-45 jack. At the other end, connect a patch cable from your structured wiring patch panel directly to the Host or Node environment input.

Caution: The IMS sensors are not TCP/IP devices and therefore should not be connected directly to any wiring infrastructure that is connected to network equipment such as a hub, router, or switch. Sensors use RJ-45 plugs and cables similar to those used with Ethernet devices.

Mounting

The humidity sensor can be mounted directly on a surface or attached to a single-gang electrical box. Consideration should be given to cable routing before attaching the sensor to the wall. Will the cable go through the wall (cable hidden) or will it run down the wall (cable visible)? Once this has been determined, run the cable to the location where the sensor will be installed.

Electrical box installation

Bring the RJ-45 cable through the electrical box. Remove the sensor cover by turning the two hex screws on the bottom of the sensor housing clockwise. Bring the cable through the back of the sensor and connect the cable to the jack as shown in Figure 1. Attach the sensor to the electrical box using the appropriate screws. Secure the sensor cover by turning the two hex screws on the bottom of the cover counterclockwise.

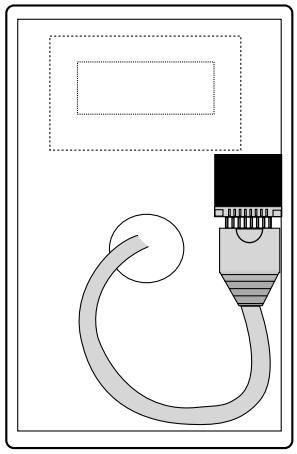


Figure 1: 4821 with Cable exiting through back of enclosure

Hidden cable surface installation

Bring the RJ-45 cable through the wall at the mounting location. Remove the sensor cover by turning the two hex screws on the bottom of the sensor housing clockwise. Bring the cable through the back of the sensor and hold the sensor housing against the wall. Use a pencil to mark the hole locations at the top and bottom of the housing. Remove the sensor from the wall. Install the drywall anchors (if necessary) to the wall. Bring the cable through the back of the sensor and connect it to the jack as shown in Figure 1. Attach the sensor to the wall using #6 tapping screws. Secure the sensor cover by turning the two hex screws on the bottom of the cover counterclockwise.

Visible cable surface installation

Remove the sensor cover by turning the two hex screws on the bottom of the sensor housing clockwise. Hold the sensor housing against the wall. Use a pencil to mark the hole locations at the top and bottom of the housing. Install the drywall anchors (if necessary) to the wall. Attach the sensor to the wall using #6 tapping screws. Connect the cable to the jack as shown in Figure 2. Secure the sensor cover by turning the two hex screws on the bottom of the cover counterclockwise.

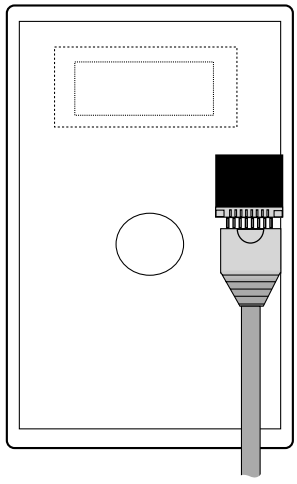


Figure 2: 4821 with Cable exiting out enclosure bottom

Configuration

All IMS Solution sensors are auto-configured when you plug them into the Host or Node. When a new sensor is plugged into the Host or Node, the configuration is set to the factory default via the *Sensor Template.* If you have modified these templates, the configuration will be set to the modified configuration. When a sensor is removed, or the connection is disrupted, the configuration data remains intact but the sensor will go into trouble status and generate a trouble alarm. When the sensor is plugged in again, or the connection is re-established, configuration data remains unchanged and the sensor returns to normal operating condition.

Caution: Removing a sensor for less than 60 seconds does not produce a trouble alarm. Removing or unplugging a sensor for more than 60 seconds or plugging in a different sensor at any time will cause a trouble alarm.

Sensor Template *(factory default)*

Input Name:	Humidity
Low Limit:	20%
High Limit:	60%
Recognition Time:	60 Seconds
Reset Time:	0 Seconds
Data Logging:	Active
Voice:	humidity.wav
Input Class:	Humidity

Specifications

Range:	5–95%
Temperature:	32–158º F (0–70º C)
Accuracy:	+/- 3%
Connector:	RJ-45
Housing:	white plastic

IMS-4830 Water Detection Sensor

Installation Instructions

Introduction



The IMS-4830 Water Detection Sensor protects your server and equipment from damaging water leaks from malfunctioning HVAC systems, cafeteria accidents, or any general plumbing failures in your facilities. The IMS-4830 is powered directly by the IMS-4000 unit.

After mounting the sensor, attach the included WaterRope, and simply lay its orange cable around your equipment: place it on the floor or beneath a raised floor; inside a drop-ceiling or in the rafters between floors; or anywhere you must know about water near your equipment.

You can attach additional Water Detection sensors to each other to expand your water leak detection capabilities throughout your facility; alternatively, IMS WaterRopes are designed to plug into each other to widen your perimeter for any individual sensor.

Package Contents

(1) IMS-4830 Water Detection Sensor

(1) 10' of WaterRope

(5) Adhesive cable clamps

(2) Plastic drywall anchors

(2) #6 Metal tapping screws

(4) Rubber feet

Cabling

The water detection sensor connects to the IMS-4000 Host or Node via an RJ-45 cable (e.g. CAT5 cable). The connection from the sensor to the Host or Node can utilize your existing network wiring infrastructure. For example, the sensor may be installed in another room or another floor. Connect the sensor to your structured wiring network via an RJ-45 jack. At the other end, connect a patch cable from your structured wiring patch panel directly to the Host or Node environment input.

Caution: The IMS sensors are not TCP/IP devices and therefore should not be connected directly to any wiring infrastructure that is connected to network equipment such as a hub, router, or switch. Sensors use RJ-45 plugs and cables similar to those used with Ethernet devices.

Extending the WaterRope

You can extend the monitored area by attaching additional pieces of WaterRope. Simply connect the new WaterRope to the end of the first. You can have up to ten (10) pieces of WaterRope (100') connected together from one Water Detection Sensor.

Cascading Water Sensors

You can cascade up to three Water Detection Sensors from a single IMS input channel. This is useful if there is a large distance between each sensor and you don't want to use up additional IMS inputs for individual sensors. Simply connect an RJ-45 cable to the *Next Sensor* jack on the first sensor to the IMS jack of the second sensor. See Figure below.

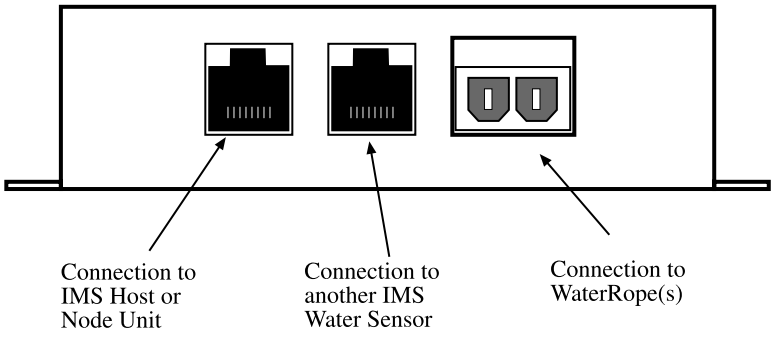


Figure 1: Sensor connections

Mounting

The sensor can be mounted to a wall or lie flat on the floor. To maximize the coverage of the WaterRope, install the sensor close to the area to be monitored. For wall mounting, install the Water Detection Sensor close to the floor. Install the two drywall anchors (if necessary) and attach the Water Detection Sensor using the two #6 tapping screws. When installing the sensor on the floor, attach the four rubber feet to the bottom of the enclosure.

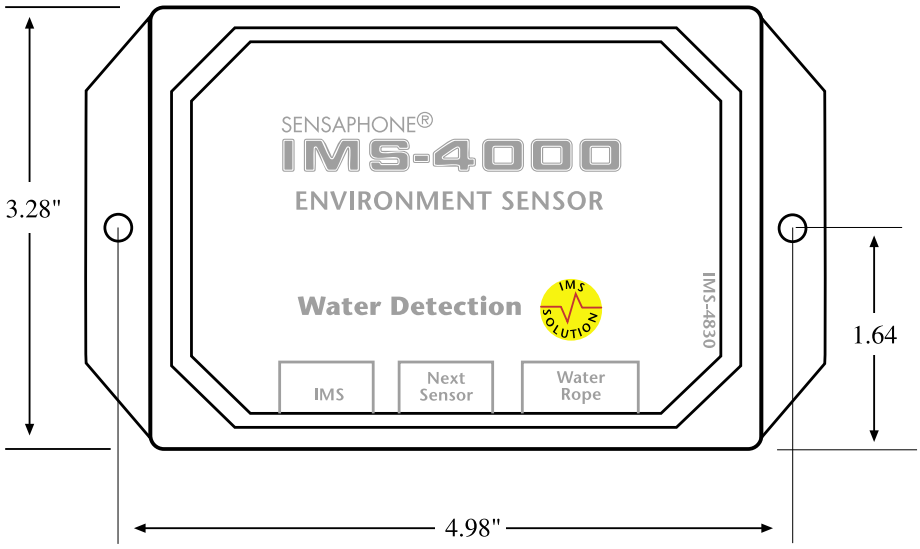


Figure 2: Mounting the sensor

Configuration

All IMS Solution sensors are auto-configured when you plug them into the Host or Node. When a new sensor is plugged into the Host or Node, the configuration is set to the factory default via the *Sensor Template.* If you have modified these templates, the configuration will be set to the modified configuration. When a sensor is removed, or the connection is disrupted, the configuration data remains intact but the sensor will go into trouble status and generate a trouble alarm. When

the sensor is plugged in again, or the connection is re-established, configuration data remains unchanged and the sensor returns to normal operating condition.

Caution: Removing a sensor for less than 60 seconds does not produce a trouble alarm. Removing or unplugging a sensor for more than 60 seconds or plugging in a different sensor at any time will cause a trouble alarm.

Sensor Template *(factory default)*

Input Name:	Water Sensor
Recognition Time:	3 Seconds
Reset Time:	0 Seconds
Data Logging:	Active
Voice:	water sensor.wav
Input Class:	Water

Specifications

Sensing Method:	Conductivity
Sensor:	Polymer core cable with 2 sensing wires
IMS Connection:	RJ-45
Housing:	black plastic with mounting ears

IMS-4840 External Power Sensor

Installation Instructions

Introduction



The IMS-4840 External Power Sensor lets you monitor power anywhere within your infrastructure. It reports any loss of power and measures the current voltage in the circuit, allowing you to know the status of each server rack and even of your remote UPS. Any failed generator starts are reported to you immediately. The IMS-4840 can monitor voltage from 0–250VAC 50/60Hz.

Package Contents

(1) IMS-4840 Power Sensor

(2) Plastic drywall anchors

(2) #6 Metal tapping screws

(4) Rubber feet

Cabling

The Power Sensor connects to the IMS-4000 Host or Node via an RJ-45 cable (e.g. CAT5 cable). The connection from the sensor to the Host or Node can utilize your existing network wiring infrastructure. For example, the sensor may be installed in another room or another floor. Connect the sensor to your structured wiring network via an RJ-45 jack. At the other end, connect a patch cable from your structured wiring patch panel directly to the Host or Node environment input.

Caution: The IMS sensors are not TCP/IP devices and therefore should not be connected directly to any wiring infrastructure that is connected to network equipment such as a hub, router, or switch. Sensors use RJ-45 plugs and cables similar to those used with Ethernet devices.

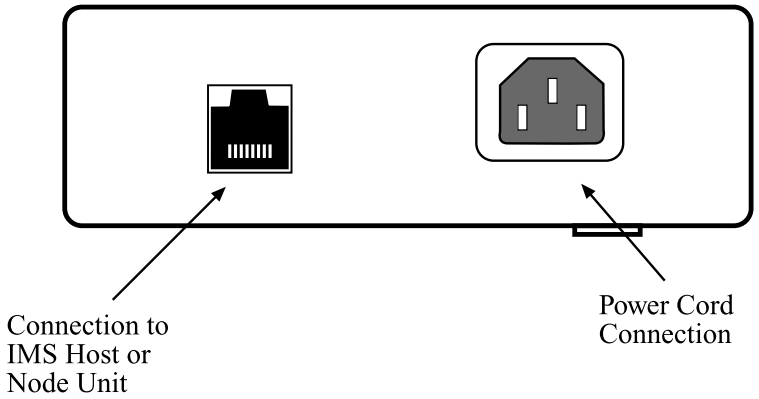


Figure 1: Connections to the IMS-4840

Mounting

The sensor can be mounted to a wall or lie flat on the floor. To mount the sensor to a wall, install the two drywall anchors (if necessary) and attach the Power Sensor using the two #6 tapping screws. When installing the sensor on the floor, attach the four rubber feet to the bottom of the enclosure.

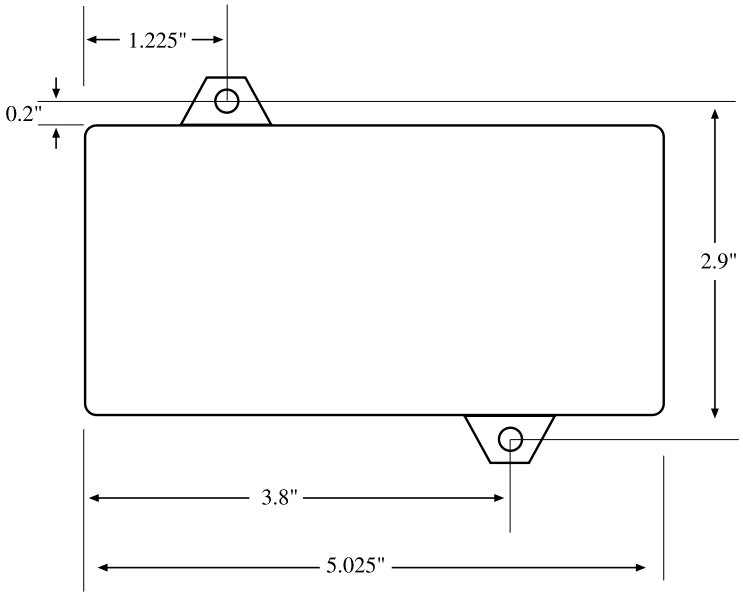


Figure 2: Mounting the sensor

Configuration

All IMS Solution sensors are auto-configured when you plug them into the Host or Node. When a new sensor is plugged into the Host or Node, the configuration is set to the factory default via the *Sensor Template.* If you have modified these templates, the configuration will be set to the modified configuration. When a sensor is removed, or the connection is disrupted, the configuration data remains intact but the sensor will go into trouble status and generate a trouble alarm. When the sensor is plugged in again, or the connection is re-established, configuration data remains unchanged and the sensor returns to normal operating condition.

Caution: Removing a sensor for less than 60 seconds does not produce a trouble alarm. Removing or unplugging a sensor for more than 60 seconds or plugging in a different sensor at any time will cause a trouble alarm.

Sensor Template *(factory default)*

Input Name:	Power
Low Limit:	90VAC
High Limit:	130VAC
Recognition Time:	60 Seconds
Reset Time:	0 Seconds
Data Logging:	Active
Voice:	power default.wav
Input Class:	Power

Specifications

Range:	0–250 VAC, 50/60 Hz
Accuracy:	± 2%
Power Connection:	universal IEC-320 power inlet
IMS Connection:	RJ-45
Housing:	Black plastic with mounting ears

IMS-4850 Dry Contact Bridge

Installation Instructions

Introduction



The IMS-4000 Dry Contact Bridge allows you to connect a dry contact alarm from any device to your IMS-4000 Host or Node. The Dry Contact Bridge is compatible with Normally Open and Normally Closed contacts. The electrical connection between the sensor and IMS-4000 is made via RJ-45 patch cable (not included). The sensor may be mounted either on a wall or rest on the floor.

Package Contents

(1) IMS-4850 Dry Contact Bridge

(2) Plastic drywall anchors

(2) #6 Metal tapping screws

(4) Rubber feet

Wiring the Contact

Connect your alarm contact to the terminal block labeled *Input*. Insert 1/2" stripped bare wire into the slot and tighten the screw. The slide switch selects between Normally Open (NO) and Normally Closed NC) dry contacts. Place the switch in the appropriate position for the alarm contact you are monitoring.

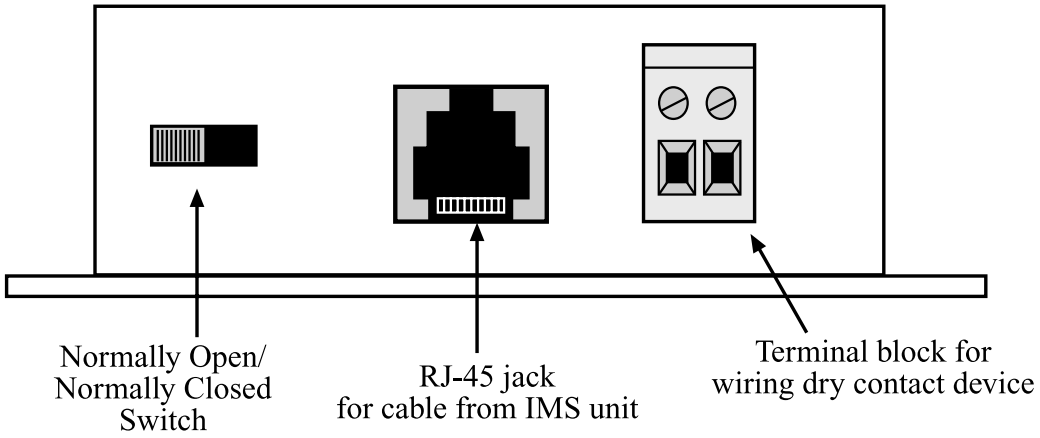


Figure 1: Connections to the IMS-4850

Cabling

The Dry Contact Bridge connects to the IMS-4000 Host or Node via an RJ-45 cable (e.g. CAT5 cable). The connection from the sensor to the Host or Node can utilize your existing network wiring infrastructure. For example, the sensor may be installed in another room or another floor. Connect the bridge to your structured wiring network via an RJ-45 jack. At the other end, connect a patch cable from your structured wiring patch panel directly to the Host or Node environment input.

Caution: The IMS sensors are not TCP/IP devices and therefore should not be connected directly to any wiring infrastructure that is connected to network equipment such as a hub, router, or switch. Sensors use RJ-45 plugs and cables similar to those used with Ethernet devices.

Mounting

The Dry Contact Bridge can be mounted to a wall or lie flat on the floor. To mount it to a wall, install the two drywall anchors (if necessary) and attach the bridge using the two #6 tapping screws. When installing the sensor on the floor, attach the four rubber feet to the bottom of the enclosure.

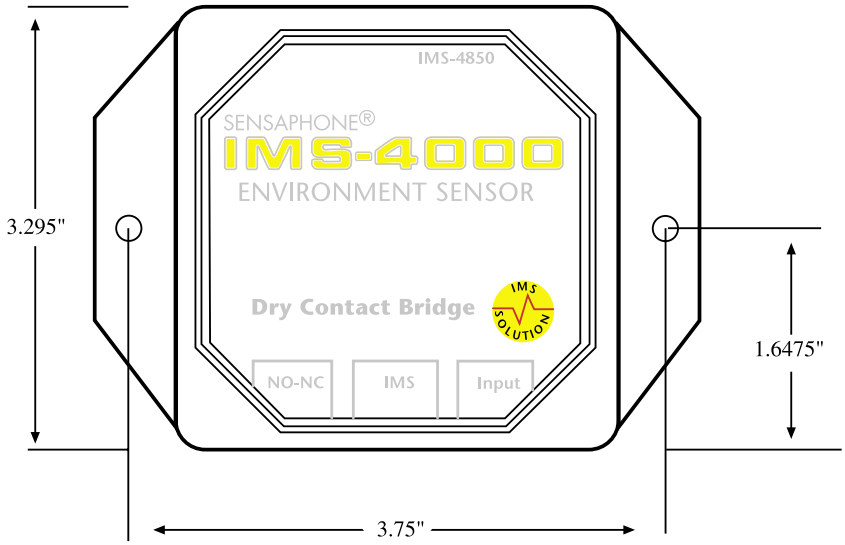


Figure 2: Mounting the sensor

Configuration

All IMS Solution sensors are auto-configured when you plug them into the Host or Node. When a new sensor is plugged into the Host or Node, the configuration is set to the factory default via the *Sensor Template.* If you have modified these templates, the configuration will be set to the modified configuration. When a sensor is removed, or the connection is disrupted, the configuration data remains intact but the sensor will go into trouble status and generate a trouble alarm. When the sensor is plugged in again, or the connection is re-established, configuration data remains unchanged and the sensor returns to normal operating condition.

Caution: Removing a sensor for less than 60 seconds does not produce a trouble alarm. Removing or unplugging a sensor for more than 60 seconds or plugging in a different sensor at any time will cause a trouble alarm.

Sensor Template (factory default)

Input Name:	Contact Bridge
Recognition Time:	3 Seconds
Reset Time:	0 Seconds
Data Logging:	Active
Voice:	dry contact.wav
Input Class:	Other

Specifications

Input:	Normally Open or Normally Closed dry contact
Source/Sense Voltage:	14VDC
Source/Sense Current:	10mA
IMS Connection:	RJ-45
Operating Temperature Range:	32-122 deg F (0-50 degC)
Housing:	Black plastic with mounting ears

IMS-4851 4–20mA Bridge

Installation Instructions

Introduction



The IMS-4000 4–20mA Bridge allows you to connect a 4–20mA transducer to your IMS-4000 Host or Node. The 4–20mA Bridge features optical isolation between the input and the IMS-4000, which ensures trouble-free operation and safety. The electrical connection between the bridge and IMS-4000 is made via RJ-45 patch cable (not included). The bridge may be mounted either on a wall or rest on the floor.

Package Contents

(1) IMS-4851 4–20mA Bridge

(2) Plastic drywall anchors

(2) #6 Metal tapping screws

(4) Rubber feet

Wiring the Transducer

Connect your 4-20mA transducer to the terminal block labeled *Input* as shown in the figure below. Insert 1/2" stripped bare wire into the slot and tighten the screw. The Current Flow light will glow steadily when current is flowing into the bridge from the transducer. Note that a 4-20mA transducer typically requires you to have an external DC power supply for the transducer. A 24VDC supply is available from Sensaphone (FGD-0053).

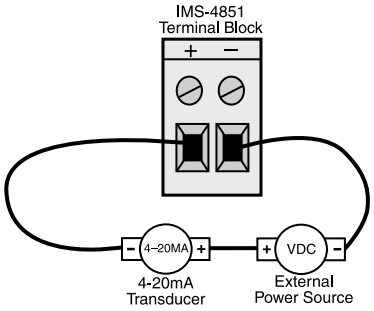


Figure 1: 4–20mA transducer wiring to IMS-4851 Terminal Block

Cabling

The 4-20mA Bridge connects to the IMS-4000 Host or Node via an RJ-45 cable (e.g. CAT5 cable). The connection from the sensor to the Host or Node can utilize your existing network wiring infrastructure. For example, the bridge may be installed in another room or another floor. Connect the bridge to your structured wiring network via an RJ-45 jack. At the other end, connect a patch cable from your structured wiring patch panel directly to the Host or Node environment input.

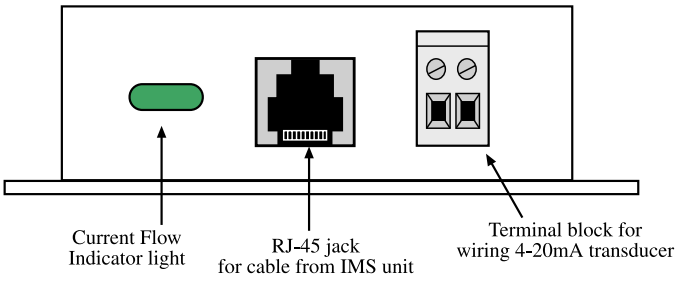


Figure 2: Connections to the IMS-4851

Caution: The IMS sensors are not TCP/IP devices and therefore should not be connected directly to any wiring infrastructure that is connected to network equipment such as a hub, router, or switch. Sensors use RJ-45 plugs and cables similar to those used with Ethernet devices.

Mounting

The 4-20mA Bridge can be mounted to a wall or lie flat on the floor. To mount it to a wall, install the two drywall anchors (if necessary) and attach the bridge using the two #6 tapping screws. When installing the sensor on the floor, attach the four rubber feet to the bottom of the enclosure.

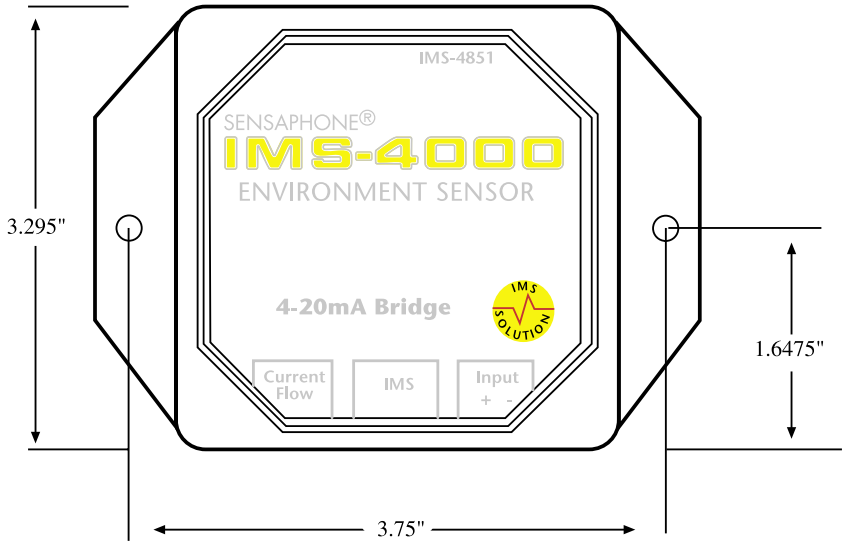


Figure 3: Mounting the sensor

Configuration

The 4-20mA Bridge has a fixed table range of 0-100% for a 4-20mA signal. This means that the displayed value in the ConsoleView software will be 0 to 100%. All IMS Solution sensors are auto-configured when you plug them into the Host or Node. When a new sensor is plugged into the Host or Node, the configuration is set to the factory default via the *Sensor Template.* If you have modified these templates, the configuration will be set to the modified configuration. When a sensor is removed, or the connection is disrupted, the configuration data remains intact but the sensor will go into trouble status and generate a trouble alarm. When the sensor is plugged in again, or the connection is re-established, configuration data remains unchanged and the sensor returns to normal operating condition.

Caution: Removing a sensor for less than 60 seconds does not produce a trouble alarm. Removing or unplugging a sensor for more than 60 seconds or plugging in a different sensor at any time will cause a trouble alarm.

Host and Node Firmware Requirements

The 4-20mA Bridge requires the following firmware versions in the Host and Node(s) for sensor compatibility:

IMS-4000 Host

- Input board firmware chip version xx.xx.xx.103 or higher

  NOTE: Input board firmware is NOT flash upgradeable. A new firmware chip must be installed. For information on obtaining a new firmware chip, please contact Sensaphone Technical Support at 610.558.2700 or via e-mail at *support@sensaphone.com*.

- ConsoleView version 2.04 or higher
- IMS4K OS version 2.41 or higher
- Voice version 2.09 or higher

*Host version information is viewable through the ConsoleView software on the *Version Info* screen and the *Help>About* selection from the main menu.

IMS-4000 Node

- Firmware version 2.19 or higher.

*Node version information is viewable through the ConsoleView software on the *Node Properties>Diagnostics* screen.

Sensor Template *(factory default)*

Input Name:	Transducer
Recognition Time:	3 Seconds
Reset Time:	0 Seconds
Data Logging:	Active
Voice:	None
Input Class:	Other

Specifications

Input:	4–20mA DC
Current Limit:	50mA
Input Impedance:	Variable (1000Ω @ 4mA, 260Ω @ 20mA)
Accuracy:	± 0.25%
IMS Connection:	RJ-45
Operating Temperature Range:	32–122 deg F (0–50 degC)
Housing:	Black plastic with mounting ears

IMS-4860 Door Switch

Installation Instructions

Introduction

The IMS-4000 Door Switch with bridge enables your IMS-4000 to detect if any unauthorized entry or intrusion has occurred. The bridge may be mounted either on a wall or rest on the floor. The switch is mounted to doors or windows you wish to monitor. The electrical connection between the bridge and IMS-4000 is made via RJ-45 patch cable.



Package Contents

(1) Door Switch with mounting hardware

(1) IMS-4860 bridge

(1) 25′ accessory wire

Mounting the Door Switch

The door switch is usually installed to function in a normally closed position when the door (or window or other portal) on which it is mounted is closed. The complete assembly is of two parts: a magnet in a plastic housing, and a sensor switch with screw terminals in another plastic housing.

Mount the switch by fastening it to the non-moving frame surrounding the door or window. Use either mounting screws or the adhesive foam tape attached to the switch segments. Fasten the magnet near the edge of the movable sash or door. Position the magnet housing no more than 1/8" from the switch and tighten mounting screws. Use the spacer bar (included) if needed for alignment.

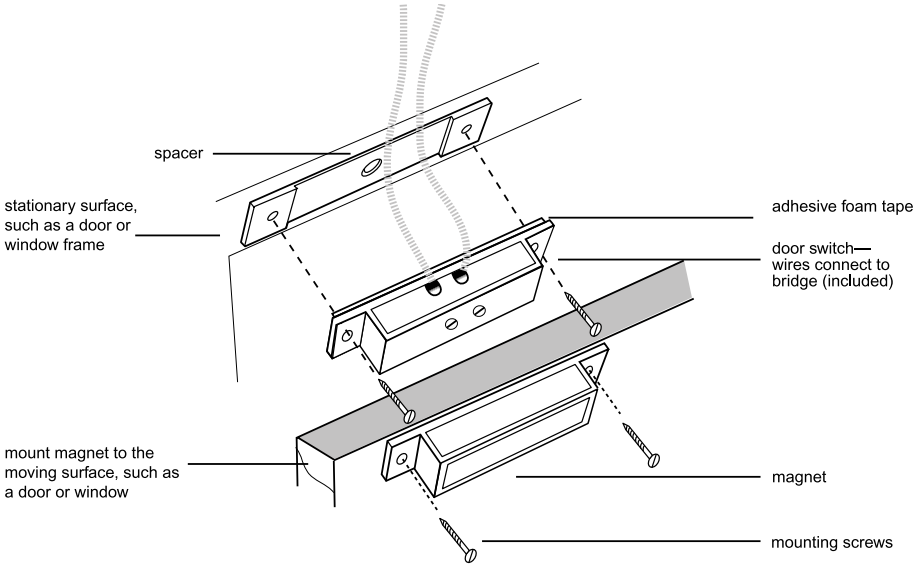


Figure 1: Door switch mounting

Mounting the Bridge

The bridge may be mounted directly on a surface using double-sided foam tape (included) or it may be secured to equipment using tie-wraps. The choice depends on your specific application.

Cabling

The Door Switch connects to the IMS-4000 Host or Node via an RJ-45 cable (e.g. CAT5 cable) from the bridge. The connection from the bridge to Host or Node can utilize your existing network wiring infrastructure. For example, the switch may be installed in another room or another floor. Connect the bridge to your structured wiring network via an RJ-45 jack. At the other end, connect a patch cable from your structured wiring patch panel directly to the Host or Node environment input.

Caution: IMS sensors are not TCP/IP devices and therefore should not be connected directly to any wiring infrastructure that is connected to network equipment such as a hub, router, or switch. Sensors use RJ-45 plugs and cables similar to those used with Ethernet devices.

Configuration

All IMS Solution sensors are auto-configured when you plug them into the Host or Node. When a new sensor is plugged into the Host or Node, the configuration is set to the factory default via the *Sensor Template.* If you have modified these templates, the configuration will be set to the modified configuration. When a sensor is removed, or the connection is disrupted, the configuration data remains intact but the sensor will go into trouble status and generate a trouble alarm. When the sensor is plugged in again, or the connection is re-established, configuration data remains unchanged and the sensor returns to normal operating condition.

Caution: Removing a sensor for less than 60 seconds does not produce a trouble alarm. Removing or unplugging a sensor for more than 60 seconds or plugging in a different sensor at any time will cause a trouble alarm.

Sensor Template *(factory default)*

Input Name:	Contact Bridge
Recognition Time:	3 Seconds
Reset Time:	0 Seconds
Data Logging:	Active
Voice:	dry contact.wav
Input Class:	Other

Specifications

Bridge:

Input:	Normally Open or Normally Closed dry contact
Source/Sense Voltage:	14VDC
Source/Sense Current:	10mA
Cable/Connector:	7' cable with RJ-45 plug
Operating Temperature Range:	32–122 deg F (0-50 degC)
Housing:	Black plastic
Dimesnsions:	2.13" x 0.6" x 1.38"

Door Switch:

Normality:	Normally Closed
Dimensions:	2.0" x 0.4" x 0.4" (part with screw terminals)
	2.0" x 0.4" x 0.4" (part with magnet)

IMS-4861 Passive Infrared Detection Sensor

Installation Instructions

Introduction



The IMS-4861 Passive Infrared Detection Sensor is a dual-element passive infrared intrusion detector for use in electronic security systems. It reduces false alarms by eliminating background noises and nuisance stimuli. The IMS-4861employs variable pulse-count adjustment, thus making it adaptable for use both inside and outside of server/equipment rooms. It is designed to connect to the IMS-4000 Host or Node. Refer to the manufacturer's instruction guide for more information.

Package Contents

(1) IMS-4861 Passive Infrared Detection Sensor

(2) Plastic drywall anchors

(2) #6 Metal tapping screws

Cabling

The Passive Infrared Detection Sensor comes with an attached 7' cable with an RJ-45 plug on the end. If the sensor is close to the IMS-4000 Host or Node, you can plug the sensor directly to an IMS environmental input. If the cable is too short you can use the included RJ-45 adaptor and a longer patch cable to extend the length. For applications where the sensor may be far from the IMS unit, you may utilize your existing network wiring infrastructure. For example, the sensor may be installed in another room or another floor. Connect the sensor to your structured wiring network via an RJ-45 jack. At the other end, connect a patch cable from your structured wiring patch panel directly to the Host or Node environment input.

Caution: The IMS sensors are not TCP/IP devices and therefore should not be connected directly to any wiring infrastructure that is connected to network equipment such as a hub, router, or switch. Sensors use RJ-45 plugs and cables similar to those used with Ethernet devices.

Mounting

You should install the IMS-4861 sensor in a location that is most likely to intercept an intruder. The IMS-4861 monitors motion across a 90.5º field of vision and can detect motion across the beam as well as motion coming toward the sensor.

Note: Avoid installing the sensor where it faces direct sunlight; faces areas that may change temperature rapidly, or areas where there are air ducts or substantial air flows. All of these can create false reports.

The IMS-4861 can be installed by its bracket to either a wall or a ceiling. The bracket cover is used for mounting to walls. Remove the cover for ceiling mounting. *(See Figure 1)*

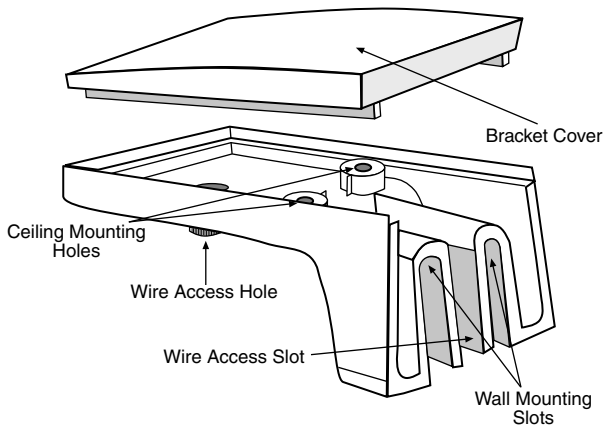


Figure 1: Mounting bracket

Run all cable wiring to the sensor through either the Wire Access Slot (wall mounted), or the Wire Access Hole (ceiling mounted).

The sensor can also be attached directly to a wall or corner without the bracket. Knockout holes for direct mounting can be accessed by opening the sensor body (see instructions below), taking out the PC board by removing the single screw that holds it in place, and then knocking out the appropriate four (4) holes: flat holes for direct mounting, or side (angled) holes for corner-mounting.

Configuration

All IMS Solution sensors are auto-configured when you plug them into the Host or Node. When a new sensor is plugged into the Host or Node, the configuration is set to the factory default via the *Sensor Template.* If you have modified these templates, the configuration will be set to the modified configuration. When a sensor is removed, or the connection is disrupted, the configuration data remains intact but the sensor will go into trouble status and generate a trouble alarm. When the sensor is plugged in again, or the connection is re-established, configuration data remains unchanged and the sensor returns to normal operating condition.

Caution: Removing a sensor for less than 60 seconds does not produce a trouble alarm. Removing or unplugging a sensor for more than 60 seconds or plugging in a different sensor at any time will cause a trouble alarm.

Sensitivity Adjustment

The sensitivity potentiometer should be adjusted according to the security risk level of the site. For high-risk locations, the sensitivity should be adjusted close to MIN (9%). In low risk situations, the sensitivity should be adjusted closer to MAX (100%). Default is 54%.

Note: Always walk-test and readjust as necessary.

Jumper Pin Selections

LED Selection Jumper

Jumper in postion ON (to the left): LED is enabled. The LED will light when the sensor is in alarm condition.

Jumper in position OFF (to the right): LED is disabled.

PULSE/AUTO: Pulse Count Jumper

Jumper in position 1 (to the right): Jumper setting for a stable environment without air drafts.

Jumper in position AUTO (to the left): Setting for a harsh environment.

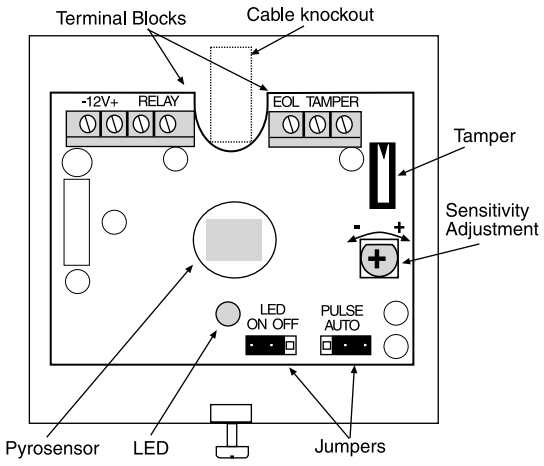


Figure 2: Sensitivity adjustment and jumper locations

Sensor Template *(factory default)*

Input Name:	Motion Detector
Recognition Time:	1 Second
Reset Time:	0 Seconds
Data Logging:	Active
Voice:	motion detector.wav
Input Class:	Other

Specifications

Pyrosensor:	Dual element type
Power Input:	8.2–16 Vdc
Current Consumption:	8mA @ 12 Vdc
Temperature Compensation:	Yes
Alarm Period:	2 sec (± 5sec)
Alarm Output:	N.C. 100mA @ 28 Vdc (10Ω in line resistor Form “A”)
Tamper Switch:	N.C. 100mA @28 Vdc (10Ω in line resistor Form “A”)-open
Operating ambient temperature range:	-4ºF to +140ºF (-20ºC to +60ºC)
Operating humidity range:	Up to 95% (non-condensing)
Storage temperature range:	-40ºF to +176ºF (-40ºC to +80ºC)
RFI protection:	≥30 V/m @ 10-1000 MHz
EMI immunity:	50,000 V electrical interference
Dimensions:	3.8" x 1.8" x2.5" (97mm x 63mm x 46.5mm)
Weight:	3 oz (85 grams)

IMS-4862 Smoke Detector Sensor

Installation Instructions

Introduction



The IMS-4862 Smoke Detector Sensor is designed to connect to the IMS-4000 Host or Node and monitor for smoke in indoor environments. The electrical connection between the sensor and IMS-4000 is made via the attached RJ-45 patch cable. The sensor may be secured to a wall or ceiling (hardware not included).

Cabling

The Smoke Detector Sensor comes with an attached 7' cable with an RJ-45 plug on the end. If the sensor is close to the IMS-4000 Host or Node, you can plug the sensor directly to an IMS environmental input. If the cable is too short you can use the included RJ-45 adaptor and a longer patch cable to extend the length. For applications where the sensor may be far from the IMS unit, you may utilize your existing network wiring infrastructure. For example, the sensor may be installed in another room or another floor. Connect the sensor to your structured wiring network via an RJ-45 jack. At the other end, connect a patch cable from your structured wiring patch panel directly to the Host or Node environment input.

Caution: The IMS sensors are not TCP/IP devices and therefore should not be connected directly to any wiring infrastructure that is connected to network equipment such as a hub, router, or switch. Sensors use RJ-45 plugs and cables similar to those used with Ethernet devices.

Mounting

The sensor may be mounted directly against a wall or ceiling (hardware not included).

Configuration

All IMS Solution sensors are auto-configured when you plug them into the Host or Node. When a new sensor is plugged into the Host or Node, the configuration is set to the factory default via the *Sensor Template.* If you have modified these templates, the configuration will be set to the modified configuration. When a sensor is removed, or the connection is disrupted, the configuration data remains intact but the sensor will go into trouble status and generate a trouble alarm. When the sensor is plugged in again, or the connection is re-established, configuration data remains unchanged and the sensor returns to normal operating condition.

The smoke alarm is a latching alarm device. To reset the smoke alarm, momentarily disconnect the cable from the front panel of the IMS Host or Node and then reconnect it.

Caution: Removing a sensor for less than 60 seconds does not produce a trouble alarm. Removing or unplugging a sensor for more than 60 seconds or plugging in a different sensor at any time will cause a trouble alarm.

Sensor Template *(factory default)*

Input Name:	Smoke Detector
Recognition Time:	10 Seconds
Reset Time:	0 Seconds
Data Logging:	Active
Voice:	smoke detector.wav
Input Class:	Smoke

Specifications

Sensitivity:	2.0 ± .37% - .39% /ft.
Contact Rating:	2 AMP 28 VDC or 120 VAC resistive
Heat sensor rating:	Fixed 135º F (57ºC) rate of rise > 15ºF/min. (8.3ºC/min.)
Operating voltage:	8.5–33 VDC, 10% max. ripple
Maximum ambient temperature:	100ºF (37.8ºC)
Power-up time:	15 seconds
Housing:	white plastic
Housing dimensions:	6.1" d x 1.9" h

Technical Support for the IMS-4000 Sensors

For questions about installing any of these sensors, please contact your local IMS Solution Reseller or VAR or contact the manufacturer directly at:

Phonetics, Inc.
901 Tryens Road
Aston, PA 19014
www.ims-4000.com

Tel: 610.558.2700
Fax: 610.558.0222
Email: support@ims-4000.com

Appendix A: Weekly Testing Procedure

We recommend that you test your IMS-4000 system weekly to be sure it is functioning properly. This will ensure that when a problem arises the IMS-4000 will be ready to alert the appropriate personnel. A test log template is included at the back of this manual.

There are several tests that can be performed:

1) Call the unit and listen to the Status Report. This will test the unit's ability to answer the phone and speak a message. It will also verify that all of the inputs are reading properly, the alarm conditions are OK, the electricity is on, the microphone is functioning, and the batteries are OK.
2) Create an alarm on each input by tripping all connected sensors.

   Temperature sensors: Heat or cool the sensor.

   Motion sensors: Have someone walk in front of the sensor.

   Door/window sensors: open the door/window.

   Water sensors: Apply a small amount of water beneath the sensor or use a wet towel and touch it to the sensor probes.

   Humidity sensors: Raise the humidity around the sensor by holding a cup of very hot water beneath the sensor.

   Smoke detectors: Hold magnet near test area on smoke detector, or make smoke.

Allow the unit to contact all programmed telephone numbers. This will make sure that the IMS-4000 is programmed properly. It will also prepare personnel to respond appropriately when they receive a call from the Sensaphone.

3) Test the batteries in any IMS unit by unplugging the AC power and making sure that the IMS-4000 continues to function.
4) If you are using your IMS-4000 to listen for a smoke alarm, then be sure to test the smoke alarm to make sure that the IMS-4000 picks up the audible signal and triggers a high-sound-level alarm. Allow the unit to dial all programmed telephone numbers.
5) If you require assistance, call Sensaphone Technical Support at 610.558.2700.

Appendix B: Troubleshooting

Software

Why does my IMS-4000 Host begin dialing as soon as I turn it on?

● IMS-4000 will only dial to deliver an alarm message. An unacknowledged alarm exists, and IMS-4000 is trying to deliver an alarm message.

Why can't I connect with my IMS-4000 using my Ethernet network?

● IMS-4000 Hosts and Nodes are 10MB Ethernet devices. If your Ethernet network speed is 100MB, you won't be able to communicate with an IMS-4000 Host or Node.

● The IMS-4000's Host or Node's network settings may be incorrect. Verify the IP address, Gateway, DNS, and Subnet mask settings.

● There may be a network IP address conflict. The IMS-4000 Host or Node's IP address may be the same as another device on your network.

Why can't I connect with my IMS-4000's (Host or Node) serial port?

● A NULL RS-232 serial cable is required to perform the local configuration of an IMS-4000 Host or Node. Verify that you are using a NULL cable. A Null modem serial cable is available for purchase from Phonetics as an accessory (part number IMS-4406).

● Make sure that your cable is connected to a serial (COM) port on your PC, not a parallel (LPT) port.

● Your PC's terminal emulation program settings may be incorrect. The serial Port settings should be as follows:

Bits per second: 9600
Data Bits : 8
Parity: None
Stop bits: 1
Flow control: None

Why can't I connect with my IMS-4000 Host using a PPP dial-up connection?

If your modem won't dial at all:

● Make sure that your Windows Dial-up Network connection is properly set up. Check that the telephone number is properly programmed.

● Make sure that your modem is connected to a serial COM port on your PC, not a parallel (LPT) port.

If your modem dials but you can't connect with the IMS-4000 Host:

● Verify the User Name and Password settings on the Windows Dial-Up Network connection match the settings programmed in your IMS-4000's Profile Setup.

● Make sure that your modem is turned on and plugged into a working telephone line.

Will IMS-4000 retain its programming if there has been a long power failure and the backup battery dies?

Yes. When all power is removed from the IMS-4000,voice messages and unit programming are retained in a nonvolatile solid-state flash disk.

My IMS-4000 unit got damaged and had to be replaced. Can I use the original unit's saved programming to quickly program the replacement unit?

Yes.

Why won't my IMS-4000 Host dial out?

- Check that you have a Touch-Tone telephone line. The IMS-4000 Host will not be able to dial out if it's on a Pulse telephone line.

- The Contact telephone number may be incorrectly programmed. Verify the telephone numbers. Is a '1 +area code' prefix required? Does your telephone line require a '9' prefix to reach an outside line?

- Each Contact telephone number has a programmable call schedule. It may not be the programmed time of day, or day of week for the IMS-4000 Host to call a particular contact. Verify the call schedule for each contact.

- Recognition time may be set too long for an alarm condition to become a valid alarm. Shorten the Recognition time for the alarm or increase the amount of time that the monitored condition exists.

- The wrong Alarm Class has been assigned. For each environmental or IP alarm, you may specify an Alarm Class. Check the Alarm Class assigned to the environmental or IP channel.

- The user Profile has not been programmed to receive calls for a particular alarm Class. When an alarm occurs, the IMS-4000 checks its list of User Profiles to see who should be contacted. Only users whose class list includes the class of the alarm will be contacted.

- 'Dial Out Attempts' might be set to zero. If this is the case, the IMS-4000 Host will make zero attempts to call the programmed Contacts. Increase 'Dial Out Attempts' to a number greater than zero.

I keep getting a busy signal when I call my IMS-4000 Host.

The IMS-4000 Host may be trying to deliver an alarm message.

Why does IMS-4000 call again with the same alarm after I just acknowledged it?

- The alarm is clearing and quickly re-tripping. If this occurs, and the Alarm Recognition time is very short, the result will be another call for the re-tripped alarm. Increase the Alarm Recognition time to avoid rapid callbacks for the same alarm.

Why won't the IMS-4000 Host communicate with one or more Nodes?

Every IMS-4000 expansion Node is an IP device with a unique address. Check to make sure that the Host IP address is programmed correctly in the Node(s).

Appendix C: IMS-4000 Accessories

The accessories listed below are available from Phonetics, Inc. and our authorized distributors. Other dry contact sensors, designed for more specialized applications, may also be used. Commercial/industrial electrical supply houses can provide devices to monitor virtually any condition. For further information, contact Sensaphone Customer Service at 610.558.2700.

Part Number	Description
BAT-0006	6V 3.4AH battery (Node)
BAT-0014	12V 2.9AH battery (Host)
IMS-4002	IMS-4000 Node
IMS-4003	IMS-4000 Node (220VAC 50Hz)
IMS-4301	IMS-4000 PowerGate
IMS-4302	IMS-4000 PowerGate2
IMS-4401	Axis® Network Camera
IMS-4402	IMS-4000 7' CAT5 Patch Cable
IMS-4403	IMS-4000 14' CAT5 Patch Cable
IMS-4404	IMS-4000 25' CAT5 Patch Cable
IMS-4405	IMS-4000 RJ-45 F/F Coupler Kit (4)
IMS-4406	Wall Mount Kit
IMS-4407	Null Modem Cable
IMS-4408	IMS-4000 Solution Manual (complete)
IMS-4409	IMS-4000 ConsoleView Software CD
IMS-4410	Axis® 2400 Video Server
IMS-4411	Sideways Panel Wall Mount Enclosure
IMS-4412	Deluxe Wall Mount Enclosure
IMS-4413	IMS-4000 PowerGate2 Input Power Cable
IMS-4501	IMS-4000 Universal Wall Mount Kit
IMS-4810	IMS-4000 Room Temperature Sensor
IMS-4811	IMS-4000 Room Temperature Sensor w/Display (Fahrenheit)
IMS-4812	IMS-4000 Mini-Temperature Sensor
IMS-4813	IMS-4000 Room Temperature Sensor w/Display (Celsius)
IMS-4820	IMS-4000 Humidity Sensor
IMS-4821	IMS-4000 Humidity Sensor w/Display
IMS-4830	IMS-4000 Water Sensor w/10' Water Detection Rope

IMS-4831	IMS-4000 10’ Water Detection Rope
IMS-4840	IMS-4000 Power Sensor
IMS-4850	IMS-4000 Dry Contact Bridge
IMS-4851	IMS-4000 4–20mA Bridge
IMS-4860	IMS-4000 Door Switch
IMS-4861	IMS-4000 Passive Infrared Motion Detector w/7' RJ-45 Cable
IMS-4862	IMS-4000 Smoke Detector w/7' RJ-45 Cable

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Appendix E: Returning an IMS Unit for Repair

In the event that any of your Sensaphone IMS-4000 units does not function properly, we suggest that you do the following:

1) Record your observations regarding the individual unit's malfunction.
2) Call the Technical Service Department at 610.558.2700 prior to sending the unit to Phonetics, Inc. for repair.

If the unit must be sent to Phonetics, Inc. for Servicing, please do the following:

1) Turn the power switch on the rear of the unit Off.
2) Disconnect all cables, inputs and wiring, and unplug the unit.
3) Carefully pack the unit to avoid damage in transit. Use the original container (if available) or a sturdy shipping box.
4) To avoid shipping delays, you must include the following information :
    a) Your name, address and telephone number.
    b) A note explaining the problem.
5) Ship your package to the address below:

SERVICE DEPARTMENT
PHONETICS, INC.
901 Tryens Road
Aston, PA 19014

6) Ship prepaid and insured via UPS or US Mail to ensure a traceable shipment with recourse for damage or replacement.

Test Log

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

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

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