BLACK BOX®

ServSensor V4E Lite

Use this intelligent environmental monitoring device to identify problems before they disrupt your equipment.

Features an embedded Web server and Linux operating system.

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You'll be live with one of our technical experts in less than 60 seconds.

Federal Communications Commission and Industry Canada Radio Frequency Interference Statements

This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

Instrucciones de Seguridad
(Normas Oficiales Mexicanas Electrical Safety Statement)

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.

2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.

3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.

4. Todas las instrucciones de operación y uso deben ser seguidas.

5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.

6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.

7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.

8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.

9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.

10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.

11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.

13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.

14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.

15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.

16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.

17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.

18. Servicio por personal calificado deberá ser provisto cuando:
    A: El cable de poder o el contacto ha sido dañado; u
    B: Objectos han caído o líquido ha sido derramado dentro del aparato; o
    C: El aparato ha sido expuesto a la lluvia; o
    D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
    E: El aparato ha sido tirado o su cubierta ha sido dañada.

Table of Contents

Chapter 1: Specifications

1. Specifications

Audio — Sampling rate: 8 kHz

Certifications — AdRem NetCrunch, Quest Software–Big Brother®, Castle Rock, HP® OpenView®, IBM® Tivoli®, LoriotPro, Logalot, MRTG®, SiteScope®, Somix®—WebNM® and Denika®, WhatsUp® Gold, Computer Associates Unicenter® TNG

Components — Manufactured using highly integrated, low-power surface-mount technology to ensure long-term reliability

Configuration — Via Web browser (HTTP/HTTPS)

Expandable Modules — EME1X8: 8-port intelligent sensors module;
EME1DC16: 16-port dry-contacts modules

Mean Time Between Failures (MTBF) — 400,000 hours

Memory — 128 MB SDRAM, 128 MB NVRAM

Network Interface — (1) 10/100BASE-T Ethernet RJ-45

Operating System — Embedded Linux

Processor — iMX25 CPU

Protocols Supported (Client) — DHCP, DNS, SMTP, (5) NTP, SNMP

Connectors — Inputs: (8) RJ-45 for connecting sensors; (2) RJ-45 expansion ports; (1) USB Version 1.1 Type A; (1) 2.5" jack for analog audio; (1) RS-485 2-pin terminal box (used for Modbus®);
Output: (1) 2.5" jack for analog audio; (1) 2.5" jack for microphone

Temperature Tolerance — Operating: 32 to 131° F (0 to +55° C)

Humidity — 20 to 80%, noncondensing

Altitude — 0 to 9842 ft. (0 to 300 m)

Indicators — (19) LEDs: (1) Power, (1) Link, (1) Activity, (8) Status, (8) On-line

Power — Input: 100–240 VAC, 47-63 Hz external power supply;
Output: 7.0–9 VDC, 3 amps;
Consumption: 5.025 watts, 0.670 amps

Size — 1.8"H x 8.5"W x 5.4"D (4.6 x 21.6 x 13.7 cm)

Weight — 1.7 lb. (0.8 kg)

2. Overview

2.1 Introduction

Used for environmental monitoring, the ServSensor V4E Lite identifies problems before they lead to business disruptions. This high-speed, accurate, intelligent monitoring device features a completely embedded host and Linux® operating system.

2.2 What's Included

Your package should contain the following items. If anything is missing or damaged, contact Black Box Technical Support at 724-746-5500.

• (1) ServSensor V4E Lite unit

• (1) 5-ft. crossover cable

• (1) 5-ft. straight-pinned cable

• (2) rackmounting brackets

• (1) power adapter

• (1) power cord

• (1) temperature/humidity sensor (EME1TH2-005) with RJ-45 to RJ-45 cable

• (4) terminal blocks (installed)

• (1) CD-ROM containing this user's manual and Help files

2.3 Hardware Description

Figure 2-1 illustrates the ServSensor's front panel. Table 2-1 describes its components.
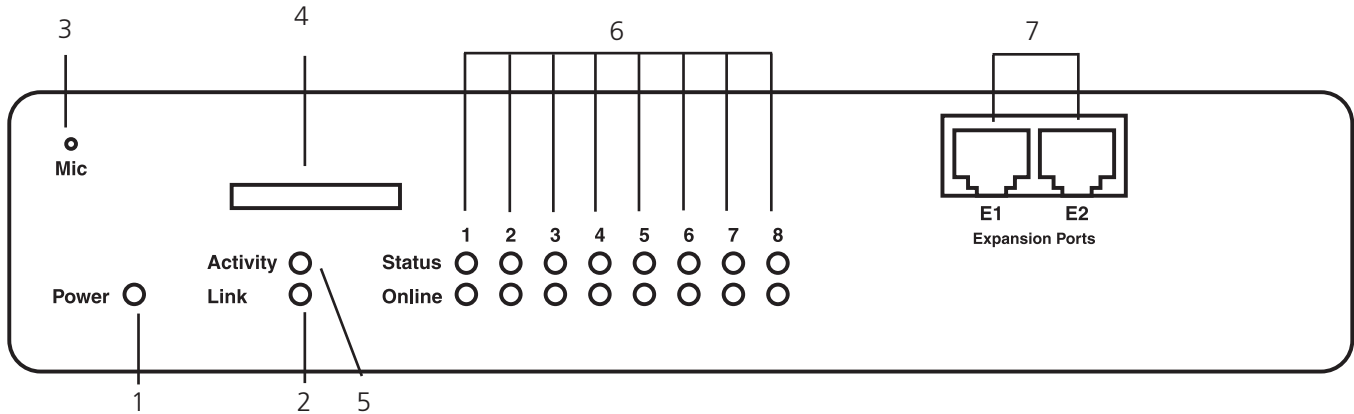
2.3.1 Front Panel

Figure 2-1. Front panel.

Table 2-1. Front-panel components.

Number	Component	Description
1	Power LED	When the unit is powered on, the power LED will be lit continuously. If the power LED is flashing, there is a problem with the CPU. Contact Technical Support at 724-746-5500 or info@blackbox.com.
2	Link LED	The Link LED indicates network connectivity. It lights when a network is connected to the ServSensor V4E Lite.
3	Mic	The mic is a small hole for access to the internal microphone. Use it as a sound sensor (or use an external mic).
4	SD card slot	SD card (not included) installs here.
5	Activity LED	The Activity LED flashes when network traffic is sent to or received by the ServSensor V4E Lite.
6	Status/Online LEDs 1–8	The Status/Online LEDs are numbered 1–8. They indicate the connectivity status of the sensors connected to each port. You can also use these LEDs to indicate system status during various operations.
		Additionally, the LEDs can indicate the progress of an upgrade. The red LEDs move from left to right to indicate activity, and all the green LEDs indicate overall progress of the upgrade. When all the red lights are off and the green are on, the upgrade/recovery process is complete.
		These lights also indicate if the unit is operating in safe mode. This is when the unit loads the operating system (OS) with a minimal set of drivers. If your device enters safe mode after rebooting, contact Black Box Technical Support at 724-746-5500 or info@blackbox.com.
		The unit may enter recovery mode if a firmware upgrade is incomplete. In this case, the unit displays a continuously lit row of red LEDs. If this happens, contact Black Box Technical Support at 724-746-5500 or info@blackbox.com.

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Table 2-1 (Continued) . Front panel components.

Number	Component	Description
7	Expansion ports E1–E2	Use the two expansion ports numbered E1–E2 to connect the 8-port expansion module (EME1X8) and/or the 16 dry-contact expansion module (EME1DC16).

2.3.2 Back Panel

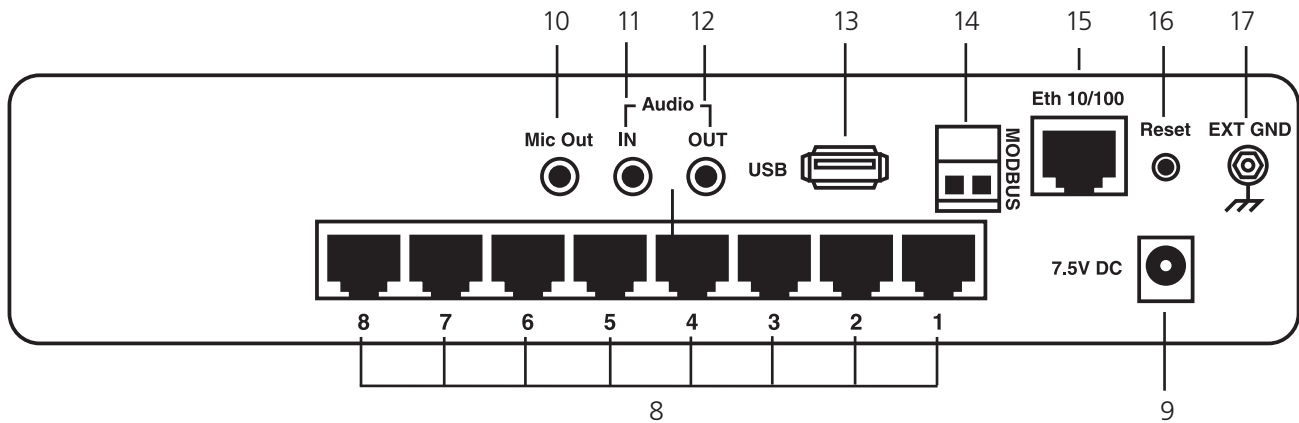Figure 2-2 shows the ServSensor's back panel. Table 2-2 describes its components.

Figure 2-2. Back panel.

Table 2-2. Back panel components.

Number	Component	Description
8	(8) RJ-45 connectors	Use these ports to connect Intelligent Sensors to the ServSensor V4E Lite.
9	Barrel connector	This is a 7.5V DC plug. Connect a 7.0–9.0-V, 2.5-A power supply (included).
10	Mic out connector	Connect an external microphone for voice modem applications.
11	Audio in	Connect an external microphone.
12	Audio out	Connect the output for external speakers.
13	USB Type A port	Use the USB 1.1 port to connect a USB GBarPRS/GSM compatible modem, a USB Wi-Fi dongle, or a USB Bluetooth® dongle.
14	2-pin terminal block (RS-485 port)	The ServSensor V4E Lite supports Modbus master or slave.
15	RJ-45 10/100 network port	Use this RJ-45 port to connect your ServSensor V4E Lite to the network.
16	Reset	Press this button to reset the ServSensor V4E Lite.
17	EXT GND	Use the EXT. GND connector to externally ground the unit.

3. Installation

3.1 Setting Up the IP Address

The ServSensor V4E Lite is shipped with the default IP address of 192.168.0.100. Follow the steps listed below to change this IP address to fit your own network configuration.

Before starting, make sure you have these items:

• (1) RJ-45 male CAT5 crossover cable

• (1) PC with Ethernet card or LAN socket

• (1) Power socket for the unit to connect to

To set up the IP address:

1. Connect the ServSensor V4E Lite via its Ethernet port to your computer's Ethernet port with a CAT5 crossover cable.

2. Open a Web browser and type the default IP address (as in Figure 3-1), then press the Enter key.
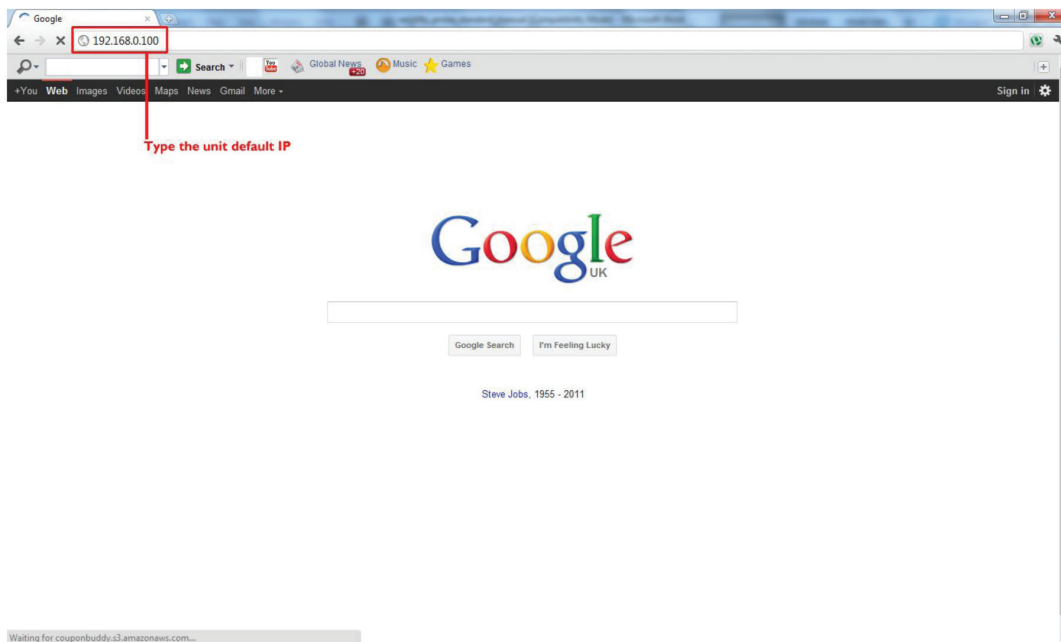
Figure 3-1. Google Web Browser screen.

NOTE: In some cases, your computer might not be able to connect to this default IP address. In this situation, you will need to change the IP address of your PC. See the instructions above.

3. After you press the Enter key in Step 2, Figure 3-2 appears. The default password for Admin is "public." Change the password to make your unit secure.

Figure 3-2. User Type/Password screen.

4. Next, the home page will be displayed. It looks similar to the screen shown in Figure 3-3.

Figure 3-3. Settings tab.

5. Click on the "Settings" tab, then click on "Ethernet network" from the list on the left frame of the page. See Figure 3-4.
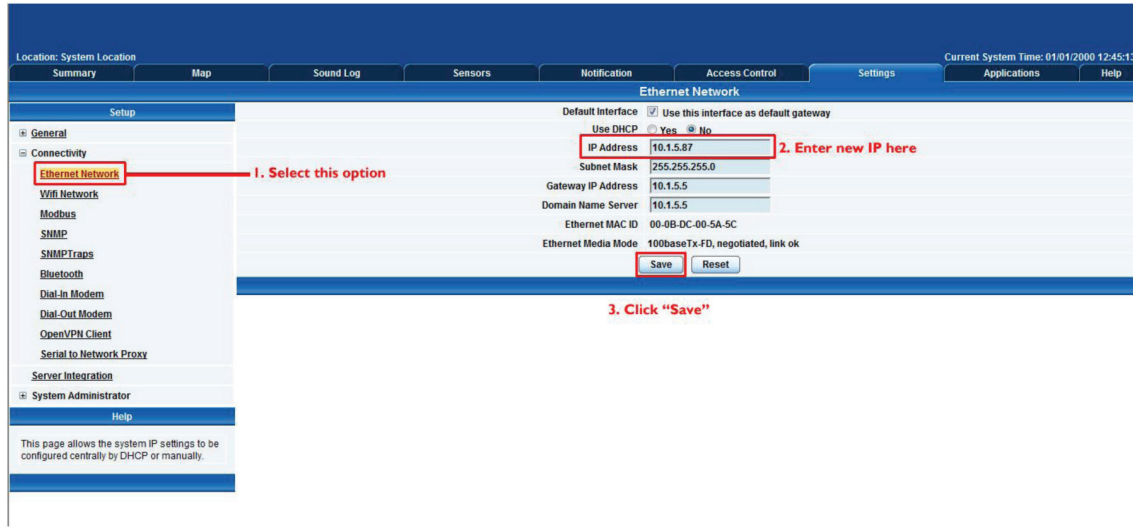
Figure 3-4. Ethernet Network screen.

To change the IP address of the ServSensor V4E Lite:

1. Select Ethernet network.

2. Input the new IP address.

3. Click the "Save" button.

3.2 Testing the New IP Address with the "Ping" Command

Once you assign the new IP address, use the "ping" command to test the ServSensor V4E Lite. You can also use this command as a diagnostic tool to check whether your unit is connected to the network. See Figure 3-5.

1. Click "Start."

2. Click "Run."

3. Type "ping (IP address that the user entered)," and press Enter. An example IP address (10.1.5.206) is shown in Figure 3-5.
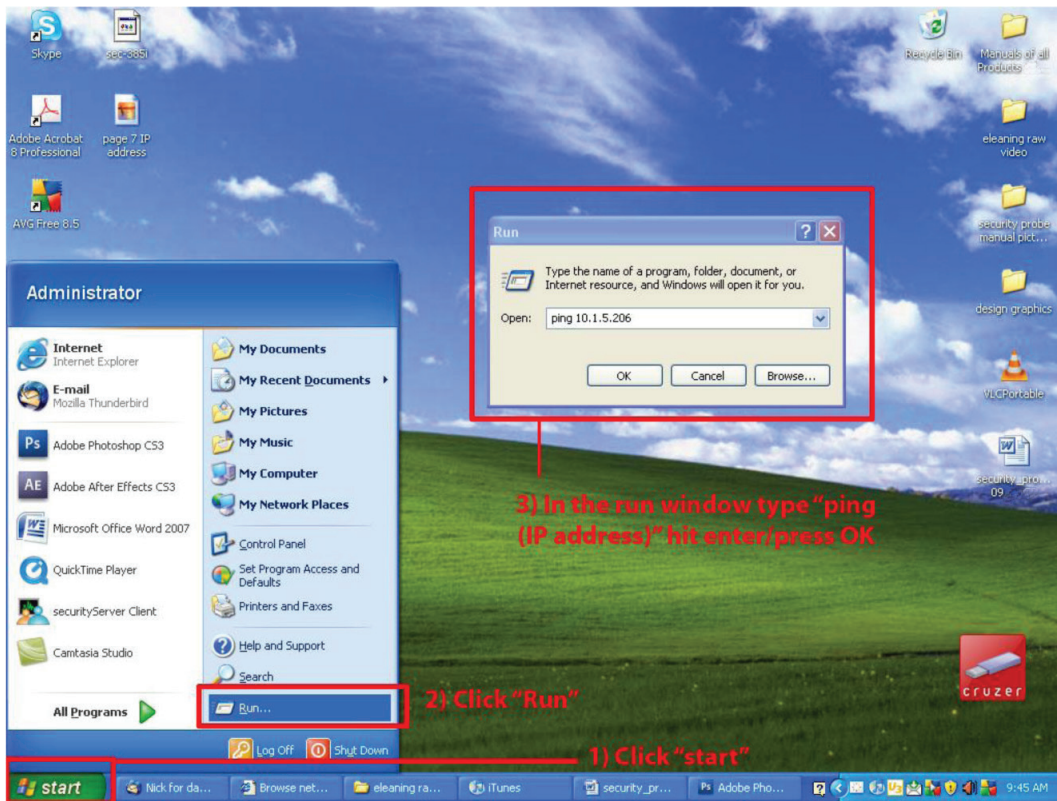
Figure 3-5. Ping Command screen.

4. After you press the "Enter" key, an MS-DOS® prompt window showing the test results appears (see Figure 3-6). If you get a message saying "request timed out," either the IP address is incorrect or a ServSensor V4E Lite is not connected to the network.
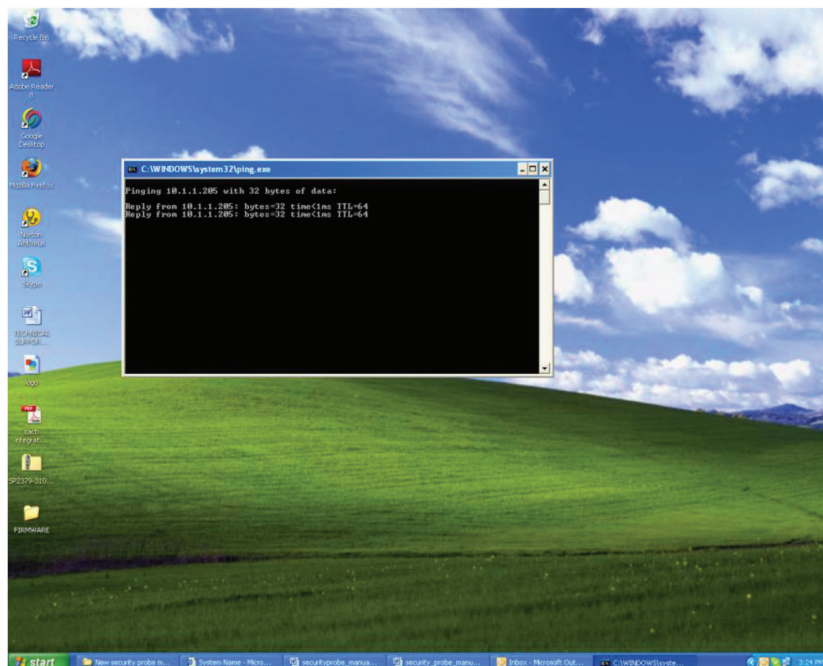

Figure 3-6. MS-DOS window.

3.3 Firmware Upgrade

Make sure you are running the latest firmware. Please contact Black Box Technical Support at 724-746-5500 or info@blackbox.com for the latest firmware.

NOTE: This manual refers to the Default IP address, 192.168.0.100. Substitute this for your own IP address if you have changed the default IP address.

This tutorial gives you the information you need to upgrade the firmware.

To get to the tutorial's starting point:

• Log in as administrator.

• Click the "Settings" tab.

Figure 3-7. Settings tab.
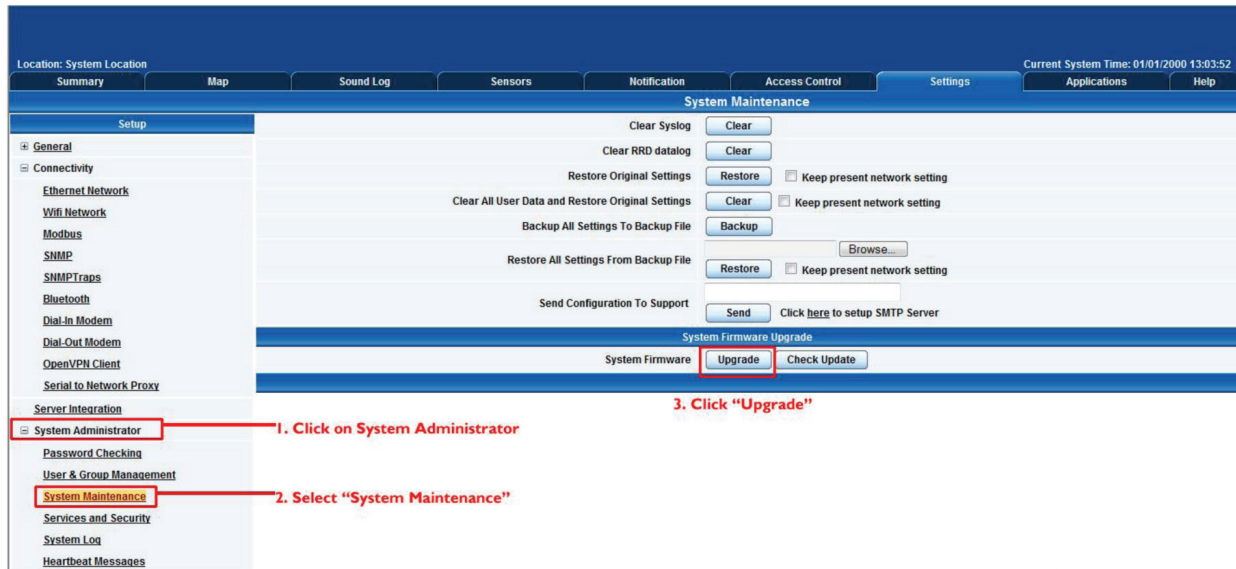
Figure 3-8. System Administrator, System Maintenance screen.

1. Click "System Administrator" and then "System Maintenance."

2. Click "Upgrade."
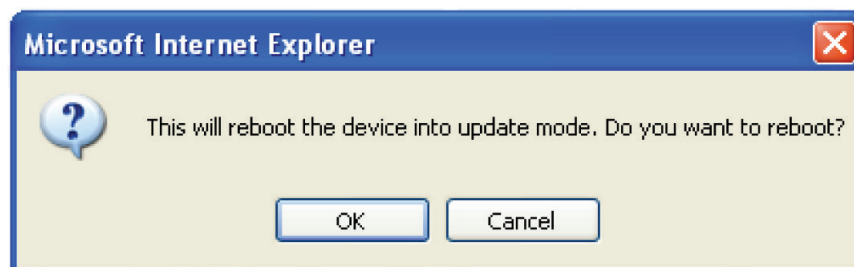
3. The popup screen shown in Figure 3-9 appears.

Figure 3-9. Reboot prompt.

4. Click "OK." The unit will reboot in Safe Mode. Then you will be redirected to the Safe Mode Web-based interface. This can take some time, so please be patient. The page will display the message shown in Figure 3-10 when rebooting.
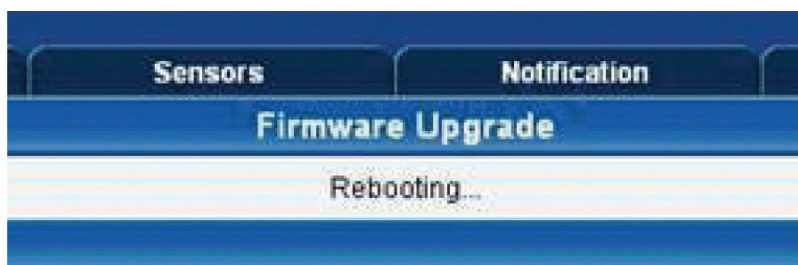

Figure 3-10. Firmware Upgrade Rebooting screen.

5. After the ServSensor reboots, the page shown in Figure 3-11 appears. Click "Browse" and navigate to the firmware file you downloaded, then click "Upgrade."
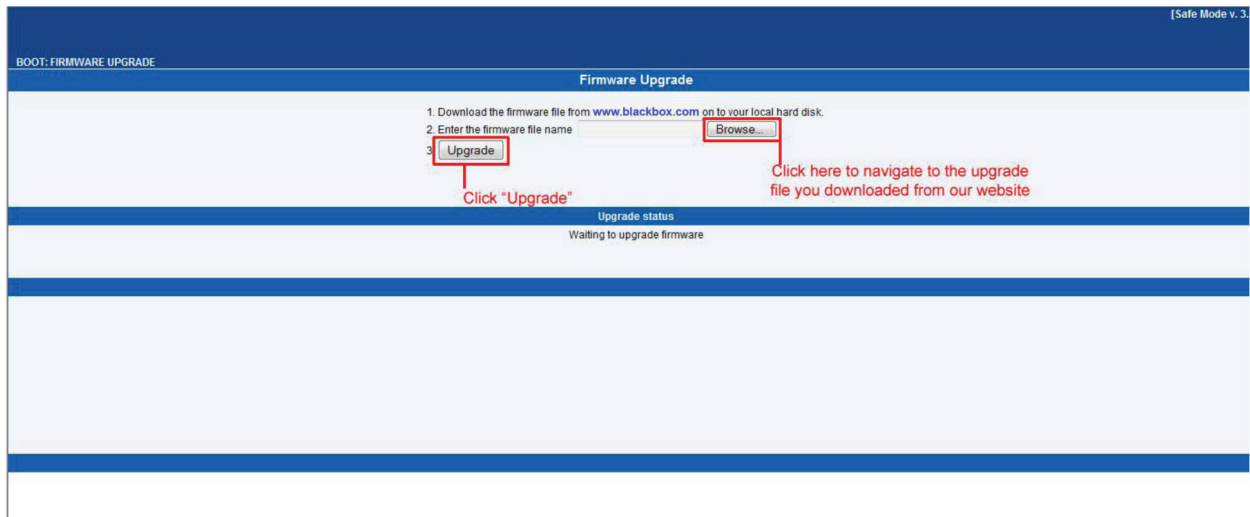

Figure 3-11. Upgrade button.

6. During the process, you will see the messages shown in Figure 3-12.
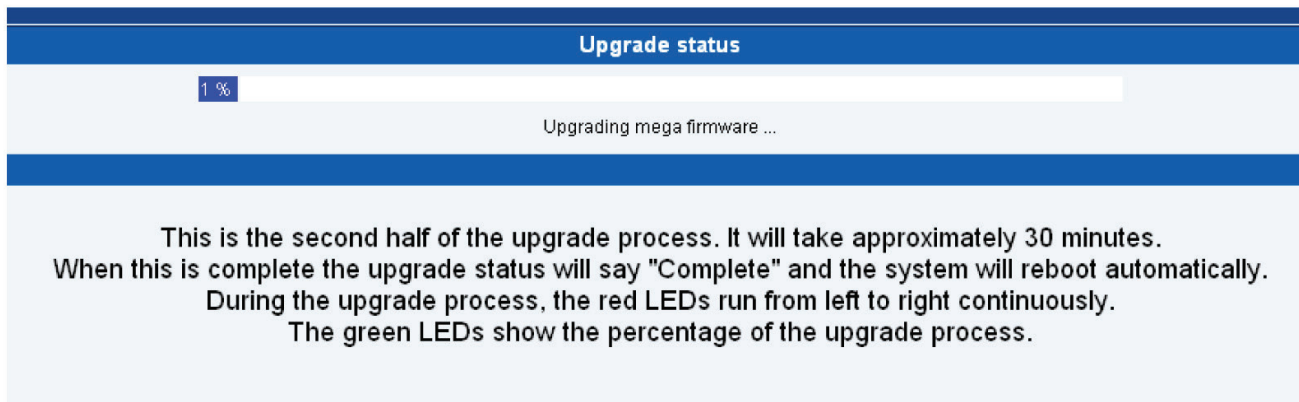

Figure 3-12. Upgrade Status screen.

7. The unit will then reboot. The process is complete when the LEDs are back to their "normal" status.

3.4 Multi-users and Groups Setup

3.4.1 Group Setup

1. Log in to the ServSensor V4E Lite with the Administrator password. The default will be "public" if you have not changed this yet.

2. Click on the Settings page, then System Adminstrator, then User & Group Management as shown in Figure 3-13.

NOTE: The following screen diagrams may appear small and hard to read. Please use the zoom feature in your PDF reader program to increase the size of the page to better view these screen diagrams.
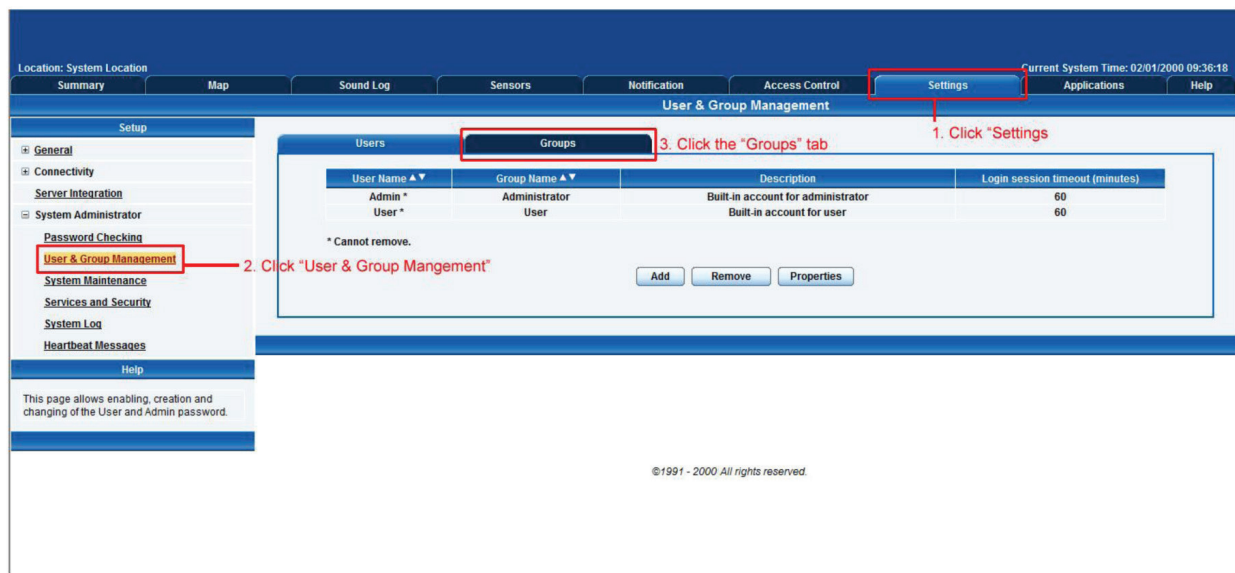

Figure 3-13. Group Setup screen.

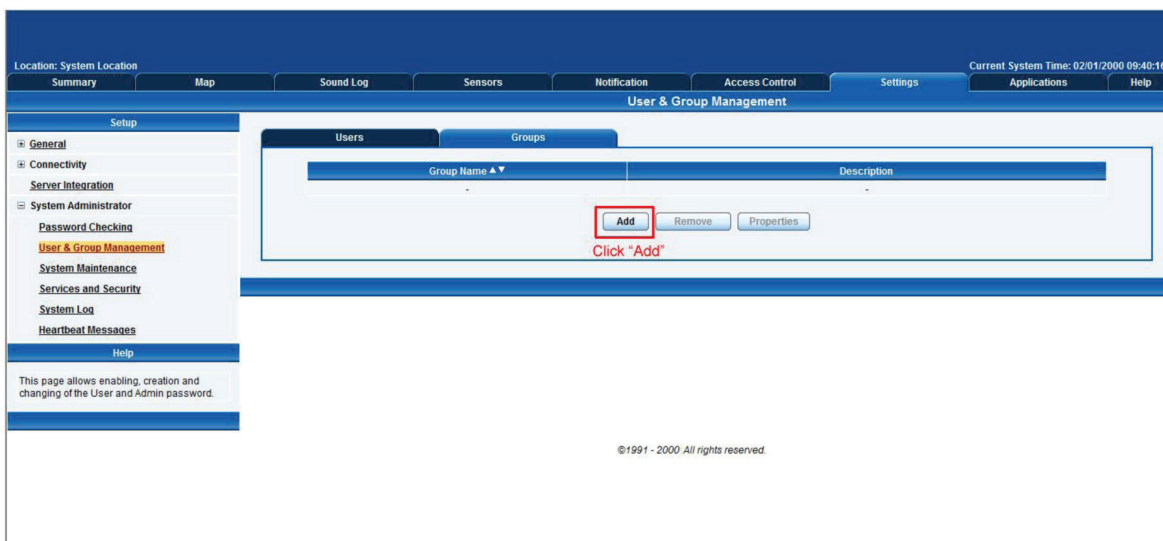3. Click on the "Go to Group Setup" link that will take you to the Groups page shown in Figure 3-14.

Figure 3-14. Groups page.

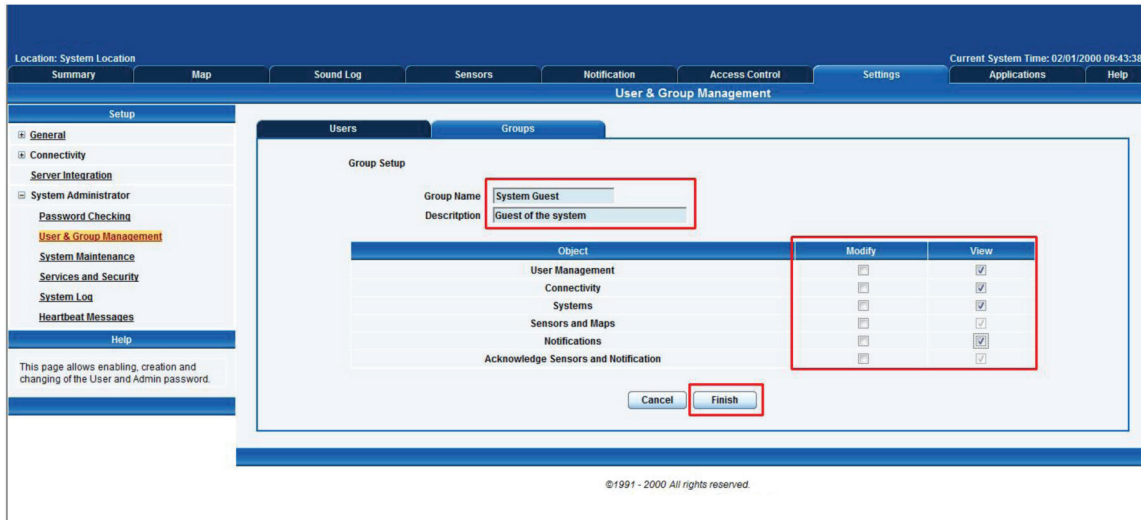4. Click on the "Add" button to add your groups as shown in Figure 3-14.

Figure 3-15. User & Group Management screen.

5. Enter your group name. For example, we have added a group called "System Guest" and entered our description.

6. Check the objects with the Web interface that this group will be able to Modify and View. Then, click the "Finish" button to save your group. (See Figure 3-15.)
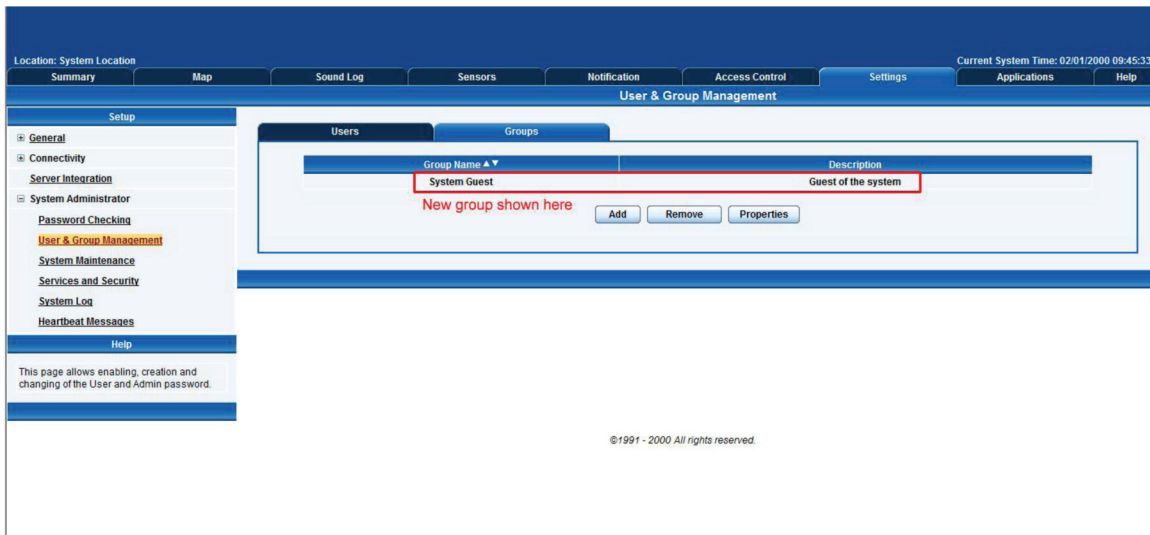

Figure 3-16. System Guest group added.

7. The new group "System Guest" has been added to our group list as shown in Figure 3-16.
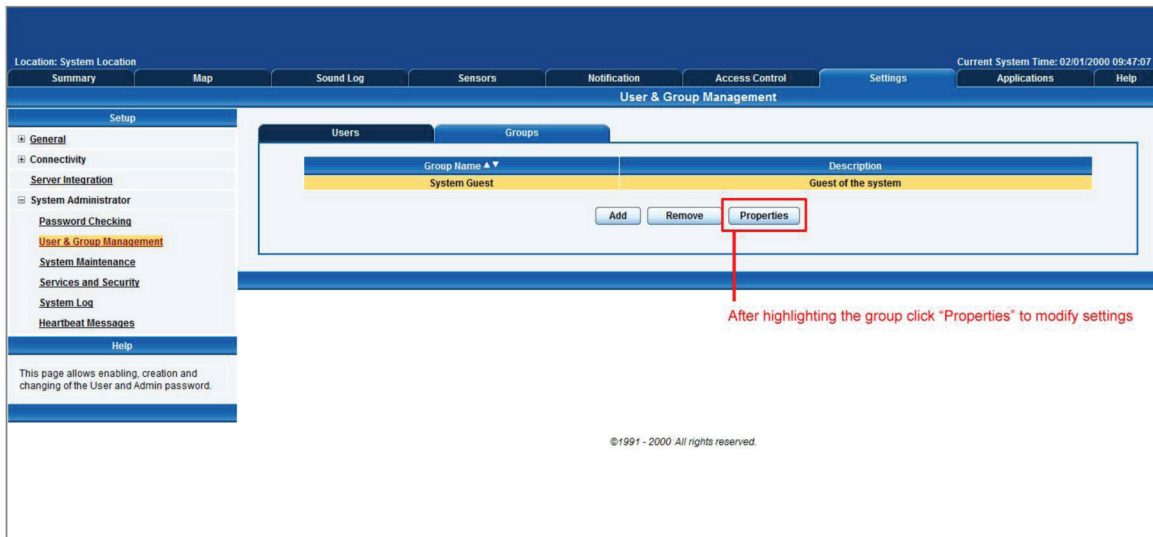
Figure 3-17. User & Group Management screen.

8. If you want to modify your group settings, click on the group you want to modify. Then click on the "Properties" button as shown in Figure 3-17.

3.4.2 User Setup

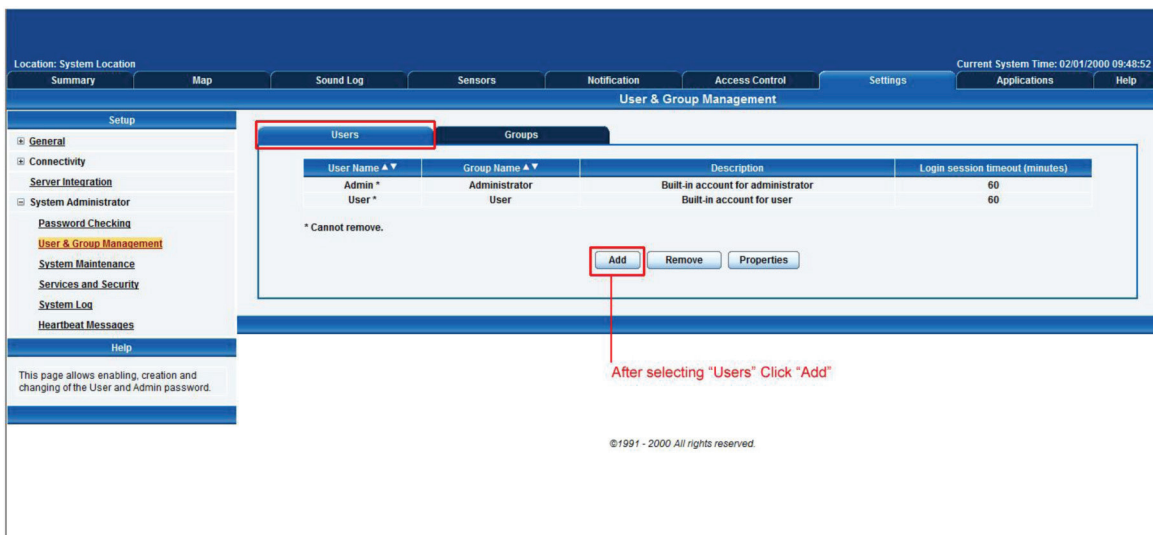1. Click on the "Users" tab and then click the "Add" button to add the new users to your groups as shown in Figure 3-18.

Figure 3-18. User Setup screen.

2. Enter your user details as shown in Figure 3-19. In our example, we have entered Bob Smith as your Guest into our "System Guest" group. We have also added the option so that this user cannot change his login password. After adding your users for each group, click the "Finish" button to save each user.

Figure 3-19. Enter user details.

3. The new user has been entered into our list of users.

Figure 3-20. User list.

4. To modify a user's setting, click on the user to select it, then click the "Properities" button as shown in Figure 3-21.
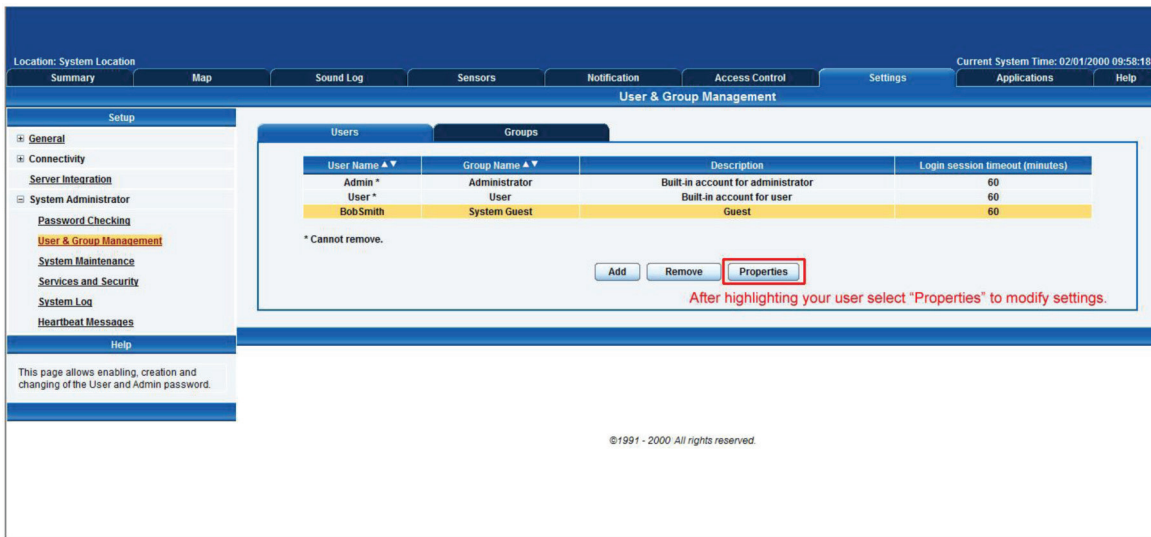
FIgure 3-21. Properties button.

3.5 Services and Security

3.5.1 Active Services Application (Disabling)

Figure 3-22. Services and Security screen.

You can enable or disable the Nagios, Secure Shell, and Telnet applications running on the unit to make it more secure.

3.5.2 Closing or Changing Ports Disabling HTTP and Enabling HTTPS

Figure 3-23. Active services.

You can also close or change the ports used to access the unit's Web interface, disable HTTP, and enable HTTPS only.

The "s" at the conclusion of HTTPS stands for secure. The SSL/TLS connection type is used primarily for high-value sites or "pages," to make it more likely to be unreadable to someone at the end points.

The traffic between client and the ServSensor V4E Lite is not cached along the various units as it moves across the Internet, so it can't be accessed by someone after the connection is terminated.

3.5.3 The SNMPv3 SSL Security Feature
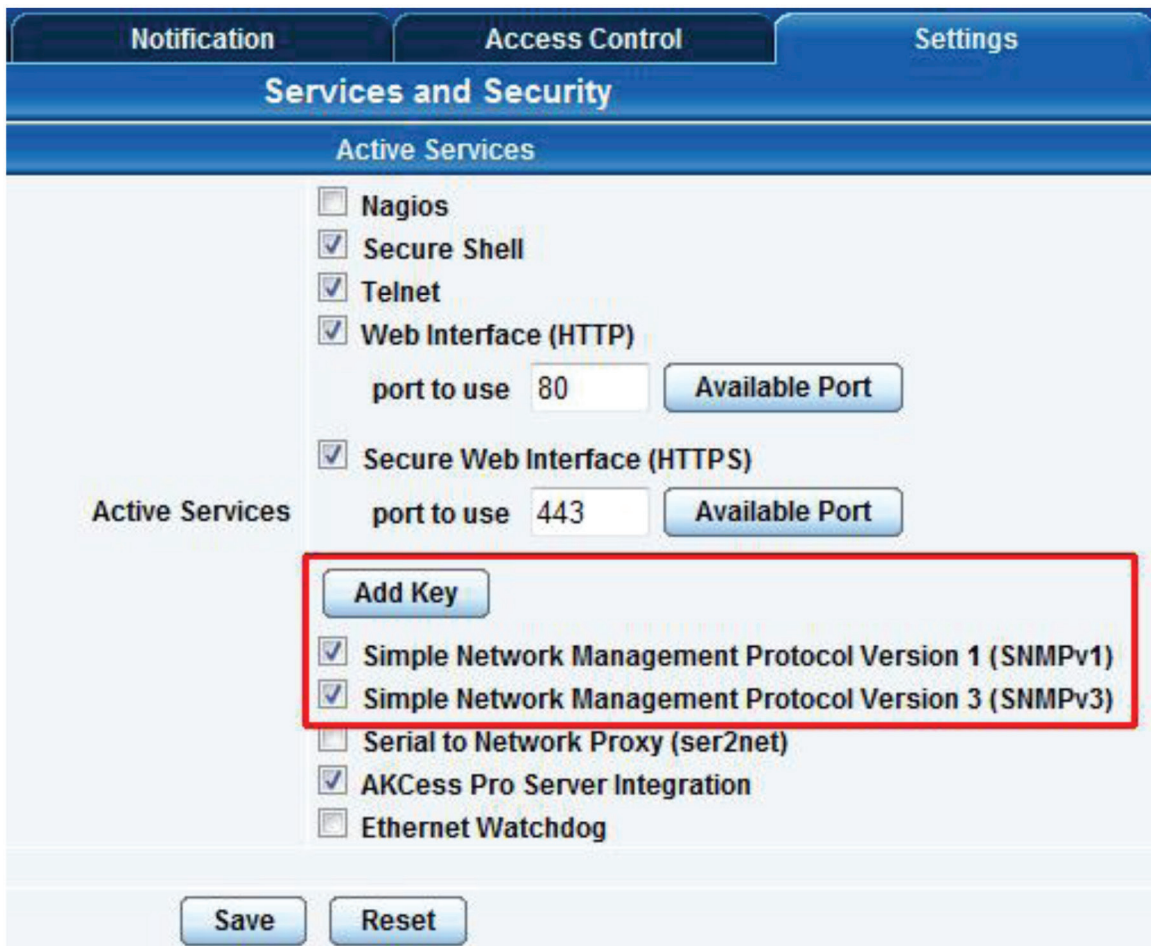
Figure 3-24. Add Key screen.

Use the SNMPv3 SSL (Secure Sockets Layer), which is the standard security technology for establishing the encrypted link betwen the ServSensor and the Web browser. The link ensures that all data passed between the ServSensor and the browser remains private and integral.

SNMPv3 provides important security features:

• Confidentiality—Encrypts packets to prevent snooping by an unauthorized source.

• Integrity—Message integrity to ensure that a packet has not been tampered with in transmit.

• Authentication—To verify that the message is from a valid source.
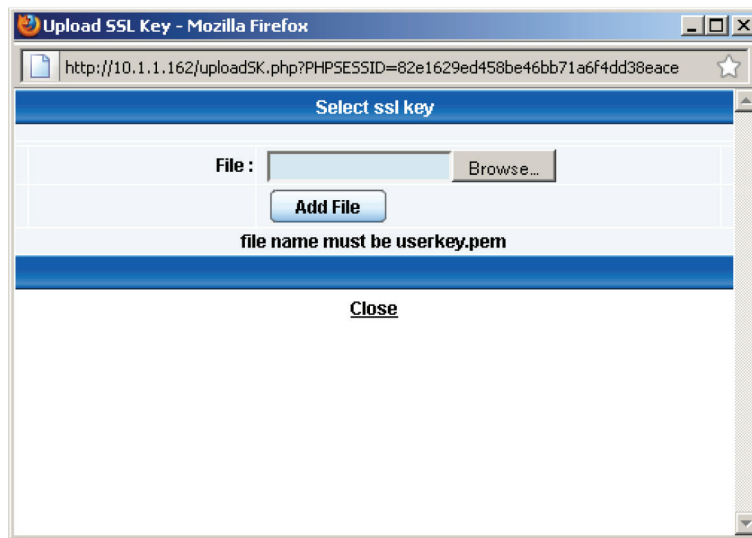
Figure 3-25. Select SSL Key screen.

3.5.4 Active Security

In the active security section, you can enable users who are logged into the unit's Web interface to "Acknowledge" alarms, which is normally reserved only for the Administrator.

When the unit boots up, it will announce the IP address that it has been configured with. As an added security feature, this announcement can be disabled so that the IP address remains unknown.
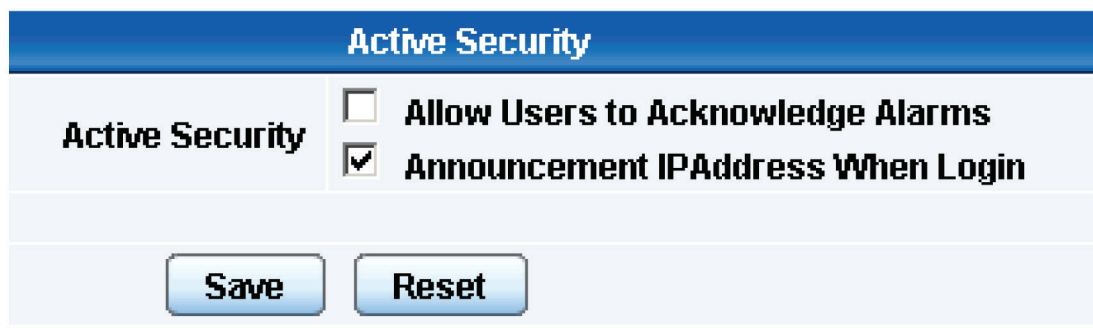
Figure 3-26. Active Security screen.

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3.5.5 The NAC or Network Access Control Security Feature

Figure 3-27. Network Access Control screen.

The NAC or Network Access Control feature enables you to restrict access to the Web interface for only certain IP addresses, or deny access to the Web interface for only certain IP addresses.

3.6 Setting Up a Sensor

This section describes the basic setup of a sensor, using a Black Box temperature sensor as an example. If you require information on specific functions of a particular sensor, then download the manual for that sensor from our Web site, www.blackbox.com.

1. Plug the sensor into one of the RJ-45 "intelligent sensor ports" on the ServSensor's rear panel. In this example, we will use Port 1. See Figure 3-28.

Figure 3-28. Intelligent sensor Port 1.

2. Point your browser to the ServSensor's IP address (the default is 192.168.0.100). Log in as the administrator using your administrator password (the default is "public"). You will then be taken to the summary page shown in Figure 3-29.
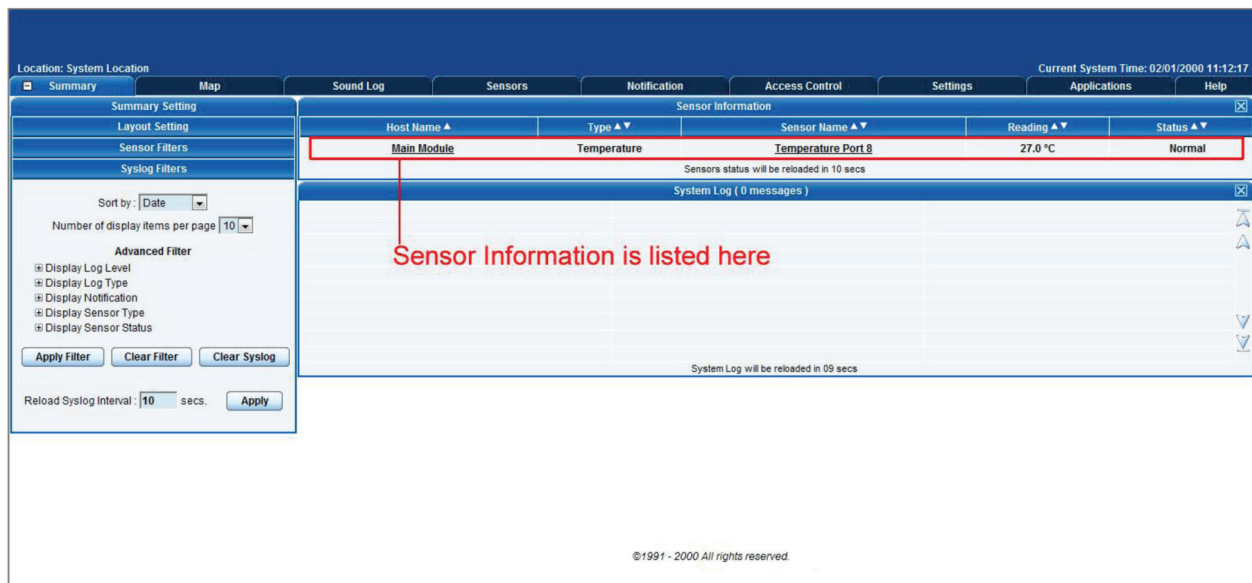
Figure 3-29. Summary page.

The temperature sensor should be listed, along with its current reading and status.

This summary page enables you to quickly see which sensors are connected and their status, view the system log, and also view footage from any connected cameras. Next are some of the tools the Web-based interface provides for getting feedback from the sensors.

3. Click on the temperature sensor's name (indicated in Figure 3-29). This will bring you to Figure 3-30, the Sensors page.
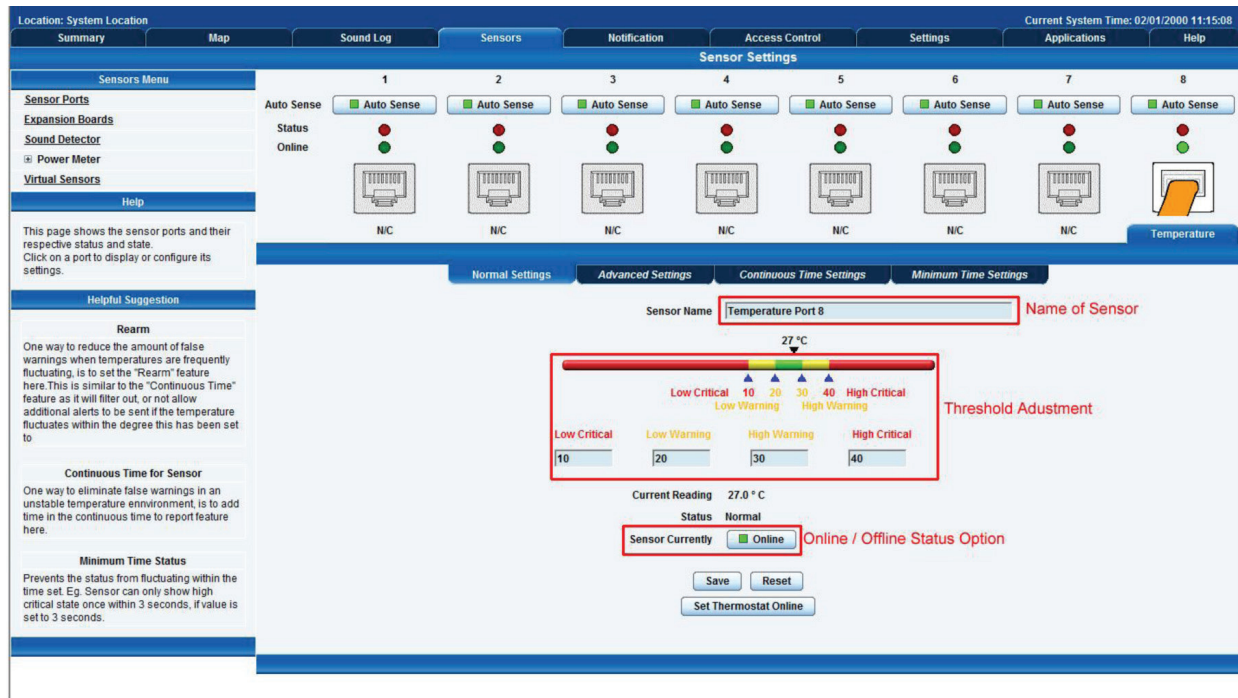
Figure 3-30. Sensors page.

NOTE: Another way to access this page is to click on the "Sensors" tab at the top of the page.

3.6.1 Notification Thresholds

From this page, you can carry out various operations as indicated above. You can also view the current status (normal, low critical, high critical, etc). In Figure 3-30, the sensor indicates a temperature of 27° C and a status of Normal. If you click on the blue marker arrow next to the "Threshold adjustment" label (shown in Figure 3-30), you can drag this marker to re-configure the thresholds. After dragging the marker, click "Save." In Figure 3-31, you can see that this marker has been moved to make a new threshold, and the sensor status has changed along with it.
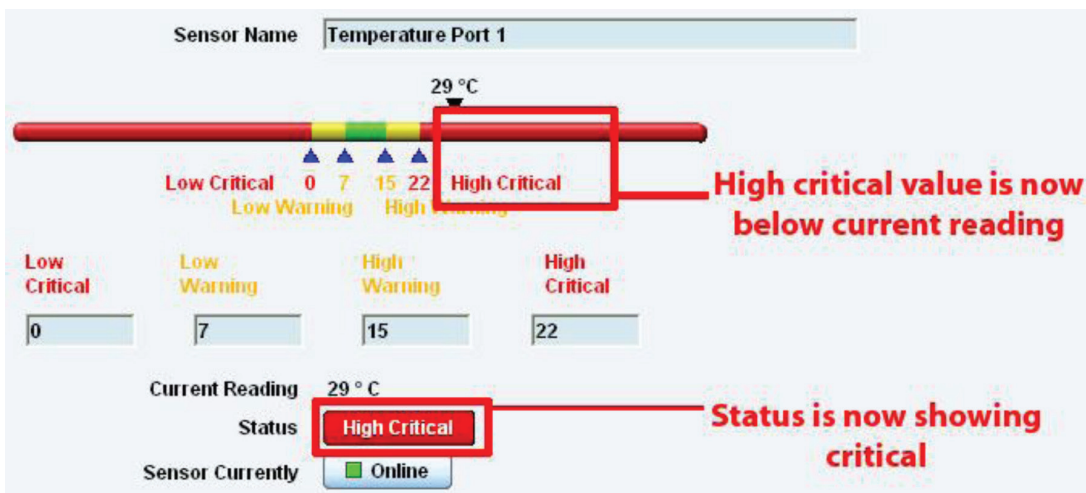
Figure 3-31. High critical status shown.

If the marker is then dragged back above the current temperature reading, the status should return to a normal condition again. (See Figure 3-32.)

NOTE: If this does not happen right away, press the browser's refresh button.
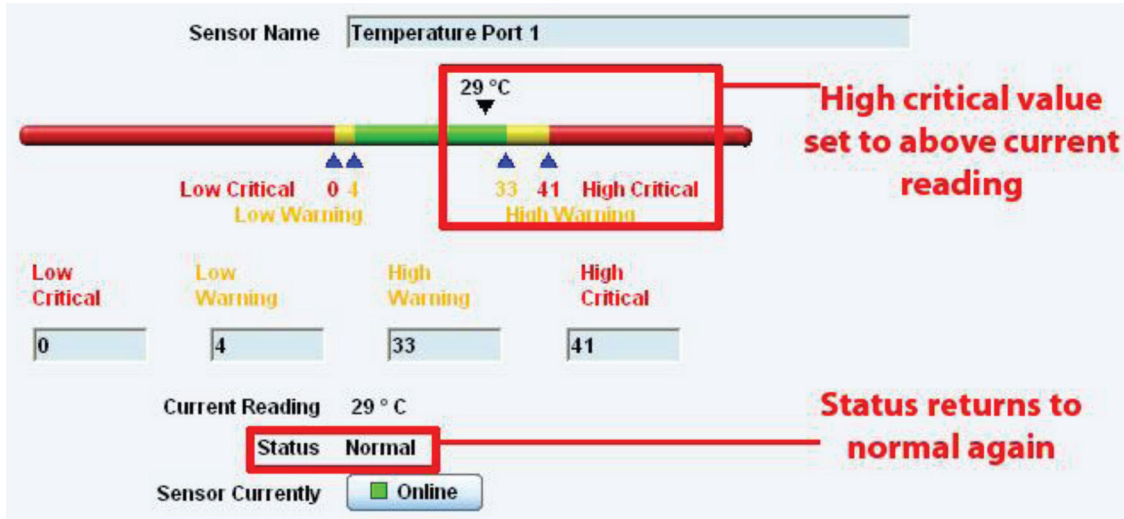
Figure 3-32. Normal status indicated.

If you want to take a sensor offline, then click on the "Sensor Currently" button. This will place the sensor offline and you won't have to physically unplug it. See Figure 3-33.

Figure 3-33. Sensor Online/Offline screen.

Your page will look similar to Figure 3-34 after you take the sensor offline.
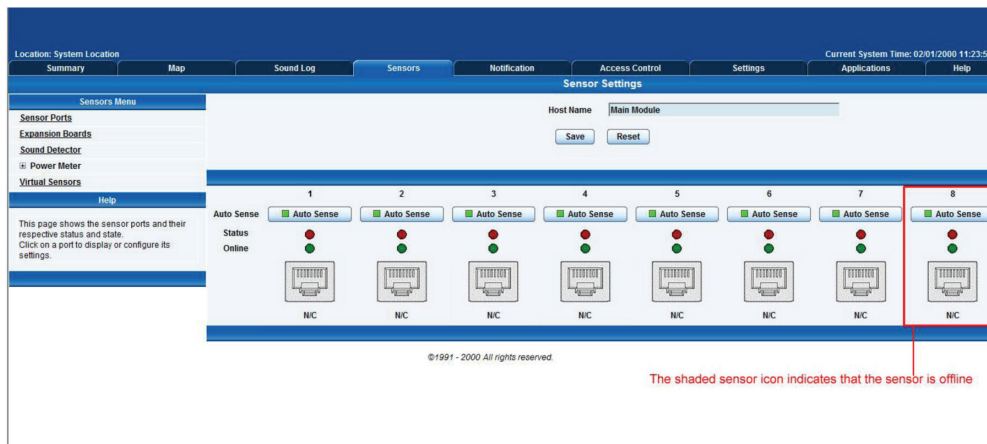
Figure 3-34. Sensor Offline screen.

To bring a sensor back online, select the type from the drop-down menu and click "Save." See Figure 3-35.
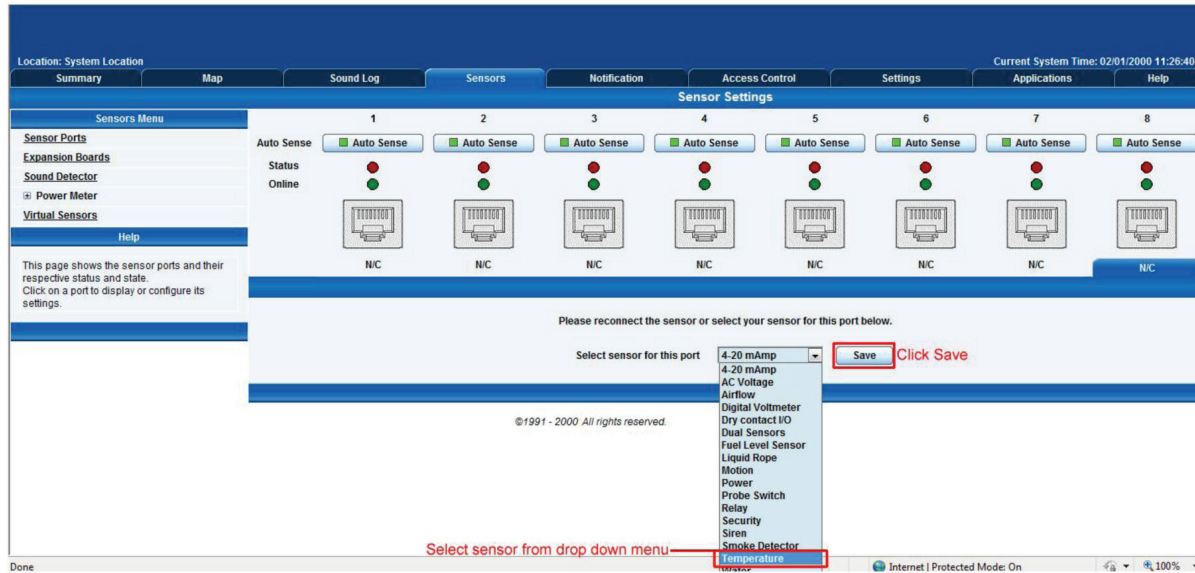
Figure 3-35. Select Sensor Type screen.

3.6.2 Advanced Sensor Settings

Click on the Advanced Settings tab to get the options shown in Figure 3-36.
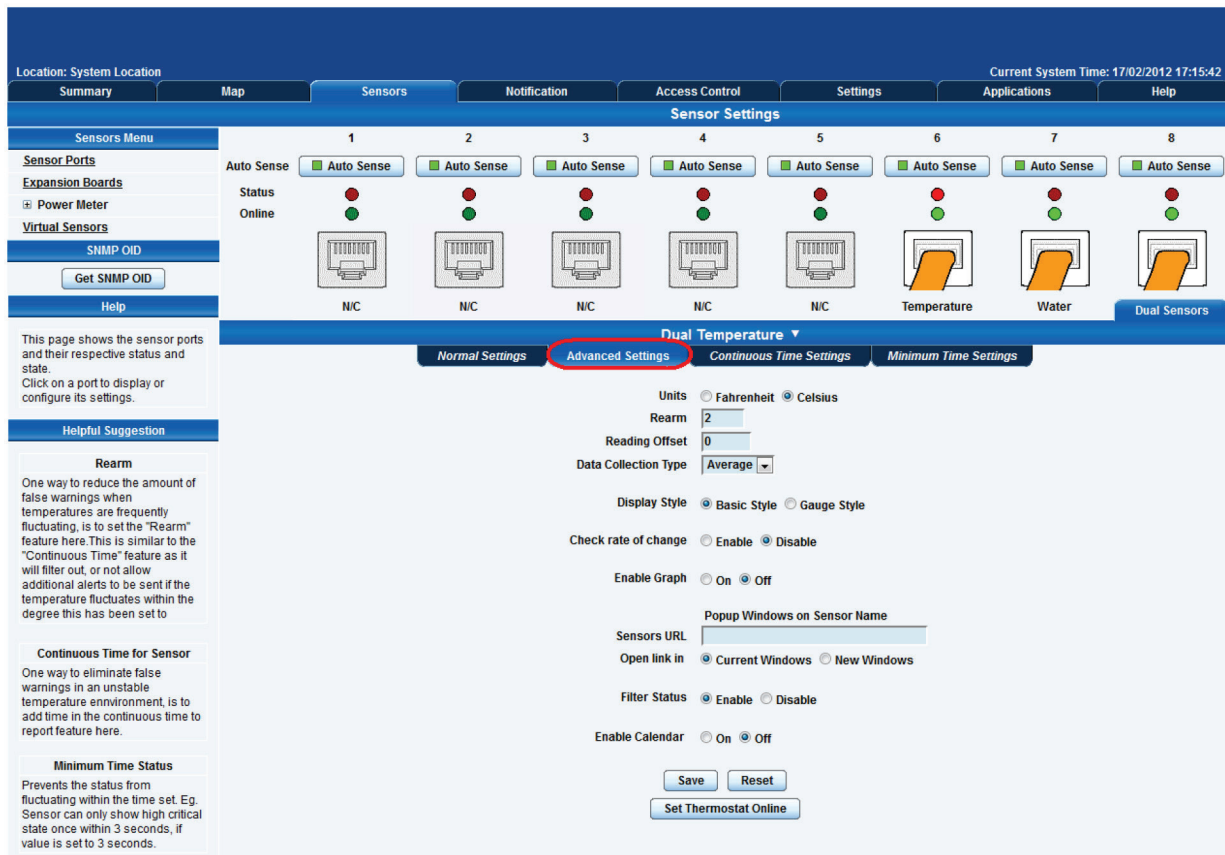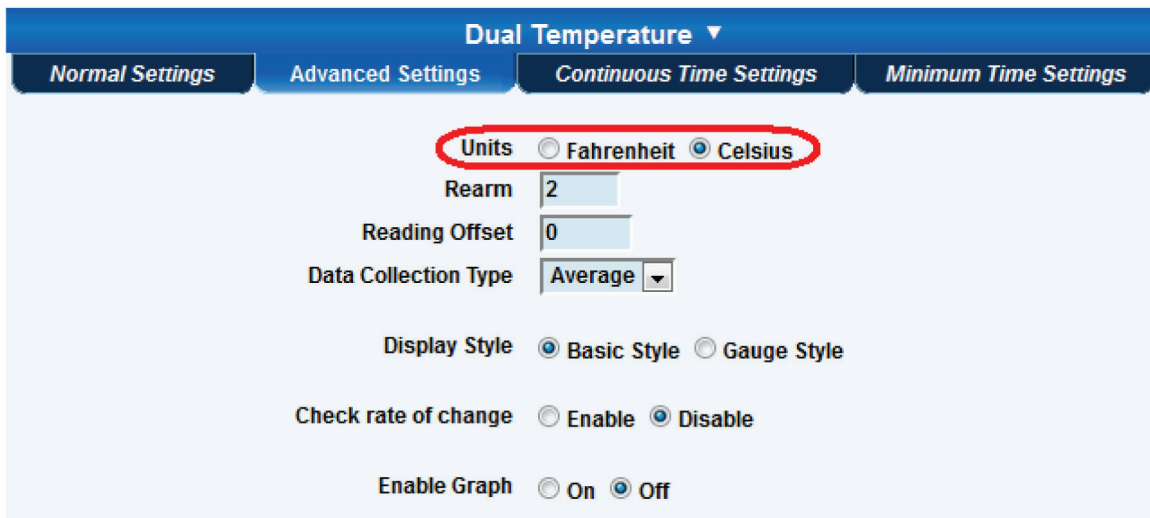
Figure 3-36. Advanced Sensor Settings screen.
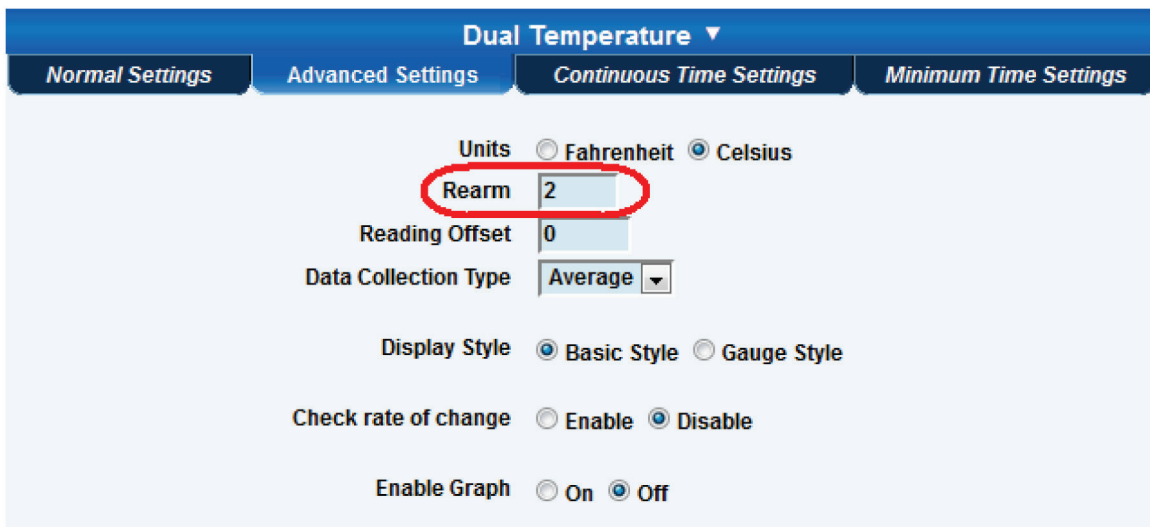
Advanced Mode Functions:

FIgure 3-37. Advanced mode functions, units.

Units: Changes units from C to F or vice versa.

Figure 3-38. Advanced mode functions, rearm.

Rearm: The Rearm parameter is useful for sensors, such as the temperature and humidity sensors, whose values can vary.

This prevents the sensor from flickering between two states. For example, if the Warning High threshold for the temperature sensor is set to 80 degrees, and the sensor temperature varies between 79 and 80, you could be faced with a very large number of e-mails, traps, and events logged. The Rearm parameter prevents this by forcing the temperature to drop by the Rearm value before changing the state back to normal. In this example, if Rearm is set to 2, then the sensor would have to drop from 80 down to 77 before the status would change from Warning High back to normal.

Figure 3-39. Advanced setings, reading offset.

Reading offset: A calibration tool. If you want to calibrate the temperature sensor, for example, you could enter an offset value of 5. This means that if the sensor reads 20 degrees then it would record as 25 degrees. This figure can also be a minus figure (for example, -5 would show 15 degrees instead of 20).

Figure 3-40. Advanced settings, data collection type.

Data Collection Type

This refers to the data collection from the sensor and how the data is then displayed on the graphs.

There are three options for collection of data: Average, Highest, and Lowest. The default setting is "Average."

When the data collection type is set to "Average," the output graphs for the daily, monthy, and yearly all have the same size on the screen. For the daily graph, each data point on the graph is one data point collected from the sensor. But for the monthly and yearly graph, to display more data into the same size as for the daily graph, some consolidation on the data is needed. One data point on the monthly and yearly graph is the average of the sensor data in a range.

The maximum and minimum values showing on the monthly and yearly graphs are the value of this consolidated data and not the raw data over that period of time.

When the Data Collection Type is set to the highest setting,then you will get the graphing output dsiplaying the sensor's highest reading. This is the same for the lowest setting.

Figure 3-41. Advanced settings, display style.

Display Style

You can keep the sensors "Dislplay Style" in the Web interface as the Basic Style (slide bar) or you can change it to "Gauge Style."
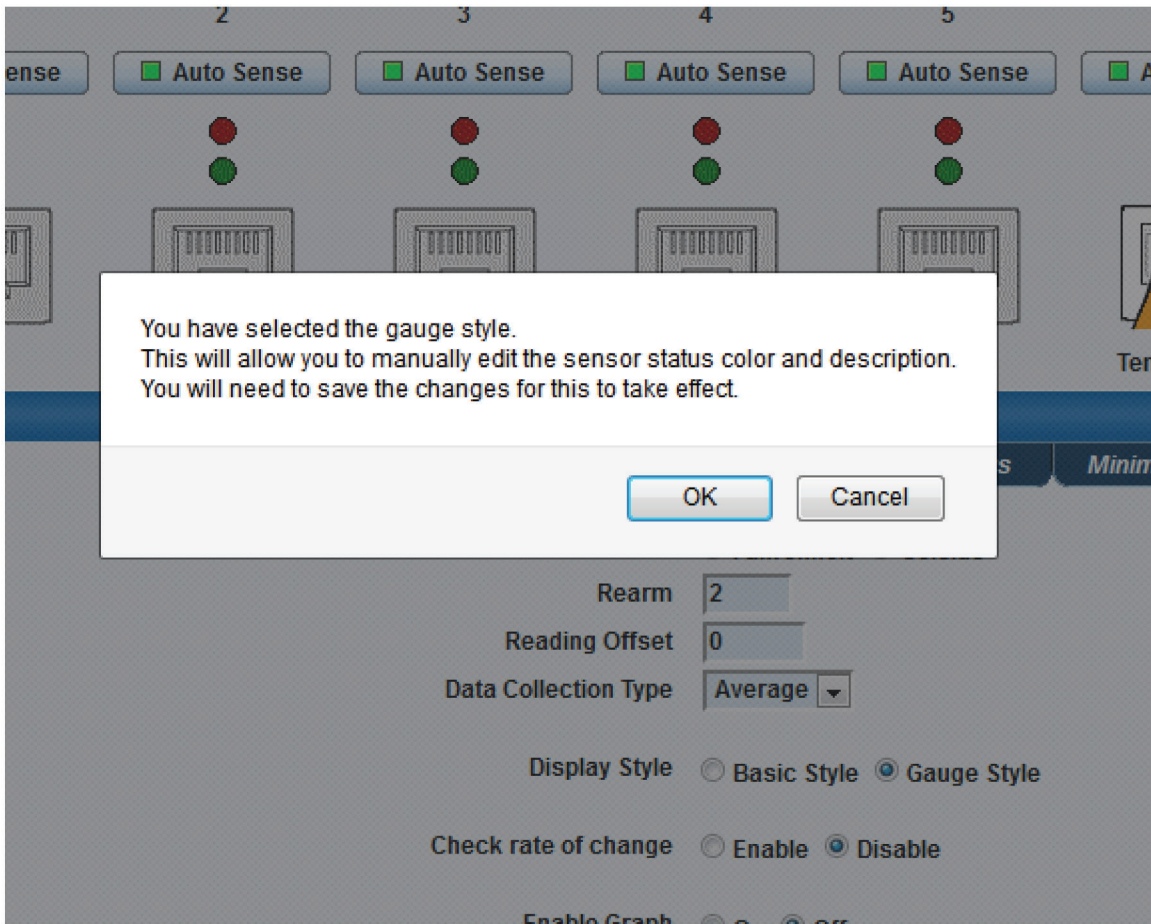
Figure 3-42. Gauge Style screen.

When switching to the Gauge Style type, you will first be prompted with the popup dialog box shown above.
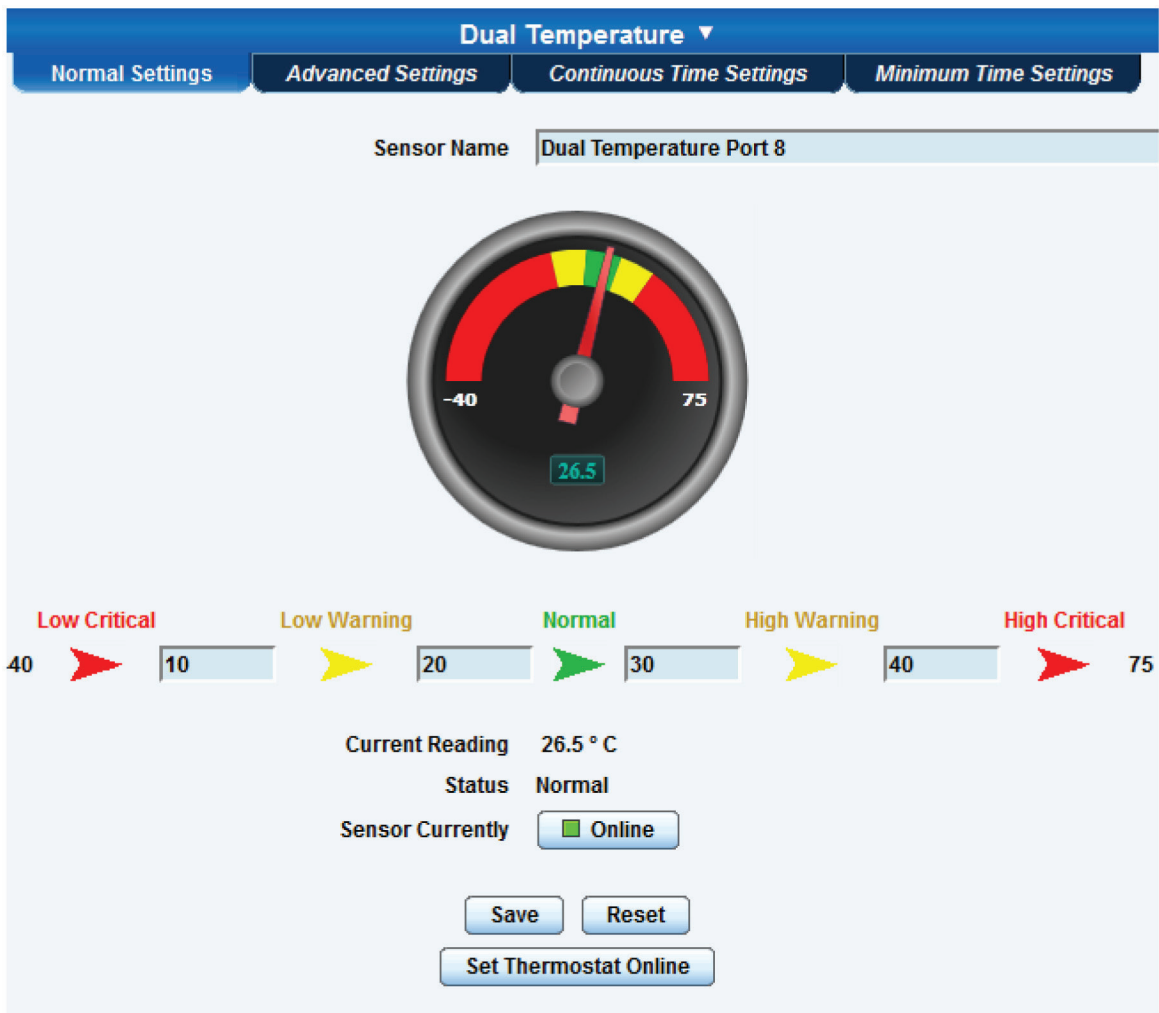
Figure 3-43. Sensor threshold levels.

You will now see the new display where you can set the sensor's threshold levels as shown above.
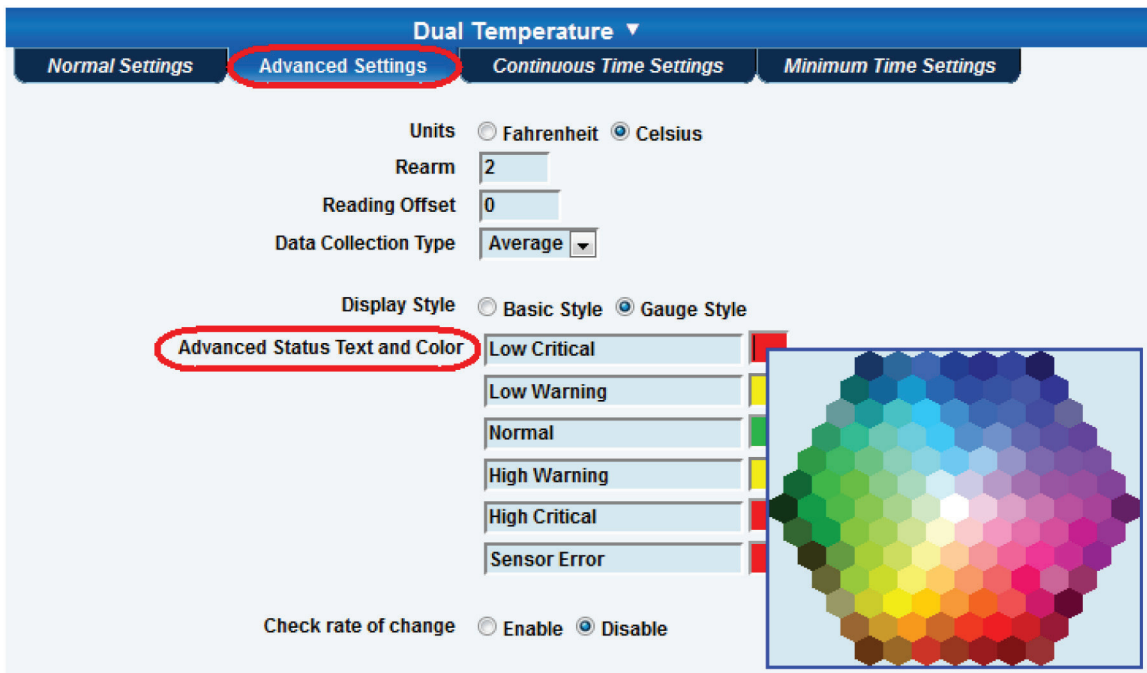
Figure 3-44. Advanced Settings Text and Colors screen.

After clicking on the "Advanced Settings" tab, you can change the text and colors for each sensor threshold as shown in the screen above.
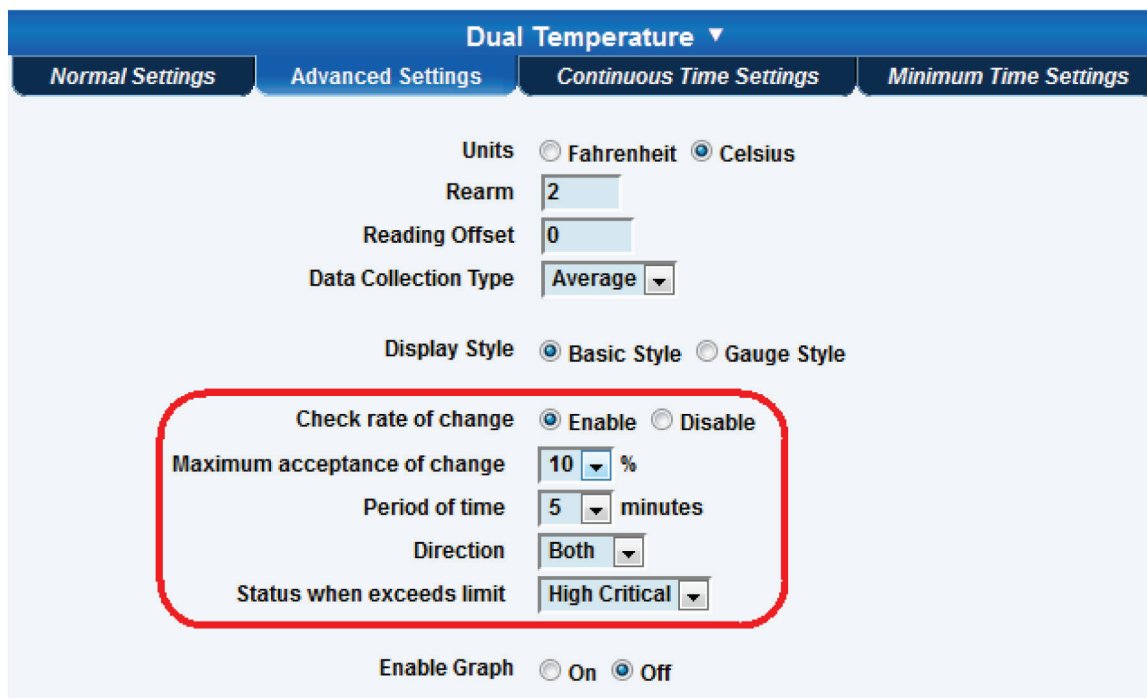
Figure 3-45. Advanced Settings, Check Rate of Change screen.

Check rate of change

When enabling the "check rate of change" feature for the sensor, you can set the rate in a percentage ranging from 1% to 80% over a period of time ranging from 1 to 20 minutes. You can set the direction to Up, Down, or Both, and you can set the Status when the limit is exceeded to show either High Critical or Low Critical.

You can tie this sensor alert to any notification. Use it with a fuel level sensor to alert you to theft of fuel or leaks in storage tanks.

Continuous Time Settings and Minimum Time Settings Tabs

The following advanced functions set the time frame in which the system should delay a notification being triggered when a sensor gives a reading that exceeds the thresholds (high warning, normal, etc).

Continuous Time to Report High Critical: This helps to eliminate unnecessary messages during minor fluctuations. You can set the amount of time to delay a notification of a status change from high warning to high critical. Enter the time in seconds and press the "Save" button. The amount of time that you can enter is between 0 and 65535 seconds, which equals approximately 18 hours.

Continuous Time to Report High Warning: As above, but delays notification for "High Warning."

Continuous Time to Report for Normal: As above, but delays notification for return to "Normal" state.

Continuous Time to Report for Low Warning: As above, but delays notification for "Low Warning" state.

Continuous Time to Report for Low Critical: As above, but delays notification for "Low Critical" state.

Continuous Time to Report for Sensor Error: As above, but delays notification being sent for sensor going into an error state.

Example: An airflow sensor or humidty sensor may have temporary drops in readings that are normal operating characteristics; a logical time limit is set to show abnormal conditions.

Enable Calendar: If you select this option, the screen shown in Figure 3-46 will be displayed.
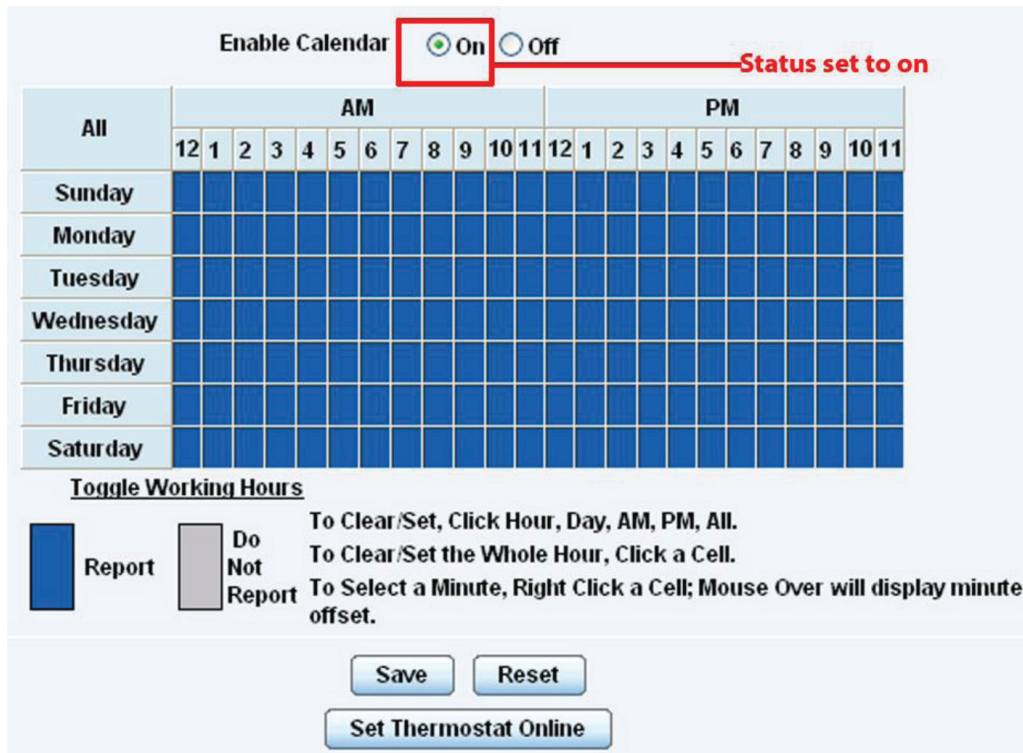
Figure 3-46. Enable Calendar Status screen.

In this example, we want to monitor an office building between the hours of 7 PM–9 AM Monday–Friday only. You can see in this picture we have selected the "Do Not Report" option for the hours in which we do not want to receive any notifications or have any events logged. You change the status of that time frame (Report/Do Not Report) simply by clicking on the square. This will change it from blue to gray; a second click will return it to blue.
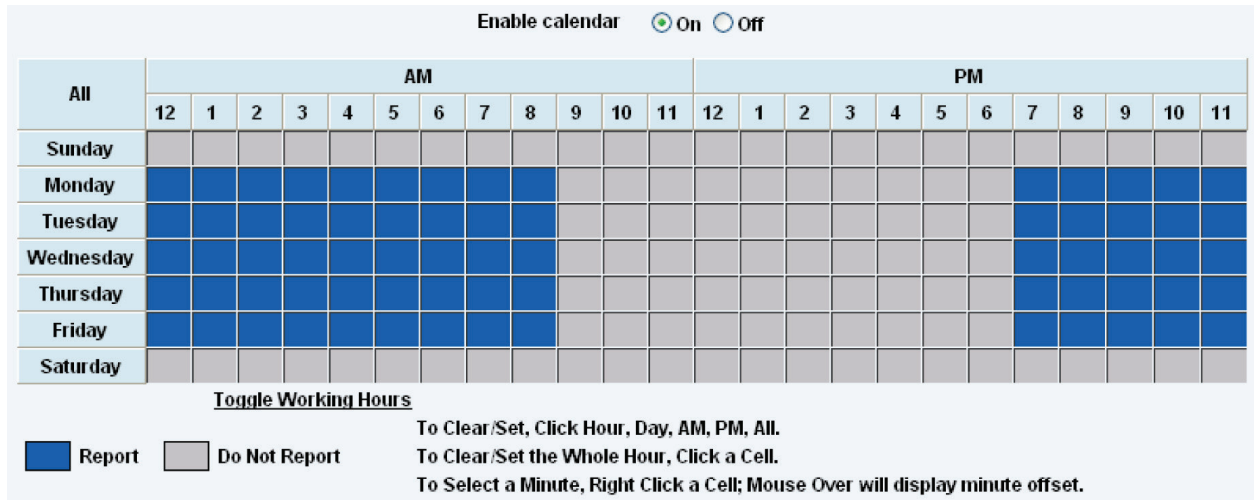
Figure 3-47. Enable Calendar screen.

3.7 Using an Internal Mic as a Sound Detection Sensor

You can use the internal microphone (or an external plugged into the line in jack) as a sound detector.

This tutorial provides you with the information you need to set up the internal mic as a sound detection sensor.

To get to the starting point of this tutorial:

• Log into the Web based interface.

• Click on the Sensors tab.

1. Click "Sound Detector" under the Sensors menu. See Figure 3-48.

2. Click "Advanced Mode."

3. After you click on the Advanced Mode button, you'll see the advanced options available. (See Figure 3-49.)
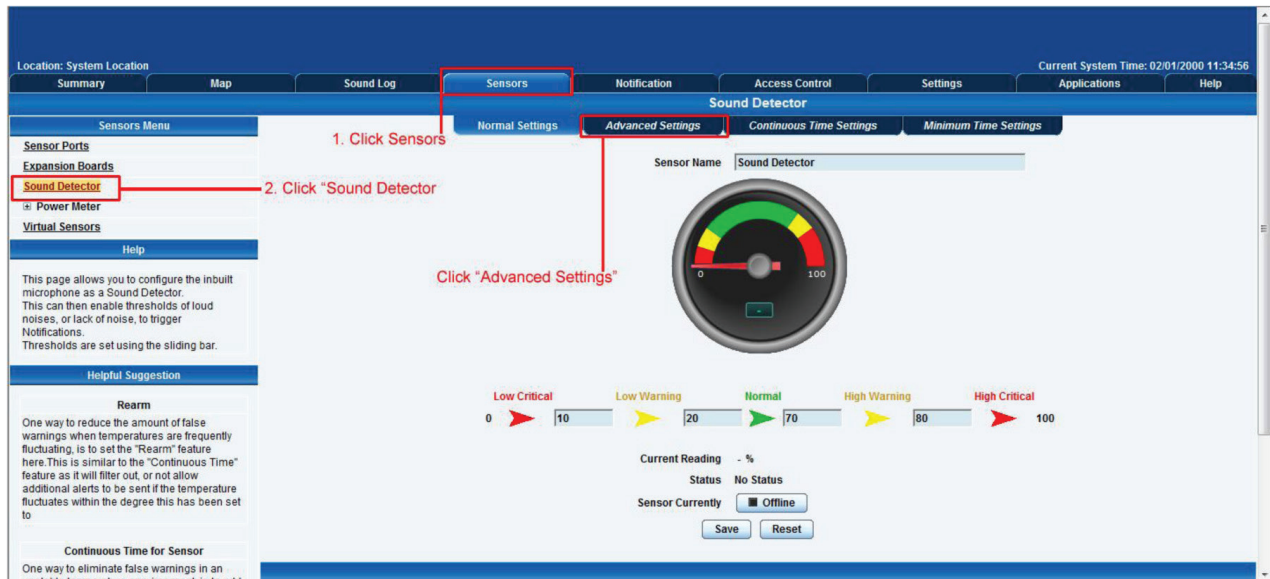
Figure 3-48. Sound Detector tab.

Figure 3-49. Advanced options.

Recording Source: Here you can choose either internal or external microphone.

Microphone Boost (+20 dB): Boosts the microphone by 20 dB.

Microphone Sensitivity: The level of sensitivity that can be set.

For example, if you set the level to 80, the microphone will detect more sound than if the level were set at 20.

Pulse Length: This defines the minimum duration of a sound to trigger an alert notification.

Rearm: The Rearm parameter prevents the sensor from flickering between two states. For example, if the Warning High threshold for the sound sensor is set to 80 and the sensor temperature varies between 79 and 80, a very large number of e-mails, traps, and events would be logged. The Rearm parameter prevents this by forcing the signal level to drop by the Rearm value before changing the state back to normal. In this example, if Rearm is set to 2. then the sensor would have to drop from 80 down to 77 before the status would change from Warning High back to normal.

Data Collection Type: There are three settings for this parameter: lowest, highest, and average. Data will be collected for the lowest, highest, or average sound reading accordingly.

Advanced Status Text and Color: Here you can select to change your display text and warning colors.

NOTE: As with all the other sensors, you can now set up the sound detector to be attached to a notification. Then, when your thresholds are broken, it will trigger a specified type of notification.

3.8 Expansion Ports

The ServSensor has two expansion ports that enable you to connect up to two daisychainable expansion modules. The available expansion modules are an 8-port intelligent sensor board (EME1X8) and an opto-isolated (16) dry-contact expansion module (EME1DC16). In this section, we will go through the basic setup of the 8-port intelligent sensor board. If you need information on specific functions of a particular sensor or expansion board, then please refer to the relevant manual for that product.

1. Plug the expansion board into one of the two ports located on the front panel of the unit. These are numbered E1 and E2. See Figure 3-50.

Figure 3-50. Plug expansion boards into these ports.

2. From the summary page, navigate to the "Sensors" tab. Then click "Extended port" as outlined in Figure 3-51.
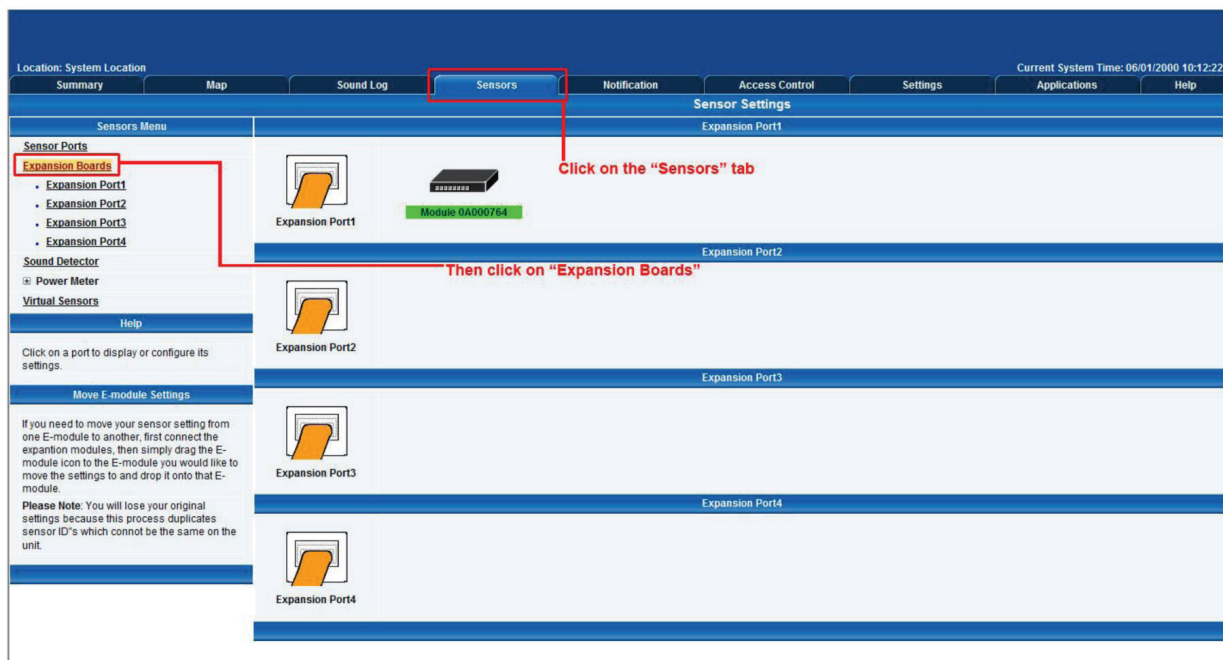
Figure 3-51. Sensors tab, extended port option.

3. A list of all extended ports will be shown. Each port will display any available extension modules, which will be highlighted in green. Click on the module to go to the sensor settings page.
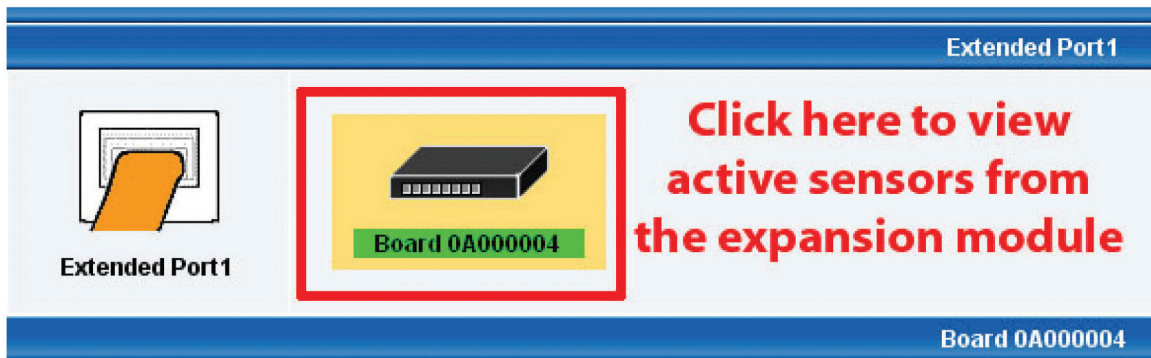
Figure 3-52. Extended Port1 selection.

4. This will bring you to the Extended Port Sensors page (see Figure 3-53).
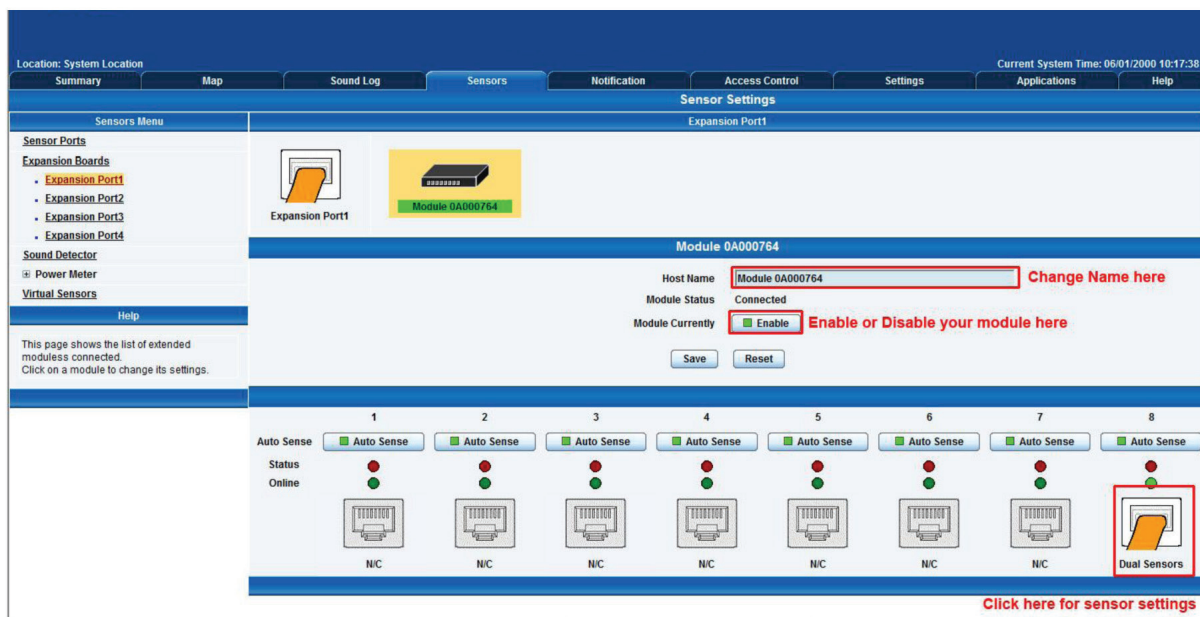
Figure 3-53. Extended Port Sensors page.

5. Once you have clicked on the "Dual sensors" tab, you will be directed to the familiar-looking Notification Thresholds page (see Figure 3-54). From this page, you can carry out various operations as indicated in the sensor settings tutorials.

Figure 3-54. Notification Thresholds page.

4. Notifications

If you set up a notification, you can define the action to take when the sensor gives a reading beyond your set thresholds. This enables you to determine how you will be notified that a sensor's reading has reached the specified parameters (high warning, critical, etc.) described in Chapter 3.

This tutorial provides you with the information you need to set up a notification.

To get to the starting point of this tutorial:

• Login as administrator.

• Click the "Notifications" tab.

4.1 Adding a Notification

1. Click on the "Begin Notification Wizard" tab as shown in Figure 4-1.
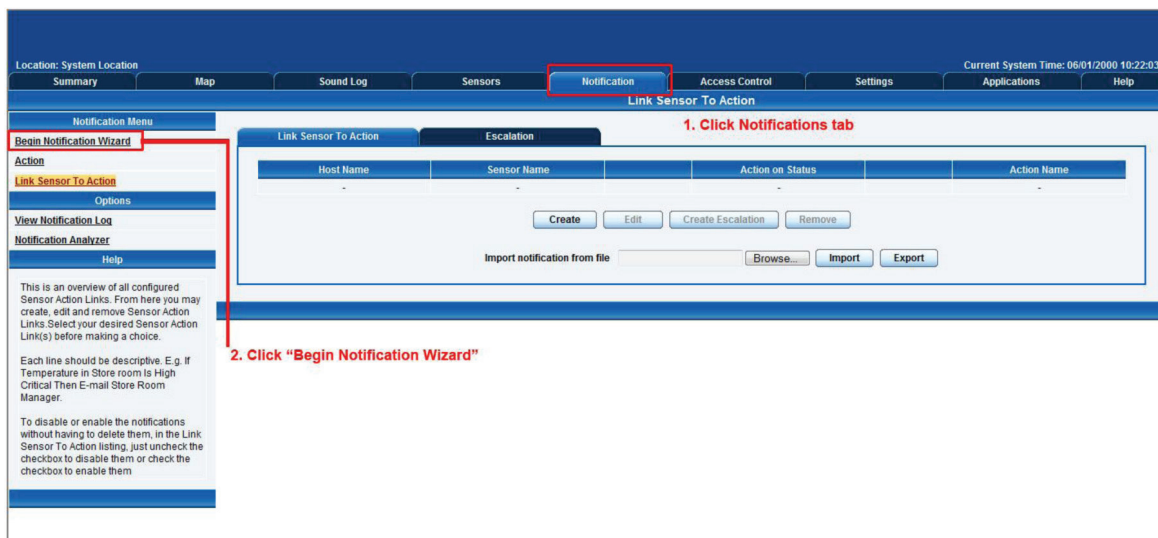
Figure 4-1. Notification Wizard tab.

2. The Notification Wizard page will be displayed as shown in Figure 4-2.
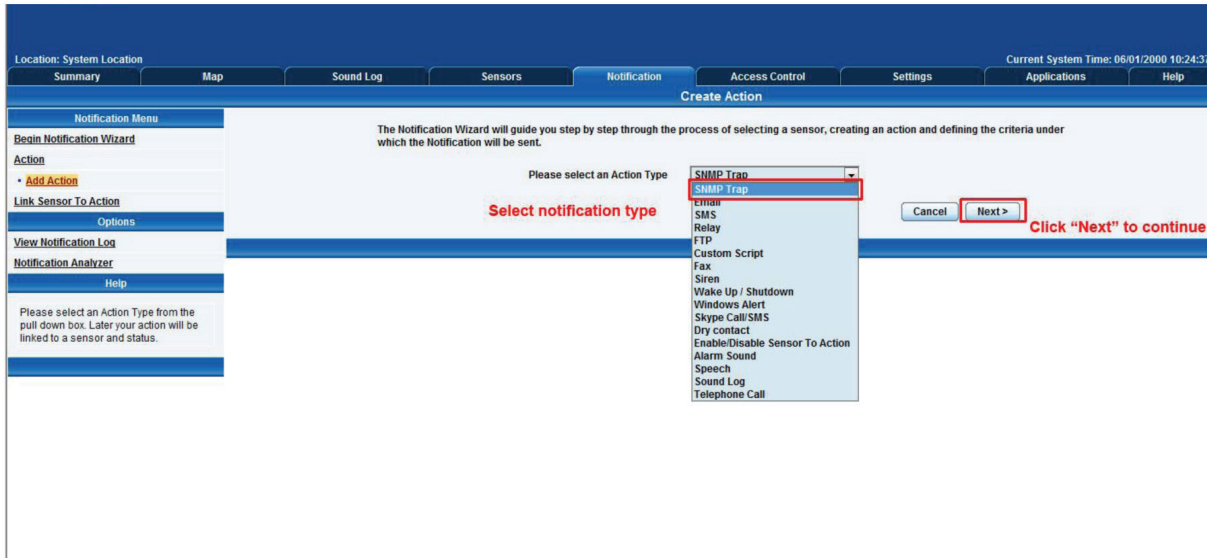
Figure 4-2. Notification Wizard page.

Next, you'll see how to set up a few different ways of notification step by step.

4.2 SNMP Trap

If you set up a notification via an SNMP trap, when your sensor reaches a certain threshold, it will send a notification to your SNMP server.

This tutorial provides you with the information you need to set up an SNMP trap.

To get to the tutorial's starting point:

• Log in as administrator.

• Click the "Notifications" tab.

• Choose "Notifications Wizard."

• Choose "SNMP Trap."

1. After selecting to add an SNMP trap, you will need to fill in the following information shown in Figure 4-3.

Figure 4-3. Add an SNMP trap.

2. Once this information is correct, click the "Add Trap Destination" button. Input another trap or click on "Next." Enter the parameters shown in Figure 4-4.
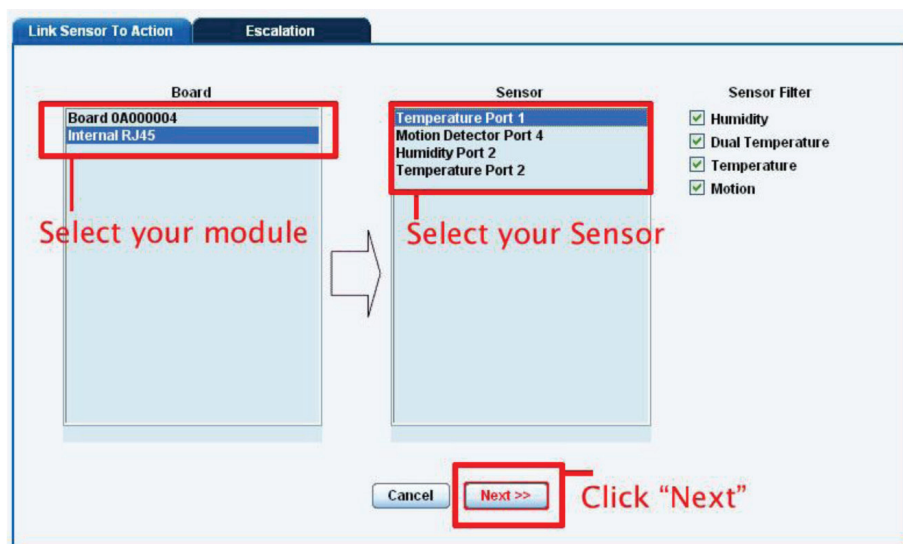
Figure 4-4. Notification parameters.

These parameters set the maximum number of times to send the trap notification and the time interval between each notification.

3. After clicking "Next," you'll see the screens shown in Figures 4-5 and 4-6.

Figure 4-5. Parameter Selection, screen #1.
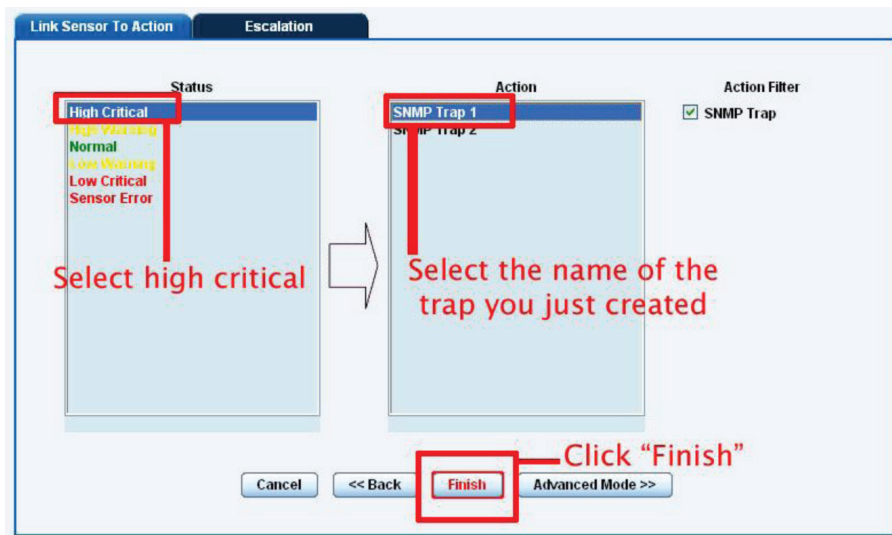
Figure 4-6. Parameter Selection, screen #2.

On these screens, you can select the parameters for when to send the SNMP trap notification. In this example, we selected to bind the SNMP trap to the temperature sensor connected on Port 1. The trap will be sent when the sensor reads a "High Critical" and we bind this to the SNMP trap we just created and named "SNMP Trap 1."

4. Once we have created the parameters for the SNMP trap, we need to make it active. To do this, go back to the "Notifications" tab. (It should look like the screen shown in Figure 4-7.) Click "Create."
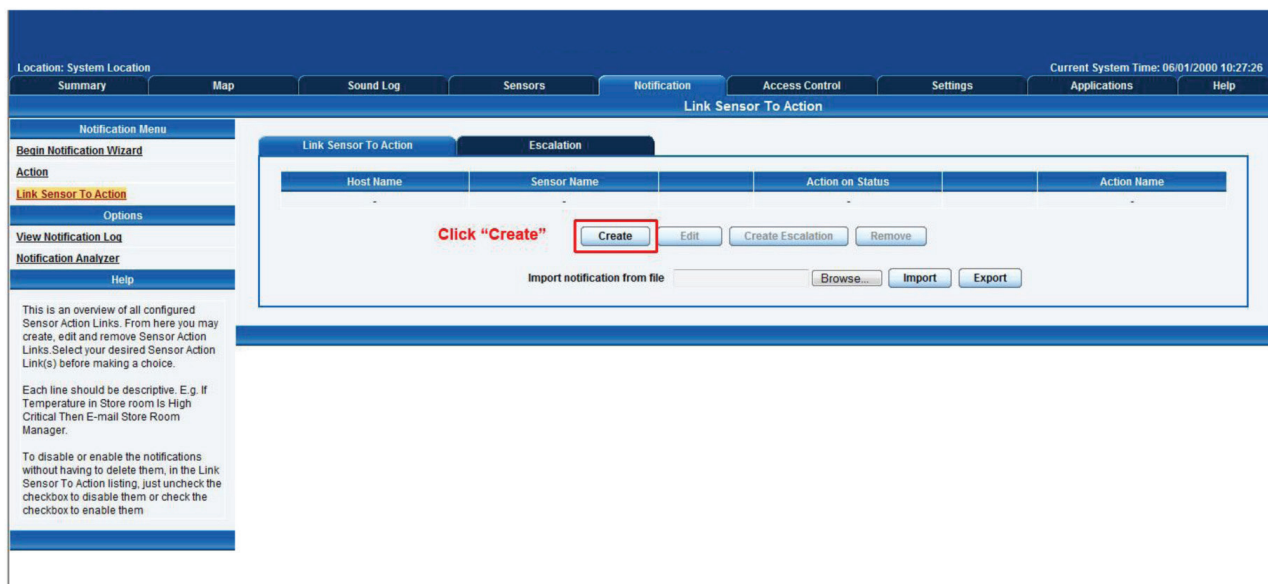
Figure 4-7. Notifications tab.

5. Select the sensor and SNMP trap parameters (see Figures 4-8 and 4-9). First, click on the board that the sensor is attached to and then select the sensor and click "Next."
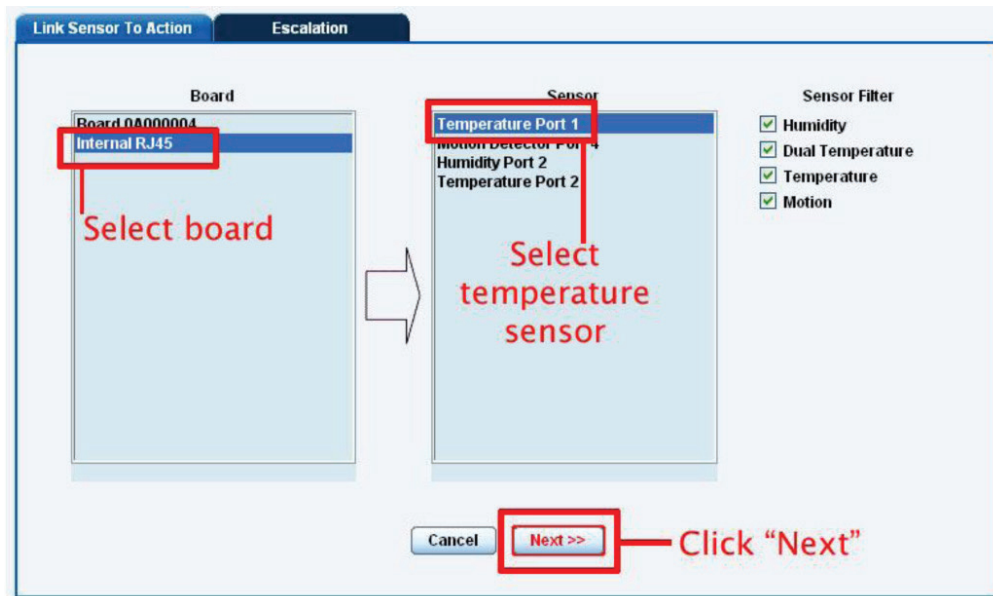
Figure 4-8. Select the sensor.

6. Select the status that you want to issue the notification for, select the action type, then click "Finish."
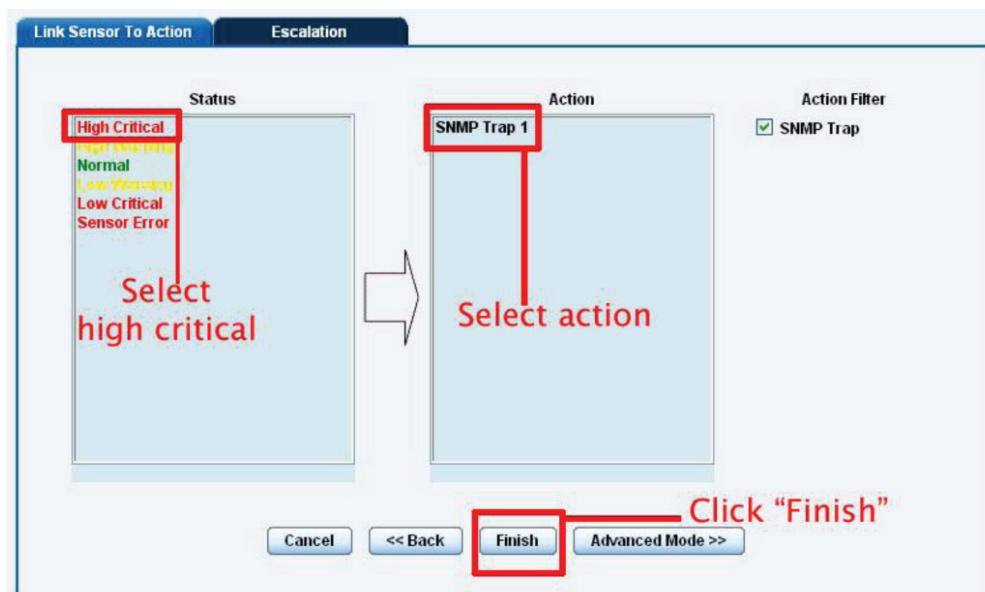
Figure 4-9. Select the SNMP parameters.

7. The SNMP trap has been added to the Notifications page.
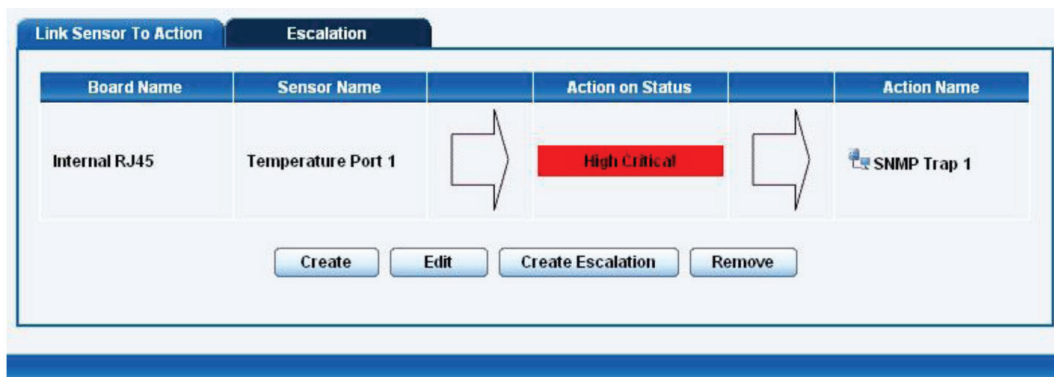
Figure 4-10. SNMP trap added.

NOTE: To remove this trap and make it inactive, highlight the notification and click "Remove."

You can repeat this process to set up multiple SNMP traps for different sensors or for multiple SNMP servers, etc.

4.3 E-mail

This tutorial provides you with the information needed to set up an e-mail notification.

To get to the starting point of this tutorial:

• Log in as administrator.

• Select the "Notifications" tab.

• Click "Notification Wizard."

1. If you set up an e-mail notification, Figure 4-11 will appear. Click the "Action Name" field and choose a name for your e-mail. Click the "Mail From" and "Mail To" fields and enter the appropriate information, then click "Next."
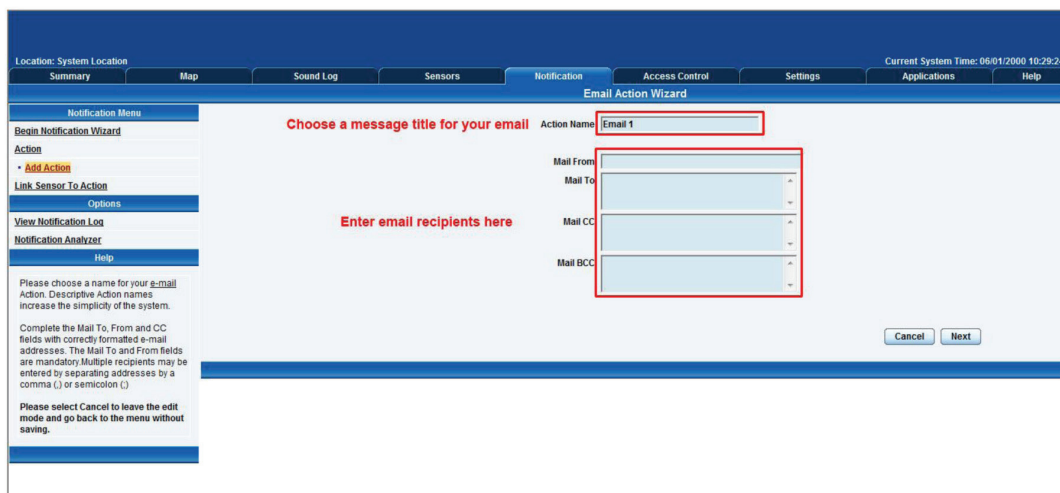
Figure 4-11. E-mail Action Wizard screen.

2. After clicking "Next," you will get a page where you can input the e-mail name and message. Click the "Customize" button, and the fields will re-write in a format that will allow for an automated e-mail that will display the sensor information. (See Figure 4-12.)
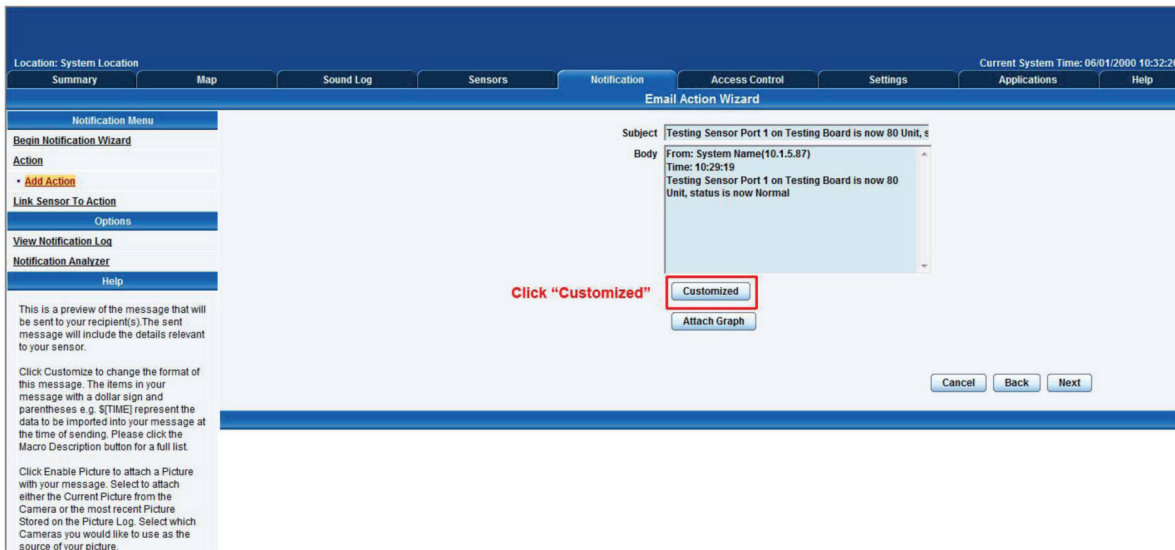
Figure 4-12. Input e-mail name and message.
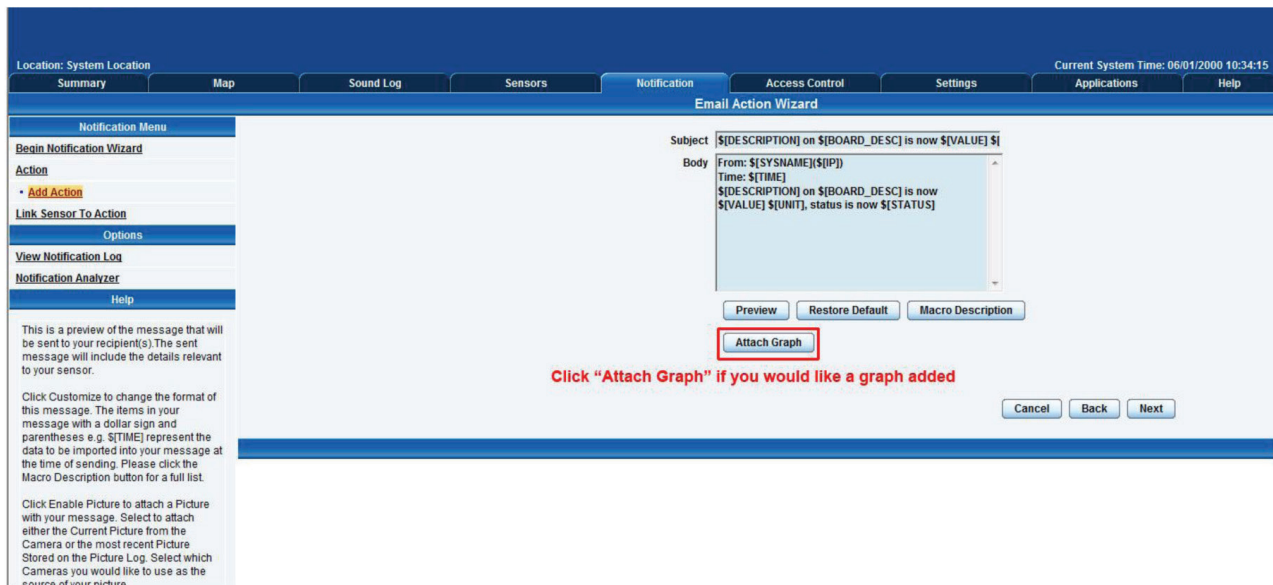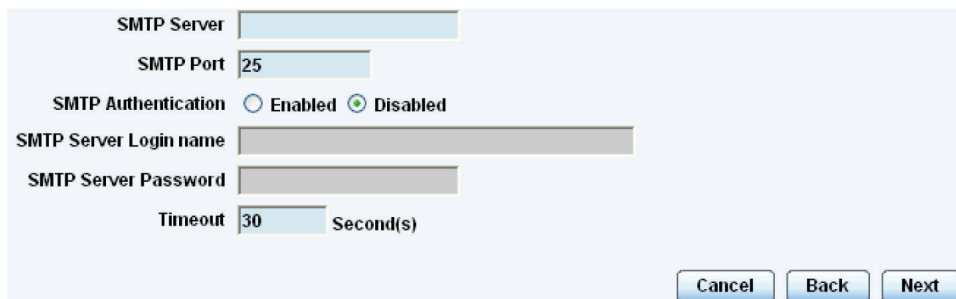
Figure 4-13. Attach graph.

3. Click "Next."

4. Now you need to input your SMTP server address for your e-mail account. (See FIgure 4-14.)
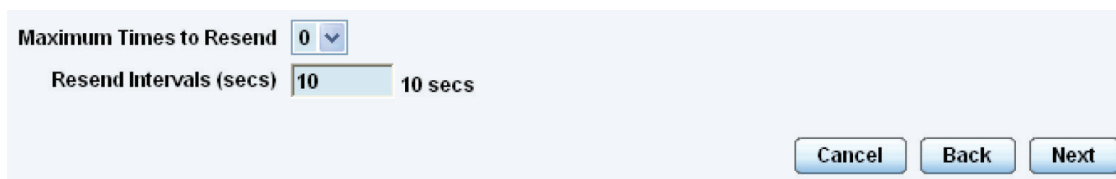
Figure 4-14. Input SMTP server address.

5. Once this is entered, click "Next."

6. Now, as with the SNMP trap, you can select how many times to attempt to resend the e-mail, and the time elapsed between each attempt.

7. Click "Next" after you fill in your parameters. (See Figure 4-15.)
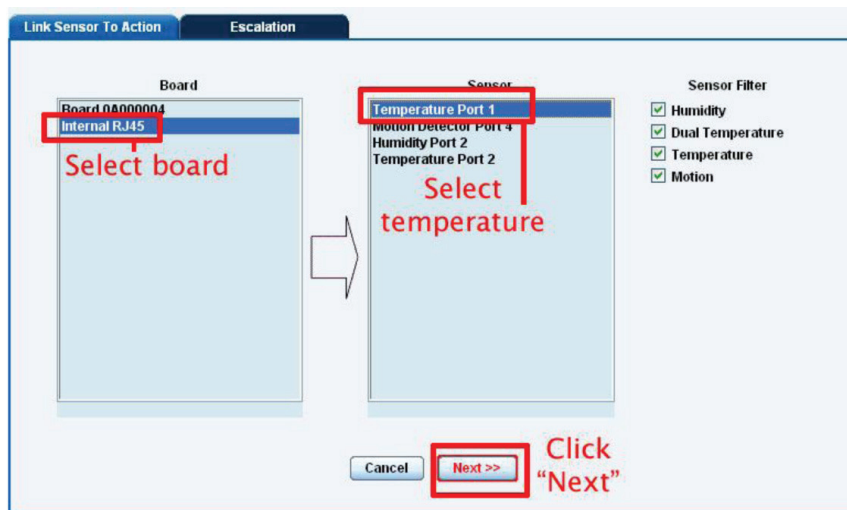
Figure 4-15. Select frequency to resend e-mail attempts.

8. Now link the e-mail you just created to the temperature sensor on Port 1. Select the board the sensor is attached to, then select the sensor and click "Next." (See Figure 4-16.)

Figure 4-16. Select sensor.

9. Select the status you want to issue the alert for and then select the action type. (See Figure 4-17.)
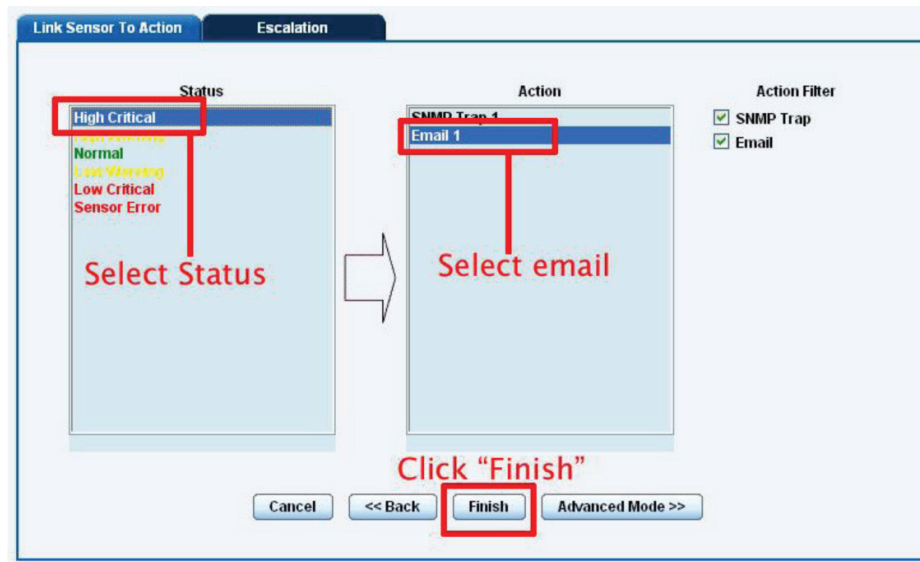
Figure 4-17. Select status and action type.

10. Click "Finish." You will now be taken back to screen shown in Figure 4-18.

11. Click on "Create."
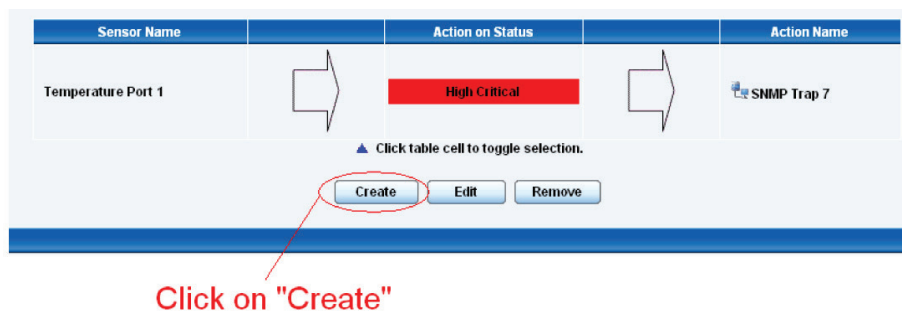
Figure 4-18. Create notification link

12. Create the notification link as before. Then click "Next."
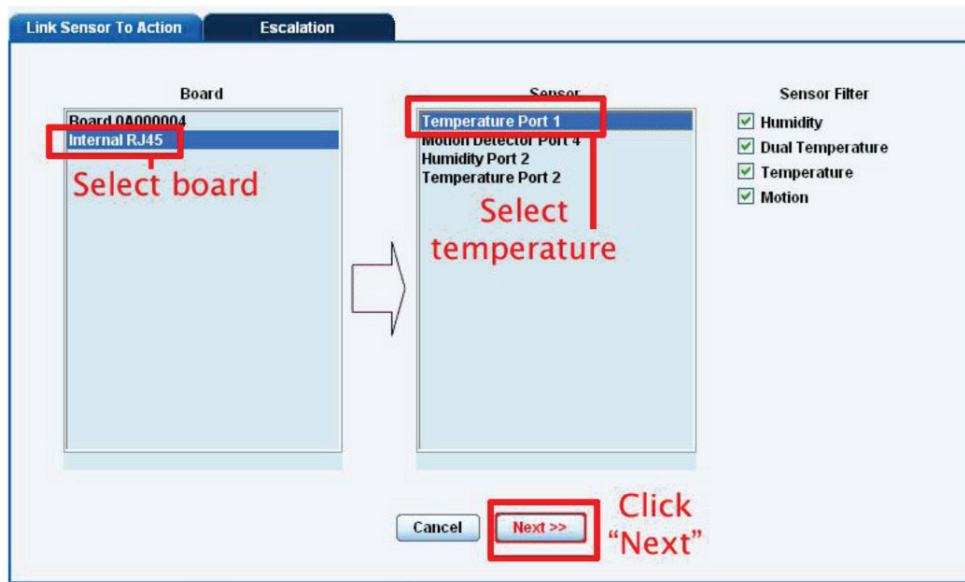
Figure 4-19. Create notification tab: select board, select termperature.
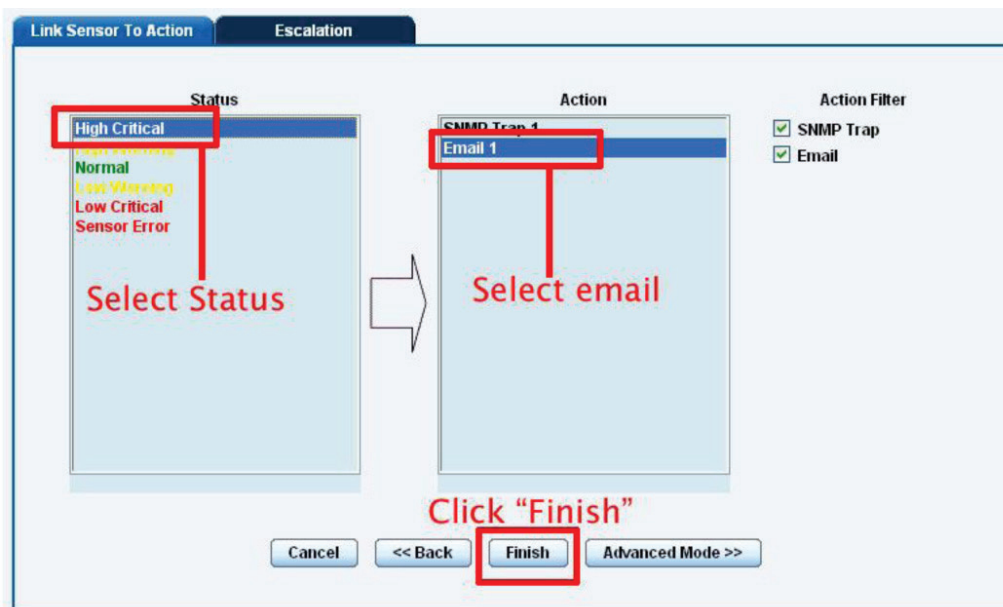
Figure 4-20. Create notification tab: select status, select e-mail.

14. You will now be back at the main notification page. You should now see listed our two notifications, the SNMP trap and the e-mail. (See Figure 4-20.)

As you can see from this page, an SNMP trap is set up to give us notification of a "High Critical," and an e-mail notification that will activate on a "High Warning."

Sensor Name		Action on Status		Action Name
Temperature Port 1		High Critical		SNMP Trap 7
Temperature Port 1		High Warning		Tutorial E-mail

▲ Click table cell to toggle selection.

Figure 4-21. SNMP Trap and E-mail Notificiations screen.

4.4 SMS Notification

Set up a notification so that you will be sent an SMS message. This message can be sent via a GSM/GPRS mobile phone connected via a Bluetooth connection or the USB port.

This tutorial provides you with the information you need to set up a SMS notification.

To get to the starting point of this tutorial:

• Log in as administrator.

• Select the "Notifications" tab.

• Click "Notification Wizard."

1. From the list of notification types, select SMS and click "Next." You will then be presented with the screen shown in Figure 4-22. Select the "Action Name" field and enter a notification name. Then select the "Phone Number" field and enter the phone number you want to send the notification to. Click "Next."

2. You can now either add multiple numbers, delete phone numbers, "Cancel" this action, or click "Next." In this case, we will click "Next." (See Figure 4-23.)

Figure 4-22. SMS Action Wizard, screen #1.

Figure 4-23. SMTP Action Wizard, screen #2.

3. Now we will set up the message that will be sent to the phone. You will see the screen shown in Figure 4-24.

Click the "Customized" button to add a macro to your notification.
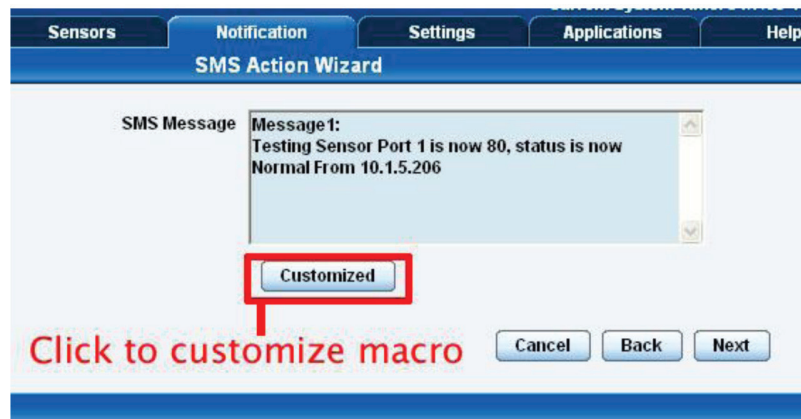
Figure 4-24. Customize Macro screen.

NOTE: A macro is a script that returns specific data collected by the unit. In our example, the macro will tell the notification to contain the "description" (sensor name), the value (current sensor reading), and the status (high/low warning, etc.). These macros are common to all sensor notifications.

4. You will now see that the SMS message has changed its format to include the Macro script. (See Figure 4-25.) Click "Next."

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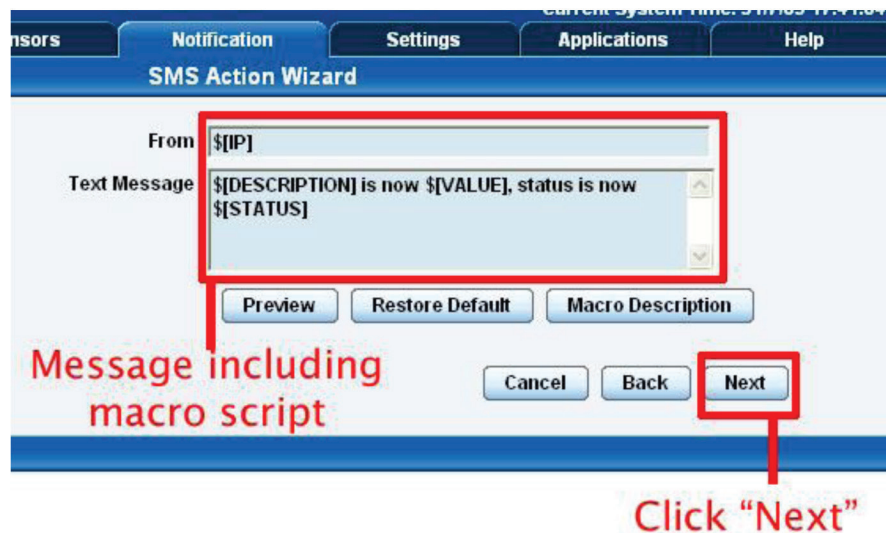
Figure 4-25. Macro script message.

5. Next, we will set up the type of connection. This will depend on the type of modem you are connecting. For the purpose of this tutorial, we will assume you are connecting a GSM/GPRS enabled modem to the serial port. Select COM1 from the list. (See Figure 4-26.)

6. Choose the port that the modem is connected to.

Figure 4-26. Choose the Connection Type You Wish to Use screen.

7. You will now be able to select the number of times you want the SMS to be resent and the interval between sending them. (See Figure 4-27.)

8. Select the number of times you want to resend this notification and the interval (in seconds). Click "Next."
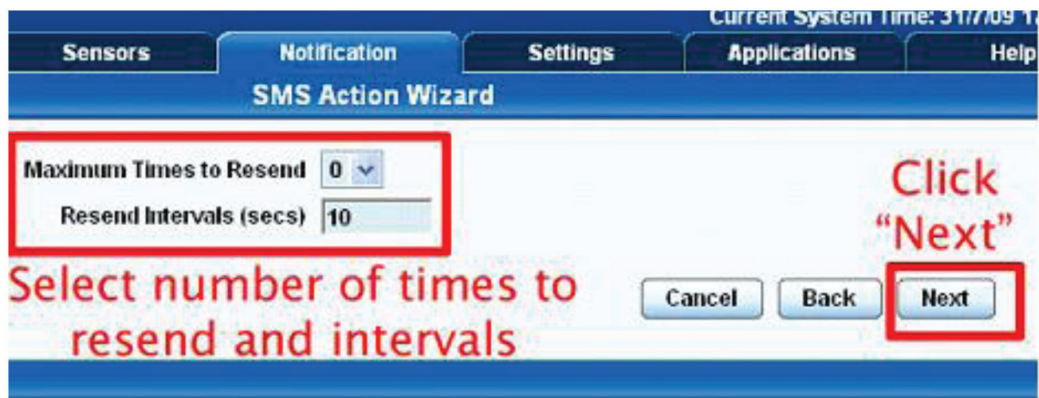
Figure 4-27. Select number of times to resend and intervals.

9. Select the sensor that you want to bind this notification to.

10. Choose the board and sensor, then click "Next."
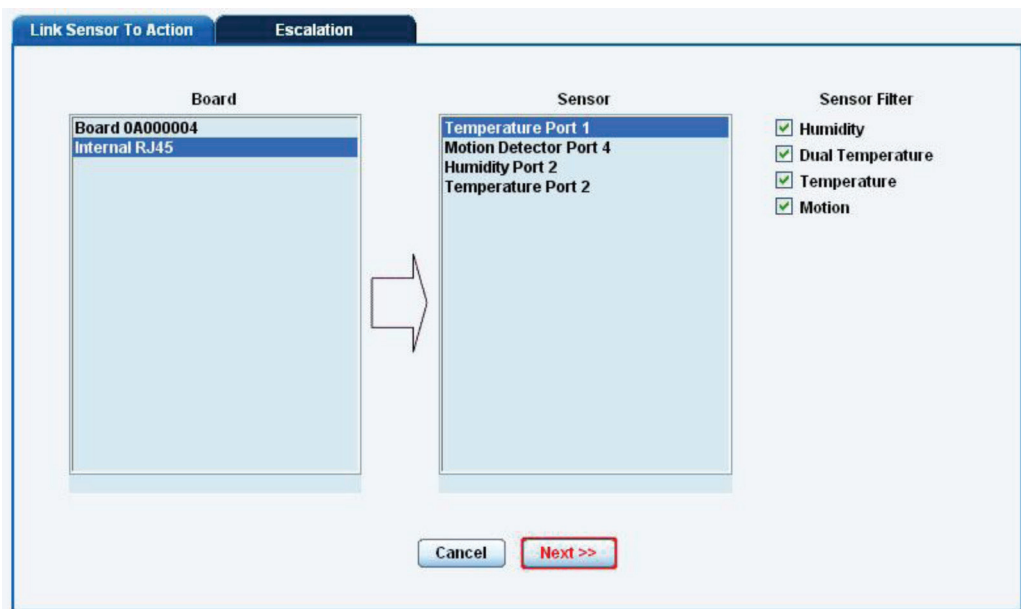
Figure 4-28. Choose board and sensor.
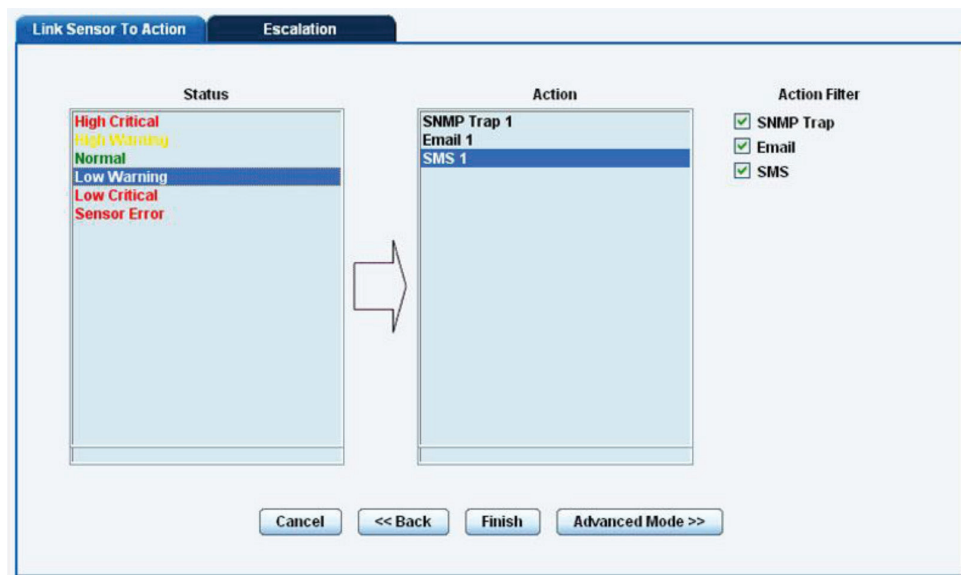
Figure 4-29. Link sensor to action tab.

11. This time we will use this notification for a low warning. Then select the notification name we assigned, in this case we chose "SMS 1." Click "Finish" to finalize this. (See Figure 4-29.)

12. Now we will add the SMS notification to our active list. This is the same process as for the others—simply click on "Create" and then select the appropriate parameters. Follow Steps A–F below and on the next page.

      A. Select the board the sensor is connected to.

      B. Select the sensor.

      C. Click "Next."
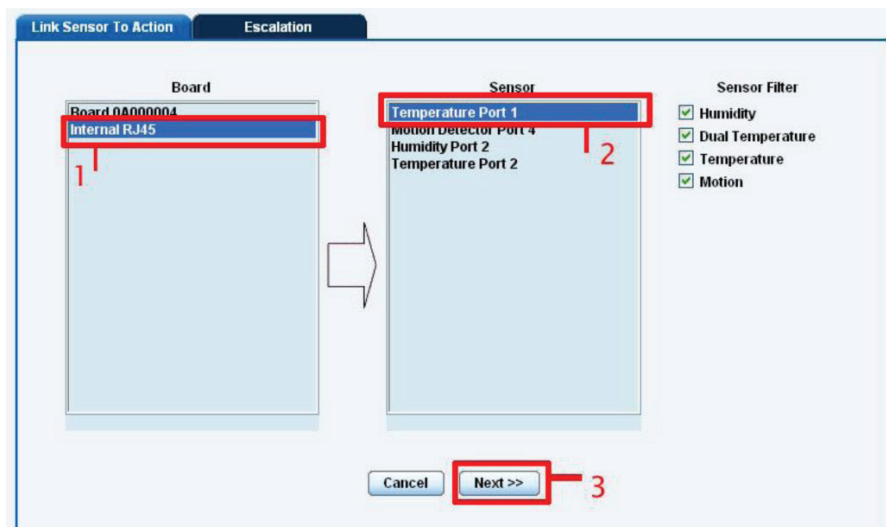
Figure 4-30. Steps A–C.

      D. Select the status you want to issue the alert for.

      E. Select the action type.

      F. Click "Finish."

Figure 4-31. Steps D–F.

13. You will now be back at the main notification page (Figure 4-32). The page should display three types of notifications: the SNMP trap, e-mail, and SMS.

Figure 4-32. Main notification page.

For the purposes of this tutorial, we will not cover the setup of every type of notification. However, with this information you should be able to follow the procedure for the other types of notifications easily, as they all follow a similar format. If you have questions, contact Black Box Technical Support at 724-746-5500 or info@blackbox.com.

5. Mapping

The mapping feature allows instant visual feedback about a sensor's position and status. It is a useful monitoring tool for a setup with several sensors in different positions.

This tutorial provides you with the information needed to set up the mapping feature.

To get to the starting point of this tutorial:

• Log in as administrator.

• Click the "Map" tab.

5.1 Adding a Map

1. First, we need to add a picture file to be used as the map. This can be a blueprint of your office, a 3D picture of your office/site being monitored, or a photo of the wiring closet you are monitoring.

NOTE: The maximum map file size is 512 KB.
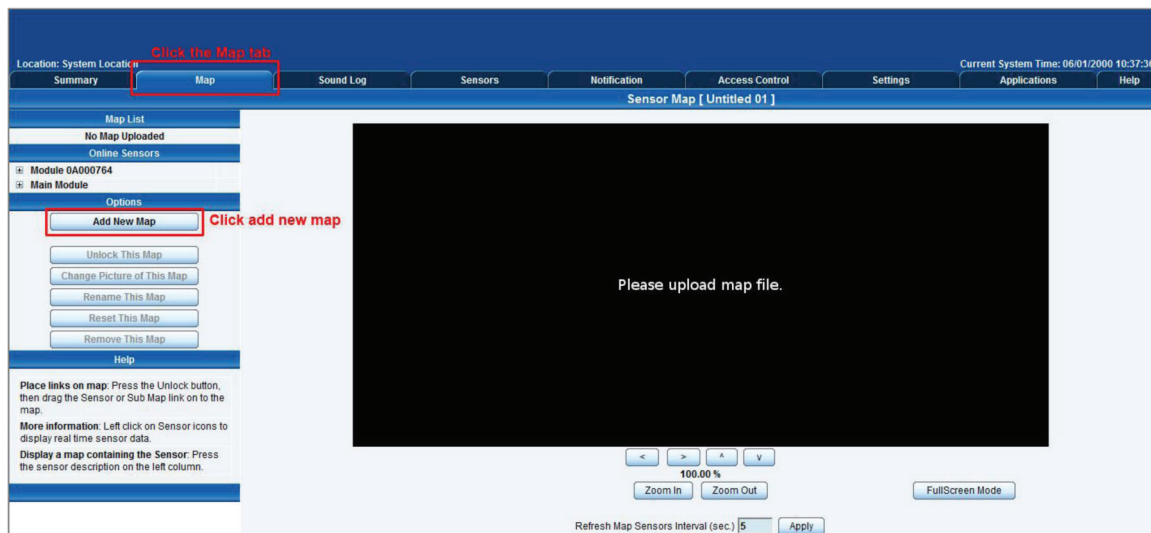
Figure 5-1. Click on the "Map" tab.

2. Browse to the file on your hard drive that you want to use.
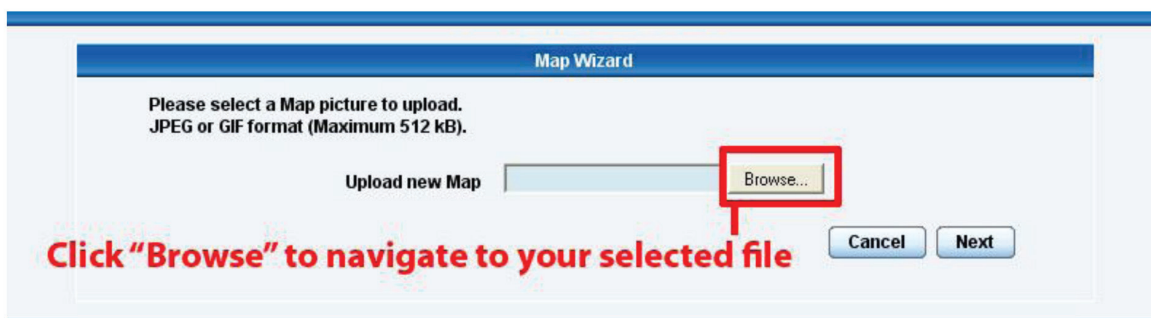
Figure 5-2. Browse to selected file.

3. In this tutorial, we are going to use a 3D map of a town center we are monitoring.
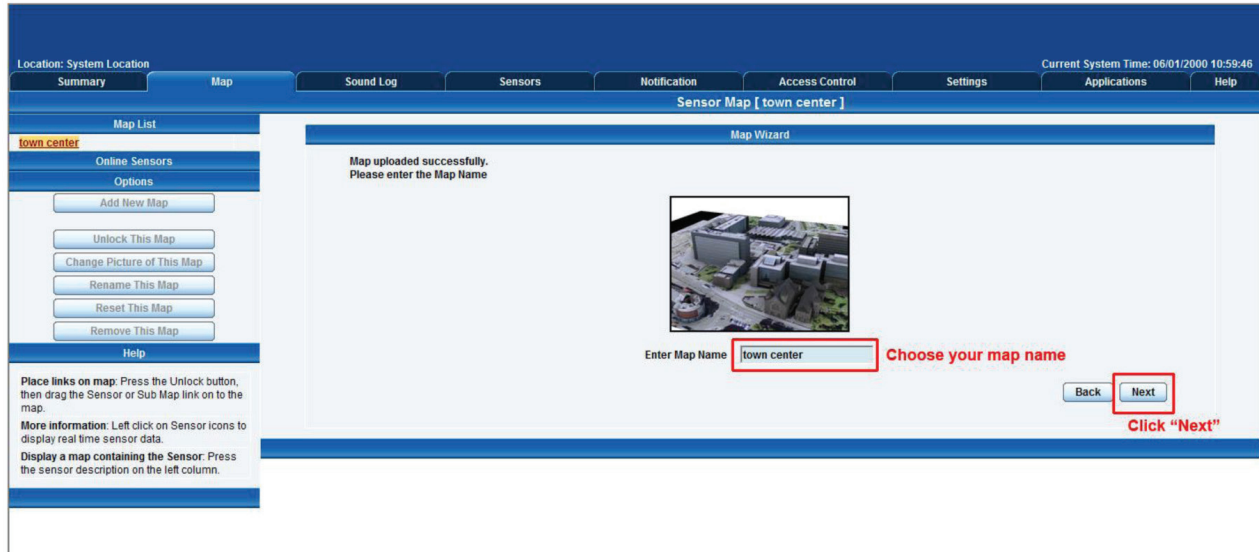
Figure 5-3. Enter map name.

4. Choose to have the map as a top-level map.

Figure 5-4. Enter map level.

5. You will now have the option to finish or to add sensors to your map. For this tutorial, click "Next."
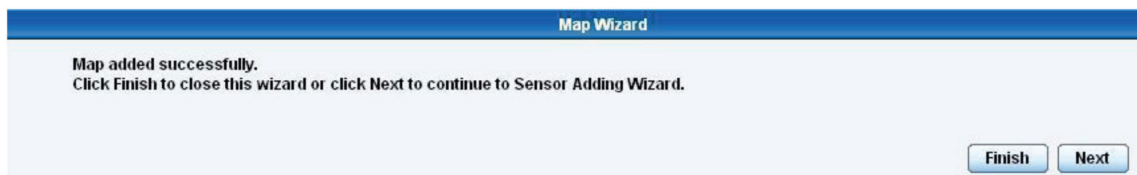
Figure 5-5. "Finish" or "Next."

6. You will now be taken to the map page where it will display your map. To add sensors, click "Next."
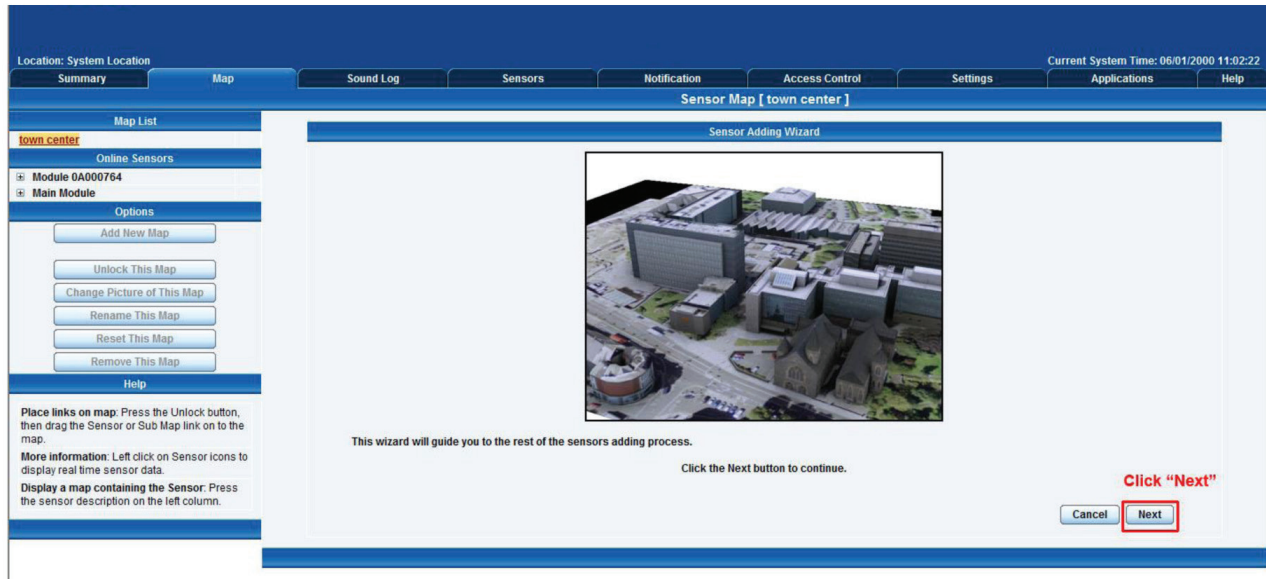
Figure 5-6. Sensor map.

7. After clicking "Next," click the "Unlock" button. This enables you to add sensors to the map.
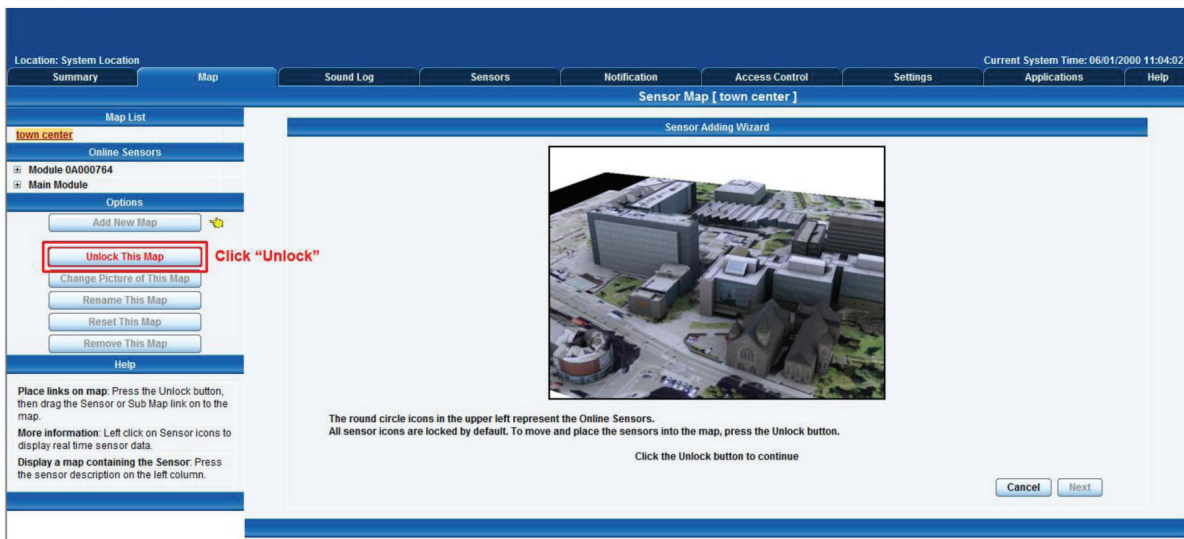
Figure 5-7. Add sensors to map.

8. You can now drag sensor icons and position them on the map.
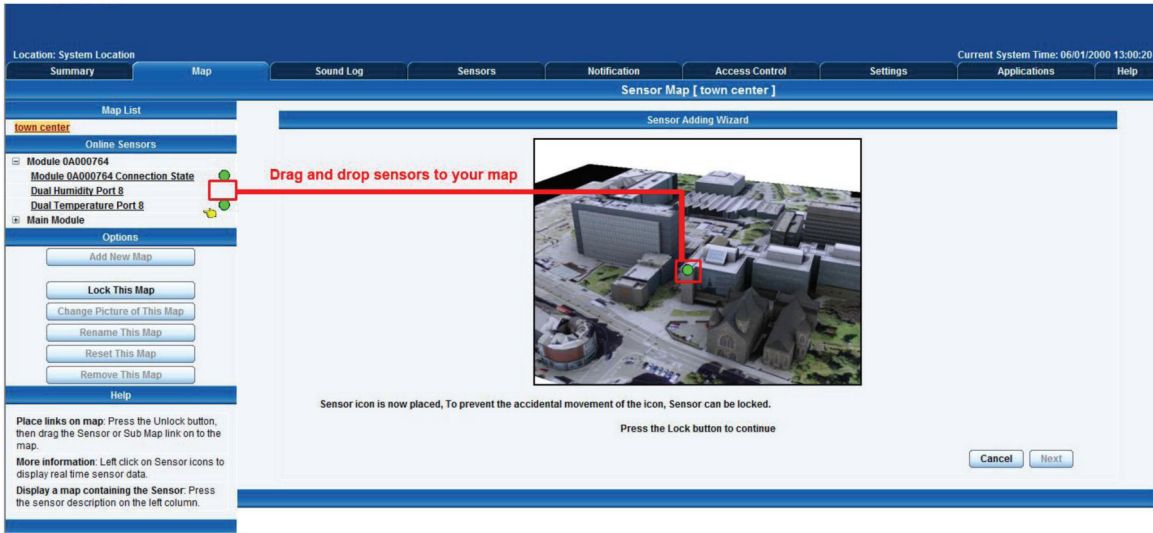
Figure 5-8. Position sensor icons on map.

9. After you have positioned the sensors in the correct location of your map, click "Lock."
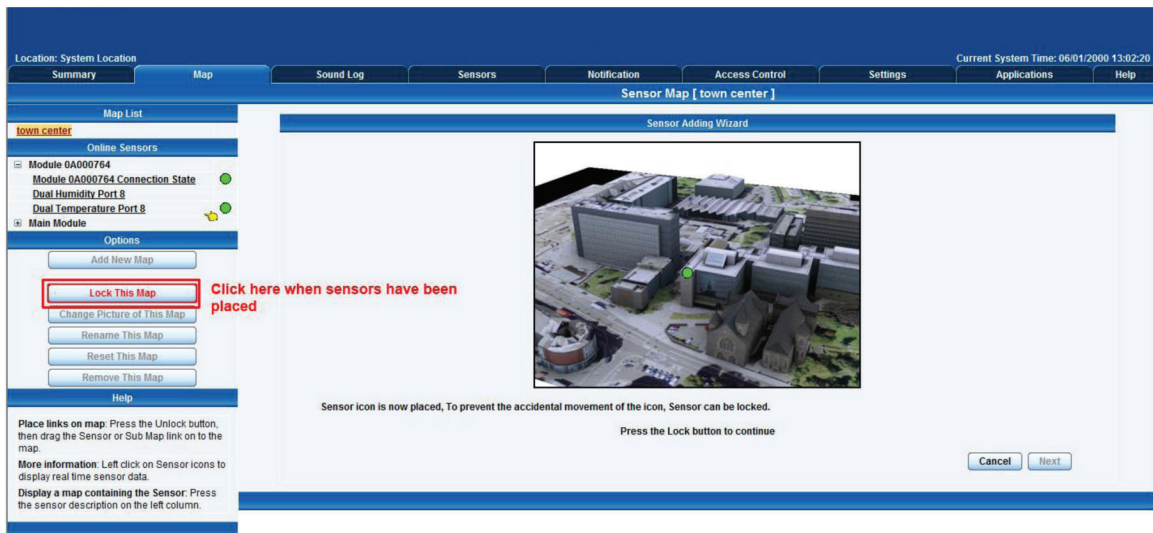
Figure 5-9. Click "Lock."

10. Finally you click on the "Finish" button to save your changes.
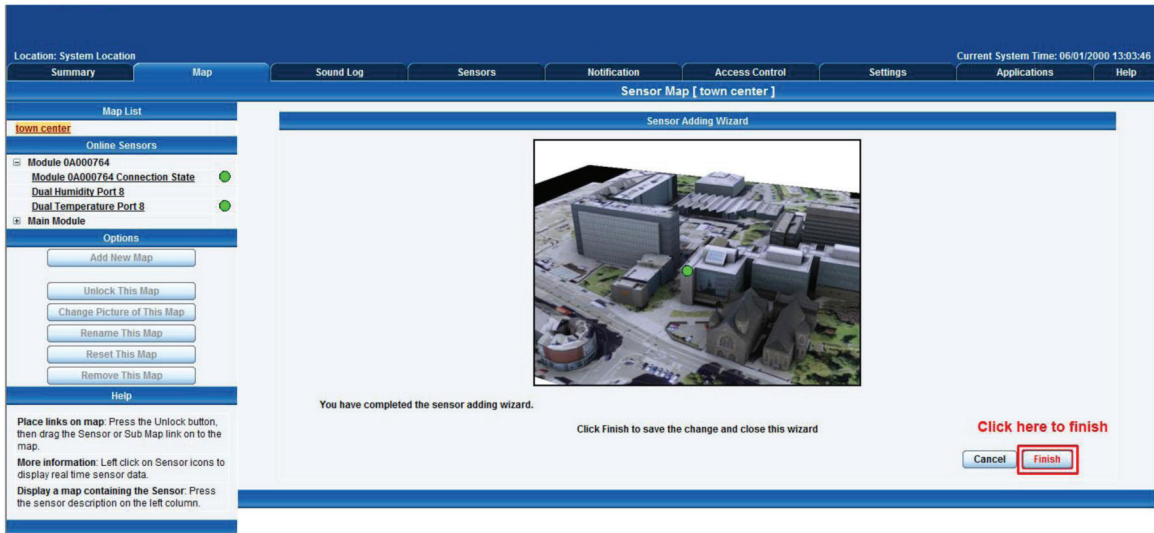
Figure 5-10. Save changes.

5.2 Monitoring via the Map Interface

Now we are going to look at how to monitor the sensor status and use the map interface.

1. To see further information about a sensor, you can click on its icon. First, you must click on the "Unlock Icons" button.
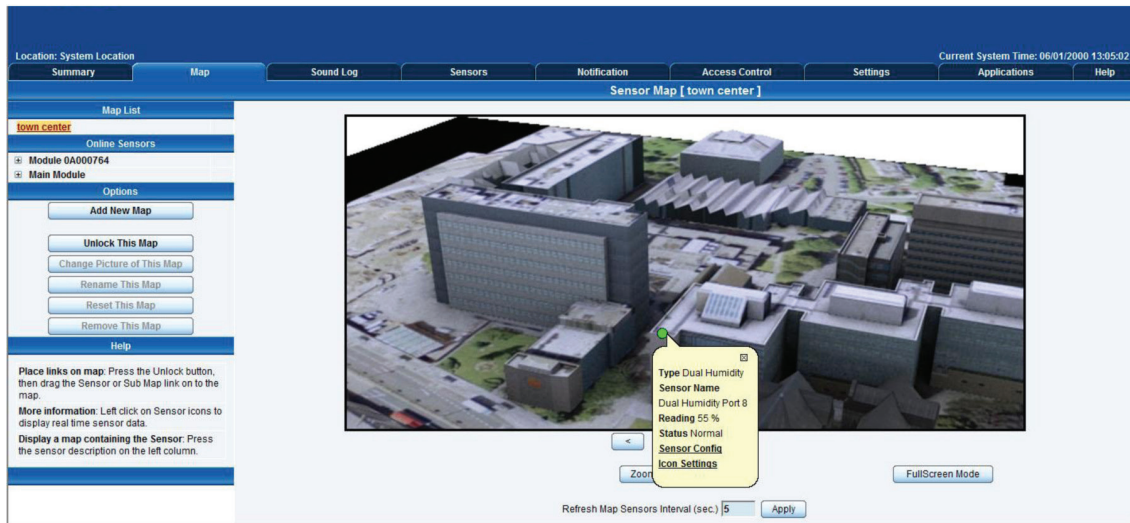
Figure 5-11. Using the map interface.

If you connect other sensors, these too can be dragged and positioned on the map.

6. Filters

6.1 Sensor Filters

1. The ServSensor comes equipped with the option to filter your sensor information that is displayed within the summary page. To enter the filter menu, select "Sensor Filters" from the drop-down tab on the left side of the page.

Figure 6-1. Select sensor filters.

2. Once you click the tab, you will be able to select your filter results by altering various fields of information contained within the sensor filter window.
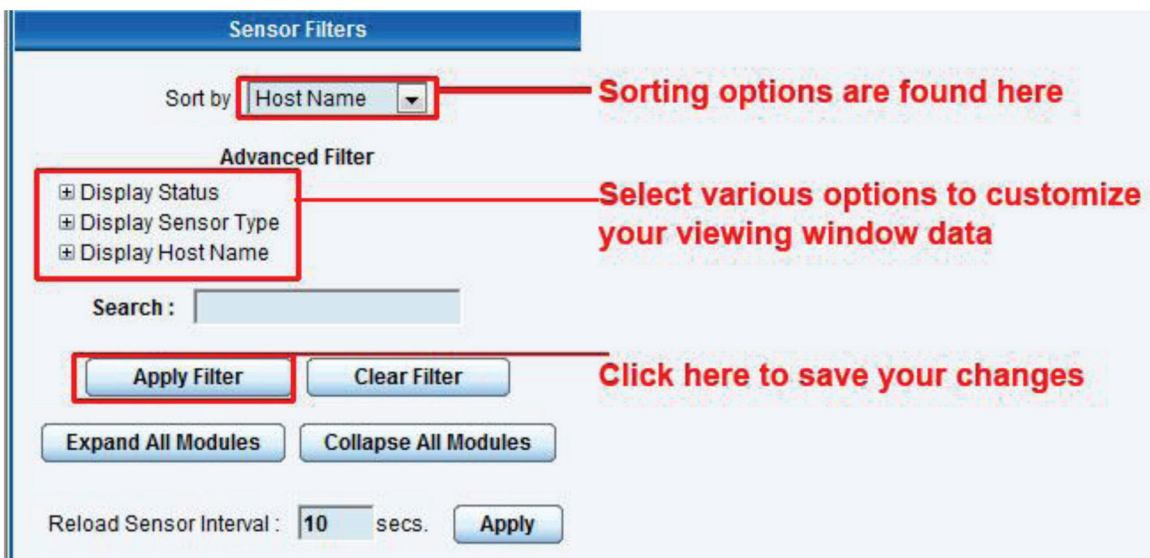
Figure 6-2. Add information fields.

3. You can alter the page reload interval by using these options.
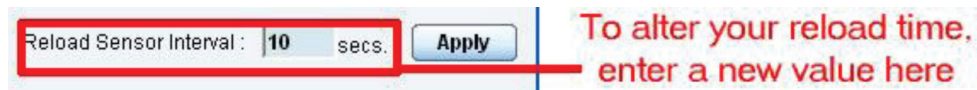
Figure 6-3. Alter the page reload interval.

4. Once you have selected your preferred filter options, your new settings will be displayed in the "Sensor Information" window found on the Summary page.

Figure 6-4. Summary page.

6.2 Syslog Filters

Syslog filters enable you to customize your syslog window. To begin. select the "Syslog Filters" tab found on the summary page.
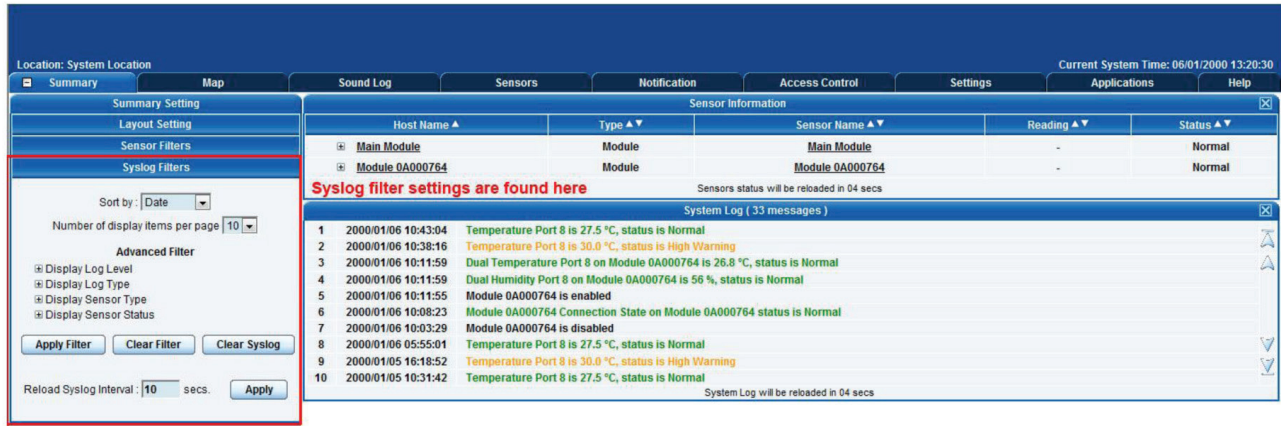
Figure 6-5. Syslog Filters tab.

Once you click the tab, you will be able to select your filter results by altering various fields of information contained within the syslog filter window.
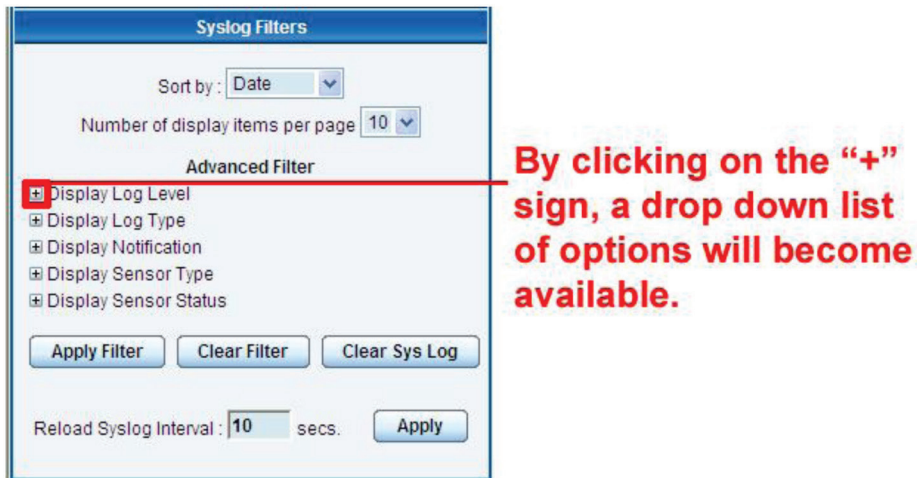
Figure 6-6. Drop-down menu.

By checking and unchecking various boxes within the Syslog filter window, you can customize your displayed results contained within the syslog filter.
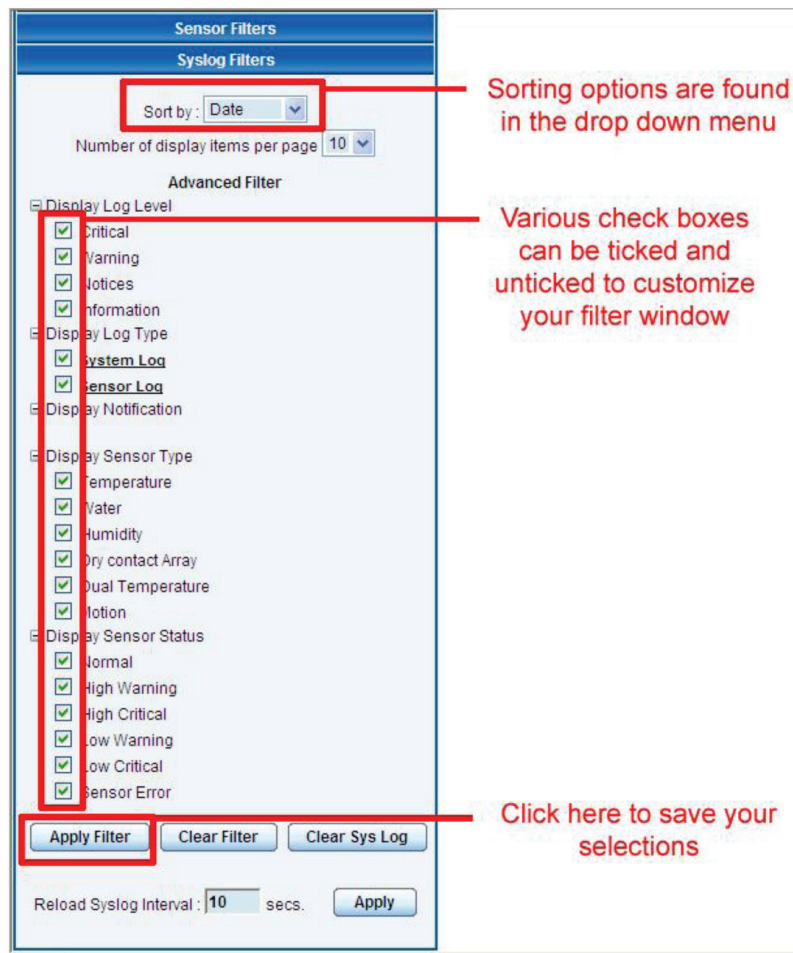
Figure 6-7. Customize syslog filter results display.

You can alter your reload interval by using the options shown below.

Figure 6-8. Change reload interval.

Once you have selected your preferred filter options, your new settings will be displayed in the "System log Information" window found on the Summary page.

Figure 6-9. Saved syslog filters display.

7. Making the ServSensor Visible on the Internet

The setup we have just created will enable you to access your ServSensor V4E Lite on a local area network (LAN), monitor via the Web based interface, or with SNMP traps.

But, what if you want to be able to remotely access your unit from anywhere in the world? This is possible; however, the following steps are only a guide. Your exact setup and configuration will often depend on your network equipment. You are going to need access to your router, if you are using one, and know whether your IP address is static or dynamic.

1. Suppose your ServSensor is connected to a router on your network, and the following IP addresses are assigned:

Your unit's IP address is the default 192.168.0.100.

Your computer's IP address is 192.168.0.200

Your router's IP address is 192.168.0.300

2. To find out your router's external IP address, go to www.whatsmyip.com

Suppose your router's external IP address is 278.67.04.09

3. You now need to set up port forwarding on your router. This varies depending on your router's model. Generally, you need to point your browser to your router"s IP address (in this case 192.168.0.300). This will then enable you to log into your router's administration interface. You can find how to go about doing this for your router on www.portforward.com

For an example of how to do this for a commonly used router, follow this link :-http://www.portforward.com/english/routers/port_forwarding/Linksys/WRT54G/HTTP.htm

You need to set up your router's HTTP forwarding to Port 80. This will then mean when you access your router using the external IP address, you will be forwarded to your unit's internal IP address.

4. To test this, open your Web browser, and go to your external IP address (in our example 278.67.04.09). If you're using a dynamic IP address, check it again before doing this because it may have changed since the start of this tutorial.

5. To make this easier, you could use a Dynamic Name Server (DNS). This means that you no longer need to remember IP addresses or use www.whatsmyip.com to find out your IP address. You will instead register a domain name (for example myServSensorHub.homeip.com). This will then automatically point to your router's external IP address (e.g. 278.67.04.09). This will require you to register the domain name and open an account with a DNS service provider. We recommend www.dyndns.com because it allows you to register up to five free domain names.

6. If you have set up everything correctly, you will now be able to access your unit from anywhere in the world simply by pointing your Web browser to your DNS address.

8. SEC to SEC SNMP Trap Receive

8.1 Introduction

The SNMP Trap Receiver is a feature that is included in the 80 Virtual Sensors in the ServSensor's web interface. This feature allows you to receive an SNMP trap from another device such as a sensor or another SEC unit. This can also be used to turn on and off other sensors, trigger a relay, send alerts from the ServSensor unit and perform other actions.

This manual describes an example configuration using two SEC units: one will be the SNMP Trap Sender (A) and the other will be the SNMP Trap Receiver (B).

On the sender unit (A) there is a sensor configured: a temperature sensor.

The receiver unit (B) will be configured to listen for SNMP Traps from (A) unit's temperature sensor using virtual sensors.

SNMP Traps are sent from (A) when the sensor status or its reading value changes.

8.2 SNMP Trap Sender (A) SEC (10.1.1.225) configuration
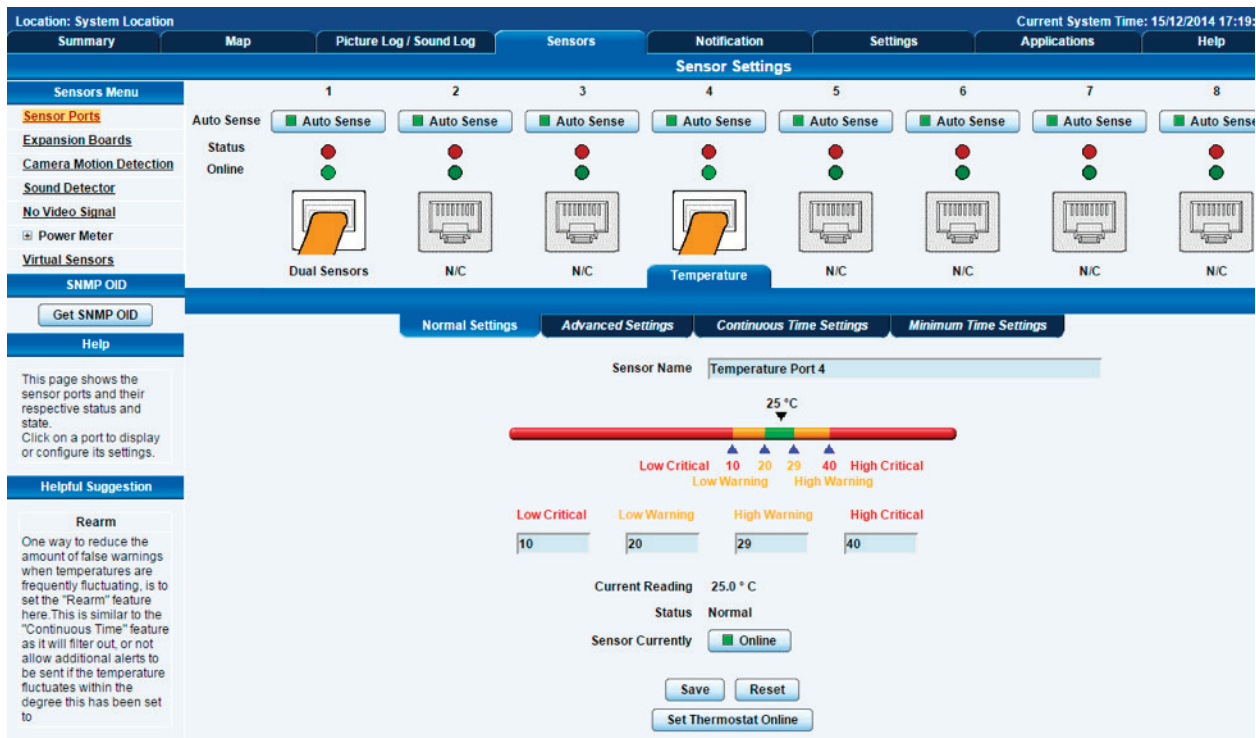
Figure 8-1.

First, make sure that the sensors are working properly and the readings are as desired. We will use the Temperature Sensor in our example.
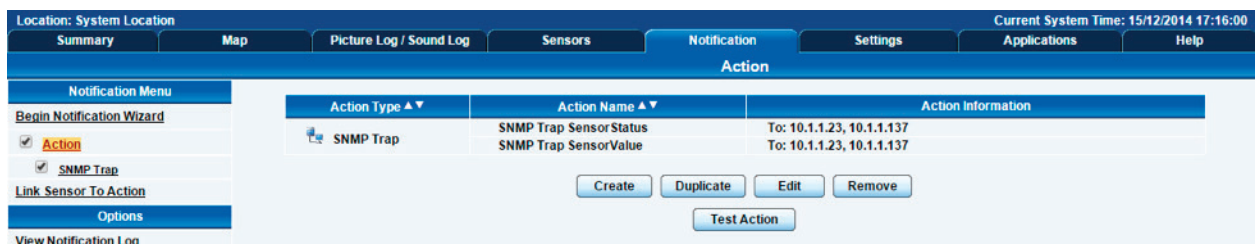
Figure 8-2.

Go to Notification / Action and click on the Create button to create SNMP Trap actions.
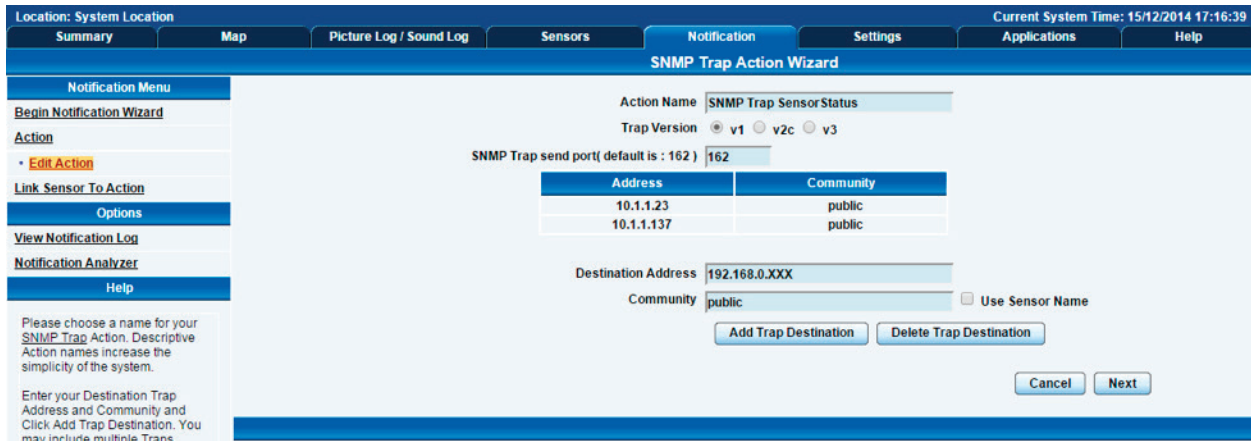
Figure 8-3.

Configure the SNMP Trap action:

• Give the SNMP Trap a name to easily identify it, in our example it's for sending Sensor Status traps.

• Select the Trap Version (v1 is the default).

• Specify the SNMP Trap sending port, if it's different from the default.

• Add the target (B) unit's IP address in the Destination Address field, and specify the Community if it's different from the default "public." You'll need to click the Add Trap Destination to add the IP address to the list. Add IPs one-by-one in the same way if multiple addresses are required.

NOTE: We've also added our PC's IP address (10.1.1.23) to the list, to test the generated SNMP Traps. More on this later.

• Click Next when you've finished adding the target IPs.
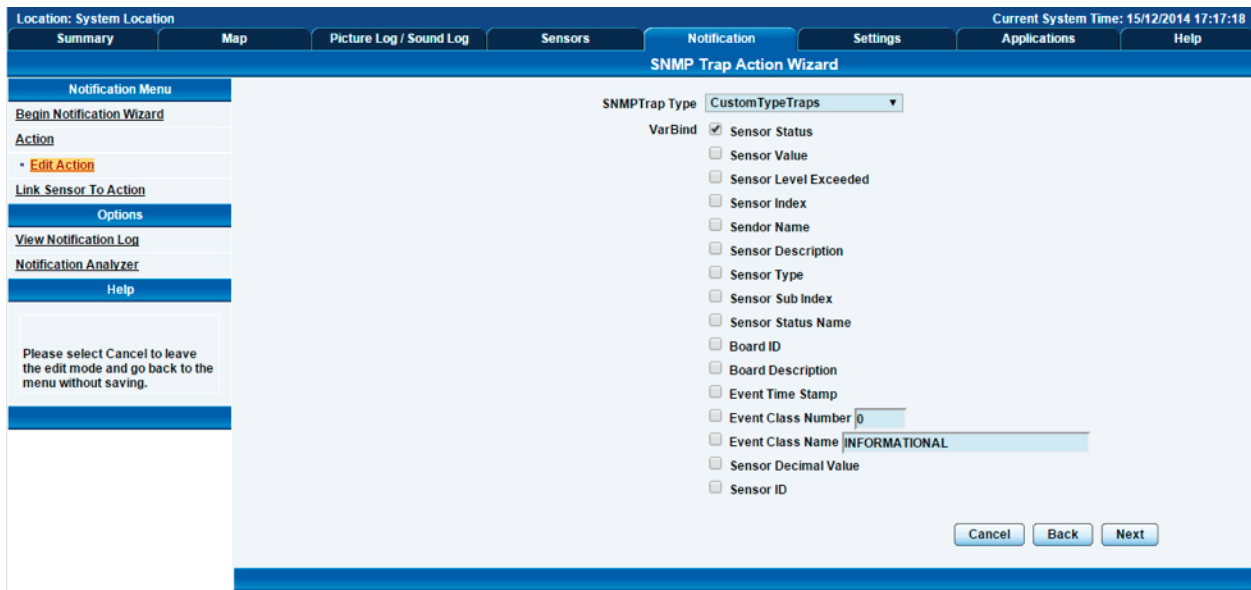
Figure 8-4.

NOTE: We recommend that you choose the CustomType Traps from the list as the SNMP Trap Type, as it will always have the same "specific" number: 1000.

• Because this SNMP Trap will be only used for sending Sensor Status events, select that from the list and unselect all others.

NOTE: You can also select multiple values to have a single SNMP Trap for sending them.

• Click Next to continue.

Figure 8-5.

You may change the resend times and the interval between resending the SNMP Trap. Click on Finish to complete the SNMP Trap action's configuration.
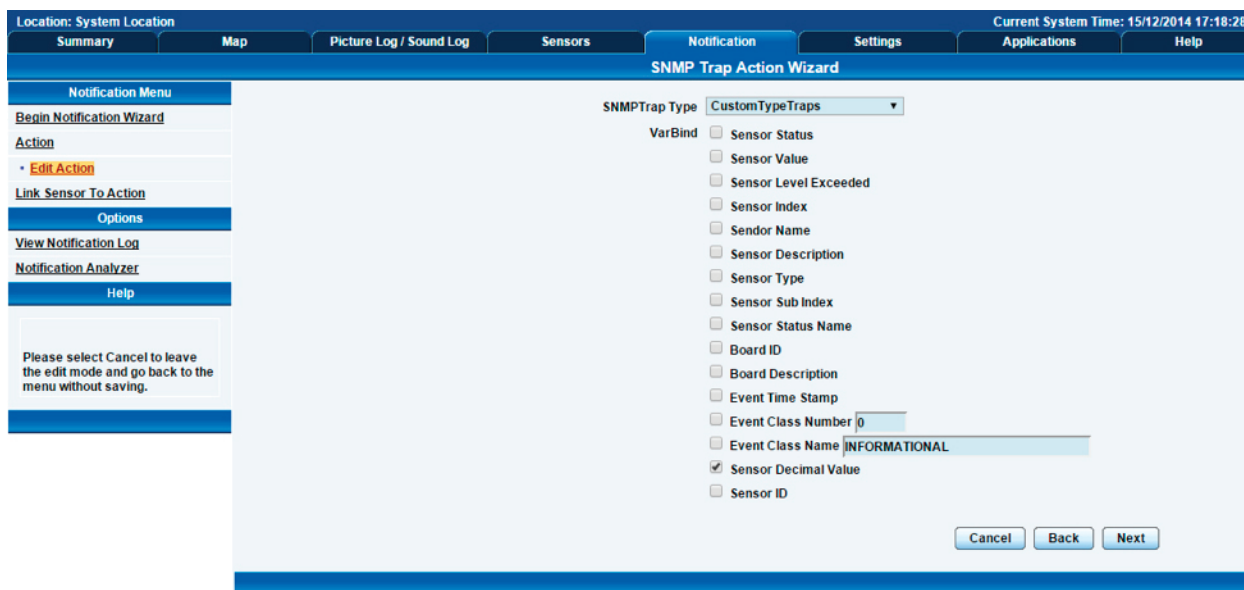
Figure 8-6.

As an example, we also configured a separate SNMP Trap action for the temperature sensor's value.

The configuration of the action is exactly the same as for the previous action (sensor status), the only difference is the Trap Type: here we choose the Sensor Decimal Value to send it to the target unit (B).

Figure 8-7.

After the SNMP Trap actions are made, you need to link the sensors to the SNMP Trap actions.

Go to Notification / Link Sensor To Action and click on the Create button.

As an example, here's our configuration for the Temperature Sensor Status SNMP Trap notification, which will send a Trap upon each status change of the sensor:
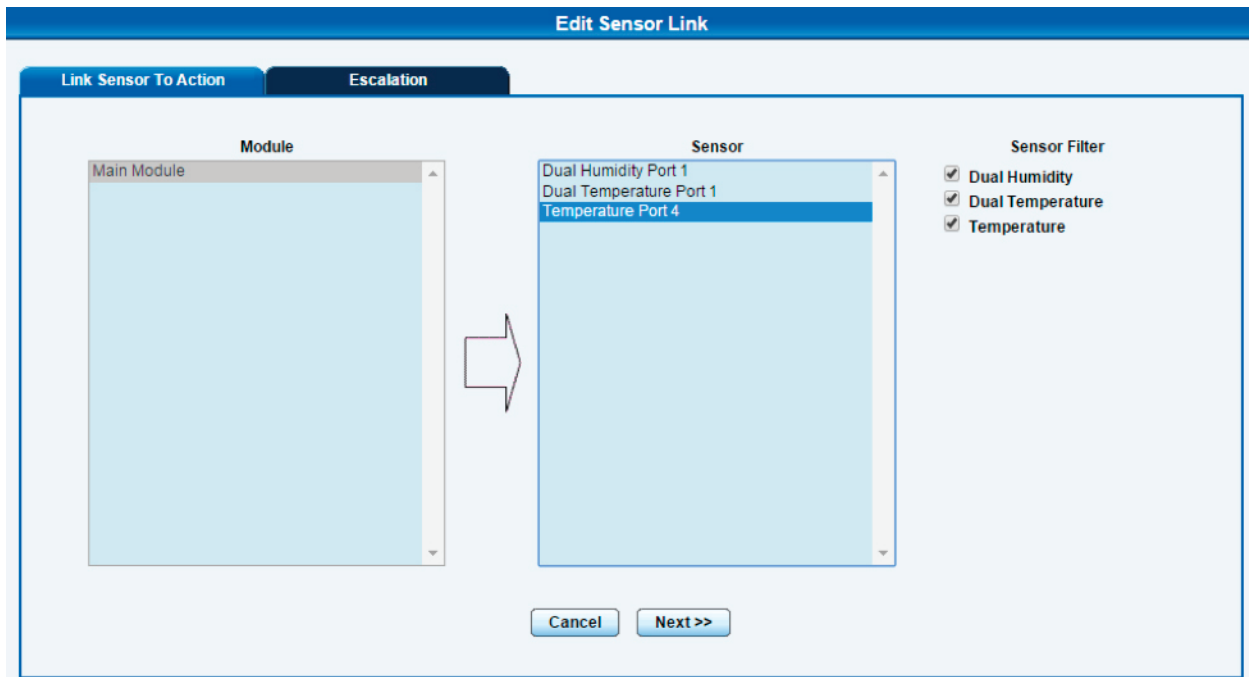
Figure 8-8.
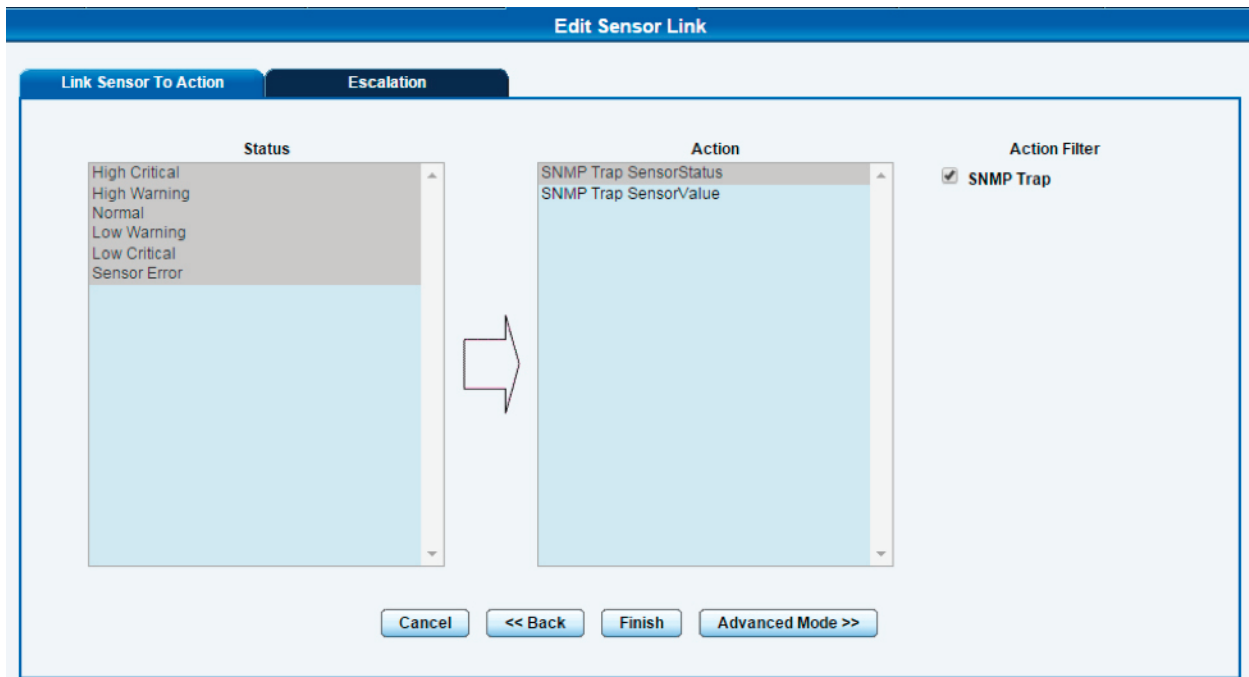
Figure 8-9.

You may select the Sensor Status as desired, for example, if you only want to send SNMP Trap when the sensor status is High Critical and Low Critical, only select those here.

For creating the Temperature Sensor Value SNMP Trap, the configuration is the same; just select that action in the last step.

NOTE: You'll need to create notification rules for each sensor that you want to send an SNMP Trap about.

	System Log (2000 messages)	
1	2014/12/14 08:50:32	Trap ok: Sent to 10.1.1.137
2	2014/12/14 08:50:32	Trap ok: Sent to 10.1.1.23
3	2014/12/14 08:50:32	Trap ok: Sent to 10.1.1.137
4	2014/12/14 08:50:32	Trap ok: Sent to 10.1.1.23
5	2014/12/14 08:50:32	Temperature Port 4 is 29.0 °C, status is High Warning
6	2014/12/14 08:50:31	Trap ok: Sent to 10.1.1.137
7	2014/12/14 08:50:31	Trap ok: Sent to 10.1.1.23
8	2014/12/14 08:50:31	Trap ok: Sent to 10.1.1.137
9	2014/12/14 08:50:31	Trap ok: Sent to 10.1.1.23
10	2014/12/14 08:50:31	Temperature Port 4 is 28.5 °C, status is Normal
		System Log will be reloaded in 03 secs

Figure 8-10.

To verify that the SNMP Trap sending is working, you can check the System Log entries and the SNMP Trap log on the sender unit (A):

Figure 8-11.

Under Notification / View Notification Log, select SNMP Trap log from the drop-down menu.

8.3 Getting OIDs for the SNMP Traps

Before setting up the SNMP Trap receiver on the target unit (B), you'll need to get the correct sensor OIDs from the sender unit (A).

Use an MIB Browser application, such as iReasoning MIB Browser. We'll show you the steps using this program.

First, you must load the MIB file (downloadable from blackbox.com). Then specify the sender unit's IP (A) in the Address field (in our example, it's 10.1.1.225).
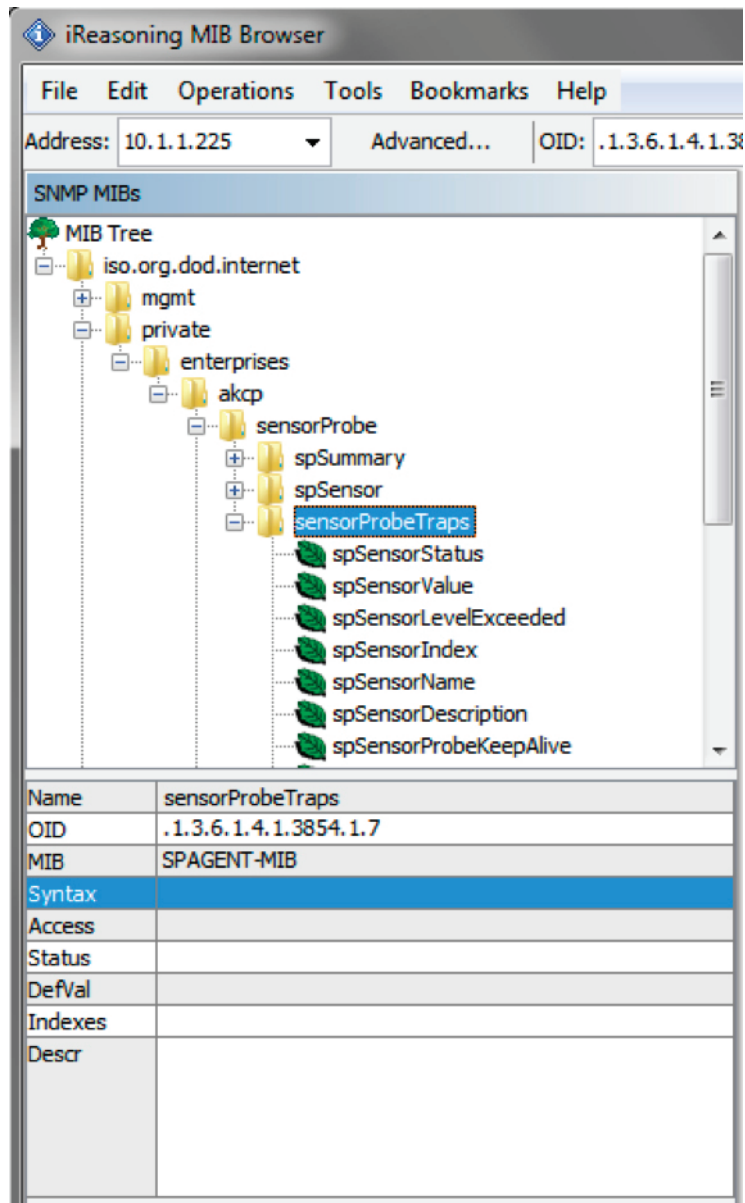
Figure 8-12.

Expand the MIB Tree until you reach the ServSensor's Traps section, as in the picture.
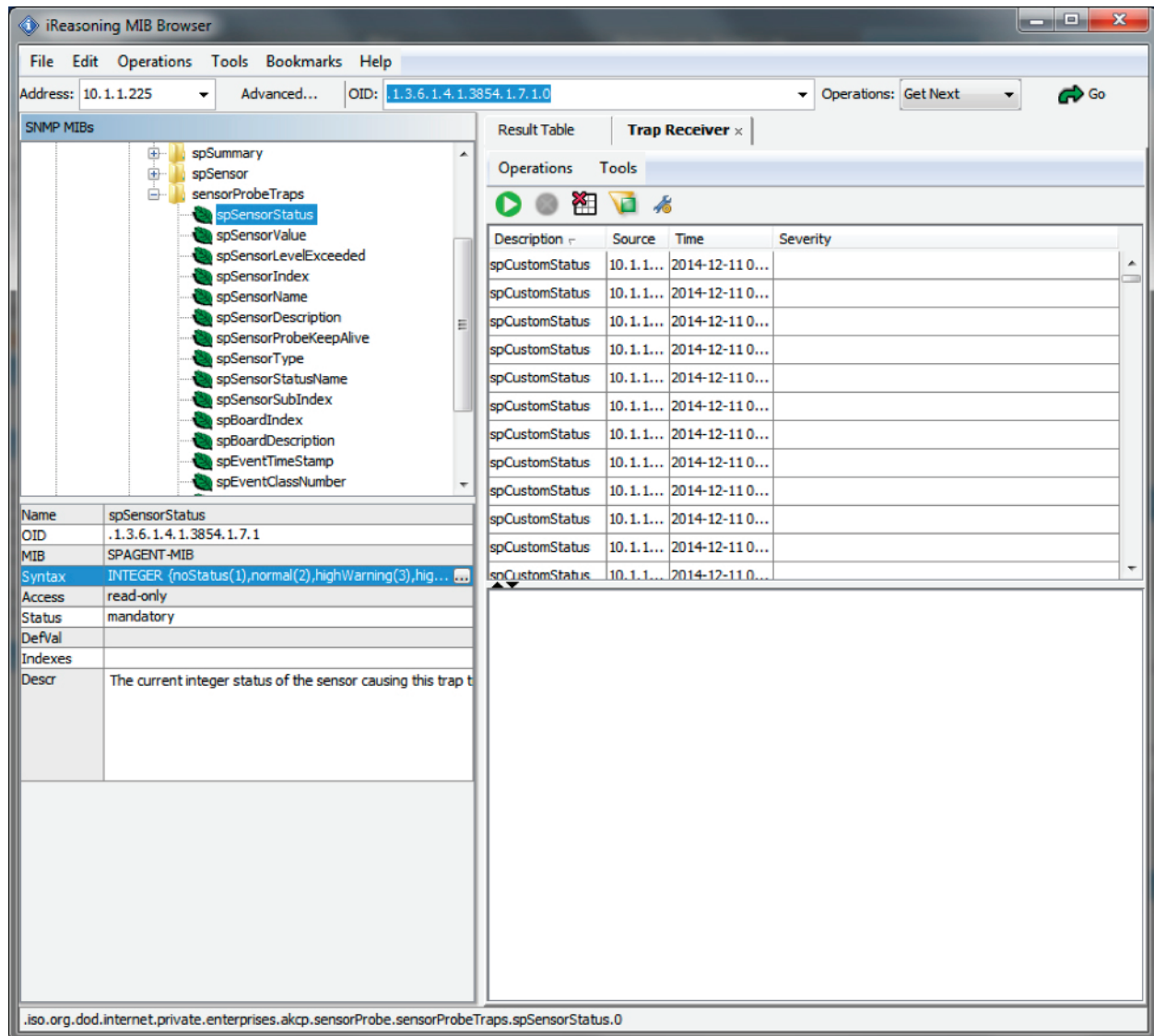
Figure 8-13.

Next, choose the OID value that you need to get the SNMP Trap from the sender unit (A).

In our example, we choose spSensorStatus to get Status SNMP Traps.

For the spSensorStatus it will be .1.3.6.1.4.1.3854.1.7.1.0

Copy the OID from the top of the window (OID: field), next to where you typed the sender (A) unit's IP.

NOTE: For the Syntax field, these values will be needed to configure the virtual sensor on the target unit (B). For the spSensorSta-tus OID, these are valid:

INTEGER {noStatus(1), normal(2), highWarning(3), highCritical(4), lowWarning(5), lowCritical(6), sensorError(7), turnOn(8), turnOff(9)}
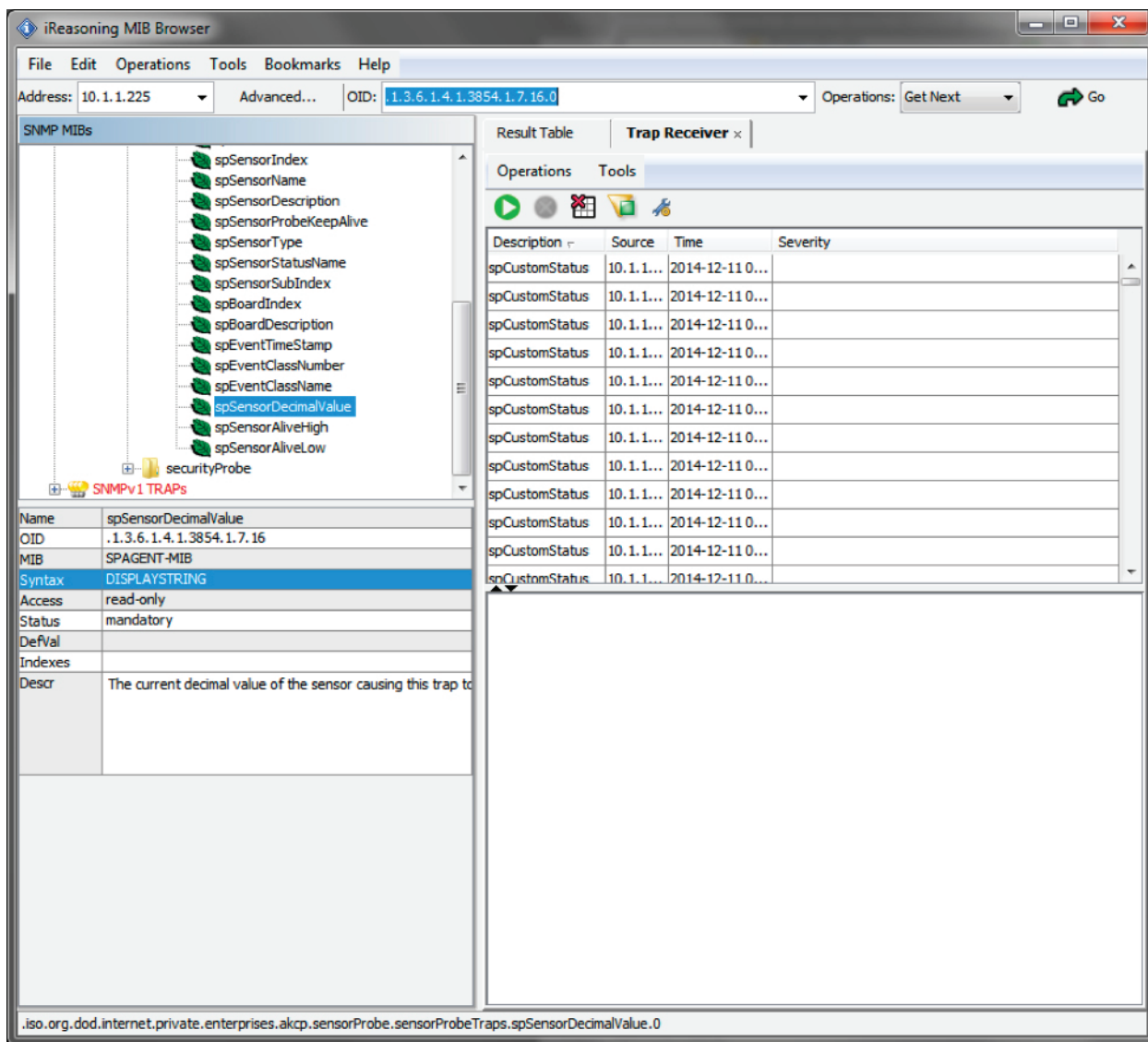
Figure 8-14.

We also set up SNMP Trap for the Temperature sensor's Value reading, so we will also need the spSensorDecimalValue OID from the MIB browser.

The OID for spSensorDecimalValue will always be:1.3.6.1.4.1.3854.1.7.16.0

Similar to the spSensorStatus OID, you need to copy the OID from the top of the window (OID: field), next to where you typed the sender (A) unit's IP.

If you need other OIDs, note them similarly.
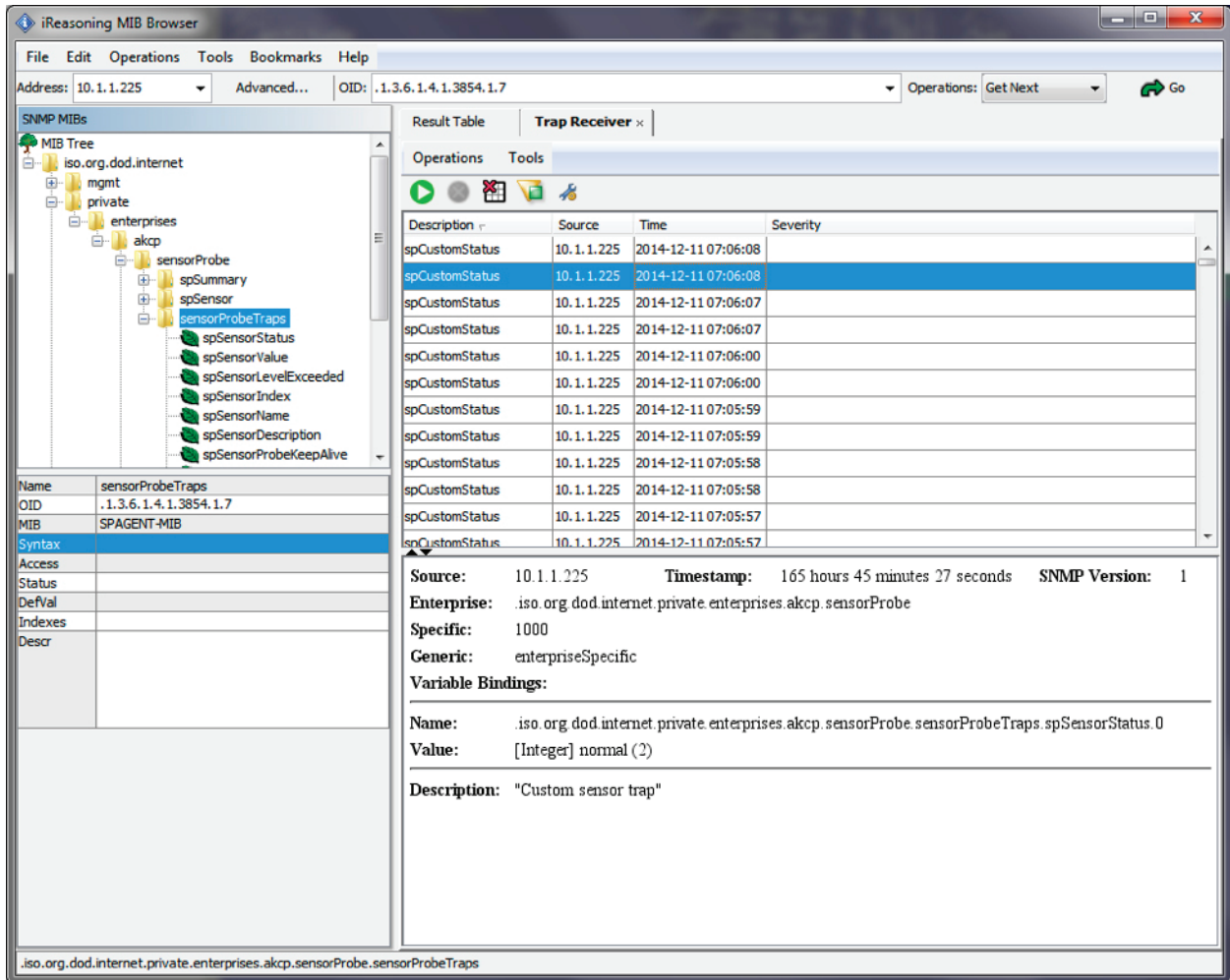
Figure 8-15.

You may also test the SNMP Trap action using iReasoning MIB Browser.

Use the Trap Receiver from Tools / Trap Receiver.

The Trap Receiver will start automatically, and display the results on the right side of the window.

Use the Test Action button on the sender unit (A) WEB UI to initiate an SNMP Trap:

Figure 8-16.

NOTE: You must specify your PC's IP address in the configuration of the SNMP Trap action, otherwise, you won't see the Trap.
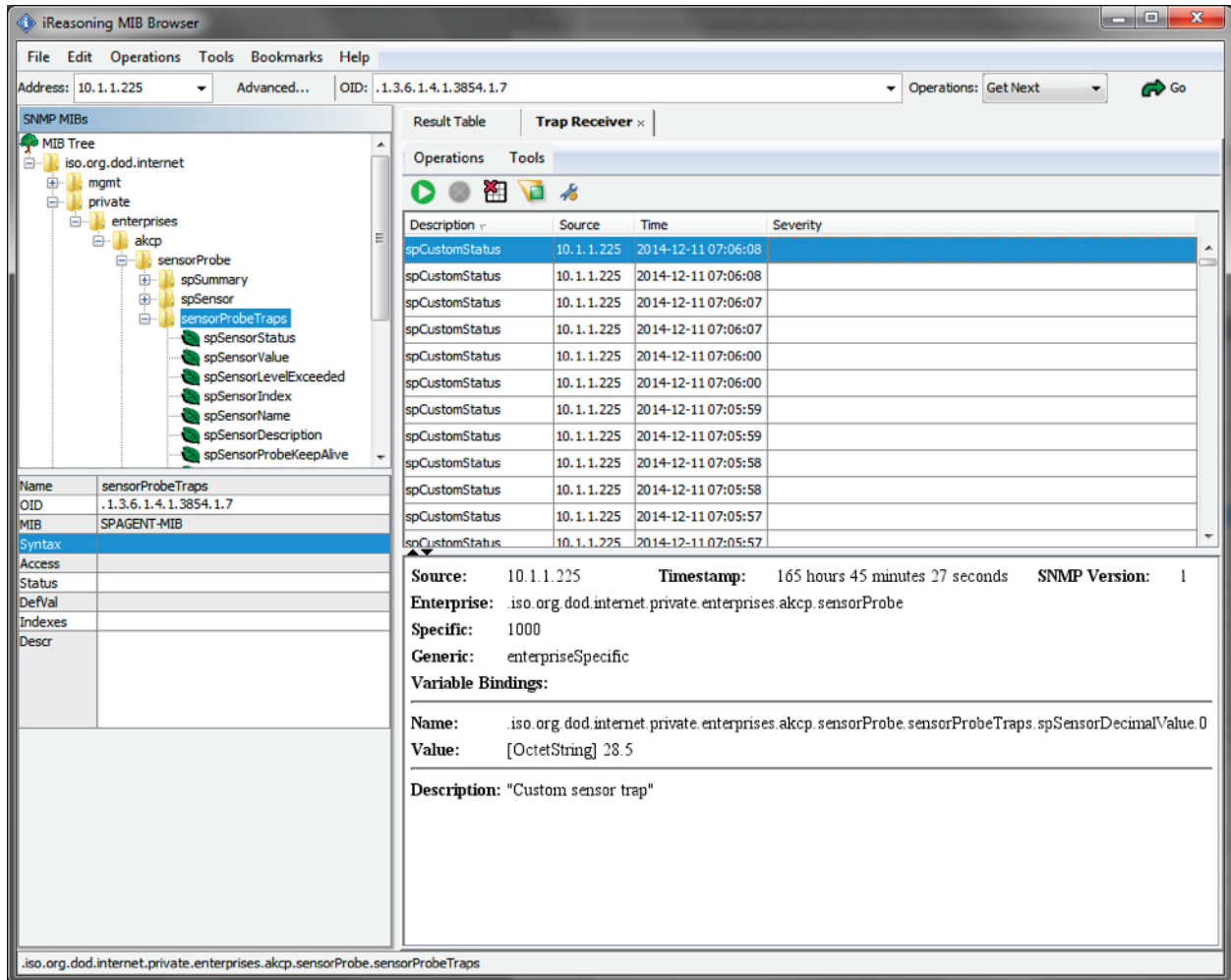
Figure 8-17.

Here is an example result window for the spSensorDecimalValue (and in the previous picture, the spSensorStatus was shown).

877-877-2269 | blackbox.com

8.4 SNMP Trap Receiver (B) SEC (10.1.1.137) Configuration

Figure 8-18.

Go to Settings / Connectivity / SNMP Traps page, and ensure the SNMP Traps Receiver versions are enabled as shown above. You may change the SNMP community, SNMP v3 settings, and the SNMP port if you wish.

NOTE: The SNMP Trap receiver is turned on by default.
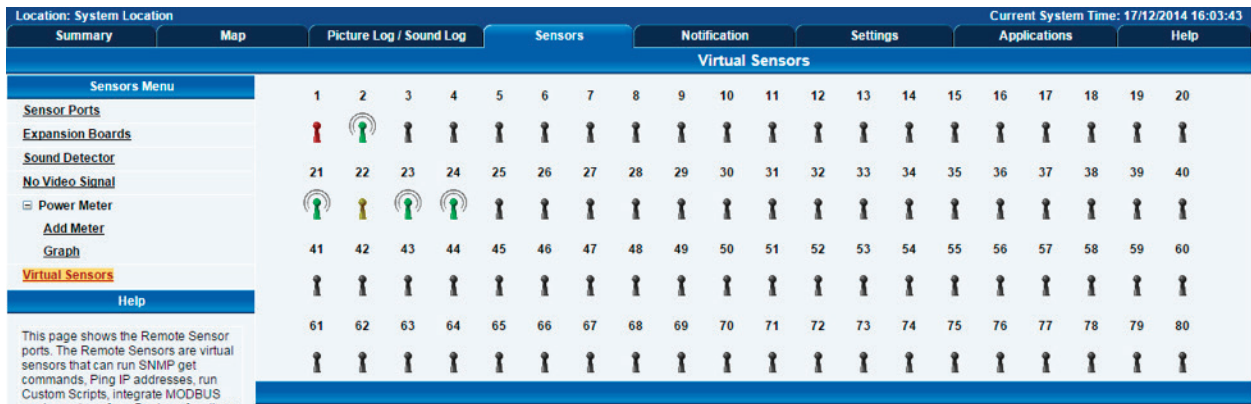
FIgure 8-19.

Open the Sensors / Virtual Sensors page to begin configuring the virtual sensors.
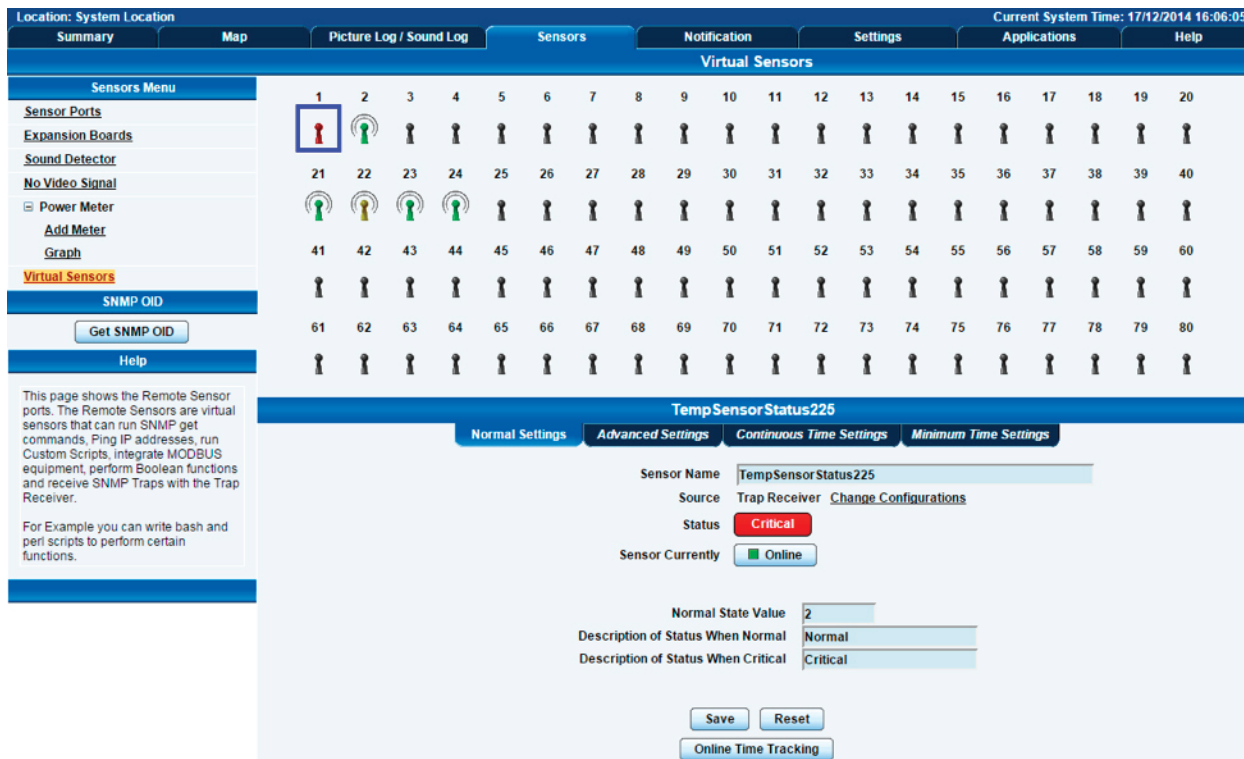
Figure 8-20.

In our first example, here is the configured SNMP Trap receiver virtual sensor on the target SEC (B). It shows the status of the Temperature Sensor on the source SEC (A).

To set up the SensorStatus SNMP Trap receiver, follow these steps:

Figure 8-21.

Choose an unconfigured virtual sensor, click on the Configuration button, then select the Source as Trap Receiver.

Figure 8-22.

Configure the following:

• IP: the source SEC unit's IP (A)

• OID: the sensor's OID value that you wish to get the SNMP Trap about; in our example it's spSensorStatus, to get the correct OID you have to use an MIB Browser as mentioned before.

• Specific: except for SNMP Trap v3, it will be always 1000 if you configured the SNMP Trap sender action using the custom settings on the source SEC (A) as recommended earlier; otherwise, you'll have to use a Trap Receiver first, to get the correct "specific value from an SNMP Trap packet sent to your PC.

• Sensor style: Switch or Analog, depending on the sensor; for the Sensor Status it's Switch.

• Normal State Value: the virtual sensor will display "normal" when this status is received in the SNMP Trap packet. Unless you need another value, the default is 2 (see all other values earlier, as mentioned at the MIB browser section).

• Description for statuses: as desired.

Click Finish when you've completed the configuration.
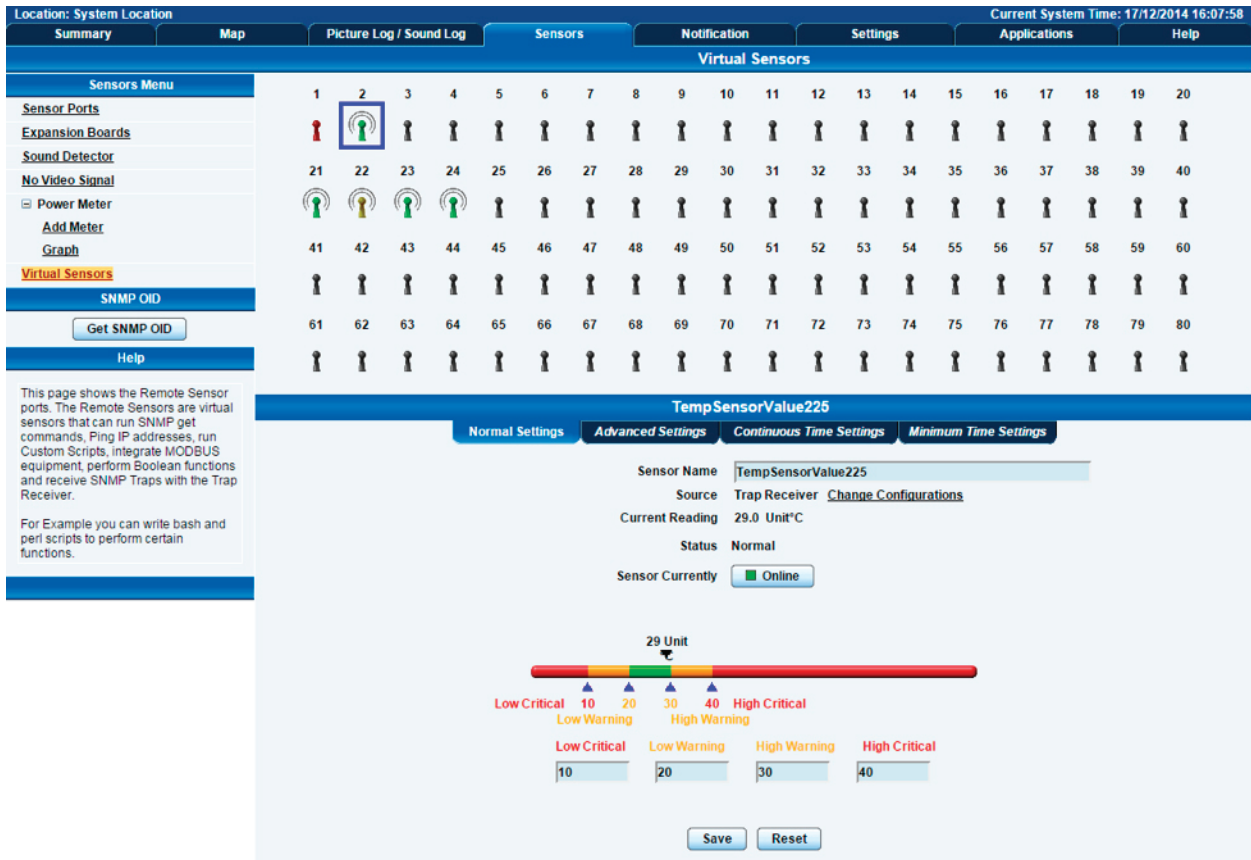
Figure 8-23.

Second example: the configured SNMP Trap receiver virtual sensor on the target SEC (B) from the Temperature Sensor's decimal value on the source SEC (A).

To set up the SensorValue receiver, follow these steps:
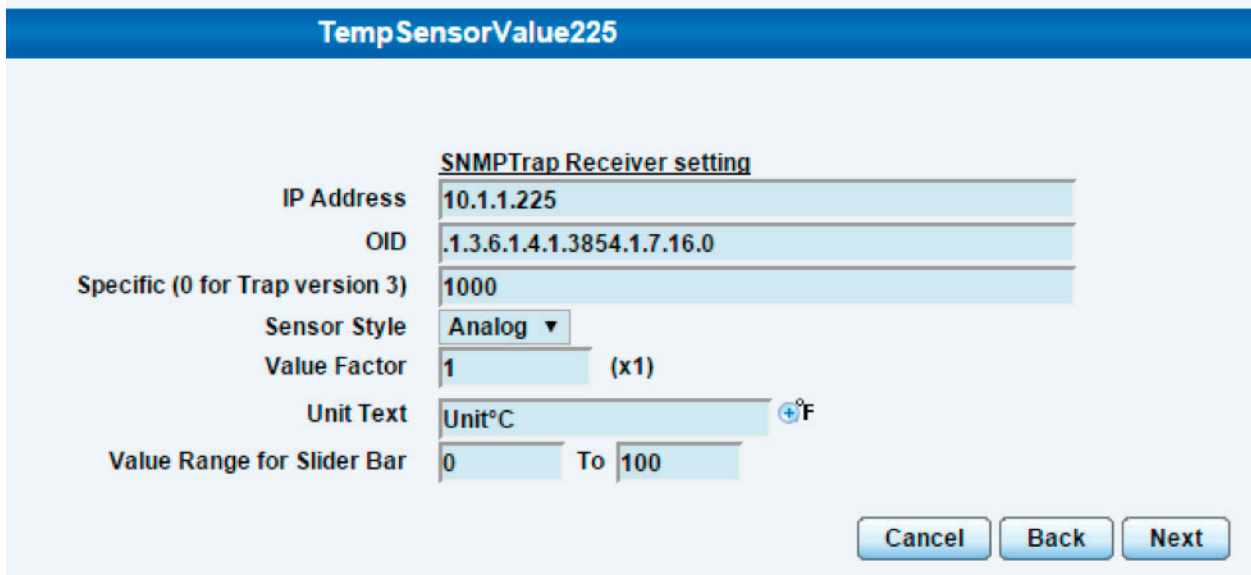
Figure 8-24.

Select Trap Receiver as in the previous configuration, and then fill out the values:

• IP address of the source SEC (A)

• OID: the sensor's OID value that you wish to get the SNMP Trap about; in this example it's spSensorDecimalValue, to get the correct OID you have to use an MIB Browser as mentioned before.

• Specific: except for SNMP Trap v3, it will always be1000 if you configured the SNMP Trap sender action using the custom settings on the source SEC (A) as recommended earlier; otherwise, you'll have to use a Trap Receiver first, to get the correct "specific" value from an SNMP Trap packet sent to your PC.

• Sensor style: Switch or Analog, depending on the sensor; for the Sensor Value it's Analog.

• Value factor: if you wish to multiply the reading, specify here.

• Unit Text: the unit of the sensor reading; it could be anything, it's not limited to the built-in units.

• Value Range: the range scale where the sensor readings will be interpreted.
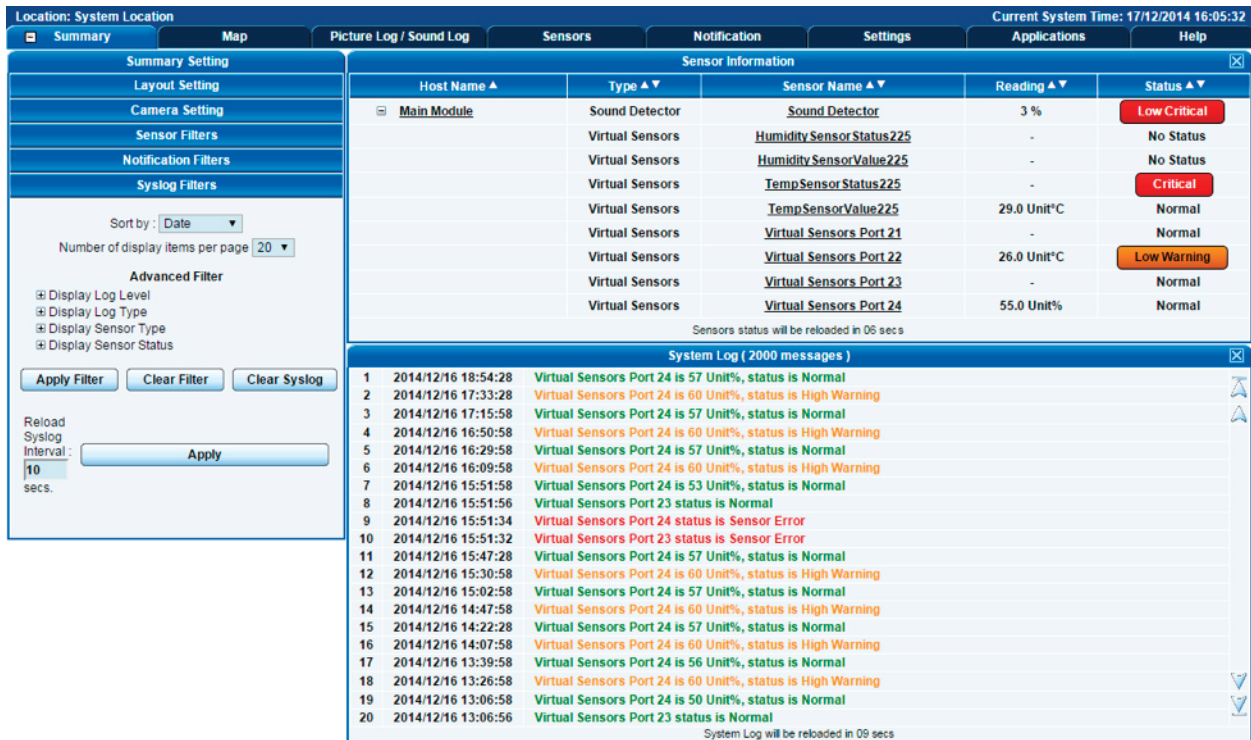
Figure 8-25.

An overview of the Summary page on the target SEC unit (B), showing the virtual sensors and the recorded System Log messages for virtual sensor status changes by SNMP Traps coming from the source SEC unit (A).

NOTE: There will be no SNMP Trap events recorded in this unit's SNMP Trap log. These are only logged in the source unit (A).

After configuring the virtual sensors properly, you can create custom actions on the target SEC (B) depending on the statuses of the virtual sensors, just like you would with any other type of sensors.

Contact Black Box Technical Support at 877-877-2269 or info@ blackbox.com if you have any further technical questions or problems.

9. SNMP Trap Receiver Controlling IO-digital8 Relay

What is the SNMP trap and IO-digital8?

The SNMP Trap Receiver is a feature that is included in the 80 Virtual Sensors in the ServSensor's web interface. This feature allows you to receive an SNMP trap from another device. This can be used to trigger a relay, as this manual will describe. This can also be used to turn on and off other sensors, send alerts from the ServSensor unit and perform other actions.

The IO-digital8 is an 8-port dry contact sensor that uses a single RJ-45 sensor port on the ServSensor. Each of the 8 ports can be configured as an input or an output up to 5 VDC and can sink 20 mA.

1. Enable SNMP Trap Receiver.
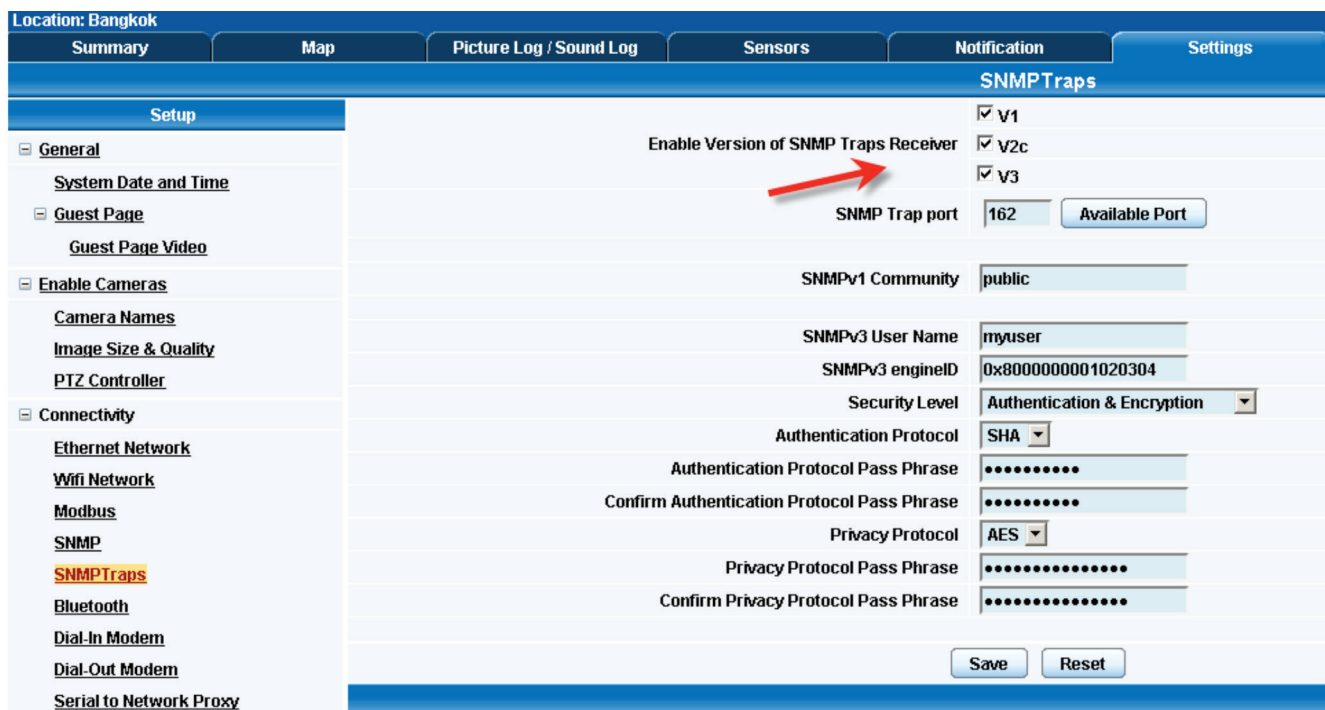
Figure 9-1.

First, open the ServSensor's web interface, login as Admin and navigate to the Settings page >> Connectivity >> SNMP Traps page.

Make sure the SNMP Traps Receiver versions are enabled as shown above.

2. Set up the Trap Receiver in 80 virtual sensors.
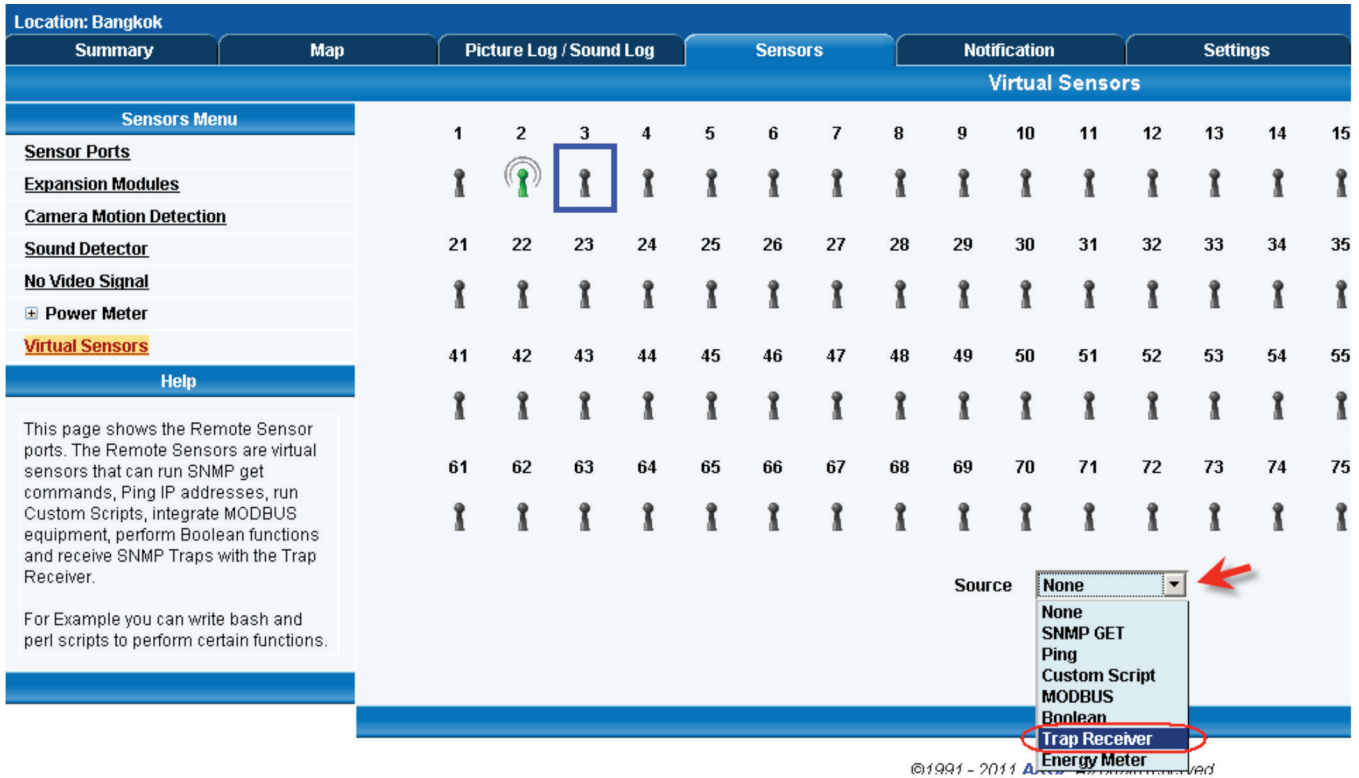
Figure 9-2.

Next navigate to the Sensors page >> Virtual Sensors, then click on the virtual sensor number you wish to setup for the trap receiver, click on the "Configure" button, and choose the "Trap Receiver" from the drop-down menu as shown above.

Figure 9-3.

Enter your SNMP trap information, including the units IP address, the OID of the sensor, the Specific number, etc., and click the finish button.

NOTE: The "Specific" you can view from a trap receiver program such as mibbrowser of Ireasoning (it has the trap receiver in the Tools menu).
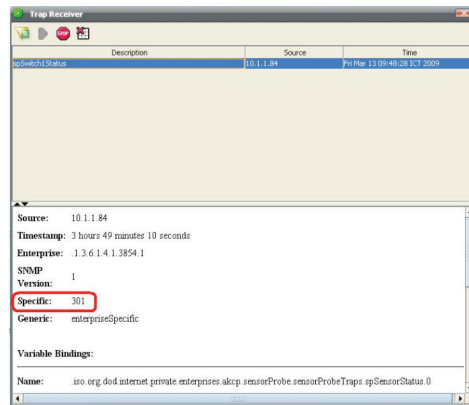
Figure 9-4.

You can check this by opening the trap receiver program and sending the trap to the PC. This specific value will be up to the setting of the ServSensor Trap Type OID, the sensor type and sensor port.

You can change the ServSensor Hub Trap Type by using this snmp command here:

snmpset -m all -v1 -c <community> <IPaddress> .1.3.6.1.4.1.3854.1.2.2.1.60.0 i <traprype>

When

specificTypeTrap(1),

generalTypeTrap(2),

bothTypeTraps(3),

statusTypeTraps(4)

3. Setup the IO-digital8 relay.
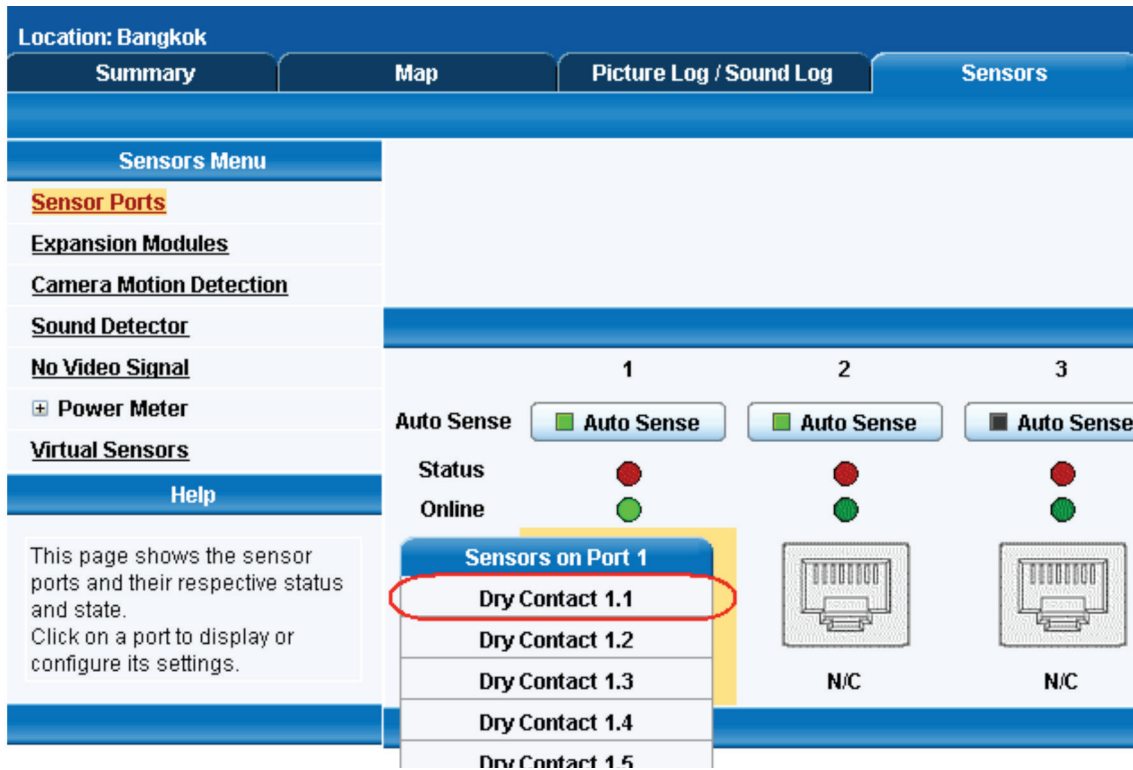
Figure 9-5.

Navigate to the Sensors page >> Sensors page and click on the IO-digital8 relay you will be linking to your Trap Receiver Virtual Sensor.
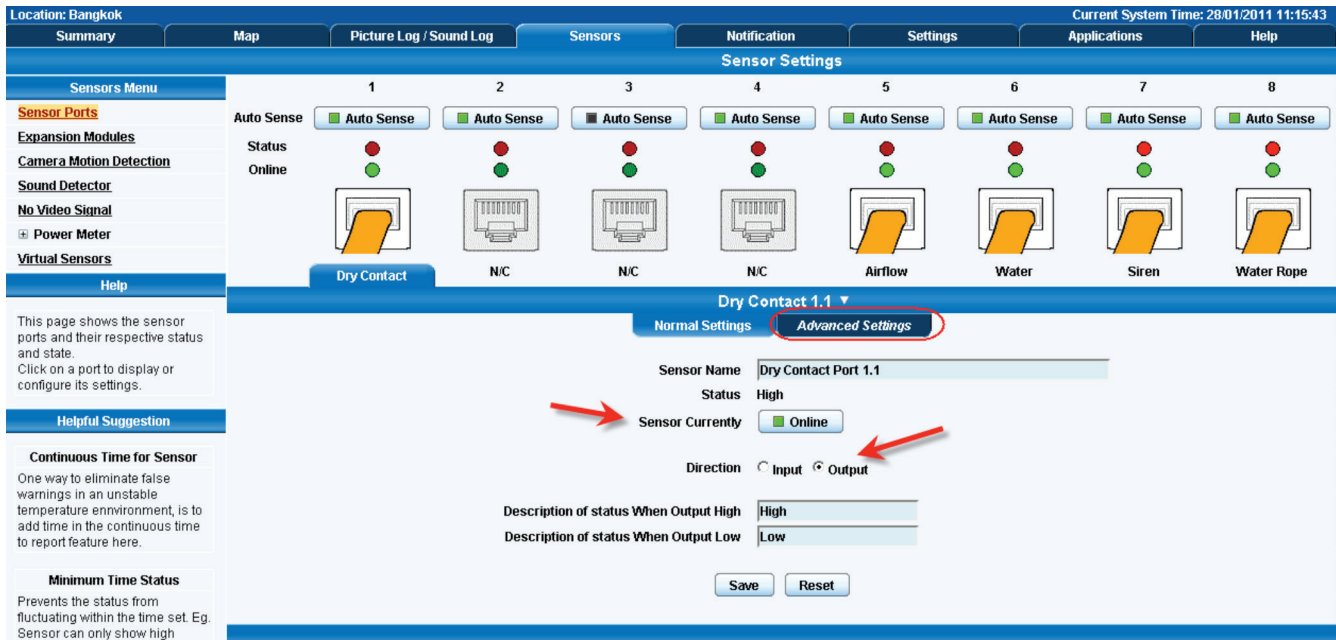
Figure 9-6.

First, enable the relay by turning it "Online," then configure the direction, whether it will be an input or output, then click on the Advanced Settings tab.
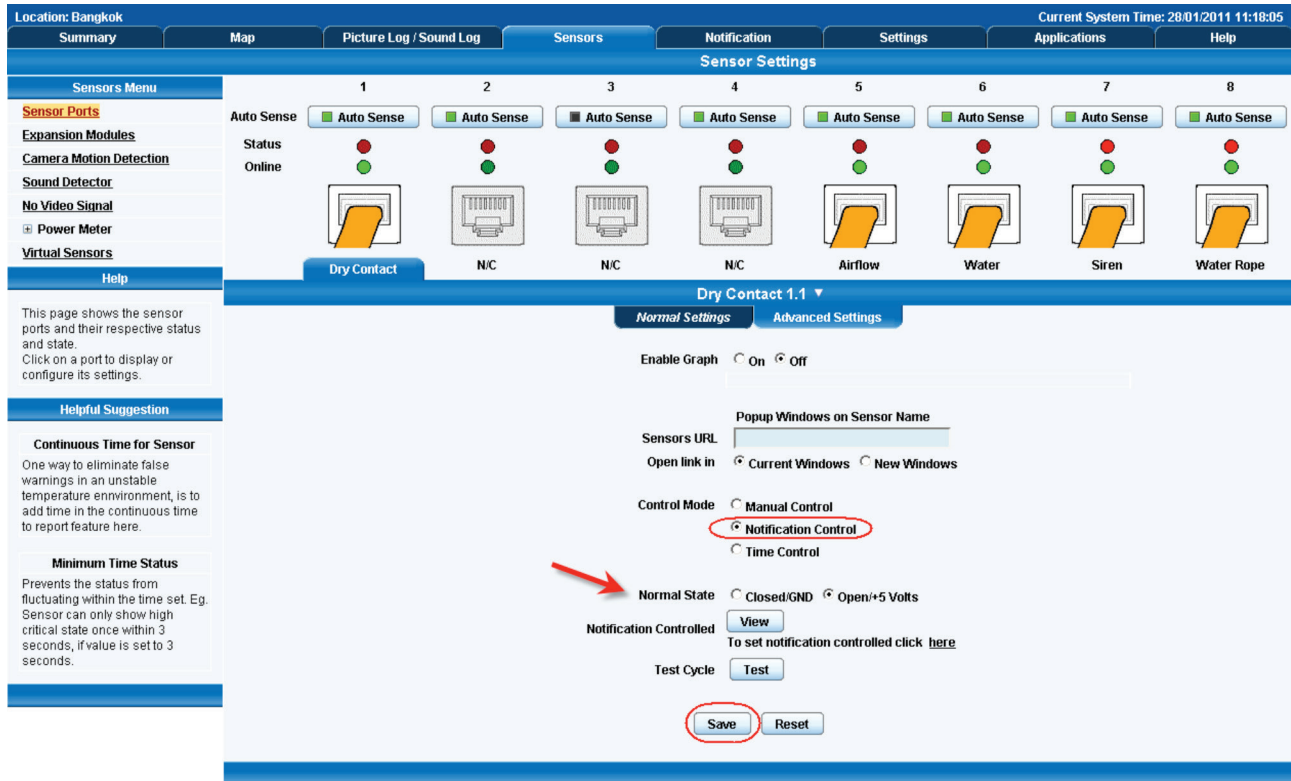
Figure 9-7.

Set the relay's "Control Mode" to Notification Control and set the Normal State to which the relay will be in, either Closed/GND or Open+5 Volts, and click the "Save" button.

4. Setup the Dry Contact Action.
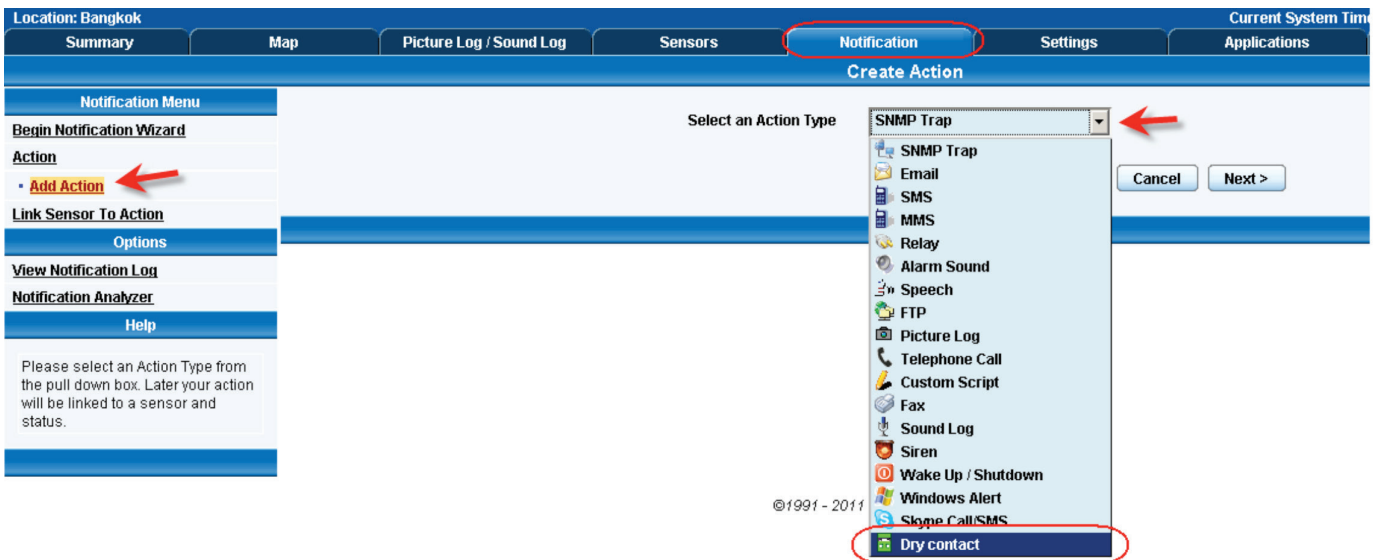
Figure 9-8.

Now we will setup the dry contact action that will control the relay. First Navigate to the Notifications page >> Add Action >> Select the Dry Contact from the Action Type drop down list as shown above, then click the "Next" button.
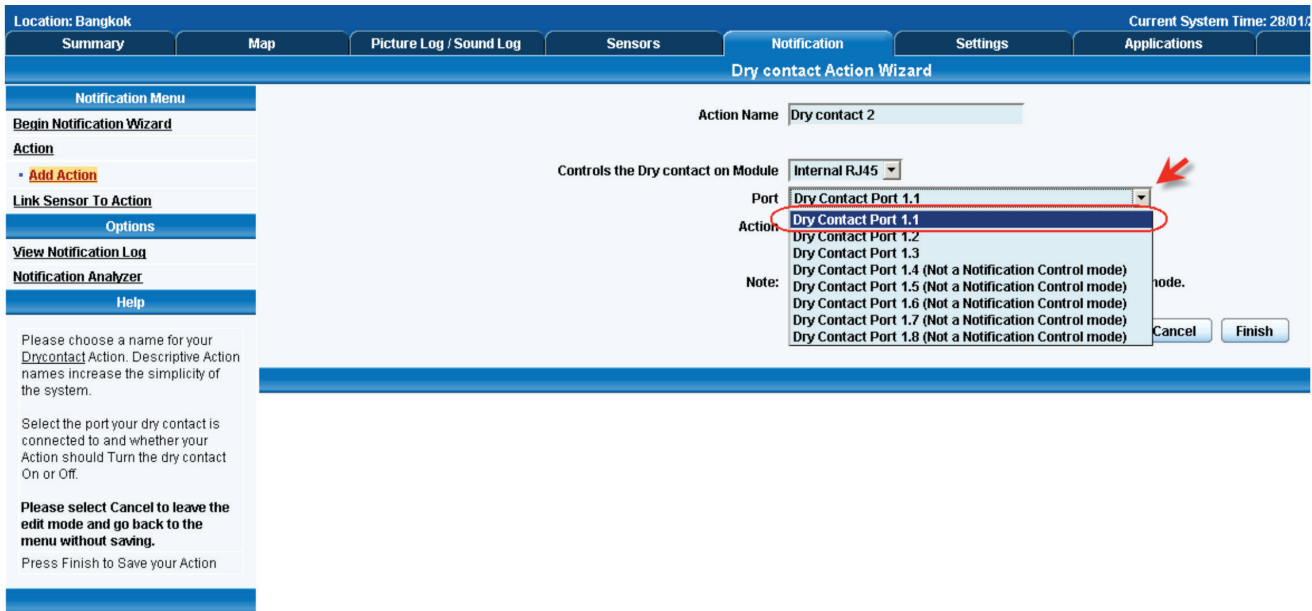
Figure 9-9.

Name the relay action, then select the port that we set up earlier from the Port drop-down list.
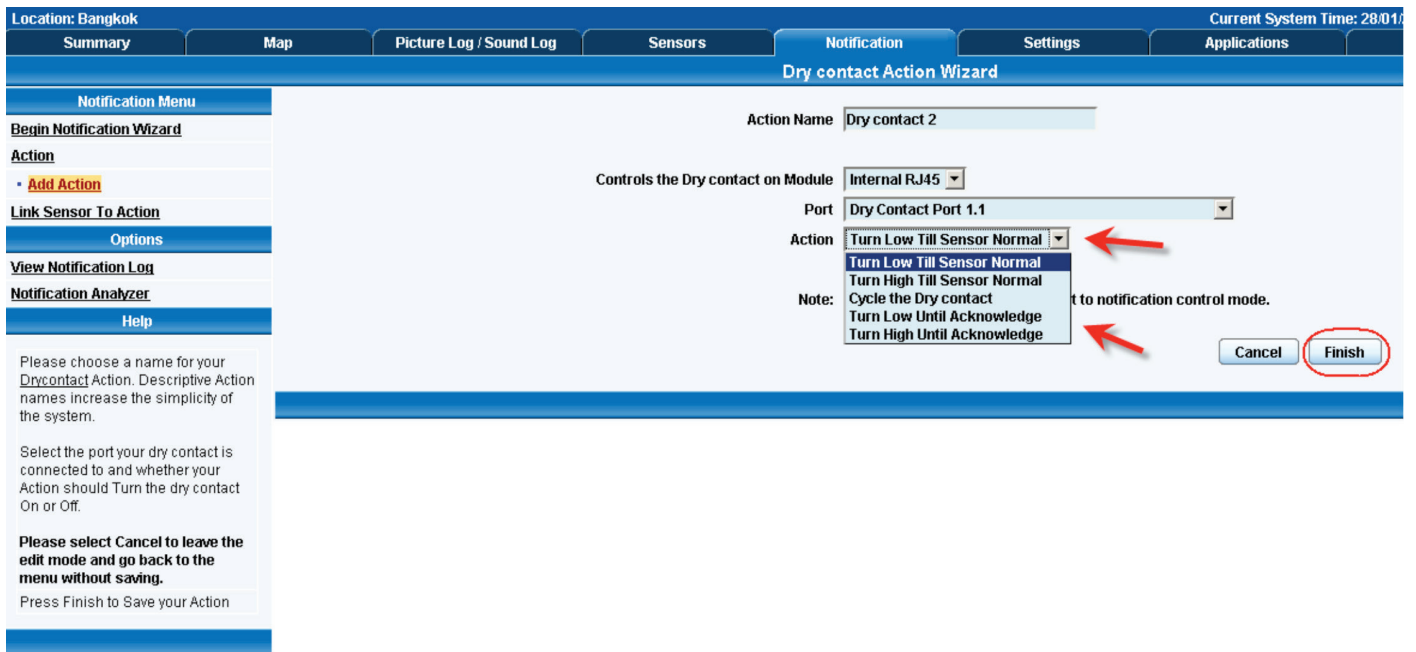
Figure 9-10.

Now select the Action for which you require the relay to perform when it will be triggered by the Trap Receiver Virtual Sensor and click the "Finish" button.

FIgure 9-11.

The new action appears in the actions listing. Click on the Link Sensor To Action link.

5. Link the Trap Receiver to the Dry Contact Action.

Figure 9-12.

After clicking on the "Link Sensor To Action" link, click on the "Create" button.
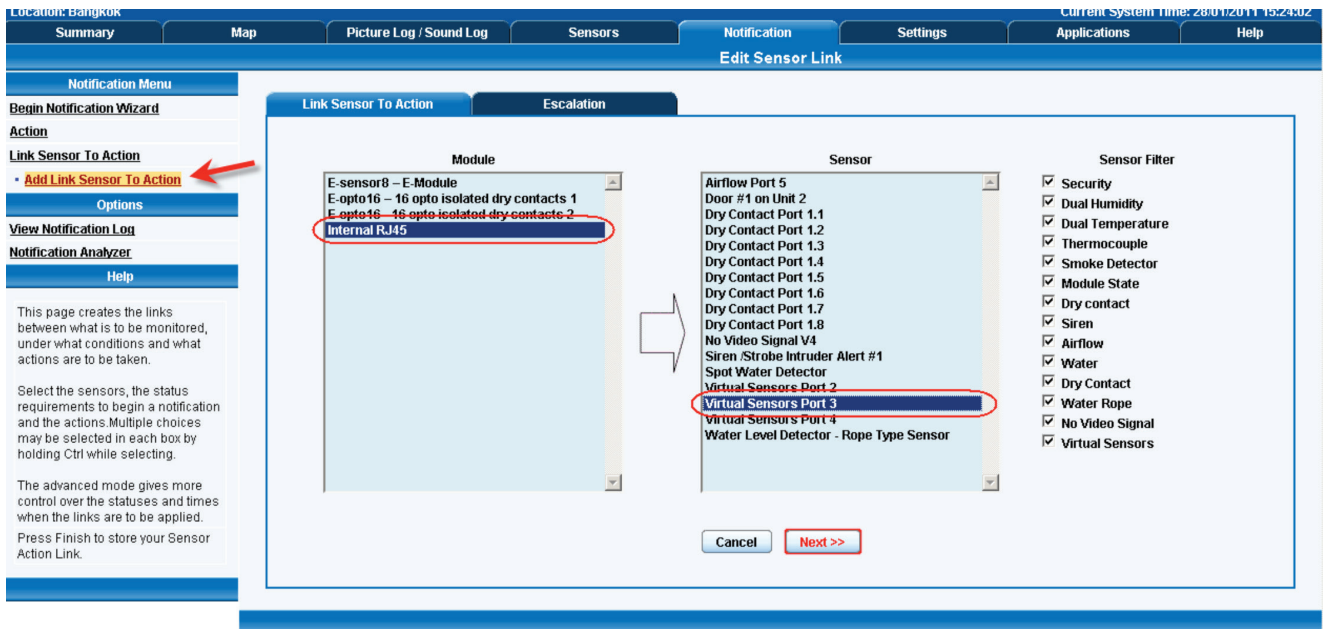
Figure 9-13.

Now click on the Internal RJ-45 in the Module list, then the Virtual Sensor that we setup for the Trap Receiver, and click on the "Next" button.
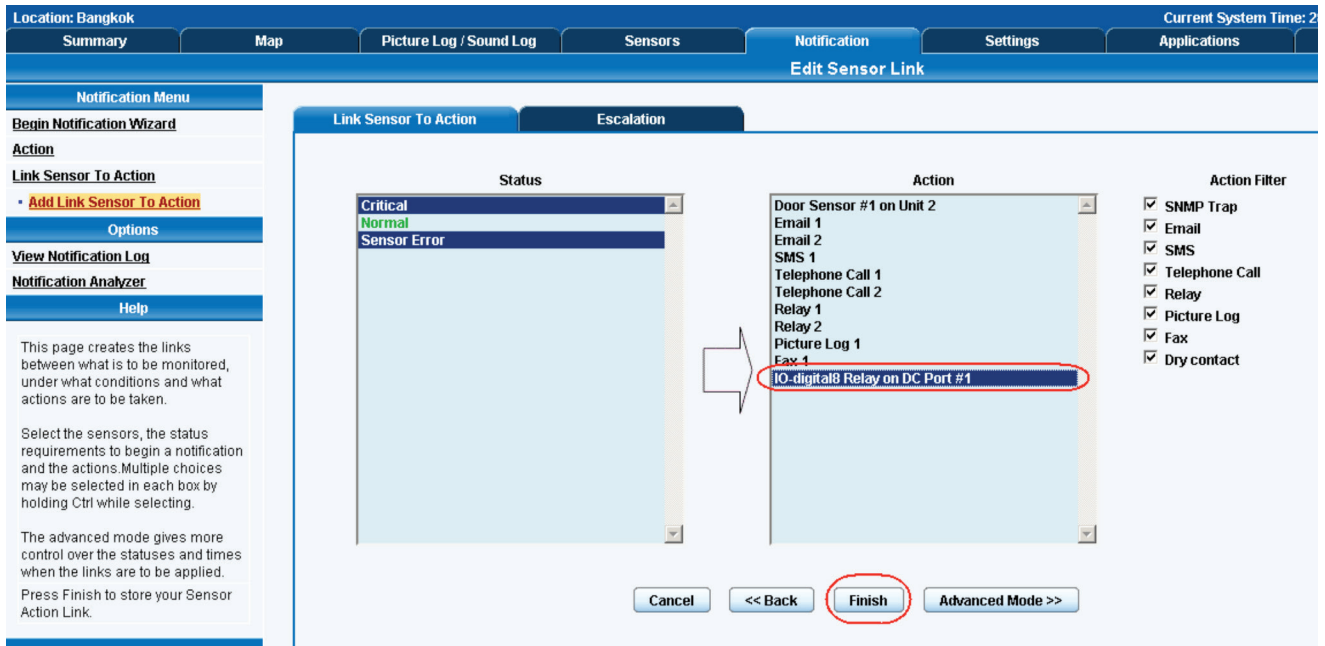
Figure 9-14.

Select the Status that the Virtual Sensor will be in to activate the relay. Then select the Dry Contact relay action that we previously created from the Action listing. Finally, click the "Finish" button.

Figure 9-15.

The Trap Receiver Virtual Sensor is now linked to the IO-digital8 dry contact relay.

10. Frequently Asked Questions (FAQs)

Question: I cannot see the temperature sensor displayed on summary page.

Answer: After logging in for the first time with the temperature sensor connected, you may need to do the following.
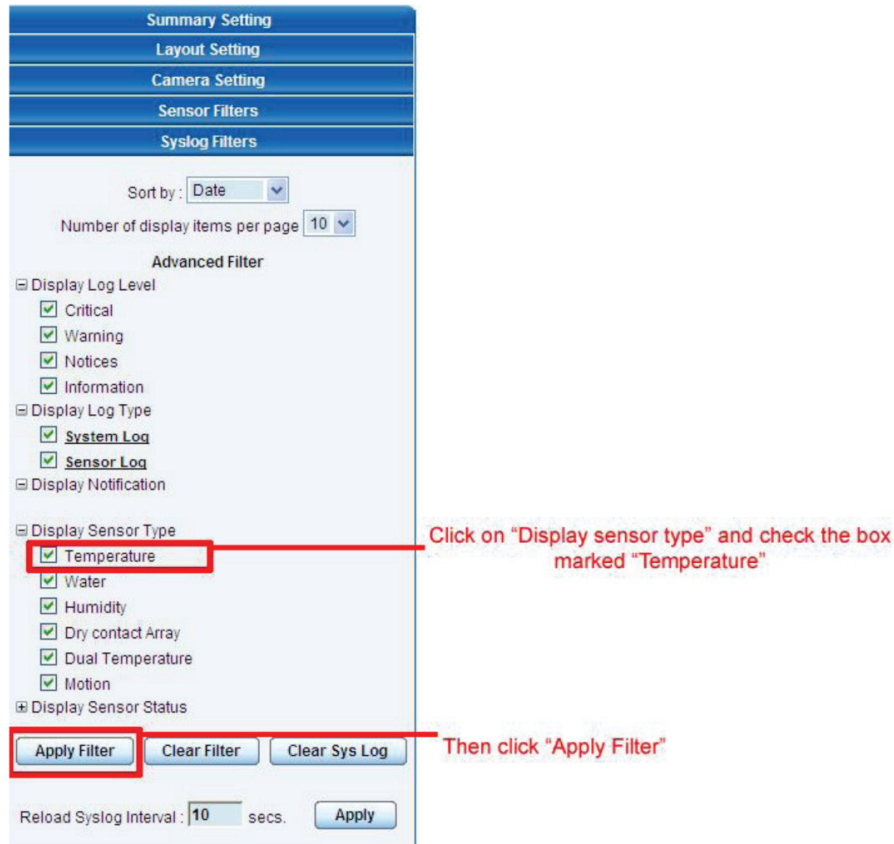
Figure 10-1. Select sensor to display.

Next, click on "Apply Filter." The temperature sensor should then be displayed in the list of connected sensors.

Question: I cannot access my unit's Web interface.

If you're having issues with network connectivity, first make sure that the link100 LED is lit on the front display of the unit. If this is not lit, then no network connection is present.

Answer:

1. If connected directly to a PC, make sure you're using a good quality crossover cable.

2. Make sure you're using a standard CAT5 Ethernet cable to connect to your network.

Question: What do my LED lights mean?

Answer: The following diagrams show what the various LED displays mean.
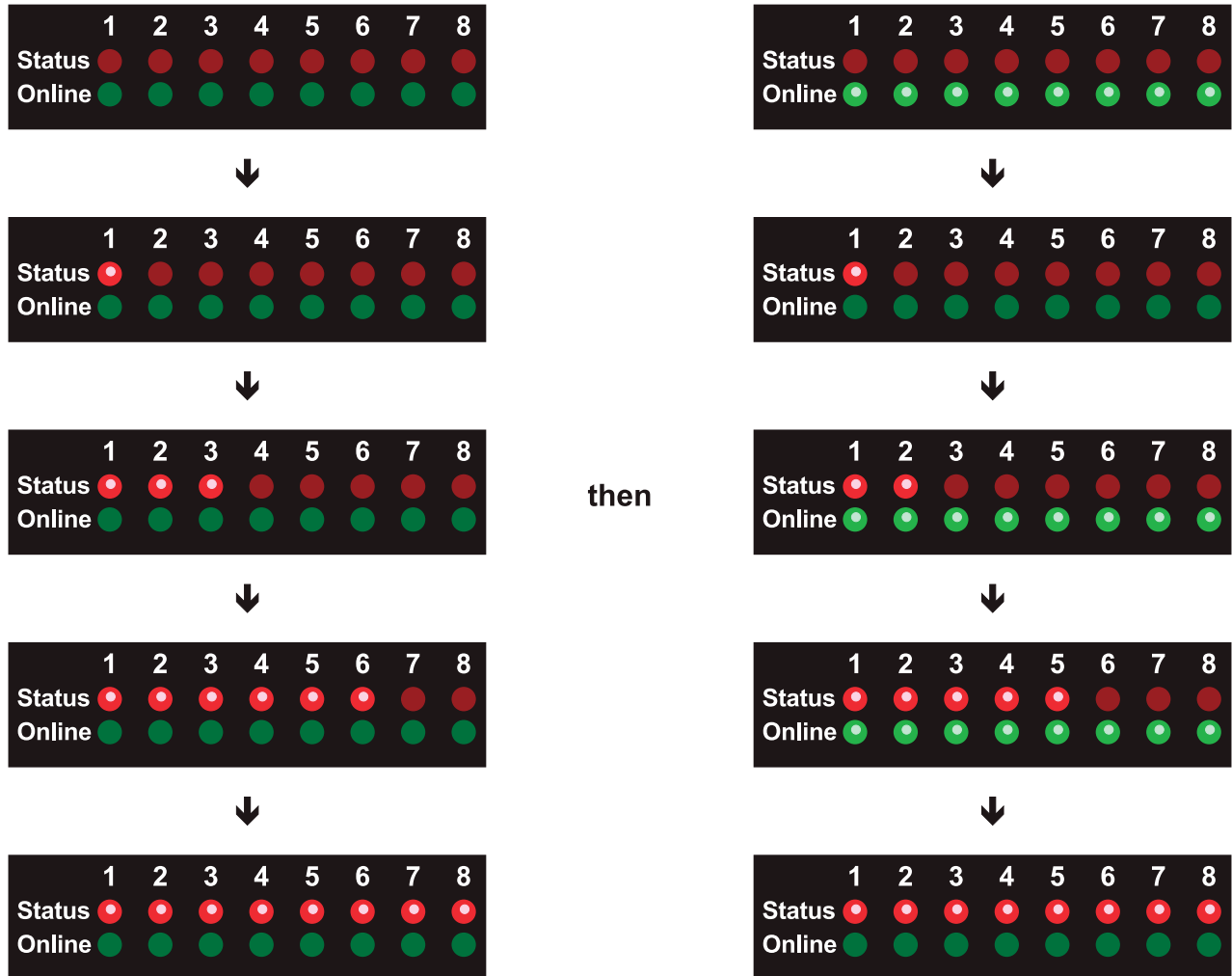
Figure 10-2. LED patterns in Normal mode.
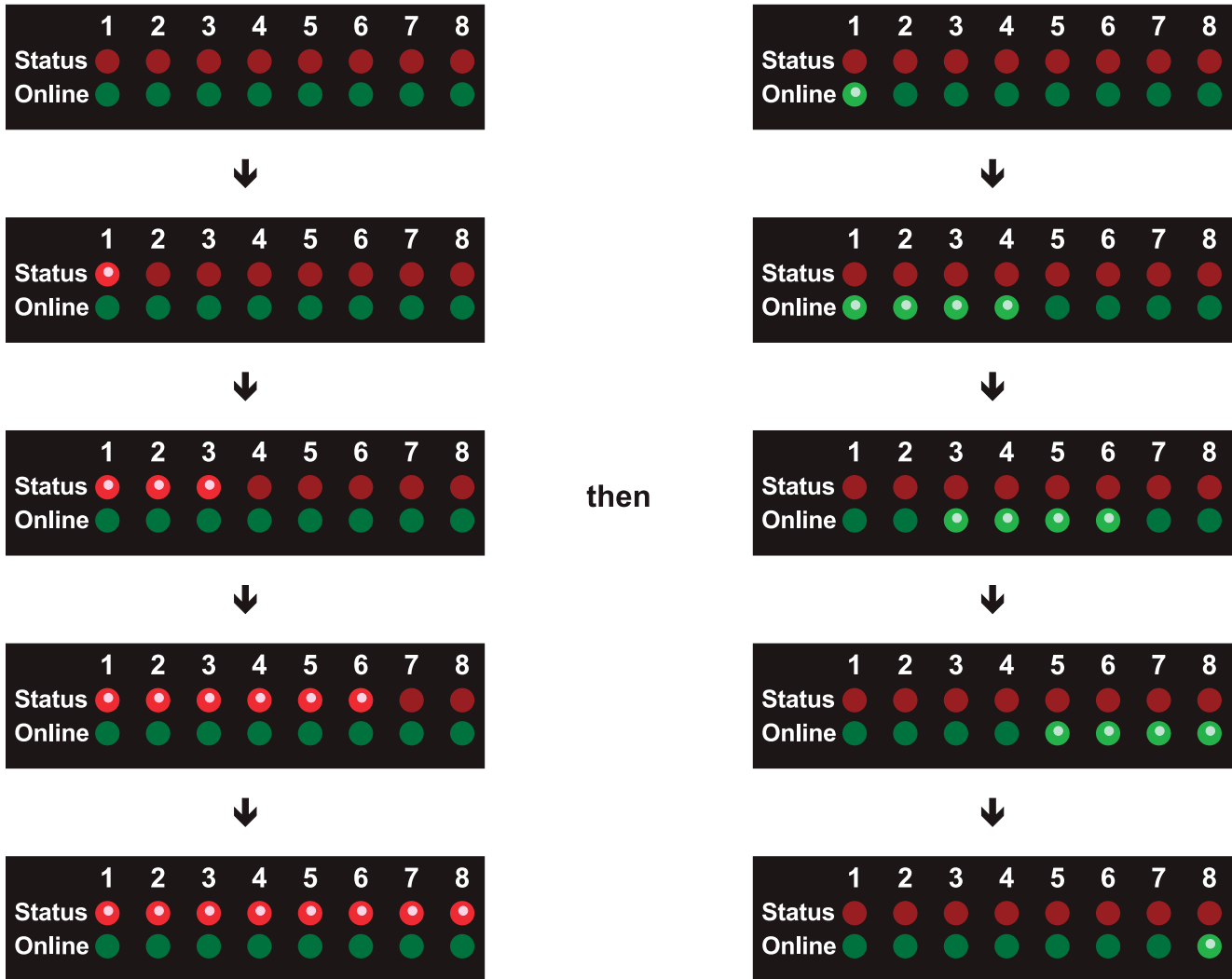
Figure 10-3. LED patterns in Safe mode.
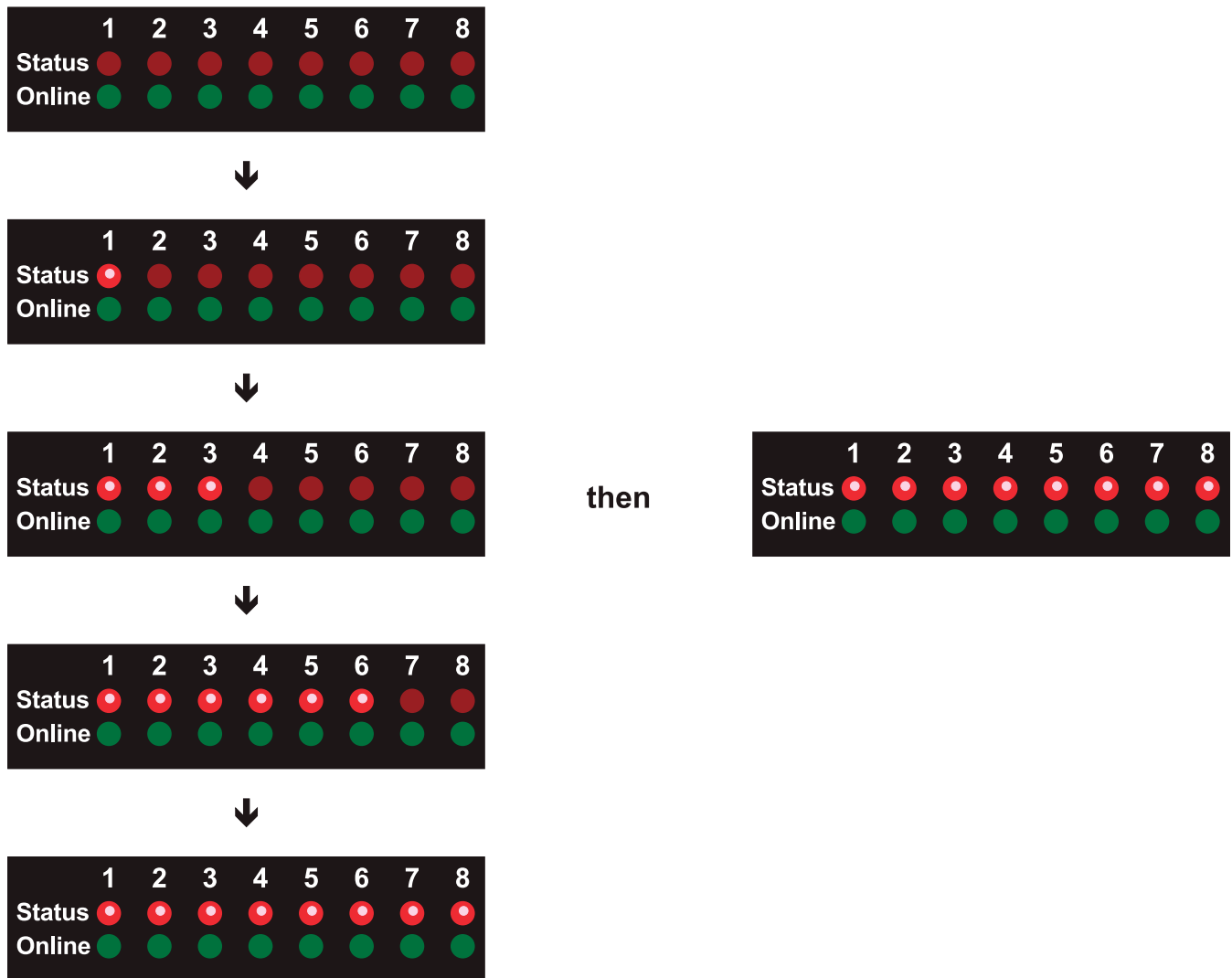
Figure 10-4. LED patterns in Recovery mode.

LEDs run clockwise after the power is connected.

From left to right, each LED indicates:

1st LED: U-Boot init

2nd LED: Kernel loaded with good CRC

3rd LED: Board init

4th LED: Serial port

5th LED: Ethernet

6th LED: NOR Flash

7th LED: NAND Flash

8th LED: Root file-system mounted. Starting initialization process

After the root file-system is mounted, all green LEDs will be flashing, and red LEDs light increasingly from left to right. The onboard Web server can be accessed during this time and shows a splash screen with boot details. After the boot process is finished, the LEDs show the status of the online sensors.

Question: I forgot my unit's IP address.

Answer: If you forget the IP address of your unit, you can simply press the reset button on the back of the unit. This will then announce the IP address through the unit's internal speaker.

Question: I forgot the password for my unit.

Answer: Hold down the reset button for seven seconds. This will turn off the use password feature for the Web-based interface. This will remain turned off until you hold the button down for a further seven seconds, or the unit announces "Now turning off password checking."

NOTE: This will turn off the password checking for accessing the Web interface only; you still have to enter the password when you access the system via Telnet.

Question: Can I use DHCP to assign my unit's IP address?

Answer: Yes, you can use DHCP to assign the IP address. The unit ships with this disabled. To turn it on, you need to log into the Web interface and navigate to the Ethernet settings via the "Security" tab, "Ethernet Network," and then click on the "Yes" button for "Use DHCP."
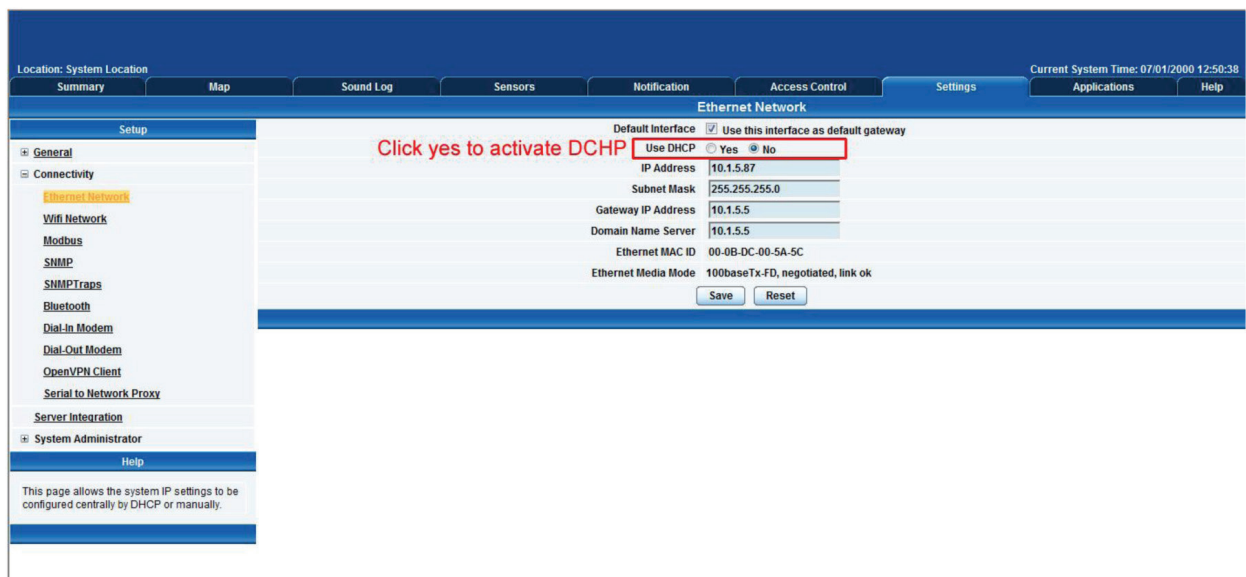
Figure 10-5. Activate DHCP.

NOTE: If the unit has a static IP address assigned, it will no longer send out DHCP requests. If you later want to turn DHCP back on, you can do that using the Web-based interface.

Question: How do I set up my routing table?

Answer: To set up the routing table, open a DOS window (start, run type command press enter) and at the command prompt, then enter: >route add 192.168.0.100.10.1.1.20

Where 10.1.1.20 is the IP address of the Ethernet interface on the PC that the unit is plugged into with the crossover cable.

Now ping* 192.168.0.100 to see if the connection was successful.

Question: How can I change my administrator password?

Answer: If you want to make your unit more secure and change the administrator password from the default (public) to your own choice, follow these steps:

1. Log into your unit using the default password.

2. Click the "Settings" tab.
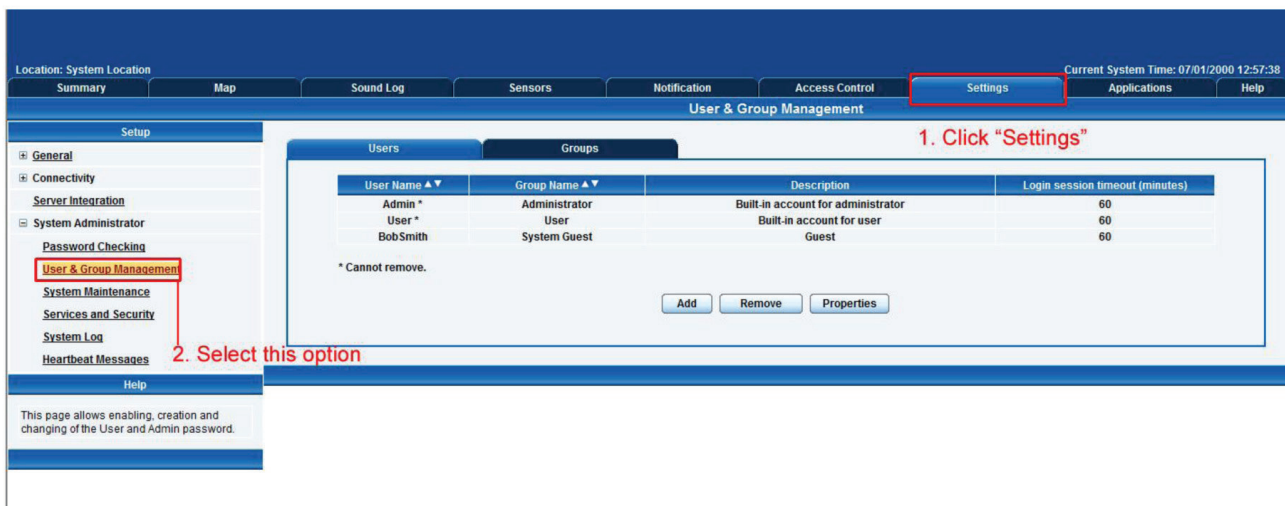
Figure 10-6. Select change password option.

3. Change the password.
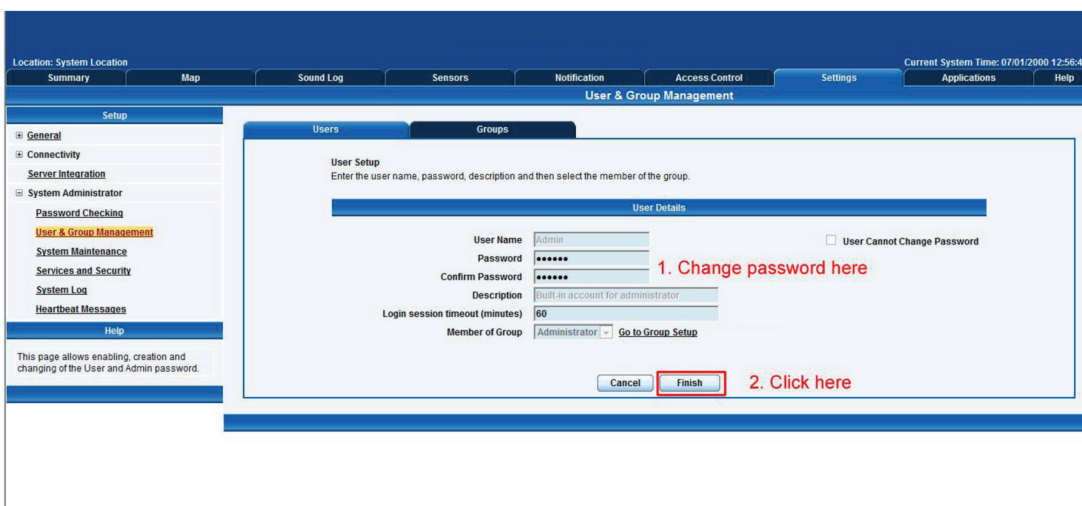
Figure 10-7. Change user and/or admin passwords.

Question: What function do the different types of notifications provide?

Answer: The notifications are used to notify you when a sensor reading has hit a certain preset "critical" threshold. There are many ways you can be notified. They are as follows:

SNMP Trap: This form of notification sends out a signal to your SNMP server.

E-Mail: This sends a notification via e-mail.

SMS: This sends an SMS message to your mobile phone.

MMS: This will send you a multimedia message to your mobile phone. This can include an image captured from one of the ServSensor Hub's cameras.

Relay: The relay is used as a switch, for example, it could switch on an air-conditioning unit if the temperature reading of a temperature sensor reaches a certain threshold.

Alarm sound: This notification will sound an alarm.

Speech: Creates a text-to-speech notification.

Telephone call: Will call you and play a prerecorded message or a text-to-speech message.

Custom script: Allows you to load a custom script that runs on a sensor reading a preset parameter.

Fax: Will send a fax to you with a notification message.

Sound log: Creates a log of sound captured with the internal/external microphone.

Siren and strobe: Will activate a siren and strobe light.

Wake up/shut down: This will send a signal to wake up or shut down a server.

If you require any assistance in setting these up, contact Black Box Technical Support at info@blackbox.com.

Question: Can I connect my unit via Wi-Fi?

Answer: Yes, you can connect the unit via Wi-Fi. Simply plug a USB dongle into the USB port on the rear of the unit.
You then need to configure your connection type and encryption key, etc. Do this from the Web-based interface in the "Settings" tab and the connectivity option.

Figure 10-8. Win Network screen.

Question: What is the Heartbeat message?

Answer: This setting is to have the ServSensor notify you that it is still running. You can be notified by either traps or by e-mail:

Alive Trap settings: Send Keep Alive Traps (Default Off): Select on if you want the system to send Alive Traps.

Destination: Enter the IP address of the server to send traps to.

Community: SNMP community string.

Resend Interval (mins): The period of time between each keep-alive trap. Values range from 1 to 65535 minutes.

Question: What is the network sniffer?

Answer: The network sniffer application can be used to capture network packets running to and from the ServSensor Hub, and all the network traffic. You can then import the captured file into TCP dump for details of these network packets. The network trace will help in debugging any network problems; for example, if e-mail cannot be sent.

Question: Can I use the camera for a videoconferencing call?

Answer: Yes, it is possible to use the camera and the integrated microphone to make a videoconferencing call. You need the software called "OpenPhone" running on your computer. This is included on the CD-ROM that came with your unit. (Look for OpenPhone.exe). Next follow these steps:

1. Initiate connection from OpenPhone (PC) to ServSensor.

   a. Open the program by double clicking "openphone.exe"

   b. Click the "Make Call" button, enter the IP address of the ServSensor Hub Linux/ServSensor V4E Hub to initiate a call in the "Address" field. Then, click "OK."

   c. The unit will automatically respond to a call and establish the connection. You will then see the video and hear sound from the unit.

2. Initiate connection from a ServSensor to OpenPhone (PC).

   a. Open the program by double clicking "openphone.exe"

   b. On the Web interface, click on the "Applications" tab, and click on "Video Conferencing."

   c. Select the "Call to" option and enter the IP address of the PC running OpenPhone. Click "Save" to discover your computers IP address in the command prompt, type "ipconfig."

   d. On the OpenPhone application, click "Answer" to accept the call.

3. Connection between two ServSensor Hub Linux/ServSensor V4E Hub (only voice conference).

   a. On the Web interface of the calling ServSensor Hub Linux/ServSensor V4E Hub, click on the "Applications" tab, and click "Video Conferencing."

   b. On the right pane, select the "Call to" field and enter the IP address of the receiving ServSensor Hub Linux/ServSensor V4E Hub into this field. Click "Save."

   c. The connection should automatically establish.

You can end the videoconference call by doing the following:

1. **End the call on OpenPhone (PC):** To end call, click the "Hang Up" button on the OpenPhone. This method can be used to end the call between the system and OpenPhone.

2. **End the call on the unit:** From the Web interface, click on the "Applications" tab and click on "Video Conferencing." On the right pane, select "End call and wait for a new incoming call" option. Then, click "Save."

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```
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```

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Version 3, 29 June 2007

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- zlib

zlib.h -- interface of the 'zlib' general purpose compression library

version 1.2.11, January 15th, 2017

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