

## ServSensor EXP DC16

**Adds 16 opto-isolated dry contacts,  
so you can monitor more data points  
from a ServSensor V4E.**



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## 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.
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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 debe 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 conectado 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 física 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 líneas de energía.
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 objetos líquidos 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: Objetos 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

1. Specifications .....	6
2. Overview.....	7
2.1 Introduction .....	7
2.2 What's Included .....	7
2.3 Hardware Description.....	8
2.3.1 Front Panel .....	8
2.3.2 Back Panel.....	9
3. Installation .....	10
3.1 Connecting to the Base Unit.....	10
3.2 Setting Up a Sensor (Standard Configuration) .....	11
3.3 Setting Up a Sensor (Daisy-chained Configuration).....	14
4. Notifications.....	18
4.1 Adding a Notification .....	18
4.2 SNMP Traps.....	19

## 1. Specifications

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

**Data Transfer Rate:** 115.2 kbps

**Expandability/E-modules:** Daisychain multiple E-modules, including EME1X8 and EME1DC16, uses standard RJ-45 connections and CAT5 LAN cable, connect up to 600 intelligent sensors

**Maximum Cable Length:** 1000 ft. (300 m)

**Mean Time Between Failures (MTBF):** 400,000 hours

**Network Interface:** (1) standard 10/100BASE-T Ethernet RJ-45 port

**Connectors:** Input: (16) 2-wire dry-contact inputs configured as opto-isolated (2-wire dry-contact inputs support up to 50 VDC and 80 mA of current), (1) RJ-45 expansion module input (E-in), (1) RJ-45 expansion module output (E-out)

**Indicators:** (3) LEDs: (1) Power, (1) Network Connectivity, (1) Dry Contact Status

**Temperature Tolerance:** Operating: -31 to 131° F (-35 to +55° C)

**Humidity:** 20 to 80%, noncondensing

**Power:** Output: 7.0–9 VDC, 3 amps, configurable output signals (0–5 VDC) on any of the 8 RJ-45 sensor ports  
Consumption: Typical 6.15 watts, 0.82 amps

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

**Weight:** 2.4 lb. (1.1 kg)

## 2. Overview

### 2.1 Introduction

The ServSensor EXP DC16 (EME1DC16) expansion module extends the ServSensor V4E (EME134A) capabilities by connecting an additional 16 opto-isolated dry contacts. This increases the number of data points that can be monitored from a single ServSensor V4E.

### 2.2 What's Included

Your ServSensor EXP DC16 package should contain the following items. If anything is missing or damaged, contact Black Box Technical Support at 724-746-5500 or [info@blackbox.com](mailto:info@blackbox.com).

- ServSensor EXP DC16
- (1) CD-ROM
- (1) 7.0 –9 V, 2.5 A power supply
- (2) Brackets for rackmounting
- (1) 5-ft. (1.5-m) straight cable

## 2.3 Hardware Description

### 2.3.1 Front Panel

Figure 2-1 shows the ServSensor EXP DC16's front panel, and Table 2-1 describes its components.

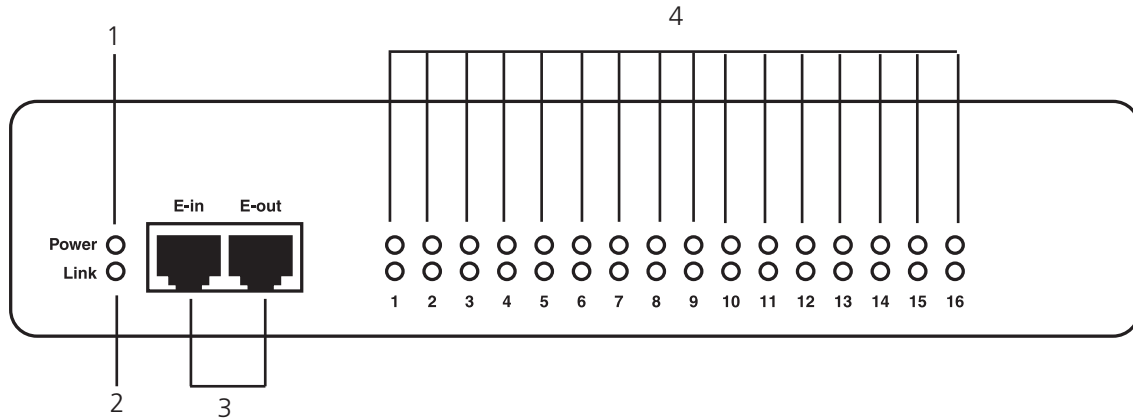


Figure 2-1. Front panel.

Table 2-1. Front panel components.

Number	Component	Description
1	Power LED	Lights continuously when the ServSensor EXP DC16 is powered on. If the LED is flashing, there is a problem with the CPU.
2	Link LED	Lights when a network connection is present.
3	RJ-45 ports	Expansion In/Expansion Out ports. These ports are named E-in and E-out. The E-in port connects to your ServSensor V4E base unit via a CAT5e straight-through cable. The E-out port is used to daisychain additional expansion modules via a CAT5e straight-through cable.
4	Status/Online LEDs 1–16	LEDs numbered 1–16 indicate the connectivity status of the sensors connected to each port. These LEDs also indicate system status during various operations.

Table 2-2. Status/Online LED functions.

Function	Description
Upgrade in progress	The red LEDs will move from left to right to indicate activity, and the green LEDs indicate overall progress of the upgrade. When all the red lights are off and all the green lights are on, the upgrade/recovery process is complete.
Unit is operating in safe mode	Used when the ServSensor EXP DC16 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.
Unit is in recovery mode	The ServSensor EXP DC16 may enter recovery mode if a firmware upgrade is incomplete. The unit displays a continuously lit row of red LEDs during recovery mode. If your device enters recovery mode, contact Black Box Technical Support at 724-746-5500 or info@blackbox.com.



2.3.2 Back Panel

Figure 2-2 shows the ServSensor EXP DC16's back panel, and Table 2-3 describes its components.

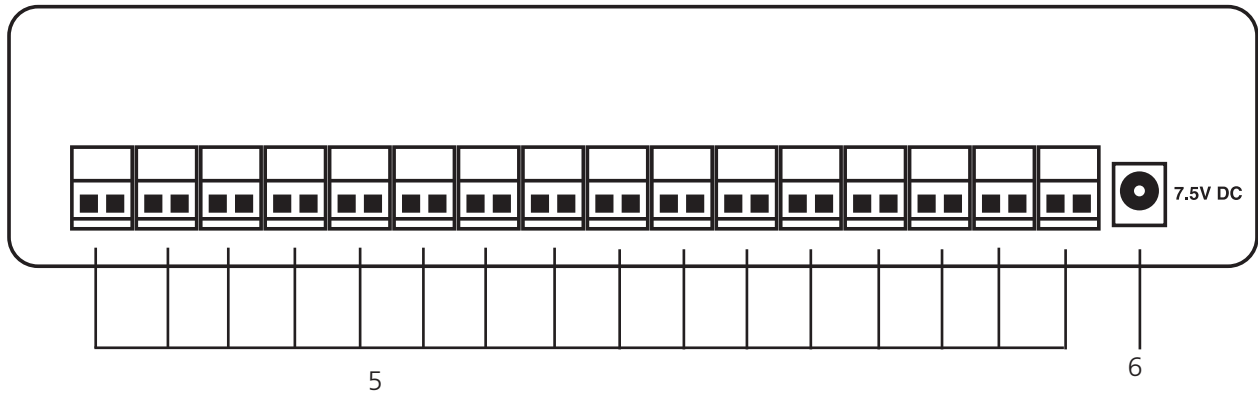


Figure 2-2. Back panel.

Table 2-3. Back panel components.

Number	Component	Description
5	(16) 2-pin ports	The 2-pin dry contact ports, numbered 1–16, are used to connect the input voltage.
6	(1) barrel connector	This is a 7.5-VDC plug. Use a 7.0–9-V, 2.5-A power supply (included).

## 3. Installation

### 3.1 Connecting to the Base Unit

To connect the ServSensor EXP DC16 to the ServSensor V4E, follow the steps listed below.

1. Connect the cable to your chosen port. See Figure 3-1.

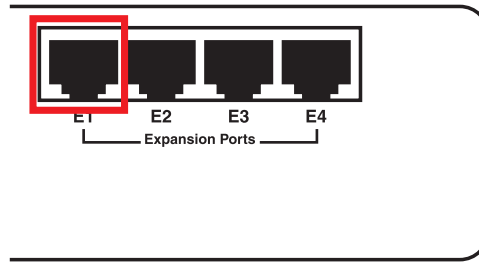


Figure 3-1. E1 port.

2. Connect the other end to the "E-in" port. See Figure 3-2.

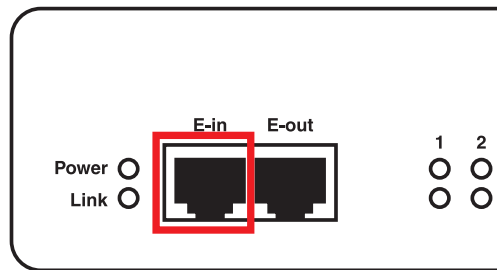


Figure 3-2. E-in port.

**NOTE:** Make sure that the 7.5 volt power supply is connected.

The expansion modules can be mounted in either a standard configuration or a daisychained configuration, as shown in Figures 3-3 and 3-4.

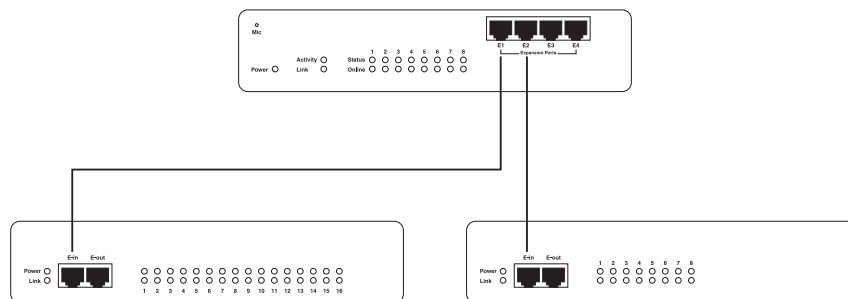


Figure 3-3. Standard configuration.

In the example shown in Figure 3-3, two expansion modules are connected from two separate expansion ports on the ServSensor. In the example shown in Figure 3-4, the same two modules are connected to one expansion port in a daisychain configuration.

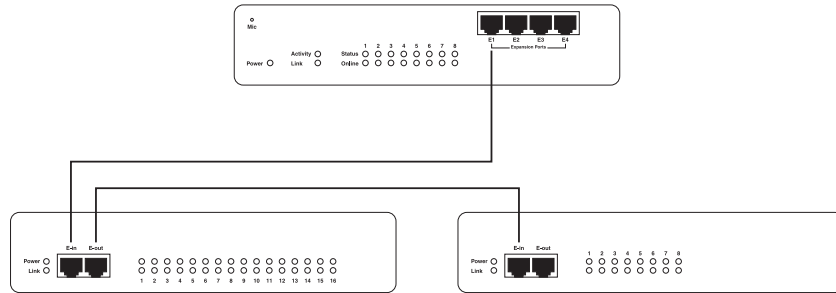


Figure 3-4. Daisychained configuration.

### 3.2 Setting up a Sensor (Standard Configuration)

This section describes the basic setup of a dry contact sensor in a standard configuration. It focuses on the dry contact sensor; however, this basic setup process applies to all compatible sensors. If you require information on specific functions of a particular sensor, then download the manual for that sensor from our Web site or locate it on your product CD.

1. Plug the sensor into one of the dry contact ports on the rear panel of the unit. In this example, we will use Port 1. See Figure 3-5.

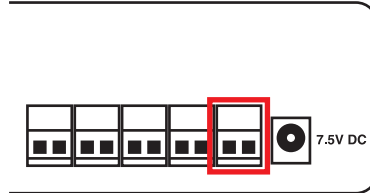


Figure 3-5. Plug the temperature sensor into Port 1.

2. Type the IP address of the unit (default, 192.168.0.100) into your browser.
3. Log in as the administrator using your administrator password (the default is "public"). The Summary page will appear as shown in Figure 3-6.

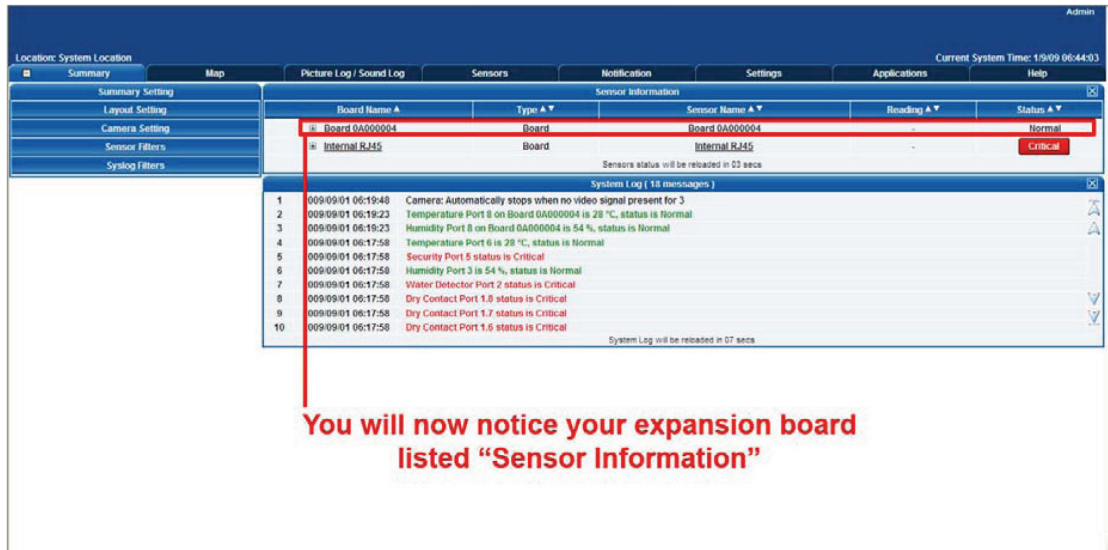


Figure 3-6. Summary page.

The dry contact sensor should be listed along with its current reading and status.

4. Click on the dry contact sensor’s name (indicated in previous screen). The Sensors page appears.

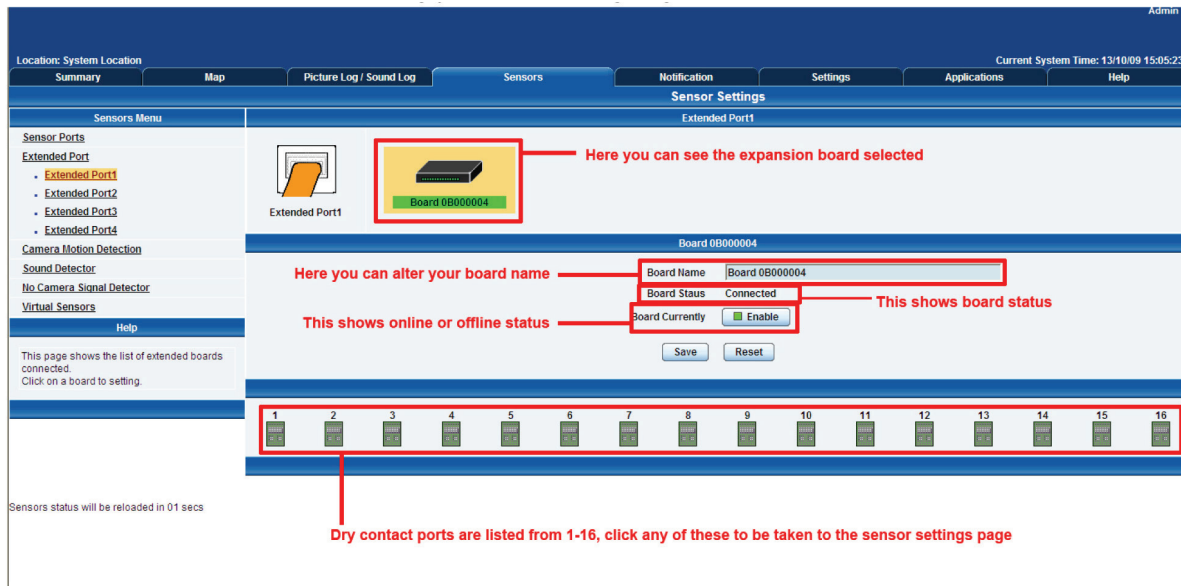


Figure 3-7. Sensors page.

NOTE: You can also access this page by clicking on the Sensors tab at the top of the page.

5. Extended ports are listed from 1–4 on the left side of the sensor menu page.

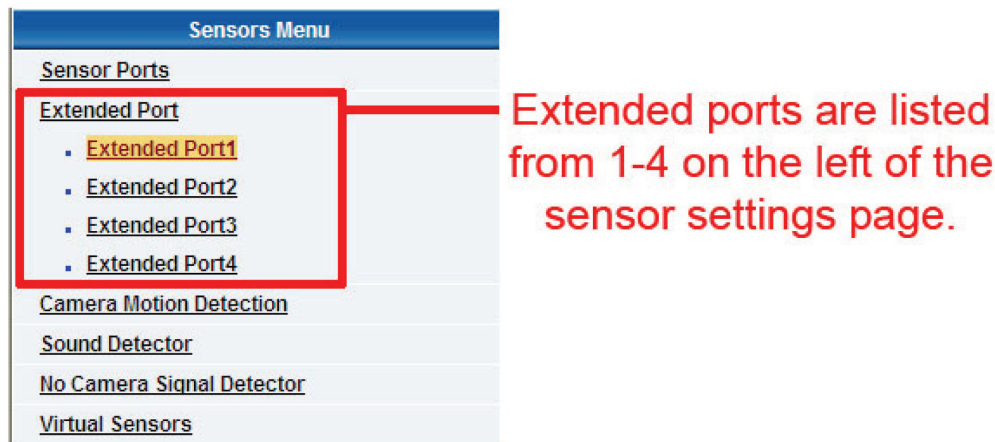


Figure 3-8. Sensors menu.

6. Click on the dry contact sensor icon (or another type of sensor icon).

7. The page shown in Figure 3-9 appears.

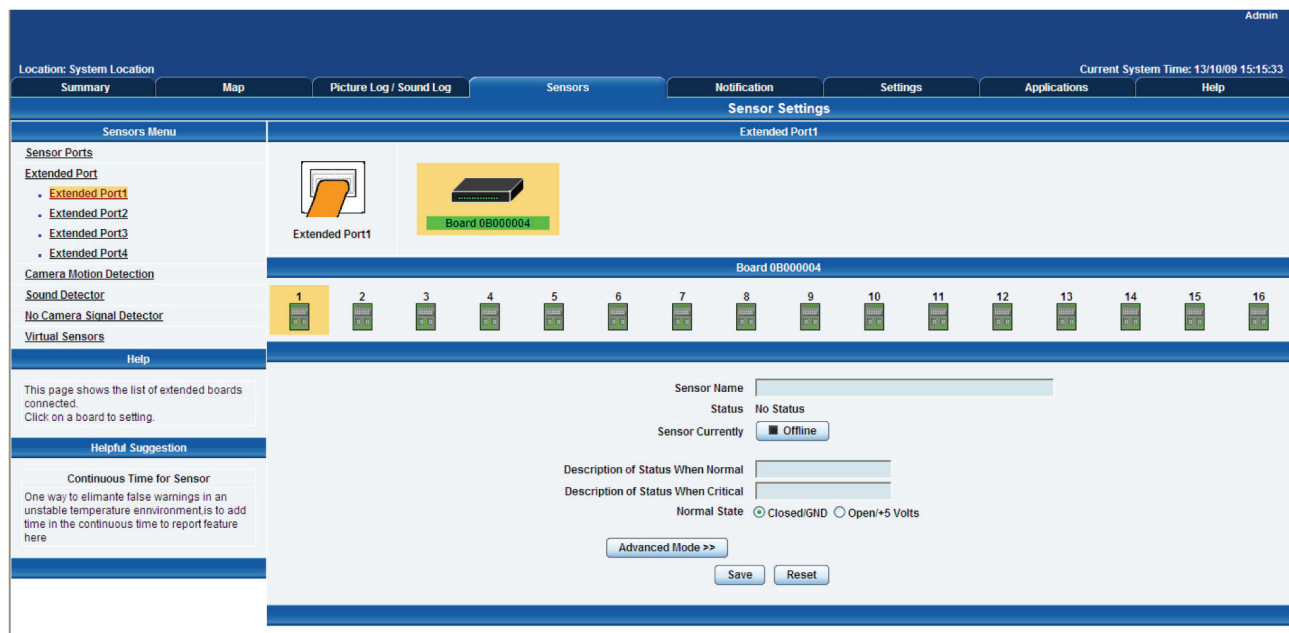


Figure 3-9. Sensor Settings page.

As with the ServSensor V4E, the procedure for changing sensor values remains the same. For more information on sensor settings, refer to the ServSensor (EME134A) manual or individual sensor manual.

## 3.3 Setting up a Sensor (Daisychained Configuration)

This section describes the basic setup of a sensor in a daisychained configuration. It focuses on the dry contact sensor; however, this basic setup process applies to all compatible sensors. If you require information on specific functions of a particular sensor, then download the manual for that sensor from our Web site or locate it on your product CD.

Connect the two modules together by following the instructions below:

1. Insert a straight-through CAT5 cable into the "E-out" port.

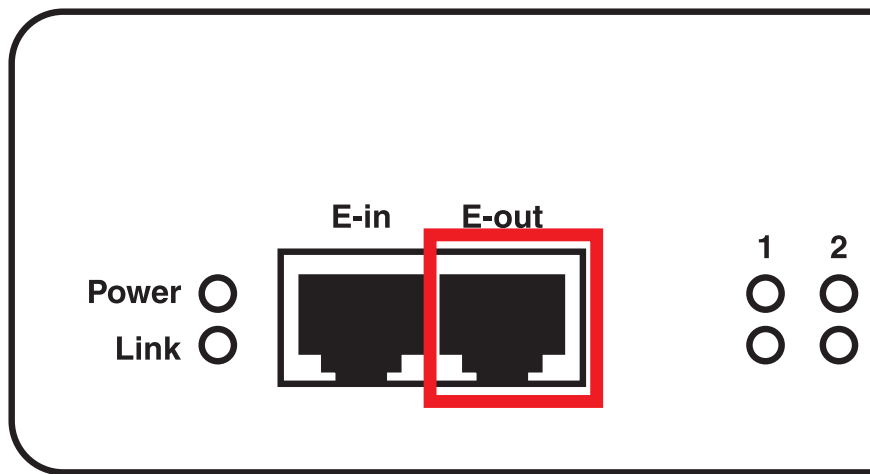


Figure 3-10. E-out port.

2. Insert the other end of the CAT5 cable into the "E-in" port.

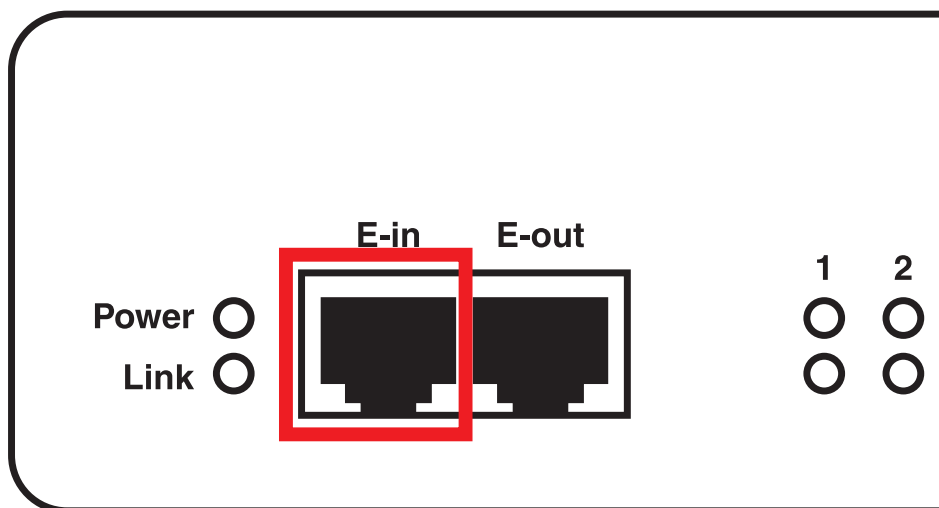


Figure 3-11. E-in port.

NOTE: Make sure you also have a 7.5-volt power supply connected.

- When the unit is connected, the LEDs will enter the boot-up sequence indicating that the expansion module (EME1DC16) is communicating with your ServSensor V4E (EME134A).
- Plug a sensor into one of the dry contact ports on the rear panel of the unit. In this example, we will use Port 1.

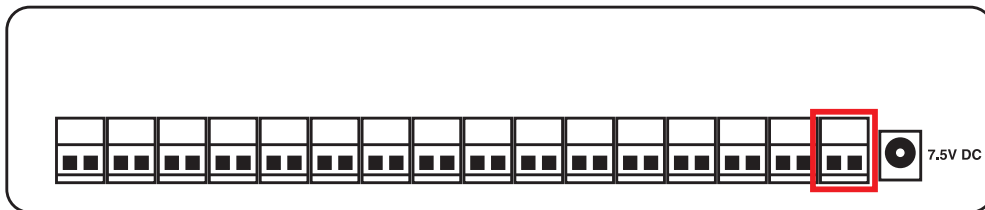


Figure 3-12. Plug sensor into Port 1.

- After the unit is connected, access your Web interface, type the desired IP address into your browser and log in, and navigate to the summary page. Two boards will be displayed within the sensor information window as shown in Figure 3-13.

Sensor Information				
Board Name ▲	Type ▼	Sensor Name ▲▼	Reading ▲▼	Status ▲▼
Board 0A000003	Board	Board 0A000003	-	Warning
Board 0B000004	Board	Board 0B000004	-	Connected
Internal RJ45	Board	Internal RJ45	-	Warning

Sensors status will be reloaded in 10 secs

Both expansion boards are now displayed.

Figure 3-13. Sensor information window.

- Click on the lower of the two boards and the sensors page will appear.

NOTE: You can also access this page by clicking on the "Sensors" tab at the top of the summary page.

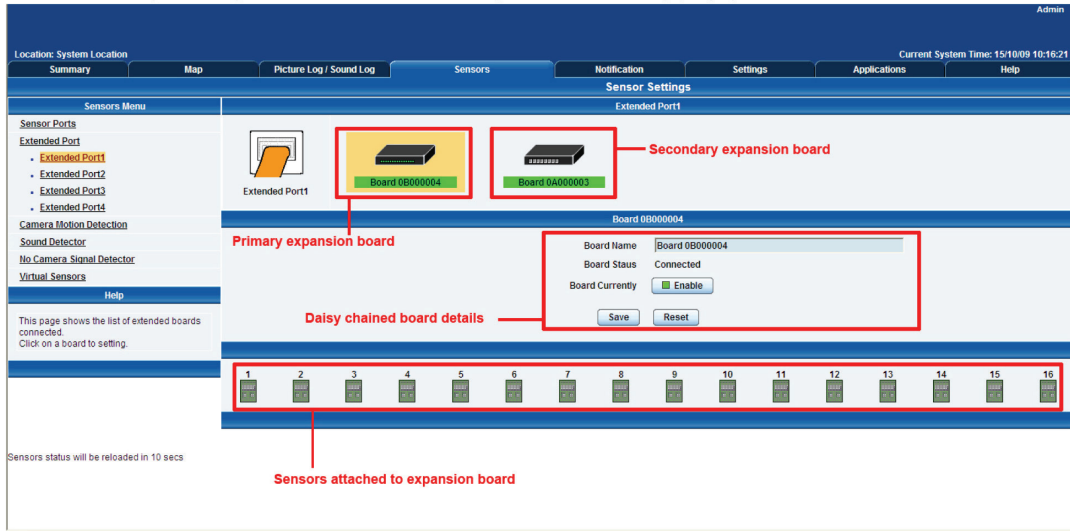


Figure 3-14. Sensors page.

7. Click on any available sensor icon (see Figure 3-15). The settings for that particular sensor will appear as shown in Figure 3-16.



Figure 3-15. Temperature sensor settings icon.



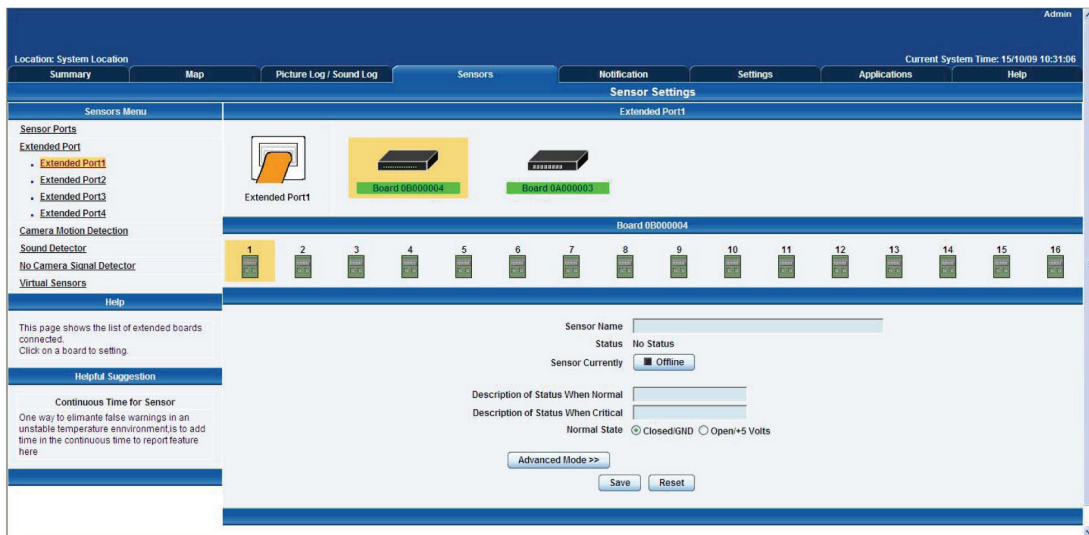


Figure 3-16. Sensor Settings page.

## 4. Notifications

Set up a notification to define what to do when the sensor gives a reading beyond your previously set thresholds. This allows you to determine how you will be notified that a sensor's reading has reached the specified parameters (high warning, critical, etc.).

### 4.1 Adding a Notification

1. Login as the administrator.
2. Click the "Notification" tab.
3. Click the "Notification Wizard." Figure 4-1 appears.

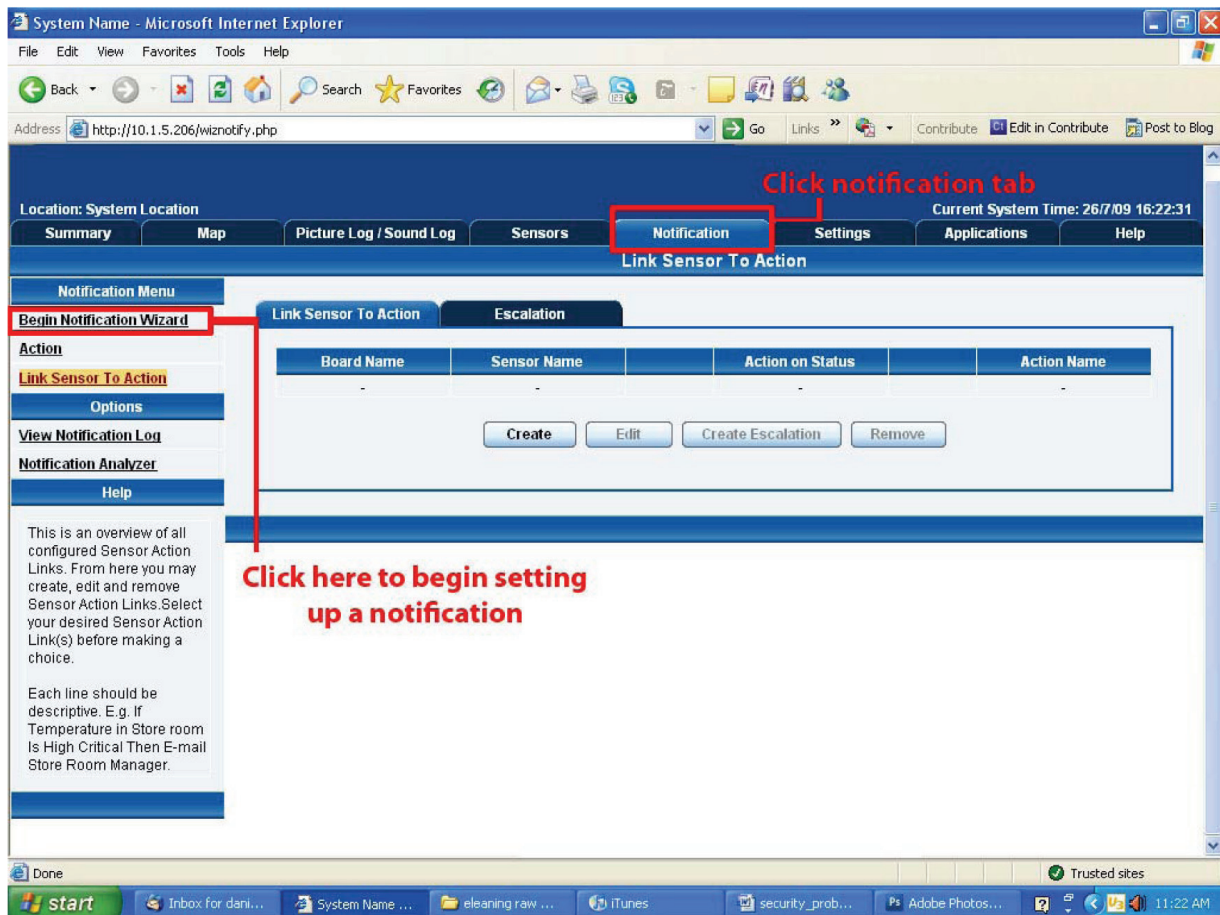


Figure 4-1. Notification Wizard tab.

4. The Notification Wizard page (see Figure 4-2) is displayed.

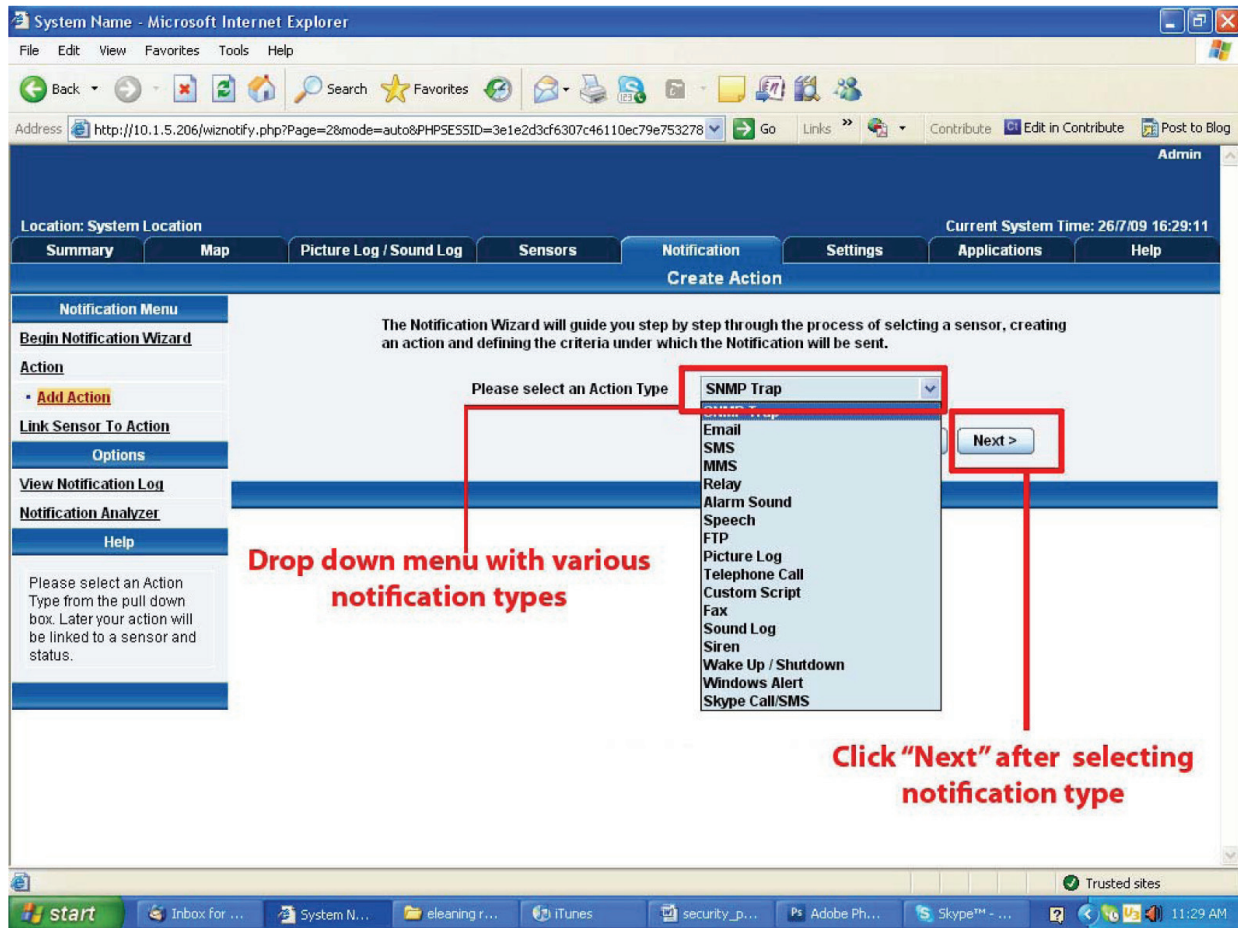


Figure 4-2. Notification Wizard page.

**NOTE:** Next you'll see a sample notification. To learn what the other types of notifications do, refer to the separate notification manuals on your product CD.

## 4.2 SNMP Traps

Set up a notification via SNMP trap, so that when your sensor reaches a certain threshold it will send a notification to your SNMP server.

1. Log in as the administrator.
2. Click on the "Notifications" tab.
3. Choose "Notifications Wizard."
4. Select "SNMP Trap." The screen shown in Figure 4-3 appears.

The image shows a configuration screen for an SNMP Trap. It features several input fields and buttons. Red boxes and lines highlight specific areas with red text annotations:

- Action Name:** A text box containing "SNMP Trap 1". A red box around it is annotated with "Enter name for your SNMP notification".
- Trap Version:** Radio buttons for "v1" (selected), "v2c", and "v3".
- SNMP Trap send port:** A text box containing "162".
- Destination Address:** A text box containing "192.168.0.XXX". A red box around it is annotated with "Enter the IP address of your SNMP trap".
- Community:** A text box containing "public". A red box around it is annotated with "Enter community name of trap".
- Buttons:** "Add Trap Destination", "Cancel", and "Next".

Figure 4-3. SNMP Trap screen.

5. Fill in the following information:
  - Enter a name for the SNMP notification.
  - Enter the IP address of the SNMP trap.
6. Press the "Add Trap Destination" button.
7. Input another trap or click the "Next" button. The screen shown in Figure 4-4 appears.

The image shows a configuration screen for an SNMP Trap Notification. It features a blue header with "Sensors" and "Notification" tabs, and "SNMP Trap Action Wiz" below. The main content area has two settings:

- Maximum Times to Resend:** A dropdown menu set to "0".
- Resend Intervals (secs):** A text box containing "10" and a label "10 secs".

Figure 4-4. SNMP Trap Notification screen.

8. Enter the Maximum Times to Resend and the Resend Intervals (secs). These parameters set the maximum number of times to send the trap notification and the time interval between each notification.
9. Click "Next," and the following screens will appear. On these screens, you can select the parameters for when to send the SNMP trap notification.

10. Select the expansion board and the sensor.

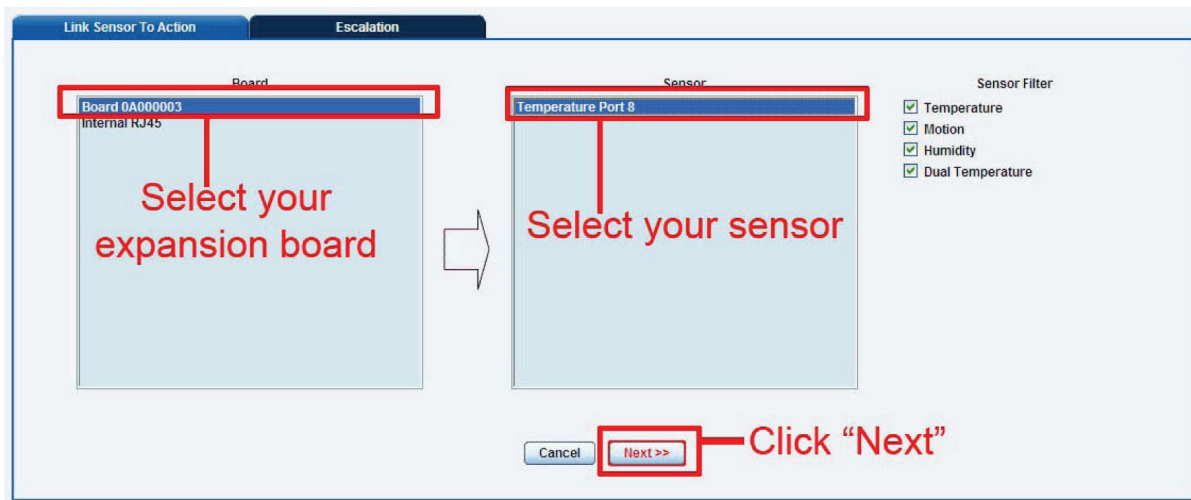


Figure 4-5. Selecting the expansion board and sensor.

11. Select the status and the action.

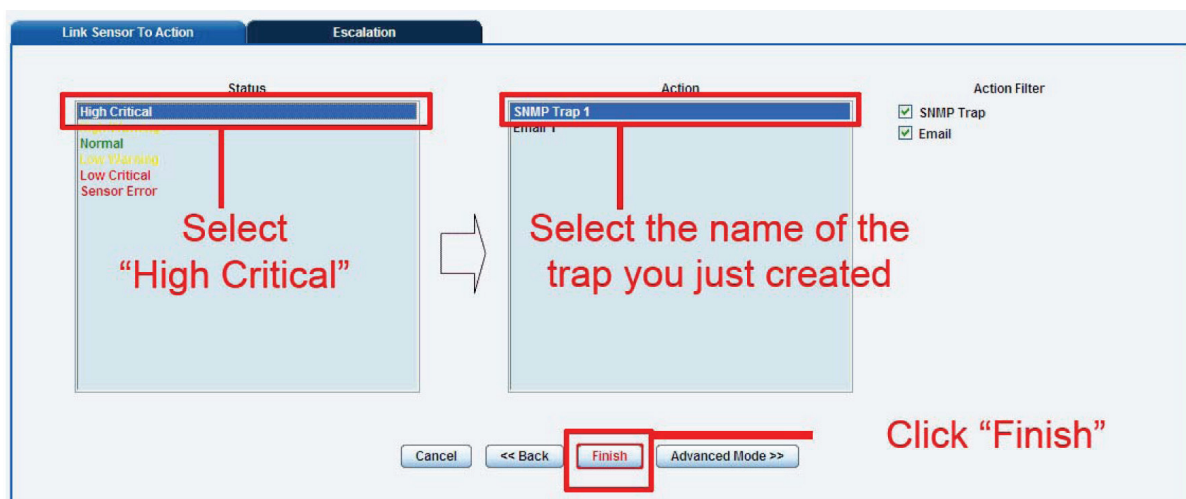


Figure 4-6. Selecting setting and trap name.

**NOTE:** In the example above, the SNMP trap is bound to the temperature sensor that's connected on Port 1. The trap will be sent when the sensor reads a "High Critical," and this is bound to the SNMP trap we just created and named "SNMP Trap 1."

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

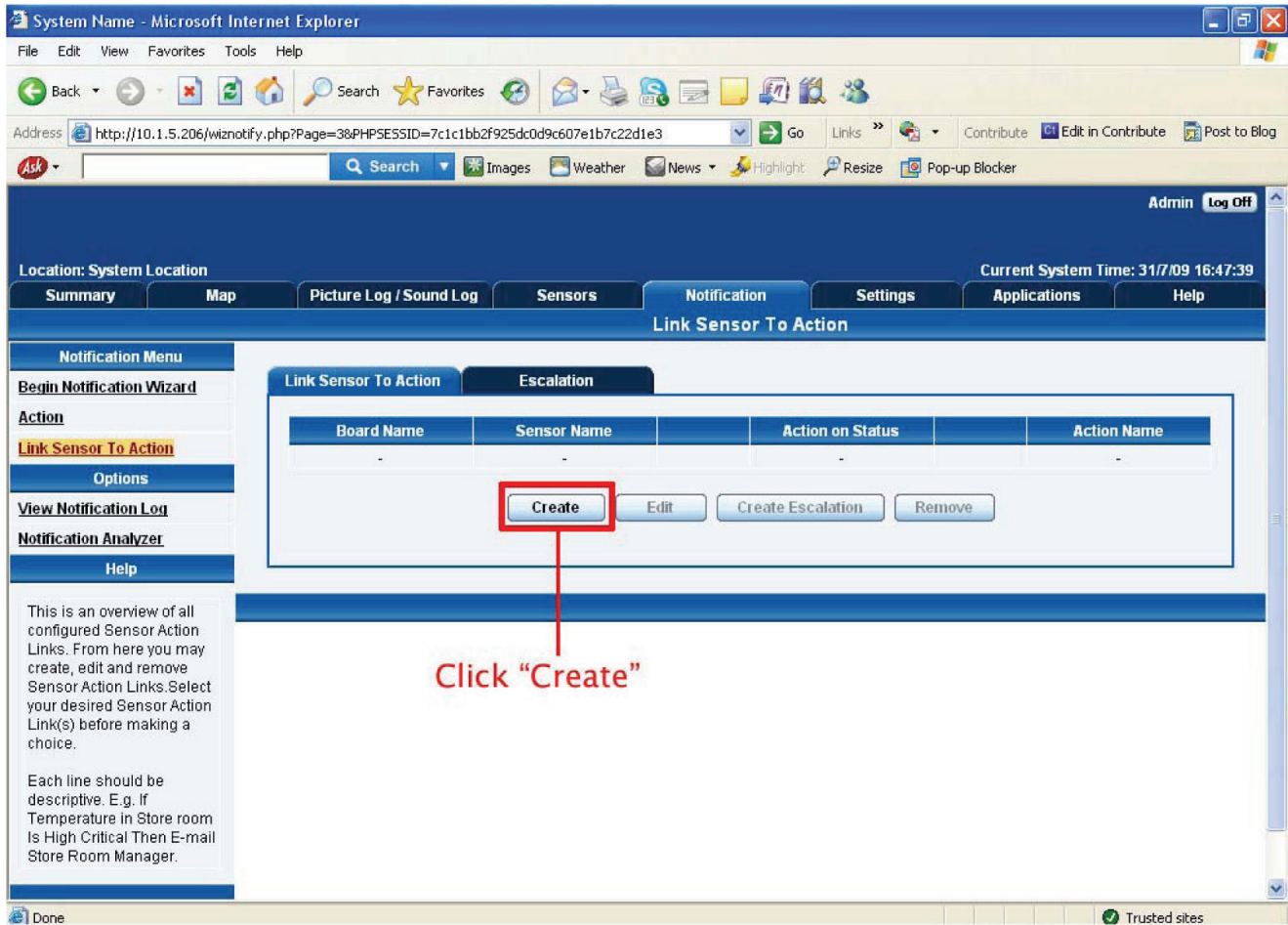


Figure 4-7. Notification tab.

13. Select the sensor and SNMP trap parameters as before. Figures 4-8 and 4-9 appear. Select the expansion board, then select the sensor.

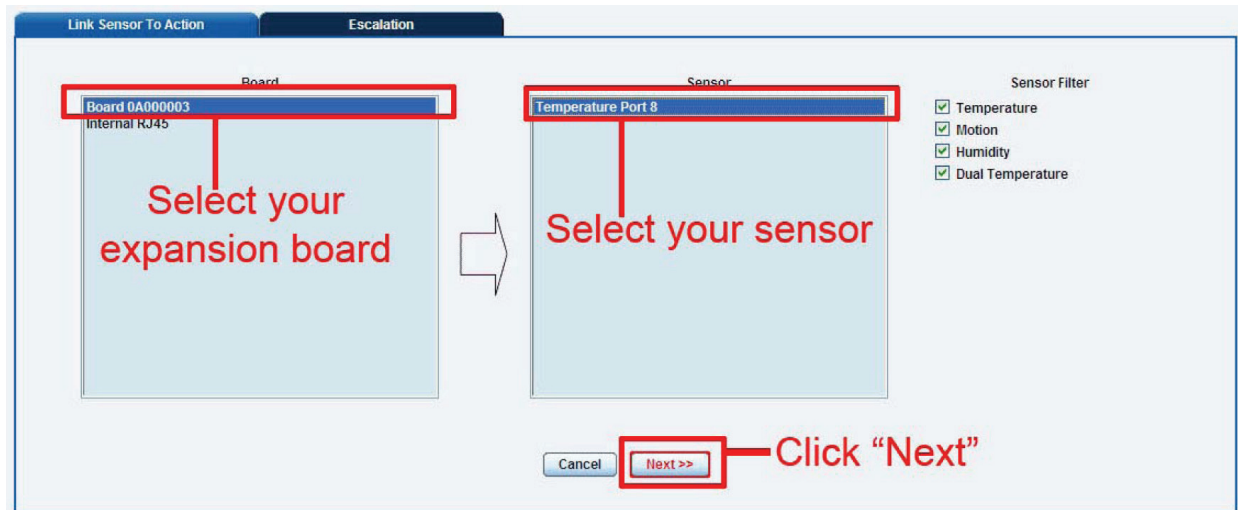


Figure 4-8. Select the expansion board, then select the sensor.

14. Select the status, then select the action.

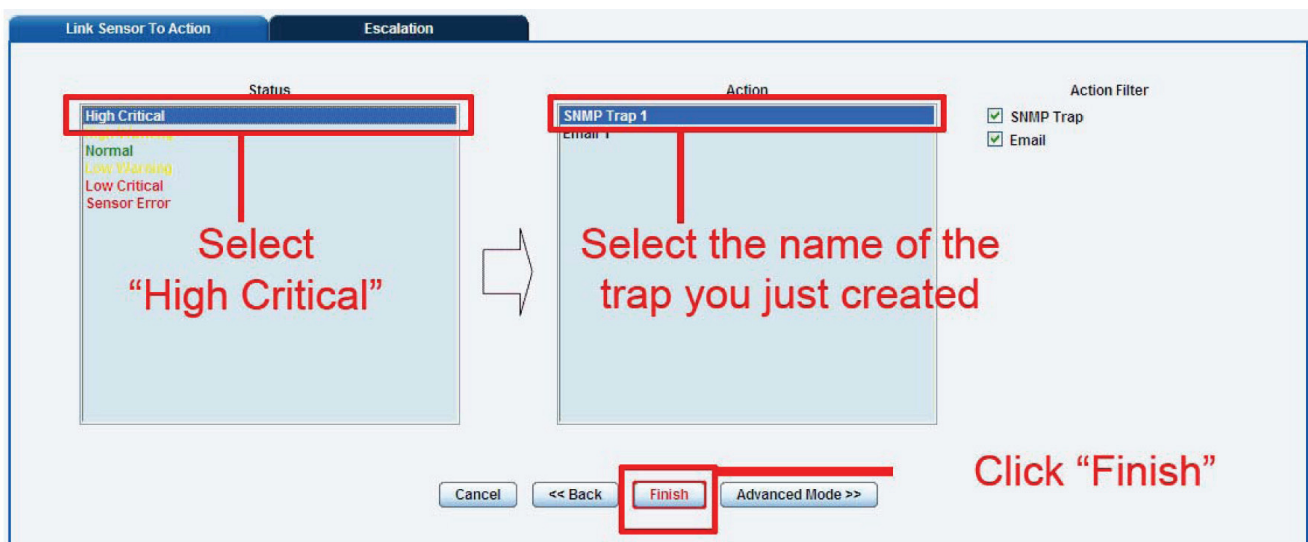


Figure 4-9. Select "High Critical," select the trap name, then click "Finish."

As shown in Figure 4-10, the SNMP trap has been added to the "Notification" page.

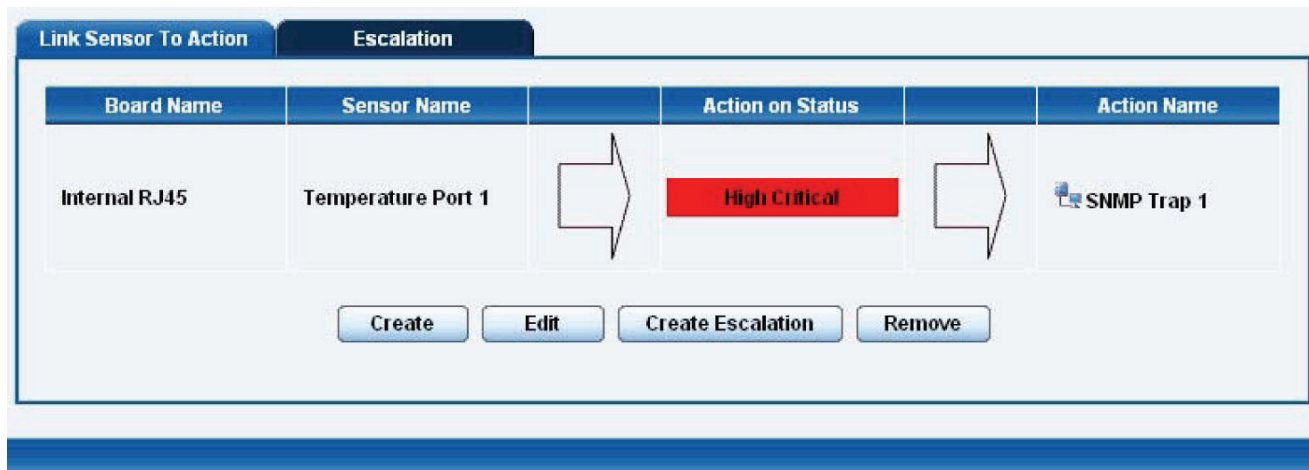


Figure 4-10. Notification page.

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

**NOTE:** You can repeat this process to set up multiple SNMP traps for different sensors or for multiple SNMP servers.



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