ENVIROMUX® Series

ENVIROMUX-SEMS-16(U)
Server Environment Monitoring System
Installation and Operation Manual
Firmware Version 4.5
TRADEMARK
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CHANGES
The material in this guide is for information only and is subject to change without notice. Network Technologies Inc reserves the right to make changes in the product design without reservation and without notification to its users.

CE Statement

We, Network Technologies Inc, declare under our sole responsibility that the ENVIROMUX-SEMS-16 is in conformity with European Standard EN55022.

WARNING

This unit contains a sealed lead acid battery. Battery maintenance must be performed by an authorized trained technician. Always follow local laws and regulations regarding the disposal of this unit.

CAUTION

RISK OF ELECTRIC SHOCK. Do not remove cover. No user serviceable components inside. All repairs and maintenance must be performed by authorized service personnel only.

CAUTION

Turn OFF power to the ENVIROMUX-SEMS and discharge your body’s static electric charge by touching a grounded surface or use a grounding wrist strap before performing any connections to the unit.

CAUTION

For continued protection against fire and electric shock this device should only be connected to an AC mains outlet equipped with a proper ground terminal. In countries where the AC mains outlet is not equipped with a proper ground terminal, the rear panel ground must be connected to a proper ground.
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INTRODUCTION

The ENVIRONMENT-SEMS-16 Server Environment Monitoring System (ENVIRONMENT) provides a way to supervise, from a remote location, the environmental conditions and security in cabinets and rooms containing servers, hubs, switches and other network components. Input data is filtered, collected, analyzed and processed to instantly and accurately display the status of the room. The user is able to specify parameters for all monitored conditions: if the parameters are exceeded, the unit will signal an alarm, which may include several pre-defined processes.

The ENVIRONMENT-SEMS-16 monitors the internal temperature and humidity of the unit, giving readings that can be used as an estimate for the conditions of other nearby rack components. Additionally, it is capable of monitoring a maximum of 16 external sensors (available from NTI) and up to 8 additional contact-type sensors (often called open-collector, contact-closure, relay-style, normal-open, or normal-closed). ENVIRONMENT includes 4 output relays to control devices such as door locks, keypads, and circulation fans and two outputs specifically for the connection of an alarm siren and/or beacon.

The external sensors sold by NTI will monitor temperature and humidity, monitor AC line voltage, frequency, and current, detect smoke, motion, vibration, glass breaking, a door opening, and detect the presence of water on a flat surface (such as the floor). The temperature and humidity sensors will provide current readings as well as alerts when thresholds are exceeded. The AC line monitor detects AC line input voltages between 50~250V AC, the Frequency (Hertz) between 47~63Hz, and the Power (Current) up to 12 amperes from a single AC line. The remainder of the sensors will simply provide alerts. These sensors can be manufactured by any third party, provided the alert notification method is compatible. Each of the aforementioned NTI sensors will connect to the ENVIRONMENT via RJ45 connectors and cat5 cable. The ENVIRONMENT can also work with both 4-wire and 2-wire contact-style sensors (4-wire sensors require a power connection, 2-wire do not). Screw terminals are provided for the connection of external contact-style sensors.

The Ethernet will provide the main user interface for the ENVIRONMENT-SEMS-16. The ENVIRONMENT will provide data logging that can be viewed via a web browser and provide alerts via email, Syslog, SNMP traps, SMS text messages and front panel LEDs.

Features:

- Single user via RS232 or up to 8 users via Ethernet
- Connections include DB9 for RS232 and RJ45 w/ LEDs for Ethernet
- RJ45 connections for up to 16 sensors
- Screw terminals for up to 8 digital input devices and 4 digital output devices
- 12VDC provided for all digital inputs (50mA on terminals 1-7, 650mA on terminal 8 only)
- RJ45 Sensors include Temperature, Humidity, Temperature and Humidity, Water, Vibration, Smoke, Motion Sensor, Glass break detector and more
- Monitors server room environmental conditions remotely
- Alerts users of environmental faults (temp too high, water, etc) via email, Syslog, SMS messages, SNMP traps, Illuminated front panel LEDs, or notifications on a web page
- Provides control for devices such as door locks, keypad, or a circulation fan via digital outputs (1A / 30 VDC, .5A / 100VAC)
- Full configuration via web page
- Limited configuration via SNMP (v1, v2c, and/or v3), Telnet or RS232 interface
- Browser independent (IE, Netscape, Mozilla, Opera)
- Outgoing mail using SMTP or SMTP over SSL for alert notifications- up to 17 different email addresses
- Configurable Alarms to match specific user schedule
- Local Authentication, SSL3
- Data logging to keep viewable record of events such as changes in the environment or user access
- Monitors (ping) up to 64 configurable IP addresses. Response Timeout and number of retries are user configurable for each address
- Flash upgradeable via FTP server or web page
- Internal temperature, humidity, and power sensors
- Two RJ45 connectors included for future expansion via cascading
Options:

- **Dual Power** - ENVIROMUX with two power connections for optional extra power source connection (see page 13) - add "-DP" to the model number (i.e. ENVIROMUX-SEMS-16- DP)
- **DC Power** - to install the ENVIROMUX in a Telecom environment (see page 13). Add "-48V" or "-24V" to the model number (i.e. ENVIROMUX-SEMS-16-48V / -24V)
  * For -48V model, converter accepts 36~72VDC (48VDC nominal), positive or negative polarity.
  * For -24V model, converter accepts 18~36VDC (24VDC nominal), positive or negative polarity.
  * 3-pole screw terminal for connecting 48V / 24V input
- **USB Port** - ENVIROMUX with USB Type A port for connection of USB 1.1 flash drive- Add "U" to the model number (i.e. ENVIROMUX-SEMS-16U)- see also page 64.

**ENVIROMUX-MS-SEMS- Optional Management Software for ENVIROMUX-SEMS-16**

- Intuitive graphical software provides an easy-to-use, unified interface for both monitoring and configuring up to 3,000 ENVIROMUX-SEMS-16 units and all connected sensors.
- Units may be monitored and configured individually or in a group.
- Display values and status for individual sensors or list of sensors.
- Client/server architecture
  - Server application actively polls all units for status information as well as listens for alerts from all units.
  - Client application communicates with the server to read statuses and to deploy configuration changes.
- Requires Java Runtime Environment 1.6 or later.
- NTI will provide customer, without charge, copies of any appropriate updates/enhancements for 12 months. This software update service is optionally extendable every twelve months for 20% of list price.

For more on the ENVIROMUX-MS-SEMS, go to [http://www.networktechinc.com/enviro-rem-gui.html](http://www.networktechinc.com/enviro-rem-gui.html).
MATERIALS

Materials included with this kit:
1- ENVIROMUX-SEMS-16 Server Environment Monitoring System
1- Power Cord- country specific (2 power cords for model ENVIROMUX-SEMS-16-DP)
1- CD containing a pdf of this owners manual
1- Quick Start Guide
1- Rack mount kit

Materials required for connection but not supplied:
- Cables required for connection:
  DB9 male to female standard serial cable wired straight through (pin 1 to pin 1, pin 2 to pin 2, etc..)
  Cat5 for RS485 sensors with RJ45 connectors wired to the TIA/EIA-568B standard (see page 67 for specifications)
  ENVIROMUX-2W-xx  2-wire sensor cables (page Error! Bookmark not defined.) for dry contact sensors
- Cables required for Expansion via Cascading:
  Cat5 cable with RJ45 connectors wired straight through (pin 1 to pin 1, pin 2 to pin 2, etc..)

See our webpage for the latest sensors available; www.networktechinc.com/enviro-sensor.html

Contact your nearest NTI distributor or NTI directly for all of your cable needs at 800-RGB-TECH (800-742-8324) in US & Canada or 330-562-7070 (Worldwide) or at our website at http://www.networktechinc.com and we will be happy to be of assistance.

SUPPORTED WEB BROWSERS

Most modern web browsers should be supported. The following browsers have been tested:

- Microsoft Internet Explorer 6.0 or higher
- Netscape 7.2 or higher
- Mozilla FireFox 1.5 or higher
- Opera 9.0

Note: In order to view all of the graphics, the browser’s JavaScript and Java must be enabled.
## FEATURES AND FUNCTIONS

### FRONT VIEW OF ENVIROMUX-SEMS-16U

### REAR VIEW OF ENVIROMUX-SEMS-16U

### LED Status Chart (page 63) for more on LED indicators.

### Connector Table

<table>
<thead>
<tr>
<th>#</th>
<th>LABEL</th>
<th>CONNECTOR</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>---</td>
<td>IEC Connector</td>
<td>for connecting the power cable (see also “Dual Power Option” on page 13)</td>
</tr>
<tr>
<td>3</td>
<td>---</td>
<td>Power Switch</td>
<td>used to turn the power to the ENVIROMUX ON/OFF</td>
</tr>
<tr>
<td>4</td>
<td>RJ45 Sensors</td>
<td>RJ45 female connectors</td>
<td>for attachment of various sensors</td>
</tr>
<tr>
<td>5</td>
<td>Digital IN</td>
<td>Terminal block</td>
<td>connection block for wired sensors (2-to-4 wire)</td>
</tr>
<tr>
<td>6</td>
<td>Output Relays</td>
<td>Terminal block</td>
<td>connection block for devices to be controlled in the event of alerts</td>
</tr>
<tr>
<td>7</td>
<td>In and Out</td>
<td>RJ45 female connectors</td>
<td>ports for expansion to up to 4 connected systems</td>
</tr>
<tr>
<td>8</td>
<td>Console</td>
<td>DB9 female connector</td>
<td>DCE port for RS232 serial connection of a terminal to control the system</td>
</tr>
<tr>
<td>9</td>
<td>Ethernet</td>
<td>RJ45 female connectors</td>
<td>for connection to a Local Area Network (LAN) for remote configuration, monitoring, and control</td>
</tr>
<tr>
<td>10</td>
<td>Aux Pwr</td>
<td>Terminal block</td>
<td>for powering a serial modem with 12VDC power at 150mA maximum (fuse protected)</td>
</tr>
<tr>
<td>11</td>
<td>Aux</td>
<td>DB9 male connector</td>
<td>DTE port for serial connection of a modem for cell phone monitoring of alerts</td>
</tr>
<tr>
<td>12</td>
<td>Siren</td>
<td>Terminal block</td>
<td>for two-wire connections of audible alarm (page 8)</td>
</tr>
<tr>
<td>13</td>
<td>Beacon</td>
<td>Terminal block</td>
<td>for two-wire connection of visual alarm (page 8)</td>
</tr>
<tr>
<td>14</td>
<td>Ground</td>
<td>#10-32 threaded stud</td>
<td>for external bonding connection</td>
</tr>
<tr>
<td>15</td>
<td>Supported USB Devices</td>
<td>USB Type A Female</td>
<td>for connection of supported USB 1.1 compatible devices (flash drive for logging data)(see more information on page 64)</td>
</tr>
<tr>
<td>16</td>
<td>Reset Button</td>
<td>---</td>
<td>for rebooting the firmware for the ENVIROMUX-SEMS (see page 63 for details)</td>
</tr>
</tbody>
</table>
Figure 1- Typical Application
Rack Mounting Instructions

The ENVIROMUX was designed to be mounted in a rack. It includes a rack mount kit to make attachment easy.

1. Attach the ears to the ENVIROMUX using the #6-32x3/16" flat Phillips-head screws (6) provided as shown in the illustration below.
2. The holes in the ears should line up with pre-threaded holes in the sides of the ENVIROMUX. Tighten the screws securely.

3. Install 4 cage nuts to the rack in locations that line up with the holes in the mounting ears on the ENVIROMUX.
4. Secure the ENVIROMUX to the rack using four #10-32x3/4" screws and cage nuts (provided). Be sure to tighten all mounting screws securely.

*Note: Do not block power supply vents in the ENVIROMUX case. Be sure to enable adequate airflow in front of and behind the ENVIROMUX.*

5. Attach all cables securely to the ENVIROMUX and where necessary supply adequate means of strain relief for cables.
Sensor Attachment

Note: It is very important to locate the temperature and/or humidity sensors away from ventilation sources and fans.

1. Connect each external sensor having an RJ45 male connector on it (ENVIROMUX-STS, ENVIROMUX-SHS, ENVIROMUX-STHS, ENVIROMUX-LDS) to one of the female connectors labeled "RJ45 Sensors" on the ENVIROMUX. Male connectors should snap into place. Cables may be up to 1000 feet in length. See page 67 for wiring specification and pinout.

![Figure 4- Sensors connected by cables with RJ45 connectors](image)

Note: If the ENVIROMUX-LDS Liquid Detection sensor is installed, the twisted orange sensing cable should be placed flat on the surface (usually the floor) where liquid detection is desired. If tape is required to hold the sensor in place, be sure to only apply tape to the ends, exposing as much of the sensor as possible. At least 5/8” of the sensor must be exposed for it to function. (See Figure 5)

![Figure 5- ENVIROMUX-LDS sensor mounting](image)

To test the ENVIROMUX-LDS:

1. Configure the sensor (page 28). (Normal Status set to “Open”, Sampling Period set to 5 seconds.)
2. Submerge at least ½ inch of the exposed twisted orange wire (not the wrapped end) for up to 30 seconds. Do NOT use distilled water as water must be conductive.
3. Monitor the sensor (page 19) to see the sensor “Value” change from “Open” (dry) to “Closed” (wet).
4. Dry the exposed area of sensor and the sensor “Value” should change back to “Open” within 30 seconds.
2. Some sensors do not have RJ45 connectors on them and instead have terminal blocks. These can either be connected to the "DIGITAL IN" connectors or they can be terminated and plugged into the remaining RJ45 connectors (see Figure 6). (The illustration uses CAT5 patch cable to make cable connection easy.) Some examples of these sensors include ENVIROMUX-IMD, ENVIROMUX-IMD-CM, ENVIROMUX-VSS, ENVIROMUX-SDS, and ENVIROMUX-GBS. Cables may be up to 1000 feet in length. (For more on these and other sensors, see pages 2 and 3.)

Note: For sensors requiring 5VDC power source, substitute the wire connected to pin 4 (see page 68) instead of pin 7.

3. To connect contact sensors without using RJ45 connectors, terminal blocks have been provided labeled "DIGITAL IN". Two wire switch-only type sensors can be connected to the plus (+) and minus (−) terminals of each or 4 sets of terminals. If the sensors require a 12V power source to operate, additional 12V and ground terminals have been provided for each set of terminals. Connect each two-wire or four-wire contact sensor using 16-26 AWG wire.

- Devices connected to DIGITAL IN terminals 1-7 must be rated at 50mA or less.
- Devices connected to DIGITAL IN terminal 8 must be rated at 650mA or less.

FYI: The terminal block is removable for easy sensor wire attachment if needed.

4. Terminals have been provided for connection of the ENVIROMUX-BCN-R Beacon and ENVIROMUX-SRN-M Siren to use for visual alerts and audible alerts when configured. Devices such as this can be installed in locations best suited to get attention. All devices must be installed using 16-26 AWG wire.

WARNING
Devices connected to either the Beacon or the Siren terminals cannot exceed 180mA contact load.
Connect Output Devices

For connection of additional output devices to be controlled by the ENVIROMUX, terminals labeled "Output Relays" have been provided. The 4 pairs of contacts will work as switches to either close or open (switch ON or OFF) when used. The switch position is configured on the Sensor Configuration page (page 23).

**WARNING**

OUTPUT RELAY dry contact ratings must not be exceeded. Dry contact rating: DC 30V, 1A; AC 100V, 500mA. The OUTPUT RELAY contacts are not to be connected directly to AC mains wiring.

Figure 9- Install additional devices to output terminals
Terminal Connection for RS232

To make a direct serial connection to the ENVIROMUX from a terminal with HyperTerminal via RS232, a 9DB female DCE port labeled "Console" is provided. Connect a male-to-female 9DB cable from a serial port on the terminal to the 9DB female connector on the ENVIROMUX. The cable should be wired straight through (pin 1 to pin 1, pin 2 to pin 2, etc.).

![Figure 10- Connect a terminal for direct RS232 serial communication](image1)

Ethernet Connection for Remote User Control

To make a remote connection, over the Ethernet, from anywhere on the local area network, connect a CAT5/5e/6 Ethernet cable with RJ45 male connectors on the ends, wired straight through (pin 1 to pin 1, pin 2 to pin 2, etc.).

*Note: To make a direct connection from a computer to the ENVIROMUX through the ETHERNET port, a crossover cable is required. See page 67 or “PC-To-ENVIROMUX Crossover Cable”.*

![Figure 11- Connect ENVIROMUX to the Ethernet](image2)
Modem Connection

If alert notifications via SMS to a cell phone are desired, a modem (GSM or CDMA) can be connected on the rear of the ENVIROMUX-SEMS-16(U). Using a modem each user can receive SMS alert messages directly on their cell phone.

A serial modem (GSM or CDMA) can be connected to the DB9 connector on the rear of the ENVIROMUX-SEMS-16 labeled "AUX" using a DB9 male-to-female extension cable (NTI DINT-xx)(sold separately). The external modem can be either self-powered or connected to 12V from the ENVIROMUX using the "AUX PWR" terminal. The ENVIROMUX is a DCE serial device.

The serial GSM modems that have been tested and are confirmed to be compatible with the ENVIROMUX include:

- MultiTech Model MTCBA-G-F2 GPRS/GSM Modem (NTI ENVIROMUX-GSMA)
- Enfora GSM1218 GPRS/GSM Modem
- Wavecom Fastrack M1306 GSM Modem
- Teltonika CM 1100
- NetComm N3GS003

Note: The modem must be connected to ENVIROMUX and powered ON before powering ON the ENVIROMUX.

Note: The "AUX PWR" terminal is backed up by the battery inside ENVIROMUX.

Figure 12- Aux port and power for GSM or CDMA modem connection

WARNING
Device connected cannot exceed 150mA contact load.
Cascaded Installation via Direct Connection

For a cascaded installation using the Direct Connect method (see page 16), enabling the monitoring of all sensors from up to four ENVIROMUX-SEMS-16 systems, connect a CAT5/5e/6/7 patch cable (maximum 25 feet long) with RJ45 male connectors on each end (wired straight thru, pin 1 to pin 1, pin 2 to pin 2, etc.) between the “In” and “Out” ports as shown in the image below. With this properly connected the user can monitor the sensors of all systems from either a single connected terminal (page 10) or through a single Web Interface (page 18).

![Image of cascaded installation]

**Figure 13- Cascade up to 4 systems for centralized sensor monitoring**

Power cord Connection

Connect the power cord supplied to the IEC connector on the rear of ENVIROMUX. Plug the other end into AC mains and use the switch to power ON ENVIROMUX.

![Image of power cord connection]

**Figure 14- Connect the power cord**
**Dual Power Option**

The ENVIROMUX-SEMS-16-DP has two IEC connectors on the rear, for connection to two separate power sources. If the power source connected to “PWR 1” fails, the ENVIROMUX will automatically and without interruption switch over to the power source connected to “PWR 2” before switching to the battery backup (page 64).

*Note: If only one power source is used, it should be connected to “PWR 1”.*

*Note: The power ON/OFF switch is located on the front panel of ENVIROMUX when two IEC connectors are present.*

![Figure 15- Power connections for ENVIROMUX with Dual Power Option](image)

**48VDC Power Option**

The ENVIROMUX-SEMS-16-48V has connections on the rear for a user-supplied 48VDC power supply. This is typically used when the ENVIROMUX is installed in a Telecom environment. The ENVIROMUX-SEMS-16-48V will accept a DC power source between 36~72VDC (48VDC nominal), positive or negative polarity. A removable 3-pole screw terminal is provided for easy connection. The image below shows an ENVIROMUX-SEMS-48VDP, which has dual 48VDC power connections for a dual power supply option.

![Figure 16- 48VDC Power Option Connections](image)
OVERVIEW - USE AND OPERATION

The ENVIROMUX is controlled via RS232 or Ethernet using a terminal emulator, web browser, or SNMP monitor. The user interfaces are for viewing and configuring sensor data and system settings. However, full configuration of the system can be done only through the Web browser due to graphics limitations in the other interfaces.

The web interface allows for the configuration of the thresholds for all attached sensors, their alert methods, and the formats of the alerts. In addition, network information (IP address, subnet mask, default gateway, DNS, etc.), user administrative settings, and log settings can also be configured. All settings are saved in memory when applied. A user may also restore the unit back to its default settings at any time via the web interface (see page 61).

Individual sensor status pages are available for each connected sensor. A sensor summary page allows the user to view the connected sensors’ current values, threshold settings and alert statuses. Also, the user can view recorded sensor readings that have been stored in the system data log.

Sensors

The ENVIROMUX provides 16 RJ45 sensor input jacks and 8 screw terminals ports. Some available sensor configurations include Temperature, Humidity, or Temperature+Humidity, Liquid, Vibration, Smoke, Motion Sensor, Glassbreak detector, and AC Line Monitors. See page 2 for more on available sensors.

The temperature/humidity sensors have been given factory default settings and thresholds that can be changed (see page 20). Sensor readings can be reported continuously, only when readings change, or at a regular rate (for instance, a temperature reading could be updated once each hour).

Sensors connected to the terminals labeled “Digital In” must be manually configured, and can be any sensor of contact-closure / open-collector type that operate on 12VDC and 50mA, with a maximum load resistance of 10kΩ or less. (See page 24 for more info.)

IP Assignment

An IP address can be assigned to the ENVIROMUX through any of three methods:

- Using the NTI Device Discovery Tool (page 17)
- Through the web interface on the Network page (page 34)
- Using the RS232 interface (page 53)

Initially, IP configuration will be the easiest to change using the NTI Device Discovery Tool (found on the CD), which will search for NTI devices on the user’s network and allow IP assignment to them through its web interface. Other settings for subnet mask and default gateway may also be configured (see page 17). These settings must be configured properly in order to access the ENVIROMUX web interface.

User Management

The ENVIROMUX supports up to 16 user accounts plus the root account (page 36). Each user account is protected by local password authentication. Each user may be assigned “User” or “Administrative” privileges. Users accessing the ENVIROMUX will be granted access to only the monitoring functions, and will be able to view the log. An account with “Administrative” privileges has all of the privileges necessary to view and configure network settings, add/edit/delete other user accounts, configure sensors, etc.

Alerts

A high and low threshold limit can be set for each temperature or humidity sensor within the operating range of the sensor. Each open collector/contact-closure sensor can be set as normally-open or normally-closed. When a sensor takes a reading that is outside a threshold or a contact-closure sensor is not in its normal condition, an alert notification can be generated. The user can specify how often alert notifications are provided. Also, there is an adjustable alert delay time involved with alert notifications. This means if a sensor’s readings are moving in and out of the threshold boundaries within a configurable period of time, additional alert notifications will not be sent. Alerts may be sent if the condition of the sensor returns to normal or back within its threshold boundaries. Alert notifications (page 26 and sample on page 47) will be provided through any or all of five main methods:

- visible notification via the user interfaces (red LED on front panel, beacon, alert on webpage)
- emails (up to 17 different addresses)
- SNMP Traps
- SMS Messages (up to 17 different phone numbers)
- Syslog Messages
Data and Event Logging

The ENVIROMUX can log sensor readings, sensor alerts, alert handling, sensor connections/removals, and user logins/logouts. The logs can be viewed at any time through the web interface (page 47). Additionally, as entries are generated, they can be emailed or sent as SNMP traps. Entries can be deleted from the logs via the web interface. The maximum size of each log is 1000 entries, listed in chronological order. Each log’s behavior upon reaching this maximum size can be configured, allowing the log to either wrap (overwrite oldest entries), stop logging, or clear and start over. The entire log can be downloaded as a plain text file from the web interface at any time. Log entries can be removed individually, in groups, or all at once.

Email

The ENVIROMUX can access an outgoing SMTP server (authenticated or non-authenticated, with or without SSL encryption) to send email. Outgoing mail may contain pre-formatted alert notifications or data log messages (samples on page 47 and 48). The user can configure what conditions cause emails to be sent. The ENVIROMUX’s email address can be configured through the web interface on the Enterprise Setup page (page 33), and SMTP server information can be configured on the Network Setup page (page 34). Up to 17 outgoing email addresses (112 characters maximum including commas) may be configured (corresponding to the 16 user and 1 root email addresses).

Syslog

The ENVIROMUX can send alerts as SYSLOG messages when a sensor enters/leaves alert mode, and for all log events. The destination for SYSLOG can be configured in each user profile (page 38). For a SYSLOG message to be sent, put a checkmark in the “Syslog” box. Enter an IP address in the “IP address” box and click Apply.

SNMP

The ENVIROMUX can send alerts as SNMP traps when a sensor enters/leaves alert mode, and for all log events. Using an SNMP MIB browser, a user can monitor all sensor statuses and system IP settings, as well as configure sensor thresholds, sensor names, and the system name. Click on the checkbox for SNMP under contacts (page 38) for each user that should receive SNMP messages. The SNMP agent supports SNMP v1, v2c and v3. For instruction to setup and use SNMP, see page 81.

Note: The SNMP MIB file (sems-16-v1.xx.mib), for use with an SNMP MIB browser, can be found on the manual CD. Click on the link to open the file, then save the file to your hard drive to use with the SNMP MIB browser.

External Modem

An external modem (GSM or CDMA) can be connected to allow the system to send alert notifications via SMS messages. When a sensor crosses a threshold, an alert notification can be formatted to SMS message (see page 38) and the modem could transmit the message to pre-specified cellular numbers (up to 17- one for each user). The external modem can be supplied from an external power supply or from the provided 12V.

Power-on/Reset Operation

On power-up, after going through its boot sequence, the ENVIROMUX will launch the monitoring application, load any stored configuration values, and immediately identify and begin taking readings from any connected sensors. Alerts will be reported using the configured alert methods, and data will be logged using the stored preferences. A user can log in at any time after the system has launched the monitoring application (approximately 60 seconds after power is applied) to view and configure properties of the system and its sensors.

FYI: The boot sequence can also be initiated manually using the Reset button. See page 63 for details.

Out-of-Box Operation

The operation of the unit directly out of the box is nearly identical to the Power-on/Reset operation. However, information about the unit will only be able to be monitored and controlled through the RS232 port until valid network settings are assigned to the device (see page 34). The RS232 provides only limited configuration options, pertaining mostly to Ethernet settings.

Alert notifications will only be able to be viewed through the front panel until network settings are configured. Email and SNMP alert notifications must be configured within the web interface (page 33) before these methods can be used. The network settings must be compatible with the physical network to which the ENVIROMUX is attached. Once these configurations are made, they will be saved in the unit, even if the ENVIROMUX is powered-OFF.

Expandability

Multiple ENVIROMUX units may be used together on one system, so as to increase the number of sensors the user can have connected. Despite having multiple units, the user does not have to access the webpage of each ENVIROMUX individually. Up to 4 units can be cascaded such that all of the data from each of the units can be displayed on a single format.
There are 2 ways to cascade ENVIROMUX:

1. **Direct Connect** - The units can be connected together through an expansion cable that can be as long as 25ft (depending on how many units are cascaded). See page 12 for how to install with an expansion cable.

2. **Ethernet Connect** - The units can be connected via the Ethernet to expand the number of sensors. All units must be on the same LAN.

A master unit will poll each of the slave units and present all of the data in a combined group from either of the user interfaces. A maximum of 4 units using the Direct Connect method or 6 units using the Ethernet Connect method can be cascaded.

*Note: For ENVIROMUX units used as slaves in a cascaded system, the Siren, and Beacon terminals are not cascaded and are therefore not useable on slave units. Only the additional sensor inputs and the output relays will be seen by the master unit.*
DEVICE DISCOVERY TOOL

In order to easily locate the ENVIROMUX on a network, the NTI Device Discovery Tool may be used. A link to the Discovery Tool is provided on the web page that appears when you insert the instruction manual CD provided into your CD ROM drive. Click on the link or browse the CD and click on the file discover.html. This will open your browser and display the Device Discovery Tool page.

Note: The Device Discovery Tool requires the Java Runtime Environment to operate. A link to the web page from which it can be downloaded and installed is provided on the CD.

Note: The computer using the Device Discovery Tool and the ENVIROMUX must be connected to the same physical network in order for the Device Discovery Tool to work.

Network Technologies Inc
Device Discovery Tool

- START
  - When you load this page, the NTI Device Discovery Applet should load. Accept the Certificate to allow this applet access to your network. Press the button entitled Detect NTI Devices to start the discovery process. After a short time, the tool will display all NTI devices on your network, along with their network settings.

    Note: Do not close this page while the NTI Discovery Tool is running. Close the NTI Device Discovery Application first, then this webpage.

- How To Use the Discovery Tool
  - To Change A Device's Settings, within the row of the device whose setting you wish to change, type in a new setting and press the Enter key or the Submit button on that row. You can also press the Submit All button to submit all changes at once.

  - To Refresh the list of devices, press the Refresh button.

  - To Blink the LEDs of the unit, press the Blink LED button (This feature not supported on all products). The Blink LED button will change to a Blinking... button. The LEDs of the unit will blink until the Blinking... button is pressed, or the NTI Device Discovery Application is closed. The LEDs will automatically cease blinking after 2 hours.

  - To Stop the LEDs of the unit blinking, press the Blinking... button. The Blinking... button will change to a Blink LED button.

Figure 17- Device Discovery Tool page

Use the Device Discovery Tool to display all NTI ENVIROMUX units on the network, along with their network settings. Follow the instructions on the Device Discovery Tool page to use the tool and to change the device settings if so desired.
USE AND OPERATION VIA WEB INTERFACE

A user may monitor and configure the settings of any device connected to the ENVIROMUX using the Web Interface via any web browser (see page 3 for supported web browsers). To enable the Web Interface, connect the ENVIROMUX to the Ethernet (page 10). Use the Device Discovery Tool (page 17) to setup the network settings. Then, to access the web interface controls, the user must log in.

**Note:** In order to view all of the graphics in the Web Interface, the browser’s JavaScript and Java must be enabled.

Log In and Enter Password

To access the web interface, type the current IP address into the address bar of the web browser. (The default IP address is shown below):

```
http://192.168.1.21
```

A log in prompt requiring a username and password will appear:

**Username = root**
**Password = admin**
(lower case letters only)

**Note:** usernames and passwords are case sensitive

Figure 18- Login prompt to access web interface

With a successful log in, a screen similar to the following will appear:

Figure 19- Initial "Welcome" Page
From the initial Welcome page, the user can use the menu to the left to manage all the functions of the ENVIROMUX.

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MONITORING</td>
<td>Monitor all the sensor and data input received by the ENVIROMUX (below)</td>
</tr>
<tr>
<td>ADMINISTRATION</td>
<td>Configure all network and multi-user access settings (page 33)</td>
</tr>
<tr>
<td>LOG</td>
<td>View and configure the Event and Data Logs (page 47)</td>
</tr>
<tr>
<td>LINKS</td>
<td>Provides a link to servers or website favorites for quick navigation (page 49)</td>
</tr>
<tr>
<td>SUPPORT</td>
<td>Links for downloading a manual, the MIB file, or firmware upgrades</td>
</tr>
<tr>
<td>REFRESH</td>
<td>Refresh the image on the display to show the most current information available</td>
</tr>
<tr>
<td>LOGOUT</td>
<td>Log the user out of the ENVIROMUX web interface</td>
</tr>
</tbody>
</table>

**Monitoring**

Under Monitoring, there are links to view the sensors, webcams, and IP address data being monitored by ENVIROMUX.

<table>
<thead>
<tr>
<th>Link</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summary</td>
<td>Lists all sensors, including their type, description, value, and status (below)</td>
</tr>
<tr>
<td>Internal Sensors</td>
<td>Provides a link to view the status of specific Internal Sensors (page 22)</td>
</tr>
<tr>
<td>External Sensors</td>
<td>Provides a link to view the status of specific External Sensors (page 24)</td>
</tr>
<tr>
<td>Digital Inputs</td>
<td>Provides a link to view the status of each Digital Input (page 29)</td>
</tr>
<tr>
<td>Output Relays</td>
<td>Provides a link to view the status of each Output Relay (page 30)</td>
</tr>
<tr>
<td>IP Devices</td>
<td>Provides a link to view the status of each IP device defined - indicating an active connection or not (page 31)</td>
</tr>
<tr>
<td>Webcams</td>
<td>Displays an image from up to 8 webcams with links to connect to each (page 32)</td>
</tr>
</tbody>
</table>

**Summary Page**

The Summary Page breaks the data reported into 6 categories:

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supplies</td>
<td>Indicates the status of the power supply(s)</td>
</tr>
<tr>
<td>Internal Sensors</td>
<td>there are three inside the ENVIROMUX</td>
</tr>
<tr>
<td>External Sensors</td>
<td>sensors that connect to the RJ45 connectors</td>
</tr>
<tr>
<td>Digital Inputs</td>
<td>sensors that connect to the terminals “Digital In”</td>
</tr>
<tr>
<td>Outputs</td>
<td>Relays that open or close depending on alert status</td>
</tr>
<tr>
<td>IP Devices</td>
<td>IP Addresses that can be monitored by ENVIROMUX</td>
</tr>
</tbody>
</table>

To see the settings of each sensor, click on the link in the description column for the desired sensor. Click on the browser’s Back button to return to the summary.
**Power Supplies**

The status of the power supply can be seen, and when an ENVIROMUX-SEMS-16-DP is present, both power supplies will be shown. Click on the power supply to open a web page that displays the type of item sensed, the status of the power supply, and the time and date of the most recent alert sent regarding the power supply.

![Main Power Supply Status](image)

**Figure 21- Power Supply status page**

If the power supply is in alert status, the user has the option to either **acknowledge** the alert or **dismiss** it. If the user acknowledges the alert, no additional alert messages will be sent during that alert status cycle. If the user dismisses the alert, another alert message will be sent once the “notify again after” time designated on the configuration page (below) elapses.

A **Configure** button at the bottom of the page allows the user to configure parameters of the power supply.

**Power Supply Alert Configuration**

**Type**

**Description:** Each power supply can be given a unique description (see Figure 22). Descriptions can be from 1-80 characters in length and include most characters. They cannot contain a backslash (\) or quotation mark (”). Descriptions will be used in e-mail alerts in the DESCRIPTION field.

Within this section the alerts regarding this sensor can be disabled.

*Note: If alerts for a power supply are disabled, the associated output action (see "Outputs"- page 26) will still take place. There just won’t be any alert notifications that this is occurring. For example, this might be used to turn ON a device, such as a beacon, when the power supply loses power, and OFF again when power is restored. An alert message may not be desired under these circumstances.*

*Note: If the user wants to disable alerts for a power supply after the power supply is already in alert status, the user must either acknowledge or dismiss the alert first.*

**Group:** This is the group of sensors the power supply sensor will belong to. Users that subscribe to alerts from this group will receive alerts from the power supply sensor. Each sensor can be configured to send alerts. Up to 16 sensor groups can be defined. Each user can receive alerts from any or all of the sensor groups.

*Note: In the event of a line power failure, the battery backup (page 64) will power the ENVIROMUX for up to 1 hour.*
**Power Supply Alerts Configuration**

**Alert Settings**

- **Notify when return to normal**: The user can also be notified when the power supply has returned to the normal operation by selecting the *Notify when return to normal* box.

- **Notify Again**: Specifies the amount of time before an alert message is repeated. The repeated alert can be set to occur from 1-999 seconds, minutes, or hours.

- **Automatically acknowledge alert when condition clears**: The sensor can be configured to automatically acknowledge the alert and return the status to normal in the event the alert condition clears and normal operation resumes.

**Alert Notifications**

The alert can be configured to notify one or more users via email, SNMP traps (v1,v2c, v3), Syslog messages, or SMS alerts. It can also activate an audible siren, or an alarm beacon. Alerts are also indicated on the "Int Alert" or "Ext Alert" LEDs on the front of the ENVIROMUX and in the WEB interface.

**Outputs**

Each power supply can be associated with one of the connections labeled "Output Relays" (see page 30), and that connection can be set to open or close the contacts of the relay either on alert, or when returning to normal. The tamper can also block the output command generated by the alert. In this way other devices can be controlled by power supply alerts. Examples of this can be found in the wiring examples on pages 68 and 69.
Internal Sensors

ENVIROMUX has three on-board sensors, which are permanently present:
- one temperature sensor
- one humidity sensor
- one power (battery) sensor

Internal sensors are monitored and fully configurable just as External Sensors are (see Figure 24 and page 24).

Internal sensors are always shown in the left menu of the web page and they cannot be removed.

External Sensors

The External Sensors are those that connect through RJ45 connectors. There are two types of external sensors supported by the RJ45 connectors: RS485 Sensors and Contact Sensors.

RS485 Sensors

The following types of RS485 sensors are supported:
- Temperature Sensor (ENVIROMUX-STS/STS-O/STSP)
- Humidity Sensor (ENVIROMUX-SHS)
- Combined Temperature + Humidity Sensor (ENVIROMUX-STHS/STHS-99)
- Current Sensor (ENVIROMUX-S420MA)
- Voltage Detector Converter (ENVIROMUX-S60VDC)
- AC Line Monitor (ENVIROMUX-ACLM-V/-P)
- 5VDC Sensor Converter (ENVIROMUX-S5VDC)
- Light Intensity Sensor (ENVIROMUX-LIS)

RS485 Sensor Management

The RS485 sensors are detected and identified by type automatically when they are connected to the RJ45 connector. The newly detected sensor will appear in the left menu of the web page under Monitoring->External Sensors. A web page will be created for the sensor and the default name issued to the sensor by ENVIROMUX will be "Undefined #n", where n is the number of RJ45 connector from 1 to 16.

If a double-function sensor is detected (ENVIROMUX-STHS), it will be displayed as two sensors, each one with a single function (as shown in Figure 20). For example a Temperature/Humidity sensor will appear as separate sensors (Temperature sensor and a Humidity sensor) both with the same number connector. The default name of both sensors will be Undefined #n, where n is the connector. A double-function sensor will be listed as a “Combo” type (i.e. Temperature Combo).

The user can see the sensor measurements by clicking on the sensor’s name on the left menu or in the Summary page. A web page will be displayed for the selected sensor, showing the type of sensor, the name, value of the reading (if it is an analog value it will be also displayed graphically), the threshold settings (in red) and the current reading (in green) of a selected sensor. It also shows the time, date, and measurement taken of the most recent alert and statistics (last alert, lowest value, highest value). Lowest and highest values are indicated only for RS485 sensors.
If the sensor is in alert status, the user has the option to either **acknowledge** the alert or **dismiss** it. If the user acknowledges the alert, no additional alert messages will be sent during that alert status cycle. If the user dismisses the alert, another alert message will be sent once the “notify again after” time designated on the configuration page (below) elapses.

A **Configure** button at the bottom of the page allows the user to configure parameters of the sensor. If the sensor is removed or communication lost for any reason (example: cable disconnected) the unit will detect this and show the sensor in “Non Responding” status. Question marks (???) will replace the name in the menu on the left. In this way the user will know the sensor has a problem or as been accidentally disconnected. If the user wants to remove a sensor (including a sensor now replaced by question marks) from the list, it must be done manually using the **Remove** button on the configuration page.

---

**Figure 23- External Sensor Reading**

**Figure 24- Sensor Configuration Page**

---

Attach image captured from a webcam to include with alert sent via email. This feature is available for all sensors connected to either the “RJ45 Sensor” ports or “Digital In” sensors in models with a USB port. See “Alert Notifications” on page 34 for more.
External Sensor Configuration

Type
Description: Each sensor can be given a unique description. Descriptions can be from 1-80 characters in length and include most characters. They cannot contain a backslash (\) or quotation mark ("). Descriptions will be used in e-mail alerts in the DESCRIPTION field.

Within this section the alerts regarding this sensor can be disabled.

Note: If alerts for a sensor are disabled, the associated output action (see "Outputs"- page 26) will still take place. There just won't be any alert notifications that this is occurring. For example, this might be used to turn ON a device, such as a fan, when the server room gets too warm, and OFF again when the temperature returns to normal. An alert message may not be desired under these circumstances.

Note: If the user wants to disable alerts for a sensor after the sensor is already in alert status, the user must either acknowledge or dismiss the alert first.

Group: This is the group of sensors this sensor will belong to. Users that subscribe to alerts from this group will receive alerts from sensors within the group. Each sensor can be configured to send alerts. Up to 16 sensor groups can be defined. Each user can receive alerts from any or all of the sensor groups.

Minimum Level: This shows the minimum value supported by the sensor. It is factory configured for each type of sensor and cannot be changed. Its value is detected when connecting the sensor.

Maximum Level: This shows the maximum value supported by the sensor. It is factory configured for each type of sensor and cannot be changed. Its value is detected when connecting the sensor.

Units: (only for Temperature sensors) This lets the operator choose between Celsius and Fahrenheit as the temperature measurement unit.

Custom Sensors (for Current Sensor Configuration only)
Associate to a Custom Sensor: Various types of sensors can be connected to an ENVIROMUX-S420MA Current Sensor. In order to better define the sensor on the Summary Page, in SNMP traps, or in an MIB browser, select this box. If this box is not selected, the range of this sensor will be reported as shown-“4-20mA”.

Custom Sensor Type: This defines the sensor type as viewed in the Summary Page (page 19) in the “Type” column. Leaving it empty will result in an empty field in the Summary Page.

Unit: Enter between 1 and 3 alphabetical characters. These characters will be used by the ENVIROMUX to represent the unit of measure reported by the attached sensor. Leaving it empty will result in an empty string in the reported data.

SNMP Custom Type ID: Use this field if SNMP traps will be used for alert notifications. The Type ID corresponds with a value defined in the MIB file under “extSensorType” (default value is 32567 for type “Custom”). Place the desired number in this box that represents the type of sensor to be reported in the MIB browser or SNMP trap.

To define a new type of sensor;
1. open the MIB file,
2. locate the section titled “extSensorType”,
3. assign a description and a number not already in use (in the “SYNTAX” field) to associate with it,
4. enter the number for the newly defined extSensorType in the SNMP Custom Type ID box.

If the Type ID is left blank, the value “0” will be assigned, which will be reported in the browser and SNMP trap as type “undefined”.

Minimum Level: The minimum range of the units to be associated with the current reading measured from the attached sensor.
Maximum Level: The maximum range of the units to be associated with the current reading measured from the attached sensor.
Thresholds

**Minimum Threshold:** The user must define the lowest acceptable value for the sensors. If the sensor measures a value below this threshold, the sensor will move to alert status. The assigned value should be within the range defined by Minimum Level and Maximum Level and lower than the assigned Maximum Threshold value. If values out of the range are entered, they will be automatically adjusted to be within range.

**Maximum Threshold:** The user must define the highest acceptable value for the sensors. If the sensor measures a value above this threshold, the sensor will move to alert status. The assigned value should be within the range defined by Minimum Level and Maximum Level and higher than the assigned Minimum Threshold value. If values out of the range are entered, they will be automatically adjusted to be within range.

Sampling

**Sampling Period:** Determines how often the displayed sensor value is refreshed on the Sensor page. A numeric value and a measurement unit (minimum 1 seconds, maximum 999 minutes) should be entered.

*Note:* Regardless of the sampling period ENVIROMUX will read the sensor every second and will send an alert as needed based on the configured values. An extended sampling period will not delay an alert response from ENVIROMUX. The shorter the sampling period, the more traffic that will be seen on the network.

**Add Data to Log File:** This is a check-box that lets the user decide if the data sampled should be recorded in the Data Log.

**Add reading to log file every:** Enter the time period between logged measurements.

Alert Settings

**Alert Delay:** The alert delay is an amount of time the sensor must be in an alert condition before an alert is sent. This provides some protection against false alarms. The Alert Delay value can be set for 0-999 seconds or minutes.

**Example:**
The maximum threshold of a temperature sensor is 90 F, and the temperature of the monitored area is fluctuating between 88 and 91 degrees:

<table>
<thead>
<tr>
<th>Reading # (taken 1/second)</th>
<th>Value</th>
<th>Action (with delay set @ 3 seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>88F</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>89F</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>90F</td>
<td>Ignored</td>
</tr>
<tr>
<td>4</td>
<td>89F</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>90F</td>
<td>Ignored</td>
</tr>
<tr>
<td>6</td>
<td>89F</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>90F</td>
<td>Ignored</td>
</tr>
<tr>
<td>8</td>
<td>90F</td>
<td>Ignored</td>
</tr>
<tr>
<td>9</td>
<td>90F</td>
<td>Alert sent</td>
</tr>
<tr>
<td>10</td>
<td>89F</td>
<td></td>
</tr>
</tbody>
</table>

The sensor is in an alert condition in Reading 3 but is back within the acceptable range in Reading 4. At Reading 5, the sensor is in an alert condition again. Without the Alert Delay set, alerts will be sent for both Reading 3 and Reading 5. If the Alert Delay had been set to 3 seconds, an alert would only be sent if the sensor had made three consecutive readings in an alert condition (since readings are made every second). In this case, an alert will not be sent until Reading 9.
Notify Again: Specifies the amount of time before an alert message is repeated. The repeated alert can be set to occur from 1-999 seconds, minutes, or hours.

Notify when return to normal: The user can also be notified when the sensor readings have returned to the normal range by selecting the “Notify when return to normal” box for a sensor.

Automatically acknowledge alert when condition clears: Place a checkmark in this box to have alert notifications in the summary page return to normal state automatically when sensor readings return to normal.

Alert Notifications
The alert can be configured to notify one or more users via e-mail, SNMP traps (v1,v2c,v3), Syslog messages, or SMS alerts. The e-mail subject line for e-mail notification can be customized for easy source identification. The alert can activate an audible siren, or an alarm beacon. Alerts are also indicated on the “Int Alert” or “Ext Alert” LEDs on the front of the ENVIROMUX and in the WEB interface.

In the ENVIROMUX-SEMS-16U, external sensors have the added feature of being able to be associated with a webcam. If a checkmark is added to the block “Attach capture from webcam:” and a webcam is selected from the drop-down box, an image will be captured and sent with the alert message when an alert is sent via e-mail. Webcams that are monitored by the ENVIROMUX (page 32) will be available for this purpose.

Note: To be able to send web camera captures as e-mail attachments, viewer security (in your camera’s configuration) needs to be disabled. Consult your web camera manual to see if this feature is present and for instructions on how to do this.

Outputs
Each sensor can be associated with one of the connections labeled “Output Relays” (see page 23), and that connection can be set to open or close the contacts of the relay either on alert, or when returning to normal. The tamper can also block the output command generated by the alert. In this way other devices can be controlled by sensor and tamper alerts. Examples of this can be found in the wiring examples on pages 68 and 69.

Test Alerts
With all the configuration settings completed, each sensor and how the ENVIROMUX will react to an alert condition can be tested. Press the Simulate Alert button at the bottom of the configuration page to test each of the notification methods configured. To cancel the simulation, press the Clear button.

Note: A simulated alert will test all settings including any delay that has been configured (i.e. if a 2 minute delay is configured, it will delay sending the email for 2 minutes)

To perform a test, the ENVIROMUX must be properly setup for a user to receive alert messages. Use the chart on the following page to make sure the ENVIROMUX is setup properly.
Apply a valid e-mail address for the ENVIROMUX-SEMS-16 to the Enterprise Setup Page (see page 38)

Fill in Network Page with valid information (see page 39)

Create a user profile- be sure to include valid user e-mail address and assign at least one group to user to receive messages from (page 43)

Configure sensor and assign sensor to a group. For a user to receive messages from this sensor, this group must be selected in the user profile (above).

Use the “Simulate Alert” button to test the sensor configuration. The sensor will send a message to the assigned group.

The user will receive the message from the group as configured in the alert notification methods on the sensor configuration page (page 31).

Figure 26- Chart to setup alert notification
Contact Sensors

Contact Sensors are sensors that close or open a contact according to the sensor condition. Their presence and their type cannot be automatically detected by the RJ45 Sensor port. The sensors have to be manually added to the unit list by the administrator or a user with administrator privileges.

Add a Contact Sensor to RJ45 Sensor port

When adding a contact sensor to an RJ45 Sensor port, the administrator must specify the type of sensor and the RJ45 connector where the sensor is connected.

![Add New External Sensor](image)

**Figure 27- Add External Sensor**

- If the sensor is created, it gets the default name *Undefined #n*.
- If the connector was already in use and has a sensor already defined for it, an error message will be displayed at the bottom of the Summary page.

A menu sub-item will be created for the sensor in the left menu, under Monitoring->External Sensors. Also a web page will be created for the sensor. The administrator can further set the properties of the sensor from the sensor's Configuration web page. The configuration page for contact sensors has the same options as that for the External Sensors (see descriptions on page 24).

If the sensor is disconnected and no longer used, it has to be removed manually from the list using the Remove button on the sensor's configuration page (see Figure 28).

![Contact Sensor Configuration](image)

**Figure 28- Contact Sensor Configuration**
Digital Inputs

The “Digital In” terminals (page 8) are for easy installation of contact sensors (as opposed to using the RJ45 sensor ports). Connect up to 8 different contact sensors having either 2-wire contacts (for open or closed circuit sensing) or 4-wire contacts (for open or closed circuit sensors requiring 12V power supplies to operate).

These sensors can be accessed from the Monitoring->Digital Inputs item in the left side menu of the unit web page. The management and configuration is similar to Contact Sensors (page 28).

Note: The "Normal Status" of the contact sensor must be set to either open or closed, depending on the contact position of the sensor connected to it. If the sensor connected has a normally closed switch position at rest, the Normal Status should be set to “Closed”. If the connected sensor has a normally-open switch position, the Normal Status should be set to “Open”.

Figure 29- Add a Digital Input

Figure 30- Digital Input Configuration
Output Relays

There are 4 output relays available for the control of external devices. These devices may be switched ON or OFF provided they do not exceed the maximum ratings for the output relay: 30VDC, 1A or 100VAC, 0.5A (see “Output Relays” specifications on page 65). Output relays are provided with unique editable descriptions enabling the user to readily differentiate between messages received regarding relay status or sensors. The default status of each relay (the state the relay will revert to in the absence of power) is normally-open. When power is applied to the ENVIROMUX through either the AC input or the battery, the “Normal Status” (the state the relay will be in during normal operation) can be configured as either normally-open or normally-closed (see Figure 32).

Note: When the ENVIROMUX is powered OFF with the battery completely drained, each relay will revert to the normally-open (N.O.) state, regardless of the “Normal Status” setting.

Once configured, output relays are controlled by their associated sensor and can be programmed to change state (from normally-open to normally-closed or vice versa) on an alert or on the return to normal conditions. Programming is done on the configuration page of the associated sensor. Each output relay can be associated with any sensor.

Note: Do not use more than one input to place the same output relay in two different states. This may cause unpredictable results.

To manually change the state of an output relay, choose the desired state in the “Set Output” block (see Figure 31) and click “Apply Changes”.

Figure 31- Output Relay manual control page

Effects of an output relay changing state that can be configured include:

* the sensor group for determining what users will be alerted of the state change
* the method of alert notification, if any

Figure 32- Output relay configuration page
IP Devices

Up to 64 IP addresses can be assigned to be monitored by ENVIROMUX. They will be displayed under the Monitoring->IP Devices item in the left side menu. The ENVIROMUX will periodically ping (test) these addresses to determine whether or not they are up and running. If the address is not running, an alert will be recorded.

For each device the user can configure the
- IP address,
- the name,
- the sensor group the IP device will belong to
- the ping period (period of time between two consecutive tests),
- the time-out period (in seconds) in which the address should respond
- the number of times the ENVIROMUX should ping the address before reporting an alert
- how often, if at all, the reading taken should be added to the data log.

If the address fails to respond within the time-out for the selected number of times it will generate an alert. It will be tested again after the programmed period of time.

Just as with other sensors, the method of alert notification and the effect, if any, on output contacts can be configured in response to IP address connection failures.

---

**IP Device Configuration**

**Type: IP Device**

<table>
<thead>
<tr>
<th>Description:</th>
<th>BM System X3455</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP Address:</td>
<td>192.168.1.31</td>
</tr>
</tbody>
</table>

**Ping Timing / Alert Settings**

| Ping Period: | 5 Min |
| Timeout:     | 2 Sec  |
| Nb of Retries: | 10 |

**Alert Notifications**

- Enable E-mail Alerts
- Enable Syslog Alerts
- Enable Siren Alerts

**E-mail Subject:** IBM System X3455 IP Alert

**Outputs**

- Associate Output: None
- On alert: open
- On return to normal: open

---

**Figure 33- IP Device Configuration**
Web Cams

The Web Cams page displays the video snapshots of up to 8 monitored web cameras. ENVIROMUX will display the video from specified IP addresses and provide images 320 x 240 resolution. Place a name, the URL or IP address of the link, and the name of the image taken by the camera in the blocks provided (examples in Figure 34), click the “Add to view” checkbox, and click APPLY at the bottom of the page. Then click on View (Monitoring->Web Cams->View) to see the images taken by those cameras. The images can be set to be refreshed every 100 msec (.1 second) up to 99,900 msec (almost 100 seconds). The user can click on any image and be connected to the site defined by the Link (below).

![Web Cameras Configuration Table]

Figure 34- Web Cams Configuration

The images from web cameras can also be associated with alert messages. When configured (page 26), an image from a web camera can be taken and sent along with a sensor alert message via email.

**Note:** To be able to send web camera captures as e-mail attachments, viewer security (in your camera’s configuration) needs to be disabled. Consult your web camera manual to see if this feature is present and for instructions on how to do this.
## Administration

From the administration section there are several sub sections for configuring ENVIROMUX:

<table>
<thead>
<tr>
<th>SETTINGS</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise</td>
<td>Fields for assigning the company name, address, contact person, the ENVIROMUX-SEMS-16 e-mail address, phone number, and modem settings including cell phone number and baud rate.</td>
</tr>
<tr>
<td>Network</td>
<td>Fields for providing all the network settings ENVIROMUX will need to connect to and email to users</td>
</tr>
<tr>
<td>SNMP Agent</td>
<td>Apply SNMP agent settings</td>
</tr>
<tr>
<td>Date &amp; Time</td>
<td>Fields for date and time manual input or SNTP server settings for automatic input</td>
</tr>
<tr>
<td>Serial Port</td>
<td>Communication settings for the Console port for connection to a terminal</td>
</tr>
<tr>
<td>USERS</td>
<td></td>
</tr>
<tr>
<td>Root</td>
<td>Fields for configuring the root user to use ENVIROMUX including changing the root password</td>
</tr>
<tr>
<td>Add User</td>
<td>Fields for setting up users, passwords, and editing user settings</td>
</tr>
<tr>
<td>Edit Groups</td>
<td>Fields for naming each of the sensor groups</td>
</tr>
<tr>
<td>ADVANCED</td>
<td></td>
</tr>
<tr>
<td>Cascade</td>
<td>Fields for defining whether ENVIROMUX is a standalone system or one of up to four units in a cascaded system either directly connected or connected through the Ethernet</td>
</tr>
<tr>
<td>Configuration</td>
<td>For saving or loading a file containing the full configuration of the ENVIROMUX including the log file</td>
</tr>
<tr>
<td>Update Firmware</td>
<td>For updating the firmware of the ENVIROMUX when improved software becomes available.</td>
</tr>
<tr>
<td>REBOOT/SHUTDOWN</td>
<td>Enables user to reboot or shutdown the ENVIROMUX using the web interface</td>
</tr>
</tbody>
</table>

**Figure 35- Enterprise Setup Page**

**Settings-Enterprise Setup**

The Enterprise Setup page (Administration ->Settings-> Enterprise) is used to enter basic company information to be applied to the body of alerts. Enter the information to the blocks provided with your company name, location, the contact person that alert e-mails should refer to, the phone number to reach them, and the e-mail address assigned to the ENVIROMUX-SEMS-16. If a cell phone will be used as an alert method, a modem will be needed (GSM or CDMA) and the cell phone number and baud rate that is compatible with that modem will be needed. If a modem has not yet been connected, the message "Modem Not Present" will appear on the setup menu. The modem must be powered ON and connected before the ENVIROMUX is powered ON.

When a modem is present, the type, status, IMEI number, and signal strength will be displayed. The modem will work with a signal strength between -111dBm (weak) and -51dBm (strong).

In a cascaded configuration (page 41) a slave will identify itself using the “Enterprise Name” in e-mail and SMS trap alert messages.
**Settings-Network Setup**

From the Network Setup page (Administration->Settings->Network) the administrator can either choose to have the IP address and DNS information filled in automatically by the DHCP server, or manually fill in the fields.

*Note: If you select “Obtain an IP address automatically”, make sure a DHCP server is running on the network the ENVIROMUX-SEMS-16 is connected to.*

If the administrator chooses to have the DNS information filled in automatically, the SMTP server and port number still need to be entered for e-mail alerts to work. If the SMTP server requires a password in order for users to send e-mails, the network administrator must first assign a user name and password to the ENVIROMUX. Then apply the user name and password to the "User" and "Password" fields on the Network Setup page. The ENVIROMUX must be power-cycled for changes to the SMTP server to take effect.

*Note: The SMTP server port number is shown in Figure 36 as “25”. This is a common port number assigned, but not necessarily the port number assigned to your SMTP server. For SMTP servers that support SSL, the common port number is 465.*

The administrator may assign a different HTTP Server Port than is used by most servers (80). This might be desired if the administrator wants a secure connection.

*Note: If the port number is changed and forgotten, to determine what it has been changed to connect the ENVIROMUX for RS232 control (page 10) and review the Network Settings (page 52).*

If the SMTP server supports SSL (user authentication), click the block next to “This server requires SSL” to place a check mark in it.

If you are using IP masquerading, you may need to check the box “The unit is behind a firewall using port forwarding” and enter the IP address of the firewall. This will enable sensor readings to update at a remote browser outside the local network.

*Figure 36- Network Setup Page*
Settings-SNMP Agent
The SNMP Agent Setup page (Administration->Settings->SNMP Agent) is used to configure SNMP messages.

Apply names to the "Read-write Community Name" and "Read-only Community Name" as applicable.

Select one or more protocols by which to view SNMP sensor readings using your browser. Choose from v1, v2c, and/or v3. You must select at least one.

Select from the drop-down menu the protocol format SNMP trap alerts will be sent in. Choose from v1, v2c, or v3.

Click “Apply” when finished.
For instruction to setup and use SNMP, see page 81.

Figure 37- SNMP Agent Setup Page
Note: The V3 Engine ID shown in this page must be applied to the users SNMP configuration in order to receive SNMP v3 readings or alerts.
Note: To prevent any public SNMP access to the ENVIROMUX, leave v1 and v2C unchecked and check only v3.

Settings-Date and Time

The Date and Time of the ENVIROMUX (Administration->Settings->Date & Time) can be either manually setup to use an onboard clock or set to be synchronized with an SNTP server.

To synchronize it, click on the checkbox “Synchronize with SNTP Servers” and enter the primary and secondary SNTP server IP addresses (even if the primary is the same as the secondary). Enter the time zone that the ENVIROMUX should be set to.

To set it manually, click on the checkbox “Change Date/Time Manually”. Select the desired date format from the drop-down box and enter the date. Select the format of the time of day (24 hours, AM, or PM) and enter the time accordingly.

In order to have the time change in accordance Daylight Saving Time rules, place a checkmark in the block “Automatically adjust clock for daylight saving changes” and select the appropriate time zone in the box above.

Add a checkmark to the appropriate box if you want to have a time stamp added to e-mail alerts and/or SMS alerts. Click on “Apply” when finished.

FYI-
The ENVIROMUX complies with the new U.S.-Daylight Saving Time rules (passed in 2005).
Settings-Serial Port Setup

The ENVIROMUX serial port (labeled “Console”) must be setup to communicate with the terminal (page 10). Under Administration -> Settings -> Serial Port, set the baud rate and format to the same settings as those of the port on the connected terminal.

Users-Root

Under Administration -> Users -> Root, the root user (or any user with administrator rights) can change the root password and configure how the root user will receive alert messages. Users with administrative rights can change all configuration settings except for the root user name.
Users- Add User

Under Administration-> Users->Add User, up to 16 users can be added and configured with either user or administrative rights. Users with administrative rights can change all configuration settings within the ENVIROMUX. Users with user rights can only see the current readings of the sensors and change their own passwords.

![Add New User Profile](image)

**Figure 41- Add New User Page**

To add a user, a user with administrator rights must click on Administration->Users->Add User. An "Add New User Profile" window will appear where the initial basic user information can be entered. Once that information is entered, the next window provides blocks for additional user configuration.

User names must be alphanumeric with no spaces.

Passwords must be alphanumeric with at least 5 characters.
The User Profile (Administration->Users->any user) contains all the user settings for restrictions or permission of a user to use ENVIROMUX.

Within the profile the administrator:

- sets the password (must be at least 5 characters)
- decides the level of security for the user
- determines which sensor group alerts will come to the user and which ones will not
- sets the means by which a user will receive alert messages
- enters the user e-mail address (1 address only, maximum 63 characters)
- enters the IP address for the Syslog and SNMP server
- enters the phone number to be called if a modem is installed to receive SMS messages
- sets the schedule in which a user will receive alert messages
- assigns the SNMP v3 security settings (if used) for the user

If a user is set with only "User" rights instead of "Administrator" rights, the user will only be able to see current sensor readings and to change their password if so desired. No other ENVIROMUX access it possible.

**Note:** If the root user’s password is changed and forgotten, contact Network Technologies Inc at (800) 742-8324 (800-RGB-TECH) or (330) 562-7070 for assistance.

**Note:** Each user can have only one email address (maximum 63 characters) associated with that user (see Figure 42). If an additional email address is needed, an additional user must be added with the desired email address. As long as both users are configured to get messages from the same sensor groups, both email addresses will get the same alert messages. For more on users and sensor groups, see page 40.
SNMP v3 User Settings
Security settings can be configured within each user configuration if the SNMP v3 protocol has been selected for use (page 35).

<table>
<thead>
<tr>
<th>SETTINGS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Authentication Protocol</td>
<td>Choose between MD5 to require authentication, or none to disable it</td>
</tr>
<tr>
<td>Privacy Protocol</td>
<td>Choose between DES to encrypt SNMP readings or traps or none to disable encryption. If encryption is enabled, then the Authentication Protocol must also be set at “MD5”</td>
</tr>
<tr>
<td>Authentication Passphrase</td>
<td>Assign the passphrase to be used to enable the receipt of SNMP v3 messages</td>
</tr>
<tr>
<td>Privacy Passphrase</td>
<td>Assign the passphrase to be used to open and read readings or alert messages received via SNMP v3</td>
</tr>
</tbody>
</table>

After changing any settings in the user profile, press “Apply”.

If any changes are made to the user’s SNMP v3 Settings, the ENVIROMUX-SEMS-16 must be rebooted (page 46) before they will take effect. If other users’ settings need to be changed, the reboot can be done after all users’ settings are complete.

For instruction to setup and use SNMP, see page 81.
Users-Edit Groups

Groups are used to create a common relationship between sensors. From the Administration->Users>Edit Groups page the user with administrator permissions can assign names for the groups sensors belong to. Up to 16 groups can be assigned.

<table>
<thead>
<tr>
<th>Group Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:</td>
</tr>
<tr>
<td>2:</td>
</tr>
<tr>
<td>3:</td>
</tr>
<tr>
<td>4:</td>
</tr>
<tr>
<td>5:</td>
</tr>
<tr>
<td>6:</td>
</tr>
<tr>
<td>7:</td>
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<tr>
<td>8:</td>
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<tr>
<td>9:</td>
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<tr>
<td>10:</td>
</tr>
<tr>
<td>11:</td>
</tr>
<tr>
<td>12:</td>
</tr>
<tr>
<td>13:</td>
</tr>
<tr>
<td>14:</td>
</tr>
<tr>
<td>15:</td>
</tr>
<tr>
<td>16:</td>
</tr>
</tbody>
</table>

Figure 43- Edit Groups Page

For example, suppose there are two sensors installed in Server Room #1: a Temperature Sensor and a Door Contact Sensor. The User responsible for monitoring Server Room #1 would like to be notified when either one of the sensors is in alert status. This can be accomplished in two ways:

1. A single group named “Server Room #1” is created. Both sensors located in Server Room #1 are assigned to this group (from the sensor configuration page (page 24)). The User can then subscribe to the “Server Room #1” group (from the “Groups” section of the User Profile page (page 38)), and select the method in which to be alerted (from the “Contacts” section of the User Profile page). The User will now receive alerts from all sensors in the “Server Room #1” group.

2. Two groups are created: one named “Temperature Sensors” and one name “Contact Sensors.” Each sensor is assigned to its respective group (from the sensor configuration page (page 24)). The User can then subscribe to both groups (from the “Groups” section of the User Profile page (page 38)) and select the method of alert contact. The User will now receive alerts from all sensors in the “Temperature Sensors” group and the “Contact Sensors” group. However, some sensors in these groups may not be located in Server Room #1.
Advanced-Cascade Configuration

From the Administration->Advanced>Cascade menu, the administrator can configure the ENVIROMUX to either be

- a standalone master system,
- a master with up to 5 Ethernet slaves (Ethernet connected)
- a master with up to 3 local slaves (directly connected)
- an Ethernet slave
- a local slave #1, #2, or #3

Note: When ENVIROMUX units are connected as slaves, only their sensors and output relays are used and are monitored through the master unit.

If local slaves are connected,

1. Go to the Cascade Configuration page for each ENVIROMUX and using the choices in the drop down box on , select the position each ENVIROMUX will hold in the cascaded system (examples seen in Figure 44).
2. Press "Apply".
3. Connect the slaves to the master as shown below using CAT5/5e/6 patch cables with RJ45 connectors wired straight thru (pin 1 to pin 1, pin 2 to pin 2, etc.) (max. 25 feet long).
4. Power cycle each slave unit
5. Power cycle the master unit

Sensors attached to the connected slaves will appear when viewing the Summary Page for the master (see Figure 48). The Beacon and Siren connections of the slave units are not used.

Figure 44- Cascade configuration with local slaves

Figure 45- Master with local slaves
If Ethernet slaves are connected,
1. Each Ethernet slave must be given a unique IP address (page 34)
2. Go to the Cascade Configuration page for each ENVIROMUX and using the choices in the drop down box, select the position unit will hold in the cascaded system (examples seen in Figure 46).
3. Press “Apply” to save the change.
4. After the position is selected for the master, the blocks below will be available to enter the IP address of each Ethernet slave to be monitored by the master.
5. Press “Apply” to save the changes.
6. Power cycle each slave
7. Power cycle the master

Note: The master and each slave must be power cycled for changes to take effect.

Sensors attached to the connected slaves will appear when viewing the Summary Page for the master. The Beacon and Siren connections of the slave units are not used.

---

**Figure 46- Cascade configuration with Ethernet slaves**

---

**Figure 47- Master with Ethernet slaves**
## SUMMARY

Friday, 12-18-2009  03:23:12 PM

<table>
<thead>
<tr>
<th>Conn.</th>
<th>Type</th>
<th>Description</th>
<th>Value</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>(M)</td>
<td>Power</td>
<td>IPMI Rack SEMS Main Power</td>
<td>OK</td>
<td>Normal</td>
</tr>
<tr>
<td>(S1)</td>
<td>Power</td>
<td>DP Test Unit Main Power Supply</td>
<td>OK</td>
<td>Normal</td>
</tr>
<tr>
<td>(S1)</td>
<td>Power</td>
<td>DP Test Unit Secondary Power Supply</td>
<td>OK</td>
<td>Normal</td>
</tr>
<tr>
<td>(S2)</td>
<td>Power</td>
<td>E-SEMS Rev B DP Main Power Supply</td>
<td>OK</td>
<td>Normal</td>
</tr>
<tr>
<td>(S2)</td>
<td>Power</td>
<td>E-SEMS Rev B DP Secondary Power Supply</td>
<td>OK</td>
<td>Normal</td>
</tr>
<tr>
<td>(M)</td>
<td>Temperature</td>
<td>IPMI Rack SEMS Internal Temperature</td>
<td>92.4°F</td>
<td>Normal</td>
</tr>
<tr>
<td>(M)</td>
<td>Humidity</td>
<td>IPMI Rack SEMS Internal Humidity</td>
<td>13%</td>
<td>Normal</td>
</tr>
<tr>
<td>(M)</td>
<td>Voltage</td>
<td>IPMI Rack SEMS Battery</td>
<td>14.5V</td>
<td>Normal</td>
</tr>
<tr>
<td>(S1)</td>
<td>Temperature</td>
<td>Internal Temperature</td>
<td>92.7°F</td>
<td>Normal</td>
</tr>
<tr>
<td>(S1)</td>
<td>Humidity</td>
<td>Internal Humidity</td>
<td>17%</td>
<td>Normal</td>
</tr>
<tr>
<td>(S1)</td>
<td>Voltage</td>
<td>Battery</td>
<td>13.6V</td>
<td>Normal</td>
</tr>
<tr>
<td>(S2)</td>
<td>Temperature</td>
<td>Rev B LTTU Internal Temperature</td>
<td>94.4°F</td>
<td>Normal</td>
</tr>
<tr>
<td>(S2)</td>
<td>Humidity</td>
<td>Rev B LTTU Internal Humidity</td>
<td>18%</td>
<td>Normal</td>
</tr>
<tr>
<td>(S2)</td>
<td>Voltage</td>
<td>Rev B LTTU Battery</td>
<td>13.3V</td>
<td>Normal</td>
</tr>
<tr>
<td>(M) #1</td>
<td>Dry Contact</td>
<td>Furnace Rm. CO Detector</td>
<td>Open</td>
<td>Normal</td>
</tr>
<tr>
<td>(M) #2</td>
<td>Smoke Detector</td>
<td>IPMI Server Rack - (Flat SC5)</td>
<td>Open</td>
<td>Normal</td>
</tr>
<tr>
<td>(M) #3</td>
<td>Vibration</td>
<td>Undefined #3</td>
<td>Open</td>
<td>Normal</td>
</tr>
<tr>
<td>(M) #4</td>
<td>Motion Detector</td>
<td>Undefined #4</td>
<td>Open</td>
<td>Normal</td>
</tr>
<tr>
<td>(M) #5</td>
<td>Water</td>
<td>IPMI Server Rack (Flat UC5)</td>
<td>Open</td>
<td>Normal</td>
</tr>
<tr>
<td>(M) #6</td>
<td>Temperature Combo</td>
<td>Screen Room #1 Temp</td>
<td>75.7°F</td>
<td>Normal</td>
</tr>
<tr>
<td>(M) #6</td>
<td>Humidity Combo</td>
<td>Screen Room Humidity #1</td>
<td>23%</td>
<td>Normal</td>
</tr>
<tr>
<td>(M) #7</td>
<td>Temperature Combo</td>
<td>Screen Room #2 - (UC6-200)</td>
<td>72.9°F</td>
<td>Normal</td>
</tr>
<tr>
<td>(M) #7</td>
<td>Humidity Combo</td>
<td>Screen Room #2 - (UC6-200)</td>
<td>30%</td>
<td>Normal</td>
</tr>
<tr>
<td>(M) #8</td>
<td>Temperature</td>
<td>Screen Room #3 - (SC5-200)</td>
<td>72.1°F</td>
<td>Normal</td>
</tr>
<tr>
<td>(M) #9</td>
<td>Humidity Combo</td>
<td>Screen Room #3 - (SC5-200)</td>
<td>28%</td>
<td>Normal</td>
</tr>
<tr>
<td>(M) #10</td>
<td>Door</td>
<td>Undefined #10</td>
<td>Open</td>
<td>Normal</td>
</tr>
<tr>
<td>(M) #11</td>
<td>Dry Contact</td>
<td>Undefined #11</td>
<td>Open</td>
<td>Normal</td>
</tr>
<tr>
<td>(M) #12</td>
<td>Panic Button</td>
<td>Undefined #12</td>
<td>Open</td>
<td>Normal</td>
</tr>
<tr>
<td>(M) #13</td>
<td>Temperature Combo</td>
<td>Undefined #13</td>
<td>20.2°C</td>
<td>Normal</td>
</tr>
<tr>
<td>(M) #13</td>
<td>Humidity Combo</td>
<td>Undefined #13</td>
<td>37%</td>
<td>Normal</td>
</tr>
<tr>
<td>(M) #14</td>
<td>Temperature</td>
<td>Eng Lab Area Temperature</td>
<td>30.1°F</td>
<td>Normal</td>
</tr>
<tr>
<td>(M) #15</td>
<td>Key Station</td>
<td>Undefined #15</td>
<td>Open</td>
<td>Normal</td>
</tr>
<tr>
<td>(M) #16</td>
<td>Water</td>
<td>Outdoor Porch Water (SC5-350)</td>
<td>Open</td>
<td>Normal</td>
</tr>
<tr>
<td>(S1) #1</td>
<td>Temperature Combo</td>
<td>IPMI Rack Top Front Temperature</td>
<td>82.3°F</td>
<td>Normal</td>
</tr>
<tr>
<td>(S1) #1</td>
<td>Humidity Combo</td>
<td>IPMI Rack Top Front Humidity</td>
<td>15%</td>
<td>Normal</td>
</tr>
</tbody>
</table>

Figure 48- Portion of Summary Page from a Master with Slaves
Advanced-Configuration File

The Administration->Advanced>Configuration page has 4 options:

- Save all of the configuration characteristics of the ENVIROMUX to a file on an Ethernet connected PC to be reloaded as desired.
- Load a file already saved and quickly restore the ENVIROMUX configuration to a previous state.
- Reset all sensors only to factory-default settings
- Reset the ENVIROMUX system configuration to factory-default settings.

Save Configuration File

Configuration settings for sensors, webcams, all things under the topic of “Monitoring” (page 19) can be saved to a restorable file. (Passwords and network settings are not saved, for security reasons.) To save the current ENVIROMUX configuration, click on “Save Configuration File”. A window will open showing a directory in the connected PC. If this is not the directory where configuration files should be saved, browse to the desired directory and save the file using a name that has some meaning to you. Once saved, the file can be reloaded at any time.

Load Configuration File

The “Load” button is used to overwrite the current ENVIROMUX configuration with the settings in a saved configuration file. To load an existing configuration file, click on “Browse”. A window will open in the connected PC through which the user can locate and select a configuration file. Once chosen, click on “Load” to overwrite the present ENVIROMUX configuration settings with those in the loaded file.

Note: Before overwriting the existing configuration, consider whether the existing configuration should be saved first. If it will be saved, be sure to save the current configuration file under a different name than the configuration file to be loaded.

This is particularly useful when preparing to make changes to the configuration that may provide unsatisfactory results. If the configuration is saved in a file before changes are made, stepping backward and restoring the previous settings is as simple as clicking on the file saved. Just be sure to remember the name of the file saved and where in the PC it was saved.

Figure 49- ENVIROMUX Configuration Page
Advanced- Update Firmware

It may be desired, on occasion, to update the firmware in the ENVIROMUX. This can only be done by the “root” user and can be done either through the Web Interface, or using RS232 (see page 61). This section explains how to update the firmware using the Web Interface.

*Note: We recommend that you perform a configuration save (see page 44) before upgrading your firmware. In the event it is necessary, with a saved file you can easily reload the settings after the upgrade is complete.*

![Update Firmware Page](image)

Under Administration->Advance>Update Firmware the user can change the firmware to a version that includes updates to the ENVIROMUX programming. A link in the menu will locate the current firmware file to be downloaded to the PC.

**WARNING:** Failure to carefully follow these directions can permanently damage the product. Please read these directions in full before continuing. Do not, under any circumstances, reset or power-down the unit while the firmware is being updated. Do not attempt to update the firmware when a power-failure is likely, particularly if the “Low Batt” LED is blinking, indicating a failed battery.

- Follow these directions to update the firmware:
  1. Print out these instructions for reference during the update procedure.
  2. Download the firmware file from the NTI website to the PC.
  3. On the Update Firmware page, press <Browse> to browse to the firmware file on the PC.
  4. Click **Update Firmware**.
  5. Wait for the following message to appear:

    **Upload Succeeded.**
    **Flash of new image completed.**
    **System will automatically restart.**

    *Note: It may take several minutes for a message to appear.*

  6. The ENVIROMUX-SEMS-16 will reset itself in 10 seconds, logging out all connections. After approximately 60 seconds, the ENVIROMUX-SEMS-16 should resume normal operation.

- If a message appears indicating that the Upload has failed, or that a non-fatal error has occurred:
  1. Ensure that the uploaded file is the NTI firmware file.
  2. Resume the process from step 2 above.

  *Note: This message does not indicate that damage to the product has occurred.*

- If a message appears indicating that there has been a fatal error:
  1. **DO NOT RESET OR POWER-DOWN THE PRODUCT.**
  2. Repeat the update process from the first step 2 above.
  3. If another Fatal Error message appears, see the troubleshooting section (page 76) and call NTI tech-support at 1-800-742-8324 or 330-562-7070.

  *Note: The product should continue to run normally unless it is reset. However, damage may have occurred to the web server software that will prevent the product from starting up correctly. See page 78 for a recovery procedure.*
REBOOT/SHUTDOWN

If a user wants to remotely reboot the ENVIROMUX to refresh settings (such as after changing settings in the SNMP Agent page (page 35), or if the user wants to shut down the ENVIROMUX during a power-failure, the REBOOT/SHUTDOWN page under the Administration section can be used.

![Reboot/Shutdown page](image)

The REBOOT/SHUTDOWN page shows the current status of the power supply(s) and backup battery (page 64). Click on the "Reboot" button to force the ENVIROMUX to shut down and then restore itself to normal operation. Any configuration changes that were made prior to this action will be made active.

**Note: In the event of a power failure, using REBOOT will cause the ENVIROMUX to shut OFF.**

Click on the "Shut Down" button to shut down the ENVIROMUX in the event of a power failure. During a power failure, this will be the only way the ENVIROMUX can be shut OFF. The **battery backup will power the ENVIROMUX for up to 1 hour.** The power switch will only shut down the ENVIROMUX during normal operation. When using the "Shut Down" button, the user will be reminded to also shut OFF the power switch on the ENVIROMUX. If the power switch is not shut OFF, when AC power has been restored the ENVIROMUX will power ON automatically.

**Note: If power is shutdown during a power failure, you will not be able to power ON the ENVIROMUX until after AC power has been restored.**

**Note: When using SHUTDOWN or REBOOT button, the user will be prompted to confirm the action (image below) before completing the action.**

![Reboot confirmation prompt](image)
Under **Main Menu->Log**, the user will find links to pages where Event Log records and Data Log records can be viewed and managed. The maximum size of each log is 1000 entries, listed in chronological order.

### View Event Log

The View Event Log page displays various happenings within the use of the ENVIRONMUX and any alert conditions that occur. Power up, power down, alarm reports, alarm acknowledgements, logins, and others. The date and time of these occurrences are recorded and available for printing, viewing, or deletion. Log entries can be removed individually, in groups, or all at once. Event log messages are automatically sent to users as configured on the sensor configuration page (page 23) in addition to being recorded in the Event Log. The log can also be downloaded as a tab-delimited plain text file. If a USB flash drive is present, logs will also be recorded on the flash drive to make them portable provided the feature is enabled (see “Log Settings” on next page).

#### Sample of Event Log Message received via e-mail:

**ENTERPRISE:** NTI  
**LOCATION:** Danner Drive  
**CONTACT:** Sales Dept  
**DESCRIPTION:** Battery  
**CONNECTOR:** internal  
**TYPE:** Power  
**MESSAGE:** Battery disconnected  
**VALUE:** 14.2V

### View Data Log

The View Data Log page displays the recorded sensor readings (configurable for each sensor- see page 23).

The date and time of these readings are recorded and available for printing, viewing, or deletion. Log entries can be removed individually, in groups, or all at once. If desired, notification of Data log entries can be sent via e-mail, SNMP Trap, or Syslog as configured under Log Settings (see Figure 55). The log can also be downloaded as a tab-delimited plain text file.
Sample of Data Log Message received via e-mail:

ENTERPRISE: NTI
LOCATION: Danner Drive
DESCRIPTION: Internal Temperature
TIME: 2000-10-30  03:45:11
TYPE: Temperature
VALUE: 24.0C

Log Settings

The log’s behavior upon reaching the maximum size can be configured (Log->Settings), allowing the log to wrap (overwrite oldest entries), stop logging, or clear the entire log and begin a new log. The entire log can be downloaded as a tab-delimited plain text file from the web interface at any time (see “View Data Log” above). When a flash drive is installed in the USB port on the front of the ENVIROMUX (ENVIROMUX-SEMS-16U only), logs can also be recorded on the flash drive to make them portable. The number of logs that can be recorded depends on the capacity of the flash drive installed. Log recording can be stopped and started as needed using the buttons on the Log Settings page. To begin recording to the flash drive, press the Start button. Users that are configured to receive alert or data logs from the group specified will also receive notification when the log files have reached 90% of their capacity (900 entries). Additionally, the administrator can choose to have the same users receive notification of each data log entry via email, SNMP trap, and/or Syslog by placing a checkmark in the associated checkboxes.
LINKS

Up to 64 links to external web pages can be added under the Monitoring->Links menu item. Links allow the user to quickly navigate to a URL or IP address with one click to the left menu. This could provide a quick and centralized access to web cameras, routers switches, etc. assuming they have a web page.

![Configure Links]

**Figure 56- Configure Links to Favorites**

To add a Link:

1. Apply a description to identify the link (up to 31 characters)
2. Apply IP Address or URL (up to 79 characters) of desired server or website.
3. Click "Apply"
4. Click "Add New" to add another Link (if space is available, up to 64 can be configured).

To remove a Link:

1. Click the box to the left of the Description to select the link
2. Click "Delete Selected"

LOG OUT

When a user is finished accessing the ENVIROMUX user interface, it is recommended that the user click on the LOGOUT link in the side menu. If the LOGOUT link isn’t used, the web interface can be accessed by anyone that sits down to the desk where it is logged in until ENVIROMUX automatically logs the user out. The automatic logout will only occur after 8 hours of access time.
RS232 OR TELNET CONNECTION

RS232 Connection
This section assumes that a terminal has been connected to ENVIROMUX as described on page 10 (Figure 10) and that both the ENVIROMUX and terminal RS232 ports have been configured (using HyperTerminal in the figure below) to the same port settings (default parameters are: 9600 bps, 8-N-1-no flow).

![Figure 57- RS232 Port Properties Configuration](image)

**Telnet Connection**

The user may connect to ENVIROMUX using a Telnet client either 1) through HyperTerminal or 2) from a command prompt. Before Telnet can be used, two conditions must be met:

1. A terminal must first be connected to ENVIROMUX through the ETHERNET port, either remotely, or directly (see "Ethernet Connection for Remote User Control" on page 10).
2. Telnet must be enabled. Telnet is disabled by default, and can be enabled by first connecting through RS232 (above) and then using Main Menu item 5 (see "Enable/Disable Telnet Server" on page 55).

Telnet will remain enabled even if power is cycled to the ENVIROMUX. With Telnet enabled, once ENVIROMUX is setup it can be accessed remotely in case the user needs limited access due to the Web Interface being unavailable.

The Telnet menus and behavior are identical to controlling ENVIROMUX using a connected terminal with RS232.
**Telnet via HyperTerminal**

Open HyperTerminal and configure the connection to use TCP/IP. Enter the IP address of ENVIROMUX (default is 192.168.1.21) and port number 5900 (see Figure 58).

![Telnet connection via HyperTerminal](image)

**Figure 58- Telnet connection via HyperTerminal**

---

**Telnet via Command Prompt**

At a command prompt (DOS window), type the following command to connect to ENVIROMUX:

```
C:\> telnet 192.168.1.21 5900  (or substitute current IP address)
```

Press <Enter> and continue below under "Login to the Main Menu".

---

**Log In to the Main Menu**

With the HyperTerminal window open, press the <Enter> key. The following message will appear:

```
Network Technologies Inc.
ENVIROMUX-SEMS-16 V1.1

Enter password:>
```

Enter the root password *(default is “admin”)*

Only the “root” user can access this menu. Other users cannot access it, even if they have administrator rights.

Passwords are case sensitive. The administrator username cannot be changed from "root", but the password should be changed (see page 36).

The Main Menu will be displayed.
Main Menu

MAIN MENU
=========
1. Configure Enterprise
2. Display Network Settings
3. Configure Network Settings
4. Change Password
5. Enable/Disable Telnet Server
6. Configure SNMP
7. Configure Date & Time
8. Monitoring
9. Restore Settings to Defaults
A. Reboot
B. Shutdown
C. Logout & Exit
D. Upgrade Firmware

Enter Option >

Press a key from <1> to <9> or <A> to <D> (capital or small letters) to select the next action

Configure Enterprise Submenu

To enter into this submenu, you should press <1> from Main Menu. The following menu will be displayed:

ENTERPRISE CONFIGURATION
=========================
1.    Enterprise Name
2.    Location
3.    Contact
4.    Phone
5.    E-mail
0.    Return to Main Menu

Press a key from <1> to <4> to configure one of the displayed items. Press <0> to return to previous (Main) menu. This information will appear in the body of emails received with alert messages.

Display Network Settings

To display network settings press <2> from Main Menu. The following text will be displayed (actual values from the right side may differ depending on your configuration):

NETWORK SETTINGS
==================
The unit uses a static IP Address
MAC Address:   00:40:9D:23:EA:E9
IP Address:   192.168.1.30
Subnet Mask:   255.255.255.0
Default Gateway:  192.168.1.1
DNS Server:  192.168.1.2
Alternate DNS Server:  0.0.0.0
Firewall:                  disabled
Firewall IP Address:
HTTP Server Port:          80
SMTP Server:    smtp.somewhere.com
SMTP Port:    25
SMTP Server Authentication:disabled
SMTP Server SSL:                enabled
SMTP Server Authentication:     enabled

Press any key to return to Main Menu

Hit a key to go back to Main Menu
Network Configuration Submenu

To enter into this submenu, <3> from Main Menu. The following submenu will be displayed:

```
NETWORK CONFIGURATION
========================
1. Change MAC Address
2. Toggle DHCP Mode
3. Change IP Address
4. Change Subnet Mask
5. Change Default Gateway
6. Change Preferred DNS Server
7. Change Alternate DNS Server
8. Enable/Disable Firewall
9. Change Firewall IP Address
A. Change HTTP Server Port
B. Change SMTP Server
C. Change SMTP Port
D. Enable/Disable SMTP SSL
E. Enable/Disable SMTP Authentication
F. Change SMTP User Name
G. Change SMTP Password
0. Return to Main Menu
```

Enter Option >

Hit a key from <1> to <9> or <A> to <G> to edit the corresponding variables or <0> to return back to Main Menu

**Changing MAC Address**

To change the MAC address, hit <1> from Network Configuration Menu.

Enter new MAC Address (00:40:9D:23:EA:E9):

The current MAC Address is displayed between parentheses. Type a new MAC address and hit <Enter> or just hit <Enter> to keep the current address unchanged. The display will return to Network Configuration submenu. When typing a new MAC Address, the <Backspace> key can be used to correct typing errors.

**Toggle DHCP Mode**

*Note: Make sure the ENVIROMUX-SEMS-16 is connected to a network with a DHCP server attached prior to changing this setting to "dynamic IP Address".*

The system can use a manually assigned IP Address that will not change ("static"), or can get its IP Address from a DHCP server ("dynamic"). When selecting to toggle the mode (by pressing <2>), the current mode will be displayed and the user will be asked if he wants to change. By pressing <y> or <Y>, the user will toggle the DHCP mode:

The unit uses a static IP Address.
Do you want to toggle the status? (y/n):

Pressing any other key will cancel the operation.
Changing IP Address

To change IP address, hit <3> from Network Configuration Menu.

Enter new IP Address (192.168.1.21):

The current IP Address is displayed between parentheses. Type a new IP address and hit <Enter> or just hit <Enter> to keep the current address unchanged. The display will return to Network Configuration submenu. When typing a new IP Address the <Backspace> key can be used to correct typing errors.

Changing Subnet Mask

To change subnet mask, hit <4> from Network Configuration Menu.

Enter new Subnet Mask (255.255.255.0):

The current subnet mask is displayed between parentheses. Type a new subnet mask and hit <Enter> or just hit <Enter> to keep the current mask unchanged. The display will return to Network Configuration Submenu. When typing new subnet mask the <Backspace> key can be used to correct typing errors.

Changing Default Gateway

To change default gateway address, hit <5> from Network Configuration Menu.

Enter new Default Gateway (192.168.1.1):

The current default gateway address is displayed between parentheses. Type a new address and hit <Enter> or just hit <Enter> to keep the current address unchanged. The display will return to Network Configuration Submenu. When typing a new gateway address the <Backspace> key can be used to correct typing errors.

Changing DNS Server Address

To change DNS Server address, hit <6> from Network Configuration Menu.

Enter new DNS Server (192.168.1.2):

The current DNS server address is displayed between parentheses. Type a new address and hit <Enter> or just hit <Enter> to keep the current address unchanged. The display will return to Network Configuration Submenu. When typing new DNS server address the <Backspace> key can be used to correct typing errors.

Changing Alternate DNS Server Address

To change Alternate DNS Server address, press <7> from Network Configuration Menu.

Enter new DNS Server (192.168.1.2):

The current Alternate DNS server address is displayed between parentheses. Type a new address and hit <Enter> or just hit <Enter> to keep the current address unchanged. The display will return to Network Configuration Submenu. When typing new alternate DNS server address the <Backspace> key can be used to correct typing errors.

Changing HTTP Server Port settings

To change the HTTP Server Port from the default port 80 to a secure port, press <8> from Network Configuration Menu.

Enter new HTTP Server Port (80):

The current HTTP server port assignment is displayed between parentheses. Type a new port number and hit <Enter> or just hit <Enter> to keep the current port number unchanged. The display will return to Network Configuration Submenu. When typing new HTTP port server number the <Backspace> key can be used to correct typing errors.
Changing SMTP server settings

SMTP Server is used to send e-mail notification to the configured users. The IP address of the server and port have to be configured before being able to use it. The default port for an SMTP server is 25. If your current SMTP server uses a port number other than the default, the ENVIROMUX should be configured accordingly.

To change SMTP Server address press <9> from Network Configuration Menu. The system will prompt for a name, displaying the old name between parentheses. If the operator introduces a valid server (which can be a numeric IP address or a literal) the system will save the new value into the permanent storage. The system does not check for the presence of the server or if the name can be resolved by the DNS. The operator has to assure that the server name introduced is operational, otherwise the e-mail messages will not be sent.

To change SMTP port, press <A> from Network Configuration Menu. The old port will be displayed between parentheses and the system will ask for a new value.

Most SMTP servers require authentication, i.e. the user connects to that server using a name and a password. To toggle between non-authenticated and authenticated mode, press <B> (or <b>) from Network Configuration Menu.

To change the user name, press <C> (or <c>) and to change the password, press <D> (or <d>). A maximum of 63 characters can be used for either the user name or password.

Change Password

To enter into this submenu, press <4> from Main Menu

A request to type the current password will be displayed. If a wrong password is entered, the user will be logged out from the Main Menu.

After introducing the correct current case-sensitive password, the user will be prompted to type and retype the new password. If they match and the length is smaller than 80 characters (alphanumeric) but larger than 5 characters, the password will be accepted and changed to the new one, otherwise the operation should be repeated.

Enable/Disable Telnet Server

This submenu allows the operator to disable or enable the Telnet server running on the system according to his needs. Press <5> from Main Menu. The following text will appear on the screen (example for a currently disabled telnet Server):

The Telnet Server is currently disabled
Press <Space> to enable it, other key to return

The setting will be effective after rebooting the unit...

After pressing <Space Bar> the setting will be changed and the system will show on the screen:

Telnet Server enabled!
Do you want to reboot now? (y/n)

The operator can choose to press <Y> and the system will reboot instantly or press <N> and continue to work. If <N> was pressed, the system will keep the old status until the first re-boot.
SNMP Agent Configuration Submenu
To enter this submenu, press <6> from main Menu. The following text will be displayed:

```
SNMP Agent Configuration
================================
1. Enable/Disable SNMPv1 Access
2. Enable/Disable SNMPv2c Access
3. Enable/Disable SNMPv3 Access
4. Configure SNMP Traps Format
5. Read Only Community String
6. Read-Write Community String
7. Display EngineID
0. Return to Main Menu
```

Hit a key from <1> to <7> to configure the SNMP system, or <0> to return.

**Enable/Disable SNMP v1,v2c,v3 Access**

The SNMP agent is used to monitor and control sensors and settings of the system from a remote station using SNMP (v1, v2c, or v3) protocol. Access to SNMP can be disabled or enabled by the operator by pressing <1>, <2> or <3>. The system will display the current status of the SNMP version access and will ask the operator to press <Space Bar> to toggle the status.

**Configure SNMP Traps Format**

The SNMP Traps are used as a method to send alerts or log messages over the network. Their format can be configured for v1, v2c, or v3. To configure the format, press <4> from this submenu, and then <1>, <2> or <3> (respectively) to choose the format for SNMP Traps.

**Read-Only Community String**

The SNMP Read-only community string enables a user to retrieve "read-only" information from the ENVIROMUX using the SNMP browser and MIB file. This string must be present in the ENVIROMUX and in the proper field in the SNMP browser.

**Read-Write Community String**

The SNMP Read-Write community string enables a user to read information from the ENVIROMUX and to modify settings on the ENVIROMUX using the SNMP browser and MIB file. This string must be present in the ENVIROMUX and in the proper field in the SNMP browser.

**Display EngineID**

The Engine ID identifies the ENVIROMUX-SEMS-16 to the SNMP firmware in the user’s CPU. In order to receive SNMP v3 alert messages, the Engine ID must be entered into the user’s configuration as displayed after pressing <7> from this menu.
Configure Date & Time Submenu

To enter this submenu, press <7> from main Menu. The following text will be displayed:

```
CONFIGURE DATE & TIME
================================
1. Select Timer Source
2. Change Primary SNTP Address
3. Change Secondary SNTP Address
4. Change Current Time
5. Change Current Date
6. Set Time Zone
7. Display System Time
0. Return to Main Menu
```

Select Timer Source

To select a timer source, press <1> from Configure Date & Time Menu. The user will be informed of the current timer setting (internal or network time server), and prompted to change to the other type. Pressing <Y> will toggle to the other timer source. Pressing <N> will keep the current setting.

The unit uses internal timer
Do you want to synchronize with a network time server? [Y/N]:

Change Primary SNTP Address

To change SNTP address, press <2> from Configure Date & Time Menu. The current address is shown in parentheses. Typing in the new address and pressing <ENTER> will change the address.

Enter Primary SNTP server address (192.168.3.1):

Change Secondary SNTP Address

To change secondary SNTP address, press <3> from Configure Date & Time Menu. The current address is shown in parentheses. Typing in the new address and pressing <ENTER> will change the address.

Enter Secondary SNTP server address (192.168.3.1):

Change Current Time

To change the time, press <4> from Configure Date & Time Menu.

Manually change time (Friday, 07-21-2006 11:38:49) HH:MM:SS [A|P]:

Example: 01:00:00 P will specify 1:00 P.M. If the A or P is omitted, the display will be in military format and the entry assumed to be A.M. (1:00 p.m. in military format is 13:00:00).

Change Current Date

To change the date, press <5> from Configure Date & Time Menu.

Manually change date (Friday, 07-21-2006 11:39:19) MM-DD-YYYY:
Set Time Zone

To select a time zone, press <7> from Configure Date & Time Menu. The following screen will appear:

0-(GMT-12:00) Eniwetok, Kwajalein
1-(GMT-11:00) Midway Island, Samoa
2-(GMT-10:00) Hawaii
3-(GMT-09:00) Alaska
4-(GMT-08:00) Pacific Time (US & Canada); Tijuana
5-(GMT-07:00) Mountain Time (US & Canada)
6-(GMT-07:00) Arizona
7-(GMT-06:00) Central Time (US & Canada)
8-(GMT-06:00) Saskatchewan
9-(GMT-06:00) Mexico City
10-(GMT-06:00) Central America
11-(GMT-05:00) Eastern Time (US & Canada)
12-(GMT-05:00) Indiana (East)
13-(GMT-05:00) Bogota, Lima, Quito
14-(GMT-04:00) Atlantic Time (Canada)
15-(GMT-04:00) Caracas, La Paz
16-(GMT-04:00) Santiago
17-(GMT-03:30) Newfoundland
18-(GMT-03:00) Brasilia
19-(GMT-03:00) Buenos Aires, Georgetown
N-next
X-Xit
Current Time Zone [11(GMT-05:00) Eastern Time (US & Canada)]
Select zone [nn]:

The user can press <N> for next screen, <P> for previous screen, or <X> for exit, followed by <ENTER> to navigate between the screens or go back to the Configure Date & Time Menu. Typing the number next to the corresponding time zone followed by pressing <ENTER> will set the current time zone to the one chosen.

Display System Time

To display the current system date and time, press <8> from Configure Date & Time Menu.

Current time is: Friday, 07-21-2006 15:57:16 (notice this is displayed in military format)

Monitoring Submenu

Monitoring Submenu allows the user to view the current status of all Sensors, Digital Inputs, Output Relays or IP Devices, as well as to change the status of Control Outputs. To enter this submenu, press <8> from Main Menu. The following Submenu will be displayed:

MONITORING

1. Power Supply
2. Internal Sensors
3. External Sensors
4. Digital Inputs
5. Output Relays
6. Command Output Relays
7. IP Devices
0. Return to Main Menu
**Power Supply**

To view the power supply status, press <1> at the Monitoring Menu. A status screen will appear. Pressing any key will return the user to the Monitoring Menu.

<table>
<thead>
<tr>
<th>Power Supply Status</th>
<th>VALUE</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Power Supply</td>
<td>OK</td>
<td>Normal</td>
</tr>
</tbody>
</table>

Press any key to continue

**Internal Sensors**

To view the internal sensors, press <2> at the Monitoring Menu. A status screen will appear. Pressing any key will return the user to the Monitoring Menu.

<table>
<thead>
<tr>
<th>Sensors Status:</th>
<th>DESCRIPTION</th>
<th>VALUE</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>Internal Temperature</td>
<td>40.5</td>
<td>Alert</td>
</tr>
<tr>
<td>Humidity</td>
<td>Internal Humidity</td>
<td>40.5</td>
<td>Normal</td>
</tr>
<tr>
<td>Power</td>
<td>Internal Power</td>
<td>40.5</td>
<td>Normal</td>
</tr>
</tbody>
</table>

Press any key to continue

**External Sensors**

To view the external sensor status screen, press <3> at the Monitoring Menu. The display shows the type, description, value, and status of each sensor. Pressing any key will return the user to the Monitoring Menu. (View below is what will be seen with no sensors connected.)

<table>
<thead>
<tr>
<th>Sensors Status:</th>
<th>DESCRIPTION</th>
<th>VALUE</th>
<th>STATUS</th>
</tr>
</thead>
</table>

Press any key to continue

**Digital Inputs**

To view any digital input status screen, press <4> at the Monitoring Menu. The status screen contains a description, value, and status for each input. Pressing any key will return the user to the Monitoring Menu. (View below is what will be seen with no sensors connected.)

<table>
<thead>
<tr>
<th>Digital Inputs Status</th>
<th>VALUE</th>
<th>STATUS</th>
</tr>
</thead>
</table>

Press any key to continue
Output Relays

To view the output relay status screen, press <5> at the Monitoring Menu. The display shows the description of each relay, as well as its value. Pressing any key will return the user to the Monitoring Menu.

<table>
<thead>
<tr>
<th>#</th>
<th>DESCRIPTION</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Output Relay #1</td>
<td>Closed</td>
</tr>
<tr>
<td>2</td>
<td>Output Relay #2</td>
<td>Closed</td>
</tr>
<tr>
<td>3</td>
<td>Output Relay #3</td>
<td>Closed</td>
</tr>
<tr>
<td>4</td>
<td>Output Relay #4</td>
<td>Closed</td>
</tr>
</tbody>
</table>

Press any key to continue

Command Output Relays

To change the output relay status, press <6> at the Monitoring Menu. The display shows the description of each relay, as well as its value. Typing <X> for exit, followed by <ENTER> will return the user to the Monitoring Menu.

<table>
<thead>
<tr>
<th>#</th>
<th>DESCRIPTION</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Output Relay #1</td>
<td>Closed</td>
</tr>
<tr>
<td>2</td>
<td>Output Relay #2</td>
<td>Closed</td>
</tr>
<tr>
<td>3</td>
<td>Output Relay #3</td>
<td>Closed</td>
</tr>
<tr>
<td>4</td>
<td>Output Relay #4</td>
<td>Closed</td>
</tr>
</tbody>
</table>

Press number of Output Relay to change, or 'X' to exit
Enter Option >

Typing the number of a relay and pressing <ENTER> will allow the user to change the value of the relay from Closed to Open, as shown below.

<table>
<thead>
<tr>
<th>0-Open</th>
<th>1-Closed</th>
</tr>
</thead>
</table>

Enter new value >

IP Devices

To view the IP device status screen, press <7> at the Monitoring Menu. The screen shows the description, value, and status of each device. Pressing any key will return the user to the Monitoring Menu.

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>VALUE</th>
<th>STATUS</th>
</tr>
</thead>
</table>

Press any key to continue
**NTI SERVER ENVIRONMENT MONITORING SYSTEM**

**Retrieve Settings to Defaults**
To restore all settings in the ENVIROMUX to default settings, press `<9>` from the Main Menu. All user programmed settings will be lost and restored back to factory default settings.

**Reboot**
To reboot the ENVIROMUX, press `<A>` from the Main Menu. A prompt will appear asking if you are sure you want to continue. Press `<Y>`. The ENVIROMUX will reboot and the user will need to login again to restore the connection after approximately 60 seconds.

**Logout and Exit**
It is important that the user logout of the RS232 or Telnet menu when finished. There is no automatic logout in this program, so unless the user logs out, anyone can use this connection as long as it is left open.

To logout and exit the ENVIROMUX, press `<B>` from the Main Menu. A message will immediately appear:

```
Connection closed...
Press <Enter> to reconnect.
```

**Upgrade Firmware**
*Note: To upgrade the Firmware, a LAN connection is required, either directly using a crossover cable (specs on page 67), or through the Ethernet (page 10).*

1. To upgrade the Firmware, press `<C>` from Main Menu (see page 52). A prompt will appear asking if you are sure you want to continue. Press `<Y>`.

*Note: Take note of the Firmware version currently in place (shown in Figure 59 as V1.1) for reference after this procedure.*

2. The window should now display the following text, indicating that the board is ready to receive new Firmware.

```
Please, wait...
RAM based FTP Server ready.
```

3. From a computer connected through the LAN (this could be the same computer, connected at the “Console” port and to the LAN), open a DOS command window and type the following:

```
C:\>FTP [ENVIROMUX IP address]  (ex: default IP is 192.168.1.21)
```
4. The following prompt will appear;

   220 NET+OS 6.3 FTP server ready.
   User (192.168.3.83:(none)):

   Press <Enter>

5. At the “ftp>” prompt, type “bin” and press <Enter>

   ftp>bin

   The following will display:

   200 Type set to I.
   ftp>

6. Enter the following command:

   C:\>put C:\<file_path>\<firmwarefilename>.bin

   where file_path is the location of the firmware file. The press <Enter>.

7. When the transfer has started, the following message will appear:

   200 PORT command Ok.
   150 About to open data connection.

8. When the transfer is complete (should take approximately 30 seconds depending on the connection speed), the following message will appear:

   226 Transfer complete
   ftp: 914628 bytes sent in 28.16Seconds 32.48Kbytes/sec.
   ftp>

9. When the transfer is completed, type “quit” and press the <Enter> key to exit the ftp program.

   C:\>quit

10. The HyperTerminal window in the connected terminal will now display the following text:

    FTP: Flash download complete.
    Resetting system in 3 seconds.

    ENVIROMUX will restart with the new Firmware. Press <Enter> to reconnect to ENVIROMUX.

    The following text (or something similar) will appear:

    Network Technologies Inc.
    ENVIROMUX-SEMS-16 V1.2

    If the upgraded firmware is different than the firmware that was originally in place, the version number will change to confirm it. (Shown above as “V1.2”.)

    ENVIROMUX is now ready to use.
**FRONT PANEL LED INDICATORS**

![Diagram of LED indicators](image)

**Figure 60- Front panel LED indicators**

<table>
<thead>
<tr>
<th>LED Label</th>
<th>Status</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pwr</td>
<td>OFF</td>
<td>No Power</td>
</tr>
<tr>
<td></td>
<td>Solid ON</td>
<td>AC Power is ON</td>
</tr>
<tr>
<td></td>
<td>Blinking slowly (once /second)</td>
<td>AC Power has failed, Battery backup (pg. 64) is ON&lt;br&gt;(The LED will not blink if the unit is powered OFF by the switch.)</td>
</tr>
<tr>
<td></td>
<td>Blinking rapidly</td>
<td>Discovery Tool (pg. 17) is in use and communicating with the ENVIROMUX</td>
</tr>
<tr>
<td>Low Batt</td>
<td>OFF</td>
<td>Battery is OK, AC power is ON</td>
</tr>
<tr>
<td></td>
<td>Solid ON</td>
<td>Battery is below 12V and charging (no action required)</td>
</tr>
<tr>
<td></td>
<td>Blinking</td>
<td>Battery has been disconnected (battery is below 10.7V), requires attention, contact NTI</td>
</tr>
<tr>
<td>Check Log</td>
<td>OFF</td>
<td>No new messages in Data Log since last viewing</td>
</tr>
<tr>
<td></td>
<td>ON</td>
<td>New message in Data Log-not an alert</td>
</tr>
<tr>
<td>Int Alert</td>
<td>OFF</td>
<td>No new alert message in Event Log re: internal sensors</td>
</tr>
<tr>
<td></td>
<td>ON</td>
<td>New alert message in Event Log re: internal sensors</td>
</tr>
<tr>
<td>Ext Alert</td>
<td>OFF</td>
<td>No new alert message in Event Log re: external sensors</td>
</tr>
<tr>
<td></td>
<td>ON</td>
<td>New alert message in Event Log re: external sensors</td>
</tr>
</tbody>
</table>

**System Reset Button**

A reset button is located on the front of the ENVIROMUX-SEMS-16 (see Figure 60). The button can be used to reboot/restart the firmware of the ENVIROMUX. Pressing this button supersedes the use of the power on/off switch and battery backup to allow the firmware to easily reboot in the event of a system lockup. To activate a reset, momentarily press the button with a pen or other small pointed object. The ENVIROMUX will reboot and be ready for login within its usual start-up time period.
BATTERY BACKUP

ENVIROMUX has a rechargeable sealed lead-acid battery backup that will prevent the monitoring system from shutting down in the event of a power failure. Should a service power failure occur, the ENVIROMUX will continue to operate as normal for 1 hour under full load and approximately 30 minutes after the "Low Bat" LED on the front panel (page 53) illuminates.

When the battery is not being used, it is being charged as long as line power is provided. It will take 32 hours for the battery to fully charge from a fully discharged state. While charging the "Low Batt" LED will be solid ON.

If the power is ON and the battery is fully charged, the "Low Batt" LED will be dark.

If the battery fails to charge or if the battery's output voltage drops from 12VDC to below 10.7 volts, the "Low Batt" LED will blink. The battery will automatically be disconnected from the system. If this happens, the battery must be replaced. Contact NTI to arrange for return and service.

Note: If the power switch is turned OFF while still plugged into line power, the ENVIROMUX will sense this and not engage the backup battery.

CAUTION

RISK OF ELECTRIC SHOCK. Do not remove cover. No user serviceable components inside. All repairs and maintenance must be performed by authorized service personnel only.

USB PORT

The ENVIROMUX-SEMS-16U is equipped with a USB Type A female port for connection of a USB flash drive. The port is enabled by default when a USB flash drive is connected. While the flash drive is present, the Event and Data Logs will be written to a text file on the flash drive in addition to the memory in the ENVIROMUX. If you want to stop recording logs to the flash drive, a button is provided on the Log Settings page (page 48) to stop recording, and also to start again when desired.

Note: When using the USB port with a flash drive, be sure to press the Stop buttons in the Log Settings page (page 48) before removing the flash drive from the port. Failure to do so may result in a loss in data stored on the drive.


ENVIROMUX-SEMS-16 SPECIFICATIONS

Front Panel Interface
LEDs ..............................................................Green – Power, Solid for Main power, flashing for Backup power
.............................................................Red – Low Bat (solid for charging battery, blinking for fault)
.............................................................Yellow – Check Log
.............................................................Red – Internal Sensor Alert
.............................................................Red – External Sensor Alert
USB..............................................................USB Type A Female, USB 1.1 compatible (ENVIROMUX-SEMS-16U only)

RJ45 Sensor Inputs
Connector ......................................................RJ45 connector
Voltage Supply ...............................................5VDC and 12VDC
Max. Current Supply ......................................50mA
Signal Type ....................................................RS485 for RS485 sensors; 2-wire for contact sensors
Max. Cable Length .........................................1000 FT
ESD Protection ..............................................IEC 61000-4-2
Fuse Protection ..............................................Resetable poly fuse – 500mA hold, 1A trip; 15VDC max. One fuse shared by 8 ports.

Digital Inputs
Connector ......................................................Detachable terminal block-plug-in, 8 x 2 contacts
Wire Range ....................................................16-26 AWG
Max. Input Voltage .........................................25VDC
Max. Contact Resistance .................................1K Ohm
Auxiliary Voltage Supply .................................12VDC +/-10%
Max. Current Supply ................................……50 mA (terminals 1-7) 650mA (terminal 8 only)
ESD Protection ..............................................IEC 61000-4-2
Fuse Protection ..............................................Resetable poly fuse – 200mA hold, 400mA trip; 16VDC max. One fuse shared by 2 ports

Output Relays
Connector ......................................................Detachable terminal block-plug-in, 4 x 2 contacts
Wire Range ....................................................16-26 AWG
Output Type ....................................................Dry contact, relay isolated
Output Rating .................................................1A / 30 VDC, 0.5A / 100VAC
Normal Contact State .....................................N.O.
Contact Resistance ........................................20m
ESD Protection ..............................................No, Relay Isolated.
Fuse Protection ..............................................No, Relay Isolated.

Warning: The digital output contacts are not to be connected directly to AC mains wiring.

Beacon Port & Siren Port
Connector ......................................................Detachable terminal block-plug-in, 1x2 contacts
Wire Range ....................................................14-22 AWG
Voltage Output ................................................12VDC +/-10%
Current Output ..............................................180mA
ESD Protection ..............................................IEC 61000-4-2,
Fuse Protection ..............................................Resetable poly fuse – 200mA hold, 400mA trip; 16VDC max.

Expansion Ports
Connector ......................................................RJ45
Signal Type .....................................................I2C
Max Number of Daisy Chained Units .............4
ESD Protection ..............................................IEC 61000-4-2
Control Serial Port
Connector ......................................................DB9 Female
Supported Signals .........................................TXD, RXD, RTS, CTS, DTR, DSR
Baud Rate ......................................................max 115,200 bps
Data Format ......................................................8 bits
Parity ..............................................................odd, even or no parity
Stop Bits ........................................................1, 2 stop bits
ESD Protection ................................................IEC1000-4-2

Auxiliary Serial Port
Connector ......................................................DB9 Male
Supported Signals .........................................TXD, RXD, RTS, CTS, DTR, DSR, DCD, RI
Baud Rate ......................................................max 115,200 bps
Data Format ......................................................8 bits
Parity ..............................................................no parity
Stop Bits ........................................................1 stop bits
ESD Protection ................................................IEC1000-4-2

Auxiliary Power Port
Connector ......................................................Detachable terminal block-plug-in, 1x2 contacts
Wire Range ....................................................14-22 AWG
Voltage Output ...............................................12VDC+/-10%
Current Output ................................................150mA
ESD Protection ................................................IEC 61000-4-2
Fuse Protection ................................................Resetable poly fuse – 200mA hold, 400mA trip; 30VDC max.

Ethernet Port
Connector ......................................................RJ45-socket
Connection Speed .........................................10/100 Base-T
Security ..........................................................SSL
Supported Protocols ........................................http, https, Telnet

Back-Up Battery
Type ..............................................................Rechargeable Sealed Lead-Acid Battery
Voltage, Current Rating ........................................12VDC, 2.9Ahrs
Battery Operational Time .....................................1 hr, fully loaded; 30 min. after ‘Low Bat’ LED illuminates
Battery Charging Time .......................................32 hrs (from fully discharged to fully charged).
Replaceable ......................................................Yes – can be replaced by authorized personnel only (NTI)

General Specifications
Power Input ....................................................110/220VAC, 50 – 60 Hz, 45W
Operating Temperature .....................................32°F -104°F (0-40°C)
Operating Humidity ..........................................17-90%RH, non-condensing
MTBF .............................................................56,708 hours
Enclosure Size ..................................................1 RU metal enclosure (19” x 9.5” x 1.75”)

TCP/IP
Supported Browsers ...........................................IE, Netscape, Mozilla, Opera
Network Configuration ....................................Allows Static or Dynamic IP Configuration
Max Number of Email Addresses .....................17; 1 per User Account + 1 for Administrator
WIRING METHODS

PC-to ENVIROMUX Crossover Cable

In order to make a direct connection between a PC and the ETHERNET connector of the ENVIROMUX-SEMS, a crossover cable must be used. The cable is made with CAT5 cable terminated with RJ45 connectors and wired according to the chart below.

<table>
<thead>
<tr>
<th>Pin assignment at Standard End</th>
<th>Wire Color</th>
<th>Pin assignment at Crossed End</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>White/Orange</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Orange</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>White/Green</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Blue</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>White/Blue</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>Green</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>White/Brown</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>Brown</td>
<td>8</td>
</tr>
</tbody>
</table>

RS485 Sensor Cable

The CAT5 connection cable between the ENVIROMUX and the external RS485 Sensors (page 7) is terminated with RJ45 connectors and must be wired according to the EIA/TIA 568 B industry standard. Wiring is as per the table and drawing below.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Wire Color</th>
<th>Pair</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>White/Orange</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Orange</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>White/Green</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Blue</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>White/Blue</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Green</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>White/Brown</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>Brown</td>
<td>4</td>
</tr>
</tbody>
</table>
Contact Sensor Wiring

When applying CAT5 cables to contact sensors for plug-in to the RJ45 Sensor sockets, the following socket-to-sensor wiring must be followed:

**RJ45 Sensor Socket Pinout**

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Pin Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GND</td>
</tr>
<tr>
<td>2</td>
<td>SENSE</td>
</tr>
<tr>
<td>3</td>
<td>RS485 +</td>
</tr>
<tr>
<td>4</td>
<td>+5 VDC</td>
</tr>
<tr>
<td>5</td>
<td>TAMPER SWITCH</td>
</tr>
<tr>
<td>6</td>
<td>RS485 -</td>
</tr>
<tr>
<td>7</td>
<td>+12 VDC</td>
</tr>
<tr>
<td>8</td>
<td>GND</td>
</tr>
</tbody>
</table>

**Schematic for wiring Contact Sensor to RJ45 Socket**

- For 5VDC contact sensors, substitute pin 4(5VDC) for pin 7 (12VDC).

**View looking into RJ45 Socket**

**Schematic for wiring Contact Sensor to DIGITAL IN Terminals**

- Point in drawing where wires cross but **DO NOT** intersect
**Other wiring examples**

In this example, when the correct key-code is entered at the keypad, OUTPUT1 of the keypad will apply 12V to the Electric Strike to activate it.

If the keypad tamper switch is tripped, the ENVIROMUX software (when properly configured to control output relay 1) will break the ground circuit thus disabling both the keypad and the Electric Strike.

**Schematic for wiring Keypad to Digital In Terminals**

DIGITAL IN terminals 1-7 are rated at 50mA max. current

DIGITAL IN terminal 8 is rated at 650mA max. current.

---

Point in drawing where wires cross but **DO NOT** intersect

DIGITAL IN 1 is set to open OUTPUT RELAY 1 when it receives a signal (circuit open when tampered with) OUTPUT RELAY 1 is set to a N.C. state.

Electric Strike (ENVIROMUX-EDR-SCR or ENVIROMUX-EDR-SF) must be connected to DIGITAL IN 8.
In this example, the keypad is powered by ENVIROMUX and the tamper switch will break the circuit to the electric strike if opened.

Through the ENVIROMUX firmware, the closure of OUTPUT 1 on the keypad will cause an alert message and can close the OUTPUT RELAY 1 normally open switch, powering the electric strike.

On the sensor configuration page, the tamper can be configured to block the closure of OUTPUT RELAY 1.

Note: Up to two keypads may be connected to the RJ45 sensor ports provided only 1 is connected per row of ports. (i.e. one keypad may be connected to any port 1-8, and one may be connected to any port 9-16).

DIGITAL IN terminals 1-7 are rated at 50mA max. current

DIGITAL IN terminal 8 is rated at 650mA max. current.

Connect to any terminal on the Digital IN block

= Point in drawing where wires cross but DO NOT intersect

For 5VDC keypad, substitute pin 4(5VDC) for pin 7(12VDC).

On the sensor configuration page, the tamper can be configured to block the closure of OUTPUT RELAY 1.

OUTPUT 1 TAMPER
COM N.O. (N.C.)

Keypad

12VDC

OUTPUT RELAYS

DIGITAL IN terminals 1-7 are rated at 50mA max. current

DIGITAL IN terminal 8 is rated at 650mA max. current.

Connect to any terminal on the Digital IN block

= Point in drawing where wires cross but DO NOT intersect

For 5VDC keypad, substitute pin 4(5VDC) for pin 7(12VDC).

On the sensor configuration page, the tamper can be configured to block the closure of OUTPUT RELAY 1.

OUTPUT 1 TAMPER
COM N.O. (N.C.)

Keypad

12VDC

OUTPUT RELAYS

DIGITAL IN terminals 1-7 are rated at 50mA max. current

DIGITAL IN terminal 8 is rated at 650mA max. current.

Connect to any terminal on the Digital IN block

= Point in drawing where wires cross but DO NOT intersect

For 5VDC keypad, substitute pin 4(5VDC) for pin 7(12VDC).

On the sensor configuration page, the tamper can be configured to block the closure of OUTPUT RELAY 1.
Example for wiring Smoke Detector to RJ45 Socket

VIEW OF TERMINAL BLOCK
ON REAR OF ENVIROMUX-SDS

- Pins 3, 4, 5 and 6 are not used here.
- View looking into RJ45 Socket

Example for wiring Smoke Detector to Digital In Terminals

DIGITAL IN

Remove screws to remove terminal block for easy wire connection

VIEW OF TERMINAL BLOCK
ON REAR OF ENVIROMUX-SDS

- Do not connect the ENVIROMUX to the 24VDC TERMINAL.
Example for wiring CE Smoke Detector to Digital In Terminals

(ON REAR OF ENVIROMUX-SEMS-16)
DIGITAL IN

VIEW OF WIRE TERMINALS ON BASE
OF ENVIROMUX-SDS-CE

CONNECT THE SMOKE SENSOR CONTACT TERMINALS TO ANY SET
OF DIGITAL IN TERMINALS
ON THE ENVIROMUX-SEMS-16 (1-8)

VIEW OF TERMINALS ON REAR
OF ENVIROMUX-SEMS-16

VIEW OF WIRE TERMINALS ON BASE
OF ENVIROMUX-SDS-CE

DIGITAL IN

5 6 7 8
+12V +12V +12V +12V

18-22AWG WIRES
(NOT SUPPLIED)

12VDC

POWER TERMINALS

GRD
Example for wiring ENVIROMUX-PWR-RLY-15A to ENVIROMUX-SEMS-16

In this wiring example, closing Output Relay 1 on the ENVIROMUX-SEMS-16 will power OFF the output the AC power relay.

Configure ENVIROMUX-SEMS-16 such that:

When the digital input is open, this will indicate the ENVIROMUX-PWR-RLY-xA output is ON.

When the digital input is closed, this will indicate the ENVIROMUX-PWR-RLY-xA output is OFF.
Example of schematic for wiring ENVIROMUX-AVDS to ENVIROMUX-SEMS-16

DIGITAL IN terminals 1-7 are rated at 50mA max. current. DIGITAL IN terminal 8 is rated at 650mA max. current.

A 120V AC adapter is included with the ENVIROMUX-AVDS. Alternatively, the ENVIROMUX-AVDS can instead be powered through the ENVIROMUX-SEMS-16. To do so, the ENVIROMUX-AVDS must be connected to either DIGITAL IN 8 or to the AUX PWR terminals "12V" and "\( \frac{1}{2} \)"
Example of schematic for wiring ENVIROMUX-AVDS-LC to ENVIROMUX-SEMS-16

DIGITAL IN terminals 1-7 are rated at 50mA max. current.

DIGITAL IN terminal 8 is rated at 650mA max. current.

The ENVIROMUX-AVDS-LC is powered through the ENVIROMUX-SEMS-16. Connect the 4 wire cable to either DIGITAL IN 8 or to the AUX PWR terminals "12V" and "V".

(AUX PWR) +12V －
Each and every piece of every product produced by Network Technologies Inc is 100% tested to exacting specifications. We make every effort to insure trouble-free installation and operation of our products. If problems are experienced while installing this product, please look over the troubleshooting chart below to see if perhaps we can answer any questions that arise. If the answer is not found in the chart, a solution may be found in the knowledgebase on our website at [http://information.networktechninc.com/jive/kbindex.jspa](http://information.networktechninc.com/jive/kbindex.jspa) or please call us directly at (800) 742-8324 (800-RGB-TECH) or (330) 562-7070 and we will be happy to assist in any way we can.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Pwr&quot; LED is blinking</td>
<td>• Blinking 1/sec = Power is OFF, battery backup is powering the ENVIROMUX  &lt;br&gt; • Blinking rapidly = discovery tool in use</td>
<td>• Restore AC power to the ENVIROMUX                                       &lt;br&gt; • Nothing wrong- close Discovery Tool to stop</td>
</tr>
<tr>
<td>Cannot access ENVIROMUX through my browser</td>
<td>• Browser not supported  &lt;br&gt; • Trying to connect to wrong IP address  &lt;br&gt; • User not authorized</td>
<td>• See supported browsers on page 3  &lt;br&gt; • Type correct IP address into browser URL field. If IP address is unknown, use Discovery Tool (page 17) to identify it.  &lt;br&gt; • See administrator for user name and password</td>
</tr>
<tr>
<td>Cannot access ENVIROMUX user interface with direct Ethernet connection</td>
<td>• Telnet not enabled  &lt;br&gt; • Cable not wired correctly</td>
<td>• Must enable Telnet through serial menu (page 55)  &lt;br&gt; • For direct connection via Ethernet port, use a crossover cable (see page 67)</td>
</tr>
<tr>
<td>ENVIROMUX will not recognize sensor</td>
<td>Previously used sensor port was never cleared from memory upon removal</td>
<td>Click on &quot;???” in summary page, click on “Configure ” button, click on “Remove” at bottom of Configure page to remove and clear the port. (see page 23)</td>
</tr>
<tr>
<td>Device Discovery tool will not work</td>
<td>Java not installed</td>
<td>Download and install Java (see page 17)</td>
</tr>
<tr>
<td>Not receiving e-mail alert messages</td>
<td>• Ethernet cable disconnected  &lt;br&gt; • Wrong or no IP address provided for SMTP server  &lt;br&gt; • User does not have user profile correctly configured</td>
<td>• Check Ethernet cable connections  &lt;br&gt; • Check all Network Settings (page 34)  &lt;br&gt; • Check user profile. Make sure groups have been selected and the contact settings are correct (see page 38)</td>
</tr>
<tr>
<td>Beacon not illuminating</td>
<td>• Wires are not connected properly  &lt;br&gt; • Beacon in use is improperly rated  &lt;br&gt; • Sensor is not configured to power ON beacon</td>
<td>• Check wire connections  &lt;br&gt; • Make sure Beacon is rated at 12VDC, 180mA or less  &lt;br&gt; • Check sensor configuration- make sure Beacon is selected under &quot;Alert Notifications“</td>
</tr>
<tr>
<td>Siren not making noise</td>
<td>• Wires are not connected properly  &lt;br&gt; • Siren in use is improperly rated  &lt;br&gt; • Sensor is not configured to power ON siren</td>
<td>• Check wire connections  &lt;br&gt; • Make sure Siren is rated at 12VDC, 180mA or less  &lt;br&gt; • Check sensor configuration- make sure Siren is selected under &quot;Alert Notifications“</td>
</tr>
<tr>
<td>The sensor page does not display the current readings</td>
<td>Java scripts cannot be displayed-java not enabled in browser</td>
<td>Enable the Java Scripts and Java in the browser</td>
</tr>
<tr>
<td>Sensors connected to RJ45 Sensor ports stop working</td>
<td>Sensors applied collectively exceed current rating of row (1-8, 9-16). Fuse protecting ports has opened.</td>
<td>Disconnect sensors. After approx. 10 minutes fuse inside ENVIROMUX should reset. Make sure load of all 8 sensors per row does not exceed 500 mA. (i.e. only one keypad per row (row 1 = ports 1-8, row 2= ports 9-16))</td>
</tr>
<tr>
<td>Unit will not boot up- access via Ethernet not possible</td>
<td>Firmware has been corrupted</td>
<td>Use the Operation Recovery Procedure on page 78. If problem happens again, contact NTI for service.</td>
</tr>
<tr>
<td>Problem</td>
<td>Cause</td>
<td>Solution</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-----------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Sensor connected to DIGITAL IN terminal stops working</td>
<td>Sensor is rated for more current than terminal can supply. Fuse protecting port has opened. ENVIROMUX-EDR-SF and ENVIROMUX-EDR-SCR Electric Strike may cause this if connected to DIGITAL IN terminals 1-7</td>
<td>Disconnect failed sensor. After approx. 10 minutes internal fuse should reset. Reconnect sensor to terminals provided sensor current requirements fall within terminal limitations. DIGITAL IN terminals 1-7 max. load = 50mA DIGITAL IN terminal 8 max. load = 650mA</td>
</tr>
<tr>
<td>Event Log has “GSM Error code -3”</td>
<td>GSM Modem failed to communicate with cell tower due to a weak signal</td>
<td>Adjust the modem antenna using the Enterprise Setup screen (page 33) of as a guide for the best signal</td>
</tr>
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**SMTP Error Codes**

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<th>Meaning</th>
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<td>-100</td>
<td>The SMTP server is unavailable: Possible reasons:</td>
<td></td>
</tr>
<tr>
<td>-99</td>
<td>- spelling errors in server name or IP</td>
<td></td>
</tr>
<tr>
<td>-98</td>
<td>- server name is not resolved by a DNS server because DNS server is off or not reachable</td>
<td></td>
</tr>
<tr>
<td>-97</td>
<td>- wrong configuration of the Default gateway.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- connection is blocked by a firewall</td>
<td></td>
</tr>
<tr>
<td>-96</td>
<td>Suggestion: use the SEMS IP Devices feature to ping the SMTP server. If it does not answer, the connection is not up</td>
<td></td>
</tr>
<tr>
<td>-95</td>
<td>EHLO_ERR</td>
<td></td>
</tr>
<tr>
<td>-94</td>
<td>AUTH_NO_SUPPORT_ERR</td>
<td></td>
</tr>
<tr>
<td>-93</td>
<td>AUTH_FAILURE_ERR</td>
<td></td>
</tr>
<tr>
<td>-92</td>
<td>SENDER EMAIL ADDRESS WAS REJECTED</td>
<td></td>
</tr>
<tr>
<td>-91</td>
<td>The destination address is not recognized by the SMTP server (not a valid e-mail address)</td>
<td></td>
</tr>
<tr>
<td>-90</td>
<td>DATA_ERR</td>
<td></td>
</tr>
<tr>
<td>-89</td>
<td>BAD_DATA_ERR</td>
<td></td>
</tr>
<tr>
<td>-89</td>
<td>SMTP_SSL_BAD_DATA_ERR</td>
<td></td>
</tr>
<tr>
<td>-89</td>
<td>One or more email addresses have been entered incorrectly. See page 38 for editing a user profile.</td>
<td></td>
</tr>
<tr>
<td>-13</td>
<td>General Error: Most likely cause is an incorrect sender email address on the Enterprise page. Can also be caused by account restrictions in the mail server.</td>
<td></td>
</tr>
<tr>
<td>-8</td>
<td>Syntax error</td>
<td></td>
</tr>
<tr>
<td>-6</td>
<td>TCP error: This usually comes in conjunction with error -4 and has the same causes.</td>
<td></td>
</tr>
<tr>
<td>-5</td>
<td>NO Mailbox: The destination address is not recognized by the SMTP server (not a valid e-mail address)</td>
<td></td>
</tr>
<tr>
<td>-4</td>
<td>No server: The SMTP server is unavailable: Possible reasons:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- spelling errors in server name or IP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- server name is not resolved by a DNS server because DNS server is off or not reachable: wrong configuration of the Default gateway.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- connection is blocked by a firewall</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Suggestion: use the SEMS IP Devices feature to ping the SMTP server. If it does not answer, the connection is not up</td>
<td></td>
</tr>
<tr>
<td>-1</td>
<td>Missing Address: The destination address field is empty</td>
<td></td>
</tr>
</tbody>
</table>
Operation Recovery Procedure

If your ENVIROMUX-SEMS-16 is unresponsive after performing a firmware upgrade it may have experienced a problem during the firmware upgrade procedure. To get it working again, follow this procedure:

1. Make a serial connection to the Unit (PC running a terminal program (i.e. HyperTerminal) connected to “Console” port on the ENVIROMUX- parameters are 9600bps, 8-N-1-No flow).
2. Press in the reset button (page 63) and press the power switch of the ENVIROMUX to OFF.
3. Release the reset button. Verify that all LEDs turn OFF.
4. Power the ENVIROMUX back ON and monitor the ENVIROMUX via HyperTerminal as it boots up.

One of two things will happen, 1) either the ENVIROMUX will boot normally and you will be able to try the firmware upgrade again via the webpage or 2) “Start Recovery.....CCCC etc..” will be displayed in the terminal program. If “Start Recovery.....CCCC etc..” is displayed in the terminal program, follow these steps:

1. After the First C shows on the display, in the terminal program, click on Transfer Menu --> “Send file”.
2. Change protocol to “Xmodem”
4. Click on “Send”. This will start the firmware upgrade. The firmware upgrade file transfer will take approximately 20 minutes.
5. Once done the ENVIROMUX will reboot with the new firmware.

The ENVIROMUX-SEMS-16 should be back to normal running with the latest firmware. If you have a saved configuration file, to restore your configuration, see page 44.
HOW TO SETUP EMAIL IN AN ENVIROMUX ENTERPRISE ENVIRONMENT MONITORING SYSTEM

Follow these steps to prepare the ENVIROMUX to send Email messages to ENVIROMUX users. This procedure applies to all ENVIROMUX Enterprise Environment Monitoring Systems and Server Environment Monitoring Systems.

1. **Enterprise Configuration**

   - **Enterprise Name**: Server Room E-MINI-LX
   - **Location**: NTI
   - **Contact**: Sales
   - **Phone**: 330-566-5565
   - **E-mail**: NTI@Gmail.com

   **Note**: When authentication is required (check your email server requirements) the Username and Password applied on the Network Configuration page must be for the user’s email address applied in the Enterprise Setup Page. If no authentication is required, the Username and Password fields can be left empty.

2. **Network Configuration**

   - **SMTP Server**: smtp.Gmail.com
   - **Port**: 465
   - **Use SSL**: √
   - **Use Authentication**: √
   - **Username**: NTI
   - **Password**: ***

   **Figure 62- Example of configuration for Gmail server**
2. Fill in Network Page with valid information:

A. SMTP Server - check with your service provider as to what this should be. Sometimes it is just the name of the provider (gmail.com), sometimes characters are added (mail.gmail.com, smtp.gmail.com, smtp-mail.gmail.com, etc)

B. The default port is 25. If authentication is required, a different port number may be required. Check with your service provider.

C. Check “Use SSL” if your SMTP server requires SSL.

D. Check “Use Authentication” if SMTP server requires authentication to send emails.
   a. If required, Enter “Username” and “Password” that has been assigned to ENVIROMUX. Make sure they apply to the email address applied in the Enterprise Setup Page.

Example: username@gmail.com Most servers (not all, check with your service provider) use just the characters in front of the “@” for your Username on the account. These, and only these characters should be entered into the “Username” block.

Note: Passwords are case sensitive. Be sure to apply the password exactly as it is required by the server.

3. Verify User is configured to receive notifications for at least one sensor group as well as having “E-Mail Alerts” selected and a valid “E-Mail address” to send the notifications to. (All sensors are assigned to one of up to 8 groups under Sensor Configuration, and the more groups a user applies a checkmark in, the more sensors they will get notifications about.)

Configure User

<table>
<thead>
<tr>
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<th>Group Settings</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Group 1</td>
</tr>
<tr>
<td></td>
<td>□ Group 2</td>
</tr>
<tr>
<td></td>
<td>□ Group 3</td>
</tr>
<tr>
<td></td>
<td>□ Group 4</td>
</tr>
<tr>
<td></td>
<td>□ Group 5</td>
</tr>
<tr>
<td></td>
<td>□ Group 6</td>
</tr>
<tr>
<td></td>
<td>□ Group 7</td>
</tr>
<tr>
<td></td>
<td>□ Group 8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>□ Contact Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-mail Alerts</td>
</tr>
<tr>
<td>Brief E-mail</td>
</tr>
<tr>
<td>E-mail Address</td>
</tr>
<tr>
<td>Syslog Alerts</td>
</tr>
<tr>
<td>SNMP Traps</td>
</tr>
<tr>
<td>Syslog/SNMP IP Address</td>
</tr>
<tr>
<td>SMS Alerts</td>
</tr>
<tr>
<td>SMS Number</td>
</tr>
</tbody>
</table>

E-mail Address: User@gmail.com

Figure 63- Configure user to receive alerts via email
HOW TO SETUP THE ENVIROMUX ENTERPRISE ENVIRONMENT MONITORING SYSTEM TO SEND SNMP TRAPS

Follow these steps to prepare the ENVIROMUX to send SNMP traps to ENVIROMUX users. This procedure applies to all ENVIROMUX Enterprise Environment Monitoring Systems and Server Environment Monitoring Systems.

Under Network Settings:
1. Enable the proper SNMP Agent type (v1/v2c, v1/v2c/v3, or just v3) depending upon what type of SNMP browser you use.
   - v1/v2c = no security required
   - v1/v2c/v3 = messages with or without security
   - v3 = only secure messages will be sent

2. Place a checkmark in “Enable SNMP Traps”.
3. Enter names for the Read-write community and Read-only community (usually just “private” and “public” as shown).

Under Sensor Configuration:
4. Under the sensor configuration for each sensor, enter a Group number that the sensor should belong to. Users can receive alert messages from some, all, or no sensor groups, as configured under User Settings.
5. Place a checkmark in “Enable SNMP Traps” checkbox under the sensor configuration for each sensor that should send traps when there is an alert. If you want them sent for Critical Alerts and Non-Critical Alerts, there is a checkbox for each level.

Under User Settings:
6. Apply a checkmark to the Group number(s) for the sensor(s) you want to receive SNMP traps about.
7. Be sure to apply a checkmark in the “SNMP Traps” box under Configure User ->Contact Settings for each user that should receive SNMP traps.
8. Enter a valid IP address where traps are to be sent for each user.
9. If the “Enable SNMP Agent” setting under “Network Settings” was SNMPv1/v2c/v3, then the Authentication Protocol (MD5 or SHA), Authentication Passphrase, Privacy Protocol (DES or AES), and Privacy Passphrase will only need to be filled in for users that will receive secure messages.

If only v3 was selected, then these settings must be filled in for each user.

The protocol types will be dependent upon the type of SNMP Agent you are using (refer to your SNMP Agent specifications).
- Authentication Protocol = MD5 or SHA
- Privacy Protocol = DES or AES

If only SNMPv1/v2c will be used, the default settings of “None” will apply.

The Passphrases will be those that have been setup in your agent for the user being configured.

Note: The username in the ENVIROMUX user configuration must match the username in the SNMP browser configuration.

10. Select which Traps type the user should receive. If SNMPv1 or SNMPv2c are selected, the Authentication and Privacy settings above do not need to be configured as they are only required to receive SNMPv3 messages.

11. Use the MIB file supplied on your manual CD with your SNMP browser to setup and manage SNMP traps.
Locating OIDs (Object Identifiers) Using a MIB browser with an ENVIROMUX Enterprise Environment Monitoring System

To use SNMP (Simple Network Management Protocol) to monitor the sensors and control the functions of an ENVIROMUX Enterprise Environment Monitoring System (SYSTEM), you first need to install SNMP network management software. The software package will include an MIB (Management Information Base) browser and there are many different MIB browsers so we will be very general about the instruction provided herein. The MIB browser can be used to quickly view sensor data and the status of all characteristics of the SYSTEM. How you make use of that information is up to you.

General Information
Every piece of information available from the SYSTEM through the MIB browser has an OID (Object Identifier). The MIB file provided with the SYSTEM (on the CD and available from http://www.networktechinc.com/download/d-enviro-sems.html) provides a database to organize information received regarding sensors, output relays, IP Devices, etc. Each piece of information derived from this database has a unique OID. To see the OID for any piece of information, select the variable and the OID assigned to it will be displayed.

For this instruction we used the free MIB browser “iReasoning” found at http://ireasoning.com/mibbrowser.shtml.

View OIDs
To view this information, you must do the following:
1. Install the browser to your PC
2. Copy the MIB file associated with your SYSTEM to the hard drive on your PC.(perhaps to a new directory “MIB files” as shown below.)
3. Load the MIB file for the SYSTEM to your browser.

TIP: iReasoning provided a couple of default MIB files that were preloaded. To clean up the resulting data tree, we used “UnLoad MIBs” (above) to remove those.

4. Enter the IP address of the SYSTEM so the browser knows where the SYSTEM is to retrieve data.
5. With the iReasoning browser, the Read-only Community Name (default is “public”) was automatically sensed and applied when the IP address was entered, but if this doesn’t happen in your browser, make sure the “Read Community” field in the agent properties includes the name “public” (or whatever you have changed it to in the ENVIROMUX-16D network configuration).

6. With that information entered, the default SYSTEM will be accessible for SNMP browsing. A connection that uses security will require more configuration. Refer to the SYSTEM manual and your browser manual to apply the required additional settings. Once a connection is made, the browser will present a directory structure with tree organizing all the different variables of information available from the SYSTEM. Click on the various categories and sub categories to go as deep into the hierarchy as necessary. As seen in the image below, each variable of information presented has an OID assigned to it. These OIDs can be used in conjunction with other SNMP control systems to communicate and/or perform functions automatically.
Each RJ45 Sensor port has two OIDs assigned, because the sensors that connect to these ports often have two possible functions (Temperature/Humidity, ACLM-V with two connections, etc.). The image above shows they are numbered sequentially (The “extSensor Type” variable for Port 1 is extSensorType.1 and extSensorType.2, port 2 is extSensorType.3 and extSensorType.4, and so on, for a total of 32 extSensors (RJ45 Sensor) for an ENVIROMUX-16D.)

Each variable for a sensor that is reported has its own OID (i.e. Index number, type, description of the connected sensor, the connector number the sensor is plugged into, group the sensor belongs to, etc.). When using OIDs, be sure to create an association with the right variable.

To get specific results in the Result Table, right click on an item in the MIB Tree and choose the type of search (“operation”) you want.

- **Get Next**- will result in the next OID record of that category, displaying them one at a time.
- **Get Bulk**- will result in all the OIDs of that category being displayed at once, but only that category
- **Get Subtree**- will result in OIDs of that category and any sub-categories in the tree
- **Walk**- will result in a listing of every OID in the system from the point at which you select it until the last category in the tree.

The value of each variable for the sensor can be listed separately.
The ENVIROMUX-STHS-99 is a specialty sensor that provides a third piece of information (dew point) managed through an additional category with virtual ports named “dewPoint Sensors”.

The other values are 50 because there are no other dewpoint sensors connected. The default value for this variable for an unused sensor is 50.

The sensor connected to Port 1 has a dew point value of 41.7 (deg.F)

The category remoteInputs and remoteRelays are reserved for identifying contact sensors connected through ENVIROMUX-D16DO16(R) expansion units. No remoteInputs are connected to this SYSTEM (the default value of the remoteInputValue is closed (0)).
Attention: Residents of New York, USA

This product is subject to New York’s recycle laws regarding lead acid batteries.

⚠️ WARNING

This unit contains a sealed lead acid battery. Battery maintenance must be performed by an authorized trained technician. Always follow local laws and regulations regarding the disposal of this unit.

For instruction on the proper disposal of the battery contained in this unit, either contact the Rechargeable Battery Recycling Corporation (RBRC) at 800-822-8837 or go to their website at [www.call2recycle.org](http://www.call2recycle.org). Disposal will be at no cost to you.

For instruction on the safe removal and disposal of the battery, visit the ENVIROMUX-SEMS-16 website at [http://www.networktechinc.com/enviro-remis.html](http://www.networktechinc.com/enviro-remis.html) or contact us at (800) 742-8324 (800-RGB-TECH) or (330) 562-7070.

In order to return the ENVIROMUX-SEMS-16 to Network Technologies Inc, please contact us at (800) 742-8324 (800-RGB-TECH) or (330) 562-7070 to receive a return goods authorization. All packaging and shipping expenses will be the sole responsibility of the customer.
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WARRANTY INFORMATION

The warranty period on this product (parts and labor) is two (2) years from the date of purchase. Please contact Network Technologies Inc at (800) 742-8324 (800-RGB-TECH) or (330) 562-7070 or visit our website at http://www.networktechinc.com for information regarding repairs and/or returns. A return authorization number is required for all repairs/returns.