



HART XL High-Sensitivity Smoke Detector

LaserNET™ Version 3.3 Software Program User's Guide

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FOREWORD

This manual is intended to clearly and accurately describe the software functions of the LaserNET™ software program Version 3.3. This manual is to be used by trained distributors only for configuring the HART XL system.

TERMS AND ABBREVIATIONS

AC-	Alternating Current
AUX-	Auxiliary
BPM-	Beats Per Minute
CCM -	Central Control Module
CCP-	Central Control Panel
CFG-	Configuration
COM-	Communication Port
CPU-	Central Processing Unit
Ft.-	Feet
GUI-	Graphical User Interface
HSSD®-	High Sensitivity Smoke Detector
IIM-	Intelligent Interface Module
I/O-	Input/Output
ID-	Identification
M-	Metres
MAX-	Maximum
MB-	Megabyte
MIN-	Minute or Minimum
P/N-	Part Number
PC-	Personal Computer
RAM-	Random Access Memory
ROM-	Read Only Memory
SEC-	Second
TB-	Termination Board
UL-	Underwriter Laboratories Incorporated
Vdc-	Volts Direct Current

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CHAPTER 1

INTRODUCTION

1-1 INTRODUCTION

LaserNET Version 3.3 software is a graphical configuration and system-monitoring tool for the HART XL High Sensitivity Smoke Detectors. This manual describes LaserNET, shows how to install it and tells how to use it for configuration of HART XL Detectors and monitoring operations. LaserNET Version 3.3 is not compatible with previous HART products.

1-2 LASERNET SYSTEM REQUIREMENTS

LaserNET is designed to run on computers running Windows® 95/98/2000/ME, 4.0NT or XP. The computer should meet these minimum criteria:

- A Pentium® 75 MHz CPU or faster
- 24 MB of RAM
- 3 MB of free hard disk space
- A VGA monitor (800 x 600 pixel)
- A mouse or compatible pointing device
- One unused COM port (for Direct Detector or Local IIM connections). See Paragraph 1-5 for an explanation of these terms.
- A modem (for Remote-IIM connections). See Paragraph 1-5.
- CD-ROM drive

1-3 GETTING STARTED

Before using LaserNET :

- Get familiar with the HART XL High Sensitivity Smoke Detector by reading the Installation, Operation and Maintenance Manual (TM0042).
- Ensure the personal computer meets the LaserNET system requirements as described in Paragraph 1-2.
- Install the LaserNET software as described in Paragraph 1-6.
- Make the necessary physical and electrical connections between the personal computer and the HART XL system.

1-4 HARDWARE BACKGROUND

Before using LaserNET, the installer or user should gain some familiarity with the HART XL High Sensitivity Smoke Detector. Background information can be found in the HART XL Installation, Operation and Maintenance Manual (TM0042).

LaserNET is designed to configure and monitor the following components which make up the HART XL system:

- **HART XL HSSD® or High Sensitivity Smoke Detector.** The HART XL Detector is an air sampling smoke detector designed for early warning smoke detection applications such as telecommunications facilities, data processing facilities, museums and warehouses. The Detector is available in two sensitivity ranges. Both provide coverage for an area up to 2000 sq. m (20,000 sq. ft.). The standard Detector has a dynamic sensitivity range of 0.0025 to 1%/m (0.00075% to 0.3%/ft.). However, for cleanroom applications, where the environment must be virtually free of air particles, the Ultra™ HART XL Detector has a sensitivity range of 0.0005%-0.1%/m (0.00015% to 0.03%/ft.). For proper operation, the HART XL Detector must be configured with the LaserNET software.
- **IIM, or Intelligent Interface Module.** The Intelligent Interface Module (IIM) is the communication link that networks up to 127 HART XL Detectors. A computer running LaserNET Version 3.3 software can communicate with the IIM either through a local computer or a remote computer via a modem. This allows the HART XL Detectors to be completely configured and monitored from a central location. The IIM is available as a stand-alone enclosure.

1-5 SYSTEM CONFIGURATIONS

HART XL detection systems are configured in one of two forms as explained in the following paragraphs. Additional detail is available in the manuals supplied with the system hardware.

1-5.1 Non-Networked Systems

1-5.1.1 DIRECT CONNECTION

This connection is created by connecting a computer running LaserNET software to the Detector via a programming cable (P/N 53800-H08) from the computer's RS-232 port to the RS-232 jack located on the side of the Detector.



Figure 1-1. Example of a Direct Connection

1-5.2 Networked Systems

LaserNET can communicate with the Intelligent Interface Module (IIM) either through a local computer or a remote computer via a modem. All Detectors networked through the IIM can be completely configured and monitored through the LaserNET-IIM connection. The IIM can monitor any fire alarm control panel for common alarm and fault conditions. These alarm and fault inputs can be displayed in LaserNET.

The computer running LaserNET software is connected directly to the IIM via a programming cable (P/N 53800-H08) from the computer's RS-232 port to the IIM computer port or connected remotely to the IIM via the computer's modem and telephone line.

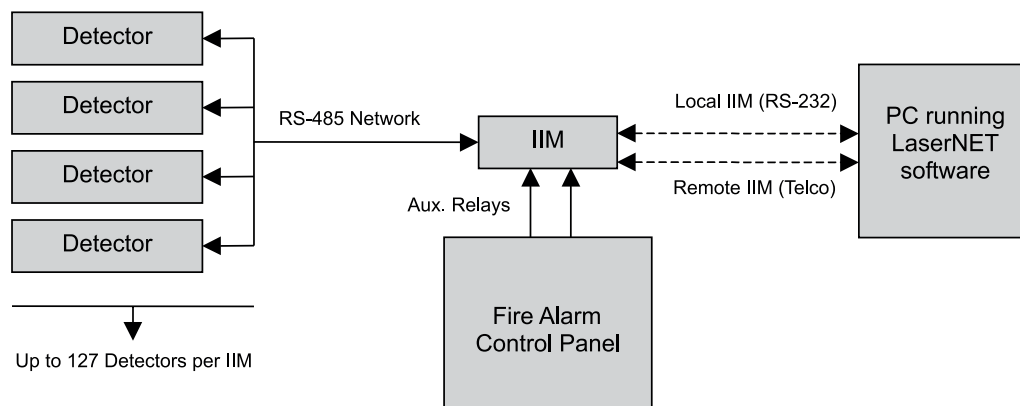


Figure 1-2. IIM System Showing Local IIM and Remote IIM Connections

1-5.3 Computers Without 9-Pin COM Ports

Manufacturers of new notebook computers do not always incorporate a standard 9-pin COM port for serial communication to external devices. Instead, USB ports are becoming the industry standard. This presents a problem when using these computers to communicate with the HART Detector using LaserNET.

There are several sources providing conversion devices that will convert the USB port to a standard 9-pin COM port. These devices work with limited and inconsistent results.

As an alternative to using USB to COM port converters, we recommend adding a standard 9-pin COM port to the computer by incorporating a PCMCIA Serial I/O Adapter. These type of adapters can be added to any notebook computer that has a PCMCIA slot. Virtually all notebook computers incorporate at least one of these slots.

We have tested and recommend using a model of this adapter offered by the Black Box Corporation (Part Number IC115A-R2). This recommended device should provide consistent communication with the HART Detector across a wide range of computers, and the setup process is relatively straightforward. Black Box can be contacted at www.blackbox.com.

Note: Please be advised that this model will only work if the computer has a PCMCIA slot.

1-6 INSTALLING LASERNET ON THE COMPUTER

1. Insert the CD into the CD-ROM drive.
2. Locate the CD-ROM drive and find the file titled "Setup.exe". Double-click on the file to begin the InstallShield® Wizard.

Note: If the computer is setup for AutoRun, InstallShield® will automatically appear.

3. Select a language (English, French or Spanish) from the drop-down menu of the Choose Setup Language Screen (Figure 1-3) and click **<OK>** to continue.
4. After selecting a language, the InstallShield® Wizard Screen will appear (Figure 1-4).



Figure 1-3. Choose Setep Language Screen



Figure 1-4. InstallShield® Wizard Screen

4. After InstallShield® Wizard is finished processing, the Welcome screen will appear (Figure 1-5). Read all of the instructions carefully before proceeding. When finished, click on the **<Next>** button to proceed to the next screen.

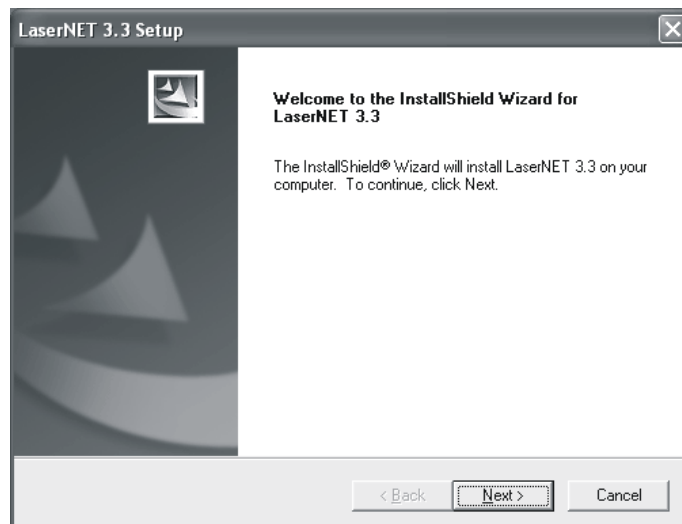


Figure 1-5. Welcome Screen

5. Choose Destination Location screen (Figure 1-6). Setup will automatically default to place the file in the C: drive. To choose another location to place the file, click on the **<Browse>** button. The Choose Folder screen will appear (Figure 1-7) to allow the user to place the program in a specified location. Click on the **<OK>** button after choosing a new folder to return to the Choose Destination Location Screen. After the destination for LaserNET has been chosen, click on the **<Next>** button to proceed to the next screen. Click on the **<Back>** button to go to the previous screen at any time. Click on the **<Cancel>** button at any time to end the InstallShield® Wizard.

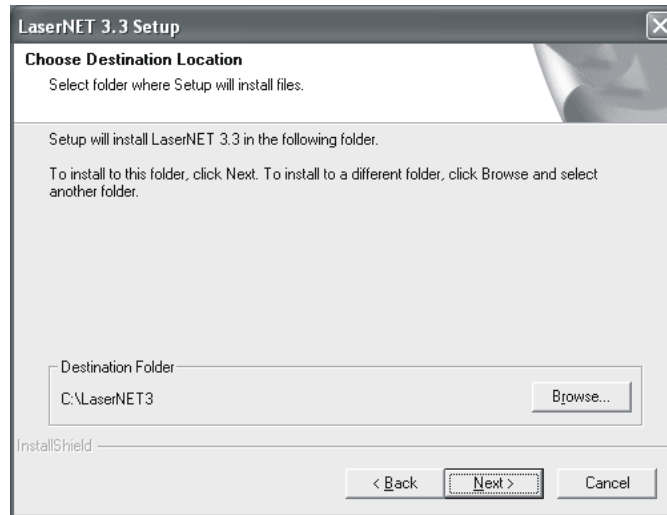


Figure 1-6. Choose Destination Location Screen

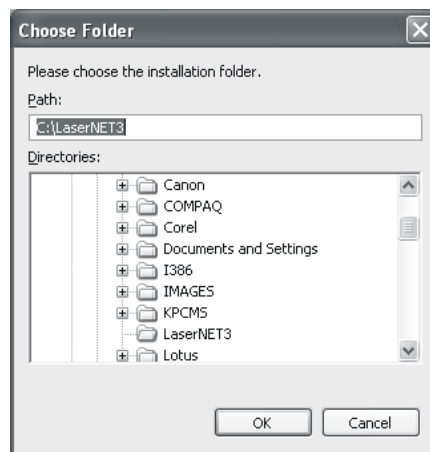


Figure 1-7. Choose Folder Screen

6. Select Program Folder (Figure 1-8). The system will automatically default to create a new folder for LaserNET (Figure 1-8). To choose another folder, scroll down the list and click on the folder in which LaserNET should be placed, or type in a new folder name. Click the **<Next>** button to start the installation process.

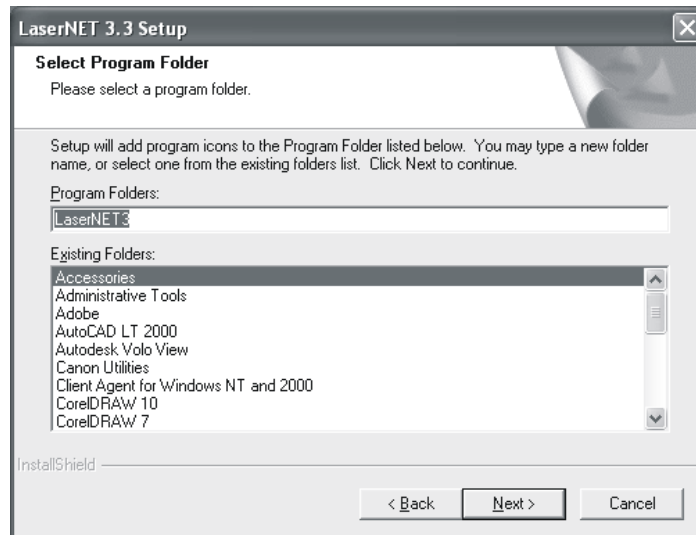


Figure 1-8. Select Program Folder Screen

6. The next prompt gives the option to install a short-cut for LaserNET on the desktop (Figure 1-9). Click on either **<Yes>** or **<No>**.

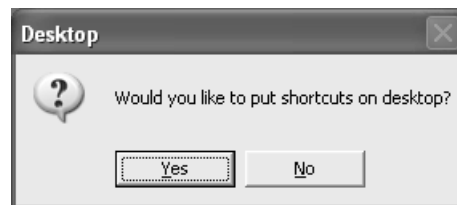


Figure 1-9. Desktop Shortcut Prompt Screen

7. The Setup Complete Screen (Figure 1-10) informs the user that the setup is now complete. It offers the choice to either view the ReadMe file or launch LaserNET. Check the preferable box and then click the **<Finish>** button to end the InstallShield® Wizard.

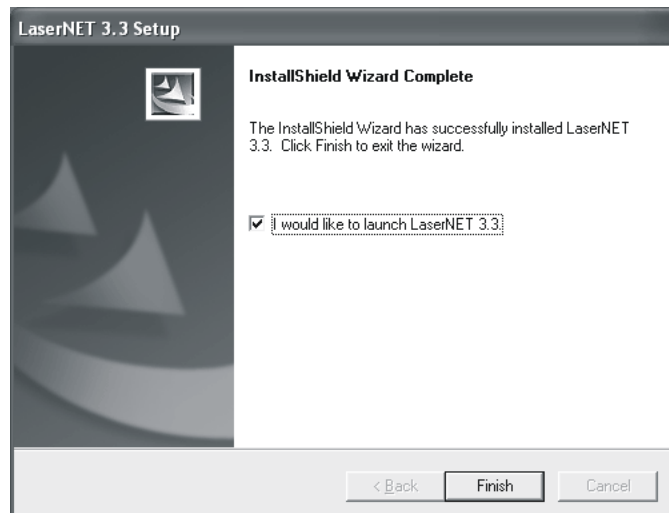


Figure 1-10. Setup Complete Screen

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CHAPTER 2

FEATURES AND FUNCTIONS

2-1 INTRODUCTION

This chapter presents a brief summary of LaserNET's features keyed to the chapters and paragraphs in this manual. It also gives an index to parameters set or monitored using LaserNET windows, dialogue boxes and displays discussed in this manual.

2-2 INITIAL CONFIGURATION—CHAPTER 3

This chapter explains how to set up the electrical connection between the LaserNET host computer and the HART XL Detector. There are three types of physical connections:

- Local IIM
- Remote IIM
- Direct Detector Connection

The connection must be configured using the System Configuration window as noted in Paragraph 3-2.

The procedure for setting up modem communications between a remote IIM and the computer running LaserNET is detailed in Paragraph 3-3.

2-3 CONFIGURATION OF THE IIM—CHAPTER 4

This chapter is specific to IIM-based systems; configuration of the Direct Connection is addressed elsewhere in this manual. LaserNET is used to set and monitor the following parameters, among others:

- Owner location (4-3)
- Miscellaneous parameters (4-4)
 - Wiring configuration (4-4.1)
 - Fault delay (4-3.2)
 - Auxiliary parameters (4-3.3)
- Assigning HART XL addresses (4-5)
- Detector connections map (4-6)
- AutoDial configuration (4-7)
 - Phoneline supervision (4-7.1)
 - Callback (4-7.2)
 - Alarms and Faults that trigger autodial (4-7.3)
- Printing the IIM configuration (4-8)

2-4 MAIN SCREEN AND COMMUNICATIONS—CHAPTER 5

This chapter introduces the user or installer to the LaserNET main screen, from which all communications, configuration and monitoring operations are conducted. The following topics are addressed:

- The main screen and its features (5-1)
- Establishing communications with the HART XL Detector using LaserNET (5-2)
 - Direct Detector connections (5-2.1)
 - Local IIM connections (5-2.2)
 - Remote IIM connections (5-2.3)
- Viewing and Acknowledging Alarms and Faults (5-3)
- Disconnecting (5-4)

2-5 CONFIGURING AND MONITORING HART XL DETECTORS—CHAPTER 6

Once connection has been made between the LaserNET host computer and the Detector, and the proper password entered, a range of display, control and configuration options become available to the installer or user. This chapter discusses these options.

- HART XL Detector Monitoring and Configuration (6-1)
- Status Indicators in the Display Control Window (6-2)

The following indicators are displayed in the Display and Control window:

- Status
- Smoke-Level Bar Graph
- Smoke Level
- Alarm Indicators
- Other Status Indicators (Average, Isolate, Night and Auto-Setup™)
- Show Faults (6-3)
- Buttons on the Display and Control Window (6-4)
 - Airflow Status Button. Selecting <Airflow> displays the following options:
 - Airflow Deviation
 - Low/High Airflow Fault
 - Smoke Status Button. Selecting the <Smoke> button opens the Smoke Status window, from which the following parameters can be addressed:
 - Cumulative Alarm Delays
 - Current Smoke Level
 - Alarm 2, Alarm 1, Pre-Alarm 2 and Pre-Alarm 1 Thresholds
 - Detector Sensitivity Range
 - Day/night Alarm Settings
 - Referencing (IIM only)
 - Isolation Button
 - Reset Button
- Configuring a Detector (6-5)

Paragraph 6-5 covers the Detector configuration process. Configuration of the following parameters is covered:

- Owner Location (6-5.1)
- Smoke Alarms (6-5.2)
 - Day Smoke Thresholds (6-5.2.1)
 - Night Smoke Thresholds (6-5.2.2)
 - Alarm Time-Delay Option (6-5.2.3)
 - Current Smoke Levels (6-5.2.4)
 - Detector Sensitivity Range (6-5.2.5)
 - Cumulative Alarm Delay Option (6-5.2.6)
 - Day/Night Alarms Option (6-5.2.7)
- Faults (6-5.3)
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 - Low Airflow Threshold (6-5.3.2)
 - High Airflow Threshold (6-5.3.3)

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2-6 STORING HISTORICAL DATA—CHAPTER 7

The smoke history window and event logs are powerful administrative tools. This chapter introduces them and gives brief instruction in their use. It describes the smoke history window and details its uses and features. The following subjects are covered:

- Smoke History (7-1)
 - Opening the History Window (7-1.1)
 - Downloading Smoke History from a Detector (7-1.2)
 - Using the Smoke History (7-1.3)
 - Adding Titles and Comments to a Smoke History Printout (7-1.4)
 - Saving and Loading Smoke History to/from Disk (7-1.5)
 - Printing a Smoke History Graph (7-1.6)
 - Clearing the Smoke History Storage Buffer (7-1.7)
 - Setting the Smoke History Sample Rate (7-1.8)
- Detector Event Log (7-2)

HART XL Detectors store an event history as an aid to management and troubleshooting. Areas covered include:

- How to Download an Event History from a Detector (7-2.1)
- Printing the Event History (7-2.2)
- Saving the Event History (7-2.3)
- Clearing the Stored History (7-2.4)
- Max/Min Smoke Levels (7-3)

Each HART XL Detector stores maximum and minimum smoke levels as well as a date and time stamp for each such reading. This chapter describes how LaserNET is used with this feature.

- Viewing Max/Min Levels (7-3.1)
- Clearing Max/Min Levels (7-3.2)
- The LaserNET System Log (7-4)

LaserNET stores all events taking place at connected devices in the System Event Log with a time and date stamp. This paragraph tells how to take advantage of this log.

- Downloading the System Event Log (7-4.1)
- Printing the System Event Log (7-4.2)
- Saving the System Event Log (7-4.3)
- Clearing the System Event Log (7-4.4)

CHAPTER 3

INITIAL CONFIGURATION

3-1 INTRODUCTION

This chapter explains how to configure LaserNET™ to communicate with a Direct Connection, Local IIM or Remote IIM.

3-2 CONFIGURING THE COMPUTER CONNECTION

The first step in configuring LaserNET is to specify the type of connection to the computer.

1. Select **Setup>System Computer>Configure** from the main screen. The System Configuration window opens, as shown in Figure 3-1.

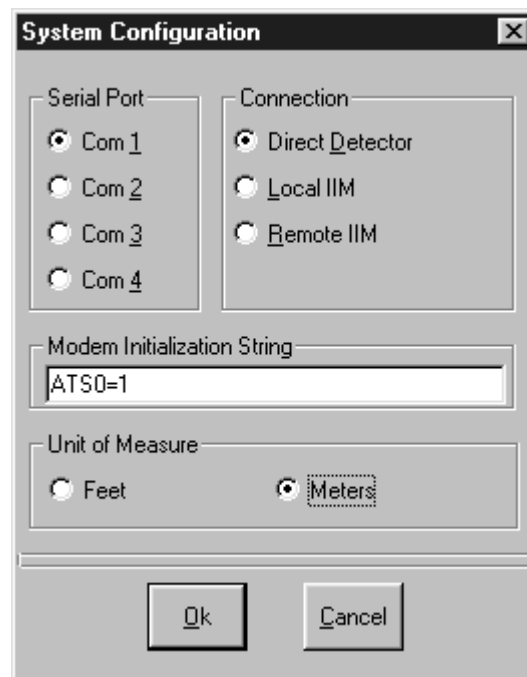


Figure 3-1. System Configuration Window

2. Select an available serial communications port (such as COM1 or COM2) from the serial port box. To help make a selection, see the documentation that was provided with the computer.
3. Select the type of connection in the Connection box. Choose Local IIM if the configuration is like that shown in Figure 1-2 with the personal computer and IIM connected via RS-232 cable. The Remote IIM configuration is also shown in Figure 1-2 with the telephone line between the computer and the IIM. Select Direct Detector if the configuration is the same as is shown in Figure 1-1.
4. If a specific modem initialization string is required, enter it in the Modem Initialization String field. The initialization string is only used when communicating in the Remote IIM connection mode. The documentation provided with the modem will provide the required or default initialization string for individual types of modems.
5. Select Metres or Feet. Unless selected otherwise, the system will automatically default to Metres. If Feet is chosen, a message window will appear requesting the user to quit LaserNET and re-launch the program.
6. Select **<OK>** to save the entries and close the screen. If Remote IIM was selected, the software will look for the modem.

To save the configuration, LaserNET must be closed and restarted.

Configuration for a Local IIM, Remote IIM and Direct Connection is complete. A Remote IIM connection requires further configuration, as described next.

3-3 COMMUNICATING WITH A REMOTE IIM

Before connections can be made to a Remote IIM, the telephone number of the remote IIM must be specified in the machine connected to the IIM. Up to 99 phone numbers can be stored .

To add a new Remote IIM to the directory:

1. Select **Setup>System Computer>Directory**. The following figure displays.

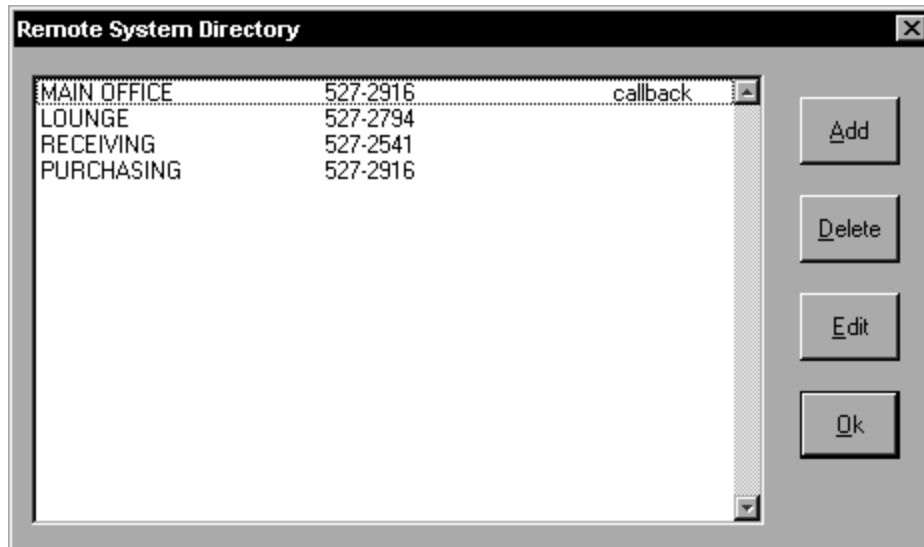


Figure 3-2. Remote System Directory

2. Click on **<ADD>**. The following screen opens.

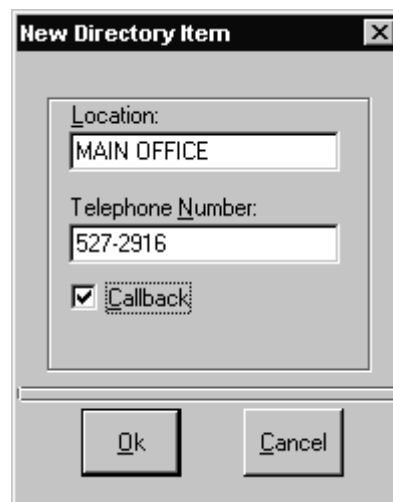


Figure 3-3. New Directory Item Screen

3. Enter a location name.
4. Enter the telephone number for the Remote IIM. Up to 20 characters are allowed including commas for pauses; dashes are ignored.
5. Check Callback to enable the feature. Callback is a security feature which restricts access to only one authorized computer. When a remote computer calls the Remote IIM, the IIM hangs up and automatically calls the programmed callback phone number.
6. Select **<OK>**.

To delete a Remote IIM from the directory:

1. If the Remote System Directory window is not open, select **Setup>System Computer>Directory**.
2. Highlight the entry to delete and click on **<Delete>**. A confirmation window prompts the user to confirm the deletion.

To edit a Remote IIM listing:

1. Highlight the entry and click on **<Edit>** (see refer to Figure 3-2). The Edit Directory Item Window (Figure 3-4) displays where changes can be made. Select **<OK>** to save the changes.



Figure 3-4. Edit Directory Item Window

Note: If connection difficulties are encountered when dialling into a Remote IIM, try editing the phone number. It may be necessary to insert additional commas between segments of the number to avoid timing problems. For example, a comma (indicating a pause of a few seconds) should always be inserted between the number required to get an outside line and the rest of the telephone number. If the Remote IIM is accessible via an extension off a PBX, four or more commas may have to be inserted between the primary phone number and the extension to allow the remote PBX time to connect. Because different PBX systems respond at different speeds, the number of commas needed must be found by experiment.

3-4 LAUNCHING LASERNET

1. Select **Start>Programs>LaserNET 3>LaserNET 3** or double-click on the LaserNET icon on the desktop.

The main screen displays as shown in Figure 3-5.

Note: When menu selections are greyed out, they are not available due to password access level, hardware configuration or communication has not been established with a Detector.

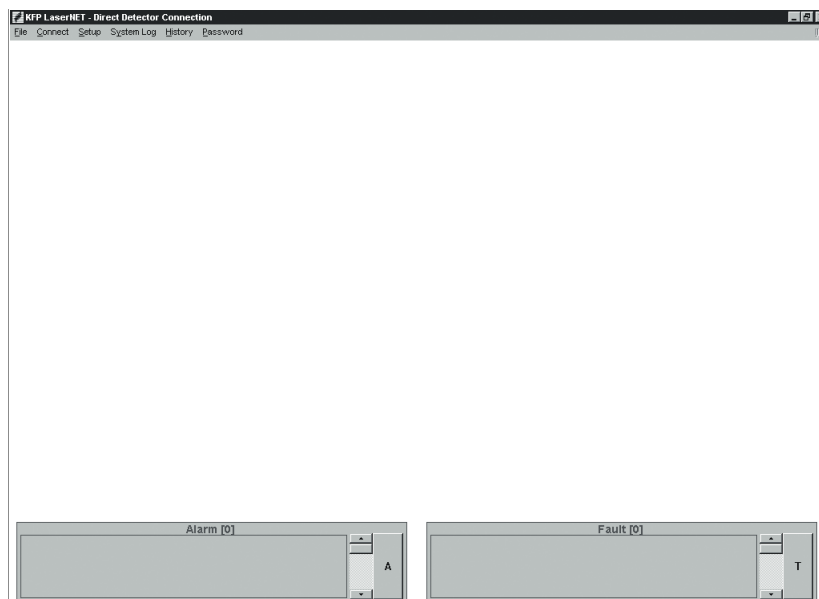


Figure 3-5. LaserNET Main Screen

3-5 ENTERING AND CHANGING PASSWORDS

3-5.1 Access Levels

Three levels of access are available:

<u>Access Level</u>	<u>Password</u>
Monitoring	No password required (not available for Remote IIM connection)
Owner Level	Up to 8 characters, default = own
Installer Level	Up to 8 characters, default = inst

Note: Passwords are not case sensitive.

A limited number of monitoring functions are available without entering a password. The installer-level password gives access to all functions. The owner-level password gives access to the following functions:

- Smoke History Download
- Event History Download
- View Max/Min Levels
- Print Configuration
- Time and Date

3-5.2 Entering the Password

To enter the password:

1. First, connect to the system by selecting **Connect** from the main menu. The system will default to be configured for a Direct Connection. See Chapter 3 if the system needs to be configured for a connection other than Direct Connection. The Display and Control Window (see Figure 5-1) will appear if a connection is made. If a connection is not made, a notification message will appear. Recheck hardware and system configuration and repeat step one.
2. From the main menu select **Password>Enter Password**. The Logon window displays, as shown in Figure 3-6.
3. Enter the password.
4. Select **<OK>**.



Figure 3-6. Logon Window

3-5.3 Changing the Password

Passwords should be changed from the factory default values to prevent unauthorized access.

1. Select **Password>Change Owner Pwd** or **Password>Change Installer Pwd**. The appropriate screen will appear. See Figure 3-7 for an Owner Password screen example.



Figure 3-7. Change Owner Password Screen

2. Enter the new password. Up to eight characters can be used.
3. Select <OK>.

3-5.4 Special Cases

Depending on the system configuration, the password feature works differently because of the way the password is stored.

Generally the storage location is transparent to the user or installer. However, communications must be established between the personal computer and the Detector or IIM before a password can be entered.

1. When using Direct Detector connections, the password cannot be entered or changed unless the computer is communicating with the Detector. The password is stored in the Detector.
2. When using Local IIM connections, the password cannot be entered or changed unless the computer is communicating with the IIM. The password is stored in the IIM. The default passwords apply to the IIM connections as well.
3. When using Remote IIM connections, the password cannot be entered until connection has been made with the remote site. It may take up to one second per device for LaserNET to establish communications with all Detectors connected to the IIM. The password is stored in the IIM. If the correct password is not entered after three attempts, the modem will hang up.

3-6 DETECTOR AND IIM CONFIGURATION

Once the connection is configured in LaserNET, set the operating parameters of these components as outlined in the following chapters.

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CHAPTER 4

CONFIGURING THE IIM

4-1 INTRODUCTION

Follow the instructions in this chapter if either Local IIM or Remote IIM was specified in the System Configuration screen as explained in Paragraph 3-2.

This chapter describes how to configure the IIM. Skip this chapter if a Direct Connection is used.

Note: LaserNET™ will not allow IIM configuration unless the connection between the personal computer and the IIM has been properly configured and specified in LaserNET. If the connection information has not yet been entered in LaserNET, refer to Chapter 3 and follow the directions before proceeding.

4-2 INTELLIGENT INTERFACE MODULE WINDOW

The IIM window displays the status of the IIM (Figure 4-1). To open the Intelligent Interface Module window, select **IIM** from the upper right hand corner of the LaserNET main menu bar. The computer must be communicating with the IIM to access this window in either the Local or Remote mode. This screen is available without entering a password. The Setup Menu is only available in Local IIM mode and requires an installer password.

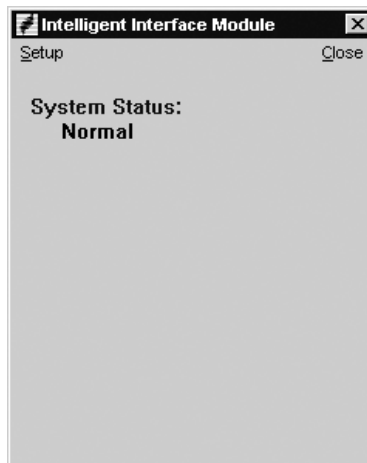


Figure 4-1. IIM Window

4-3 OWNER LOCATION INFORMATION

The IIM provides a means of identifying itself to the LaserNET software by programming into the IIM a unique name called the owner location. To program the owner location:

1. Enter the installer password.
2. Select **IIM** from the main screen. The Intelligent Interface Module window opens, as shown in Figure 4-1.
3. Select **Setup>Owner Location** from the menu bar. The IIM Location window opens, as shown in Figure 4-2.

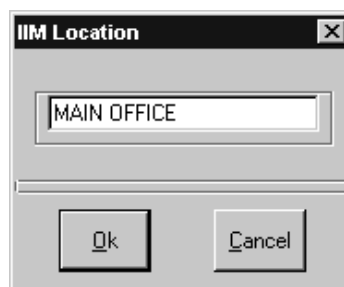


Figure 4-2. IIM Location Window

4. Enter a name for the IIM up to 20 characters long.
5. Select **<OK>** to save your entry and close the window. The top line of the LaserNET screen displays: "Local LaserNET Connection to (owner location)."

4-4 MISCELLANEOUS IIM PARAMETERS

There are three additional configuration options for the IIM: the type of RS-485 wiring supervision, IIM fault delay and enabling of auxiliary alarm and fault inputs on the IIM.

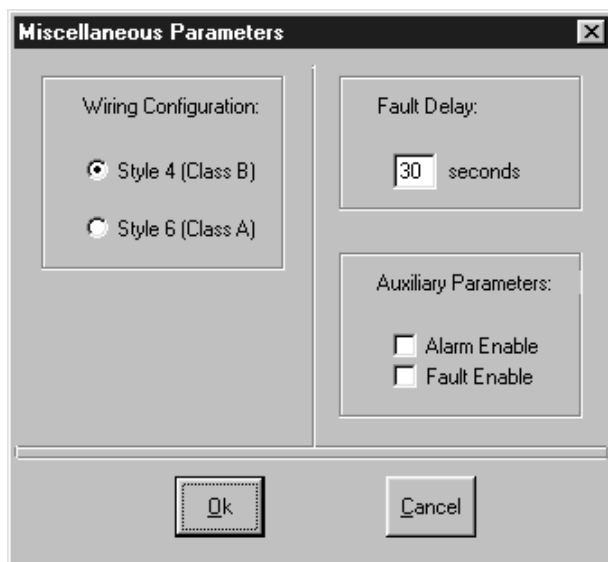


Figure 4-3. Miscellaneous Parameters

4-4.1 Wiring Configuration

The RS-485 HART XL network can be configured for two styles of supervised wiring. For additional details, refer to the HART XL Installation, Operation and Maintenance Manual (TM0042).

- **Style-4.** This is the factory default. One pair of wires is run (in a Class-B fashion) from Channel One on the IIM to all of the Detectors.
- **Style-6.** This option is used to provide Class-A wiring, allowing communications to continue to all Detectors even with (one) open or ground fault on the RS-485 signalling line circuit. One pair of wires runs from Channel One on the IIM to all of the Detectors, then returns to IIM Channel Two.

To specify the wiring configuration, do the following:

1. Select **IIM** from the menu bar on the main screen. The Intelligent Interface Module window opens.
2. Select **Setup>Miscellaneous**. The Miscellaneous Parameters window opens, as shown in Figure 4-3.
3. In the Wiring Configuration box, select one of the two options: **Style-4** or **Style-6**.

Note: In order to make the change effective, the installer or user must reset the IIM by pressing the Reset switch on the IIM board.

4. Select **<OK>** to save the configuration.

4-4.2 Fault Delay

This option delays the fault condition on an IIM for the programmed period of time.

1. Select **Setup>Miscellaneous** to open the Miscellaneous Parameters window.
2. In the Fault Delay box, enter a delay period in seconds. The period can be from zero (that is, no delay) to 90 seconds. The factory default is 30 seconds.
3. Select **<OK>** to save the configuration.

4-4.3 Auxiliary Parameters

The auxiliary alarm and fault inputs on the IIM must be enabled in order for them to display their status in LaserNET.

1. Select **Setup>Miscellaneous** to open the Miscellaneous Parameters window.
2. In the Auxiliary Parameters box, check **Alarm Enable** or **Fault Enable** to activate these inputs.
3. Select **<OK>** to save the configuration.

4-5 ASSIGNING HART XL ADDRESSES

The IIM communicates with all HART XL Detectors over an RS-485 signalling line circuit. This circuit supports up to 127 unique addresses which are used to identify each HART XL Detector. There are hardware and software addresses which must be set for correct operation of the communications network. The software addresses are stored in the IIM, as explained in the next paragraph. The hardware address for each HART XL Detector is set on the termination board. See the HART XL Installation, Operation and Maintenance Manual (TM0042) for information on setting hardware addresses.

4-5.1 IIM (P/N 53836-K191 or 53836-K190)

The software addresses of all the Detectors installed on the RS-485 loop must be selected to communicate with the IIM. Configure as follows:

1. Select **Setup>Detectors** from the main screen that is referred to in Figure 3-5 (not the Intelligent Interface Module screen of Figure 4-1). The Detectors window opens, as shown in the next figure.

Figure 4-4. IIM Detectors Window

2. In the Addresses Installed section, either:
 - a. Place a check in the box for each installed address, or
 - b. LaserNET will register/deregister a range of Detectors with the Enter a Range of Detector Addresses function.
3. Enter the range of Detectors (ex., 3 to 15), choose either Register or Deregister and click **<OK>**.

4-6 DETECTOR CONNECTION MAP

The Detector Connection Map provides a troubleshooting aid for Style-4 and Style-6, RS-485 network wiring. Detectors normally communicate on Channel One. If a network is broken, the Detectors after the break will be reassigned to Channel Two for communications with the IIM. By viewing the Detector Connection Map, the location of the wire break can be isolated.

4-6.1 Viewing the Connection Map

The Detector Connection Map shows what Detectors are connected. This screen is for viewing only and cannot be changed.

1. Select **IIM** from the main screen. The Intelligent Interface Module window opens as shown in Figure 4-1.
2. Select **Setup>Detector Connection Map**. The Detector Connection Map opens as shown in Figure 4-5. It shows the wiring configuration, which Detectors are connected, as well as on which channel the Detectors are connected. Click **<OK>** to return to the main screen.

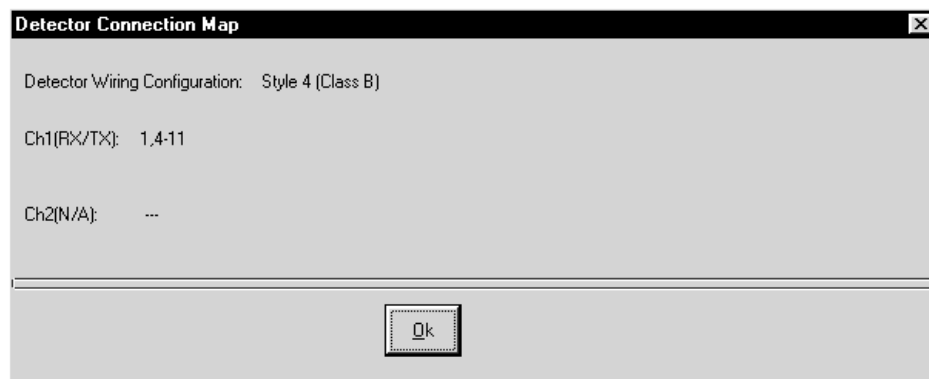


Figure 4-5. Detector Connection Map

4-7 **AUTODIAL CONFIGURATION**

With the Autodial feature, the IIM can automatically dial preprogrammed phone numbers when alarms and faults occur. The IIM continues to dial until a successful connection is made to a remote computer. In order to set up the connection with LaserNET, the remote computer must have a modem connection and LaserNET software running.

When Autodial is enabled, the IIM initiates communications when an alarm or fault is generated by an HART XL Detector. The IIM dials up to three preprogrammed phone numbers until making a successful connection to a remote computer.

See Tables 4-1 and 4-2 for conditions which initiate Autodial for an IIM. When Autodial is enabled, the Autodial sequence will be initiated if:

- HART XL Detectors are connected and a Detector alarm or fault occurs. Subsequent Detector alarms or faults will cause the Autodial sequence to repeat if the user has disconnected.
- If auxiliary alarms and auxiliary faults are enabled, an auxiliary alarm or fault input will trigger Autodial.

4-7.1 Phone Line Supervision

This feature which monitors the phone line every 60 seconds to ensure that a dial tone is present and the modem can dial out. If no dial tone is detected, a common IIM fault condition is generated. This feature is only used when Autodial is enabled.

4-7.2 Callback

This is a security feature which allows only one authorized remote computer to communicate with a Remote IIM. When a remote computer calls into the Remote IIM, the IIM hangs up and automatically calls the programmed callback phone number.

To configure the IIM for Autodial or Callback, do the following:

1. Select **IIM** from the main screen. The Intelligent Interface Module window opens, as shown in Figure 4-1.
2. Select **Setup>Autodial**. Figure 4-6 displays.

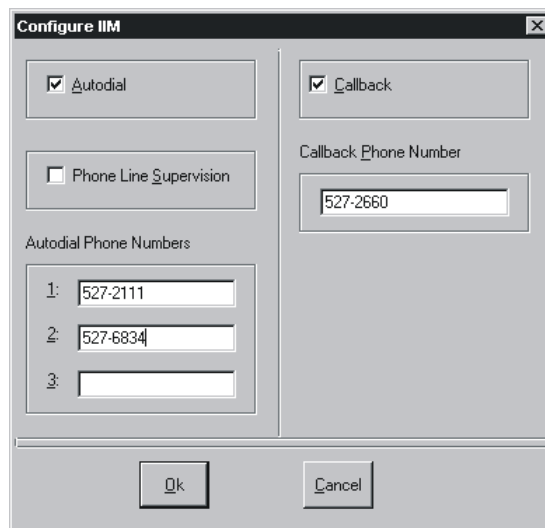


Figure 4-6. Configure IIM Window

3. To enable the Autodial function, check **Autodial**.
4. Enter the phone number of the computer that will be called in the 1 field. A second and third phone number can be entered if desired in fields 2 and 3. Each number can be up to 15 digits long, including commas which designate pauses and dashes which are ignored.

When the alarm or fault is received at the IIM, phone number 1 is dialed. If no connection is made, the IIM hangs up and tries number 2 if programmed to do so. If no connection is made using number 2, it tries number 3 if programmed. If no connection is made with numbers 2 and 3, the IIM tries number 1 again, and so on, until a connection is made, or until the alarm or fault condition is reset.

5. To enable phone-line supervision, check **Phone Line Supervision**.
6. To enable the callback security feature, check **Callback** and enter the phone number of the authorized remote computer in the Callback Phone Number field. The phone number can be up to 15 digits long. Use commas to designate pauses; dashes are ignored.

Note: The remote computer must have the IIM phone number configured for Callback. See Paragraph 3-3.

7. Select **<OK>** to save the configuration.

4-7.3 Alarms and Faults that Trigger Autodial

The IIM Autodial feature (if enabled), fault LED and fault relay respond to alarms and faults as shown Tables 4-1 and 4-2.

Table 4-1. IIM Alarms and Faults that Trigger Autodial

IIM Fault	IIM Fault LED and Relay	Autodial
Detector Not Responding	Yes	Yes
Aux Alarm	No	Yes
Aux Fault	No	Yes
Aux Alarm Supervision Fault	Yes	Yes
Aux Fault Supervision Failure	Yes	Yes
Dialtone Supervision Failure	Yes	No
Memory CRC Failure	Yes	Yes
Modem Missing	Yes	-
Style-6 Network Broken	Yes	Yes

Table 4-2. Detector Alarms and Faults that Trigger Autodial

Detector Alarm or Fault	IIM Fault LED and Relay	Autodial
Alarm 2	No	Yes
Alarm 1	No	Yes
Pre-Alarm 2	No	Yes
Pre-Alarm 1	No	Yes
Detector Fault	No	Yes
PSU Fault	No	Yes
Isolation Fault	No	Yes
High-Airflow Fault	No	Yes
Low-Airflow Fault	No	Yes
Reference Fault	No	Yes

4-8 PRINT THE IIM CONFIGURATION

The IIM configuration can be printed from the computer.

1. Select **IIM** from the menu bar on the main screen. The Intelligent Interface Module window opens.
2. Select **Setup>Print Configuration**. The configuration information will be printed to the computer's default printer.

CHAPTER 5

MAIN SCREEN AND COMMUNICATIONS

5-1 INTRODUCTION

Once the connection between the personal computer and the HART XL Detector has been configured—as described in Chapter 3—the operation of the Detector, the viewing of alarms and faults and the monitoring of specific operating parameters for the Detector is accessible.

This chapter describes the features of the LaserNET main screen, tells how to initiate communications through the Direct Detector Connection or IIM and how to enter the operating parameters for the Detector.

5-2 ESTABLISHING COMMUNICATIONS

5-2.1 Direct Detector Connection

Select **Connect** from the main screen. The Display and Control window (Figure 5-1) opens displaying the graphic representation of a Detector. A warning message will appear if a connection cannot be made. If this message appears, check the system configuration and wiring and try again.

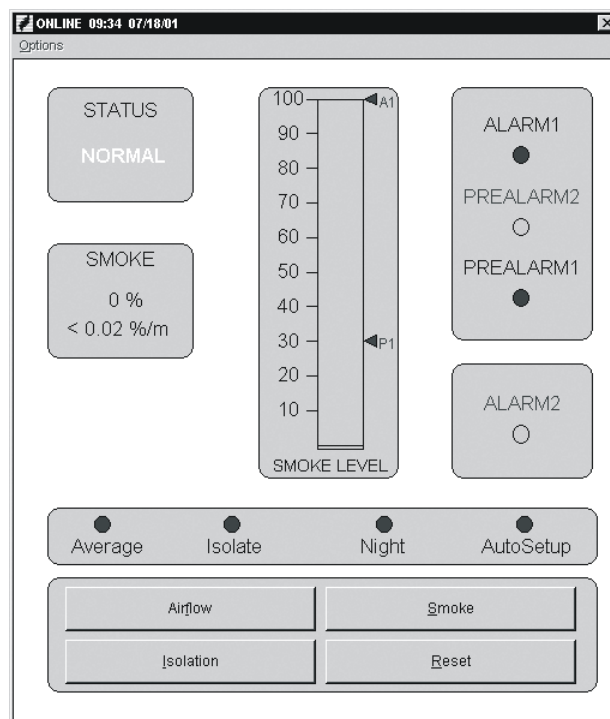


Figure 5-1. Display and Control Window for a Direct Detector Connection

Note: The information displayed on this screen and the button functions is explained in Chapter 6.

5-2.2 Local IIM Connection

Select **Connect** from the main screen. A “Please Wait” message appears while the computer establishes communications and the IIM passes information back to the computer. The wait should be less than 30 seconds. When a successful connection has been made, the banner on the main screen will read ‘Local LaserNET Connection to-(owner location)’.

The main screen varies depending on the number of HART XL Detectors connected to the IIM:

- **One Detector:** A window opens displaying a graphic representation of a system monitor with a dynamic smoke-level bar graph, as shown in Figure 5-2. The owner location defined for that Detector will be displayed in this window's banner, along with the address in parentheses.

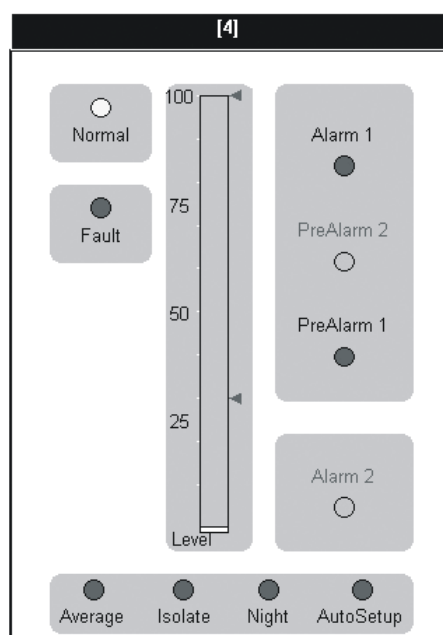


Figure 5-2. One-Zone LaserNET Display Window

- Two to Eight Detectors:** When more than one Detector is displayed, an abbreviated graphic appears for each Detector. The owner location of each Detector is displayed at the top of each graphic. A typical two-zone system is shown in the next figure. For additional information, click on one of the Detectors. A window opens showing the display and control window of that Detector, as shown in Figure 5-1. Alarm levels are indicated by red arrows beside the bar graph for those alarms that are enabled. When you close the window with the X in the upper right-hand corner (see Figure 5-1), the screen returns to the multi-zone display shown in Figure 5-3.

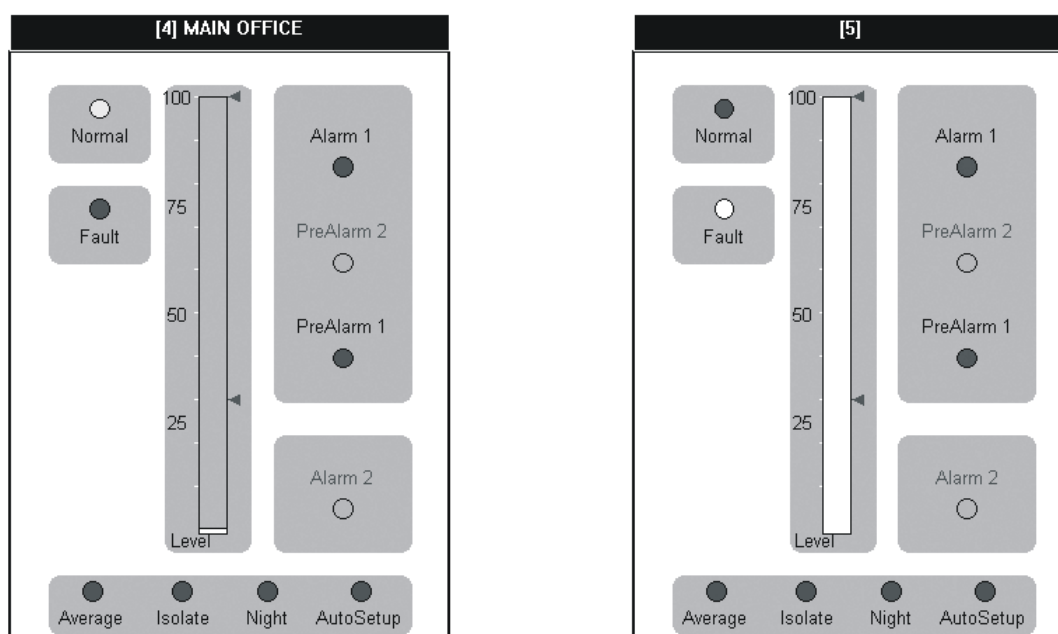


Figure 5-3. Two-Zone LaserNET Display Window

- Nine to One Hundred Twenty-Seven:** Each Detector is represented by a smoke-level bar graph, alarm status box, and a trouble status box. Alarm levels are indicated by red arrows beside the bar graph for those alarms that are enabled. When more than 16 Detectors are activated, a scroll up/down button will appear on the left hand side of the Display Window allowing the user to toggle between the screens to monitor the Detectors. A multi-zone system is shown in Figure 5-4.

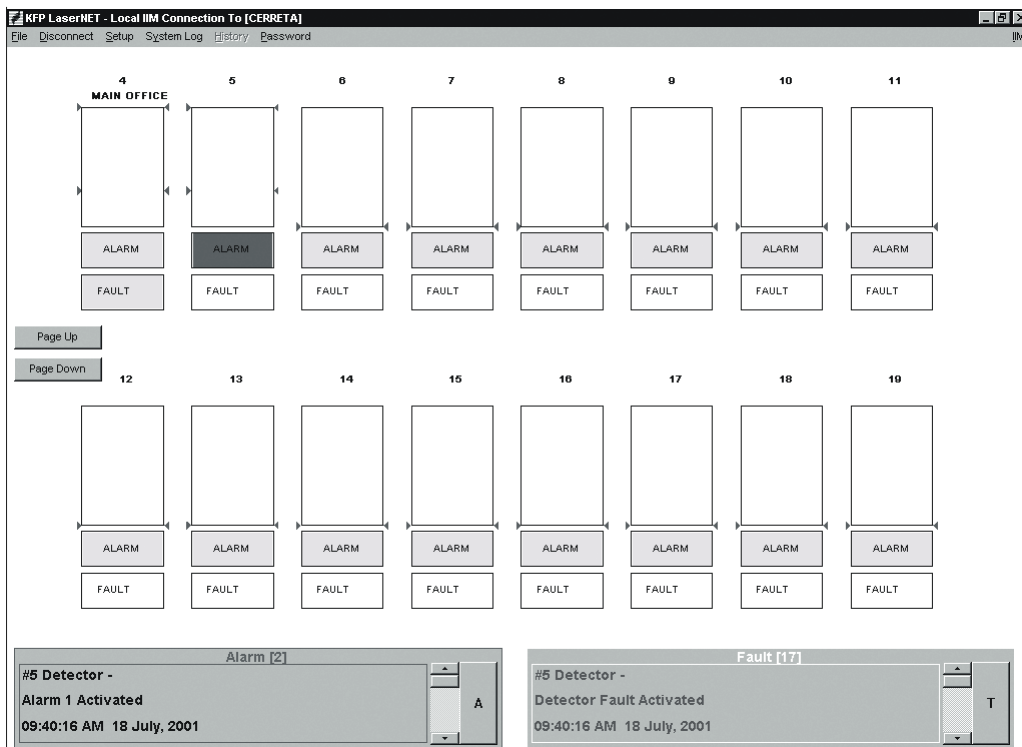


Figure 5-4. Multi-Zone LaserNET Display Window

Alarm status boxes are normally green, but turn red when an alarm condition is present. Trouble status boxes are normally green, but turn yellow in the presence of a trouble condition or blue if the Detector is isolated.

To obtain more information about a Detector, or change the settings, double-click on the graphic for that Detector. The screen will look like Figure 5-1. To return to the multi-zone display of Figure 5-4, click on the X in the upper right-hand corner of the screen.

5-2.3 Remote IIM Connection

On the remote computer, select **Connect** from the main screen. The Dial Remote System window (Figure 5-5) opens. Select the system to connect to, then select **<Dial>**. The phone number being dialed is then displayed in the banner of the window.

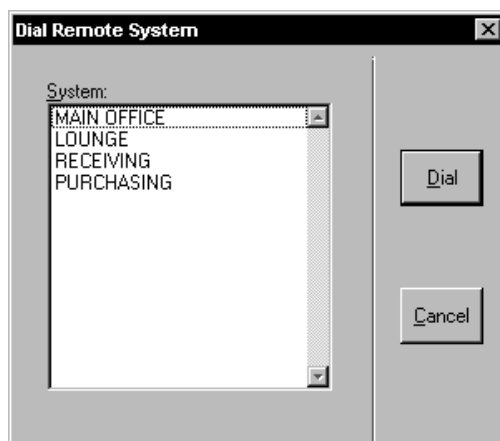


Figure 5-5. Dial Remote System Window

When the IIM answers the call, this window closes and a "Please Wait" message appears while the personal computer establishes communications and the IIM passes information back to the computer. This should take less than 30 seconds. When a connection has been established, the main screen banner displays 'Remote LaserNET Connection to-(owner location)'. The display on the main screen will then be the same as for a Local IIM connection as described in Paragraph 5-2.2.

5-3 VIEWING AND ACKNOWLEDGING ALARMS AND FAULTS

All active alarms and faults are shown in the Alarm and Fault status boxes at the bottom of the main screen. If the system is configured for a Direct Detector connection, all alarm and fault conditions are displayed for the connected Detector. If the system is configured for an IIM, all alarms and faults are displayed for all networked Detectors as well as IIM faults, a common fault (if so configured) and the auxiliary alarm and fault (if so configured).

When there are no active alarms or faults, the status boxes are empty, the borders of the status boxes are green and the number zero displays in the title bar.

When an alarm condition occurs in a Detector (or an auxiliary alarm):

- The word Normal (green) changes to Alarm (red) in the title bar of the status box and the number of active alarms displays.
- The alarm message displays in the Alarm box.
- The computer beeps until each active alarm is acknowledged.

To acknowledge an alarm, click on **<A>** (Alarm Acknowledge) to the right of the box. Continue to click on the **<A>** button until all alarms are acknowledged. Once all active alarms are acknowledged:

- The alarm message displays in halftone red,
- The computer stops beeping, and
- The scroll bar to the left of the **<A>** button will allow viewing of all active alarm messages.

When an alarm condition restores:

- An alarm-off message is displayed, as above,
- As each alarm-off message is acknowledged, the message and the corresponding alarm message is deleted from the alarm box, and
- When all alarm conditions are restored and acknowledged, the box empties and the border returns to green.

When a fault condition occurs in a Detector or IIM (or an auxiliary fault):

- The word Fault in the status box changes from green to yellow,
- The fault message displays in the Fault box,
- The computer beeps until each active fault is acknowledged, and
- The number of active faults displays in the title bar of the Fault box.

Each fault condition must be acknowledged by clicking on the **<F>** (Fault Acknowledge) button to the right of the box. Once all active faults are acknowledged:

- The fault message displayed in halftone yellow,
- The computer stops beeping, and

When a fault condition restores:

- A fault-off message is displayed, as above,
- As each fault-off message is acknowledged, the message and the corresponding fault message is deleted from the fault box, and
- When all fault conditions are restored and acknowledged, the box empties and its border returns to green.
- The scroll bar to the left of the **<F>** button will allow viewing of all active fault messages.

5-4 DISCONNECTING

To hang-up on a remote site, select **Disconnect** from the main screen menu bar.

CHAPTER 6

CONFIGURING AND MONITORING HART XL DETECTORS

6-1 HART XL DETECTOR MONITORING AND CONFIGURATION

Once the connection has been made to a Detector—as described in the previous chapter—a wide range of display, control and configuration programming options are available. This chapter details those options.

While viewing the status of a Detector does not require a password (except when viewing through an IIM), an installer level password is needed to make configuration changes. The owner-level password gives access to the smoke history download, event history download, the maximum/minimum smoke and airflow levels, print configurations, view software versions and allows the Detector time and date to be set.

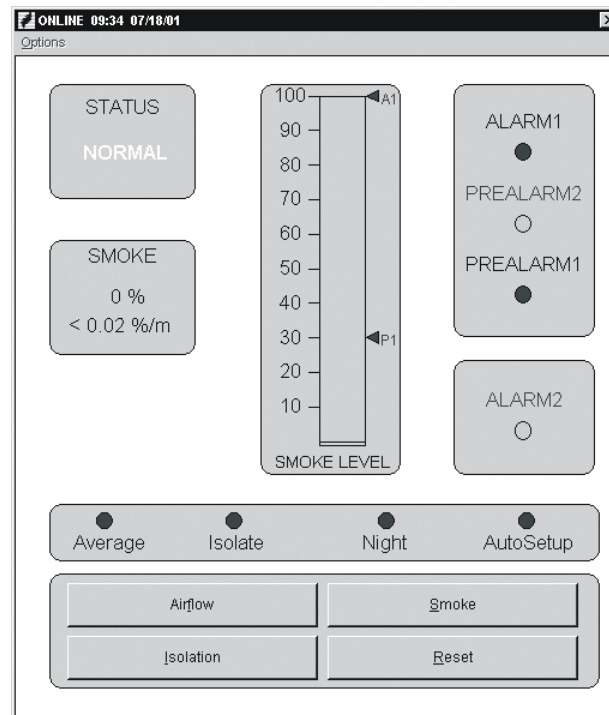


Figure 6-1. Direct Connection and IIM Display Control Window

6-2 STATUS INDICATORS IN THE DISPLAY CONTROL WINDOW

There are several groups of indicators on the Display and Control window. In a normal condition, without active alarms or faults, the Status Box displays 'Normal' in green and the yellow smoke-level bar graph may be moving below the Pre-Alarm 1 threshold. The green Average and Night and yellow Isolate and Auto-Setup lights may also appear, depending on the system configuration.

1. **Status.** This shows the current status of the system. Normal will appear in green, Fault in yellow and Alarm in red.
2. **Smoke-Level Bar Graph.** This is a dynamic display which shows the current smoke level. There are two red pointers which show the programmed thresholds for Alarm 1 and Pre-Alarm 1.
3. **Smoke Level.** Smoke level is displayed in units of % and %/m or %/ft.
4. **Alarm Indicators.** There are four red alarm lights, corresponding to the four alarm thresholds: Alarm 2, Alarm 1, Pre-Alarm 2 and Pre-Alarm 1. These will track the alarm state of the device, taking into account any time delays or signal conditions. These lights will also follow the activation of the "Isolation" switch and, if the Detector is isolated, will not be lit even if the threshold is exceeded. The number of alarm indicators showing will vary depending on system settings. To view actual thresholds, select the **<Smoke>** button.
5. **Other Status Indicators.**
 - **Average.** Lights green when Signal Averaging is enabled. This is considered a normal operating condition.

- **Isolate.** Lights yellow when the Isolation function is active (see paragraphs on Isolation Switch below). This is considered a fault condition.
- **Night.** Lights green when the Night Alarms function is active (see information on setting Day/Night Alarms in Paragraph 6-5.2.7). This is considered a normal operating condition.
- **Auto-Setup™.** Lights yellow when Auto-Setup is running. This is considered a normal operating condition (see Paragraph 6-5.7 for more information on Auto-Setup).

6-3 SHOW FAULTS

If there are Faults in the Detector, a **<Show Faults>** button appears under the Status box (Figure 6-2). Clicking on the **<Show Faults>** button displays a small window of Fault icons (Figure 6-3). LaserNET will display icons for the following faults:

- **Low Airflow.** The airflow in the pipe network has dropped below the configurable low airflow threshold. Check the pipe network for obstructions or blockages of airflow and check if the Detector fan is operating.
- **High Airflow.** The airflow in the pipe network has risen above the programmed high airflow threshold. Check for breaks in the pipe network.
- **Detector Fault.** The Detector has failed its sensitivity or diagnostics test or the termination board is unable to communicate with the Detector head. Check the connections of the cable that connects the Detector head and the termination board.
- **Power Supply Fault.** The power supply is not functioning correctly. Check all connections inside the power supply. If connected properly, replace the power supply module.
- **Sensitivity.** Occurs when the Detector fails the sensitivity test.
- **Communications Failure.** LaserNET is unable to communicate with the HART XL Detector. Check the RS-232 cable connections at the Detector and at the computer. Check the connections of the RS-232 connector extension inside the Detector. Check DIP switch address settings.
- **CPU Error.** Reset the Detector to clear the CPU Error. If this does not clear the error, please contact the supplier.
- **RAM Configuration.** Termination board memory has been corrupted. Power down the Detector with the battery link disconnected.

Note: This will remove all Detector configuration settings. Save the Detector configuration before shutting down with the battery link removed.

- **Display Fault.** The Display Module is connected but not enabled. Enable the Display Module in Options/Configure/Display Enable.
- **Reference Fault-IIM Only.** A reference Detector is not specified or communicating. Check that the reference Detector has been configured to provide a reference or that the reference Detector has been wired to the network correctly and operating normally.
- **Unregistered Fault-IIM Only.** A Detector on the IIM network has not been properly registered. Check that all the detectors have been registered through LaserNET.

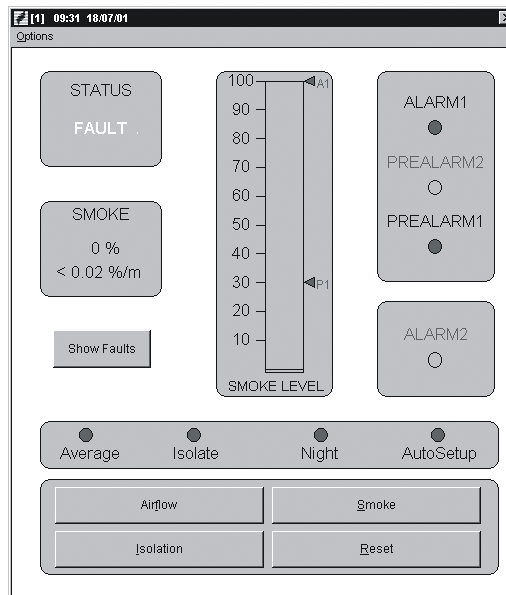


Figure 6-2. Faults Button

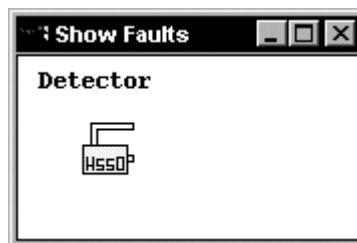


Figure 6-3. Show Faults

6-4 BUTTONS ON THE DISPLAY AND CONTROL WINDOW

There are four buttons on the Display and Control window: Airflow, Smoke, Isolation and Reset.

6-4.1 Airflow

Selecting **<Airflow>** displays a real-time view of airflow level, as well as all programmed parameters for airflow as shown in Figure 6-4.

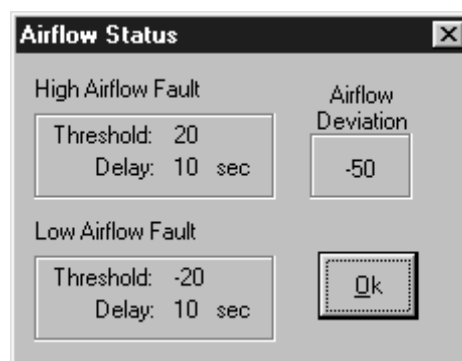


Figure 6-4. Airflow Status Window

- **Airflow Deviation.** This box displays the real-time airflow level through the Detector head. This is a relative measurement (-50 to +50, with "normal" being 0, -50 being no airflow and +50 being maximum airflow). The airflow through a Detector is highly variable because of a variety of environmental conditions such as temperature, humidity and altitude. As a result, a normalizing function is available when the normal airflow display shows a value other than 0. To normalize the airflow, see Paragraph 6-5.3.1.
- **Low Airflow Fault/High Airflow Fault.** These boxes display the programmed thresholds for both levels. Each level has a corresponding programmable delay, which is shown in seconds.

6-4.2 Smoke

Selecting **<Smoke>** opens the Smoke Status window (Figure 6-5 for a Direct Connection and an IIM) which displays a real-time smoke level as well as all programmed parameters for the smoke level.

Figure 6-5. Smoke Status Window for an Direct Connection or IIM

- **Cumulative Alarm Delays.** This box indicates whether this feature is enabled or disabled.
- **Current (smoke) Level.** This box displays smoke level in real time in percent of full-scale, as well as in %/m or %/ft.
- **Alarm 2, Alarm 1, Pre-Alarm 2 and Pre-Alarm 1 (IIM and Direct Connection).** These boxes will display the programmed smoke thresholds, in percent of full scale, for Alarm 1, Pre-Alarm 2 and Pre-Alarm 1 levels. Alarm 2 is display as %/m or %/ft. obscuration. In each case, there are two levels shown, one for Day and one for Night. If the Day/Night feature is not enabled, the Night value is ignored. Each level has a corresponding programmable delay which is displayed in seconds.
- **Detector Sensitivity Range.** This box indicates the sensitivity range that was chosen (see Smoke Alarms, Paragraph 6-5.2).
- **Day/Night Alarms.** This box indicates whether the feature is enabled or disabled. It also displays the programmed Day Start Time and Night Start Time in 24-hour format. These times are ignored if the feature is disabled.
- **Referencing.** This box is only used with an IIM connection. This box will display whether the Detector is used as a reference Detector or uses a reference Detector. (See Paragraph 6-5.6.)

6-4.3 Isolation

Selecting **<Isolation>** isolates or de-isolates the Detector. Isolation allows the Detector to be tested without generating alarms on the fire alarm panel. When the Detector is isolated, the Isolate indicator lights and the Detector will be in a fault condition. No alarm conditions will be reported by the Detector when they are isolated.

When isolated:

- On a Detector, the Alarm 2, Alarm 1, Pre-Alarm 2 or Pre-Alarm 1 indicators do not light.
- The Isolate light is yellow and a fault message occurs in the status box. The computer will beep until the isolation is acknowledged.
- The real-time smoke level will continue to be displayed on the bar graph and in the Smoke Status window.
- The Alarm and Pre-Alarm relay outputs are disabled.
- The Fault relay output will be activated.

If there are active alarms when isolation is invoked, the alarm relays on the Detector will restore and an alarm-off message will be sent to an IIM.

Note: If the Detector is isolated and the actual smoke level is above programmed thresholds, care must be taken before the Detector is de-isolated. If the actual smoke level is above a programmed threshold when the Detector is de-isolated, the Detector will immediately go into alarm. LaserNET will display a de-isolation warning (see Figure 6-6).

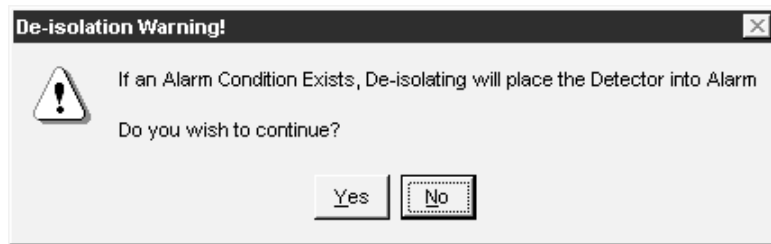


Figure 6-6. De-Isolation Warning Message

6-4.4 Reset

Selecting **<Reset>** resets any latched alarm or fault conditions on the Detector if the conditions have cleared.

6-5 CONFIGURING A DETECTOR

When a Detector is installed, it must be configured for proper operation. A Detector will arrive with its configuration preset to certain factory default values; these are shown in Table 6-1 (for the IIM and Direct Connection).

6-5.1 Owner Location

This feature is used only when connected to an IIM. It is used to program the location as seen in the banner of the Display and Control Window. Note that Location is distinct from Address which is configured elsewhere.

1. Select **Options>Configure>Owner Location**. The screen shown in the following figure will open.



Figure 6-7. Owner Location Window

2. The location of the Detector (if entered) is displayed in the window. Enter a new location name up to 20 characters long.
3. Select **<OK>** to save the configuration.
4. The owner location, along with the address in parentheses, will now be displayed in the title bar of the Display and Control window.

Table 6-1. IIM/Detector Factory Default Settings

Function	Default
Alarm 2, Day and Night	Disabled
Alarm 1, Day and Night	0.2%/m(D); 100% (N)
Pre-Alarm 2, Day and Night	Disabled
Pre-Alarm 1, Day and Night	30%
Alarm Delay (All Levels)	0 Seconds
*Day Night Alarm Mode	Disabled
*Start of Day	06:00
*Start of Night	22:00
Alarm and Pre-Alarm Latch	Latched
*Alarm and Pre-Alarm Latch Period	0 Minutes
*Cumulative Alarms	Disabled
Signal Averaging	Disabled
*Signal Averaging Period	8 Seconds
Faults Latch	Non-Latched
Power Supply Fault Delay	0 Seconds
High Airflow Fault Level	+20
Low Airflow Fault Level	-20
High Airflow Fault Delay	10 Seconds
Low Airflow Fault Delay	10 Seconds
History Date Update Rate	30 Seconds
Isolation Output	Enabled
Isolate	Deactivated
Detector Test	Deactivated
Referencing *IIM Only	Disabled
*Referenced to Detector	#1
Installer Level Password	INST
Owner's Level Password	OWN
Display Enable	Disabled
Display Module Sound on Alarm	Disabled
Display Module Sound on Pre-Alarm	Disabled
Display Module on Fault	Disabled
Display Module Units	Metres
*The default modes for these items are not significant until their parent functions are activated.	

6-5.2 Smoke Alarms

The thresholds for the alarm levels, the time delays associated with these alarm levels and the day/night option are configured in this paragraph.

1. Select **Options>Configure>Smoke Alarms**. The Smoke Alarms window (Figure 6-8) shows the current settings.

The 'Smoke Alarms' window is a configuration interface with the following sections:

- Alarm Level 2:** Day and Night settings. Threshold: 1.0 %/m obs. (Day), 1.0 %/m obs. (Night). Delay: 0 sec (Day), 0 sec (Night). ☒ Disabled.
- Alarm Level 1:** Day and Night settings. Threshold: 100 % (Day), 100 % to alarm (Night). Delay: 0 sec (Day), 0 sec (Night).
- Pre Alarm Level 2:** Day and Night settings. Threshold: 50 % to alarm (Day), 50 % to alarm (Night). Delay: 0 sec (Day), 0 sec (Night). ☒ Disabled.
- Pre Alarm Level 1:** Day and Night settings. Threshold: 30 % to alarm (Day), 30 % to alarm (Night). Delay: 0 sec (Day), 0 sec (Night).
- Current Smoke Level:** 0 % < 0.02 %m.
- Detector Sensitivity Range:** 0.2 - 0.02 %/m.
- ☐ Cumulative Alarm Delays.
- ☐ Day/Night Alarms.
- Day Start Time:** 06:00.
- Night Start Time:** 22:00.
- Buttons:** Ok, Cancel.

Figure 6-8. Smoke Alarms Window for a Direct Connection and IIM

6-5.2.1 DAY SMOKE THRESHOLDS

Day Smoke Thresholds are entered in the Alarm 2, Alarm 1, Pre-Alarm 2 and Pre-Alarm 1 boxes (Direct Connection and IIM). The following rules apply to setting these thresholds:

- The thresholds can be set from 10% to 100% of full scale, in increments of 5%.
- Two thresholds can be set to the same level.
- For Direct Connection or IIM, Alarm 2 cannot be set below Alarm 1, and Pre-Alarm 2 cannot be set below Pre-Alarm 1.

The window will display the factory default, or other programmed settings when opened. To change the settings:

1. Select the Day Threshold field in the Alarm 2 or Pre-Alarm 2 or Pre-Alarm 1 box. Enter the new value.
2. Repeat this step for all alarm(s).
3. Select **<OK>** to save the configuration.

6-5.2.2 NIGHT SMOKE THRESHOLDS

Night smoke thresholds only need to be set if the day/night option is selected. If this option is not used, the values in these boxes will be ignored. Skip to the paragraph on Alarm Time Delay Options (Paragraph 6-5.2.3).

If the day/night option is used, values for the night smoke thresholds are entered following the same procedure as in Paragraph 6-5.2.1, except selecting the appropriate Night Threshold fields.

6-5.2.3 ALARM TIME-DELAY OPTION

This option prevents transient conditions from causing unwanted alarms. When programmed, each alarm level will activate when the smoke level reaches its threshold and the programmed delay is satisfied. The following conditions apply:

- The smoke-level bar graph on the display and control graphic will accurately reflect the real-time smoke level throughout the delay period.
- The alarm indicators on the display and control graphic will not light until the delay is satisfied.
- If the smoke level drops below the threshold during the delay period, the delay time will be reset.

- Delays can be set from zero to 60 seconds in one second increments.
- Different delays can be programmed for day and night conditions.

The window will display factory default or programmed settings. To change:

1. Select the Day Delay field in an Alarm or Pre-Alarm box, if desired. Enter the new value.
2. Repeat Step 1 for all alarms and pre-alarms, if desired.
3. If the Day/Night Option has been selected, then values for alarm delays can be entered for the night period. Repeat Steps 1 and 2 for the Night Delay field, if desired.
4. Select **<OK>** to save the configuration.

6-5.2.4 CURRENT SMOKE LEVEL

Displays smoke level in real-time in percent of full-scale as well as in %/m or %/ft. (depending on system configuration).

6-5.2.5 DETECTOR SENSITIVITY RANGE

Allows the Detector's sensitivity range to be chosen. There are two ways to use this feature. Either (a) Select the sensitivity range by monitoring the current smoke level and adjusting the sensitivity higher or lower to the desired level, or (b) Use the Auto-Setup™ feature and let LaserNET automatically select the sensitivity range of the Detector. If the range does not seem to be sensitive enough, adjust the range to the desired level.

6-5.2.6 CUMULATIVE ALARM DELAY OPTION

This option is used only if the Alarm Delay option in Paragraph 6-5.2.3 is used. When enabled, this option prevents an alarm level's delay time from starting until the alarm level below it has activated by completing its own delay time. In order for this option to work, a time delay must be programmed for each level.

To enable this feature:

1. Check the Cumulative Alarm Delays box.
2. Select **<OK>** to save the configuration.

6-5.2.7 DAY/NIGHT ALARMS OPTION

Allows for a different smoke level threshold and smoke level time delay to be used during the day and at night. The day smoke thresholds are typically higher and the time delays longer than at night. This is to adjust for ambient conditions caused by high activity that may be present during the day, and therefore might cause unwanted alarms.

To enable the day/night option:

1. Check Day/Night Alarms.
2. The Day Start Time field will show the factory default or programmed value. Select this field and enter the new value in 24-hour format.
3. The Night Start Time field also shows the factory default or programmed value. Select this field and enter the new value in 24-hour format. The Night Detector light on the main screen will be green during the programmed night period.
4. Select **<OK>** to save the configuration.

6-5.3 Faults

The thresholds for airflow faults and time delays for fault conditions are configured in this paragraph.

To begin, select **Options>Configure>Faults**. The Faults window (Figure 6-9) opens, giving the current settings.

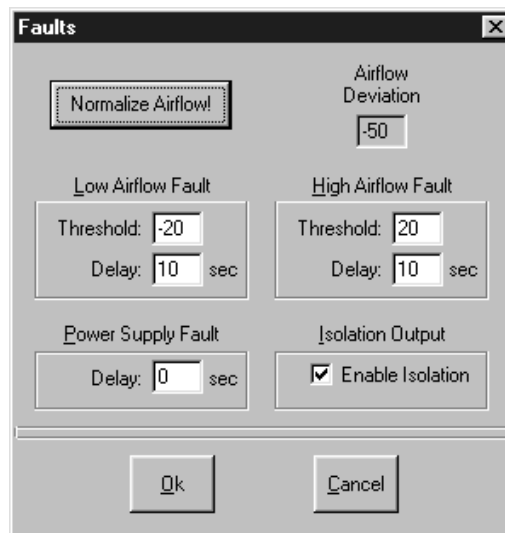


Figure 6-9. Faults Window, IIM and Direct Connection

6-5.3.1 AIRFLOW DEVIATION/NORMALIZING AIRFLOW

This feature is used to show the deviation of airflow from the normal airflow level.

1. Check the initial Airflow Deviation number on start-up. The number will show the amount (+/-) the system is from the norm. Being that each system is different, a number other than zero deviation from the norm will most likely appear.
2. Use the Normalize Airflow function to set the system's deviation to "zero deviation from the norm". If the Normalized Airflow falls either too high or too low to normalize, a fault message will appear and normalization will not be allowed. If a fault message occurs, the piping network must be recommissioned. Refer to the "SNIFF" Program and the HART XL Installation Manuals, or contact Kidde Fire Protection for further help.
 - Press the **<Normalize Airflow>** button to normalize the current airflow (this will change the Airflow Deviation to zero). A dialogue box will appear displaying the offset due to the previous normalization. Continuing with the normalization process will offset the current airflow deviation as long as it is within the bounds set by the system thresholds. If the deviation is within the threshold bounds, the normalization process can be continued and the airflow deviation will be offset to "0". For example, the airflow deviation was 2, after the normalization process, the normal deviation becomes zero and the offset becomes 2. Select **<Yes>** to continue.
 - A second caution message will appear telling users to verify the suction pressures and transport times with "SNIFF" before continuing. Select **<OK>** to continue or **<Cancel>** to return to the Faults window.

6-5.3.2 LOW AIRFLOW THRESHOLD

This feature is used to generate a fault in the event of a blocked air-sampling pipe or a nonoperational fan. The following notes apply to setting this threshold:

- Airflow can be highly variable and will fluctuate with changes in temperature, humidity or pressure within the monitored hazard.
- The airflow threshold should be set about -20 below the "normal" airflow for the system.
- The threshold can be set in increments of one with -40 absolute value as the minimum.

The window will display the current or factory default settings. To change:

1. Select the Threshold field in the Low Airflow box. Enter the new value.
2. Select **<OK>** to save this setting.

6-5.3.3 HIGH AIRFLOW THRESHOLD

This feature is used to generate a fault condition in the event of a disconnected air-sampling pipe. The following rules apply to setting this threshold.

- Airflow can be highly variable and will fluctuate with changes in temperature, humidity or pressure within the monitored hazard.
- The high airflow threshold should be set at least +20 above the normal airflow for the system.
- The threshold can be set in increments of one with +40 absolute value as the maximum.

The window will display the factory default or programmed setting. To change:

1. Select the Threshold field in the High Air Flow box. Enter the new value.
2. Select **<OK>** to save the setting.

6-5.3.4 AIRFLOW FAULT DELAYS

This feature is used to prevent transient changes in airflow from causing unwanted fault conditions. A small delay is normal for most applications, with the default being 10 seconds. When this feature is enabled, a fault condition will activate when the threshold is crossed and time delay is satisfied. The following conditions apply:

- The current level in the real-time airflow display will accurately reflect the airflow level throughout the delay period.
- The fault indicator on the display and control graphic will not light until the delay is satisfied.
- If the airflow level drops below (for high airflow) or rises above (for low airflow) its programmed level during the delay period, the delay timer will be reset.
- Delays can be set from zero to 60 seconds in one second increments.
- Different delays can be programmed for high and low airflows.

The window displays the factory default or programmed settings. To change:

1. Select the Delay field in the Low Air Flow box. Enter the new value if desired.
2. Select the Delay field in the High Air Flow box. Enter the new value if desired.
3. Select **<OK>** to save the configuration.

6-5.3.5 POWER SUPPLY FAULT DELAYS

These are used to prevent transient problems with the power supply from causing unwanted fault conditions. A typical example would be a power supply delay to prevent a transfer from normal power to emergency generator from generating a fault from loss of AC power. When programmed, a fault condition will activate when the condition is detected and the time delay is satisfied. The following conditions apply:

- Delays can be set from zero to 60 seconds in one second increments.
- Different delays can be set for power supply and Detector faults.

The window will display the factory default or programmed settings. To change:

1. Select the Delay field in the Power Supply Fault box. Enter the new value, if desired.
2. Select **<OK>** to save the configuration.

6-5.3.6 ISOLATION OUTPUT

Enable Isolation is checked to allow the Isolate relay to operate when the Detector is isolated (for Detector cleaning, etc.). If the Enable Isolation is not checked, the fault relay will operate when the Detector is isolated.

6-5.4 Output Latching

The alarm and fault outputs can be configured to be either latching or non-latching. Alarms, when non-latching, can have a latch period programmed.

To begin configuration of latched and non-latched alarms and latching faults, select **Options>Configure>Output Latching**. The Output Latching window (Figure 6-10) will appear, displaying the current settings.

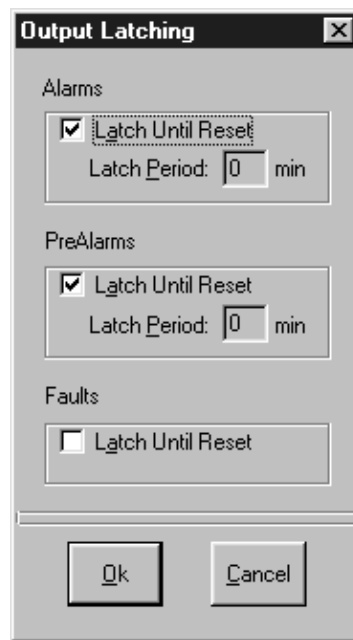


Figure 6-10. Output Latching Window

6-5.4.1 LATCHED ALARMS

When alarms are configured for latching, the alarm outputs will require a manual reset to clear the alarm condition once the smoke level has dropped below the alarm threshold(s).

To set latching alarms:

1. Check the Latch Until Reset box in the alarms box.
2. Select **<OK>** to save the configuration.

6-5.4.2 NON-LATCHING ALARMS

When alarms are configured for non-latching, the alarm condition on the Detector will clear after the smoke level has dropped below the programmed threshold and the programmed latch period has expired. The following conditions apply:

- The latch period can be set from zero to 60 minutes in one minute increments.
- If the smoke level rises above the threshold during the latching period, the timer is reset.

To configure:

1. Ensure that the Latch Until Reset box is unchecked (see above).
2. Select the Latch Period field in the Alarms box. Enter the new value.
3. Select **<OK>** to save the configuration.

6-5.4.3 LATCHING FAULTS

Fault conditions are normally configured for non-latching, in that the fault indication will clear automatically as soon as the fault condition disappears. For troubleshooting purposes, it is sometimes desirable to make faults latching, so that the fault will require a manual reset to clear the fault indication after the fault condition is cleared. To configure:

1. Check the Latch Until Reset box in the Faults box.
2. Select **<OK>** to save the configuration.

6-5.5 Signal Averaging

Some environments may have transient ambient conditions which will sometimes cause spikes in the smoke level reading, even when the system is "normal." The signal averaging feature allows these spikes to be averaged out over a fixed time period to provide a smoother system response and help eliminate unwanted alarms.

The green Average indicator on the display and control graphic will be lit when this option is enabled.

When enabled, a short-term running average of the smoke level is stored in memory and used to display as the smoke level, the average calculated for the time period. The time period is programmable for 2, 4 or 8 seconds.

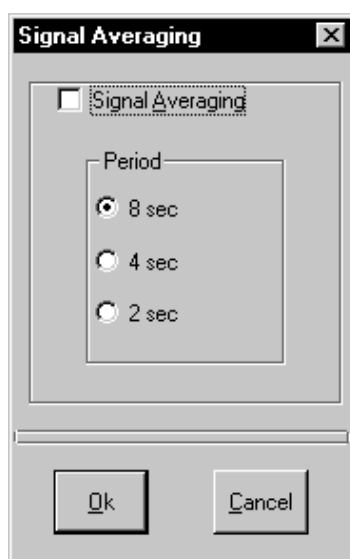


Figure 6-11. Signal Averaging Screen

To enable the function:

1. Access the menu by **Options>Configure>Signal Averaging**.
2. Check the Signal Averaging box.
3. In the Signal Averaging Period field, select either **2**, **4** or **8** seconds.
4. Select **<OK>** to save the configuration.

6-5.6 Referencing

This feature is only available when using an IIM. Certain installations using HART XL may have HVAC systems which provide make-up air from outside the monitored space. Sometimes this make-up air comes from outside the building and will contain elevated levels of separate particles or low levels of smoke, often caused by vehicle exhaust fumes, chimney soot or general urban pollution. This will then elevate the background smoke level in the monitored space and may cause unwanted alarms.

Referencing is a means of eliminating high background smoke levels caused by outside influences. One Detector is assigned to monitor the make-up (or outside) air. The smoke level value of this reference Detector is then subtracted from the smoke levels of the other detectors assigned to this reference Detector.

The following conditions apply to referencing:

- The reference Detector is the Detector which monitors the make-up or outside air. There can only be one reference Detector in the system.
 - A Detector which uses the reference unit will have the reference detector's smoke level (up to 30%) subtracted from its own smoke level.
 - The referencing feature should only be used when the normal ambient conditions in the air outside the monitored space cause a 10% to 30% deflection on the smoke level bar graph display.
 - A fault will be generated in the Fault box on the main screen if the reference Detector exceeds 30%.
 - Any Detector which is configured to use a reference unit will show a fault if a reference Detector is not defined.
 - The reference Detector does not report alarms.
1. Select **Options>Configure>Referencing** from the menu to open the Signal Referencing window (Figure 6-12) and show the current settings.

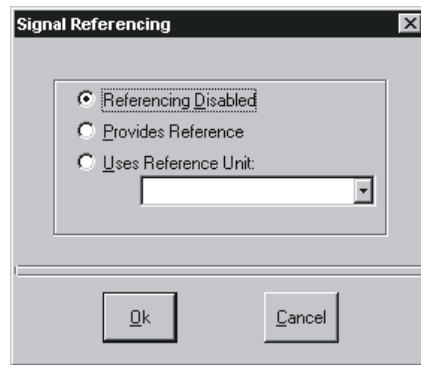


Figure 6-12. Signal Referencing Window

2. For a Reference Detector. To enable referencing, one Detector must be selected as the reference Detector.

When connected to the Detector to be used as the reference Detector:

- a. Check **Provides Reference**.
- b. Select **<OK>** to save the configuration.

3. For a Detector Which Uses a Reference Unit. Every Detector which will use referencing must be configured.

When connected to a Detector which will be a reference unit:

- a. Check **Uses Reference Unit**.
- b. If the reference Detector has already been defined, its address will appear in the Uses Reference Unit field. If not, enter the address of the reference Detector in this field or choose the Detector address from the drop down menu next to the Uses Reference Unit field.
- c. Select **<OK>** to save the configuration.
- d. Repeat for every other Detector in the system which uses a reference unit.

6-5.7 Auto-Setup™

The Auto-Setup is enabled through LaserNET by setting a time period to collect data for determining the Detector sensitivity range.

1. Select **Options>Configure>Auto Setup**. Figure 6-13 displays.

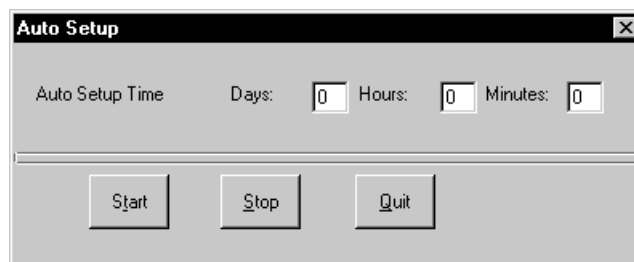


Figure 6-13. Auto Setup

2. Enter a learning time period. The time period can range from 15 minutes to 14 days as that is the selection in the Auto-Setup box. Choose **<Start>** to begin the program.
3. Auto-Setup will run for assigned period of time. The main screen Auto-Setup light will appear yellow while the Auto-Setup function is running.
4. If desired, Auto-Setup can be terminated before the assigned time period. The options appear in the Auto-Setup window and include **<Stop>** or **<Quit>**. **<Stop>** will cancel the Auto-Setup and configure the Detector sensitivity range with data that is already accumulated. **<Quit>** cancels Auto-Setup and keeps the current sensitivity selection. The buffer that collects data will be erased when **<Quit>** is selected.
5. After Auto-Setup has completed, it will automatically set the Detector sensitivity range to the appropriate number based on the results of average smoke levels that were gauged during the testing period.

Note: If Load Configuration is selected or an alarm condition occurs while Auto-Setup is enabled, LaserNET will abort the Auto-Setup function. An existing alarm, pre-alarm, fault or isolate condition will prevent the execution of Auto-Setup.

6-5.8 Display Enable

Connect the Display Module to the Detector.

1. Select **Options>Configure>Display Enable**. Figure 6-14 displays.

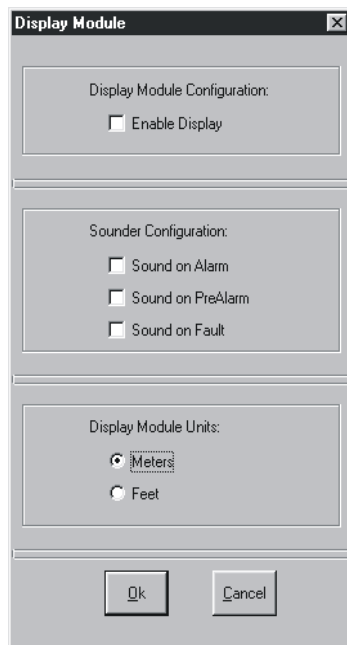


Figure 6-14. LCD Enable Screen

- **Enable Display**—Check **Enable Display** and click on the **<OK>** button. If the LCD isn't connected, a warning message will appear. Recheck hardware configuration and repeat the step.
- **Sounder Configuration**—Select **Alarm** to set the Detector to have sound only in an Alarm condition, Pre-Alarm box to set the Detector sound only in a Pre-Alarm condition, or the Fault box for the Detector to sound only for fault conditions.
- **Display Module Units**—This function controls the numeric display on the Detector. Select either **Metres** or **Feet**.

6-5.9 Display Passwords

This feature allows the display module password to be modified via LaserNET. Enter in the new password(s) (must be from two to eight numeric characters ranging from 0-9) and click **<OK>**.

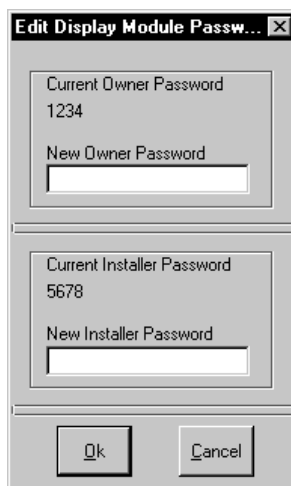


Figure 6-15. Display Passwords Screen

6-5.10 Information

Specific information about the Detector installation must be entered here by the installer of the system. This will provide guidance to future service technicians, as well as the owner, if there is a problem. Access this screen by selecting **Options>Configure>Information**. Figure 6-16 appears.

The 'Information' dialog box contains the following fields and values:

- Description: Zone One: Engineering Laboratory
- Installation Date: June 16, 2001
- Service Date: September 23, 2001
- Installer Information:
 - Name: XYZ Distributing, Inc.
 - Address: 123 First Street, Belvue Road, Northolt, Middlesex UB5 5QW UK
 - Telephone: +44 (0)20 8839 0770

Buttons: Ok, Cancel

Figure 6-16. Information Screen

1. Select the **Description** field. Additional descriptive information about the Detector, up to 40 characters, may be entered in this field.
2. Select the **Installation Date** field. Enter an installation date up to 20 characters long.
3. Select the **Service Date** field. Enter the date when the Detector was last serviced, up to 20 characters long.
4. Select the **Name** field. Enter a company name up to 40 characters long.
5. Select the **Address** field. Enter a company address up to 40 characters long.
6. Select the **Telephone** field. Enter a company phone number up to 20 characters long.

6-5.11 Time and Date

Each Detector has a real-time clock which contains the date and time. This clock is backed-up by a 10-year lithium battery in order to maintain the date and time information when 24 Vdc power is disconnected. In the event of power failure, information can be retained for up to a period of approximately 90 days. When the Detector is installed for the first time, and the battery jumper is set, the date and time must be entered in the system.

1. Select **Options>Configure>Time and Date** from the menu. The Time and Date window opens, as shown in Figure 6-17.

The 'Detector Time & Date' dialog box contains the following fields and values:

- Time (24 hour): 14 : 33 : 17 (Hour, Min., Sec.)
- Date: 04 / 09 / 2001 (Month, Day, Year)

Buttons: Ok, Cancel

Figure 6-17. Time and Date Window

2. The time and date currently programmed in and the Detector is shown in the window. Time is shown in a 24-hour format, HH:MM:SS. Date is in month-day-year order, MM-DD-YYYY. The time and date, if incorrect, can be changed by highlighting the appropriate field and entering the correct number.
3. Select **<OK>** to save this configuration.

6-5.12 Factory Defaults

All settings can be returned to their factory defaults. These settings are shown in Table 6-1. All settings will be returned to the default values simultaneously using the following procedure.

1. Select **Options>Configure>Factory Defaults**. The Default Configuration window will open, as shown in Figure 6-18.

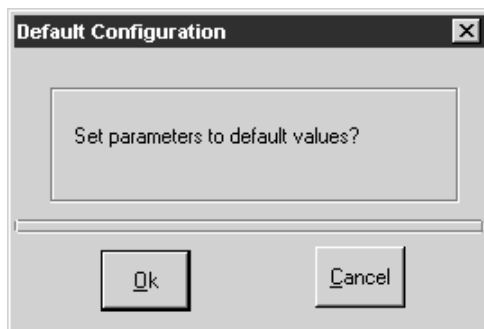


Figure 6-18. Default Configuration Window

2. To reset all parameters to their default values, select **<OK>**. The configuration will be returned to default.

6-6 TEST OPTIONS

The following detector tests can be initiated from the Test Options menu. The detector sensitivity test is the only required test for commissioning and maintenance procedures. Airflow Test, Trouble Relay Test and Monitored Input Test are included to aid in troubleshooting the detector. See Chapter 7 and 8.

6-6.1 Sensitivity Test

A Detector sensitivity test can be run from the computer. It takes about 30 seconds to complete. The signal averaging and referencing functions are disabled during the test.

1. Select **Options>Sensitivity Test**. If the Detector is working correctly, the smoke level bar graph on the display and control graphic will rise to 75%. The display and control graphic will show "Test".
2. At the successful completion of the test, a "Test Pass" message as shown in Figure 6-19 will appear in the Status box. Select **<OK>** to close the window.

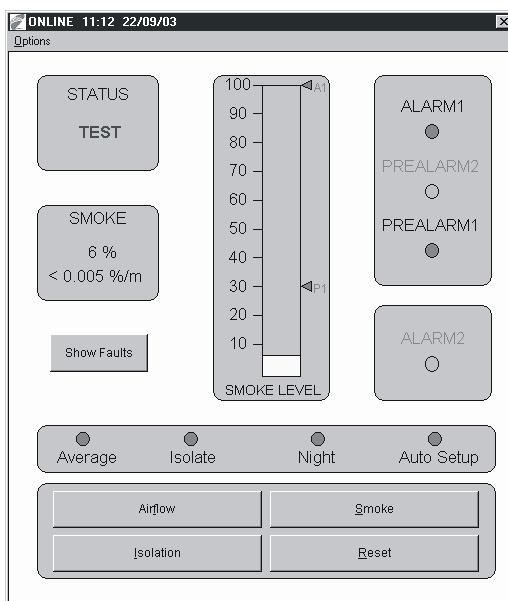


Figure 6-19. Sensitivity Test Window

3. The event log will record Test Passed, if successful, Test Off, and if the Detector failed, Detector Fault.
4. If the test is a failure, a Detector fault will be generated in the Detector.

6-6.2 Airflow Test

The Airflow Test toggles the fan power (on/off) to test the airflow monitoring circuit.

1. Select **Options>Test Options>Airflow Test**. The fan will shut off and the display and control graphic will indicate that it is in a test mode, as shown in Figure 6-20.
2. If the airflow monitoring circuit is functioning correctly, the Detector will report a low airflow fault after the preset airflow fault delay period has lapsed. See Paragraph 6-5.3.2.
3. To return the Detector to the normal operating mode, select **Options>Test Options>Airflow Test** to turn the fan on. If the detector is configured for fault latching, reset the Detector. See Paragraph 6-5.4.1.
4. The event log will record the changes in airflow status.

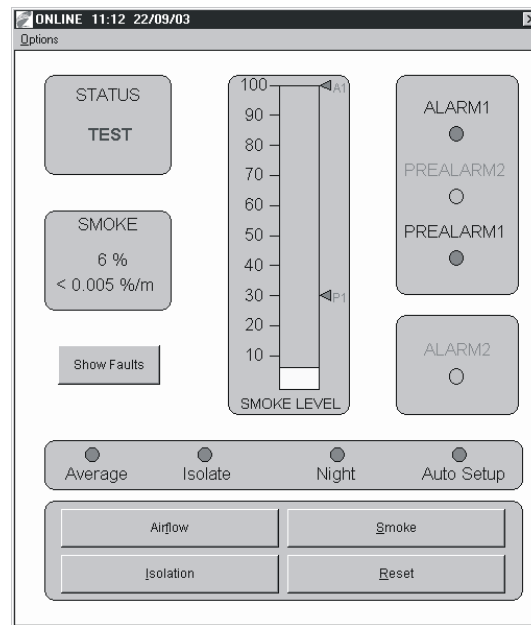


Figure 6-20. Airflow Test Window

6-6.3 Fault Relay Test

The Fault Relay Test activates the fault relay for 10 seconds. The purpose of this test is to verify the functionality of the fault relay.

1. Select **Options>Test Options>Fault Relay Test**. The trouble relay will be activated for 10 seconds. The display and control graphic will indicate that it is in test mode, as shown in Figure 6-21.
2. Verify that a fault was reported to the fire alarm panel.
3. The Detector will return to normal operating mode after the 10 second test period has lapsed.
4. If the fire alarm panel is configured for fault latching, reset the panel after the 10 second test period has lapsed.

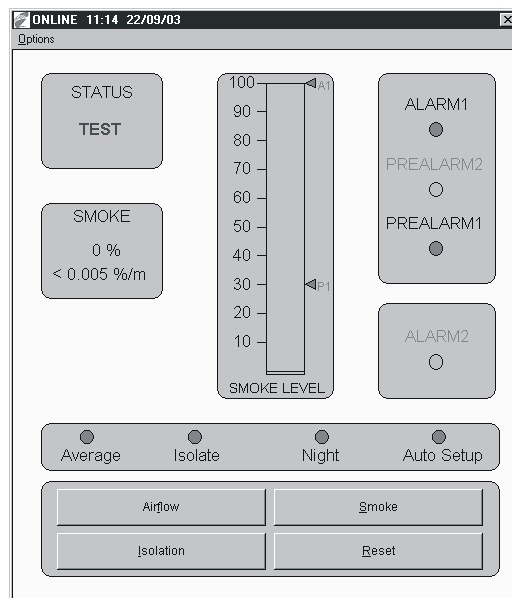


Figure 6-21. Fault Relay Test Window

6-6.4 Monitored Inputs Test

The Monitored Inputs Test verifies that the detector head inputs to the termination board are functioning correctly.

1. Select **Options>Test Options>Monitored Input Test**. This will initiate the Detector self-diagnostic tests on the termination board inputs.
2. If the inputs are functioning correctly, the display and control graphic will indicate a "Test Passed" message in the Status Box.
3. The Detector will return to normal operating mode shortly after completing the test.

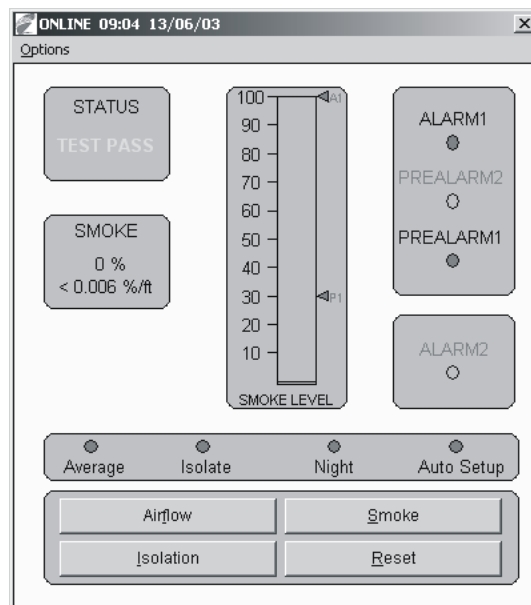


Figure 6-22. Monitored Inputs Test Window

6-7 PRINTING THE CONFIGURATION

The programmed configuration of a Detector can be printed, as follows.

6-7.1 Printing to a Printer

To print to the default printer on the computer:

1. Select **Options>Print Configuration** from the menu. The Print Configuration Window opens, as shown in Figure 6-23.

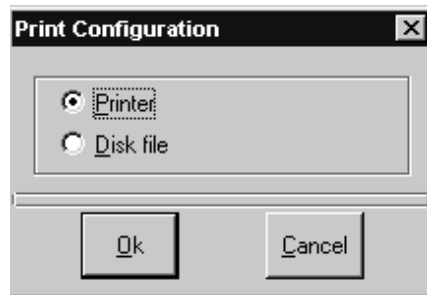


Figure 6-23. Print Configuration Window

2. Select **Printer**, and then select **<OK>**. The configuration will print to the computer's default printer.

6-7.2 Printing to a Disk File

This will save the configuration information to a disk file.

1. Select **Options>Print Configuration** from the menu. The Print Configuration window opens, as shown in the previous figure.
2. Select **Disk File** and then select **<OK>**. The HART XL Configuration Save window opens, as shown in the following figure.

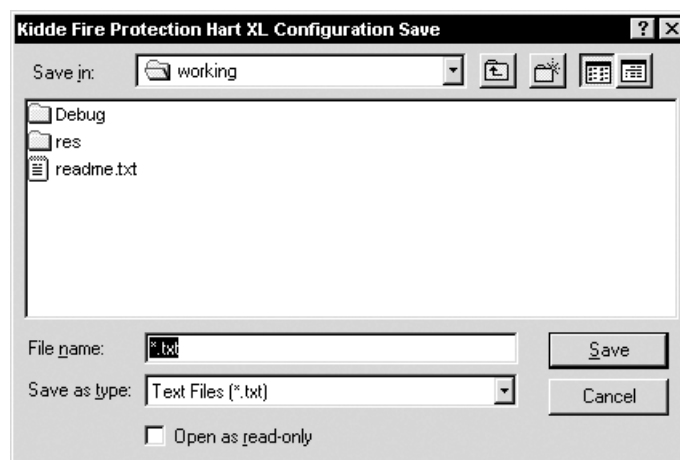


Figure 6-24. HART XL Configuration Save Window

3. Enter a file name in the File Name field.
4. Select the directory to which the file will be saved.
5. Select **<OK>** to save the file.

6-8 SAVING AND LOADING DETECTOR CONFIGURATIONS

The configuration of a Detector can be saved as a configuration file stored on disk, and vice versa; any configuration file can be loaded onto a Detector. This allows programming to take place in the office for download in the field. It also makes possible reliable programming of many Detectors with identical configurations. The feature can be used either on-line or off-line.

6-8.1 Loading a Configuration, Off-Line

LaserNET must be disconnected from the Detector.

1. Select **File>Load Config**.

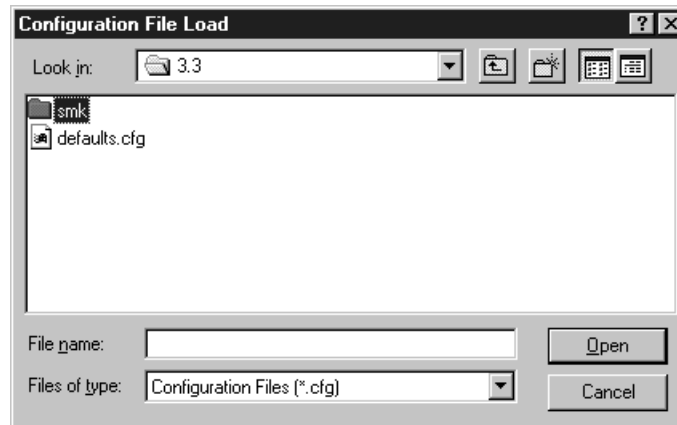


Figure 6-25. Configuration Load Window

2. All the configuration files for the directory shown in the Look In box will be displayed in the Files box. All Detector configuration files are saved with the *.cfg extension. To change directories, view all directories in the Directories box and double-click on the desired directory.
3. Select the desired file from the Files box. The file name will appear in the File Name field. The file DEFAULTS.CFG contains the factory default settings.
4. Select **<OK>** to load the file into LaserNET. A display and control graphic window will open with Off-Line Mode in the banner. The file is now available for editing.

6-8.2 Loading a Configuration, On-Line

LaserNET must be communicating with the IIM or Detector and the correct installer-level password must be entered.

1. Select **File>Load Config** from the main screen.
2. The Configuration Load window opens.
3. All the configuration files for the directory shown in the Look In box will be displayed in the Files box. All Detector configuration files are saved with the *.cfg extension. To change directories, view all directories in the Directories box and double-click on the desired directory.
4. Select the desired file from the Files box. Its name will appear in the File Name field. The file DEFAULTS.CFG contains the factory default settings.
5. Select **<OK>** to load the file.
6. The Date and Time Window opens. The values in the Time and Date fields will be taken from the computer's real-time clock. If the time and date are incorrect, change them using the procedures in Paragraph 6-5.11.
7. After this operation, clear the Event Log.

6-8.3 Saving a Configuration to File

The save procedure is the same, whether on-line or off-line.

1. Select **File>Save Config**. The Configuration Save window opens, as shown in Figure 6-26.

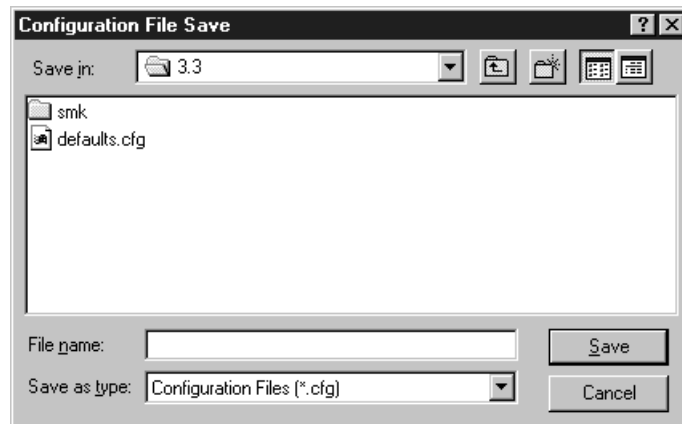


Figure 6-26. Configuration Save Window

2. The file name to be saved will be shown in the File Name field. For IIM or Direct Connection, the default file name is *.CFG. To save with a different file name, select the desired file name from the Files box and it will appear in the File Name field. The file name must end with a *.cfg extension.
3. The directory where the file will be saved is displayed in the Save In box. To change directories, view all directories in the Directories box and double-click on the desired directory. It is recommended that each job site be saved to a separate directory to avoid confusion.
4. Select **<OK>** to save the configuration. A confirmation window will open showing the drive\directory\file name to be saved. Select **<OK>** to save.

6-9 SOFTWARE VERSION

The LaserNET software version and the Detector's embedded software versions can be displayed through LaserNET.

1. Select **Options>Software Version**. The Software Version window opens (Figure 6-27).

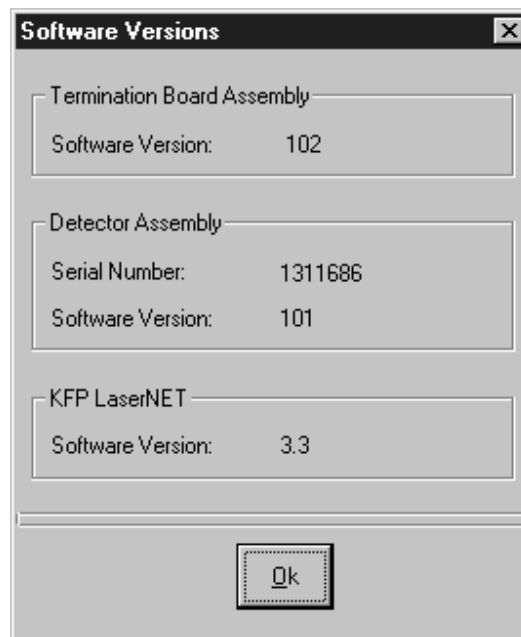


Figure 6-27. Software Version Window

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CHAPTER 7

STORING HISTORICAL DATA

The HART XL system has three ways of storing historical data in the Detector: in the Smoke History, Event History and through Max/Min Levels. Data may also be stored in the System Log on a PC. This information is valuable to the installer in setting system parameters. It is also valuable to the owner for post-incident analysis.

7-1 SMOKE HISTORY

Smoke history is the most important historical data stored by the HART XL. Up to 40,320 time-stamped samples are stored in the Detector. The sample rate is programmable from one sample every two seconds to one sample every 60 seconds. The highest value that is recorded during the sample period is the one which is stored. Up to 28 days of smoke history will be stored in the history buffer (depending on the sampling rate). Once the history buffer is full, the oldest data is written over as new samples are stored. If signal averaging or referencing is enabled, the stored smoke levels reflect the adjusted values.

Most history commands will be entered in the history window, shown in the following figure. Direct Detector Mode displays in parentheses in the title bar for a direct connection to a Detector, while owner location displays for an IIM connection. For off-line operation, the parentheses are empty. Descriptions of the icons in this window are detailed later in this chapter.

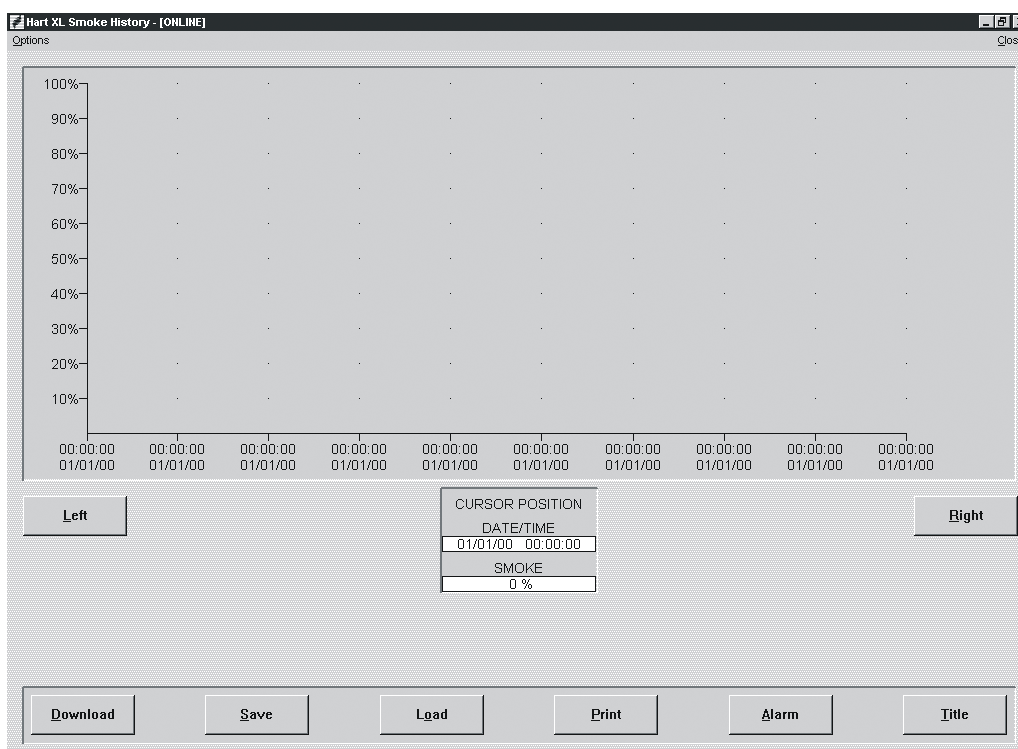


Figure 7-1. Smoke History Window

7-1.1 Opening the History Window

Both this procedure and off-line operations will vary slightly depending on whether the system is configured for a Detector or an IIM.

1. **Direct Detector Connection.** Either select **History** from the main screen, then select **Options>Download** from the Smoke History screen or select **Options>Smoke History>Download** from the main screen. The Smoke History window opens, as shown in Figure 7-1.
2. **IIM Connection.** There are three alternatives:
 - a. If there is only one Detector on the IIM, follow the procedure for a Direct Detector Connection.

- b. For IIMs with more than one Detector, click on the button for a specific Detector. This opens the Display and Control window for that Detector. Then follow the procedure for a Direct Detector Connection.
- c. If no Display and Control windows are open, selecting **History** from the main screen connects to the Detector with the lowest address. The Smoke History screen will display the owner address in the blue bar across the top.

3. **Off-line Connection.** Select **History** from the main screen.

7-1.2 Downloading Smoke History from a Detector

With LaserNET communicating with the Detector and the History window open, the Detector's smoke history that is stored in the Detector can be downloaded to LaserNET. It is recommended to download and save the Detector's smoke history after any major event.

Download

Figure 7-2. Download Button

1. Select **Options>Download** from the menu bar. Alternatively, select the Download button shown in Figure 7-2.
2. The data download begins and a status box displays the progress of the download.
3. The download begins with the newest data and proceeds to the oldest.
4. The download can be stopped at any time by selecting **Options>Download** from the menu bar. Whatever data has been downloaded will be displayed.
5. When the download is complete, the smoke-level graph will display in the history window, as shown in Figure 7-3.

Notes:

- A complete download should take approximately three minutes. The time remaining for the download is shown in the status box.
- If an alarm or fault condition is generated during the download, the download window is minimized and LaserNET maintains a copy of the downloaded data.
- If the history window is manually minimized during downloading, downloading continues and the downloaded data is stored by LaserNET.
- The smoke levels displayed will reflect the adjusted values if signal averaging or referencing are selected as an option.

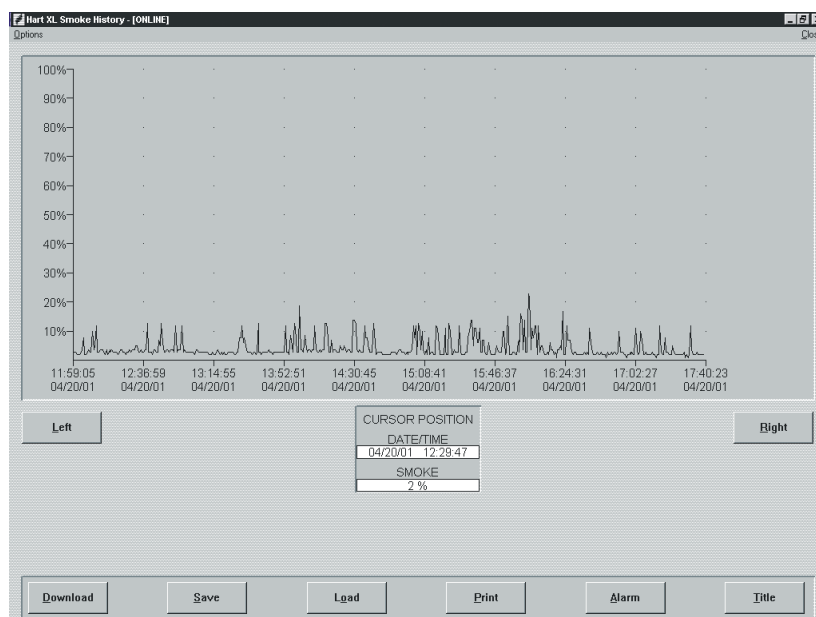


Figure 7-3. Smoke History Window With Data

7-1.3 Using the Smoke History Window

Several features are available for viewing the smoke history once it has been downloaded. The history graph is divided into equal segments with the date and time shown beneath each division on the horizontal axis and obscuration percentages given for the vertical axis.

7-1.3.1 ZOOMING

To zoom in on specific sections of the graph:

1. Place the cursor over one end of the range to be enlarged. The Cursor Position box will show the date, time and smoke level for the point beneath the cursor.
2. While holding down the left mouse button, move the cursor to the other end of the range, using the Cursor Position box as a guide if necessary. A rectangle will outline the range to be enlarged.
3. Select the Scroll Left and Scroll Right buttons (Figure 7-4 and 7-5) to view the history to the left or right of the displayed data.



Figure 7-4. Scroll Left Button



Figure 7-5. Scroll Right Button

4. To zoom out to the full graph, click on the right mouse button.

7-1.3.2 ALARM LEVELS

To superimpose the programmed alarm levels over the smoke history curve:

1. Select the Display Alarm Levels button, or select **Options>Alarm Levels** from the menu. The programmed alarm levels are shown.



Figure 7-6. Display Alarm Levels Button

2. The alarm levels are superimposed over the graph in dotted red lines. For a Direct Connection or IIM, there will be three such lines labelled Alarm 1, Pre-Alarm 2 and Pre-Alarm 1.

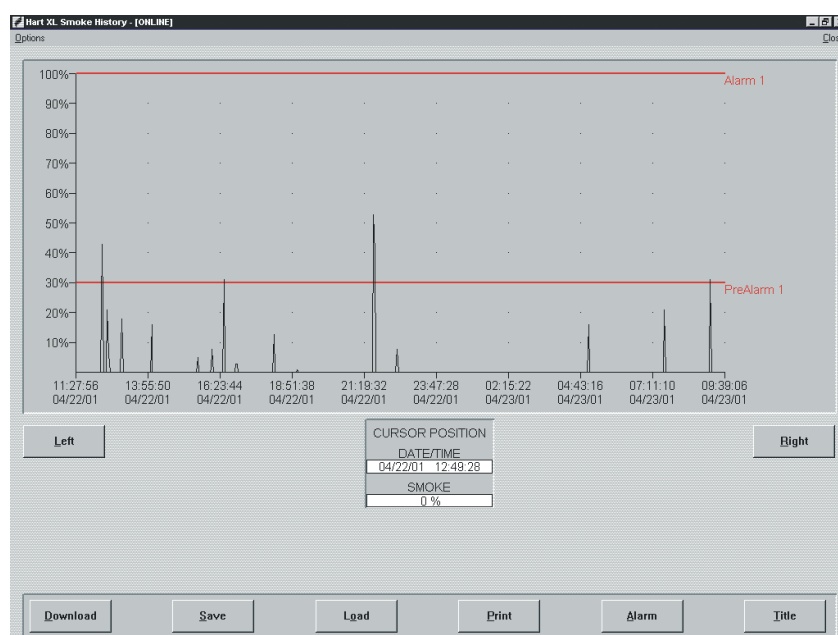


Figure 7-7. Smoke History Window Showing Smoke Data and Alarm Levels

- To remove the alarm levels from the display, click on the Alarm Levels button again or select Options, then Alarm Levels from the menu.

7-1.3.3 VIEWING RAW SMOKE LEVELS

When signal referencing is used, the smoke history graph displays the net smoke history in normal mode; that is, the raw smoke level minus the reference value. However, the raw smoke level alone can also be displayed as follows.

- Select **Options>Format>Raw Smoke** from the menu.
- The smoke history graph now displays the raw smoke level, but the vertical axis has been extended to show a range from 0% to 130%. This allows display of the raw smoke level before the reference value (a maximum of 30%) is subtracted. An example is shown in Figure 7-8.

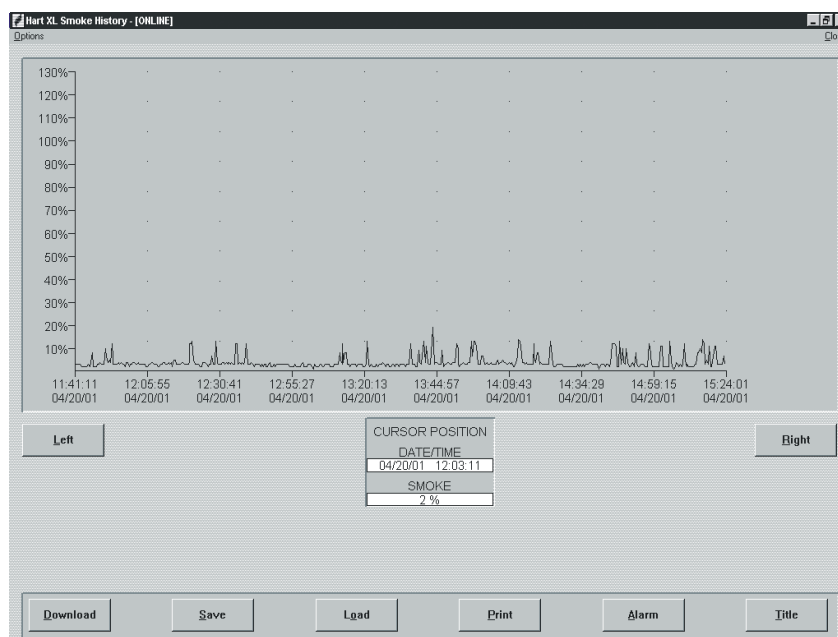


Figure 7-8. Smoke History Showing Raw Smoke Data

7-1.3.4 VIEWING SMOKE AND REFERENCE

This feature is only used when Referencing is enabled (see Paragraph 6-5.6). This graph takes the smoke level from the referencing Detector and subtracts it from the Detector's smoke level. A blue line indicates the smoke level for the referencing Detector.

7-1.3.5 DISCONTINUITY

Discontinuity is a feature that allows the user to view at what time a Detector was powered down. A yellow line will appear (as shown in Figure 7-9) to indicate a power-down time. This feature is useful because it allows a power-down time in the event of a smoke history event. It is suggested that the smoke history data be saved immediately after an event occurs. (See Paragraph 7-1.5 for further details on how to save smoke history.)

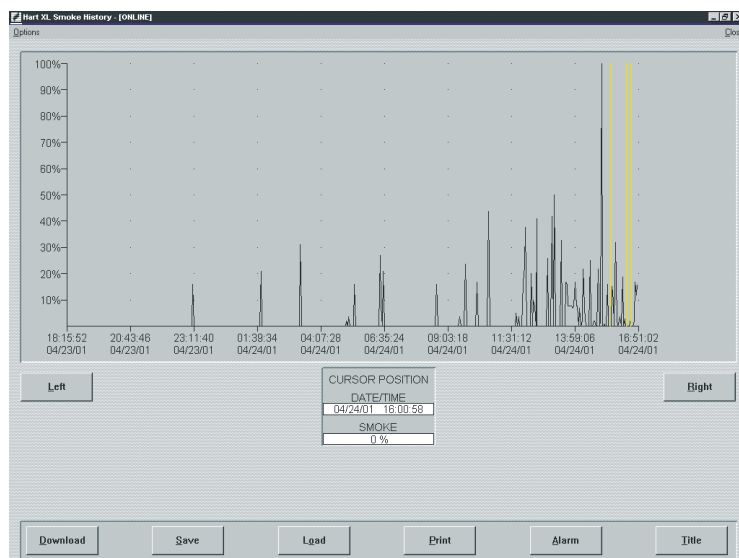


Figure 7-9. Discontinuity

7-1.4 Adding Titles and Comments

Titles and comments can be added to a data file and saved and printed with the smoke history graph.



Figure 7-10. Title and Comments Button

1. Select either the Title button (comments appears in the same window) or **Options>Titles** from the menu.

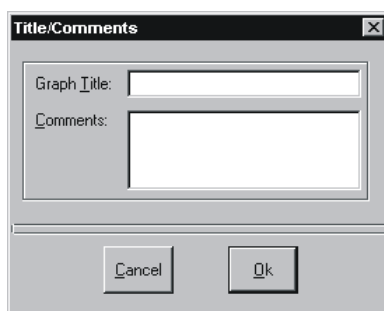


Figure 7-11. Title/Comment Window

2. Enter a title up to 59 characters long in the Graph Title field.
3. Enter a comment of up to 99 characters in the Comments field.
4. Select **<OK>** to save the title and comments as part of the data file.

7-1.5 Saving and Loading Smoke History To/From Disk

The smoke level history, once downloaded into LaserNET, can be saved to disk as a file for future reference. The files can then be retrieved and viewed off-line.

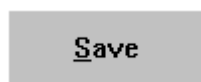


Figure 7-12. Save to Disk Button



Figure 7-13. Load from Disk Button

To save a file:

1. Select either the Save to Disk button or **Options>Save** from the menu.
The Save History Data window opens, as shown Figure 7-14.

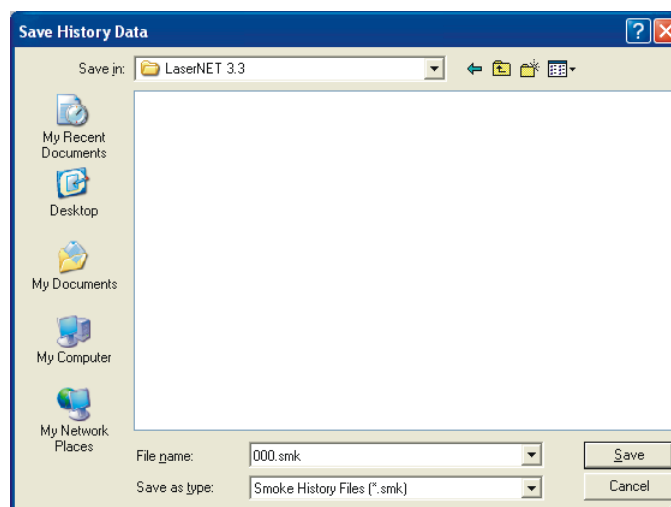


Figure 7-14. Save History Data Window

2. Enter a file name in the File Name field.
The file name will use the extension .SMK.
3. The file will be saved in the directory displayed in the Save in box. To change directories, double-click in the **Directories** box.
4. Select **<OK>** to save the file.

To view a saved file:

1. Select either the Load from Disk button or **Options>Load** from the menu. The Load History Data window opens, as shown in Figure 7-15.

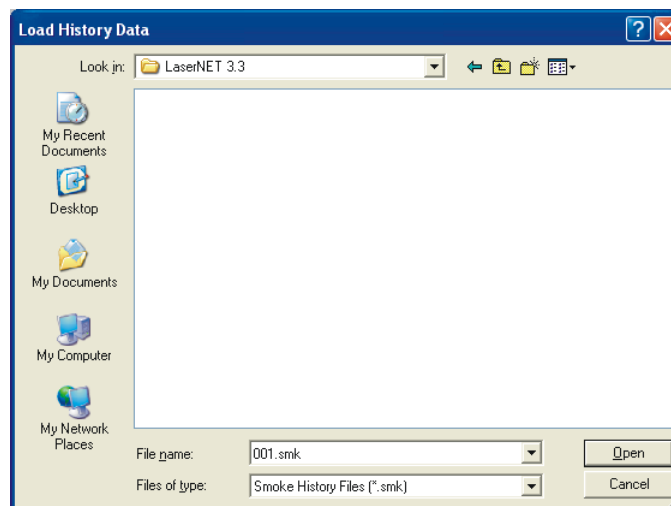


Figure 7-15. Load History Data Window

2. Enter the file to load by typing in the File Name field or double-click in the Files box. The file name will use the extension .SMK.
3. Select **<OK>** to load the selected file. The stored data will now display in the Smoke History window.

7-1.6 Printing a Smoke History Graph

This function prints the smoke history graph as displayed, including title and comments from the computer.

1. Select the Print button (Figure 7-16) or **Options>Print** from the menu. The Print Options window (Figure 7-17) opens.



Figure 7-16. Print Button

2. The smoke history graph can be printed in either landscape (horizontal) or portrait (vertical) orientation. The default is landscape. Select either **Landscape** or **Portrait**.
3. Select **<OK>** to begin printing.

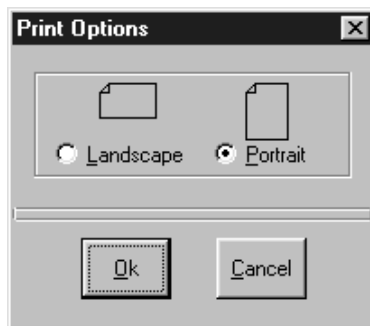


Figure 7-17. Print Options Window

7-1.7 Clearing the Smoke History Buffer

After a period of testing, the history buffer can be cleared to avoid confusion at a later time.

1. From the Display and Control window, select **Options>Smoke History>Clear**.
2. Select **<OK>** to clear the stored smoke history.

7-1.8 Setting Smoke History Sample Rate

The smoke history sample rate is programmable over a range of one sample every two to 60 seconds, in two-second increments. Since the history buffer can store up to 40,320 samples, the length of the monitoring time ranges from 22.4 hours to as long as 28 days. The table below shows typical examples.

Table 7-1. History Buffer Sample Intervals and Monitoring Times

History Buffer Sample Rate	Monitoring Time
2 Seconds	22.4 Hours
4 Seconds	44.8 Hours
8 Seconds	89.6 Hours
16 Seconds	7.4 Days
30 Seconds	14 Days
60 Seconds	28 Days

Note: The history buffer will be cleared when the sample rate is changed.

1. From the Display and Control window, select **Options>Smoke History>Sample Rate**. The History Buffer Update Period Window opens, as shown in Figure 7-18.

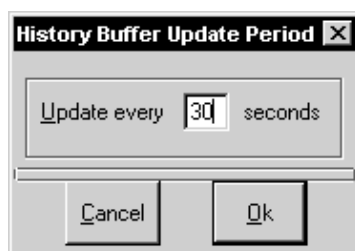


Figure 7-18. History Buffer Update Period Window

2. Enter a sample interval, between two and 60 seconds, in two second increments.
3. Select **<OK>** to save the configuration. A warning window will open asking to confirm that the History Buffer should be cleared.
4. Select **<OK>** to confirm and save the new sample rate.

7-2 EVENT HISTORY

Events can be alarms, fault conditions, operation functions and configuration changes. A complete list of events is shown in Table 7-2. Each Detector stores up to 128 events, each with a time and date stamp. Once the event log is full, the oldest event is written over with new event data.

7-2.1 Downloading an Event History From a Detector

With the Display and Control window open for a specific detector, and with LaserNET communicating with that detector, the event history stored in the Detector can be downloaded to LaserNET.

1. Select **Options>Event History>Download Event History**. The HART XL Event History window opens, as shown in Figure 7-19.

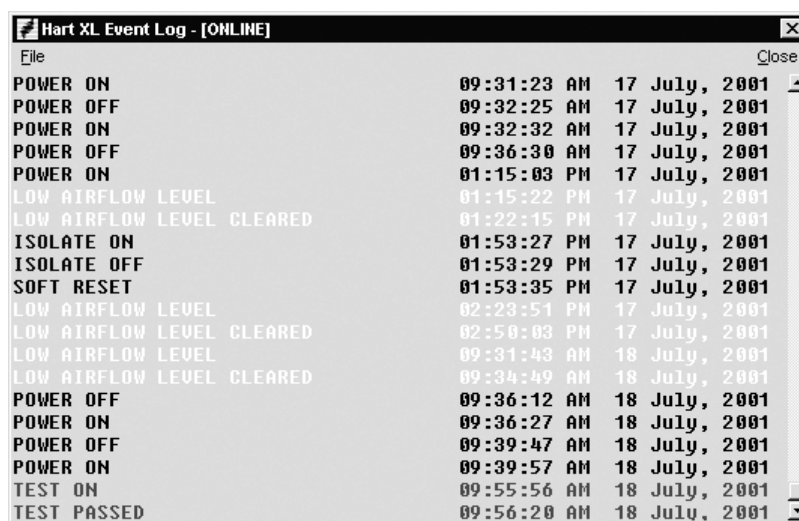


Figure 7-19. Event History Window

2. Each event and its time and date displays with the newest event at the top and the oldest at the bottom. Use the scroll bar to move up and down through all events.

7-2.2 Printing the Event History

1. From the HART XL Event Log window, select **File>Print**.

Table 7-2. Event History Types

Event Type	Color	Comment	Event Type	Color	Comment
Change to configuration	Black		Day/Night Mode activated	Black	
Pre-alarm 1	Red		Day/Night Mode deactivated	Black	
Pre-alarm 2	Red		Detector Trouble	Yellow	
Alarm 1	Red		Detector Trouble Cleared	Yellow	
Alarm 2	Red		LCD Trouble	Yellow	
Isolate On	Yellow		LCD Trouble Cleared	Yellow	
Isolate Off	Yellow		Alarm 2 Threshold Changed	Black	
Low Airflow On	Yellow		Pre-alarm 1 Threshold Changed	Black	
Low Airflow Off	Yellow		Pre-alarm 2 Threshold Changed	Black	
High Airflow On	Yellow		Alarm 1 Delay Changed	Black	
High Airflow Off	Yellow		Alarm 2 Delay Changed	Black	
Average On	Black		Pre-alarm 1 Delay Changed	Black	
Average Off	Black		Pre-alarm 2 Delay Changed	Black	
Power On	Yellow	Internal Failure	Averaging Period Changed	Black	
Power Off	Yellow	Internal Failure	History Update Changed	Black	
RAM fail	Yellow		Latching Trouble Setting Changed	Black	
ROM fail	Yellow		Time and Date Set At	Black	
Configuration RAM fail	Yellow		Latching Alarm Setting Changed	Black	
External PSU Fail	Yellow		Alarm Timed Latch Setting Changed	Black	
External PSU Fail Cleared	Yellow		PSU Trouble Delay Changed	Black	
Watchdog Timeout	Yellow	Internal Failure	Detector Trouble Delay Changed	Black	
History buffer cleared	Black		High Airflow Threshold Changed	Black	
Default configuration set	Black		High Airflow Delay Changed	Black	
Event log cleared	Black		Alarm 2 Night Threshold Changed	Black	
Pre-alarm 1 Off	Red		Cumulative Alarm Delay Changed	Black	
Pre-alarm 2 Off	Red		Alarm 1 Night Threshold Changed	Black	
Alarm 1 Off	Red		Pre-alarm 1 Night Threshold Changed	Black	
Alarm 2 Off	Red		Pre-alarm 2 Night Threshold Changed	Black	
Reference Out Enabled	Black		Pre-alarm 1 Night Delay Changed	Black	
Reference Out Disabled	Black		Pre-alarm 2 Night Delay Changed	Black	
Reference In Enabled	Black		Alarm 1 Night Delay Changed	Black	
Reference In Disabled	Black		Alarm 2 Night Delay Changed	Black	
Not Receiving Reference Data	Yellow		Day Time Changed	Black	
Not Receiving Reference Data Off	Yellow		Night Time Changed	Black	
Max/Min Levels cleared	Black		Reference Detector Changed	Black	
Detector Sensitivity Set	Black		Reference Mode Changed	Black	
LCD Communications Failure	Yellow		Password Changed	Black	
LCD Communications Failure Cleared	Yellow		Low Airflow Delay Changed	Black	
PCLine Fault	Yellow		Low Airflow Threshold Changed	Black	
PCLine Fault Cleared	Yellow		LCD Not Registered Trouble	Yellow	
Airflow Normalized	Black		LCD Not Registered Trouble Cleared	Yellow	
Auto Setup Enabled	Black		Display Sounder Settings Changed	Black	
LCD Registered	Black		Time Date Set To	Black	
LCD De-registered	Black		Hardware Reset	Black	
Test On	Black		Remote Reset	Black	
Test Off	Black		Soft Reset	Black	
Auto Setup Failed	Black		Test Passed	Black	
Auto Setup Success	Black		Test Failed	Black	
Auto Setup Terminated	Black		Trouble Relay Test	Black	
Airflow Test Activated	Black		Monitored Inputs Test Passed	Black	
Airflow Test De-activated	Black		Monitored Inputs Test Failed	Black	

7-2.3 Saving an Event History

A log can be saved as an ASCII text file and imported into any word processing program for viewing or printing.

1. From the HART XL Event History window, select **File>Save**. Figure 7-20 displays.

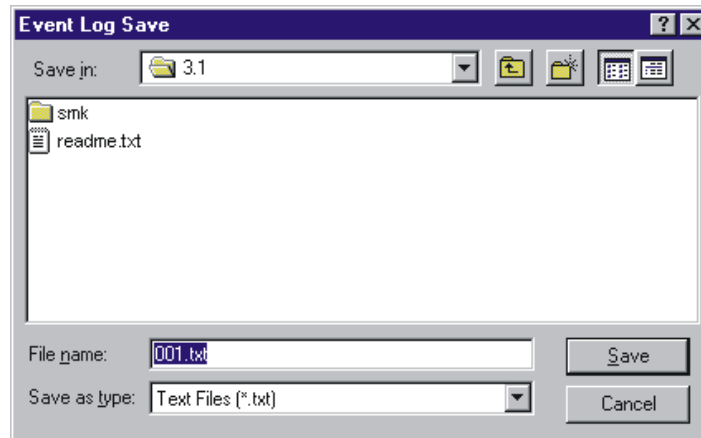


Figure 7-20. Event Log Save Window

2. The name of the file to be saved displays in the File Name field. The defaults are as follows:
For a Detector: No default name; any valid file name can be used.
3. Select **<OK>** to save the file.

7-2.4 Clearing the Event History

After a period of testing, the event history is usually cleared to avoid confusion in the future.

1. From the Display and Control window, select **Options>Event History>Clear Event History**. The Warning window opens, as shown in Figure 7-21.

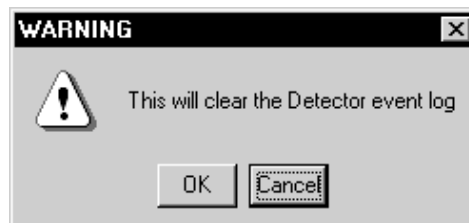


Figure 7-21. Warning Window, Event History

2. Select **<OK>** to clear the event history. A confirmation message will appear stating that the Event Log has been cleared.

7-3 **MAX/MIN SMOKE LEVELS**

Each Detector and IIM stores maximum and minimum smoke and airflow levels together with date and time stamps for each. This feature is only available when the Display and Control window is open for a specific detector and while LaserNET is communicating with that detector. These values are stored separately from smoke level history. If referencing is used, the stored smoke level values will be the adjusted levels.

7-3.1 Viewing Max/Min Smoke Levels

1. Select **Options>Max/Min Levels>View Max/Min Levels**. Figure 7-22 displays.

Max/Min Levels			
Smoke:	% Full Scale	% Obscur	Date / Time
Max Smoke Level:	> 100%	1.0168 %/m	01:58:13 PM 17 July, 2001
Min Smoke Level:	< 0%	0.0000 %/m	09:56:20 AM 18 July, 2001

Airflow:	Value	Threshold	Date / Time
Max Deviation:	50	20	09:29:19 AM 17 July, 2001
Min Deviation:	-50	-20	11:43:06 AM 13 July, 2001

Ok

Figure 7-22. Max/Min Levels Window

7-3.2 Clearing Max/Min Smoke Levels

1. Select **Options>Max/Min Levels>Clear Max/Min Levels**. A warning window will appear to confirm that the Max/Min Levels will be cleared.
2. Select **<OK>** to clear the stored values.

7-4 LASERNET SYSTEM LOG

LaserNET stores all events occurring at connected Detectors in the system log. Each event is time and date stamped. These events consist of alarms and fault conditions which are displayed in LaserNET while connected and communicating with detectors. It also stores operator functions initiated from LaserNET. A complete list of these events is shown in Table 7-3.

Table 7-3. System Log Types

Event Type	Color	Comment
No Event	Black	
Alarm 2	Red	
Alarm 1	Red	
Pre-Alarm 2	Red	
Pre-Alarm 1	Red	
Isolation	Blue	
Detector Fault	Yellow	
PSU Fault	Yellow	
Low Airflow Fault	Yellow	
High Airflow Fault	Yellow	
No Reference Data Fault	Yellow	IIM Only
Excessive Offset Fault	Yellow	IIM Only
User Log On	Black	
User Log Off	Black	
IIM Alarm	Red	IIM Only
IIM Alarm Supervision Failure	Yellow	IIM Only

Event Type	Color	Comment
IIM Fault	Yellow	IIM Only
IIM Fault Supervision Failure	Yellow	IIM Only
Illegal Access	Yellow	
IIM Disconnect from PC	Black	IIM Only
Other User Disconnection	Black	
Illegal Command	Yellow	Internal Failure
IIM Phone Supervision Failure	Yellow	IIM Only
IIM EEPROM Checksum Failure	Yellow	Internal Failure
IIM Style 6 Network Broken	Yellow	IIM Only
IIM Modem Missing	Yellow	Internal Failure
Hart XL/Detector Connection	Black	Detector Only
User Dialout	Black	IIM Only
User Hangup	Black	IIM Only
Modem Disconnect	Black	IIM Only
Local IIM Connection	Black	IIM Only
Remote IIM Connection	Black	IIM Only

The system log is designed primarily for use with the IIM. However, it also stores data in a Direct Connection. There are several things to consider when using the system log:

- The date and time stamps are derived from the computer's clock.
- Only events which annunciate on LaserNET are stored in the system log.
- Only operator actions originating from LaserNET are stored in the system log.

7-4.1 Downloading the LaserNET System Event Log

This can be done either on-line or off-line.

1. Select **System Log** from the main screen. Figure 7-23 displays.

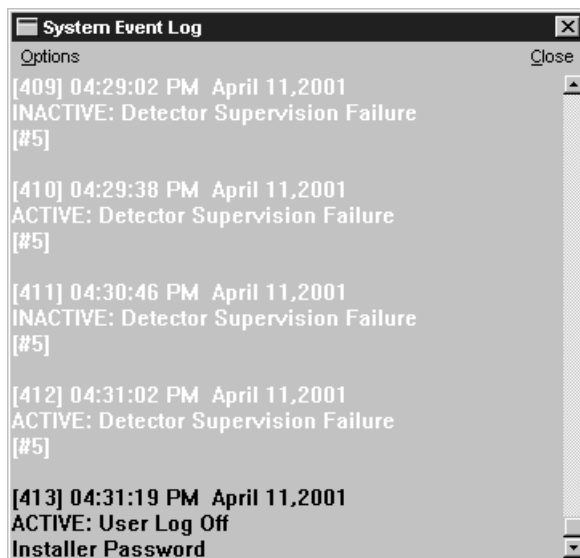


Figure 7-23. System Event Log Window

2. Each event is displayed, with the newest events at the bottom and the oldest at the top. Use the scroll bar to see all events. The data format is shown below:

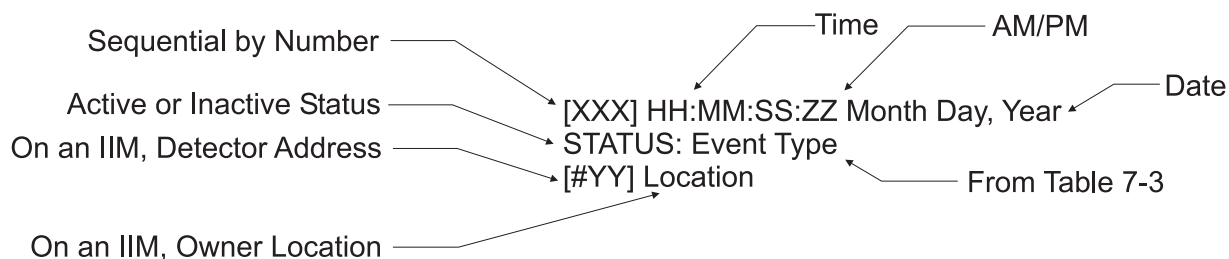


Figure 7-24. Event Display Description

7-4.2 Printing the LaserNET System Event Log

1. From the System Event Log window, select **Options>Print**. The Print System Event Log window opens, as shown in Figure 7-25.

Note: The total number of logged events displays just below the banner.

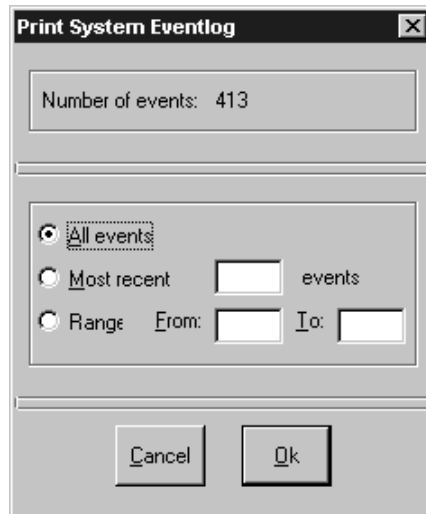


Figure 7-25. Print System Event Log Window

2. There are three ways to select which events will print:
 - a. All Events.
 - b. Most Recent. Check Most Recent and enter the desired number of events in the Events field.
 - c. Range. Check **Range** and enter the first and last events in the **From:** and **To:** fields.
 - d. Select **<OK>** to begin printing.

7-4.3 Saving the LaserNET System Event Log

The System Event Log can be saved as a text file to disk.

1. From the System Event Log window select **Options>Save as Text**. Figure 7-26 displays.

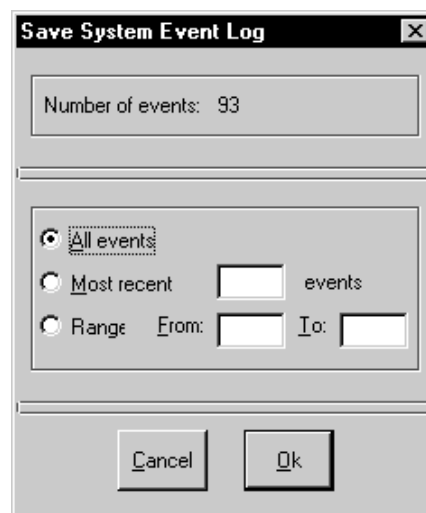


Figure 7-26. Save System Event Log Window

2. There are three ways to select which events to save:
 - a. All Events.
 - b. Most Recent. Check Most Recent and enter the number of events in the Events field.
 - c. Range. Check **Range** and enter the first and last events in the **From:** and **To:** fields.
 - d. Select **<OK>**. The System Event Log Save window opens, as shown in Figure 7-27.

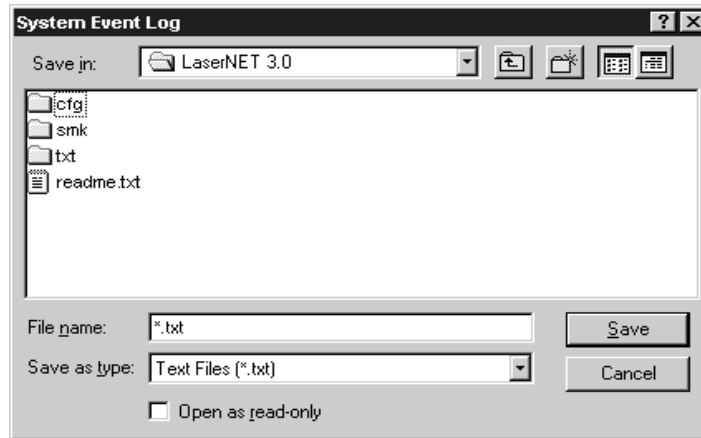


Figure 7-27. System Event Log Save Window

3. Enter the name in the File Name field. The extension .txt is added automatically, identifying it as an ASCII text file.
4. The directory where the file will be saved is displayed in the Save In box. To change directories, view all directories in the **Directories** box, and double-click on the one desired.
5. Select **<OK>** to save the file.

7-4.4 Clearing the System Event Log

After a period of testing, the system log should be cleared to avoid confusion in the future.

Note: No confirmation is requested when selecting this option, so proceed with caution.

1. From the System Event Log window select **Options>Erase Log**. The log is immediately erased without any further messages.

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