Local Management Terminal for Windows

User Guide
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▷ datum

NOTE …

The contents of any amendments may affect operation and/or maintenance of the equipment.

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1   Introduction

The Local Management Terminal for Windows (LMT) is a Windows 95/98 and Windows NT program that provides an easy-to-use graphical environment. Telecommunications network support and technical personnel can use this software to manage a Datum Synchronization Supply Unit (SSU- 2000) network element (NE) by means of a local terminal.

This user guide provides instructions for installing and using the LMT software for operation, administration, maintenance, and provisioning (OAM&P) of an SSU-2000 unit.

1.1   Product Overview

The LMT software allows you to communicate with an SSU-2000 unit to perform configuration, performance, security, event, fault, and alarm management tasks in the familiar Windows environment. The software provides an intuitive graphical interface in which to perform the functions of command line interfaces such as Interactive Command Set (ICS) or Transaction Language One (TL1).

Using LMT, however, you can monitor, set, store, and retrieve configuration settings; monitor system performance, events, and alarms; and manage user information for the SSU-2000 unit by clicking menu commands or selecting or typing values for configuration options organized in the interface by module type and function.

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You can see the SSU-2000 system status and view the event and alarms messages in real-time in the **LMT:SSU-2000** window. Configuring SSU-2000 main shelf (chassis) and expansion shelf modules is a matter of pointing to and selecting or typing the configuration value.

For example, to specify configuration options for a clock module, click on the clock module representation in the **LMT:SSU-2000** window. Then, select the clock module configuration options in the dialog box.

When you have made the configuration selections, click **OK** to store the configuration settings in a data file, validate the option values, and send the corresponding TL1 commands to the SSU-2000 unit to update the software or programmable hardware configuration for the selected clock module.

At the same time, the LMT updates the display of the system status and configuration settings. If configuration changes that you make generate event messages, the messages display in real-time in the message display area of the **LMT: SSU-2000** window.

1.2   Who Should Read This User Guide

This user guide is intended for system engineers, operations support, and technical personnel familiar with configuring and maintaining telecommunications equipment.

The procedures in this user guide make these additional assumptions:

■   Readers are technician-level personnel with experience in installing, operating, configuring, provisioning, maintaining, and troubleshooting telecommunication network equipment.

■   Readers are familiar with basic telecommunication terminology and concepts.

■   Readers are familiar with the Windows navigation and interface terminology.

■   Readers are familiar with the support and maintenance procedures, but need not be proficient in the use of TL1, ICS, or other command line interfaces.

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1.3   About This User Guide

This user guide contains the following sections and appendixes:

■   **Section 1: Introduction** — Provides an overview of this user guide and its intended audience. The section contains information about the stylistic and typographical conventions used in this guide, defines a list of other documents available for further reading, and describes where to find information about the LMT Software and other Datum products and documentation.

■   **Section 2: Software Overview** — Presents a functional description of the LMT for Windows software.

■   **Section 3: Installing and Starting LMT Software** — Provides complete instructions for installing the LMT software, making a connection to the SSU-2000 unit, and logging in to the software.

■   **Section 4: Getting Started** — Provides an introduction to using the LMT software. This section gathers the most common procedures to perform using the LMT software.

■   **Section 5: Navigating the LMT to Perform Common Tasks** — Provides a table listing the most common LMT tasks you will want to perform and how to perform them using the LMT menus and dialog boxes.

■   **Section 6: Using the LMT Menus** — Provides a guide to the LMT menu commands for performing data and security management, performance monitoring, and system configuration.

■   **Section 7: Overview of Configuring Modules** — Describes the general steps to follow to configure an SSU-2000 main or expansion shelf module and ports using the LMT module configuration dialog box options.

■   **Section 8: Configuring the Clock Module** — Provides an overview of the SSU-2000 clock module and a complete description of using the options in the Clock Module Configuration dialog box and tabs to configure the clock module.

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- **Section 9: Configuring the Communications Module** — Provides an overview of the SSU-2000 communications module and a complete description of using the options in the Communications Module Configuration dialog box and tabs to configure the communications module.

- **Section 10: Configuring the DS1 or E1 Output Module** — Provides an overview of the SSU-2000 DS1 and E1 output module and a complete description of using the options in the DS1/E1 Output Module Configuration dialog box and tabs to configure the DS1 and E1 output module.

- **Section 11: Configuring the DS1 or E1 Input Module** — Provides an overview of the SSU-2000 DS1 and E1 input module and a complete description of using the options in the DS1/E1 Input Module Configuration dialog box and tabs to configure the DS1 and E1 input module.

- **Section 12: Configuring the 2048 kHz Output Module** — Provides an overview of the SSU-2000 2048 kHz output module and a complete description of using the options in the 2048 kHz Output Module Configuration dialog box and tabs to configure the 2048 kHz output module.

- **Appendix A: LMT Data Files** — Contains a reference to format and contents of the data files created by the LMT software.

- **Appendix B: LMT Alarm and Event Messages** — Provides a guide to autonomous alarm and event messages displayed in the LMT software.

- **Glossary** — Contains a list of acronyms and abbreviations, and a definition of terms found in this user guide.

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1.4   Typographical and Other Conventions

This user guide uses the following conventions:

■   **Acronyms and Abbreviations** — Terms are spelled out the first time they appear in text. Thereafter, only the acronym or abbreviation is used. In addition, the glossary defines the acronyms and abbreviations.

■   **Revision Control** — The title page lists the printing date and versions of the product this user guide describes.

■   **References** — References to other documents include the name (and part number for Datum User Guides).

■   **Commands and User Interface Elements** — Menu commands, dialog boxes, dialog box tab, options, and other interface elements described in the user guide are termed as they appear in the LMT software. Table 1-1 describes the typographical conventions used to distinguish these elements in procedural topics.

Table 1-1.   Typographical Conventions

When Text Appears This Way …	It Means …
Local Management Terminal for Windows (Part Number: 12713155-00202) User Guide	The title of a document.
CRITICAL PORT-A	An operating mode, alarm state, status, or chassis label.
On the **File** menu, click **Exit**.	Menus and menu options you select (in the order given).

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Table 1-1.   Typographical Conventions (Continued)

When Text Appears This Way …	It Means …
Press the **Delete** key. Press the **Print Screen** key. Press the **Ctrl+V** key combination.	A named keyboard key. The key name is shown as it appears on the keyboard. An explanation of the acronym or function for the key immediately follows the first reference to the key, if required. For key combinations, press and hold down the first key while pressing the second key, then release both keys.
`SSU-2000>` `Username:`	Text in a source file or a system prompt or that appears in the LMT **Message** pane.
using *phase supervision* …	A term or a word being emphasized.
Datum ***does not*** recommend …	A word or term given special emphasis so that you do not miss the idea being presented.

1.5   Cautions, Tips, and Notes

Cautions, Tips, and Notes attract attention to essential or critical information in this user guide. The types of information included in each are explained in the following:

CAUTION …

All cautions have this form and symbol. *Do not* disregard cautions. They are installation, operation, or maintenance procedures, practices, conditions, statements, and so forth, which if not strictly observed, may result in damage to, or destruction of, equipment or may cause a long-term health hazard.

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TIP …

All tips have this form and symbol. Tips contain information that may make your task easier to perform or understand.

NOTE …

All notes have this form and symbol. Notes contain installation, operation, or maintenance procedures, practices, conditions, statements and so forth, that alert you to important information which may make your task easier or increase your understanding.

1.6 Related Documents

Refer to the *SSU-2000 Synchronization Supply Unit* (Part Number: 12713020-002-2) User Guide for more information about the SSU-2000 unit. See your Datum representative or sales office for a complete list of available documents or copies.

NOTE …

Datum offers a number of applicable training courses designed to enhance product usability. Contact your Datum representative or sales office for a complete list of courses and outlines.

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1.7 Where to Find Answers to Product and Document Questions

If you believe that this product is not performing as expected, or if you have comments about this user guide, please contact your Datum Inc. representative or sales office. You may also complete and send in the *Reader Comment Form* located in the back of this user guide.

We appreciate your suggestions for ways to improve any aspect of the user guide. You may mark suggestions on a copy of the page and include it with the comment form.

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2   Software Overview

The Local Management Terminal (LMT) for Windows Version 1.0 software, supplied on CD-ROM, is your tool for communicating configuration, operation, maintenance, and other commands to and receiving performance and other monitoring information from an SSU-2000 unit.

This section provides a high-level introduction to the LMT software. To read specific procedures about installing and using the LMT software, see these sections:

■ **Section 3: Installing and Starting LMT Software** — How to install the LMT software on a desktop or portable computer, make a direct serial connection to an SSU-2000 unit, and log on.

■ **Section 4: Getting Started** — Introduction to the LMT software interface and using the LMT software to perform basic security and data management procedures.

■ **Section 5: Navigating the LMT to Perform Common Tasks** — Description of navigating in the LMT:SSU-2000 window, menus, and dialog boxes, and keyboard commands and techniques.

■ **Section 6: Using the LMT Menus** — Summary of the LMT menu commands for performing data and security management, performance monitoring, and system configuration tasks.

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■ **Section 7: Overview of Configuring Modules** — Overview of using the LMT module configuration dialog boxes, tabs, and options for configuring and provisioning unit modules. Specific information about configuring modules can be found in these sections:

❑ **Section 8: Configuring the Clock Module** — Describes how to use the Clock Module Configuration dialog box options.

❑ **Section 9: Configuring the Communications Module** — Describes how to use the Communications Module Configuration dialog box options.

❑ **Section 10: Configuring the DS1 or E1 Output Module** — Describes how to use the DS1/E1 Output Module Configuration dialog box options.

❑ **Section 11: Configuring the DS1 or E1 Input Module** — Describes how to use the DS1/E1 Input Module Configuration dialog box options.

❑ **Section 12: Configuring the 2048 kHz Output Module** — Describes how to use the 2048 kHz Output Module Configuration dialog box options.

2.1   Control Languages and the LMT Software

Software embedded in the SSU-2000 hardware allows you to change factory defaults or other stored configuration settings, or to customize the unit to meet the requirements of a unique environment.

Operators can control the SSU-2000 unit by using a command line protocol such as the Transaction Language One (TL1) or Interactive Command Set (ICS) control languages, or by using the Local Management Terminal (LMT) for Windows software.

■ The TL1 control language is perhaps the dominant telecommunications industry ASCII command line interface with security-level access to command functions.

■ The ICS control language is an ASCII command line interface with security-level access to command functions.

Although these control languages are highly functional, they require familiarity with the syntax and statements of each language.

Datum's Local Management Terminal for Window (LMT) software takes advantage of an easy-to-use graphical point-and-click environment that creates TL1 and ICS commands automatically.

LMT software allows you to completely control and monitor the SSU-2000 system with little or no knowledge of command line control languages. Using the LMT software, you easily and quickly control and monitor the SSU-2000 unit using simple and familiar Microsoft Windows point-and-click procedures for:

■   Selecting commands from menus.

■   Selecting the unit and modules to configure or monitor.

■   Setting configuration options and parameters in dialog boxes.

■   Using point-and-click commands to store or retrieve data files containing sets of configuration options created to meet particular application requirements.

■   Monitoring real-time system status and event messages in the **LMT:SSU-2000** window.

📄   **NOTE …**

For more information about the TL1 and ICS command languages, see the *SSU-2000 Synchronization Supply Unit* User Guide (Part Number: 12713020-002-2) or contact your Datum sales representative.

📄   **NOTE …**

The LMT version 1.0 software is fully compatible with the SSU-2000 hardware with Revision B of the SSU-2000 software installed. Datum does not guarantee that LMT software will operate correctly on Datum equipment with Revision A of the SSU-2000 software.

If you want to upgrade to Revision B of the SSU-2000 software, contact your Datum sales representative or call Customer Service at (512) 721-4000 between 8 a.m. and 5 p.m. CST.

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2.2 Features and Benefits of the LMT Software

The LMT software allows you to perform the TL1 or ICS control and monitor functions supported by the software of the SSU-2000 unit with these additional benefits and features:

■ **Data Management** — Specify a location for storing data files, and manage user information.

■ **Performance Monitoring** — Build queries for phase, Maximum Time Interval Error (MTIE), and Time Deviation (TDEV) performance and event data, and display phase history.

■ **System Configuration** — Test network connections and assign and view port or module names.

■ **System Monitoring:**

❑ Select hardware component to control or monitor by clicking on a graphical representation of the system.

❑ View real-time, color-coded status display for each port or module, reference LED for input modules, clock mode LEDs for clock modules, and alarm and event information for module or for system.

❑ View configuration settings appropriate for the selected port or module.

❑ Enable or remove port or module while system is operating.

❑ Control framing type, input frequency, Synchronization Status Message (SSM), Cyclic Redundancy Checking (CRC), zero suppression, and control port quality settings graphically.

❑ Control input signal alarm thresholds, signal error, and clear counts.

❑ Restore factory or user defaults.

❑ View graph of current phase data.

❑ View service information for a port or module.

❑ Apply the current output card configuration to all cards; copy the port configuration to all ports; make the current configuration the user default.

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2.3   Hardware and Software Requirements

Before installing the LMT software, verify that your system configuration meets these minimum hardware and software requirements:

■ IBM PC-compatible computer with a 133 MHz Pentium class or better microprocessor, with a minimum of 32 MB of RAM, and a CD-ROM drive.

■ Direct serial port and serial cable for connection to an SSU-2000 unit.

■ Windows NT or Windows 9x (or later release) operating system.

■ Video card capable of displaying at least 256 colors.

■ Monitor capable of displaying 800 x 600 resolution.

■ Available disk storage space of at least 50 MB.

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2.4   Windows Terms You Should Know

Table 2-1 defines basic Windows terms used in the procedures described in this section.

Table 2-1.   Windows Terms and Definitions

Term	Definition
Click	Press and release the left (or default) mouse button.
Double-click	Click the left (or default) mouse button two times in rapid succession.
Right-click	Click the right (or alternate) mouse button.
Check or clear	Click in a check box to select (turn on) an option; click in a checked box to clear (turn off) an option.
Window	Standard Windows object, such as the **LMT:SSU-2000** Window, used to display a specific kind of information. The **LMT:SSU-2000** Window displays a graphical representation of the SSU-2000 selected shelf.
Dialog box	A secondary window used to collect information. For example, the Data Directory Dialog Box is a standard file browser dialog box that opens when you click **Data Directory** on the **File** menu.
Dialog box tab	Dialog box control that is analogous to a divider in a notebook. Click on the tab label to bring the tab to the front of the tab stack. Tabs allow dialog boxes to contain multiple pages of information arranged logically by subject or function. For example, the GPS Configuration dialog box contains the Configuration Management tab, Alarm Settings tab, Current Alarms tab, and Module Information tab.

Table 2-1.   Windows Terms and Definitions (Continued)

Term	Definition
Wizard	Special sequence of dialog boxes that guide you through a process by providing instructions and collecting the answers to questions. The Setup.exe installation routine is an example of a wizard that guides you through the installation process, while capturing information about where you want the software to be installed, where to store the **Start** menu icons, and so on.
Default	Preconfigured settings. Default settings generally reflect the most common or typical application. The SSU-2000 default configuration settings are stored in the hardware at the factory, and can be overwritten by user-selected settings. The LMT software allows you to save custom settings as User Defaults, or restore User or Factory default settings.
Active	Window, dialog box, or dialog box tab that receives input.
Label	Text or graphic caption that identifies the name of the control.

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3   Installing and Starting LMT Software

This section describes how to install and start Local Management Terminal (LMT) for Windows.

3.1   Preparation

Before you install LMT for Windows, make sure you have:

■   An IBM PC or compatible computer or laptop with a Pentium-class microprocessor, a minimum of 32 MB RAM, a mouse or similar device, and monitor.

■   The LMT for Windows CD-ROM.

■   Windows 9x or NT operating on the computer or laptop.

■   Available disk storage space of at least 50 MB.

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3.2   Installing LMT for Windows

This section describes how to install LMT for Windows on a stand-alone computer or laptop that can be connected to an SSU-2000 unit.

The LMT software is installed from a CD-ROM using a standard Windows installation setup routine or wizard. Depending on how the computer or laptop is set up, if you have the Windows Device Manager System Properties set up to play CDs automatically when loaded, the SETUP.EXE automatically starts.

▶ **To start SETUP.EXE manually:**

1. From the **Start** menu, click **Run** to open the Windows Run dialog box. (See Figure 3-1.)

2. Click **Browse** to open the Browse dialog box. Navigate to the CD-ROM drive and select SETUP.EXE. (See Figure 3-2.)

3. Click **Open** to start the installation routine. Follow the instructions in the installation dialog boxes.
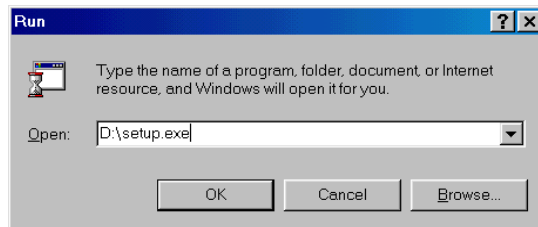
Figure 3-1.   Windows Run Dialog Box

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Figure 3-2. shows a Browse dialog box with "Look in: LMTV1-5-5B", a RunTime folder, SETUP.EXE highlighted, File name: SETUP.EXE, Files of type: Programs, and Open/Cancel buttons.
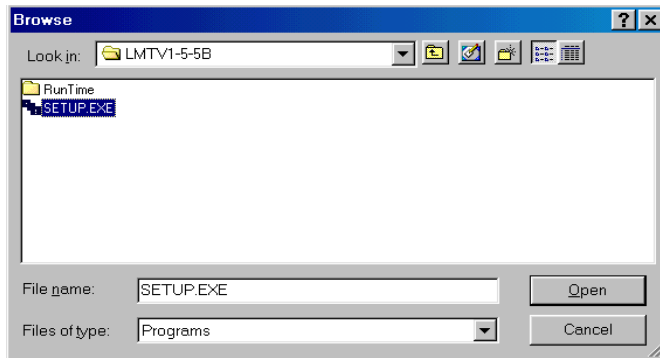
Figure 3-2.   Windows Browse Dialog Box

3.3   Starting LMT for Windows

After you install the LMT software, open it as you would any Windows program.

▶ **To start the LMT for Windows:**

Do one of the following:

■ On the desktop, double-click the LMT icon.

■ From the Windows **Start** menu, select the LMT software from the menu.

■ In the Windows Explorer program, locate the LMT program in the file system, and double-click the LMT program icon or file name.

■ In the My Computer window, locate the LMT software in the window and double-click the file or icon.

3.4 Uninstalling LMT for Windows

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▶ **To uninstall the LMT software:**

1. From the Windows **Start** menu, click **Settings**, click **Control Panel,** and then click the **Add/Remove Programs** (Figure 3-3) icon to open the Add/Remove Programs Properties sheet (Figure 3-4).

2. Select **LMT for Windows** from the list of programs.

3. Click **Add/Remove** to remove the software from your hard drive.

4. Click **OK** to close the dialog.

5. On the **File** menu, click **Close** to exit the Control Panel window.
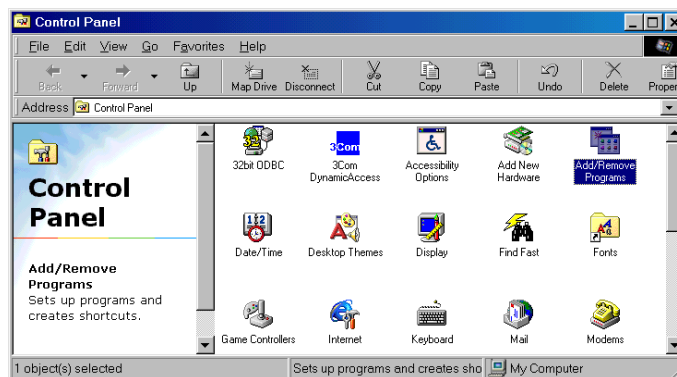
Figure 3-3.   Windows Control Panel

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.
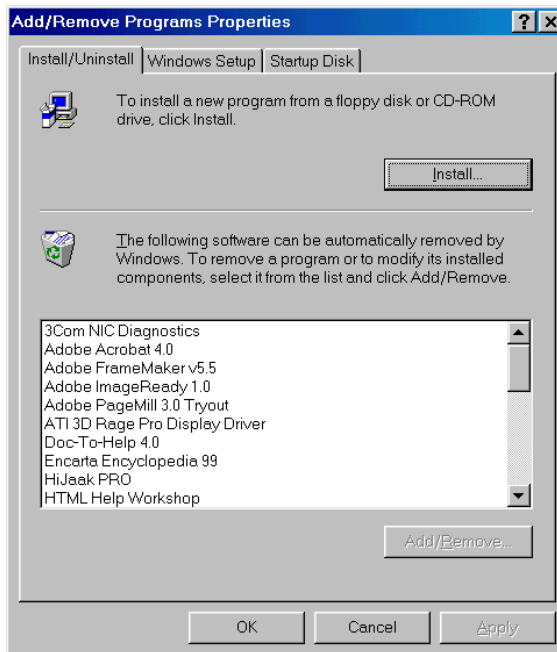
Figure 3-4.   **Windows Add/Remove Programs Properties Sheet**

📄 **NOTE …**

If you have questions about installing or using LMT software, contact Datum Customer Service at: 512-721-4032 (8:00 a.m. to 5 p.m., Monday through Friday CST) or during after hours, weekends, and holidays call 512-721-4000.

■ **Fax numbers**: 512-251-9685 or 512-721-4033.

■ **E-mail address**: custserv@austron.datum.com.

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4 Getting Started

This section provides a brief introduction to using the Local Management Terminal for Windows (LMT) to perform these basic tasks:

■ Connect to the SSU-2000 unit, and starting LMT software. (See Section 4.1.)

■ Manage SSU-2000 system security. (See Section 4.2.)

■ Log on and off. (See Section 4.3.)

■ Learn about the LMT window elements. (See Section 4.4.)

■ Create and manage configuration data files. (See Section 4.5.)

■ Print data files and graphs using spreadsheet or similar software. (See Section 4.6.)

4.1 Connecting to the SSU-2000 Unit

Before you can start the LMT software, you must be connected to the SSU-2000 unit. The SSU-2000 unit has three RS-232-C serial communications ports. Attach a terminal device with LMT software installed to one of the ports. Figure 4-1 illustrates how to connect the terminal to the local port on the communications module.

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▶ To connect the terminal to the SSU-2000 serial port:

1. Secure one end of the direct serial cable to the serial port of the PC or laptop where the LMT software is installed.

2. Secure the other end of the cable to an SSU-2000 serial port (Figure 4-1).

Laptop computer
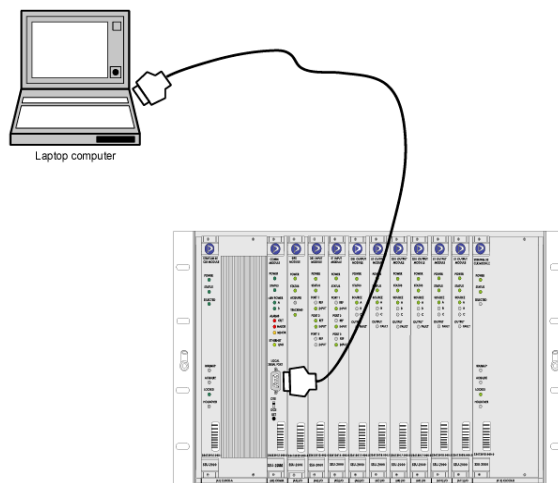
Figure 4-1.   Connecting a Terminal to the SSU-2000 Serial Port

▶ To change serial ports:

If the LMT software cannot connect to the configured serial port, the Could Not Connect dialog box opens with options for changing the serial port or retrying the current port:

1. Select a serial port from the list.

2. Click **OK** to make the change and close the dialog box.

   OR

   Click **Cancel** to close the dialog box without making changes.

4.2   Managing System Security

The SSU-2000 security system software allows Administrators to manage access to operating limits and functions. The security level assigned to each user determines which options are available while using the LMT software. For more information about system privileges, see your SSU-2000 System Administrator and refer to the *SSU-2000 Synchronization Supply Unit* (Part Number: 12713020-002-2) User Guide.

Using the LMT software, System Administrators with Administrative security level privileges can add, delete, and modify user information and assign passwords (Section 4.2.1). After the System Administrator assigns your password, you can change the password (Section 4.2.2).

4.2.1   Managing User Information

Follow the instructions below to manage user information in the system. If no users have been added, you can log on using the default ADMIN user name and null password. Table 4-1 lists the system default user names and security levels. Default user names cannot be deleted.

When users have been added, the default administrative user log on is void, and all users must enter a valid user name and password to log in.

Table 4-1.   Default User Names, Security Levels, and Passwords

User Name	Security Level	Password Requirements
GUEST	1	No password required.
ADMIN	4	No password required if no other users have been added; otherwise, a password or backdoor password is required. **Note:** The backdoor password changes daily based on the current date setting within the SSU-2000 unit.

▶ **To add a user:**

📝 **NOTE …**

When adding users, always add a *security level 4* user first. If you add a user below a level 4 first, and that user logs off, you would not be able to add, delete, or modify user information. In this case, contact Datum Customer Service at 512-721-4000 (voice), 512-251-9685 (Fax), or send email to custserv@austron.datum.com.

For more information see the *SSU-2000 Synchronization Supply Unit* (Part Number: 12713020-002-2) User Guide.

1. On the **System Configuration** menu, click **User Management**. The User Manager dialog box opens (Figure 4-2).

Figure 4-2.   User Manager Dialog Box

2. From the **User** list, select the username to add. Click **Add User**. The New User dialog box opens (Figure 4-3).
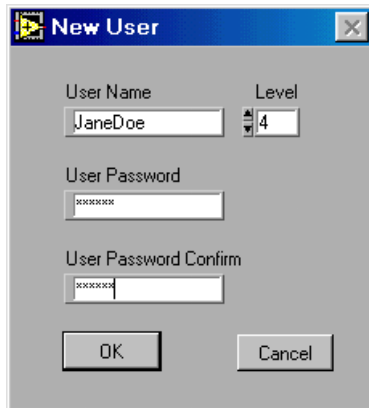
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Figure 4-3.   New User Dialog Box

3. Complete Step 4 and Step 5 below to assign a password for the user.

   OR

   Click **OK** to add the user information with a null password.

4. Type the password to use in the **User Password** text box. As you type, the characters appear as asterisks (*) in the text box. Press **Enter**. The cursor moves to the **User Password Confirm** text box.

5. Re-type the password in the **User Password Confirm** text box. Click **OK** to assign the password, add the user information, and close the dialog box.

   OR

   Click **Cancel** to cancel adding the user information and close the dialog box.

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▶ To delete a user:

1. From the **System Configuration** menu, click **User Management**. The User Manager dialog box opens (Figure 4-2).

2. Select the user name you want to delete from the **User** list. Click **Delete User**. A message box opens (Figure 4-4).
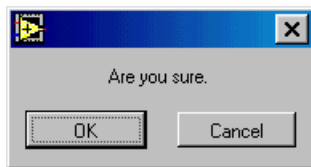
Figure 4-4.   Delete User Message Box

3. Click **OK** to delete the user information and close the dialog box.

   OR

   Click **Cancel** to save the user information and close the dialog box.

▶ To edit user information:

1. From the **System Configuration** menu, click **User Management**. The User Manager dialog box opens (Figure 4-2).

2. Select the user name you want to edit from the **User** list. Click **Edit User**. The Edit User dialog box opens (Figure 4-5).

4
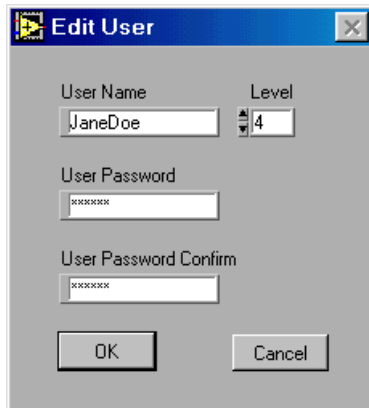
Figure 4-5. **Edit User Dialog Box**

3. To change the user name, type the changes in the **User Name** text box.

4. To change the security level for a user, click in the **Level** text box and type the security level number.

OR

Use the **UP ARROW** or **DOWN ARROW** to scroll to the number you want in the list of security level numbers.

5. To assign a password for a user, type the password to use in the **User Password** text box. As you type, the characters appear as asterisks (*) in the text box. Press **Enter**.

6. Re-type the password in the **User Password Confirm** text box.

7. Click **OK** to save your changes and close the dialog box.

OR

Click **Cancel** to cancel the changes and close the dialog box.

4.2.2   Changing Passwords

Passwords are not case sensitive and may contain a maximum of 10 characters consisting of both letters and numbers.

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▶ **To change your personal password:**

1. From the **System Configuration** menu, click **User Management**. The User Manager dialog box opens (Figure 4-2).

2. Select your user name in the **User** list. Click **Edit User**. The **Edit User** dialog box opens (Figure 4-5).

3. Type the password you want to use in the **User Password** text box. As you type, the characters appear as asterisks (*) in the text box. Press **Enter**.

4. Re-type the password in the **User Password Confirm** text box.

5. Click **OK** to change your password and close the dialog box.

   OR

   Click **Cancel** to cancel the password change and close the dialog box.

4.3   Logging On and Off

After connecting the SSU-2000 unit (see Section 4.1), you are ready to log on the SSU-2000 unit. If you log on the SSU-2000 unit, and one or more users are already logged on, they see an event message in the *message display area* of **LMT:SSU-2000** window. (See Section 4.4.) An event message appears in the event log and displays in the message area of the **LMT:SSU-2000** window.

> ⚠ **CAUTION …**
>
> ***Do not*** attempt configuration tasks while other users are logged on the SSU-2000 unit without confirming your intentions with the other users. Otherwise, configuration data may be overwritten.

You can log on the SSU-2000 unit using TL1 commands, ASCII commands, or the LMT software. The first time you log on the SSU-2000 unit after power-up, the communications interface provides a default user name ADMIN and a null password. This one-time log on:

- Grants you Administrator security access level user privileges

- Lets you access all system levels and functions

- Remains in effect until you add users.

After adding users, you must log on as usual, provide your assigned user name and password.

📝 **NOTE …**

When adding users, always add a *security level 4* user first. If you add a user below a level 4 first, and that user logs off, you would not be able to add, delete, or modify user information. If this happens, contact Datum Customer Service at 512-721-4000 (voice), 512-251-9685 (Fax), or send e-mail to custserv@austron.datum.com.

For more information, see the *SSU-2000 Synchronization Supply Unit* (Part Number: 12713020-002-2) User Guide.

▶ **To log on for the first time:**

1. Start the LMT software as you would any Windows software. For example:

   ❑ On the Windows **Start** menu, click the LMT icon.

     OR

   ❑ On the desktop or Windows Explorer, double-click the LMT icon.

2. In the Login dialog box (Figure 4-6), type **ADMIN** in the **Name** text box.

4

3. Click **OK** to save the changes and close the dialog box.

    OR

4. Click **Cancel** to close the dialog box without saving changes.
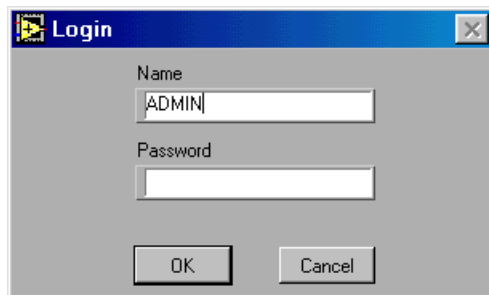
Figure 4-6.   Login Dialog Box

▶ **To log on after users have been assigned:**

1. Start the LMT software as you would any Windows software. For example:

    ❑ From the Windows Start menu, click the LMT icon.

        OR

    ❑ From the desktop or Windows Explorer, double-click the LMT icon.

2. In the **Login** dialog box, type your user name in the **Name** text box. Press **Tab**.

3. Type your password in the **Password** text box. Your password displays as asterisks in the text box.

4. Click **OK** to log on and close the dialog box.

    OR

5. Click **Cancel** to close the dialog box without logging on.

4

4.4   Understanding the LMT:SSU-2000 Window

When you start the LMT software, the **LMT:SSU-2000** window displays the standard Windows components listed below. Figure 4-7 shows an example of the window.

■   **Title Bar** — The horizontal bar at the top of the window that displays the window name and provides controls for activating, dragging, or resizing the window.

■   **Menu Bar** — The horizontal bar at the top of the window below the title bar. The **LMT:SSU-2000** window menu bar contains these menu titles: **File**, **Performance Monitoring**, and **System Configuration**.

■   **LMT:SSU-2000 Window Display Area** — The display area of the window shown in Figure 4-7 contains the *module status display* and *message display* portions of the window.
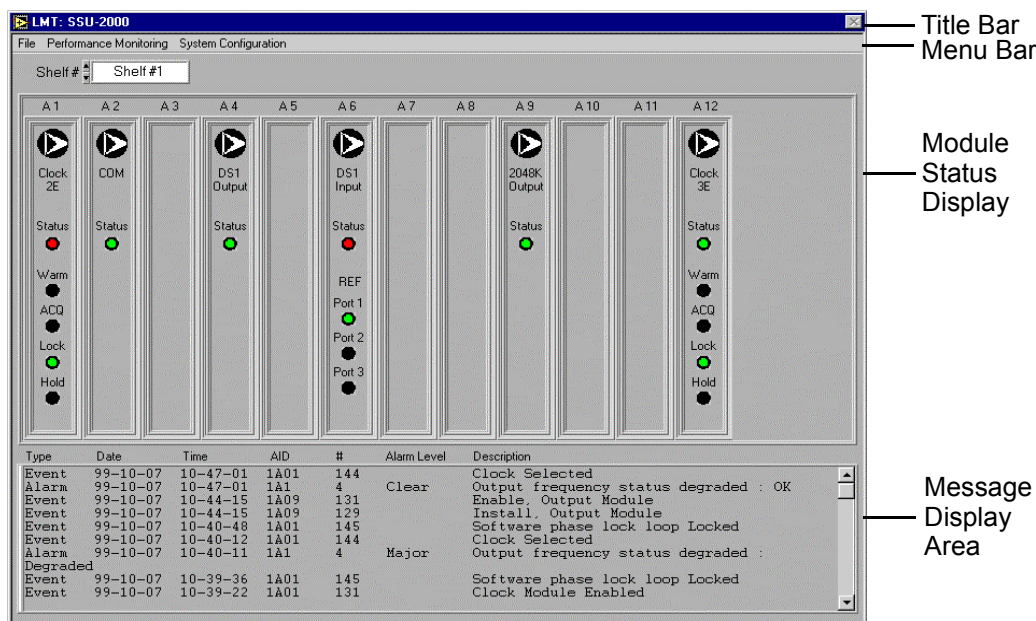
Figure 4-7.   LMT:SSU-2000 Window (Shelf #1: main shelf)

4

4.5   Managing Data Files

LMT stores the configuration settings that you enter in the LMT interface in a number of data files. When LMT connects to the SSU-2000 unit, it receives information from the communications module regarding the current hardware and software configuration settings. LMT creates the default data file set and stores the settings. You can select a location for the data file repository.

For a complete list of the LMT data files, information about the data file naming conventions, and data file contents, see Appendix A.

▶ **To choose the data file folder:**

1. From the **File** menu, click **Data Directory**.

2. In the Data Directory dialog box (Figure 4-8), select an existing folder or create a new data folder for the data files.

📄 **NOTE …**

Data is saved in a number of specific data files contained in the default folder or another folder you specify.

When you log on to the SSU-2000, the LMT software receives the configuration settings from the SSU and stores them in the appropriate data file.

When you click OK in a configuration dialog box or make a change that would require that the LMT software update a data file, if a data file already exists in t he currently selected data folder, the LMT software asks if you want to save the changes in the current data file folder (overwriting the existing data) or write the data to a new .csv data file in another folder.

For more information about the LMT data files, see Appendix A.
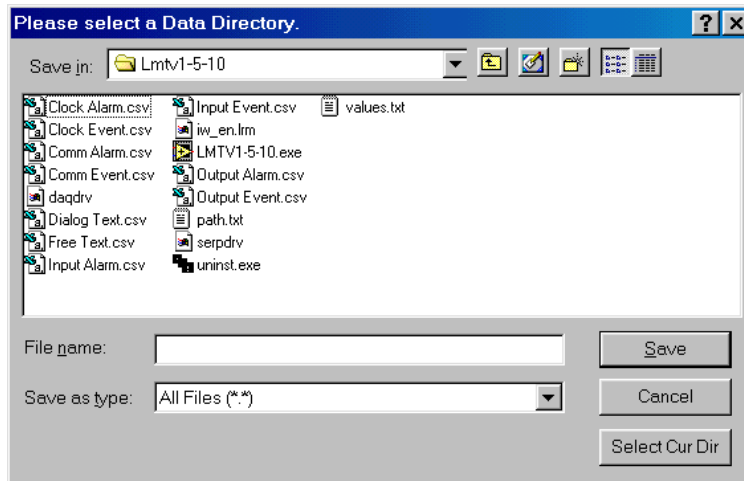
Figure 4-8.   Data Directory Dialog Box

▶ **To save data:**

■ Click **OK** in a module configuration dialog box.

■ In the Overwrite Data message box:

❑ Click **Overwrite** to save the data in the appropriate data file of the current data folder.

   OR

❑ Click **Change Directory** to keep the existing data, save current configuration settings to a data file of the same name in another data folder, and close the dialog box.

4

▶ To overwrite the existing data:

1. Click **OK** in a configuration dialog box.

2. In the Overwrite Data message box, click **Overwrite**. The LMT software overwrites the existing data in the current data folder.

▶ To save the configuration settings:

■ Click **OK** in the configuration dialog box to update the data file and send the configuration data to the SSU-2000 unit.

LMT validates the configuration values you have entered, adds the values to the proper configuration data file, and sends the information to the SSU-2000 unit to update the unit or module.

▶ To view data offline:

■ Open the LMT Comma Separated Value (*.csv*) data files in Microsoft Excel or any application that accepts the comma delimited field format for offline viewing.

4.6   Printing

You can print LMT graphs and data by opening the data files in a spreadsheet or similar program that supports the *.csv* (Comma Separated Value) file format (for example: Microsoft Excel).

5

5 Navigating the LMT to Perform Common Tasks

This section provides a general description of getting around in the LMT:SSU-2000 interface:

- **Using the LMT:SSU-2000 Window** — Section 5.1 describes using the **LMT:SSU-2000** window of the Local Management Terminal for Windows (LMT) software.

- **Performing Common Tasks** — Section 5.2 includes tables which describe common LMT tasks and instructions for performing them.

- **Using Keyboard Commands** — Section 5.3 describes common keyboard techniques for navigating in the **LMT:SSU-2000** window, menus, and dialog boxes.

5.1 Using the LMT:SSU-2000 Window

The **LMT:SSU 2000** window opens after you successfully log on to the SSU-2000 unit. This window provides the controls you use to perform LMT functions. Controls are available either as commands on the LMT menus, or as options in configuration dialog boxes and dialog box tabs.

The **LMT:SSU-2000** window menu bar offers these menus:

■   **File Menu**

■   **Performance Monitoring Menu**

■   **System Configuration Menu**

5

For detailed descriptions of each menu command, see Section 6.

The **LMT:SSU-2000** window contains controls for selecting the main or expansion shelf (chassis) and the module to configure, viewing the module status indicators, opening configuration dialog boxes, and viewing event messages.

■   **Shelf #** — Click on the list to display the list (Figure 5-1) or click the up or down arrows to scroll through the list and select the shelf number to which you want to connect.
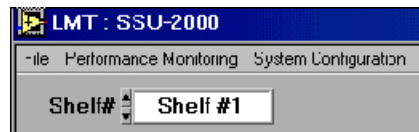
Figure 5-1.   Shelf # List Box

❑   To select the main shelf, select **Shelf #1**.

❑   To select an expansion shelf, click the **UP ARROW** or **DOWN ARROW** to select **Shelf #2** through **Shelf #5**.

■   **Module Status Display** — This part of the window depicts the SSU-2000 main or expansion shelf with which the LMT software is communicating. The module status display represents the current status of the unit in real-time and updates the image as changes occur in the system. For example, if you insert or remove a module from the SSU-2000 unit, the module status display reflects the change graphically; as the status of the unit or a module changes, the display reflects the change. The message area displays system events.

■   **Module Status Indicators** — All modules display these indicators:

❑ **Slot Number** — A label at the top of the module status display shows the SSU-2000 unit slot number.

5

📄 **NOTE …**

SSU-2000 unit slots are numbered A1 through A12 (from left to right) for the main unit (or shelf), and A1 through A16 (from left to right) for the expansion unit. In expansion units, slots are numbered A1 through A16, with A15 and A16 being the slots provided for the buffer modules.

As an example of how slots are termed in the LMT user interface and documentation, in the main unit, the Communications Module (COMM) is located in slot A2, CLOCK-A is located in slot A1, and CLOCK-B is located in slot A-12.

❑ **Module Type** — A label shows the module type.

❑ **Status Indicators** — Real-time indicators, representing the module LEDs, show the status condition for all enabled modules in the selected shelf. Table 5-1 summaries the status or mode indicator conditions common to all modules.

Table 5-1.   Module Status Indicators

Indicator	Color	Description
STATUS	Green	On (green) = Module is functioning correctly and detects no faults or alarms.
	OFF	Off = Module is not enabled.

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■ **Clock Module Status Indicators** — The clock module displays additional status indicators to show the current operating mode for the clock module (Table 5-2).

Table 5-2.   Clock Module Mode Indicators

Indicator	Color	Description
SELECTED	Green	On (green) = Clock module is selected as the reference. Off = Clock module is not selected as the reference.
WARM	Yellow	On (yellow) = Clock module is in warmup mode. Off = Clock module is not in warmup mode.
ACQ	Green	On (yellow) = Clock module is acquiring a lock on a signal. Off = Clock module is not acquiring a lock on a signal.
LOCK	Green	On = Clock module is locked on a signal. Off = Clock module is not locked on a signal.
HOLD	Yellow	On = Clock module is in Holdover mode of operation. Off = Clock module is not in Holdover mode of operation.

■ **Input Module Reference Port Indicators** — Multiport input modules display additional indicators to show the currently selected reference port for the module

(Table 5-3). For each port, the REF port status indicator shows whether the port is a reference port.

Table 5-3. Multiport Input Module Reference Port Indicators

Indicator	Color	Description
REF	Green	On (green) = Port is currently selected as the reference.
	OFF	Off = Port is not selected as the reference port or is not enabled.

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- **Configuration Dialog Box** — To open a configuration dialog box with appropriate options for the module type, click the module representation in the module status display area of the **LMT:SSU-2000** window.

- **Message Display** — The lower portion of the **LMT:SSU-2000** window provides a real-time display of all system alarm and event messages as they occur. The message display reflects changes to the SSU-2000 configuration, whether the changes are made using the LMT or other software, or by removing or adding modules to the system. All messages shown in the message display are in the form of strings translated from TL1 messages.

5.2   Performing Common Tasks

This section provides a number of tables organized by the most commonly performed LMT tasks (Table 5-4 through Table 5-9).

For each task described in the first column of a table, navigate through the interface according to the instructions in the second column of a table. Instructions in **boldface** indicate an interface element that you click or select. Instructions in parentheses ( ) indicate an option you complete by making a choice or entering some information.

For example, the first item in Table 5-4 provides this instruction for changing the folder location in which to store LMT configuration files:

File | **Data Directory** | (select a folder) | **OK**.

5

▶ **To perform this instruction:**

After logging in to the SSU-2000 unit using the LMT software.

1. Click **File** to open the File menu.

2. Click **Data Directory** to open the Data Directory dialog box.

3. Navigate to and select a folder.

4. Click **OK** to save your changes and close the dialog box.

The most common LMT tasks are described in these tables:

■ **File Management Tasks**, see Table 5-4.

■ **Performance Monitoring Tasks of the SSU-2000 Unit**, see Table 5-5.

■ **Manage Alarms and Events Tasks of the SSU-2000 Unit**, see Table 5-6.

■ **User Management Tasks**, see Table 5-7.

■ **System Configuration Tasks**, see Table 5-8.

■ **Module Configuration Tasks**, see Table 5-9.

Table 5-4.   File Management Tasks

To Perform This Task …	Do This …
Change data file storage folder location.	**File** | **Data Directory** | (select new folder) | **OK**.

Table 5-5.   Performance Monitoring Tasks of the SSU-2000 Unit

To Perform This Task …	Do This …
Display current phase data for DS1/E1 input module against CLOCK-A	**Performance Monitoring** | **Phase Data** | **Display Current Phase** | **OK**. *or …* Click **Communications Module** | **Communications Module Configuration dialog box** | **Status tab** | **OK**.
View current MTIE data for the DS1/E1 input module	**Performance Monitoring** | **MTIE** | (select **Input Module**) | (select **Port Number**) | (select **Clock**) | (select **Date**) | **OK**.
View current TDEV data for the DS1/E1 input module in table format	**Performance Monitoring** | **TDEV** | (select **Input Module**) | (select **Port Number**) | (select **Clock**) | (select **Date**) | **OK**.
View phase history for DS1/E1 input module	**Performance Monitoring** | **Phase Data** | (select **Input Module**) | (select **Port Number**) | (select **Clock**) | **Display Phase History** | (select **Averaging Period**) | **OK**.

5

5

Table 5-6.   Manage Alarms and Events Tasks of the SSU-2000 Unit

To Perform This Task …	Do This …
Change the alarm elevation time for the communications module	Click **Communications Module** | **Communication Module Configuration dialog box** | **Alarm Settings** tab | **Alarm Elevation Time** (enter an integer between 0 and 172800 seconds) | **OK**.
Set DS1 Output module **Redundant Module Status** alarm level to **Ignore**.	Click **DS1 Output Module** | **Output Configuration dialog box** | **Alarm Settings tab** | **Redundant Module Status** | **Severity = Ignore** | **OK**.
Save the current alarm data to a file	**Performance Monitoring** | **Alarms** | **Alarms Query dialog box** | **Display All Currently Active Alarms** | **OK**. *or …* **Performance Monitoring** | **Alarms** | **Alarms Query dialog box** | **Show Alarm History** | (select **Module**) | (select **Severity**) | (select **Number**) | **OK**.
View all currently active communications module alarms	Click **Communications Module** | **Communications Module Configuration dialog box** | **Status tab** | (view **Date**, **Time**, **Module**, **Alarm #**, **Level**, and **Description**) | **OK**.
View the last 10 events for Clock A.	**Performance Monitoring** | **Events** | **Module** = (Clock A slot number, e.g. S1A12) | **Number = 10** | **OK**.
View the last 50 MAJOR alarms for all modules	**Performance Monitoring** | **Alarms** | **Module = All Modules** | **Severity = Major** | **Number = 50** | **OK**.

Table 5-7.   User Management Tasks

To Perform This Task …	Do This …
Add a user	**System Configuration** | **User Management** | **Add New User** | (enter **User Name**) | (select **User Level)** | (enter **User Password**) | (enter **User Password Confirmation**) | **OK**
Delete a user.	**System Configuration** | **User Management** | **Delete User** | (answer **YES** to **Are You Sure?** message) | **OK**
View a list of current users.	**System Configuration** | **User Management** | **Current Users** | **OK**

5

Figure 5-8 instructions in Column 2 are in alphabet order by module type.

Table 5-8.   System Configuration Tasks

To Perform This Task …	Do This …
Remove a module	**System Configuration** | **Remove Module** | (select **Module**) | **OK**.
Restart a module	**System Configuration** | **Restart Module** | (select **Module**) | **OK**.
Test the SSU-2000 network connection	**System Configuration** | **Test Network Connection** | **IP Address to Ping** = (enter IP address) | **Begin Test** | (view results in **Network Test Results Display**) | **OK**.

Table 5-8 instructions are sorted by module types, in alphabet order.

Table 5-9.   Module Configuration Tasks

To Perform This Task …	Do This …
Configure clock bypass mode for 2048 kHz output module	Click **2048 kHz Output Module** | **Whole Card Configuration tab** | **Clock Support Control** | **Enable Clock Bypass** | **OK**.
View clock mode for CLOCK-A	Click **Clock A Module** | **Configuration tab** | **Loop Controls** | view **Clock Mode** | **OK**.
Configure CLOCK-A as the reference clock	Click **Clock A Module** | **Configuration Tab** | **This Clock is the Reference** | **OK**.
View CLOCK-A module serial number	Click **Clock A Module** | **Module Information tab** | view **Serial Number** | **OK**.
View system time for the communications module	Click **Communications Module** | **Configuration tab** | view **System Time** | **OK**.
Change DS1 output port line length compensation setting (valid only for modules with DS1 Framer installed)	Click **DS1 Output Module** | view **Line Length** value for port name | **OK**.
View software revision number for the input module.	Click **Input Module** | **Module Information tab** | view **Software Version** | **OK**.
Configure input signal error and clear count for LOS.	Click **Input Module** | **Port _N_ Configuration Tab** | **Input Signal and Error Counts** | **LOS Error Limit** = (enter value) | **LOS Clear Limit** = (enter value) | **OK**.
Configure Cyclic Redundancy Checking.	Click **Input Module** | **Port _N_ Configuration Tab** | **Input Signal Control** | **Cyclic Redundancy Checking** | **OK**.
Configure the E1 input module with CCS framing type.	Click **Input Module** | **Port _N_ Configuration Tab** | **Input Signal Control** | Framing Type = CCS | **OK**.
Configure the E1 input module cesium fault settings to LO.	Click **Input Module** | **Port _N_ Configuration Tab** | **Miscellaneous** | Cesium Fault = LO | **OK**.

Table 5-9.   Module Configuration Tasks (Continued)

To Perform This Task …	Do This …
Configure the SSM bit position	Click **Input Module** | **Port *N* Configuration Tab** | **Port Quality Control** | **SSM Bit Position** = (select value) | **OK**.
Change PQL settings for input port	Click **Input Module** | **Port *N* Configuration tab** | **Port Quality Control** | **Current PQL Level** = (enter value) | **OK**.
Configure an input module port	Click **Input Module** | **Port *N* Configuration Tab** | select or set all options that apply: **Input Signal Control** | **Port Quality Control** | **Input Signal Alarm Threshold** | I**nput Signal and Error Count** | **Miscellaneous** | **OK**.
Copy the configuration settings for this output card to all output cards	Click **Output Module** | **Configure All Output Modules Like This** | **OK**.
Enable Synchronization Status Messages (SSM) for DS1 output module	Click **Output Module** | **Output Signal Control** | **Sync Status Messaging** = X | **OK**.
Configure 2048 kHz output module fault mode to *Automatic*	Click **2048 kHz Output Module** | **Whole Card Configuration tab** | **Output Signal Control** | **Fault Mode** = **Automatic** | **OK**.
Use these Clock Module configuration settings as the user default settings	Click **Clock Module** | **Clock Module Configuration dialog box** | **Configuration Management tab** | **Make This Configuration the User Default** | **OK**.
View minimum Tau value required for locking	Click the **Clock Module** | **Clock Module Configuration dialog box** | **Configuration tab** | view **Min Tau for Lock** | **OK**.
View CLOCK-A warmup time	Click **Clock Module** | **Clock Module Configuration dialog box** | **Configuration tab** | view **Warmup Time** | **OK**.
Restore communications module factory default configuration settings	Click **Communications Module** | **Communications Module Configuration dialog box** | **Configuration Management tab** | **Restore Factory Defaults** | **OK**.

5

5.3   Using Keyboard Operations

The following keyboard operations are often used in the LMT software:

■   **Moving to the Next Field** — Press the **Tab** key to move forward from field to field in an LMT dialog box or tab.

■   **Moving to the Previous Field** — Press the **Shift+Tab** key to move backwards from field to field in an LMT dialog box or tab.

■   **Navigating and Deleting Characters** — To navigate within and delete characters in a text box:

   ❑   Press **BACKSPACE** to delete the character to the left of the cursor.

   ❑   Press **DELETE** to delete the character to the right of the cursor.

   ❑   Press **HOME** to move the cursor to the beginning of the text line.

   ❑   Press **END** to move the cursor to the end of the text line.

■   **Navigating in Text Boxes** — Click in the text box to place the insertion point in the text box. Type the value. For text boxes that offers lists of values to choose from, click on the text box to open the list and click the value to select it, or click the **UP ARROW** or **DOWN ARROW** to scroll up or down through the list of values.

■   **Saving Changes —** After making changes in a dialog box or tab, click **OK** to store the changes, update the SSU-2000 unit and LMT display, and close the dialog box

■   **Closing a Dialog Box** — Click **Cancel** to close a dialog box without storing changes.

NOTE …

The User Manual observes these conventions in describing how you interact with interface elements:

- **Interactive elements** — Interface controls and options are described in terms of the action you perform on them. The description directs you to *select* one of several options from a range or list, *mark* or *clear* a check box, or *enter* text.
- **Non-interactive elements** — Static descriptors or labels are called *labels*, and are described in terms of the information they convey: *This label displays the current PQL value.*

5

5

IN THIS SECTION …

■ File Menu
■ Performance Monitoring Menu
■ System Configuration Menu

6

6   Using the LMT Menus

This section provides information about using the Local Management Terminal (LMT) menus and menu commands for file management, performance monitoring, and system configuration.

The topics describe each dialog box, dialog box tab, and dialog box or tab option that LMT software presents when you select each menu and command.

■   Figure 6-1 summarizes the LMT menus and commands graphically.

■   Table 6-1 summarizes menu command functions and provides a cross-reference to the topic which describes the command.

■   Section 7 provides general information about setting configuration options for SSU-2000 modules and ports.

■   Section 8 through Section 12 provide information about setting configuration options for specific modules.

6

NOTE …

The User Manual observes these conventions in describing how you interact with interface elements:

■ **Interactive elements** — Interface controls and options are described in terms of the action you perform on them. The description directs you to *select* one of several options from a range or list, *mark* or *clear* a check box, or *enter* text.

■ **Non-interactive elements** — Static descriptors or labels are called *labels*, and are described in terms of the information they convey: *This label displays the current PQL value.*

6

File

- Data Directory
- EXIT

Menu Commands

Performance Monitoring

- Phase Data
- MTIE
- TDEV
- Events
- Alarms

System Configuration

- User Management
- Clock Slection
- Restart Module
- Remove Module
- Test Network Connection
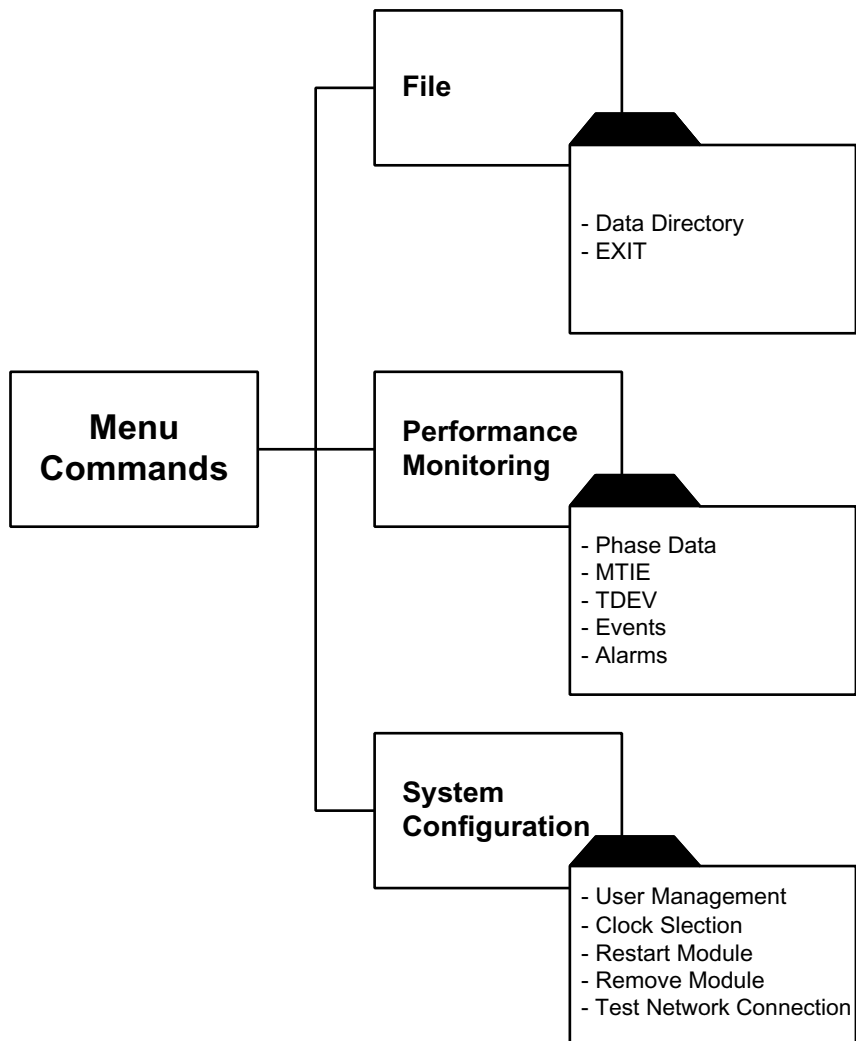
Figure 6-1.   Menu Command Map

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Table 6-1.　LMT Menu Commands and Functions

Menu	Command	Function
File	Data Directory	Open the Data Directory dialog box and select a file or folder location for storing the current *.csv* file name extension configuration files. Section 6.1.1.
	Exit	Close the LMT software. Section 6.1.2.
Performance Monitoring	Phase Data	Open the Phase Data Query dialog box. Section 6.2.1.
	MTIE	Open the MTIE Data Query dialog box. Section 6.2.2.
	TDEV	Open the TDEV Data Query dialog box. Section 6.2.3.
	Events	Open the Events Query dialog box. Section 6.2.4.
	Alarms	Open the Alarms Query dialog box. Section 6.2.5.
System Configuration	User Management	Open the User Manager dialog box. Section 6.3.1.
	Clock Selection	Open the Clock Selection dialog box. Section 6.3.2.
	Restart Module	Open the Module Selection dialog box. Section 6.3.3.
	Remove Module	Open the Module Selection dialog box. Section 6.3.4.
	Test Network Connection	Open the Network Test dialog box Section 6.3.5

6.1   File Menu

The **File** menu, Figure 6-2, provides commands for browsing and opening folders and data files, specifying the directory in which to store data files, and exiting from the LMT software.
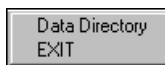
Figure 6-2.   File Menu

6

6.1.1   Data Directory

On the **File** Menu, click **Data Directory** to open the Data Directory dialog box (Figure 6-3). Use the options in the dialog box to select or create a new folder in which to store the LMT data files. The Data Directory dialog box allows you to:
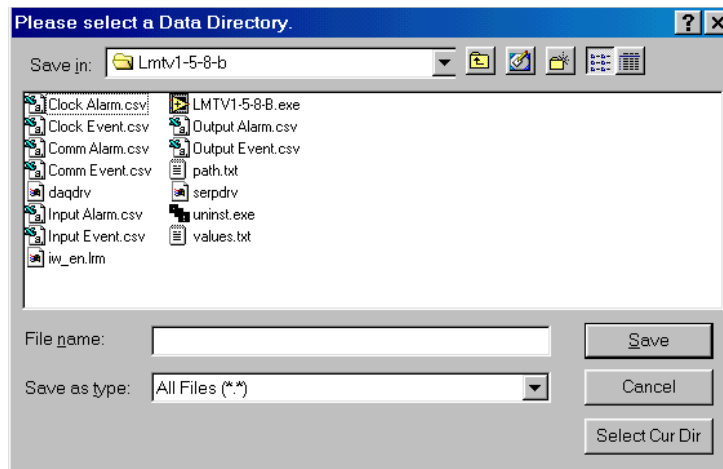
Figure 6-3.   Data Directory Dialog Box

▶ To browse in folders:

❑ Click the down arrow in the **Save in** list to display the list of available folder locations.

❑ Click **Up One Level** to open the folder (directory) level above the current folder.

❑ Click **View Desktop** to list the files on the desktop.

Select a drive and folder location in which to store the *.csv* file name extension data files.

▶ To view file information and properties:

❑ Click **List** to display file **Name** information for files in the current view in list format.

❑ Click **Details** to display **Name**, **Size**, **Type**, **Modified**, and **Attribute** information for files in the current view in list format.

▶ To create a folder in which to store the data files:

❑ Click **Create New Folder**.

❑ The LMT software creates a new folder named **New Folder**, and highlights the folder name. Type the name for the new folder and click **Open** to open the new folder.

❑ Click **Select Cur Dir** to select the new folder in which to store LMT data files and close the Data Directory dialog box

   OR

❑ Click **Cancel** to close the dialog box without changing the folder location.

For more information about the LMT data files, see Section 4.5. For information about the data file naming conventions and the contents of each data file, see Appendix A.

6.1.2   Exit

On the **File** menu, click **Exit** to close the LMT software.

6.2   Performance Monitoring Menu

The **Performance Monitoring** menu (Figure 6-4) provides commands for opening query dialog boxes for phase, MTIE, TDEV, event, and alarm data. Use the options in the query dialog box for each data type to specify the data to display in the data dialog box.

6

Phase Data
MTIE
TDEV
Events
Alarms

Figure 6-4.   Performance Monitoring Menu

Performance data is gathered by the LMT software for a given input when you make the request by clicking **OK** in the query dialog box. At that time, the LMT software applies the selection criteria you have chosen to the data available from the SSU-2000 unit, formats the data as a graph or table, and presents the data in the data dialog box..

📄   **NOTE …**

Report and data dialog box graphs display data for a single channel only, for example, one input signal versus one clock signal.

6.2.1   Phase Data

On the **Performance Monitoring** menu, click **Phase Data** to open the Phase Query dialog box (Figure 6-5). Use the options in this dialog box to select the phase data to display.

6.2.1.1   Phase Query Dialog Box

The Phase Query dialog box provides controls for selecting criteria to use in displaying phase data. To create the phase data graph, select the type of phase data, the input module, port number, clock, and phase averaging period to graph, and click **OK**.
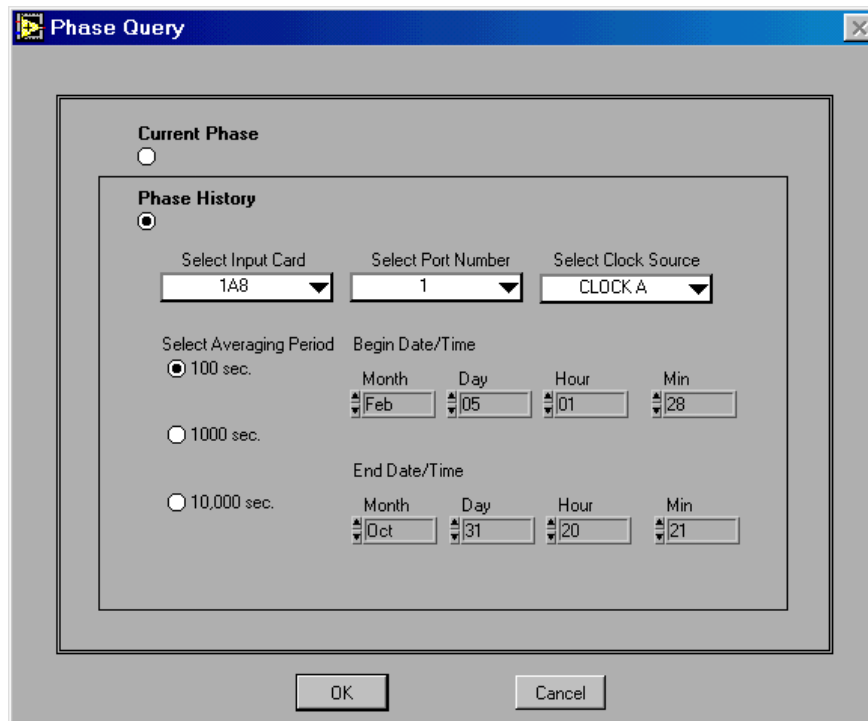
Figure 6-5.   Phase Query Dialog Box

■   **Current Phase** — Select this option to display the current phase data read for all input ports against all clocks in the Current Phase Data dialog box (Figure 6-6) when you click **OK** in the Phase Query dialog box.

■   **Phase History** — Select this option to open the Phase Data dialog box (Figure 6-8) when you click **OK** in the Phase Query dialog box. The Phase Data dialog box displays the results of the phase data selection criteria you apply in the Phase Query dialog box. When you select the **Phase History** option, these additional selection criteria options become available:

❑ **Select Input Card** — Select the Access Identifier (AID) of the input module for which to graph phase history data.

📄 **NOTE …**

The Access Identifier (AID) identifies the unit (shelf), module, and port locations within the SSU-2000. The LMT software uses the AID in the message display area messages and interface labels. The AID follows this format: `aid = xAy-z`

where:

■ `x` = shelf 1-5 (note that only the main unit #1 can contain input modules).

■ `y` = slot 1-16 in the main or expansion unit.

■ `z` = port 1-20 (note that multi-port input modules use ports 1-3; output modules use ports 1-20)

In the LMT:SSU-2000 message display area:

■ CLOCK-A = S1A1

■ CLOCK-B = S1A12

❑ **Select Port Number** — For multi-port input modules, select the port number for which to graph phase history data. Click the list to open the list. Click on a port number to select: **1**, **2**, or **3**.

❑ **Select Clock Source** — Select the clock source for which to graph phase history data: **CLOCK A**, **CLOCK B**, or **BOTH**.

❑ **Averaging Period** — Select the phase averaging period in seconds. **100**, **1000**, or **10,000**.

❑ **Begin Date/Time** — Specify the start of the averaging period for the phase history data. Click on the list to display the list and select a value, or click the up or down arrows to scroll up or down through the list of values. Select **Month**, **Day**, **Hour**, and **Min**.

❑ **End Date/Time** — Specify the end of the averaging period for the phase history data. Click on the list to display the list and select a value, or click the

up or down arrows to scroll up or down through the list of values. Select **Month**, **Day**, **Hour**, and **Min**.

■ **OK** — Click to display the selected current phase or phase history data.

■ **Cancel** — Click to close the Phase Query dialog box without displaying phase data.

6

6.2.1.2 Current Phase Data Dialog Box

The Current Phase Data dialog box opens when you select **Current Phase** and click **OK** in the Phase Query dialog box. The Current Phase Data dialog box displays the most recent one second phase averages for all ports versus the selected clocks.
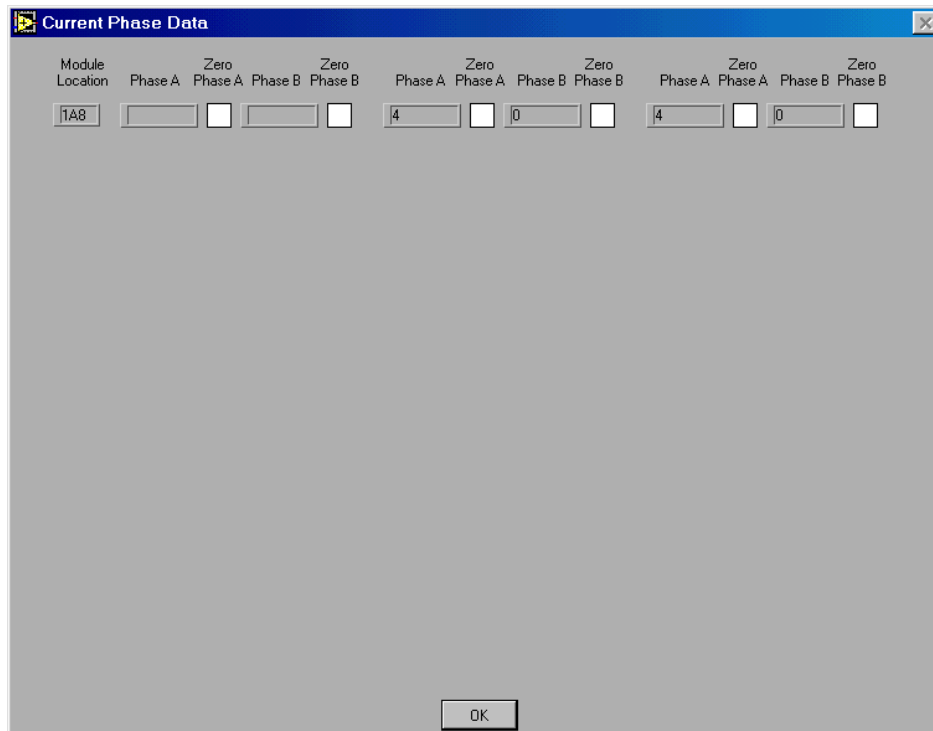
Figure 6-6. **Current Phase Data Dialog Box**

The Current Phase Data dialog box displays the module location from which the phase readings are taken, and current phase readings against each clock for each port.

- **Module Location** — This label provides the AID for the module from which the phase readings are taken. For a description of the AID format, see the note on page 59.

- **Phase A** — This label provides the phase readings in nanoseconds against CLOCK-A for the selected module and port.

- **Zero Phase A** — Mark this option to zero the phase data for the module and port when you click **OK** in the Current Phase dialog box.

- **Phase B** — Mark this option to zero the phase data for the module and port when you click **OK** in the Current Phase dialog box.

- **Zero Phase B** — This label provides the phase readings against CLOCK-B for the selected module and port.

- **OK** — Click to close the Current Phase Data dialog box.

6.2.1.3   Phase Data Dialog Box

The Phase Data dialog box opens when you select **Phase History** and click **OK** in the Phase Query dialog box. The Phase Data dialog box title bar displays a label describing the input port AID, averaging period, and the beginning and ending date and time used in the phase history graph.

Figure 6-7 shows the Phase Data dialog box with data for a 100-second averaging period; Figure 6-8 shows the same data for a 1000-second averaging period.
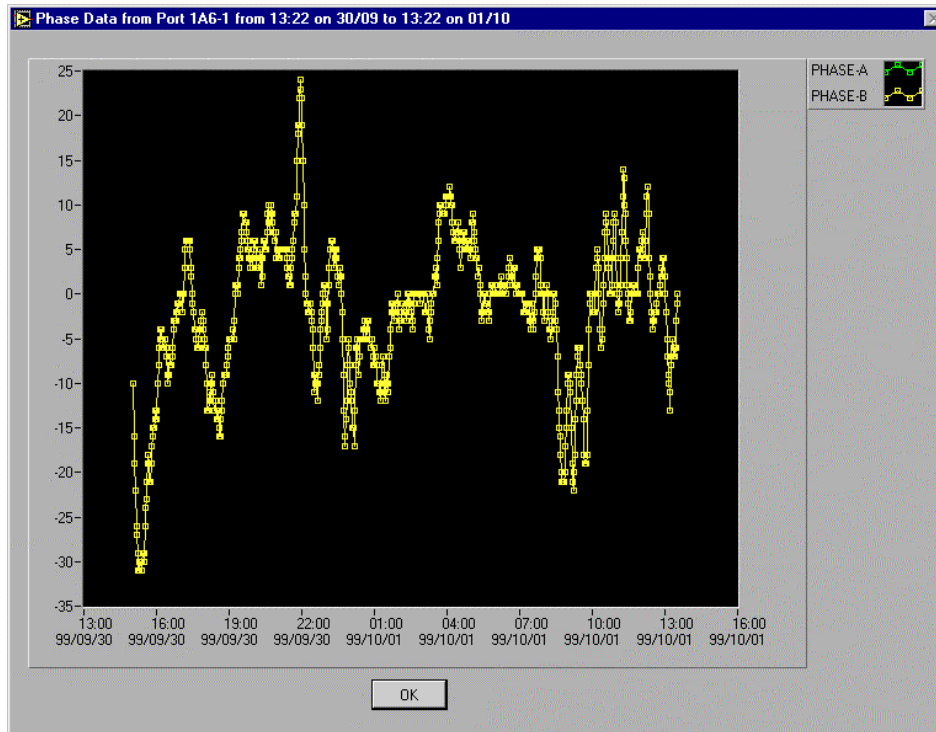
Figure 6-7.   Phase Data Dialog Box (100 seconds)
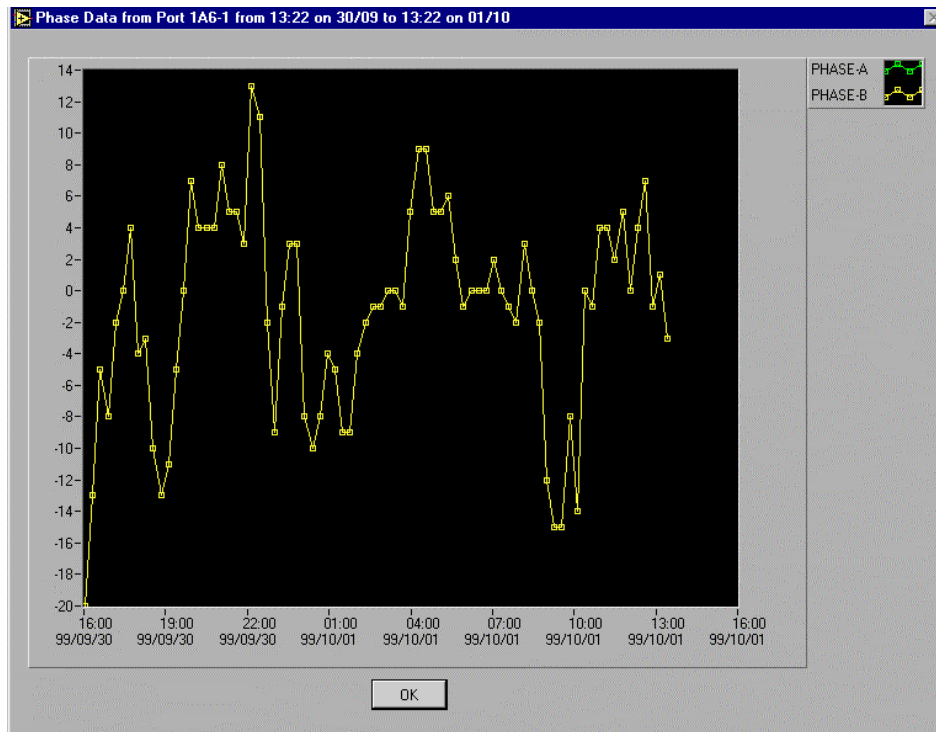
Figure 6-8.   Phase Data Dialog Box (1000 seconds)

■   **Phase Data Dialog Box Title Bar —** This label describes the data type, input module and port AID, averaging period, and start and end time and date used to compile the phase history measurements.

■   **Phase History Graph —** This portion of the dialog box displays a linear graph of the retrieved phase history data (*X-axis* = time, *Y-axis* = phase in nanoseconds). If there is not sufficient data to create the graph, the software displays a message box (Figure 6-9):

Figure 6-9.   Could Not Retrieve Phase History Data Message Box

■   **OK** — Click to close the Phase Data dialog box.

6.2.2   MTIE

On the **Performance Monitoring** menu, click **MTIE** to open the MTIE Query dialog box (Figure 6-10). Use the options in this dialog box to specify the MTIE data to display as a graph and table.

6.2.2.1   MTIE Query Dialog Box

The MTIE Query dialog box (Figure 6-10) provides controls for selecting criteria to use in displaying MTIE data. To compile the MTIE data, select the input module, port number, clock module, and time period, and click **OK**.
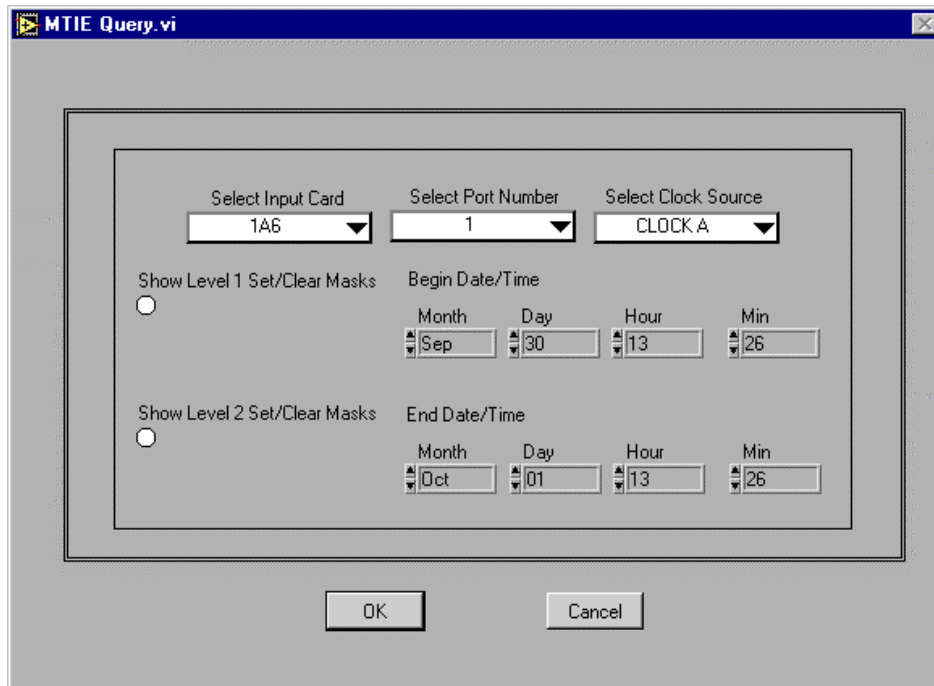
Figure 6-10.   MTIE Query Dialog Box

- ■   **Select Input Card —** Select the AID of the input module for which to graph MTIE data. For a description of the AID format, see the note on page 59.

- ■   **Select Port Number —** For multi-port modules, select the AID of the port number for which to graph MTIE data. For a description of the AID format, see the note on page 59.

- ■   **Clock —** Select the clock against which the MTIE data will be read: **A Clock**, or **B Clock**.

- ■   **Show Level 1 Set/Clear Masks** — Mark this option to include the Level 1 set and clear masks in the MTIE graph.

- ■   **Show Level 2 Set/Clear Masks** — Mark this option to include Level 2 set and clear masks in the MTIE graph.

6

■ **Begin Date/Time** — Specify the start of the observation period for the MTIE data. Click on the list to display the list and select a value, or click the up or down arrows to scroll up or down through the list of values. Select **Month**, **Day**, **Hour**, and **Min**.

■ **End Date/Time** — Specify the end of the observation period for the MTIE data. Click on the list to display the list and select a value, or click the up or down arrows to scroll up or down through the list of values. Select **Month**, **Day**, **Hour**, and **Min**.

■ **OK** — Click to display the selected MTIE data. If there is not sufficient MTIE data to create the graph and table, the software displays the message (Figure 6-11):

■ **Cancel** — Click to close the MTIE Query dialog box without displaying the requested MTIE data.
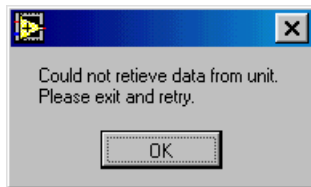
Figure 6-11.   Could Not Retrieve MTIE Data Message Box

6.2.2.2   MTIE Data Dialog Box

The MTIE Data dialog box (Figure 6-12) displays the MTIE data specified in the MTIE Query dialog box as a graph and a table.
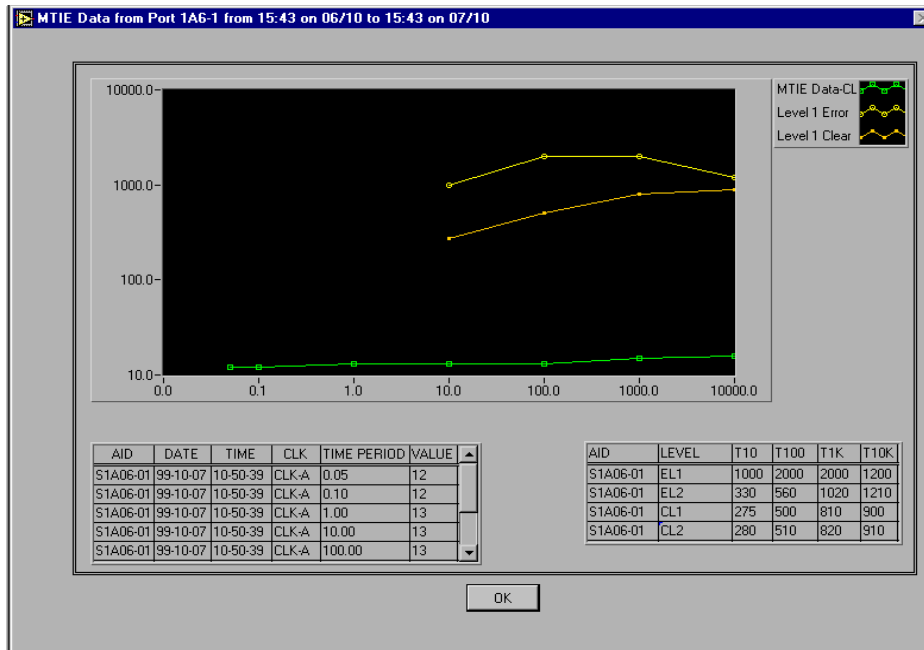
Figure 6-12.   MTIE Data Dialog Box

■   **MTIE Graph —** The MTIE graph displays the selected MTIE data in a log-log
    graph style (*X-axis* = observation time in seconds, *Y-axis* = MTIE in nanoseconds).

   ❑   **MTIE Data X-axis** — This axis of the graph represents time in seconds, as
       defined by the minimum to maximum calculated observation periods.

   ❑   **MTIE Data Y-axis** — This axis of the graph represents time in nanoseconds,
       automatically scaled to display all data and MTIE masks.

■ **MTIE Table —** The MTIE table displays the selected MTIE data in a table. The table shows values for: **AID**, **DATE**, **TIME**, **CLK**, **TIME PERIOD**, **VALUE**, **LEVEL**, **T10**, **T100**, **T1K**, **T10K**. For a description of the AID format, see the note on page 59.

📄 **NOTE …**

LMT graphs the selected port MTIE data, and presents data from only one channel per graph. Port MTIE data versus CLOCK-A and CLOCK-B is displayed on separate graphs.

6

■ **OK —** Click **OK** to close the MTIE Data dialog box.

6.2.3   TDEV

On the **Performance Monitoring** menu, click **TDEV** to open the TDEV Query dialog box (Figure 6-13). Use the options in this dialog box to select the TDEV data to display as a graph and table in the TDEV Data dialog box.

6.2.3.1   TDEV Query Dialog Box

The TDEV Query dialog box (Figure 6-13) provides controls for selecting the criteria to use in displaying TDEV data in both graph and table format. To compile the TDEV data, select the input module, port number, clock module, and time period, and click **OK**.
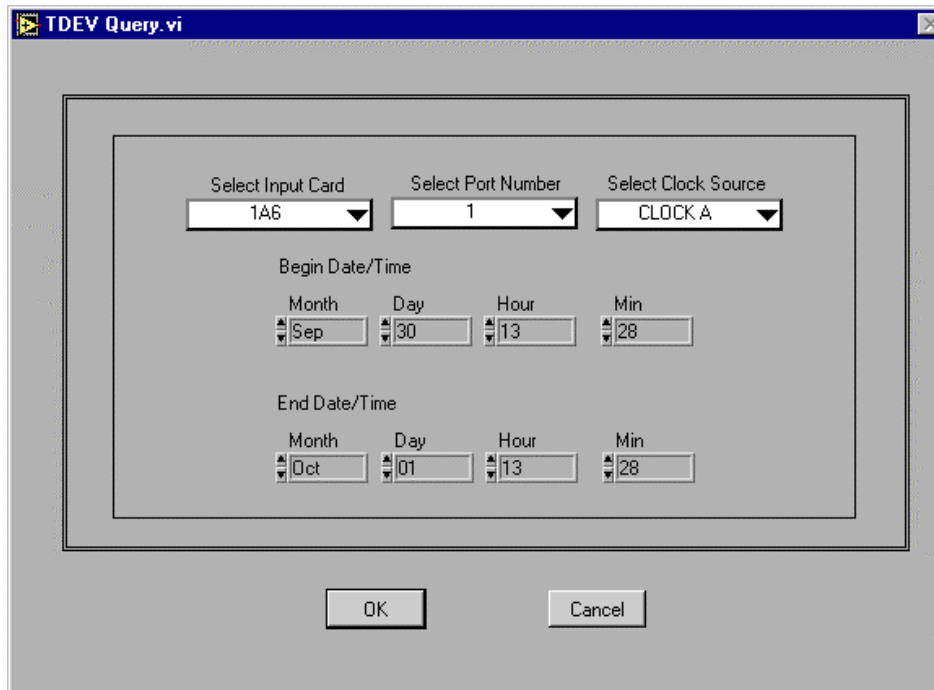
Figure 6-13.   TDEV Query Dialog Box

■ **Select Input Card —** Select the AID of the input module for which to graph TDEV data. For a description of the AID format, see the note on page 59.

■ **Select Port Number —** For multi-port modules, select the AID of the port for which to graph TDEV data. For a description of the AID format, see the note on page 59.

■ **Select Clock Source —** Select the Clock against which the TDEV data will be read: **A Clock**, or **B Clock**.

■ **Begin Date/Time** — Specify the observation period for the TDEV data. Click on the list to display the list and select a value, or click the up or down arrows to scroll up or down through the list of values. Select **Month**, **Day**, **Hour**, and **Min**.

6

■ **End Date/Time** — Specify the end of the observation period for the TDEV data. Click on the list to display the list and select a value, or click the up or down arrows to scroll up or down through the list of values. Select **Month**, **Day**, **Hour**, and **Min**.

■ **OK** — Click to display the selected TDEV data in the TDEV Data dialog box. If there is not sufficient TDEV data to create the graph, a message box displays the message box (Figure 6-14).

■ **Cancel** — Click to close the TDEV Query dialog box without displaying the requested TDEV data.

Figure 6-14.   Could Not Retrieve TDEV Data Message Box

6.2.3.2   TDEV Data Dialog Box

The TDEV Data dialog box (Figure 6-15) opens when you click **OK** in the TDEV Query dialog box. This dialog box displays a graph or table of the data specified in the TDEV Query dialog box.
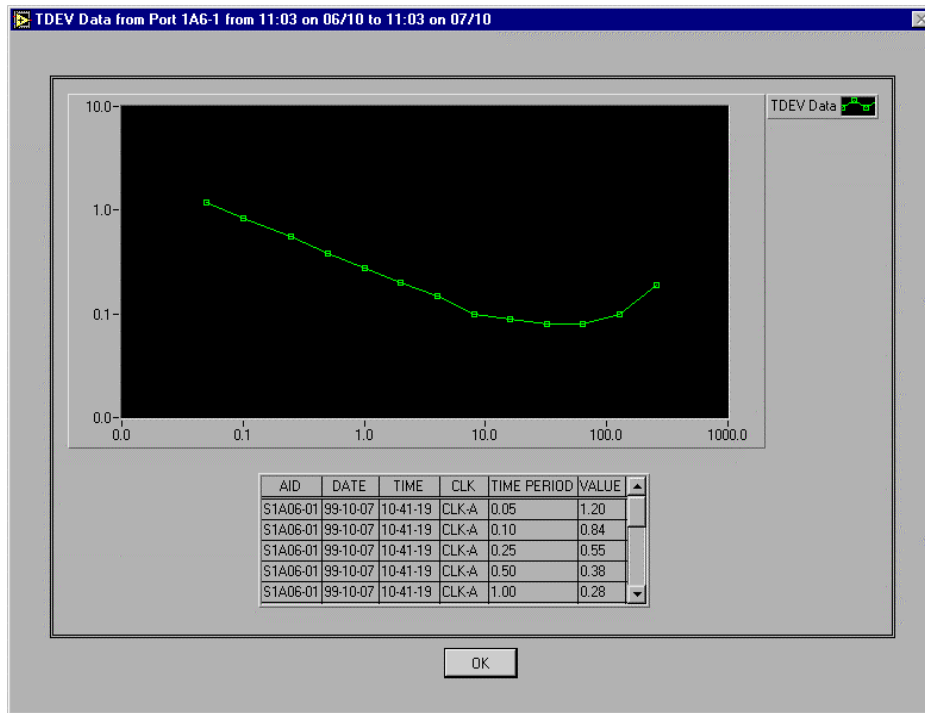
6

Figure 6-15.   TDEV Data Dialog Box

■ **TDEV Data Dialog Box Title —** This label describes the data type, input module and port AID, and start and end time and dates used in the TDEV measurements. For a description of the AID format, see the note on page 59.

■ **Graph —** This portion of the dialog box displays a graph of the retrieved TDEV data in a log-log graph style (*X-axis* = integration time in seconds, *Y-axis* =TDEV in nanoseconds). If there is not sufficient data to create the graph, the TDEV report dialog displays the message box (Figure 6-16):

■ **OK —** Click to close the TDEV Data dialog box.
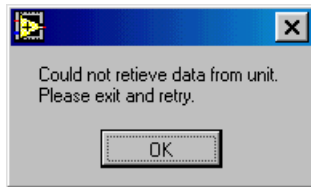
Figure 6-16.   Could Not Retrieve TDEV Data Message Box

6 **6.2.4   Events**

On the **Performance Monitoring** menu, click **Events** to open the Events Query dialog box (Figure 6-17). Use the options in this dialog box to select the event or alarm data to view in real-time.

6.2.4.1   Events Query Dialog Box

The Events Query dialog box (Figure 6-17) opens when you select **Events** on the **Performance Monitoring** menu. Use the options in the Events Query dialog box to select the event information to display in the Event Report dialog box.
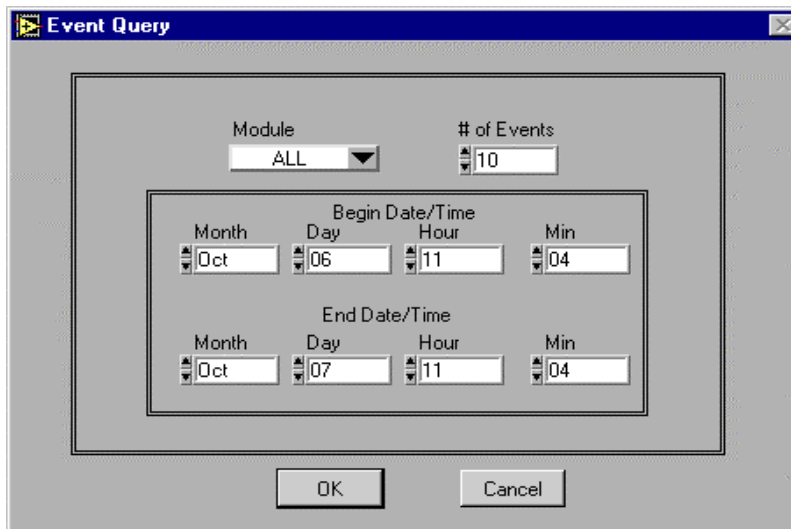
Figure 6-17.   Events Query Dialog Box

■ **Module** — Select the module **AID** to use or select **ALL** to display event information for all modules: Click on the **Module** list to display the list (Figure 6-18). Click on an **AID** value in the list to select the value. For a description of the AID format, see the note on page 59.
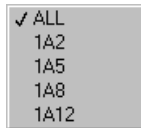
Figure 6-18.   Events Query Module List

■ **# of Events** — Enter or select the number of events (as many as 500) to retrieve. Click on the list and enter an integer and click the up or down arrows to scroll to the value.

■ **Begin Date/Time** — Select the starting date and time range for the event report. Select the **Month**, **Day**, **Hour**, and **Min**.

■ **End Date/Time** — Select the ending date and time range for the event report. Select the **Month**, **Day**, **Hour**, and **Min**.

■ **OK** — Click to open the Event Report dialog box and display the selected event data. If there is not sufficient event data to display the report, a message box displays this message (Figure 6-19):

■ **Cancel** — Click to close the Events Query dialog box without displaying the requested event data.
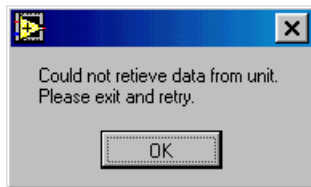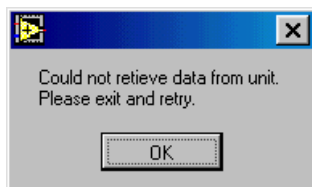

Figure 6-19.   Could Not Retrieve Event Data Message Box

6.2.4.2   Event Report Dialog Box

The Event Report dialog box (Figure 6-20) opens when you click **OK** in the Events
Query dialog box. This dialog box displays the selected event data.
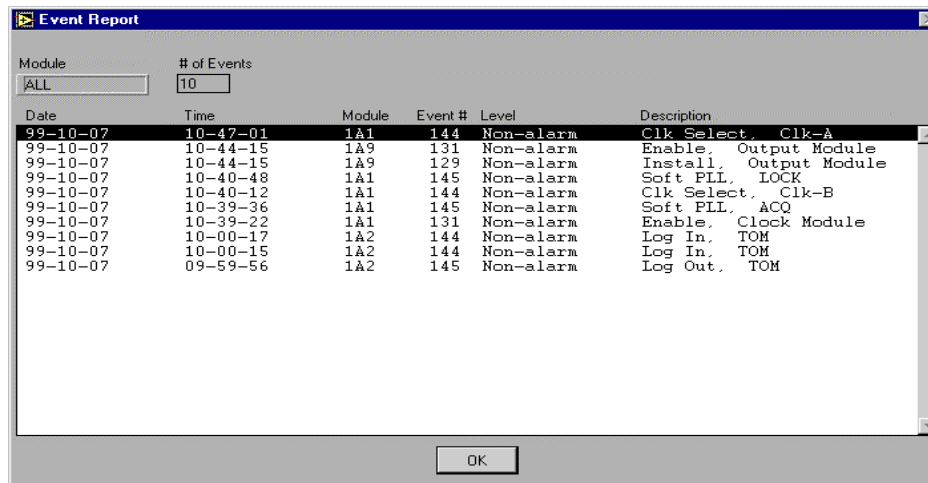
Figure 6-20.   Event Report Dialog Box

- ■ **Module** — This label displays the module for which events are reported: the
  individual module **AID** selected or **ALL** modules with event information. For a
  description of the AID format, see the note on page 59.

- ■ **# of Events —** This label displays the number of events selected.

- ■ **Event Display —** The event display shows the selected event information. For
  each event, the display shows **Date**, **Time, Module** (displays the AID), **Event #**,
  Level, and **Description**. For a description of the AID format, see the note on
  page 59.

📄   **NOTE …**

The Message Display area of the **LMT:SSU-2000** window displays
SSU-2000 events as they occur.

- ■ **OK** — Click to close the Events Report dialog box.

6.2.5   Alarms

On the **Performance Monitoring** menu, click **Alarms** to open the Alarm Query dialog box (Figure 6-21). Use the options in this dialog box to select the Alarms data to display.

6.2.5.1   Alarm Query Dialog Box

The Alarm Query dialog box (Figure 6-21) opens when you click **Alarms** on the **Performance Monitoring** menu. Use the options in this dialog box to set the selection criteria for filtering the alarm information to display in the Alarms Report dialog box.
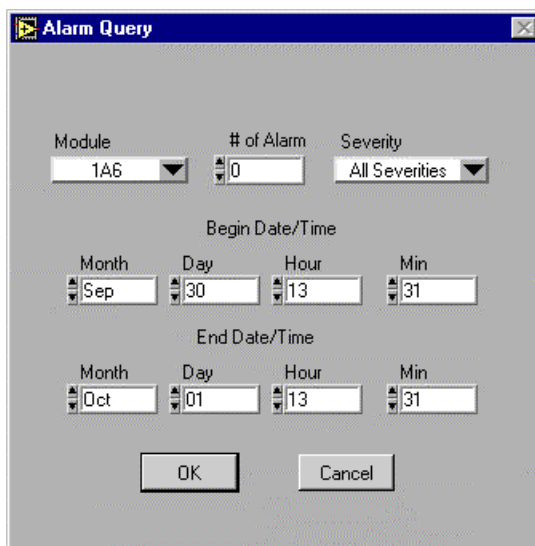
Figure 6-21.   Alarms Query Dialog Box

- ■   **Module** — Select the module **AID** for which to display alarm information. Click on the **Module** list to display the list. Click on a module AID to select it. For a description of the AID format, see the note on page 59.

- ■   **# of Alarms** — Enter or select the number of alarm messages to display in the Alarm Report dialog box. Click on the up or down arrows to scroll to the value.

- **Severity** — Select the severity level. Click on the **Severity** list to display the list. Click a severity level to select the value, or click **All Severities** to display all alarm severity levels in the Alarm Report dialog box.

- **Begin Date/Time** — Specify the starting date and time range for the alarm report. Select the **Month**, **Day**, **Hour**, and **Min**.

- **End Date/Time** — Specify the ending date and time range for the alarm report. Select the **Month**, **Day**, **Hour**, and **Min**.

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- **OK —** Click **OK** to display the Alarm Report dialog box. If there is not sufficient alarm data to create the report, a message box displays the message (Figure 6-22):

- **Cancel** — Click **Cancel** to close the Alarm Report dialog box.

Figure 6-22.   Could Not Retrieve Alarm Data Message Box

6.2.5.2 Alarm Report Dialog Box

The Alarm Report dialog box (Figure 6-23) displays the results of the alarm criteria selected in the Alarm Query dialog box.
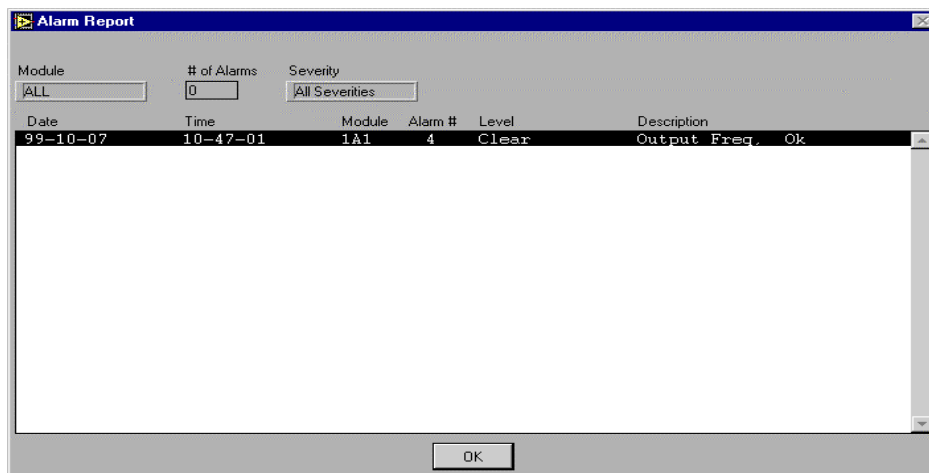
Figure 6-23. **Alarm Report Dialog Box**

- **Module —** This label displays the module AID specified in the Alarm Query dialog box. For a description of the AID format, see the note on page 59.

- **# of Alarms** — This label displays the number of alarms specified in the Alarm Query dialog box.

- **Severity —** This label displays the severity level specified in the Alarm Query dialog box: **MINOR**, **MAJOR**, **CRITICAL**, or **All Severities**.

- **Alarm Message Area** — The alarm message area of the dialog box displays the results of the Alarm Query dialog box selection criteria. Each row in the message area presents this information about the alarm: **Date**, **Time**, **Module**, **Alarm #**, **Level**, and **Description**.

- **OK** — Click **OK** to close the Alarm Report dialog box.

6.3   System Configuration Menu

The **System Configuration** menu (Figure 6-24) provides commands for managing users, editing the PQL table settings, making clock selections, restarting or removing modules, and testing the network connection.

6

User Management
Clock Selection
Restart Module
Remove Module
Test Network Connection
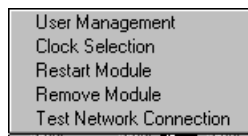
Figure 6-24.   System Configuration Menu

6.3.1   User Management

On the **System Configuration** menu, click **User Management** to open the User Manager dialog box (Figure 6-25). Use the options in this dialog box to setup user information for the SSU-2000 unit.

6.3.1.1   User Manager Dialog Box

The User Manager dialog box (Figure 6-25) opens when you click **User Management** on the **System Configuration** menu. This dialog box displays the user names and security level of those who are currently logged in to the SSU-2000 unit and offers options for adding, deleting, or editing user information.

Figure 6-25.   User Manager Dialog Box

■   **User —** Select a user name from the **User** list. The list shows user names and
     security levels for all users.

■   **Add New User —** Click to open the Add New User dialog box.

■   **Delete User —** Click to delete the selected user name in the **User** list. A message
     box asks for confirmation of your intention to delete the user (Figure 6-26). Click
     OK to delete the user from the user table, or click **Cancel** to cancel the deletion
     operation.

■   **Edit User —** Click to open the Edit User dialog box.
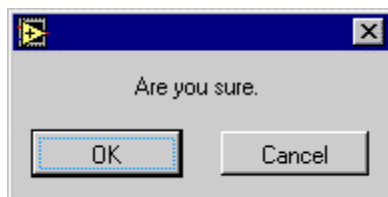
Figure 6-26.   Delete User Confirmation Dialog Box

6.3.1.2 Add New User Dialog Box

The Add New User dialog box opens when you click **Add New User** in the User
Management dialog box. Use the options in this dialog box to add a user to the user
table.

Figure 6-27.   Add New User Dialog Box

■   **User Name** — Enter the user name for the new user.

■   **Level —** Enter or select the security access level for the new user. **1**, **2**, **3**, or **4**.
    Click on the **Level** field and type a level or click the up or down arrows to scroll
    through the list.

■   **User Password** — Enter a password for the new user.

■   **User Password Confirmation —** Enter the password for the new user again, to
    confirm that you have entered it correctly.

■   **OK —** Click **OK** to save the changes and close the dialog box.

■   **Cancel —** Click **Cancel** to close the dialog box without saving the changes.

6.3.1.3   Edit User Dialog Box

The Edit User dialog box opens when you click **Edit User** in the User Management dialog box. Use the options in this dialog box to change information about the selected user.
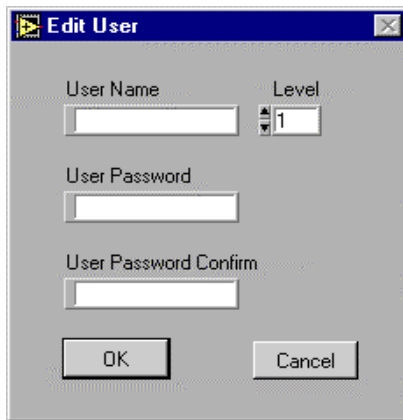
Figure 6-28.   Edit User Dialog Box

- ■   **User Name** — Edit the user name.

- ■   **Level** — Edit the security access level for the selected user.

- ■   **User Password** — Edit the password for the selected user.

- ■   **User Password Confirmation** — Enter the password again, to confirm that you have edited it correctly.

- ■   **OK** — Click **OK** to save the changes and close the dialog box.

- ■   **Cancel** — Click **Cancel** to close the dialog box without saving the changes.

6.3.2   Clock and Reference Selection

On the **Performance Monitoring** menu, click **Clock and Reference Selection** to open the Clock and Reference Selection Algorithm dialog box (Figure 6-29). Use the options

in this dialog box to change the reference and clock selection options for the clock modules.
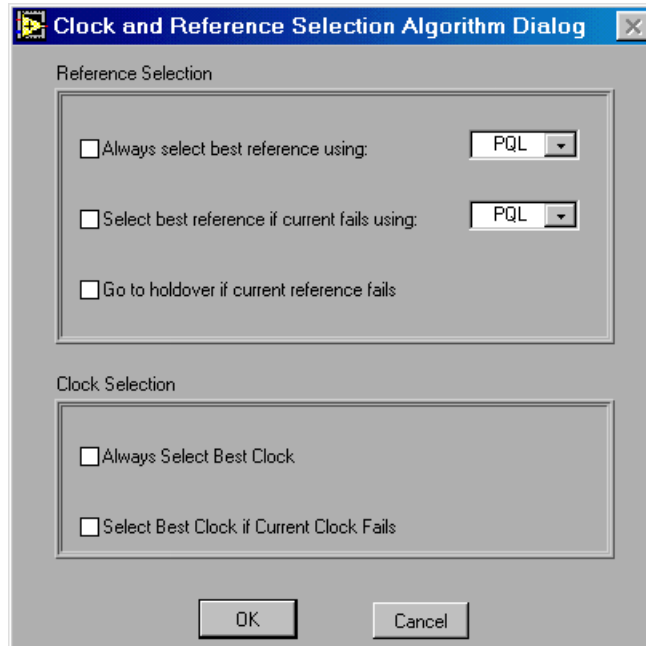
Figure 6-29.   Clock and Reference Selection Algorithm Dialog Box

■   **Reference Selection Options** — Select options in this section of the dialog box to configure the reference selection criteria to use for the SSU-2000 unit.

 ❑   **Always select best reference using** — Mark this option to cause the SSU-2000 unit to select the best input reference under all circumstances. Select **PQL** or **Priority** to configure what criteria the unit uses to select the best input reference. Set the **Port Priority** and the **Provisioned PQL** in the **Port Quality Control** area of the DS1/E1 Input Module Configuration dialog box.

 ❑   **Select best reference if current fails** — Mark this option to cause the SSU-2000 to select the best input reference only when the currently selected reference fails. Select **PQL** or **Priority** to configure what criteria the unit uses

to select the best input reference, should the currently selected reference fail. Set the **Port Priority** and the **Provisioned PQL** in the **Port Quality Control** area of the DS1/E1 Input Module Configuration dialog box.

❑ **Go to holdover if current reference fails** — Mark this option to cause the SSU-2000 clock modules to go to Holdover mode if the currently selected reference fails.

❑ **Always select best clock** — Mark this option to cause the SSU-2000 unit to select the best clock under all circumstances.

❑ **Select best clock if current clock fails** — Mark this option to cause the SSU-2000 to select the best clock only when the currently selected reference fails.

❑ **OK** — Click **OK** to save the configuration, update the SSU-2000 unit, and close the dialog box.

❑ **Cancel** — Click **Cancel** to close the dialog box without saving the configuration changes or updating the SSU-2000 unit.

6.3.3   Restart Module

On the **Performance Monitoring** menu, click **Restart Module** to open the Module Selection dialog box (Figure 6-30). Use the options in this dialog box to select the modules to restart.

▶ **To restart a module:**

■ Mark the option beside the AID of the module you want to restart. For a description of the AID format, see the note on page 59.

🗎	**NOTE …**
	To restart a module, you must be logged on to the SSU-2000 with Level 4 security access.

■ Click **OK** to close the dialog box and restart the module.

6

OR

■   Click **Cancel** to close the dialog box without restarting the module.
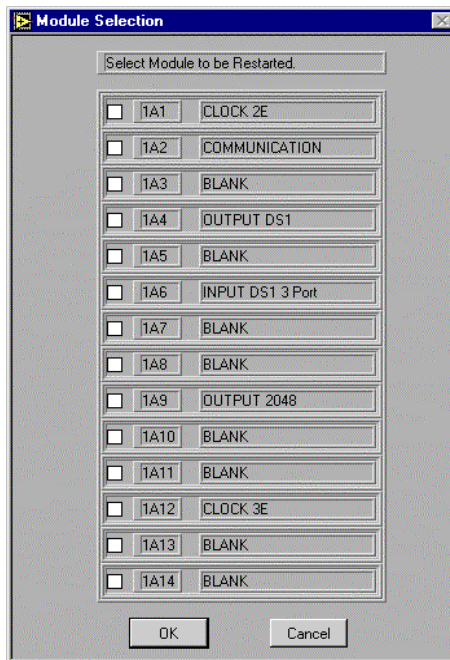
Figure 6-30.   Module Selection Dialog Box

6.3.4   Remove Module

On the **Performance Monitoring** menu, click **Remove Module** to open the Module Selection dialog box (Figure 6-31). Use the options in this dialog box to select the modules to remove.

6

Module Selection   ☒

Select Module to be remove from system list.

☐ 1A1   BLANK
☐ 1A2   BLANK
☐ 1A3   BLANK
☐ 1A4   BLANK
☐ 1A5   BLANK
☐ 1A6   BLANK
☐ 1A7   BLANK
☐ 1A8   BLANK
☐ 1A9   BLANK
☐ 1A10   BLANK
☐ 1A11   BLANK
☐ 1A12   BLANK
☐ 1A13   BLANK
☐ 1A14   BLANK

OK   Cancel
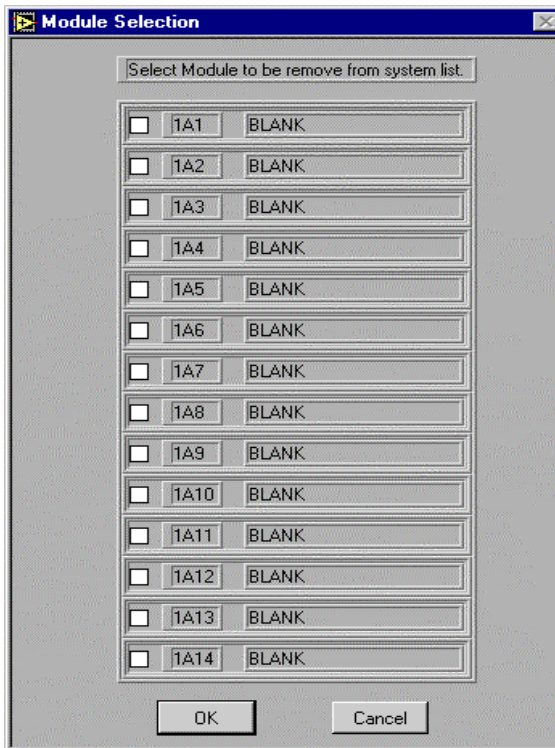
Figure 6-31.   Module Selection Dialog Box

▶ **To remove a module:**

■ Mark the option beside the AID of the module you want to remove. For a description of the AID format, see the note on page 59.

■ Click **OK** to close the dialog box and remove the module.

   OR

■ Click **Cancel** to close the dialog box without removing the module.

6.3.5 Test Network Connection

On the **Performance Monitoring** menu, click **Test Network Connection** to open the Test Network Connection dialog box (Figure 6-32). Use the options in this dialog box to ping an IP address and display the test results.
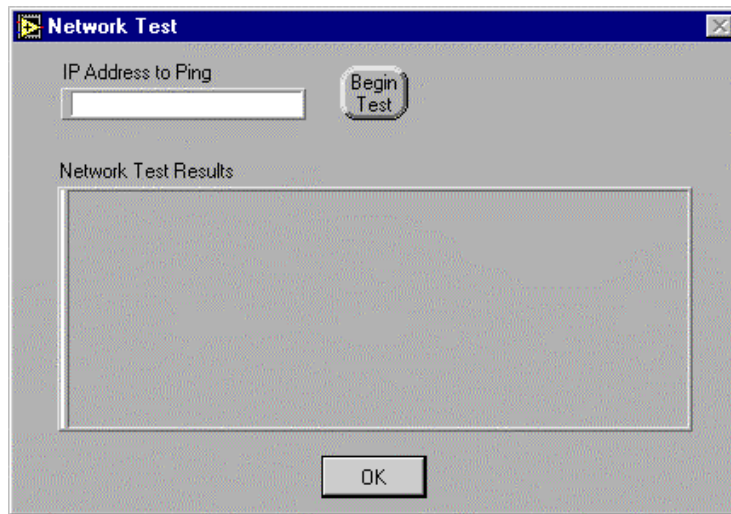
Figure 6-32.   Test Network Connection Dialog Box

■   **IP Address to Ping** — Select or enter the IP address to test.

■   **Begin Test** — Click to test the selected IP address.

■   **Network Test Results** — The network test results display in this message area.

■   **OK** — Click to close the dialog box.

7

7   Overview of Configuring Modules

This section describes the general steps to follow to configure an SSU-2000 main or expansion shelf module and ports using the LMT module configuration dialog box options.

7.1   Configuring Modules

The configuration options for each SSU-2000 module displayed in the module status display area of the **LMT:SSU-2000** window can be found in the configuration dialog box for that module.

▶ **To configure a module:**

1. Click the representation of the shelf you want to configure in the module status display area of the **LMT:SSU-2000** window.

2. In the module configuration dialog box (Figure 7-2), click a tab to open the tab. Each module configuration dialog box contains these tabs:

    ❑ **Alarm Settings** — This tab displays module alarm severity level, start delay settings, controls for setting the alarm elevation time for the module. and for copying the alarm settings for the first alarm to all other alarms for this module.

❑ **Status** — This tab displays information about the module status and the current alarms for the module.

❑ **Configuration Management** — This tab offers options for managing the User Default and Factory Default configuration settings for this module.

❑ **Module Information** — This tab displays the manufacturing information for the module. This information may be required for customer service of the module.

■ View or set the configuration options for the module.

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■ When you have made the configuration changes, click **OK** to store the changes, update the SSU-2000 unit and the LMT module status display and configuration settings, and close the configuration dialog box.

   OR

   Click **Cancel** to close the module configuration dialog box without saving the configuration changes or updating the SSU-2000 or LMT module status display.

▶ **For a description of the module configuration dialog boxes:**

For a complete description of the LMT module configuration dialog boxes, tabs, and options for each module, refer to these sections:

■ Configuring the Clock Module (Section 8)

■ Configuring the Communications Module (Section 9)

■ Configuring the DS1 or E1 Output Module (Section 10)

■ Configuring the DS1 or E1 Input Module (Section 11)

■ Configuring the 2048 kHz Module (Section 12)

📄 **NOTE …**

The User Manual observes these conventions in describing how you interact with interface elements:

■ **Interactive elements** — Interface controls and options are described in terms of the action you perform on them. The description directs you to *select* one of several options from a range or list, *mark* or *clear* a check box, or *enter* text.

■ **Non-interactive elements** — Static descriptors or labels are called *labels*, and are described in terms of the information they convey: *This label displays the current PQL value.*

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For information about file and user management, performance monitoring, and system configuration, see Section 6.

7.2   LMT Module Configuration Options

The **LMT:SSU-2000** window (Figure 4-7) displays the module status display and message display.

7.2.1   Module Status Display

The module status display area of the **LMT:SSU-2000** window presents a real-time graphical representation of the SSU-2000 system with which the LMT software is communicating. The module status display shows each module that is currently installed in the selected main or expansion shelf.

The module status display depicts the current state of each module by colored indicators that correspond to the SSU-2000 status, alarm, port, operating mode, or other LEDs appropriate to each module type.

Each module representation in the module status display is labeled with the port number and module type, and displays real-time status indicators appropriate to the

current status of the module. Each module representation is associated with a module configuration dialog box containing the configuration settings and options for changing settings for that module.

7.2.2   Messages Display Area

The messages display area at the bottom of the **LMT:SSU-2000** window presents a real-time view of the current events and alarms for the system.

---

7   **7.3**   **LMT Module Configuration Dialog Boxes**

Each module type has an associated configuration dialog box that opens when you click the module representation in the module status display area of the **LMT:SSU-2000** window.

Each module configuration dialog box organizes its options within a number of tabs. This section provides an overview of the common features of all configuration dialog boxes, tabs, and options, followed by a complete description of each module configuration dialog box, tabs, and options.

Clock Module
- Configuration
- Alarm Settings
- Status
- Configuration Management
- Module Information

Communications Module
- Configuration
- Alarm Settings
- Status
- Configuration Management
- Module Information

Dialog Box Options

DS1/E1 Output Module Configuration
- Module Setting
- Port Setting
- Alarm Settings
- Status
- Configuration Management
- Module Information

DS1/E1 Input Module Configuration
- Port 1 Configuration
- Port 2 Configuration
- Port 3 Configuration
- Alarm Settings
- Status
- Configuration Mangement
- Module Information

2048 KHz Output Module Configuration
- Module Setting
- Port Setting
- Alarm Settings
- Status
- Configuration Management
- Module Information

Figure 7-1.   LMT Dialog Box Map

Figure 7-2 shows an example of a module configuration dialog box, the Communications Module Configuration dialog box, with the Configuration tab displayed.
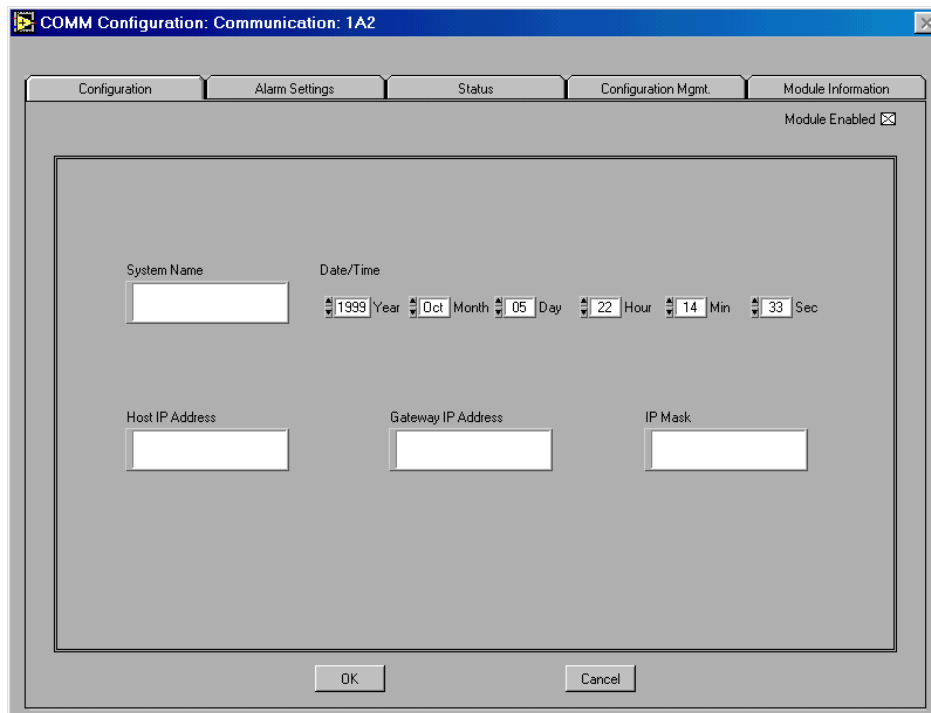
7

Figure 7-2.   Example of a Module Configuration Dialog Box

7.3.1   Module Configuration Dialog Box Naming Conventions

The *actual* names of the module configuration dialog boxes, shown in the title bar of each dialog box, vary, depending on the module type and its position in the main or expansion shelf. The names that you see in the title bar of the module configuration dialog boxes follow these conventions:

■   The Communications Module Configuration dialog box is titled **COMM Configuration: Communication: 1A2**. This tells you that the configuration

options for a communications module are available in the tabs of this dialog box. The module position indicator, 1A2, tells you that this module is located in the main shelf, in the COMM (A2) slot position.

■ The Output Configuration Module dialog box is titled **Output Configuration: Output DS1: 1A5**. This tells you that the output configuration options for a DS1 output module are available in the tabs of this dialog box. The module position indicator, 1A5, tells you that this module is located in the main shelf, in the I/O-3 (A5) slot position.

The descriptions in this User Guide refer to LMT Module Configuration dialog box titles using these generic designations:

■ Output Module Configuration dialog box

■ Input Module Configuration dialog box

■ Communications Module Configuration dialog box

■ Clock Module Configuration dialog box

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7.3.2   General Procedures for Configuring Modules

This section contains general procedures for using all configuration dialog boxes, followed by specific procedures for each type of module configuration dialog box.

▶ **To open a dialog box:**

■ Click the module in the module status display area of the **LMT:SSU-2000** window.

▶ **To open a dialog box tab:**

■ In the dialog box, click the dialog box tab label.

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▶ **To set configuration options for an SSU-2000 module:**

1. In the module status display, click the module to open the configuration dialog box for the module.

2. Each dialog box presents a number of tabs containing configuration options for the module. Click the tab label to bring the tab to the front and view the configuration options.

3. Select or enter values for configuration settings for each module.

❑ For multi-port modules, select or enter values for each port.

❑ For single-port modules, select or enter values for the module.

▶ **To store configuration settings:**

After making the configuration changes in each tab of the module configuration dialog box, click **OK** to:

■ Store the configuration changes made in all tabs of the dialog box.

■ Send the updated configuration settings to the SSU-2000.

■ Update the LMT module display and configuration setting values.

📄 **NOTE …**

When you click **OK** in the a configuration dialog box, the LMT software stores the configuration settings in the xAy_Config.csv data file. For information about LMT data file names, see Appendix A.

▶ **Close the module configuration dialog box.**

To close the dialog box without saving changes:

■ Click **Cancel** to close the module configuration dialog box *without* storing configuration changes, updating the SSU-2000 or LMT display, and close the module configuration dialog box.

▶ **To copy configuration settings to other ports or modules:**

The LMT software provides a number of efficient ways to minimize your configuration efforts by copying configuration settings.

■ In the **Configuration Management tab** of each dialog, choose one of these options (Figure 7-3 shows the Configuration Management tab of the Communications Module Configuration dialog box as an example):
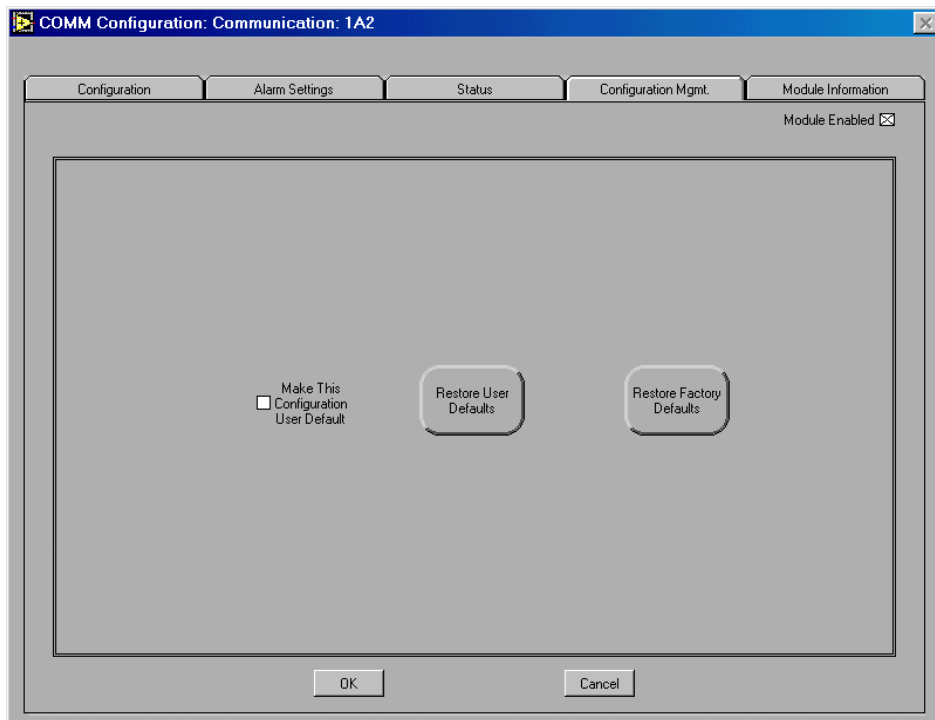
Figure 7-3.   Example Configuration Management Tab

7

❑ **Make this Configuration the User Default —** Mark this option to store the current configuration options for this module as the SSU-2000 User Default configuration settings.

❑ **Restore User Defaults —** Mark this option to restore the user default configuration settings. Before restoring the settings, the LMT software asks you to confirm that you want to replace the current settings with the user default settings (Figure 7-4). Click **OK** to restore the user default configuration settings and update the SSU-2000 configuration settings and the LMT display. Click **Cancel** to close the message box without restoring the user default configuration settings, or updating the SSU-2000 and the LMT display.
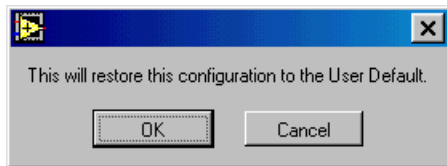
Figure 7-4.   Restore User Defaults Message Box

❑ **Restore Factory Defaults —** Mark this option to restore the factory default configuration settings. Before restoring the settings, the LMT software asks you to confirm that you want to replace the current settings with the factory default settings (Figure 7-5). Click **OK** to restore the factory default configuration settings and update the SSU-2000 configuration settings and the LMT display. Click **Cancel** to close the message box without restoring the factory default configuration settings, or updating the SSU-2000 and the LMT display.
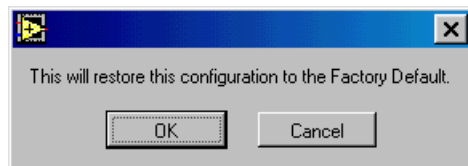
Figure 7-5.   Restore Factory Defaults Message Box

8   Configuring the Clock Module

8

This section provides an overview of the SSU-2000 clock module and a complete description of using the options in the Clock Module Configuration dialog box and tabs to configure the clock module.

8.1   Clock Module

The ST2E rubidium clock module reads measurement data from the input modules, provides frequency control of the oscillators using DDS circuitry, and generates a reference signal to be used by the input and output modules. The Clock Configuration dialog box title bar displays the clock type: either Stratum 2 or Stratum 3E clock.

A typical SSU-2000 system contains dual clock modules, each of which maintains phase synchronization with the redundant clock module. In such a configuration, one clock is selected as the controller or *master* clock, while the other is the backup clock, with automatic switching between clocks if one clock module is removed or fails.

■   The master clock module:

❑   Controls the operation of the input and output modules.

❑   Downloads module configuration information to all modules except the communications module.

   ❑   Requests measurement data and status data from the input modules.

   ❑   Sets the output modules to use the currently selected clock signals.

■   Each clock module:

   ❑   Maintains an internal time-of-day clock that is used to timestamp events to within 0.1 second of detection of the event.

   ❑   Provides one set of signals for use by the modules in the main chassis (shelf), and a separate set for the expansion shelves.

8   8.2   Clock Module Configuration Dialog Box

The Clock Module Configuration dialog box (Figure 8-1) opens when you click a representation of a clock module in the module status display area of the **LMT:SSU-2000** window.
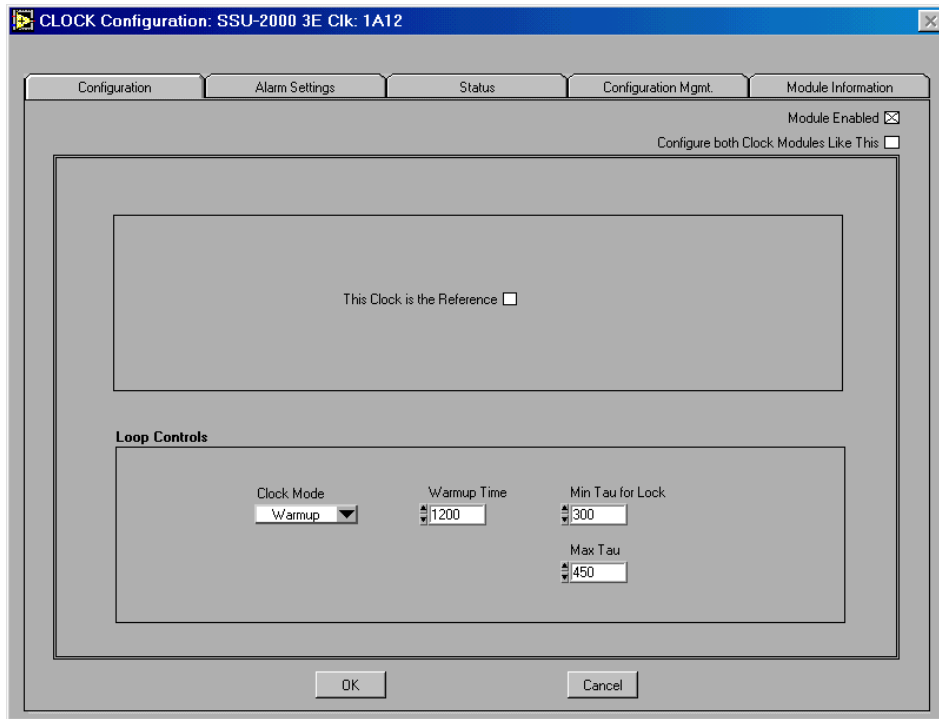
Figure 8-1.   Clock Module Configuration Dialog Box Configuration Tab

■   **Module Enabled —** Mark this check box to enable the Clock module. Clear this check box to disable all options for the clock module.

📋   **NOTE …**

The tab options for the clock module are available only when the module is enabled.

■   **Configure Both Clock Modules Like This** — Mark this check box to copy the configuration settings for this clock module to the redundant clock module.

8.2.1   Configuration Tab

The Clock Module Configuration dialog box Configuration tab (Figure 8-1) provides options for configuring the clock module.

■ **This Clock is the Reference —** Mark this option to configure this clock as the reference, i.e., the controller or *master* clock, and the redundant clock, if any, as the backup clock.

■ **Loop Controls** — Set the loop controls for this clock module:

❑ **Clock Mode** — Select the clock mode: **Warmup**, **Acquire**, **Locked**, or **Holdover**.

❑ **Warmup Time** — Select the clock warmup time (in seconds). Click on the up or down arrows to raise or lower the current setting.

❑ **Min Tau** — Enter an integer to specify the minimum Tau limit value required for lock for this clock module (the factory default is 300 seconds).

❑ **Max Tau for Lock** — Enter an integer to specify the maximum Tau limit value allowed for this clock module (the factory default setting is 9000 seconds for 2E clock modules, and 450 for ST3E clock modules).

■ **OK** to save the configuration changes and close the dialog box.

📄 **NOTE …**

When you click **OK** in the a configuration dialog box, the LMT software stores the configuration settings in the xAy_Config.csv data file. For information about LMT data file names, see Appendix A.

■ Click **Cancel** to close the dialog box without saving changes or displaying the requested information.

To open the Clock Selection Algorithm dialog box, click **Clock Selection** on the **System Configuration** menu. For more information about Clock Selection Algorithm dialog box options, see Section 6.3.2.

8.2.2   Alarm Settings Tab

The Clock Module Configuration dialog box Alarm Settings tab (Figure 8-2) provides options viewing or setting the alarm elevation time, the initial severity level and start delay for each clock module alarm, or for copying the first alarm settings to all clock module alarms.
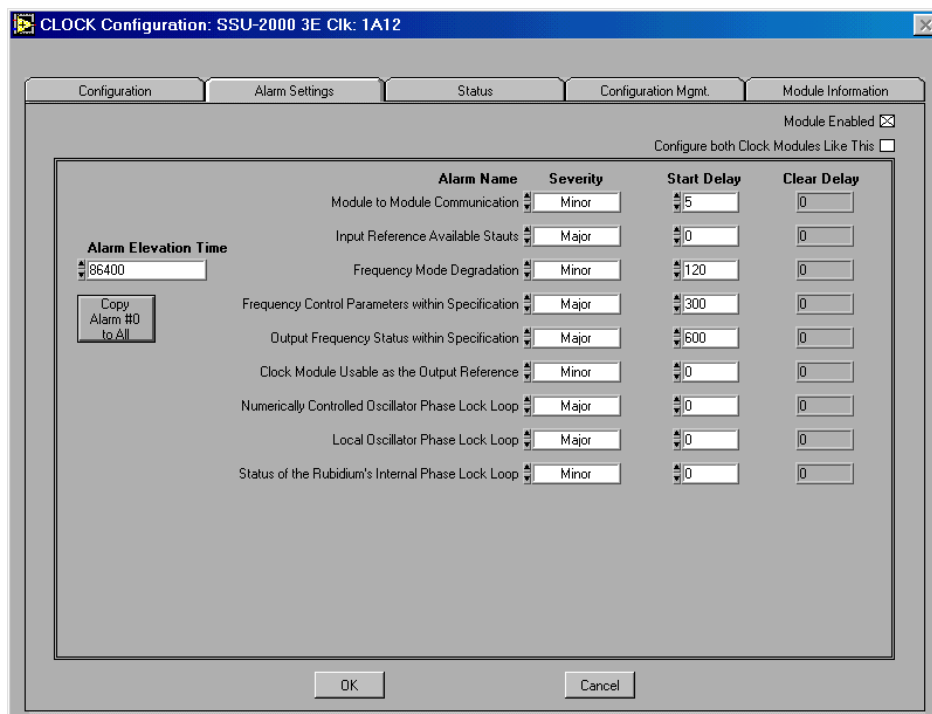
Figure 8-2.   Clock Module Dialog Box Alarm Settings Tab

■   **Alarm Elevation Time —** This option accepts an alarm elevation time expressed as an integer between 0 and 172800 seconds (86,400 seconds = 1 day). The alarm elevation time specifies for how many seconds the alarm condition must persist before elevating the alarm to the next higher level. Clock module alarms are elevated from Minor to Major to Critical based on the alarm elevation time set with this option and stored in the module.

■ **Copy Alarm #0 to All** — Click this option to copy the configuration settings of the top level alarm in this dialog box (in this case, the **Module to Module Communication** alarm settings) to all clock module alarms. Click **OK** in the Copy Alarm message box (Figure 8-3) to copy the alarm settings, or click **Cancel** to cancel the operation.
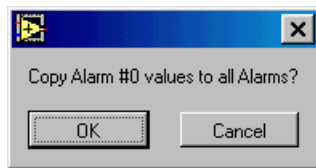
Figure 8-3.   Copy Alarm Message Box

■ **Alarm Name —** This label displays the clock module alarm name.

❑ **Module to Module Communication** — This alarm indicates the status of communications between modules. This alarm returns the status messages OK or Bad.

❑ **Input Reference Available Status** — This alarm indicates that the reference is not available to control the clock. This alarm returns the status messages OK or Invalid.

❑ **Frequency Mode Degradation** — This alarm indicates and invalid reference input that will eventually cause the clock module to go into Holdover mode, a mode of operation in which an internal clock provides the synchronization reference when the internal reference is lost or other suitable reference is not available. This alarm returns the status messages OK or Invalid.

❑ **Frequency Control Parameters within Specification** — This alarm indicates that the reference input frequency is over the clock pull-in range. This alarm returns the status messages OK or Out of Range.

❑ **Output Frequency Status within Specification** — This alarm indicates that the output has exceeded the pull-in range of the oscillator. This alarm returns the status messages OK or Degraded.

❑ **Clock Module Usable as the Output Reference** — This alarm indicates that the clock mode has warmed up. This alarm returns the status messages OK or Invalid.

❑ **Numerically Controlled Oscillator Phase Lock Loop** — This alarm indicates the status of the numerically controlled oscillator PLL. This alarm clears within one minute after the clock module is installed. This alarm returns the status messages OK or Not Locked.

❑ **Local Oscillator Phase Lock Loop** — This alarm indicates the status of the local oscillator PLL. This alarm clears within one minute after the clock module is installed. This alarm returns the status messages OK or Not Locked.

❑ **Status of the Rubidium Internal Phase Lock Loop** — This alarm indicates the status of the Stratum 2E Rubidium clock module. This alarm returns the status messages OK or Not Locked.

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■ **Severity —** Select the initial severity for the alarm to be **IGNORE**, **REPORT**, **MINOR**, **MAJOR**, or **CRITICAL**. This option sets the severity for an alarm when it is first logged (as distinct from an **Alarm Elevation Time** setting, which allows the alarm severity to increase in the specified time).

■ **Start Delay —** Enter an integer between 0 and 86400 (86,400 seconds = 1 day), representing the number of consecutive seconds for which the alarm condition must persist before setting the alarm. Changing the delay period for an alarm generates an event.

📄 **NOTE …**

If the factory default value is IMMED or -1, this start delay value is not user-settable and the alarm takes effect immediately.

■ **Clear Delay —** This label displays an integer between 0 and 86400 (86,400 seconds = 1 day), representing the number of consecutive seconds for which the module must be free of the alarm condition before clearing the alarm.

■ Click **OK** to save the configuration changes, update the SSU-200 and the LMT module status display and configuration values, and close the dialog box.

■ Click **Cancel** to close the dialog box without saving changes or displaying the requested information.

8.2.3 Status Tab

Use the options in the Clock Module Configuration dialog box Status tab (Figure 8-4) to view all current alarms and the output status for the clock module.
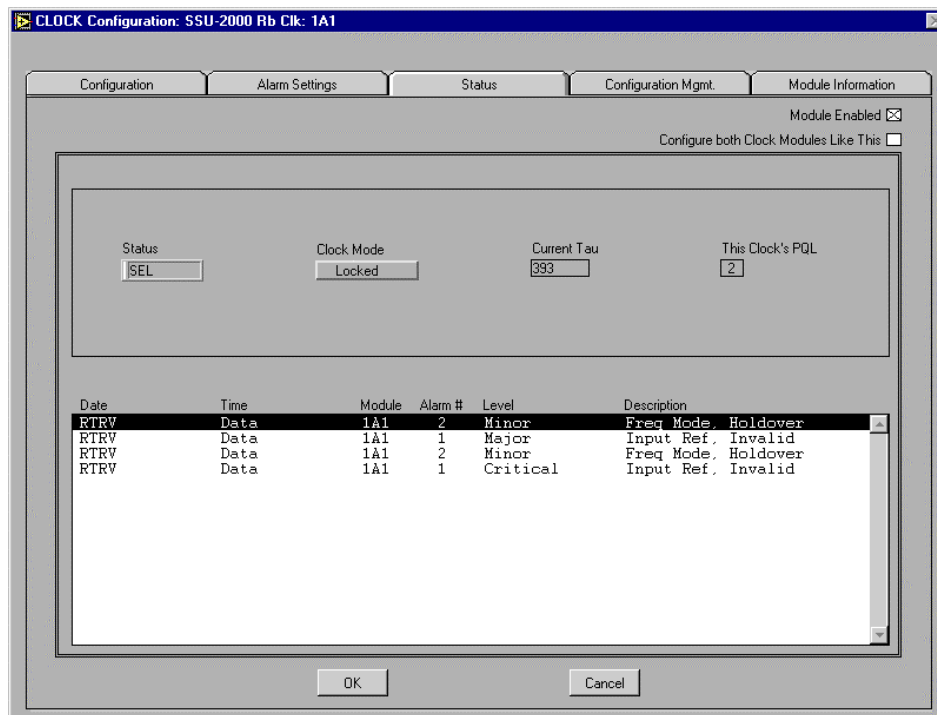
8

Figure 8-4.   Clock Module Dialog Box Status Tab

■ **Status** — This label displays the current status of the clock module: **OK**, **Disabled**, **Faulted**, or **Selected**.

■ **Clock Mode** — This label displays the current clock mode: **Warmup**, **Acquire**, **Locked**, **Holdover**.

■ **Current Tau** — This label displays the current Tau value for the clock module.

■ **This Clock's PQL** — This label displays the current PQL value for the clock module.

■ **Message Display** — This area of the dialog box displays the current active alarms for the clock module:

❑ **Date** — This portion of the status message provides the date information for the alarm in this format: YY-MM-DD.

❑ **Time** — This label displays the timestamp information for the alarm in this format: HH-MM-SS.

❑ **Module** — This label displays the clock module Access Identifier (AID).

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📄 **NOTE …**

The Access Identifier (AID) identifies the unit (shelf), module, and port locations within the SSU-2000. The LMT software uses the AID in the message display area messages and interface labels. The AID follows this format: `aid = SxAy-z`

where:

■ `S` = an internal identifier which may or may not be shown in the message or label.

■ `x` = shelf 1-5 (note that only the main unit #1 can contain input modules).

■ `y` = slot 1-16 in the main or expansion unit.

■ `z` = port 1-20 (note that multi-port input modules use ports 1-3; output modules use ports 1-20)

In the LMT:SSU-2000 message display area:

■ CLOCK-A = S1A1
■ CLOCK-B = S1A12

❑ **Alarm #** — This label displays the clock module alarm number. Use the alarm # to locate additional information about the alarm condition in Section A, Alarms and Events, in the *SSU-2000 Synchronization Supply Unit User Guide*.

❑ **Level** — This label displays the clock module alarm severity level: **IGNORE**, **REPORT**, **MINOR**, **MAJOR**, or **CRITICAL**.

❑ **Description —** This label displays a brief description of the alarm condition.

■ Click **OK** to close the clock output module configuration dialog box.

■ Click **Cancel** to close the clock output module configuration dialog box.

8.2.4 Configuration Management Tab

The Clock Module Configuration dialog box Configuration Management tab (Figure 8-5) provides configuration management options for the clock module.
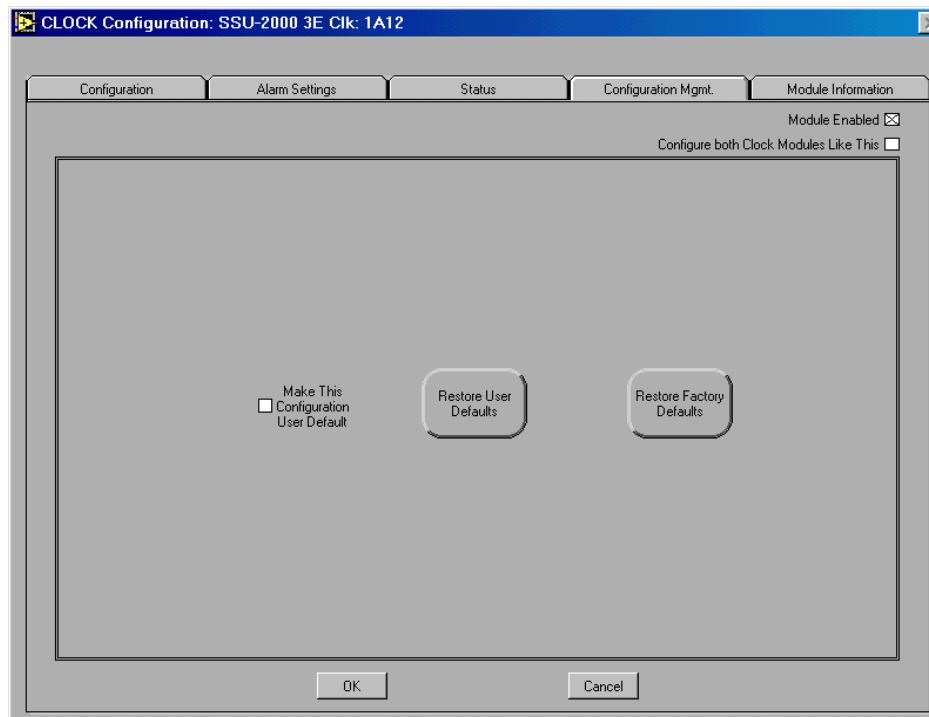

Figure 8-5.   Clock Module Configuration Dialog Box Configuration Management Tab

■ **Make This Configuration User Default —** Mark this option to save the current configuration settings for the clock module as the User Default configuration settings. To return to the User Default settings after making configuration changes to the module, click **Restore User Defaults** in this tab.

■ **Restore Factory Defaults —** This option restores the Factory Default configuration settings for the clock module. Before restoring the settings, the LMT software asks you to confirm that you want to replace the current settings with the Factory Default settings. Click **OK** in the message box to restore the Factory Default settings and update the module status display. Click **Cancel** in the message box to close the message box without restoring the Factory Default settings.

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This will restore this configuration to the Factory Default.

OK   Cancel
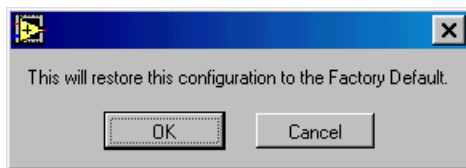
Figure 8-6.   Restore Factory Defaults Message Box

■ **Restore User Defaults —** Click this option to restore the User Default configuration settings to the clock module. Before restoring the settings, the LMT software asks you to confirm that you want to replace the current settings with the User Default configuration settings. Click **OK** in the message box to restore the User Default settings and update the module status display. Click **Cancel** in the message box to close the message box without restoring the User Default settings.

■ **OK —** Click to store the changes, send the settings to the SSU-2000 unit, and close the Clock Module Configuration dialog box.

■ **Cancel —** Click to close the Clock Module Configuration dialog box without storing the changes.

8.2.5   Module Information Tab

The Clock Module Configuration dialog box Module Information tab (Figure 8-7) provides manufacturing information about the clock module.

8
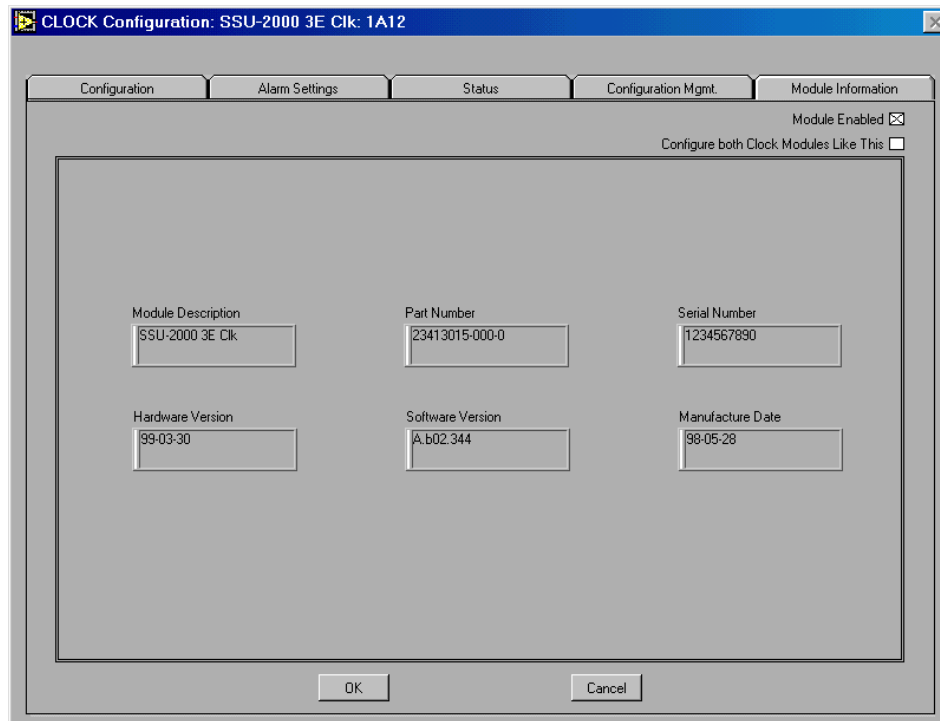
Figure 8-7.   Clock Module Dialog Box Module Information Tab

■   **Module Description** — This label displays a description of the module item.

■   **Module Serial Number —** This label displays the module serial number.

■   **Module Part Number —** This label displays the module part number.

■   **Software Revision —** This label displays the module software revision number.

■   **Hardware Revision —** This label displays the module hardware revision number.

■   **Date of Manufacture —** This label displays the date the module was manufactured.

■   **OK** — Click to close the dialog box.

■ **Cancel** — Click to close the dialog box.

📄 **NOTE …**

Customer Service will request the information found in the Module Information tab when you request service for the clock module.

💡 **TIP …**

The module manufacturing information is stored in the Manf_Info.csv data file. This file is created each time the LMT software connects to the SSU-2000 and is updated when a module is removed from or inserted into the SSU-2000 while the LMT software is connected. The filename is fixed, but you may select the storage folder.

You can use the Manf_Info.csv data file to inventory network SSU-2000 modules. All LMT data is stored in Comma Separated Value format, and can be opened in Microsoft Excel or in other programs which support the *.csv* file name extension. For more information about using the LMT data files, see Appendix A.

8

9   Configuring the Communications Module

This section provides an overview of the SSU-2000 communications module and a complete description of using the options in the Communications Module Configuration dialog box and tabs to configure the communications module.

9

9.1   Communications Module

The communications module supplies the user interface to the SSU-2000 unit. The module also logs system events into non-volatile memory for later inspection and reports alarm events as they occur.

You can communicate with the SSU-2000 system using ICS or TL1 control languages, or perform equivalent control and monitoring functions using the LMT software.

9.2   Communications Module Configuration Dialog Box

Click the Communications Module representation in the module status display area of the **LMT:SSU-2000** window to open the Communications Module dialog box (Figure 9-1). Use the options in the Communications Module dialog box and tabs to view or configure module configuration settings:
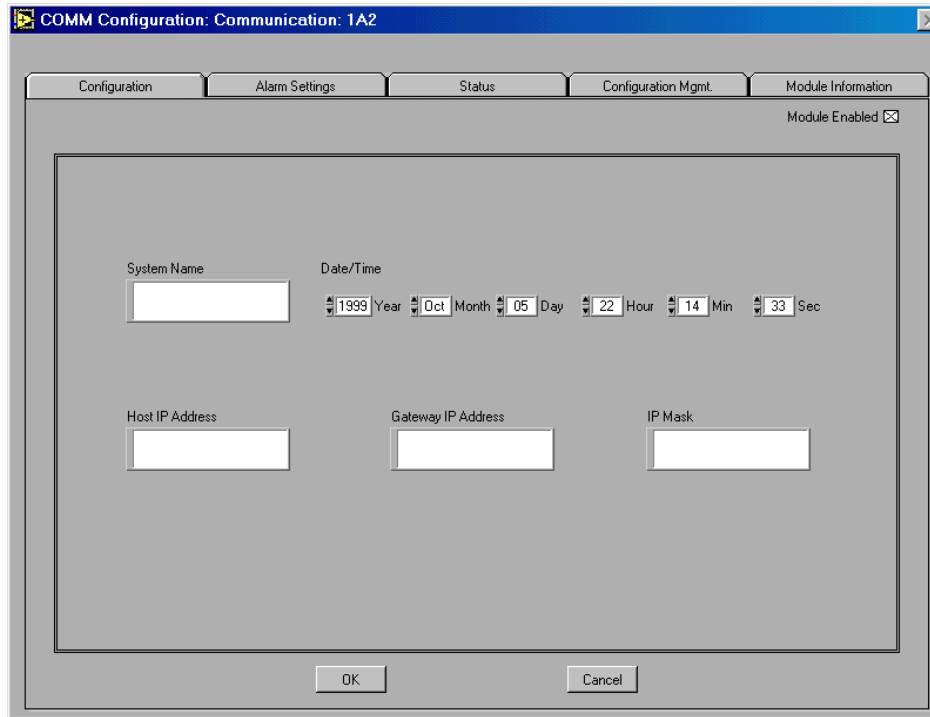
**Figure 9-1.   Communications Module Configuration Dialog Box
Configuration Tab**

■   **Module Enabled** — Mark this check box to enable the communications module.
Clear this check box to disable all options for the communications module.

NOTE …

The tab options for the communications module are available only when
the module is enabled.

9.2.1 Configuration Tab

The Communications Module Configuration dialog box Configuration Tab (Figure 9-1) provides options for configuring the communications module. The Configuration tab displays this information:

- **System Name —** This label displays the name assigned to the SSU-2000 unit by a user.

- **Date/Time —** This label displays the current date and time according to the SSU-2000 unit. Enter or scroll up or down (by clicking on the up or down arrows) to a value for **Year**, **Month**, **Day**, **Hour**, **Min.** (Minute), or **Sec.** (Second).

- **Host IP Address —** Enter the internet IP address for the host computer. The IP address is a unique 32-bit identifier for the specific TCP/IP host computer or network with which the LMT software is communicating.

- **Gateway IP Address —**Enter the internet gateway IP address for the host computer. The Gateway IP address is a unique 32-bit identifier for the specific TCP/IP host computer or network with which the LMT software is communicating.

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■ **IP Mask** — Enter the IP network mask. The IP network mask is unique 32-bit value which specifies which bit positions are interpreted as the network position.

📄 **NOTE …**

The IP Address consists of three parts: the IP address, the IP gateway address, and the IP network mask.

■ The IP address is Internet protocol address internally represented as a 32-bit unsigned value. For example, the IP dotted address 192.168.70.224 is internally represented as IP address 0xC0A846E0.

■ The gateway address is the Internet gateway address. The format is the same as described for the IP address.

■ The IP network mask is the specification as to which bits are to be interpreted as the network address. The network mask is a 32-bit value with ones in all bit position that are to be interpreted as the network position. For example, the network dotted mask 255.255.255.0 represented as network mask as 0xFFFFFF00.

The IP address must be unique in the network.

■ **OK** — Click to store the settings, update the SSU-2000 and the LMT display, and close the dialog box.

■ **Cancel** — Click to close the dialog box without saving the configuration changes.

9.2.2 Alarm Settings Tab

Use the options in the Communication Module Configuration dialog box Alarm Settings tab (Figure 9-2) to configure communications module alarm elevation time, alarm severity level, and Start Delay times for each communication module alarm, or to copy alarm settings from the first alarm to all other module alarms.

📄 **NOTE …**

The Alarm Settings tab options for each module are available only when the module is enabled.
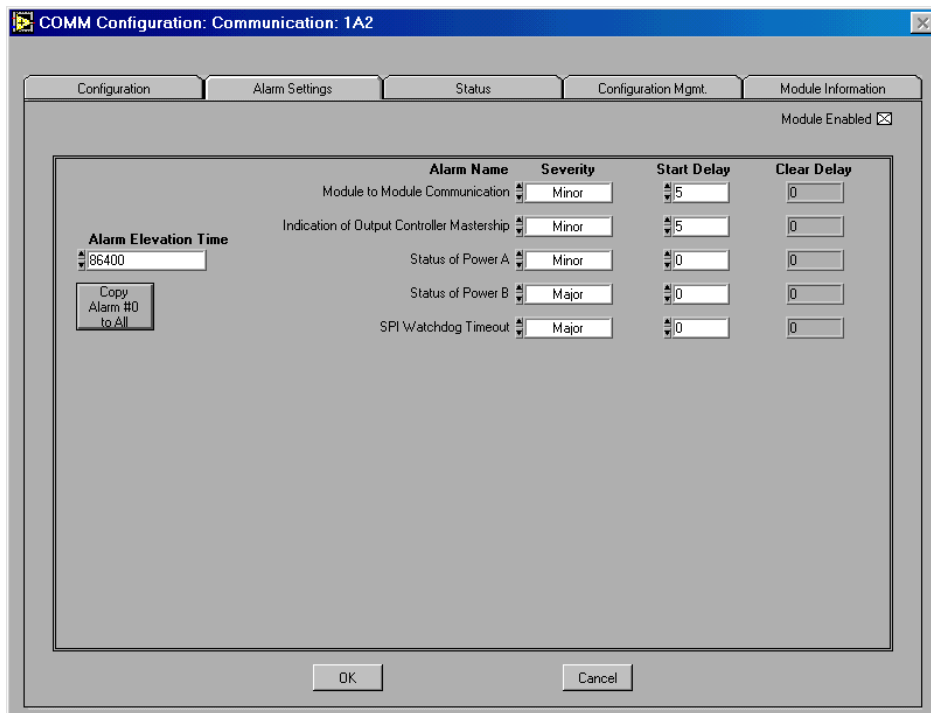
**Figure 9-2.   Communications Module Configuration Dialog Box
Alarm Settings Tab**

■   **Alarm Elevation Time —** This option accepts an alarm elevation time expressed
as an integer between 0 and 172800 seconds (86,400 seconds = 1 day). The alarm
elevation time specifies for how many seconds the alarm condition must persist
before elevating the alarm to the next higher level. Communication module alarms
are elevated from Minor to Major to Critical based on the alarm elevation time set
with this option and stored in the module.

■   **Copy Alarm #0 to All** — Click this option to copy the configuration settings of
the top level alarm in this dialog box (in this case, the **Module to Module
Communication** alarm settings) to all communication module alarms. Click **OK**
in the message box (Figure 9-3) to confirm or click **Cancel** to cancel the operation.

Figure 9-3.   Copy Alarm Message Box

■   **Individual Alarm Settings —** The options in this section configure alarm settings for each port. For each alarm on each port of the input module, specify:
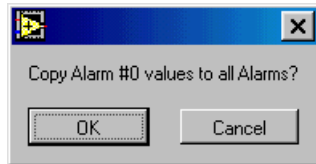
■   **Alarm Name —** This label displays the alarm name.

   ❑   **Module to Module Communication** — This alarm indicates the status of the communication between modules. This alarm returns the status messages OK or Bad.

   ❑   **Indication of Output Controller Mastership** — This alarm identifies the status of the master reference clock. This alarm returns the status messages OK or Bad.

   ❑   **Status of Power A** — This alarm indicates the status of the A-BUS power input. This alarm returns the status messages OK or Lost.

   ❑   **Status of Power B** — This alarm indicates the status of the B-BUS power input> This alarm returns the status messages OK or Lost.

   ❑   **SPI Watchdog Timer** — This alarm indicates the status of the serial peripheral interface hardware (SPI watchdog timeout) for the communications module. This alarm returns the status messages OK or Timeout.

■   **Severity —** Select the initial severity for the alarm to be **IGNORE**, **REPORT**, **MINOR**, **MAJOR**, or **CRITICAL**. This option sets the severity for an alarm when it is first logged (as distinct from an **Alarm Elevation Time** setting, which allows the alarm severity to increase in the specified time).

■   **Start Delay —** Enter an integer between 0 and 86400 (86,400 seconds = 1 day), representing the number of consecutive seconds for which the alarm condition

must persist before setting the alarm. Changing the delay period for an alarm generates an event.

📄 **NOTE …**

If the Factory Default value is IMMED or -1, this start delay value is not user-settable and the alarm takes effect immediately.

■ **Clear Delay —** This label displays an integer between 0 and 86400 (86,400 seconds = 1 day), representing the number of consecutive seconds for which the module must be free of the alarm condition before clearing the alarm.

■ **OK** — Click to store the changes, update the SSU-2000 and LMT display, and close the dialog box.

■ **Cancel** — Click to close the dialog box without saving changes.

9

9.2.3   Status Tab

The Communications Module Configuration dialog box Status tab (Figure 9-4) provides information about *all* currently active alarms for the communications module:
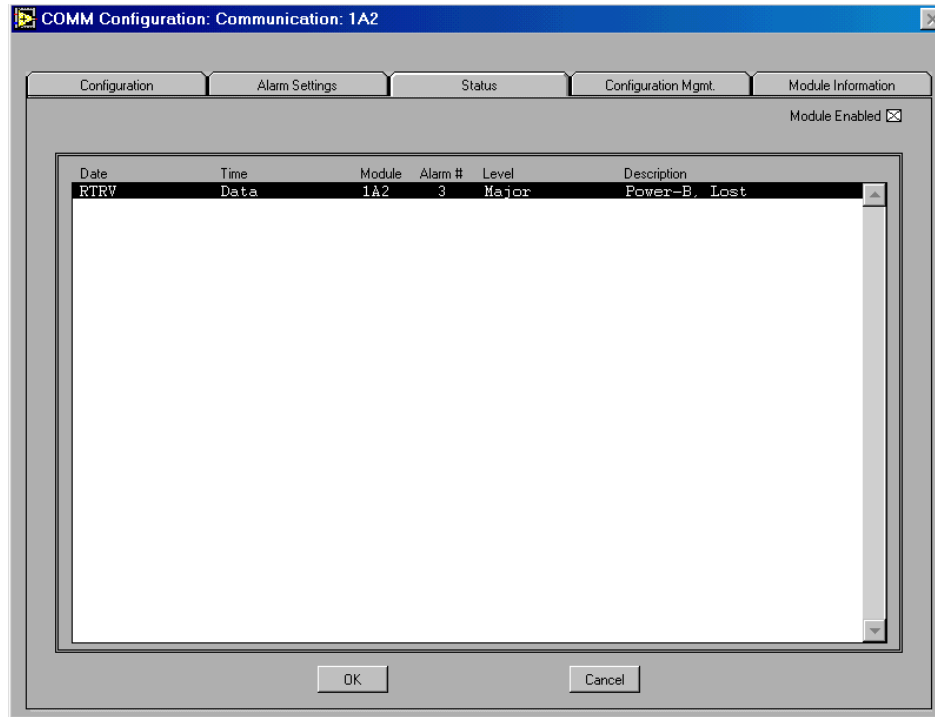
9

**Figure 9-4.   Communications Module Configuration Dialog Box
                Status Tab**

■ **Date** — This label displays the date information for the communications module
    alarm in this format: YY-MM-DD.

■ **Time** — This label displays the timestamp information for the alarm in this format:
    HH-MM-SS.

■ **Module** — This label displays the communication module AID.,

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📄 **NOTE …**

The Access Identifier (AID) identifies the unit (shelf), module, and port locations within the SSU-2000. The LMT software uses the AID in the message display area messages and interface labels. The AID follows this format: `aid = SxAy-z`

where:

■ `S` = an internal identifier which may or may not be shown in the message or label.

■ `x` = shelf 1-5 (note that only the main unit #1 can contain input modules).

■ `y` = slot 1-16 in the main or expansion unit.

■ `z` = port 1-20 (note that multi-port input modules use ports 1-3; output modules use ports 1-20)

In the LMT:SSU-2000 message display area:

■ CLOCK-A = S1A1

■ CLOCK-B = S1A12

■ **Alarm #** — This label displays the communications module alarm number. Use the alarm # to locate additional information about the alarm condition in Section A, Alarms and Events, in the *SSU-2000 Synchronization Supply Unit User Guide*.

■ **Level** — This label displays the communications module alarm severity level: **IGNORE**, **REPORT**, **MINOR**, **MAJOR**, or **CRITICAL**.

■ **Description —** This label displays a brief description of the alarm condition.

■ **OK** — Click to store the changes, update the SSU-2000 and the LMT display, and close the dialog box.

■ **Cancel** — Click to close the dialog box without saving changes.

9.2.4 Configuration Management Tab

The Communications Module Configuration dialog box **Configuration Management** tab (Figure 9-5) provides options for managing the configuration settings for the communications module.
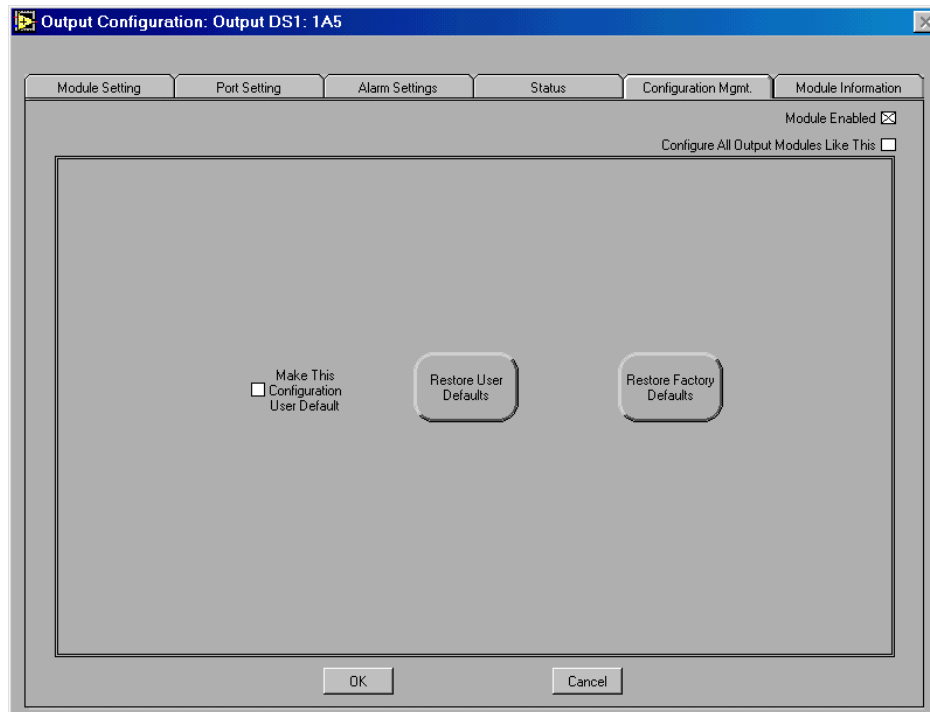
Figure 9-5. **Communications Module Configuration Dialog Box Configuration Management Tab**

- ■ **Make This Configuration User Default —** Mark this option to save the current configuration settings for the communications module as the User Default configuration settings. To return to the User Default settings after making configuration changes to the module, click **Restore User Defaults** in this tab.

- ■ **Restore Factory Defaults —** This option restores the Factory Default configuration settings for the communications module. Before restoring the settings, the LMT software asks you to confirm that you want to replace the current

settings with the Factory Default settings. Click **OK** in the message box (Figure 9-6) to restore the Factory Default settings and update the module status display. Click **Cancel** in the message box to close the message box without restoring the Factory Default settings.

Figure 9-6.   Restore Factory Defaults Message Box

■   **Restore User Defaults —** Click this option to restore the User Default configuration settings to the communications module. Before restoring the settings, the LMT software asks you to confirm that you want to replace the current settings with the User Default configuration settings. Click **OK** in the message box to restore the User Default settings and update the module status display. Click **Cancel** in the message box to close the message box without restoring the User Default settings.
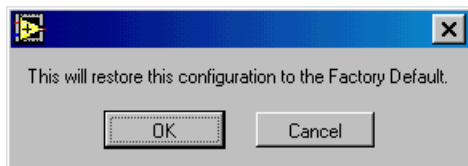
■   **OK —** Click to store the changes, update the SSU-2000 and LMT display, and close the dialog box.

■   **Cancel —** Click to close the dialog box without storing the changes.

9.2.5   Module Information Tab

The Communications Module Configuration dialog box Module Information tab
(Figure 9-7) displays communication module manufacturing information (for viewing
only).

9

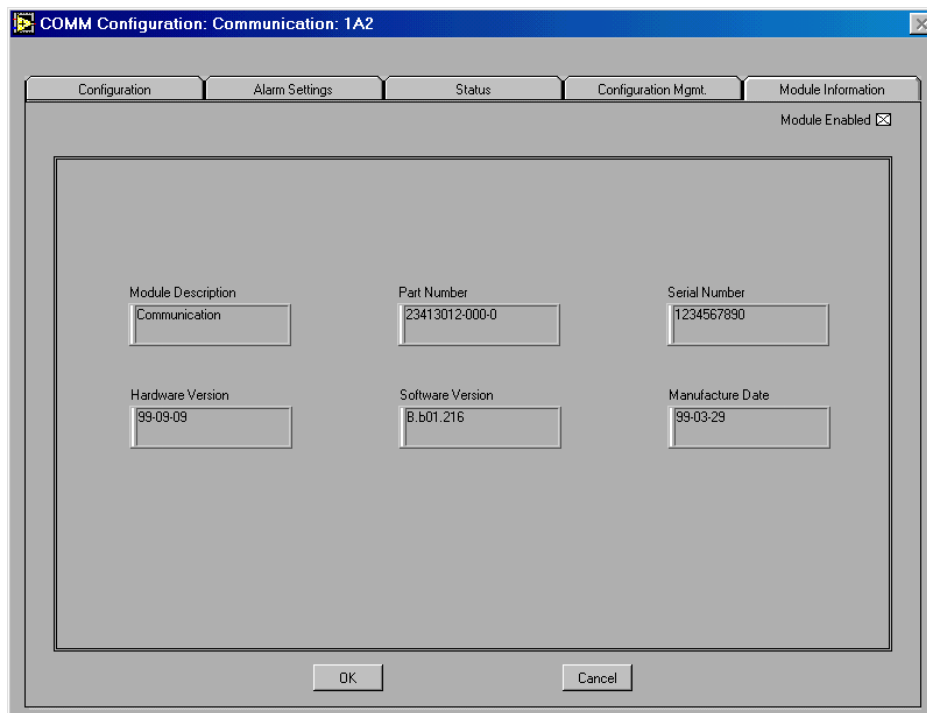**Figure 9-7.   Communications Module Configuration Dialog Box
Module Information Tab**

- **Module Description** — This label displays a description of the module item.

- **Module Serial Number —** This label displays the module serial number.

- **Module Part Number —** This label displays the module part number.

- **Software Revision** — This label displays the module software revision number.

■ **Hardware Revision —** This label displays the module hardware revision number.

■ **Date of Manufacture —** This label displays the date the module was manufactured.

■ **OK —** Click to close the dialog box.

■ **Cancel —** Click to close the dialog box.

📄 **NOTE …**

Customer Service will request the information found in the Module Information tab when you request service for the module.

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💡 **TIP …**

The module manufacturing information is stored in the Manf_Info.csv data file. This file is created each time the LMT software connects to the SSU-2000 and is updated when a module is removed from or inserted into the SSU-2000 while the LMT software is connected. The filename is fixed, but you may select the storage folder.

You can use the Manf_Info.csv data file to inventory network SSU-2000 modules. All LMT data is stored in Comma Separated Value format, and can be opened in Microsoft Excel or in other programs which support the *.csv* file name extension. For more information about using the LMT data files, see Appendix A.

9

10 Configuring the DS1 or E1 Output Module

This section provides an overview of the SSU-2000 DS1 and E1 output module and a complete description of using the options in the DS1/E1 Output Module Configuration dialog box and tabs to configure the DS1 and E1 output module.

10

10.1 DS1 and E1 Output Module

The primary function of the DS1 or E1 output module is to produce the best-case output under all circumstances.

■ The E1 output module generates a 2048 kHz phase-locked signal. This signal is used to clock the frame generator (or framer) for insertion of proper framing bits.

■ The DS1 output module generates a 1544 kHz phase-locked signal. This signal is used to generate a set of 20 output signals for distribution to large networks and to clock the frame generator (or framer) for insertion of proper framing bits.

10.2   DS1/E1 Output Module Configuration Dialog Box

Click the DS1/E1 output module representation in the module status display area of the
LMT:SSU-2000 window to open the DS1/E1 Output Module Configuration dialog box
and monitor or configure options for either the DS1 or E1 output module.

After retrieving data from the SSU-2000, during which time the **LMT:SSU-2000**
window displays the **RTRV Wait** message box (Figure 10-1), the DS1/E1 Output
Module Configuration dialog box (Figure 10-2) opens. Use the options in the DS1/E1
Output Module Configuration dialog box and tabs to configure options for the DS1/E1
output module.

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Figure 10-1.   RTRV Wait Message Box

■   **Module Enabled** — Mark this check box to enable the DS1/E1 output module.
Clear this check box to disable all options for the DS1/E1 output module.

📄   **NOTE …**

The tab options for each module are available only when the module is
enabled.

■   **Configure All Output Modules Like This** — Mark this check box to copy the
configuration options for the DS1/E1 output module to all DS1/E1 output modules.

10.2.1 Module Setting Tab

The DS1/E1 Output Module Configuration dialog box Module Setting tab (Figure 10-2) provides options for monitoring or configuring the DS1 or E1 output signal control or clock support control settings.
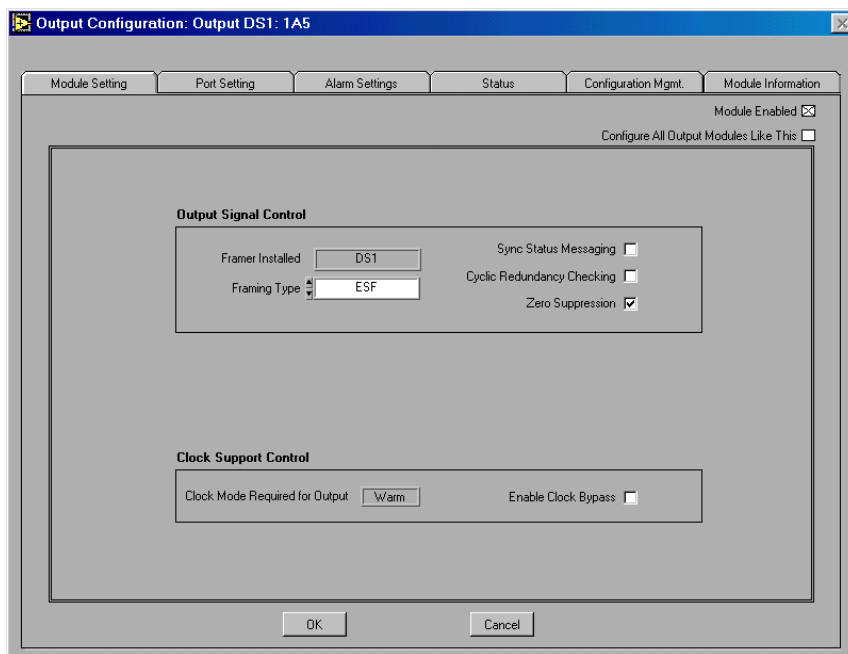

**Figure 10-2.   E1 Output Module Configuration Dialog Box
                        Module Setting Tab**

■   **Output Signal Control** — Use the options in this section of the tab to configure output signal options for the DS1/E1 output module:

❑   **Framer Installed** — This label displays the type of framer installed on the DS1/E1 output module: **DS1** or **E1**.

❑   **Framing Type** — Select a framing type. Click on the list box to display the list or click the up or down arrows to scroll through the options on the list: **D4**, **D4** and **ESF** framing types are enabled for modules with DS1 framers installed. **CAS** and **CCD** framing types are enabled for modules with E1 framers.

❑ **Sync Status Messaging —** Mark this check box to enable **Synchronization Status Messaging** (SSM). Clear this check box to disable SSM.

SSMs allow the DS1 or D1 output module to determine the traceability quality level of the communications input signals by extracting SSMs from the incoming data. This information can then be used by the clock modules to select a reference. The SSM information can also be embedded and transmitted in the SSU-2000 output signals: in the DS1 ESF Facilities Data Link (FDL) channel, in the E1 time slot zero (TS0) Sa byte, and in the SONET overhead S1 byte.

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📄 **NOTE …**

The SSU-2000 uses the following SSM selection criteria:

■ If the SSU-2000 is configured for **Provisioned** mode, the system uses the provisioned SSM.

■ If the SSU is configured for **Automatic** mode, and there is a valid received SSM, the system uses the most recent valid received SSM. If there is not a valid received SSM, the system uses the provisioned SSM.

❑ **Cyclic Redundancy Checking —** Mark this check box to enable **Cyclic Redundancy Checking** (CRC) for every **Framing Type** except **Unframed**. Clear this check box to disable **Cyclic Redundancy Checking**.

❑ **Zero Suppression —** Mark this check box to enable **Zero Suppression** for framed signals for every **Framing Type** except **Unframed**. Clear this check box to disable **Zero Suppression**.

📄 **NOTE …**

DS1 output modules support D4 or ESF framed signals, and B8ZS zero suppression, CRC6 checking, and SSMs for framed signals.

E1 output modules support CAS or CCS framed signals, and HDB3 zero suppression, CRC4 checking, and SSMs for framed signals.

❑ **SSM Bit Position —** Select the bit position used to send SSMs. Enter an integer between 4 and 8. This option is enabled only when the module **Framing Type** is E1 and **Synchronization Status Messaging** is enabled.

■ **Clock Support Control —** The options in this section configure clock options.

❑ **Clock Mode Required for Output —** This label displays the clock mode required for the output module: **Warm**, **Acquire,** or **Lock**.

❑ **Enable Clock Bypass —** Mark this option to enable the Clock Bypass feature for the DS1 or E1 output module. When enabled, bypass mode allows the module to select Clock-C, the pass-through clock, if it is the only clock available. When this option is disabled, the unit does not select Clock-C, even if no other clock is available. The default setting for this option is enabled.

■ **OK** — Click to store the changes, update the SSU-2000 and LMT display, and close the dialog box.

■ **Cancel** — Click to close the dialog box without storing the changes.

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10.2.2 Port Setting Tab

The DS1/E1 Output Module Configuration dialog box Port Setting tab (Figure 10-3) provides options for enabling or disabling, assigning a name to or changing the line length for DS1 or E1 ports 1 through 20.
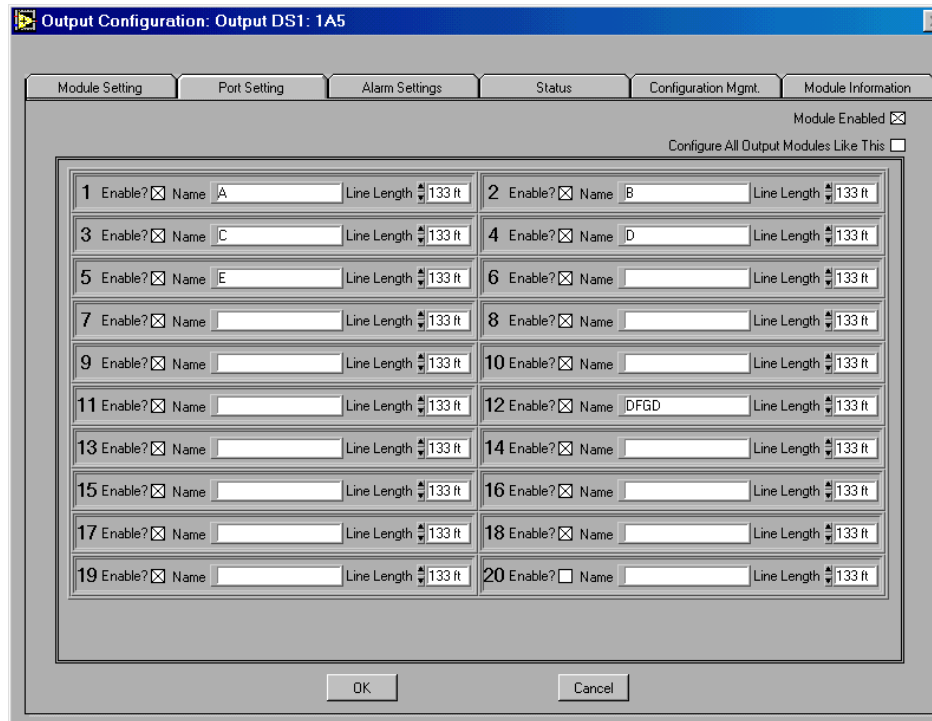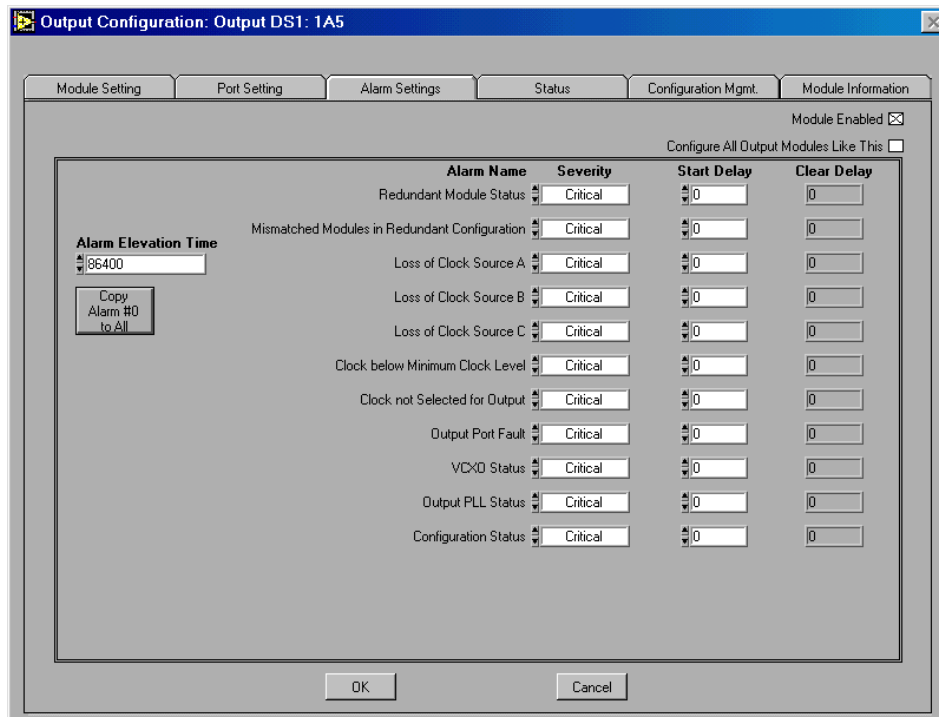
**Figure 10-3.   DS1/E1 Output Module Configuration Dialog Box
                  Port Setting Tab**

■   For ports 1 through 20, set the port configuration options:

❑   **Enable? —** Mark this check box to enable the DS1 or E1 output port. Clear this check box to disable all options for the port.

❑   **Name** — Enter a name for the port.

❑   **Line Length —** Select the line length compensation for modules with a DS1 framer: **133** (0-133 ft.), **266** (134-266 ft.), **399** (267-399 ft.), **533** (400-533 ft.), or **655** (534-655 ft.).

■   **OK** — Click to store the changes, update the SSU-2000 and LMT display, and close the dialog box.

■ **Cancel** — Click to close the dialog box without storing the changes.

10.2.3   Alarm Settings Tab

Use the options in the DS1 or E1 Output Module Configuration dialog box Alarm Settings tab (Figure 10-4) to configure output module alarm elevation time, alarm severity level, and start delay times for each output module alarm, or to copy alarm settings from the first alarm to all other output module alarms.

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Figure 10-4.   DS1/E1 Output Module Configuration Dialog Box Alarm Settings Tab

■ **Alarm Elevation Time** — Enter or select an alarm elevation time. This option accepts an integer between 0 and 172800 seconds (86,400 seconds = 1 day). The alarm elevation time specifies for how many seconds the alarm condition must persist before elevating the alarm to the next higher level. DS1 or E1 output

module alarms are elevated from Minor to Major to Critical based on the alarm elevation time set with this option and stored in the module.

■ **Copy Alarm #0 to All** — Click this option to copy the configuration settings of the top level alarm in this dialog box (in this case, the **Module to Module Communication** alarm settings) to all DS1 or E1 output module alarms. Click **OK** in the message box (Figure 10-5) to confirm or click **Cancel** to cancel the operation.
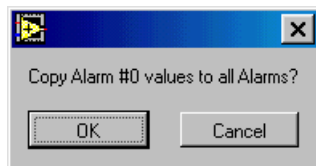

Figure 10-5.   The Copy Alarm Message Box

■ **Alarm Name —** This label displays the clock module alarm name.

❑ **Redundant Module Status** — This alarm indicates an output alignment fault for units operating in redundant output mode, in which two output modules are connected in such a way that the output signal remains the same even if one of the modules fails. This alarm returns the status messages OK or Failed.

❑ **Mismatched Modules in Redundant Configuration** — This alarm indicates that an E1 module is in redundant mode with a DS1 module. This fault occurs when there is a mismatch between signal types of the primary (master) and secondary (slave) output modules operating in redundant mode, i.e., one of the redundant pair is generating an E1 signal type, and the other is generating a DS1 signal type. This alarm returns the status messages OK or Invalid.

❑ **Loss of Clock Source A** — This alarm indicates that the clock module in slot A1 is failed, removed, or otherwise unavailable (i.e., it is in warmup mode or lost). This alarm returns the status messages OK or Lost.

❑ **Loss of Clock Source B** — This alarm indicates that the clock module in slot A12 is failed, removed, or otherwise unavailable (i.e., it is in warmup mode or lost). This alarm returns the status messages OK or Lost.

❏ **Loss of Clock Source C** — This alarm indicates that the reference signal is in LOS and that both CLOCK-A and CLOCK-B are failed, removed, or otherwise unavailable (i.e., in warmup mode or lost). This alarm returns the status messages OK or Lost.

❏ **Clock Below Minimum Clock Level** — This alarm indicates that CLOCK-A or CLOCK-B is below the output module setting for the minimum clock level. This alarm returns the status messages OK or Below.

❏ **Clock Not Selected for Output** — This alarm indicates that no clock has been selected in the software for output. Select the clock module to use as the reference clock in the Clock Module Configuration dialog box Configuration tab. This alarm returns the status messages Selected or Not Selected.

❏ **Output Port Fault** — This alarm indicates that there is a hardware fault for the indicated output port. This alarm returns the status messages OK or Active.

❏ **VCXO Status** — This alarm indicates that there is an oscillator fault. This alarm returns the status messages OK or Lost.

❏ **Output PLL Status** — This alarm indicates that the phase lock loop does not lock. This fault may occur if there is a problem with either clock module or VCXO. This alarm returns the status messages OK or Lost.

❏ **Configuration Status** — This alarm indicates that the two output modules in redundant mode do not have the same configuration. To clear this alarm, reseat or replace the mismatched module. This alarm returns the status messages OK or Failed.

■ **Severity —** Select the initial severity for each output module alarm: **IGNORE**, **REPORT**, **MINOR**, **MAJOR**, or **CRITICAL**. This option sets the severity for an alarm when it is first logged (as distinct from an **Alarm Elevation Time** setting, which allows the alarm severity to increase in the specified time).

■ **Start Delay —** Enter an integer between 0 and 86400 (86,400 seconds = 1 day), representing the number of consecutive seconds for which the output module alarm

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condition must persist before setting the alarm. Changing the delay period for an alarm generates an event.

📄 **NOTE …**

If the Factory Default value is IMMED or -1, this start delay value is not user-settable and the alarm takes effect immediately.

■ **Clear Delay —** This label displays an integer between 0 and 86400 (86,400 seconds = 1 day), representing the number of consecutive seconds for which the output module must be free of the alarm condition before clearing the alarm.

■ **OK** — Click to store the changes, update the SSU-2000 and LMT display, and close the dialog box.

■ **Cancel** — Click to close the dialog box without storing the changes.

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10.2.4   Status Tab

Use the options in the DS1 or E1 Output Module Configuration dialog box Status tab (Figure 10-6) to view all current alarms and the output status for the DS1 or E1 output module.
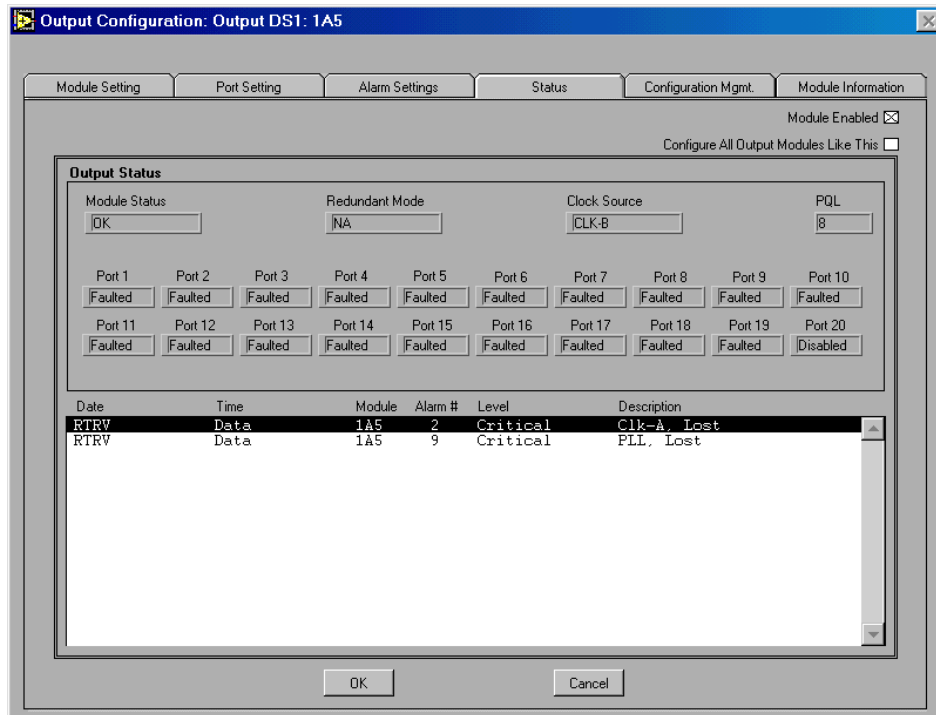
**Figure 10-6.   DS1/E1 Output Module Configuration Dialog Box
Status Tab**

■   **Module Enabled —** Mark this check box to enable the DS1/E1 output module.
Clear this check box to disable all options for the output module.

■   **Configure All Output Modules Like This** — Mark this option to copy the
module configuration information for this DS1 or E1 output module to all other
SSU-2000 DS1 or E1 output modules.

■   **Module Status** — This label displays the current status of the DS1 or E1 output
module: **OK**, **BAD**, **DISABLED**, or **REMOVED**.

■   **Redundant Mode** — This label displays the shelf location identifier for the
redundant pair for this module: **1A5**, for example, or **NA** if the module is not in
redundant mode.

■ **Clock Source** — This label displays the current clock source for the DS1 or E1 output module.

■ **PQL** — This label displays the current Priority Quality Level value for each port on the DS1 or E1 module.

■ **Port Status (Ports 1 through 20)** — These labels display the status of each port for the DS1 or E1 module: **OK**, **Disabled**, or **Faulted**.

■ **Status Message Area** — The Status Message area at the bottom of the Status tab displays the currently active alarm messages for the DS1 or E1 output module. Each status message contains this information:

❑ **Date —** This portion of the status message provides the date information for the alarm in this format: YY-MM-DD.

❑ **Time** — This label displays the timestamp information for the alarm in this format: HH-MM-SS.

❑ **Module** — This label displays the DS1 or E1 output module AID. ,

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📄 **NOTE …**

The Access Identifier (AID) identifies the unit (shelf), module, and port locations within the SSU-2000. The LMT software uses the AID in the message display area messages and interface labels. The AID follows this format: `aid = SxAy-z`

where:

■ `S` = an internal identifier which may or may not be shown in the message or label.

■ `x` = shelf 1-5 (note that only the main unit #1 can contain input modules).

■ `y` = slot 1-16 in the main or expansion unit.

■ `z` = port 1-20 (note that multi-port input modules use ports 1-3; output modules use ports 1-20)

In the LMT:SSU-2000 message display area:

■ CLOCK-A = S1A1

■ CLOCK-B = S1A12

❑ **Alarm #** — This label displays the DS1 or E1 output module alarm number. Use the alarm # to locate additional information about the alarm condition in Section A, Alarms and Events, in the *SSU-2000 Synchronization Supply Unit User Guide*.,

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📄 **NOTE …**

The AID identifies the shelf, module, and port within the SSU-2000. The AID is used in the message display area messages, and is used in the LMT for Windows interface to identify the SSU-2000 system main and expansion shelves, modules, and module ports.

The AID follows this format:
```
aid = SxAy-z
```
where:

- x = shelf 1-5
- y = slot 1-16
- z = port 1-20

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❑ **Level** — This label displays the DS1 or E1 output module alarm severity level: **IGNORE**, **REPORT**, **MINOR**, **MAJOR**, or **CRITICAL**.

❑ **Description** — This label displays a brief description of the alarm condition.

■ **OK** — Click to store the changes, update the SSU-2000 and LMT display, and close the dialog box.

■ **Cancel** — Click to close the dialog box without storing the changes.

10.2.5   Configuration Management Tab

The DS1 or E1 Output Module Configuration dialog box Configuration Management tab (Figure 10-7) provides options for managing configuration options for the module:
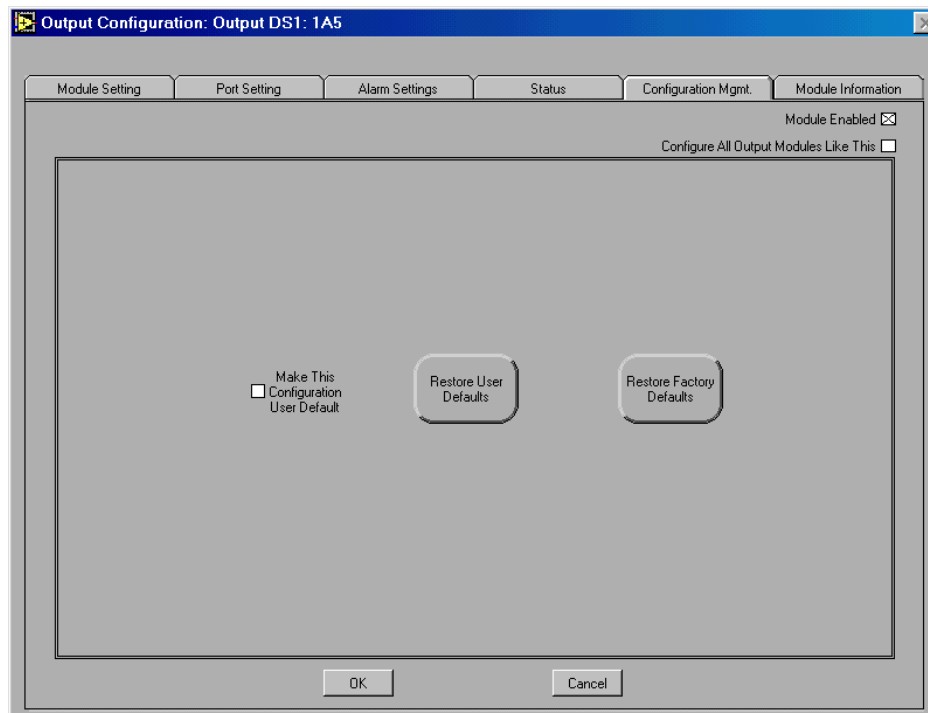
Figure 10-7.   Communications Module Configuration Dialog Box Configuration Management Tab

- ■   **Module Enabled** — Mark this check box to enable the DS1/E1 output module. Clear this check box to disable all options for the output module.

- ■   **Configure All Output Modules Like This** — Mark this option to copy the module configuration information for this DS1 or E1 output module to all other SSU-2000 DS1 or E1 output modules.

- ■   **Make This Configuration User Default** — Mark this option to save the current configuration settings for the DS1 or E1 output module as the User Default

configuration settings. To return to the User Default settings after making configuration changes to the module, click **Restore User Defaults** in this tab.

■ **Restore Factory Defaults —** This option restores the Factory Default configuration settings for the DS1 or E1 output module. Before restoring the settings, the LMT software asks you to confirm that you want to replace the current settings with the Factory Default settings. Click **OK** in the message box (Figure 10-8) to restore the Factory Default settings and update the module status display. Click **Cancel** in the message box to close the message box without restoring the Factory Default settings.
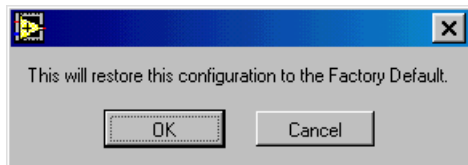

Figure 10-8.   Restore Factory Defaults Message Box

■ **Restore User Defaults —** Click this option to restore the User Default configuration settings to the DS1 or E1 output module. Before restoring the settings, the LMT software asks you to confirm that you want to replace the current settings with the User Default configuration settings. Click **OK** in the message box to restore the User Default settings and update the module status display. Click **Cancel** in the message box to close the message box without restoring the User Default settings.

■ **OK** — Click to store the changes, update the SSU-2000 and LMT display, and close the dialog box.

■ **Cancel** — Click to close the dialog box without storing the changes.

10.2.6   Module Information Tab

The DS1/E1 Output Module Configuration dialog box Module Information tab (Figure 10-9) provides labels that display manufacturing information for the output module (for viewing only).

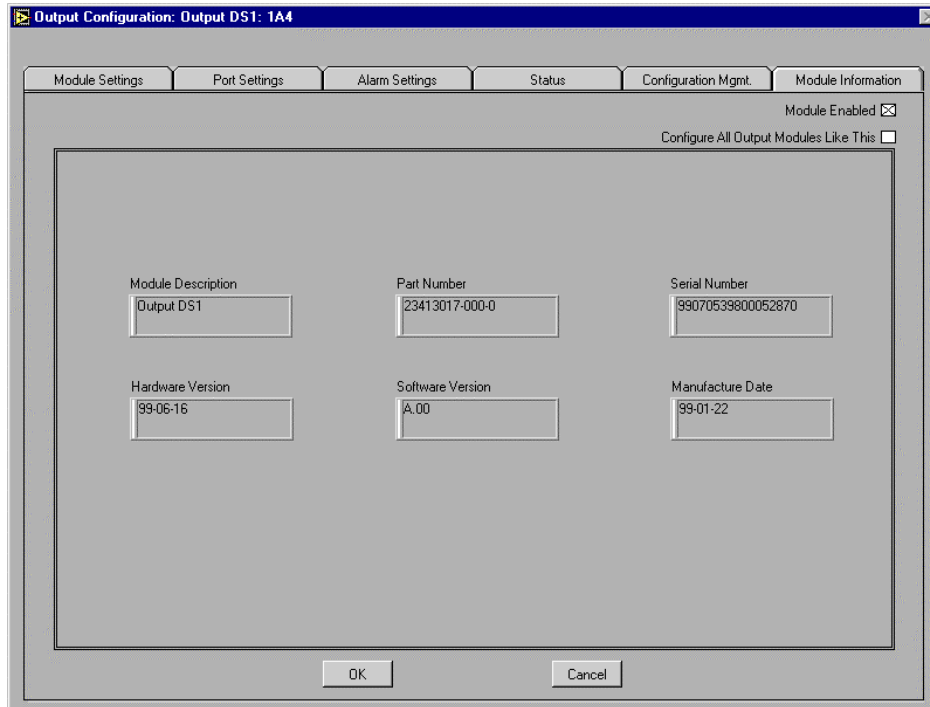**10**

Figure 10-9.   Communications Module Configuration Dialog Box Module Information Tab

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📄   **NOTE …**

Customer Service will request the information found in the Module Information tab when you request service for the module.

- **Module Description** — This label displays a description of the module item.

- **Module Serial Number —** This label displays the module serial number.

- **Module Part Number —** This label displays the module part number.

■ **Software Revision —** This label displays the module software revision number.

■ **Hardware Revision —** This label displays the module hardware revision number.

■ **Date of Manufacture —** This label displays the date the module was manufactured.

■ **OK** — Click to close the dialog box.

■ **Cancel** — Click to close the dialog box.

TIP …

The module manufacturing information is stored in the Manf_Info.csv data file. This file is created each time the LMT software connects to the SSU-2000 and is updated when a module is removed from or inserted into the SSU-2000 while the LMT software is connected. The filename is fixed, but you may select the storage folder.

You can use the Manf_Info.csv data file to inventory network SSU-2000 modules. All LMT data is stored in Comma Separated Value format (.csv), and can be opened in Microsoft Excel or in other programs which support the *.csv* file name extension. For more information about using the LMT data files, see Appendix A.

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11   Configuring the DS1 or E1 Input Module

This section provides an overview of the SSU-2000 DS1 and E1 input module and a complete description of using the options in the DS1/E1 Input Module Configuration dialog box and tabs to configure the DS1 and E1 input module.

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11.1   DS1 and E1 Input Module

The DS1 or E1 input modules provide the timing reference input to the SSU-2000, and monitor and report the status of their input signals.

11.2   DS1/E1 Input Module Configuration Dialog Box

Click on the input module representation in the **LMT:SSU-2000** window module status display to open the DS1/E1 Input Module Configuration dialog box.

■   **Module Enabled —** Mark this check box to enable the selected input module. Clear this check box to disable all options for the selected input module.

■   **Configure All Input Modules Like This** — Mark this option to copy the module configuration information for this input module to all other SSU-2000 input

modules.**This Port is the Reference** — Mark the reference input port: **Port 1**, **Port 2**, or **Port 3**.

11.2.1 Configuration Tab

The DS1/E1 Input Configuration dialog box (Figure 11-1) contains a Port Configuration tab for each input port of the DS1/E1 input module: one Port Configuration tab for one-port modules and three Port Configuration tabs for three-port modules. The tab options are enabled only when the input module is enabled.

Use the options on each Port Configuration tab to configure the ports for the selected input module.
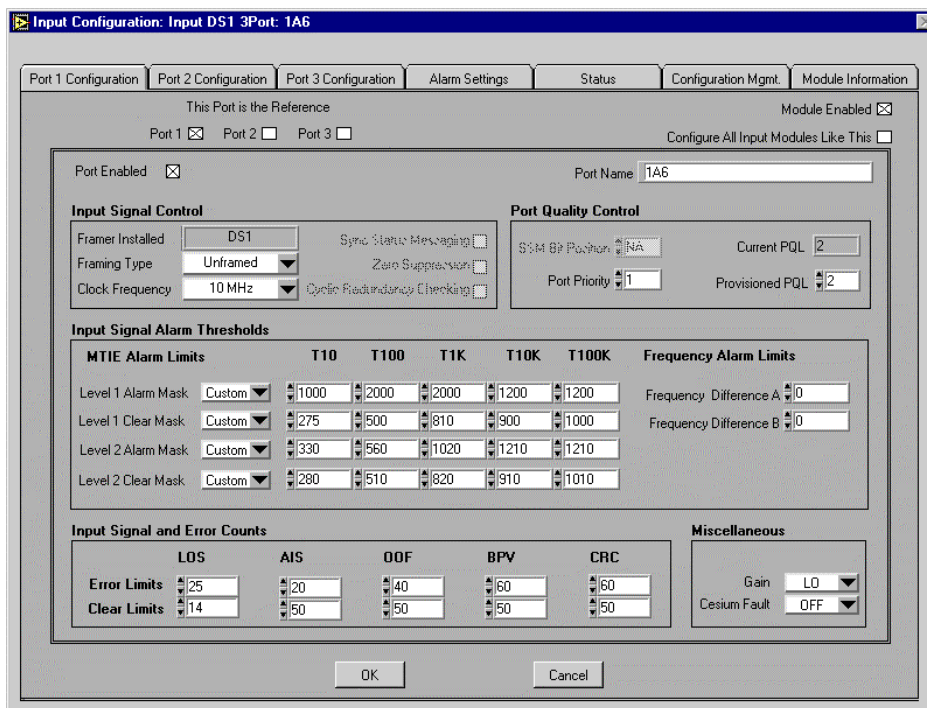
Figure 11-1.   DS1/E1 Input Module Configuration Dialog Box Port 1 Configuration Tab

- **This Port is the Reference —** Indicates the reference input port. To change the reference input, mark a different port: **Port 1**, **Port 2**, or **Port 3**.

- **Module Enabled —** Mark this check box to enable the module. Clear this check box to disable all options for the module.

- **Configure All Input Modules Like This** — Mark this option to copy the module configuration information for this input module to all other SSU-2000 input modules.**This Port is the Reference** — Mark the reference input port: **Port 1**, **Port 2**, or **Port 3**.

- **Port Enabled** — Mark this option to make this port available. Clear this option to make this port unavailable. When the port is unavailable, the LMT does not report alarms or display measurement data for the port.

- **Port Name —** Enter or view an input port name for the port.

- **Input Signal Control —** This section of the Port Configuration tab contains options for configuring the input signal for this port:

  - ❑ **Framer Installed —** This label displays the framer hardware supported by this input module port: DS1 or E1.

  - ❑ **Framing Type —** Select the framing type for this port: **ESF**, **D4**, **CCS**, **CAS**, or **Unframed**. **D4** and **ESF** are active only if a DS1 framer is installed; **CAS** and **CCS** are active only if an E1 framer is installed.

  - ❑ **Clock Frequency** — Select the clock frequency (this option is enabled only if the selected **Framing Type** is **Unframed): 1MHz**, **1.544MHz**, **2.048MHz**, **5MHz** or **10MHz**.

  - ❑ **Sync Status Messaging —** Mark this option to enable Synchronization Status Messaging (SSM) for this input module port for all framing types *except* **Unframed**. Clear this option to turn off SSM for this input module port. This option is not available if the selected framing type is **Unframed**.

  - ❑ **Zero Suppression —** Mark this option to enable **Zero Suppression** for all framing types *except* **Unframed**. Clear this option to turn off zero suppression. This option is not available if the selected framing type is **Unframed**.

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❑ **Cyclic Redundancy Checking** — Mark this option to enable Cyclic Redundancy Checking (CRC) for all framing types *except* **Unframed**. Clear this option to turn off CRC. This option is not available if the selected framing type is **Unframed**.

📖 **NOTE …**

DS1 input modules support D4 or ESF framed signals, and B8ZS zero suppression, CRC6 checking, and SSMs for framed signals.

E1 input modules support CAS or CCS framed signals, and HDB3 zero suppression, CRC4 checking, and SSMs for framed signals.

■ **Port Quality Control Section** — This section of the Port Configuration Tab contains options for configuring the port quality options:

❑ **SSM Bit Position** — Select the bit position to use for receiving SSMs (this option is enabled only if the input module hardware supports E1 framing, the selected **Framing Type** is **CAS** or **CCS**, *and* if **Synchronization Status Messaging** is enabled): **4**, **5**, **6**, **7**, or **8**.

❑ **Port Priority** — Select the **Port Priority** value: **1** through **10**, or **MON** (Monitor). The input module port priority levels are 0 through 10: Port Priority 0 is monitor mode (**MON**), Port Priority 1 is the highest priority, and Port Priority 10 is the lowest priority.

❑ **Current PQL** — This label displays the **Current PQL** setting for this input module port. The SSU-2000 uses the Priority Quality Level (PQL) to represent the Synchronization Status Message (SSM), a measure of the traceability of the signal at the input module port. For information about the SSM selection criteria, see the Note following the description of the **Provisioned PQL** option.

❑ **Provisioned PQL** — Select the Provisioned Quality Level for the input port:: **2**, **3**, **4**, **5**, **6**, or **8**. The input module maintains a Provisioned Quality Level for each port.

📄 **NOTE …**

The SSM identifiers are embedded within the SSU-2000 output signal. The SSU-2000 software uses the **Current PQL**, **Provisioned PQL**, and the following SSM selection criteria to determine the SSM to generate.

- If the input module port is configured for **Provisioned** mode by *disabling* **Sync Status Messaging** in the Port Configuration tab, the port uses the provisioned SSM.
- If the input module port is configured for **Automatic** mode by *enabling* SSM (SSM option ON), and there is a valid received SSM, the input port uses the most recent valid received SSM. Otherwise, if there is no valid received SSM, the port uses the provisioned SSM.

■ **Input Signal Alarm Thresholds** — This section of the Port Configuration tab contains options for configuring the input signal alarm thresholds. The input module calculates MTIE, a measurement of the relative noisiness of an input signal, for all input signals. The input module monitors ongoing MTIE calculations and logs an alarm if the MTIE calculation for any of several window sizes exceeds the values for each of the two specified alarm masks:

❑ **MTIE Alarm Limits** — Select a **Set** threshold and a **Clear** threshold for **Level 1 Alarm Mask**, **Level 2 Clear Mask**, **Level 2 Alarm Mask**, and **Level 2 Clear Mask**. Each threshold can be set to **PRS**, **DS1**, **G.811**, **G.823**, or **Custom Mask.**

For **Custom Mask**, also select a value for each time period point in the mask: **T10** (10 seconds), **T100** (100 seconds), **T1K** (1000 seconds), **T10K** (10,000 seconds), or **T100K** (100,000 seconds).

❑ **Frequency Alarm Limits** — Enter the Frequency Alarm limit for the port for both frequency alarms: **Frequency Difference A**, input frequency measured against clock A, and **Frequency Difference B**, input frequency measured against clock B. For each alarm threshold, enter an integer between 1 (ns) and

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99,999 (ns), representing the frequency difference measured in picoseconds per second.

📄 **NOTE …**

Although the input module continuously monitors MTIE against Clock A and Clock B, the SSU-2000 only logs an MTIE alarm if the measurements against the currently selected clock violate an MTIE alarm mask.

■ **Input Signal and Error Counts** — This section of the Port Configuration tab contains options for configuring the **Error Limits** and **Clear Limits** for each of the five communications input signal errors that require them: **LOS**, **AIS**, **BPV**, **CRC**, and **OOF**.

  ❑ **Error Limits** — For each error, enter an integer to specify the number of consecutive seconds for which the error condition must persist before the SSU-2000 logs the alarm.

  ❑ **Clear Limits** — For each error, enter an integer to specify the number of consecutive seconds for which the input signal must be free of error before the SSU-2000 clears the alarm.

📄 **NOTE …**

If any port input signal is a framed communications signal, the input module monitors for Alarm Indication Signaling (**AIS**), Bipolar Violations (**BPV**), Loss of Signal (**LOS**), and Out Of Frame (**OOF**) error. If the signal is unframed the input module monitors for the LOS only.

Additionally, when SSMs are enabled (, the input module extracts Synchronization Status Messages (SSM) from the incoming data.

■ **Miscellaneous** — This section of the Port Configuration tab contains options for configuring input gain and cesium fault options:

  ❑ **Input Gain** — Select the antenna input gain option: **HI, LO**.

❑ **Cesium Fault** — Select the Cesium Fault Logic Level for Port One: **Off**, **LO**, or **HI**.

📄　**NOTE …**

The Cesium Fault Logic Level setting is valid only if you have configured Port One to receive an unframed input signal. For a three-port input module, this option applies only to the Port One configuration (there is no setting for Port Two or Port Three).

If the input module indicates that the Port One Cesium Fault Logic Level matches the alarm setting, the SSU-2000 unit logs an AIS alarm against Port 1. The SSU-2000 unit clears the AIS alarm when the Port One Cesium Fault Logic Level no longer matches the alarm level.

■ **OK** — Click to store the changes, update the SSU-2000 and LMT display, and close the dialog box.

■ **Cancel** — Click to close the dialog box without storing the changes.

11.2.2　Alarm Settings Tab

The DS1/E1 Input Configuration dialog box (Figure 11-2) contains the Alarm Settings tab with options for viewing and specifying alarm settings for the input module ports. The tab options are active only if the module is enabled.

Use the options on the Alarm Settings tab to select a port and configure the alarm elevation time, alarm severity level, and start delay time for each module alarm. The tab also provides options for copying an alarm setting to all alarms, or copying port alarm settings to all ports.
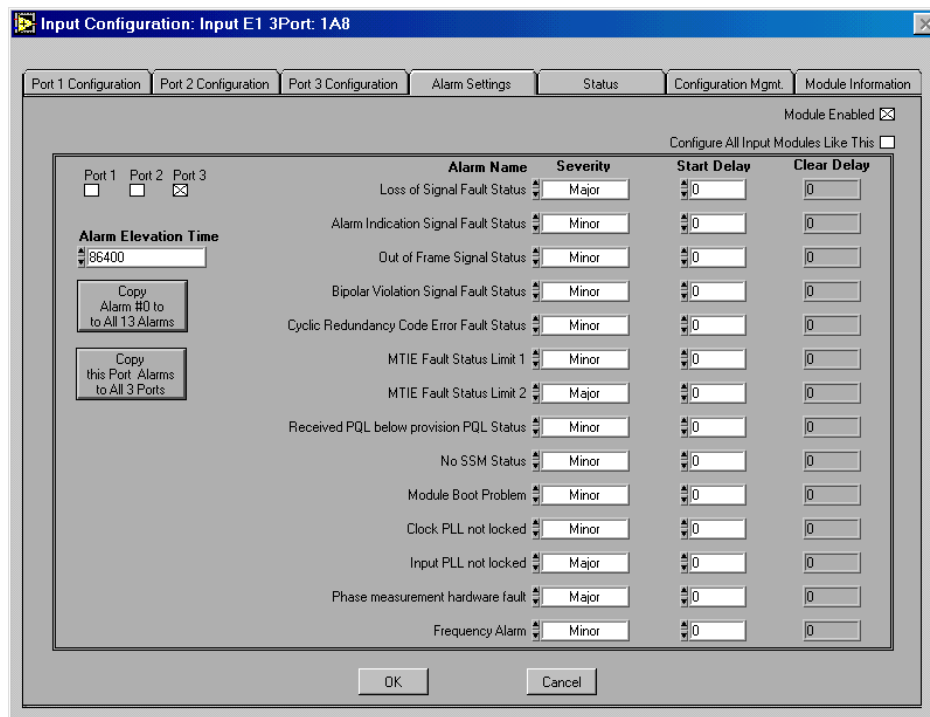
**Figure 11-2.   DS1/E1 Input Module Configuration Dialog Box
                  Alarm Settings Tab**

- **Port** — Select the port for which to view the alarm settings: **Port 1**, **Port 2**, or **Port 3**.

- **Alarm Elevation Time** — Enter the number of seconds for which the alarm may exist before the system elevates the alarm to the next severity level. The alarm elevation time may be an integer between 0 and 172800 seconds.

- **Copy Alarm #0 to All 13 Alarms** — Click this option to copy the settings specified for Alarm #0 to all the input module alarms. In the message box (Figure 11-3) click **OK** to confirm or **Cancel** to cancel the operation.
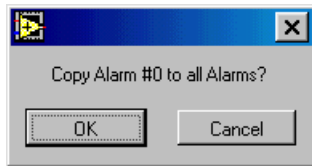
Figure 11-3.   Copy Alarm #0 to all Alarms Message Box

■   **Copy This Port Alarms to All 3 Ports** — Click this option to copy the alarm
    settings for the selected port to all ports on this input module.

■   **Severity** — For each alarm name, select the alarm severity level: **Critical**, **Major**,
    Minor, **Report**, or **Ignore**:

    ❑   **Critical** — At this level, the unit generates event messages and causes a port
        fault. Because **Critical** is the highest alarm severity level, the unit does not
        elevate Critical alarms.

    ❑   **Major** — At this level, the unit generates event messages and causes a port
        fault. If the alarm condition persists beyond the elevation time limit specified,
        the unit elevates the alarm to Critical.

    ❑   **Minor** — At this level, the unit generates event messages. If the alarm
        condition persists beyond the elevation time limit specified, the unit elevates
        the alarm to Major.

    ❑   **Report** — At this level, the unit generates event messages. The unit does not
        elevate the alarm to the next higher alarm level.

    ❑   **Ignore** — At this alarm level, the unit does nothing. The unit does not elevate
        the alarm to the next higher alarm level.

■   **DS1/E1 Input Module Alarms** — Set the **Severity** and **Start Delay** values for
    these input module alarms:

    ❑   **Loss of Signal Fault Status** — This alarm indicates the presence of a signal
        fault. A signal fault is logged for the Input module when a port stops receiving
        an inbound signal. This alarm returns the status messages OK or Active.

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❑ **Alarm Indication Signal Fault Status** — This alarm indicates the status of the input signal. Alarm Indication Status (AIS) is an in-band, unframed, "all ones" signal used to indicate that the sending device is experiencing problems which may degrade its output. This alarm returns the status messages OK or Active.

❑ **Out of Frame Signal Status** — This alarm indicates the status of the frame signal. The Out of Frame (OOF) signal error occurs when the framing chip of the module cannot determine the framing type of the inbound signal. This alarm returns the status messages OK or Active.

❑ **Bipolar Violation Signal Fault Status** — This alarm indicates a Bipolar Violation (BPV) signal fault. The BPV signal fault indicates that an input module port has received two consecutive pulses of the same polarity, violating the alternate mark inversion format for framed signals. This alarm returns the status messages OK or Active.

❑ **Cyclic Redundancy Code Error Fault Status** — This alarm indicates the status of cyclic redundancy checking (CRC) of inbound framed signals for an input module port. This alarm returns the status messages OK or Active.

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❑ **Maximum Time Interval Error Fault Status Limit 1** — This alarm indicates that the module has exceeded the Maximum Time Interval Error (MTIE) calculation for the Limit 1 alarm threshold (set in the Port Configuration tab). This alarm returns the status messages OK or Exceeded.

❑ **MTIE Fault Status Limit 2** — This alarm indicates that the module has exceeded the Maximum Time Interval Error (MTIE) calculation for the Limit 2 alarm threshold (set in the Port Configuration tab). This alarm returns the status messages OK or Exceeded.

❑ **Received PQL below provisioned PQL status** — This alarm indicates that the received Synchronization Status Message (SSM) Priority Quality Level

(PQL) is below the provisioned PQL value. This alarm returns the status messages OK or Below Prov(ision).

📄 **NOTE …**

The Priority Quality Level (shown in the **Current PQL Level** option) and the Provisioned Quality Level (set in the **Provisioned Quality Level** option) determine the SSM that will be used:

- If the input module port is configured for **Provisioned** mode by enabling **Sync Status Messaging** in the Port Configuration tab, the port will use the provisioned SSM.
- If the input module port is configured for **Automatic** mode by turning the Sync Status Messaging option off, and there is a valid received SSM, the input port will use the most recent valid received SSM; if there is no valid received SSM, the port will use the provisioned SSM.

❑ **No SSM Status** — This alarm indicates that the SSM for the input module port is ON but there is no valid received SSM. This alarm returns the status messages OK or Lost.

❑ **Module Boot Problem** — This alarm indicates that the input module is not seated correctly. This alarm returns the status messages OK or Failed.

❑ **Clock PLL not locked** — This alarm indicates that the Clock PLL is not locked. A fault occurs if the input module hardware cannot lock to the timing signals generated by the clock module. Make sure that the input module is seated correctly in the shelf. This alarm returns the status messages OK or Not Locked.

❑ **Input PLL Not Locked** — This alarm indicates that he input frequency is not locked. To clear the alarm, verify the input frequency setting or reseat the input module. This alarm returns the status messages OK or Not Locked.

❑ **Phase Measurement Hardware Fault** — This alarm indicates that there is a fault with the phase measurement hardware. To correct this fault, make sure that the input module is seated correctly in the shelf. This alarm returns the status messages OK or Bad.

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❑ **Frequency Alarm** — This alarm indicates that there is a fault with the input frequency. This alarm returns the status messages OK or Bad.

■ **OK** — Click to store the changes, update the SSU-2000 and LMT display, and close the dialog box.

■ **Cancel** — Click to close the dialog box without storing the changes.

11.2.3 Status Tab

The Input Configuration dialog box (Figure 11-4) provides option on the Status tab for viewing the status and all current alarms for the input module, and the status, phase information, PQL, error count, and clear count for each port of the input module.

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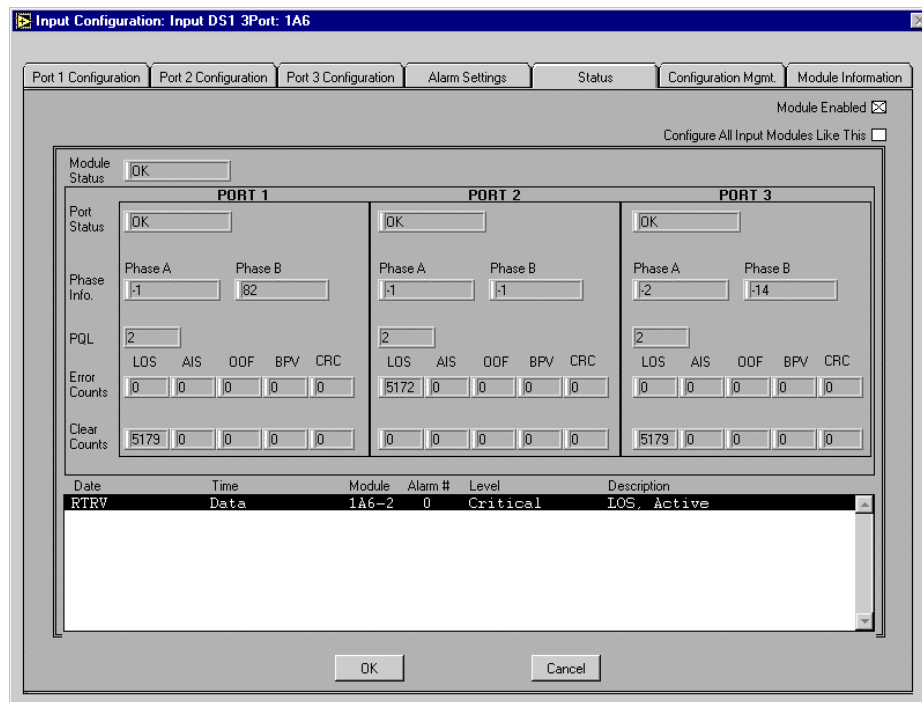
Figure 11-4.   DS1/E1 Input Module Configuration Dialog Box Status Tab

■ **Module Status** — This label displays the current status of the input module: **OK**, **BAD**, **DISABLED**, or **REMOVED**.

■ **Port Status** — This label displays the port status information for each port: **OK**, **BAD**, **DISABLED**.

  ❑ **Phase Info** — This label displays **Phase A** values (against CLOCK-A) and **Phase B** values (against CLOCK-B) for each port.

  ❑ **PQL** — This label displays the current Priority Quality Level value for each port.

  ❑ **Error Counts** — This label displays the current error count settings for these input signal errors: **LOS**, **AIS**, **OOF**, **BPV**, and **CRC**. The **Error Counts** value indicates the number of consecutive seconds for which the error condition persists before the SSU-2000 logs the alarm.

  ❑ **Clear Counts** — This label displays the current clear count settings for these input signal errors: **LOS**, **AIS**, **OOF**, **BPV**, and **CRC**. The Clear Counts value indicates the number of consecutive seconds for which the input signal is free of error before the SSU-2000 clears the alarm.

■ **Status Message Area** — The Status Message area at the bottom of the tab displays the currently active alarm messages for the module. Each status message contains this information:

  ❑ **Date —** This portion of the status message provides the date information for the alarm in this format: YY-MM-DD.

  ❑ **Time** — This label displays the timestamp information for the alarm in this format: HH-MM-SS.

  ❑ **Module** — This portion of the status message provides the module name assigned by a user.

  ❑ **Alarm #** — This portion of the status message provides the alarm number.

  ❑ **Level** — This portion of the status message provides the alarm severity level: **IGNORE**, **REPORT**, **MINOR**, **MAJOR**, or **CRITICAL**.

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❑ **Alarm Description —** This portion of the status message provides a brief description of the alarm condition.

■ **OK** — Click to store the changes, update the SSU-2000 and LMT display, and close the dialog box.

■ **Cancel** — Click to close the dialog box without storing the changes.

11.2.4   Configuration Management Tab

The DS1/E1 Input Module Configuration dialog box Configuration Management tab (Figure 11-5) provides configuration management options for the module.
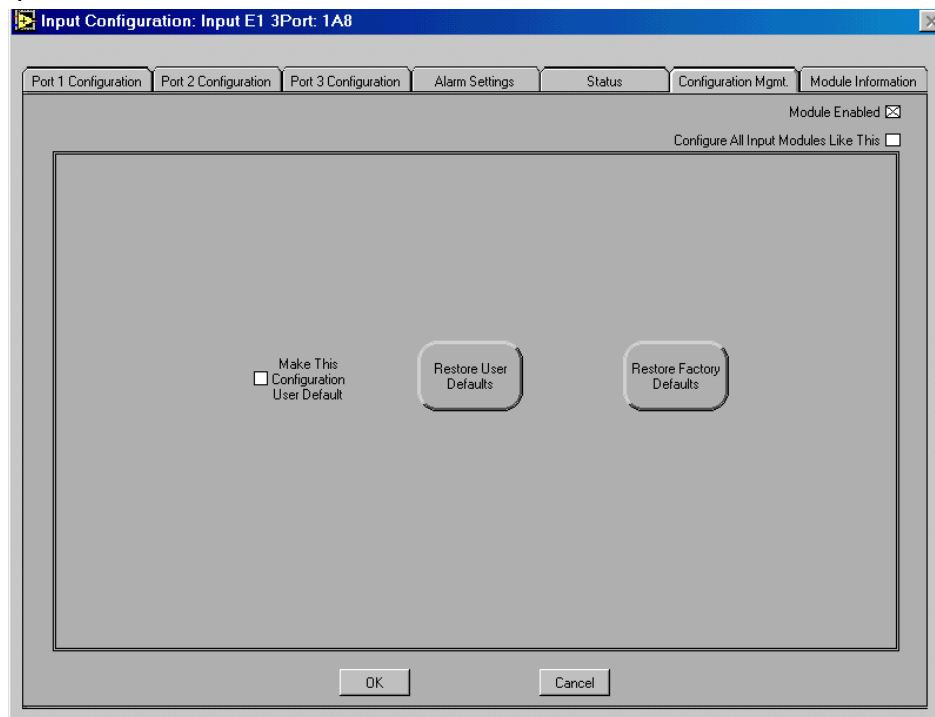
Figure 11-5.   DS1/E1 Input Module Configuration Dialog Box Configuration Management Tab

■ **Make This Configuration User Default —** Mark this option to save the current configuration settings for the DS1 or E1 input module as the User Default configuration settings. To return to the User Default settings after making configuration changes to the module, click **Restore User Defaults** in this tab.

■ **Restore Factory Defaults —** This option restores the Factory Default configuration settings for the DS1 or E1 input module. Before restoring the settings, the LMT software asks you to confirm that you want to replace the current settings with the Factory Default settings. Click **OK** in the message box (Figure 11-6) to restore the Factory Default settings and update the module status display. Click **Cancel** in the message box to close the message box without restoring the Factory Default settings.
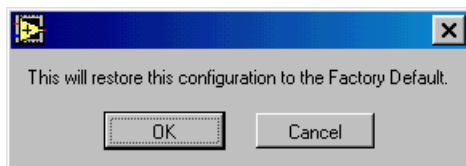
Figure 11-6.   Restore Factory Defaults Message Box

■ **Restore User Defaults —** Click this option to restore the User Default configuration settings to the DS1 or E1 input module. Before restoring the settings, the LMT software asks you to confirm that you want to replace the current settings with the User Default configuration settings. Click **OK** in the message box to restore the User Default settings and update the module status display. Click **Cancel** in the message box to close the message box without restoring the User Default settings.

■ **OK** — Click to store the changes, update the SSU-2000 and LMT display, and close the dialog box.

■ **Cancel** — Click to close the dialog box without storing the changes.

11.2.5   Module Information Tab

The DS1/E1 Input Module Configuration dialog box Module Information tab (Figure 11-7) provides manufacturing information about the module.

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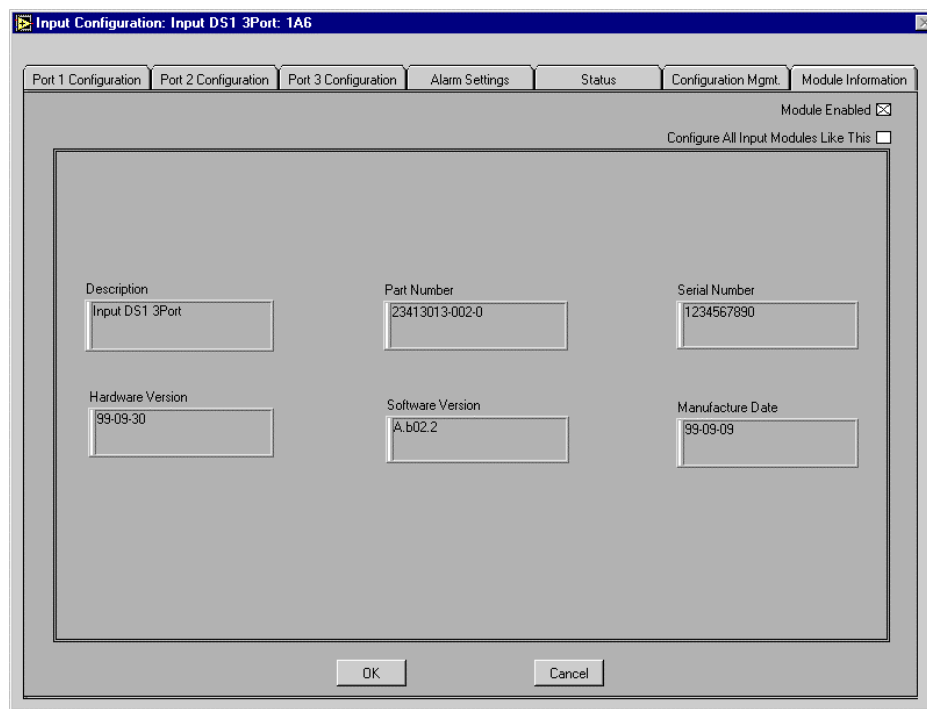
**Figure 11-7.   DS1/E1 Input Module Configuration Dialog Box
                            Module Information Tab**

■   **Module Description** — This label displays a description of the module item.

■   **Module Serial Number —** This label displays the module serial number.

■   **Module Part Number —** This label displays the module part number.

■   **Software Revision —** This label displays the module software revision number.

■   **Hardware Revision —** This label displays the module hardware revision number.

■   **Date of Manufacture —** This label displays the date the module was
    manufactured.

■   **OK** — Click to close the dialog box.

■   **Cancel** — Click to close the dialog box.

📄   **NOTE …**

Customer Service will request the information found in the Module Information tab when you request service for the clock module.

💡   **TIP …**

The module manufacturing information is stored in the Manf_Info.csv data file. This file is created each time the LMT software connects to the SSU-2000 and is updated when a module is removed from or inserted into the SSU-2000 while the LMT software is connected. The filename is fixed, but you may select the storage folder.

You can use the Manf_Info.csv data file to inventory network SSU-2000 modules. All LMT data is stored in Comma Separated Value format, and can be opened in Microsoft Excel or in other programs which support the *.csv* file name extension. For more information about using the LMT data files, see Appendix A.

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12 Configuring the 2048 kHz Output Module

This section provides an overview of the SSU-2000 2048 kHz output module and a complete description of using the options in the 2048 kHz Output Module Configuration dialog box and tabs to configure the 2048 kHz output module.

12.1 2048 kHz Output Module

The primary function of the 2048 kHz output module is to produce the best case output signal under all circumstances. The SSU-2000 may be configured with redundant 2048 kHz output modules to ensure that the output signal remains the same even if one of the modules fails.

12.2 2048 kHz Output Module Configuration Dialog Box

The 2048 kHz Output Module Configuration dialog box (Figure 12-1) opens when you click a 2048 kHz output module representation in the **LMT:SSU-2000** window.

Use the options in the 2048 kHz Output Module Configuration dialog box to configure options for the 2048 kHz output module.

■ **Module Enabled —** Mark this check box to enable the 2048 kHz output module. Clear this check box to disable all options for the 2048 kHz output module.

■ **Configure All Modules Like This** — Mark this check box to copy the configuration settings for this 2048 kHz output module to all 2048 kHz output modules.

12.2.1 Module Setting Tab

Use the options on the 2048 kHz Output Module Configuration dialog box Module Setting tab (Figure 12-1) to monitor or configure the output signal fault mode, clock mode, and clock bypass for the 2048 kHz output module.
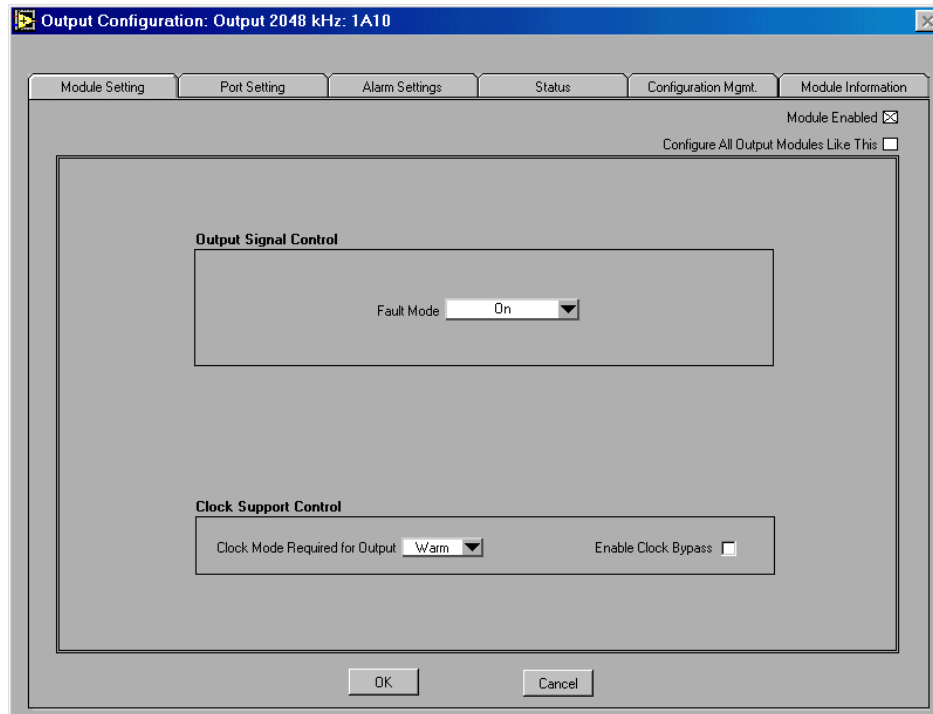
Figure 12-1.   2048 kHz Output Module Configuration Dialog Box Module Setting Tab

■ **Fault Mode** — Select the output signal control fault mode: **On, Off, or Automatic**. The output module uses this fault mode when the output level exceeds the 2.1 volt specification.

 ❑ **On** — Turn fault mode to On. In this mode, a port fault in this module causes a fault condition that persists until a user intervenes to change the condition.

 ❑ **Off** — Turn fault mode to Off. In this mode, the system will ignore a port fault in this module.

 ❑ **Automatic** — Turn fault mode to Automatic. In this mode, a port fault in this module clears automatically.

■ **Clock Mode Required for Output** — Select the minimum clock mode required for output: **Warm**, **Acquire**, or **Lock**. The default mode is Acquire. If the selected clock has a clock mode level below that of the selected minimum clock level, the system will report an alarm.

■ **Enable Clock Bypass** — Mark this option to enable the clock bypass mode. Clear this option to disable the clock bypass mode. A 2048 kHz output module in clock bypass mode is allowed to select CLOCK-C, the pass-through clock.

■ **OK** — Click to store the configuration settings, update the SSU-2000 and the LMT display, and close the dialog box.

■ **Cancel** — Click to close the dialog box without storing changes or updating the SSU-2000 or the LMT display.

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12.2.2   Port Setting Tab

Use the options in the 2048 kHz Output Module Configuration dialog box Port Setting tab (Figure 12-2) to enable or assign a name to ports 1 through 20 for the 2048 kHz output module.
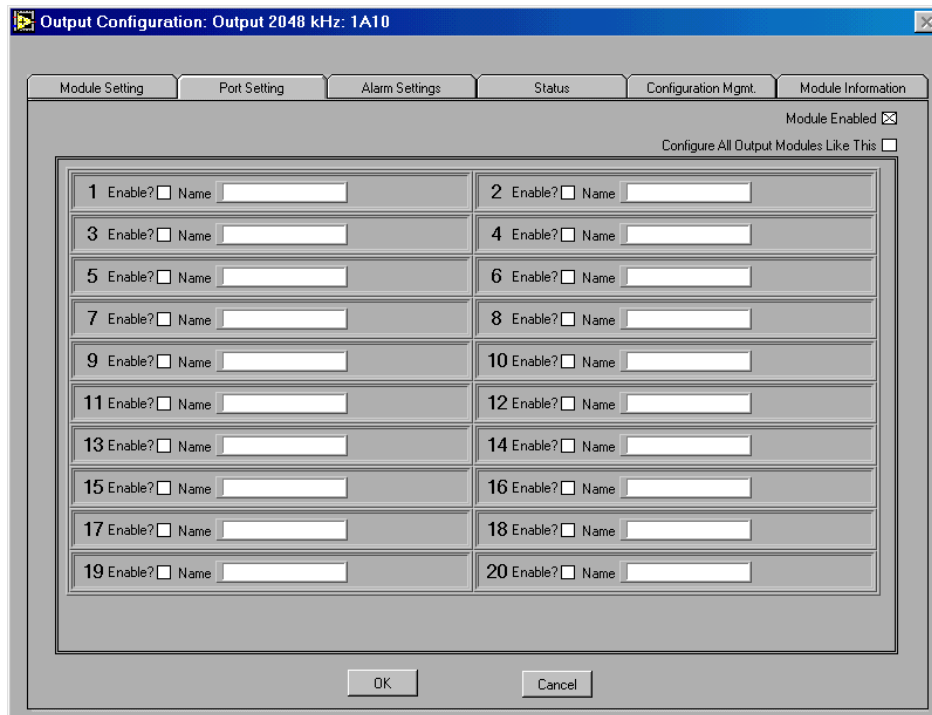
Figure 12-2. **2048 kHz Output Module Configuration Dialog Box**
Port Setting Tab

Configure ports 1 through 20:

■ **Enable?** — Mark the option to enable the port. Clear the option to disable the port.

■ **Name** — Enter a name for the port. The name may contain as many as 20 ASCII characters.

■ **OK** — Click to store the configuration settings, update the SSU-2000 and the LMT display, and close the dialog box.

■ **Cancel** — Click to close the dialog box.

12.2.3   Alarm Settings Tab

Use the options in the 2048 kHz Output Module Configuration dialog box Alarm Settings tab (Figure 12-3) to monitor or configure alarm elevation time, alarm severity level, and start delay times for each module alarm, or to copy alarm settings from the first alarm to all other module alarms.

📄   **NOTE …**

The Alarm Settings tab options for each module are available only when the module is enabled.

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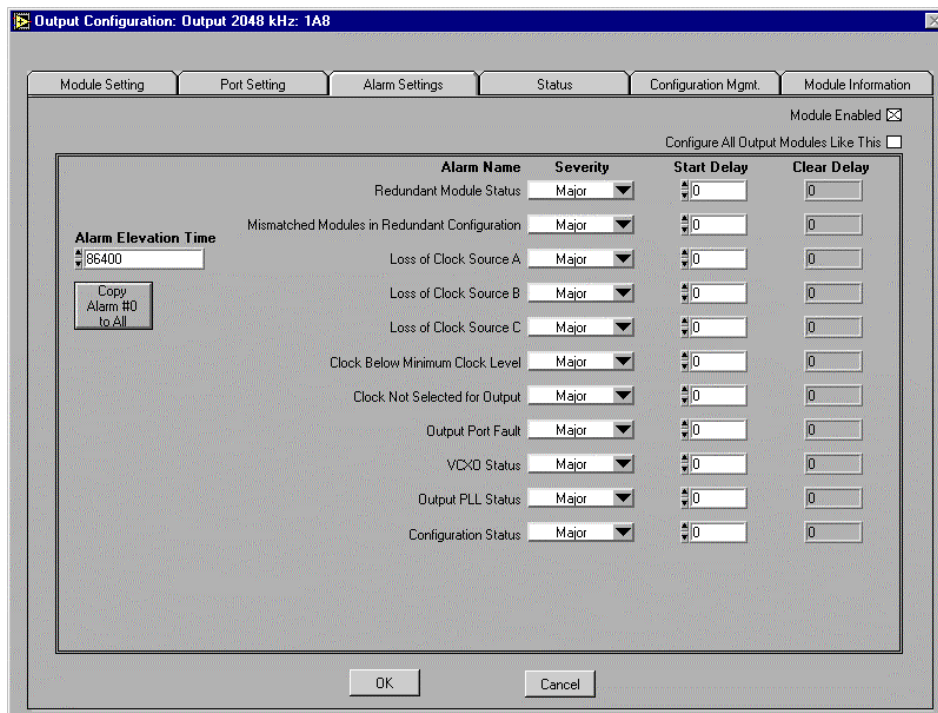
Figure 12-3.   2048 kHz Output Module Configuration Dialog Box Alarm Settings Tab

■ **Alarm Elevation Time —** This option accepts an alarm elevation time expressed as an integer between 60 and 500000 seconds (86,400 seconds = 1 day). The alarm elevation time specifies for how many seconds the alarm condition must persist before elevating the alarm to the next higher level. 2048 kHz output module alarms are elevated from Minor to Major to Critical based on the alarm elevation time set with this option and stored in the module. All 2048 kHz output module alarms have a default alarm level of MAJOR.

■ **Copy Alarm #0 to All** — Click this option to copy the configuration settings of the top level alarm in this dialog box (in this case, the **Redundant Module Status** alarm settings) to all 2048 kHz output module alarms. In the message box (Figure 12-4) click **OK** to confirm or **Cancel** to cancel the operation.
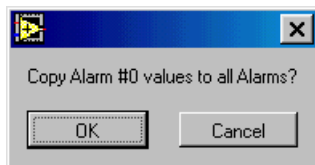
Figure 12-4.   Copy Alarm Message Box

■ **Individual Alarm Settings —** The options in this section configure alarm settings for each port. For each alarm of the 2048 kHz output module, specify:

■ **Alarm Name —** This label displays the alarm name.

❑ **Redundant Module Status** — This alarm indicates the status of the communication between modules. This alarm returns the status messages OK or Bad.

❑ **Mismatched Modules in Redundant Configuration** — This alarm indicates that a 2048 kHz module is in redundant mode with a module of another output type. This fault occurs when there is a mismatch between the signal types of the primary (master) and secondary (slave) output modules operating in redundant mode, i.e., one 2048 kHz output module and one composite clock, DS1, or E1 output module). This alarm returns the status messages OK or Invalid.

❑ **Loss of Clock Source A** — This alarm indicates that the clock module in slot A1 is failed, removed, or otherwise unavailable (i.e., it is in warmup mode or lost). This alarm returns the status messages OK or Lost.

❑ **Loss of Clock Source B** — This alarm indicates that the clock module in slot A12 is failed, removed, or otherwise unavailable (i.e., it is in warmup mode or lost). This alarm returns the status mesaages OK or Lost.

❑ **Clock Below Minimum Clock Level** — This alarm indicates that CLOCK-A or CLOCK-B is below the output module setting for the minimum clock level. This alarm returns the status messages OK or Below.

❑ **Clock Not Selected for Output** —This alarm indicates that no clock has been selected in the software for output. Select the clock module to use as the reference clock in the Clock Module Configuration dialog box Configuration Tab. This alarm returns the status messages Selected or Not Selected.

❑ **Output Port Fault** — This alarm indicates that there is a hardware fault for the indicated output port. This alarm returns the status messages OK or Active.

❑ **VCXO Status** — This alarm indicates that there is an oscillator fault. This alarm returns the status messages OK or Lost.

❑ **Output PLL Status** — This alarm indicates that the phase lock loop does not lock. This fault may occur if there is a problem with either clock module or VCXO. This alarm returns the status messages OK or Lost.

❑ **Configuration Status** — This alarm indicates that the two output modules in redundant mode do not have the same configuration. Clear this alarm by reseating or replacing the mismatched module. This alarm returns the status messages OK or Failed.

■ **Severity —** Select the initial severity for the alarm to be **IGNORE**, **REPORT**, **MINOR**, **MAJOR**, or **CRITICAL**. This option sets the severity for an alarm when it is first logged (as distinct from an **Alarm Elevation Time** setting, which allows the alarm severity to increase in the specified time).

■ **Start Delay** — Enter an integer between 0 and 86400 (86,400 seconds = 1 day), representing the number of consecutive seconds for which the alarm condition

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must persist before setting the alarm. Changing the delay period for an alarm generates an event.

📄 **NOTE …**

If the Factory Default value is IMMED or -1, this start delay value is not user-settable and the alarm takes effect immediately.

- **Clear Delay —** This label displays an integer between 0 and 86400 (86,400 seconds = 1 day), representing the number of consecutive seconds for which the module must be free of the alarm condition before clearing the alarm.

- **OK** — Click to store the configuration changes, update the SSU-2000 and the LMT display, and close the dialog box.

- **Cancel** — Click to close the dialog box without saving changes.

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12.2.4   Status Tab

Use the options in the 2048 kHz Output Module Configuration dialog box Status tab (Figure 12-5) to view the module, redundant mode, clock source, and port status, and to view all module alarms.
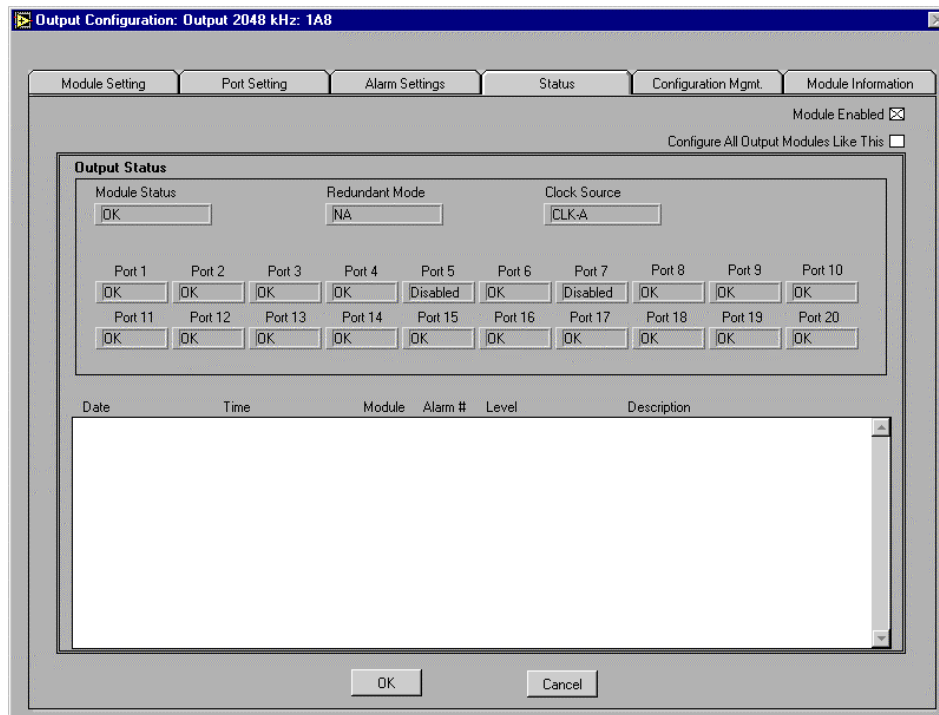
Figure 12-5.   2048 kHz Output Module Configuration Dialog Box Status Tab

■   **Module Status** — This label displays the current status of the 2048 kHz output module: **OK**, **BAD**, **DISABLED**, or **REMOVED.**

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■ **Redundant Mode** — This label displays the **AID** of the redundant pair (e.g., 1A5) or **NA** (if the 2048 kHz output module is not in operating in redundant mode).,

📄 **NOTE …**

The Access Identifier (AID) identifies the unit (shelf), module, and port locations within the SSU-2000. The LMT software uses the AID in the message display area messages and interface labels. The AID follows this format: `aid = SxAy-z`

where:

■ `S` = an internal identifier which may or may not be shown in the message or label.

■ `x` = shelf 1-5 (note that only the main unit #1 can contain input modules).

■ `y` = slot 1-16 in the main or expansion unit.

■ `z` = port 1-20 (note that multi-port input modules use ports 1-3; output modules use ports 1-20)

In the LMT:SSU-2000 message display area:

■ CLOCK-A = S1A1
■ CLOCK-B = S1A12

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■ **Clock Source** — This label displays the currently selected clock source for the 2048 kHz output module.

■ **Port Status** — These labels display the current port status for ports 1 through 20: **OK**, **BAD**, **DISABLED**, or **REMOVED**.

■ **Message Display Area** — Monitor current alarm information for the 2048 kHz output module: **Date**, **Time**, **Module** (AID), **Alarm #**, **Level**, and **Description**.

■ **OK** — Click to close the dialog box.

■ **Cancel** — Click to close the dialog box.

12.2.5   Configuration Management Tab

The 2048 kHz Output Module Configuration dialog box Configuration Management tab (Figure 12-6) provides configuration management options for the module.
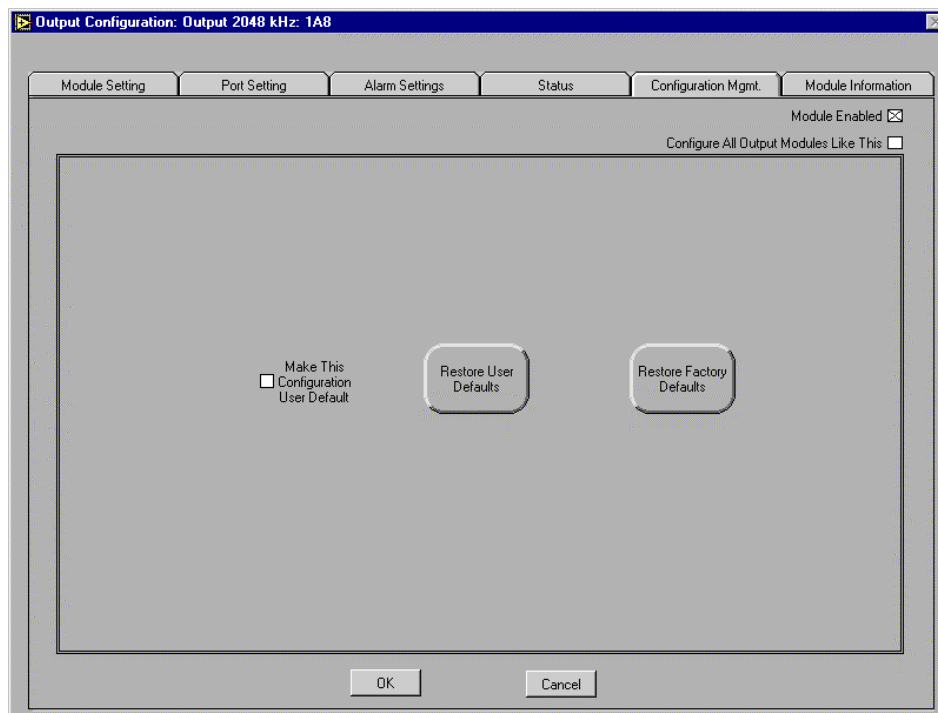
Figure 12-6.   2048 kHz Output Module Configuration Dialog Box Configuration Management Tab

- ■   **Make This Configuration User Default —** Mark this option to save the current configuration settings for the 2048 kHz output module as the User Default configuration settings. To return to the User Default settings after making configuration changes to the module, click **Restore User Defaults** in this tab.

- ■   **Restore Factory Defaults —** This option restores the Factory Default configuration settings for the 2048 kHz output module. Before restoring the settings, the LMT software asks you to confirm that you want to replace the current settings with the Factory Default settings. Click **OK** in the message box to restore

the Factory Default settings and update the module status display. Click **Cancel** in the message box to close the message box without restoring the Factory Default settings.

Figure 12-7.   Restore Factory Defaults Message Box

■   **Restore User Defaults —** Click this option to restore the User Default configuration settings to the 2048 kHz output module. Before restoring the settings, the LMT software asks you to confirm that you want to replace the current settings with the User Default configuration settings. Click **OK** in the message box to restore the User Default settings and update the module status display. Click **Cancel** in the message box to close the message box without restoring the User Default settings.

■   **OK —** Click to store the changes, update the SSU-2000 and the LMT display, and close the dialog box.

■   **Cancel —** Click to close the dialog box.

12.2.6   Module Information Tab

The 2048 kHz Output Module Configuration dialog box Module Information tab (Figure 12-8) provides manufacturing information about the module.
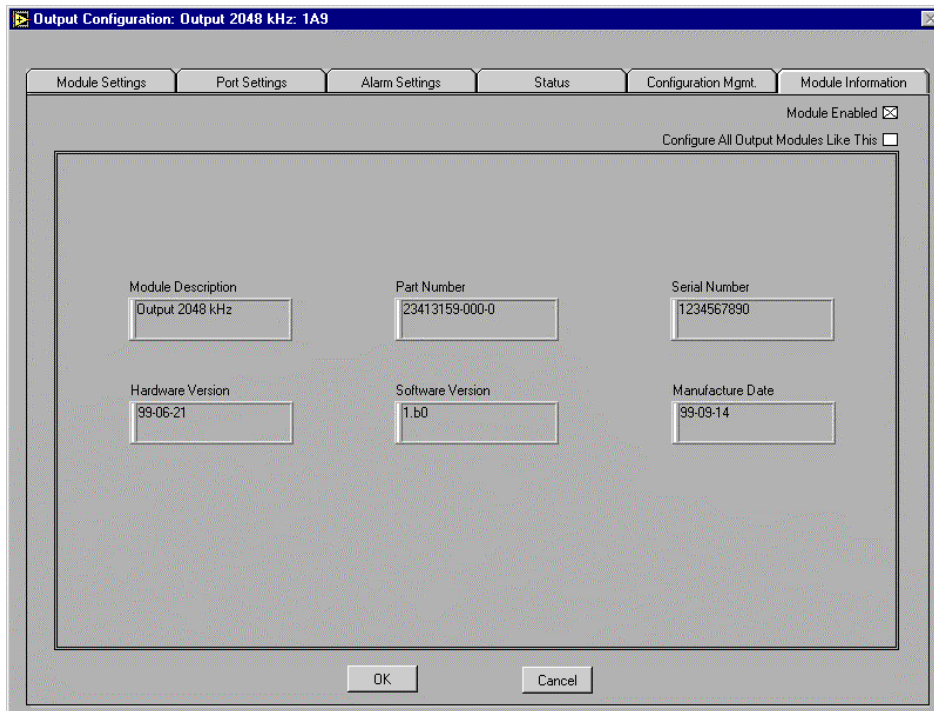
**Figure 12-8.   2048 kHz Output Module Configuration Dialog Box
Module Information Tab**

■ **Module Description** — This label displays a description of the module item.

■ **Module Serial Number —** This label displays the module serial number.

■ **Module Part Number —** This label displays the module part number.

■ **Software Revision —** This label displays the module software revision number.

■ **Hardware Revision —** This label displays the module hardware revision number.

■ **OK** — Click to close the dialog box.

■ **Cancel** — Click to close the dialog box.

■ **Date of Manufacture** — This label displays the date the module was manufactured.

📄 **NOTE …**

Customer Service will request the information found in the Module Information tab when you request service for the clock module.

TIP …

The module manufacturing information is stored in the Manf_Info.csv data file. This file is created each time the LMT software connects to the SSU-2000 and is updated when a module is removed from or inserted into the SSU-2000 while the LMT software is connected. The filename is fixed, but you may select the storage folder.

You can use the Manf_Info.csv data file to inventory network SSU-2000 modules. All LMT data is stored in Comma Separated Value format, and can be opened in Microsoft Excel or in other programs which support the *.csv* file name extension. For more information about using the LMT data files, see Appendix A.

12

A   LMT Data Files

This appendix describes the Local Management Terminal (LMT) for Windows data file naming conventions and provides a reference to the data file names with a description of the contents of each.

When the LMT software connects to an SSU-2000 unit, the software creates a number of fixed file name data files for storing each type of data in a Comma-Separated-Value (*.csv*) file name extension, a standard comma-delimited or *flat* data file. You can open *.csv* data files and view or edit the fields in Microsoft Excel or any other software that supports the *.csv* file name extensions.

For information about managing data files, see Section 4.5. For information about the LMT menus used to manage data files, see Section 6.1.1.

A

A.1   File Naming Conventions

For the LMT data files described in Appendix A.2, the file name represents a module port for which data is recorded. The file name takes the form *xAy-z*, where:

x = Shelf ID number (1 through 5)
A = Place holder
y = Module number (1 through 14)
z = Port number (1 through 3 for input modules and 1 through 20 for output modules)

A.2 Data Files

Table A-1 describes the data files created by the LMT software.

Table A-1.   Data File Names and Descriptions

File Name	Description
Manf_Info.csv	While connected to the software, this file generates when connected to the unit, updates if a module is removed or inserted into the unit, and provides an inventory of the SSU-2000s installed in the network.
Events.csv	Stores all event data that has been requested by the user.
xAy_Alarms.csv	Provides alarm data gathered from a specified module.
xAy_Config.csv	Stores module configuration information for alarm settings, and status and setup information at the location defined by *xAy* (see Appendix A.1). Each time you connect to a specific module or change the module configuration, the software overwrites the existing file. However, each module type may have variations on the data stored.
xAy-z_ClkA_Phase_T100.csv	Stores T100 phase data for the specified input, *xAy-z*. This file includes time stamped phase data for the T100 phase data for CLOCK-A versus the input port. When data is requested, the software overwrites the existing file.

A

Table A-1.   Data File Names and Descriptions (Continued)

File Name	Description
xAy-z_ClkB_Phase_T100.csv	Stores T100 phase data for the specified input, ***xAy-z***. This file includes time stamped phase data for the T100 phase data for CLOCK-B versus the input port. When data is requested, the software overwrites the existing file.
xAy-z_ClkA_Phase_T1K.csv	Stores T1K phase data for the specified input, ***xAy-z***. This file includes time stamped phase data for the T1K phase data for CLOCK-A versus the input port. When data is requested, the software overwrites the existing file.
xAy-z_ClkB_Phase_T1K.csv	Stores T1K phase data for the specified input, ***xAy-z***. This file includes time stamped phase data for the T1K phase data for CLOCK-B versus the input port. When data is requested, the software overwrites the existing file.
xAy-z_ClkA_Phase_T10K.csv	Stores T10K phase data for the specified input, ***xAy-z***. This file includes time stamped phase data for the T10K phase data for CLOCK-A versus the input port. When data is requested, the software overwrites the existing file.
xAy-z_ClkB_Phase_T10K.csv	Stores T10K phase data for the specified input, ***xAy-z***. This file includes time stamped phase data for the T10K phase data for CLOCK-B versus the input port. When data is requested, the software overwrites the existing file.
xAy-z_ClkA_MTIE_DDMMYYYY.csv	Stores *24-hour* MTIE data for the specified input and date. This file includes time stamped MTIE data for both CLOCK-A inputs. When data is requested, the software overwrites the existing file.

A

Table A-1. Data File Names and Descriptions (Continued)

File Name	Description
xAy-z_ClkB_MTIE_DDMMYYYY.csv	Stores *24-hour* MTIE data for the specified input and date. This file includes time stamped MTIE data for both CLOCK-B inputs. When data is requested, the software overwrites the existing file.
xAy-z_ClkA_TDEV_ DDMMYYYY.csv	Stores *24-hour* TDEV data for the specified input and date. This file includes time stamped TDEV data for both CLOCK-A inputs. When data is requested, the software overwrites the existing file.
xAy-z_ClkB_TDEV_ DDMMYYYY.csv	Stores *24-hour* TDEV data for the specified input and date. This file includes time stamped TDEV data for both CLOCK-B inputs. When data is requested, the software overwrites the existing file.

A

B   LMT Alarm and Event Messages

The SSU-2000 Communications Module monitors the events of all SSU-2000 modules and expansion units and writes the event log to non-volatile memory, from which it can be retrieved by the LMT or other software commands.

This section provides a guide to autonomous alarm and event messages displayed in the Message Display area of the LMT:SSU 2000 window. Messages appear in the ICS format.

- Table B-1 through Table B-4 describe autonomous alarm messages displayed in the LMT:SSU-2000 window.

- Table B-5 through Table B-8 describe autonomous event messages displayed in the LMT:SSU-2000 window.

- The *SSU-2000 Synchronization Supply Unit* User Guide (Part Number: 12713020-002-2): Appendix C defines the Interactive Command Set (ICS) ASCII command protocol.

Events are conditions within the SSU-2000 which may indicate abnormal operation or a change in the operational status of the unit. Recurring events may be escalated to alarm status and may require action by the user. Conversely, alarms may be de-escalated and corrected automatically. Refer to the *SSU-2000 Synchronization Supply Unit* User Guide (Part Number: 12713020-002-2) for information about troubleshooting.

B

Although every alarm is considered to be an event, not every event is an alarm. For example, a login is recorded as an event but is not considered to be an alarm. In this case, no action is required by the user.

Figure B-1 illustrates the structure and meaning of a typical event report.
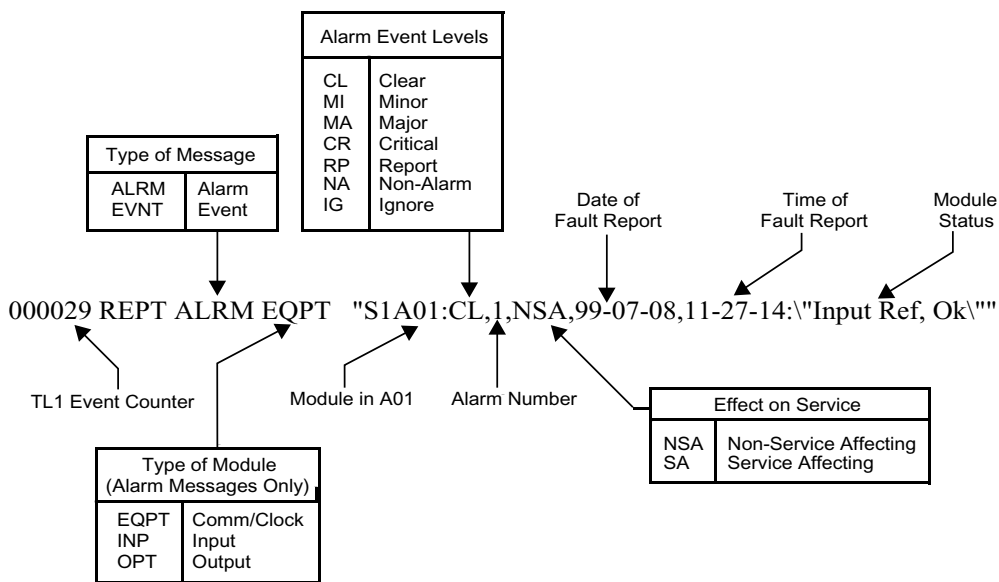
Figure B-1. **Typical LMT Event Message Structure**

B.1   LMT Alarm Messages

With the exception of alarms indicating loss of power on the main shelf or expansion shelves, all LMT alarm messages report module events or fault conditions that may require corrective action. The corrective actions apply only to fault messages requiring user intervention. Refer to the *SSU-2000 Synchronization Supply Unit User Guide* (Part Number: 12713020-002-2) for information about troubleshooting.

Table B-1 through Table B-4 describe the autonomous alarm messages that the LMT:SSU-2000 window reports in the Message Display area. The tables organize alarm messages numerically for each module type.

📄 **NOTE …**

Alarm levels are user-configurable. Table B-1 through Table B-4 list the factory defaults of each alarm level.

Table B-1.   Clock Module Alarm Messages

Alarm Message	Alarm Number	Default Alarm Level	Status Messages
Status of module-to-module communication	00	MINOR	■ Communication OK ■ Communication Bad
Input reference available status	01	MINOR	■ OK ■ Invalid
Frequency mode degradation	02	MINOR	■ OK ■ Holdover
Frequency control parameters within specification	03	MAJOR	■ OK ■ Out of Range
Output frequency status within specification	04	MINOR	■ OK ■ Degraded
Clock module usable as the output reference	05	MINOR	■ OK ■ Invalid
Status of the numerically controlled oscillator phase lock loop	06	MAJOR	■ OK ■ Not Locked

B

Table B-1.   Clock Module Alarm Messages (Continued)

Alarm Message	Alarm Number	Default Alarm Level	Status Messages
Status of the local oscillator phase lock loop	07	MAJOR	■ OK ■ Not Locked
Status of the rubidium's internal phase lock loop of the (ST2E clock only)	08	MINOR	■ OK ■ Not Locked

Table B-2.   Communications Module Alarm Messages

Alarm Message	Alarm Number	Default Alarm Level	Status Messages
Module-to-module communication	00	MINOR	■ OK ■ Bad
Indication of output controller mastership	01	MINOR	■ OK ■ Bad
Status of Power A	02	MINOR	■ OK ■ Lost
Status of Power B	03	MINOR	■ OK ■ Lost
Status of module's serial peripheral interface hardware (SPI watchdog timeout)	04	MAJOR	■ OK ■ Timeout

B

Table B-3.   DS1/E1 Input Module Alarm Messages

Alarm Message	Alarm Number	Default Alarm Level	Status Messages
Loss of signal fault status	00	MAJOR	■ OK ■ LOS
Alarm indication signal fault status	01	MINOR	■ OK ■ AIS
Out of frame signal fault status	02	MINOR	■ OK ■ OOF
Bipolar violation signal fault status	03	MINOR	■ OK ■ BPV
Cyclic redundancy code error fault status	04	MINOR	■ OK ■ CRC
Maximum time interval error fault status limit 1	05	MINOR	■ OK ■ Exceeded
Maximum time interval error fault status limit 2	06	MAJOR	■ OK ■ Exceeded
Received PQL below provision PQL status	07	MINOR	■ OK ■ Below Prov
No SSM status	08	MINOR	■ OK ■ Lost
Module boot problem	09	MINOR	■ OK ■ Failed
Clock PLL not locked	10	MINOR	■ OK ■ Not Locked

B

Table B-3.   DS1/E1 Input Module Alarm Messages (Continued)

Alarm Message	Alarm Number	Default Alarm Level	Status Messages
Input PLL not locked	11	MAJOR	■ OK ■ Not Locked
Phase measurement hardware fault	12	MINOR	■ OK ■ Bad
Frequency error	13	MINOR	■ OK ■ Exceeded

Table B-4.   Output Module Alarm Messages

Alarm Message	Alarm Number	Default Alarm Level	Status Messages
Redundant module status	00	MAJOR	■ OK ■ Failed
Mismatched DS1/E1 modules in redundant configuration	01	MAJOR	■ OK ■ Invalid
Loss of clock source A	02	MAJOR	■ OK ■ Lost
Loss of clock source B	03	MAJOR	■ OK ■ Lost
Loss of clock source C	04	MAJOR	■ OK ■ Lost
Clock below minimum clock level	05	MAJOR	■ OK ■ Below

B

Table B-4.   Output Module Alarm Messages (Continued)

Alarm Message	Alarm Number	Default Alarm Level	Status Messages
Clock not selected for output	06	MAJOR	■ Selected ■ Not Selected
Output port fault (displayed as hex value)	07	MAJOR	■ OK ■ Active
VCXO status	08	MAJOR	■ OK ■ Lost
Output PLL status	09	MAJOR	■ OK ■ Lost
Configuration status	10	MAJOR	■ OK ■ Failed

B.2   LMT Event Messages

Table B-5 through Table B-8 describe the autonomous event messages that the LMT:SSU-2000 window reports in the Message Display area. The tables organize event messages numerically for each module type.

Table B-5.   Sample Clock Module Event Messages

Event Message	Event Number	Event Description
Insert Clock Module	129	Indicates that the user inserted a module.
Remove, Clock Module	130	Indicates that the user removed a module.
Enable, Clock Module	131	Indicates that the clock module has been enabled.

Table B-5.   Sample Clock Module Event Messages (Continued)

Event Message	Event Number	Event Description
Disable, Clock Module	132	Indicates that clock module has been disabled.
Restart	133	Indicates that the user rebooted the module.
Clk Select	144	Indicates which clock module the user selected to generate an output.
Software phase lock loop	145	Indicates that the software phase lock loop is locking.
Inp Select, 1A04-02	146	Indicates that an input has been selected as reference
Warmup Chg, 1800 sec, COML	194	Indicates that the user has changed the Oscillator warmup time setting
Start tc, 240, COML	195	Indicates that the user has changed the Starting Time Constant (TAU) of the Oscillator
Dflt tc, 10000, COML	196	Indicates that the user has changed the Default Time Constant (TAU) of the Oscillator
Clk AR On, COML	199	Indicates that the user has changed the Clock Auto-Return (ON | OFF).
Inp Switch, AR On, COML	200	Indicates that the user has changed the Input Auto-Return (ON | OFF).
LO, Dis, COML	201	Indicates that the user has changed the Local Oscillator Output (ON | OFF) on the LO Output connector.
Inp Sel Mode, PQL, COML	202	Reference selection mode (Priority Quality Level - PQL)

B

Table B-5.   Sample Clock Module Event Messages (Continued)

Event Message	Event Number	Event Description
Err Delay, (1), 300 sec, COML	251	Indicates that the user has changed Alarm Delay time.
Alm Level, (2), Maj, COML	252	Indicates that the user has changed Alarm level (IGNORE, REPORT, MINOR, MAJOR, CRITICAL).
Elevate Time, 7200 sec, COML	253	Indicates that the user has changed alarm elevation time.
Setup, User Default, COML	254	Indicates that the user has set the module's configuration.

Table B-6.   Sample Communications Module Event Messages

Event Message	Event Number	Event Description
Install, Comm Module	129	Indicates that the user installed a module.
Remove, Comm Module	130	Indicates that the user removed a module.
Enable, Comm Module, COML	131	Indicates that the Communications module has been enabled.
Disable, Comm Module, COML	132	Indicates that the Communications module has been disabled.
Restart, in 5 seconds, COML	133	Indicates that the user rebooted the module.
Log In, JAY, COML, level: 2	144	Indicates that a user logged in.
Log Out, JOHN, COML, level: 2	145	Indicates that a user logged out.

B

Table B-6.   Sample Communications Module Event Messages

Event Message	Event Number	Event Description
Auto Out, SMITH, COML, level: 3:	146	Indicates that the system automatically logged a user out.
Msg, <HELLO USER>, COML	147	Indicates that the user sent a message.
Not Acknowledged, 1A01	148	Indicates that the module configuration could not be obtained.
Module Status, Bad, 1A04	150	Indicates that the module did not boot properly.
InitUserTable, TOM, COML	192	Indicates that the administrator initialized the user database.
Add User, ANDY, COML	193	Indicates that the administrator added a user to the user database.
Mod User, DON, COML	194	Indicates that the user or an administrator modified the user database.
Del User, TESTUSER, COML	195	Indicates that the administrator deleted a user from user database.
Pql Table, DS1, pql (5)=ST2, COML	196	Indicates that the user modified the PQL database.
Pql Table Dflt, COML	197	Indicates that the user has set the PQL database to the factory defaults.
Unit Name, AUSTIN, COML	198	Indicates that the user changed the SSU name.
Err Delay, (1), 300 sec, COML	251	Indicates that the user changed an alarm delay time.

B

Table B-6.   Sample Communications Module Event Messages

Event Message	Event Number	Event Description
Alm Level, (2), Rep, COML	252	Indicates that the user changed an alarm level.
Elevate Time, 3600 sec, COML	253	Indicates that the user changed an alarm elevation time.
Setup, Save, COML	254	Indicates that the user changed the user defaults or performed a save.

Table B-7.   Sample DS1/E1 Input Module Event Messages

Event Message	Event Number	Event Description
Install, Input Module	129	Indicates that the user installed a module.
Remove, Input Module	130	Indicates that the user removed a module.
Enable, Input Module, COML	131	Indicates that the user enabled a module.
Disable, Input Module, COML	132	Indicates that the user disabled a module.
Restart, in 5 seconds, COML	133	Indicates that the user rebooted the module.
Zero Phase, B, COML	144	Indicates that the user has forced the phase to be cleared.
Rcv Pql Chg, 3	145	Indicates that the input has received a different PQL.

B

Table B-7.   Sample DS1/E1 Input Module Event Messages (Continued)

Event Message	Event Number	Event Description
Pha Buildout, 334000, 335000	146	Indicates that the input performed phase buildout algorithm and the difference in the phase that caused a phase buildout.
Setup, Save, COML	254	Indicates that the user defaults have been set and saved.
Elevate Time, 86400 sec, COML	253	Indicates that the user changed an alarm elevation time.
Alm Level, (2), Maj, COML	252	Indicates that the user changed an alarm level.
Err Delay, (0), 10 sec, COML	251	Indicates that the user changed an alarm delay time.
DS1 Framer, ESF, COML	193	Indicates that the user changed an Input framer setup.
E1 Framer, CCS, COML	194	Indicates that the user changed an Input framer setup.
Freq, 10 MHz, COML	195	Indicates that the user changed input framer setup.
ZS, On, COML	196	Indicates that the user changed input framer setup.
SSM, Off, COML	197	Indicates that the user changed input SSM capability.
CRC, On, COML	198	Indicates that the user changed input framer setup.
Port, Dis, COML	199	Indicates that the user Enabled | Disabled input port.

B

Table B-7.   Sample DS1/E1 Input Module Event Messages (Continued)

Event Message	Event Number	Event Description
SSM, Auto, COML	200	Indicates that the user changed the SSM setup.
Priority, 5, COML	201	Indicates that the user changed the input priority level.
SSM Bit, 4, COML	202	Indicates that the user changed the SSM Bit location (E1 only)
Prov PQL, 5, COML	203	Indicates n that the user the changed input provisioned PQL.
MTIE, T100, L1, 550, COML	204	Indicates that the user changed the input MTIE limits (L1 | L2).
Gain, On, COML	205	Indicates that the user changed the input gain control.
CSFlt, Off, COML	206	Indicates that the user changed the input Cesium Fault control.
Err Cnt, BPV, 16, COML	207	Indicates that the user changed the current Signal Alarm Error Count (LOS, AIS, OOF, BPV, or CRC).
Clr Cnt, OOF, 5, COML	208	Indicates that the user changed the Current Signal Alarm Clear Count (LOS, AIS, OOF, BPV, or CRC).
Freq Err Limit, Clk-A, 1000, COML	209	Indicates that the user changed the frequency error limits.
Freq Clr Limit, Clk-A, 800, COML	210	Indicates that the user changed the frequency clear limits.

B

Table B-7.   Sample DS1/E1 Input Module Event Messages (Continued)

Event Message	Event Number	Event Description
MTIE Clr Limit, T100, L1, 500, COML	211	Indicates that the user changed the MTIE clear limits.
MTIE Limit, DS2, COML	212	Indicates that the user changed the MTIE to standard limits (PRS, DS1, G.811, G.823).

Table B-8.   Sample DS1/E1 Output Module Event Messages

Event Message	Event Number	Event Description
Install, Output Module	129	Indicates that the user installed a module.
Remove, Output Module	130	Indicates that the user removed a module.
Enable, Output Module, COML	131	Indicates that the user enabled the output module.
Disable, Output Module, COML	132	Indicates that the user disabled the output module.
Restart, in 5 seconds, COML	133	Indicates that the user rebooted the module.
Cannot Enable, Output Module, COML	144	Indicates that the user cannot enable the output module.
Alm Level, (0), Maj, COML	252	Indicates that the alarm level changed.
Elevate Time, 86400 sec, COML	253	Indicates that the alarm elevation time changed.

B

Table B-8.   Sample DS1/E1 Output Module Event Messages (Continued)

Event Message	Event Number	Event Description
Setup, User Default, COML	254	Indicates that the user defaults have been set and saved.
Frame Mode, ESF, COML	193	Indicates that the output framing type changed.
ZS, On, COML	194	Indicates that the user changed the output framing type.
DS1 LEN, [0-5], len=133 ft, COML	195	Indicates that the user changed the output line length (DS1 only).
CRC, On, COML	199	Indicates that the user changed the output framing type.
SSM Bit, 8, COML	201	Indicates that the user changed output SSM bit position (E1 only).
Min Clk Level, ACQ, COML	202	Indicates that the user changed Minimum Clock Level to turn on the outputs.
Bypass, On, COML	203	Indicates that the user changed the Bypass mode of operation.

B

B

Glossary

1 PPS

One pulse per second, or approximately 86,400 times per day.

Access Identifier

Identifies the shelf, module, and port within the SSU-2000. The AID is used in the message display area of the **LMT:SSU-2000** window to display SSU-2000 event and alarm messages, and in the Local Management Terminal for Windows (LMT) dialog box titles and labels to identify the SSU-2000 system main and expansion shelves, modules, and module ports.

AID

Acronym: Access Identifier

Backdoor Logon

A logon which provides a way of getting into a password-protected system without an assigned password.

AIS

Acronym: Alarm Indication Signal.

Alarm Indication Signal (AIS)

Signal transmitted downstream to inform that an upstream failure has been detected. Replaces normal traffic signal when a maintenance alarm indication is activated.

Alternate Mark Inversion (AMI)

Signaling protocol in which ones are indicated by either a positive or a negative pulse, and zeros by no pulse. The ones alternate between positive going and negative going.

AMI

Acronym: Alternate Mark Inversion.

ASCII

Acronym: American Standard Code for Information Interchange.

Glossary

| ASYNCHRONOUS TRANSFER MODE (ATM) |

Glossary

Asynchronous Transfer Mode (ATM)
Very high speed transmission technology using high bandwidth, low-delay, connection-oriented, packet-like switching and multiplexing techniques in which each 53-byte fixed-size cell is presented to the network on a start-stop basis (asynchronously).

ATM
Acronym: Asynchronous Transfer Mode.

B8ZS
Acronym: Binary with 8 Zero Substitution.

Binary with 8 Zero Substitution (B8ZS)
Zero suppression scheme associated with DS1.

Bipolar Violation (BPV)
In the T-carrier line coding system that inverts the polarity of alternate one bits, a bipolar violation (BPV) indicates the presence on the carrier line of two consecutive one bits of the same polarity.

BPV
Acronym: Bipolar Violation.

CAS/CCS
Acronym: Channel Associated Signaling/Common Channel Signaling.

CDMA
Acronym: Code Division Multiple Access.

Channel Associated Signaling/Common Channel Signaling (CAS/CCS)
Framing modes associated with E1 signaling.

Clock Module
Provides the timing sources for SSU outputs.

Code Division Multiple Access (CDMA)
New form of digital cellular phone service. CDMA is a spread spectrum technology that combines the original information signal with a correlating code, resulting in a signal which occupies a much greater bandwidth than the original but allows several simultaneous conversations to share the same frequency allocation.

Communications Module (COMM)
Supports user interaction with an SSU or TSG.

Configuration
For the LMT, hardware or software parameters or settings that affect the operation or performance of the unit.

CRC
Acronym: Cyclic Redundancy Checking.

CRC4
Cyclic Redundancy Checking protocol used with E1 signaling.

CRC6
Cyclic Redundancy Checking protocol used with DS1 signaling.

CRITICAL Alarm
Alarm message which signifies that the output reference is invalid or that the output modules have no clock source.

Cyclic Redundancy Checking (CRC)
A data validation process in which a CRC character, whose value depends on the hexadecimal value of the number of ones in the data block, is added to the data block at the end of a transmission by the transmitting device. The receiving device makes a similar calculation and compares the results to determine if there was a mistake in the transmission.

Glossary

| D4 |

D4

In T-1 digital transmission technology, D4 is the fourth-generation channel bank or interface between the T-1 carrier system and an analog premises device. D4 and ESF are the framing modes associated with DS1 signaling. D4 utilizes superframes for information transfer; ESF uses extended superframes.

Data Communications Equipment (DCE)

Protocol which resolves interface issues between DTE and network. As defined in the RS-232 specification equipment to which DTE is connected, often to enable access to network facilities.

Data File

For the LMT, the fixed file name Comma Separated Value (.csv) file name extension in which the configuration settings are stored.

Data Terminal Equipment (DTE)

In the RS-232 standard specification, the RS-232-C is connected between the Data Communications Equipment (DCE) and a DTE. The major difference between a DCE and a DTE is that pins two and three are reversed.

DCE

Acronym: Data Communications Equipment.

DDS

Acronym: Direct Digital Synthesis.

Digital Signal, Level 1 (DS1)

Digital signal consisting of 24 DS-0s and a framing bit (193 bits) transmitted 8000 times per second, which may be carried on T1 or other transmission medium; 1.544 million bits per second in North America, and 2.048 million bits per second elsewhere (where it is called E-1).

Direct Digital Synthesis (DDS)

DDS circuitry uses oscillator frequency to generate an analog output waveform of a specific frequency from a stable reference clock.

Glossary

Download

Receive data into a computer or ROM from another computer, as for example, receiving updated software from a host computer into Flash ROM.

DS1

Acronym: Digital Signal, Level 1.

DTE

Acronym: Data Terminal Equipment.

E1

See *Digital Signal, Level 1 (DS1)*. European equivalent of North American DS1. E-1 carries information at the rate of 2.048 million bits per second.

ESF

Acronym: **E**xtended **S**uper**F**rame format.

Event History

Historical records of activities for a device, usually comprised of event messages indicating a change in the physical or logical state of the device.

Extended SuperFrame Format (ESF)

A modification of the Superframe (sometimes called D4) framing scheme for DS1. ESF extends the framing pattern from 12 frames to 24 frames. A frame is 192 data bits and one frame bit. The 24 frame bits are a unique pattern of 1s and 0s that allows for terminal alignment, frame count, CRC bits, and a 2K data channel. Framing allows receiving equipment to identify the start and sequence of data in the binary 1.544 million bits per second DS1 stream.

Facilities Data Link (FDL)

ESF allows 4 Kbps to be used for a facilities data link which supports the communication of various types of monitoring or diagnostic network information used for provisioning and maintenance. Some units use FDL for PQL settings.

Fault

Hard failure or performance degradation serious enough to threaten network function.

Glossary

| FDL |

Glossary

FDL
Acronym: Facilities Data Link.

FLL
Acronym: Frequency Lock Loop.

Frame Generator
Frame generators accept input PQL from the reference input and convert it to the appropriate sync status message (SSM) for output.

Framing
Error control procedure which inserts bits which can be used by the receiver to identify the time slots allocated to each subchannel in multiplexed digital channels. Framing bits may also carry alarm signals.

Framing Error
Error which occurs when a receiver does not interpret frame bits correctly.

Frequency
Rate at which electromagnetic waveform alternates. Frequency measurements are calculated from phase measurements over time.

Frequency Lock Loop (FLL)
Mechanism whereby a generated signal is locked to a precise frequency relationship with a reference clock signal. See also *Phase Lock Loop (PLL)*.

G.703
ITU-T Recommendation G.703, "Physical/Electrical Characteristics of Hierarchical Digital Interfaces." The G recommendations are a series of standards defined by the ITU-T for transmission facilities.

Generic Requirement (GR)
Telcordia Technologies (formerly Bellcore) document type that replaces Framework Technical Advisory (FA), Technical Advisory (TA), and Technical Reference (TR) document types. The GR is a living document representing Telcordia Technologies' current view of a technology.

Global Positioning System (GPS)

System of satellites, that transmits its position and time (derived from on-board celestial navigation equipment and atomic clocks), and a pseudo random noise (PRN) code.

GPS

Acronym: Global Positioning System.

GR

Acronym: Generic Requirement.

Graphical User Interface (GUI)

A communication method between a computer and users that depends on graphical objects such as windows, menus, and icons. Users access software functions by manipulating the graphical objects using a pointing device or keyboard commands.

GUI

Acronym: Graphical User Interface.

HDB3

Acronym: High-Density Bipolar of Order 3.

High-Density Bipolar of Order 3

Zero suppression scheme associated with E1.

Holdover Mode

Mode of operation in which an internal clock provides the synchronization reference in the event that the internal reference is lost and another suitable reference is not available.

ICS

Acronym: Interactive Command Set.

Input Module

Provides the timing reference inputs for an SSU.

Glossary

| INPUT CHANNEL |

Input Channel
One input signal versus one clock signal.

Input Port
One input signal versus both clock signals (two channels).

Interactive Command Set (ICS)
A set of commands, responses, and events forming an interface with an SSU or TSG or other equipment with which users can interact by means of a computer or terminal that is connected by a serial cable to the equipment.

ITU
Acronym: International Telecommunications Union.

ITU-T
Acronym: International Telecommunications Union-Telecommunications Standardization Sector.

LED
Acronym: Light Emitting Diode.

Light Emitting Diode (LED)
LEDs on the chassis display panel provide a visual indication of the current status or condition of a network element or system component.

LMT
Acronym: Local Management Terminal.

LT
Acronym: Local Terminal.

Local Terminal (LT)
Computer, laptop, or ASCII terminal which is connected to a network element by a direct serial connection.

Glossary

Locked Mode

Operational mode in which the processor controls DDS on the clock input signals in order to maintain the output frequency with respect to the input reference. The processor measures the phase of each input and adjusts the control value based on the phase changes of the reference. The processor also monitors all input signals for MTIE, frequency, and input signal errors such as Loss of Signal (LOS) or Out of Frame (OOF).

LOF

Acronym: Loss of Frame.

Login

Process by which users identify and authenticate themselves to a network system or interface. Users typically enter their username and password.

LOS

Acronym: Loss of Signal.

Loss of Frame (LOF)

Generic term which is used specifically in different signal domains. For example, in the SONET domain, LOS is a condition that indicates that a valid framing pattern could not be obtained.

Loss of Signal (LOS)

Generic term which is used specifically in different signal domains. For example, in the SONET domain, LOS is a loss of signal condition which is detected physically in the receiver.

MAJOR Alarm

Alarm message which signifies that the output signals are not synchronized to an input signal.

Maximum Time Interval Error (MTIE)

A measure of the noisiness of the incoming signal.

Mbps

Acronym: Megabits per second.

Glossary

| MINOR Alarm |

Glossary

MINOR Alarm
Alarm message which signifies a condition that is not fatal to synchronization, but which could lead to more significant problems.

MTIE
Acronym: Maximum Time Interval Error.

NE
Acronym: Network Element.

Network Element (NE)
Processor controlled entities of the telecommunications network that primarily provide switching and transport network functions and contain network operations functions.

OAM&P
Acronym: Operation, Administration, Maintenance, and Provisioning.

Out of Frame Error (OOF)
Designates an error condition in framing bits, declared when two of four or two of five framing bits are missed.

Output Module
Provides output sources from the SSU or TSG.

Output Port
The specific number and type of outputs that can be used as output timing sources for the SE.

Password
Word or string of characters which a user or system administrator associates with a username, and which is entered by the user during the login in process to authenticate the username login to the network.

Phase Lock Loop (PLL)
Mechanism whereby a generated clock is locked to a precise phase relationship to a reference clock. A signal that is phase locked is also frequency locked. See also *Frequency Lock Loop (FLL)*.

Phase Measurement

Phase measurements determine the difference in phase between the input signals and the reference clock.

PLL

Acronym: Phase Lock Loop.

PPS

Acronym: Pulses Per Second. See *1 PPS*.

PQL

Acronym: Priority Quality Level.

PRC

Acronym: Primary Reference Clock.

Priority Quality Level (PQL)

PQL settings provide an internal representation of traceability of signal presented at the input ports. The PQL settings can be managed by means of an editable translation table in which PQLs are assigned for provisioning Synchronization Status Messages. PQL information is carried in the FDL of the ESF.

Primary Reference Clock (PRC)

Any device that provides a PRS quality output signal.

Primary Reference Receiver (PRR)

A radio receiver that provides a PRS quality output signal.

Primary Reference Source (PRS)

1. A timing signal with ANSI and Stratum 1, or ITU and ETSI PRC accuracy and stability.

2. A master clocking source in a system or network from which other distributed devices derive their clocking and which enables the system or network to maintain synchronization.

PRR

Acronym: Primary Reference Receiver.

Glossary

| PRS |

PRS
Acronym: Primary Reference Source

SDH
Acronym: Synchronous Digital Hierarchy.

SE
Acronym: Synchronization Element.

SEM
Acronym: Synchronization Element Manager.

Slave Clock
Clock which is locked to a reference timing signal.

Software Configurable Hardware
Hardware options that operators can set by means of a software interface.

SONET
Acronym: Synchronous Optical NETwork.

SSM
Acronym: Synchronization Status Message.

SSU
Acronym: Synchronization Supply Unit.

ST2E Rb Clock
Stratum 2E Rubidium clock module. Uses the Rubidium oscillator and meets or exceeds the performance requirements for ANSI and Telcordia Technologies (Bellcore) Stratum 2 and ITU and ETSI Type II Transit Node clocks.

Synchronization
Timing of network transmissions by a master clock.

Glossary

Synchronization Element Manager (SEM)
Software interface for managing performance, configuration, security, fault, alarm, and event reporting for synchronization elements.

Synchronization Status Message (SSM)
Method by which synchronization network elements can communicate the traceability of their synchronization quality levels. SSMs take the form of identifiers embedded within the reference signals, and are used as synchronization sources for Timing Signal Generators (TSGs) and other network elements (NEs). The identifiers carry information about the quality of the synchronization source to which the particular synchronization signal is traceable. Identifiers also indicate whether the signal is available for use as a synchronization source. SSMs are especially useful in avoiding timing loops, while allowing the TSG or NE to autonomously reconfigure to the most suitable synchronization source available.

Synchronization Supply Unit (SSU)
Logical function of reference timing signal selection, processing, and distribution that provides the frequency characteristics of slave clocks for telecommunications synchronization.

Synchronous Digital Hierarchy (SDH)
Fiber-optic-based serial standards for use with SONET and ATM in Europe.

TDEV
Acronym: Time Deviation.

Time Deviation
Measure of the frequency components of a series of phase readings.

Timing Signal Generator (TSG)
Device which generates and distributes network synchronization signals, generally in a variety of waveforms.

TL1
Acronym: Transaction Language One.

Glossary

| TRANSACTION LANGUAGE ONE (TL1) |

Transaction Language One (TL1)
A Telcordia Technologies (formerly Bellcore) interface standard used in the telecommunications industry.

TSG
Acronym: Timing Signal Generator.

Universal Time Coordinated (UTC)
In the U.S., the official UTC is maintained by the U.S. Naval Observatory. Globally, UTC is kept by a number of laboratories cooperating in the determination of UTC. Also known as Universal Coordinated Time (UCT).

UTC
Acronym: University Time Coordinated. Also known as Universal Coordinated Time (UCT).

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Sections ──────▼   ▼────── **Index**

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