Fiber SenSys®

SpectraView®

User's Reference Manual

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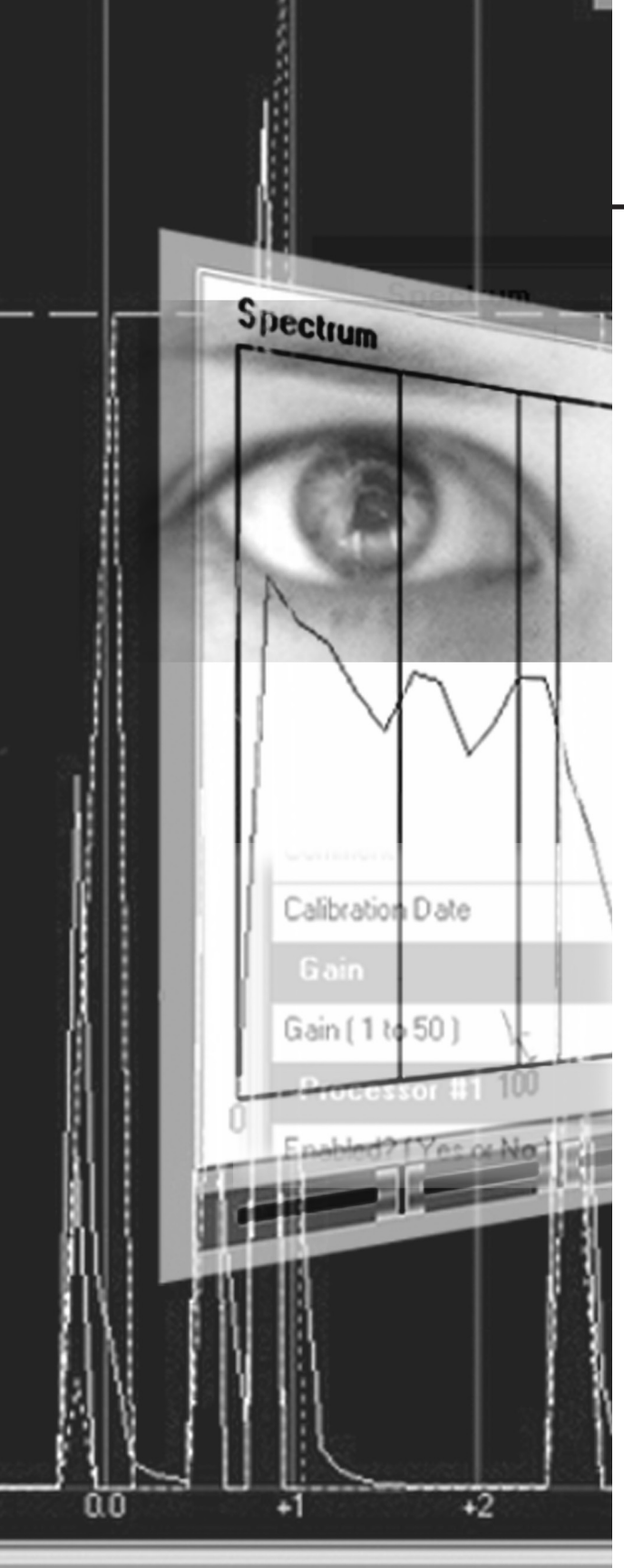


1

INTRODUCTION

Introduction to SpectraView®

Fiber SenSys' SpectraView® is a software package designed to monitor the performance of all Fiber Defender series Alarm Processing Units (APUs) and analyze recorded sensor cable signals. SpectraView offers users a Graphical User Interface (GUI) for interfacing with an APU and changing its alarm processing parameters. Using SpectraView's APU Modeler, users can also create predictive "models" of sensor signals and manipulate them by changing the APU parameter settings.

The APU Modeler feature offers users the ability to predict sensor behavior at various parameter settings - all from the convenience of a remote PC.

Figure 1-1: The SpectraView® Main Screen

Navigating Around SpectraView®

Normal Windows® software conventions are used for navigating around SpectraView. The pointer is positioned around the SpectraView window using a mouse. Right and left-clicks are used to initiate actions, and data is entered into fields using the keyboard.

When SpectraView is launched, the SpectraView Main screen appears as shown in Figure 1-1.

About, Help and Exit buttons are displayed in the upper right-hand corner of the screen. Pressing the **About** button displays SpectraView revision level information, pressing the **Help** button brings up the online help files and pressing the **Exit** button closes SpectraView.

Serial Port and **Modes** buttons are displayed in the upper left-hand corner of the screen. Pressing the **Serial Port** button brings up the Serial Port selection pop-up window. Pressing the **Modes** button brings up the Modes selection pop-up window.

Serial Port Pop-up Window

All communication between SpectraView and the Alarm Processing Unit (APU) is done through the serial communications port, or RS232 port, of the PC. The Serial Port pop-up window allows the user to select the proper serial port for communication.

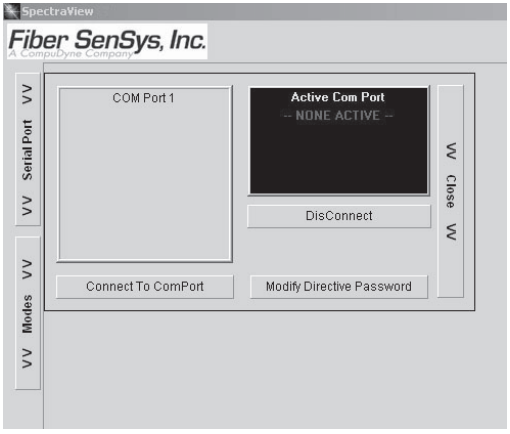


Figure 1-2: The Serial Port Pop-Up Window lets users specify the proper serial communication port

The Directive Mode password, a security feature required to access certain APU attributes, can be modified from this pop-up window. For more information on operating the Serial Port selection pop-up window, see Chapter 3.

Modes Pop-up Window

Modes are individual functions available in SpectraView. The Modes pop-up window displays the list of available modes.

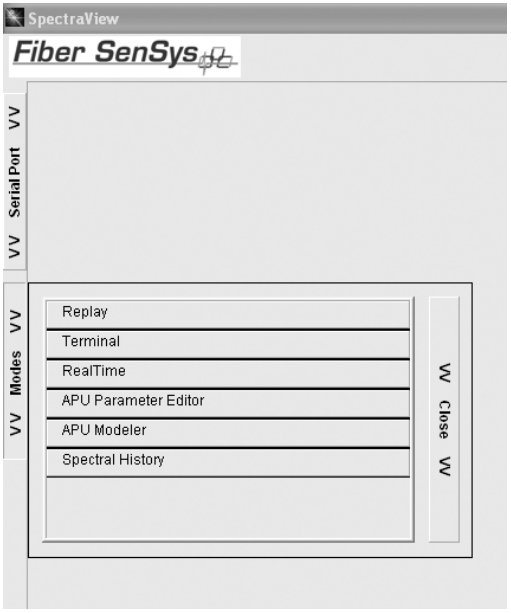


Figure 1-3: The Modes selection pop-up window displays the list of available modes

There are 6 modes available in SpectraView:

- Replay mode
- Terminal mode
- Real-Time mode
- APU Parameter Editor mode
- APU Modeler mode
- Spectral History mode

Terminal mode allows the user to access and change APU parameters using built-in Terminal emulation software. Real-Time shows instantaneous frequency content of the sensor signal and Replay mode provides the ability to display previously recorded files. Combined together, these three modes allow a user to monitor, troubleshoot and set parameters on model FD-220/FD-220P, FD-205, FD-208/FD-208R, FD-331/FD-332 and FD-341/FD-342 APUs.

An additional feature allows users of the FD-330 and FD-340 series to use the **Switch Channel** button for the Real-Time and APU Parameter Editor modes to switch between the dual-channels.

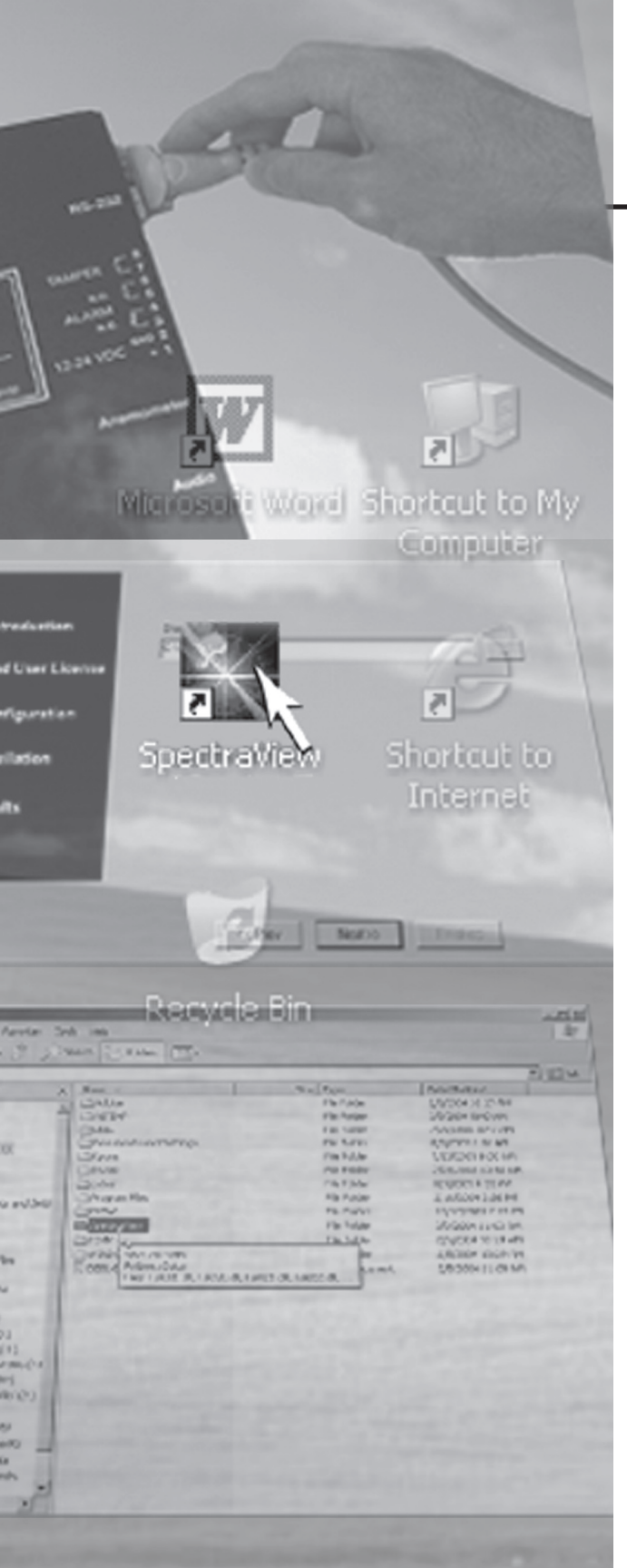
Using the APU Parameter Editor, users can view, edit and save existing APU alarm parameters without having to enter the Terminal mode.

The APU Modeler mode lets users create predictive models of APU response by varying parameters of previously recorded sensor signals.

Spectral History mode, available with FD-330 or FD-340 series APUs, allows users to exract spectral data records stored internally in the APU's volatile memory then save them to file as spectral data files (.spb).

Files displayed in Replay and Spectral History modes feature a date/time stamp.

Pressing any button in the Modes selection pop-up window enters its corresponding mode. For more information on operating these modes, refer to Chapter 3.



2

GETTING STARTED

Before operation with SpectraView® can begin, it must be installed on a PC that is physically connected to an active Alarm Processing Unit (APU). A sensor cable must be connected to the APU for test purposes.

The software must also be operated on a PC on which users have either full administrative or Power User rights.

System Requirements

SpectraView can be installed on any PC meeting these minimum requirements:

- Windows NT® 4.0, Windows 98®, Windows 2000®, Windows ME® or Windows XP®
- PC with Pentium III processor or better
- 128 Mb of RAM, minimum
- 10 Mb of available hard-drive space
- 800 x 600 pixel display or better

Installing SpectraView

To install the SpectraView software:

1. Insert the CD into the CD ROM drive
2. Open Windows Explorer® and locate the CD ROM drive. Click on it to view the contents of the CD
3. Open the "SpectraView" folder and locate the **Install.exe** file icon. Click on it to launch the installation program
4. Follow the on-screen instructions

If the operating system's Autorun feature is enabled, the installation program begins automatically when the installation CD is inserted. Follow the on-screen instructions.

Setting up the Hardware

SpectraView can be used with any of the Fiber Defender series intrusion detection systems:

FD-220/FD-220P. Fiber optic intrusion detection system designed for fence line applications only.

FD-205. Fiber optic intrusion detection system designed for fence line, buried and other non-standard applications. This system comes with an anemometer option for wind compensation in fence line applications.

FD-208/FD-208R. Fiber optic intrusion detection system designed for fence line, buried and other non-standard applications. This system incorporates insensitive leads up to 10 km long, allowing the APU to be placed in a central, remote location. The FD-208 is available in either a stand-alone configuration - for protecting a single zone - or rack-mount configuration for protecting multiple zones.

FD-331/FD-332. Fiber optic intrusion detection system designed for fence line, buried and other non-standard applications. This system comes with an optional anemometer and embedded Fiber Security Network (FSN) or IP/XML communication options. A single-channel (FD-331) or dual-channel model (FD-332) is available.

FD-341/FD-342. Fiber optic intrusion detection system designed for fence line, buried and other non-standard applications. This system incorporates insensitive leads up to 20 km long, allowing the APU to be placed in a central, remote location. This system comes with embedded Fiber Security Network (FSN) or IP/XML communication options. A single-channel (FD-341) or dual-channel model (FD-342) is available.

Hardware Requirements

Using SpectraView with a Fiber Defender system requires the following minimum hardware components:

- **Power Supply for the APU**: 12-24 VDC adapter for most APUs. The FD-208R accepts only 120/240VAC, 50/60 Hz input
- **Fiber Optic Sensor Cable**: A one meter "loopback" cable is acceptable for testing purposes. For more information on the loopback cable, see *Creating a Loopback Cable* later in this chapter
- **RS232 Cable**: DB9 M/F straight-through type cable
- **APU**: Any of the Fiber Defender series APUs can be used

Setup

Under normal conditions, SpectraView is used in conjunction with Fiber Defender systems that are already installed on the perimeter. Simply connect the APU to the proper serial port on the PC using a DB9, male-to-female, straight-through type RS232 cable. Double click on the **SpectraView.exe** desktop icon to begin.

SpectraView can also be used to test an APU prior to its deployment. To set up a single APU for testing purposes:

1. Connect the APU to the proper serial port on the PC using an RS2332 cable
2. Connect power to the APU and verify the green "Power" or "Operate" LED illuminates
3. Connect a 1 meter "loopback" cable between the APU's input and output optical connectors. A one meter length of sensing cable can be used to create the loopback cable. For the FD-208/FD-208R only, a single-mode cable must be connected between the input connector and the 1 meter multimode loopback cable. For instructions on creating the loopback cable, see *Creating a Loopback Cable* following this section
4. Launch the SpectraView software by double-clicking on the **SpectraView.exe** desktop icon

Creating a Loopback Cable

It is sometimes more convenient to use a 1 meter loop of sensor cable, or "loopback" cable, to test an APU rather than connect an entire length of deployed sensor cable.

To create a loopback cable:

1. Obtain a 1 meter section of SC-3 or SC-4 optical fiber sensor cable. Only SC-3 or SC-4 sensor cable can be connected directly to the FD- 220, FD-205 and FD-330 series APUs

NOTE:
If the FD-208/FD-208R or FD341/FD342 is being tested, an insensitive lead must be connected directly to the APU's input connector. A one meter 9µm/125µm single-mode fiber with ST-type connectors can be used as the insensitive lead. Connect the insensitive lead between the input connector and the loopback cable.

2. Following the instructions found in the CK-200 connector kit (available through Fiber SenSys), connectorize the ends of the fiber with ST connectors

3. Test the loopback cable by connecting it to the optical connectors of the known-good APU as shown in Figure 2-1. There should be no fault or alarm indicators illuminated with the cable properly connected

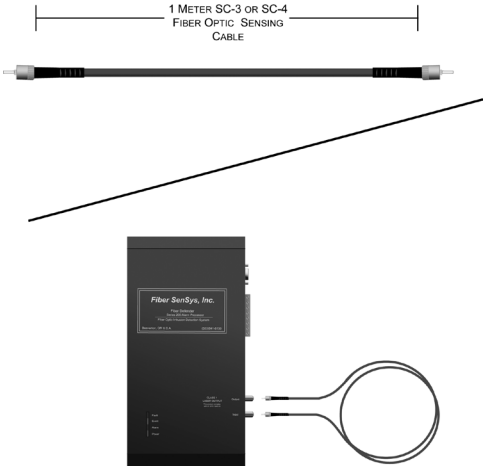


Figure 2-1: Using a Loopback Cable for testing is more convenient than using a full-length cable

4. Run a "STATUS" check on the APU and verify the LOSS number reads less than "6". For more information on running a Status check, see *Terminal Mode* in Chapter 3 or refer to the appropriate Fiber Defender user's reference manual

Communication Setup

SpectraView communicates with all Fiber Defender series APUs via an RS232 serial connection. The Fiber Defender APU is equipped with a standard DB9 female connector. Most PCs are equipped with DB9 male connectors that complete the interface. Interconnection is made via a DB9 male-to-female, straight-through type connector.

SpectraView can be configured to operate on any logical serial port that is available on the PC. Refer to the PC's documentation to determine which logical serial port is available for communications. Connection properties for successful data communication are:

Bits Per Second:	9600
Data Bits:	8
Parity:	None
Stop Bits:	1
Flow Control:	Hardware

Communication Errors

In the event of communication failure, the software presents a “Cannot Detect APU” error message. Other indications of communication failures include:

- No response when selecting a serial communications port
- No keyboard function in Terminal mode
- A “Not Connected to APU” message in Real-Time mode
- “Unable to Communicate With APU” message appears when the Modify Directive Password button is pressed

There may be one of several possible causes for a communication error. A serial port conflict may exist, for example, if another program has reserved, or is using, the selected port.

Check the integrity of the DB9 cable connection between the APU and the PC serial port. Verify the cable is a straight-through type serial cable. If the Directive Mode password currently saved in the APU is other than the default (“DIR”), and this new password has not been entered in SpectraView using the Modify Directive Password button, this communication error will result. Therefore, verify the current Directive Mode password in the APU has also been entered in SpectraView.

For more information on the Directive Mode password, refer to *Connecting Ports* in Chapter 3.

3

OPERATION

This chapter discusses the operation of SpectraView®.

Press the **SpectraView®** desktop icon to launch the software. The SpectraView Main screen appears as shown in Figure 1-1 of Chapter 1.

Connecting Ports

Recall from Chapter 1 that the PC must be connected logically to the APU via a serial port in order to operate most SpectraView modes.

To connect a serial port logically, press the **Serial Port** button to open the Serial Port pop-up window.

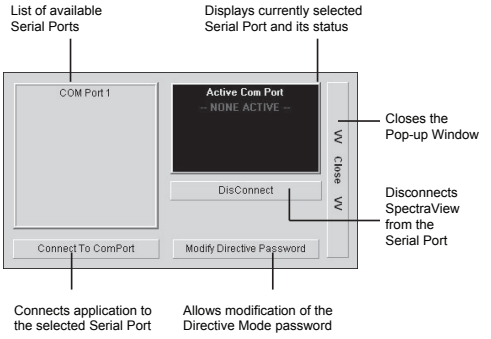


Figure 3-1: The Serial Port Pop-up Window has all the features necessary to connect a serial port logically

To logically connect a serial port:

1. Select the desired serial port from the list of available ports
2. Press the **Connect to COM Port** button to logically connect SpectraView to the selected port
3. The active serial port will be displayed in the "Active Com Port" window

Prior to entering the Real-Time mode, SpectraView runs a check of the Directive Mode password currently saved in the APU. SpectraView also runs this check prior to transmitting/receiving information while in the APU Parameter Editor mode. If the password is anything other than the default ("DIR"), a "Cannot Detect APU" error results. The new password must be entered into SpectraView using the **Modify Directive Password** button. Refer to *The Directive Mode Password* following this section.

Press the **Disconnect** button to logically disconnect a serial port from SpectraView. Terminal and Real-Time modes will not operate until a serial port is re-connected.

Press the **Close** button to close the pop-up window.

NOTE:
If a communication error results, or communication with the APU is interrupted at any point, the serial port must be logically disconnected and re-connected before operation can continue.

The Directive Mode Password

Whenever SpectraView connects to the APU using the Real-Time or APU Parameter Editor mode, it does so by first placing the APU firmware in the directive mode. When entering these modes, SpectraView runs a check of the current Directive Mode password saved in the APU. If the password is anything other than the default ("DIR"), a "Cannot Detect APU" error message results. The new password must be entered in SpectraView using the Modify Directive Password button.

To enter the new Directive Mode password into SpectraView:

1. Press the **Serial Port** button to open the Serial Port pop-up window
2. Select a serial port and press the **Connect to COM Port** button
3. After connecting to the port, press the **Modify Directive Password** button (see Figure 3-1). Enter the new password and press the **OK** button

NOTE:
The new password remains in SpectraView's memory only until the software is exited. Any Directive Mode password other than the default password ("DIR") is lost upon exiting SpectraView and must be re-entered each time SpectraView is launched.

The Directive Mode password ***saved in the APU*** can be changed via either the Terminal or APU Parameter Editor modes. To change the password in the APU Parameter Editor, enter the new password in the Directive Password row of the Parameter Settings table (refer to *APU Parameter Editor Mode* later in this chapter). The new password will go into effect when the table is next sent to the APU.

The Directive Mode password is changed using Terminal mode by entering the SETUP menu and selecting the Calibrate/Passwords submenus.

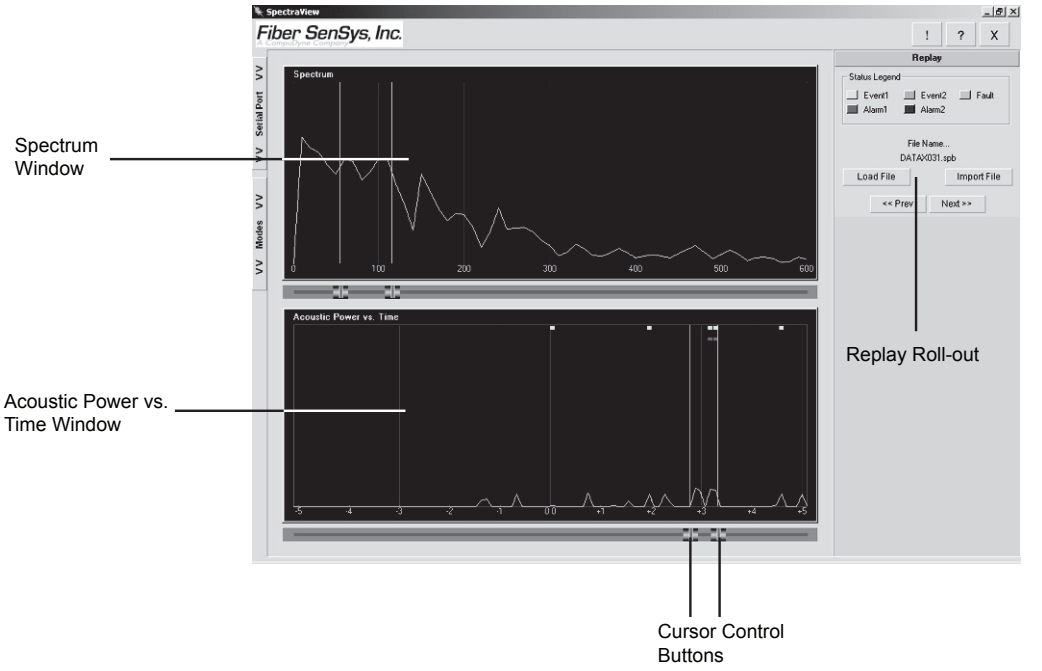


Figure 3-2: The Replay mode screen

Modes

Replay Mode

In this mode, SpectraView gives the user the ability to replay recorded files. Selecting Replay mode brings up the Replay Mode screen:

Files loaded into the Replay mode are displayed in two windows: the Spectrum window and the Acoustic Power vs. Time window. The purpose of the Spectrum window is to provide the user with a visual display of the signal frequencies received by the sensor cable in a given recording. It provides a graph of signal frequency versus relative acoustic power. Data in the Spectrum window is a direct conversion of the sensor cable signals displayed in the Acoustic Power vs. Time window below it.

Recorded files are stored in SpectraView's default data file storage directory (called "Data"). The data directory resides as a sub directory of the root where SpectraView's executable file resides. All files saved through SpectraView, either data or comment, have the same file extension (.spb). Alternately, users can open a file saved via OSMON or a previous version of SpectraView using the **Import File** button. Files of this type have a (.fsi) extension.

To select a file for viewing, press the **Load File** button. This brings up the Open dialog box:

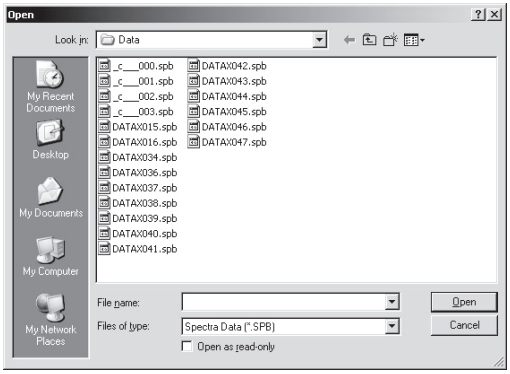


Figure 3-3: The Open Dialog box lets users select SpectraView files to open

If the user presses the **Cancel** button, the dialog box closes and no changes appear on the Replay Mode screen. If the user presses the **Open** button (or double clicks on the desired file name) after selecting a file, the dialog box closes and the Replay Mode screen displays the data window or the comment window automatically for the user.

When a saved file is loaded, the name of the loaded file is displayed in the legend box above the **Load File** button (Figure 3-4).

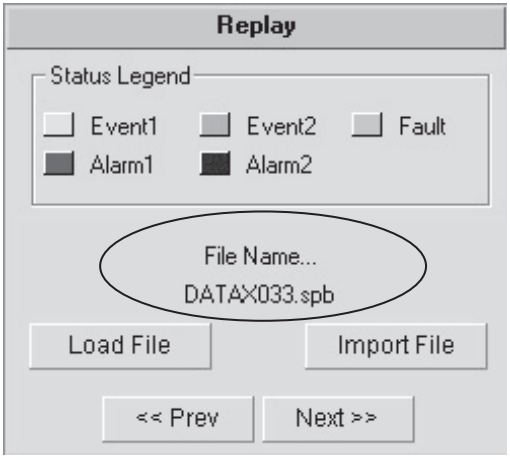


Figure 3-4: Actively displayed files are shown above the Load File button

The Replay Mode screen displays files in sequence when the user presses the ***Previous (<<)*** or ***Next (>>)*** button.

Through use of these buttons, the software automatically loads and displays the next or previous file in the sequence. If there is no next or previous file, SpectraView continues to display the last file selected in the sequence.

If the loaded file is a data file (Figure 3-2), the user is presented with a Spectrum window and an Acoustic Power vs. Time window for analysis of the 10 second recording. If the loaded file is a comment file, the user is presented with a read-only file displaying the associated file comments.

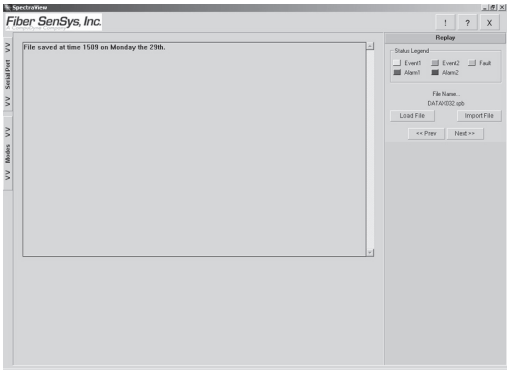


Figure 3-5: Comment files display only comments entered by the user

Spectrum Content Window

The Replay mode presents the user with two windows of data, the top being the Spectrum window. This window displays the frequency content of the data file versus the relative acoustic power.

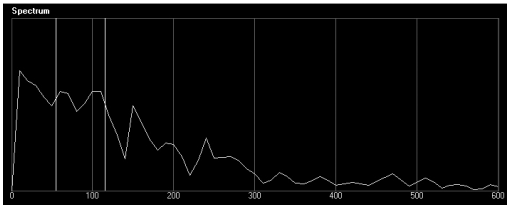


Figure 3-6: The Spectrum Window is displayed at the top of the Replay mode screen

The purpose of the Spectrum window is to provide the user with a visual display of the signal frequencies received by the sensor cable in a given recording. Data in the Spectrum window is a direct conversion of the sensor cable signals displayed in the Acoustic Power vs. Time window below it. The Spectrum window X-axis indicates sensor cable signal frequency in Hertz. The Y-axis represents relative acoustic power.

Both the Spectrum and Acoustic Power windows have two buttons to control their respective cursors. A cursor is moved independently by grabbing and dragging its **Cursor Control** button.

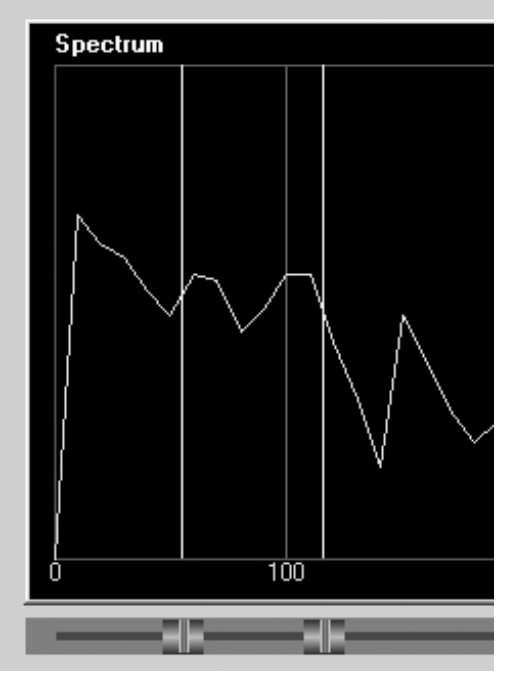


Figure 3-7: Cursor Control Buttons move graph cursors independently

Each window's cursors can be moved simultaneously by right-clicking and dragging either cursor control button. Both cursors can be opened up to the limits of the display by right-clicking anywhere along the Cursor Control bar.

The range of data displayed in the Spectrum window is controlled by the position of the cursors in the Acoustic Power vs. Time window. For example, if both cursors in the Acoustic Power vs. Time window are positioned at their furthest extremes, the Spectrum window displays the frequency content for the full signal recording. On the other hand, if the Acoustic Power vs. Time cursors are positioned between the +1 and +2 second marks, the Spectrum window displays the frequency content for the signal that occurs only at that point in the recording.

Acoustic Power vs. Time Window

The bottom window displayed in the Replay Mode screen is the Acoustic Power vs. Time window.

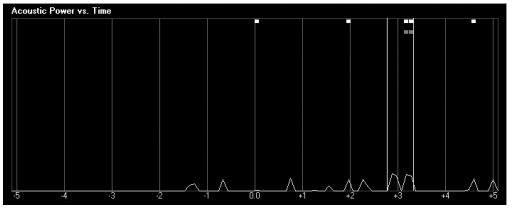


Figure 3-8: The Acoustic Power vs. Time Window is displayed at the bottom of the replay mode screen

This window displays the sensor cable signal data. The X-axis represents the time frame of the recording in seconds while the Y-axis represents the relative acoustic power.

NOTE:
The Acoustic Power vs. Time Window here differs from the window displayed in the APU Modeler mode. For more information on these differences, see ***APU Modeler Acoustic Power vs. Time*** *later in this chapter.*

Negative numbers on the time axis indicate the time (in seconds) before the trigger while positive numbers refer to the time after the trigger. The 0.0 reference marks the point where the initial trigger or manual recording was activated.

Status indicators are displayed at the top of the Acoustic Power vs. Time window in the form of colored boxes. A status legend appears in the upper right-hand corner of the Replay Mode screen:

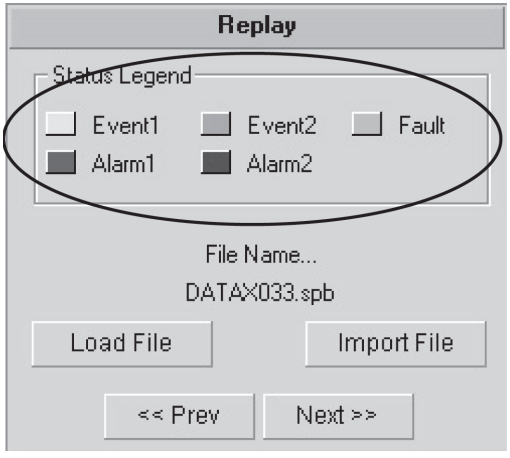


Figure 3-9: The Status Legend corresponds to markers appearing at the top of the Acoustic Power vs. Time window

The Status legend lists the following:

Event 1	Event associated with Processor 1
Event 2	Event associated with Processor 2
Alarm 1	Alarm associated with Processor 1
Alarm 2	Alarm associated with Processor 2
Fault	Indicates a loss of laser signal or break in the optical path of the sensor cable loop

Each Status marker indicates the APU status at any given point in time in a recording.

The range of data displayed in the Acoustic Power vs. Time window is controlled by the position of the cursors in the Spectrum window. For example, if both cursors in the Spectrum window are positioned at their furthest extremes, the Acoustic Power vs. Time window displays the sensor cable signals that occurred across the entire frequency spectrum during the recording. On the other hand, if the Spectrum window cursors are positioned between the 300 and 400 Hz marks, the Acoustic Power vs. Time window displays the recorded sensor cable signals that fall only within that frequency range.

Interpreting and Using the Data

The Replay mode is advantageous because the ability it offers the user to play back and analyze recorded data files. For instance, a signal triggering an alarm at a remote APU can be replayed and analyzed for validity. A careful check of the signal frequency content determines whether the signal is consistent with an intruder or a non-threatening event such as the wind striking the fence. Low order frequencies generally indicate a non-threatening event. Higher order, inconsistent frequencies generally indicate the presence of an intruder.

It is recommended that simulated intrusions be conducted during system installation to determine the required APU parameter settings. Store the recordings from each simulated intrusion for comparison over the life of the system. Simulated intrusions that do not conform to previous recordings may indicate system component degeneration.

Terminal Mode

Terminal mode opens a direct communication line between the user and the APU via the RS232 serial interface. This function enables one to make adjustments to the APU parameters. The Terminal mode allows the user to use SpectraView in place of the Hyperion or HyperTerminal.

Using the Modes selection pop-up window, press the **Terminal** button to bring up the Terminal Mode screen:

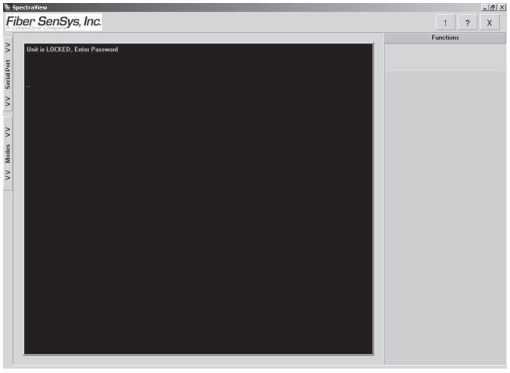


Figure 3-10: The Terminal Mode screen provides the same functions as Terminal emulation software or the Hyperion

Adjustments to APU parameters are made by accessing the various password-protected menus and making changes. Detailed tables of the FD-220/FD-220P, FD-205, FD-208/FD-208R, FD-331/FD-332 and FD-342/FD-342 Terminal Command Menu are found in Appendix A.

Passwords may be changed if the user so chooses. Users may use any combination of characters available on the interface device (either the Hyperion or PC). For more information on changing passwords and calibrating the system, refer to the appropriate user's reference manual.

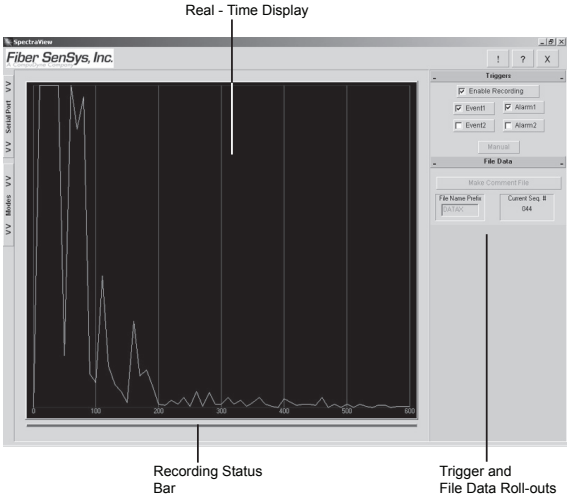


Figure 3-11: The Real-Time Mode screen provides indication of sensor cable signals in Real-Time

NOTE:
Use care when setting new passwords. Not all characters available in Terminal mode are supported by Hyperion.

Real-Time Mode

Real-Time mode provides real-time indication of the frequency content coming from the sensor cable signal. This mode is especially useful for monitoring incoming sensor signals remotely and characterizing each one. In doing so, users can differentiate non-threatening signals from those generated by intruders. Users can also use this mode while simulating intrusions to determine the best APU parameter settings during system setup.

When Real-Time mode is selected, the Real-Time mode screen is brought up as shown in Figure 3-11:

Three separate indicators in the Real-Time display correspond to input from the sensor cable:

Event Corresponds to the amber LED on the APU front panel. The Real-Time display flashes yellow whenever an event occurs.

Alarm Corresponds to the red Alarm LED on the APU front panel. The Real-Time display flashes red whenever an alarm occurs.

Fault Corresponds to the red Fault LED on the APU front panel. The word "Fault" appears on the Real-Time display in red whenever a fault occurs.

Recording Data Files

The Real-Time mode provides users with the ability to record data files from a sensor signal. Each recorded file has a unique file name. The user must first choose a 5 character file name prefix. This prefix is entered in the File Data roll-out:

Number and letter characters are accepted; the prefix is case sensitive. The suffix of the file name is automatic. For every new prefix, SpectraView will begin the number suffix at 000. For existing prefixes, the next available suffix will be used. Each recorded file will then be numbered consecutively each time a trigger occurs. This numbering will reset to 000 after it reaches a maximum of 999 files of the same file name prefix.

In order to begin recording data, the **Enable Recording** box must be checked in the Triggers roll-out as shown:

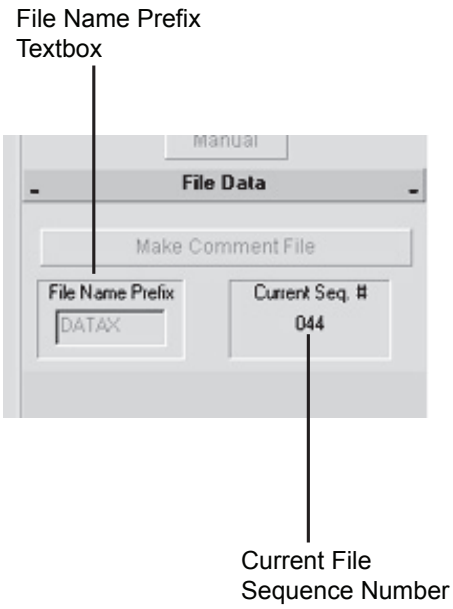


Figure 3-12: SpectraView files are recorded under a user-specified prefix

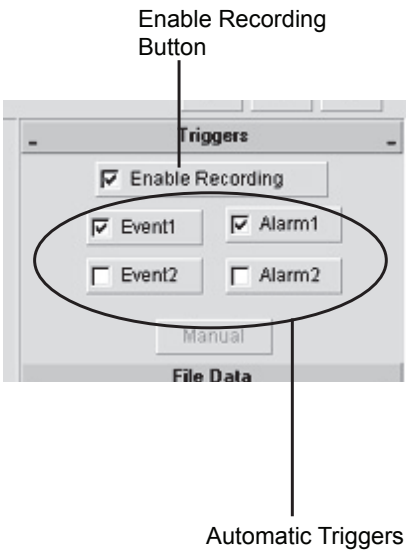


Figure 3-13: Checking the Enable Recording Checkbox prompts SpectraView to record data whenever the selected conditions are met

SpectraView automatically begins recording based on whatever triggers are currently checked. When SpectraView detects a trigger, it stores a 10 second record of acoustic information generated by the sensor cable. SpectraView will record 5 seconds before the trigger and 5 seconds after. This enables the user to see what sort of disturbances occurred before and after the trigger, thereby giving the user a better idea of the cause of the trigger.

For more information on triggers, see *Triggers* following this section.

Along with acoustic data, SpectraView records the APU parameter settings and saves them with each file. Users have the option of whether or not to use these parameter settings when displaying the file later in the APU Modeler mode. For more information, see *Roll-Out Bars* later in this chapter.

The user also has the option to manually record at any time by pressing the **Manual** record button.

With manual recording, a 10 second window is recorded, overlapping the five seconds before and five seconds after the selection. Triggers are not involved in the manual recording process.

A red "Recording in Progress" status bar, located below the Real-Time display window, indicates when SpectraView is recording data.

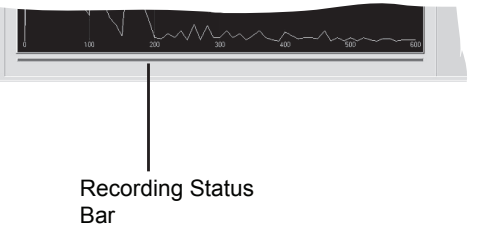


Figure 3-14: The Recording Status Bar indicates file recording progress

This application's default data file storage directory is called *Data*. It will reside as a subdirectory of the root where this application's executable is.

NOTE:
The 10 second window for recording only holds true if SpectraView receives data at least five seconds before and five seconds after the trigger. For example, if a trigger occurs less than five seconds after the user initially enables recording, then SpectraView only records data for the amount of time leading up to the trigger. Likewise, if the APU goes offline for any reason after a trigger occurs, such as during a loss of power, only the amount of time between the trigger and the power failure (in this example) will be recorded if less than five seconds.

Triggers

There are four automatic triggers that can be selected when the user enables recording (Figure 3-13). These triggers are:

Event 1	Event associated with Processor 1
Event 2	Event associated with Processor 2
Alarm 1	Alarm associated with Processor 1
Alarm 2	Alarm associated with Processor 2

Each trigger's box can be checked or unchecked. Checking or un-checking a box determines when a recording begins. For example, if the *Event 1* box is checked, a file will be recorded containing 5 seconds of data prior to and 5 seconds of data after Processor 1 registers an event. No alarms are recorded unless they fall into the 10 second window surrounding the event.

As each trigger is checked, SpectraView is alerted to record a new file in the sequence of files. If all four triggers occur in a 10 second window, only one file will be recorded. The checkbox status (checked or unchecked) of all four automatic triggers is stored in the system. It resets to the last checkbox status when changing displays, or launching the executable again.

The user also has an option of using the manual trigger to start a recording, an especially useful option when recording ambient noise.

Making Comment Files

A user may choose to compose a comment file to make notes of the recording that is being made, e.g. an explanation of the event being recorded. Comment files are entered by pressing the **Make Comment File** button.

Pressing the Make Comment File button brings up the Make Comment File dialog box:

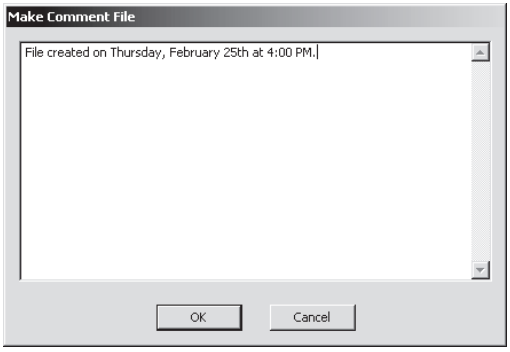


Figure 3-15: Users enter comments in the Make Comment File dialog box

Users can enter comments up to 999 characters in length.

Once the user clicks the **OK** button, the comment file will be saved with the 5 letter prefix previously entered and the 3 digit suffix generated by SpectraView. Comment files are saved in the same sequence as recording data files. If the user presses the **Cancel** button during comment file generation, the dialog box exits without saving comments.

NOTE:
Comment files cannot be made while a recording is in progress.

APU Parameter Editor Mode

The APU Parameter Editor mode lets the user review and/or change the calibration parameters of the APU from one convenient screen. This is an alternative to using the Terminal mode to scroll through each parameter individually (refer to *Terminal Mode* earlier in this chapter for more information).

Using the APU Parameter editor, users can retrieve parameter settings from an APU, modify them and send them back to the APU. Users can also save parameter settings as a file, print them and/or download them for later use.

To enter the APU Parameter Editor mode, press the **Modes** button (left-hand margin of the SpectraView Main screen – see *Modes Pop-Up Window* in Chapter 1) and select "APU Parameter Editor." This brings up the APU Parameter Editor screen as shown.

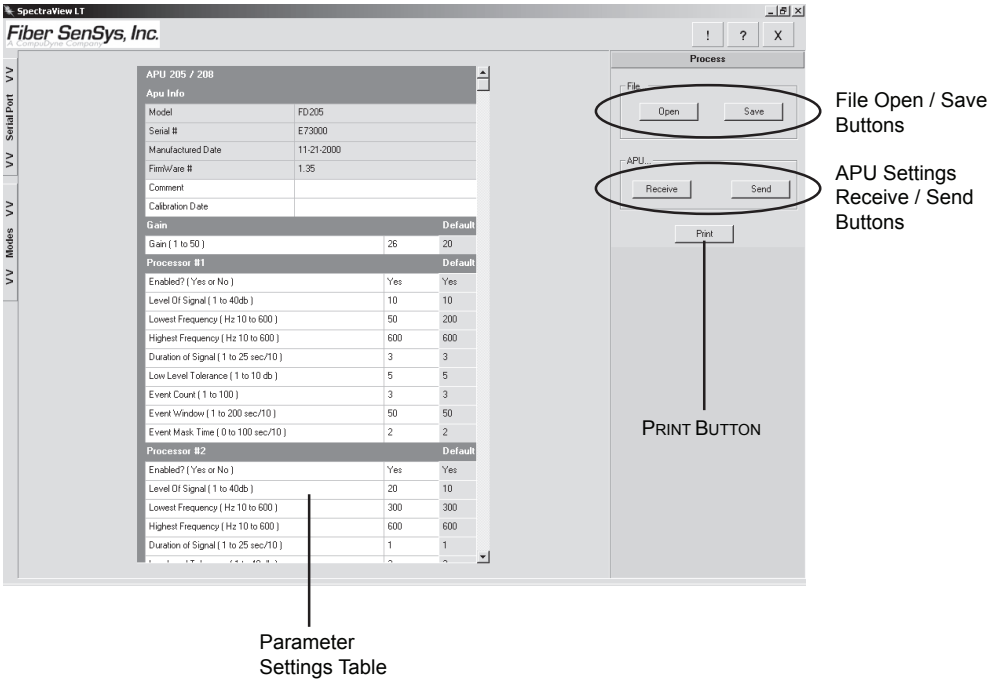


Figure 3-16: The APU Parameter Editor

This screen displays a table of APU information and current parameter settings. Four buttons for sending and receiving APU calibration data and opening or saving calibration files appear in the upper right-hand corner of the screen.

Using the APU Parameter Editor

Before using the transmit/receive functions of the APU Parameter editor, communication must be established with the APU.

Press the **Receive** button (upper right-hand corner of the screen) to read the current calibration parameters from the APU. SpectraView queries the APU, reads in the processor information and displays it:

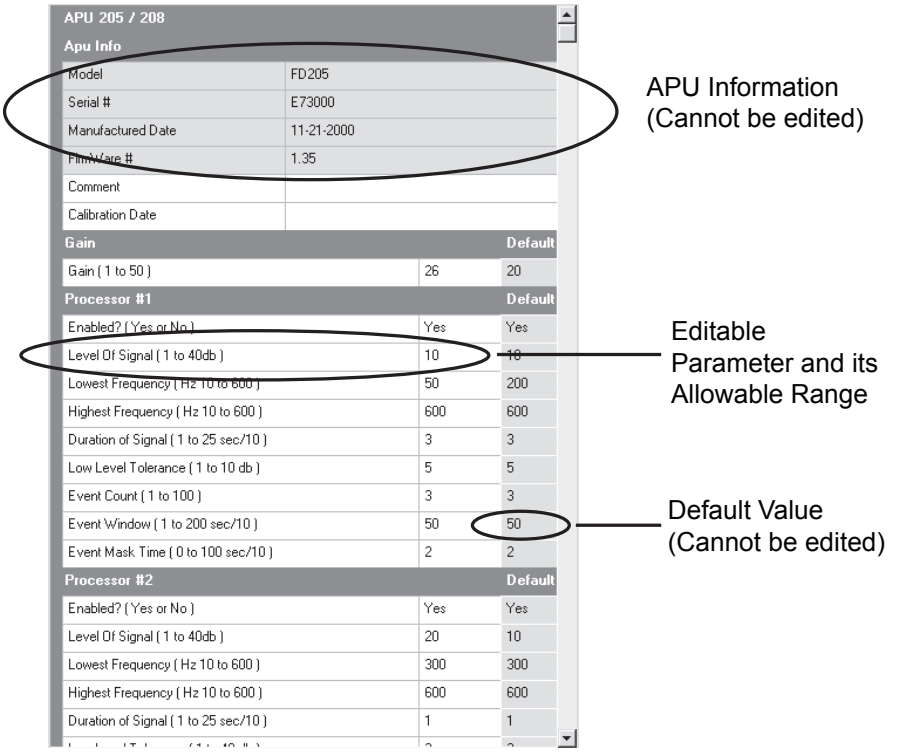


Figure 3-17: Users can change APU Parameter Settings using the Parameter Settings Table

Once received by SpectraView, the APU model number, serial number, manufacturing date and firmware version appear at the top of the Parameter Settings table. Also appearing in the table are the individual calibration parameters, shown by row, and their current settings. The allowable range for each parameter as well as the default value is also shown.

Parameters appearing in light red cells of the table cannot be edited.

Appearing also in the table are rows for entering comments, the date of calibration and the Directive Mode password.

To edit or change a parameter setting:

1. Click on the desired parameter (only parameters appearing in white table cells can be edited). The parameter's row is highlighted in yellow indicating it is ready for editing.

2. Change the parameter setting to the desired value. Numerical values can be entered using the number keys or incremented/ decremented from the current value using the + or – keys. Numerical values must also be kept within the allowable range or the software will reject the new value and prompt the user to enter a value within range.

NOTE:
When used with the FD-205 or FD-331/FD-332, the anemometer parameters cannot be edited unless the Wind Sensor parameter is first set to "Anemometer" nor can the wind software parameters be edited unless the Wind Sensor parameter is first set to "Wind Software".

Once the parameters have been edited, the new settings can be saved to the APU by pressing the **Send** button.

A message indicating the rejection of either the anemometer or wind software settings is displayed while sending data to the APU, depending upon which Wind Sensor parameter data is unused.

The current table and its associated parameter settings can be saved as an APU properties file (.apb extension) by pressing the **Save** button and specifying a filename and location. Such files can later be read into the APU Parameter editor by pressing the **Open** button and selecting a desired file. This feature provides users with the ability to upload saved parameter settings and write them to the APU.

The current table and its associated parameter settings can also be printed by pressing the **Print** button.

Exiting the APU Parameter editor before saving changes to the APU causes all changes to be lost.

The Comb Filter

When used with the FD-205 or FD-208, the APU Parameter editor gives the user access to the comb filter feature.

The comb rejection filter, or "comb filter," allows specific frequencies to be rejected by the APU processor(s). This lets the user calibrate the APU to reject known harmonics, such as harmonic vibrations from nearby AC powered equipment. The range of the filter is 0 to 600 Hz, meaning that if a value of 50 is entered, the filter rejects all harmonics of 50 Hz, e.g. 50 Hz, 100 Hz, 150 Hz, etc.

The comb filter rejects all frequencies in a bandwidth of +/- 5 Hz from the filter setpoint. Thus, if the comb filter is set to 50 Hz, the filter rejects all frequencies from 45 to 55 Hz, and from 95 to 105 Hz, etc.

CAUTION:
AT NO TIME SHOULD THE COMB FILTER BE SET TO A VALUE OF "10". THIS IS BECAUSE WITH A FILTER BANDWIDTH OF +/- 5 HZ, IT WOULD EFFECTIVELY DISABLE THE APU ALARM FEATURE

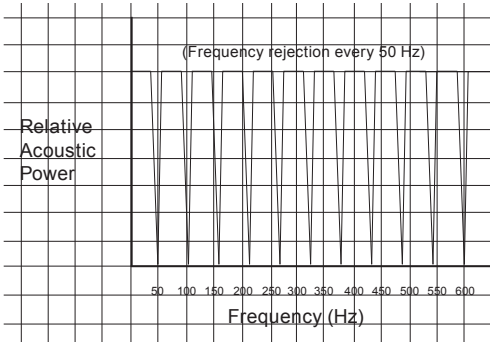


Figure 3-18: The Comb Filter lets users set SpectraView to reject sensor signal frequencies at specified intervals

The resolution of the comb filter is 10 Hz, meaning comb filter values can be entered only in values of 10.

Enable Tamper and Alarm Relay Features

The Alarm Relay Time feature lets the user change the length of time during which the alarm relay remains in its triggered state. If, for example, the relay is normally closed, increasing the alarm relay time increases the length of time the triggered alarm relay remains open.

The Enable Tamper feature enables or disables the tamper switch input. For more information on the tamper switch input, refer to the appropriate user's reference manual.

APU Modeler Mode

In this mode, users can download saved sensor cable data files and modify the APU parameter settings to view or "model" the impact on the performance of the APU. This gives users an idea how the APU processors would perform under different parameter settings. In effect, the APU Modeler mode lets users experiment with parameter settings and anticipate system performance before actually making changes to the APU.

Placing SpectraView in APU Modeler mode brings up the APU Modeler screen (Figure 3-19).

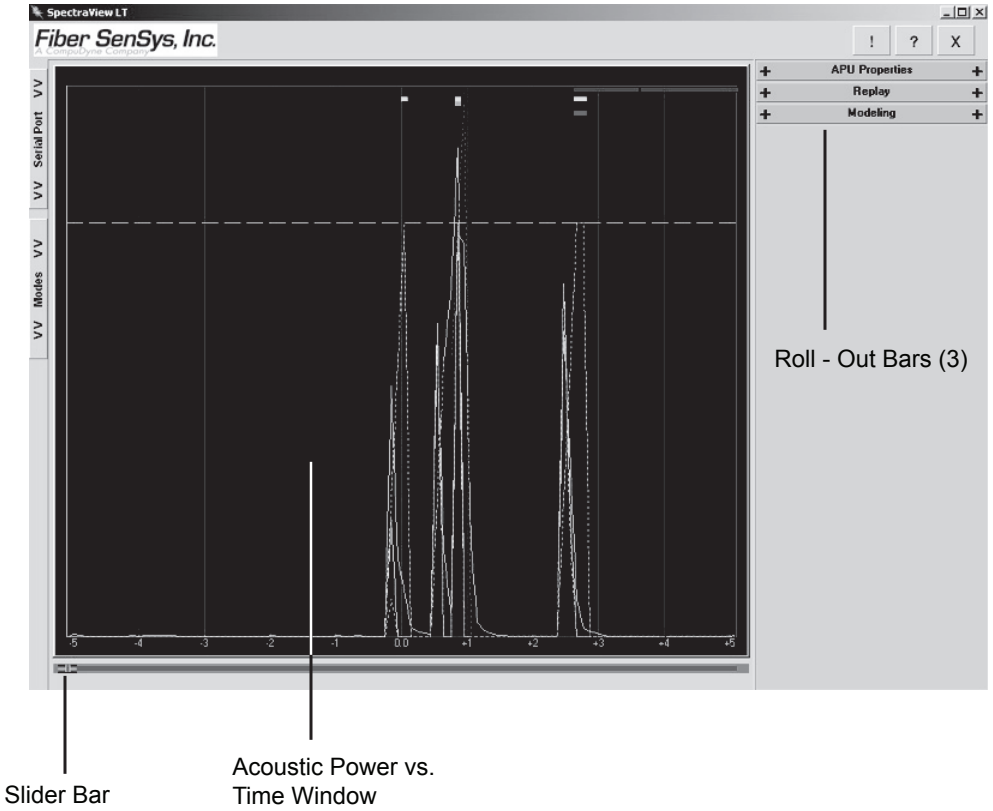


Figure 3-19: The APU Modeler provides a way to model or anticipate the effect of parameter settings changes

The APU Modeler screen consists of 3 major components: The Acoustic Power vs. Time window, the Slider bar and the Roll-Out bars. The Acoustic vs. Time window in the APU Modeler screen differs slightly from the window in the Replay mode. For information on using the Acoustic Power vs. Time window in this mode, see *APU Modeler Acoustic Power vs. Time* later in this chapter.

Roll-Out Bars

Located on the far right-hand side of the screen, these bars roll up or down when clicked upon to let the user view APU parameter settings, load data or APU parameter files and make data waveforms visible or invisible on the display. The first roll-out bar is the **APU Properties** bar. This bar displays an APU parameter table identical to the one found in the APU Parameter Editor.

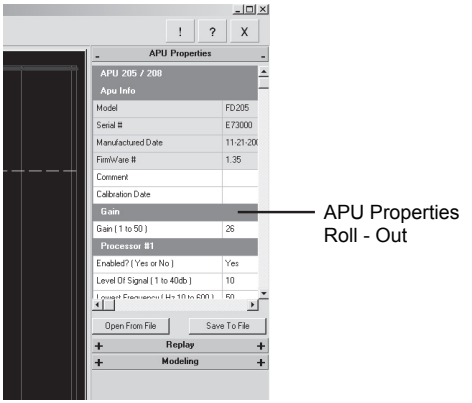


Figure 3-20: APU Parameter Settings can be changed in the model by using the APU Properties Roll-Out

Upon first entering the APU Modeler mode, the table displays the FD205/ FD208 default settings, regardless of what APU type is currently being used with SpectraView. After loading a data file, SpectraView prompts the user to decide whether to load the APU parameter settings the file was saved under or not. If the saved data's APU parameter settings are chosen, they appear in the APU parameter table. If they are declined, the default settings continue to be displayed.

NOTE:
If the parameter settings of the saved data are incompatible with the default APU parameter settings (for instance, the saved data came from an FD-220), the software prompts the user to load the proper APU parameter settings.

The APU Modeler does not incorporate wind compensation features. If a data file is saved with a wind-reduced gain of 14, for instance, the uncompensated gain number will be saved with the file.

Users can load an APU parameter settings file (.apb extension) by pressing the **Open From File** button and specifying a filename and location. Users can also modify the APU parameter settings and save the table by pressing the **Save to File** button and specifying a filename and location.

The **Replay** roll-out bar allows the user to load and view saved data files.

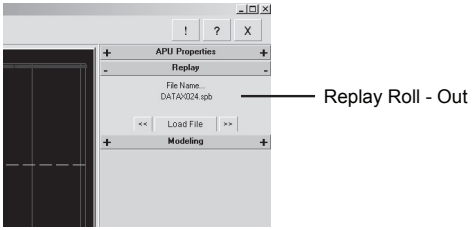


Figure 3-21: The Replay Roll-out

To load a data file, press the **Load** button and specify a spectral data file (.spb extension). New data files can then be loaded by pressing the “previous” or “next” buttons (**<<** or **>>** buttons respectively). SpectraView loads the next available .spb file in the directory each time the **<<** or **>>** button is pressed.

Data is displayed from only 1 .spb file at a time.

The **Modeling** roll-out bar lets the user render chosen attributes of the Acoustic Power vs. Time window visible or invisible:

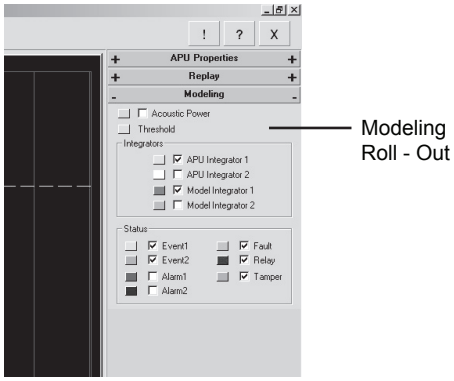


Figure 3-22: The Modeling Roll-Out controls the display of modeled spectral waveforms

An attribute is made visible by checking its box. Un-checking a box renders an attribute invisible.

Attributes of the Acoustic Power vs. Time window that can be affected are listed in Table 3-1.

The Event Threshold line indicates the point at which a signal is counted as an event. For more information on the APU Modeling Acoustic Power vs. Time window and these attributes, refer to the *APU Acoustic Power vs. Time* section earlier in this chapter.

Table 3-1
Editable Attributes of the APU Modeler Acoustic Power vs. Time Window

Attribute	Definition
Acoustic Power	Raw data signal from the sensor cable
APU Integrator 1	Processed digital signal from Processor 1
APU Integrator 2	Processed digital signal from Processor 2
Model Integrator 1	User-adjustable signal representing Processor 1
Model Integrator 2	User-adjustable signal representing Processor 2
Event 1	Processor 1 signals processed as events
Event 2	Processor 2 signals processed as events
Alarm 1	Processor 1 alarms
Alarm 2	Processor 2 alarms
Fault	Fault conditions generated in the APU
Relay	Time during which the alarm relay state(s) was changed. Corresponds with Alarm 1 and Alarm 2 indicators
Tamper	Time during which the tamper alarm relay state was changed

The Slider Bar

The Slider Bar provides the user with point-by-point acoustic power and frequency indicators for a given data waveform. It is located just below the bottom edge of the Acoustic Power vs. Time window.

To use the Slider Bar, grab the cursor control and drag it to a point on a displayed data waveform (see *APU Modeler Acoustic Power vs. Time* for more details on data waveforms). The position of the cursor and acoustic power appear in the upper left-hand corner of the APU Modeler screen.

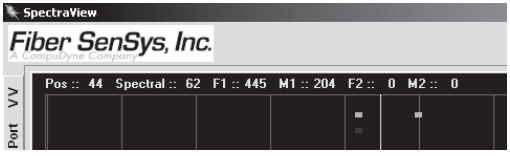


Figure 3-23: Acoustic Power Indicators correspond to the marker position on the waveforms

Acoustic Power indicators are detailed in Table 3-2.

Table 3-2
Acoustic Power Indicator Details

Indicator	Description
Pos	Position of the cursor/individual data point on a waveform
Spectral	Relative acoustic power of the raw sensor cable waveform
F1	Integrator value of Processor 1
F2	Integrator value of Processor 2
M1	Integrator value of user-adjustable Processor 1 (Model 1)
M2	Integrator value of user-adjustable Processor 2 (Model 2)

Acoustic power indicators are given for each waveform, regardless of whether the user has made the waveform visible or not.

APU Modeler Acoustic Power vs. Time

The APU Modeler Acoustic Power vs. Time window is similar in appearance to the Acoustic Power vs. Time window found in the Replay mode but it differs in use and concept.

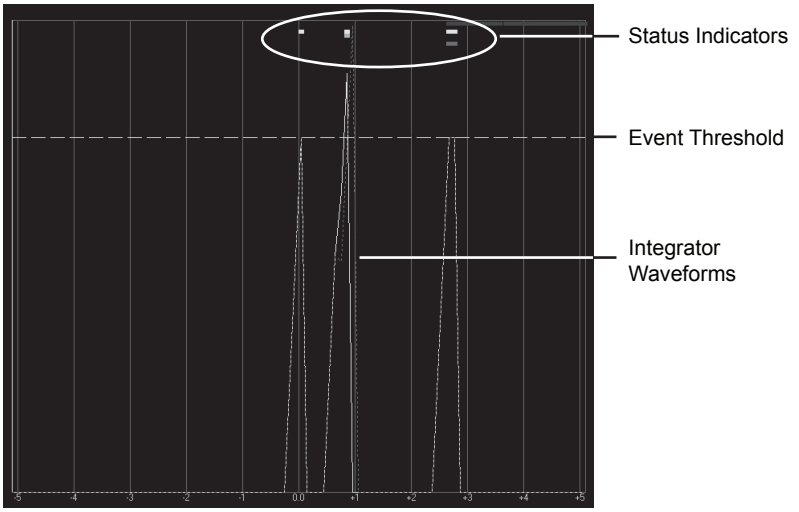


Figure 3-24: The Acoustic Power vs. Time Window functions

In the APU Modeler mode, the Acoustic Power vs. Time window displays up to 5 waveforms: Acoustic Power, APU Integrator 1, APU Integrator 2, Model Integrator 1 and Model Integrator 2. These waveforms are used to display the effects of varying APU parameter settings.

APU Integrator 1 and *2* waveforms are fixed representations of the response from Processor 1 and Processor 2 respectively. *Model Integrator 1* and *2* waveforms are variable representations of the response of Model Integrator 1 and 2 to the same data. Model Integrator 1 and Model Integrator 2 waveforms are adjusted by changing the APU parameter settings in the APU parameter table (upper right-hand corner of the screen).

To adjust the model integrator waveforms:

1. Open a spectral data file (.spb extension) using the Replay roll-up bar.
2. If the saved data's APU parameter settings are not being used, import the desired APU parameter settings from an APU parameter settings file (.apb extension).
3. Adjust the gain and Processor 1 or Processor 2 parameter settings as desired. The model integrator waveforms are updated to reflect the changes made.

Each integrator waveform can be rendered visible or invisible by checking or un-checking its corresponding box in the Modeling roll-up bar.

As changes are made to the Processor 1 or Processor 2 APU parameter settings, the model integrator waveforms are updated simultaneously. On-screen alarm and relay indicators are unaffected. Acoustic Power, Event Threshold, APU Integrator 1 and APU Integrator 2 waveforms are also unaffected.

In the APU Modeler mode, changes to the APU parameters affect only the model integrator waveforms. The actual APU parameters (as saved in the APU) are not changed. The purpose of manipulating APU parameter values in this mode is to predict how the actual performance of the APU is affected.

The *Event Threshold* line (Figure 3-24) indicates the point at which a signal is counted as an event.

Not all APU parameter changes affect the model integrator waveforms. The APU parameters that directly affect the model integrators are listed in Table 3-3.

Table 3-3
APU Parameters Affecting the Model Integrators

Parameter	Description
Gain	Adjusts the sensitivity of the system to disturbances. For example, a gain setting of 30 is more likely to raise a signal above the Event Threshold than a gain setting of 10
Level of Signal	Sets the amplitude (in dB) above which the integrator must exceed before an event is generated by the processor
Lowest Frequency	The lowest allowable frequency used by the processor to evaluate the presence of an intruder
Highest Frequency	The highest allowable frequency used by the processor to evaluate the presence of an intruder
Duration of Signal	Time interval during which any signal above the *Level of Signal* setting must exist to qualify as an event
Low Level Tolerance	An allowance that permits a signal lower than the *Level of Signal* setting to generate an event as long as it lasts for the period of time automatically set by the processor. The higher the tolerance setting, the longer the signal must last. If the signal is outside the tolerance setting, it cannot generate an event regardless of how long it lasts
Event Mask Time	A period of time after an event during which any subsequent events or activities are ignored. This setting is useful for masking the effects of oscillations from a single event, such as a bird striking the fence. Oscillations from such nuisances usually die down within 0.5 seconds
Comb Filter	Allows specific frequencies to be rejected in the APU integrator(s). This ensures known harmonics, such as harmonic vibrations from nearby AC powered equipment, are removed from the APU integrators. The range of the filter is 0 to 600 Hz, meaning that if a value of 50 is entered, the filter rejects all harmonics of 50 Hz, e.g. 50 Hz, 100 Hz, 150 Hz, etc. The comb filter rejects all frequencies in a bandwidth of +/- Hz from the filter setpoint. Thus, if the comb filter is set to 50 Hz, the filter rejects all frequencies from 45 to 55 Hz, and from 95 to 105 Hz, etc.
Climb Sensitivity (FD-220 only)	Sets the sensitivity of the climb processor (reflected in APU Integrator 1). This represents the level below which any signal generated by the sensor cable must be before an event is counted
Cut Sensitivity (FD-220 only)	Sets the sensitivity of the cut processor (reflected in APU Integrator 2)

A more detailed discussion of these parameters and their effects on the APU processors is found in the applicable user's reference manual. Generally determining how the model integrator waveform is affected by an exact change in these parameters is a matter of experimentation.

NOTE:
The APU Modeler does not incorporate wind compensation features. If a data file is saved from an APU which has a wind-reduced gain of 14 (but under normal circumstances has a gain of 20, for instance), the wind-compensated APU integrator (gain of 14) will appear on the display in the APU Modeler. The ***uncompensated*** *gain number of 20, however, will appear in the APU Properties roll-out. In addition, the unmodified model integrator will reflect the gain of 20. Users should keep this principle in mind when making adjustments to the model integrators.*

Interpreting and Using the Data

The purpose of the APU modeler is to give users an advance "preview" of how changes in APU parameters affect events and alarms. The advantage of the APU modeler is the ability it offers users to "model" APU parameter settings for maximum intrusion detection and minimal nuisance alarms before ever making actual changes to an APU.

For instance, if an APU is being installed in a fence line application, it is recommended that a volunteer "intruder" attempt to climb the fence. Data files from the APU should be saved and analyzed using SpectraView. If the intruder was not properly detected, or if the sensor cable picked up activity from other sources (such as the wind, etc.), the APU modeler feature should be used to adjust the system gain and/or processor parameters to achieve optimal performance.

In the following example, debris from a nearby construction site was blowing into the fence on a regular basis, causing spurious alarms.

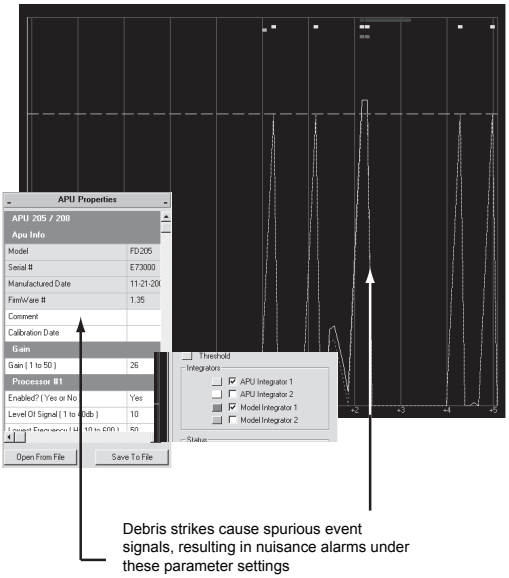


Figure 3-25: Spurious alarms caused by debris strikes require key APU parameters to be changed

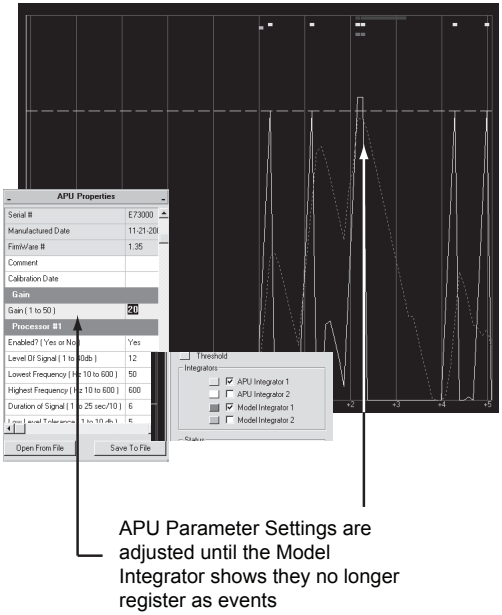


Figure 3-26: Key APU Parameters were adjusted until the model indicated the debris strikes had minimal effect

Sensor cable data was saved to file and analyzed with SpectraView. Using the APU modeler feature, the **gain**, **event mask time** and **signal level parameters** were adjusted until the model integrator waveforms indicated that sensor cable signals from the debris had minimal effect.

When making adjustments to the APU parameters, it should be noted that if the signal rises above the Event Threshold level at any point, an event will be generated. The APU parameters should be adjusted so that signals generated by nuisances fall below the Event Threshold and signals generated by intruders rise above it.

Spectral History Mode

NOTE:
This mode is for FD-330 and FD-340 series APUs only.

The Spectral History mode is available in both SpectraView and SpectraView LT.

Users with an FD-330 or FD-340 series APU can take advantage of the APU's built-in spectral record feature through SpectraView's Spectral History mode. This mode will allow users to retrieve the spectral records from the APU's volatile memory and save one or more of the records as individual spectral history files.

Selecting "Spectral History" from the list of available modes brings up the Spectral History screen shown in Figure 3-27.

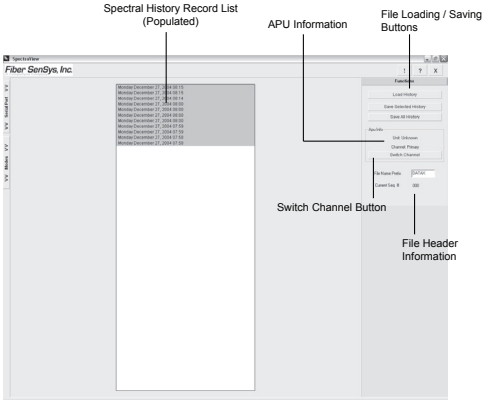


Figure 3-27: The Spectral History screen displays all spectral records currently in APU memory.

The spectral history record is unpopulated when users first enter this mode. Press the **Load History** button to retrieve the spectral history records from the memory of the APU (each APU may hold up to 24 records). SpectraView retrieves and displays a list of spectral history records.

SpectraView retrieves the list of records residing only in the currently selected channel. To retrieve a list of records from the alternate operating channel, press the **Switch Channels** button.

Spectral records can be saved individually as spectral data files in the SpectraView default file folder (“Data”) by pressing the **Save Selected History** button or as an entire group by pressing the **Save All History** button. Once stored in the default SpectraView file folder, the spectral files can be replayed in the Replay mode or the APU modeler mode.

To save individually selected spectral records:

1. Using the mouse, left click to select one or more spectral data records from the spectral data record list. The records are highlighted in yellow once selected for download
2. Press the **Save Selected History** button

Alternatively, users may press the **Save All History** button to save the entire list of records in the spectral history record list.

Once either button is pressed, SpectraView reestablishes contact with the APU and then extracts the record data, saving it directly to the default file storage directory as a spectral data file (.spb extension). There is a momentary pause while the software does this but a “Spectral History Data Saving to File Completed” message evantually appears, indicating the file saving process was successful.

Spectral data files are stored with a set prefix, specified by the user. The prefix (up to 5 characters in length) is entered in the **File Name Prefix** textbox in the upper righ-hand corner of the screen. As with the Real-Time mode, SpectraView assigns a filename suffix consisting of a sequence number which increments with each successive file saved under the same prefix. For example, if the user assigns a filename prefix of “File”, the first file saved under the “File” prefix is assigned a suffix of “000” (thus, the filename of the saved spectral history file is File000.spb). The suffix rolls automatically for subsequent files saved in the same sequence.

Appendix A

Terminal Command Menus

This appendix summarizes the command menu structure for each Alarm Processing Unit. For a detailed description of the principles behind these calibration parameters, refer to the appropriate Fiber Defender product manual.

FD-205 Terminal Command Menu

Password	Menu	Submenu	Parameters	Default
GAIN			Gain (1 to 50)	**20**
SETUP				
		Enter 1, 2, 3 or 4		
	1	**Wind**	Enable Wind Rejection Software	**N**
			Wind Rejection (20 to 80)	**50**
			- OR -	
			Enable Anemometer Processing	**N**
			Low Wind Speed (0 to 120 mph)	**20**
			Gain Reduction in Low Wind (0 to 30)	**2**
			High Wind Speed (0 to 255 mph)	**50**
			Gain Reduction in High Wind (0 to 30)	**6**
			Wind Delay (0 to 12 seconds)	**5**
			Anemometer Peak (1) or Average (2)	**1**
	2	Comment	(15 characters max)	
	3	Calibration Date	(15 characters max)	
	4	Calibrate		
		Enter 1, 2, 3, 4 or RS		

FD-205 Terminal Command Menu
(continued)

Password	Menu	Submenu	Parameters	Default
		(1) Processor 1	Enable (Y or N)	**Y**
			Level of Signal (1 to 40 dB)	**10**
			Lowest Frequency (10 to 600 Hz)	**200**
			Highest Frequency (10 to 600 Hz)	**600**
			Duration of Signal (1 to 25 sec/10)	**3**
			Low Level Tolerance (1 to 10 dB)	**5**
			Event Count (1 to 100)	**3**
			Event Window (1 to 200 sec/10)	**50**
			Event Mask Time (0 to 100 sec/10)	**2**
		(2) Processor 2	Enable (Y or N)	**Y**
			Level of Signal (1 to 40 dB)	**10**
			Lowest Frequency (10 to 600 Hz)	**300**
			Highest Frequency (10 to 600 Hz)	**600**
			Duration of Signal (1 to 25 sec/10)	**1**
			Low Level Tolerance (1 to 40 dB)	**3**
			Event Count (1 to 100)	**2**
			Event Window (1 to 200 sec/10)	**80**
			Event Mask Time (0 to 100 sec/10)	**7**
			Allow Wind-dependent Processing	**Y**

FD-205 Terminal Command Menu
(continued)

Password	Menu	Submenu	Parameters	Default
		(3) Details	Alarm Relay Time (1 to 10 sec)	**1**
			Enable Tamper Switch (Y or N)	**N**
			Anemometer (1) or Wind Software (2)	**1**
		(4) Passwords	Gain Menu: 15 characters max	**GAIN**
			Setup Menu: 15 characters max	**SETUP**
			Directive Mode: 15 characters max	**DIR**
		(RS) Reset	Destroy all present settings and restore factory settings? (Y or N)	
HIST	Read Only		Note date and time and hit Enter for alarm history	
STATUS	Read Only		System light loss, laser current, power supply voltage, real time displays of Event 1, Event 2, Alarm and Fault	
VERSION	Read Only		Model number, serial number, mfg. date, firmware version, days of operation	

FD-208 Terminal Command Menu

Password	Menu	Submenu	Parameters	Default
GAIN			Gain (1 to 50)	**20**
SETUP				
			Enter 1, 2, 3 or 4	
	1	**Wind**	Enable Anemometer Processing	**N**
			Enable Wind Rejection Software	**N**
			Wind Rejection (20 to 80)	**50**
	2	**Comment**	(15 characters max)	
	3	**Calibration Date**	(15 characters max)	
	4	**Calibrate**		
			Enter 1, 2, 3, 4 or RS	
		(1) Processor 1	Enable (Y or N)	**Y**
			Level of Signal (1 to 40 dB)	**10**
			Lowest Frequency (10 to 600 Hz)	**200**
			Highest Frequency (10 to 600 Hz)	**600**
			Duration of Signal (1 to 25 sec/10)	**3**
			Low Level Tolerance (1 to 10 dB)	**5**
			Event Count (1 to 100)	**3**
			Event Window (1 to 200 sec/10)	**50**
			Event Mask Time (0 to 100 sec/10)	**2**

FD-208 Terminal Command Menu
(continued)

**Not to be used with the FD-208*

Password	Menu	Submenu	Parameters	Default
		(2) Processor 2	Enable (Y or N)	**Y**
			Level of Signal (1 to 40 dB)	**10**
			Lowest Frequency (10 to 600 Hz)	**300**
			Highest Frequency (10 to 600 Hz)	**600**
			Duration of Signal (1 to 25 sec/10)	**1**
			Low Level Tolerance (1 to 40 dB)	**3**
			Event Count (1 to 100)	**2**
			Event Window (1 to 200 sec/10)	**80**
			Event Mask Time (0 to 100 sec/10)	**7**
			Allow Wind-dependent Processing	**Y**
		(3) Details	Alarm Relay Time (1 to 10 sec)	**1**
			Enable Tamper Switch (Y or N)	**N**
			Anemometer* (1) or Wind Software (2)	**2**
		(4) Passwords	Gain Menu: 15 characters max	**GAIN**
			Setup Menu: 15 characters max	**SETUP**
		(RS) Reset	Destroy all present settings and restore factory settings? (Y/N)	

FD-208 Terminal Command Menu
(continued)

Password	Menu	Submenu	Parameters	Default
HIST	Read Only		Note date and time and hit Enter for alarm history	
STATUS	Read Only		System light loss, laser current, power supply voltage, real time displays of Event 1, Event 2, Alarm and Fault	
VERSION	Read Only		Model number, serial number, mfg. date, firmware revision, days of operation	

FD-220/FD-220P Terminal Command Menu

Password	Menu	Submenu	Parameters	Default
SETUP	Climb		Climb Sensitivity (0 to 50)	**20**
			Enable Climb Processor (E or D)	**E**
			Climb Count (1 to 10)	**3**
	Cut		Cut Sensitivity (0 to 50)	**20**
			Enable Cut Processor (E or D)	**E**
			Climb Count (1 to 10)	**5**
	Wind		Wind Rejection (20 to 80)	**50**
			Enable Wind Rejection (E or D)	**E**
ADMIN	Output		Enable Tamper Switch (Y or N)	**Y**
			Alarm Relay Time (1 to 10 seconds)	**1**
	Comment		Comment (15 characters max)	
			Calibration Date (15 characters max)	

FD-220/FD-220P Terminal Command Menu
(continued)

Password	Menu	Submenu	Parameters	Default
Special	**Passwords (P)**		Setup menu (15 characters max)	**SETUP**
			Admin menu (15 characters max)	**ADMIN**
			Special menu (15 characters max)	**SPECIAL**
			Dir commands (15 characters max)	**DIR**
	Reset (RS)		Destroy all present settings and restore factory settings (Y/N)?	
HIST	Read Only		Note date and time and hit Enter for alarm history	
STATUS	Read Only		System light loss, laser current, power supply voltage, real-time displays of Event 1, Event 2, Alarm and Fault	
VERSION	Read Only		Model number, serial number, mfg. date, firmware version, days of operation	

FD-331/FD-332 Terminal Command Menu

Password	Menu	Submenu	Parameters	Default (Fence)	Default (Buried)
GAIN			Gain (1 to 50)	**20**	**20**
SETUP					
			Enter 1, 2, 3 or 4		
	1	**Wind**	Enable Wind Rejection Software	**N**	**N**
			Wind Rejection (20 to 80)	**50**	**50**
			- OR -		
			Enable Anemometer Processing	**N**	**N**
			Low Wind Speed (0 to 120 mph)	**20**	**20**
			Gain Reduction in Low Wind (0 to 30)	**2**	**2**
			High Wind Speed (0 to 255 mph)	**50**	**50**
			Gain Reduction in High Wind (0 to 30)	**6**	**6**
			Wind Delay (0 to 12 seconds)	**5**	**5**
			Anemometer Peak (1) or Average (2)	**1**	**1**
	2	**Comment**	(15 characters max)		
	3	**Date**	Select Real Time Clock [1] or Calibration Date [2]		
			(15 characters max for calibration date)		
	4	**Calibrate**			
			Enter 1, 2, 3, 4 or RS		

FD-331/FD-332 Terminal Command Menu
(continued)

Password	Menu	Submenu	Parameters	Default (Fence)	Default (Buried)
		(1) Processor 1	Enable (Y or N)	**Y**	**Y**
			Level of Signal (1 to 40 dB)	**10**	**10**
			Lowest Frequency (10 to 600 Hz)	**200**	**10**
			Highest Frequency (10 to 600 Hz)	**600**	**120**
			Duration of Signal (1 to 25 sec/10)	**3**	**3**
			Low Level Tolerance (1 to 10 dB)	**5**	**5**
			Event Count (1 to 100)	**3**	**2**
			Event Window (1 to 200 sec/10)	**50**	**90**
			Event Mask Time (0 to 100 sec/10)	**2**	**0**
		(2) Processor 2	Enable (Y or N)	**Y**	**N**
			Level of Signal (1 to 40 dB)	**10**	**10**
			Lowest Frequency (10 to 600 Hz)	**300**	**10**
			Highest Frequency (10 to 600 Hz)	**600**	**120**
			Duration of Signal (1 to 25 sec/10)	**1**	**1**
			Low Level Tolerance (1 to 40 dB)	**3**	**3**
			Event Count (1 to 100)	**5**	**2**
			Event Window (1 to 200 sec/10)	**80**	**90**
			Event Mask Time (0 to 100 sec/10)	**7**	**0**
			Allow Wind-dependent Processing	**Y**	**Y**
				Default (All)	
		(3) Details	Alarm Relay Time (1 to 10 sec)	**1**	
			Enable Tamper Switch (Y or N)	**N**	
			Anemometer (1) or Wind Software (2)	**2**	

FD-331/FD-332 Terminal Command Menu
(continued)

Password	Menu	Submenu	Parameters	Default (All)
		(4) Passwords	Gain Menu: 15 characters max	**GAIN**
			Setup Menu: 15 characters max	**SETUP**
			Directive Mode: 15 characters max **FACTORY USE ONLY - DO NOT CHANGE**	**DIR**
		(RS) Reset	CH reset type. FSN Address [1] or APU Settings [2]: (FSN enabled units only)	
			- OR-	
			Destroy all present settings and restore factory settings? (Y or N)	
HIST	Read Only		Note date and time and hit Enter for alarm history	
STATUS	Read Only		System light loss, laser current, power supply voltage, real time displays of Event 1, Event 2, Alarm and Fault	
VERSION	Read Only		Model number, serial number, mfg. date, firmware revision, days of operation	

FD-341/FD-342 Terminal Command Menu

Password	Menu	Submenu	Parameters	Default (Fence)	Default (Buried)
GAIN			Gain (1 to 50)	**20**	**20**
SETUP					
			Enter 1, 2, 3 or 4		
	1	**Wind**	Enable Wind Rejection Software	**N**	**N**
			Wind Rejection (20 to 80)	**50**	**50**
	2	**Comment**	(15 characters max)		
	3	**Date**	Select Real Time Clock [1] or Calibration Date [2]		
			(15 characters max for Calibration Date)		
	4	**Calibrate**			
			Enter 1, 2, 3, 4 or RS		
		(1) Processor 1	Enable (Y or N)	**Y**	**Y**
			Level of Signal (1 to 40 dB)	**10**	**10**
			Lowest Frequency (10 to 600 Hz)	**200**	**10**
			Highest Frequency (10 to 600 Hz)	**600**	**120**
			Duration of Signal (1 to 25 sec/10)	**3**	**3**
			Low Level Tolerance (1 to 10 dB)	**5**	**5**
			Event Count (1 to 100)	**3**	**2**
			Event Window (1 to 200 sec/10)	**50**	**90**
			Event Mask Time (0 to 100 sec/10)	**2**	**0**

FD-341/FD-342 Terminal Command Menu
(continued)

**Not to be used with the FD-340 Series*

Password	Menu	Submenu	Parameters	Default (Fence)	Default (Buried)
		(2) Processor 2	Enable (Y or N)	**Y**	**N**
			Level of Signal (1 to 40 dB)	**10**	**10**
			Lowest Frequency (10 to 600 Hz)	**300**	**10**
			Highest Frequency (10 to 600 Hz)	**600**	**120**
			Duration of Signal (1 to 25 sec/10)	**1**	**1**
			Low Level Tolerance (1 to 40 dB)	**3**	**3**
			Event Count (1 to 100)	**5**	**2**
			Event Window (1 to 200 sec/10)	**80**	**90**
			Event Mask Time (0 to 100 sec/10)	**7**	**0**
			Allow Wind-dependent Processing	**Y**	**Y**
				Default (All)	
		(3) Details	Alarm Relay Time (1 to 10 sec)	**1**	
			Enable Tamper Switch (Y or N)	**N**	
			Anemometer *(1) or Wind Software (2)	**2**	
		(4) Passwords	Gain Menu: 15 characters max	**GAIN**	
			Setup Menu: 15 characters max	**SETUP**	
			Directive Mode: 15 characters max **FACTORY USE ONLY - DO NOT CHANGE**	**DIR**	

FD-341/FD-342 Terminal Command Menu
(continued)

Password	Menu	Submenu	Parameters	Default (All)
		(RS) Reset	CH reset type. FSN Address [1] or APU Settings [2]: (FSN enabled units only) - OR - Destroy all present settings and restore factory settings? (Y or N)	
HIST	Read Only		Note date and time and hit Enter for alarm history	
STATUS	Read Only		System light loss, laser current, power supply voltage, real time displays of Event 1, Event 2, Alarm and Fault	
VERSION	Read Only		Model number, serial number, mfg. date, firmware revision, days of operation	

Glossary

Acoustic Power
The energy associated with a given sensor signal, i.e. ambient noise

Alarm
An event or group of events that satisfies the logical requirements established by the event count and event window parameters

APU
Alarm Processing Unit

Data File Extension
A 3 letter suffix attached to a file name, typically “*.spb” for spectral data files or “*.apb” for APU parameter files

Directive Mode
A mode of APU processor operation for use by factory technicians. The APU processor is placed in this mode prior to using the SpectraView Real-Time or APU Parameter Editor modes.

Event
A disturbance of sufficient size to exceed the “Level” APU parameter setting

Event Threshold
The value that, when exceeded by the integrator, generates an event

File Sequencing
Stepping through a list of files with a common file name prefix. SpectraView sequences files numerically starting with 000

GUI
Graphical User Interface

Hyperion
A portable calibration tool designed for use in outdoor, all-weather environments available through Fiber SenSys LLC

Integrator
Sums the selected acoustic power signals over time. If no signal is present, the integrator value decreases over time

Model
A user-defined set of parameters which may be different from the APU parameters that were used when the spectral data file was recorded

Real-Time

Instantaneous APU input to SpectraView

Spectrum Content

The frequency or group of frequencies contained in the sensor signal from the APU

Terminal

A mode of direct communication to the APU using either SpectraView or other devices intended for setting APU parameters to settings other than factory defaults

Triggers

When checked in SpectraView, a specific disturbance that alerts SpectraView to record a data file.

Wind Compensation

Automatic system gain reduction that lessens the effects of wind on the sensor cable

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