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FibreXtreme®

Serial FPDP Protocol Analyzer
User Manual

Document No. F-T-MU-S2ANLYZR-A-0-A4

Systran®

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FCC

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1. INTRODUCTION

1.1 How to Use This Manual

1.1.1 Purpose

This manual describes the installation and operation of the FibreXtreme Serial FPDP Protocol Analyzer.

1.1.2 Scope

This manual is intended for systems personnel involved in the installation and operation of the Serial FPDP Protocol Analyzer.

1.1.3 Style Conventions

- Parameter names are bolded. For example, **Interleaved**.
- File names are bolded. For example, **.BIN**.
- Button names are bolded. For example, **OK**.
- Path names are italicized. For example, *utility/sw/cfg*.
- Code and monitor screen displays of input and output are boxed and indented on a separate line. Text that represents user input is bolded. Text that the computer displays on the screen is not bolded. For example:

```
C:\ls
file1          file2             file3
```

1.2 Related Information

- *ANSI Z136.2-1988 American National Standard for the Safe Use of Optical Fiber Communication Systems Using Laser Diode and LED Sources.*
- *IEC 825-1984 Radiation Safety of Laser Products, Equipment Classification, Requirements, and User's Guide, 2 parts,* 1993.
- *FibreXtreme SL100/SL240 Hardware Reference Manual for PCI, PMC, and CPCI Cards,* (Doc. No. F-T-MR-S2PCIPMC), Systran Corporation.
- *FibreXtreme SL100X/SL240X Hardware Reference Manual for VME and Rehostable CMC FPFP Cards,* (Doc. No. F-T-MR-S3FPDP##), Systran Corporation.
- *LinkXchange LX2500 Crossbar Switch Hardware Reference Manual,* (Doc. No. F-T-MR-LX2500), Systran Corporation.
- *Serial Front Panel Data Port (FPDP) Standard, VITA 17.1*
- VITA - http://www.vita.com/
- Systran Corp – http://www.systran.com/
- Systran Corp Serial FPDP Partner Program – http://www.serialfpdp.com/

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Our Quality System addresses the following basic objectives:

- Achieve, maintain and continually improve the quality of our products through established design, test, and production procedures.
- Improve the quality of our operations to meet the needs of our customers, suppliers, and other stakeholders.
- Provide our employees with the tools and overall work environment to fulfill, maintain, and improve product and service quality.
- Ensure our customer and other stakeholders that only the highest quality product or service will be delivered.

The British Standards Institution (BSI), the world's largest and most respected standardization authority, assessed Systran's Quality System. BSI's Quality Assurance division certified we meet or exceed all applicable international standards, and issued Certificate of Registration, number FM 31468, on May 16, 1995. The scope of Systran's registration is: "Design, manufacture and service of high technology hardware and software computer communications products." The registration is maintained under BSI QA's bi-annual quality audit program.

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2. PRODUCT OVERVIEW

2.1 Overview

The Systran Serial FPDP Protocol Analyzer is a two-channel analyzer in a portable chassis. The Serial FPDP Protocol Analyzer hardware platform, combined with the powerful FXplorer software, supports a vast set of intuitive features for analyzing Serial FPDP data. A 10/100 Base-T Ethernet port makes all this power accessible to multiple users at remote locations on the network. Selectable 1-, 2-, or 2.5- Gbps data transfer rates add to the analyzer's versatility for Serial FPDP data analysis.



Figure 2-1 Serial FPDP Protocol Analyzer

2.2 Features

The features include:

- Powerful TRAC engines (intelligent trace control processors) for triggering, filtering, performance monitoring, and data capturing.
- User-configurable trace views save you time by enabling you to navigate through the data relevant to your analysis.
- Patented hardware search capability combined with 640 MB of onboard trace memory per channel eliminates the need for post-processing to view, search, and filter data in a trace view, thereby reducing your time waiting for results. Applying prefiltering to a data capture extends the effective trace memory to gigabytes of data.

- Performance monitoring of key statistics and user-defined statistics provide a real-time indication of performance.
- Support for networked users via Ethernet and TCP/IP.

The software and cooperative processors provide the power and flexibility for analysis of the most complex Serial FPDP devices and networks.

2.3 System Description

2.3.1 Hardware

The Serial FPDP analyzer's hardware features include the following:

- 1-Gbps, 2-Gbps, and 2.5-Gbps data transfer rates
- Powerful, intelligent processors
- Extensive filtering capabilities
- Standard trace depth of 640 MB
- An Ethernet host interface connection

The Serial FPDP analyzer is available in a two-channel configuration. A portable chassis has been designed around the PCI board form factor. A standard Ethernet port allows easy connection to a host PC Ethernet port or network hub, allowing an inexpensive notebook computer to host the test equipment. The networking capabilities provide access from anywhere on the network.

Transfer rates are software selectable for Serial FPDP data analysis. You can select a 1-, 2-, or 2.5- Gbps data transfer rate.

Powerful TRAC engines are intelligent trace control processors for performing complex multi-level triggering, filtering, and conditional decision making as specified by the TRAC strategy. Counters can be added to a TRAC strategy for counting or timing purposes and messages can be used for communication between channels.

The Serial FPDP analyzer's filtering capability allows you to filter out all primitives and frame data size during run time. You can easily configure filtering parameters to limit the amount of data stored to trace memory and conserve the resources of the TRAC engines. Data can also be filtered after it has been captured.

The Serial FPDP analyzer has a standard trace depth of 640 MB per channel and a hardware search engine capable of scanning a channel's trace memory in less than 1 second.

Analyzer control is achieved via an Ethernet host interface connection. The analyzer uses a Pentium processor and a 10/100 Base-T Ethernet controller for communication with the host system.

The Serial FPDP analyzer uses SFP (small form factor pluggable) transceiver modules.



NOTE: The Serial FPDP Protocol Analyzer comes standard with short wavelength (850 nm) SFP transceiver modules. Long wavelength (1300 nm) or HSSDC2 copper kits may be purchased separately.

Each channel has logic for filtering, triggering, monitoring, and profiling. The block diagram in Figure 2-2 shows the Serial FPDP analyzer's dedicated hardware capability per channel.

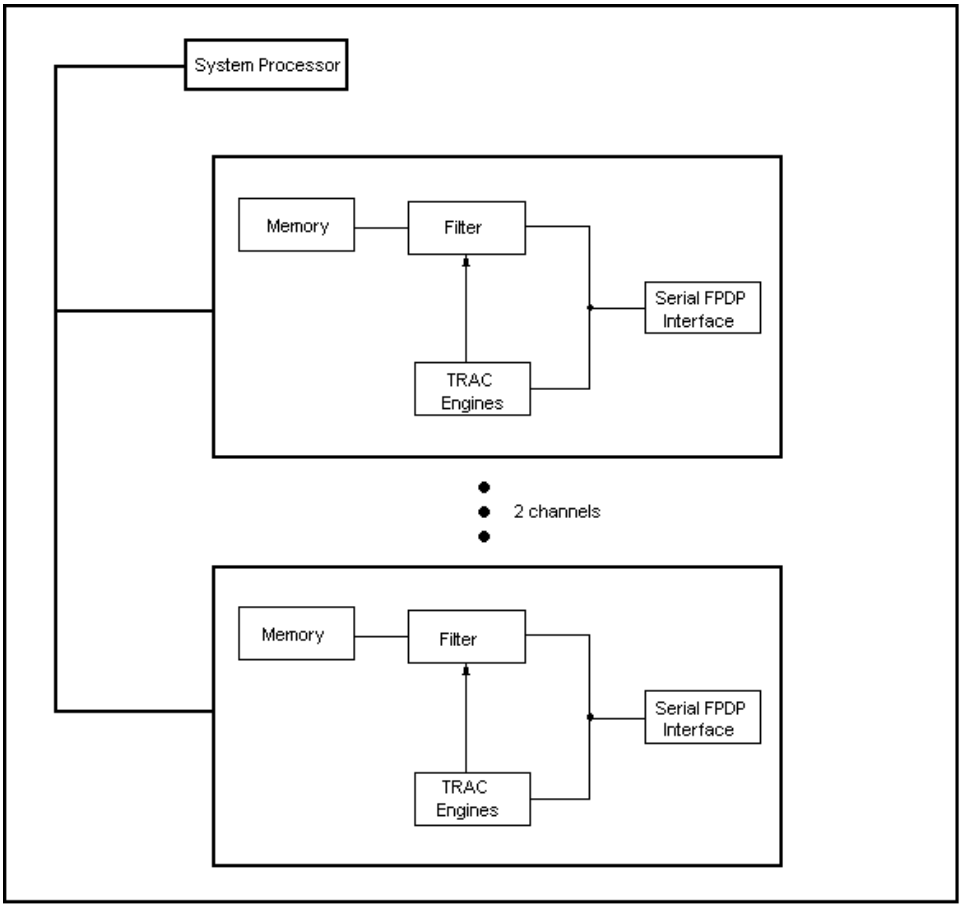


Figure 2-2 Serial FPDP Analyzer System Block Diagram

2.3.2 Software

FXplorer has a Windows-based user interface consisting of a comprehensive set of features for your complete analysis needs.

FXplorer software includes the following features:

- TRAC Strategy Builder for creating complex capture strategies without having to do any programming.
- The flexibility of selecting only the captured data you want to view and displaying it as desired.
- Extensive capability to search across channels for frames, primitives, transmission errors, time stamps, triggers, and bookmarks.
- Performance monitoring for monitoring and graphing a range of critical statistics.

FXplorer software is easy to use. Menus and dialog boxes guide you through setup, capture strategy configuration, analyzer operation, and trace analysis.

2.4 System Requirements

Before installing FXplorer software, be sure your system has the following:

- Microsoft Windows 9x, Windows NT 4.0, Windows 2000, or Windows XP
- Intel Pentium II processor or faster (recommended)
- 64 MB RAM minimum
- 10 MB available hard disk space (additional space for saved traces dependent on user)
- CD-ROM drive
- 10/100 Base-T Ethernet Connection

2.4.1 Recommended Windows Settings

For optimum display of FXplorer software, Systran recommends the following display settings in the Windows Control Panel:

- 1024 x 768 (or greater) screen resolution
- Color palette set to High Color (16-bit)

2.5 On-line Help

Extensive on-line help is readily available in FXplorer software. By clicking on a dialog box or a field within a dialog box, you can obtain information instantly. Refer to **Using On-line Help** in **Chapter 4 - Operation** for information on how to access context-sensitive help. Help topics on procedures and reference information and the on-line reference manual can be accessed through the Help pulldown menu.

3. INSTALLATION

3.1 Overview

This chapter discusses hardware and software installation, network configuration, installing and replacing SFP modules, and how to update the firmware.

3.2 Hardware Installation

3.2.1 Enclosure

Figure 3-1 and Figure 3-2 show the front and back of the Serial FPDP Protocol Analyzer. Refer to these illustrations, as necessary, when connecting the analyzer to your system.

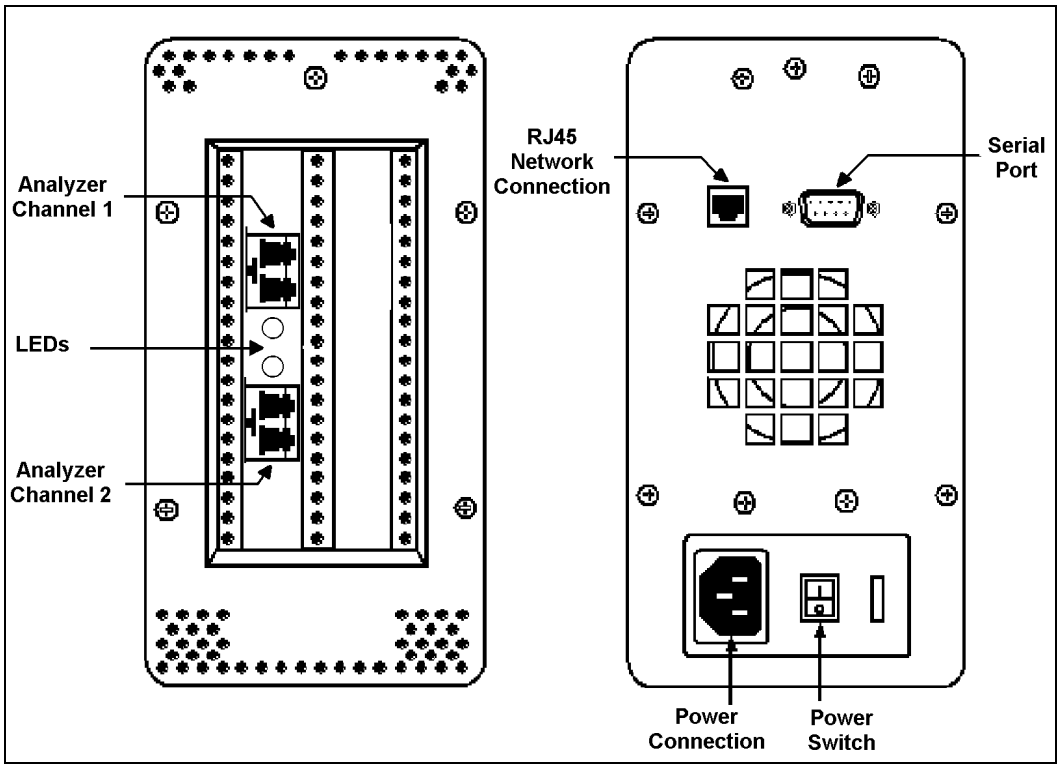


Figure 3-1 Front View **Figure 3-2 Back View**

There are two LEDs, one for each channel, located between the transceivers. These LEDs indicate the following:

Red – Error detected (e.g. 8B/10B, CRC, loss of signal)

Green – Frame received (idle frames are not counted)

Off – Idle link

3.3 Power Connection

Be sure to use a standard 3-prong grounded power cord to connect the Serial FPDP Protocol Analyzer to AC power. Ensure that the AC socket/outlet is also properly grounded, located near the analyzer, and easily accessible to the operator.

3.4 Cabling Configurations

3.4.1 Overview

The channels operate in crossover or flatline mode. The hardware configurations for these modes are described here. For information on configuring the software for a specific mode, refer to **Configuring Your Analyzer** in **Chapter 4 - Operation**.

3.4.2 Crossover Mode

The receive signal on each channel of the pair is crossed over to become the transmit signal of the other channel, as shown in the wiring diagram in Figure 3-3.

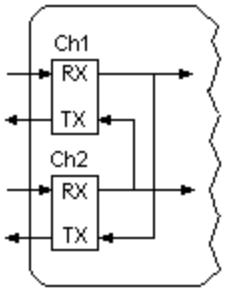


Figure 3-3 Internal Wiring Configuration for Crossover Mode

Figure 3-4 is an example of a cabling configuration for crossover mode. This example shows a loop with a LinkXchange LX2500 Crossbar Switch and five devices. An advantage of crossover mode is that it uses the same port for both a channel and a device, thereby conserving ports.

Crossover mode is also useful on a switch for placing an analyzer between a device and switch port as shown in Figure 3-4.

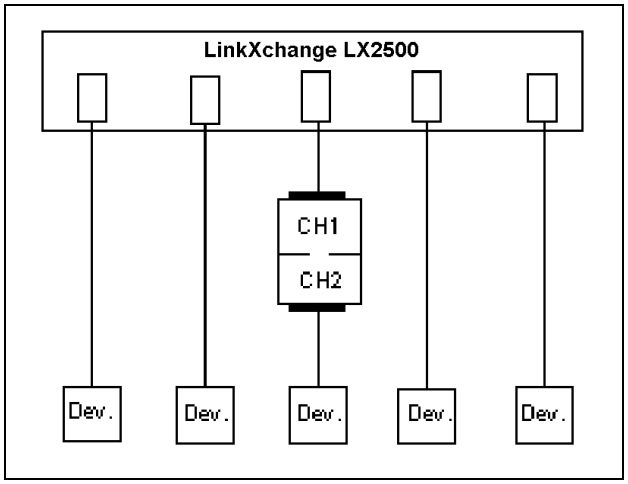


Figure 3-4 Cabling Configuration for Crossover Mode

Make the connections in this mode by disconnecting the device to be tested from the LinkXchange LX2500 and connecting it to one channel. Use another duplex cable to connect the other channel to the LinkXchange LX2500 . Refer to the wiring configuration in Figure 3-3 and the cabling configuration in Figure 3-4.

3.4.3 Flatline Mode

In flatline mode, the channel transmits a static signal on the transmitter output, which causes the LinkXchange LX2500 to bypass the port (note that for optical links, the light is turned off). Refer to the wiring configuration in Figure 3-5. This mode allows the channels to operate completely passively on the Serial FPDP loop.

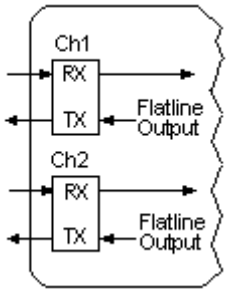


Figure 3-5 Internal Wiring Configuration for Flatline Mode

Figure 3-6 is an example of a cabling configuration for flatline mode. This example shows a loop with a LinkXchange LX2500 and several devices. An advantage of flatline mode is that you can place individual channels anywhere on the loop. However, this mode requires that each channel be plugged into a port that will bypass that port in response to the flatline output signal.

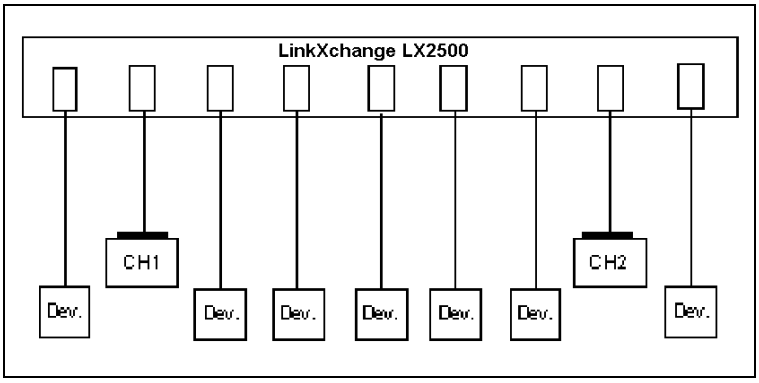


Figure 3-6 Cabling Configuration for Flatline Mode

Make the connections in this mode using a dedicated port for each channel. Refer to the wiring configuration in Figure 3-5 and the cabling configuration in Figure 3-6.

3.5 Network Configuration

3.5.1 Determining Network Architecture

Analyzers can be installed on either a public or a private network. A public network is generally one that has other devices besides analyzers communicating over the network. A public network may be a company-wide network or an Intranet and is governed by a network administrator. A private network, on the other hand, is a network of analyzers and PCs communicating only with each other. It is separate from the corporate network and is under your direct control.

3.5.2 Connecting to the Network

Using twisted pair Ethernet cable, connect the analyzer from the RJ-45 network connection to the network hub or switch. For 10 Base-T installation, use category 3, 4, or 5 UTP (unshielded twisted pair) cable. For 100 Base-T installation, use category 5 UTP or higher performance cable. The maximum distance from the analyzer to the network hub or switch is 328 ft (100 m).

To connect directly from the analyzer to the host PC network adapter, use a crossed-over cable (a cable in which the transmit and receive wires are reversed at opposite ends of the cable).

3.5.3 Obtaining IP Addresses

Each analyzer must have an IP address (a 32-bit value identifying an Internet host) assigned to it to communicate on the network. Obtain IP addresses by doing the following for your type of network:

PUBLIC NETWORK:

If you don't have a range of available IP addresses already assigned to you, see your network administrator, who will assign a range of IP addresses based on the number of analyzers on your network.

PRIVATE NETWORK:

Use a private network if additional traffic on the corporate network is not desirable or sufficient IP addresses are not available for assigning to analyzers.

RFC #1597 (Request for Comment — informal standards for networks) by the Internet Engineering Task Force (IETF) recommends that you assign IP addresses for private networks according to the following guidelines:

The Internet Assigned Numbers Authority (IANA) has reserved three blocks of IP address space for private networks:

1	Class A Network Block	10.0.0.0 – 10.255.255.255
16	Class B Network Blocks	172.16.0.0 – 172.31.255.255
256	Class C Network Blocks	192.168.0.0 –192.168.255.255

Classes are based on the size of the network. Systran recommends using a Class B network since 64,000 IP addresses are available (172.16.0.0 to 172.31.255.255). The values x.x.x.0 and x.x.x.255 are the network and broadcast addresses, respectively, and

x.x.x.1 is usually the gateway machine to other networks. Avoid assigning these addresses to analyzers.

3.5.4 Configuring the Network Adapter on the Host Computer

If a network adapter is not already installed in the host computer, install it according to the manufacturer's instructions. Once it is installed, configure it to use the TCP/IP protocol as follows.

WINDOWS 95 / WINDOWS 98 (SECOND EDITION)

1. From the Windows Start menu, select Settings and then Control Panel.
2. Double click on the Network icon. The Network dialog box opens.
3. On the Configuration tab, verify a network component is installed for your network adapter hardware. If it is not, click on the **Add** button and select Adapter. In the Adapter menu, select the appropriate adapter and click on the Add button.
4. Select Protocol and click on the **Add** button. The Protocol menu appears. In the Protocol menu, click on Microsoft and then select TCP/IP from the list of available network protocols. Click on the **OK** button.
5. Windows 95: On the Configuration tab, select TCP/IP and then Properties.
   Windows 98: On the Configuration tab, select the TCP/IP network components for your hardware (for example, TCP/IP -> 3Com 10/100 Ethernet). Select Properties.

   The TCP/IP Properties dialog box opens. If DHCP server software is not available on the network to dynamically assign an IP address to the computer, an IP address must be statically assigned. On the IP Address tab, select Specify an IP Address. Enter the IP address and subnet address. Click on the **OK** button.



NOTE: A subnet address is a value used to determine if the destination address is within the local network. If the destination address is not within the local network, the address is sent between networks through a router. The subnet address consists of four octets separated by decimal points. Each octet contains a one- to three-digit number (0 to 255), representing 8 bits of address. A value is required in this field.

6. Restart your computer for the changes to takes effect.

WINDOWS 2000

1. From the Windows Start menu, select Settings and then Control Panel.
2. Double click on the Network and Dial-up Connections icon.
3. Double click on Local Area Connection. The Local Area Connection Status dialog box opens.
4. The Local Area Connection Properties dialog box opens. Verify the network hardware is installed in your computer. If it is not, refer to the computer manufacturer's instructions for installation.
5. Return to the Local Area Connections Properties dialog box. Select Internet Protocol (TCP/IP) in the list and click on the Properties button. The Internet Protocol (TCP/IP) Properties dialog box opens.
6. If DHCP server software is not available on the network to dynamically assign an IP address to the computer, an IP address must be statically assigned. Select Use

the following IP address. Enter the IP address and subnet mask. Click on the **OK** button.



NOTE: A subnet address is a value used to determine if the destination address is within the local network. If the destination address is not within the local network, the address is sent between networks through a router. The subnet address consists of four octets separated by decimal points. Each octet contains a one- to three-digit number (0 to 255), representing 8 bits of address. A value is required in this field.

7. Restart your computer for the changes to takes effect.

WINDOWS NT

1. From the Windows Start menu, select Settings and then Control Panel.
2. Double click on the Network icon. The Network dialog box opens.
3. On the Adapters tab, verify the installed network adapter for your hardware is available. If it is not, click on the **Add** button and select the appropriate adapter.
4. On the Protocols tab, verify TCP/IP Protocol is installed. If it is not, click on the Add button and select TCP/IP Protocol from the list of network protocols. Click on the **OK** button.
5. If DHCP server software is not available on the network to dynamically assign an IP address to the computer, an IP address must be statically assigned. Click on TCP/IP Protocol and select Properties. The TCP/IP Properties dialog box opens. Select Specify an IP address and subnet address. Click on the **OK** button.



NOTE: A subnet address is a value used to determine if the destination address is within the local network. If the destination address is not within the local network, the address is sent between networks through a router. The subnet address consists of four octets separated by decimal points. Each octet contains a one- to three-digit number (0 to 255), representing 8 bits of address. A value is required in this field.

6. Restart your computer for the changes to takes effect.

WINDOWS XP

1. From the Windows Start menu, select Settings and then Control Panel.
2. Double click on the Network and Internet Connections icon. The Network and Internet Connections dialog box opens
3. Click on the Network Connections icon. The Network Connections dialog box opens.
4. Double click on Local Area Connection. The Local Area Connection Status dialog box opens.
5. On the General tab, click on the **Properties** button. The Local Area Connection Properties dialog box opens. Verify the network hardware is installed in your computer. If it is not, refer to the computer manufacturer's instructions for installation.
6. Select Internet Protocol (TCP/IP) in the list and click on the **Properties** button. The Internet Protocol (TCP/IP) Properties dialog box opens.

7. If DHCP server software is not available on the network to dynamically assign an IP address to the computer, an IP address must be statically assigned. Select Use the following IP address. Enter the IP address and subnet mask. Click on the **OK** button.



NOTE: A subnet address is a value used to determine if the destination address is within the local network. If the destination address is not within the local network, the address is sent between networks through a router. The subnet address consists of four octets separated by decimal points. Each octet contains a one- to three-digit number (0 to 255), representing 8 bits of address. A value is required in this field.

8. Restart your computer for the changes to takes effect.

3.5.5 Assigning An IP Address To The Analyzer

Each analyzer must have an IP address assigned to it to communicate on the network. IP addresses can be assigned either through DHCP server software, which dynamically assigns IP addresses each time an analyzer is turned on, or in the configuration menu through serial port communications, which permanently assigns static IP addresses.

DYNAMIC IP ADDRESS ASSIGNMENT

To dynamically assign IP addresses to analyzers, access the Network Configuration Menu by doing the following:

1. Connect the cable (shipped with the Serial FPDP Protocol Analyzer) from the serial port to the host computer.



NOTE: You can use any serial communication program. However, the following steps in this procedure specifically describe the Windows HyperTerminal program.

2. Access the Windows HyperTerminal program. The Connection Description dialog box appears on the screen.
3. Enter a name for your new connection and click on any icon. Click on the **OK** button. The Connect To dialog box appears on the screen.
4. In the *Connect using* field, select the appropriate communications setting for your system. Click on the **OK** button.
5. The Communications Properties dialog box appears on the screen. Set the communications settings to the following:
   - Bits per second (baud): 9600
   - Data bits: 8
   - Parity: None
   - Stop bits: 1
   - Flow control: None

   Click on the **OK** button. A blank screen with a blinking cursor appears.
6. Press Enter to display the serial connection to the device.
7. Select *toggle ip config* until the following menu options appear in the terminal window.

```
Configuration Menu: pp1735
```

```
  Current IP address: 198.30.206.50
  Current configuration (unmodified):
    System version systran9
    IP will use DHCP to acquire addresses.
[i] toggle ip config
[x] exit
[r] reboot
[c] copyrights
choose one:
```

8. Select *save configuration* to save any changes made.
9. Select *reboot* to load the changes into the hardware. Once the analyzer is configured, the DHCP server software assigns it an IP address each time the analyzer is turned on.
10. When the login prompt appears on the screen, select Exit from the File pulldown menu. Click on **Yes** to disconnect.

If the network is already configured, you can use Telnet to access the Network Configuration Menu by selecting Run in the Windows Start menu and typing:

```
Telnet <IP Address>
```

STATIC IP ADDRESS ASSIGNMENT

To permanently assign IP addresses to analyzers, access the Network Configuration Menu by doing the following:

1. Connect the cable (shipped with the Serial FPDP Protocol Analyzer) from the serial port to the host computer.



NOTE: You may use any serial communication program. However, the following steps in this procedure specifically describe the Windows HyperTerminal program.

2. Access the Windows HyperTerminal program. The Connection Description dialog box appears on the screen.
3. Enter a name for your new connection and click on any icon. Click on the **OK** button. The Connect To dialog box appears on the screen.
4. In the Connect using field, select the appropriate communications setting for your system. Click on the **OK** button.
5. The Communications Properties dialog box appears on the screen. Set the communications settings to the following:
    - Bits per second (baud): 9600
    - Data bits: 8
    - Parity: None
    - Stop bits: 1
    - Flow control: None

    Click on the **OK** button. A blank screen with a blinking cursor appears.
6. Press Enter to display the serial connection to the device.
7. To change the IP address, select toggle ip config. The Configuration Menu appears displaying the current configuration and options for changing the

configuration. If necessary, configure the available options. The Configuration Menu is shown below:

```
  Configuration Menu: pp1735

  Current IP address: 198.30.206.50
  Current configuration (modified):
    System version systran9
    IP will use user-specified address:
        ipaddr 0.0.0.0. netmask 0.0.0.0 gateway 0.0.0.0
[i] toggle ip config
[a] enter ip address
[n] enter netmask
[g] enter default gateway
[s] save configuration
[x] exit
[r] reboot
[c] copyrights
choose one:
```

8. Select save configuration to save any changes made.
9. Select reboot to load the changes into the hardware. Once configured, the analyzer can be moved around the network and accessed if the connection is to a network node for which the manually installed IP address is valid.
10. When the login prompt appears on the screen, select Exit from the File pulldown menu. Click on **Yes** to disconnect.

If the network is already configured, you can use Telnet to access the Network Configuration Menu by selecting Run in the Windows Start menu and typing:

```
Telnet <IP Address>
```

Linux is distributed under the terms of the GNU General Public License. To download Linux source code, go to www.systran.com/techweb/downloads/linuxsc.zip. You will be required to enter a Login and Password. Enter 'systran' for Login and 'corporation' for Password. Both the Login and Password must be in lowercase.

3.6 Installing/Replacing SFP Modules

You can use optical small form factor pluggable (SFP) modules on the Serial FPDP Protocol Analyzer.

To replace an SFP module, do the following:



CAUTION: Be sure to follow electrostatic discharge (ESD) control procedures. Systran recommends the use of a wrist strap connected to a grounded working surface. Failure to take ESD precautions can result in damage to the analyzer, the SFP module, or both.



NOTE: SFP modules can be unplugged and plugged in while the system is powered on.

1. If an SFP module is not already installed, go to step 3. If an SFP module is already installed, remove the cable from the channel connection.



NOTE: With some SFP modules, unlatching the module with the cable attached may be easier.

2. On the front of the Serial FPDP Protocol Analyzer, press the latch on the left of the SFP module with your index finger to release it from the SFP cage. Pull the SFP module straight out.
3. Position the new SFP module so the latch to release it from the SFP cage is on the left and the latch to release the cable from the SFP module is on the right. Slide it into the slot until it latches. If the SFP module does not slide easily into the slot, don't force it; you have it upside down. Remove it and insert it right side up.
4. Make sure the cable end is seated properly in the SFP module.
5. Attach the cable to the channel connection.

3.7 Software Installation



NOTE: For Windows NT, be sure that you are logged on to Windows NT with administrator privileges.

Install FXplorer software by doing the following:

1. Insert the FXplorer Software CD into the CD-ROM drive if you haven't already done so. Select Run from the Windows Start menu and type the following, indicating the location of the CD-ROM drive:

```
d:\setup
```

   (In this example, **d** is the location of the CD-ROM drive).
2. Follow the instructions on the screen to install the software.

Use Uninstall to remove the software from your system by doing the following:

3. Select Settings from the Windows Start menu and click on Control Panel.
4. Double-click on the Add/Remove Programs icon. Follow the directions in the Add/Remove Programs Properties dialog box to remove the software from your hard drive.

3.8 Updating the Firmware

The firmware file (**.BIN**) is included with the FXplorer software update to allow you to update the firmware.

Do the following to update the firmware:

1. Select the Find Hardware selection in the Analyzer pulldown menu. The Analyzer Selection dialog box appears on the screen as shown in Figure 3-7.

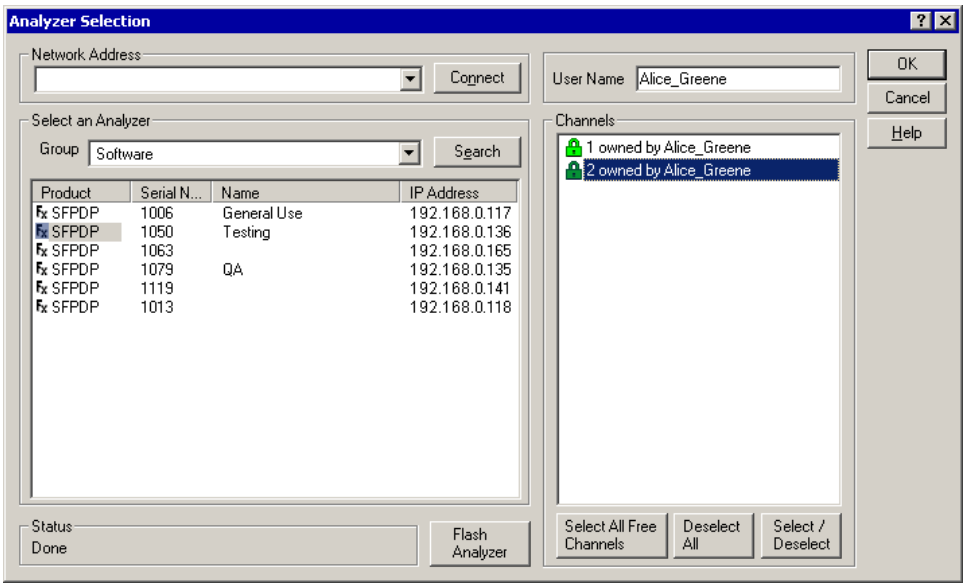


Figure 3-7 Analyzer Selection Dialog Box

2. Click on the analyzer in the list where the firmware to be upgraded is located.
3. Click on the **Flash Analyzer** button to display the Update Analyzer Flash dialog box shown in Figure 3-8.

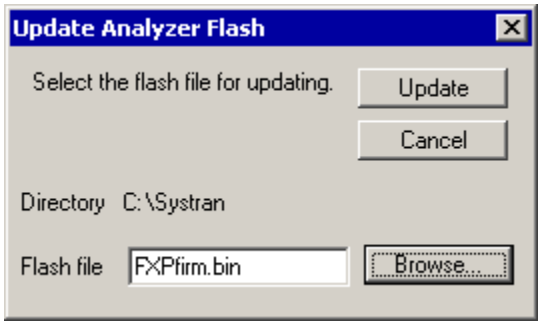


Figure 3-8 Update Analyzer Flash Dialog Box

4. Type the path and firmware file name in the Flash file field or click on the **Browse** button to find the **.BIN** file.
5. Click on the **Update** button. A screen appears indicating your current firmware version and the firmware version on file. Click on the **Update** button again, and the update process will start. This process takes about 30 seconds to 1 minute to complete.
6. Upon completion of the process, the dialog box closes automatically. Following the onscreen prompt, restart FXplorer.

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4. OPERATION

4.1 Overview

This chapter describes on-line help, startup, configuration of the analyzer, channel configuration, determining data to capture, displaying data, and shutdown.

4.2 On-line Help

4.2.1 Required Files for On-line Help

The following files are required for on-line help and are installed in the appropriate places on your system during FXplorer software installation:

- **FXPLORER.HLP**
- **FXPLORER.CNT**
- **SETBROWS.EXE**
- **ROBOEX32.DLL**
- **INETWH32.DLL**



CAUTION: If any of these help-system files are removed or separated into different directories, the on-line help will not work properly.

The **SETBROWS.EXE**, **INETWH32.DLL**, and **ROBOEX32.DLL** files enable you to directly access the Systran website through links within the on-line help. You must have an installed web browser and run FXplorer on a network with access to the Internet to use these links.

If you have more than one web browser on your system and want to indicate a specific path for the browser, if an error message appears requesting a browser, or if you can't access your browser, do the following:

1. In the Windows System directory, double-click on **SETBROWS.EXE**. The WinHelp Internet Access dialog box appears on the screen.
2. Either enter the path and name of the browser or click Browse to find the desired browser and click on the **OK** button.
3. Click on the **OK** button to close the WinHelp Internet Access dialog box.

4.2.2 Using On-line Help

On-line help is available by selecting FXplorer Help Topics in the Help pulldown menu, which displays the table of contents and index for the appropriate product(s).

Context-sensitive help is also available. The table below, Table 4-1, indicates how to access a specific type of context-sensitive help.

Table 4-1 Accessing Context-Sensitive Help

Topic Type	Tool	Action
Dialog box	Pointer cursor	Click on Help button
Fields in dialog boxes	Question mark cursor (click on ? in upper right corner of dialog box to get this cursor)	Click on specific field
Graph window	F1 key	Click on pane
Help file table of contents	F1 key	Click within main menu when a dialog box is not on the screen
Menu selections	F1 key	Click on specific selection
Tool bars	F1 key	Click anywhere within tool bar (main menu, search, and tools tool bars)

4.2.3 Changing the Help File Window Size

On-line help uses the Explorer View Help structure, which displays the table of contents, index, and search windows to the left of the help topic for easy navigation through the help file. When you need more space to display a topic (for example, to view a program example or function syntax), click on the **Help Topic** button in the help window to expand the viewing area. Clicking on the **Help Topic** button again returns the screen to the Explorer View Help structure.

4.3 Concepts and Definitions

Each channel records data from a Serial FPDP link and transmits it to the host PC on the network. Before operation, the network is scanned for available Serial FPDP Protocol Analyzers, and you select the analyzer to be used and the channels to capture data. For more network information, refer to **Network Configuration** in **Chapter 3 - Installation.** At this time, you also set general operating parameters and load a TRAC Strategy in which parameters for filtering, data capturing, and triggering are defined. Setting a trigger and filter are optional. Start the channels capturing data and stop them to look at the traces.

The following concepts and terms are used in these chapters, **Chapter 5 - Trace View Data,** and **Chapter 6 – TRAC Strategies,** and should be understood before beginning data capture:

Filtering ..... The process of limiting the amount or type of data captured or viewed.

Triggering ..... Causes data capture to stop immediately after the trigger, after an additional buffer's worth of data capture, or at a point in between, depending on the trigger position. Any channel triggering causes all channels to eventually stop capturing data.

TRAC strategy ..... The software configuration of TRAC engines to make real-time decisions during channel monitoring.

Trace view ..... A formatted trace output in a standard view. Standard Serial FPDP trace views include Single Line (all frames and primitives on a single line) or Multi Line (all frames and primitives on multiple lines).

4.4 Startup



NOTE: Be sure a valid IP address has been assigned to the Serial FPDP Protocol Analyzer. Refer to **Assigning IP Addresses** in **Chapter 3 - Installation** if necessary.

1. Turn the Serial FPDP Protocol Analyzer on by pressing the power switch on the back of the enclosure.
2. Start the software by selecting the FXplorer icon in the program group. The FXplorer interactive window appears on the screen.

4.5 Configuring Your Analyzer

4.5.1 Selecting an Analyzer and Channels

1. In the Analyzer pulldown menu, click on the Find Hardware selection to access the Analyzer Selection dialog box shown in Figure 4-1.

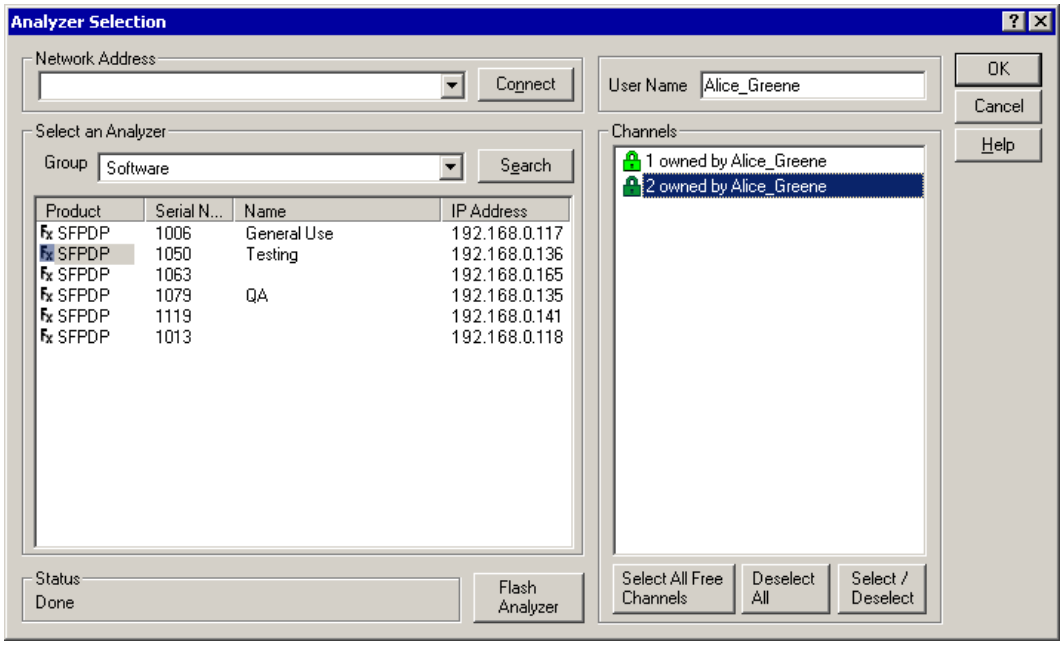


Figure 4-1 Analyzer Selection Dialog Box

2. If the desired Serial FPDP Protocol Analyzer is on the network but does not appear in the list of analyzers, do one of the following:
   - If you know the network address or can obtain it from your network administrator, type it in the Network Address field in either dotted decimal format (for example, 192.168.0.55) or as a fully qualified domain name (for example, SFPDP.systran.com) and click on the **Connect** button. Once the address is entered in this field, it becomes part of a list of recurring entries. For more network information, refer to **Network Configuration** in **Chapter 3 – Installation**.
   - Click on the **Search** button to search for analyzers on the network. The network will be scanned for analyzers, which then appear in the analyzer list.



NOTE: In typical large networks not all segments can be reached, so a search may not find the Serial FPDP Protocol Analyzer for which you are looking. In that case, enter a network address as explained above.

3. In the analyzer list, Serial FPDP Protocol Analyzers are listed by model number, the last four digits of the serial number, name (if assigned), and IP address. Click on the desired analyzer in the list.

   If you have multiple analyzers connected to your system, they may be assigned to specific groups. If this is the case, find the group containing the desired analyzer

by scrolling through the Group menu. Refer to **Labeling and Grouping Analyzers** in this chapter for more information on how to assign a name to an analyzer and an analyzer to a group.

4. Clicking on a specific analyzer lists the channels connected to the system and indicates their status. A white unlocked icon indicates an available channel; a red locked icon indicates a channel selected by another user. Click on an unlocked icon to select a channel. It becomes a green locked icon. The name shown in the User Name field appears next to the selected channel, indicating the owner of that channel.

   If you select a channel preceded by a red locked icon, a prompt appears warning that another user owns the channel. However, if you disregard the prompt and proceed, you take over ownership of that channel.



NOTE: You will be warned by a prompt when someone takes control of your channel(s) and you are being disconnected from the analyzer. If you are saving a trace at the time and are disconnected, only part of the trace is saved but the saved data will be correct.

If someone takes control of one of your channels but not both of them while you are in FXplorer software, you are disconnected from the analyzer and will have to reselect your channels. However, if you are no longer in FXplorer software (for example, by selecting Exit and Keep Channel Ownership) and someone takes control of one of your channels, you will still be connected to the channel they didn't take control of when you go back into the software.



NOTE: Occasionally, the most recent information on channel ownership isn't shown in the channel list. Clicking on the **Search** button will refresh the screen and update the information in the channel list.

5. When you are no longer using the channels, select Disconnect in the Analyzer pulldown menu to give up channel ownership but remain in the software.
6. If desired, you can change the name shown in the User name field, which indicates the user name assigned to the host PC. When you exit this dialog box, the change is saved and becomes the new default in this field.
7. Click on the **OK** button to close the dialog box and load the settings into the hardware. The serial number and name of the selected analyzer appear in the application title bar.

4.5.2 Labeling and Grouping Analyzers

FXplorer software allows you to group Serial FPDP Protocol Analyzers by function, location, etc., and name the analyzers on the network, if desired, so you can quickly and easily find the analyzer you want to use.

Assign a Serial FPDP Protocol Analyzer to a group by doing the following:

1. Select an analyzer according to the procedure in **Selecting an Analyzer and Channels** in this chapter.
2. In the Analyzer pulldown menu, select Analyzer Label. A dialog box appears on the screen as shown in Figure 4-2.

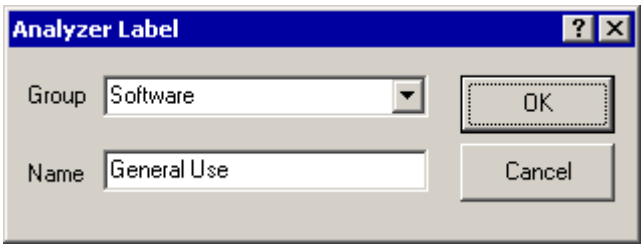


Figure 4-2 Analyzer Label Dialog Box

3. Define the parameters in the following fields:

Group

Select a name from the menu or enter the name of the group to which to assign the analyzer. You can assign the analyzer to a new or an existing group. Analyzers not assigned to a specific group are automatically assigned to the Default group.



NOTES:

1. Analyzers cannot belong to multiple groups.
2. You can override an analyzer group assignment made by another user by entering a different group name for an analyzer.

Name

If desired, assign a name to the analyzer in the Name field.

4. Click on the **OK** button to close the dialog box. The Analyzer Selection dialog box lists the analyzer groups in the Group menu. If you assigned a name to the analyzer, it is displayed in the analyzer list.

4.5.3 Labeling Channels

FXplorer software dialog boxes and trace views identify channels by channel number. If desired, you can create customized labels for channel identification.

Create channel labels by doing the following:

1. In the Analyzer pulldown menu, select Channel Labels. The Label Channels dialog box appears on the screen as shown in Figure 4-3, listing the channels that you own and identifying the Serial FPDP Protocol Analyzer to which these channels belong.

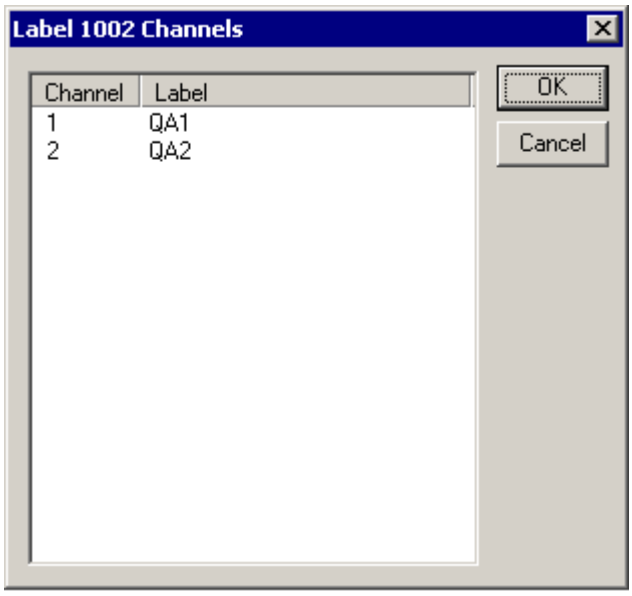


Figure 4-3 Label Channels Dialog Box

2. Type the label for the corresponding channel.



NOTE: Although you can enter more text than is visible in the data entry field in the Label Channels dialog box, very long labels are difficult to view in their entirety on channel tabs and in trace views.

   Continue to assign labels as desired, pressing Tab to move to the next channel in the list or clicking on the line for the desired channel.

3. Click on the **OK** button to close the dialog box. The channel labels are saved and will appear in subsequent testing sessions.

The labeled channels are for a specific analyzer and do not apply to any other analyzers in the system. Labels applied to channels can be seen only by the user who assigned them. If another user accesses those channels in a subsequent testing session, labels applied by a previous user are not visible.

In a trace view, channel labels can be changed or added, but these changes are not reflected in the FXplorer dialog boxes. Refer to **Channel Labels** in **Chapter 5 - Trace View Data** for more information on trace view channel labels.

4.6 Channel Configuration

The Interface Configuration dialog box allows you to specify the interface configuration mode (depending on the cabling configuration used in hardware installation) and the data transfer rate.

1. In the Analyzer pulldown menu, select Interface Configuration. The Interface Configuration dialog box shown in Figure 4-4 appears on the screen.

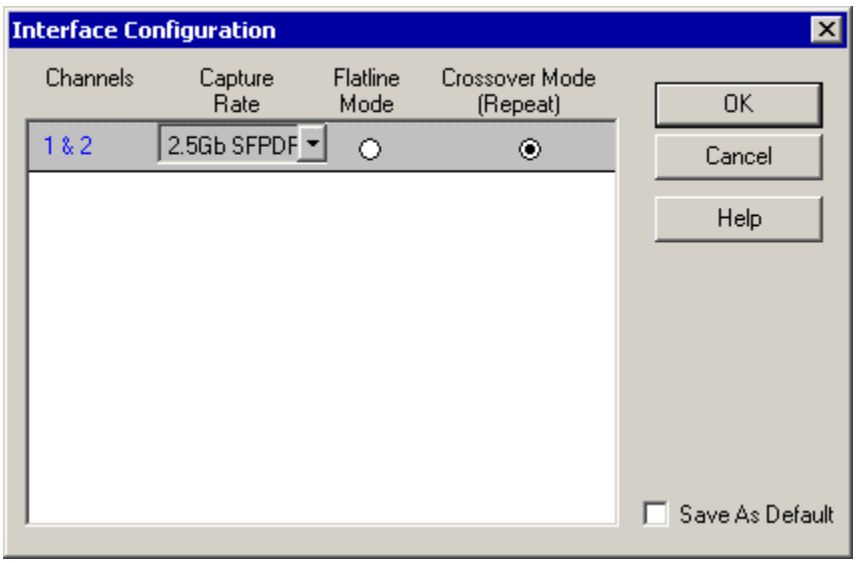


Figure 4-4 The Interface Configuration Dialog Box

2. In the 'Capture Rate' column, click on the field to display the pulldown menu. Scroll through the list to select 1-, 2-, or 2.5-Gbps.
3. Select the interface configuration mode that identifies the cabling configuration mode used in hardware installation. Refer to **Cabling Configurations** in **Chapter 3 – Installation**.



NOTE: To change the mode for a channel pair, you must own both channels in the pair.

Only the Repeat option is available for Crossover mode. The signal goes through a buffer, restoring the amplitude of the incoming signal and retransmitting it on the opposite port. The signal also gets clocked from the recovered clock derived from the serial input, thereby reducing jitter.

4. If desired, select the 'Save as Default' checkbox to save your changes as default values.
5. Click on the **OK** button to close the dialog box and load the settings into the hardware.

4.6.1 Setting Prefiltering Parameters

Prefiltering parameters are defined in the Prefilter Settings dialog box. Prefiltering (runtime filtering) is the process of filtering data before it is written to trace memory. TRAC engines can also be used to control prefiltering by using the suspend and resume actions in a TRAC strategy. Refer to **Using Suspend and Resume in a TRAC Strategy** in **Chapter 6 – TRAC Strategies** for more information on this capability. Postfiltering

provides additional filtering capability by filtering trace view data. Refer to **Postfiltering** in **Chapter 5 - Trace View Data** for more information.

In the Prefilter Settings dialog box, you can set parameters for frame data filtering for each channel capturing data. Frame data filtering limits the amount of data within the Serial FPDP frame stored into trace memory.



NOTE: Setting frame-data filtering in the Prefilter Settings dialog box affects the search results. Be careful when defining filter settings so you do not filter out data for which you may want to search.

Set prefiltering parameters by doing the following:

1. In the Tools pulldown menu, select Prefilter Settings. The Prefilter Settings dialog box shown in Figure 4-5 appears on the screen.

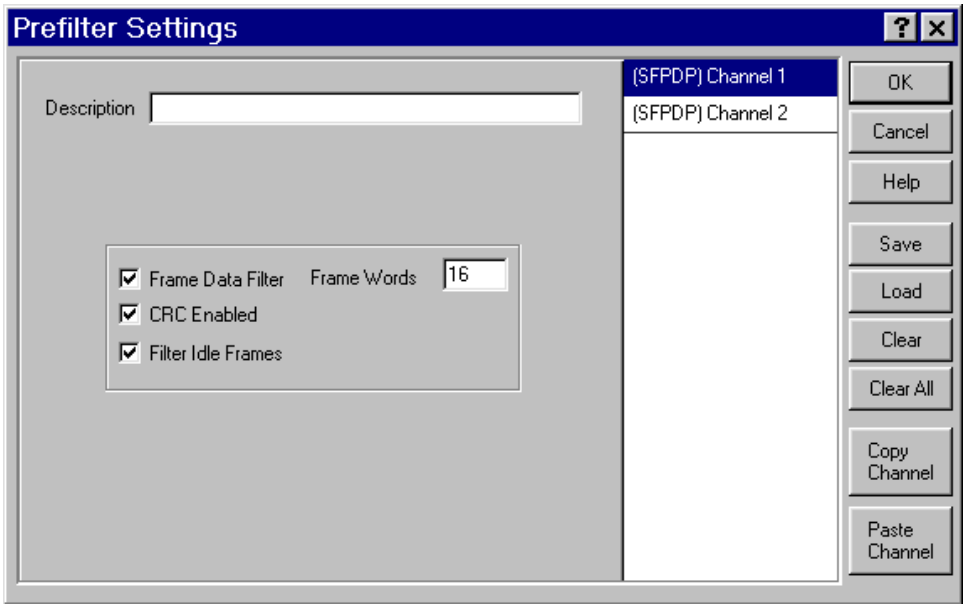


Figure 4-5 Prefilter Settings dialog box

2. In the channel list, click on the desired channel for which to define filter settings.
3. To define frame data filtering, do the following:
   a) Select the 'Frame Data Filter' checkbox to enable data filtering.
   b) In the Frame Words field, enter a value for the maximum number of words to be captured. A value of '0' indicates that no words will be captured. Trace views will report the entire frame size and will display no more than the desired number of words.
4. Select the 'CRC Enabled' checkbox to enable CRC checking. The Serial FPDP Protocol Analyzer must be set to the same CRC mode as other devices on the link. If the CRC mode is set incorrectly, the analyzer will misinterpret the Serial FPDP traffic it captures.
5. Select the "Filter Idle Frames" checkbox to remove all Serial FPDP idle frames, which do not contain any data. See Appendix C, Serial FPDP Protocol, for more information on Serial FPFP frames.
6. Provide descriptive information, if desired, in the Description field on the defined filter settings for this channel.

7. Repeat steps 2 – 6 to define filter settings for the other channel.
8. Use the following buttons to perform the desired action:

OK.....Closes the Prefilter Settings dialog box and loads the settings into the hardware.

Cancel.....Closes the Prefilter Settings dialog box and discards any changes made.

Save .....Displays the Save Prefilter Settings dialog box for saving the defined filter settings to a disk file. The lower part of the dialog box lists the channels for which to save the filter settings and their descriptions. Channel descriptions can also be entered here. You can choose not to save a channel's filter settings by clearing the checkbox. Type a file name in the File name field and click on the **Save** button. The filter settings for the selected channels are saved to a file with the **.FLT** extension.

Load.....Displays the Load Prefilter Settings dialog box for selecting previously saved filter settings and loading them into the hardware. Select the desired file and click on it. The lower part of the dialog box lists the channels for which filter settings are defined. Only channels that are selected are loaded from the disk file into the indicated destination when you press the **Open** button. To clear a channel, click on the desired channel and select None in the menu. A channel can be loaded into the same channel from which it was saved or any other available channel listed in the Destination menu.

Clear .....Clears all parameters for the selected channel(s). Select a channel by clicking on it in the list. Select both channels using Ctrl-click or Shift-click.

Clear All .....Clears filter settings for all channels.

Copy Channel.....Copies the parameters of the selected channel.

Paste Channel.....Pastes the copied parameters to the selected channel.

9. Click on the **OK** button to close the dialog box and load the settings into the hardware.

4.7 Determining Data to Capture

Before starting FXplorer, determine the data to capture. The software provides two ways to do this:

- Load an existing TRAC strategy
- Create a TRAC strategy

4.7.1 Using a TRAC Strategy

Using the TRAC Strategy Builder, you can create simple or complex capture strategies. Capture strategies can be configured without doing any programming.

If desired, you can save a capture strategy created by either method to a **.TRS** file to be reused in later capture sessions.

If the desired TRAC strategy has not been created, refer to **Creating a TRAC Strategy** in **Chapter 6 – TRAC Strategies** for more information on the TRAC Strategy Builder.

Select a previously saved TRAC strategy and load it into the TRAC Strategy dialog box by following the procedure in **Loading a TRAC Strategy** in **Chapter 6 – TRAC Strategies.**

4.7.2 Capturing Data

1. After the desired capture strategy has been loaded, select Start from the Analyzer pulldown menu. The channels begin capturing and storing data into a circular trace memory.

   During analyzer operation, the channel status bar shown in Figure 4-6 reports on the channels that you own if you selected Channel Status bar in the View pulldown menu. It shows a dynamic representation of Serial FPDP activity by channel.

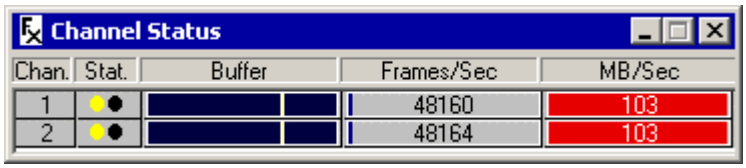


Figure 4-6 Channel Status Bar

The channel status bar shows the following data in real time:

Status.....Displays status lights for all models to indicate the operating status of each channel. The light on the left turns amber to indicate the channel is armed and black to indicate the channel is not armed. The light on the right turns red to indicate when the channel has triggered and black to indicate that the channel has not triggered.

Buffer .....Shows a dynamic representation of data in the buffer. The bar fills from left to right and starts over again from the left, displaying a line to indicate that the buffer has wrapped.

Frames/Sec .....Shows Serial FPDP frames per second, as appropriate for the data being captured.

MB/Sec .....Shows Serial FPDP megabytes per second, as appropriate for the data being captured.

The channel status bar can be repositioned on the screen or minimized, if desired. You can change the way the data is displayed in the channel status bar by clicking with the right mouse button on the channel status bar and displaying the Channel Status Settings dialog box shown in Figure 4-7.

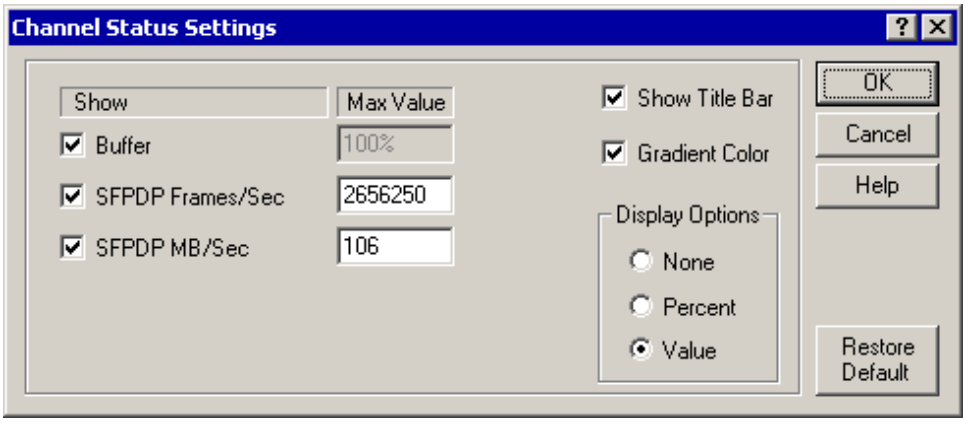


Figure 4-7 Channel Status Settings Dialog Box

a) Change the following settings as desired:

Show.....Disables/enables buffer and data type selections for SFPDP Frames/Sec or SFPDP MB/Sec as appropriate for the data being captured.
Max Value.....Indicates the highest value to be recorded in the channel status bar for a specific data type.
Show Title Bar.....Displays/hides the title bar in the channel status bar.
Gradient Color.....Causes the color to change based on the value.
Display Options.....Determines how the data is displayed within a bar. None shows the data as a horizontal bar, Percent shows the data as a percentage of the maximum value, and Value shows the data as a numeric value.

The **Restore Default** button restores all parameters to their default settings. The Max Value fields do not automatically update when the Capture Rate is changed.

b) Click on the **OK** button to save your changes and close the dialog box.

2. If desired, use the real-time performance-monitoring feature to graph data during analyzer operation. Refer to **Chapter 8 - Real-Time Performance Monitoring** for information on graph configuration.
3. In the Analyzer pulldown menu, select View Trace to end data capture and display trace data. The View Settings dialog box appears on the screen for selecting the trace view(s) and the channels to display the trace data. Refer to **Selecting Trace Data to View** in **Chapter 5 - Trace View Data** for more information.

4.8 Displaying Data

A variety of features are available for displaying trace data. You can display data in two views. More than one view of the same trace can be displayed on the screen at the same time. You can navigate to specific data in large traces quickly and easily using FXplorer's navigational tools. Refer to **Chapter 5 - Trace View Data** for more information.

4.9 Shutdown

1. To close the FXplorer software and return to the Windows desktop, do one of the following:
   - If not connected to any channels, select Exit in the File pulldown menu.
   - To disconnect the channels and exit the software, select Disconnect in the Analyzer pulldown menu and select Exit in the File pulldown menu.
   - To exit the software but keep channel connections, select Exit and Keep Channel Ownership in the File pulldown menu.



CAUTION: Ensure both channels are not being used before turning off power to the switch.

2. Turn the Serial FPDP Protocol Analyzer off by pressing the power switch on the back of the enclosure.

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5. TRACE VIEW DATA

5.1 Overview

Viewing traces is an important element of the data-capture process, and FXplorer provides numerous tools with which to do this. Navigation and channel management tools as well as various trace view features enable you to optimize the viewing environment.

5.1.1 Concepts and Definitions

The following terms are used throughout this chapter and should be understood:

Previously captured trace .....A trace that has already been saved.
Newly captured trace .....A trace not yet saved.
Current line .....The selected line (by time stamp) in the trace view.
Active trace (window) .....The front-most window when more than one window is displayed on the screen. The title bar in an active window is highlighted. Software functions, such as the search function, are performed on the active window only. Make another window active by clicking on it or selecting it in the Window pulldown menu, and it will move to the front-most position on the screen. In the Window pulldown menu, the active window is indicated by a checkmark.

5.2 Selecting Trace Data to View

You can select for viewing either a previously captured trace or a newly captured trace.

To view a previously captured trace:

1. In the File pulldown menu, select Open. The Open dialog box appears on the screen with a list of saved traces.
2. Select the desired trace to open and click on the **Open** button. The View Settings dialog box shown in Figure 5-1 appears on the screen.

To view a newly captured trace:

1. In the Analyzer pulldown menu, select View Trace or click on the View Trace icon in the tool bar to stop data capture and download the trace data to the host PC.
2. The View Settings dialog box shown in Figure 5-1 appears on the screen.

5.3 Configuring Trace views

There are several options for configuring a trace view in the View Settings dialog box. You can quickly and easily create a basic trace view configuration or use the advanced capability for organizing data captured by channels. Trace view configuration settings can be saved and reused.

NOTE: Refer to **Organizing Trace View Data** in this chapter for information on using the advanced Trace View capability.

For basic trace view configuration, do the following:

1. Access the View Settings dialog box shown in Figure 5-1.
    - For a previously saved trace, click on Open in the File pulldown menu and select a file in the Open dialog box.
    - For a newly captured trace, select View Trace in the Analyzer pulldown menu or click on the View Trace icon in the tool bar to stop data capture and download the data to the host PC.

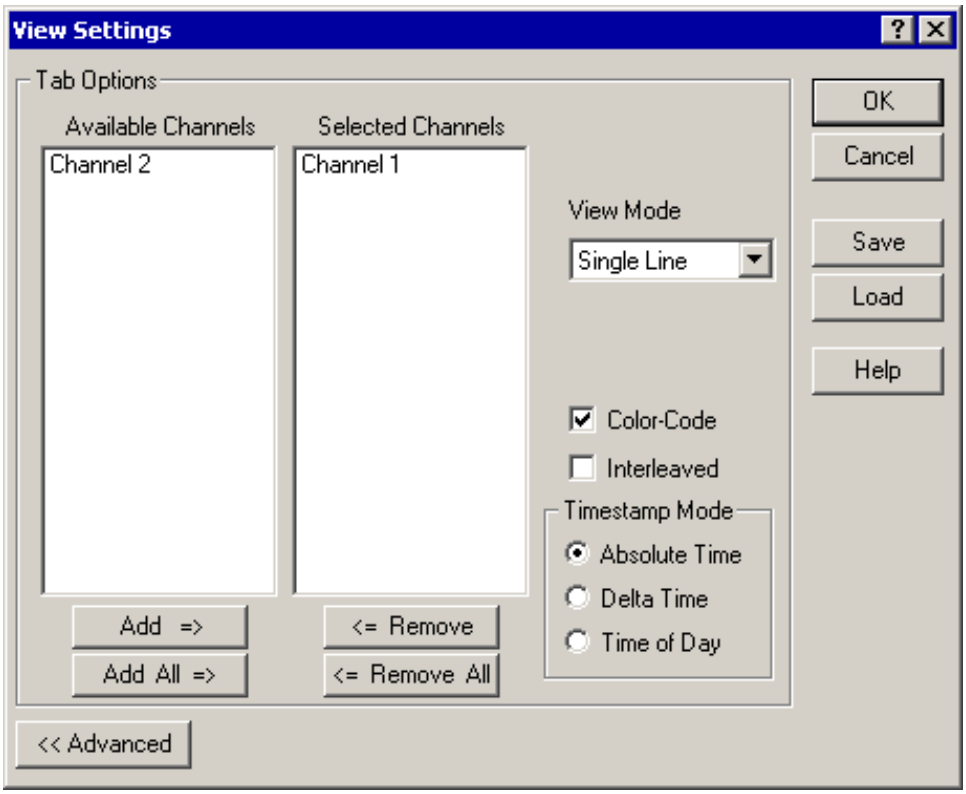


Figure 5-1 View Settings Dialog Box

2. In the Tab Options area, set the following parameters:

Channels

Add or remove a channel by clicking on the desired tab, selecting the channel, and then clicking on the button for the appropriate action. You can also add or remove a channel by double-clicking on it. To select both channels in the list, use Ctrl-click or shift-click.

View Modes

Select a trace view for viewing trace data. Refer to **Standard Trace Views** in this chapter for more information on each view.

Single Line View Mode

Displays all primitives and frame activity on a single line in the trace view.

Multi Line View Mode

Displays Serial FPDP primitives and frames on multiple lines in the trace view.

Color-Code

If enabled, displays each channel in the tab in a different background color.

Interleaved

If enabled, arranges data by event; if disabled, arranges data by channel. For more information, refer to **Arranging Data by Channel or Event** in this section.

Time Stamp Modes

Select one of the following:

Absolute time..... Indicates the time the event occurred relative to when trace recording was started. The time stamp for each event is shown as seconds/milliseconds/ microseconds/nanoseconds. This is the default time stamp mode.

Delta time ..... Indicates the duration of that line or the time from when the line was recorded until the next line was recorded for that channel. Each time stamp indicates the duration of its entry. The time stamp for each event is shown as seconds/milliseconds/microseconds/nanoseconds.

Time of day..... Indicates the actual time and day the event occurred. The time stamp for each event is shown as year/month/day and hours/minutes/seconds/ milliseconds/microseconds/nanoseconds.

3. Use the following buttons to perform the desired action:

OK.....Closes the View Settings dialog box and displays the defined configuration in the trace view.

Cancel.....Closes the View Settings dialog box and discards any changes made.

Save .....Displays the Save View Settings dialog box for saving the trace view configuration as a **.VSF** file.

Load .....Displays the Load View Settings dialog box for loading a trace view configuration containing previously saved trace view parameters.

4. Click on the **OK** button to close the dialog box. The trace view reflects the defined configuration. When a trace is displayed on the screen, you can change the view options by doing the following:
    - Select Trace View Settings from the Trace View pulldown menu and change the configuration in the Trace View dialog box.
    - Right click on the trace and select the desired option: Change Format to change the view mode; View Options to enable/disable Interleaved and Sub-columns, select a Time Stamp Mode, to add or remove channels from a selected tab, or to isolate an event; and Correlate Group to change the group to which a window is assigned.
    - Select Cascade or Tile from the Window pulldown menu to arrange the windows on the screen.

5.4 Trace Views

5.4.1 Overview

FXplorer organizes captured data into standard trace view displays for user analysis. You can change the display of the standard trace views with the View Settings dialog box and the Trace View pulldown menu.

Available views include the Multi Line view and the Single Line view. Each trace view consists of a trace data pane on the left and a histogram pane on the right.

A trace view shows the time stamp for each event, the channel that the event occurred on, and the specific event.

5.5 Standard Trace Views

5.5.1 Single Line View

The Single Line view displays Serial FPDP primitives and frame activity on a single line in the trace view. Figure 5-2 shows an example of the Single Line view.

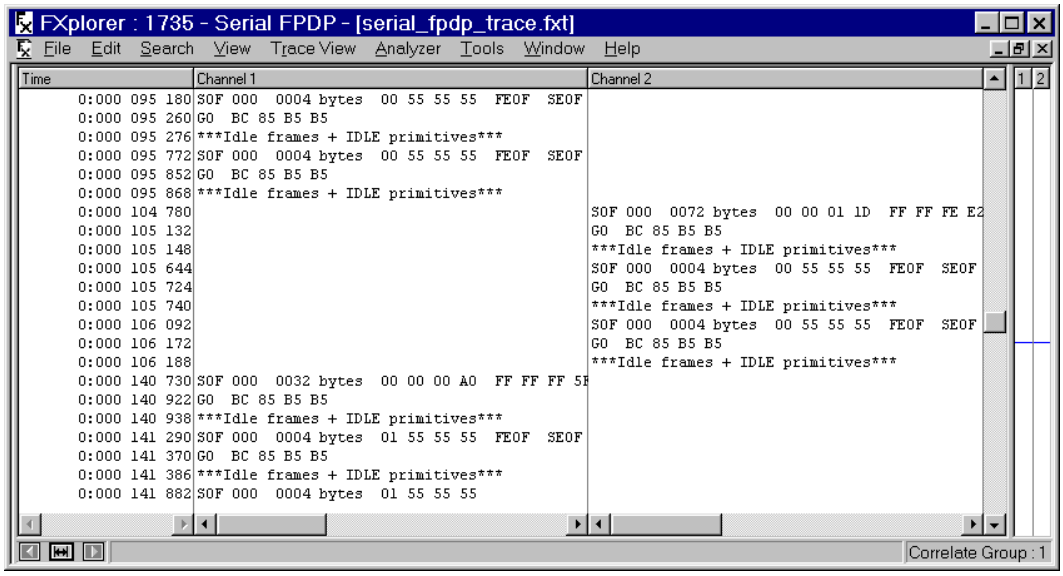


Figure 5-2 Single Line Trace View

5.5.2 Multi Line View

The Multi Line view displays Serial FPDP primitives and frame activity on multiple lines in the trace view. Figure 5-3 shows an example of the Multi Line view.

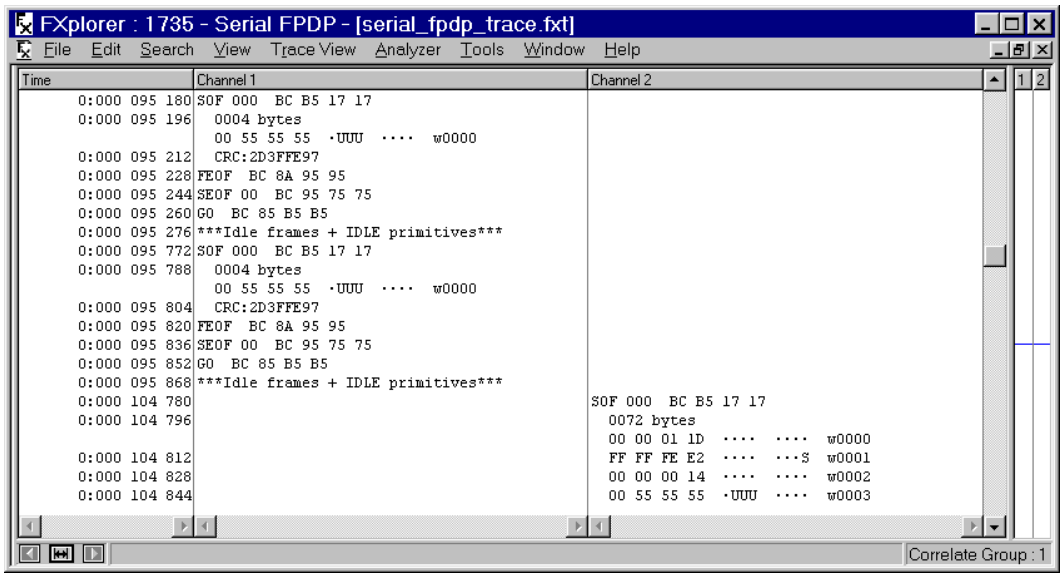


Figure 5-3 Multi Line Trace View

5.6 Trace View Options

5.6.1 Time Stamp Modes

The time stamp in a trace view can be displayed in the following modes:

Delta time .....Indicates the duration of that line or the time from when the line was recorded until the next line was recorded for that channel. Each time stamp indicates the duration of its entry. The time stamp for each event is shown as seconds/ milliseconds/microseconds/nanoseconds.

Absolute time.....Indicates the time the event occurred relative to when trace recording was started. The time stamp for each event is shown as seconds/milliseconds/microseconds /nanoseconds. This is the default time stamp mode.

Time of day.....Indicates the actual time and day the event occurred. The time stamp for each event is shown as year/month/day and hours/minutes/seconds/milliseconds/microseconds /nanoseconds.

To change the time stamp mode, do one of the following:

- Click on the Trace View pulldown menu and select Time Stamp Modes. Click on the desired time stamp mode in the menu: Delta Time, Absolute Time, or Time of Day.
- Right click in the current trace view to display a pulldown menu from which you can select the desired time stamp mode.
- In the View Settings dialog box, select the desired time stamp mode from the menu.

5.6.2 Channel Labels

If you labeled channels during analyzer configuration, the trace views and histogram display these labels.

You can assign labels or change the labels in a trace view by doing the following:

1. When a trace view is visible on the screen, select Trace Channel Labels in the Edit pulldown menu. The Label Channels dialog box appears on the screen.
2. Type the label for the corresponding channel.



NOTE: Although you can enter more text than is visible in the data entry field in the Label Channels dialog box, very long labels are difficult to view in their entirety in trace views.

3. Click on the **OK** button to close the dialog box.

Assigning or changing labels in the trace view does not affect FXplorer dialog boxes.

5.6.3 A Different View of the Same Trace

When a trace view is displayed on the screen, you can replace that view with another view of the same trace by doing one of the following:

1. Select the Trace View pulldown menu, click on Change Format, and select the desired view.
2. Right click in the active trace view, select Change Format in the pulldown menu, and click on the desired view.

5.6.4 Multiple Views of the Same Trace

Displaying multiple views of the same trace enables you to view the same information on a variety of levels. For example, you can display both the Single Line view for a frame activity on the Serial FPDP link and the Multi Line view showing Serial FPDP primitives and frames. Both views of the trace can be displayed on the screen at the same time.

Multiple trace views can be displayed on the screen in the following ways:

1. In the View Settings dialog box that appears before viewing new trace data or when selecting a previously saved trace, select the desired view mode when adding channels to a tab. To view those same channels in a different view mode, either add another tab to the same window and select a different view or add those same channels to a tab in a different window and select a different view.
2. When a trace view is displayed on the screen, add another window in a different trace view by doing the following:
    - In the Window pulldown menu, select New Window. A copy of the active trace view appears in a new window on the screen.
    - Change the view of the new window by right clicking in the trace view, selecting Change Format in the pulldown menu, and clicking on the desired view or by clicking on the Trace View pulldown menu and selecting the desired view in the Change Format menu.

Trace view windows in the same group are time correlated to the active window. For more information on this feature, refer to **Time Correlating Trace View Windows in a Group** in this chapter.

5.6.5 Event Data in Subcolumns

FXplorer's subcolumn option enables you to arrange event data in columns as shown in Figure 5-4. It also allows you to expand the width of the desired column of data to the widest line of data in that column so that you can see the data in its entirety without having to scroll back and forth.

To use the subcolumn option, select Subcolumns in the View pulldown menu. FXplorer displays event data in the active trace view in resizable columns. Resize the desired column to its maximum width by double-clicking on the column header. To return the column to its default width (20 characters wide), double-click on the column header again.

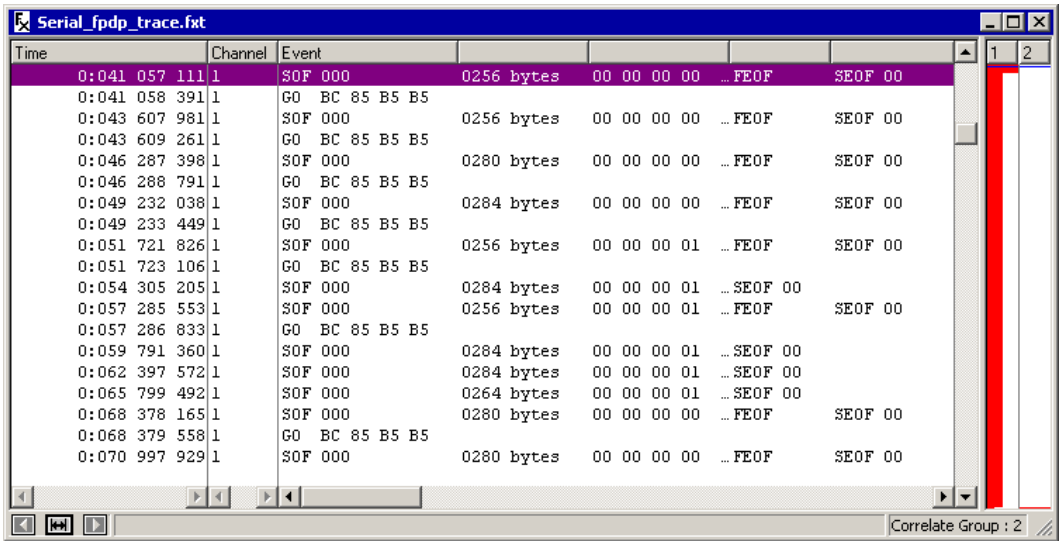


Figure 5-4 Example of a Trace View Display Using Subcolumns

5.6.6 Time Correlating Trace View Windows in a Group

FXplorer assigns trace view windows to a group when they are displayed on the screen. Trace view windows (different views of the same trace and/or channels displayed in separate windows) in the same group are time correlated; the current line in all trace view windows in the group track with the current line in the active trace view window by time stamp. When you select the current line in the active trace view window, the current line in the other trace view windows goes to the same time stamp or to the closest time stamp that is less than the time stamp of the current line in the active window.

When you display a trace view window on the screen, it is assigned to Group 1 (the default), and all other trace view windows displayed are also assigned to Group 1. The group to which a trace view window is assigned is identified in the status bar.

Assign the active trace view window to a new group by doing one of the following:

- Right click in the window and select New Group in the Correlate Group menu.
- Select Correlate Group in the Edit pulldown menu. Click on New Group.

The active trace view window is assigned the next group number in the sequence.

Change the group to which the active trace view window is assigned by doing one of the following:

- Right click in the window and select Change Group in the Correlate Group menu. Select one of the groups listed.
- Select Correlate Group in the Edit pulldown menu and select Change Group in the Correlate Group menu. Select one of the groups listed.

The active trace view window is assigned to the selected group.

5.6.7 Multiple Traces

Displaying multiple traces on the screen enables you to compare different trace data in the same view. When a trace view is displayed on the screen from either a previously captured trace or a newly captured trace, you can display other views from other traces by doing the following:

1. In the File pulldown menu, select Open. The Open dialog box appears on the screen.
2. Select the desired trace from the directory and click on the **Open** button. The View Settings dialog box appears on the screen. Indicate the view mode and channels to view. Click on the **OK** button, and the selected trace appears on the screen.

5.6.8 Isolate Event

The isolate event feature allows you to display trace data in a separate window for a selected event (frame, primitive, or error) for a specific channel. This feature is useful for reviewing a specific event in the trace view, for example, for examining the occurrence of an error.

When a trace view is displayed on the screen from either a previously captured trace or a newly captured trace, you can display the event window similar to that shown in Figure 5-5 by doing one of the following:

- Double-click on the desired event in the trace view.
- Select the desired event in the trace view and select Isolate Event in the Trace View pulldown menu.
- Select the desired event, right click in the trace view, and select Isolate Event from the View Options menu.

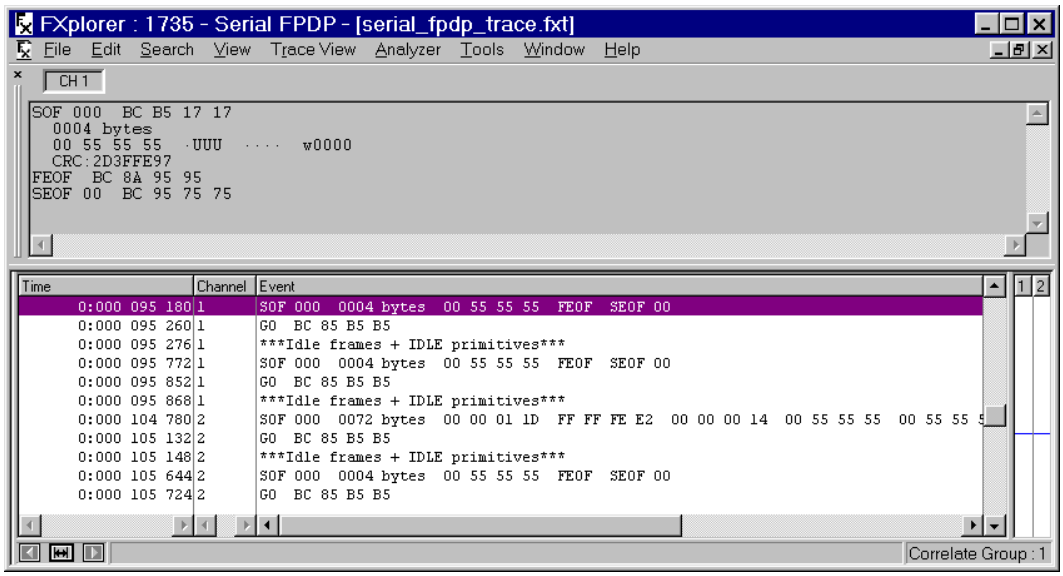


Figure 5-5 The Event Window Showing the Single Line View (Interleaved) for Channel 1

Use the following guidelines when viewing trace data in the event window:

- To change the data or the channel in the event window, click in the trace view on a different channel and/or a different location in the trace view.

- Scrolling through the trace view changes the data in the event window. When there is no data to display for the selected channel, the event window displays data for the channel on the left if there is one or the channel on the right if there isn't until the selected data has data to display. The channel for which data is being displayed is identified in the event window header.
- The event window can be moved to another location on the screen as desired. For precise control when moving the window, click in the header and press the Ctrl key while dragging the window to the desired location. To dock the window to an edge of the FXplorer screen, click in the header and drag the window to an edge of the screen. The next time the software is started and the trace is displayed, the event window appears at its last designated location.
- You can resize the window by dragging the bottom edge up or down until the window is the desired size.

5.7 Navigational Tools

5.7.1 Overview

Looking for a specific event in a large trace view can be time consuming and frustrating. A variety of tools are available for quick and easy navigation through a trace view. Navigational tools range from basic Windows tools to more powerful tools, such as bookmarking and searching for a trigger or a specific frame or primitive.

5.7.2 Windows Tools

Move through a trace using any of the following Windows tools:

Up and down arrow keys	Moves the current line from time stamp to time stamp.
Page Up and Page Down keys	Moves the current line one screen at a time.
Scroll bar	Scrolls vertically or horizontally to show a hidden part of the trace view. When navigating through a trace using the scroll bar, you can easily return to the current line by pressing the arrow keys.
Clicking on the histogram	Causes the trace view to move the nearest time stamp corresponding to the point clicked in the histogram to the top of the view window.

5.7.3 Go To Time Selection

The Go to Time selection allows you to go to a specific time stamp in the active trace view by doing the following:

1. In the Search pulldown menu, select Go to Time. A dialog box appears on the screen.
2. Enter a time stamp in the desired format to go to (for example, 3.789823510 or 3:789823510).
3. Click on the **OK** button, which moves the time stamp to the top of the view window. If an approximate time stamp is entered, the nearest time stamp value moves to the top of the view window.

5.7.4 Histogram

The histogram shows channel activity by time stamp for a specific channel and is time correlated to the trace view. Because the histogram is live, you can click on an interesting area, causing the trace view to move the nearest time stamp corresponding to the point clicked in the histogram to the top of the view window. Time is represented as a thin, horizontal line in the histogram as a guide to where you are in the trace view. Drag the left side of the histogram to the right to hide it.

5.7.5 Bookmarking

Bookmarking allows you to mark a specific line in an active trace view and easily return to it at any time.

ADD A BOOKMARK

Add a bookmark to an active trace view by doing the following:

1. Select the line in the trace view in which to place the bookmark.
2. Press B or right click in the active trace view and select Add Bookmark in the Bookmarks menu or select Add Bookmark from Bookmarks in the Edit pulldown menu.
3. You can add descriptive information on the bookmark by doing the following:
   a) Right click on the bookmark and select Bookmark List from the Bookmarks menu. The Bookmark List dialog box shown in Figure 5-6 appears on the screen.

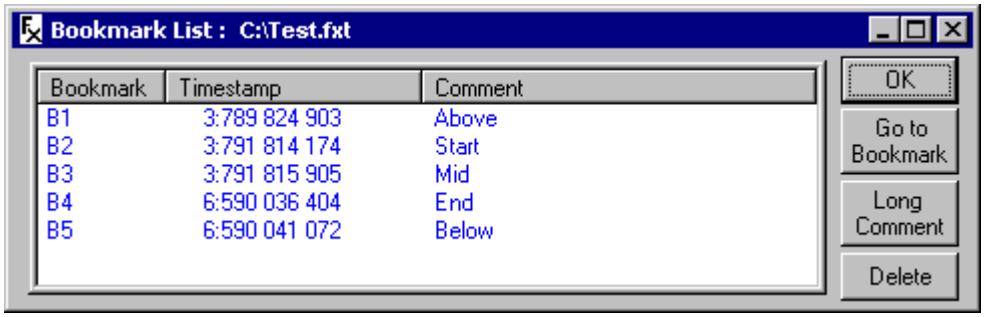


Figure 5-6 Bookmark List Dialog Box

   b) Enter information in the Comment field describing the bookmark.
   c) Click on the **OK** button to close the dialog box.

A bookmarked line in a trace view is gray. In another view of the same trace, the line with the time stamp closest to that in the bookmarked line is light gray.

EDIT A BOOKMARK

Edit a bookmark by doing the following:

1. Right click in the active trace view and select Bookmark List in the Bookmarks menu or select Bookmarks in the Edit pulldown menu to display the Bookmark List dialog box. Each bookmark assigned to the active trace is listed in the Bookmark List dialog box.
2. Place the cursor in the Comment field to edit the description or click on the **Long Comment** button to display the Edit area to type a longer description of the bookmark.
3. Click on the **OK** button to close the Bookmark List dialog box and save your changes.

DELETE A BOOKMARK

Delete a bookmark by doing the following:

1. Right click in the active trace view and select Bookmark List in the Bookmarks menu. The Bookmark List dialog box appears on the screen. Each bookmark assigned to the active trace view is listed in the Bookmark List dialog box.
2. Click on the desired bookmark to delete in the Bookmark field.
3. Press the **Delete** button.
4. Click on the **OK** button to close the Bookmark List dialog box and save your changes.

Another way to delete a bookmark is by doing the following:

1. Move to the line containing the bookmark in the active trace view.
2. Right click to display the pulldown menu and select Bookmarks or select Bookmarks in the Edit pulldown menu.
3. In either menu, select Delete, which will delete the bookmark from the current line.

GO TO A BOOKMARK

1. In the Search pulldown menu, select Go to Bookmark.
2. The Bookmark List dialog box appears on the screen.
3. Select the desired bookmark in the list.
4. Click on the **Go to Bookmark** button in the Bookmark List dialog box. The bookmarked line moves to the top of the trace view window.
5. Click on the **OK** button to close the Bookmark List dialog box or press the **Minimize** button in the upper-right corner of the dialog box to keep it available.

MARKING A LINE

When you mark a line in the active trace view, FXplorer software calculates the elapsed time between the marked line and the current line and indicates it (in seconds, milliseconds, microseconds, and nanoseconds) in the status bar at the bottom of the window as Time to Mark. When the current line is before a marked line, the time appears as a negative value, and when it is after a marked line, it appears as a positive value.

To mark a line, place the cursor on the desired line in the active trace view, and select Set Mark in the Edit pulldown menu. Each trace view for each channel on the screen can have its own mark. Marking another line in the trace view replaces the previously marked line. Closing the trace view removes the marked line.

To go to a marked line in a trace view, select Go to Marked Line in the Search pulldown menu. The marked line is displayed at the top of the trace view window.

5.8 Searching

5.8.1 Searching for a Trigger

To search for a trigger (if one exists), select Trigger from the Search pulldown menu or press F4. The cursor moves to the trigger location.

When a TRAC strategy is created, the trigger (if one is specified) is placed as soon as possible after the first occurrence. For example, suppose a TRAC strategy is created to look for PIO1 = 1, PIO2 = 0, DIR = 0 (i.e., SOF = 100), any data, any EOF, and any SEOF. The Serial FPDP Protocol Analyzer looks for a frame with SOF = 100, any data, any EOF, and any SEOF. Once this frame criteria is met, the analyzer goes to the trigger step. Thus, the trigger happens after the SEOF has been compared to the frame criteria and after a delay of a few more words because of signal propagation through the FPGA.

5.8.2 Searching for a Frame

To specify the data pattern for which to search and to initiate the search in the active trace view, do the following:

NOTE: The data filtering setting in the Prefilter Settings dialog box affects the search results. If your search does not yield the desired results, you may have filtered out too much frame data.

1. Select Search for Frame in the Search pulldown menu. The SFPDP Frame Search dialog box appears on the screen as shown in Figure 5-7.

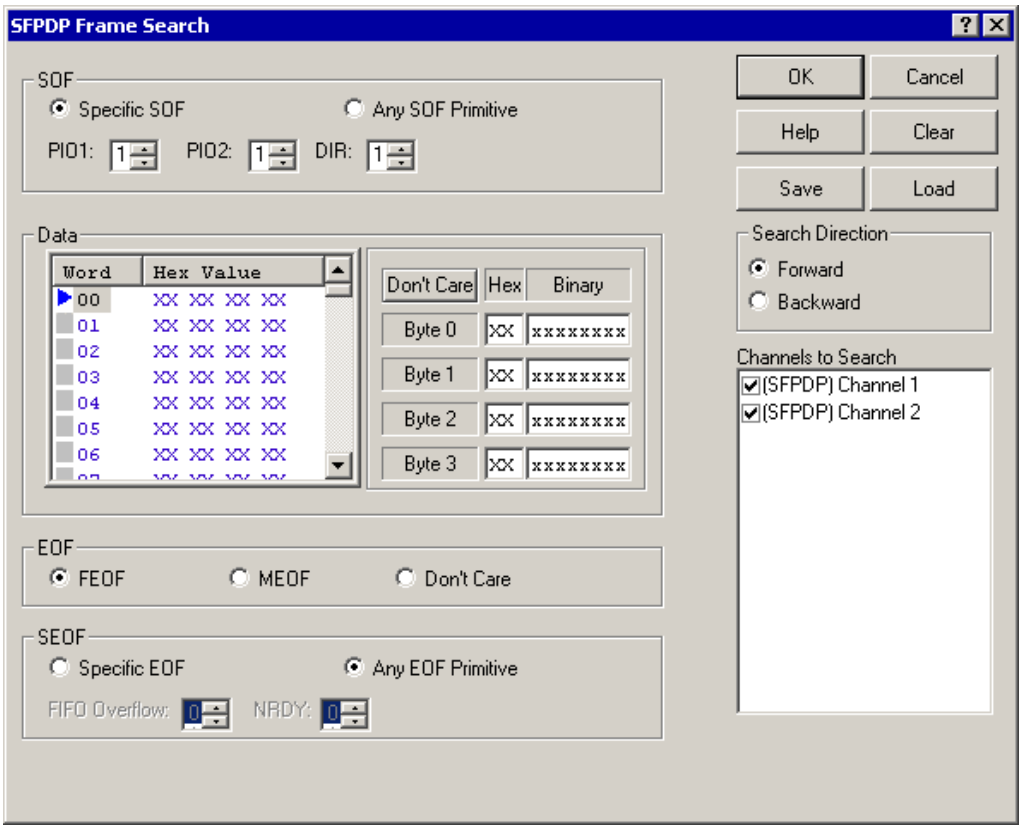


Figure 5-7 SFPDP Frame Search Dialog Box

2. Set the search parameters by doing the following:
   - **Select the desired channels.**

     In the Channels to Search list, click on the desired channel(s) to search.
   - **Select the search direction.**

     Select the direction in which to search in the trace view by clicking on the Backward or Forward radio button. Selecting Backward specifies a search from the current position in the trace view in a backward direction; selecting Forward specifies a search from the current position in the trace view in a forward direction.
   - **Define the data pattern for which to search in the SFPDP Frame Search dialog box.**

     As desired, define a data pattern in the SOF, Data, EOF, and SEOF areas of the dialog box. Refer to **SFPDP Frame Dialog Box** in **Chapter 7 - TRAC Strategy Builder Reference** for information on specific fields.

   Use the following buttons in the SFPDP Frame Search dialog box to perform the desired action:

   OK.....Closes the SFPDP Frame Search dialog box and initiates the search in the active trace view.
   Cancel.....Closes the SFPDP Frame Search dialog box and discards any changes made.
   Clear.....Sets the values to all x's, indicating "Don't Care" in all the fields in the SFPDP Frame Search dialog box. Searching for "Don't Care" causes the software to find the first frame in the specified search direction.
   Save .....Displays the Save Search Pattern dialog box for saving the search parameters. The file is saved with the **.FRM** extension.
   Load .....Displays the Load Frame dialog box for selecting a previously saved data pattern. Select the desired file name and click on the Open button. The search pattern defined in the selected file is loaded into the SFPDP Frame Search dialog box.

3. Click on the **OK** button to close the dialog box and initiate the search in the active trace view. The cursor moves to the first line that matches the search pattern. During the search process, you can cancel the search by pressing the **Cancel** button.

   Select Next in the Search pulldown menu (or press F3) to search for the next occurrence in the trace view. Select Prior in the Search pulldown menu (or press Shift-F3) to search for the previous occurrence in the trace view.

5.8.3 Searching for a Primitive

To specify a primitive for which to search and to initiate the search in the active trace view, do the following:

1. Select Search for Primitive in the Search pulldown menu. The SFPDP Primitive Search dialog box appears on the screen as shown in Figure 5-8.

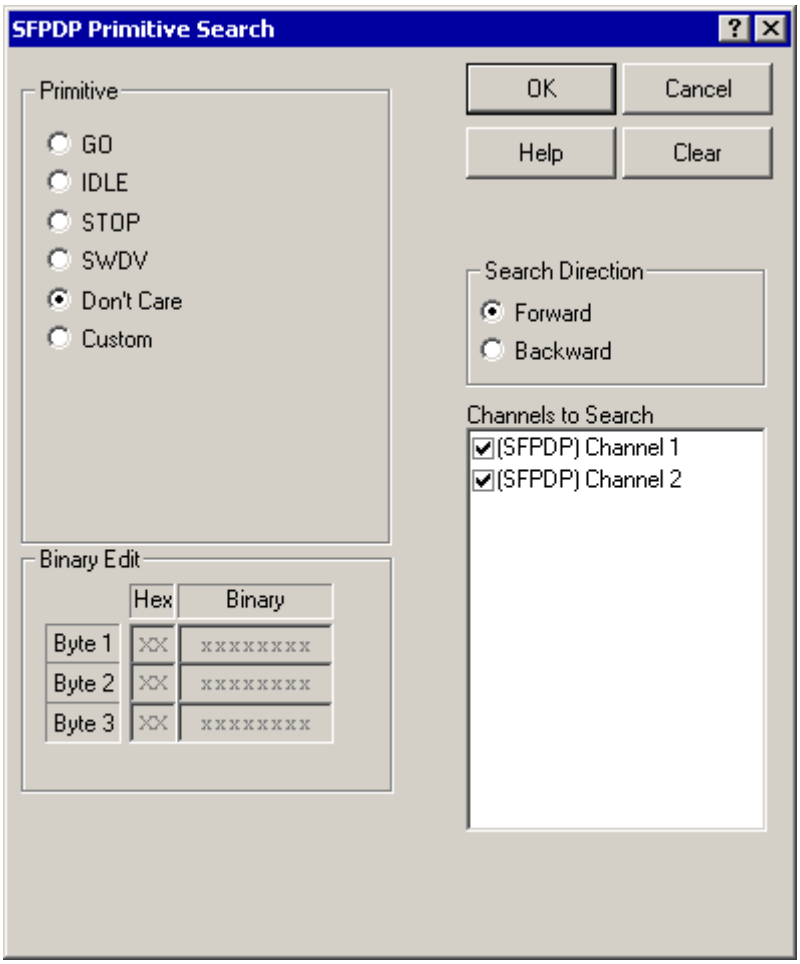


Figure 5-8 SFPDP Primitive Search Dialog Box

2. Define the search parameters by doing the following:
   - **Select the desired channels.**

     In the Channels to Search list, click on the desired channel(s) to search.
   - **Select the search direction.**

     Select the direction in which to search in the trace view by clicking on the Backward or Forward radio button. Selecting Backward specifies a search from the current position in the trace view in a backward direction; selecting Forward specifies a search from the current position in the trace view in a forward direction.
   - **Select the primitive.**

     Indicate the desired primitive for which to search in the SFPDP Primitive Search dialog box. Refer to **SFPDP Primitive Dialog Box** in **Chapter 7 - TRAC Strategy Builder Reference** for information on specific fields.

Selecting “Don’t Care” causes the software to find the first primitive (including SOF, EOF, or SEOF) in the specified search direction.

3. Click on the **OK** button in the SFPDP Primitive Search dialog box to close the dialog box and initiate the search in the active trace view. The cursor moves to the first line that matches the search pattern. During the search process, you can cancel the search by pressing the **Cancel** button.

   Select Next in the Search pulldown menu (or press F3) to search for the next occurrence in the trace view. Select Prior in the Search pulldown menu (or press Shift-F3) to search for the previous occurrence in the trace view.

5.8.4 Searching for Errors

This feature allows you to search for errors in the active trace view. You can search for any combination of the following errors: invalid transmission words, loss of signal/synchronization, CRC errors, and latched errors.

To set parameters and initiate a search for errors in the active trace view, do the following:

1. In the Search pulldown menu, select Search for Error. The SFPDP Error Search dialog box appears on the screen as shown in Figure 5-9.

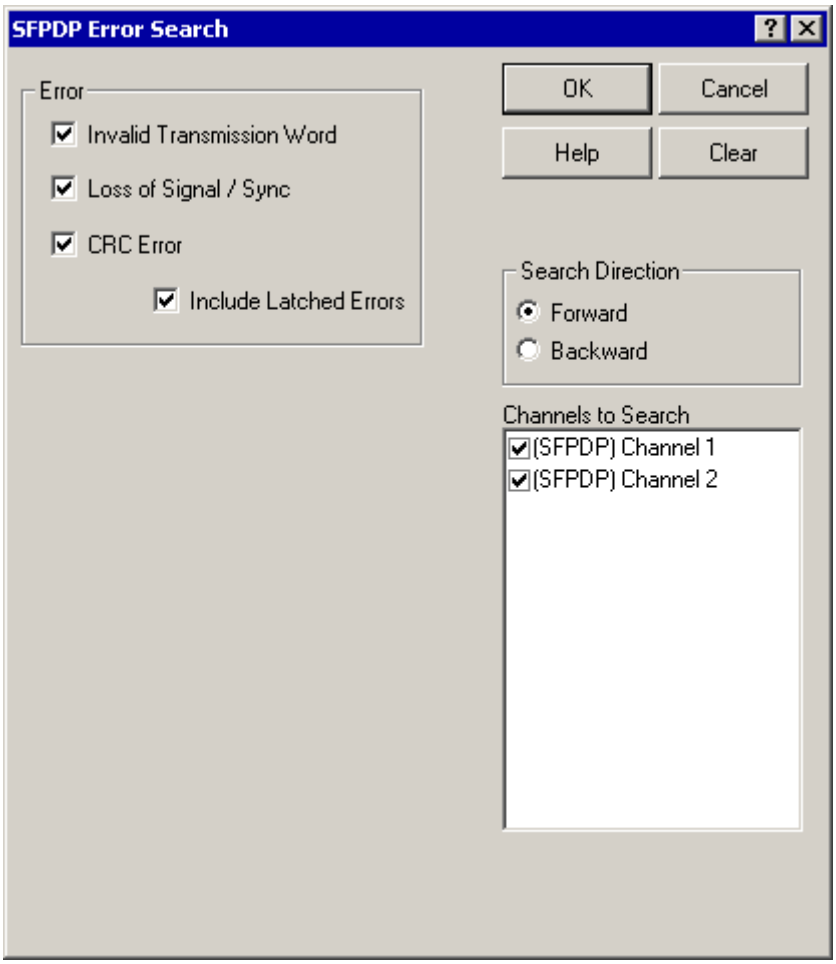


Figure 5-9 SFPDP Error Search Dialog Box

2. Define the following parameters:
   - **Select the desired channels**
     In the Channels to Search list, select the desired channel(s) to search.
   - **Select the search direction**
     Click on the Backward or Forward radio button to select the desired direction. Selecting Backward specifies a search from the current position in the trace view in a backward direction; selecting Forward specifies a search from the current position in the trace view in a forward direction.
   - **Select the error**
     If no errors are selected, FXplorer does not perform a search. Selecting Invalid Transmission Word and/or CRC Error and the Include Latched Errors field causes the software to search for the specific error and its latched counterpart. For example, if CRC and Include Latched Errors are both selected in the dialog box, FXplorer searches for CRC errors and CRC latched errors. Latched errors are errors detected while filtering.
3. Click on the **OK** button in the Error Search dialog box to close the dialog box and initiate the search in the active trace view. The cursor moves to the first line that matches the search pattern. During the search process, you can cancel the search by pressing the **Cancel** button.

   Select Next in the Search pulldown menu (or press F3) to search for the next occurrence in the trace view. Select Prior in the Search pulldown menu (or press Shift-F3) to search for the previous occurrence in the trace view.

5.9 Channel Management

5.9.1 Overview

Channel management is the ability to organize captured data so that it can be easily reviewed and analyzed. FXplorer provides tools to manage data captured, allowing you to customize the screen for optimum viewing. You can choose which channels to view, how to display channels, and how to arrange the data.

5.9.2 Organizing Trace View Data

FXplorer provides the capability of organizing trace view data for ease of data analysis. Using windows, tabs, and channels, you can determine which channel data to display and how it should be organized.

To organize trace view data, do the following:

1. Access the View Settings dialog box and define the desired parameters by following steps 1–3 in **Configuring Trace Views** in this chapter.
2. In the View Settings dialog box, click on the **Advanced** button to expand the dialog box.
3. The View Options area is similar to the contents pane in Microsoft Windows Explorer. The trace to be displayed is identified at the top followed by the windows assigned to the trace. Clicking on the plus sign preceding a window displays its contents and the tabs to which channels are assigned. Clicking on a tab displays in the Tab Options area the channels that are available and those that are assigned to the tab. Use the up and down arrow keys to move around the View Options area.

   Windows and tabs can be added and removed by clicking on the appropriate button. Change the tab label, as desired, to identify the contents of the tab in the trace view by clicking on it and typing a new name. A tab name can contain a maximum of 50 characters.

   Tabs can be rearranged by dragging and dropping them to a different window.
4. Clicking on the trace name displays the following parameters applicable to the entire trace display:
   - The Windows field determines how windows will be arranged on the screen:

     Cascade
     Arranges trace view windows on the screen so they overlap.

     Maximize/Tile
     Maximize is available when you have only one window selected. This selection maximizes the window on the screen to its largest size. Tile is available when you have more than one window selected. Selecting Tile arranges windows on the screen so they are all equally visible. For fewer than four windows, you can choose to tile them horizontally or vertically. If you have four or more windows, they will be automatically positioned.

     No Change in Position
     Maintains the previous window arrangement. This selection is available if trace view windows are already displayed on the screen.

Apply to All Traces

Applies the selected window arrangement (tile or cascade) to all windows in all traces, including any windows being added.

Save as Default Settings

Saves the settings in this screen and uses them as the new default settings.

All the windows in the display can be assigned to the same group or to different groups. Windows in the same group are time correlated with each other. The current line in all trace view windows in the group track by time stamp with the current line in the active trace view. Change the group to which a window is assigned by clicking on it and either selecting a group listed in Correlate Group or clicking on the New Group button and assigning the window to a new group. Refer to **Time Correlating Trace View Windows in a Group** in this chapter for more information.

5. Click on the **OK** button to close the dialog box. The trace view reflects the defined configuration. You can create any type of configuration to display channel data in the View Settings dialog box. The following are a few examples:
   - One window with a tab for each channel showing the same view mode.
   - Channels in separate windows, each having a tab for each view mode.
   - One window with a tab that shows one or two channels in a standard view mode and a tab that shows a channel or more in a customized trace view.

The View Settings dialog box in Figure 5-10 shows parameters defined to create a trace view comparing the data of two channels in the same view mode.

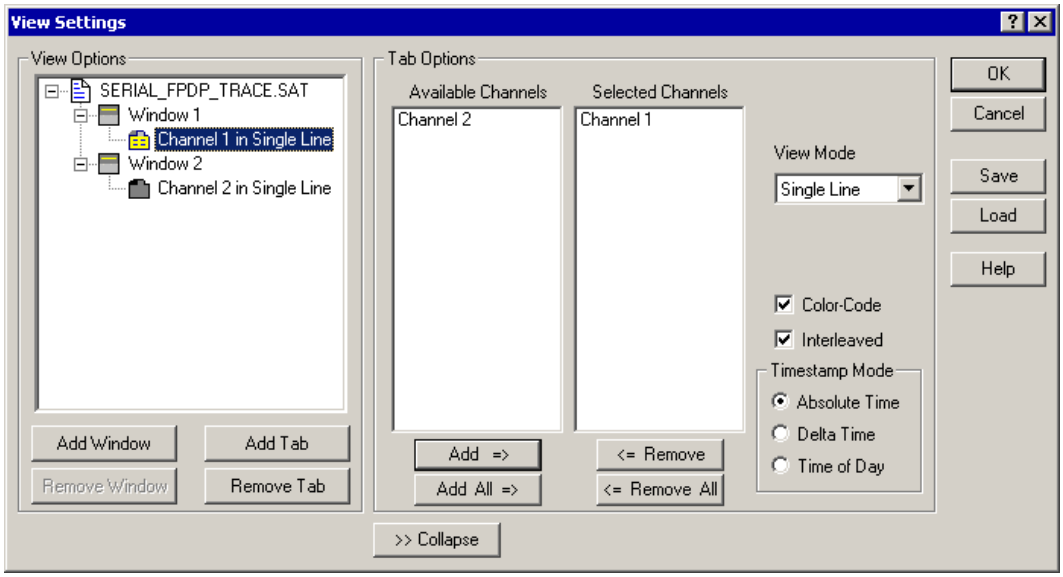


Figure 5-10 Defining a Trace View Configuration for Comparing the Data of Two Channels in the Same View

Clicking on a tab in a trace view brings that tab forward for viewing.

5.9.3 Selecting Channels to View

FXplorer offers the flexibility of capturing data on two channels and then displaying data for only one channel. You also have the option of removing a channel from or adding one to your configured trace display.

Select the channels for which to show data by doing the following:

- In the View Settings dialog box that appears before displaying a trace view, click on the desired channel to add to the tab. Click on the **Add** button. The selected channel appears in the Selected Channels list. Remove a channel from the list by selecting the channel to remove and clicking on the **Remove** button.
- When the trace view appears on the screen, add or remove a channel by clicking with the right mouse button and selecting View Options from the menu. Click on Add/Remove Channels. In the Add/Remove Channels dialog box, select the channel to add or remove. Click on the button for the desired action and then on the **OK** button to close the dialog box.

5.9.4 Arranging Data by Channel or Event

In the Single Line trace view, data can be arranged either by channel or by event (interleaved). To interleave data, select Interleaved in the View Settings dialog box that appears before displaying a trace. The trace data appears similar to that shown in Figure 5-11.

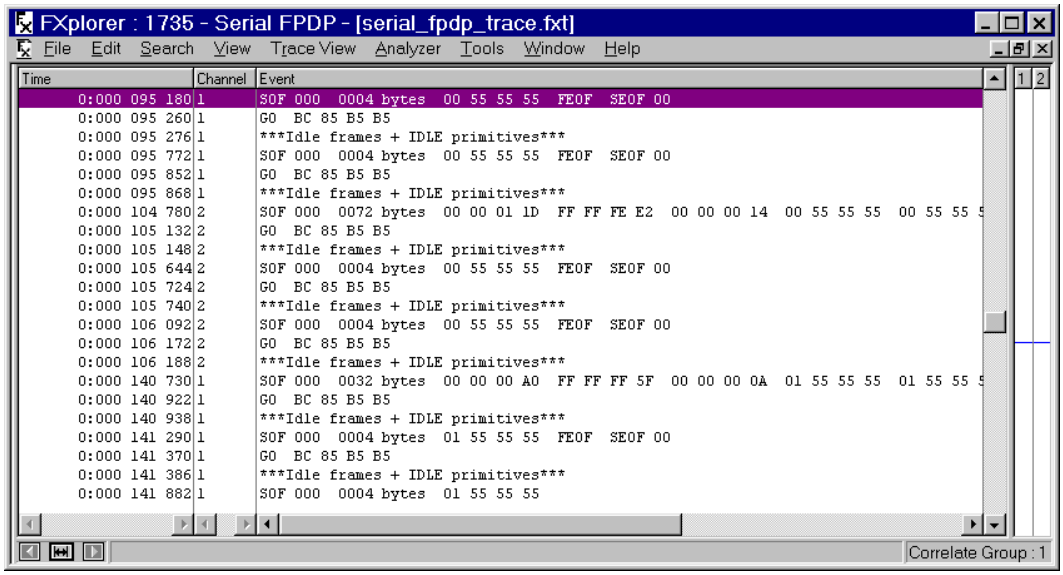


Figure 5-11 Interleaved Data in a Trace

5.9.5 Color-Coding Channels

To more easily view data downloaded from channels, you can display channel data in different colors. In the Trace View pulldown menu, select Color-Code Channels or in the View Settings dialog box, select Color-Code.

5.9.6 Rearranging Channels in a Trace View

When you are viewing data by channel in a trace view, you can rearrange the channels by clicking on the channel header and dragging and dropping it to the desired location in the trace view. To return the channels to their sequential order, select Reorder Channels in the Trace View pulldown menu.

5.10 Postfiltering

Postfiltering is the process of filtering data after it has been captured. It involves filtering out or keeping the frames and primitives indicated in the Postfilter Settings dialog box and displaying the results in a new trace view. Postfiltering is most useful when looking for errors that occur infrequently and where the nature of the error is not known in advance. In this case, you may choose to capture a trace with no prefiltering, using one or more iterations of postfiltering to identify and locate the error.

The postfilter engine filters frames and primitives based on the throw or keep option. All items indicated in the Throw list are discarded unless you have indicated exceptions; everything else is saved. Conversely, all items indicated in the keep list are saved unless you have indicated exceptions; everything else is discarded.

Set postfiltering parameters by doing the following:

1. Select Postfilter Settings in the Tools pulldown menu. The Postfilter Settings dialog box shown in Figure 5-12 appears on the screen.

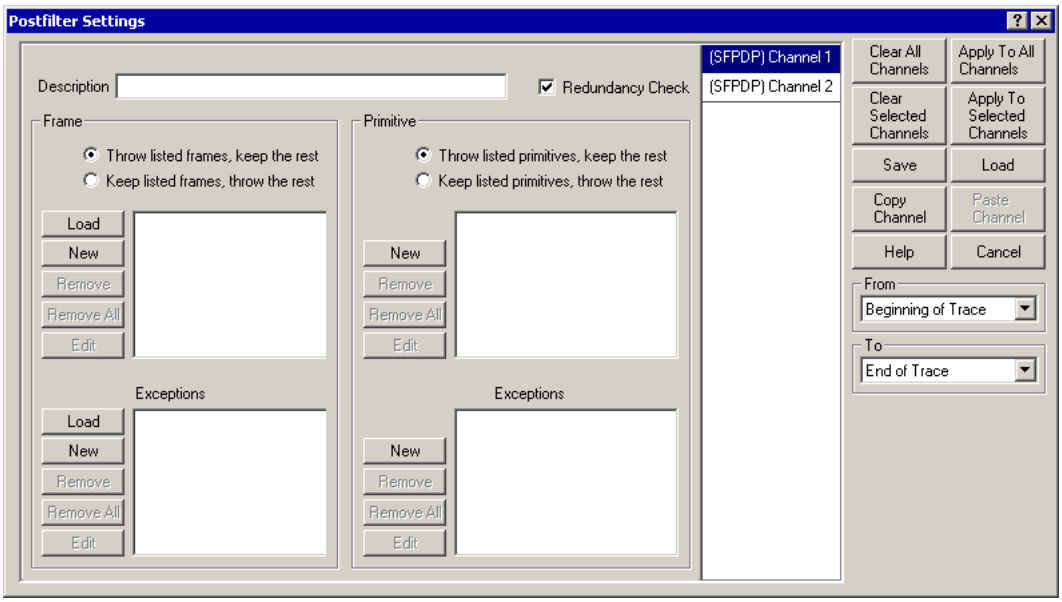


Figure 5-12 Postfilter Settings Dialog Box

2. In the channel list, click on the desired channel for which to define filter settings.
3. Click on the appropriate radio button for the desired action: throw the listed frames or primitives away or keep the listed frames or primitives
4. Indicate the desired frames and primitives to keep or throw away and any exceptions in the appropriate lists, using the following buttons:

   Load (frame filtering only)

   Loads previously saved frame parameters, which are listed as an item in the Throw or Keep list. Refer to **SFPDP Frame Dialog Box** in **Chapter 7 - TRAC Strategy Builder Reference** for more information on saving frame parameters.

   New

   Displays a dialog box for defining the desired frame or primitive. Refer to **SFPDP Frame Dialog Box or SFPDP Primitive Dialog Box** in **Chapter 7 - TRAC Strategy Builder Reference** for more information on the specific dialog

box. Clicking on the **OK** button returns you to the Postfilter Settings dialog box and adds the specified parameters to the appropriate list.

Remove

Removes the selected item from the list.

Remove All

Removes all items from the list.

Edit

Displays the appropriate dialog box for editing parameters for the selected item in the list.



NOTE: If the **Throw** radio button is selected, the frames/primitives indicated in the list box will be thrown away except for those placed in the Exceptions list, which will be kept. If the **Keep** radio button is selected, the frames/primitives indicated in the list box will be kept except for those placed in the Exceptions list, which will be thrown away.

5. Provide descriptive information, if desired, in the Description field on the defined filter settings for this channel.
6. Enabling Redundancy Check causes the software to check the defined filtering parameters for redundancy when you press the **Apply To All Channels** button, the **Apply To Selected Channels** button, or when you select another channel. If any redundant parameters have been defined, a message appears indicating this. Redundant parameters slow down the trace data filtering process.
7. Repeat steps 2-6 to define filter settings for the other channel. You can copy parameters from one channel and paste them to the other channel using the **Copy** and **Paste** buttons.
8. Use the following buttons in the Postfilter Settings dialog box to perform the desired action:

Clear All Channels

Clears the filter settings for both channels. A prompt appears confirming that you want to do this.

Clear Selected Channels

Clears the filter settings for the selected channel. Select a channel by clicking on it in the list. Select both channels using Ctrl-click or Shift-click. A prompt appears confirming that you want to do this.

Save

Displays the Save Postfilter Settings dialog box for saving the defined filter settings to a disk file. The lower part of the dialog box lists the channels for which to save the filter settings and their descriptions. Channel descriptions can also be entered here. You can choose not to save a channel's filter settings by clearing the checkbox. Type a file name in the File name field and click on the Save button. The filter settings for the selected channels are saved as a **.PFT** file.

Copy Channel

Copies the parameters of the selected channel.

Apply to All Channels

Applies the filter settings to the other channel in the active trace view. A prompt appears warning that all primitives and frames will be thrown away for that channel having undefined filter parameters or when a channel has been defined to throw or keep all frames and primitives.

Apply to Selected Channels

Applies the filter settings to the selected channels in the active trace view. Select both channels using Ctrl-click or Shift-click. A prompt appears warning that all primitives and frames will be thrown away for those channels having undefined filter parameters or when a channel has been defined to throw or keep all frames and primitives.

Load

Displays the Load Postfilter Settings dialog box for selecting previously saved filter settings and loading them into the hardware. Select the desired file and click on it. The lower part of the dialog box lists the channels for which filter settings are defined. Only channels that are selected are loaded from the disk file into the indicated destination when you press the Open button. To clear a channel, click on the desired channel and select None in the menu. A channel can be loaded into the same channel from which it was saved or any other available channel listed in the Destination menu.

Paste Channel

Pastes the copied parameters to the selected channels. Select one channel by clicking on it in the list. Select both channels using Ctrl-click or Shift-click.

Cancel

Closes the Postfilter Settings dialog box and discards any changes made.

9. Select the channels to which filter parameters should be applied. Select one channel by clicking on it in the list. Select both channels using Ctrl-click or Shift-click.
10. Scroll through the From and To menus to select the desired data range to which the defined filter parameters will be applied.
11. Click on the **Apply to All Channels** or **Apply to Selected Channels** button, as desired, to apply the postfilter settings to the active trace view. The View Settings dialog box appears on the screen for selecting the desired trace view options for the postfiltered trace view. Clicking the **OK** button in the View Settings dialog box displays the filtered trace view as a subset of the active trace view with _Fx appended to the trace view name (x is a sequential number assigned to the filtered trace view). The filtered trace view is time correlated with the unfiltered trace view.
12. Closing the postfiltered trace view causes a dialog box to appear for changing the path, directory, and file name when saving this trace view. Clicking the **No** button closes the postfiltered trace view without saving it; clicking the **Yes** button saves the postfiltered trace view using the default path, directory, and file name; and clicking the **Browse** button allows you to make the desired path, directory, and file name changes in the Save As dialog box before saving it.

5.11 Copying Trace Data

Selected data in a trace view can be copied to a text file by doing the following:

1. Select a range of data in the trace view by either clicking with the mouse on the first and last lines of data to be copied or by pressing shift and the down arrow key to highlight the desired range of data.
2. Click on Copy in the Edit pulldown menu, press Ctrl C, or right click in the trace view and select Copy from the menu.
3. Using a text editor, paste the trace data into the desired document.

5.12 Saving Trace Data

5.12.1 Saving Data in Trace View Format

When a newly captured trace is displayed on the screen, any action that may cause the trace to be discarded (such as closing the trace, closing the software, or starting FXplorer) displays a prompt reminding you to save the trace. Click on **Yes** at the prompt to save the trace or **No** to discard it. If you select **Yes**, the Save Trace File dialog box appears on the screen as shown in Figure 5-13.

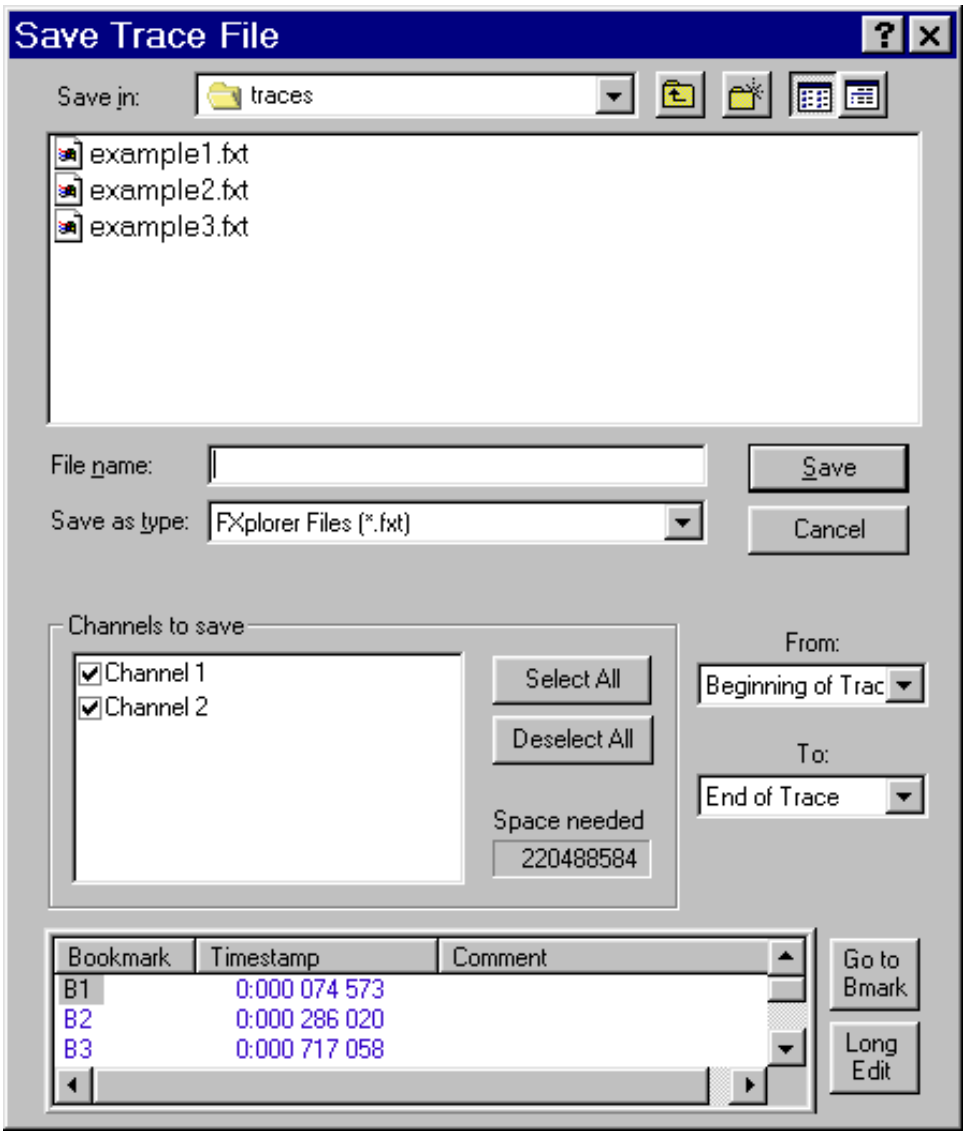


Figure 5-13 Save Trace File Dialog Box

You can also choose to save the trace by selecting Save As in the File pulldown menu or clicking with the right mouse button in the active trace view and selecting Save As in the menu.

Save the trace by doing the following:

1. Select the channels for which trace data should be saved. Select one or more channels by clicking in the check box for the selected channels. Select both channels by clicking on the **Select All** button, and deselect both channels by clicking on the **Deselect All** button. The Space Needed field indicates the amount of space required on your hard drive to save the selected range of trace data.
2. Select the trace data to save by scrolling through the From and To fields and selecting the desired range.
3. Highlight a bookmarked line in the trace view by double-clicking on the desired bookmark or by selecting the bookmark in the bookmark list view at the bottom of the dialog box and clicking on the **Go to Bmark** button.

   You can edit the bookmark comment by clicking in the Comment column for a single line description or by clicking on the Long Edit button to display the Edit area for a longer description. Changes are immediately made to the bookmark field and in the Bookmark List dialog box for the trace. If you are in the Edit area, click on the **Bmark List** button to return to the bookmark list view. In the bookmark list view, an asterisk in the comment section indicates that the comment has more than one line.



NOTE: The bookmark list view will only be displayed if bookmarks have been created.

4. Type a file name in the File name field and click on the **Save** button. The trace is saved as an **.FXT** file.

5.12.2 Saving Trace Data as a Text File

Trace data can be saved as a text file to be viewed and formatted using a text editor. Text files can also be viewed in spreadsheet programs, for example Microsoft Excel. To save trace data as a text file, do the following:

1. Display a trace view on the screen.
2. From the File pulldown menu, select Save To Text. The Save To Text dialog box appears on the screen as shown in Figure 5-14.

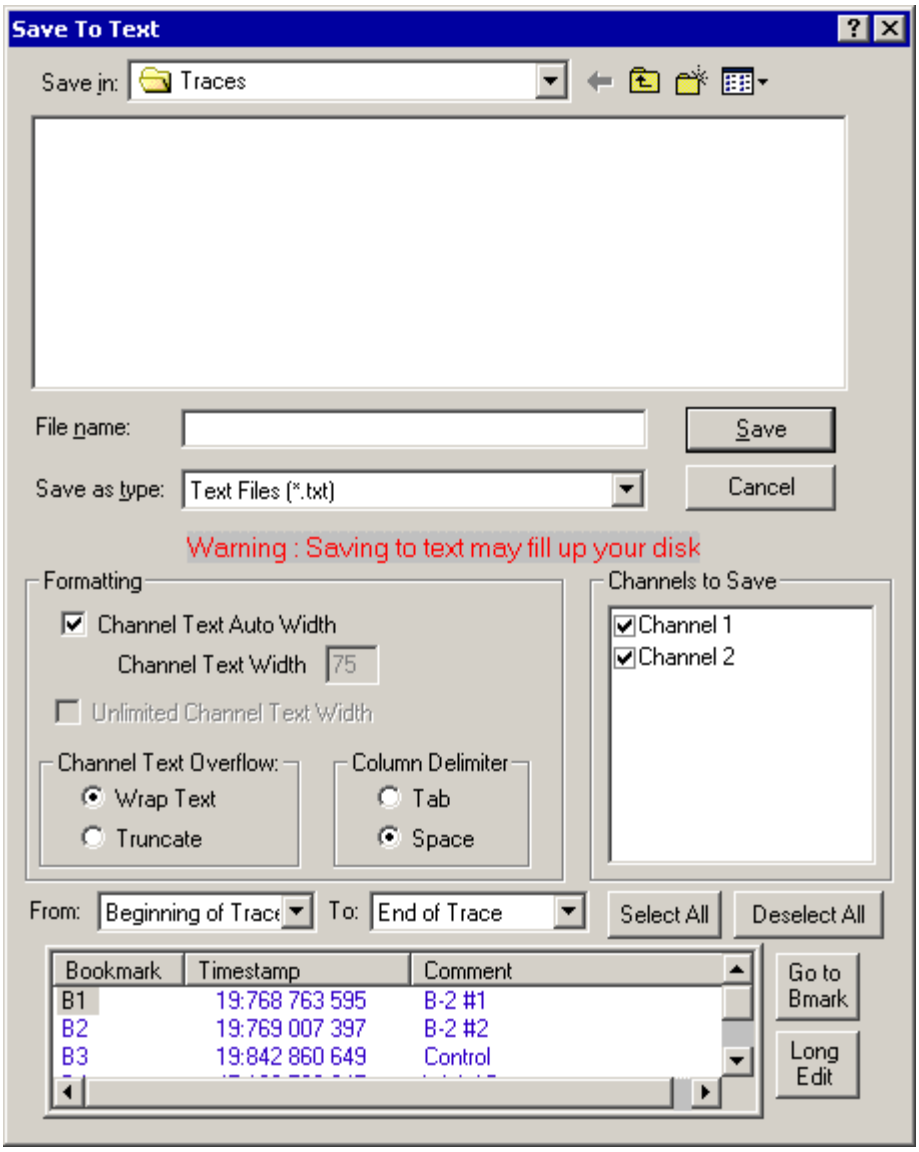


Figure 5-14 Save To Text Dialog Box

3. Define the formatting parameters:

Channel Text Auto Width

The text width of each channel can be automatically determined or a specific width can be indicated in the Channel Text width field.

Unlimited Channel Text Width

Allows for all of the text in each channel to be saved. By selecting this

option, no data is truncated or wrapped and the length of the text is unlimited.

Channel Text Overflow

Determines how text that is too long for the column should be handled. Wrap Text wraps text to the next line and Truncate cuts off text at the end of the column.

Column Delimiter

Separates the column with either a tab or a space. Selecting Tab allows you to modify columns to desired widths when using a text editor with the ability to adjust tabs (such as WordPad or Microsoft Word).

4. Select the channels for which trace data should be saved as a text file. Select one or more channels by clicking in the check box for the selected channels. Select both channels by clicking on the **Select All** button, and deselect both channels by clicking on the **Deselect All** button.
5. Select the trace data to save by scrolling through the From and To fields and selecting the desired range.
6. Highlight a bookmarked line in the trace view by double-clicking on the desired bookmark or by selecting the bookmark in the bookmark list view at the bottom of the dialog box and clicking on the **Go to Bmark** button.

   You can edit the bookmark comment by clicking in the Comment column for a single line description or by clicking on the **Long Edit** button to display the Edit area for a longer description. Changes are immediately made to the bookmark field and in the Bookmark List dialog box for the trace. If you are in the Edit area, click on the **Bmark List** button to return to the bookmark list view. In the bookmark list view, an asterisk in the comment section indicates that the comment has more than one line.



NOTE: The bookmark list view will only be displayed if bookmarks have been created.

7. Type a file name in the File name field and click on the **Save** button. The trace is saved as a **.TXT** file.

5.13 Printing Trace View Data

Print the desired trace view data by doing the following:

1. When a trace view is displayed on the screen, selecting Print in the File pulldown menu or the Print icon in the tool bar accesses the Print dialog box shown in Figure 5-15 for the currently active trace view. This dialog box displays the trace view title, including the channel arrangement (interleave or noninterleave) and the trace view displayed.

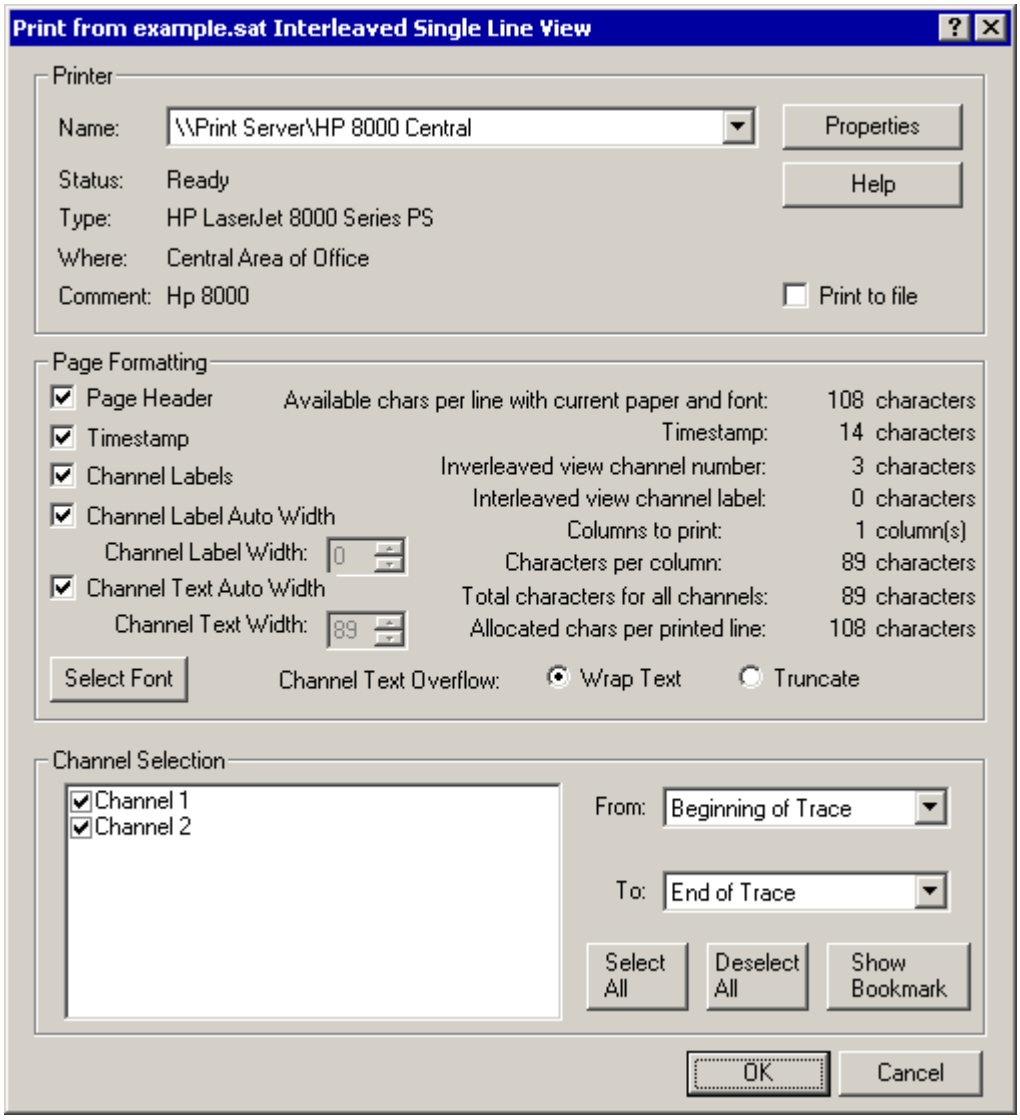


Figure 5-15 Print Dialog Box

2. Define the following parameters:

Properties

The available print space is determined by the default paper size (8-1/2 in. by 11 in.) and default page orientation (Portrait). To change either of these defaults, click on the Properties button and change them as desired.

Print to file

If desired, click on *Print to file* to save the trace data to a file rather than send the data to the specified printer. If *Print to file* is left unchecked, data will be sent to the printer when the **OK** button is pressed.

Page Formatting

Page Header ..... The page number, trace view title, date and time the trace data was printed, and column headers.

Time Stamp ..... The time stamp for each event in the selected trace view data.

Channel Labels..... If the interleave channel arrangement was selected for the trace view, the channel label selections are available. You can choose to print labels (if they have been assigned) for each channel and either let the width be automatically determined by the length of the longest channel label or indicate a specific width.

Channel Text ..... The text width of each channel can be automatically determined or a specific width can be indicated. Selecting Wrap Text (the default) allows text that is too long for the column to wrap to the next line; selecting Truncate cuts off text at the end of the column when it is too long for the column.

Select Font ..... Clicking this button accesses the Font dialog box for selecting a proportional font and type size in which to print the report. The default font is Courier New, size 9.

As you determine the format of the trace view data, the right column of the Page Formatting area reports the number of characters for the elements to be printed and the number of columns of channel data to print. The font size and style selected as well as the print space available defined in Properties determine the amount of available print space and is indicated by the value in *Available chars per line with current paper and font.*

Channel Selection

Select a channel by clicking in the check box for the desired channels from which to print data. Select both channels by clicking on the **Select All** button, and deselect both channels by clicking on the **Deselect All** button. By default, all channels are selected.

Data range to print

Select the range of trace data to print by scrolling through the From and To fields and selecting the desired range.

Bookmark list view

The **Show Bookmark** button displays the list of bookmarks from which you can choose. Highlight a bookmarked line in the trace view by double-clicking on the desired bookmark or by selecting the bookmark in the bookmark list view at the bottom of the dialog box and clicking on the **Go to Bmark** button.

You can edit the bookmark comment by clicking in the Comment column for a single line description or by clicking on the **Long Edit** button to display the Edit area for a longer description. Changes are immediately made to the bookmark field and in the Bookmark List dialog box for the trace. If you are in the Edit area, click on the **Bmark List** button to return to the bookmark list view. In the bookmark list view, an asterisk in the comment section indicates that the comment has more than one line.



NOTE: The bookmark list view will only be displayed if bookmarks have been created.

3. Click on the **OK** button to close the dialog box and send the trace view data to the printer. If the *Print to file* checkbox was selected, a dialog box appears for assigning a file name to the selected trace view data.

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6. TRAC STRATEGIES

6.1 Overview

A TRAC strategy is the software configuration of TRAC engines to make real-time decisions during channel monitoring. A TRAC strategy can be configured to perform such tasks as controlling triggering; controlling filtering; counting frames, primitives, events, or frame data words; timing events; and coordinating decisions across channels. A TRAC strategy (one for each channel) comprises a number of TRAC sequences. A TRAC sequence is a user-configured sequence of blocks that determines the decisions made by that channel's TRAC engines.

Using the TRAC Strategy Builder, you can customize your capture strategies, making them as simple or complex as desired. The TRAC Strategy Builder consists of a series of dialog boxes that guide you through the TRAC strategy creation process. Refer to **Creating a TRAC Strategy** in this chapter for more information.

6.2 How a TRAC Strategy Works

6.2.1 Overview

In the TRAC Strategy Builder, decision and action blocks as well as counters and messages can be configured to accomplish a specific purpose during analyzer operation.

6.2.2 Decision and Action Blocks

A decision block directs a TRAC engine to wait for a specific event; an action block specifies the condition(s) to be met before an action can occur or simply specifies an action to occur without meeting any prior conditions. THEN and OR block connectors link decision and action blocks in the TRAC sequence.

6.2.3 Counters

Counters can be added to a TRAC strategy for counting or timing purposes. FXplorer provides three types of counters: loop, time, and word. A maximum of 12 counters per channel (4 of each type) can be defined in a TRAC strategy. When a counter is added to a TRAC strategy in the Counter dialog box, the counter type is identified in the counter name. In the counter list in the TRAC Strategy Builder, an *L* preceding the name indicates a loop counter, *W* indicates a word counter, and *T* indicates a time counter.

All counters count up or down, depending on the initial value set in the Counter dialog box. The initial value is the value at which the counter starts after it is reset. If the initial value is set to 0, the counter counts up. If the initial value is not 0, the counter counts down.

A loop counter counts frames, primitives, or a sequence of events. It counts once each time the sequence requests. It increments, decrements, or resets when instructed to do so by an action block.

A time counter times an event or activity or provides a timeout or a delay in TRAC sequence execution. It is incremented or decremented by a system clock, and it can be started, stopped, or reset by an action block. The time measurement entered as an initial value for a time counter is interpreted by FXplorer as the number of system clock cycles. The system clock cycle is 37.6 ns for 1 Gb, 18.8 ns for 2 Gb, and 16 ns for 2.5 Gb.

A word counter counts frame data words. It can be used to measure the amount of traffic that matches specific criteria. It adds to or subtracts from the frame block the number of words in a frame when instructed by an action block to do so. If you have more than one frame in the sequence, a word counter increments or decrements by the number of words transferred in the last frame. Be sure that the word counter is incrementing or decrementing after the specific frame has been completed but before the next one begins. This can be accomplished by waiting for a frame. You can count frame data words within any type of frame. An action block can also be used to instruct the word counter to reset. When you reset the word counter, it goes back to the initial value. When setting an initial value for a word counter, be sure to include the eight words of overhead (frame header, CRC, EOF, and SEOF).

6.2.4 Messages

Eight messages (0–7) are available. A message is an incoming signal for which the TRAC sequence looks. An action block is used to specify which message to wait for and what to do when it is detected. A TRAC sequence can make decisions based on messages from one or more TRAC sequences. A TRAC sequence cannot determine which sequence sent the message, only that the message is sent.

6.2.5 Triggering

A TRAC strategy may or may not be configured to trigger. A trigger on any channel causes a trigger on all other channels being used, thereby eventually stopping capture on all channels. Data capture can stop immediately after the trigger, after an additional buffer's worth of data, or at some point in between. Placing the trigger at the end of the trace is accomplished by having the hardware stop data capture immediately after the trigger. A trigger position earlier in the trace is accomplished by having the hardware continue to capture more data after the trigger has occurred. The trigger position within the trace is independently controllable for each channel.

When a TRAC strategy is created, the trigger (if one is specified) is placed as soon as possible after the first occurrence. For example, suppose a TRAC strategy is created to look for PIO1 = 1, PIO2 = 0, DIR = 0 (i.e., SOF = 100), any data, any EOF, and any SEOF. The Serial FPDP Protocol Analyzer looks for a frame with SOF = 100, any data, any EOF, and any SEOF. Once this frame criteria is met, the analyzer goes to the trigger step. Thus, the trigger happens after the SEOF has been compared to the frame criteria and after a delay of a few more words because of signal propagation through the FPGA.

6.3 Creating a TRAC Strategy

6.3.1 Overview

General procedures are provided here for performing basic tasks in the TRAC Strategy Builder followed by a specific example illustrating the task. For a description of a specific dialog box, refer to **TRAC Strategy Builder Dialog Boxes** in **Chapter 7 – TRAC Strategy Builder Reference**. The examples shown in this section are included as **.TRS** files in the *HELP_EXAMPLES* subdirectory of the FXplorer software.

6.3.2 Configuring a Simple TRAC Strategy for a Single Channel

A simple one-channel TRAC strategy consists of a decision block and an action block. It tells the TRAC engine to wait for a specific event and then perform an action without triggering. Configure a simple TRAC strategy by doing the following:

1. Select TRAC Strategy in the Tools pulldown menu. Refer to **Selecting an Analyzer and Channels** in **Chapter 4 – Operation** for information on how channels are selected.

   Click on the button for the desired analyzer and click on the **OK** button. The TRAC Strategy Builder appears on the screen.
2. Select the desired channel for which to configure the TRAC strategy.
3. Select the desired decision block (Frame, Primitive, or Low Level Error) in the block menu and click on the Append button. The related dialog box appears on the screen. Configure the block and click on the **OK** button to close the dialog box.
4. Select the Action block in the block menu and click on the **Append** button. The Conditional and Action dialog box appears on the screen. Configure the block to perform an action by leaving the setting on the DO selection and selecting an action from the action list in the right column. Click on the **OK** button to close the dialog box.
5. Leave the *Auto add trigger at the end of sequence* checkbox selected.
6. Identify the channel configuration in the Description field, if desired.

Figure 6-1 shows an example of a simple TRAC strategy.

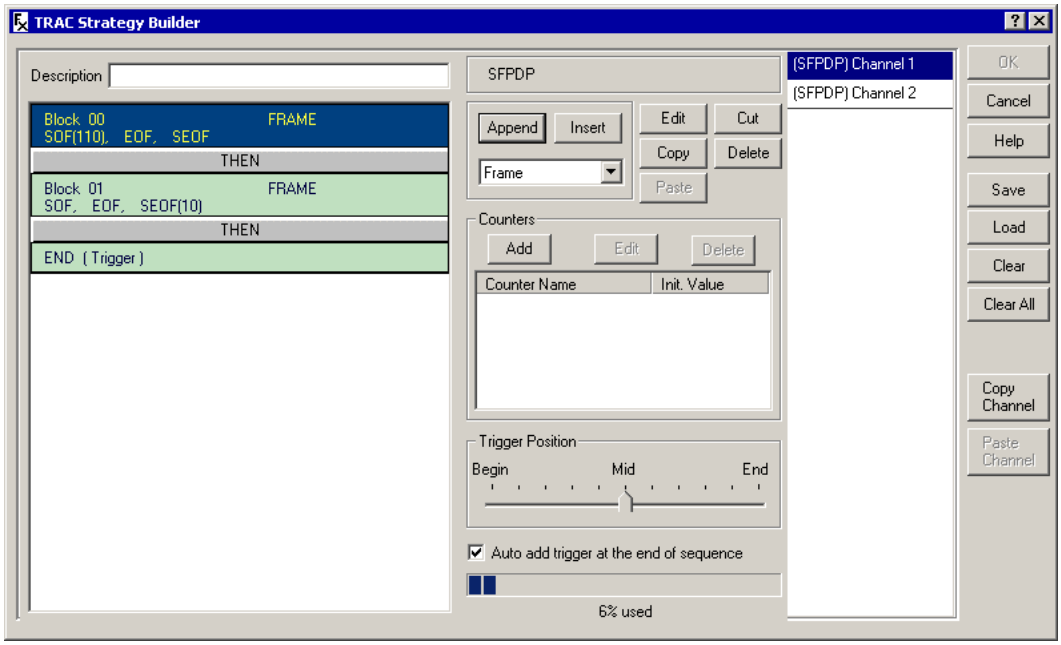


Figure 6-1 A Simple TRAC Strategy

In the example in Figure 6-1, the TRAC strategy is configured for channel 1 and consists of two blocks. Block 00 is a decision block configured as a frame block looking for a specific SOF; block 01 is a frame block looking for a specific SEOF. This strategy is set to trigger at the end of this sequence.

6.3.3 Adding a Trigger to a TRAC Strategy

Adding a trigger to a TRAC strategy is optional. If you know a problem exists but don't know where it is, set a trigger to watch for the problem. Refer to **Triggering** in this chapter for more information.

Set a trigger in the TRAC strategy in one of the following ways:

- In the TRAC Strategy Builder, leave the checkbox for *Auto add trigger at the end of sequence* selected (the default setting) and set the trigger position to the desired percentage.
- Add an action block**.** Select DO in the Conditional and Action dialog box. Enable Trace Control in the action list in the right column. Select Trigger in the Trace Control menu. Click on the **OK** button to return to the TRAC Strategy Builder, and set the trigger position to the desired percentage.

6.3.4 Adding Complexity to a TRAC Strategy

The following steps explain how to use the tools in the TRAC Strategy Builder to add complexity to a capture strategy by creating the example shown in Figure 6-2.

1. Add a frame block to a TRAC strategy by selecting Frame in the block menu. Click on the **Append** button. Configure the block and click on the **OK** button to close the dialog box.
2. Copy an existing block and paste it in another location by selecting block 00 and clicking on the **Copy** button. Select the END block to paste the copied block above it. Click on the **Paste** button. The copied block appears in the desired location. Click on the **Edit** button to display the SFPDP Frame dialog box. Change the block as desired, and change the block label.

3. Configure for an OR condition. Click on the first THEN block connector, which toggles to OR. A gray bar on the left identifies the two blocks connected by OR.
4. Add a primitive block by selecting Primitive in the block menu. Click on the **Append** button. Configure the block and click on the **OK** button to close the dialog box.
5. Leave the *Auto add trigger at the end of sequence* checkbox selected.
6. Identify the channel configuration in the Description field, if desired.

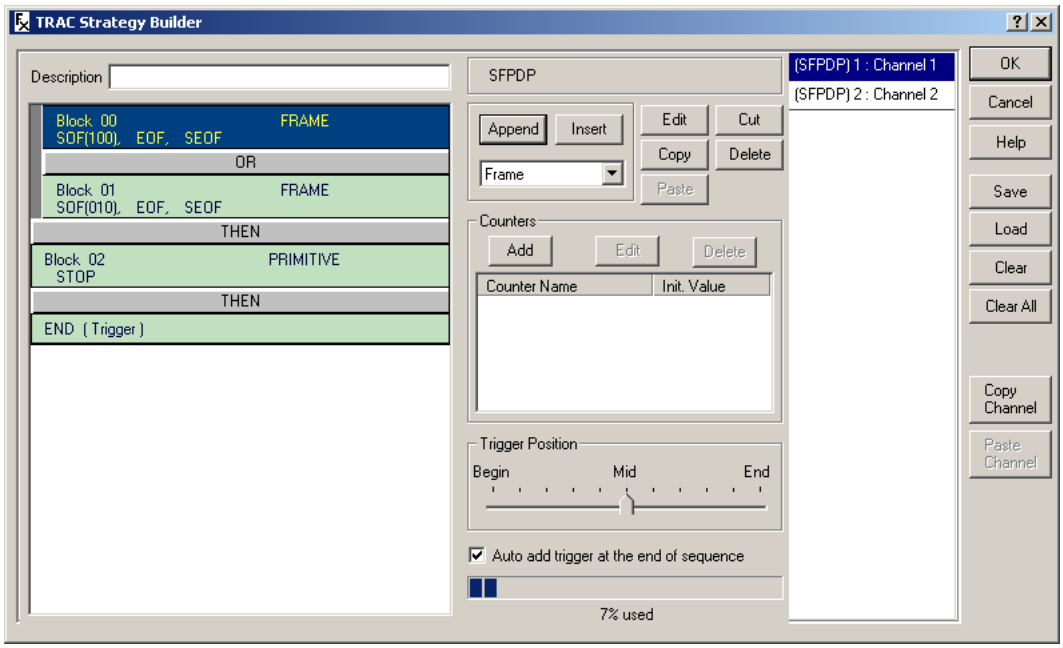


Figure 6-2 An Example of a Complex Capture Strategy

In the example in Figure 6-2, the TRAC strategy is configured for channel 1 and consists of three blocks. Blocks 00 and 01 are decision blocks configured as frame blocks looking for an SOF with a PI01 of 1 or an SOF with a PI02 of 1. Block 02 looks for a STOP primitive. This strategy is set to trigger at the end of this sequence.

6.3.5 Controlling Filtering

Prefiltering controls filtering during data capture as described in **Setting Prefiltering Parameters** in **Chapter 4 – Operation.** In addition, TRAC engines can be used to control filtering by using the suspend and resume actions in the TRAC strategy. For additional prefiltering capability in the TRAC strategy, refer to **Using Suspend and Resume in a TRAC Strategy** in this chapter.

6.3.6 Using Suspend and Resume in a TRAC Strategy

You can configure an action block in a TRAC sequence to stop capturing data at a specific point during analyzer operation and then resume data capture, thereby capturing only data of interest rather than every word of data.

The following are essential elements in a TRAC strategy for using suspend and resume for filtering data:

1. Add an action block in the sequence where data capture should be stopped. In the Conditional and Action dialog box, leave the setting on the DO selection. Enable Trace Control in the action list in the right column of the dialog box. Select Suspend in the Trace Control menu.
2. Add an action block in the sequence where data capture should be started. In the Conditional and Action dialog box, leave the setting on the DO selection. Enable Trace Control in the action list in the right column of the dialog box. Select Resume in the Trace Control menu.

Figure 6-3 shows an example of how suspend and resume may be used in a strategy to filter out data.

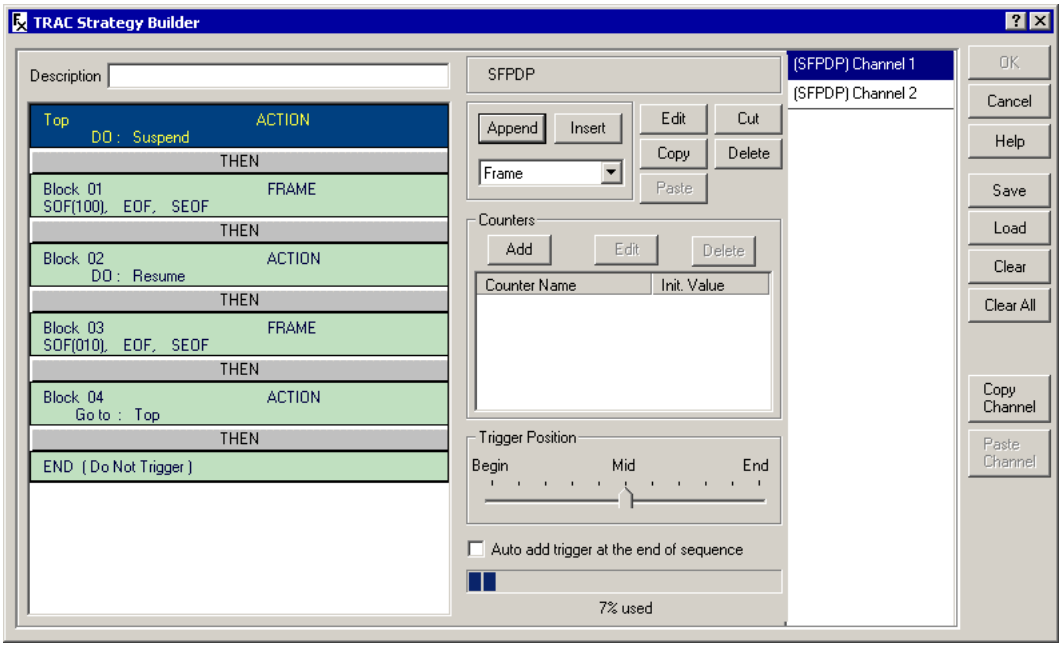


Figure 6-3 Using Suspend and Resume to Filter Out Data

In the example in Figure 6-3, the TRAC strategy is configured for channel 1. It tells the TRAC engine to stop data capture at the top of the sequence, resumes data capture in Block 2, and then loops back to the top of the sequence and repeats.

6.3.7 Using Counters in a TRAC Strategy

HOW TO ADD COUNTERS

Add the counters to be used by a specific channel in the TRAC strategy by clicking on the **Add** button in the Counters section of the TRAC Strategy Builder and entering the desired parameters for each counter in the Counter dialog box.

BASING DECISIONS ON COUNTER VALUES

The following are essential elements for configuring a strategy in which a decision is based on a counter value:

1. Add a counter to the TRAC Strategy Builder and assign it the desired initial value. Refer to **Counters** in this chapter for information on entering an initial value for a counter.

2. Add an action block in the sequence where an action should occur in response to a counter value. In the Conditional and Action dialog box, select IF and define the counter condition and action.

Figure 6-4 shows an example of how a decision may be made based on a counter value in a strategy.

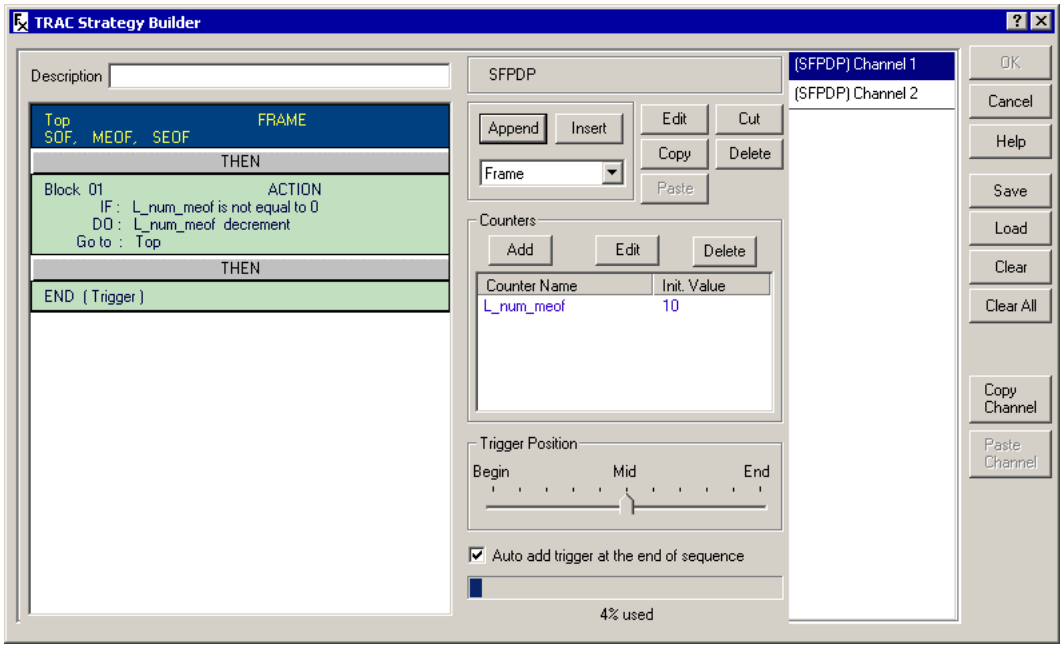


Figure 6-4 Basing a Decision on a Loop Counter Value

In the example in Figure 6-4, this TRAC strategy is configured for channel 1 and tells the TRAC engine to look for a frame with a MEOF, and if the counter value is not equal to 0, go back to look for the next frame with a MEOF and decrement the counter. It will continue to look for frames with a MEOF and decrement the counter until the loop counter value is equal to 0, at which point, it will capture a sufficient amount of additional data after the trigger to place the trigger position at the middle of the trace.

CAUSING AN ACTION TO OCCUR AT A SPECIFIED TIME USING A TIME COUNTER

The following are essential elements in a TRAC strategy configured to cause an action to occur at a specific time:

1. Add a time counter to the TRAC Strategy Builder and assign it the desired initial value. Refer to **Counters** in this chapter for information on entering an initial value for a time counter.
2. Place an action block in the sequence where the time counter should be started. In the Conditional and Action dialog box, leave the setting on the DO selection. Enable Counter in the action list in the right column of the dialog box. Select the desired time counter in the menu. Select Start in the action menu.
3. Place an action block in the sequence where the time counter should expire. In the Conditional and Action dialog box, select WAIT FOR. Click on Counter and leave it at the default setting (equal to 0). Select a time counter in the menu. Select an action from the action list in the right column of the dialog box.

Figure 6-5 shows an example of how to cause an action to occur in a strategy at a specified time.

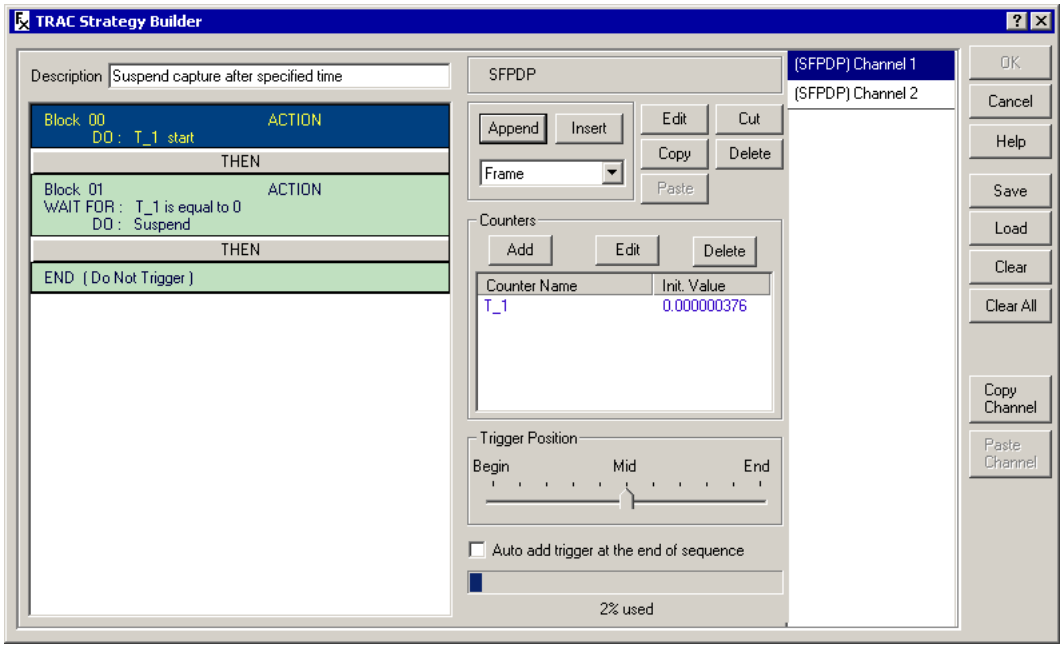


Figure 6-5 Causing an Action to Occur After a Specified Time Using a Time Counter

In the example in Figure 6-5, the TRAC strategy is configured for channel 1 and starts the time counter at the initial value of 376 ns. Block 01 waits for the counter to reach 0, and when it does, stops capture.

USING A WORD COUNTER

The following are essential elements in a TRAC strategy configured using word and loop counters to determine the number of frames that are 2 KB (512 words):

1. Add a word counter to the TRAC strategy, setting the initial value to 512. Refer to **Counters** in this chapter for information on determining the initial value for a word counter.
2. Add a loop counter. For this example, set the initial value to 0 and name it 2kFrame (representing a frame size of 512 words).
3. Place an action block in the sequence where the W_512Word counter should be reset. In the Conditional and Action dialog box, leave the setting on the DO selection. Enable Counter in the action list in the right column of the dialog box. Select the W_512Word counter in the menu and select Reset in the action menu.
4. Add a frame block.
5. Place an action block to subtract. In the Conditional and Action dialog box, leave the setting on the DO selection. Enable Counter in the action list in the right column of the dialog box. Select the W_512Word counter in the list. Select Subtract in the action menu. The counter must do a subtraction before the next SOF. When a subtraction is performed on a word counter, the counter is decremented by the number of words in the preceding frame.
6. Place an action block next in the sequence. In the Conditional and Action dialog box, select IF. Click on Counter and leave it at the default setting (equal to 0). Select the W_512Word counter from the list. Select Go to from the action list in the right column of the dialog box. Select the *reset* block from the list. In the action list, click on counter and select the 2kFrame counter. Select Increment in the Action menu.

7. Place an action block next in the sequence. In the Conditional and Action dialog box, leave the setting on the DO selection. Select Go to from the action list in the right column of the dialog box. Select the *reset* block from the list.
8. Deselect *Auto add trigger to* end *of sequence.*

Figure 6-6 shows an example of how a TRAC strategy may be configured to count the total number of frames for a specific frame data size.

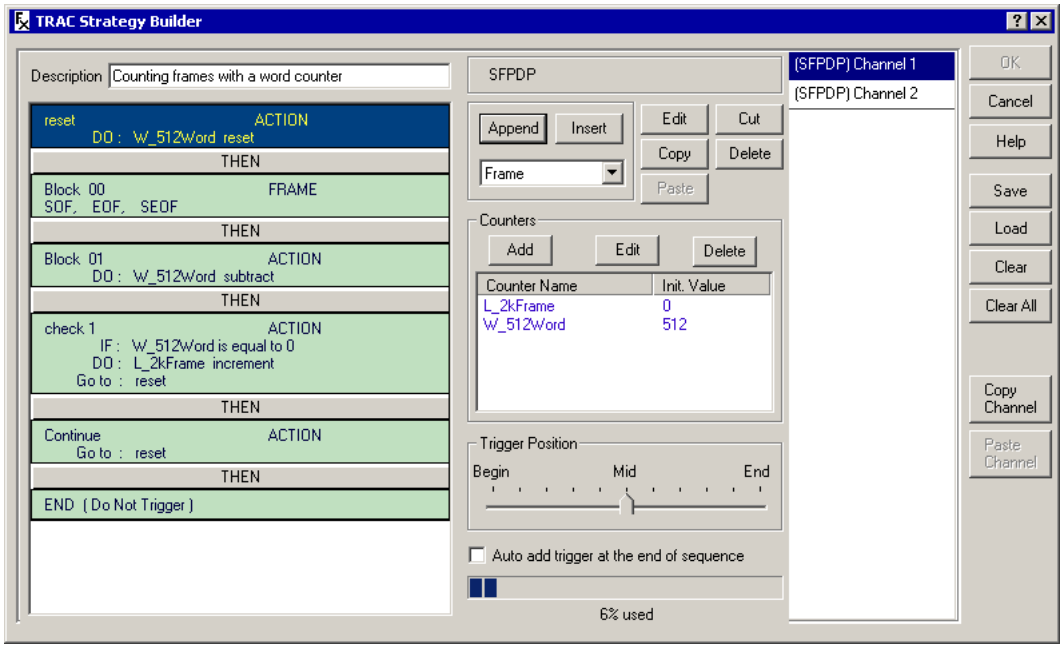


Figure 6-6 Using a Word Counter to Count Frames for a Specific Data Size

In the example in Figure 6-6, the TRAC strategy is configured for channel 1 and resets the word counter to the initial value of 512. This word counter represents a frame with a data size of 512 words. Block 00 waits for a frame. Block 01 then subtracts the frame size detected in Block 00 from the word counter value of 512. The remaining value is 0 for a 512-word data or higher for smaller data. The *check 1* block determines if the word counter is equal to 0 after the subtraction. If it is, the 2kFrame loop counter is incremented by one and the capture strategy goes back to the *reset* block, resetting the word counter to its initial value of 512. This strategy will not trigger; it will continue to check frame by frame.

6.3.8 Configuring Channels

OVERVIEW

FXplorer's TRAC engines provide the intelligence and power for channels to work cooperatively or independently, depending on the configured TRAC strategy. All available channels can be configured in a TRAC strategy with channels interacting with each other if you desire.

COPYING PARAMETERS FROM ONE CHANNEL TO ANOTHER

To copy parameters from one channel to another in the TRAC Strategy Builder, display the configured channel from which to copy and press the **Copy Channel** button. Select the channel to which the parameters will be copied and click on the **Paste Channel** button.

SENDING A MESSAGE TO ANOTHER CHANNEL

Refer to **Messages** in this chapter for information on messages.

The following are essential elements in a TRAC strategy for sending a message to another channel:

1. In channel 1, place an action block in the sequence where a message should be sent. In the Conditional and Action dialog box, leave the setting on the DO selection and select Send Message from the action list in the right column. Select the desired message.
2. In channel 2, place an action block in the sequence where to watch for the message selected in step 1. In the Conditional and Action dialog box, click on the WAIT FOR selection. Select Message and enter the message number selected in step 1.

Figure 6-7 and Figure 6-8 are examples of one channel seeing a message sent by another channel.

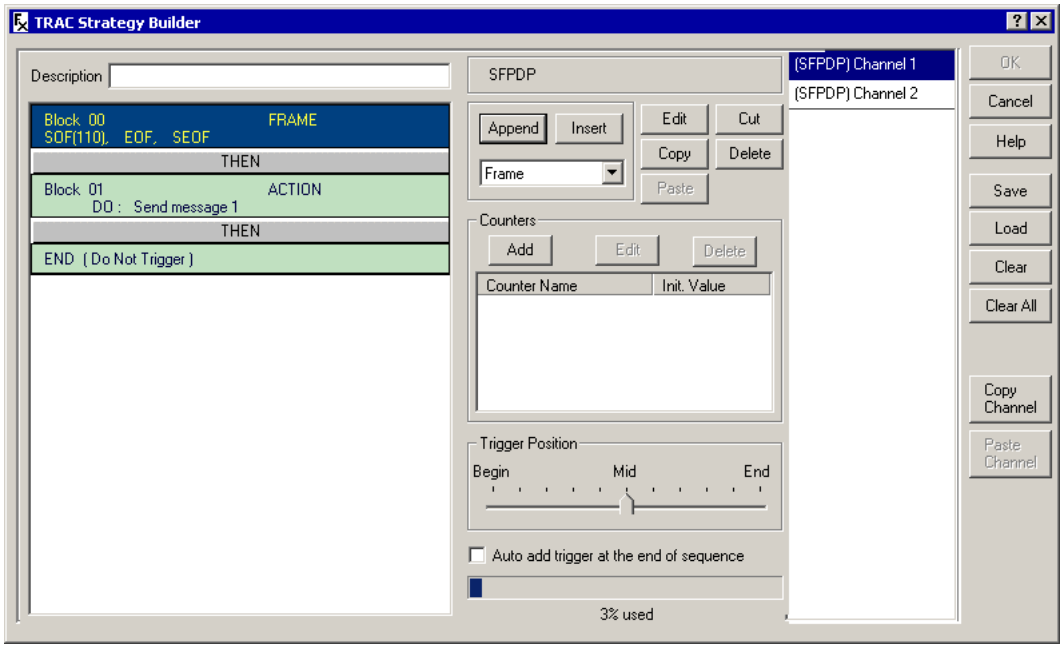


Figure 6-7 Channel 1 Configured to Send a Message

In the example in Figure 6-7, Channel 1 waits for a frame with an SOF set to 110, and when it finds it, sends message 1. No trigger is set for this channel.

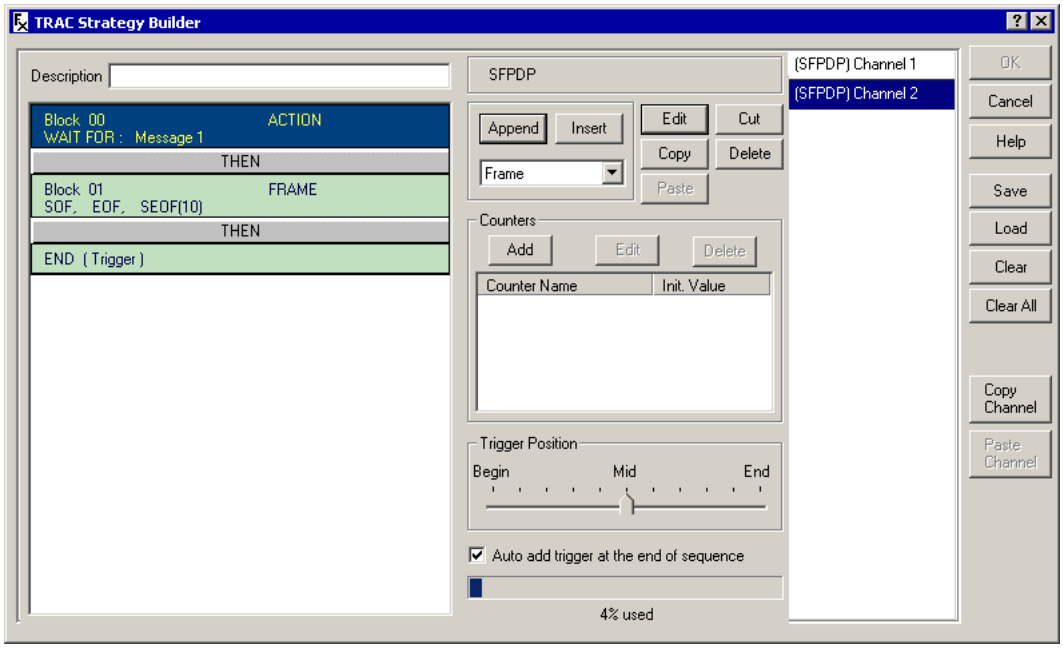


Figure 6-8 Channel 2 Configured to Wait for a Message Sent by Channel 1

In the example in Figure 6-8, Channel 2 waits until channel 1 sends a message. It then looks for a frame with a SEOF set to 10 and when it finds it, captures a sufficient amount of additional data after the trigger to place the trigger position at the middle of the trace. The message ensures that the frame with an SOF set to 110 occurs on channel 1 before channel 2 looks for the frame with a SEOF set to 10.

6.4 Saving a TRAC Strategy

Save a TRAC strategy to a disk file by doing the following:

1. Click on the **Save** button in the TRAC Strategy Builder. The Save TRAC Strategy dialog box appears on the screen as shown in Figure 6-9.

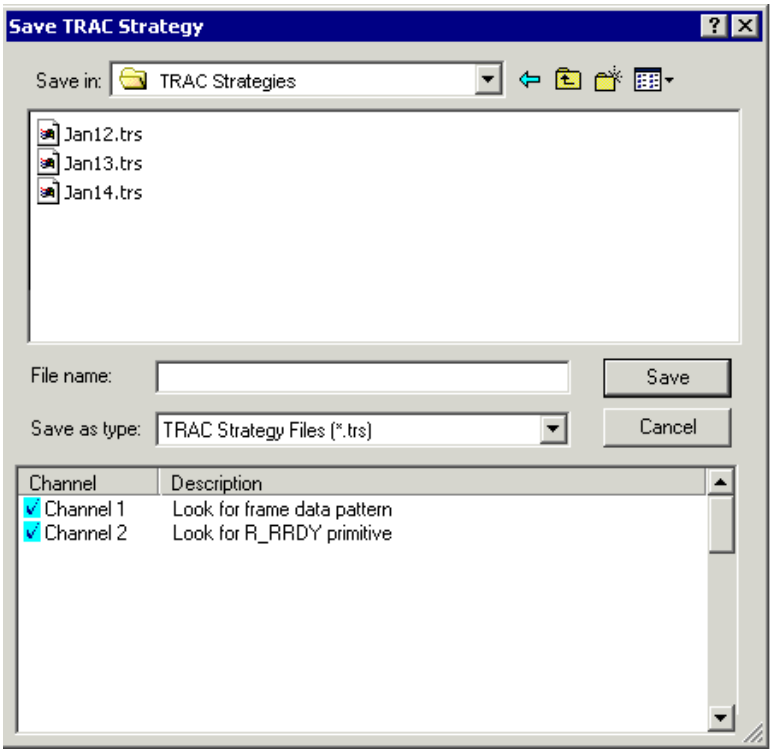


Figure 6-9 Save TRAC Strategy Dialog Box

2. The lower part of the dialog box lists the configured channels to save. You can choose not to save a channel by clearing the checkbox. Channel descriptions can also be entered here.
3. Type a file name in the File name field and click on the Save button. One or more channels configured in the TRAC Strategy Builder as well as all related dialog boxes defined for this TRAC strategy are saved as a single **.TRS** file.

6.5 Loading a TRAC Strategy

Load a previously saved TRAC strategy into the TRAC Strategy Builder for editing or running an analysis session by doing the following:

1. Click on the **Load** button in the TRAC Strategy Builder. The Load TRAC Strategy dialog box shown in Figure 6-10 appears on the screen.

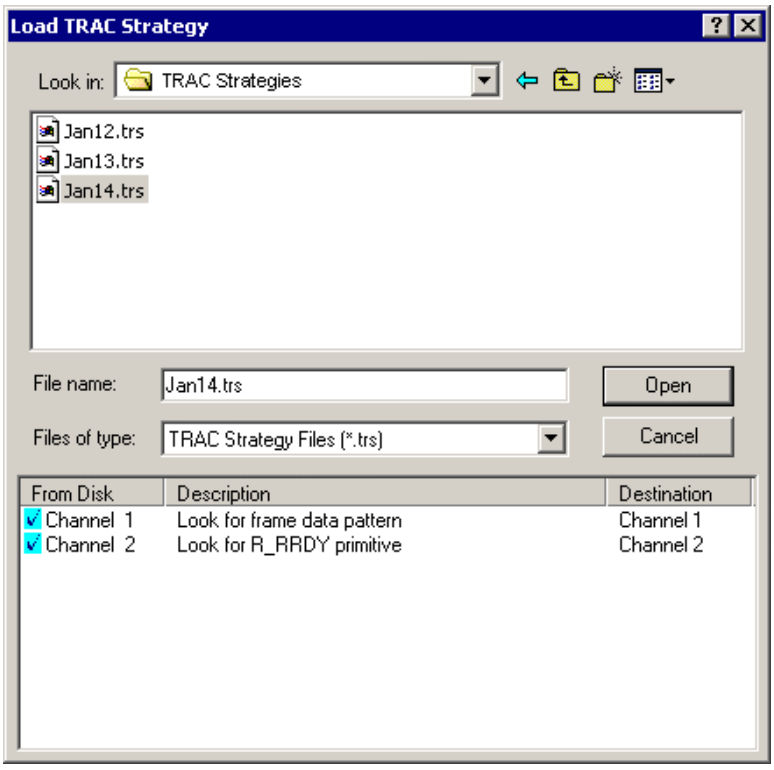


Figure 6-10 Load TRAC Strategy Dialog Box

2. Select the desired **.TRS** file and click on it. The configured channels for the TRAC strategy are listed in the lower part of the Load TRAC Strategy dialog box.
3. You have the following options for loading channels into the TRAC Strategy Builder:
   - Load a channel into the same channel from which it was saved – leave the channel as is.
   - Load a channel into a different channel from which it was saved – click on the Destination field for that channel and select the desired available channel in the menu.
   - Don't load a channel into the TRAC Strategy Builder – click on the Destination field for that channel and select None from the menu, which will deselect the channel.
4. Click on the **Open** button to load the capture strategy into the TRAC Strategy Builder, which reappears on the screen.
5. Click on the **OK** button in the TRAC Strategy Builder, which closes the dialog box and loads the capture strategy into the hardware.

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7. TRAC STRATEGY BUILDER REFERENCE

7.1 TRAC Strategy Builder Dialog Boxes

The dialog boxes for TRAC strategy configuration are described here, including the fields in each dialog box as well as any requirements for data entry.

7.2 TRAC Strategy Builder

In the TRAC Strategy Builder shown in Figure 7-1, you define a capture strategy to be used by the TRAC engine(s) during analyzer operation. Configure decision and action blocks for the TRAC sequence and set filtering and triggering parameters if desired. The TRAC Strategy Builder is accessed by selecting TRAC Strategy in the Tools pulldown menu.

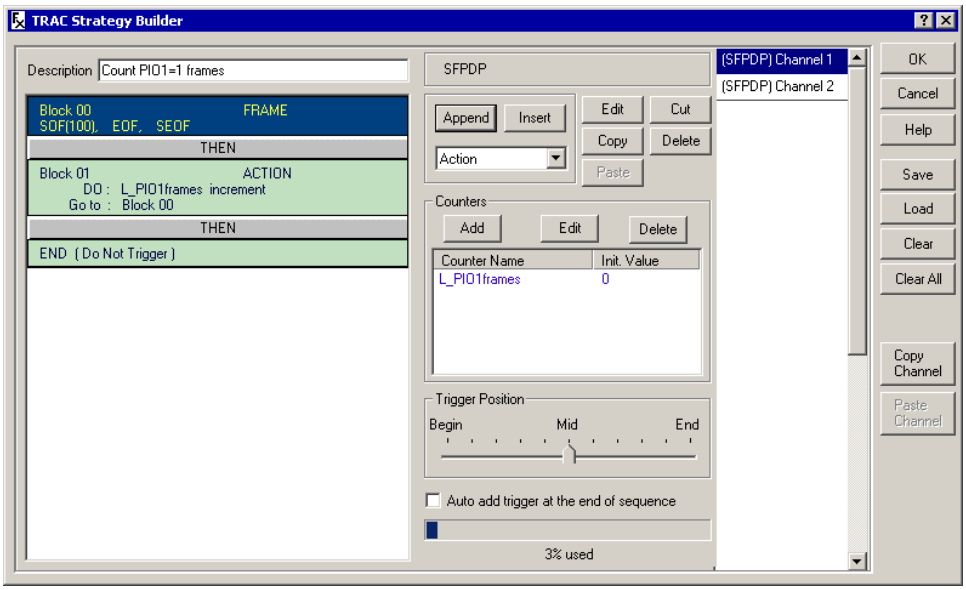


Figure 7-1 TRAC Strategy Builder

The TRAC Strategy Builder contains the following fields and buttons:

SFPDP .....Indicates the Serial FPDP protocol.

Channels .....Lists the channels available for TRAC strategy configuration. Click on the desired channel for which to configure parameters.

Description .....Identifying information about the capture strategy for a specific channel. This information appears with the channel number in the Save TRAC Strategy and Load TRAC Strategy dialog boxes to help you more easily identify a specific channel in the channel list.

TRAC sequence.....A user-configured sequence of blocks that determines the decisions made by that channel's TRAC engines. Blocks are connected by THEN and OR block connectors. A THEN block connector can be changed to OR by clicking on it. Consecutive OR block connectors are not allowed. In the TRAC sequence, blocks that are part of the OR sequence are marked by a gray bar at the left.

Append .....Places a configured block at the end of the TRAC sequence. When you click on the Append button, a dialog box appears for configuration of the selected block in the block menu.

Insert.....Places a configured block above the selected block in the TRAC sequence. When you click on the Insert button, a dialog box appears for configuration of the selected block in the block menu.

Block menu.....Displays the available block types: Frame, Primitive, Low Level Error, or Action. The block type selected in the block menu determines the dialog box that appears when you click on the Append or Insert button.

Edit .....A block tool that displays the dialog box for editing the selected block parameters.

Copy.....A block tool that copies the selected block in the TRAC sequence.

Paste.....A block tool that pastes the copied or cut block before the selected block in the TRAC sequence.

Cut .....A block tool that copies the selected block in the TRAC sequence. The block is not removed from its original location until you click on the Paste button to place the block in the new location.

Delete .....A block tool that removes the selected block from the TRAC sequence.

Counters .....Lists the counters for the current channel to be used during the TRAC strategy as defined in the Counter dialog box. You can add, delete, and edit counters.

Add .....Displays the Counter dialog box for adding a counter to the TRAC strategy. A maximum of 12 counters per

channel (4 loop, 4 time, and 4 word counters) can be added to the TRAC strategy.

Edit .....Displays the Counter dialog box for editing parameters for the selected counter.

Delete .....Removes the selected counter from the counter list.

Trigger Position.....Sets the trigger position as a percentage of trace memory. The slider can be moved in increments of 10%. The default trigger position is 50%.



NOTE: When FXplorer triggers, the trigger is not yet positioned as desired until the buffer has wrapped and a predetermined number of records are recorded after the trigger event. The trigger position setting determines this number of predetermined records. The channel status bar in the software indicates when a channel has triggered.

Auto add trigger

at the end of sequence .....Automatically adds a trigger to the end of a TRAC sequence without requiring you to create an action block to add a trigger.

Percentage Used.....Shows the percentage of instructions used out of 128 instructions per TRAC sequence. When the bar indicates that 100% of the instructions have been used, no more blocks can be added to the TRAC sequence.

OK.....Accepts the entered data and closes the dialog box.

Cancel .....Closes the dialog box without saving your changes.

Save.....Displays the Save TRAC Strategy dialog box for saving the TRAC strategy as a **.TRS** file. Refer to **Saving a TRAC Strategy** in **Chapter 6 - TRAC Strategies** for more information.

Load .....Displays the Load TRAC Strategy dialog box for selecting a previously saved TRAC strategy and loading it into the TRAC Strategy Builder. Refer to **Loading a TRAC Strategy** in **Chapter 6 - TRAC Strategies** for more information.

Clear .....Clears all parameters for the selected channel(s). Select one channel by clicking on it in the list. Select both channels using Ctrl-click or Shift-click.

Clear All.....Clears all of the TRAC strategy parameters for all of the channels in the current channel group.

Copy Channel .....Copies the TRAC strategy parameters of the selected channel.

Paste Channel .....Pastes the copied parameters to the selected channels. Select one channel by clicking on it in the list. Select both channels using Ctrl-click or Shift-click.

7.3 Counter Dialog Box

The Counter dialog box shown in Figure 7-2 is accessed by clicking on the Add or Edit buttons in the TRAC Strategy Builder.

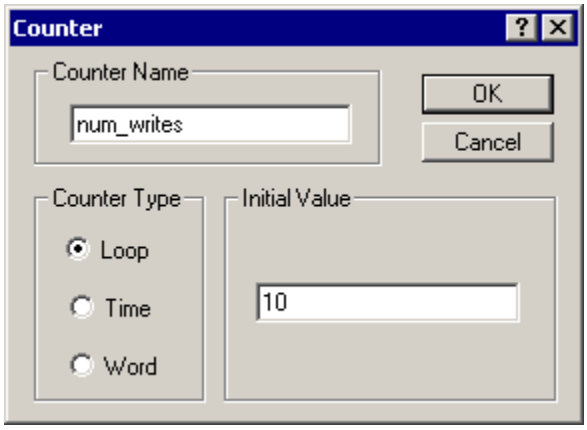


Figure 7-2 Counter Dialog Box

The Counter dialog box contains the following fields:

Counter Name

Identifies the counter. Enter a maximum of 10 characters. Counters of the same type must be assigned unique names. Upon adding the counter to the counter list in the TRAC Strategy Builder, the software adds L_, T_, or W_ (indicating the counter type) to the beginning of the name.

Counter Type

Select the type of counter to add to the TRAC strategy:

Loop .....Counts frames, primitives, or a sequence of events. It counts once each time the sequence requests. It increments, decrements, or resets when instructed to do so by an action block.

Time .....Times an event or activity or provides a time-out or a delay in TRAC sequence execution. It is incremented or decremented by a system clock, and it can be started, stopped, or reset by an action block.

Word.....Counts words. It can be used to measure the amount of traffic that matches specific criteria. It adds to or subtracts from the counter total the number of words in a frame when instructed to do so for each frame by an action block. An action block can also be used to instruct it to reset.

Initial Value

The value at which the counter starts after it is reset. If the initial value is set to '0,' the counter counts up. If the initial value is not '0,' the counter counts down.

When adding a time counter, the initial value is entered as a time measurement (seconds, milliseconds, microseconds, and nanoseconds). FXplorer converts this value into system clock cycles, rounding the entered value to the nearest system clock cycle. A system clock cycle is 37.6 ns for 1 Gb, 18.8 ns for 2 Gb, and 16 ns for 2.5 Gb.

When entering an initial value for a word counter, be sure to include the additional words of overhead (CRC, EOF, and SEOF).

7.4 Block Configuration Dialog Boxes

7.4.1 SFPDP Frame Dialog Box

Selecting a frame block in the block menu displays the SFPDP Frame dialog box shown in Figure 7-3.

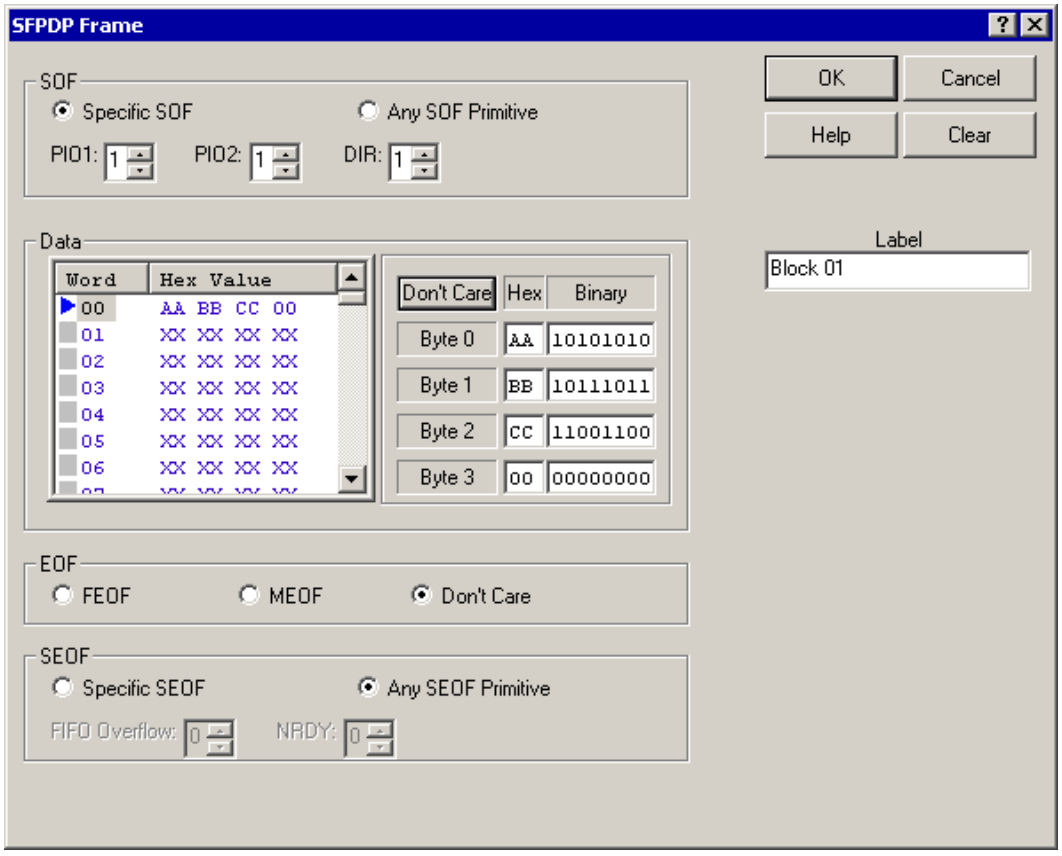


Figure 7-3 SFPDP Frame Dialog Box

The SFPDP Frame dialog box contains the following fields and buttons:

Label

The block name, consisting of a maximum of 10 characters (for example, Block 00). The label is used in the Goto field of other blocks to refer to this block. Use the default or type a name in this field.

SOF

Defines Start of Frame (SOF). Select Specific SOF to specify a value or Any SOF Primitive.

Data

In the Data section you can initialize the data word map using the editing area. This section consists of a viewing area and an editing area with the following features:

- Color-coded viewing area:
  - — Yellow square preceding a line indicates a defined word.
  - — Gray square preceding a line indicates an undefined word.

— Blue arrow preceding a line indicates the current word to be defined.

- A word containing both upper and lowercase x's indicates a partially defined value. The editing area is used for defining words and displays the four bytes to be edited for a specific word. Values can be edited in hexadecimal or binary. Enter a value and press Tab to move to the next byte. To set the value of the specified word to all x's, click the "Don't Care" button.

EOF

Defines End of Frame (EOF). Select Frame End of Frame (FEOF), Mark End of Frame (MEOF), or Don't Care.

SEOF

Defines Status End of Frame (SEOF). Select Specific SEOF to specify a value or Any SEOF Primitive.

Clear

Sets the values to "Don't Care."

OK

Closes the SFPDP Frame dialog box and returns you to the TRAC Strategy Builder. The Frame block appears in the TRAC sequence.

Cancel

Closes the SFPDP Frame dialog box and discards any changes made.

7.5 SFPDP Primitive Dialog Box

Selecting a primitive block in the block menu displays the SFPDP Primitive dialog box shown in Figure 7-4.

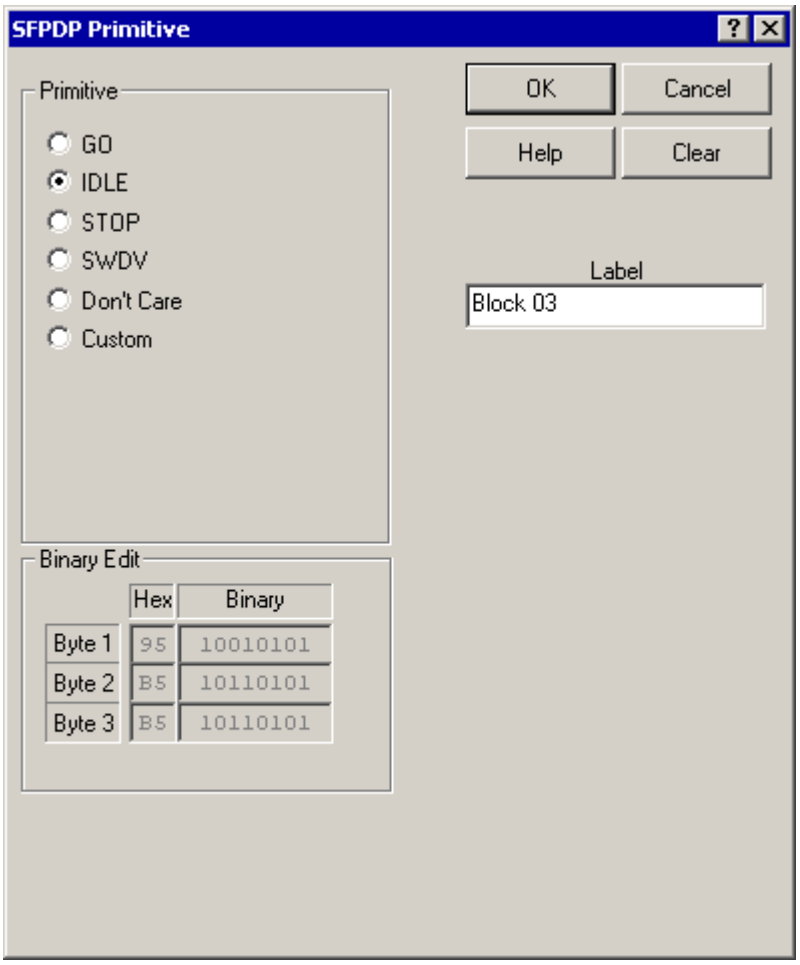


Figure 7-4 SFPDP Primitive Dialog Box

The SFPDP Primitive dialog box contains the following fields and buttons:

Label

The block name, consisting of a maximum of 10 characters (for example, Block 00). The label is used in the Goto field of other blocks to refer to this block. Use the default or type a name in this field.

Primitives

Select one of the following primitives for which the TRAC sequence will look:

GO .....Okay to transmit data.
IDLE .....Idle primitive signal.
STOP .....Halts the transmission of data.
SWDV.....Start of SYNC frame; SYNC with data valid.
Don't Care.....Triggers on any primitive. No bytes can be edited.
Custom.....Bytes 1–3 can be edited for a user-defined value in the Hex/Binary area. Edit the available bytes for the selected primitive. If you are editing the hexadecimal value, the

binary value changes accordingly, and if you are editing the binary value, the hexadecimal value changes accordingly. Byte 0 is fixed. Byte 0 represents the 8B/10B Comma character K28.5 (0xBC), which all Serial FPDP primitives start with.

OK

Closes the SFPDP Primitive dialog box and returns you to the TRAC Strategy Builder. The primitive block appears in the TRAC sequence.

Cancel

Closes the SFPDP Primitive dialog box and discards any changes made.

7.6 Low Level Error Dialog Box

Selecting a low-level error block in the block menu displays the Low Level Error dialog box shown in Figure 7-5.

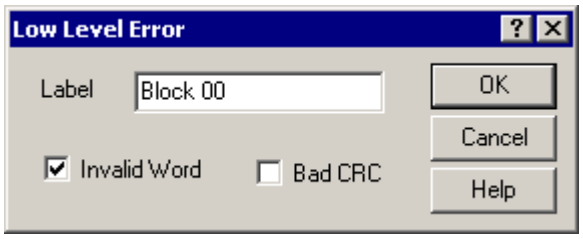


Figure 7-5 Low Level Error Dialog Box

The Low Level Error dialog box contains the following fields and buttons:

Label

The block name, consisting of a maximum of 10 characters (for example, Block 00). The label is used in the Goto field of other blocks to refer to this block. Use the default or type a name in this field.

Invalid Word

Enabling Invalid Word causes the TRAC strategy to look for an invalid transmission word, unrecognized ordered set, or disparity error.

Bad CRC

Enabling Bad CRC causes the TRAC strategy to look for a frame with bad cyclic redundancy check (CRC).

OK

Closes the Low Level Error dialog box and returns you to the TRAC Strategy Builder. The low-level error block appears in the TRAC sequence.

Cancel

Closes the Low Level Error dialog box and discards any changes made.

7.7 Conditional and Action Dialog Box

Selecting an action block in the block menu displays the Conditional and Action dialog box shown in Figure 7-6.

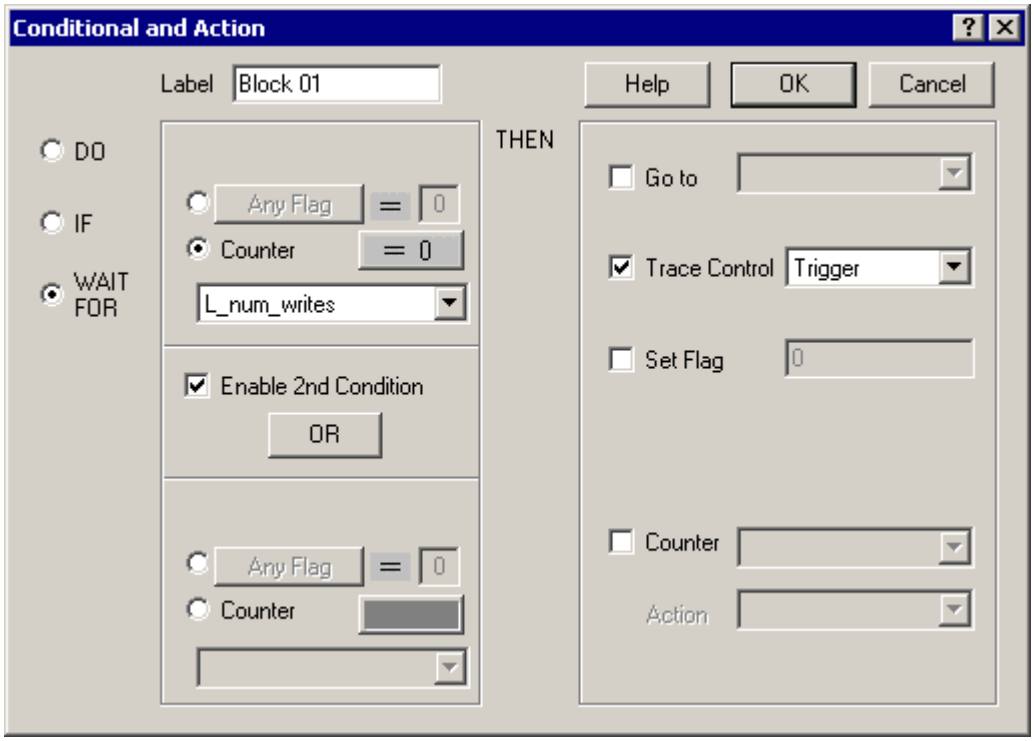


Figure 7-6 Conditional and Action Dialog Box

The Conditional and Action dialog box contains the following fields and buttons:

Label

The block name, consisting of a maximum of 10 characters (for example, Block 00). The label is used in the Goto field of other blocks to refer to this block. Use the default or type a name in this field.

DO

If this radio button is enabled, it causes an action to occur without requiring any conditions to be met.

IF

If this radio button is enabled, an action occurs only if the indicated condition(s) are met.

WAIT FOR

If this radio button is enabled, the indicated condition(s) must be met before the specified action can occur.

Flag

A condition that looks for a specified flag (0-7) set by another TRAC sequence (any flag) or no TRAC sequence (no flag). This condition is used with IF and WAIT FOR actions.

Counter

A condition that looks for the specified counter that is equal to 0 or not equal to 0. This selection is available only if counters are present in the counter list in the TRAC Strategy Builder.

Enable Second Condition

If this field is checked, the list of conditions from which to select for a second condition becomes active.

OR/AND

Toggles between OR and AND. Selecting AND specifies that both conditions 1 and 2 must be met before the action is performed; selecting OR specifies that either condition 1 or 2 must be met before the action is performed.

Go to

Specifies the next block to go to in the TRAC strategy. Select a block from the menu of available blocks in the TRAC sequence.

Trace Control

Displays a menu allowing you to cause the analyzer to resume or suspend storing data into trace memory or trigger in the trace memory at the position specified in the TRAC Strategy Builder.

Set Flag

Sets a flag (0–7) in the TRAC sequence.

Counter

Displays a list of available counters on which to perform a selected action. This selection is available only if counters are present in the TRAC Strategy Builder. Specify the counter and desired action:

Loop.....Increment or Decrement (depending on the value entered into the Initial Value field in the Counter dialog box) or Reset (resets the counter to its initial value). Increment is available (increments the counter by a value of 1) if the initial value is 0. Decrement is available (decrements the counter by a value of 1) if the initial value is not equal to 0.

Time .....Start (starts the counter), Stop (stops the counter), or Reset (resets the counter to its initial value).

Word.....Add (increments the counter value by the number of words in a frame), Subtract (decrements the counter value by the number of words in a frame), or Reset (resets the counter to its initial value).

OK

Closes the Conditional and Action dialog box and returns you to the TRAC Strategy Builder. The action block appears in the TRAC sequence.

Cancel

Closes the Conditional and Action dialog box and discards any changes made.

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8. REAL-TIME PERFORMANCE MONITORING

8.1 Overview

The real-time performance monitoring allows you to observe Serial FPDP activity while it is occurring, providing a visual display of Serial FPDP data metrics. Spikes and dips in a graph are clear indicators of change. Extreme deviations outside the norm may alert you to potential problems. Averages of specific statistics for a channel compared to the statistics of other channels can help identify devices under the most stress, which may be useful in determining how to reconfigure the system to improve overall performance. Statistics gathering is also helpful in comparing the performance of a specific device type and in the marketing of your product.

This feature monitors data types and counter values (resources) and graphs the real value or the change in performance. The data can be graphed and displayed in real time and also saved to a file, which can be displayed later in a graph or read by other software, including spreadsheet software, for further analysis.

Graphing resources allows you to obtain the following statistics:

- SFPDP Frames (per sec)
- SFPDP MB per sec (link utilization)
- Average data size (bytes per frame)

The performance-monitoring window is similar to Microsoft Windows Explorer. The directory pane on the left uses folders to organize your graphs. The right pane displays the selected graphs.

8.2 Concepts and Definitions

The following terms are used throughout this section and should be understood:

Actual datapoint value.....The value displayed at a cursor point on a line in the graph.

Offset.....The value the graph is raised or lowered on the vertical axis to more easily view the data.

Display value .....The scale representation of the datapoint value.

Graph.....The rate or count value of the selected data type charted by records. A point on the graph in rate mode represents the difference between one record and the previous record. A point on the graph in count mode represents the real value of the record. A graph shows one or more lines of data.

Legend.....The chart below the graph displaying the following data for each line: channel, resource, mode, maximum value, minimum value, average value, current value, scale, and offset. As the graph changes, the data in the legend is updated.

Line .....A visual representation of performance for a specific resource in rate or count mode for a channel.
Live graph.....Data graphed and viewed in real time.
Record .....The value of all resources at a specific time. Resources are graphed using data, which is read and stored as a record once per second.
Recorded data .....Data that is recorded and then viewed at another time.
Resource .....A data type (SFPDP frames/sec, SFPDP MB/sec, or average data size in bytes per frame) or a counter from which a statistic is derived.

8.3 Configuring a Live Graph



NOTE: To change the graph configuration as desired, refer to **Making Changes During Real-Time Performance Monitoring** in this chapter for more information. To understand the information generated during real-time performance monitoring and use the view options, refer to **Graphed Data** in this chapter.

To configure a graph for real-time performance monitoring, select Live Graph from the Graph submenu in the Tools pulldown menu. A blank graph appears on the screen with "Live Graph" indicated in the title bar. By default, the new graph is added to the root directory in the directory pane.

8.3.1 Defining the Graph

The parameters set in the Edit Graph Configuration Settings dialog box define the general appearance of the graph. Set the parameters in this dialog box by doing the following:

1. Click on the Graph Settings icon in the graph tool bar. The Edit Graph Configuration Settings dialog box shown in Figure 8-1 appears on the screen.

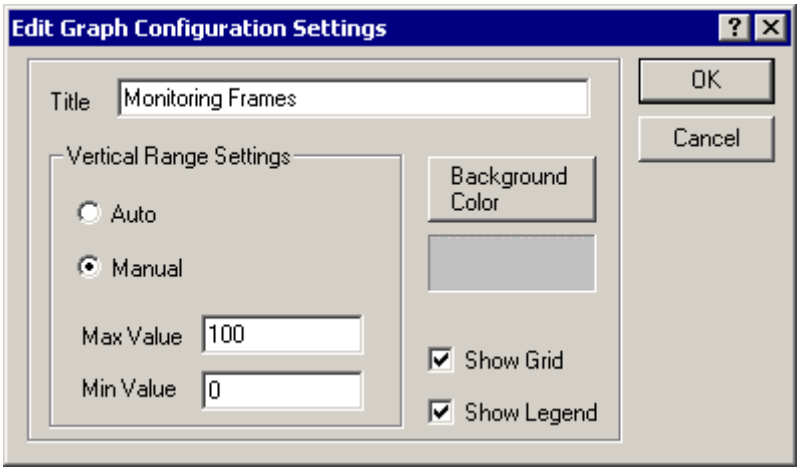


Figure 8-1 Edit Graph Configuration Settings Dialog Box

2. Define the parameters for the following fields:

Title

The title of the graph. FXplorer software allows a maximum of 50 alphanumeric characters.

Vertical Range Settings

Selecting Auto adjusts the vertical range so that every line in the graph is visible.

Selecting Manual allows you to define the vertical range. Enter a minimum value to be displayed at the bottom of the vertical axis of the graph and a maximum value to be displayed at the top of the vertical axis of the graph.

The setting in this field can override the Auto reset vertical range setting in the Add Line/Edit Resource dialog boxes.

Background Color

The background color of the graph. Clicking on the Background Color button displays the color dialog box from which you can select a background color.

Grid

Show or hide the grid (horizontal and vertical lines in the graph background).

Legend

Show or hide the legend (data that is being graphed).

3. Click on the **OK** button to close the Edit Graph Configuration Settings dialog box. The changes are displayed in the current graph.

8.4 Adding a Line to a Graph

Select the desired line in the legend and click on the Add a new line icon in the tool bar or right click and select Add Line from the menu. The Add Line dialog box shown in Figure 8-2 appears on the screen.

1. Click on the Add a new line icon in the tool bar or right click and select Add Line from the menu. The Add Line dialog box appears on the screen.

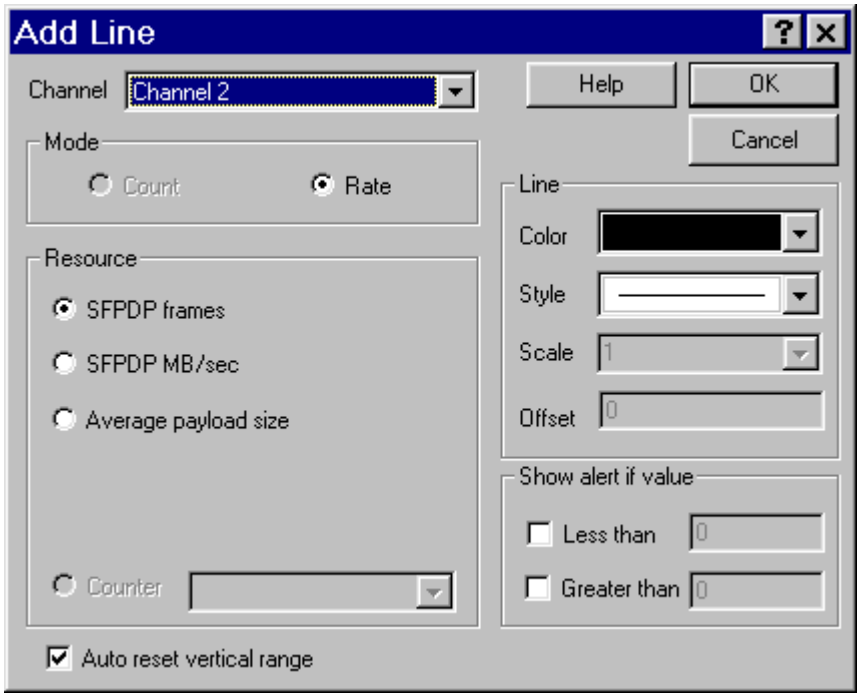


Figure 8-2 Add Line Dialog Box

2. Define the parameters for the following fields:

Channel

The channel for which data will be monitored.

Mode

The Mode includes two radio buttons:

Count mode..... Graphs the absolute value in one-second time intervals. This mode is available for counters only.

Rate mode..... Graphs the value in one-second time intervals as the difference between the value of a specific record and the value of the previous record. This mode is available for all resources.

Resource

The Resource field defines the type of data to monitor. When you are adding a line to a graph, the resources available to add to the graph depend on the resource(s) already being monitored.

The resources that may be available include:

SFPDP frames (per sec)

SFPDP MB/sec

Average payload size (bytes per frame)

Counter ..... Counters are available if they were configured in the TRAC strategy being run. Only loop and word counters can be monitored.

Line

Line attributes include the following:

Color..... Use the default color or select a color from the menu.

Style ..... Use the default style or select the line style from the menu.

Scale ..... Select a scale value that will be multiplied by the real value before graphing. Lines of data being monitored in the same graph can have different scales. If you are unsure of the scale to use, select Auto reset vertical range to make all lines visible on the graph.

Offset..... The value used to offset the data. An offset value allows you to strategically position the data in the graph.

Show alert if value

When you enable the *Less than* or *Greater than* fields (or both) and enter a corresponding value, FXplorer indicates when the graphed value is out of range by marking that value. Enter a positive or negative integer as the minimum or maximum value.

Auto reset vertical range

This field is checked if you selected Auto in the Vertical Range Settings field in the Edit/New Graph Configuration Settings dialog box. The setting in this field can override the Vertical Range Settings in the Edit/New Graph Configuration Settings dialog box. Selecting this field (if it is not already checked) adjusts the vertical range so that every line in the graph is visible.

3. Click on the **OK** button to close the dialog box and save your changes. The dialog box closes, and performance monitoring begins. As data changes in the graph, it is updated in the legend.
4. Follow steps 1–3 to add another line to the graph.

8.5 Removing a Line from a Graph

Select the desired line in the legend and click on the *Remove the selected line* icon from the graph tool bar or right click and select Remove Line from the menu. The line is removed from the graph.

8.6 Making Changes During Real-Time Performance Monitoring

You can edit the graph during performance monitoring (for example, adjusting the Max Graph or Min Graph values to better show the data), and the graph will immediately show those changes.

CAUTION: During performance monitoring, you cannot replace the TRAC strategy currently running, change the channel group, or disconnect and reconnect to the Serial FPDP Protocol Analyzer without losing the graphed data.

8.6.1 Editing a Line

Edit a line in an active graph by doing the following:

1. Display the Edit Resource dialog box shown in Figure 8-3 by doing one of the following:
   - Select the desired line in the legend and click on the *Edit the selected line* icon in the graph tool bar.
   - Right click and select Edit Selected Line from the menu.
   - Double-click on the selected line in the legend.

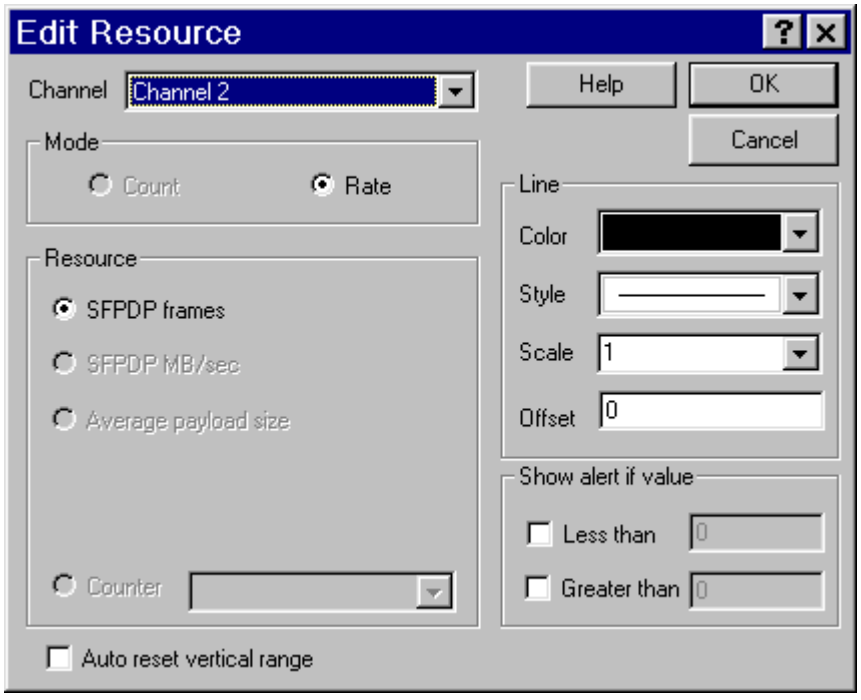


Figure 8-3 Edit Resource Dialog Box

2. Make the desired changes in the Edit Resource dialog box. Refer to **Adding a Line to a Graph** in this chapter.

3. Click on the **OK** button to close the dialog box and save your changes. The changes are displayed in the current graph.

8.6.2 Adding Graphs

Using multiple graphs for performance monitoring allows you to organize data as desired (such as by channel or resource).

Add a graph by doing the following:

1. In the Graph menu, select New Graph or click on the Add new graph icon in the Graph main menu tool bar. The New Graph Configuration Settings dialog box (similar to the Edit Graph Configuration Settings dialog box) appears on the screen. Define the overall settings for the specific graph.
2. When you close the New Graph Configuration Settings dialog box by clicking on the **OK** button, the new graph is added to the selected group in the directory pane.
3. Add the desired lines to the graph following the procedure in **Adding a Line to a Graph** in this chapter.

Graphs can be grouped as desired in the directory pane. Refer to **Grouping Graphs** in this chapter for more information.

8.6.3 Removing Graphs

Delete a graph by doing the following:

1. Select the graph to delete in the directory pane.
2. Click on Delete Graph in the Graph menu or select the *Delete selected graph* icon in the graph main menu tool bar. The graph is removed from the directory.

8.7 Saving a Graph Configuration

A graph configuration can be saved to a file for use in future performance monitoring sessions. The graph configuration file contains user-defined parameters set in the Edit Graph Configuration dialog box and the Add Line/Edit Resource dialog boxes.

Save a graph configuration to a file by doing the following:

1. With a configured graph on the screen, select Save Config. File in the File menu. The Save As dialog box shown in Figure 8-4 appears on the screen.

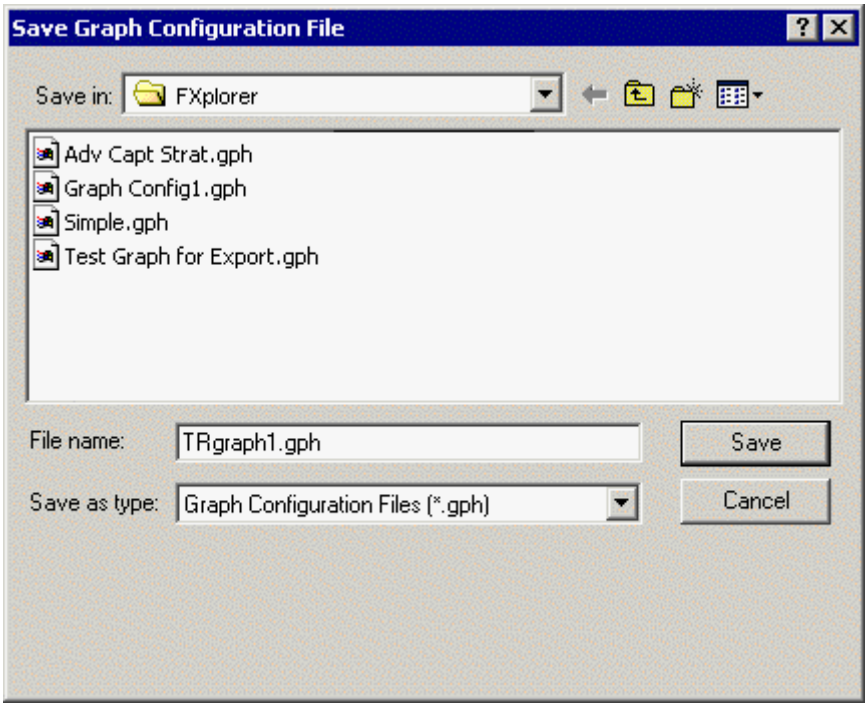


Figure 8-4 Save As Dialog Box for Saving a Graph Configuration

2. Type a file name in the File name field and click on the **Save** button. The graph is saved as a **.GPH** file.

8.8 Loading a Graph Configuration

You can load a saved graph configuration to use for displaying graphed data.



NOTE: A graph configuration file applies only to the parameters for which it was configured. For example, if you are running channel 1, you can't use a graph configuration set for channel 2.

Load a graph configuration by doing the following:

1. With either a blank or configured graph on the screen, select Open Config. File from the File menu. The Open Graph Configuration File dialog box shown in Figure 8-5 appears on the screen.

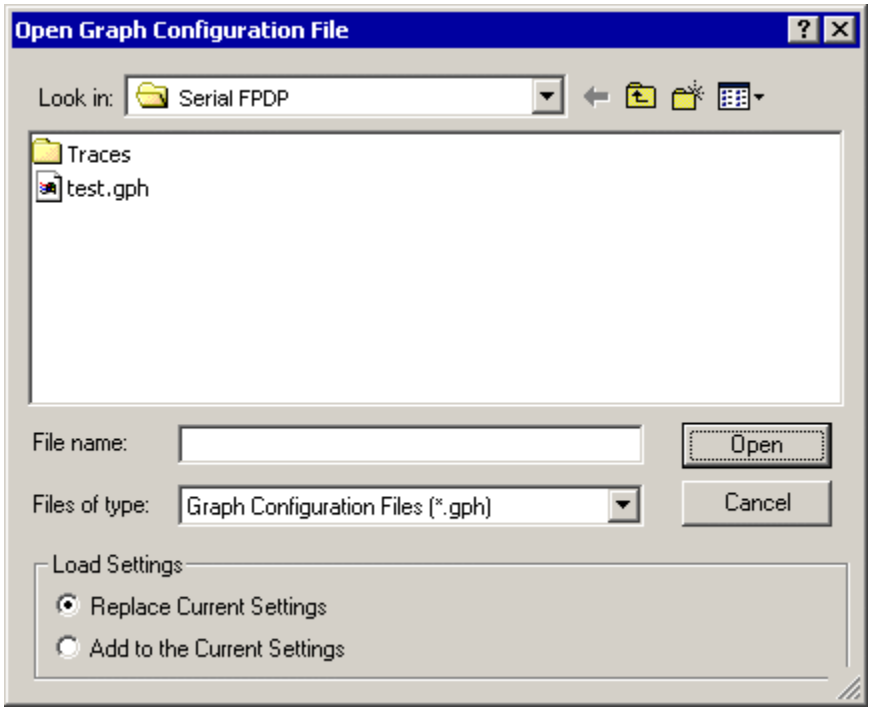


Figure 8-5 Open Graph Configuration File Dialog Box

2. Select the desired configuration file in the list. The file name appears in the File name field.
3. In the Load Settings field, select Replace Current Settings to load the configuration settings from the selected graph configuration file or Add to the Current Settings to add the current settings from the selected graph configuration file to the graphs already displayed on the screen.
4. Click on the **Open** button to load the graph configuration. The dialog box closes, and performance monitoring begins.

8.9 Recording Data

8.9.1 Defining Parameters for Recording Data

To record data in a file, either in the background or while you are viewing it on the screen, do the following:

1. When a blank or configured graph is on the screen, select Record from the Graph menu. The Record Graph File dialog box shown in Figure 8-6 appears on the screen.

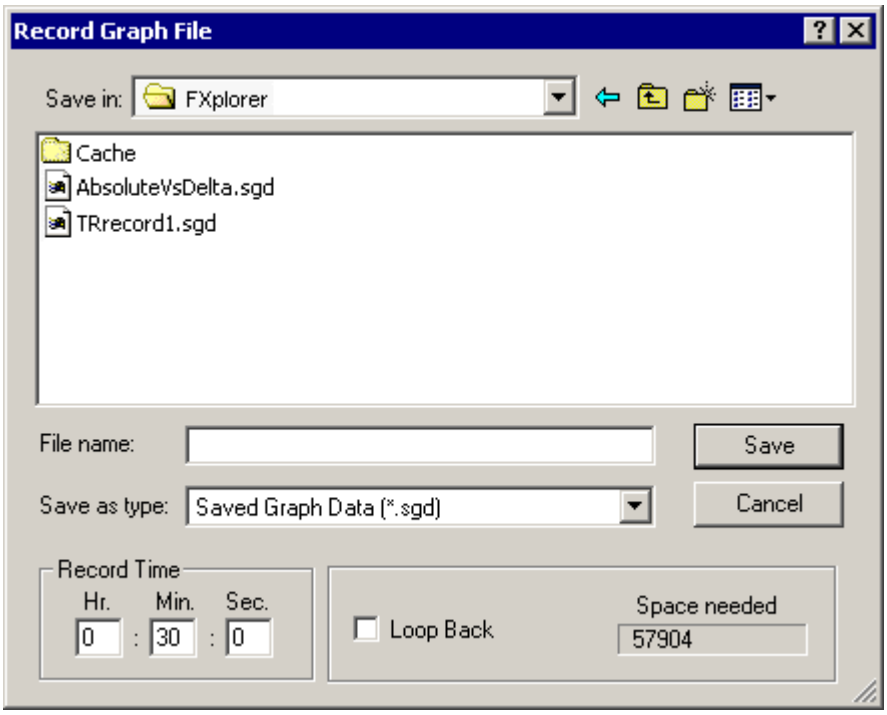


Figure 8-6 Record Graph File Dialog Box

2. Define the parameters for the following fields:

Record Time

The length of time in hours, minutes, and seconds that FXplorer will record data in an **.SGD** file.

Loop Back

Causes FXplorer to return to the beginning of the **.SGD** file when the recording time is up and overwrite the previously recorded data. Recording stops only when you select Stop from the Graph menu or you click on the *Stop* icon in the graph main menu tool bar.

Recording in Loop Back mode is useful when you want to record for long periods of time with the intention of saving a small amount of data at a critical point.

Space Needed

The amount of space in bytes needed on your hard drive to save the data. Be sure you have enough space to save the file.

File name

The name of the file.

3. Click on the **Save** button to close the dialog box.

During recording, the graph provides a status of recording activity in the left column above the directory pane. It indicates the day and time recording started, the length of time set for recording data, the time remaining, and amount of space used for saving the data.

You can select Stop in the Graph menu or click on the *Stop* icon in the tool bar at any time to stop recording. Otherwise, FXplorer will stop recording when the specified record time is reached.

When the recording time is up, a message appears asking if you want to save the graph configuration settings to the same file to which you saved the data. Selecting **Yes** enables you to view the data in the same graph configuration as is on the screen when playing back data. Selecting **No** saves the data only and when you play the data back, you will have to create a graph configuration unless you saved the graph configuration, which can be loaded into the graph at that time. Save the graph configuration with the data or as a separate graph configuration to easily view the graph with the same parameters when playing back the data.

8.9.2 Playing Recorded Data

To play (view) recorded data, do the following:

1. Select Saved Graph from the Graph submenu in the Tools pulldown menu. The Open Saved Graph Data File dialog box appears on the screen.
2. Select the desired file and click on the **Open** button. If you saved the configuration settings with the data, the configured graph appears on the screen.
3. To view the graph with the same parameters used when recording data, load the previously saved graph configuration file.

   If a blank graph appears on the screen, either load the previously saved graph configuration file by following the procedure in **Loading a Graph Configuration** or configure the graph by following the procedures in **Defining the Graph** and **Adding a Line to a Graph** in this chapter.



NOTE: Since all data is saved during recording, you can show data for any of the resources when configuring a graph, as well as the resources you graphed during recording.

When viewing recorded data in which more time was recorded than the maximum visible time on the horizontal axis, use the scroll bar or click on the *Play* icon in the graph tool bar to play back the data so all recorded data can be viewed.

8.9.3 Exporting Recorded Data

FXplorer's performance monitoring feature allows you to export recorded data into other programs, such as a text editor or spreadsheet program. This capability provides you with greater flexibility in displaying data for further analysis.

Export recorded data by doing the following.

1. Select Saved Graph from the Graph submenu in the Tools pulldown menu. The Open Saved Graph Data File dialog box appears on the screen.
2. Select the desired file and click on the **Open** button. If you saved the configuration settings with the data, the configured graph appears on the screen.

   If a blank graph appears on the screen, either load the previously saved graph configuration file or configure the graph by following the procedures in **Defining the Graph** and **Adding a Line to a Graph** in this chapter.
3. In the File menu, select Export Text File. The Export Text File dialog box shown in Figure 8-7 appears on the screen.

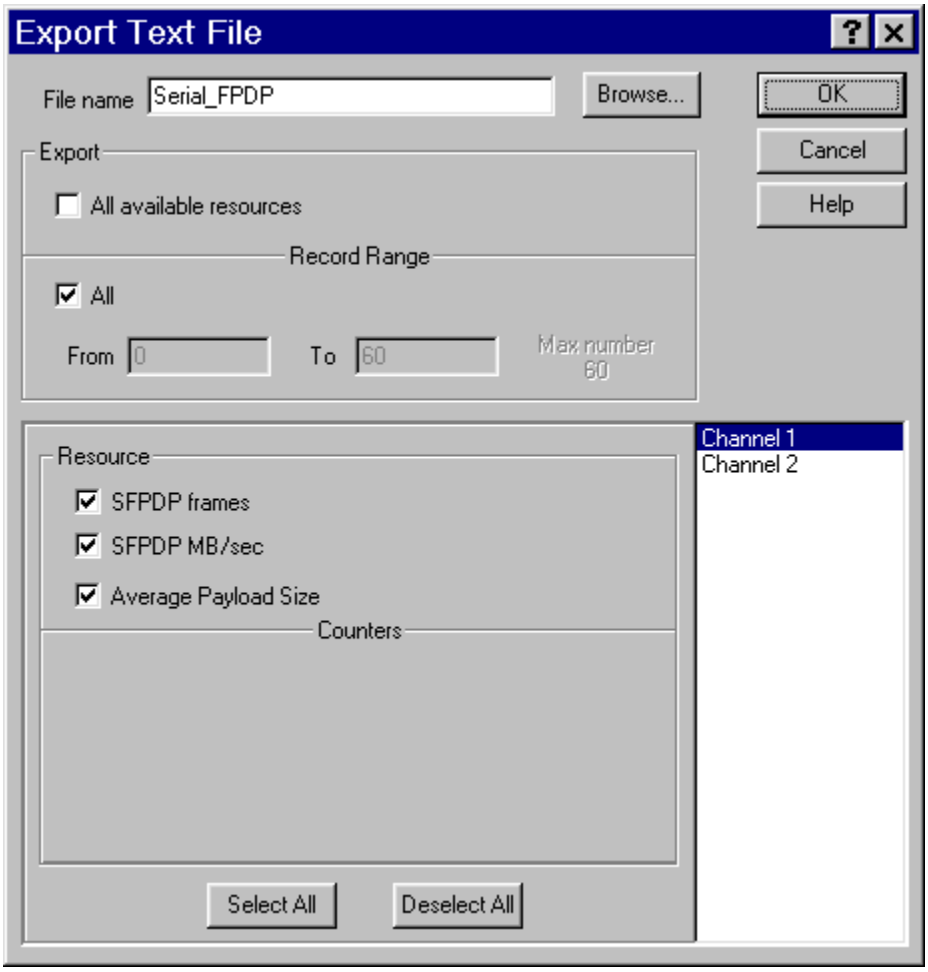


Figure 8-7 Export Text File Dialog Box

4. Define the following parameters:

   File name

   The name of the text file to which recorded data will be saved. This file can be exported into other programs.

   Export all available resources

   Includes all recorded data types for all recorded channels in the text file.

   Record Range

   Select All to save the entire range of records to the text file or indicate the range of recorded data to be saved to the text file in the From and To fields. Max number indicates the maximum number of records in the graph.

   Resource

   The data type(s) for a specific channel to include in the text file.

   Counters

   Loop or word counters configured in the TRAC strategy (if any).

   Channels

   The desired channel(s) for which to export data.

   Select All

   Selects all the data types listed in the Resource field to include in the text file for a specific channel.

   Deselect All

   Clears all the checkboxes for the data types listed in the Resource field so no data types are selected for the specific channel. If desired, select the other channel in the list and indicate the data type(s) for that channel in the Resource field.

5. Click on the **OK** button. The selected data is saved to a text file, and the dialog box closes.
6. Import the file into a spreadsheet program or text editor and format as desired.

8.10 Viewing a Saved Graph

A saved graph contains data that was recorded at an earlier time. You can view this data in the same configuration as when it was recorded or in a different configuration, showing different resources, if desired.

Display a saved graph by doing the following:

1. Select Saved Graph from the Graph submenu in the Tools pulldown menu. The Open Saved Graph Data File dialog box shown in Figure 8-8 appears on the screen.

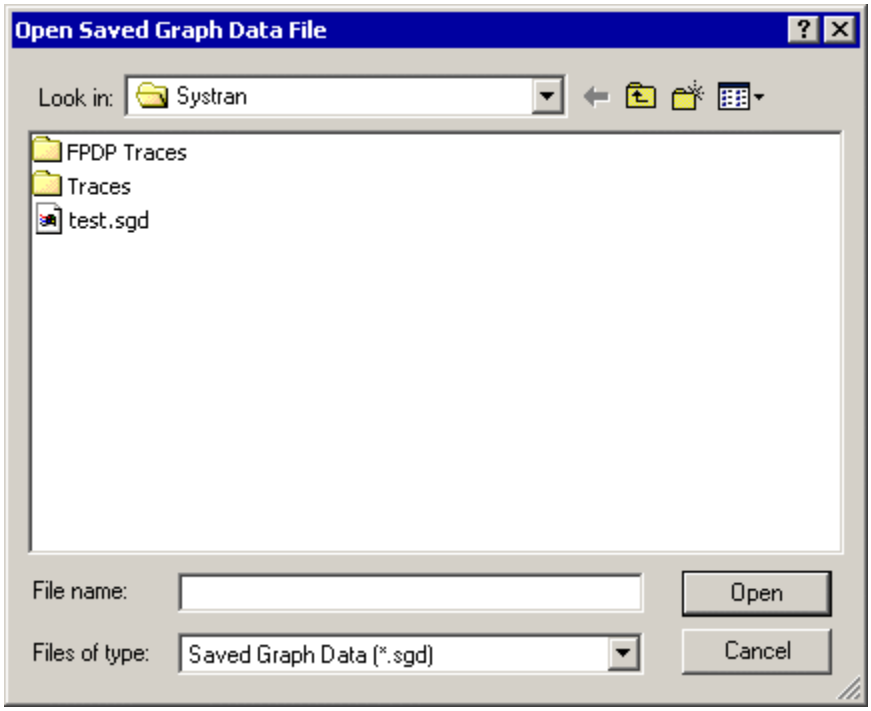


Figure 8-8 Open Saved Graph Data File Dialog Box

2. Select the desired data file in the list. The file name appears in the File name field.
3. If you have a graph already displayed on the screen, the dialog box contains the Load Settings field for determining how the configuration settings should be applied to the data. Select Use Included Settings to load the configuration settings saved with the data file, select Use Current Settings to use the configuration settings from the graphs already displayed, or Add Included Settings to Current Settings to combine the configuration settings saved with the data file with the settings from the graphs already displayed.

4. Click on the Open button.



NOTE: If no other graphs are already on the screen and the graph configuration settings were not saved with the data file, a blank graph appears on the screen. Refer to Loading a Graph Configuration for information on using existing configuration settings with saved data.

- If no other graphs are already on the screen and you selected a data file with saved configuration settings, the data appears in a configured graph.
- If other graphs are already on the screen, the data file appears as determined by your selection in the Load Settings field.

To configure a graph for the saved data or edit the current configuration settings, refer to **Configuring a Live Graph** in this chapter for information on adding and editing lines in a graph.

8.11 Graphed Data

8.11.1 Understanding Graphed Data

Graphed data can be viewed either as real-time performance monitoring or after it has occurred and the data has been saved.

The date and time the data was graphed appears at the top right of the graph.

In a graph, the vertical axis displays the value for a specific resource. If you are graphing average data size, the vertical value is in number of data words; if you are graphing frames, the vertical value is in SFPDP frames/sec; if you are graphing MB/sec, the vertical value is in SFPDP MB/sec.

During real-time performance monitoring, the horizontal axis displays the time past (in seconds) as a negative value. When viewing recorded data, the horizontal axis displays the time past the starting point (in seconds) as a positive value.

To determine the value at a specific time on the selected line, move the cursor to a point on the line in the graph. An approximate value is indicated in the status bar.

The legend below the graph displays the following data, which during real time changes as the data is being updated in the graph:



NOTE: When viewing recorded data, the data in the legend changes only if the recorded time is more than the visible time.

Channel.....The channel for which you are monitoring data. You can change the channel here by clicking on it in the desired line and selecting another from the menu.

Resource .....The type of data you are monitoring. You can change the resource here by clicking on it in the desired line and selecting another from the menu.

Mode .....Values are graphed in count (the real value) or rate (the value as the difference between the value of a specific record and the value of the previous record) mode.

Max .....The highest value graphed in the display.

Min .....The lowest value graphed in the display.

Avg.....The average value graphed in the display.

Current.....In a live graph, the current value is indicated by a light blue line at the far right (denoted by 0 on the horizontal axis). In a recorded graph, the current value is indicated by a light blue line at the far left.

Scale .....The data value is multiplied by the scale factor before graphing. The scale factor is used to size the plotted line to fit the vertical scale of the graph. You can change the scale here by clicking on it in the desired line and selecting another value from the menu.

Offset.....The value the graph is raised or lowered on the vertical axis. You can change the offset here by clicking on it in the desired line and entering a different value.

Columns in the legend can be widened by dragging the vertical border of the desired column to the right until all the data is visible.

The values used in performance monitoring are derived from the following equation:

Actual data point value = (display value ÷ scale) - offset

In real-time performance monitoring, a red vertical line in the graph indicates that a trigger occurred at that record or time.

8.12 Viewing Options

8.12.1 Displaying Time

The horizontal axis has two modes for displaying the time value. Time of day is the actual time in hours/minutes/seconds that the data is being recorded. Absolute time is the time past in seconds relative to the current time for real-time performance monitoring or the time past the starting point in seconds for saved data. To change the way the time is displayed on the horizontal axis, select Absolute Time or Time of Day in the View menu.

8.12.2 Using the Zoom Tools to Change the Vertical Range

The zoom in and zoom out tools change the minimum and maximum vertical range of the graph.

- To increase the maximum and decrease the minimum vertical range:

  Click on the *Zoom Out* icon in the graph tool bar or right click on the graph and select Zoom Out from the menu.
- To decrease the maximum and increase the minimum vertical range:

  Click on the *Zoom In* icon in the graph tool bar or right click on the graph and select Zoom In from the menu.
- To change the center value:

  Double-click on a value and that value will become the center. The minimum and maximum vertical range values will adjust accordingly.
- To reset the minimum and maximum vertical ranges to their original values:

  Click on the *Reset Vertical Range* icon in the graph tool bar or click on the graph with the right mouse button and select Reset Vertical Range from the menu.

8.12.3 Going to Specific Data in a Saved Graph

To quickly move to a specific record or time of day in a saved graph, select Go to in the View menu and enter the desired record number or time of day in the dialog box. When you click on the **OK** button to close the dialog box, FXplorer finds the requested record or time of day and displays it at the far left of the graph.

With FXplorer's marking feature you can mark a record or time of day in a saved graph so that you can easily and quickly return to it at a later time. This feature is especially helpful when your graph contains a large amount of data. FXplorer software allows you to mark a record or time of day in a saved graph by placing a vertical line at the selected data.

ADDING A MARK IN A SAVED GRAPH

To mark a line in a graph, do the following:

1. Display a saved graph on the screen by following the steps in **Viewing a Saved Graph** in this chapter.
2. Select the record or time of day in the graph to mark (depending on which is selected in the View menu) by doing one of the following:
    - Right click on a record or time of day in the graph. Select Add Mark from the menu. The Add Mark dialog box appears on the screen with the selected record number or time of day indicated.
    - Select Add Mark in the View menu. The Add Mark dialog box shown in Figure 8-9 appears on the screen. Enter the record or time of day to mark.

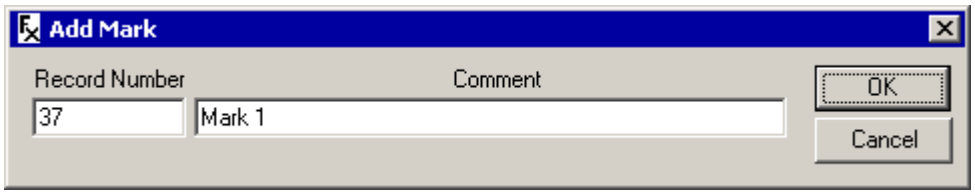


Figure 8-9 Add Mark Dialog Box

3. Type a description of the marked line in the Comment field.
4. Click on the **OK** button to close the dialog box.

GOING TO A MARK IN A SAVED GRAPH

Go to a mark by doing the following:

1. Display a saved graph on the screen by following the steps in **Viewing a Saved Graph** in this chapter.
2. Select Show Mark List in the View menu or right click in the graph and select Show Mark List from the menu. The Mark List dialog box shown in Figure 8-10 appears on the screen.

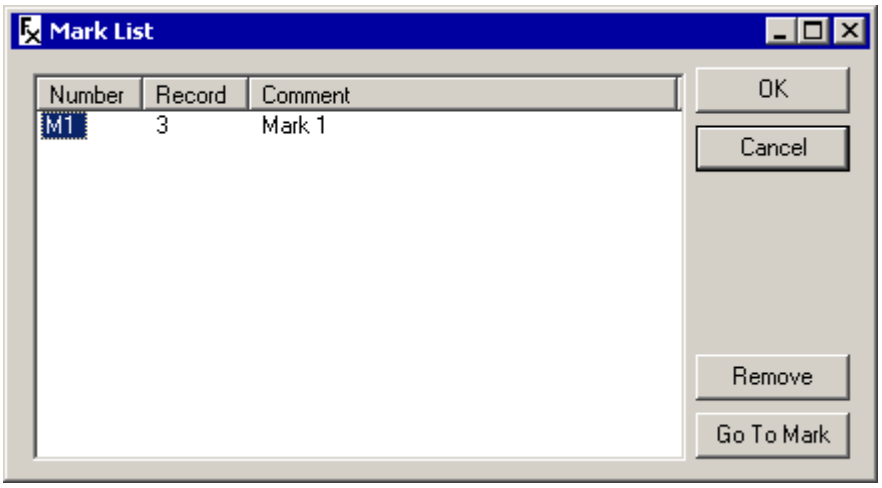


Figure 8-10 Mark List Dialog Box

3. Select the desired mark to go to.
4. Click on the **Go to Mark** button in the dialog box. FXplorer software displays the marked line.
5. Click on the **OK** button to close the dialog box.

REMOVING A MARK IN A SAVED GRAPH

Remove a mark by doing the following:

1. Display a saved graph on the screen by following the steps in **Viewing a Saved Graph** in this chapter.
2. Select Show Mark List in the View menu or right click in the graph and select Show Mark List from the menu. The Mark List dialog box appears on the screen.
3. Select the desired mark to be removed.
4. Click on the **Remove** button. The mark is removed from the list.
5. Click on the **OK** button to close the dialog box.

8.12.4 Changing the Maximum Visible Time on The Horizontal Axis

The default value for the maximum visible time on the horizontal axis is 100 seconds. You can increase this value to provide a broader perspective of the graph or decrease the value to focus on a specific record.

Change the maximum visible time on the horizontal axis by doing the following:

1. In the View pulldown menu, select Visible Time. The Set Visible Time (seconds) dialog box appears on the screen.

2. Enter a value between 4 and 200. The maximum visible time on the horizontal axis is rounded to the closest value divisible by 4.

8.12.5 Grouping Graphs

You can create folders to group your graphs so that they are easy to find and use. By default, graphs are added to the root directory if no other groups exist. If the directory pane contains other groups besides the root directory, graphs are added to the selected group.

To display all the graphs in a group on the screen, click on the folder. To display a single graph, click on the graph.

To create a new group, do the following:

1. Click on the *Add new gro*up icon in the graph main menu tool bar or select New Group from the Graph menu. A dialog box appears on the screen for assigning a name to the group.
2. Type the desired name in the Enter Group Name field and click on the **OK** button to close the dialog box. A folder appears on the screen with the assigned name of the new group. All graphs that were selected when the new group was created are assigned to that group.

You can change the group to which an existing graph is assigned by dragging and dropping it into the desired group.

To save the structure, save the graph configuration before closing performance monitoring by following the procedure in **Saving a Graph Configuration** in this chapter. The next time you load the graph configuration, the graphs will be listed within the assigned groups. When you add a graph configuration to a graph configuration that is already on the screen, clicking on the Add to the Current Settings radio button causes the added graphs to be added in their currently assigned groups.

8.13 Example of Graphed Data

Figure 8-11 shows an example of a simple graph during real-time performance monitoring. The graph in this example was configured for one channel to monitor Serial FPDP frames in rate mode.

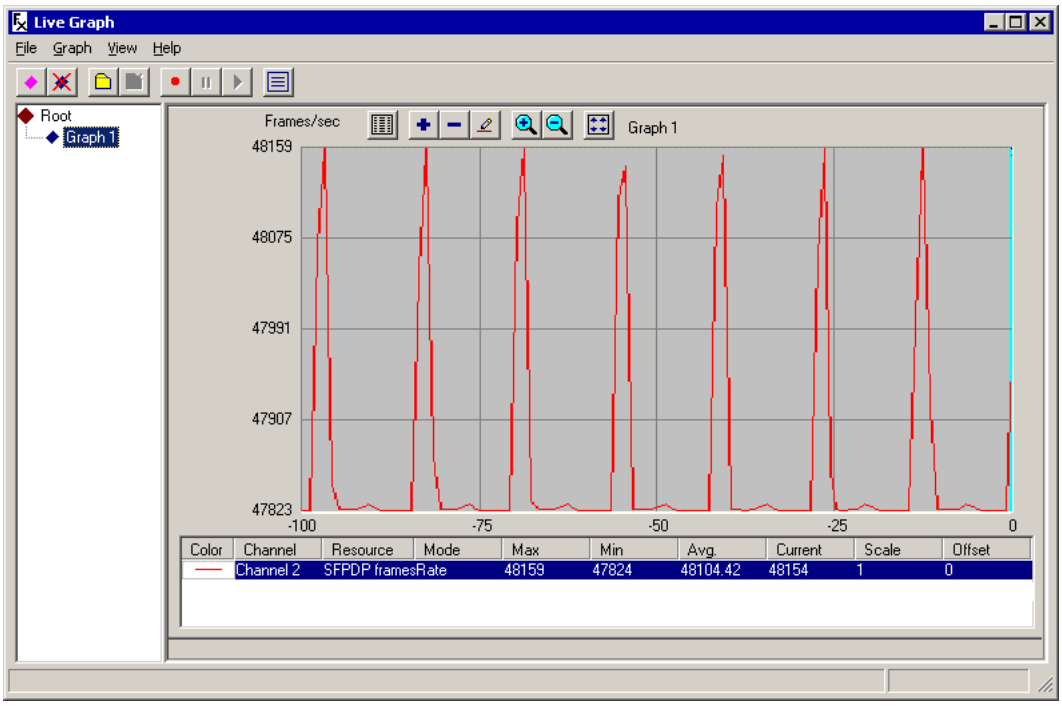


Figure 8-11 Example of a Simple Graph During Real-Time Performance Monitoring

8.14 Stopping Performance Monitoring

Click on the Close button in the upper-right corner of the dialog box to stop performance monitoring. This stops performance monitoring only, it does not stop FXplorer operation.

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APPENDIX A

SPECIFICATIONS

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A.1 Serial FPDP Protocol Analyzer Specifications

AC Input
- Autoranging Input Voltage ..... 90–132/180–264 VAC
- Line Frequency ..... 47–63 Hz
- Current (maximum) ..... 2.5 A

Physical Dimensions ..... 4 in. width x 7 in. height x 15.5 in. length (102 mm width x 178 mm height x 394 mm length)

Weight ..... 8 lb (3.6 kg)

Environmental
- Operating Temperature Range ..... 32° to 95° F (0° to 35° C)

Network
- Cabling:
  - 100 Base-T mode ..... Category 5 UTP
  - 10 Base-T mode ..... Category 3/4 or 5 UTP
- Segment Length (port to hub) ..... 328 ft (100 m)

A.2 Media Interface Specifications

A.2.1 Short Wavelength Laser Media Interface: 2.5, 2.125, 1.0625 Gbps

Connector: ..... Duplex LC

Maximum Data Rate: ..... 2.5 Gbps

Media ..... 50 µm or 62.5 µm multimode fiber

Maximum Fiber Length:
- 2.5 Gbps ..... 250 m with 50 µm fiber
125 m with 62.5 µm fiber
- 2.125 Gbps ..... 300 m with 50 µm fiber
150 m with 62.5 µm fiber
- 1.0625 Gbps ..... 500 m with 50 µm fiber
300 m with 62.5 µm fiber

Transmit Wavelength: ..... 840 to 860 nm

Transmit Power: ..... -9.5 to –4 dBm

Receive Wavelength: ..... 770 to 860 nm

Receive Sensitivity: ..... -16 to 0 dBm

A.2.2 Long Wavelength Laser Media Interface: 2.5, 2.125, 1.0625 Gbps

Connector: ..... Duplex LC

Maximum Data Rate: ..... 2.5 Gbps

Media ..... 9 µm singlemode fiber

Maximum Fiber Length:
- 2.5 Gbps ..... 10 km
- 2.125 Gbps ..... 10 km
- 1.0625 Gbps ..... 10 km

Transmit Wavelength: ..... 1260 to 1360 nm

Transmit Power: ..... -5 to 0 dBm

Receive Wavelength: ..... 1260 to 1580 nm

Receive Sensitivity: ..... -19 to 0 dBm

A.2.3 HSSDC2 – HSSDC2 Copper Media Interface: 1.0625 Gbps

Connector:..... HSSDC2 (Fibre Channel)
Maximum Data Rate: ..... 1.0625 Gbps
Media:..... 150 Ohm shielded, Quad Copper
Maximum Cable Length:..... 30 meters (equalized cable)

A.2.4 HSSDC2 – HSSDC2 Copper Media Interface: 2.125 Gbps

Connector:..... HSSDC2 (Fibre Channel)
Maximum Data Rate: ..... 2.125 Gbps
Media:..... 150 Ohm shielded, Quad Copper
Maximum Cable Length:..... 15 meters (equalized cable)

A.2.5 HSSDC2 – HSSDC2 Copper Media Interface: 2.5 Gbps

Connector:..... HSSDC2 (InfiniBand)
Maximum Data Rate: ..... 2.5 Gbps
Media:..... 100 Ohm shielded, Quad Copper
Maximum Cable Length:..... 10 meters (equalized cable)

APPENDIX B

SOFTWARE REFERENCE

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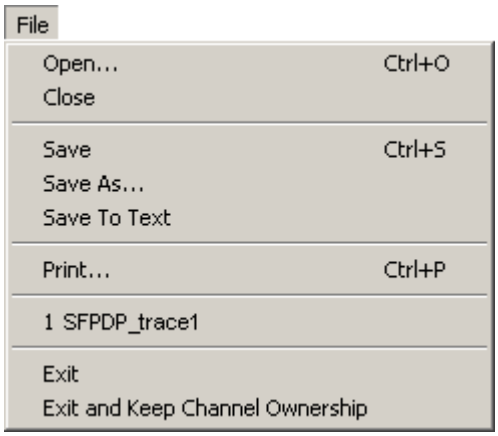
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B.1 Pulldown Menus

B.1.1 File Menu Commands



Open

Opens a trace file. Same as the Open icon in the tool bar.

Close

Closes the active trace file and prompts you to save any changes that were made. *Selection available only when a trace is displayed.*

Save

Saves bookmark changes in the active trace file under its current name. Same as the Save icon in the tool bar. *Selection available only when a trace is displayed.*

Save As

Displays the Save As dialog box for saving and naming (or renaming) the active trace file. *Selection available only when a trace is displayed.*

Save to Text

Displays the Save to Text dialog box for saving trace data as a text file to be viewed and edited using a text editor. *Selection available only when a trace is displayed.*

Print

Displays the Print dialog box to set parameters for printing trace view data. *Selection available only when a trace is displayed.*

File 1, 2 …

Lists the four most recently accessed trace files. Selecting one of these files opens the trace file for viewing.

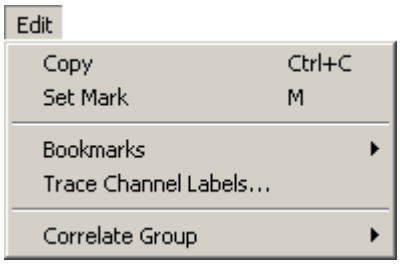
Exit

Closes the software, disconnects any selected channels, and returns you to the Windows desktop. If you have not saved a newly captured trace, a prompt appears as a reminder to save it.

Exit and Keep Channel Ownership

Closes the software, allowing you to keep channel ownership. If you have not saved a newly captured trace, a prompt appears as a reminder to save it. *Selection available only when you own channels.*

B.1.2 Edit Menu Commands



Copy

Copies a selected range of data in an active trace view to the Clipboard, replacing any data already stored there. The copied data can then be pasted into a text file. *Selection available only when a trace is displayed.*

Set Mark

Marks a line in the active trace view. *Selection available only when a trace is displayed.*

Bookmarks

Displays a menu for adding a bookmark, deleting a bookmark, and displaying the Bookmark List dialog box. *Selection available only when a trace is displayed.*

Trace Channel Labels

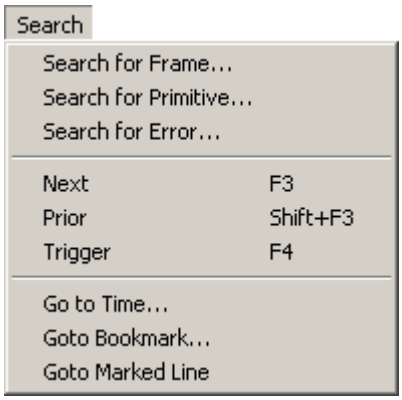
Displays a dialog box for labeling channels in a trace view. *Selection available only when a trace is displayed.*

Correlate Group

Displays a menu for assigning the active trace view window to a new group or changing the group to which the active trace view window is assigned. *Selection available only when a trace is displayed.*

B.1.3 Search Menu Commands

Menu available only when a trace is displayed.



Search for Frame

Displays the SFPDP Frame Search dialog box for defining a frame data pattern and initiating a search.

Search for Primitive

Displays the SFPDP Primitive Search dialog box for specifying a primitive and initiating a search.

Search for Error

Displays the Error Search dialog box for defining error search parameters and initiating a search.

Next

Searches the current trace view for the next occurrence of the specified frame, primitive, or error.

Prior

Searches the current trace view for the previous occurrence of the specified frame, primitive, or error.

Trigger

Finds the trigger location in the current trace view if a trigger occurred.

Go to Time

Displays a dialog box for entering a time stamp to find in the active trace view. Clicking on the **OK** button closes the dialog box and displays the time stamp at the top of the trace view window. If an approximate time stamp is entered, the nearest time stamp value is displayed at the top of the view window.

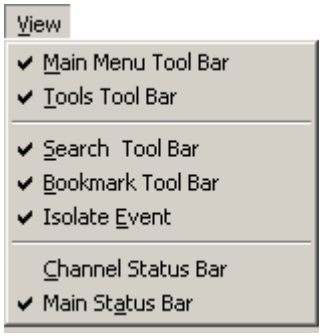
Go to Bookmark

Displays the Bookmark List dialog box from which to select a bookmark to find in the active trace view. Clicking on the **Go to Bookmark** button in the dialog box displays the bookmarked line at the top of the trace view window.

Go to Marked Line

Finds the marked line in the active trace view and displays it at the top of the trace view window.

B.1.4 View Menu Commands



Main Menu Tool Bar

Allows you to perform basic tasks, such as saving and printing a trace and starting and stopping the analyzer. The main menu tool bar can be repositioned to attach to any edge of the main window or to float within the main window.

Tools Tool Bar

Shows or hides the tools tool bar. This tool bar allows you to define prefiltering and postfiltering parameters, create a capture strategy, or access a live or saved graph. It can be repositioned to attach to any edge of the main window or to float within the main window.

Search Tool Bar

Shows or hides the search tool bar. This tool bar allows you to navigate through the active trace view. It can be repositioned to attach to any edge of the main window or to float within the main window.

Bookmark Tool Bar

Shows or hides the bookmark tool bar. This tool bar displays the comment for the selected bookmark in the current trace and accesses the Bookmark List dialog box. It can be repositioned anywhere at the top or bottom of the main window.

Isolate Event

Displays a window for a specific event in a trace view.

Channel Status Bar

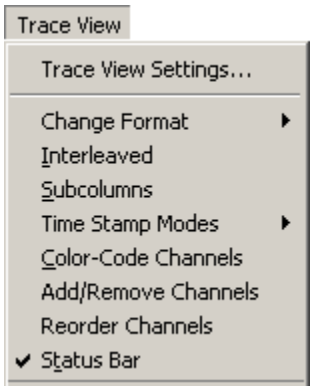
Shows or hides the channel status bar during analyzer operation. The status bar reports on channel operating status and shows a dynamic representation of Serial FPDP activity by channel. It is user configurable.

Main Status Bar

Located at the bottom of the trace view window. When you mark a line in the trace view, Time to Mark appears in the status bar indicating the elapsed time between the marked line and the current line. The status bar also identifies the group to which the active window is assigned.

B.1.5 Trace View Menu Commands

The first two selections are always available. The rest are available only when a trace is displayed.



Trace View Settings

Displays the View Settings dialog box for configuring the parameters for a trace view display.

Change Format

Replaces the active trace view with a view selected from the list. The list contains standard views and any customized views.

Trace Views:

Single Line – Shows all primitives and frame activity on a single line in the trace view.

Multi Line – Shows Serial FPDP primitives and frames on multiple lines in the trace view.

Interleaved

When interleaved is selected, the active trace view displays data by event (interleaved view). When interleaved is not selected, the active trace view shows data by channels (non-interleaved view).

Subcolumns

When enabled, displays event data in the active trace view in resizable columns. Double-click on a column header to adjust the column width for the widest line of data in that column. Double-clicking on the column header again returns the column width to the default (20 characters wide).

Time Stamp Modes

Select a mode for displaying the time stamp in a trace view:

Delta time – Indicates the duration of that line or the time from when the line was recorded until the next line was recorded for that channel. Each time stamp indicates the duration of its entry. The time stamp for each event is shown as seconds/milliseconds/microseconds/nanoseconds

Absolute time – Indicates the time the event occurred relative to when trace recording was started. The time stamp for each event is shown as seconds/milliseconds/microseconds/ nanoseconds. This is the default time stamp mode.

Time of day – Indicates the actual time and day the event occurred. The time stamp for each event is shown as year/month/day and hours/minutes/seconds/milliseconds/ microseconds/nanoseconds.

Color-Code Channels

Displays each channel in the active trace view in a unique color.

Add/Remove Channels

Allows you to add channels to or remove them from the active trace view.

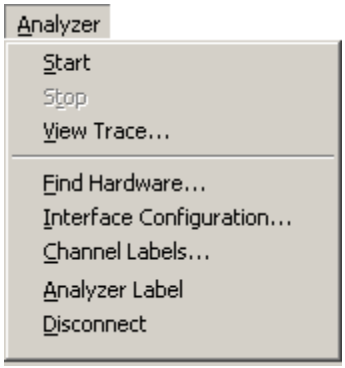
Reorder Channels

Returns channels to their sequential order when they have been rearranged.

Status Bar

Located at the bottom of the trace view window. Displays the Correlate Group number. The Status Bar also allows you to reset channel widths and scroll through channels.

B.1.6 Analyzer Menu Commands



Start

Initiates capture mode. Starting the analyzer turns control over to the TRAC engines, which determine the types of events to be captured and the triggering condition (if any). Same as the Start icon in the tool bar.

Stop

Stops the analyzer, thereby halting the TRAC engines and data capture. Trace data is not displayed. Same as the Stop icon in the tool bar.

View Trace

Stops the analyzer, thereby halting the TRAC engines and clearing the memory. The View Settings dialog box appears for selecting the trace view(s) and the channels to display the trace data. Same as the View Trace Data icon in the tool bar.

Find Hardware

Displays the Analyzer Selection dialog box for selecting an analyzer and the channels on which to run a TRAC strategy.

Interface Configuration

Displays a dialog box for configuring analyzer channels. Specify the interface configuration and data transfer rate. You can also save your changes as default settings.

Channel Labels

Displays a dialog box for labeling channels. Channel labels appear in FXplorer and trace dialog boxes as well as in trace views.

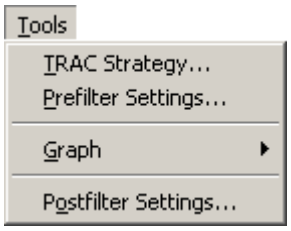
Analyzer Label

Selecting Analyzer Label displays a dialog box for naming the selected analyzer and assigning it to a group.

Disconnect

Allows you to give up channel ownership while remaining in the software.

B.1.7 Tools Menu Commands



TRAC Strategy

Accesses the TRAC Strategy Builder for creating a TRAC strategy if you have selected an analyzer and channels in the Analyzer Selection dialog box. If you have not first selected the hardware to use, the TRAC Engine Selection dialog box appears on the screen for indicating the type of TRAC engines for which to configure the TRAC strategy.

Prefilter Settings

Displays the Prefilter Settings dialog box for defining prefiltering parameters by channel.

Graph

Allows you to monitor a live graph or open a saved graph:

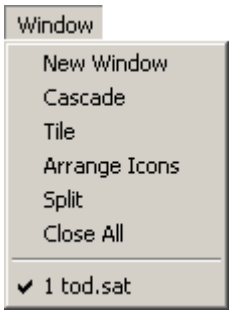
Live Graph – Displays a blank graph on the screen to be configured for monitoring the performance of channels in real time. Data can be recorded to view later.

Saved Graph – Displays the Open dialog box for selecting a file from which to load recorded data. Configure this data into a graph, as desired.

Postfilter Settings

Displays the Postfilter Settings dialog box for defining postfiltering parameters by channel.

B.1.8 Window Menu Commands



New Window
Displays the active trace view in a new window.

Cascade
Overlaps trace views on the screen.

Tile
Positions trace views on the screen so they are all equally visible.

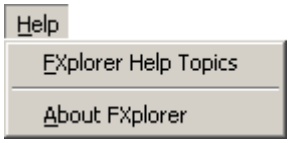
Arrange Icons
Arranges the icons for minimized windows at the bottom of the screen. If an open document window is at the bottom of the screen, some or all of the icons will be underneath this document window and will not be visible.

Split
Turns the cursor into a double-headed arrow so that you can adjust the horizontal width of the trace data pane or the histogram in a trace view. You can drag the split bar to the left or right, as desired, and click on either the trace data pane or the histogram pane. Clicking on the histogram pane causes the trace data pane to become wider and vice versa.

Close All
Closes all trace views and prompts you to save any changes that were made.

Window 1, 2 …
Lists the currently open trace views with a checkmark indicating the active view. Select a trace view from this list to make it active.

B.1.9 Help Menu Commands



FXplorer Help Topics
Lists the topics in the software on-line help.

About FXplorer
Indicates the current software and firmware version numbers.

B.2 Tool Bars

B.2.1 Main Menu Tool Bar



Open

Opens a trace file. Same as Open in the File pulldown menu.



Save

Closes the active trace file and prompts you to save any changes that were made. Same as Close in the File pulldown menu.



Copy

Copies a selected range of data in an active trace view to the Clipboard. The copied data can then be pasted into a text file. Same as Copy in the Edit pulldown menu.



Print

Displays the Print dialog box to set parameters for printing trace view data. Same as Print in the File pulldown menu.



Go

Starts the capture mode. Same as Start in the Analyzer pulldown menu.



Stop

Stops the capture mode. Same as Stop in the Analyzer pulldown menu.



View Trace Data

Stops capturing data and displays the View Settings dialog box for selecting the trace view and the channels to display the trace data. Same as View Trace in the Analyzer pulldown menu.

B.2.2 Tools Tool Bar



TRAC Strategy

Accesses the TRAC Strategy Builder for creating a TRAC strategy if you have selected an analyzer and channels in the Analyzer Selection dialog box. If you have not first selected the hardware to use, the TRAC Engine Selection dialog box appears on the screen for indicating the type of TRAC engines for which to configure the TRAC strategy.



Prefilter Settings

Displays the Prefilter Settings dialog box for defining prefiltering parameters by channel.



Postfilter Settings

Displays the Postfilter Settings dialog box for defining postfiltering parameters by channel.



Live Graph

Displays a blank graph on the screen to be configured for monitoring the performance of channels in real time. Data can be recorded to view later.



Saved Graph

Displays the Open dialog box for selecting a file from which to load recorded data. Configure this data into a graph, as desired.

B.2.3 Search Tool Bar



Search for Frame

Displays the SFPDP Frame Search dialog box for defining a search pattern and initiating a search.



Search for Primitive

Displays the SFPDP Primitive Search dialog box for defining a search pattern and initiating a search.



Search for Error

Displays the Error Search dialog box for defining error search parameters and initiating a search.



Search for Trigger

Finds the trigger location in the current trace view if a trigger occurred.



Search for Next Pattern Match

Searches the current trace view for the next occurrence of the specified frame, primitive, or error.



Search for Prior Pattern Match

Searches the current trace view for the previous occurrence of the specified frame, primitive, or error.



Go to Time Stamp

Displays a dialog box for entering a time stamp to find in the active trace view. Clicking on the **OK** button closes the dialog box and displays the time stamp at the top of the trace view window. If an approximate time stamp is entered, the nearest time stamp value is displayed at the top of the view window.



Show Bookmark List

Displays the Bookmark List dialog box from which to select a bookmark to find in the active trace view. Clicking on the **Go to Bookmark** button in the dialog box displays the bookmarked line at the top of the trace view window.

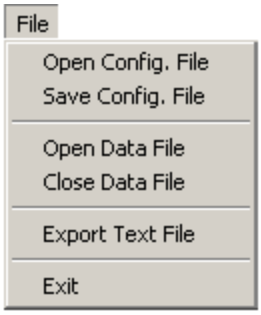


Go to Marked Line

Finds the marked line in the active trace view and displays it at the top of the trace view window.

B.3 Graph Menus

B.3.1 File Menu Commands



Open Config. File

Displays the Open dialog box for selecting a previously saved graph configuration file to load.

Save Config. File

Displays the Save As dialog box for saving a graph configuration file to use in future performance-monitoring sessions.

Open Data File

Displays the Open dialog box for selecting previously recorded data to load into a graph.

Close Data File

Removes the previously recorded data from the screen.

Export Text File

Displays the Export Text File dialog box for determining the recorded data to save to a text file.

Exit

Stops performance monitoring and clears the graph(s) from the screen.

B.3.2 Graph Menu Commands



New Graph

Displays the New Graph Configuration Settings dialog box for adding a graph to the screen. Same as the Add New Graph icon in the graph main menu tool bar.

Delete Graph

Deletes the graph selected in the directory pane. Same as the Delete Selected Graph icon in the graph main menu tool bar.

New Group

Displays a dialog box for assigning a name to a new group. When you enter a name in the dialog box and click on the **OK** button, a new folder appears in the directory pane with the assigned name. Same as the Add New Group icon in the graph main menu tool bar.

Delete Group

Deletes the selected folder and its contents from the directory pane. Same as the Delete Selected Group icon in the graph main menu tool bar.

Record

Displays the Record Graph dialog box for specifying the length of time to record data and the file to which recorded data will be saved. Same as the Record icon in the graph main menu tool bar.

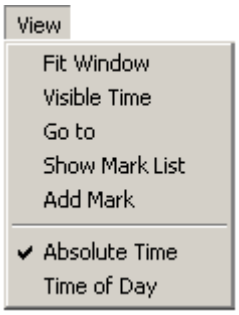
Stop

Stops recording or playing back recorded data. Same as the Stop icon in the graph main menu tool bar.

Play

If the recorded time is more than the visible time, plays the data so all recorded data can be viewed. Same as the Play Back icon in the graph main menu tool bar.

B.3.3 View Menu Commands



Fit Window

Adjusts all graphs on the screen to equal height. Same as the Fit all graphs in window icon in the graph main menu tool bar.

Visible Time

Displays the Set Visible Time (seconds) dialog box for changing the maximum visible time on the horizontal axis of the graph.

Go to

Displays a dialog box for specifying the desired record or time of day to go to.

Show Mark List

Allows you to view the list and descriptions of records or times that you have marked. You can delete any of them, select one to go to, or edit the descriptions.

Add Mark

Displays the Add Mark dialog box for adding a mark and entering a description.

Absolute Time

Displays the horizontal axis in absolute time (by record).

Time of Day

Displays the horizontal axis in actual time (hours/minutes/seconds).

B.3.4 Help Menu Commands



Contents

Displays the help table of contents for information on real-time performance monitoring.

B.3.5 Graph Main Menu Tool Bar



Add new graph icon

Displays the New Graph Configuration Settings dialog box for adding a graph to the screen. Same as the New Graph selection in the Graph pulldown menu.



Delete selected graph icon

Deletes the graph selected in the directory pane. Same as the Delete Graph selection in the Graph pulldown menu.



Add new group icon

Displays a dialog box for assigning a name to a new group. When you enter a name in the dialog box and click on the **OK** button, a new folder appears in the directory pane with the assigned name. Same as the New Group selection in the Graph pulldown menu.



Delete selected group icon

Deletes the selected folder and its contents from the directory pane. Same as the Delete Group selection in the Graph pulldown menu.



Record icon

Displays the Record Graph dialog box for specifying the length of time to record data and the file to which recorded data will be saved. Same as the Record selection in the Graph pulldown menu.



Stop icon

Stops recording or playing back recorded data. Same as the Stop selection in the Graph pulldown menu.



Play back icon

If the recorded time is more than the visible time, plays the data so all recorded data can be viewed. Same as the Play selection in the Graph pulldown menu.



Fit all graphs in window icon

Adjusts all graphs on the screen to equal height. Same as the Fit Window selection in the View pulldown menu.

B.3.6 Graph Tool Bar



Graph settings icon

Displays the Edit Graph Configuration Settings dialog box for editing parameters that define the general appearance of the graph.



Add a new line icon

Displays the Add Line dialog box for defining the parameters of a new line in a graph.



Remove the selected line icon

Deletes the selected line in a graph.



Edit the selected line icon

Displays the Edit Resource dialog box for changing the parameters of the selected line.



Zoom in icon

Decreases the maximum and increases the minimum vertical range of the graph.



Zoom out icon

Increases the maximum and decreases the minimum vertical range of the graph.



Reset vertical range icon

Resets the vertical range so that every line in the graph is visible.

B.4 Software File Extensions

FXplorer software saves files with the following extensions:

File Extension	Used for
.FLT	Prefiltering files
.FRM	Serial FPDP frame files and frame search pattern files
.FXT	Trace files
.GPH	Graph configuration file
.PFT	Postfiltering files
.SGD	A file containing recorded data for performance monitoring
.TRS	TRAC strategy files
.TXT	Text file to which recorded data is saved for exporting to other programs
.VSF	Trace view settings file

APPENDIX C

SERIAL FPDP PROTOCOL

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C.1 Overview

The Serial Front Panel Data Port (FPDP) VITA 17.1 protocol provides near optimal throughput while maintaining low overhead for use in high-speed data transfer applications, typically using a fiber optic link. As the names implies, it is a serial adaptation of FPDP (VITA 17). Serial FPDP currently supports three link speeds: 1.0625 Gbps, 2.125 Gbps, and 2.5 Gbps. Since an 8B/10B encoding scheme is used, this corresponds to a raw data rate of 106.25 MBps, 212.5 MBps, and 250 MBps (1 MB = 10^6 bytes). Based on the protocol presented here, the usable link throughput available to the user is 105 MBps, 210 MBps, and 247 MBps.

All ordered sets used by this protocol are standard Fibre Channel ordered sets with the exception of positive IDLE, which is allowed for a more flexible receiver interface. Note that the protocol referred to throughout this document is the protocol used by the transmitter and accepted by the receiver. The receiver does not have to see the protocol defined here to receive data. Any generic Fibre Channel data stream with an IDLE at least every 4096 words can be used.



NOTE: Systran offers a variety of Serial FPDP cards, which are called FibreXtreme SL100 or SL100X and FibreXtreme SL240 or SL240X. FibreXtreme SL100 or SL100X cards support the 1.0625 Gbps link speed. FibreXtreme SL240 or SL240X cards support the 2.5 Gbps link speed. Systran does not currently offer cards that support the 2.125 Gbps Serial FPDP link speed.

C.2 Ordered Sets Used

Fibre Channel denotes a certain mapping of the transmission words in the 8B/10B protocol to be ordered sets, which denote special control information for Fibre Channel. These same ordered sets are used in VITA 17.1, but are assigned different meaning.

There are eighteen ordered sets used by VITA 17.1 to denote different information. Twelve of these ordered sets are used to embed five bits of data—eight start-of-frame (SOF) sets are used to embed three bits at the start of a frame, and four status-end-of-frame (SEOF) sets are used to embed two bits at the end of the frame. The SOF ordered sets embed three FPDP signals—PIO1, PIO2, and DIR.

Note that although the direction signal on FPDP is active low (/DIR), the signal transmitted on the link is active high (DIR).

The four EOF ordered sets embed the FPDP signal NRDY (once again, the inverted version of the FPDP interface's /NRDY) and Transmit FIFO Overflow flag.

There are two additional EOF ordered sets used by VITA 17.1 to denote the actual end of frame. The Mark EOF (MEOF) denotes a frame that has SYNC associated with it, and the Frame EOF (FEOF) denotes a normal data frame. The other four ordered sets are inter-frame padding used to denote flow control information and alternate frame interpretations. Table C-1 shows the mappings from the Fibre Channel ordered sets onto the VITA 17.1 ordered sets, along with the meaning associated with each ordered set.

Table C-1 Ordered Set Mapping

Fibre Channel Ordered Set	VITA 17.1 Ordered Set	Description
SOFc1	SOF	Start of Frame: PIO1 = 0, PIO2 = 0, DIR = 0
SOFi1	SOF	Start of Frame: PIO1 = 0, PIO2 = 0, DIR = 1
SOFn1	SOF	Start of Frame: PIO1 = 0, PIO2 = 1, DIR = 0
SOFi2	SOF	Start of Frame: PIO1 = 0, PIO2 = 1, DIR = 1
SOFn2	SOF	Start of Frame: PIO1 = 1, PIO2 = 0, DIR = 0
SOFi3	SOF	Start of Frame: PIO1 = 1, PIO2 = 0, DIR = 1
SOFn3	SOF	Start of Frame: PIO1 = 1, PIO2 = 1, DIR = 0
SOFf	SOF	Start of Frame: PIO1 = 1, PIO2 = 1, DIR = 1
EOFt	SEOF	Status EOF: FIFO Overflow = 0, NRDY = 0
EOFdt	SEOF	Status EOF: FIFO Overflow = 0, NRDY = 1
EOFa	SEOF	Status EOF: FIFO Overflow = 1, NRDY = 0
EOFn	SEOF	Status EOF: FIFO Overflow = 1, NRDY = 1
EOFni	MEOF	Mark EOF: EOF for a SYNC frame
EOFdti	FEOF	Frame EOF: EOF for a normal data frame
R_RDY	SWDV	SYNC with DATA Valid: Says that the next frame will be a SYNC with DATA frame
NOS	STOP	Tells the remote transmitter to stop sending data
CLS	GO	Tells the remote transmitter it can continue to send data
IDLE	IDLE	IDLE character: Used as a padding word to maintain receiver synchronization

C.3 Frames

There are four basic frame types defined in VITA 17.1 - an IDLE frame, data frame, a SYNC without data frame, and a SYNC with data frame. The data is divided into frames so the FPDP signals are sampled at some minimum interval, and so the receiver is guaranteed to see IDLEs to maintain synchronization. SYNC is used to delimit data streams and maintain host program synchronization. This signal is under user control for PCI based products, and is the same as the FPDP /SYNC signal for CMC/FPDP based products. The SL100/SL240 PCI cards will only generate SYNC frames as SYNC without DVALID frames. Whenever a SYNC appears on the output of the Transmit FIFO, the current frame is terminated and the proper SYNC frame (SYNC with data or SYNC without data) is sent. Figure C-1 shows the four types of frames and the ordered set placement within those frames.

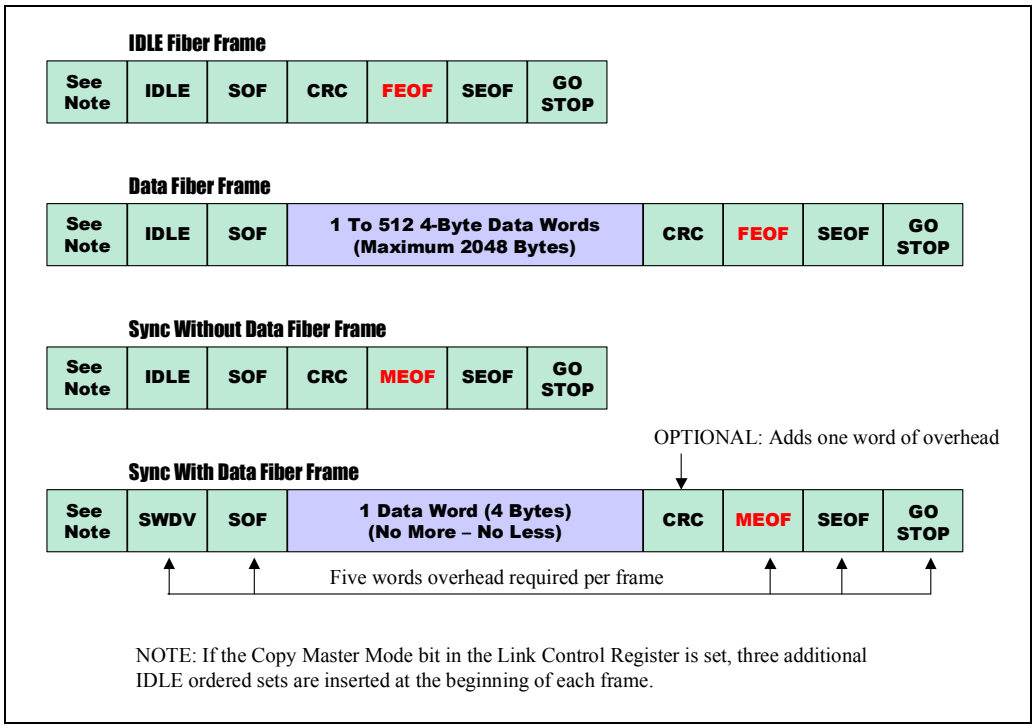


Figure C-1 VITA 17.1 Framing Protocol

C.3.1 Link Bandwidth

With CRC disabled and the Copy Master Mode bit clear (‘0’), there is a five-word overhead for every frame transmitted. Since frames can contain up to 512 words of data, this results in an efficiency of 99.03%. With CRC enabled and the Copy Master Mode bit clear, there is a six-word overhead for every frame transmitted. This results in a maximum efficiency of 98.84%. With the Copy Master Mode bit set (‘1’), three additional ordered sets are added per frame. This results in an efficiency of 98.46 percent without CRC and 98.27 percent with CRC. Table C-2 gives the theoretical maximum sustained throughput based on these numbers.

Table C-2 Maximum Sustained Throughput

FibreXtreme Card Name	Link Speed	With CRC and Copy Master Mode bit = 0	Without CRC and Copy Master Mode bit = 0	With CRC and Copy Master Mode bit = 1	Without CRC and Copy Master Mode bit = 1
SL100 or SL100X	1.0625 Gbps	105.02 MB/s	105.22 MB/s	104.41 MB/s	104.61 MB/s
N/A	2.125 Gbps	210.04 MB/s	210.44 MB/s	208.82 MB/s	209.23 MB/s
SL240 or SL240X	2.5 Gbps	247.10 MB/s	247.58 MB/s	245.68 MB/s	246.15 MB/s



NOTE: On FibreXtreme SL100/SL240 and SL100X/SL240X cards, the Copy Master Mode bit is located in the Link Control register.

C.3.2 FPDP Signal Sample Rate

The states of the FPDP signals (PIO1, PIO2, DIR, and NRDY) are transmitted across the link at varying rates. The worst-case rate at which these signals are sampled is for CRC checked filled data frames and the Copy Master Mode bit set . In this case, the signals are sampled every 521 words. For CRC checked filled data frames and the Copy Master Mode bit clear, these signals are sampled every 518 words. Table C-3 summarizes the worst-case sampling frequencies for the different link transmission speeds (SL100 and SL240).

Table C-3 Sampling Frequencies

FibreXtreme Card Name	Link Speed	With CRC and Copy Master Mode bit = 0	Without CRC and Copy Master Mode bit = 0	With CRC and Copy Master Mode bit = 1	Without CRC and Copy Master Mode bit = 1
SL100 or SL100X	1.0625 Gbps	51.28 KHz	51.38 KHz	50.98 KHz	51.08 KHz
N/A	2.125 Gbps	102.56 KHz	102.76 KHz	101.96 KHz	102.16 KHz
SL240 or SL240X	2.5 Gbps	120.65 KHz	120.89 KHz	119.96 KHz	120.19 KHz



NOTE: On FibreXtreme SL100/SL240 and SL100X/SL240X cards, the Copy Master Mode bit is located in the Link Control register.

C.4 Copy Master Mode

The Serial FPDP Protocol Analyzer requires at least three IDLE ordered sets per frame in order to capture Serial FPDP traffic. Copy Master Mode inserts three extra IDLE ordered sets at the beginning of each Serial FPDP frame. This translates to at least four IDLEs in Data or Idle frames and SYNC Without Data frames and at least three IDLEs and a SWDV ordered set in SYNC With Data frames. There are two methods in which to enter Copy Master Mode on FibreXtreme cards.

The first method is to set the Copy Master Mode bit in the Link Control register. All FibreXtreme PCI-based cards provide the user with access to their register set. FibreXtreme CMC cards also have a register set. However, the CMC card's register set is only accessible if the CMC card is installed on a microcontroller-based carrier card.

The second method is to use a CMC card that is factory-configured to be in Copy Master Mode by default. This method must be used if the CMC card is installed on a non-microcontroller based carrier card. See **Appendix D – Ordering Information** for available CMC cards that are in Copy Master Mode by default.

C.5 Data Transmission and Flow Control

As SL100/SL240 and SL100X/SL240X is seen as a point-to-point link from the transmitter, there is no need to log into the receiver node to begin sending data. FibreXtreme boards can begin transmission as soon as they are started and data is available in the Transmit FIFO. Using the frames described above, the transmitter sets up a constant stream of frames, into which it inserts data as it becomes available. Data is only inserted if the flow control signal from the remote end is GO—if it is STOP, then the data waits in the Transmit FIFO until the signal changes. Systran's FibreXtreme boards use the same protocol when transmitting from either end to allow the link to operate bi-directionally. Since these data streams are independent, the maximum throughput on the link would be 210 MB/s (105 MB/s/direction) for SL100 or SL100X or 494 MB/s (247 MB/s/direction) for SL240 or SL240X.

The receiver should transmit the STOP signal when it has space for the data contained in 20 km of fiber or less left. Assuming 5 µs/km for the speed of light, this gives us 100 µs of data. For SL100 and SL100X, each 32-bit word (40 bits on the link) takes 37.64 ns, there are 2657 words stored in 20 km of cable. For SL240 and SL240X, each 32-bit word (40 bits on the link) takes 16 ns, so there are 6250 words stored in 20 km of cable. The first 10 km is reserved for sending the STOP signal to the transmitter, and the second 10 km is for the data already contained in the receive fiber.

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APPENDIX D

ORDERING INFORMATION

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D.1 Overview

This appendix contains the order number for all Systran products mentioned in this manual. For an up to date list, or for inquiries about these products, contact Systran Sales.

D.2 Copy Master Mode

The Serial FPDP Protocol Analyzer requires at least three IDLE ordered sets per Serial FPDP frame in order to correctly capture and interpret Serial FPDP traffic. To add the necessary IDLE ordered sets, the FibreXtreme card must be placed in Copy Master Mode. This is accomplished by setting the Copy Master Mode register bit or purchasing a CMC card that is factory-configured to be in Copy Master Mode by default. See Appendix C – Serial FPDP Protocol for details on the Serial FPDP protocol.

D.2.1 Serial FPDP Protocol Analyzer

Table D-1 Serial FPDP Protocol Analyzer

Order Number	Description
FHGA-ALYZ0002-00	Serial FPDP Protocol Analyzer includes two 850 nm Small Form-factor Pluggable (SFP) transceiver modules and one three meter 50/125 µm singlemode fiber-optic cable. It is capable of monitoring 1.0625, 2.125, and 2.5 Gbps Serial FPDP traffic.

D.2.2 Long Wavelength Kit

Table D-2 Long Wavelength Kit

Order Number	Description
FHGA-LWKIT000-00	Long wavelength kit consists of two 1300 nm Small Form-factor Pluggable (SFP) transceiver modules and one three meter 9/125 µm singlemode fiber-optic cable.

D.2.3 HSSDC2 Copper Kit

Table D-3 HSSDC2 Copper Kit

Order Number	Description
FHGA-H2KIT000-00	HSSDC2 copper kit consists of two 2.5 Gbps HSSDC2 Small Form-factor Pluggable (SFP) transceiver modules, two 1.0625/2.125 Gbps HSSDC2 SFP transceiver modules, one three meter HSSDC2-HSSDC2 100-Ohm shielded equalized copper cable, and one three meter HSSDC2-HSSDC2 150-Ohm shielded equalized copper cable.

D.2.4 SL100X CMC FPDP

Table D-4 SL100X CMC Standard

Order Number	Description
FHE4-FM4MWBCM-00	SL100X CMC, 850 nm laser, Set in Copy Master Mode by default
FHE4-FM4SWBCM-00	SL100X CMC, 1300 nm laser, Set in Copy Master Mode by default

D.2.5 SL240X CMC FPDP

Table D-5 SL240X CMC Standard

Order Number	Description
FHE6-FM6MWBCM-00	SL240X CMC, 850 nm laser, Set in Copy Master Mode by default
FHE6-FM6SWBCM-00	SL240X CMC, 1300 nm laser, Set in Copy Master Mode by default

D.2.6 Short Wavelength: Multimode Fiber-Optic Cable

The following table lists the order numbers for the simplex and duplex, 50/125 µm multimode fiber-optic cables, for use with the short wavelength laser media interface.

Table D-6 Multimode Fiber-Optic Cable (LC – LC)

Simplex Part Number	Duplex Part Number	Length	Cable End 1	Cable End 2
FHAC-M1LC3000-00	FHAC-M2LC3000-00	3 m	LC	LC
FHAC-M1LC5000-00	FHAC-M2LC5000-00	5 m	LC	LC
FHAC-M1LC1001-00	FHAC-M2LC1001-00	10 m	LC	LC
FHAC-M1LC2001-00	FHAC-M2LC2001-00	20 m	LC	LC
FHAC-M1LC3001-00	FHAC-M2LC3001-00	30 m	LC	LC
FHAC-M1LCxxxx-00	FHAC-M2LCxxxx-00	Custom	LC	LC

Table D-7 Multimode Fiber-Optic Cable (LC – ST)

Simplex Part Number	Duplex Part Number	Length	Cable End 1	Cable End 2
FHAC-M1LCST03-00	FHAC-M2LCST03-00	3 m	LC	ST
FHAC-M1LCST05-00	FHAC-M2LCST05-00	5 m	LC	ST
FHAC-M1LCST10-00	FHAC-M2LCST10-00	10 m	LC	ST
FHAC-M1LCST20-00	FHAC-M2LCST20-00	20 m	LC	ST
FHAC-M1LCST30-00	FHAC-M2LCST30-00	30 m	LC	ST
FHAC-M1LCSTxx-00	FHAC-M2LCSTxx-00	Custom	LC	ST

Table D-8 Multimode Fiber-Optic Cable (SC – LC)

Simplex Part Number	Duplex Part Number	Length	Cable End 1	Cable End 2
FHAC-M1SCLC01-00	FHAC-M2SCLC01-00	1 m	SC	LC
FHAC-M1SCLC03-00	FHAC-M2SCLC03-00	3 m	SC	LC
FHAC-M1SCLC05-00	FHAC-M2SCLC05-00	5 m	SC	LC
FHAC-M1SCLC10-00	FHAC-M2SCLC10-00	10 m	SC	LC
FHAC-M1SCLC20-00	FHAC-M2SCLC20-00	20 m	SC	LC
FHAC-M1SCLC30-00	FHAC-M2SCLC30-00	30 m	SC	LC
FHAC-M1SCLCxx-00	FHAC-M2SCLCxx-00	Custom	SC	LC

D.2.7 Long Wavelength: Singlemode Fiber-Optic Cable

The following table lists the order numbers for the simplex and duplex, 9/125 µm singlemode fiber-optic cables, for use with the long wavelength laser media interface.

Table D-9 Singlemode Fiber-Optic Cable (LC –LC)

Simplex Part Number	Duplex Part Number	Length	Cable End 1	Cable End 2
FHAC-S1LC3000-00	FHAC-S2LC3000-00	3 m	LC	LC
FHAC-S1LC5000-00	FHAC-S2LC5000-00	5 m	LC	LC
FHAC-S1LC1001-00	FHAC-S2LC1001-00	10 m	LC	LC
FHAC-S1LC2001-00	FHAC-S2LC2001-00	20 m	LC	LC
FHAC-S1LC3001-00	FHAC-S2LC3001-00	30 m	LC	LC
FHAC-S1LCxxxx-00	FHAC-S2LCxxxx-00	Custom	LC	LC

Table D-10 Singlemode Fiber-Optic Cable (SC –LC)

Simplex Part Number	Duplex Part Number	Length	Cable End 1	Cable End 2
FHAC-S1SCLC01-00	FHAC-S2SCLC01-00	1 m	SC	LC
FHAC-S1SCLC03-00	FHAC-S2SCLC03-00	3 m	SC	LC
FHAC-S1SCLC05-00	FHAC-S2SCLC05-00	5 m	SC	LC
FHAC-S1SCLC10-00	FHAC-S2SCLC10-00	10 m	SC	LC
FHAC-S1SCLC20-00	FHAC-S2SCLC20-00	20 m	SC	LC
FHAC-S1SCLC30-00	FHAC-S2SCLC30-00	30 m	SC	LC
FHAC-S1SCLCxx-00	FHAC-S2SCLCxx-00	Custom	SC	LC

D.2.8 HSSDC2 – HSSDC2 Copper Media Interface: 1.0625/2.125 Gbps

Shielded 150-Ohm Quad copper cable with HSSDC2 (Fibre Channel) connectors, for use with the HSSDC2 copper media interface.

Table D-11 Shielded 150-Ohm Quad Copper Cable with HSSDC2 (Fibre Channel) Connectors

Order Number	Description
FHAC-Q2H11000-00	1 m HSSDC2 cable, equalized
FHAC-Q2H13000-00	3 m HSSDC2 cable, equalized
FHAC-Q2H15000-00	5 m HSSDC2 cable, equalized
FHAC-Q2H11001-00	10 m HSSDC2 cable, equalized
FHAC-Q2H12001-00	20 m HSSDC2 cable, equalized
FHAC-Q2H12501-00	25 m HSSDC2 cable, equalized
FHAC-Q2H13001-00	30 m HSSDC2 cable, equalized

D.2.9 HSSDC2 – HSSDC2 Copper Media Interface: 2.5 Gbps

Shielded 100-Ohm Quad copper cable with HSSDC2 (InfiniBand) connectors, for use with the HSSDC2 copper media interface.

Table D-12 Shielded 100-Ohm Quad Copper Cable with HSSDC2 (InfiniBand) Connectors

Order Number	Description
FHAC-Q2H31000-00	1 m HSSDC2 cable, equalized
FHAC-Q2H33000-00	3 m HSSDC2 cable, equalized
FHAC-Q2H35000-00	5 m HSSDC2 cable, equalized
FHAC-Q2H31001-00	10 m HSSDC2 cable, equalized

GLOSSARY

active trace (window)----------The front-most window when more than one window is displayed on the screen. The title bar in an active window is highlighted. Software functions, such as the search function, are performed on the active window only. Make another window active by clicking on it or selecting it in the Window pulldown menu, and it will move to the front-most position on the screen. In the Window pulldown menu, the active window is indicated by a checkmark.

actual datapoint value----------The value displayed at a cursor point on a line in the graph.

crossed-over cable----------A cable in which the transmit and receive wires are reversed at opposite ends of the cable.

crossover mode ----------In this mode the same port is used for both a channel and a device, thereby conserving ports. It is useful on a switch for placing an analyzer between a device and switch port.

current line ----------The selected line (by time stamp) in the trace view.

CRC ----------Cyclical redundancy check.

display value ----------The scale representation of the datapoint value.

EOF----------End of Frame.

FEOF ----------Frame End of Frame for normal Serial FPDP data frame.

filtering----------The process of limiting the amount or type of data captured or viewed.

flatline mode ----------In this mode the channel transmits a static signal on the transmitter output, which causes the LinkXchange LX2500 to bypass the port (note that for optical links, the light is turned off). You can place individual channels anywhere on the loop. However, this mode requires that each channel be plugged into a port that will bypass that port in response to the flatline output signal.

FPDP ----------The Front Panel Data Port (FPDP) bus is intended to provide data transfer between two or more VMEbus boards at up to 160 MB/sec while not compromising existing VMEbus and other connection on the chassis P1 and P2 connectors. FPDP is specified in VITA 17.

frame data filtering----------Frame data filtering limits the amount of data within the Serial FPDP frame stored into trace memory.

GO/STOP----------GO or STOP contains Serial FPDP flow-control information.

graph----------The rate or count value of the selected data type charted by records. A point on the graph in rate mode represents the difference between one record and the previous record. A point on the graph in count mode represents the real value of the record. A graph shows one or more lines of data.

IANA ----------Internet Assigned Numbers Authority.

IETF ----------Internet Engineering Task Force.

IP address ----------A 32-bit value identifying an Internet host.

legend ----------The chart below the graph displaying the following data for each line: channel, resource, mode, maximum value, minimum value, average value, current value, scale, and offset. As the graph changes, the data in the legend is updated.

line ----------A visual representation of performance for a specific resource in rate or count mode for a channel.

live graph ----------Data graphed and viewed in real time.

MEOF ----------Mark End of Frame for a Serial FPDP SYNC frame.

newly captured trace ----------A trace not yet saved.

offset----------The value the graph is raised or lowered on the vertical axis to more easily view the data.

prefiltering----------Prefiltering (runtime filtering) is the process of filtering data before it is written to trace memory.

previously captured trace --------A trace that has already been saved.

private network ----------A network of analyzers and PCs communicating only with each other. It is separate from the corporate network and is under your direct control

public network ----------A network that has other devices besides analyzers communicating over the network.

record----------The value of all resources at a specific time. Resources are graphed using data, which is read and stored as a record once per second.

recorded data ----------Data that is recorded and then viewed at another time.

resource ----------A data type (SFPDP frames/sec, SFPDP MB/sec, or average data size) or a counter from which a statistic is derived.

repeat ----------Only the Repeat option is available for Crossover mode. The signal goes through a buffer, restoring the amplitude of the incoming signal and retransmitting it on the opposite port. The signal also gets clocked from the recovered clock derived from the serial input, thereby reducing jitter.

SEOF ----------Status End of Frame. Contains parallel FPDP flow-control information.

Serial FPDP/SFPDP ----------Serial FPDP is a high-speed low-latency data-streaming serial communications protocol for use in high-speed real-time data transfer applications. It currently is defined to operate at three distinct link speeds, 1.0625 Gbps, 2.125 Gbps, and 2.5 Gbps with sustained data rates in excess of 105, 208, and 245 MB/sec, respectively. Serial FPDP can also operate over long distances (up to 10 kilometers) using fiber-optic cable. Serial FPDP is specified in VITA 17.1.

SFP ----------Small form factor pluggable.

SOF----------Start of Frame. Contains FPDP PIDs and DIR.

SWDV----------SYNC with Data Valid serial FPDP frame.

TRAC strategy----------The software configuration of TRAC engines to make real-time decisions during channel monitoring.

TRAC ----------Intelligent trace control processors.

trace view----------A formatted trace output in a standard view. Standard Serial FPDP trace views include Single Line (all frames and primitives on a single line) or Multi Line (all frames and primitives on multiple lines).

triggering ----------This causes data capture to stop immediately after the trigger, after an additional buffer's worth of data capture, or at a point in between, depending on the trigger position. Any channel triggering causes all channels to eventually stop capturing data.

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