

SierraFC M164 Fibre Channel Protocol Analyzer

User Manual



Software Version 4.0 Document Version 1.0

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Chapter 1

Introduction

This manual describes installation and operation of the LeCroy SierraFC M164[™] Fibre Channel Protocol Analyzer and includes examples of typical applications.



Figure 1.1: LeCroy SierraFC M164 Protocol Analyzer

Analyzer Overview

The SierraFC M164 Protocol Analyzer helps Hardware, Firmware, Design, and Application Engineers troubleshoot and diagnose problems within their product. The analyzer supports capturing, triggering, and filtering.

The Analyzer provides for bi-directional trigger and capture of exchanges, primitives, and patterns. You can capture all frames and/or exclude traffic.

The Analyzer has a USB port and an Ethernet port to connect to a computer. You can cascade analyzer units for higher port counts. You can trigger manually or trigger on a specific Event.

The Analyzer provides a full range of views and statistical reports.

Receiving Your Analyzer

The analyzer package includes the following components:

- □ SierraFC M164 Analyzer identified in the packing list
- □ SierraFC M164 Quick Start
- USB A-B 2.0 cable, 1.8 meter
- □ Ethernet cable, 10 feet
- □ Three-Prong AC power cord
- Rack Mount and Rack Mount Installation Guide
- □ Installation CD ROM with software and documentation

Unpacking the Analyzer

Inspect the received shipping container for any damage. Unpack the container and account for each of the system components listed on the accompanying packing list. Visually inspect each component for absence of damage. In the event of damage, notify the shipper and LeCroy Corporation. Retain all shipping materials for shipper's inspection.

Analyzer Features

The Analyzer has the following features:

- Power Switch
- □ Trigger, Error, Link, Speed, and Frame LEDs (see next page)
- Port 1 connector
- Port 2 connector
- Port 3 connector
- Port 4 connector
- □ Status and Configuration LCD Display
- Configuration Buttons
- Front Panel Configuration Buttons
- External Trigger Input and Output
- □ USB port for host connectivity
- □ Ethernet port for network connectivity
- **1**9-inch Rack Mountable. Refer to the *Rack Mount Installation Guide*.



Figure 1.2: Front Panel

On the back, the Analyzer has:

- Power In
- □ STX SYNC Expansion Card In/Out data ports (optional)



Figure 1.3: Back Panel

LEDs

LEDs support each port link, with the following functionality (refer to Figure 1.4 on page 13):

Trigger Blue	Illuminates when a trigger occurs.
Error Red	Illuminates when an error occurs.
Link Yellow	Illuminates when a link is established.
Frame Green	After the link is established, indicates traffic on the bus.

There are five LEDs on the left of the analyzer for ports P1 and P2, and five LEDs on the right of the analyzer for ports P3 and P4. These 10 LEDs indicate the speed of 1Gbps, 2Gbps, 4Gbps, 8Gbps and 16Gbps. Speed LEDs are off when there is no link (see the following figure and Figure 1.2 on page 12).



Figure 1.4: LEDs on the Left Front Panel



Figure 1.5: LEDs on the Right Front Panel

Status and Configuration Display

The Analyzer front LCD display indicates the configuration and status of operations. For example, during initialization, the LCD panel displays boot status messages.

LCD Display and Button Functions for Configuring the Analyzer

The SierraFC M164 can be configured from the unit itself. Five buttons are provided to enable you to configure the Analyzer. When you first turn on the Analyzer, after initialization, the LCD displays **SierraFC_M164 Available** with two arrows pointing up and down as shown in the illustration below.



Figure 1.6: LCD Display and Button on the Front Panel

When connected via ethernet or USB, the **Up** \uparrow and **Down** \downarrow buttons display the following:

- Static or Dynamic IP Address
- SierraFC_M164 SN
- Connection
- Unit Name
- □ Set IP Configuration
- □ IP Mode Dynamic, or
- IP Mode Static

The Left \leftarrow and Right \Rightarrow buttons are used to change the configuration properties.

The LCD will display **Button Inactive In This MenuItem** if the button does not serve any purpose for that selection.

Perform the following steps to set IP Configuration, Static on Dynamic IP using the buttons and the LCD display on the Analyzer:

Set IP Configuration

To set IP Configuration:

- 1. Press the Up Button once to get into the Set IP Configuration mode.
- 2. Press the Center Button once to select Set IP Configuration.

Set IP Mode Static is displayed in the LCD display. If you do not want to set IP Mode Static, press the **Up Button** to set the IP Mode Dynamic, see "IPMode Dynamic" on page 15).

- Press the Center Button once to select Set IP Mode Static.
 The Static IP address (for example: 188.168.040.036) is displayed in the LCD display.
- Press the Center Button once to set the Static IP address. The first numeral of the IP address will start blinking.
- 5. Use the Up Button or Down Button to change the IP Address.
- 6. Press the **Right Button** or **Left Button** to move to the right or left to change each component of the static or dynamic IP adress and change it using step 5.
- 7. Once the IP Address is set, press the center button to select it.
- 8. Press the Up Button once to Accept and Reboot.
- 9. Press the Up Button once Cancel the Changes.
- 10. Press the **Up Button** once to set the **Gateway** address. Repeat steps 4 through 9 to set the Gateway address.
- 11. Press the **Up Button** once to set the **Subnet Mask** address. Repeat steps 4 through 9 to set the Subnet Mask address.
- 12. Press the **Up Button** once to set the **Static IP** address. Repeat steps 4 through 9 to set the Static IP address.
- 13. Press the **Center Button** once to confirm reboot. The LCD display will read **Center Button to Confirm Reboot.**
- 14. The Analayzer will reboot. The LCD display will display the new IP Configuration.

IPMode Dynamic

Perform the following steps to set IP Mode Dynamic on the Analyzer:

- 1. Press the **Up Button** once to get into the **Set IP Configuration** mode.
- Press the Center Button once to select Set IP Configuration.
 Set IP Mode Dynamic is displayed in the LCD display.
- 3. Press the **Center Button** once to select Set IP Mode Dynamic.

The **Dynamic IP** address (for example: 188.168.040.036) is displayed in the LCD display.

- 4. Press the **Center Button** to select it.
- 5. Press the Up Button once to Accept and Reboot.
- 6. Press the Up Button once Cancel the Changes.

Installing Your Analyzer

Software Installation

The software works on systems using the Windows[®] XP, Windows Vista, Windows Server 2003, 2008 and Windows 7 operating systems.

- 1. Insert the Installation CD-ROM into the CD drive on the host machine.
- 2. The installation automatically starts setup, unless Auto Run is off. In that case, select the CD-ROM from "My Computer" and click **Setup**.
- 3. After the warning to close all other programs and before starting the installation, the Install component selection opens.
- 4. Select components for installation.
- 5. Click **<u>Next</u>** to complete the installation.

System restart

You must restart your computer before you can use your Analyzer software.

Error Message

If you get an error message during installation of the drivers for Window, consult your system administrator. Your system may allow only administrator-level users to copy such driver files.

Hardware Setup

The hardware setup is described below.

Connecting in General

Note: You must install the software before connecting the analyzer to the host machine for the first time.

To set up the analyzer:

1. Connect the analyzer to a 100V–240V, 50Hz–60Hz, power outlet and turn on the Power switch.

At power on, the analyzer will go through initialization as shown on the LCD display.

- Connect the USB cable between the SierraFC M164 USB port and a USB port on the Host PC. The host PC operating system detects the analyzer and driver files. (See "Connecting via Ethernet" on page 26 for Ethernet connectivity.)
- 3. Connect the analyzer as shown in the following figure. The figure shows one possible connection from an Initiator to a hard drive.



Figure 1.7: Analyzer Connections

Cables to Use

Connect from Hard Drives using SFP and a cable suitable for your setup.

Connect from Initiators using SFP and a cable suitable for your setup.



Figure 1.8: Analyzer Connections

Expandability

You can expand by:

- **Cascading with CATC SYNC Expansion Cards**
- □ Using the Power Expansion Card (optional)

You can remove expansion cards with two simple tools.

Removing Expansion Cards

You can remove expansion cards using two tools:

- □ Standard (flat blade) 3/16" screwdriver
- □ LeCroy Extraction Tool (part number 230-0160-00



To remove an expansion card, follow these steps:

1. Unplug the system from AC power and turn the system so the expansion port is facing you. Note the two retaining screws and the holes for the extraction tool that are located on the panel of the expansion card.



2. Insert the extraction-tool prongs into the holes in the expansion card panel.

Note: If the prongs do not slip easily into the holes, use a small nail file or similar device to remove paint from the prongs



3. Rotate the extraction tool to a horizontal position to lock the prongs into place and make a handle



4. Using the screwdriver, loosen both retaining screws by rotating them counterclockwise approximately two full turns, until feeling slight resistance. **Do not force the retaining screws** after two turns.



5. Using the extraction tool as a handle, gently wriggle the expansion card forward about 1/8".



6. Repeat steps 4 and 5 approximately three times, until the card is free from the retaining screws and you can remove the card from the system.



Cascading with CATC SYNC Expansion

You can use cascading of analyzer units for higher port count, by connecting the units through the optional CATC SYNC Expansion Card on the analyzer back.

Connecting a SierraFC M164 and a Summit T3-16 via the CATC Sync Expansion Card (ACC-EXP-002-X)

A SierraFC M164 and a PCIe Summit T3-16 are connected using their CATC Sync ports which require an optional expansion card (ACC-EXP-002-X).

Note: Refer to relevant protocol analyzer user manual for instructions on how to install the expansion board.

To do so perform the following steps:

1. Make sure to stop any recordings in progress.

Note: You may plug/unplug the sync cable while the analyzer unit is powered on.

- 2. Connect the female end of the sync cable to the SYNC OUT port of the SierraFC M164.
- 3. Connect the male end of the sync cable to the SYNC IN port of the PCIe Summit T3-16.



Figure 1.9: An Example of Connecting a SierraFC M164 and a Summit T3-16

Select Device

After you start the software, click on **Configuration a**nd select **All Connected Devices** (see the following screen capture).

🚝 LeCroy FC Protocol Suite	- [FCProject2*]
🔘 File View Edit Co	nfiguration Project Setup Tools Window Help
i 🚅 🔒 🗏 🔘 🔴	Port Calibration
	License Manager
Analyzer Settings Captu	Software Settings
Recording Buffer	Education California
Buffer Size and Seg	External rig Setting
Num. of	Update Sierra Device Total size used : 25MB
Segments : 1	Setup IP R4MB Out of 16294MB available
	All Connected Devices
Trigger Position	L Auto Run
0 % trigger posit	ion Museline Courses 20
0%	100%
Last Captured Trace File	
Trace File Name: C'ADI	ogram files\lecrou\fc protocol suite\Llser\Trace fcs
i use upidad manager	(no automatic upioad)
Analyzer Settings	
Channel Enable	Speed Disable Descrambling
I P1 I P3	P1, P2: AutoSpeed P1, P2
🔽 P2 🔽 P4	P3, P4 : AutoSpeed 💌 🔽 P3, P4
Set Protocol Error Deter	ction

Figure 1.10: Connecting to Device(s)

The following **Select Device** dialog displays. The colors in the 'Location' column mean the following:

- Red: Firmware and/or BusEngine components need to be updated to the latest version
- Light Blue: The device is ready to be connected.
- □ Yellow: The device is not chained or cascaded.

Device	Dev Name	Location	Status	Order		💿 💽 Set Alias Nam
 Sierra FC SN: 62009 	Tahoe	172.16.133.150	- Firmware not latest Curi	No Chained	-	Disconnect
Sierra FC SN: 62062	FC8G	172.16.133.151	Ready to connect	Unit 2	-	
Sierra FC SN: 62084	FC8G	66.238.94.184	Ready	No Chained	•	
	10					Carl Remove Devi
						👃 IP Settings
						-
ected Device Id: 0x00104	4C00F284				*	
lected Device Id: 0x00104	4C00F284					🍂 Networks
ected Device Id: 0x00104	4C00F284				*	Networks Refresh Device lis

Figure 1.11: Select Device Dialog

Note: Click Refresh Device List to display all the devices on the network.

The Select Device dialog displays the following buttons:

Set Alias Name

Click Set Alias Name to display the Set device alias name dialog as shown below.

Set device alias r	name	×
Alias name:	Sierra FC_test	
ОК	Cancel	

Figure 1.12: Set Device Alias Name Dialog

Disconnect

Click **Disconnect** to disconnect a device.

Add Device...

Click **Add Device** to add a device with a static IP address.

Add Device with Sta	atic IP							×
Device IP Address:	3	•	0	•	0	•	0	
ОК				Car	icel			

Figure 1.13: Add Device with Static IP Dialog

Remove Device

Click **Remove Device** to remove a previously added device.

IP Settings...

Click **IP Setting** to reset IP settings of a device. The following IP Setting dialog displays.

IP Setting	
IP Mode	
C Static IP	O DHCP
Static IP Address:	172 . 16 . 133 . 151
Subnet Mask:	0.0.0.0
Default Gateway:	0.0.0.0
Reset	Undate

Figure 1.14: IP Setting Dialog

Networks...

Click Networks to select an adapter. The following dialog displays.

Select Adapter			×
No. Adapter Description	IP	MAC	
1 Intel(R) Wireless WiFi Link 4965AGN - Pac.	169.254.40.154	001de05cc38b	
2 Intel(R) 82566MM Gigabit Network Connect	172.16.133.128	001c2570494f	
ПК	Cancel		

Figure 1.15: Select Adapter Dialog

Refresh Device List

Click Refresh Device List to refresh the device list.

To connect to a device, select a device which is Ready to Connect and click the **Connect** button on the right. The Connection Properties dialog is displayed (see the following screen capture).

Device	Dev N	lame	Location	Status		Order		💿 💽 Set Alias Nam
Sierra FC SN: 62009	Tahoe	Conn	ection properties		×	Unit 1	-	Connect
Sierra FC SN: 62062	FC8G	Plea	Please specify the action to take when pext time. SN:			Unit 2		Add Douriso
Sierra FC SN: 62084	FC8G	6206	62062 is detected		No Chained	-		
		0 / © 1	Ask if I want to connect t Fake no action	o the device				
cted Dievice Id: 0x0010	4C00F26E			ОК			*	🔹 Networks

Figure 1.16: Connection Properties Dialog

Specify one of the actions from the following:

- Automatically connect to the device
- □ Ask if I want to connect to the device
- Take no action

If 'Automatically connect to the device' is selected, the next time the application opens the device will be automatically connected.

In the **Select Device** dialog chained or cascaded units are displayed in the **Device** column with a **[** (square bracket) icon. The sequence of the units is displayed in the **Order** column. See the following screen capture.

Device	Dev Name	Location	Status	Order		👔 Set Alias Nar
Sierra FC SN: 62009	Tahoe	172.16.133.150	Ready to connect	Unit 1	-	Disconnect
Sierra FC SN: 62062	FC8G	172.16.133.151	Ready	Unit 2	-	Add Davia
Sierra FC SN: 62084	FC8G	66.238.94.184	Ready to connect	No Chained	-	
cted Device Id: 0x00104	4C00F26E				A	
cted Device Id: 0x0010	4C00F26E					🙀 Networks
ected Device Id: 0x00104	4C00F26E				~	Refresh Device

Figure 1.17: Select Device Dialog Displaying Unit 1 and Unit 2 Chained

Note: When using STX Sync cards, you need to manually specify the order of the chained units. To match your unit sequence to the address for each unit in the Select Device dialog, click the pull down tab under the Order heading (on the right side) and select unit numbers: 1 for Unit 1, 2 for Unit 2, and so on. This determines the order in which the cascaded ports appear in the trace. When using the CATC Sync cards the order is automatically detected.

IMPORTANT! Power up all units before starting the software.

Connecting via Ethernet

The Ethernet connection can have any of these configurations:

- 1. Analyzer connected to a network using a hub, switch, Gigabit Ethernet interface, or similar device.
- 2. Analyzer connected to the host computer (machine running the application software), using a hub, switch, Gigabit Ethernet interface, or similar device.
- 3. Analyzer connected directly to the host computer using an Ethernet cable.

Connecting to a Network

When connected to a network, the analyzer can communicate with the DHCP server to establish a connection. The DHCP server continually sends the next available IP address to the analyzer until the software starts.

The SierraFC M164 product uses the following ports: TCP Ports: 4000 - 4003

UDP Ports: 4027 - 4029

Connecting using a Hub, Switch, or Similar Device

When connected to the host machine using a hub, switch, Gigabit Ethernet interface, or similar device, the Analyzer must be given a static IP address such that it will reside on the same subnet as the host computer. See Figure 1.14 on page 24 to set the IP address. To add the IP address to the Select Device dialog, use the Add Device button (see Figure 1.13 on page 24).

Analyzer Connected Directly to the Host PC Using a Ethernet Cable

When connected to the host machine using a crossed ethernet cable, the Analyzer must be given a static IP address such that it will reside on the same subnet as the host computer. See Figure 1.14 on page 24 to set the IP address. To add the IP address to the Select Device dialog, use the Add Device button (see Figure 1.13 on page 24).

Connecting Over Different Subnets

If the Host PC (with the Sierra software) and SierraFC M164 are on the same subnet, they will see each other's broadcasts, and the SierraFC M164 application will automatically appear in the Select Device dialog, from which you can select a device (as described in the previous section).

If the Host PC and SierraFC M164 do not reside on the same subnet, they will not see each other automatically. You must add the SierraFC M164 IP address manually. To add the IP address, use the Add Device button (see Figure 1.13 on page 24).

Connecting Via USB

To set up the Analyzer using a USB connection:

- 1. Remove the Analyzer from its shipping container.
- 2. Insert the Installation CD.
- 3. Connect the Analyzer to a power outlet using the provided power cord.
- 4. Connect the USB port to a USB port on the PC using a USB cable.
- 5. Turn on the rear power switch and the front power switch.
- 6. Click Next after you see the Add New Hardware Wizard window.
- Follow the Microsoft^{*} Windows^{*} on-screen Plug-and-Play instructions for the automatic installation of the Analyzer as a USB device on your PC. (The required USB files are included on the Installation CD.)
- 8. Click **Finish** when you see the message that says "Windows has finished installing the software that your new hardware requires" and the file has been installed in your PC.

Do not change from USB to Ethernet, or back, without power cycling the Analyzer.

To connect the Analyzer to a host system via ethernet, refer to "Connecting the SierraFC M164 to a Host System Over Ethernet" on page 229.

Launching Your Analyzer

To launch the software, double-click the FC Icon in the Program Manager Window.

Click OK to display the software.

Operating in Simulation Mode

The system operates in Simulation Mode by default if the software detects no hardware. However, you can operate in Simulation Mode directly, without installing the Analyzer hardware.

The Analyzer software launches and displays the appropriate tool bar, but with the limitation that the Analyzer operates only on static, previously captured, bus data.

Limitations

Simulation Mode lets you try all of the available functions, but the system is not capturing any real data and is displaying only pre-captured results.

Using the Software

The SierraFC M164 application has protocol analysis software to capture data, trigger on Events, and save. Easy Mode allows standard Trigger and Data capture. Advanced Mode (see figure below) allows you to program custom triggering in and out, capturing, state jumps, and timers. (See "Protocol Analysis" on page 33.)

LeCroy FC Protocol Suite - [FCProject1]
File View Edit Configuration Project Setup Tools Window Help
Analyzer Settings Capture Trigger Notes Recording Buffer Buffer Size and Segments Num. of Segments: Segment 100% Trigger Position 0 % trigger position 0 % trigger position 100% Last Captured Trace File
Last Captured Trace File
Trace File Name: c:\program files\lecroy\fc protocol suite\User\Trace.fcs
Use upload manager (no automatic upload)
Analyzer Settings
Channel Enable Speed Disable Descrambling
✓ P1 ✓ P3 P1, P2: AutoSpeed ✓ P1, P2
P2 P4 P3, P4 P3, P4 P3, P4
Set Protocol Error Detection
Easy,switch to Advanced mode
Easy, switch to Advanced Mode

Figure 1.18: Easy/Advanced Mode Toggle Button

Protocol Analyzer

To use the software for protocol analysis (see on page 29), first select File > Protocol Analyzer for a new project or File > Open an existing protocol analysis .fcc file. (See "Protocol Analysis" on page 33.) You can also open a .fcs example file. Example files are in the Examples folder. You can also use Project Setup > Last Protocol Analyzer.

In Easy Mode, on the Capture tab, select to capture Everything or Pattern. For Pattern, select a Pattern. You can exclude patterns and frames. You can do this by dragging patterns from the Patterns Library pane into the Active pane. You can use different patterns for pre-trigger and post-trigger.

In Easy Mode, on the Trigger tab, select the trigger type. For Pattern, select the pattern.

In Easy Mode, on the Settings tab, select trigger position and memory use.

Change the Analyzer settings if necessary. Change the port Speed if necessary.

Use Advanced Mode only after you become familiar with the hardware and software and have special needs. To start working with the protocol analyzer and software. See "Protocol Analysis" on page 33.

Viewing Captured Data

After data capture, the captured data is in the Viewer, see "Display Manipulation" on page 161. You can display the same data in:

- **Greadsheet View**: Shows Protocol Fields and Frames by time.
- Frame Inspector View: Shows detail information about packet highlighted in Spreadsheet or Packet views.
- **Packet View**: Shows hierarchical view of frames, sequences and exchanges.
- **Text View**: Shows transaction frames, grouped in columns by port.
- □ Statistical Report View

You can do the following:

- Show or hide fields and ports, change port names, and change data format.
- Show the layers and channels using their toolbars.
- Decode using the Decode toolbar.
- Search and Filter.

Configuration

For special work, you can use the Configuration menu to configure Port Alias, External Trig Setting, Software Settings, and Input/Output Signals. ("Display Manipulation" on page 161.)

Port Status

You can display an overview of the active ports by clicking the buttons at the bottom right of the main window (see "Port Status" on page 179).

Statistical Reports

You can generate statistics for all transports, commands, primitives, addresses, lanes, and errors (see "Statistical Report" on page 187).

CrossSync Control Panel

The LeCroy CrossSync control panel provides synchronization for complete end-to-end visibility into multi-protocol systems.

CrossSync is LeCroy's analyzer synchronization solution that enables time-aligned display of protocol traffic from multiple daisy-chained analyzers showing packet traffic from multiple high-speed serial busses. A lightweight software control panel allows users to select analyzers for synchronization and manage the recording process. Captured traffic is displayed using the latest analyzer software (in separate windows) with all the protocol specific search and reporting features.

Captured packets are displayed in separate windows that share a common time scale. Navigating the traffic in either direction will scroll to the same timestamp in a synchronized window. When using the CrossSync option, users can access the full complement of analysis capabilities available within the individual LeCroy software. Search, reporting, and decoding all operate normally (see "CrossSync Control Panel" on page 31).

This feature is available with the LeCroy SierraFC Fibre channel Protocol Suite application.

Chapter 2

Protocol Analysis

The system performs Protocol Analysis by defining and running an analysis project. An analysis project definition defines what to capture, what the analyzer triggers on, and the memory settings. You can save defined projects as project ***.fcc** files for later use.

Easy Mode (Pre-Defined Setups)

After you install the Analyzer software (see "Software Installation" on page 16) and set up the Analyzer (see "Hardware Setup" on page 17), launch the Analyzer software (see "Launching Your Analyzer" on page 28) to display the default Protocol Analyzer in Easy Mode at the Capture tab.

This mode allows you to operate the analyzer with minimum setup. In this mode, you can perform only a Trigger and Data capture.

Main Window

Use Easy Mode to get a comprehensive overview of your analyzer's capabilities:

On the Analyzer Menu Bar, click **File > Protocol Analyzer** to open a Protocol Analyzer dialog.



Figure 2.1: Protocol Analysis Project Dialog

The New Project dialog opens with default settings to capture Everything on the bus and to Trigger On on Snapshot. (The analyzer captures everything immediately without triggering on anything in particular).

Analyzer Settings

Buffer Size and Segments

The Analyzer Settings tab has the Recording Buffer pane where you can set Number of Segments and the Segment Size. (See "Buffer Size and Segments" on page 152.)

Trigger Position

You can set the trigger position in the captured buffer as a percentage of the segment size. Trigger point of 0% means the trigger point will be on the first packet in the buffer. (See "Trigger Position" on page 152.)

Auto Run

Checking the Auto Run option allows you to specify the number of concurrent runs that will be automatically carried out. (See "Auto Run" on page 152.)

Training Signal Pack Mode

This options provides two modes for training signals.

- Unpacked
- Packed

Analyzer Settings

You can enable the ports, set the port speed and disable scrambling.

Disabling a port can be used to save recording buffer space. A disabled port can still trigger the analyzer.

Auto Speed is the default port speed selection. It will automatically detect and display the line speed. In rare cases (such as debugging speed negotiation), it might be desired to set the analyzers speed manually. Note, that when the speed is set manually, traffic at different speeds will not be captured correctly.

Set Protocol Error Detection

You can select which Protocol Errors the analyzer will show and which will be ignored.

Project Overview

The Project Overview on the right side of the main window displays a comprehensive tree structured overview of the project. The project tree shows what to capture, on what the analyzer triggers, and the capture memory settings.

Capture Tab

The Capture tab allows you to set the parameters for capturing patterns. The Capture dialog box opens with default settings to capture Everything on the bus. The analyzer captures everything immediately without triggering on anything in particular.

You can drag and drop patterns from the Patterns Library pane into the Active Pane. You can select the pattern and use the Add and Remove arrows to move patterns between the Patterns Library and the Active pane.

Note: Capturing a 16GB trace requires you to capture the traffic with both ports (P1, P2 & P3, P4), otherwise, only an 8GB trace is captured.

Truncate Payload

Check this option to truncate payload after x-number of Dword(s).



Figure 2.2: Capture Dialog

Parameters

The Capture tab has the following parameters. See Figure 2.3 on page 37.

Exclude Idle Check this to exclude Idles from the data capture.

Exclude RRDY Check this to exclude RRDY primitives from the data capture.

Exclude Training Pattern Check this to exclude Training Pattern primitives from the data capture.

Exclude ARBff Check this to exclude ARBff primitives from the data capture.

Exclude NOS Check this to exclude NOS primitives from the data capture.
Exclude traffic till both ports are up Check this to exclude traffic till both ports are up.

Use separate patterns for Pre- and Post-triggers captures replaces the Capture tab with a Pre-Trigger Capture tab and a Post-Trigger Capture tab.

🚝 LeCroy FC Protocol Suite -	[FCProject3]]			
File View Edit Conf	iguration F	Project Setup	Tools	Window	Help
🛛 😂 🔚 😞 🛛 🍩 🕇 👄 Record	d 👼 🔳 I				
Analyzer Settings Capture T	rigger Notes	1			
 Everything Pattern 	🔽 Tru	ncate Payload a	after 512	Dword(s)	(2048 bytes)
Parameters Exclude Idle Exclu Exclude ARBIF Exclu Exclude traffic till both ports	ude RRDY 🖡 ude NOS sare up	Exclude Train	ning Patte	ern	

Figure 2.3: Protocol Analysis Capture Dialog

Software Menus and Toolbar

The software has the following main toolbar.





Run Hardware

To get an immediate overview of the bus traffic to and from your Analyzer:

- 1. Click the **Record** Record button.
- 2. The analyzer begins filling the defined memory buffer with traffic on the bus. After the traffic fills the memory buffer, the traffic is uploaded to the viewer and all views are displayed, except the Statistical Report View.

- Spreadsheet View is the default display. However, you can view results in any of the different views by selecting View on the menu bar and choosing the desired View. Note: the software remembers the last view (or views combination) used, and will automatically use that next time it is launched.
- 4. How to add additional buttons need to add to 4. You can add additional keys to the view panel. Please follow the steps:

(,Y,T Curso	ſS					Show/Hide F	Protocol Lay	/ers	Show/Hide port data
Relativ packet	ve time (is on the /	disp e saı	lay (ne l	(Betwee ayer an	en two se d port)	quential		\backslash	
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cerer rerrococor suice	[Sindidition c3]								
2 File Edit View Con	figuration Project	t Setup	riftering	Tools Window	Help			•	-
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ad Sheet View	-								
	. /	_						·	
Start Time	Relative Time	Port	Speed	<u>S_D</u>	D_D	Frame	Frame	Command	Summary
x 261.943.302 (ms)	7.208 (us)	-> P3	4 G			767 - NOS			
261.950.507 (ms)	7.204 (us)	→ P3	4 G			767 - NOS			
261.957.724 (ms)	7.217 (us)	-> P3	4 G			767 - NOS			
261.964.932 (ms)	7.208 (us)	-> P3	4 G			767 - NOS			
261.972.137 (ms)	7.204 (us)	-> P3	4 G			767 - NOS			
261.979.345 (ms)	7.208 (us)	-> P3	4 G			767 - NOS			
261.986.550 (ms)	7.204 (us)	-> P3	4 G			767 - NOS			
261.993.767 (ms)	7.217 (us)	-> P3	4 G			767 - NOS			
262.000.975 (ms)	7.208 (us)	⊳ P3	4 G			767 - NOS			
262.008.180 (ms)	7.204 (us)	> P3	4 G			767 - NOS			
262.015.388 (ms)	7.208 (us)	→ P3	4 G			767 - NOS			
262.022.592 (ms)	7.204 (us)	-> P3	4 G			767 - NOS			
262.029.810 (ms)	7.217 (us)	-> P3	4 G			767 - NOS			
262.037.018 (ms)	7.208 (us)	→ P3	4 G			767 - NOS			
262.044.222 (ms)	7.204 (us)	⊳ P3	4 G			767 - NOS			
262.051.431 (ms)	7.208 (us)	-⇒ P3	4 G			767 - NOS			
262.058.635 (ms)	7.204 (us)	> P3	4 G			767 - NOS			
262.065.852 (ms)	7.217 (us)	> P3	4 G			767 - NOS			
262.073.061 (ms)	7.208 (us)	> P3	4 G			767 - NOS			
262.080.265 (ms)	7.204 (us)	-⇒ P3	4 G			767 - NOS			
262.087.470 (ms)	7.204 (us)	⊳ P3	4 G			767 - NOS			
262.094.678 (ms)	7.208 (us)	-> P3	4 G			767 - NOS			
262.101.895 (ms)	7.217 (us)	> P3	4 G			767 - NOS			
262.109.100 (ms)	7.204 (us)	-⇒ P3	4 G			767 - NOS			
262.116.308 (ms)	7.208 (us)	> P3	4 G			767 - NOS			
262.123.512 (ms)	7.204 (us)	> P3	4 G			767 - NOS			
262.130.721 (ms)	7.208 (us)	> P3	4 G			767 - NOS			
262.137.938 (ms)	7.217 (us)	-> P3	4 G			767 - NOS			
262.145.142 (ms)	7.204 (us)	> P3	4 G			767 - NOS			
262.152.351 (ms)	7.208 (us)	> P3	4 G			767 - NOS			
262.159.555 (ms)	7.204 (us)	-> P3	4 G			767 - NOS			
262,166,764 (ms)	7.208 (us)	-> P3	4 G			767 - NOS			
262.173.977 (ms)	7.212 (us)	-> P3	4 G			767 - NOS			
262.181.185 (ms)	7.208 (us)	-> P3	4 G			767 - NOS			
262.188.394 (ms)	7.208 (us)	-> P3	4 G			767 - NOS			
262.195.598 (ms)	7.204 (us)	-> P3	4 G			767 - NOS			
262.202.807 (ms)	7.208 (us)	→ P3	4 G			767 - NOS			
262.210.020 (ms)	7 212 (us)	-b P3	40			767 - NOS			
262.217.228 (ms)	7.208 (us)	-0 P3	4 G			767 - NOS			
262.271.220 (ms) 262.224.437 (me)	7 208 (ue)	-b P3	4.0			767 - NOS			
262.231.641 (ms)	7 204 (us)	- A P3	40			767 - NOS			
262.231.841 (ms) 262.238.850 (ms)	7 208 (US)		4.6			767 - NOS			
	1.200 (us)		- 9			107-1903			

Data direction arrows

Figure 2.5: Typical Spreadsheet View Results Display

The results display shows each transaction for every layer identified in a different color and the data direction identified with data direction arrows. Upstream traffic has an arrow from right to left: \Leftarrow . Downstream traffic has an arrow left to right: \Rightarrow .

You can hide any layer by clicking the corresponding **Show/Hide** button on the menu bar. The system retains all captured data, but the display has only some data layers for simpler viewing.

You can configure the viewer display for test and viewing preferences (see "Viewer Display" on page 161 for details about configuring the viewer display).

The Analysis Project dialog offers you a comprehensive set of choices to create a trigger and capture project satisfying some specific need. You can set the Analyzer to:

- □ Capture specific patterns (see "Patterns and Data Capture Setup" on page 42).
- Capture different patterns pre- and post-trigger (see "Patterns and Data Capture")

Setup" on page 42).

- Exclude parameters from capture (see "Patterns and Data Capture Setup" on page 42).
- □ Trigger on a pattern or sequence of patterns (see "Trigger Setup" on page 131).
- □ Configure trace capture memory (see "Project Settings" on page 159).
- □ Select file to save trace capture in memory (see "Project Settings" on page 159).
- □ Include a project note (see "Notes" on page 159).

Saving a Trace Capture

You can save a Trace Capture for review at a later time using the Save As dialog.

Save As					? ×
Savein	n 🗁 User		• + 1	-11 *	
My Recent Documents Desktop	Trace.fcs				
My Documents My Computer					
My Network Places	File name:	NewTrace		<u> </u>	Save
Range All Traces From T-Cur From Frame Bookmark	Save as type: rsor To e No T From	Trace File (*.fcs) T-Cursor To Frame To To	V No 1		Cancel
J Save Filtere	a sample				/

Figure 2.6: Save As Dialog

You can limit the range of the saved file. You can save:

- All Traces
- □ A range between selected cursors
- A range between selected level of decoding. The levels allowed are dependent on the traffic in the trace. A trace with only Switch traffic might have the following levels available: ELS Cmd, Frame, GS Cmd, Sequence and SW Cmd, whereas a read-write trace might have Frame, SCSI Cmd and Sequence available.

Save Filtered Sample checkbox saves a trace file without filtered data.

CrossSync Control Panel

The CrossSync Control Panel allows you to select analyzers for synchronization and manage the recording process.

Launching the CrossSync Control Panel

To launch CrossSync from the FC Protocol Suite software application, select the 'Launch CrossSync Control Panel 'entry in the 'Project Setup' menu (see the screen below). Or, you can launch CrossSync from the 'Start' menu.



Figure 2.7: Launching CrossSync from the SierraFC M164 Protocol Suite Application

Please refer to the CrossSync Control Panel User Manual for more information.

Projects

You can define a new project, starting with the default project definition, or modify the settings for the last project run.

New Default Project

To start a New project, select File on the main menu bar and choose Protocol Analyzer to open a new project with default settings that you can modify (see "Main Window" on page 33).

Last Project

Clicking the Green button

opens the last project run, so you can modify it.

Project File Types

Projects have the following file types:

- *.cfgDisplay Configuration file (in the System folder "Config" subfolder)
- □ *.fccProtocol Analyzer/Capture Project/Viewer file
- □ *.fcsSample file
- □ *.wsfWorkspace file

Example Projects

The Analyzer includes example projects that you can use to perform an immediate analysis without any setup.

The Analyzer system software has a pre-defined folder (directory) structure for storing all files. All example files are in the Examples folder under the SierraFC M164 folder.

It is strongly recommended that you open some example files to see types of projects that you can create.

Run an Example Analysis Project

To run an example project:

- 1. Select <u>File > Open.</u>
- 2. Locate example analysis projects by looking in the Examples folder. Examples are available for AdvanceCaptr, EasyCaptr, and Samples.
- 3. In the Samples folder, choose an example ***.fcs** file and click **Open** to display the example project dialog.

Open		<u>?</u> ×
Look in:	🕞 Samples 💽 🔇 🌮 🖽 •	
My Recent Documents Desktop My Documents My Computer	Image: Construct of Construction of Constructination of Constructination of Construction of Construction of Con	
My Network Places	File name: AL commands.fcs	Jpen
	Files of type: Sample File (*.fcs)	ancel

Figure 2.8: Open File Dialog

4. Click the **Record** button to execute the pre-defined example.



5. After the project runs, you see an analyzer trace capture display.

Figure 2.9: Analyzer Trace Capture Display

For details about the results display, see "Display Manipulation" on page 161 and see "Display Configuration" on page 217.

Patterns and Data Capture Setup

You can refine data capture by choosing **Pattern** and then selecting specific patterns for capture. Additionally, you can define a different set of patterns to capture after trigger.

To define specific patterns for capture, click the **Pattern** button to display the Capture tab for Pattern. You can drag and drop patterns from the Patterns Library pane into the Active Pane. You can select the pattern and use the Add and Remove arrows to move patterns between the Patterns Library and the Active pane.



Figure 2.10: Choosing Capture Patterns

Choose a Parameter

To choose a parameter for capture from any of these categories, highlight the category in the parameter window and click the +>> button to add the selection. You can also drag and drop a pattern. This opens selection dialogs for each of the categories displaying all of the parameters for that category. All patterns added appear in the Project Overview.

Include Patterns

This is the default selection. Check this box to allow for the capture of the patterns that have been added to the Project Overview. When you Include Patterns, only those patterns will be recorded, thus saving buffer space and emphasizing only what the user needs. However, to get proper context, you would typically need to include a lot of Patterns. To Exclude only unwanted Patterns is another option.

Exclude Patterns

Check this box to allow for the capture of everything except the patterns that have been added to the Project Overview.

When you check the Exclude Patterns box, the Ordered Set category appears in the Pattern List, and the Exclude Idle item appears in the Project Overview under the Capture (Exclude) branch.

ﷺLeCroy FC Protocol Suite - [FCProject2*]		
i File View Edit Configuration Project Setup Tools Window Help		
📔 🖼 🔜 🕘 🔴 Record 😹 🔳 💵 🎆 🕑 🗸 🛤 🛛 🏹 🎉 🚱 🕇 + - 👯 - 🏙	● • # ₩ # # # # # # # # # # # # # # # #	📑 🤣 🗸 🛙
Analyzer Settings Capture Trigger Notes C Everything Fattern Truncate Payload after 512 Dword(s) (2048 bytes)		Project
Parameters Exclude Idle Exclude RBDY Exclude Training Pattern Exclude ARBIF Exclude NOS Exclude VC_RDY Atterns Library		
User Patterns Most recent New User Group Presets Ordition (for Advanced Mode) Or Timers/External Or Basic FCP Order Condition (for Advanced Mode) Order Order	Include the following Patterns Exclude Active : Trag from library to add an event"	
Use separate patterns for Pre- and Post-triggers captures		
Easy,switch to Advanced mode		
X to Y : 0 (ns) X to T : 5.28.555.125.445 (min) Y to T : 5.28.555.125.445 (min) Begin to End : 866.981.	981.267 (ms) 🗸	

Figure 2.11: Exclude Patterns Checked

To remove an item from capture, highlight it in the Project Overview and click the -<< button.

Pre- and Post Trigger Data Capture

You can define one set of patterns for capture prior to the occurrence of a trigger and another set of patterns for capture after the occurrence of a trigger. The selection and setup procedure is the same for both Pre-Trigger capture and Post-Trigger capture.

Check **Use separate patterns for Pre- and Post-trigger captures** to enable the Pre-Trigger Capture and Post-Trigger Capture tabs (instead of only the Capture tab).

ﷺLeCroy FC Protocol Suite - [FCProject2*]	
Bile View Edit Configuration Project Setup Tools Window Help	
🚅 🔜 😓 🍩 ● Record 🍔 🔳 🔢 🔢 (P) → 🛤 🍸 📝 🖗 + → 🕸 → 🏦	• • • • • • • • • • • • • • • • • • •
Analyzer Settings Pre-Trigger Capture Trigger Post-Trigger Capture Notes	
C Everything C Pattern ✓ Truncate Payload after 512 Dword(s) (2048 bytes)	
Exclude Idle Exclude RRDY Exclude Training Pattern Exclude ARBIF Exclude NOS Exclude VC_RDY Exclude traffic till both ports are up	
Patterns Library	-
Ber Patterns Most recent Most rec	Include the following Patterns Exclude Active : "Drag from library to add an event"
B → ↓ Timers/External B → ↓ Basic B → ↓ FCP B → ↓ AB B → ↓ ELS	*>>
■	
B CAV B CAV B CAV C Ustom Frame	
Check box for Pre- and Post trigger captures	×
Use separate patterns for Pre- and Post-triggers captures	

Figure 2.12: Pre-Trigger and Post-Trigger Capture Dialog Enabled

Defining Patterns

To select an item for capture, either highlight the category and click the +>> button, or double-click the category, to open a corresponding definition dialog.

You can define patterns for specific ports by checking or unchecking the Port ID.

Basic Patterns

Connect/Disconnect

Double-click **Connect/Disconnect** to open the Add Connect Disconnect Pattern dialog.

CLECroy FC Protocol Suite - [FCProject7*]	
🔘 File View Edit Configuration Project Setup Tools Window Help	
Analyzer Settings Pre-Trigger Capture Trigger Capture Notes	C Include the following Patterns C Exclude Active : P Basic Link Service (Any) Add Connect/Disconnect □ Connect □ Disconnect □ K Cancel V P1 V P3 V P2 V P4 Check All Uncheck All

Figure 2.13: Connect Disconnect Pattern Dialog

Check **Connect** and/or **Disconnect**.

Ordered Set

Double-click Ordered Set to open the Add Ordered Set Pattern dialog.

Analyzer Setting: Pte-Trigger Capture Trigger (Post-Trigger Capture Notes Parameters Parameters Percenter Provide RRDY Exclude Training Pattern PErclude RBT Exclude RBDY Exclude Training Pattern PErclude RBT Exclude RBT Provide RBT P

Figure 2.14: Ordered set Pattern Dialog

To select an **Ordered Set**, click the dropdown list. You can choose **NOT** to trigger on anything that is NOT the defined pattern. You can choose **Frame Delimiters**, **Primitive Signals**, or **Primitive Sequences**.

Note: The **Symbol** pattern is only available on the Trigger tab, and when using the Ordered Set pattern, only the Exclude option is available.

Basic Link Service

Double-click **Basic Link Service** in the Pattern window to open the Add Basic Link Service Pattern dialog.

dd Basic Link Service	×
Basic Link Service :	Format
BA_ACC 0x4	C Binary Hexadecimal
Show Reserved and Obsolete	
Parameter	Value
Basic Link Service Code	0x04: BA_ACC
SEQ_ID Validity	×
Sequence Identifier	×
Originator Exchange_ID	****
Responder Exchange_ID	****
Low SEQ_CNT	****
High SEQ_CNT	****
Header	OK Cancel
✓ P1 ✓ P3	
IV P2 IV P4	
Check All Uncheck All	

Figure 2.15: Basic Link Service Pattern Dialog

The format can be **Binary** or **Hexadecimal**.

To select a **Basic Link Service**, click the dropdown list.

Link Control Frame

Double-click **Link Control Frame** in the Pattern window to open the Add Link Control Frame Pattern dialog.

Add Link Control Frame	×
Frame type Any Link Control Frame Type Show Reserved and Obsolete	Format Binary © Hexadecimal
Parameter	Value
Routing Control	0xXX: Any Link Control Frame Type
Header	OK Cancel
I▼ P1 I▼ P3 I▼ P2 I▼ P4	
Check All Uncheck All	

Figure 2.16: Link Control Frame Pattern Dialog

The format can be **Binary** or **Hexadecimal**.

To select a Link Control Frame, click the dropdown list.

Symbol 16G

The Symbol 16G cannot be added as a Capture Pattern.

Training Sequence

The Training Sequence cannot be added as a Capture Pattern.

Capture (Filter Out)

Exclude Training Sequence.

FCP Patterns

FCP SCSI Command

Double-click **FCP SCSI Command** in the Pattern window to open the Add FCP SCSI Command Pattern dialog.

Add FCP SCSI Con	nmand		X
Type Any SCSI Co C OSD-2 C / Command Type: CDB Type: Show Reserve	mmand C MMC-6 (ADC-3 Any Command Any CDB Type d and Obsolete	O SBC-3 O SMC-3 O SPC-4 O SSC-2	© Binary
Pa	rameter	Value	
Operation Code		X: Any Command	
LUN		*************	
	Header		OK Cancel
₽1	✓ P3		
✓ P2	✓ P4		
Check All	Jncheck All		

Figure 2.17: FCP SCSI Command Pattern Dialog

The format can be **Binary** or **Hexadecimal**.

If you select **Any SCSI Command**, the Command Type can only be **Any Command**. Click the down arrow next to the CDB dropdown list, scroll the list to choose a CDB Type, and click **OK**. The **Any** option allows specifying any vendor-specific or other command.

If you select **MMC-6, SBC-3, SMC-3, SPC-4, SSC-2, OSD-2**, or **ADC**-3, click the down arrow next to the Command Type dropdown list, scroll the list to choose a Command Type, and click **OK**.

FCP Frame Information Unit

Double-click **FCP Frame Information Unit** in the Pattern window to open the Add FCP Frame Information Unit Pattern dialog.

Add FCP Frame Information Unit			×
Frame Type Any OxX	< -	Format C Binary © Hexadecim	al
FCP Response SCSI Status Code: Any SCSI Status Code	0xXX 🔻	RSP_LEN_VALID © 0 © 1 © X (Don't Care)
Response Code: Any Response Code	0xXX 🔻	Sense Key: Any Sense Key 0xX	-
Show Reserved and Obsolete			
Parameter		Value	
Туре	0xXX: Any		
	_		
Header		OK Cancel	
	٦		
✓ P1 ✓ P3			
✓ P2 ✓ P4			
Check All Uncheck All			

Figure 2.18: FCP Frame Information Unit Pattern Dialog

The format can be **Binary** or **Hexadecimal**.

To select a **Frame Type**, click the dropdown list. On selecting a Frame Type the Parameters and Value of that Frame Type are displayed.

SCSI Command Status

Double-click **SCSI Command Status** in the Pattern window to open the Add SCSI Command Status Pattern dialog.

Add SCSI Command Status	×		
Capture On			
Status Only	C Sense Key/Response Code		
Status	Format		
 Any SCSI Status Code (0xXX) 	Fixed O Descriptor		
C Good (0x00)	Sense Key		
C Check Condition (0x02)	Any Sense Key (0xXX)		
C Condition Met (0x04)	C No Sense (0x00)		
C Busy (0x08)	C Recovered Error (0x01)		
C Intermediate (0×10)	C Not Ready (0x02)		
C Intermediate Condition Met (0x14)	C Medium Error (0x03)		
C Reservation Conflict (0x18)	C Hardware Error (0x04)		
C Task Set Full (0x28)	C Illegal Request (0x05)		
C ACA Active (0x30)	C Unit Attention (0x06)		
C Task Aborted (0x40)	C Data Protect (0x07)		
C Response Data Present (0x50)	C Blank Check (UXU8)		
C Logical Unit Not Available (0x5A)	C Conv (boxted (0v0))		
C Write Protect Error (0x5B)	C Aborted Command (0v0B)		
C Read Protect Error (0x5C)	O Volume Overflow (0x0D)		
C Buffer Overrun (0x5D)	C Miscompare (0x0E)		
RSP Len Valid : 0 0 1 X (Don't Care) X (Don't Care)	Response Code Any Fixed format 0x70 or 0x71		
Header	OK Cancel		
▼ P1 ▼ P3			
✓ P2 ✓ P4			
Check All Uncheck All			

Figure 2.19: SCSI Command Status Pattern Dialog

You can capture on **Status Only** or **Sense Key/Response Code**. Click on **Status Only** to display all the states that are available. Click on the **Sense Key/Response Code** to display all the Format and Sense Keys.

RSP_CODE: It is selected by default. You can click on the dropdown list to select more options.

FCP Task Management

Double-click **FCP Task Management** in the Pattern window to open the Add FCP Task Management Pattern dialog.

dd FCP Task Managment		>
- Function		- Format
QUERY TASK SET	0x1 💌	C Binary 💿 Hexadecimal
Show Reserved and Obsolete		
Parameter	· · · · · · · · · · · · · · · · · · ·	/alue
FCP LUN	*********	
Command Reference Number	×	
TASK Attribute	Any Task Attribute	0x? •
Priority	X	
TASK Management Flags	0x01: QUERY TASK SET	
Header		OK Cancel
✓ P1 ✓ P3		

Figure 2.20: FCP Task Management Pattern Dialog

The format can be **Binary** or **Hexadecimal**.

To select a **Function**, click the dropdown list.

ARB Patterns

ARB Loop Initialization

Double-click **ARB Loop Initialization** in the Pattern window to open the Add ARB Loop Initialization Pattern dialog.

Add ARB Loop Initialization		<u>×</u>
Loop Init Id	×	Format C Binary © Hexadecimal
Show Reserved and Obsolete		
Parameter		Value
Loop Init ID	0x11>>>>>>>: Any	
J		
Header		OK Cancel
▼ P1 ▼ P3		
₽2 ₽4		
Check All Uncheck All		

Figure 2.21: ARB Loop Initialization Pattern Dialog

The format can be **Binary** or **Hexadecimal**.

To select a Loop Init ID, click the dropdown list.

ELS Patterns

Extended Link Service - Request

Double-click **Extended Link Service - Request** in the Pattern window to open the Add Extended Link Service Pattern dialog.

Add Extended Lin	nk Service - Request		Ţ	Format	X
Command :	Any	×	<u> </u>	•	Binary Hexadecimal
Show Reserve	ed and Obsolete				
F	Parameter		Value		
ELS Command		0xXX: Any			
	Header	1		ОК	Cancel
	1100001				
☑ P1 ☑ P2	 ✓ P3 ✓ P4 				
Check All	Uncheck All				

Figure 2.22: Extended Link Service - Request Pattern Dialog

The format can be **Binary** or **Hexadecimal**.

To select an **ELS_Type**, click the dropdown list.

Extended Link Service - Request, Reply

Double-click **Extended Link Service - Request, Reply** in the Pattern window to open the Add Extended Link Service Pattern dialog.

Add Extended Lin	k Service - Request, Reply						×
				_	⊢ Format		
ELS_Type:	Reply		-		0	Binary	
Command :	Any	×	-		۰	Hexadecimal	
	Any	X					-
🔲 Show Reserve	PLOGI	0x3					
	FLOGI	0x4					_
P	LOGO	0x5	l lu	le			
ELS Command	RCS	0x7					
	RSI	0xA					
	ESTS	0xB					
	ADVC	0xD					
	RTV	0xE					
	RLS	0xF					
	ECHO	0x10					
	RRQ	0x12	_				
	REC	0x13	_				
	SRR	0x14	_				
	PRLI	0x20					
This event consis	PRLO .	0x21	– es	t happen:	s, waits to	meet the reply.	
	Header				ОК	Cancel	
✓ P1	✓ P3						
✓ P2	▼ P4						
Check All L	Jncheck All						

Figure 2.23: Add Extended Link Service - Request, Reply Pattern Dialog

The format can be **Binary** or **Hexadecimal**.

To select an **ELS_Type**, click the dropdown list.

Extended Link Service - Reply

Double-click **Extended Link Service - Reply** in the Pattern window to open the Add Extended Link Service Pattern dialog.

Add Extended Li	nk Service -Reply				>
ELS_Type : Command :	Reply Any	x	▼ ▼	Format ©	Binary Hexadecimal
Show Reserv	red and Obsolete				
ELS Command	Parameter	DuXX- Anu	Value		
CES Commeriu		own. Any			
1					
	Honder	1	-	пк	Cancel
	neauei			UK	
E P2	E PA				
	J• I 4				
Check All	Uncheck All				

Figure 2.24: Extended Link Service - Reply Pattern Dialog

The format can be **Binary** or **Hexadecimal**.

To select an **ELS_Type**, click the dropdown list.

GS Patterns

Generic Link Service - Request

Double-click **Generic Link Service - Request** in the Pattern window to open the Add Generic Link Service Pattern dialog.

Add Generic Link	Service - Request			X
GS_Type:	FC-SW-5	0x20	•	Format
GS_Subtype :			_	C Binary
Command Type:	Request		-	Hexadecimal
Command :	Any	X	•	
Show Reserv	ed and Obsolete			
	Parameter		Value	
Revision		*		
IN_ID		*****		
GS_Type		0x20: FC-SW-5		
GS_Subtype		Any GS_Subtype		0xXX -
				OK Canad
	Header			
₽1	✓ P3			
✓ P2	✓ P4			
Check All	Uncheck All			

Figure 2.25: Generic Link Service Pattern Dialog

The format can be **Binary** or **Hexadecimal**.

Click the dropdown lists to select a **GS_Type**, **GS_Subtype**, **Command Type**, and **Command**.

Generic Link Service - Request, Reply

Double-click **Generic Link Service - Request, Reply** in the Pattern window to open the Add Generic Link Service Pattern dialog.

Add Extended Lin	k Service - Request, Reply					1	×
				E F	ormat		1
ELS_Type:	Reply		v		0	Binary	
Command :	Any	X	•		C	Hexadecimal	
	Any	X					1
📄 Show Reserve	PLOGI	0x3					
	FLOGI	0x4					
PP	LOGO	0x5	lue				
ELS Command	RCS	0x7					
	RSI	0xA	_				
	ESTS	0xB					
	ADVC	0xD					
	BTV	0xE					
	RLS	0xF					
	ECHO	0x10					
	RRQ	0x12					
	REC	0x13					
	SRR	0x14					
	PRLI	0x20					
This event consis	PRLO	0x21	📕 est hap	ipens, wa	aits to	meet the reply.	
	Header			OK		Cancel	
✓ P1	✓ P3						
✓ P2	✓ P4						
Check All U	Jncheck All						

Figure 2.26: Generic Link Service-Request, Reply Pattern Dialog

The format can be **Binary** or **Hexadecimal**.

Click the dropdown lists to select a **GS_Type**, **GS_Subtype**, **Command Type**, and **Command**.

Generic Link Service - Reply

Double-click **Generic Link Service - Reply** in the Pattern window to open the Add Generic Link Service Pattern dialog.

Add Generic Link	< Service - Reply		X
			Format
GS_Type:	FC-SW-5	0x20 🔻	
GS_Subtype :		*	O Binary
Command Type:	Reply	v	 Hexadecimal
Command :	Any	×	
Show Reserv	red and Obsolete		
	Parameter	Va	lue
Revision		×	
IN_ID		XXXXXX	
GS_Type		0x20: FC-SW-5	
GS_Subtype		Any GS_Subtype	OxXX 🔻
	Header]	OK Cancel
✓ P1	✓ P3		
₽2	✓ P4		
Check All	Uncheck All		

Figure 2.27: Generic Link Service Pattern Dialog

The format can be **Binary** or **Hexadecimal**.

Click the dropdown lists to select a **GS_Type**, **GS_Subtype**, **Command Type**, and **Command**.

SW Patterns

Switch Internal Link Service - Request

Double-click **Switch Internal Link Service - Request** in the Pattern window to open the Add Switch Internal Link Service Pattern dialog.

Add Switch Inte	rnal Link - Request			×
SW_Type : Command :	Request Any ved and Obsolete	[X	Y	⊂ Format ○ Binary ⊙ Hexadecimal
	Parameter	0.200000 4	Value	
SW_ILS_COMM	iano	UXXXXXX: Any		
1				
	Header		0	K Cancel
P2	I P4			
Check All	Uncheck All			

Figure 2.28: Switch Internal Link Service Pattern Dialog

The format can be **Binary** or **Hexadecimal**.

To select a **SW_Type** and a **Command** click the dropdown lists.

Switch Internal Link Service - Request, Reply

Double-click **Switch Internal Link Service - Request, Reply** in the Pattern window to open the Add Switch Internal Link Service Pattern dialog.

Add Switch Intern	al Link - Request, Reply		×
			Format
SW_Type:	Reply		C Binary
Command :	Any	×	Hexadecimal
	Any	X	
Show Reserved	ELP	0x1000	1
	EFP	0x11	
P.	DIA	0x1200	
SW_ILS_Comman	RDI	0x1300	
	BF	0x1700	
	RCF	0x1800	
	SW_RSCN	0x1B00	
	DRLIR	0x1E00	
	MR Basic Zoning	0x2200	
	MR Enhanced Zoning	0x2201	
	ACA	0x2300	
	RCA	0x2400	
	SFC Activate Zone Set	0x2503	
	SFC Deactivate Zone Set	0x2504	
This event consists	SFC Activate Zone Set Enhanced	0x2508	ppens, waits to meet the reply.
	Header		OK Cancel
✓ P1	✓ P3		
✓ P2	₽4		
Check All U	ncheck All		

Figure 2.29: Switch Internal Link Service-Request, Reply Pattern Dialog

The format can be **Binary** or **Hexadecimal**.

To select a **SW_Type** and a **Command** click the dropdown lists.

Switch Internal Link Service - Reply

Double-click **Switch Internal Link Service - Reply** in the Pattern window to open the Add Switch Internal Link Service Pattern dialog.

Add Switch Inter	nal Link - Reply			×
SW_Type :	Reply		_	Format C Binary
command.	JANY	×		
Show Reserve	ed and Obsolete			
F	Parameter		Value	
SW_ILS_Comma	nd	0xXXXX: Any		
1				
	Header		0	K Cancel
₽1	✓ P3			
₽2	✓ P4			
Check All	Uncheck All			

Figure 2.30: Switch Internal Link Service Pattern Dialog

The format can be **Binary** or **Hexadecimal**.

To select a **SW_Type** and a **Command** click the dropdown lists.

FICON

Any Data Information Block Type

Double-click **FICON - (Any Data Information Block Type)** in the Patterns Library panel to open the FICON - Any Data Information Block Type dialog.

Add FICON		x
Type Any X		Format C Binary C Hexadecimal
Sent O To a Channel	From a Channel	
Show Reserved and Obse	olete	
Header	Parameter	Value 🔺
	Channel Image ID	×
SB-3 Header	Control Unit Image ID	×
	Device Address	****
	Address Specific	?
	Supplemental Status	?
	Data Information Block Type	Any Data Information Block Type 0x? 🗾
	End	?
Information Unit Header	Chaining	?
	End Early	?
	CRC Not Provided	?
	Channel-Command-Word Number	×*** -
Header		OK Cancel
₽1 ₽3		
P2 P4		
Check All Uncheck Al		

Figure 2.31: FICON - (Any Data Information Block Type) Dialog

The format can be **Binary** or **Hexadecimal**.

- Any
- 🛛 Data
- Command
- Status
- Control
- Command and Data
- Link Control

Add FICON Data

Double-click FICON(Data) in the Patterns Library panel to open the FICON Data dialog.

Add ETCON			X
Type Data 0x0		·	Format C Binary C Hexadecimal
C To a Channel	From a Char	inel	
Show Reserved and Ob	solete		
Header	Parameter		Value 🔺
	Channel Image ID	\times	
SB-3 Header	Control Unit Image ID	×	
	Device Address	****	
	Address Specific	?	
	Supplemental Status	?	
	Data Information Block Type	Data	0x0 -
	End	?	
Information Unit Header	Chaining	?	
	End Early	?	
	CRC Not Provided	?	
	Channel-Command-Word Number	****	v
Header			OK Cancel
I P1 I P3			
₽2 ₽ P4			
Check All Uncheck A			

Figure 2.32: FICON (Data) Dialog

The format can be **Binary** or **Hexadecimal**.

- Any
- Data
- $\hfill\square$ Command
- Status
- Control
- Command and Data
- Link Control

Add FICON Command

Double-click **FICON(Command)** in the Patterns Library panel to open the FICON Command dialog.

Add FICON			X
Туре ———			Format
Command 0x1		•	C Binary 💿 Hexadecimal
Sent © To a Channel	From a Char	nel	
Show Reserved and Obs	olete		
Header	Parameter		Value 🔺
	Channel Image ID	×	
SB-3 Header	Control Unit Image ID	×	
	Device Address	****	
	Address Specific	?	
	Supplemental Status	?	
	Data Information Block Type	Command	0x1 -
	End	?	
Information Unit Header	Chaining	?	
	End Early	?	
	CRC Not Provided	?	
	Channel-Command-Word Number	×***	•
Header			OK Cancel
I № P1 I P3			
₽ P2 ₽ P4			
Check All Uncheck A	1		

Figure 2.33: FICON (Command) Dialog

The format can be **Binary** or **Hexadecimal**.

- Any
- 🗆 Data
- □ Command
- □ Status
- □ Control
- Command and Data
- Link Control

FICON[Command]-Any CCW Command Type

The FICON[Command] has an additional **Any CCW Command Type** dropdown menu under the **Value** pane on the right of the dialog as shown in the following figure.

Add FICON			×
Туре		Format	7
Command 0x1		Binary Hexadecimal	
Sent O To a Channel	From a Channel		
Show Reserved and Obso	olete		
Header	Parameter	Value]
Information Huik Hander	Channel-Command-Word Number	×***	
Information Unit Header	Token	*****	
	CCW Command Type	Any CCW Command Type 0xXX 💌	
	Chain Data	Any CCW Command Type 0xXX	
	Chain Command	Sense (0bxxxx0100) 0xX4	
	Suppress Length Indication	Read-Backward (0bxxxx1100) 0xXC Write (0bxxxxx01) 0xX2	
	Command Response Request	Read (0bxxxxx10) 0xX?	
	Channel-Command Word Count	Control (0bxxxxx11) 0xX?	
	10 Priority	×	-
Command Header	Data-Chaining Update	?	
	Continue-on-Command Immediate	?	·
Header		OK Cancel	
P1 P3	E	Expected number of occurrences on each link: 1	
₽ P2 ₽ P4			
Check All Uncheck All			

Figure 2.34: FICON[Command] - Any CCW Command Type Dialog

- □ Any CCW Command Type
- Sense
- Read-Backward
- Write
- Read
- Control

Add FICON Status

Double-click FICON(Status) in the Patterns Library panel to open the FICON Status dialog.

Id FICON Type		•	Format C Binary © Hexadecimal
Sent C To a Channel	From a Chan	nel	L
Show Reserved and Obs	olete		
Header	Parameter		Value 🔺
	Channel Image ID	~	
SB-3 Header	Control Unit Image ID	×	
	Device Address	×***	
	Address Specific	?	
	Supplemental Status	?	
	Data Information Block Type	Status	0x2 -
	End	?	
Information Unit Header	Chaining	?	
	End Early	?	
	CRC Not Provided	?	
	Channel-Command-Word Number	××××	
Header			OK Cancel
✓ P2 ✓ P4			
Check All Uncheck A			

Figure 2.35: FICON (Status) Dialog

The format can be **Binary** or **Hexadecimal**.

- Any
- Data
- $\hfill\square$ Command
- Status
- Control
- Command and Data
- Link Control

FICON[Status]- Any Flag-Field Code

The FICON[Status] has an additional **Any Flag-Field Code** dropdown menu under the **Value** pane on the right of the dialog as shown in the following figure.

Add FICON			×
Туре ———		Format	
Status 0x2		O Binary	Hexadecimal
- Sent-			
🔿 To a Channel	From a Channel		
Show Reserved and Obse	plete		
Header	Parameter	Value	_
	End	?	
	Chaining	?	
Information I Init I and a	End Early	?	
Information Unit Header	CRC Not Provided	?	
	Channel-Command-Word Number	×***	
	Token	*****	
	Flag-Field Code	Any Flag-Field Code	0x? •
	Channel Initiated	Any Flag-Field Code	0x?
	Command Retry	No Function	0x0
	Long Record/Immediate	Resetting Event	0x1
	Residual Count Valid	?	_
Header		ОК	Cancel
₽1 ₽3	E	ount spected number of occurrences on e	ach link: 1
₽ P2 ₽ P4			
Check All Uncheck Al			

Figure 2.36: FICON[Status] - Any Flag-Field Code Dialog

To select Any Flag-Field Code click the dropdown list which has the following options:

- No Function
- Queueing Information Valid
- Resetting Event

FICON[Status]-Any Status Byte

The FICON[Status] has an additional **Any Status Byte** dropdown menu under the **Value** pane on the right of the dialog as shown in the following figure.

Add FICON			X
Туре ———		- Format	
Status 0x2		C Binary	Hexadecimal
Sent C To a Channel	From a Channel		
Show Reserved and Obso	plete	· · ·	
Header	Parameter	Value	_
	Long Record/Immediate	7	
	Residual Count Valid	?	
	Status Byte	Any Status Byte	0xXX •
	Status Parameter	Any Status Byte	0xXX
	Queue Time Unit Factor	Attention	0x80
Status Header	Queue Time Unit	Control Unit End	0x40
	Defer Time Unit Factor	Busy	0x10
	Defer Time Unit	Channel End	0x08
	Information Units Count	Device End	0x04
	Complemental Clarks Data Count	Unit Exception	0x01
	Supplemental-Status Byte Count	L	
Longitudinal Redundancy Ch	Longitudinal Hedundancy Check	******	_
Header		ОК	Cancel
🔽 P1 🔽 P3	Ex	pected number of occurrences on eac	h link: 1
P2 P4			
Check All Uncheck Al			

Figure 2.37: FICON[Status] - Any Status Byte Dialog

- Attention
- Status Modifier
- Control Unit End
- Busy
- Channel End
- Device End
- Unit Check
- □ Unit Exception

Add FICON Control

Double-click **FICON(Control)** in the Patterns Library panel to open the FICON Control dialog.

dd FICON		X
Type Control 0x3		Format C Binary C Hexadecimal
Sent C To a Channel	From a Channel	
Show Reserved and Obso	olete	
Header	Parameter	Value 🔺
	Channel Image ID	*
SB-3 Header	Control Unit Image ID	*
	Device Address	XXXX
	Address Specific	?
	Supplemental Status	?
	Data Information Block Type	Control 0x3 🗾
	End	?
Information Unit Header	Chaining	?
	End Early	?
	CRC Not Provided	?
	Channel-Command-Word Number	×***
Header		OK Cancel
I P1 I P3		
I P2 I P4		
Check All Uncheck Al		

Figure 2.38: FICON (Control) Dialog

The format can be **Binary** or **Hexadecimal**.

- Any
- 🗆 Data
- □ Command
- Status
- □ Control
- Command and Data
- Link Control

FICON[Control]-Any Control Function

The FICON[Control] has an additional **Any Control Function** dropdown menu under the **Value** pane on the right of the dialog as shown in the following figure.

Add FICON			×
Туре		- Format	
Control 0x3		O Binary	Hexadecimal
Sent O To a Channel	From a Channel	rel	
Show Reserved and Obso	blete		
Header	Parameter	Value	^
	End Chaining	2	
	End Fash	Any Control Function	0xXX
Information Unit Header	End Early	Control End	0x00
	CRC Not Provided	Command Hesponse	Ux10
	Channel-Command-Word Number	Cancel	0x20
	Token	Sustem Reset	0x30
		Selective Beset	0x50
	Control Function	A Request Status	0x70
	Control Parameters	Device Level Exception	0x80
Control Header	Information Units Count	Status Accepted	0xA0
	Control Pouload Puto Count	Device Level Acknowledgemer	nt 0xB0
	Control Payload Byte Count	Purge Path	0xC8
Longitudinal Redundancy Cl	Longitudinal Redundancy Check	Purge Path Response	UXDU
Header		OK	Cancel
▼ P1 ▼ P3		Expected number of occurrences on	each link: 1
₽ P2 ₽ P4			
Check All Uncheck Al			

Figure 2.39: FICON[Control] - Any Control Function Dialog

To select Any Control Function click the dropdown list which has the following options:

- Control End
- Command Response
- Stack Status
- cancel
- System Request
- Selective Reset
- Request Status
- Device Level Exception
- □ Status Accepted
- Device Level Acknowledgement
- Purge Path
- Purge Path Response
Add FICON Command-Data

Double-click **FICON(Command-Data)** in the Patterns Library panel to open the FICON Command Data dialog.

Add FICON			X
Туре		[Format
Commsnd & Data 0x4			C Binary C Hexadecimal
Sent			
O To a Channel	From a Channel		
Show Reserved and Obse	olete		
Header	Parameter		Value 🔺
	Channel Image ID	×	
SB-3 Header	Control Unit Image ID	\times	
	Device Address	****	
	Address Specific	?	
	Supplemental Status	?	
	Data Information Block Type	Command-Data	0x4 🗾
	End	?	
Information Unit Header	Chaining	?	
	End Early	?	
	CRC Not Provided	?	
	Channel-Command-Word Number	****	•
Header		[OK Cancel
₽1 ₽3			
P2 P4			
Check All Uncheck Al			

Figure 2.40: FICON (Command Data) Dialog

The format can be **Binary** or **Hexadecimal**.

- Any
- 🛛 Data
- Command
- □ Status
- □ Control
- Command and Data
- Link Control

FICON[Command]-Any CCW Command Type

The FICON[Command-Data] has an additional **Any CCW Command Type** dropdown menu under the **Value** pane on the right of the dialog as shown in the following figure.

Add FICON			×
_ Туре		Format	
Commsnd & Data 0x4		O Binary O	Hexadecimal
Sent			
🔿 To a Channel	From a Chair	nnel	
C Show Reserved and Obs	olete		
Header	Parameter	Value	_
	Channel-Command-Word Number	×***	
Information Unit Header	Token	×****	
	CCW Command Type	Any CCW Command Type	0xXX •
	Chain Data	Any CCW Command Type	0.000
	Chain Command	Sense (0bxxxx0100)	0xX4
	Suppress Length Indication	Read-Backward (0bxxxx1100)	0xXC
	Command Besponse Bequest	Read (0bxxxxx10)	0xX?
	Command Response Request	Control (0bxxxxx11)	0xX?
	In plant word Count		
Command Header	TU Priority	~~	
	Data-Chaining Update	?	
	Continue-on-Command Immediate	?	_
Header		OK	Cancel
		Count Expected number of occurrences on ead	ch link: 1
Check All Uncheck A	11		

Figure 2.41: FICON[Command-Data] - Any CCW Command Type Dialog

- Sense
- Read-Backward
- Write
- Read
- Control

Add FICON Link-Control

Double-click **FICON(Link-Control)** in the Patterns Library panel to open the FICON Link Control dialog.

Add FICON			×
Г Туре ————			Format
Link Control 0x5			C Binary © Hexadecimal
Sent			
O To a Channel	From a Channel		
Show Reserved and Obso	olete		
Header	Parameter		Value 🔺
	Channel Image ID	×	
SB-3 Header	Control Unit Image ID	\times	
	Device Address	×***	
	Address Specific	?	
	Supplemental Status	?	
	Data Information Block Type	Link-Control	0x5 👻
	End	?	
	Chaining	?	
	End Early	?	
Information Unit Header	CRC Not Provided	?	
iniomation onic rieadei	Channel-Command-Word Number	×***	-
Header			OK Cancel
₽ P1 ₽ P3			
✓ P2 ✓ P4			
Check All Uncheck Al			

Figure 2.42: FICON (Link-Control) Dialog

The format can be **Binary** or **Hexadecimal**.

- Any
- 🗆 Data
- □ Command
- □ Status
- □ Control
- Command and Data
- Link Control

FICON[Link Control]-Any Link Control Function

The FICON[Link Control] has an additional **Any Link Control Function** dropdown menu under the **Value** pane on the right of the dialog as shown in the following figure.

Add FICON			×
_ Туре		Format	
Link Control 0x5		▼ O Binary ⊙	Hexadecimal
Sent C To a Channel	From a Channel		
Show Reserved and Obso	lete		
Header	Parameter	Value	
	Chaining	?	
	End Early	?	
	CRC Not Provided	?	
	Channel-Command-Word Number		
	Token	Any Link Control Function	0.000
Information Unit Header	Link Control Exection	Establish Logical Path	0x41
	Link Control Function	A Remove Logical Path	0x49
	Link Control Information	Lest Initialization	0x09
	Channel-To-Channel Counter	Logical Path Established	0,59
	Information Units Count	Test Initialization Besult	0x01
		Link-Level Reject	0x11
	Link-Control Payload Byte Count	Link-Level Busy	0x21
Longitudinal Redundancy Cł	Longitudinal Redundancy Check	Link-Level Acknowledgement	0x61 🖵
Header		OK	Cancel
₽ P1 ₽ P3	[Count Expected number of occurrences on each	link: 1
₽ P2 ₽ P4			
Check All Uncheck All			

Figure 2.43: FICON[Link Control] - Any Link Control Function Dialog

To select **Any Link Control Function** click the dropdown list which has the following options:

- Establish Logical Path
- Remove Logical Path
- Test Initialization
- Logical Path Established
- Logical Path Removed
- Test Initialization Result
- Link-Level Reject
- □ Link-Level Busy
- Link-Level Acknowledgement

FCAE

FCAE-ASM

Double-click **FCAE-ASM** in the Patterns Library panel to open the FCAE-ASM dialog to add any Type of FCAE-ASM.

Add FCAE-ASM		
Show Reserved and Obsolete		Format C Binary © Hexadecimal
Parameter		Value
Message ID	*******	
Security	*******	
L	?	
Priority	?X	
Message Payload Length	*****	
		[000000]
Header		OK Cancel
₽ P1 ₽ P3		
✓ P2 ✓ P4		
Check All Uncheck All		

Figure 2.44: FCAE-ASM Dialog

The format can be **Binary** or **Hexadecimal**.

FCAE-1553 Any

Double-click **FCAE-1553(Any)** in the Patterns Library panel to open the FCAE-1553 dialog to add any Type of FCAE-1553.

Add FCAE-1553			×
Туре			Format
Any	× -		C Binary 💿 Hexadecimal
Any Data	X 0x1		
Command	0x6		Value
ANY FC-AE-1553 Any	087	×	
Header			OK Cancel
IZ P1 IZ P3 IZ P2 IZ P4			
Check All Uncheck All			

Figure 2.45: FCAE-1553 (Any) Dialog

The format can be **Binary** or **Hexadecimal**.

- 🗅 Any
- 🗆 Data
- Command
- Status

Add FCAE-1553 Data

Double-click **FCAE-1553(Data)** in the Patterns Library panel to open the FCAE-1553 Data dialog.

Data	0x1 💌	Binary Hexadecimal
Show Reserved and I	Dbsolete	
Header	Parameter	Value
	Data (Byte 1-8)	×******
	Data (Byte 9-16)	xxxxxxxxxxxxxxx
	Data (Byte 17-24)	********
	Data (Byte 25-32)	xxxxxxxxxxxxxxx
Data	Data (Byte 33-40)	xxxxxxxxxxxxxxx
	Data (Byte 41-48)	******
	Data (Byte 49-56)	>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
	Data (Byte 57-64)	>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
Head	ler	OK Cancel
	-3	
₽2	24	
	k All 1	

Figure 2.46: FCAE-1553(Data) Dialog

The format can be **Binary** or **Hexadecimal**.

- Any
- 🗆 Data
- $\hfill\square$ Command
- Status

Add FCAE-1553 Command

Double-click **FCAE-1553(Command)** in the Patterns Library panel to open the FCAE-1553 Command dialog.

dd FCAE-1553		×
Туре ———		Format
Command	0x6 💌	C Binary O Hexadecimal
Show Reserved and Ob	solete	
Header	Parameter	Value 🔺
	NT Burst Size Request	?
	Delayed NT Burst Size Request	?
	Receive RDMA	?
	Transmit RDMA	?
Word 1	Suppress Status	?
	NT-to-NT	?
	T/R	?
	NC MONITOR FOR NT-TO-NT TRANSFERS	?
	MULTICAST	?
Word 2	Subaddress/Mode	XXXXXXXX
Word 3	Data Byte Count/Mode Code	Any Data Byte Count/Mo 0x00000000 🔹 🚽
	No Dosponso bu MIL CTD 1652 DT	2
Header		OK Cancel
▼ P1 ▼ P3		
▼ P2 ▼ P4		
Check All Uncheck /		

Figure 2.47: FCAE-1553 (Command) Dialog

The format can be **Binary** or **Hexadecimal**.

- □ Any
- 🗆 Data
- Command
- Status

FCAE-1553[Command]-Any Data Byte Count /Mode Code

The FCAE-1553[Command] has an additional **Any Data Byte Count /Mode Code** dropdown menu under the **Value** pane on the right of the dialog as shown in Figure 2.46. The dropdown menu items could be truncated, hover the mouse over the option to see the full menu option (see the following figure).

dd FCAE-1553		×
Туре		Format
Command	0x6	C Binary 💿 Hexadecimal
Show Reserved and Ob	solete	
	D	
Header	Parameter	Value 🔎
	NC MONITOR FOR NT-TO-NT TRANSFERS	2
	no non on on the new of the	ſ
Word 1	MULTICAST	?
Word 1 Word 2	MULTICAST Subaddress/Mode	* ? XXXXXXXX
Word 1 Word 2 Word 3	MULTICAST Subaddress/Mode Data Byte Count/Mode Code	r ? X0000000 Any Data Byte Count/Mo 0x0000000
Word 1 Word 2 Word 3	MULTICAST Subaddress/Mode Data Byte Count/Mode Code No Response by MIL-STD-1553 RT	? X0000000X Any Data Byte Count/Mo 0x0000000

Figure 2.48: Hover the Mouse to see the Full Menu Option

Add FCAE-1553		×
Туре —		Format
Command	0x6 💌	C Binary O Hexadecimal
Show Reserved and Ob	solete	
Header	Parameter	Value 🔺
Word 1	NC MONITOR FOR NT-TO-NT TRANSFERS MULTICAST	Any Data Byte Count/Mo 0x00000000 Dynamic Network Control 0x00000000 Sunchronize (without data 0x000000001
Word 2	Subaddress/Mode	Transmit Status Sequence 0x00000002
Word 3	Data Byte Count/Mode Code	A Initiate Self-Test 0x0000003
	No Response by MIL-STD-1553 RT	Transmitter Shutdown 0x00000004 Override Transmitter shutd 0x00000005
	MIL-STD-1553 RT Format Error	Inhibit Terminal Flag (T/F) 0x00000006
	Burst Size Acknowledge	Uverride Inhibit Terminal F UxUUUUUUUU7
	Port Login Required	Transmit Vector Word 0x00000010
	Message Error Bit	Synchronize (with data wo 0x00000011
	Instrumentation	Transmit Last Command S 0x00000012
Word 4		Fransmit Built In Test 0x00000014
	Service Request	
	Propheret Command Perceived	
Header		OK Cancel
	E	Count xpected number of occurrences on each link: 1
✓ P2 ✓ P4		
Check All Uncheck A		

Figure 2.49: FCAE-1553[Command]- Any Data Byte Count/Mode Code Dialog

To select **Any Data Byte Count/Mode Code** click the dropdown list which has the following options:

- Dynamic Network Control
- □ Synchronize (without data word)
- Transmit Status Sequence
- Initiate Self-Test
- □ Transmitter Shutdown
- Override Transmitter shutdown

- □ Inhibit Terminal Flag (T/F)
- Override Inhibit Terminal Flag
- Reset Network Terminal
- □ Transmit Vector Word
- □ Synchronize (with data word)
- Transmit Last Command Sequence
- □ Transmit Built In test
- □ Selected Transmitter Shutdown
- Override Selected Transmitter Shutdown
- □ Transmit RT Address
- □ Transmit NT_C-D/S_BURST_TOV

Add FCAE-1553 Status

Double-click **FCAE-1553(Status)** in the Patterns Library panel to open the FCAE-1553 Status dialog.

dd FCAE-1553				2
Туре ———			Format	
Status	0x7 💌		O Binary 💿	Hexadecimal
Show Reserved and C)bsolete		<u>.</u>	
Header	Parameter		Value	_
	No Response by MIL-STD-1553 RT	?		
	MIL-STD-1553 RT Format Error	?		
	Burst Size Acknowledge	?		
	Port Login Required	?		
	Message Error Bit	?		
	Instrumentation	?		
Word 1 (NT Status)	Service Request	?		
	Broadcast Command Received	?		
	Busy	?		
	Subsystem Flag	?		
	Dynamic Network Control Acceptance	?		
	Torminal Flag	2		-
Head	ler		OK	Cancel
	3			
	NA CONTRACTOR OF A CONTRACTOR OFTA			
	Ч			
Charle All Charles				
Lheck All Uncheck	K All			

Figure 2.50: FCAE-1553 (Status) Dialog

The format can be **Binary** or **Hexadecimal**.

- 🗅 Any
- 🗆 Data
- Command
- Status

FCVI

The following patterns are available for FCVI:

FCVI(Any) FCVI(SEND_RQST) FCVI(WRITE_RQST) FCVI(READ_RQST) FCVI(SEND_RESP) FCVI(WRITE_RESP) FCVI(WRITE_RESP) FCVI(CONNECT_RQST) FCVI(CONNECT_RQST) FCVI(CONNECT_RESP1) FCVI(CONNECT_RESP2) FCVI(CONNECT_RESP3) FCVI(DISCONNECT_RESP3)

Double-click on any of the FCVI patterns listed above in the Patterns Library panel to open the FCVI dialog. Select a FCVI service from the dropdown list which has the options listed above. The format can be **Binary** or **Hexadecimal**.

I FCVI		
		Format
Any	0xFF	O Binary Hexadecimal
Any	0xFF	
SEND_RQST	0x0	
WRITE_RQST	0x1	
READ_RQST	0x2	Value
SEND_RESP	0x8	
WRITE_RESP	0x9	
READ_RESP	0xA	
CONNECT_RQST	0x10	
DISCONNECT_RQST	0x12	
CONNECT_RESP1	0x18	
CONNECT_RESP2	0x19	
CONNECT_RESP3	0x1A	
DISCONNECT_RESP	0x1B	
Hander		OK Cancel
neauci		
🔽 P1 🔽 P3		
▼ P2 ▼ P4		
Check All Uncheck All		

Figure 2.51: FCVI Service Dialog

FCAV

Two FCAV Patterns patterns are available:

FCAV(Simple)

FCAV(Extended)

Double-click on any of the FCAV patterns listed above in the Patterns Library panel to open the FCAV dialog. Select an FCAV service from the dropdown list which has the two options listed above. Format can be **Binary** or **Hexadecimal**.

id FCAV				
Туре			Format	
Extended	0x01		O Binary Hexadecim	ial
Simple	0x00	I		
Extended	0x01			
Heade	:r	Parameter	Value	
		Container Count	******	
		Clip ID	******	
		Container Time Stamp	*******	
e		Video Fr. Rate	Any Video Fr. Rate 0xXX 💌	
Lontainer Headei	r	Trans, Rate	×	
		Mode	01	
		# of Objects	×	
		Sz of Ext Hdr	×	
		Object Type	Any Object Type 0xXX 💌	
		Object Link Pointer	×	1
		Object Index	×***	
Object O Informat	ion Block			
	Header		OK Cancel	
✓ P1	🔽 P3			
☑ P2	✓ P4			
Check All	Jncheck Al			

Figure 2.52: FCAV Service Dialog

To select the value for Add FCAV, Simple or Extended Container Header, click on the dropdown menu and select from the options listed below

- Any Video Fr. Rate
- Null
- **1**5
- **D** 20
- **Q** 24
- **24*1000/1001**
- □ 24 (Segmented frames)
- □ 24*1000/1001 (Segmented frames)
- 25 (PAL)
- **a** 30
- □ 30*1000/1001 (29.97 NTSC)

- **□** 50
- **□** 60
- □ 60*1000/1001 (59.94 NTSC)

Add FCAV			×	
Г Туре		Format		
Simple 0x00)	▼ C Binary ⊙ I	Hexadecimal	
Show Reserved and Obsolete				
Header	Parameter	Value	_	
	Container Count	<u>xxxxxxxx</u>		
	Clip ID	Any Video Fr. Rate	0xXX	
	Container Time Stamp	15	0x00	
	Video D. Dete	20	0x01	
Container Header	Video Fr. Hate	24	0x03	
	Trans. Rate	24*1000/1001	0x83	
	Mode	24 (Segmented frames)	0x23	
	# of Objects	24*1000/1001(Segmented frames)	0xA3	
		[25 [PAL]	Ux44	
	SZOFEXTHA	30×1000/1001 (29.97 NTSC)	0x45	
	Object Type	1 50	0x06	
	Object Link Pointer	60	0x07	
	Object Index	60×1000/1001 (59.94 NTSC)	0x87	
Object 0 Information Block	Objectifidex		•	
Header		ОК	Cancel	
▼ P1 ▼ P3				
✓ P2 ✓ P4				
Check All Uncheck All]			

Figure 2.53: FCAV Container Header Values Dialog

To select the value for Add FCAV, Simple or Extended Object Information Block, click on the drop-down menu and select from the options listed below

- Any Object Type
- □ Video uncompressed
- □ Video compressed
- Video reserved
- □ Video Program
- Video Program reserved
- □ Graphics
- Graphics reserved
- Audio uncompressed
- □ Audio compresses
- Audio reserved
- Ancillary Data
- □ Full Stream structures
- Full Stream reserved
- Negotiated
- Vendor Specific

уре		Format	
Simple 0)x00	O Binar	y 💽 Hexadecimal
Show Reserved and C	Ibsolete		
Header	Parameter	Value	-
	Container Count	Any Object Type	0xXX 🔺
	Clin ID	Video - uncompressed	0x10
	Cartaines Time Channel	Video - compressed	0x11
	Container Time Stamp	Video - reserved	0x12
	Video Fr. Rate	Video Program	0x20
ontainer Header	Trans. Rate	Graphics	0x21
	Mode	Graphics - reserved	0x31
	Mode	Audio - uncompressed	0x40
	# of Objects	Audio - compressed	0x41
	Sz of Ext Hdr	Audio - reserved	0x42
	Object Type	Ancillary Data	0x50
	Object July Deleter	1 Full Stream - structures	0x60
	Ubject Link Pointer	Full Stream - reserved	Ux61
	Object Index		
Nect II Information Bloc			
Head	er	OK	Cancel
V P1 V F	ra l		
▼ P2	4		
	. AU]		

Figure 2.54: FCAV Object Information Values Dialog

VSAN Basic

VSAN-Basic Link Service

Double-click **VSAN-Basic Link Service** in the Patterns Library panel to open the VSAN-Basic Link Service dialog to add any Type of VSAN-Basic Link Service.

dd VSAN-Basic Link Service		X
-Basic Link Service :		Format
Any X	•	C Binary 💿 Hexadecimal
Show Reserved and Obsolete		
Parameter		Value
Basic Link Service Code	0xXX: Any	
Header		OK Cancel
🔽 P1 🔽 P3		
🗹 P2 🔽 P4		

Figure 2.55: VSAN-Basic Link Service Dialog

The format can be **Binary** or **Hexadecimal**.

To select a **VSAN-Basic Link Service** click the dropdown list which has the following options:

- Any
- □ NOP
- □ ABTS
- □ BA_ACC
- □ BA RJT

VSAN-Link Control Frame

Double-click **VSAN-Link Control Frame** in the Patterns Library panel to open the VSAN-Link Control Frame dialog to add any Type of VSAN-Link Control Frame.

Add VSAN-Link Control Frame	x
Frame type Any Link Control Frame Type	Format C Binary © Hexadecimal
Show Reserved and Obsolete	
Parameter	Value
Routing Control	0xXX: Any Link Control Frame Type
Header	OK Cancel
Check All Uncheck All	

Figure 2.56: VSAN-Link Control Frame Dialog

The format can be **Binary** or **Hexadecimal**.

- Any Link Control Frame Type
- □ ACK_1
- □ ACK_0
- □ P_RJT
- □ F_RJT
- D P_BSY
- □ F BSY DATA FRM
- □ F_BSY_LINK_CTRL
- □ LCR
- □ NTY
- □ END

VSAN Basic

Add VSAN-FCP SCSI Command

Double-click **VSAN FCP SCSI Command** in the Patterns Library panel to open the VSAN FCP SCSI Command dialog.

d VSAN-FCP SCS	I Command		
Type Any SCSI Com C OSD-2 C A Command Type: CDB Type: Show Reserved	mand C MMC-6 C DC-3 Any Command Any CDB Type I and Obsolete	SBC3 O SMC3 O SPC4 O SSC2	C Binary
Para	ameter	Value	
Operation Code		X: Any Command	
LUN		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
	Header		OK Cancel
✓ P1	✓ P3		
₽2	DZ D4		
	I ▼ F 4		

Figure 2.57: VSAN FCP SCSI Command Dialog

The format can be **Binary** or **Hexadecimal**.

To select a VSAN FCP SCSI Command Type select from the following options:

- Any SCSI Command
- □ MMC_6
- □ SBC 3
- □ SMC_3
- □ SPC 4
- \Box SSC 2
- \Box OSD 2
- \square ADC_3
- L ADC_3

Add VSAN-FCP Frame Information Unit

Double-click **VSAN-FCP Frame Information Unit** in the Patterns Library panel to open the VSAN-FCP Frame Information Unit dialog.

Frame Type					_
				Format	
Any	0×XX			C Binary	Hexadecimal
FCP Response				ALID	
SCSI Status Code:	Any SCSI Status Code	0xXX 💌	© 0	O 1	🔿 X (Don't Care)
Response Code:	Any Response Code	0xXX 💌	Sense Key:	Any Sense Key	0xX 💌
Show Reserved a	and Obsolete				
Pai	rameter		¥al	ue	
Туре		0xXX: Any			
ŀ	leader			ОК	Cancel
F P1	Header I✔ P3]		ок	Cancel
F F F F P1 F F P2	teader IV P3 IV P4			ОК	Cancel

Figure 2.58: VSAN-Frame Information Unit Dialog

The format can be **Binary** or **Hexadecimal**.

To select a **VSAN-Frame Information Unit Type** click the dropdown list which has the following options:

- Any
- □ FCP_DATA
- □ FCP_CONFIRM
- □ FCP_XFER_RDY
- □ FCP_CMD
- □ FCP_RSP

Add VSAN-SCSI Command Status

Double-click **VSAN-SCSI Command Status** in the Patterns Library panel to open the VSAN-SCSI Command Status dialog.

Status Only	C Sense Key/ Response Code		
Status	Format		
C Any SCSI Status Code (0xXX)	Fixed C Descriptor		
C Good (0x00)	Sense Key		
C Check Condition (0x02)	Any Sense Key (0xXX)		
C Condition Met (0x04)	O No Sense (0x00)		
C Busy (0x08)	C Recovered Error (0x01)		
C Intermediate (0x10)	C Not Ready (0x02)		
Intermediate Condition Met (0x14)	C Medium Error (0x03)		
Reservation Conflict (0x18)	C Hardware Error (0x04)		
Task Set Full (0x28)	C Illegal Request (0x05)		
C ACA Active (0x30)	C Unit Attention (0x06)		
C Task Aborted (0x40)	C Data Protect (0x07)		
C Response Data Present (0x50)	C Blank Check (0x08)		
C Logical Unit Not Available (0x5A)	C Copy (boyted (0x09)		
Write Protect Error (0x5B)	C Aborted Command (0x0B)		
Read Protect Error (0x5C)	C Volume Overflow (0x0D)		
C Buffer Overrun (0x5D)	C Miscompare (0x0E)		
RSP Len Valid : C 0 C 1 C X (Don't Care) RSP CODE : Any RSP_CODE 0xXX RSP Length : C 8 Bytes C 4 Bytes	Response Code Any Fixed format 0x70 or 0x71		
Header	OK Cancel		
▼ P1 ▼ P3 ▼ P2 ▼ P4			
Check All Uncheck All			

Figure 2.59: VSAN-SCSI Command Status Dialog

You can capture on **Status Only** or **Sense Key/Response Code**. Click on **Status Only** to display all the states that are available. Click on the **Sense Key/Response Code** to display all the Format and Sense Keys.

RSP_CODE: It is selected by default. You can click on the dropdown list to select more options.

Add VSAN FCP Task Management

Double-click **VSAN FCP Task Management** in the Patterns Library panel to open the VSAN FCP Task Management dialog.

Id VSAN-FCP Task Managment		
Function		Format
QUERY TASK SET	0x1 🔽	C Binary 💿 Hexadecimal
Show Reserved and Obsolete		L
Parameter	۷ ا	/alue
FCP LUN	**********	
Command Reference Number	×	
TASK Attribute	Any Task Attribute	0x? •
Priority	×	
TASK Management Flags	0x01: QUERY TASK SET	
Header		OK Cancel
✓ P2 ✓ P4		
Check All Uncheck All		

Figure 2.60: VSAN FCP Task Management Dialog

The format can be **Binary** or **Hexadecimal**.

- QUERY TASK SET
- □ ABORT TASK SET
- □ CLEAR TASK SET
- **QUERY UNIT ATTENTION**
- LOGICAL UNIT RESET
- □ TARGET RESET
- □ CLEAR ACA

VSAN-FCP Task Management -Task Attribute

The VSAN-FCP Task Management has an additional **Any Task Attribute** dropdown menu under the **Value** pane on the right of the dialog as shown in the following figure.

Add ¥SAN-FCP Task Managment	×
Function	Format
QUERY TASK SET	0x1 C Binary Hexadecimal
Show Reserved and Obsolete	
Parameter	Value
FCP LUN	********
Command Reference Number	×
TASK Attribute	Any Task Attribute 0x? 🔹
Priority	Any Task Attribute 0x?
TASK Management Flags	0 SIMPLE 0x0
	ORDERED 0x2
	ACA 0x4
Header	OK Cancel
	Count
🔽 P1 🔽 P3	Expected number of occurrences on each link: 1
✓ P2 ✓ P4	
Check All Uncheck All	

Figure 2.61: VSAN-FCP Task Management Any Task Attribute Dialog

To select a Any Task Attribute click the dropdown list which has the following options:

- □ SIMPLE
- □ HEAD OF QUEUE
- □ ORDERED
- □ ACA

VSAN ARB

Add VSAN-ARB Loop Initialization

Double-click **VSAN-ARB Loop Initialization** in the Patterns Library panel to open the VSAN-ARB Loop Initialization dialog.

Add ¥SAN-ARB Loop Initialization		x			
Loop Init Id		Format			
Any	×	C Binary 💿 Hexadecimal			
Show Reserved and Obsolete					
Parameter	N N	/alue			
Loop Init ID	0x11X0000X: Any				
<u> </u>					
Header		OK Cancel			
I I I I I I I I I I I I I I I I I I I					
▼ P2 ▼ P4					
Check All Uncheck All					

Figure 2.62: VSAN-ARB Loop initialization Dialog

The format can be **Binary** or **Hexadecimal**.

- Any
- □ LISM
- LIFA
- LIPA

VSAN ELS Patterns

VSAN-Extended Link Service - Request

Double-click **VSAN-Extended Link Service - Request** in the Pattern window to open the Add VSAN-Extended Link Service Pattern dialog.

Add ¥SAN-Exten	ded Link Service - Requ	est				F .	x
ELS_Type:	Request				C Binary	Binary Heyadecimal	
Show Reserv	ed and Obsolete		X	<u> </u>			Hexadecinial
	Parameter			Value			
ELS Command		0xXX: Any					
	Header					ОК	Cancel
✓ P1	✓ P3						
✓ P2	✓ P4						
Check All	Uncheck All						

Figure 2.63: VSAN-Extended Link Service - Request Dialog

The format can be **Binary** or **Hexadecimal**.

To select an **ELS_Type** and **Command**, click the dropdown list.

VSAN-Extended Link Service - Request, Reply

Double-click **VSAN-Extended Link Service - Request, Reply** in the Pattern window to open the Add VSAN-Extended Link Service - Request, Reply Pattern dialog.

Add VSAN-Extended Link Service - Reque	est, Reply	×
		Format
ELS_Type: Reply	*	C Binary
Command : Any	×	Hexadecimal
Show Reserved and Obsolete		
Parameter	Value	
ELS Command	0xXX: Any	
This event consists of the selected command	request and reply.When the request happen	ns, waits to meet the reply.
Header	1	OK Cancel
🔽 P1 🔽 P3		
✓ P2 ✓ P4		
L		
Check AllUncheck All		

Figure 2.64: Add VSAN- Extended Link Service - Request, Reply Pattern Dialog

The format can be **Binary** or **Hexadecimal**.

To select an ELS_Type and Command, click the dropdown list.

VSAN-Extended Link Service - Reply

Double-click **VSAN-Extended Link Service - Reply** in the Pattern window to open the Add VSAN-Extended Link Service Pattern dialog.

Add VSAN-Extend	ed Link Service -Reply				X
				- Format -	
ELS_Type:	Reply		Y	0	Binary
Command :	Any	×	•	œ	Hexadecimal
	, 			L	
Show Reserve	d and Obsolete				
P	arameter		Value		
ELS Command		0xXX: Any			
<u> </u>					
	Header			OK	Cancel
	✓ P3				
E P2	DI PA				
	1. 1. 7				
Check All	Jncheck All				

Figure 2.65: VSAN-Extended Link Service - Reply Pattern Dialog

The format can be **Binary** or **Hexadecimal**.

To select an **ELS_Type** and **Command**, click the dropdown list.

VSAN-GS Patterns

VSAN-Generic Link Service - Request

Double-click VSAN-**Generic Link Service - Request** in the Pattern window to open the Add VSAN-Generic Link Service - Request Pattern dialog.

Add ¥SAN-Genei	ric Link Service - Request		X
GS_Type : GS_Subtype : Command Type: Command :	FC-SW-5 Request Any red and Obsolete	0x20	Format C Binary C Hexadecimal
	Parameter	۱	/alue
Revision		×	
IN_ID		*****	
GS_Type		0x20: FC-SW-5	
GS_Subtype		Any GS_Subtype	0.000 -
	Header		OK Cancel
₽1 ₽ P2	☑ P3 ☑ P4		
Check All	Uncheck All		

Figure 2.66: VSAN-Generic Link Service - Request Pattern Dialog

The format can be **Binary** or **Hexadecimal**.

Click the dropdown lists to select a **GS_Type**, **GS_Subtype**, **Command Type**, and **Command**. The following GS_Type options are available:

- □ FC-SW-5
- Event Service
- Key Distribution Service
- Alias Service
- Management Service
- Time Service
- Directory Service

VSAN-Generic Link Service - Request, Reply

Double-click **VSAN-Generic Link Service - Request, Reply** in the Pattern window to open the Add VSAN-Generic Link Service - Request, Reply Pattern dialog.

Add ¥SAN-Gene	ric Link Service - Request,	Reply	×
	r		- Format
GS_Type:	FC-SW-5	0x20 💌	
GS_Subtype :		v	C Binary
Command Type:	Reply	v	Hexadecimal
Command :	Any	×	
Show Reserv	ved and Obsolete		
	Parameter	Va	lue
Revision		×	
IN_ID		*****	
GS_Type		0x20: FC-SW-5	
GS_Subtype		Any GS_Subtype	0xXX -
This event cons	sists of the selected command re	equest and reply.When the request ha	appens, waits to meet the reply.
	Header		OK Cancel
♥ P1 ♥ P2	☑ P3 ☑ P4		
Check All	Uncheck All		

Figure 2.67: VSAN-Generic Link Service-Request, Reply Pattern Dialog

The format can be **Binary** or **Hexadecimal**.

Click the dropdown lists to select a **GS_Type**, **GS_Subtype**, **Command Type**, and **Command**. The following GS_Type options are available:

- □ FC-SW-5
- Event Service
- □ Key Distribution Service
- Alias Service
- □ Management Service
- □ Time Service
- Directory Service

VSAN-Generic Link Service - Reply

Double-click VSAN-**Generic Link Service - Reply** in the Pattern window to open the Add VSAN-Generic Link Service - Reply Pattern dialog.

dd ¥SAN-Gener	ric Link Service - Reply		X
			- Format
GS_Type:	FC-SW-5	0x20 🗾	C 10
GS_Subtype :		v	O Binary
Command Type:	Reply	7	Hexadecimal
Command :	Any	× •	
Show Reserv	red and Obsolete		
	Parameter	Va	lue
Revision		×	
IN_ID		*****	
GS_Type		0x20: FC-SW-5	
GS_Subtype		Any GS_Subtype	0xXX 🗾
,			
	Header		OK Cancel
	▼ P3		
J¥ F2	I▼ F4		
Check All	Uncheck All		

Figure 2.68: VSAN-Generic Link Service - Reply Pattern Dialog

The format can be **Binary** or **Hexadecimal**.

Click the dropdown lists to select a **GS_Type**, **GS_Subtype**, **Command Type**, and **Command**. The following GS_Type options are available:

- □ FC-SW-5
- Event Service
- □ Key Distribution Service
- □ Alias Service
- Management Service
- □ Time Service
- Directory Service

VSAN-SW Patterns

VSAN-Switch Internal Link Service - Request

Double-click **VSAN-Switch Internal Link Service - Request** in the Pattern window to open the Add VSAN-Switch Internal Link - Request dialog.

Add VSAN-Switch SW_Type : Command :	Internal Link - Request Request Any diand Obsolete	t [X	V	Format C Binary C Hexadecimal
F	arameter		Value	
SW ILS Comma	nd	0xXXXX: Anv		
	Header		OK	Cancel
✓ P1 ✓ P2	☑ P3 ☑ P4			

Figure 2.69: VSAN-Switch Internal Link - Request Dialog

The format can be **Binary** or **Hexadecimal**.

To select a **SW_Type** and a **Command** click the dropdown lists.

VSAN-Switch Internal Link Service - Request, Reply

Double-click **Switch Internal Link Service - Request, Reply** in the Pattern window to open the Add Switch Internal Link Service - Request, Reply dialog.

Add ¥SAN-Switch Internal Link - Request	, Reply	×
SW_Type : Reply Command : Any	× ×	Format C Binary C Hexadecimal
Show Reserved and Obsolete		
Parameter	Value	
SW_ILS_Command	0xXXXX: Any	
This supplication of the selected command of	neuest and reply 11/hen the request happen	no while to most the rapid
This event consists of the selected command t	equest and reply, when the request happen	ns, waits to meet the reply.
Header		OK Cancel
▼ P1 ▼ P3		
P2 P4		
Check All Uncheck All		

Figure 2.70: VSAN-Switch Internal Link Service - Request, Reply Dialog

The format can be **Binary** or **Hexadecimal**.

To select a **SW_Type** and a **Command** click the dropdown lists.

VSAN-Switch Internal Link Service - Reply

Double-click **VSAN-Switch Internal Link Service - Reply** in the Pattern window to open the Add VSAN-Switch Internal Link Service Pattern dialog.

Add ¥SAN-Switch I	nternal Link - Reply			×
SW_Type:	Reply		-	Format © Binary
Command :	Any	×	•	Hexadecimal
Show Reserved	and Obsolete			
Pa	rameter	Val	ue	
SW_ILS_Command	1	0xXXXX: Any		
,		_		_
	Header		OK	Cancel
✓ P1	✓ P3			
✓ P2	✓ P4			
Check All Ut	ncheck All			

Figure 2.71: VSAN-Switch Internal Link Reply Dialog

The format can be **Binary** or **Hexadecimal**.

To select a **SW_Type** and a **Command** click the dropdown lists.

VSAN-FICON

VSAN-FICON (Any Data Information Block Type)

Double-click **VSAN-FICON(Any Data Information Block Type)** in the Patterns Library panel to open the VSAN-FICON(Any Data Information Block Type) dialog.

Add VSAN-FICON		X
Type Any X		▼ Format C Binary © Hexadecimal
Sent C To a Channel	From a Channel	
E Show Reserved and Obso	olete	
Header	Parameter	Value 🔺
	Channel Image ID	*
SB-3 Header	Control Unit Image ID	×
	Device Address	****
	Address Specific	?
	Supplemental Status	?
	Data Information Block Type	Any Data Information Block Type 0x? 🗾
	End	?
Information Unit Header	Chaining	?
	End Early	?
	CRC Not Provided	?
	Channel-Command-Word Number	×***
, Header		OK Cancel
₽ P1 ₽ P3		
₽ P2 ₽ P4		
Check All Uncheck Al		

Figure 2.72: VSAN-FICON (Any Data Information Block Type) Dialog

The format can be **Binary** or **Hexadecimal**.

- Any
- Data
- Command
- Status
- □ Control
- Command and Data
- Link Control

Add VSAN-FICON Data

Double-click **VSAN-FICON(Data)** in the Patterns Library panel to open the VSAN-FICON Data dialog.

Add VSAN-FICON			X
Туре			Format
			C Binaly C Hexadecinia
Sent C To a Channel	From a Channel		
Show Reserved and Obse	olete		
Header	Parameter		Value 🔺
	Channel Image ID	*	
SB-3 Header	Control Unit Image ID	×	
	Device Address	****	
	Address Specific	?	
	Supplemental Status	?	
	Data Information Block Type	Data	0x0 -
	End	?	
Information Unit Header	Chaining	?	
	End Early	?	
	CRC Not Provided	?	
	Channel-Command-Word Number	****	•
Header			OK Cancel
₽ P1 ₽ P3			
₽ P2 ₽ P4			
Check All Uncheck Al			

Figure 2.73: VSAN-FICON (Data) Dialog

The format can be **Binary** or **Hexadecimal**.

- 🗆 Any
- Data
- Command
- Status
- Control
- Command and Data
- Link Control

Add VSAN-FICON Command

Double-click **VSAN-FICON(Command)** in the Patterns Library panel to open the VSAN-FICON Command dialog.

Add VSAN-FICON			×
Туре ———			Format
Command 0x1		•	C Binary C Hexadecimal
Sent-			
🔿 To a Channel	From a Channel		
Show Reserved and Obse	olete		
Header	Parameter		Value 🔺
	Channel Image ID	×	
SB-3 Header	Control Unit Image ID	×	
	Device Address	****	
	Address Specific	?	
	Supplemental Status	?	
	Data Information Block Type	Command	0x1 🗾
	End	?	
Information Unit Header	Chaining	?	
	End Early	?	
	CRC Not Provided	?	
	Channel-Command-Word Number	****	•
Header			OK Cancel
✓ P1 ✓ P3			
✓ P2 ✓ P4			
Check All Uncheck Al			

Figure 2.74: VSAN-FICON (Command) Dialog

The format can be **Binary** or **Hexadecimal**.

- Any
- 🗆 Data
- □ Command
- □ Status
- □ Control
- Command and Data
- Link Control

VSAN-FICON Command-Any CCW Command Type

The VSAN-FICON[Command] has an additional **Any CCW Command Type** dropdown menu under the **Value** pane on the right of the dialog as shown in the following figure.

Add VSAN-FICON		×
Type		Format
Sent C To a Channel	From a Channel	
Show Reserved and Obs	olete	
Header	Parameter	Value 🔺
Information Unit Header	Token	*****
	CCW Command Type	Any CCW Command Type 0xXX 🔹
	Chain Data	Any CCW Command Type 0xXX
	Chain Command	Sense (0bxxxx0100) 0xX4
	Suppress Length Indication	Write (0bxxxxx01)
	Command Response Request	Read (0bxxxxxx10) 0xX?
	Channel-Command Word Count	Control (0bxxxxx11) 0xX?
	10 Priority	×
Command Header	Data-Chaining Update	?
	Continue-on-Command Immediate	?
	Synchronize Response	?
Header		OK Cancel
₽1 ₽3	Ex	pected number of occurrences on each link:
₽2 ₽4		
Check All Uncheck A		

Figure 2.75: VSAN-FICON[Command] - Any CCW Command Type Dialog

- □ Any CCW Command Type
- Sense
- □ Read-Backward
- Write
- Read
- Control
Add VSAN-FICON Status

Double-click **VSAN-FICON(Status)** in the Patterns Library panel to open the VSAN-FICON Status dialog.

dd VSAN-FICON		×
Туре ————		Format
Status 0x2		C Binary Hexadecimal
Sent		
C To a Channel	From a Channel	
Show Reserved and Obse	olete	
Header	Parameter	Value 🔺
	Channel Image ID	×
SB-3 Header	Control Unit Image ID	*
	Device Address	XXXX
	Address Specific	?
	Supplemental Status	?
	Data Information Block Type	Status 0x2 🗾
	End	?
Information Unit Header	Chaining	?
	End Early	?
	CRC Not Provided	?
	Channel-Command-Word Number	×***
Header		OK Cancel
₽1 ₽3		
₽ P2 ₽ P4		
Check All Uncheck Al		

Figure 2.76: FICON (Status) Dialog

The format can be **Binary** or **Hexadecimal**.

- Any
- 🗆 Data
- □ Command
- Status
- □ Control
- Command and Data
- Link Control

VSAN-FICON[Status]- Any Flag-Field Code

The VSAN-FICON[Status] has an additional **Any Flag-Field Code** dropdown menu under the **Value** pane on the right of the dialog as shown in the following figure.

dd VSAN-FICON		
Туре —		Format
Status 0x2		O Binary Hexadecimal
Sent		
to a Channel	 From a Channel 	
Show Reserved and Obse	olete	
Header	Parameter	Value 🔺
	Chaining	?
	End Early	?
Information Unit Header	CRC Not Provided	?
	Channel-Command-Word Number	****
	Token	XXXXXX
	Flag-Field Code	Any Flag-Field Code 0x? 🔹
	Channel Initiated	Any Flag-Field Code 0x?
	Command Retry	No Function Ox0
	Long Record/Immediate	Resetting Event 0x2
	Residual Count Valid	?
	Status Byte	Any Status Byte 🔹 🗸 🗸
, Handar		OK Cancel
₽ P1 ₽ P3	Exp	pected number of occurrences on each link: 1
P2 P4		
Check All Uncheck Al		

Figure 2.77: VSAN-FICON[Status] - Any Flag-Field Code Dialog

To select Any Flag-Field Code click the dropdown list which has the following options:

- No Function
- Queueing Information Valid
- Resetting Event

VSAN-FICON[Status]-Any Status Byte

The VSAN-FICON[Status] has an additional **Any Status Byte** dropdown menu under the **Value** pane on the right of the dialog as shown in the following figure.

Add VSAN-FICON			×
_ Туре		- Format	
Status 0x2		O Binary	Hexadecimal
Sent C To a Channel	From a Channel		
Header	Parameter	Value	
Trouble	Long Record/Immediate	?	
	Residual Count Valid	?	
	Status Byte	Any Status Byte	0.000
	Status Parameter	Any Status Byte	0***
	Queue Time Unit Factor	Attention	0x80
Status Header	Queue Time Unit	Status Modifier	0x40 0x20
	Defer Time Unit Factor	Busy	0x10
	Defer Time Unit	Channel End	0x08
	Information Units Count	Unit Check	0x04 0x02
	Supplemental-Status Byte Count	Unit Exception	0x01
Longitudinal Redundancy Cl	Longitudinal Redundancy Check	******	
, Header		OK	Cancel
🔽 P1 🔽 P3	Ext	punt pected number of occurrences on ea	ach link: 1
P2 P4			
Check All Uncheck Al			

Figure 2.78: VSAN-FICON[Status] - Any Status Byte Dialog

- □ Attention
- Status Modifier
- Control Unit End
- Busy
- Channel End
- Device End
- Unit Check
- Unit Exception

Add VSAN-FICON Control

Double-click **VSAN-FICON(Control)** in the Patterns Library panel to open the VSAN-FICON Control dialog.

Add VSAN-FICON			X
Туре —			Format
Control 0x3		•	C Binary 💽 Hexadecimal
Sent			
O To a Channel	From a Channel		
Show Reserved and Obso	plete		
Header	Parameter		Value 🔺
	Channel Image ID	×	
SB-3 Header	Control Unit Image ID	×	
	Device Address	XXXX	
	Address Specific	?	
	Supplemental Status	?	
	Data Information Block Type	Control	0x3 👻
	End	?	
Information Unit Header	Chaining	?	
	End Early	?	
	CRC Not Provided	?	
	Channel-Command-Word Number	×***	T
Header			OK Cancel
☑ P1 ☑ P3			
✓ P2 ✓ P4			
Check All Uncheck Al			

Figure 2.79: VSAN-FICON (Control) Dialog

The format can be **Binary** or **Hexadecimal**.

- Any
- 🛛 Data
- □ Command
- Status
- □ Control
- Command and Data
- Link Control

VSAN- FICON[Control]-Any Control Function

The VSAN-FICON[Control] has an additional **Any Control Function** dropdown menu under the **Value** pane on the right of the dialog as shown in the following figure.

dd VSAN-FICON)
Туре		Format	
Control 0x3		▼ C Binary ⊙	Hexadecimal
Sent			
C To a Channel	From a Channel		
Show Reserved and Obso	lete		
Header	Parameter	Value	_
	End	?	
	Chaining	2 I Anna Cambral Francisco	1.0.55
	End Early	Control End	0x00
Information Unit Header	CBC Not Provided	Command Response	0x10
	Channel Commond Ward Number	Stack Status	0x20
	Channel-Command-Word Number	Cancel	0x30
	Token	System Reset	0x40
	Control Function	Selective Reset	0x50
	Control Parameters	Province Level France View	0x70
Control Header		Status Accepted	0x00
	Information Units Count	Device Level Acknowledgement	0x80
	Control Payload Byte Count	Purge Path	0xC8
Longitudinal Redundancy Cł	Longitudinal Redundancy Check	Purge Path Response	0xD0
Header		ОК	Cancel
☑ P1 ☑ P3	Ex	pected number of occurrences on each	link: 1
✓ P2 ✓ P4			
Check All Uncheck All	1		

Figure 2.80: VSAN-FICON[Control] - Any Control Function Dialog

To select Any Control Function click the dropdown list which has the following options:

- Control End
- Command Response
- Stack Status
- Cancel
- System Request
- Selective Reset
- Request Status
- Device Level Exception
- □ Status Accepted
- Device Level Acknowledgement
- Purge Path
- Purge Path Response

Add VSAN-FICON Command-Data

Double-click VSAN-**FICON(Command-Data)** in the Patterns Library panel to open the VSAN-FICON Command Data dialog.

Add VSAN-FICON			×
Туре ———		For	nat
Commsnd & Data 0x4		• 0	Binary 💿 Hexadecimal
Sent			
C To a Channel	From a Channel		
Show Reserved and Obs	olete		
Header	Parameter	Val	ue 🔺
	Channel Image ID	×	
SB-3 Header	Control Unit Image ID	×	
	Device Address	****	
	Address Specific	?	
	Supplemental Status	?	
	Data Information Block Type	Command-Data	0x4 👻
	End	?	
Information Unit Header	Chaining	?	
	End Early	?	
	CRC Not Provided	?	
	Channel-Command-Word Number	×***	
, Header			OK Cancel
🔽 P1 🔽 P3			
P2 P4			
Check All Uncheck Al	1		

Figure 2.81: VSAN-FICON (Command Data) Dialog

The format can be **Binary** or **Hexadecimal**.

- Any
- 🗆 Data
- □ Command
- Status
- □ Control
- Command and Data
- Link Control

VSAN-FICON[Command]-Any CCW Command Type

The VSAN-FICON[Command-Data] has an additional **Any CCW Command Type** dropdown menu under the **Value** pane on the right of the dialog as shown in the following figure.

Add VSAN-FICON		×
Туре		Format
Commsnd & Data 0x4		C Binary Hexadecimal
Sept		
C To a Channel	From a Channel	
Show Reserved and Obso	plete	
Header	Parameter	Value 🔺
	CCW Command Type	Any CCW Command Type 🛛 🛛 🗸 🔻
	Chain Data	Any CCW Command Type 0xXX
	Chain Command	Sense (0bxxxx0100) 0xX4
	Suppress Length Indication	Write (0bxxxxx01) 0xX2
	Command Response Request	Read (0bxxxxx10) 0xX?
	Channel-Command Word Count	Control (0bxxxxx11) 0xX?
	10 Priority	×
Command Header	Data-Chaining Update	?
	Continue-on-Command Immediate	?
	Synchronize Response	?
	Repeat Execute	?
, Usedas	1	OK Cancel
Header		
₽ P1 ₽ P3	Ex	pected number of occurrences on each link: 1
P2 P4		
Check All Uncheck Al		



- Sense
- Read-Backward
- Write
- Read
- Control

Add VSAN-FICON Link-Control

Double-click VSAN-**FICON(Link-Control)** in the Patterns Library panel to open the VSAN-FICON Link Control dialog.

Add VSAN-FICON			X
Туре —			Format
Link Control 0x5		_	C Binary 💿 Hexadecimal
Sept			
O To a Channel	From a Channel		
Show Reserved and Obso	olete		
Header	Parameter		Value 🔺
	Channel Image ID	×	
SB-3 Header	Control Unit Image ID	×	
	Device Address	XXXX	
	Address Specific	?	
	Supplemental Status	?	
	Data Information Block Type	Link-Control	0x5 🔻
	End	?	
	Chaining	?	
	End Early	?	
	CRC Not Provided	?	
Information Unit Header	Channel-Command-Word Number	****	•
Header			OK Cancel
I P1 I P3			
₽ P2 ₽ P4			
Check All Uncheck Al			

Figure 2.83: VSAN-FICON (Link-Control) Dialog

The format can be **Binary** or **Hexadecimal**.

- 🗅 Any
- 🛛 Data
- Command
- Status
- Control
- □ Command and Data
- Link Control

VSAN-FICON[Link Control]-Any Link Control Function

The VSAN-FICON[Link Control] has an additional **Any Link Control Function** dropdown menu under the **Value** pane on the right of the dialog as shown in the following figure.

Add VSAN-FICON			×
Г Туре		Format	-
Link Control 0x5		Binary Hexadecimal	
Sent			
C To a Channel	From a Channel		
Show Reserved and Obso	olete		
Header	Parameter	Value 4	-
	Chaining	?	
	End Early	?	
	CRC Not Provided	?	
	Channel-Command-Word Number	****	
	Token	Any Link Control Function	
Information Unit Header	Link Control Eurotion	Establish Logical Path 0x41	
		A Remove Logical Path Ux49	
	Link Control Information	Logical Path Established 0x51	
	Channel-To-Channel Counter	Logical Path Removed 0x59	
	Information Units Count	Test Initialization Result 0x01	
	Link-Control Pauload Bute Count	Link-Level Reject 0x11	
	Eink control i dylodd byte count	Link-Level Busy 0x21	
Longitudinal Redundancy Ch	Longitudinal Redundancy Uheck	Link-Level Acknowledgement 0x61	-
U a a das		OK Cancel	
Header			
		punt	7
🔽 P1 🔽 P3	Ex	pected number of occurrences on each link: [1	
JE 12 JE 14			
Check All Uncheck All			

Figure 2.84: VSAN-FICON[Link Control] - Any Link Control Function Dialog

To select a **Any Link Control Function** click the dropdown list which has the following options:

- Establish Logical Path
- □ Remove Logical Path
- Test Initialization
- □ Logical Path Established
- Logical Path Removed
- Test Initialization Result
- □ Link-Level Reject
- □ Link-Level Busy
- Link-Level Acknowledgement

VSAN FCAE

VSAN-FCAE-ASM

Double-click **VSAN-FCAE-ASM** in the Patterns Library panel to open the VSAN-FCAE-ASM dialog to add any Type of VSAN-FCAE-ASM.

dd VSAN-FCAE-ASM		
Show Reserved and Obsolete		Format C Binary @ Hexadecimal
Parameter		Value
Message ID	*******	
Security	******	
L	?	
Priority	?X	
Message Payload Length	*****	
Header		OK Cancel
₽ P1 ₽ P3		
P2 P4		
Check All Uncheck All		

Figure 2.85: VSAN-FCAE-ASM Dialog

The format can be **Binary** or **Hexadecimal**.

VSAN-FCAE-1553

VSAN-FCAE-1553 Any

Double-click **VSAN-FCAE-1553(Any)** in the Patterns Library panel to open the VSAN-FCAE-1553 dialog to add any Type of VSAN-FCAE-1553.

Type Any Show Reserved and Obsolete Header ANY FC-AE-1553 Any Header	Parameter	×	Format C Binary C Hexadecimal
Any Show Reserved and Obsolete Header ANY FC:AE-1553 Any Header	Parameter	×	C Binary C Hexadecimal
Show Reserved and Obsolete Header ANY FC-AE-1553 Any Header	Parameter	×	Value
Header Any ANY FC-AE-1553 Any Header	Parameter	×	Value
ANY FC-AE-1553 Any Header		×	
Header			
	1		OK Cancel
▼ P1 ▼ P3			
✓ P2 ✓ P4			
Check All Uncheck All			

Figure 2.86: VSAN-FCAE-1553 (Any) Dialog

The format can be **Binary** or **Hexadecimal**.

- □ Any
- Data
- □ Command
- □ Status

Add VSAN-FCAE-1553 Data

Double-click VSAN-**FCAE-1553(Data)** in the Patterns Library panel to open the VSAN-FCAE-1553 Data dialog.

dd VSAN-FCAE-1553		x
Type Data	0x1	Format C Binary @ Hexadecimal
Show Reserved and	Obsolete	
Header	Parameter	Value
	Data (Byte 1-8)	*********
	Data (Byte 9-16)	**********
	Data (Byte 17-24)	*********
Data	Data (Byte 25-32)	**********
Data	Data (Byte 33-40)	×**********
	Data (Byte 41-48)	*********
	Data (Byte 49-56)	***********
	Data (Byte 57-64)	×*******
▼ P1 ▼	P3	
₽ P2	P4	
Check All Unchec	k All	

Figure 2.87: VSAN-FCAE-1553(Data) Dialog

The format can be **Binary** or **Hexadecimal**.

- □ Any
- 🗆 Data
- □ Command
- □ Status

Add FCAE-1553 Command

Double-click **VSAN-FCAE-1553(Command)** in the Patterns Library panel to open the VSAN-FCAE-1553 Command dialog.

Add VSAN-FCAE-1553	}			x
Туре —			Format —	
Command 0x6		•	C Binary	 Hexadecimal
Show Reserved ar	nd Obsolete			
Header	Para	meter	Value	
	NT Burst Size Request	t	?	
	Delayed NT Burst Size	Request	?	
	Receive RDMA		?	
	Transmit RDMA		?	
Word 1	Suppress Status		?	
	NT-to-NT		?	
	T/B		?	
	NC MONITOR FOR N	T-TO-NT TRANSFERS	?	
	MULTICAST		?	
Word 2	Subaddress/Mode		******	
Word 3	Data Byte Count/Mode	e Code	Any Data Byte Count/Mo 0xXX	×××××× •
	Ma Paspansa bu Mill 9	2TD 1662 DT	า	
Н	eader		OK	Cancel
I ₽1 I	7 P3			
₽2 R	7 P4			
Check All Unch	neck All			

Figure 2.88: VSAN-FCAE-1553 (Command) Dialog

The format can be **Binary** or **Hexadecimal**.

- □ Any
- 🗆 Data
- Command
- Status

VSAN-FCAE-1553[Command]-Any Data Byte Count /Mode Code

The VSAN-FCAE-1553[Command] has an additional **Any Data Byte Count /Mode Code** dropdown menu under the **Value** pane on the right of the dialog as shown in Figure 2.81. The dropdown menu items could be truncated, hover the mouse over the option to see the full menu option (see the following figure).

dd VSAN-FCAE-1553		<u>></u>
- Type		Format
Command	0x6	C Binary 💿 Hexadecimal
Show Reserved and Obso	lete	
Header	Parameter	Value 🔺
5.7 I.I.	NC MONITOR FOR NT-TO-NT TRANSFERS	?
Word I	MULTICAST	?
Word 2	Subaddress/Mode	XXXXXXXX
Word 3	Data Byte Count/Mode Code	Any Data Byte Count/Mo 0xXXXXXXX 🔹
	No Response by MIL-STD-1553 RT	2
	MIL-STD-1553 RT Format Error	Any Data Byte Count/Mode Code 0xXXXXXXXX

Figure 2.89: Hover the Mouse to see the Full Menu Option

Add VSAN-FCAE-1553		×
Type Command	0x6	Format C Binary C Hexadecimal
Show Reserved and O	Ibsolete	
Header	Parameter	Value 🔺
Word 1	NC MONITOR FOR NT-TO-NT TRANSFERS MULTICAST	Any Data Byte Count/Mo 0x0000000 Dynamic Network Control 0x00000000 Synchronize (without data 0x00000001
Word 2	Subaddress/Mode	Transmit Status Sequence 0x00000002
Word 3	Data Byte Count/Mode Code	A Initiate Self-Test 0x00000003
Word 4	No Response by MIL-STD-1553 RT MIL-STD-1553 RT Format Error Burst Size Acknowledge Port Login Required Message Error Bit Instrumentation Service Request Broadpart Command Respired	Transmitter Shutdown 0x00000004 Override Transmitter shutd 0x00000005 Inhibit Terminal Flag (T/F) 0x00000005 Transmit Vector Word 0x00000001 Synchronize (with data wo 0x0000001 Synchronize (with data wo 0x0000001 Transmit Last Command S 0x0000001 Transmit Buit In Test 0x00000013 Selected Transmitter Shut 0x00000014
Head	er	OK Cancel
Image: P1 Image: P1 Image: P2 Image: P1 Check All Uncheck	3 4 (All	pected number of occurrences on each link:

Figure 2.90: VSAN-FCAE-1553[Command]- Any Data Byte Count/Mode Code Dialog

To select **Any Data Byte Count/Mode Code** click the dropdown list which has the following options:

- Dynamic Network Control
- □ Synchronize (without data word)
- Transmit Status Sequence
- □ Initiate Self-Test
- Transmitter Shutdown
- Override Transmitter shutdown
- □ Inhibit Terminal Flag (T/F)
- Override Inhibit Terminal Flag
- Reset Network Terminal
- Transmit Vector Word
- □ Synchronize (with data word)
- Transmit Last Command Sequence
- □ Transmit Built In test
- □ Selected Transmitter Shutdown
- Override Selected Transmitter Shutdown
- Transmit RT Address
- □ Transmit NT_C-D/S_BURST_TOV

Add VSAN-FCAE-1553 Status

Double-click **VSAN-FCAE-1553(Status)** in the Patterns Library panel to open the VSAN-FCAE-1553 Status dialog.

Add VSAN-FCAE-1553				X
Туре —		1	- Format	
Status 0x7			O Binary 💿 Hexadecimal	
Show Reserved and Obs	olete			
Header	Parameter		Value	
	No Response by MIL-STD-1553 RT	?		
	MIL-STD-1553 RT Format Error	?		
	Burst Size Acknowledge	?		
	Port Login Required	?		
	Message Error Bit	?		
	Instrumentation	?		
Word 1 (NT Status)	Service Request	?		
	Broadcast Command Received	?		
	Busy	?		
	Subsystem Flag	?		
	Dynamic Network Control Acceptance	?		
	Terminal Elag	2		-
Header			OK Cance	:
🔽 P1 🔽 P3				
▼ P2 ▼ P4				
Check All Uncheck A	1			

Figure 2.91: VSAN-FCAE-1553 (Status) Dialog

The format can be **Binary** or **Hexadecimal**.

- Any
- 🗆 Data
- $\hfill\square$ Command
- Status

VSAN-FCVI

The following patterns are available for VSAN-FCVI:

VSAN-FCVI(Any) VSAN-FCVI(SEND_RQST) VSAN-FCVI(WRITE_RQST) VSAN-FCVI(READ_RQST) VSAN-FCVI(SEND_RESP) VSAN-FCVI(WRITE_RESP) VSAN-FCVI(READ_RESP) VSAN-FCVI(CONNECT_RQST) VSAN-FCVI(DISCONNECT_RESP1) VSAN-FCVI(CONNECT_RESP2) VSAN-FCVI(CONNECT_RESP3) VSAN-FCVI(DISCONNECT_RESP3)

Double-click on any of the VSAN-FCVI patterns listed above in the Patterns Library panel to open the VSAN-FCVI dialog. Select a VSAN-FCVI service from the dropdown list which has the options listed above. The format can be **Binary** or **Hexadecimal**.

Ad	d VSAN-FCVI		<u>></u>
			Format
	Any	0xFF	O Binary Hexadecimal
	Any	0xFF	
	SEND_RQST	0x0	
Г	WRITE_RQST	0x1	
	READ_RQST	0x2	Value
	SEND_RESP	0x8	
	WRITE_RESP	0x9	
	READ_RESP	0xA	
	CONNECT_RQST	0x10	
	DISCONNECT_RQST	0x12	
	CONNECT_RESP1	0x18	
	CONNECT_RESP2	0x19	
	CONNECT_RESP3	0x1A	
	DISCONNECT_RESP	0x1B	
1			
_	Header		
	✓ P1 ✓ P3		
	✓ P2 ✓ P4		
	Check All Uncheck All		

Figure 2.92: VSAN-FCVI Service Dialog

VSAN-FCAV

Two VSAN-FCAV Patterns patterns are available:

VSAN-FCAV(Simple)

VSAN-FCAV(Extended)

Double-click on any of the VSAN-FCAV patterns listed above in the Patterns Library panel to open the VSAN-FCAV dialog. Select a VSAN-FCAV service from the dropdown list which has the two options listed above. Format can be **Binary** or **Hexadecimal**.

d VSAN-FCAV		
Туре		Format
Simple	0x00	O Binary Hexadecimal
Simple	0x00	
Extended	0x01	
Header	Parameter	Value 🔄
	Container Count	*******
	Clip ID	******
	Container Time Stamp	********
	Video Fr. Rate	Any Video Fr. Rate 0xxx 💌 🚽
Container Header	Trans. Rate	×
	Mode	00
	# of Objects	×
	Sz of Ext Hdr	×
	Object Type	Any Object Type 0xXX 🔻
	Object Link Pointer	×
	Object Index	×××
Object O Information I	Block	
н	eader	OK Cancel
	7 P3	
	7 P4	
Check All Uncl	neck All	

Figure 2.93: VSAN-FCAV Service Dialog

To select the value for AddVSAN- FCAV, Simple or Extended Container Header, click on the drop-down menu and select from the options listed below

- □ Any Video Fr. Rate
- Null
- **1**5
- **D** 20
- **a** 24
- **Q** 24*1000/1001
- □ 24 (Segmented frames)
- □ 24*1000/1001 (Segmented frames)
- □ 25 (PAL)
- **u** 30
- □ 30*1000/1001 (29.97 NTSC)

- **□** 50
- **G** 60
- □ 60*1000/1001 (59.94 NTSC)

Add FCAV			x
Type Simple 0x00		Format C Binary O	Hexadecimal
Show Reserved and Obso	lete		
Header	Parameter	Value	_
Container Header	Container Count Clip ID Container Time Stamp Video Fr. Rate Trans. Rate Mode # of Objects Sz of Ext Hdr Object Type Object Link Pointer Object Link Pointer	X0000000000000000000000000000000000000	0xXX 0x00 0x01 0x02 0x03 0x83 0x23 0x43 0x44 0x45 0x45 0x45 0x5 0x06 0x06 0x07 0x87
Object 0 Information Block			•
Header		OK .	Cancel

Figure 2.94: VSAN-FCAV Container Header Values Dialog

To select the value for Add VSAN-FCAV, Simple or Extended Object Information Block, click on the drop-down menu and select from the options listed below

- □ Any Object Type
- Video uncompressed
- Video compressed
- Video reserved
- □ Video Program
- Video Program reserved
- □ Graphics
- Graphics reserved
- □ Audio uncompressed
- □ Audio compresses
- Audio reserved
- Ancillary Data
- □ Full Stream structures
- Full Stream reserved
- Negotiated
- Vendor Specific

FCAV			
ype		Format	
Simple 0x00 Binary He			 Hexadecimal
Show Reserved and	Obsolete		
Header	Parameter	Value	4
	Container Count	Any Object Type	0,833 🔺
	Clin ID	Video - uncompressed	0x10
	Cantaines Time Channe	Video - compressed	0x11
	Container Time Stamp	Video - reserved	0x12
	Video Fr. Rate	Video Program	0x20
ontainer Header	Trans. Rate	Graphics	0x21
	Mode	Graphics - reserved	0x30
	Mode	Audio - uncompressed	0x40
	# of Objects	Audio - compressed	0x41
	Sz of Ext Hdr	Audio - reserved	0x42
	Object Type	Ancillary Data	0x50
	Object link Deinter	1 Full Stream - structures	0x60
	Ubject Link Pointer	Full Stream - reserved	Ux61
	Object Index		
DIECT II INformation Bio	CK .		
Hea	der	OK	Cancel
	P2		
▼ P2 ▼	P4		
Check All Unched	k All		

Figure 2.95: VSAN-FCAV Object Information Values Dialog

Custom Frame

Double-click **Custom Frame** in the Pattern window to open the Add Custom Frame Pattern dialog.

dd Custom Frame	e Pattern	2
Headers	ytes	NWK_H ASC_H
Show Reserved	and Obsolete Parameter	Value
	Routing Control	×
	Destination Identifier	xxxxxx
	PREF	?
	DSCP	7X
	Source Identifier	xxxxxx
FRM_H	Data structure type	Any Data structure type 0xXX 🔹
	Exchange Context	?
	Sequence Context	?
	First_Sequence	?
	Last_Sequence	?
	End_Sequence	?
₽1	P3	OK
E D2	E Di	Cancel
I▼ F2	J• F4	
Check All Ur	ncheck All	

Figure 2.96: Custom Frame Pattern Dialog

The format can be **Binary** or **Hexadecimal**.

You can select a Header by checking **EXT_H**, **DEV_H**, **NWK_H**, and/or **ASC_H**. You can also select one or more headers.

If you check **EXT_H** and/or **DEV_H**, click the dropdown list to select more options.

Custom Frame-Any Type

The Custom Frame has an additional **Any Type** dropdown menu under the **Value** pane on the right of the dialog as shown in the following figure.

Add Custo	m Frame							×
- Headers						- Format		
EXT_I	H VET		7		VWK_H	C Binaru	Hevad	ecimal
DEV_	H 16 B	ytes	7		ASC_H	- Dinary	13 Honda	comu
Show F	Reserved	and Obsolete						
Hea	ader		Parameter			Value		
		R_CTL			Any TYPE		0,000	
		D_ID			Basic Link Se	rvice	0x00	
		CS_CTI			A DEVELS		UxU1	
		s in			V IPv4 IPv6 an	d ABP over EC	0x04	
					SCSI-FCP		0x08	
		TYPE			Al Obsolete		0x09	
COM U		F_CTL			Additional FCF	P Features	0x0A	
TTIM_TT		SEQ_ID			FC SATA Tun	nelling Protocol	0v14	
		DF_CTL			SBCCS	inclining in rotocol	0x18	
		SEQ CNT			× Obsolete		0x19	
					SBCC SCS		0x1B	
		BY ID			M FC-GS		0x1C	
		Recently			J			
		Paramotor						
		✓ P3	Expect	ed numb	er of occurrences	s on each link: 1		OK
✓ P2		✓ P4						Lancel
Check /	All Ur	icheck All						

Figure 2.97: Add Custom Frame - Any Type Dialog

- Basic Link Service
- 🗆 ELS
- Obsolete
- □ IPv4, IPv6 and ARP over FC
- □ SCSI-FCP
- Obsolete
- Additional FCP Features
- Obsolete
- □ SBCCS
- Obsolete
- □ SBCC SCS
- □ SBCC SCR
- □ FC-GS
- □ FC-SW
- Obsolete
- □ Intr-Fab Rtr Inter. Link Srvs
- □ HIPPI-FP
- □ FC-AE 1553
- □ FC-ASM
- FC-VI
- FC-AV Container
- ARINC 818

- Generic FC Feat
- **RNID** Gen. Top. Dis. Page

Protocol Errors

Double-click **Protocol Errors** to open the Add Protocol Error Pattern selection dialog.

Add Protocol Errors	X
Protocol Errors:	
✓ Symbol Violation ✓ Sync Header Error ✓ Disparity Error ✓ FEC Parity Error ✓ Alignment Error ✓ Delimiter Error ✓ Delimiter Error ✓ Orimitive Error ✓ Primitive Error ✓ Frame Length Error ✓ CRC Error ✓ CRC Error	
FEC Parity Error:	
Check All List OK Canc	el
P1 P3 P2 P4 Check All Lincheck All	

Figure 2.98: Protocol Error Pattern Dialog

Check protocol error(s) and then click OK.

Trigger Setup

The **Trigger** tab in the analysis project dialog allows you to specify when the analyzer completes a data capture. Three trigger modes are available: The default **Snapshot**, **Manual Trigger**, and **Pattern/Event Trigger**.

When data capture starts with **Don't care (Snapshot)** selected, the analyzer triggers on the first data pattern on the bus.

Starting a data capture with **Pattern** selected triggers when specific pattern(s) are detected in the captured data stream. The following three ways can trigger the analyzer with **Pattern** selected:

- □ Trigger on any pattern (Any Trigger Mode)
- □ External Trigger
- □ Trigger on a sequence of patterns (Sequential Trigger Mode)

Snapshot Mode

To trigger immediately on any pattern, check the **Snapshot** button.

LeCroy FC Protocol Suite - [FCProject7*]	
File View Edit Configuration Project Setup Tools Window Help	
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Analyzer Settings Capture Trigger Notes	
Inggering Mode Snapshot	
C Manual Trigger	
C Pattern/Event/Infusion Trigge	
Patterns Library	
B	Use selected patterns in a sequence
New User Group	
e Presets	"Drag from library to add an event"
🖷 🔂 Condition (for Advanced Mode)	
ARB	+>>
🖶 🙀 🔤 ELS	
📄 👘 🔂 GS	
🖷 🖶 🔂 FCAV	
🖶 🐼 VSAN	
🖕 🖕 🚾 GS	
sw sw	
P Custom Frame	
Protocol Errors	
	V

Figure 2.99: Default Trigger Snapshot Mode Selected

Manual Trigger Mode

In the **Manual Trigger** mode, the analyzer captures bus traffic continually from when you use the Manual Trigger until you click the **Stop Hardware** button (on the analyzer toolbar), which triggers the analyzer. To perform a manual trigger, check the **Manual Trigger** button.

LeCroy FC Protocol Suite - [FCProject7*]	
File View Edit Configuration Project Setup Tools Window Help	
😂 🔜 😞 🚳 🔴 Record 🧝 🔳 💵 🔢 🕑 🗸	
Analyzer Settings Capture Trigger Notes	
Triggering Mode C Snapshot Manual Trigger C Pattern/Event/Infusion Trigge	
Patterns Library	
User Patterns Most recent New User Group Presets Presets Presets Provests Presets Provests Pro	Use selected patterns in a sequence (change order using arrows) Active : Thrag from library to add an event" Thrag from library to add an event " Thrag from

Figure 2.100: Manual Trigger Mode Selected

Pattern/Event/Infusion Trigger Mode

LeCroy Corporation

In Pattern/Event Trigger mode, the Analyzer triggers whenever any of the patterns selected for triggering occurs (an OR condition). The procedure for selecting trigger parameters is identical to that for selecting capture parameters. All items selected for triggering appear in the Project Overview pane.

To define patterns for triggering, check the Pattern button in the Trigger dialog.

ﷺLeCroy FC Protocol Suite - [FCProject7*]	
File View Edit Configuration Project Setup Tools Window Help	
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Analyzer Settings Canture Trigger Notes	
Triggering Mode	
C <u>S</u> napshot	
C Manual Trigger	
Pattern/Event/Infusion Trigge	
Patterns Library	
	Use selected natterns in a sequence.
B- W Most recent	(Change order using arrows)
New User Group	Active :
B-@ Presets	"Drag from library to add an event"
Basic	
	+>>
🖶 🖶 🐼 GS	
Basic	
the two sw	
i i	
P Protocol Errors	
	V

Figure 2.101: Select Patterns for Trigger

The **Patterns Library** window displays the following trigger pattern categories (for details on each of the trigger pattern refer to "Defining Patterns" on page 45):

- □ Timers/External
 - Timer
 - Timeout
 - External Trigger

- Basic
 - Connect/Disconnect
 - Symbol
 - Ordered Set
 - Basic Link Service
 - Link Control Frame
 - Symbol 16G
 - Training Sequence

Symbol 16G

Double-click **Symbol 16G** in the Pattern Library to set the trigger on Symbol 16G.

Add Symbol 16G	×
Sync Header: 0b 11	OK
Symbol: 0x	Cancel
₽ P1 ₽ P3	
✓ P2 ✓ P4	
Check All Uncheck All	
Count Expected number of occurrences on each link	: 1

Figure 2.102: Add Symbol 16G Dialog

The Sync Header value and the Symbol pattern can be entered.

The Ports can be selected and you can enter the **Expected number of occurrences on each link** in the **Count** field.

Training Sequence

Double-click **Training Sequence** in the Pattern Library to set the trigger on Training Sequence.

Add Training Sequence	×
Training Sequence: 0x XXXXXXX	ОК
☑ P1 ☑ P3	Cancel
₽ P2 ₽4	
Check All Uncheck All	
Expected number of occurrences on each link	: 1

Figure 2.103: Add Training Sequence Dialog

The Training Sequence pattern can be entered.

The Ports can be selected and you can enter the **Expected number of occurrences on** each link in the **Count** field.

- □ FCP
 - FCP SCSI Command
 - FCP Frame Information Unit
 - SCSI Command Status
 - FCP Task Management
 - Custom Frame
- □ ARB/ELS
 - ARB Loop Initialization
 - Extended Link Service Request
 - Extended Link Service Reply
- 🗆 GS
 - Generic Link Service Request
 - Generic Link Service Reply
- □ SW
 - Switch Internal Link Service Request
 - Switch Internal Link Service Reply
- □ FICON
 - FICON (Any Data Information Block Type)
 - FICON (Data)
 - FICON (Command)
 - FICON (Status)
 - FICON (Control)
 - FICON (Command-Data)
 - FICON (Link-Control)

- FCAE
 - FCAE-ASM
 - FCAE-1553 (Any)
 - FCAE-1553 (Data)
 - FCAE-1553 (Command)
 - FCAE-1553 (Status)
- FCVI
 - FCVI (Any)
 - FCVI (SEND_RQST)
 - FCVI (WRITE_RQST)
 - FCVI (READ_RQST)
 - FCVI (SEND_RESP)
 - FCVI (WRITE_RESP)
 - FCVI (READ_RESP)
 - FCVI (CONNECT_RQST)
 - FCVI (DISCONNECT_RQST)
 - FCVI (CONNECT_RESP1)
 - FCVI (CONNECT_RESP2)
 - FCVI (CONNECT_RESP3)
 - FCVI (DISCONNECT_RESP)
- □ FCAV
 - FCAV (Simple)
 - FCVI (Extended)
- VSAN
 - Basic
 - VSAN-Basic Link Service
 - VSAN-Link Control Frame
 - FCP
 - VSAN-FCP SCSI Command
 - VSAN-FCP Frame Information Unit
 - VSAN-SCSI Command Status
 - VSAN-FCP Task Management
 - ARB
 - VSAN-ARB Loop Initialization
 - ELS
 - VSAN-Extended Link Service-Request
 - VSAN-Extended Link Service-Request, Reply
 - VSAN-Extended Link Service-Reply
 - GS
 - VSAN-Generic Link Service-Request
 - VSAN-Generic Link Service-Request, Reply
 - VSAN-Generic Link Service-Reply
 - SW
 - VSAN-Switch Internal Link-Request
 - VSAN-Switch Internal Link-Request, Reply
 - VSAN-Switch Internal Link-Reply

- VSAN-FICON
 - VSAN-FICON (Any Data Information Block Type)
 - VSAN-FICON (Data)
 - VSAN-FICON (Command)
 - VSAN-FICON (Status)
 - VSAN-FICON (Control)
 - VSAN-FICON (Command-Data)
 - VSAN-FICON (Link-Control)
- VSAN-FCAE
 - VSAN-FCAE-ASM
 - VSAN-FCAE-1553 (Any)
 - VSAN-FCAE-1553 (Data)
 - VSAN-FCAE-1553 (Command)
 - VSAN-FCAE-1553 (Status)
- VSAN-FCVI
 - VSAN-FCVI (Any)
 - VSAN-FCVI (SEND_RQST)
 - VSAN-FCVI (WRITE_RQST)
 - VSAN-FCVI (READ_RQST)
 - VSAN-FCVI (SEND_RESP)
 - VSAN-FCVI (WRITE_RESP)
 - VSAN-FCVI (READ_RESP)
 - VSAN-FCVI (CONNECT_RQST)
 - VSAN-FCVI (DISCONNECT_RQST)
 - VSAN-FCVI (CONNECT_RESP1)
 - VSAN-FCVI (CONNECT_RESP2)
 - VSAN-FCVI (CONNECT_RESP3)
 - VSAN-FCVI (DISCONNECT_RESP)
- VSAN-FCAV
 - VSAN-FCAV (Simple)
 - VSAN-FCVI (Extended)
- Custom Frame
- Protocol Errors

Choosing a Parameter

Either highlight the category and click the +>> button, or double-click the category, to open a corresponding definition dialog. Click on the Okay button to move the pattern to the Active pane.

To remove an item, highlight it in the Project Tree, then click the -<< button.

Timers/External

Selecting a timer for a trigger in the **Any Trigger Mode** limits the time that the analyzer looks for selected triggering conditions before triggering. The timer activates when the Project runs. If none of the selected triggering conditions occurs during the timer's active time, the Analyzer triggers at the end of the time set for the timer.

Timer

You can set a timer independently of any other trigger selection, to cause an unconditional trigger after a set time.

Double-click **Timer** in the Pattern window to open the Add Timer Pattern dialog.

Add Timer Pattern	×
Timer Value: Time Unit Seconds Milli Seconds Milliseconds Milliseconds Milliseconds Milliseconds Milliseconds Milliseconds Milli Seconds	OK Cancel

Figure 2.104: Add Timer Pattern Dialog

Check a Time Unit, enter the Timer Value, and click OK.

Note: The timer and timeout resolution is limited to one DWORD. The minimum value is 12-13 DWORD.

Timeout

Selecting Timeout for the pattern opens the Add Timeout Pattern dialog.

Add Timeout Pattern			2
Pattern / External Trigger Connect/Disconnect Symbol Ordered Set	Add >> Remove <<	Start Events	
Basic Link Service Link Control Frame FCP SCSI Command Status FCP Frame Information Unit FCP Task Managment Custom Frame ARB Loop Initialization	Add >> Remove <<	End Events	1
Note : Logical OR operator applied o	n added events.		
Timeout value : 1	• milliseconds	C microseconds	C dwords
Trigger mode			
C Trigger if the End Event(s) occ	ur(s) berore the timer expli	es ()	
 I rigger if the timer expires before the 'End Event(s)' occur(s) 			
Note : Start Event(s) reset(s) the	timer unconditionally.		
	OK Cano	el	

Figure 2.105: Add Timeout Pattern Dialog

Select a pattern for Start Events or End Events, enter a Timeout value, select units, and then select Trigger Mode:

- □ Trigger If the 'End Event(s)' occur(s) before the timer expires
- □ Trigger if the timer expires before 'End Event(s)' occur(s)

Note: You cannot select a Timeout pattern if you select any other pattern as the trigger condition.

External Trigger Pattern

You can trigger on an external trigger. To set up the trigger, click the **External Trigger** pattern. In order to select an External Trigger refer to the "External Trig Setting" on page 226.

Add External Trigger Pattern	×
C	ОК
 High Active Low Active 	Cancel
C Toggle	
For changing the external trig setting, go to "Configuration" menu and select "External Trig Setting" .	

Figure 2.106: Add External Trigger Pattern Dialog

Basic Patterns

Connect/Disconnect

See "Basic Patterns" on page 46.

Symbol

Double-click **Symbol** in the Pattern window to open the Add Symbol Pattern dialog.

Add Symbol Pa	ittern		×
 K Symbol D Symbol 	K28.5 BC	•	OK Cancel
♥ P1 ♥ P2	♥ P3 ♥ P4		
Check All	Uncheck All		
Count Expected nu	mber of occurrence	es on each link:	1

Figure 2.107: Add Symbol Pattern Dialog

Choose a symbol type by checking either the K Symbol or D Symbol option.

If you choose the K symbol, click the down arrow in the Symbol dropdown list, choose a symbol on which to trigger, and click **OK**.

The D Symbol choice does not have a down arrow.

Count is the expected number of occurrences on each link. Default is 1.

Ordered Set

See "Ordered Set" on page 47 for more information.

Basic Link Service

See "Basic Link Service" on page 48 for more information.

Link Control Frame

See "Link Control Frame" on page 49.

Symbol 16G

See "Symbol 16G" on page 135.

Training Sequence

See "Training Sequence" on page 136.

FCP Patterns

FCP SCSI Command

See "FCP Patterns" on page 50 for more information.

FCP Frame Information Unit

See "FCP Frame Information Unit" on page 51 for more information.

SCSI Command Status

See "SCSI Command Status" on page 52 for more information.

FCP Task Management

See "FCP Task Management" on page 53 for more information.

ARB

ARB Loop Initialization

See "ARB Loop Initialization" on page 54 for more information.

ELS

Extended Link Service - Request

See "Extended Link Service - Request" on page 55 for more information.

Extended Link Service - Request, Reply

See "Extended Link Service - Request, Reply" on page 56 for more information.

Extended Link Service - Reply

See "Extended Link Service - Reply" on page 57 for more information.

GS

Generic Link Service - Request

See "Generic Link Service - Request" on page 58 for more information.

Generic Link Service - Request, Reply

See "Generic Link Service - Request, Reply" on page 59 for more information.

Generic Link Service - Reply

See "Generic Link Service - Reply" on page 60 for more information.

SW

Switch Internal Link Service - Request

See "Switch Internal Link Service - Request" on page 61 for more information.

Switch Internal Link Service - Request, Reply

See "Switch Internal Link Service - Request, Reply" on page 62 for more information.

Switch Internal Link Service - Reply

See "Switch Internal Link Service - Reply" on page 63 for more information.

FICON

Any Data Information Block Type

See "Any Data Information Block Type" on page 64 for more information.

FICON Data

See "Add FICON Data" on page 65 for more information.

FICON Command

See "Add FICON Command" on page 66 for more information.

FICON Status

See "Add FICON Status" on page 68 for more information.

FICON Control

See "Add FICON Control" on page 71 for more information.

FICON Command Data

See "Add FICON Command-Data" on page 73 for more information.

FICON Link Control

See "Add FICON Link-Control" on page 75 for more information.

FCAE

FCAE-ASM

See "FCAE-ASM" on page 77 for more information.

FCAE-1553

FCAE-1553 Any

See "FCAE-1553 Any" on page 78 for more information.

FCAE-1553 Data

See "Add FCAE-1553 Data" on page 79 for more information.

FCAE-1553 Command

See "Add FCAE-1553 Command" on page 80 for more information.

FCAE-1553 Status

See "Add FCAE-1553 Status" on page 83 for more information.

FCVI

FCVI(Any)

See "FCVI(Any)" on page 84 for more information.

FCVI(SEND_RQST)

See "FCVI(SEND_RQST)" on page 84 for more information.

FCVI(WRITE_RQST)

See "FCVI(WRITE_RQST)" on page 84 for more information.

FCVI(READ_RQST)

See "FCVI(READ_RQST)" on page 84 for more information.

FCVI(SEND_RESP)

See "FCVI(SEND_RESP)" on page 84 for more information.

FCVI(WRITE_RESP)

See "FCVI(WRITE_RESP)" on page 84 for more information.

FCVI(READ_RESP)

See "FCVI(READ_RESP)" on page 84 for more information.

FCVI(CONNECT_RQST)

See "FCVI(CONNECT_RQST)" on page 84 for more information.

FCVI(DISCONNECT_RQST)

See "FCVI(DISCONNECT_RQST)" on page 84 for more information.

FCVI(CONNECT_RESP1)

See "FCVI(CONNECT_RESP1)" on page 84 for more information.

FCVI(CONNECT_RESP2)

See "FCVI(CONNECT_RESP2)" on page 84 for more information.

FCVI(CONNECT_RESP3)

See "FCVI(CONNECT_RESP3)" on page 84 for more information.

FCVI(DISCONNECT_RESP)

See "FCVI(DISCONNECT_RESP)" on page 84 for more information.

FCAV

FCAV(SIMPLE)

See "FCAV(Simple)" on page 85 for more information.

FCAV(EXTENDED)

See "FCAV(Extended)" on page 85 for more information.

VSAN Basic

VSAN Basic Link Service

See "VSAN-Basic Link Service" on page 88 for more information.

VSAN Link Control Frame

See "VSAN-Link Control Frame" on page 89 for more information.
VSAN-FCP

VSAN-FCP SCSI Command

See "Add VSAN-FCP SCSI Command" on page 90 for more information.

VSAN-FCP Frame Information Unit

See "Add VSAN-FCP Frame Information Unit" on page 91 for more information.

VSAN-FCP SCSI Command Status

See "Add VSAN-SCSI Command Status" on page 92 for more information.

VSAN-FCP Task management

See "Add VSAN FCP Task Management" on page 93 for more information.

VSAN-ARB

VSAN-ARB Loop Initialization

See "Add VSAN-ARB Loop Initialization" on page 95 for more information.

VSAN-ELS

VSAN-Extended Link Service - Request

See "VSAN-Extended Link Service - Request" on page 96 for more information.

VSAN-Extended Link Service - Request, Reply

See "VSAN-Extended Link Service - Request, Reply" on page 97 for more information.

VSAN-Extended Link Service - Reply

See "VSAN-Extended Link Service - Reply" on page 98 for more information.

VSAN-GS

VSAN-Generic Link Service - Request

See "VSAN-Generic Link Service - Request" on page 99 for more information.

VSAN-Generic Link Service - Request, Reply

See "VSAN-Generic Link Service - Request, Reply" on page 100 for more information.

VSAN-Generic Link Service - Reply

See "VSAN-Generic Link Service - Reply" on page 101 for more information.

VSAN-SW

VSAN-Switch Internal Link - Request

See "VSAN-Switch Internal Link Service - Request" on page 102 for more information.

VSAN-Switch Internal - Request, Reply

See "VSAN-Switch Internal Link Service - Request, Reply" on page 103 for more information.

VSAN-Switch Internal - Reply

See "VSAN-Switch Internal Link Service - Reply" on page 104 for more information.

VSAN-FICON

VSAN-FICON Any Data Information Block Type

See "VSAN-FICON (Any Data Information Block Type)" on page 105 for more information.

VSAN-FICON Data

See "Add VSAN-FICON Data" on page 106 for more information.

VSAN-FICON Command

See "Add VSAN-FICON Command" on page 107 for more information.

VSAN-FICON Status

See "Add VSAN-FICON Status" on page 109 for more information.

VSAN-FICON Control

See "Add VSAN-FICON Control" on page 112 for more information.

VSAN-FICON Command Data

See "Add VSAN-FICON Command-Data" on page 114 for more information.

VSAN-FICON Link Control

See "Add VSAN-FICON Link-Control" on page 116 for more information.

VSAN-FCAE-ASM

VSAN-FCAE-ASM

See "VSAN-FCAE-ASM" on page 118 for more information.

VSAN-FCAE-1553

VSAN-FCAE-1553 Any

See "VSAN-FCAE-1553 Any" on page 119 for more information.

VSAN-FCAE-1553 Data

See "Add VSAN-FCAE-1553 Data" on page 120 for more information.

VSAN-FCAE-1553 Command

See "VSAN-FCAE-1553 Command" on page 146 for more information.

VSAN-FCAE-1553 Status

See "Add VSAN-FCAE-1553 Status" on page 124 for more information.

VSAN-FCVI

FCVI(Any)

See "VSAN-FCVI(Any)" on page 125 for more information.

FCVI(SEND_RQST)

See "VSAN-FCVI(SEND_RQST)" on page 125 for more information.

FCVI(WRITE_RQST)

See "VSAN-FCVI(WRITE RQST)" on page 125 for more information.

FCVI(READ_RQST)

See "VSAN-FCVI(READ_RQST)" on page 125 for more information.

FCVI(SEND_RESP)

See "VSAN-FCVI(SEND_RESP)" on page 125 for more information.

FCVI(WRITE_RESP)

See "VSAN-FCVI(WRITE_RESP)" on page 125 for more information.

FCVI(READ_RESP)

See "VSAN-FCVI(READ_RESP)" on page 125 for more information.

FCVI(CONNECT_RQST)

See "VSAN-FCVI(CONNECT_RQST)" on page 125 for more information.

FCVI(DISCONNECT_RQST)

See "VSAN-FCVI(DISCONNECT_RQST)" on page 125 for more information.

FCVI(CONNECT_RESP1)

See "VSAN-FCVI(CONNECT_RESP1)" on page 125 for more information.

FCVI(CONNECT_RESP2)

See "VSAN-FCVI(CONNECT_RESP2)" on page 125 for more information.

FCVI(CONNECT_RESP3)

See "VSAN-FCVI(CONNECT_RESP3)" on page 125 for more information.

FCVI(DISCONNECT_RESP)

See "VSAN-FCVI(DISCONNECT_RESP)" on page 125 for more information.

VSAN-FCAV

VSAN-FCAV(SIMPLE)

See "VSAN-FCAV(Simple)" on page 126 for more information.

VSAN-FCAV(EXTENDED)

See "VSAN-FCAV(Extended)" on page 126 for more information.

Custom Frame

See "Custom Frame" on page 129 for more information.

Protocol Errors

See "Protocol Errors" on page 131 for more information.

Sequential Trigger Mode

In Sequential Trigger mode, triggering occurs whenever the system detects a specific sequence of patterns. Defining the triggering patterns sets the sequence order. You must define at least two patterns to enable selection of Sequential Trigger mode.

Note: Patterns, such as Primitives and Symbols or Frames, occurring very close together on different ports, cause an error in triggering.

To define a triggering sequence, select more than one pattern, then check the **Use** selected patterns in a sequence check box.



Figure 2.108: Select Sequential Trigger Mode

Timer See "Timer" on page 139 for more information.

Defining Patterns

The definition of patterns for the sequential trigger mode is identical to the Pattern mode, with the following exception:

In sequential triggering mode, all the pattern dialogs display the option for setting to count the expected number of occurrences on each link. This allows you to specify the number of times that the pattern must occur before triggering or proceeding in the trigger sequence.

- Count Expected number of occurrences:	1
	<u>P</u>

Figure 2.109: Number of Occurrences

Note: The Events on each link are counted independently, causing a trigger whenever the number of occurrences on any link equals the specified value.

Triggering Order

As triggering patterns are defined and added, they are displayed in the Project Overview pane sequentially in the order that they were entered under the Trigger category. When the project runs, the analyzer detects the occurrence of each pattern in order and triggers on the last one.

You can re-order the sequence of triggering patterns. To change the sequence order, highlight a trigger pattern and use the **Up** or **Down** arrow to move it to a new position.



Figure 2.110: Triggering Order

Pre-Trigger

You can set the amount of data to capture before and after the trigger, as a percentage of pre-trigger, between 0% and 100%. Position the pre-trigger slider to a percentage. This feature allows the evaluation of bus activity leading up to and after the triggering Event. Figure 2.111: illustrates the operation of pre-trigger in data memory.

Pre-trigger data is capture of the specified percentage of data prior to the triggering Event. It cannot be guaranteed and may be 0. This can occur when the triggering Event occurs before storing the required amount of pre-trigger Event data. In such a case, the data display shows fewer than the specified data points prior to the triggering Event.



Figure 2.111: Pre-Trigger Example, 20% Pre-Trigger

Project Settings

To set project options, click the **Analyzer Settings** tab. The options on the Analyzer Settings are explained below.

🖉 LeFroy FF Protocol Suite - [FFProject7*]	
File View Edit Configuration Project Setup Tools Window Help	
Analyzer Settings Capture Trigger Notes	
Recording Buffer	
Buffer Size and Segments	
Num. of Segments : Segment Image: Segment </td <td></td>	
1MB 8192MB Out of 8192MB available	
Trigger Position Training Signal Pack Mode	
50 % trigger position Number of Runs : 20 © Unpacked	
0% O Packed	
Last Captured Trace File	
Trace File Name: c:\program files\lecroy\fc protocol suite\User\Trace.fcs	
Use upload manager (no automatic upload)	
Analyzer Settings	
Channel Enable Speed Disable Descrambling	
✓ P1 ✓ P3 P1, P2: AutoSpeed ✓ P1, P2	
Image: P2 Image: P4 P3, P4 : [AutoSpeed Image: AutoSpeed Image: P3, P4	
Set Protocol Error Detection	
Easy,switch to Advanced mode	

Figure 2.112: Setting Project Options

Buffer Size and Segments

The Analyzer Settings tab has the Recording Buffer pane where you can set Number of Segments and the Segment Size. The defaults are one segment of 25MB. The total size used is automatically displayed for you. Setting multiple segments will allow to trigger on the first occurrence of the trigger condition, fill up the first segment, then automatically re-arm the trigger and repeat the remaining number of segments specified. You can use the slider button or click the up or down arrow to change memory usage for recording trace data. (Minimum size of memory is 1MB. Maximum size of memory is dependent on the hardware.) (See Figure 2.1: on page 34.) Enter an integer **Num. of Segment**, from 1 to 32, then enter an integer **Segment Size** in kilobytes, up to the memory size in megabytes divided by the number of segments. The default 1.

The New Project dialog opens with default settings to capture Everything on the bus and to Trigger On on Snapshot. (The analyzer captures everything immediately without triggering on anything in particular.)

Each time a trigger condition occurs, the system records a new segment. You can use a Snapshot or Pattern trigger, but not Manual Trigger. As the same trigger automatically repeats, the system makes the number of segments that you entered.

Note: If the size of a data packet exceeds the buffer memory allocation, the project runs, but no data capture occurs. You must increase buffer memory size to a value greater than the packet size.

Trigger Position

You can set the trigger position in the captured buffer as a percentage of the segment size. Trigger point of 0% means the trigger point will be on the first packet in the buffer.

To upload segments automatically for display as the system creates them, do not select the checkbox. This defaults to 1, which defines the amount of data to capture before and after the triggering Event. You can change this percentage by dragging the slider.

To upload segments manually in the Segment Manager, select the **Use upload manager** (no automatic upload) checkbox. To upload segments automatically for display as the system creates them, do not select the checkbox.

Auto Run

To repeat the current capture and trigger setup automatically, check the **Auto Run** checkbox and enter the number of times in the **Number of Run** text box. The capture and trigger repeat automatically for the specified number of times, and the results are saved in consecutively numbered **Trace.scs** files. Each one will use the same settings as specified, and will create sequentially named traces. This is identical to pressing the record button several times in a row.

Trace File Name

Click the ellipses next to the **Trace File Name** text box and choose a file name and location for the results of your current project.

LeCroy FC Protocol Suite - [FCProject7*]	
File View Edit Configuration Project Setup Tools Window Help	
差 🔜 😞 🍥 🔶 Record 🏽 🔳 💵 🗱 🕑 🗸	
Analuzer Settings Capture Trigger Notes	
Buffer Size and Segments	
Num. of Segment ' V V V I Image Total size used : 75MB	
Segments: 3 Size: 25 MB M	
Trigger Position Training Signal Pack Mode	
50 % trigger position Number of Buns : 20 © Unpacked	
0% C Packed	
Last Captured Trace File	
Trace <u>File Name:</u> c:\program files\lecroy\fc protocol suite\User\Trace.fcs	r
Use upload manager (no automatic upload)	
Channel Enable Speed	
✓ P1 ✓ P3 P1.P2: AutoSpeed ▼	
Set Protocol Error Detection	

Figure 2.113: Trace File Name

Upload Manager

To view recorded segmented trace files, click the **Upload Manager button**, beside the Record button, to display the Upload Manager dialog.

Note: The Upload Manager button is active (green) only after you record a trace.

Upload Manager	×
▼AL commandsSeg1	Upload
▼AL commandsSeg2	
✓AL commandsSeg3	Save
✓AL commandsSeg4	
✓AL commandsSeg5	Delete
✓AL commandsSeg6	
✓AL commandsSeg7	Options
✓AL commandsSeg8	Preview 5 MB around segment
✓AL commandsSeg9	trigger position
✓AL commandsSeg10	
▼AL commandsSeg11	
✓AL commandsSeg12	1% 99%
▼AL commandsSeg13	C Show Traffic Summary
✓AL commandsSeg14	Preview
☑AL commandsSeg15	
Select All Deselect All	Close

Figure 2.114: Upload Manager Dialog

The dialog displays the segments in the format Segment1, Segment2, and so on.

Select segments by clicking the checkbox. You can also **Select All** or **Deselect All** segments.

You can **Upload** segments for display, **Save** segments as sample files, and **Delete** segments.

The **Preview** radio button allows a preview of an integer number of megabytes around the trigger position. You can set the trigger position as a percentage and select the segment number. Click the radio button to **Show Traffic Summary** with the preview. To show the preview, click the **Preview** button.

Analyzer Settings

Channel Enable

Check the relevant ports to enable them.

Note: If a Port ID check box has no check, the analyzer does not capture any patterns for that port. The system allocates trace memory for that port to its adjacent port, for example: P1 <-> P2.

Speed

The default speed is **Autospeed**. You can also select the port speed from the drop-down list: 1.0 Gbps, 2.0 Gbps, 4.0 Gbps, 8.0 Gbps or 16 Gbps.

Disable Scrambling

If checked, causes the Analyzer to assume that no traffic is scrambled. By default, the Analyzer assumes the scrambling state of the devices under test.

Protocol Error Detection

Click the Set Protocol Error Detection button to open the Protocol Error Detection dialog.

Protocol Errors Detection	X
Protocol Errors:	
Symbol Violation	OK
☑ Disparity Error	Coursel
Spacing Error	Lancer
Alignment Error	
Delimiter Error	
EOF Error	
Primitive Error	
Frame Length Error	
Sync Header Error	
Check All Uncheck All Check: Disable Protocol error detection	
Un Check: Enable Protocol error detection	

Figure 2.115: Protocol Errors Dialog

Uncheck specific Protocol Errors in order to not display them in the sample view and Statistical Report.

Notes

Add a Project Note

To enter and save information about the current project, click the **Notes** tab and enter the data about the project.

ELECroy FC Protocol Suite - [FCProject7*]	_ 8 ×
Sile View Edit Configuration Project Setup Tools Window Help	- 8×
😂 🖶 😓 🐵 🔴 Record 🚍 🔳 11 🔢 😰 🗸	
Analyzer Settings Capture Trigger Notes	Project Dverview
Project Name PEProject7 Nge:	 Charlenge (Sequence) Charlenge (Sequence) Control Payload after 512 Dword(c) <
Easy switch to Advanced mode	Ocollapse All = Expand All

Figure 2.116: Project Notes Tab

Advanced Mode (User-Defined)

Advanced Mode expands Analysis capability by allowing you to program complex triggering and data capture projects.

The Advanced Mode is a state machine with up to 23 different states. You can program each state individually to:

- **□** Trigger on a different Event or trigger unconditionally.
- □ Capture Everything, Nothing, or a user-defined pattern.
- Include up to three ELSE IF statements, allowing a jump to any other state based on a user definition.
- Use up to three timers, which you can set to a maximum value of 42949 ms. You can set a timer in the state or continue the timer set in the previous state.
- □ Output an external trigger High or Low.

Note: In Advanced Mode, Events on each link are counted independently. A condition is met if the number of Events on a link equals the defined occurrence.

Working in Advanced Mode

To start working in the Advanced Mode, click the **Easy, Switch to Advanced Mode** button in an open Analyzer window.



You can:

- Display the state definition
- □ Set Output Trigger level
- □ Select up to three timers
- Define the If condition and up to three Else If conditions
- □ Set number of occurrences before trigger
- Set captured data
- Set excluded data
- Go to next state
- Add state
- Choose link for Sequencer setup

🚝 LeCroy FC Protocol Suite - [FCProject7*]		
File View Edit Configuration Project Setup Tools Window Help		- 8×
	🔶 . & & E 🗐 .	
Analyzer Settings Advanced Mode Notes		
Analyzer Settings Advanced Mode Notes Analyzer Settings Advanced Mode New User Group	State 0 State 0 # External Trigger Else II "Drag from library to add an event" 1	State 0 (SD) , Start Capture Exclude Patterns: Gene Exclude tems: Idle, ARBIT, Ev External Trigger then Ex4Out State 1 (S1) Capture Exclude Patterns: Gene Exclude tems: Idle, ARBIT, Ev Link Control Frane (Any Link)
		K
Advanced.switch to Easy mode Multi Sequencer Port: P1, P2 Y	e Same as Current	P Add State Delete State

Figure 2.117: State Programming Dialog

Setting Trigger Conditions

To set the If and Else If trigger condition:

Click the Add Pattern button for a Pattern field and choose a trigger condition from the drop-down list.

Advanced Mode Notes Advanced Mode Notes Advanced Mode Notes Advanced Mode Notes Advanced Mode Advanced Mode Advanced Mode Advanced Mode Advanced Mode Advanced Mode Advanced Mode Advanced Mode Advanced Mode Advanced Mode Advanced Mode Advanc	State 0 State 0 State 0 (90) . Stat If External Trigger Image: State 1 State 0 (90) . Stat If External Trigger Image: State 1 State 0 (90) . Stat If External Trigger Image: State 1 State 0 (90) . Stat If External Trigger Image: State 1 State 1 If Image: State 1 Image: State 1 State 1 External Trigger Image: State 1 Image: State 1 External Trigger them Trig. E External Trigger them Trig is no inkray to ad an event" Image: No olump State 1 (91) State 1 (91) State 1 (91) State 1 (91) Image: Exclude Patterns: Cene Exclude Exclude Patterns: Cene Exclude Idea Image: Exclude Patterns: State 1 (91) State 1 (91) Cepture Exclude Patterns: Cene Image: Exclude Patterns: Exclude Noting Exclude Noting Exclude Noting Exclude Noting Image: Exclude Patterns: Exclude Noting Exclude Noting Exclude Noting Exclude Noting Image: Exclude Patterns: Exclude Idea Exclude Noting Exclude Noting Exclude Noting Image: Exclude Pa	
# ₩ ELS # ₩ GS SV # ₩ GP FCDN # ₩ PP FCAE # ₩ PP FCAE # ₩ PP FCAE # ₩ PP Cutom Frame P Protocol Errors		

Figure 2.118: Choosing a Trigger Condition

2. Define each selected pattern in the same way as in Easy Mode, as described starting on page 45. To use a timer, define it first.

Note: You can set a timer for any If or Else If condition.

- 3. Enter a value for the number of occurrences before trigger in the **Cont** field, up to a maximum of 65535 occurrences.
- 4. Choose a capture option: Everything, Nothing, or Pattern.
- If you choose Everything, you can select primitives for exclusion. See "Parameters" on page 36.

If you choose Pattern, you can select patterns for inclusion or exclusion. See "Defining Patterns" on page 45.

- 6. Choose pattern(s) and click the +>> button to add them for capture or exclusion. You define each pattern the same way as in Easy mode ("Defining Patterns" on page 45).
- 7. For an output trigger, click the down arrow in the **Ext. Out** field and choose an output trigger level. **Note:** Do not use the LOW setting in Advanced Mode.

8. To go to another state, click the down arrow in the **Go To** field and select a state. If no other state has been defined, choose **New State** to add a state.

Multi-Link Triggering

You can set different triggering for each link. To set different trigger conditions for a link, check the **Multi Sequencer** check box and select the link for setup from the Port drop-down list.

Multi Sequencer Port : P1	,P2 💌	Make Same as Current
P1 P3	, P2	
<u>13</u>	,14	

Figure 2.119: Multi-Link Triggering Setup

Set Timers

You can set and use up to three timers for triggering. You can set each timer for each state or continue from a timer set in the previous state. The timer defined for a particular state starts when entering that state. To set timers, click the **ellipses** in the **Timer** field in each state and define each of the timers in the Timer Pattern dialog.

Timer Pattern							X
Timer1 C Continue ⊙ S	et Timer	0	Milli Seconds	⊂ Timer unit ● milli	O micro	c	dword
⊂ Timer 2 ◯ Continue ⊙ S	et Timer	0	Milli Seconds	Timer unit ● milli	O micro	0	dword
Timer 3 ◯ Continue ⊙ S	et Timer	0	Milli Seconds	Timer unit ● milli	C micro	C	dword
If 'Set Timer' is selec 'Continue' the timer	cted at a sta will continue	ate the timer is rese e the count from pr	t each time ente evious state(s) u	ring that state. ntil timer elaps	By selectir es.	ng	
Timer may be set at	any state a	s part of either ''If''	or "Else If" state	ements.			
	[ОК	Cancel				

Figure 2.120: Timer Pattern Dialog

Useful Key Sequences

The following key sequences are active to assist you in navigating a defined state machine:

Ctrl+a	Add State
Insert	Insert State
Del	Delete State
Ctrl+c/Ctrl+Ins	Сору
Ctrl+v/Shift+Ins	Paste
Up/Down arrow keys	Moves selection between states
Page Up/Page Down	Page Up and Page Down states
Home	Go to first page
End	Go to end page

Project Settings

Prior to running the Advanced mode project, click the **Settings** tab. The options in the Settings dialog are the same as for the Easy Mode, described starting on page 151.

Notes

To include some descriptive information about the project, click the **Notes** tab and enter a brief descriptive note (See "Notes" on page 155).

Chapter 3

Display Manipulation

Viewer Display

After data is captured (Recorded), the Viewer displays a **.fcs** sample file in Packet View. Note that statistics are available only after the whole trace has uploaded.

$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	tort Time	Relative Time	Port	5_D	0_0	Frome	Frome	Command	Summery
DBS (a) 132 (m) + 1 000000 DES (EXAST AL, PA 14 mag=000000000000000000000000000000000000	.932 (us)	475 (ns)	4-2	000000	000000		ELS_REQUEST		AL_PA.bt.map=4000000000000000000000000000000000000
C724 (a) E38 (m) F 2 00000 00000 Light State Pert Name: D0000000 2211 (a) 107 (m) + 00000 Light State Pert Name: D0000000 2211 (a) 450 (m) + 2 00000 Light State Pert Name: D000000000000000000000000000000000000	2.065 (us)	132 (ns)	H 1	000000	000000	ELS_REQUEST			AL_PA bit map=4000000000000000000000000000000000000
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	2.704 (us)	638 (ns)	a- 2	000000	000000		ELS_REQUEST		Port Name+ 0000000
1201 (a) 440 (m) + 2 000000 000000 12.1 (a) 4.1 // A 18 mg=000000000000000000000000000000000000	2.811 (us)	107 (ns)	→ 1	000000	000000	ELS_REQUEST			Port Name= DDDDDDD
$415 (e)$ $124 (e)$ $+ 1$ 00000 $10.5 (80.51)$ $A_L PA theore 00000000000000000000000000000000000$	3.291 (us)	480 (hs)	0-2	000000	000000		ELS_REQUEST		AL_PA bit map+4000000000000000000000000000000000000
UB2 (ex) 647 (m) 4 2 00000 Common Com	1.415 (us)	124 (ns)	→ 1	000000	000000	ELS_REQUEST			AL_PA bt map=4000000000000000000000000000000000000
141 (a) 9 (m) + 1 00000 R 5 (Re2451 Per Name ODD0000 145 (a) 94 (m) + 1 00000 R 5 (Re2451 A, PA 14 mage-000000000000000000000000000000000000	.062 (us)	647 (ns)	1 ≥ 2	000000	000000		ELS_REQUEST		Port Name= 0000000
L45 (a) 44 (n) 4 - 2 00000 00000 6, FA2 EST A, FA3 the mage-000000000000000000000000000000000000	.161 (us)	98 (ns)	-P 1	000000	000000	ELS_REQUEST			Port Name+ 0000000
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $.645 (us)	404 (ns)	4-2	000000	000000		ELS_REQUEST		AL_PA bit map=4000000000000000000000000000000000000
417 (a) 947 (a) <t< td=""><td>.770 (us)</td><td>124 (ns)</td><td>-P 1</td><td>000000</td><td>000000</td><td>ELS_REQUEST</td><td></td><td></td><td>AL_PA bit map=4000000000000000000000000000000000000</td></t<>	.770 (us)	124 (ns)	-P 1	000000	000000	ELS_REQUEST			AL_PA bit map=4000000000000000000000000000000000000
515 (a) 98 (m) +1 000000 ES_FEQUEST Put Name= COLDCOOD 124 (a) 124 (a) +1 000000 ES_FEQUEST AL_PA L4 mage=000000000000000000000000000000000000	i.417 (us)	647 (ns)	4-2	000000	000000		ELS_REQUEST		Port Name= 0000000
6 (un) 44 (un) 4 - 2 0000000 0000000 0000000 0000000 0000000 0000000 0000000 0000000 0000000 0000000 0000000 0000000 0000000 0000000 0000000 0000000 0000000 0000000 000000000000000000000000000000000000	i.515 (us)	98 (ns)	HP 1	000000	000000	ELS_REQUEST			Port Name= 0000000
1:24 (w) 1:24 (w) + 1 00000 E.S. PE2AEST AL_PA M mme*00000000000000000000000000000000000	6 (us)	484 (ns)	0-2	000000	000000		ELS_REQUEST		AL_PA bit map+4000000000000000000000000000000000000
SPE (es) 642 (m) + 2 000000 000000 E.S. FEGLEST Port Name: DOLDODOD 350 (es) 94 (m) + 1 000000 E.S. FEGLEST AL, PA & mage: DODDODODODODODODODODODODODODODODODODOD	i.124 (us)	124 (ns)	HP 1	000000	000000	ELS_REQUEST			AL_PA bit map=4000000000000000000000000000000000000
VBS (etc) 9 (n) + 1 000000 ILS (R0XEST) Port Name- DODDDDD 482 (etc) 132 (m) + 1 000000 R.S. FEOLEST AL, PA is mage-000000000000000000000000000000000000	.767 (us)	642 (ns)	0-2	000000	000000		ELS_REQUEST		Port Name+ 0000000
350 (w) 454 (w) +2 0000000 000000 000000 000000 000000 000000 000000 000000 000000 000000 000000 000000 000000 000000 000000 0000000 0000000 000000	i.865 (us)	98 (ns)	+ 1	000000	000000	ELS_REQUEST			Port Name= DDDDDDDD
442 (ab) 132 (m) + 1 000000 R.S. Re2.est AL PA & mode-000000000000000000000000000000000000	.350 (us)	484 (ns)	i≉ 2	000000	000000		ELS_REQUEST		AL_PA bit map=4000000000000000000000000000000000000
121 (a) 58 (m) ≠-2 00000 ELS FEOLEST Put Name DDDDDDD 220 (a) 96 (m) +1 00000 ELS FEOLEST For Name DDDDDDDD 2704 (a) 484 (m) +2 00000 ELS FEOLEST AL PA bit mpe-f000000000000000000000000000000000000	482 (us)	132 (ns)	-P 1	000000	000000	ELS_REQUEST			AL_PA bit map=4000000000000000000000000000000000000
220 (e) 9 (m) + 1 000000 E.S. FE2.EST Part Name: 00000000 8.87 (e) 132 (m) + 1 000000 E.S. FE2.EST AL, PA L4 may=*000000000000000000000000000000000000	1.121 (us)	638 (ns)	4− 2	000000	000000		ELS_REQUEST		Port Name= 0000000
V7/14 (us) 44 (ns) 4-2 000000 ELS JESUEST AL PA & meg=000000000000000000000000000000000000	3.220 (us)	98 (ns)	-P 1	000000	000000	ELS_REQUEST			Port Name+ 0000000
487 (w) 132 (w) +0 000000 E.S. PEX.EST AL_PA L4 mage-000000000000000000000000000000000000	1.704 (us)	404 (ns)	4-2	000000	000000		ELS_REQUEST		AL_PA.bt map=4000000000000000000000000000000000000
v471 (ar) 654 (m) i+ 2 000000 ELS_REGUEST Port Name: DOLDDODD 0.054 (ar) 464 (m) i+ 2 000000 ELS_REGUEST Full Name: DOLDDODD 0.054 (ar) 464 (m) i+ 2 000000 ELS_REGUEST Full Name: DOLDDODD 0.054 (ar) 464 (m) i+ 2 000000 ELS_REGUEST Full Name: DOLDDODD 0.054 (ar) 464 (m) i+ 2 000000 ELS_REGUEST AL PA bt mage=4000000000000000000000000000000000000	1.837 (us)	132 (ns)	HP 1	000000	000000	ELS_REQUEST			AL_PA bit map=4000000000000000000000000000000000000
S70 (w) 98 (w) +-1 000000 ES_FE2XEST Put Name= CDDDDDD 0.64 (un) 454 (no) +-2 000000 ES_FE2XEST AL_PA is mone=4000000000000000000000000000000000000	.471 (us)	634 (no)	4-2	0000000	000000		ELS_REQUEST		Port Name= DDDDDDD
0.654 (un) 454 (no) 4-2 000000 ELS_REST AL_PA bit moge-000000000000000000000000000000000000	9.570 (us)	98 (ns)	HP 1	000000	000000	ELS_REQUEST			Port Name= 0000000
0.107 (u) 122 (u) +0 000000 LS (sOLAST AL PA & me=-6000000000000000000000000000000000000	0.054 (us)	484 (ns)	0-2	000000	000000		ELS_REQUEST		AL_PA bit map+4000000000000000000000000000000000000
D825 (w) 658 (w) i= 2 000000 ELS_FEQUEST Full Name= DDDDDDD 9.922 (w) 107 (m) i=1 000000 000000 ELS_FEQUEST Port Name= DDDDDDDD 9.922 (w) 107 (m) i=1 000000 000000 ELS_FEQUEST Port Name= DDDDDDDD 1541 (w) 135 (m) i=1 000000 ELS_FEQUEST AL_PA bit mage=f000000000000000000000000000000000000	0.187 (us)	132 (ns)	+ 1	000000	000000	ELS_REQUEST			AL_PA.bt map=4000000000000000000000000000000000000
0.932 (un) 107 (m) → 1 000000 ELS (EXXCS1 Port Name-DODDDDD 1480 (un) 1475 (m) → 1 000000 ELS (EXXCS1 AL, PA kt mag=4000000000000000000000000000000000000	0.825 (us)	638 (ns)	it 2	000000	000000		ELS_REQUEST		Port Name= 0000000
1.408 (w) 475 (m) № - 2 000000 ELS_FEQLEST AL_PA bit mage=000000000000000000000000000000000000	0.932 (us)	107 (ns)	HÞ 1	000000	000000	ELS_REQUEST			Port Nerne= DDDDDDD
1541 (up) 132 (m) -P 1 00000 PL5 RESERVENT	1.408 (us)	475 (ns)	4− 2	000000	000000		ELS_REQUEST		AL_PA bit map=4000000000000000000000000000000000000
2400 (m) (22 (m)	1.541 (us)	132 (ns)	-P 1	0000000	000000	ELS_REQUEST			AL_PA bit map=4000000000000000000000000000000000000
2.100 (05) 9- 2 000000 000000 Port Name- 0000000	2.100 (us)	638 (ns)	4-2	000000	000000		ELS_REQUEST		Port Name= 0000000

Figure 3.1: Spreadsheet View



Figure 3.2: Frame Inspector View



Figure 3.3: Packet View



Figure 3.4: Text View

⊨h Æ D	A			Marie M Duran -
	👋 U 🤻	5 57 1		Move X-Lursor
ered Sets Fr	ame Bus (Conditions SCSI Co	mmands Protoco	Errors Ports ELS Commands GS Commands SW Commands AL Commands Exchange Performance
Туре	Port	Count	%	
Al 👻	All 👻	All 👻		
SOFi3	P4	49	1.91e-4	
EOFt	P4	115	4.49e-4	
SOFi3	P3	36	1.40e-4	
EOFt	P3	101	3.94e-4	
CLS	P4	2	7.81e-6	
CLS	P3	2	7.81e-6	
IP_F7_F7	P4	2453610	9.58	
IP_F7_F7	P3	16324	0.06	
OLS	P4	5953041	23.23	
OLS	P3	7443071	29.05	
LR	P4	4234101	16.52	
LRR	P3	13480	0.05	
SOFF	P3	131	5.11e-4	
EOFn	P3	66	2.58e-4	
SOFF	P4	132	5.15e-4	
EOFn	P4	66	2.58e-4	
LR	P3	3986050	15.56	
NOS	P4	3520	0.01	
ARB_val	P4	21	8.20e-5	
ARB_val	P3	21	8.20e-5	
LRR	P4	1520503	5.93	
SOFi3	P2	39	1.52e-4	
EOFt	P2	39	1.52e-4	
SOFi3	P1	26	1.01e-4	
EOFt	P1	26	1.01e-4	
		25624572	100.00	

Figure 3.5: Statistical Report View





You can configure the data viewer display. Toolbars are available for quick access to data viewer display features.

You can display the same data in:

- Spreadsheet view
- □ Frame Inspector View
- Packet view
- Text view
- □ Statistical Report view
- Bus Utilization View

Note: You can change the view type when opening a sample by changing the default workspace or by saving options in the **Software Setting** dialog.

Switching Views

To display the capture in any other available view, select from the View menu or from the View Type toolbar.



Figure 3.7: View Type Toolbar

After you select a view, it appears in a separate window. To increase the new window

display size, select **View > Packet View** or click the **Show/Hide Packet View** button to hide the Packet View.

When scrolling through a window display using the scroll bar, the displays in the other windows also scroll.

To rearrange the tiling, select the **Window** menu and choose **Cascade**, **Tile Horizontal**, or **Tile Vertical**.

Spreadsheet View

Spreadsheet View displays all of the Packet View fields in a time sequential spreadsheet format.

To display the Spreadsheet View of the current capture, click **View > Spreadsheet View**

or click the

button on the View Type toolbar.

irt Time	Relative Time	Port	S_D	0_0	Frame	Frame	Command	Summary
332 (us)	475 (ns) 4	⊨ 2	0000000	000000		ELS_REQUEST		AL_PA bit map=4000000000000000000000000000000000000
365 (us)	132 (ns)	+ <u>1</u>	000000	000000	ELS_REQUEST			AL_PA bit map=4000000000000000000000000000000000000
704 (us)	638 (ns) 4	⊢ 2	000000	000000		ELS_REQUEST		Port Name= DDDDDDD
311 (us)	107 (ns)	+ 1	000000	000000	ELS_REQUEST			Port Name+ DDDDDDD
291 (us)	480 (ns) 4	⊢ 2	000000	000000		ELS_REQUEST		AL_PA bit map=4000000000000000000000000000000000000
415 (us)	124 (ns)	+ 1	000000	000000	ELS_REQUEST			AL_PA bit map=4000000000000000000000000000000000000
362 (us)	647 (ns) 4	⊢ 2	000000	000000		ELS_REQUEST		Port Name= 0000000
161 (us)	98 (ns)	+ 1 ↓	000000	000000	ELS_REQUEST			Port Name= DDDDDDD
545 (us)	484 (ns) 4	E 2	000000	000000		ELS_REQUEST		AL_PA bit map=4000000000000000000000000000000000000
70 (us)	124 (ns)	+ 1	000000	000000	ELS_REQUEST			AL_PA bit map=4000000000000000000000000000000000000
417 (us)	647 (ns) 4	⊢ 2	000000	000000		ELS_REQUEST		Port Name= 0000000
515 (us)	98 (ns) -	+ 1	0000000	000000	ELS_REQUEST			Port Name= DDDDDDD
6 (us)	484 (ns) 4	F 2	000000	000000		ELS_REQUEST		AL_PA bit map=4000000000000000000000000000000000000
24 (us)	124 (ns)	+ 1	000000	000000	ELS_REQUEST			AL_PA bit map=4000000000000000000000000000000000000
767 (us)	642 (ns) 4	⊢ 2	0000000	000000		ELS_REQUEST		Port Name= 0000000
165 (us)	98 (ns) -	+ 1	0000000	000000	ELS_REQUEST			Port Name= 0000000
150 (us)	484 (ns) 4	⊢ 2	000000	000000		ELS_REQUEST		AL_PA bit map=4000000000000000000000000000000000000
182 (us)	132 (ns)	+ 1	0000000	000000	ELS_REQUEST			AL_PA bit map=4000000000000000000000000000000000000
21 (us)	638 (ns) 4	⊢ 2	000000	000000		ELS_REQUEST		Port Name= DDDDDDD
220 (us)	98 (ns) -	+ 1	0000000	000000	ELS_REQUEST			Port Name= DDDDDDD
104 (us)	484 (ns) 4	⊢ 2	000000	000000		ELS_REQUEST		AL_PA bit map=4000000000000000000000000000000000000
137 (us)	132 (ns) -	+ 1	000000	000000	ELS_REQUEST			AL_PA bit map=4000000000000000000000000000000000000
471 (us)	634 (ns) 4	⊢ 2	0000000	000000		ELS_REQUEST		Port Name= 0000000
70 (us)	98 (ns)	+ 1	0000000	000000	ELS_REQUEST			Port Name= 0000000
054 (us)	484 (ns) 4	⊢ 2	000000	000000		ELS_REQUEST		AL_PA bit map=4000000000000000000000000000000000000
187 (us)	132 (ns) -		000000	000000	ELS_REQUEST			AL_PA bit map=4000000000000000000000000000000000000
825 (us)	638 (ns) 4	E 2	000000	000000		ELS_REQUEST		Port Name= 0000000
932 (us)	107 (ns)	₽ 1	000000	000000	ELS_REQUEST			Port Name= DDDDDDD
408 (us)	475 (ns) 4	⊢ 2	0000000	000000		ELS_REQUEST		AL_PA bit map=4000000000000000000000000000000000000
541 (us)	132 (ns)	+ 1	000000	000000	ELS_REQUEST			AL_PA bit map=4000000000000000000000000000000000000
100 (us)	638 (ns) 4	⊢ 2	000000	000000		ELS_REQUEST		Port Name= DDDDDDD
282 (us)	102 (ns)	P 1	0000000	000000	ELS REQUEST			Port Name= 0000000



Save As Text/Excel

Select File > Save As Text/Excel to open the Save As Text dialog.

For Save As Type, select Text Files or Excel Files.

For Save As Range, select **All Packets** or enter a cursor range.

Enter a File Name and click Save.

Note: The Save As Excel option is available only for Spreadsheet View and Text View.

Trace Viewer Configuration

In Spreadsheet View, you can also click the **Trace Viewer Configuration** icon to display the Trace Viewer Configuration dialog. Expand the **Frame Fields, Sequence Fields, SCSI Cmd Fields, ELS Cmd Fields SW Cmd Fields, GS Cmd Fields, FICON Fields, Additional Fields, Text View and Spread Sheet View** to change the settings.

Spread Sheet View Menu Options

Right-click on any of the columns in the Spread Sheet view to display a list of menu options (see Figure 3.9).

You can also show or hide a port by right-clicking a **Port ID** in Spread Sheet View and choosing **Show** or **Hide**.



Figure 3.9: Menu Options in Spread Sheet View

Bookmark	You can create bookmarks, delete and Goto bookmarks.
Add xxx to trigger	This option is context sensitive. This option allows a quick setting of the trigger for the next recording as the item on which the right click was done.
Set Time Stamp Origin:	There are four options to set time stamp origin.
•Absolute:	Sets the time stamp to zero when the recording starts. The first time in the trace might have the time stamp larger than zero due to filtering, hiding or other reasons such as recording started in the middle of a frame.
•Trigger:	Sets time to when the trace was triggered.
•Current Position:	Sets time to the current position.
 Based on System Time: 	Sets time based on the system time.
Change Time Stamp Format:	Select options to display time stamp format.
Goto Next:	Displays options to go to the next location.
Goto Previous:	Displays options to go to the previous location.
Goto Response:	Displays options to go to the response location.

Hide:	This option is context sensitive, it displays the relevant option to hide it.
Change Background Color:	Displays colors to change the background.
Change Foreground Color:	Displays colors to change the foreground.
Software Setting:	Select options to set the software. For detailed information see "Software Settings" on page 222.
Goto:	Displays options to go to X or Y Position, Packet No., Time Stamp, Bookmark, Begin and End.

Add, Edit and Delete Columns

You can customize the columns display by adding, editing or deleting columns. Right-click on the column header and select an option. Selecting Add Columns displays the following dialog.

Image: Second system Image: Second system <td< th=""><th>New Column</th><th>•</th><th>Column Name</th><th>Column1</th><th></th></td<>	New Column	•	Column Name	Column1	
C Pre-defined Columns Column Name Remove Command Summary Field Name Layer Spec	B → SBC3 B → SMC3 B → SPC4 B → SSC2 B → OSD2 B → ADC3 C → ELS Command - ELS Command - ELS Command - Status C → SW_ILS_Command - Status C → SW_ILS_Command - Status C → SW_ILS_Command - Status C → SW_ILS_Command - Status - Status	>> << Sou Cor Cor Cor Cor Cor	Field Name Field Name Field Name Contract of Responder Responder to Originator Inbination of data And Cor Indicator	Background of BG Color G G Color Alignment :	Spec
Column Name Field Name Layer Spec Remove Command Summary Summary Spec Spec	Pre-defined Columns				
Status Frame Frame	Column Name Command Summary Status Frame Frame Frame		Field Name	Layer	Spec

Figure 3.10: Add Column to Spread Sheet View Dialog

Frame Inspector View

Frame Inspector View has lots of information that is available in Packet View, but not Spreadsheet View, so it is most useful in conjunction with the Spreadsheet View. This view has the following three tabs:

Spec View:

This view shows the Frame as it would appear in the spec, with the field names and values spelled out clearly. Fields that are too short to clearly contain the description can be viewed as tooltips by hovering the mouse over them. Some fields might have a a lowercase 'e' button at the top right corner. Pressing this button displays an 'expanded' view of the sub-fields in this field.

Field View:

This view shows, when applicable, a hierarchical display of the selected Packet, with the relevant fields in each level.

Raw Data View:

This view shows Hex, 10-bit and Running Disparity views of each dword in the selected packet.

To open a Frame Inspector View of the current capture, select View > Frame Inspector



button on the View Type toolbar.

Fra	me Inspect	or Vi	ew											
P	acket Lengl	th: 🎚	52			Bytes								
	Spec View	Fiel	d Viev	v Ra	w Dat	a View								
	Index		He	ex		B0	B1	B2	B3					
	000000	BC	B5	56	56		S0Fi3 0x6055556							
	000001	03	01	04	00	R CTL (0x03) FCCT REPLY		D ID 0x010400						
	000002	00	FF	FF	FC	CS CTL III		S ID 0xFFFFFC						
	000003	20	98	00	00	TYPE (0x20) FC-GS		F CTL 0×980000		e				
	000004	8C	00	00	00	SEQ ID 0x8C	DF CTL E	SEQ 0x0	CNT 1000					
	000005	8E	4F	00	8F	0X 0X8	ID E4F	R) Oxt	08F					
	000006	00	00	00	00		Para 0×000	meter 300000						
	000007	01	00	00	00	Rev. 0x01		IN ID 0×000000						
	800000	FC	02	00	00	GS Type (0xFC) Directory Service	GS Subtype (0x02) Name Server	Reserved 0x00	Reserved 0x00					
	000009	80	02	00	00	Cmd/Re (0×8002)	sp code GS ACC	Maximum/R 0x0	esidual Size J000					
	00000A	00	00	00	00	Fragment ID 0x00		Reserved 0x000000						
	00000B	45	9A	ЗA	A5		C 0x459	RC A3AA5						
	00000C	BC	B5	75	75		EC 0×BC	0Ft 957575						

Figure 3.11: Frame Inspector View

Raw Data View - Frame Inspector View for 64b/66b Decoding

Raw Data View in the **Frame Inspector View** window shows the exact bit stream in 66b format. In this view, a 66 bits block is reconstructed similar to the received data (see the screen capture below). The following columns are displayed in the **Raw Data View**:

- □ **Index**: This column demonstrates the index of the 66-bits symbol in current blocks.
- **Sync**: This column shows the Sync Header bits of a symbol.
- Payload: This column shows the 8 payload bytes in each symbol before scrambling.
- Scrambled: This column shows the 8 payload bytes in each symbol after scrambling.
- FEC Payload: This column shows the 8 payload bytes in each symbol after scrambling.
- **T**: This column shows the Transcode Bit of each FEC symbol.
- PN-2112 scrambled: This column shows the scrambled value of each 65-bits block with PN-2112 scrambler.
- **Parity bits**: This value (row) shows FEC parity bits of each FEC block.

Index	s	Payload [0:63]	Scrambled [0:63]	Т	FEC Payload	PN-2112 Scrambled
000015	10	1E 00 00 00 00 00 00 00	BB 44 0B CD 9F AA 78 6B	0	BB 44 0B CD 9F AA 78 6B	1 44 33 F6 5A 0B 00 D8 6B
000016	10	1E 00 00 00 00 00 00 00	EA 62 61 C3 9F 97 1C 19	0	EA 62 61 C3 9F 97 1C 19	0 20 3D 64 C2 CA 33 B2 B3
000017	10	1E 00 00 00 00 00 00 00	74 4A 46 F1 52 48 41 73	0	74 4A 46 F1 52 48 41 73	1 8B 55 ED FO FO EA 9B 59
000018	10	1E 00 00 00 00 00 00 00	4F 30 61 EB 98 22 55 8D	0	4F 30 61 EB 98 22 55 8D	1 FO CE CA 19 17 C8 FF 26
000019	10	1E 00 00 00 00 00 00 00	AA C8 3C C9 CC 01 51 34	0	AA C8 3C C9 CC 01 51 34	1 AB 3C 63 3C F3 54 FC 9C
00001A	10	1E 00 00 00 00 00 00 00	58 15 A4 1B 1D E8 DB B2	1	58 15 A4 1B 1D E8 DB B2	1 4D E5 1B 4F 1D B8 72 B8
00001B	10	1E 00 00 00 00 00 00 00	C6 9E 9A 19 F9 0C 84 D7	0	C6 9E 9A 19 F9 0C 84 D7	0 33 E1 67 B3 DB A4 2E 7D
000010	10	1E 00 00 00 00 00 00 00	E9 16 60 26 D8 64 55 97	0	E9 16 60 26 D8 64 55 97	0 BC E4 9F C9 22 1B F9 3D
00001D	10	1E 00 00 00 00 00 00 00	56 EC 2B CA D8 7E AB 4F	0	56 EC 2B CA D8 7E AB 4F	0 09 ED EB 94 8D 89 FE 52
00001E	10	1E 00 00 00 00 00 00 00	CA C3 97 B6 DC 48 DF 62	1	CA C3 97 B6 DC 48 DF 62	1 9F 96 57 49 B5 49 CF D6
00001F	10	1E 00 00 00 00 00 00 00	4A 31 7E 1D 12 D8 93 96	1	4A 31 7E 1D 12 D8 93 96	1 9F EB 81 CA BD 92 16 3C
		Parity Bits			85 76 6E D9	05 DE 96 24
liew						
	>	Pl	Ordered Set 16 G		Relative Time Duration	
		33.045 (us)	2 64		0 (ns) 308.517 (us)	

Figure 3.12: FC16 Raw Data View with FEC

S	pec View F	Field View	Ra	w Data View												
	Index	Sync (B)	Payload [0:63]			Scram	bled	[0:63]					<u> </u>	
	000000	10		78 B5 56 3	56 00	01 02	03	CE 57	98 27	37 B3	CE	F7				Ш
	000001	01		04 05 06 0	07 08	A0 00	DB	C8 FF	C1 30	BF D7	2A	48				Ш
	000002	01		CC 00 00 0	00 DD	00 00	00	AD D8	98 E9	27 FD	4C	79				Ш
	000003	01		EE 00 00 0	00 FF	00 00	00	78 FO	D8 39	37 OF	9D	OD				Ш
	000004	01		11 00 00 0	00 22	00 00	00	4C F8	60 12	18 52	4A	00				Ш
	000005	01		33 00 00 0	00 44	00 00	00	DB 8F	60 45	8C C4	46	DC				Ш
	000006	01		55 00 00 0	00 66	00 00	00	48 C4	77 12	1A 3F	93	18				1
	000007	01		77 00 00 0	00 88	00 00	00	6F 52	D6 21	F8 7E	4B	57				a l
		~					~~	20.15	~ ~ ~		~ 7	~~			<u></u>	-1
Packe	et View															>
																_
		~		P1			🐓 Frame		S_ID	050607		OX_ID: 0xDD00			-	-
		~		4.007 (us)		2		D_ID	010203		RX_ID: 0x0000				
				⇒		Fra	me_Header (H)			≡ ⇒		Data , 44 Bytes		Fill Bytes (H)		
				0	0010203	0405060	708090A0BCC00	00000DD	00 >>		FF 00	00 00 11 00 00 00 22 00 00 00 >>	•	000000		
				CRO	: (H)		Relative Time	Dura	tion							
				1020	3040	EOFt	0 (ns)	42 (ns)							
				P1			Frame		S_ID	050607		OX_ID: 0xDD00				-
1															Þ	

Figure 3.13: FC16 Raw Data View without FEC

Packet View

Packet View displays the captured data interpreted as packets in a hierarchical view.



To display the Packet View, select **View > Packet View** or click the **button** on the View Type toolbar.



Figure 3.14: Packet View

Text View

Text View (Frame List View) displays the captured data interpreted as transaction frames, grouped in columns by port.

To display Text View, select **View > Text View** or click the Type toolbar.



button on the View

Time Stamp	Port	All Lanes	1	2	S_ID	D_ID	Speed
.515 (us)	1	LISM	LISM		000000	000000	4 G
(us)	2	LIFA		LIFA	000000	000000	4 G
.124 (us)	1	LIFA	LIFA		000000	000000	4 G
8.767 (us)	2	LISM		LISM	000000	000000	4 G
3.865 (us)	1	LISM	LISM		000000	000000	4 G
.350 (us)	2	LIFA		LIFA	000000	000000	4 G
.482 (us)	1	LIFA	LIFA		000000	000000	4 G
1.121 (us)	2	LISM		LISM	000000	000000	4 G
1.220 (us)	1	LISM	LISM		000000	000000	4 G
1.704 (us)	2	LIFA		LIFA	000000	000000	4 G
3.837 (us)	1	LIFA	LIFA		000000	000000	4 G
1.471 (us)	2	LISM		LISM	000000	000000	4 G
1.570 (us)	1	LISM	LISM		000000	000000	4 G
0.054 (us)	2	LIFA		LIFA	000000	000000	4 G
0.187 (us)	1	LIFA	LIFA		000000	000000	4 G
0.825 (us)	2	LISM		LISM	000000	000000	4 G
0.932 (us)	1	LISM	LISM		000000	000000	4 G
1.408 (us)	2	LIFA		LIFA	000000	000000	4 G
1.541 (us)	1	LIFA	LIFA		000000	000000	4 G
2.180 (us)	2	LISM		LISM	000000	000000	4 G
2.282 (us)	1	LISM	LISM		000000	000000	4 G
2.758 (us)	2	LIFA		LIFA	000000	000000	4 G
2.891 (us)	1	LIFA	LIFA		000000	000000	4 G
3.530 (us)	2	LISM		LISM	000000	000000	4 G
3.637 (us)	1	LISM	LISM		000000	000000	4 G
4.112 (us)	2	LIFA		LIFA	000000	000000	4 G
4.245 (us)	1	LIFA	LIFA		000000	000000	4 G
4.892 (us)	2	LISM		LISM	000000	000000	4 G
4.991 (us)	1	LISM	LISM		000000	000000	4 G
5.471 (us)	2	LIFA		LIFA	000000	000000	4 G
5.595 (us)	1	LIFA	LIFA		000000	000000	4 G
6.242 (us)	2	LISM		LISM	000000	000000	4 G
6.341 (us)	1	LISM	LISM		000000	000000	4 G
6.825 (us)	2	LIFA		LIFA	000000	000000	4 G
6.950 (us)	1	LIFA	LIFA		000000	000000	4 G
7.597 (us)	2	LISM		LISM	000000	000000	4 G

Figure 3.15: Text View

Bus Utilization View

The Bus Utilization View displays the bus utilization activity. You can select a graph area to view the bus utilization of that area.

To display Text View, select **View > Text View** or click the **button** on the View Type toolbar.



Figure 3.16: Bus Utilization View

Statistical Report View

Statistical Report View displays the statistics of the captured data. For additional information see "Statistical Report Toolbar" on page 199.

To display Statistical Report View, select View > Statistical Report View or click the



button on the View Type toolbar.

	ነ 👻 Ծ י			Move X-Lursor
lered Sets F	Frame Bus I	Conditions SCSI C	ommands Protoco	I Errors Ports ELS Commands GS Commands SW Commands AL Commands Exchange Performance
Туре	Port	Count	%	
All 👻	All 👻	All 👻		
SOFi3	P4	49	1.91e-4	
EOFt	P4	115	4.49e-4	
SOFi3	P3	36	1.40e-4	
EOFt	P3	101	3.94e-4	
CLS	P4	2	7.81e-6	
CLS	P3	2	7.81e-6	
IP_F7_F7	P4	2453610	9.58	
IP_F7_F7	P3	16324	0.06	
OLS	P4	5953041	23.23	
OLS	P3	7443071	29.05	
LR	P4	4234101	16.52	
LRR	P3	13480	0.05	
SOFF	P3	131	5.11e-4	
EOFn	P3	66	2.58e-4	
SOFF	P4	132	5.15e-4	
EOFn	P4	66	2.58e-4	
LR	P3	3986050	15.56	
NOS	P4	3520	0.01	
ARB_val	P4	21	8.20e-5	
ARB_val	P3	21	8.20e-5	
LRR	P4	1520503	5.93	
SOFi3	P2	39	1.52e-4	
EOFt	P2	39	1.52e-4	
SOFi3	P1	26	1.01e-4	
EOFt	P1	26	1.01e-4	
		25624572	100.00	

Figure 3.17: Statistical Report View

Customize Display

Show/Hide Port

You can simplify the viewer display by hiding the captures of ports. All active ports are highlighted on the Show/Hide Ports toolbar. Click a port button to hide the capture for that port.



Figure 3.18: Show/Hide Ports Toolbar

Show/Hide Field

You can simplify the Viewer display	y by hiding fields. Click the Filtering Setup
button on the top toolbar to Show	/Hide items.

Filter Options	
Bus Condition	0x6
Ordered Sets	0x7
Source Address ID	
Destination Address ID	0x94
Pair Addresses	0x95
Originator Exchange ID	0x96
Besponder Exchange ID	
SCSI Commands	
Task Management Europions	
SCSI Command Status	
	0x9E
Extended Link Service Bequest	0x8E4B
Extended Link Service Beolu	0x8E4C
	0x8E4D
Basic Link Service	
Switch Eabric Bequest	
Switch Eabric Benly	□ 0×8E50
ECP Information Unit	0x8E51
Generic Service Bequest	□ 0x8E52
Generic Service Beply	0x8E53
Link Control Frame	0x8E58
Miscellaneous	0x8E59
 Incomplete Exchange	0x8E5A
FiCon Information Unit	0x8E5B
ElEiCon Command	
FiCon Control Function	
EiCon Link Control Eurotion	1
Filter Type	Filter Logic
Hide O Show	C AND Belated Items
Ports	
	• OR
✓ P2 ✓ P4	Filter descending packets
Reset All Check All	

Figure 3.19: Show/Hide Field

Note: Only the fields previously hidden appear in the restore list.

9	Filtering	Setu

Related Frames

Right-click a frame to open a short-cut menu, then choose **Goto** to jump to a related frame in the viewer.

Add Bookmark	
Show Field Hide Field	
Add to Trigger	
Expand All	
Set Time Stamp Origin Change Time Stamp Format	
Goto Next Goto Previous Color	
Software Setting	
Goto	Trigger Position X Position Y Position Packet No Time Stamp Bookmark Begin End

Figure 3.20: Goto Command

Choose Data Format

You can display data values either in hexadecimal (default) decimal, binary, name and ASCII. To choose data format, right-click the mouse over a data field, and choose **Format** and the format.



Figure 3.21: Format

Data Payload View

To display Data Payload dialog click on the **Data Payload** button in a data payload packet, (see Figure 3.22 on page 177).



Data Payload button

Figure 3.22: Data Payload Button Within the Data Payload Packet

The following Data Payload dialog is displayed.

Data Payload 🔀												
Layer : SCS Packet No.	il Cmd : 15				Find	۰	Hex	o ascii	Byte cou	unt in da	ita : 🛛 🗶	
	Hexadecimal						ASCII					
0000 : 0000	0000 0000000	00000000	00000000	00000000	00000000		0000		0000	0000	0000	
0018 :00000	0000 0000000	00000000	00000000	00000000	00000000		0000				0000	
0030 :00000	0000 0000000	00000000	00000000	00000000	00000000		0000				0000	
0048 :00000	0000 0000000	00000000	00000000	00000000	00000000		0000				0000	
0060 : 00000	0000 0000000	00000000	00000000	00000000	00000000		0000		0000		0000	
0078 :00000	0000 0000000	00000000	00000000	00000000	00000000		0000		0000	0000	0000	
0090 : 00000	0000 0000000	00000000	00000000	00000000	00000000		0000		0000	0000	0000	
0000: 8400	0000 0000000	00000000	00000000	00000000	00000000		0000		0000	0000	0000	
0000 : 00000	0000 0000000	00000000	00000000	00000000	00000000		0000		0000	0000	0000	
0008 :0000	0000 0000000	00000000	00000000	00000000	00000000		0000		0000	0000	0000	
00F0 :00000	0000 00000000	00000000	00000000	00000000	00000000		0000		0000	0000	0000]
0108 :00000	0000 00000000	00000000	00000000	00000000	00000000		0000		0000	0000	0000	
0120 :00000	0000 0000000	00000000	00000000	00000000	00000000		0000		0000	0000	0000	
0138 :00000	0000 0000000	00000000	00000000	00000000	00000000		0000		0000	0000	0000	
0150 :00000	0000 0000000	00000000	00000000	00000000	00000000		0000		0000	0000	0000	1
0168 :00000	0000 00000000	00000000	00000000	00000000	00000000		0000		0000	0000	0000	
0180 :00000	0000 0000000	00000000	00000000	00000000	00000000		0000		0 0000	0000	0000	1
0198 :00000	0000 00000000	00000000	00000000	00000000	00000000		0000		0000	0000	0000	
01B0 :00000	0000 0000000	00000000	00000000	00000000	00000000		0000		0000	0000	0000] .
01C8 :00000	0000 0000000	00000000	00000000	00000000	00000000		0000		0 0000	0000	0000	.
Export										Clos	e	

Compare Two Data Payloads



To display data payloads, click the

Show compare 2 Data Payloads icon on the toolbar. This icon is active only when two data payloads packets are selected (Figure 3.23 on page 178).

2 LeCroy FC Protocol Suite - [Trace]							
🗔 File Edit View Configuration Project Set	up Filtering Tools Window Help						
Data View							
Hex O ASCII							
Layer: SCSI Cmd	Layer: SCSI Cmd						
Packet No: 1	Packet No: 2						
0000 :580688BB 309C3F7C 77D3542A	0000 :FA52AB9E 4B0D45E6 9BCF35E9	A					
000C :462147B2 CBCF3EEA 33D74A74	000C : EBD4BDE0 7E15C517 0D213A29						
0018 :2E9EF4F7 18543D2F 58200176	0018 :A21F497D 9B2D05B7 51DB2574						
0024 :F2F62277 130C22AD F8BEE341	0024 :FAF24056 CAD81929 A1DB305D						
0030 :3A5FFB73 296A37A4 8E84BFED	0030 :D6646D5B 285AEBC7 E3E1FC7A						
003C : 3F9A0F5B D70A0625 6ECC18D2	003C :CE6596A1 248BD89F 47E5436A						
0048 :41B9CEFE DB597AE3 4B83CCB6	0048 :274034E6 D0A36745 35C0D48F						
0054 :4605F236 7A78AC54 5ED75939	0054 :1A3AC0B2 21EEC9CA 86ED2850						
0060 :2B36C3FC 831D806E 16BC75E6	0060 :44726704 4E9075C6 B665C7A5						
006C :29A0EAD8 2E06AD98 8B319D66	006C :B2531401 DD67AF27 1A1CA3D4						
0078 :CE39A98F F3654E00 EC8593A8	0078 :28CB7535 41C2F1F5 09187959						
0084 :F80BF184 5C719394 4AD6BE2A	0084 :1CBB29F1 3512EB8F 65078565						
0090 :F0828939 745CE5B8 59EE29F7	0090 :6AD317B3 7B7C77F0 520E4861						
009C :3547F4BF 8392CB20 6801A172	009C :A2437502 8B669EDA 4127CCC0						
00A8 :62AA3DOF 5D67EEF4 CF84D4FA	00A8 :27B11B12 50AE94F6 01D39DE6						
00B4 :1B46F3DF 425062A0 0FB7A034	00B4 : E9AD500D 3A8EE0F6 F10AC9AB						
00C0 :3B94E1DB 3506FC70 687BF1A8	00C0 :B65695BA EC2E331F F493CC14						
00CC :10615B43 0B9E64A7 E04664A7	00CC :488CE2FE 3807B39E 243D5FFD						
00D8 :FBD0E640 036018B0 C3647403	00D8 :6464EB3D 9CC7EAB8 42F1318B						
00E4 :DF4B8F92 0D10AF87 963F3D98	00E4 :736DDE82 300787F5 5865B6F0						
00F0 :B0B5D42B E94567A6 D16D2136	00F0 :6BF33F1B 295554C7 F8B64760						
00FC :041D2BD7 06DF985F 7974E538	OOFC :04B0209B DBD77E0F 863BB8F2						
0108 :B89A029F DB00AC6B E30CDEB2	0108 :D7AB32D3 4738E6B2 354D18B2						
0114 :E753202C D176CDF2 9260DFF5	0114 :C4100E12 E63C8DB2 D955A11E						
0120 :0CA8C45A A8849CA2 196C8BD0	0120 :96450A31 1F000849 6BB6FAD7						
012C :7F61BEF0 549F271C 107FE45A	012C :7EF2668C 43DF6CA6 F2BDCC80						
0138 :589C7336 8039ADD0 DCB33C1C	0138 :A53CF37F 7EA23FBF A8047611						
0144 :DAA62AE4 1FD683C3 3D577388	0144 :4EF2F0B8 241F3C53 FC12DE62						
0150 :AE68B1C5 DA62B7E1 BD41E48E	0150 :SDCFA8AD 45B6FD49 C16D75EF						
015C : 6F183CB0 71858D3D C1112FBA	015C :7DE3A2E8 163387EC 80B3DAF1						
0168 :D05B164B A860B6D8 A1EE37A9	0168 :50D4457E 5071CDB3 B07A7CC9						
0174 :823E81F7 0578A673 3416680F	0174 :BEEDD276 00BE128A 643C10C2	· \					
0100 - FFADODEC 05700410 ESECEDS	0100 - 94580500 DECA7987 20110000	Example of two data					
		- payload packets					
X to Y : 0 (ns) X to T : 1.490.571 (ms) Y to T : 1.490.	.571 (ms) Begin to End : 8.945.940 (ms) 🖕	payroad packets					
-							

Figure 3.23: Two Data Payload Packets

To compare two data payloads, select two different payload packets, right-click and select one as **Set As Reference Data Payload** and select the other as **Set As Second Data Payload**. You can compare two data payloads in Packet View or a related frame in Text View or Spreadsheet View to display a menu.



Figure 3.24: Set Reference and Second Data Payload Packets

Port Status

You can get an overview of the active ports by clicking the **Port Status** button at the bottom right of the application window.



The Port Status displays the Port, Speed, and Function.

In addition to displaying Link, Frame, and Error, a display showing the% buffer full opens when a trigger occurs. The Error, Trigger and Buffer indicator columns are displayed only when recording.

Port status											
R E S	Port	Port Speed Function			k Frame Error Trigger			Buffer indicator			
	P1 P2	8 G	4	0							
E T	P3 P4	4 G	4	0	0			0%			
Po	Port status										
Г	Port	Speed	Function	Link	Frame	Error	Trigger	Buffer indicator			
BES	P1 P2	8 G	4	0	0			21%			
E	P3 P4	4 G	4	0	0			21%			
]'*							>>> >>>			
Po	ort statu	5						×			
Γ	Port	Speed	Function	Link	Frame	Error	Trigger	Buffer indicator			
R E S E T	P1 P2	8 G	4	0	0			100%			
	P3 P4	4 G	4	0	0			100%			

Figure 3.25: Port Status Window Displaying Buffer Indicator

Note: If sample capture occurs with more than one unit active, additional Port Status windows display.
Toolbars

Enabling Tool Bars

To customize the Viewer Display workspace, you can enable and reposition the available toolbars. To display or hide toolbars, select **View > Toolbars**, then check or uncheck toolbars.



Figure 3.26: Customizing the Toolbar

Toolbars are:

- Main
- Viewer Setting
- Advance Mode
- Trace Viewer
- □ Show Layer
- Show View
- □ Show Channels (Unit 1, Unit2, and so on)
- Cursor Position

Once enabled, the toolbars can dock at the Viewer Display window or float on the windows desktop.

Main Toolbar

See "Software Menus and Toolbar" on page 37.

View Type Toolbar

See "Switching Views" on page 164.

Viewer Toolbar

The Viewer toolbar allows searching, filtering, collapsing/expanding, and data reporting.





The **Search** button opens the search dialog (see "Search" on page 214).



The **Filtering Setup** button opens the Filter dialog (see "Filtering" on page 206) and allows you to specify the criteria for filtering the result.



The **Enable Disable Filtering** button toggles the result between a filtered and unfiltered view (see "Filtering" on page 206).



The Hide All Ordered Sets button hides all the ordered sets.



The **Pack Repeated Ordered Sets** button toggles packing repeated ordered sets in one port.



The **Expand/Collapse all Layers** button expands or collapses Transport and Application layers to simplify results display.



The down arrow on the **Go To** button allows location of cursors or specific packets: Trigger Position, X Position, Y Position, Packet Number, Timestamp, Bookmark, Begin, and End.

Destination Address	SCSI Specs
	MMC6
	SMC3
0xFFFC61	USD2
0x610000	ADC3
. Add	to Assigned List
Assisted CCCL Cases	
N PORT	SPC2
EVENT	SBC3
MULTI_CAST	SBC3
SEC KEY	SBC3

The SCSI Spec Assignment button displays the SCSI Spec Assignment dialog.

Viewer Setting Toolbar

The Viewer Setting toolbar allows wrapping, zooming, and configuration





The **Full Screen** button on the Viewer Setting Toolbar increases the data display area to the full screen.



The **Zoom In** button on the Viewer Setting Toolbar magnifies the data display area on the screen. Clicking this button in Column or Text View increases column width only.



The **Zoom Out** button on the Viewer Setting Toolbar scales the data display area to display more data lines on the screen. Clicking this button in Column or Text View decreases column width only.



The **Normal Zoom** button on the Viewer Setting Toolbar resets the zoom to default normal on the screen. Clicking this button in Column or Text View resets column width only.



The **Wrap Packets** button on the Viewer Toolbar wraps the packet data in the display to eliminate the need for horizontal scrolling.



The **View Setting** button on the Viewer Setting Toolbar opens the Sample Viewer Configuration dialog (see "Display Configuration" on page 217).

Cursor Position Status Bar

To display the cursor position status bar, select View>Toolbars > Cursor Position.

Figure 3.27: Cursor Position Toolbar

See "Using Cursors and Bookmarks" on page 210.

Show Layer Toolbar

The Show Layer toolbar shows or hides packet types.



F	ŗ	a

The **Show/Hide Frame Packets** button displays/hides the frame packets layer.



The **Show/Hide Sequence Packet** button displays/hides the sequence packet.



The **Show/Hide All of Commands Packet** button shows/hides the Command layer and all layers below.



The **Order/Reorder Packets based on Time** button toggles the time order of packets.

Status Bar

The Status bar is located at the bottom of the main display window. Depending on the current activity, the bar can be divided into as many as four segments.

Recording Progress

When you begin recording, the left-most segment of the Status Bar displays a Recording Progress Indicator.

As recording progresses, the Progress Indicator changes to reflect the recording progress graphically:

In the Progress Indicator, a black vertical line illustrates the location of the Trigger Position you selected in Recording Options.

- Pre-Trigger progress is displayed in the field to the left of the Trigger Position in the before-Trigger color specified in the Display Options.
- □ When the Trigger Position is reached, the progress indicator wiggles as it waits for the trigger.
- □ After the trigger occurs, the field to the right of the Trigger Position fills in the after-Trigger color specified in the Display Options.
- □ When recording is complete, the upper half of the progress indicator fills in white, indicating the progress of the data upload to the host computer.

You should be aware of two exceptional conditions:

- If a Trigger Event occurs during the before-Trigger recording, the before-Trigger color changes to the after-Trigger color to indicate that not all the expected data was recorded pre-Trigger.
- □ When you click **Stop** before or after a Trigger Event, the Progress Bar adjusts accordingly to begin uploading the most recently recorded data.

The Progress Bar fills with color in proportion to the specified size and actual rate at which the hardware is writing and reading the recording memory. However, the Progress Indicator is normalized to fill the space within the Status Bar.

Recording Status

During recording, the current Recording Status is displayed in the next segment. When you activate the **Record** function, this segment flashes one of the following messages (depending on the selected Recording Options):

- □ Trigger?
- □ Triggered!
- □ Uploading

After recording stops,

- □ The flashing message changes to **Uploading data**-*x*% **done** (x% indicates the percentage completion of the data uploading process).
- The traffic data is copied to disk (overwriting any previous version of this file) using the default file name data[sn].fcs where [sn] is the serial number of the analyzer chassis; or the name you assign as the default filename. You can also create a file name of your choice by specifying one in the Recording Options dialog box.

To abort the upload process:

Derverse Press Esc on your keyboard

OR

□ Again click **I** in the Toolbar.

You are asked if you want to keep or discard the partially uploaded data.

When the data is saved, the Recorded Data file appears in the main display window and the Recording Status window is cleared.

- □ If the recording resulted from a Trigger Event, the first packet following the Trigger (or the packet that caused the Trigger) is initially positioned second from the top of the display.
- □ If the recording did not result from a Trigger Event, the display begins with the first packet in the traffic file.

Recording Activity

During recording, the fourth segment from the left of the Status Bar displays Recording activity as a series of vertical bars.

The more vertical bars that are displayed, the greater the amount of activity being recorded. If there are no vertical bars, there is no recorded activity.

During uploading, the percent of the completed upload is displayed.

Note: If packets are filtered from the recording or data are truncated, the recording activity is reduced.

Search Status

The right most segment displays the current search direction: **Fwd** (forward) or **Bwd** (backward). Change the search direction from the Search Menu or double-click the Search Status segment.

Statistical Report

Whenever a captured sample is in the Trace Viewer, a **Statistical Report** selection in the **Report** menu and a **Statistical Report Button** on the viewer toolbar are enabled. You can create a Statistical Report for the entire capture or select a portion of it.

To display a Statistical Report, click the **Statistical Report** button on the viewer toolbar or select **Report > Statistical Report** to display the Select Statistical Report Range dialog.

Select Sta	tistical Rep	ort Range		×
C All Sa	mples			
C From	X-Cursor	To T-Cursor	Y	
From	Sequence	▼ No 1	To Frame 💌 No 1	
		ОК	Cancel	

Figure 3.28: Statistical Report Range Dialog

The default statistical report has All Samples. You can set a specific Statistical report range between defined cursor positions or Events.

Report between Cursors

Click the option button next to the **From** cursor selection drop down list. Then click the **From** down arrow and choose the 1st cursor, click the **To** down arrow to choose the 2nd cursor, and click **OK**. The resulting report has only the capture between the cursors.



Figure 3.29: Report between Cursors

Report between Events

Click the option button next to the **From** the Event selection dropdown list, click the **From** down arrow to choose the 1st Event, then enter the number of its occurrence. Next click the **To** down arrow to choose the 2nd Event, then enter the number of its occurrence.

Select Sta	tistical Report Range
C All San	nples
C From	X-Cursor 💌 To T-Cursor 💌
From	Frame No 1 To Frame No 1
	Frame Sequence SCSI Cmd GK Cancel GS Cmd

Figure 3.30: Report between Events

Click **OK.** The resulting report are limited to the capture between the defined Events.

Statistical Report Content

A complete statistical report consists of the following reports, accessed by clicking the corresponding tab in the dialog. The Bus Conditions and Protocol Errors tabs appear only if there are any changes to the bus condition in the trace or if there are any protocol errors.

- Ordered Sets
- Frame
- Bus Conditions
- SCSI Commands
- Protocol Errors
- Ports
- Pending IO
- ELS Commands
- □ GS Commands
- □ AL Commands
- Exchange Performance

Note: Results are displayed only for items that have been captured in the sample.

The data in the Statistical Report can be sorted in ascending or descending order by clicking on the column header.

Report Options

Some report categories offer options to display only specific items. These report categories incorporate drop-down list boxes offering pre-defined and custom options. For details see "Formatting the Statistical Report View" on page 202.

Ordered Sets

To display the Ordered Sets, click the **Ordered Sets** tab. The Ordered Sets Report displays report data shown in the following screen shot. The report displays the following information:

- **Type:** All, Custom, SOFn3, EOFn, EOFt, SOFi3
- **Port**: The ports that are selected
- **Count**: All, Custom, or a number of occurrences
- □ %: Percent of total count

Sta	tistical Re	por	t View			
	🖹 🕌 🗧	6 🖸	እ 🌺 🗘	₽ => 1	of 8639104.000000	LIP_F8_F7 Orde
	Ordered Set	s	Frame Bus	s Conditions SCSI (Commands Protocol	Errors Ports I
	Туре		Port	Count	%	
	All	-	All 👻	All 👻		
	All		P4	8639104	15.13	
	Custom		P2	86390	0.15	
	LIP_F8_F7		P1	86249	0.15	
			P3	40437902	70.81	
	SOFi3	-	P1	41	7.18e-5	
	EOFt		P1	41	7.18e-5	
	SOFi3		P2	54	9.46e-5	
	EOFt		P2	54	9.46e-5	
	LIP_F7_F	7	P3	722416	1.26	
	170 53 5	-		1010	0.40 0	

Figure 3.31: Ordered Sets Statistical Report View

Frame Report

To display the Frame Report, click the **Frame** tab. The report gives the statistics of the frame. The following information is displayed in this report:

- Depart: The ports that are selected
- □ Source ID: All, Custom and other
- Destination ID: All, Custom and other
- **Type**: Select from the dropdown list
- **Count**: All, Custom, or a number of occurrences
- □ %: Percent of total count

Sta	tistical Re	port View					
	🖹 📲 🗧	ð 🖪 🍣 1	0€ => [1	of 1 P1 Frame			
	Ordered Se	ts Frame E	}us Conditions S	CSI Commands Proto	col Errors P	orts ELS	6 (
	Port	Source ID	Destination ID	Туре	Count	%	
	All 👻	All 💌	All 👻	All 👻	All 👻		Γ
	P1	Al 🔺	F_PORT	ELS_REQUEST	1	0.48	
	P2	Custom	610000	ELS_REPLY	1	0.48	
	P1		DRCTRY	ELS_REQUEST	1	0.48	
	P1	F_PORT	FABRIC	ELS_REQUEST	1	0.48	
	P2		610000	ELS_REPLY	1	0.48	
	P1	610000	DRCTRY	FCCT_REQUEST	5	2.40	
	P2	FABRIC	610000	ELS_REPLY	1	0.48	
	P2	FFFC61	610000	ELS_REQUEST	3	1.44	
	54	440000	EFF CCA	FLC DEDLY			

Figure 3.32: Frame Statistical Report

Bus Conditions Report

To display the Bus Conditions Report, click the **Bus Conditions** tab. The Bus Conditions Report displays the conditions of the bus. The following information is displayed in this report:

- **Port**: The ports that are selected
- **Type:** All, Custom, Disconnect, Connect
- **Count**: All, Custom, or a number of occurrences
- %: of total count

Note: The Bus Conditions tab appears only if there are any changes to the bus condition in the trace.

> -∢		P2		🖗 Frame	DISC	ONNECT					
		6.143.175.4	50 (s)	1008							
		P2		🕏 Frame	CON	NECT					
		7.333.186.1	'44 (s)	2070							
₽≪		P2		ELS Cmd	4 G	S_ID: 0000EF	OX_ID: 0xFFFF	Loop Initialization Identifier	Metrics +		
		7.552.279.9	28 (s)	1		D_ID: 0000EF	RX_ID: 0xFFFF	0x11010000 : LISM			
₽≪		P2		🐓 ELS Cmd	4 G	S_ID: 0000EF	OX_ID: 0xFFFF	Loop Initialization Identifier	Metrics +		
		7.552.281.9	81 (s)	2		D_ID: 0000EF	RX_ID: 0xFFFF	0x11010000 : LISM			
₽≪		P2		👂 ELS Cmd	4 G	S_ID: 0000EF	OX_ID: 0xFFFF	Loop Initialization Identifier	Metrics +		
		7.552.284.0	34 (s)	3		D_ID: 0000EF	RX_ID: 0xFFFF	0x11010000 : LISM			
		P2		🖗 ELS Cmd	4 G	S_ID: 0000EF	OX_ID: 0xFFFF	Loop Initialization Identifier	Metrics +1		
		7.552.286.0	82 (s)	4		D_ID: 0000EF	RX_ID: 0xFFFF	0x11010000 : LISM			
+K		P2		🐓 ELS Cmd	4 G	S_ID: 0000EF	OX_ID: 0xFFFF	Loop Initialization Identifier	Metrics +		
1		7.552.288.1	35 (s)	5		D_ID: 0000EF	RX_ID: 0xFFFF	0x11010000 : LISM			
T		P2		👂 ELS Cmd	4.0	S_ID: 0000EF	OX_ID: 0xFFFF	Loop Initialization Identifier	Metrice +		
-re		7.552.290.1	88 (s)	6	40	D_ID: 0000EF	RX_ID: 0xFFFF	0x11010000 : LISM	filencs +		
-		P2		🔹 ELS Cmd	10	S_ID: 0000EF	OX_ID: 0xFFFF	Loop Initialization Identifier	Matrice III		
+ K		7.552.292.2	41 (s)	7	46	D_ID: 0000EF	RX_ID: 0xFFFF	0x11010000 : LISM			
-		P2		🔗 ELS Cmd	10	S_ID: 0000EF	OX_ID: 0xFFFF	Loop Initialization Identifier			
+K		7.552.294.2	90 (s)	8	4 G	D_ID: 0000EF	RX_ID: 0xFFFF	0x11010000 : LISM	Metrics +		
L,		P2		🖉 ELS Cmd		S_ID: 0000EF	OX_ID: 0xFFFF	Loop Initialization Identifier			
₽≪		7.552.296.3	42 (s)	9	4 G	D_ID: 0000EF	RX_ID: 0xFFFF	0x11010000 : LISM	Metrics +		
cal Repo	ort View									 	
28	🗟 🍣 🕆 🖥	, ⇒	of 1 P2	Bus Conditions			Move X-Cursor 👻				
ered Set	s Frame Bust	Conditions	6CSI Command	s Protocol Errors	Ports	AL Commands	Pending IO Exchange I	Performance			
Port	Type	Count	%								
	All										
P2	Disconnect	1	50.00								
PZ	Connect	1	50.00								

Figure 3.33: Bus Conditions Statistical Report

SCSI Commands Report

To display the SCSI Command Report, click the **SCSI Command** tab. The SCSI Command Report displays data shown in the screen capture below. The following information is displayed in this report:

- **Port**: The ports that are selected
- Source ID
- Destination ID
- □ **Type**: All, Custom, Report LUNs, Inquiry, Read Capacity (10), Read (10), Mode Sense (6)
- Dev Payload Size: All, Custom, or a number of Dwords
- □ Seq No: All, Custom and other
- **Status**: All, Custom, Good, Check Condition
- Duration: All, Custom and other
- **Count**: All, Custom, or a number
- □ %: of total count

tistical Re	port View									
3 🔡 é	ð 🙆 🗳 ·	ዮ ቶ ➡ 🔲	of 1 P3 SCSI Comm	nands		Move X-Cursor	•			
Ordered Set	ts Frame I	Bus Conditions	SCSI Commands Protocol	Errors Ports	ELS Command	ls 🛛 GS Commands 🗍 A	L Commands Exchange	e Performance	1	
Port	Source ID	Destination ID	Туре	Payload Size	Seq No	Status	Duration	Count	%	
All 👻	All 👻		All 👻	All 👻	All 👻	All 👻	All 👻	All 👻		
P3	FFFC61	610180	Inquiry	36	3	Good	925.714 287 ns	1	2.70	
P1	610000	610180	Report LUNS	16	3	Good	218.571 429 ns	1	2.70	
P3	610000	610180	Report LUNS	16	3	Good	857.142.858 ns	1	2.70	
P1	610000	610180	Inquiry	36	3	Good	231.428 572 ns	1	2.70	
P3	610000	610180	Inquiry	36	3	Good	925.714 287 ns	1	2.70	
P1	610000	610180	Inquiry	16	3	Good	420.000 001 ns	2	5.41	
P3	610000	610180	Inquiry	16	3	Good	1.697 143 us	2	5.41	
P1	610000	610180	Inquiry	24	3	Good	210.000 000 ns	1	2.70	
P3	610000	610180	Inquiry	24	3	Good	874.285 716 ns	1	2.70	
P1	610000	610180	Read Capacity (10)	0	2	Check Condition	184.285 715 ns	1	2.70	
P3	610000	610180	Read Capacity (10)	0	2	Check Condition	737.142.858 ns	1	2.70	
P1	610000	610180	Read Capacity (10)	8	3	Good	814.285 715 ns	4	10.81	
P3	610000	610180	Read Capacity (10)	8	3	Good	3.205 714 us	4	10.81	
P1	610000	610180	Read (10)	512	3	Good	4.748 571 us	6	16.22	
P3	610000	610180	Read (10)	512	3	Good	19.080 000 us	6	16.22	
P1	610000	610180	Mode Sense (6)	24	3	Good	227.142 857 ns	1	2.70	

Figure 3.34: SCSI Command Report

Protocol Errors Report

To display the Protocol Errors Report, click the **Protocol Errors** tab. The Protocol Errors Report displays the protocol error data. The following information is displayed in this report:

- **Port**: The ports that are selected
- **Type**: All, Custom, Symbol Violation, Disparity Error, Primitive Error
- **Count**: All, Custom, or other
- □ %: of total count

Note: The Protocol Errors tab appears only if there are any protocol errors in the trace.

Sta	tistical Re	port View			
	🗟 🔡 🧉	rotocol Errors			
	Ordered Sel	ts Frame Bus Condit	ions SCSI C	ommands	Protocol Errors
	Port	Туре	Count	%	
		All 👻	All 👻		
	P3	Disparity Error	3	42.86	
	P3	Primitive Error	2	28.57	
	P3	Alignment Error	1	14.29	
	P3	Symbol Violation	1	14.29	
			7	100.00	

Figure 3.35: Protocol Errors Report

Ports Report

To display the Ports Report, click the **Ports** tab. The Ports Report displays data of the ports. The following information is displayed in this report:

- **Port**: The ports that are selected
- SCSI Count
- ELS Count
- GS Count
- SW Count
- AL Count
- □ Incomplete Count
- Total XFer
- Utilization
- Utilization %

Sta	itatistical Report View													
[2 🔡 🗧) 🕹 🕹 🗘	· û ⇔ [1 of 3	P3 Protocol	Errors		Move X-C	Cursor					
	Ordered Sets Frame Bus Conditions		is Conditions	SCSI Comm	Commands Protocol Errors Ports ELS Commands GS Commands AL Commands Exchan									
[Port	SCSI Count	ELS Count	GS Count	SW Count	AL Count	Incomplete Count	Total XFer	Utilization	Utilization %				
	All 👻													
	P4	0	3	2	0	18	0	0	162.712.012 ms	17.88				
	P2	0	7	0	0	0	0	0	414.115 715 us	0.05				
	P1	34	14	18	0	0	0	6296	409.928 572 us	0.05				
	P3	36	13	0	0	18	0	6368	746.687 332 ms	82.03				
		70	37	20	0	36	0	12664	0.910223	100.00				

Figure 3.36: Ports Report

Pending IO Report

To display the Pending IO Report, click the **Pending IO** tab. The Pending IO Report displays data of the pending IOs. The following information is displayed in this report:

- **Port**: The ports that are selected
- Pending IO
- □ Max. Pending IO
- □ Avg. Pending IO

Sta	tistical Rep	ort View				×
	🖻 🔡 é	5 🗟 🌺	순 ♣ 🕈 1		Move X-Cursor	
	Ordered Se	ets Frame	SCSI Commands Pro	tocol Errors Ports	Pending IO Exchange Performance	
	Port	Pending IO	Max. Pending IO	Avg. Pending IO		
	All 👻					
	P4	3000>0×6	1 6	3.18		
	P6	3000>0×6	1 6	3.18		
	P9	3000>0×6	1 6	3.18		
	P4	3000>0×6	1 2	2.00		
	P8	3000>0×6	1 2	2.00		
1						
-						
1	to Y : 0 (n	s) X to T : () (ns) Y to T : 0 (ns)	Begin to End : 1.	1.993.414.007 (s) 🗸	
Re	ady				Signals Disabled Simulation Stop 🥥 🤪	NUM

Figure 3.37: Pending IO Report

ELS Commands

To display the ELS Commands Report, click the **ELS Commands** tab. The ELS Commands Report displays the ELS Commands data. The following information is displayed in this report:

- Depart: The ports that are selected
- □ Source ID: All, Custom, FABRIC, and other
- Destination ID: All, Custom Fabric and other
- **Type**: All, Custom, and other
- **Response Type:** All, Custom, Accept and Incomplete
- **Duration**: All, Custom and other
- **Count**: All, Custom, or a number of occurrences
- □ %: Percent of total count

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Sta	tistical Re	port View						
	📽 🔡 🖨	ð 🖪 🗳 4	0 ᡧ ➡ 🚺	of 1 P1 E	ELS Commands		Move X-C	ursor 💌
	Ordered Sel	ts Frame B	Bus Conditions S	CSI Commands	Protocol Errors	Ports ELS Commands	GS Comma	ands AL Comm
	Port	Source ID	Destination ID	Туре	Response Type	Duration	Count	%
	All 👻	All 👻	All 👻	All 👻	All 👻	All 👻	All 👻	
	P1	0	F_PORT	FLOGI	Accept	351.428 572 ns	1	1.60
	P1	610000	DRCTRY	PLOGI	Accept	360.000 001 ns	1	1.64
	P1	610000	FABRIC	SCR	Accept	107.142 857 ns	1	0.49
	P2	FFFC61	610000	PLOGI	Accept	360.000 001 ns	1	1.64
	P2	FFFC61	610000	PRLI	Accept	128.571 429 ns	1	0.58
	P2	FFFC61	610000	LOGO	Accept	115.714 286 ns	1	0.53
	P1	610000	MNGMNT	PLOGI	Accept	351.428 572 ns	1	1.60
	P4	80	F_PORT	FLOGI	Incomplete	720.000 001 ns	1	3.28
	P4	80	F_PORT	FLOGI	Accept	1.422 857 us	1	6.47
	P4	610180	DRCTRY	PLOGI	Accept	1.422 857 us	1	6.47
	P3	FFFC61	610180	PLOGI	Accept	2.862 857 us	2	13.02
	P3	FFFC61	610180	PRLI	Accept	548.571 429 ns	1	2.50
	P3	FFFC61	610180	LOGO	Accept	428.571 429 ns	1	1.95
	P2	FABRIC	610000	RSCN	Accept	107.142 857 ns	1	0.49
	P1	610000	610180	PLOGI	Accept	360.000 001 ns	1	1.64
	P3	610000	610180	PLOGI	Accept	1.422 857 us	1	6.47

Figure 3.38: ELS Commands Report

GS Commands

To display the GS Commands Report, click the **GS Commands** tab. The following information is displayed in this report:

- □ **Port**: The ports that are selected
- □ Source ID: All, Custom, and other
- Destination ID: All, Custom, and other
- **Type**: All, Custom, Management Service, Directory Service
- □ **SubType**: All, Custom, Fabric Device Management Interface, Unzoned Name Server, Name Server, Fabric Configuration Server
- **Command Code**: All, Custom, FETCH, and other
- **Response Type**: All, Custom, Reject and Accept
- **Duration**: All, Custom and other
- **Count**: All, Custom, or a number of occurrences
- □ %: Percent of total count

tatistical Report View X								
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0	Ordered Sets Frame Bus Conditions SCSI Commands Protocol Errors Ports ELS Commands GS Commands AL Commands Exchange Performance							
Г	Port	Source ID	Destination ID	Туре	SubType	Command Code	Response Type	Duration
	All 👻	All 👻	All 👻	All 👻	All	All 👻		All 👻
	P1	610000	DRCTRY	Directory Service	Name Server	RSPN_ID	Accept	428.571 429 ns
IE	P1	610000	DRCTRY	Directory Service	Name Server	RFT_ID	Accept	167.142.857 ns
	P1	610000	DRCTRY	Directory Service	Name Server	RFF_ID	Accept	137.142.857 ns
	P1	610000	DRCTRY	Directory Service	Name Server	GID_FT	Accept	278.571 429 ns
	P1	610000	MNGMNT	Management Service	Fabric Device Management Interface	RHBA	Accept	351.428 572 ns
	P1	610000	MNGMNT	Management Service	Fabric Configuration Server	GMAL	Accept	741.428 572 ns
	P1	610000	MNGMNT	Management Service	Fabric Device Management Interface	RPA	Accept	231.428 572 ns
	P1	610000	MNGMNT	Management Service	Fabric Configuration Server	GEN	Accept	128.571 429 ns
	P4	610180	DRCTRY	Directory Service	Name Server	RFT_ID	Accept	651.428 572 ns
								0.000003
	1							
Ľ								
_								

Figure 3.39: GS Commands Report

SW Commands

To display the SW Commands Report, click the **SW Commands** tab. The following information is displayed in this report:

- Dert: All, Custom and ports that are selected
- □ Source ID: All, Custom, FABRIC and other
- Destination ID: All, Custom, FABRIC and other
- **Type**: All, Custom and other
- SubType: All, Custom, Fabric Device Management Interface, Unzoned Name Server, Name Server, Fabric Configuration Server
- Command Code: All, Custom, FETCH, and other
- □ Response Type: All, Custom, Reject and Accept
- **Duration**: All, Custom and other
- **Count**: All, Custom, or a number of occurrences
- □ %: Percent of total count

lered Sets Port S All 👻	Frame B	Bus Conditions S	CSI Commands Prot	I D I D I D I D I D I D I D I D I D I D	1		
Port S	Source ID			ocol Errors Ports	ELS Commands GS C	Commands	SW Comma
All 👻		Destination ID	Туре	Response Type	Duration	Count	%
	All 👻	All 👻	All 👻	All 👻	All 👻	All	
P3	FABRIC	FABRIC	ELP	Reject	1.045 714 us	1	1.47
P4	FABRIC	FABRIC	ELP	Reject	857.142 858 ns	1	1.47
P3	FABRIC	FABRIC	ELP	Accept	1.302 857 us	1	1.47
P3	FABRIC	FABRIC	ESC	Accept	548.571 429 ns	1	1.47
P4	FABRIC	FABRIC	EFP	Accept	1.268 571 us	2	2.94
P3	FABRIC	FABRIC	EFP	Accept	548.571 429 ns	1	1.47
P4	FABRIC	FABRIC	DIA	Accept	480.000 001 ns	1	1.47
P3	FABRIC	FABRIC	RDI	Accept	480.000 001 ns	1	1.47
P4	FABRIC	FABRIC	HLO		1.388 571 us	4	5.88
P3	FABRIC	FABRIC	HLO		1.422 857 us	4	5.88
P3	FABRIC	FABRIC	LSU		1.234 286 us	3	4.41
P4	FABRIC	FABRIC	LSU		1.217 143 us	3	4.41
P4	FABRIC	FABRIC	LSA		1.131 429 us	3	4.41
P3	FABRIC	FABRIC	LSA		1.131 429 us	3	4.41
P3	FABRIC	FABRIC	MR Basic Zoning	Accept	634.285 715 ns	1	1.47
P4	FABRIC	FABRIC	MR Basic Zoning	Accept	634.285 715 ns	1	1.47
P3	FFFC61	FFFC62	ESS	Reject	1.817 143 us	1	1.47
P4	FFFC62	FFFC61			2.331 429 us	6	8.82
P3	FFFC61	FFFC62			16.405 714 us	30	44.12

Figure 3.40: SW Commands Report

AL Commands

To display the AL Commands Report, click the **AL Commands** tab. The following information is displayed in this report:

- Depart: All, Custom and ports that are selected
- □ Source ID:
- **Destination ID:**
- **Type**: All, Custom and other
- Duration: All, Custom and other
- Count
- □ %

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)rdered Se	ts Frame I	Bus Conditions S	CSI Command	ds Protocol Errors Po	ts ELS Co	ommands	GS Commands	AL Commands [
Port	Source ID	Destination ID	Туре	Duration	Count	%		
All 👻			All 👻	All 👻				
P3	0	0	LIFA	514.285 715 ns	2	8.33		
P4	0	0	LIFA	514.285 715 ns	2	8.33		
P3	0	0	LIPA	548.571 429 ns	2	8.33		
P4	0	0	LIPA	514.285 715 ns	2	8.33		
P3	0	0	LIHA	531.428 572 ns	2	8.33		
P4	0	0	LIHA	514.285 715 ns	2	8.33		
P3	0	0	LISA	531.428 572 ns	2	8.33		
P4	0	0	LISA	531.428 572 ns	2	8.33		
P3	0	0	LIRP	1.577 143 us	2	8.33		
P4	0	0	LIRP	1.577 143 us	2	8.33		
P3	0	0	LILP	1.577 143 us	2	8.33		
P4	0	0	LILP	1.577 143 us	2	8.33		
				0.000011	24	100.00		

Figure 3.41: AL Commands Report

Exchange Performance Report

To display the Exchange Performance Report (see Figure 3.42 on page 199), click the **Exchange Performance** tab. The following information is displayed in this report:

- Dert: All, Custom and ports that are selected
- Source ID
- Destination ID
- □ R/W Type
- Min Response
- Max Response
- Average Response
- □ Min Efficiency
- Max Efficiency
- □ Average Efficiency
- Total Command
- Total Byte
- **Total Duration**: All, Custom and other
- □ Min RW/Sec
- □ Max RW/Sec
- □ Average RW/Sec

tistical Report Vie	w										
¥ 🖁 🖨 🖪 🤻) ĵ ↓ => 🔽				Move X-Cursor	•					
Ordered Sets Frame	e 🗍 SCSI Commands 🗍	Protocol Errors	Ports Exchange	Performance							
Max Response	Average Response	Min Efficiency	Max Efficiency	Average Efficiency	Total Command	Total Byte	Total Duration	Min RW/Sec	Max RW/Sec	Average RW/Sec	
											T
24.742 809 ms	488.426 734 us	91.59	98.22	92.08	681	1496064	6.436 869 ms	0.16	24.96	4.28	1
23.148 416 ms	3.921 450 ms	76.57	94.16	93.82	1347	2754048	11.660 807 ms	0.07	2.73	0.50	1
710.087 144 us	186.128 551 us	91.59	184.06	137.82	204	417792	1.084 114 ms	2.74	18.52	10.47	1
32.187 921 ms	9.463 973 ms	93.69	188.01	140.81	396	811008	2.059 830 ms	0.06	0.66	0.21	-
					2628	5478912	0.021242				
•			1	1	1			1	1		٠ſ
											_

Figure 3.42: Exchange Performance Report

Statistical Report Toolbar

The Statistical Report toolbar provides the following functions accessible by buttons on the toolbar:

- □ Export to Excel
- Save as Text
- Print Report
- Print Preview
- Report Display Settings
- □ Move to X-Cursor, Y-Cursor, or None



Export as Microsoft[®] Excel file



The **Export to Excel** button opens the Export to Excel dialog. Choose a folder in which to save the Excel file, choose an appropriate file name, and click **Save**.

Save as Text file



The **Save as Text** button opens the Export to Text dialog. Choose a folder in which to save the Text file, choose an appropriate file name, and click **Save**.

Print Statistical Report



The **Print** button opens the select printer dialog. Choose an available printer and click **OK**.

Print Preview



The **Print Preview** button displays a preview of the report to print. See Figure 3.43 on page 200.

LeCroy	<i>i</i> .			FC Pro	tocol Suite		Jun 24, 2010
Order	ed Sets	:			_		_
Түре		Port	Count		%		
LIP_F	58_F7	P4	3639104 1		15.13		
LR		P2	86390		0.15		
LRR		P1	86249		0.15		
LIP_F	58_F7	PЗ	40437902		70.81		
SOFi	3	P1	41		7.18e-5		
EOFt		P1	41		7.18e-5		
SOFi	3	P2	54		9.46e-5		
EOFt		P2	54		9.46e-5		
LIP_F	7_F7	PЗ	722416		1.26		
LIP F	7 F7	P4	1212		2.12e-3		
ARB_	val	PЗ	4873		8.53e-3		
ARB	val	P4	2421		4.24e-3		
SOFi	3	PЗ	47		8.23e-5		
EOFt		P3	47		8.23e-5		
SOFi	3	P4	66		1.16e-4		
EOFt		P4	66		1.16e-4		
CLS		PЗ	85		1.49e-4		
CLS		P4	85		1.49e-4		
OPN	ρx	P4	48		8.41e-5		
OLS		PЗ	7115307		12.46		
NOS		PЗ	12044		0.02		
OPN	nx .	P3	35		6.13e-5		
			57108587		100.00		
Frame	e:		_				
Port	Source	ID	Destination ID	Тур	e	Count <	
P1	0		F_PORT	ELS_REQU	IEST	1 C	
P2	F_POR	т	610000	ELS_REPL	Y	1 0	
P1	610000)	DRCTRY	ELS REQU	IEST	1 C	
P1	610000)	FABRIC	ELS_REQU	IEST	1 C	
P2	DRCTF	IY.	610000	ELS REPL	Y	1 C	
P1	610000)	DRCTRY	FCCT_REG	IUEST	5 2	
P2	FABRIO	5	610000	ELS_REPL	Y	1 C	
P2	FFFC6	1	610000	ELS_REQU	IEST	3 ′	
P1	610000)	FFFC61	ELS_REPL	Y	3 ′	
P2	DRCTR	١Y	610000	FCCT REP	LY	5 2	
P1	610000)	MNGMNT	ELS_REOL	IEST	1 C	
P2	MNGM	NT	610000	ELS REPL	Y	1 0	
P1	610000)	MNGMNT	FCCT_REC	UEST	4 ′	
62	ынам	ΝТ	840000	COOT DED	1.2	4 4	

Figure 3.43: Sample Print Preview of Report

Report Display Settings



The Setting button opens the Setting dialog.

You can set up the report columns for display to suit a particular analysis need, eliminating the need to show/hide columns individually. Use the **Setting** dialog to configure the display for each page. See Figure 3.44 on page 201.

Setting	X
Pages Ordered Sets Frame Bus Conditions SCSI Commands Protocol Errors	Show\Hide Columns Items: Source ID Destination ID RAW Type Min Response
Ports ELS Commands GS Commands AL Commands Exchange Performance	Max Response Average Response Min Efficiency Max Efficiency Reports:
Check All Reset All	 ✓ Total Command ✓ Total Byte ✓ Total Duration
OK	Cancel

Figure 3.44: Statistical Report Column Setting

Link With Sample View

When you select a type on any page of the Statistical Report, a set of navigation buttons allows you to examine each instance of that type in the Trace Viewer.





The **Jump to Previous** button goes to the previous instance of the selected type in the Trace Viewer.



The **Jump to Next** button goes to the next instance of the selected type in the Sample Viewer.



The **Jump to Specific** button goes to the instance specified as N of M items on the Statistical Report toolbar.

The Move drop-down list moves to the X-Cursor, Y-Cursor, or None.



Formatting the Statistical Report View

Initially the Statistical Report View contains all of the information in columns, but you can customize the display by:

- □ Filtering columns by item
- □ Sorting items by column
- □ Hiding any column on the display

Filtering Column Content

To filter column content, click the down arrow in the heading for that column and choose the items to display. The default is All. By checking a specific item, you exclude everything but that item for display.

Choosing **Custom** allows you to specify more than one item for display. Check the items to display and click **OK**.

Sorting Column Content

To sort column content, click the **heading** for that column. Repeated clicking of the column heading sorts the column in ascending or descending order.

Hiding Columns

To hide a column, right-click in the column and choose **Hide**. To unhide a column, rightclick any column and choose **Unhide**.

Formatting Columns

To format a column, right-click in the column and choose **Format**. The options are:

- Hexadecimal
- Binary
- ASCII
- Decimal

Tools

The Tools menu displays two options:

- 1. Self Test
- 2. Verification Script.

Self Test

You can use the built-in self-test utility. The self test is performed to check the clock, memory, serdes, crosspoint, LED/buzzer settings are good. Go to **Tools** on the main menu bar and choose **Self Test** to open the Self Test dialog. See Figure 3.45 on page 203.

Self Test		X
Clock Memory Serdes Crosspoint LE	D/Buzzer	
Clock Type	Test Result	
Memory clock 233MHz		
🔮 PCI Clock 66.66MHz		
Port_1 TX clock		
Port_1 RX clock		
Port_2 TX clock		
Port_2 RX clock		
Port_3 TX clock		
Port_3 RX clock		
Port_4 TX clock		
V Port_4 RX clock		
,		
🗖 Save error details —————		
Save in: Errors detail.slf		
Append error details		
Idle		
Number Of Bun Each Test		
	Start Clock Check	Close
i marriali resis dequentially		

Figure 3.45: Tools - Self Test Dialog

Test Result Column

If a test is OK and you specified one run, the Test Result column on the right displays **OK: 1** times (see the screen capture above).

If a test has an error and you specified one run, the Test Result column on the right displays **Error: 1 times** (see the screen capture above).

Saving

You can save any check result by checking the **Save error details** check box and specifying a destination file name.

Number of Runs Each Test

You can specify to run a test more than once.

Run All Tests Sequentially

Check this box to run tests sequentially.

Verification Scripts

You can use the built-in verification script utility. Verification Scripts utilize the VSE ('engine') to parse traces for specific events and reports. For additional details on VSE, refer to the *Verification Script Engine for SierraFC Protocol Suite Reference Manual*.

Go to **Tools** on the main menu bar and choose **Verification Script** to open the Verification Script dialog. See Figure 3.46.

File Edit View Configuration Project Setup Filtering Tools Window Help File Edit View Configuration Project Setup Filtering Tools Window Help File Edit View Configuration Project Setup Filtering Tools Window Help File Edit View Configuration Project Setup Filtering Tools Window Help File Edit View Configuration Project Setup Filtering Tools Window Help File Edit View Configuration Project Setup Filtering Tools Window Help File Edit View Configuration Project Setup Filtering Tools Window Help File Edit View Configuration Project Setup Filtering Tools Window Help File Edit View Configuration Filtering Tools Window	LeCroy FC Protocol Suite - [Run verification script(s) - [C:\Program Files\LeCroy\FC P	rotocol Suite\User\Trace.fcs]]	_ 🗆 ×
Image: Solution of Source-ID, Destination-ID and Channel.	😞 File Edit View Configuration Project Setup Filtering Tools Window Help		_ 8×
End Set Xet (3) (1) (2) (3) (4) Verification script Testing Throughput / Latency / Response Time / First-Data to Status Time values for each set of unique combination of Source-ID, Destination-ID and Channel. Image: State of the set of unique combination of Source-ID, Destination-ID and Channel. TestNumberOfExchanges Image: TestThroughputForSCSICommands TestSICOMMENT Image: TestThroughputForSCSICommands TestSICOMMENT	🖙 🔚 😞 🐵 🕒 Record 🍔 🔳 💵 📲 🕑 🗸 🚧 🦙 🍞 🎉 🚳 🕂 🗸	x - D -	F
Verification script Result TestAllParameters For each set of unique combination of Source-ID, Destination-ID and Channel. TestNumberOfExchanges TestIng ThroughputForSCSICommands TestThroughputForSCSICommands TestIngParameters	Fra Sea Xeh 😳 🗸 👔 🕐 🥥 🕘 🗸		
Contraction of the second and t	Verification script Result TestAllParameters TestAllParameters TestNumberOFExchanges TestThroughputForSCSICommands TestThroughputForSCSICommands TestTimeParametersForSCSICommands TestTimeParametersForSCSICommands ZaxchangeInfo ZaxchangeInfo ZaxchangeInfo ZatexthargeInfo ZatexthargeInfo ZatexthargeInfo ZatexthargeInfo ZatestDateFrames ZatestDateFrames ZatestDotderedSets ZatestSequences ZatestSequences ZatestSequences ZatestSequences ZatestSequences	Testing Throughput / Latency / Response Time / First-Data to Status Time values for each set of unique combination of Source-ID, Destination-ID and Channel.	

Figure 3.46: Tools - Verification Script Dialog

Run Script

You can run scripts with the tests available in the Verification Script Dialog.

Choose the function to test and click the **Run Scripts** button. After a short time, the result appears in the log pane.

Click **Expand Log** to expand or collapse the log pane.

You can save the output. Click **Save Output** to open the Saving Output dialog. See Figure 3.47 on page 205.

Saving output	×
Select verification scrip	ot output for saving
Select All	Unselect All
ZMaxExchCompleti	onTime
Save	Cancel

Figure 3.47: Saving Output Dialog

Settings

The settings for the Editor Application, Display and Save options can be made in the Settings dialog. Click **Settings** to open the Settings Dialog. Select the desired options and click **OK**.

Settings	×
Choose Editor application and editing settings	
Notepad (by default)	
C Other	
Path to the editor	
Browse	
Edit all selected scripts in one process	
Dpen all included files	
Launch editor application in full screen	
Path to the template file for a new script	
c:\program files\lecroy\fc protocol suite\FCVFS Browse	
Path to the folder where to load script files	
c:\program files\lecroy\fc protocol suite\FCVFS Browse	
Show the full path for the trace file in dialog caption	
Restore (don't maximize) dialog at start	
Load last output from saved log files when possible	
 Activate dialog after script(s) stop running 	
Remember dialog layout	
Ignore possible run-time errors and warnings	
Saving settings Save log files to the folder which is relative to the trace file path	,
Path to the folder where to save output log files	
c:\program files\lecroy\fc protocol suite\FCVFS Browse	
Save logs automatically after scripts stopped running	
OK Cancel	

Figure 3.48: Settings Dialog

Filtering

The Filtering menu and options allow you to modify data in the sample viewer display to exclude packets with a set of user-defined patterns and show the results in all views.

To set up filtering, you must have a viewer display open.

Filter Setup

To display the Filter setup dialog, click the or select **Filtering > Filtering**.



Filter button on the Viewer toolbar

ilter	×
Filter Options	
Filter Options Bus Condition Ordered Sets Ordered Sets ID Destination Address ID Pair Addresses Originator Exchange ID SCSI Commands Task Management Functions SCSI Command Status Protocol Error Extended Link Service Request Extended Link Service Reply Arbitrated Loop Request Switch Fabric Reply FCP Information Unit Generic Service Reply Link Control Frame Miscellaneous Incomplete Exchange FiCon Information Unit	0x6 0x7 0x8 0x94 0x95 0x96 0x97 0x98 0x96 0x97 0x98 0x97 0x98 0x92 0x90 0x92 0x94 0x98 0x98 0x98 0x98 0x98 0x98 0x84 0x84 0x86
FiCon Link Control Function	j
Filter Type Image: Ports Image: P1 Image: P2 Image: P2 Image: P4	Filter Logic Use Pair Addresses C AND Related Items Image: Construction of the second sec
Save Load	OK Cancel

Figure 3.49: Filter Setup Dialog

You can select or deselect each of the items shown in the Filter Options window for filtering, by checking or unchecking a corresponding check box. Items not in the current sample are in shade.

NOTE 1: If you select a group, that also selects all child items.

NOTE 2: Only packets captured at run time are available for selection for filtering.

Filter Type

You can choose to show or hide the Filter Type items by checking the **Show** or **Hide** option button.

Filtering Direction

You can select items for filtering in a single direction or both directions by checking the corresponding Port. By default, all ports are enabled. Uncheck the port check boxes for ports not to include in the filter.

Filter Idle

Depending on the Filter Type (Hide/Show), Idle packets in the Sample Viewer are shown or hidden.

Save Filter Setup

After you have set up a Filter configuration, you can save it as a Filter file by clicking **Save**. You can then use it on a different capture by clicking **Load** in the Filter dialog.

Filter Logic

After you have set up Filter options, you can set filter logic to **And Related Items** to apply "AND" logic on related selected options or **OR** to apply "OR" logic on all selected options.

Multilevel Filtering

You can set up a filter in a sequential steps by **Multi level filtering**. In each level, you can select specific items to "AND" to the previous level. The results of all levels show in views.

Filter descend packets by ascend packet

You can apply a filter on a descend packet if you check the **Filter descend packet if ascend packet is filtered** option. If you uncheck this option, the software only filters the filtered packet. For example, if this option is checked and any SCSI command is selected, all transport and link packets of this command are filtered,. If you unchecked this option, only selected SCSI commands are filtered.

Selectable Filter Options

The Filter Options are (see Figure 3.50 on page 209):

- Bus Condition
- Ordered Sets
- □ Source Address ID
- Destination Address ID
- Pair Addresses
- Originator Exchange ID
- Responder Exchange ID
- SCSI Commands
- **D** Task Management Functions
- Protocol Error
- □ Extended Link Service Request
- Extended Link Service Reply
- □ Arbitrated Loop Request
- Basic Link Service
- Switch Fabric Request
- □ Switch Fabric Reply
- □ FCP Information Unit
- Generic Service Request
- □ Generic Service Reply
- Link Control Frame
- □ Miscellaneous (see "Miscellaneous" below)
- □ Incomplete Exchange
- □ FICON Information Unit
- □ FICON Command

- FICON Control Function
- □ FICON Link Control Function

Bus Condition

When selected, depending on the Filter Type, the Hide/Show selection shows or hides captured Bus Conditions in the Sample Viewer.

Protocol Error

When selected, depending on the Filter Type, the Hide/Show selection shows or hides captured packets with the specified Protocol Errors in the Sample Viewer.

Filter Check Condition

Checking the SCSI Command Status check box enables Check Condition for filtering.

Filter Miscellaneous

When you choose **Miscellaneous**, an additional dialog displays, allowing you to specify the filtering of State Range and/or External Signal In.

Filter	X
Filter Options Bus Condition Ordered Sets Source Address ID Destination Address ID Pair Addresses Originator Exchange ID SCSI Commands Task Management Functions SCSI Command Status Protocol Error Extended Link Service Reply Arbitrated Loop Request Basic Link Service Switch Fabric Reply FCP Information Unit Generic Service Reply Link Control Frame Miscellaneous Incomplete Exchange	Misc Items State Range From State: To State: External Signal In Ext Signal In:
Filter Type Image: Hide Ports Image: P1 Image: P2 Image: P2 Image: P4	Filter Logic Use Pair Addresses C AND Related Items 0 O DR Item trace highlight bar.
Save Load	OK Cancel

Figure 3.50: Filter State and/or External Signals

Enable Filter

7

Select **Filtering > Enable Filtering** or click the **Filter Enable** button on the display menu bar to toggle between Filtered and Unfiltered display.

Using Cursors and Bookmarks

Cursors

The data viewer display incorporates three cursors labeled **X**, **Y**, and **T**. All cursors are initially overlaid and positioned at location 0, which is the trigger position of the display. The Trigger, or **T**, cursor is the measurement reference and is always at location 0 in the display.

Positioning the X Cursor

To position the X-Cursor within the viewer data display, click the left mouse button in the gray bar on the left side of the sample viewer next to the line in which to place the cursor.

Positioning the Y Cursor

To position the Y-cursor within the viewer data display, click the right mouse button in the gray bar on the left side of the sample viewer next to the line in which to place the cursor.

Note: You can also left-click to set the X-cursor and right-click to set the Y cursor in the Frame List View by clicking in the narrow strip on the very left side of a cell.

Time

Time differences between the cursors are displayed in the Cursor Position toolbar. To display the cursor position toolbar, select **Toolbar** from the view menu and choose Cursor Position.

X to Y: 0 ns	X to T: 0 ns	Y to T: 0 ns
--------------	--------------	--------------

Figure 3.51: Cursor Position Toolbar

Locate Cursors

To quickly locate any cursor within the data viewer display, click the **Go To** button and choose the cursor to locate. You can also locate a cursor by selecting **Go To** from the Edit menu and choosing the cursor to locate.



Figure 3.52: Locate Cursor

Go to Time Stamp

To locate a timestamp, click the Go To button and choose Timestamp.

Enter a time stamp value in the Go To Timestamp dialog and click **OK**.

Go To Time Stamp		×
Go to 0000 (h).00 (m).00 (s).00	00 (ms).000 (μs).000 (ns)	
OK	Cancel	

Figure 3.53: Go to Time Stamp

Bookmarks

Bookmarks are a convenient way to mark a point in the data viewer display by name, so that you can rapidly return to that point. To create a bookmark, right-click the mouse in the data viewer area on a packet in which to place the bookmark.

Bookmark	
Set Time Stamp Origin Change Time Stamp Format	۲
Goto Next Goto Previous	*
Hide 'NOS'	
Change Background Color Change Foreground Color	
Software Setting	
Goto	•
Figure 3.54: Bookm	ark

Bookmark						×
Bookmark Name:						
Bookmark Description:	;					
Sort bookmarks by	/ start time					
Start Time	Port	Layer	Packet No.	Bookmark	Description	
261.712.633 (ms)	3	Frame	3	FRAME		
Add D)elete (ão To 🔤 1	í ime Difference	9:0		
Save As		Print				
	cel c					
		ave As				
			Close			

Click **Bookmark** from the fly out menu to open the Bookmark Comment Dialog.

Figure 3.55: Bookmark Dialog

Enter a description for the bookmark and click the **Add** button. Repeat for additional **bookmarks.**

Finding a Bookmark

To find a bookmark in the data viewer display, right-click the mouse in the sample viewer and select **Bookmark**.

Bookmark						×
Bookmark Name:	FRAME					
Bookmark Description	n:					
I Sort bookmarks b	y start time					
Start Time	Port	Layer	Packet No.	Bookmark	Description	
261.712.633 (ms)	3	Frame	3	FRAME		
, 		I.	Time Differences			
	Jelete	GO 10	Time Dimerence	5.0		
Save As		Print				
Text O Ex	cel c					
		ave As				
			Close			
			0030			

Figure 3.56: Go To Bookmark Dialog Box

Highlight the bookmark to which to go, then click the **Go To** button, or double-click the selection.

H2	🤣 ATA Cmd.	150	Command	⇒	Input (H)	÷
736.265.226 (ms)	5	1.50	0x60 : Read FPDMA Queued		6004000000000046791100004000	
Durati 38.346	on (us)					

Figure 3.57: Bookmark Found Example in Data Viewer Display

Bookmark Description

To get a quick description of a displayed bookmark, position the tool tip over a bookmark. The name and description of the bookmark display.

Set Time Stamp Origin

Right-click in the sample viewer to open the fly out menu:



Figure 3.58: Bookmark Found Example in Data Viewer Display

Highlight **Set Time Stamp Origin** and choose either Absolute, Trigger, Current Position, or Based on system time.

Search

The Search menu and toolbar options permit you to examine any data capture file to quickly locate the packet or data pattern. To perform an initial search, select **Edit > Search**



Search button to open the Search setup dialog (see Figure 3.59 on

Note: Only items captured in the sample file are enabled for search.

Search		×
Search For	Search Items	Search Sub Items
Data Pattern	SOFi3	
Bus Condition	□S0Fn3	
Ordered Sets	EOFt	
Source Address ID	EOFn	
Destination Address ID	ARBff	
Pair Addresses		
Originator Exchange ID		
Responder Exchange ID		
SCSI Commands		
Task Management Functions		
SCSI Command Status		
Protocol Error		
LExtended Link Service Request		
Extended Link Service Reply		
Arbitrated Loop Request		
Basic Link Service		
Switch Fabric Request		
Switch Fabric Reply		
Contraction Unit		
Generic Service Request		
Link Control Frame		
Header Pattern		
Incomplete Exchange		Search Logic
		C AND Selected Items
Search From		OR Selected Items
 Start 		
C Trig-Pointer		Search Direction
C X-Pointer		 Forward
C Y-Pointer		C Backward
C Last Found		Use Pair Addresses
Reset All Save L	oad Find Next	Cancel Domain >>

Figure 3.59: Search Data Pattern

You can continue to search the output file using **Next Search (F3)** or **Previous Search (F4)** for the same pattern, until you redefine the data capture search parameters.

Save Search Setup

After you have set up a Search configuration, you can save it as a Search configuration file by clicking **Save**. You can then use it on a different capture by clicking **Load** in the Search dialog.

Search Direction

Choose either Forward or Backward direction in which to perform the search.

Search From

Choose a starting point to begin or continue a search: Start of the sample file, Trigger Pointer, X Pointer, Y Pointer, or Last Found.

Search Logic

The default setting is **Or Selected Items**. With this setting, clicking **Find Next** locates all selected items in turn. If you choose **And Selected Items**, you can set a logical AND combination of items to find. Both options allow setting Advanced search features.

Search For

Choose a category to search in the **Search For** window. Each of the search categories offers additional choices in the **Search Items window** to refine the search. Check items for the selected category.

Protocol Error

You can refine the search to locate packets with an error or without an error.

Data Pattern

Search for Data Pattern allows you to search for a specific Data Type, Pattern, and Length.

- Data Pattern Only
- Data Payload Length Only
- Data Pattern and Data Payload Length

Search Domain

Click the **Domain** button and choose a search domain from all ports or a specific port.

Search Sub Items

When searching SCSI Command Status, you can refine the search by selecting from a list of Sub Items.

When you check the **SCSI Command Status**, the **Check Condition** item appears in the Search Items Window, if a check condition has occurred. Clicking this enables **Search Sub Items**, allowing you to refine the search by specifying **Sense Key**, **ASC**, and **ASCQ**.
Display Configuration

The Analyzer ships with a default display configuration of field and viewer settings. You can define your own field and viewer settings for a particular testing scenario.

Sample Viewer Configuration

The Trace Viewer Configuration dialog allows you to change the following fields and views:

- □ Frame Fields
- Sequence Fields
- □ SCSI Command Fields
- □ ELS Command Fields: ELS Command, Status, Loop Init ID
- SW Command Fields: SW Command, Status
- GS Command Fields: Command/Response code, GS_Type, GS_Subtype, Status
- □ FICON Fields
- Additional Fields
- Text View
- □ Spreadsheet View

The Trace Viewer Configuration dialog allows you to change the following display settings:

- □ Field settings
 - Data format
 - Visible checkbox
 - Byte Order alignment
- Field Header Setting
 - Name
 - Abbreviation
 - Foreground
- Viewer Settings
 - Wrap packets
 - Enable tool tip
- Data Payload
 - Columns in Row
 - Bytes in Column
- **D** Time Stamp Origin: Absolute, Trigger, User Defined, Based on System Time
- □ Time Stamp Format and Time Format
- Header Fields Appearance
- □ Save Display Configurations in a file
- Load Display Configuration settings from a file
- □ Factory Setting (Restores Default Settings)
- Font



To customize the display, click the

Configuration button on the Viewer toolbar, or select **Configuration > Viewer Configuration**, to open the Trace Viewer Configuration dialog.

Trace Viewer Configuration	×
Image: Sequence Fields Image: Sequence Fie	Field Setting Format Name Format Name Visible Visible SW_ILS_Command SW_ILS_Command Foreground Viewer Setting Viewer Setting Data Payload Wrap Packet Olumns in Row: 16 Column Bytes in Column: 1 Byte
	Time Stamp Origin • Absolute • User Define • Based On System Time • Same color for start time and port Time Stamp Format
Save Load Factory Set	tting Font OK Cancel

Figure 3.60: Trace Viewer Configuration

Field Settings

To view a packet field, select a field from the packet field tree and check the **Visible** box. Uncheck it to hide the field.

To change the data format of a packet field, select the field and choose a data format from the Format drop-down list.

Color

To change the color of the text in a packet field header, select a field from the packet field tree and click the **Foreground** button

Color		<u>?</u> ×							
Basic colors:									
Custom colors	:								
Defi	Define Custom Colors >>								
ОК	Cancel								

Figure 3.61: Color

Choose an appropriate color and click **OK.**

Font

To change display fonts, click the **<u>F</u>ont** button to open the Font dialog box.

Font			? ×
Font:	Font style:	Size:	
Arial	Regular	8	OK
Arial O Arial Black O Arial Narrow O Arial Unicode MS Tr AvantGarde Bk BT Tr AvantGarde Md BT	Regular Italic Bold Bold Italic	8 9 10 11 12 14 16	Cancel
	Sample AaBb	YyZz	
	Script:		
	Western	-	



Choose the font, font style, and size, and click OK.

Viewer Settings

Check the Wrap Packet box to enable the wrapping of packets in the display.

Check the **Enable Tooltip** box to enable tool tips for packet fields.

Data Payload

To change the length of byte fields displayed, select from the drop-down list to display in the **Columns in Row** and **Bytes in Column** box.

Time Stamp Origin

Check **Absolute Trig** to display trigger in real time. If left unchecked, the trigger position is t=0 with samples before trigger shown as a (-) number and after trigger as a (+) number, or check Trigger, User Defined, Based on System Time.

Same color for start time and port

Check the appropriate Time Stamp Format and Time Format.

Save/Load Settings

You can save the customized configuration settings in a ***.cfg** file by clicking the **Save** button and completing the Save As procedure. To load a previously saved configuration file, click **Load** and choose an appropriate file.

Port Configuration

Port Configuration allows you to configure the ports for the Analyzer and Jammer and the sequence in which they are attached.

To view and configure the ports, select **Configuration > Port Configuration**.

Figure 3.63: Set Port Configuration Dialog

Select a configuration from the drop down list in the Ports Assignment column and click **OK**. See Figure 3.65 on page 221.

Set Port Configuration		[
Configurations Filter		
Analyzer	🗖 Jammer	
All valid port configurations for S	N: 7 (0x0007)	
P1, P2	P3 , P4	
	-	
	OK Cance	:

Figure 3.64: Set Port Configuration Dialog

Port Calibration

The Port Calibration dialog displays the Units and Ports Input and Output Signal parameters.

Port Calibration			X
Unit Port P1 P2 P3 P4	Input Signal Input equalization Output Signals Output level : De-emphasis level : Time constant: OK Ca	Level 7	Restore Factory Settings Save Load
	OK Ca	incel	

Figure 3.65: Port Calibration Dialog

To display the Port Calibration dialog, select **Configuration > Port Calibration**.

Input Signals have Input Equalization.

Output Signals have Output Level, De-emphasis Level, and Time Constant.

You can Save and Load the settings, or Restore Factory settings.

Floating License

Note: This feature will be applicable in the future version of the software.

To manage the license, select **Configuration > License Manager**.

The Floating License dialog displays the available functionality by Function, Total Ports, Assigned To ports, and Not Used. It also displays the Current License Configuration by License Type, Serial Number, Analyzer and InFusion.

Software Settings

Software Settings allow you to define template files for new Analyzer projects, to specify how sample files appear when opened, and to set Spec Assignment.

To perform software settings in an open sample view, select **Configuration > Software Settings**.

	igs							
neral Trace								
Template Files								
User Path :	c:\progra	n files\lecro	y\fc protoc	ol suite\User	1			
Template Files								
Protocol	Analyzer							
🔲 New Prol	ocol Analy	, zer Project i	n Advance	d Mode				
	ision Scena	ario in Advar	nced Mode					
 Ask user to a 	lose the pr	evious captu	ured sample	e before run	ning the r	iew project		
		Factory	Settina	ок		Cancel	1	

Figure 3.66: Software Settings Dialog General Tab

Close previous trace file when new trace file opens ✓ Sampling memory usage optimization Spread Sheet Color Setting O Based on Column G Based on Port No. G Based on Read/Write Command Type Apply With Specific Command Type	 Enable Smooth Scrolling In Viewer Anchor The Selection Bar Set the Anchor row as sync. point SCSI Spec Assignment : SBC3-SPC4 Go to trigger point as soon as it is available.
Turn Off Command Color Spread Sheet ✓ Repeat decoded SCSI command in command column	

Figure 3.67: Software Settings Trace Tab

Set the options and click **OK**.

Sampling Memory Usage Optimization

The Software Settings dialog has a Sampling Memory Usage Optimization option. This Memory Assignment (MA) feature optimizes sampling memory utilization.

If the Sampling Memory Usage Optimization Option is Checked

The system tries to use empty space in all memory banks to prevent any memory bank from filling completely. Each physical link is not necessarily assigned to a specific memory bank. The system can capture more sample data than if the MA option is unchecked, and sample file size is closer to the user-defined Sampling Memory Size.

Memory Assignment efficiency varies with Port Configuration and Trigger Position:

- FPGA: The Memory Assignment feature works for a pair of ports connected to one FPGA, for example ports 1 and 2 (or ports 3 and 4). Memory Assignment does not work for two ports connected to different FPGAs, for example ports 1 and 3.
- Triggering: Memory Assignment only starts after the trigger point. During pre-trigger, each physical link is always assigned to a specific memory bank. Post-trigger, the system can try to use empty space in all memory banks, if you check the MA option. Therefore, Memory Assignment efficiency is maximum when Trigger Position is set to 0% (snap-shot trigger) and is minimum when Trigger Position is set to 99% or when there is no triggering (you stop recording manually).

Here are examples of different Port Configurations and Trigger Positions:

- **One port configuration (A-):** Sample size is user-specified sample size.
- □ **Two port pair configuration (A-)**: Ports 1/2 and 3/4 are on the same FPGA, so Memory Assignment has an effect. If you use snapshot triggering, the sample size is near specified size.
- □ **Two port pair configuration (A-):** If you use manual stop, Memory Assignment has no effect. Sample size depends on port traffic loads.
- □ **Two port pair configuration (A-)**: If trigger is set at 50%, and there is enough data to fill pre-trigger, Memory Assignment has an effect. Sample size is typically near specified size.
- Two port pair configuration (A-): If trigger is set at 50%, but there is not enough data to fill pre-trigger, Memory Assignment has an effect. Sample size is typically more than half specified size, with size determined by the amount of data captured before trigger.
- Two port pair configuration (AA): Ports 1/2 and 3/4 are not on the same FPGA, so Memory Assignment has no effect. If one port has heavy traffic, it may fill its memory bank and stop recording, resulting in smaller sample size than specified.

NOTE 1: Checking this option does not affect the sample. It only allows larger sample sizes.

NOTE 2: If traffic is balanced on ports, sample size is the same whether you check or uncheck the Sampling Memory Usage Optimization option.

NOTE 3: Memory Assignment depends on traffic load distribution at the time when the system tries to re-assign physical links to memory banks. Therefore, if you repeat a capture with the same Sampling Memory Size and Segment Number parameters, the resulting sample size may not be the same. However, if traffic load distribution is similar, sample size will be similar.

NOTE 4: The buffer status indicator shows buffer by FPGA, not by port.

If the Sampling Memory Usage Optimization Option is Not Checked

Each physical link (or logical link if MUX is enabled) is assigned to a specific memory space (memory bank), depending on the Sampling Memory Size and Segment Number parameters.

Important: If **any** physical link fills its memory bank, the recording process stops. Other memory banks will typically be less than full (and can be empty). The sample file might be smaller than the user-defined Sampling Memory Size. You might even think that the Analyzer malfunctioned.

Set Port Alias

Port Alias allows you to assign a meaningful name to each port to assist in interpreting the results displayed in the sample view.

To assign port names in an open sample view, select **Configuration > Set Port Alias**.

P	ort	Alias			×
	Ur	nit1 Unit2 Un	it3		
		Ports P1 P2 P3 P4	<mark>chng</mark> □→	New Port Name P2 P3 P4	
	S	et As Default		OK Cancel	

Figure 3.68: Assign Port Alias

Assign a meaningful name to each port for each unit in use and click **OK**. The assigned names replace the port numbers in the sample view.

If you elect to save the capture sample file, the assigned port names are saved together with the result, so that when you open the sample file later, the assigned names are retained.

Set As Default

If you want to set these port aliases for sample files that will be captured later, you can set them as default, and new samples will be opened by these default port aliases.

External Trig Setting

The External Trig Setting dialog displays the External Trig Out Setting and External Trig In Setting as High Active, Low Active, or Toggle.

External Trig Setting	×
External Trig Out Setting Type C High Active C Low Active C Toggle	External Trig In Type High Active Low Active Toggle
External TrigOut pulse width 0 × 66 ns	OK Cancel

Figure 3.69: External Trigger Setting Dialog

To display the External Trig Setting dialog, select Configuration > External Trig Setting.

External Trig Out Setting

The Analyzer can send a Low or High external signal anytime a trigger occurs. Select the External Trig Out Setting: High Active, Low Active, or Toggle from High to Low or Low to High once (3.3 V output).

Enter the External TrigOut pulse width.

External Trig In Setting

An external Low or High input signal can cause triggering. Select the External Trig In Setting: High Active, Low Active, or Toggle from High to Low or Low to High once (3.3 V output).

The nominal External Trigger voltage is 0.818 volts. Trigger In can work with 1 volt to 5 volts input voltage.

Update Sierra Device

The Update Sierra Device command allows you to update a SierraFC M164 Analyzer whose current version is incorrect.

1. Click Configuration > Update Sierra Device to display the Device Setup dialog.

	Device Setup						
	Dev Name	Туре	Current Ver	Required Ver	Status	File Name	Update Selected
	E FC Sierra Device S/N: 6	2084					
:	M	Firmware	1.09	1.0C	DONE	C:\Documents and Settings\ang	Update Ali
	•	Analyzer x2	11.04	11.07	56%	C:\Documents and Settings\ang	
	M	Self Test	21.02	21.03	BAD	C:\Documents and Settings\ang	
:							
1							
:							
!							
							Close

Figure 3.70: Device Setup Dialog with a Bad Device Status

Devices whose version is correct have an OK status in a green box. A device whose version is incorrect has a BAD status in a red box.

Note: You can click the ellipses (...) at the end of a file path and name to display an Open dialog, in which you can browse for files.

2. Click the checkbox to the left of a device with BAD status, then click **Update Selected** to begin the process that will make the Analyzer version correct.

t	evice Sel	tup						
	Dev Na	ame	Туре	Current Ver	Required Ver	Status	File Name	Update Selected
	🖃 FC Sien	a Device S/N: 62084						
:		M	Firmware	1.09	1.0C	DONE	C:\Documents and Settings\ang	Update All
		M	Analyzer x2	11.04	11.07	DONE	C:\Documents and Settings\ang	
	•	M	Self Test	21.02	21.03	21%	C:\Documents and Settings\ang	
I								
:								
1								
:								
÷								
i.								
								Close

Figure 3.71: Device Setup Dialog Beginning to Update Status of a Device

After the update, the device must restart.



Figure 3.72: Info Dialog

Then the update is complete.

Device	e Setup						
De	ev Name	Туре	Current Ver	Required Ver	Status	File Name	Update Selected
🖃 FC	Sierra Device S/N: 62009						
		Firmware	1.0C	1.0C	OK	C:\Documents and Settings\ang	Update All
		Analyzer x2	11.07	11.07	OK	C:\Documents and Settings\ang	
		Self Test	21.03	21.03	OK	C:\Documents and Settings\ang	
							Close

Figure 3.73: Device Setup Dialog with OK Device Status

Set Address Alias

Address Alias allows you to assign a meaningful name to each address to assist in interpreting the results displayed in the sample view. To assign address names in an open sample view, select **Configuration > Set Address Alias**.

Address Alias		×
Address	Alias Name	
FFFFF0	N_PORT	
FFFFF4	EVENT	
FFFFF5	MULTI_CAST	
FFFFF6	CLCK_SYNC	
FFFFF7	SEC_KEY	
FFFFF8	ALIAS	
FFFFF9	QOS_FAC	
FFFFFA	MNGMNT	
FFFFB	TIME	T
Apply alias to all view	SetAsDefault OK	Cancel

Figure 3.74: Assign Address ID

Assign a meaningful name to each address in use and click **OK**. The assigned names replace the address in the sample view, Search, filter, and Statistical Report.

If you elect to save the captured sample file, the assigned address names are saved together with the result, so that when you open the sample file later, the assigned names are retained.

Set As Default

If you want to set these address aliases for sample files that will be captured later, you can set them as default, and new samples will be opened by these default address aliases.

Connecting the SierraFC M164 to a Host System Over Ethernet

SierraFC M164 Systems are designed to connect to host PCs using a network connection, which allows the user to control the SierraFC M164 System from a local or remote host system.

To connect via USB refer to "Connecting Via USB" on page 27.

Configuring the System

There are two ways of configuring a SierraFC M164 for network connectivity:

- **DHCP** automatically assigns an IP address. DHCP is the default.
- **Static IP** prompts you to enter a specific IP address.

The SierraFC M164 can be configured from the unit itself using the five buttons and the LCD display on the front panel of the analyzer. For additonal information, see "LCD Display and Button Functions for Configuring the Analyzer" on page 14.

Dynamic Configurations

Dynamic configuration uses DHCP (Dynamic Host Configuration Protocol).

Under DHCP, SierraFC M164 will issue a broadcast to any DHCP Server requesting configuration. If a DHCP server is present on the network, it will assign an IP address, Subnet Mask and a default GATEWAY (a router port IP address) to the SierraFC M164. The Gateway port will be used by SierraFC M164 to forward packets to IP addresses that do not reside within the same subnet.

When using the dynamic configuration, the front panel display will only update the IP address.

The subnet mask and gateway address will remain at the last values programmed

(000.000.000 by default, or whatever was last programmed in the static configuration). While in dynamic mode, these parameters will have actually been programmed within the IP STACK inside the SierraFC M164, but are not displayed in the LCD display.

To change from DHCP to Static IP, you must be connected to a device using USB:

1. Select **Configuration > Setup IP** from the menu bar.

FC - [FCProject1]		
Bile ⊻iew Edit ⊆	onfiguration Project Setup Tools Window	Help
2 🖬 😞 🕘 🧧	Port Calibration	
	License Manager	
Analyzer Settings Cap	Software Settings	
- Recording Buffer-	Fotove al Tela Catting	
Buffer Size and Se	External my setting	
Num of	Update Sierra Device	Total size used : 25MB
Segments : 1	Setup IP	MB
_	1MB 8192MB	Out of 8192MB available
Trigger Position	Auto Bun	
0. %		
U % post mg	<u>Mumber of Runs</u> : 20	
	100%	
Levi Centred Trees Fi		
Last Captured Trace Fi	e	
Trace <u>F</u> ile Name:	\program files\lecroy\fc protocol suite\User\Trace.f	fcs
Use upload mana	ger (no automatic upload)	_
Analyzer Settings		
Channel Enable	Speed	Disable Descrambling

Figure 3.75: Configuration Menu with Setup IP Command

Note: If you are connected to the device using Ethernet, the Configuration menu does not have the Setup IP command.

The IP Setting dialog appears. For IP Mode, two radio buttons are available: Static IP and DHCP. DHCP is the default.

IP Setting									×
IP Mode									
 Static IP 				0	D	HCP			
Static IP Address:	13	72	•	16	•	133		82	
Subnet Mask:)	•	0	•	0	•	0	
Default Gateway:		0	•	0	•	0	•	0	
Reset						U	lpd	ate	

Figure 3.76: Static IP Setup Dialog

Static Configurations

Within static configurations, SierraFC M164 must be manually programmed with an IP address, Subnet Mask and a default GATEWAY.

Once SierraFC M164 has been programmed with the static network configuration, it will broadcast a UDP message on its own subnet stating that is on line and available for connection.

Note: This broadcast is only on the subnet that includes the SierraFC M164 System.

When the application is started on the Host PC, it will broadcast a UDP message on its own subnet asking all SierraFC M164s available to identify themselves.

Note: This broadcast is only on the Host PC's subnet.

If the Host PC and the SierraFC M164 System reside on the same subnet, they will see each other's broadcasts and the application will automatically populate the Select Device list.

2. To change to Static IP, click the **Static IP** radio button.

Enter the Static IP Address.

Enter the **Subnet Mask**.

Click Update.

The system displays a warning message.

Click Yes to get a success message.

Click **OK**. The message closes and the device resets.

3. To change back to DHCP, in the IP setup dialog, click the **DHCP** radio button, then click **Update.**

IP Setting								X
IP Mode								
C Static IP			•	ĎD	HCP			
Static IP Address:	17	2,	16	•	133	•	82	
Subnet Mask:	0		0		0		0	
Default Gateway:	0		0		0		0	
Reset					U	Ipd	ate	

Figure 3.77: Dynamic IP Setup Success Message

After you see the Warning Message, click **Yes** After you see the Success Message, click **OK**.

Note: You can also click Reset.

Ethernet Connectivity Through a Different Subnet

If you have multiple subnets and would like to connect the Analyzer over a subnet where the DHCP server is on a subnet different from the host computer or the analyzer or if the Host PC and the SierraFC M164 System do not reside on the same subnet, they will not see each other automatically. The SierraFC M164 IP address must be added manually. Perform the following steps:

- 1. Launch the application and click the Ethernet radio button.
- 2. Click **OK**.
- 3. Click on Add Device in the Select Device dialog.

Local devices	'orts USB / Ethernet					
C USE						
₢ Ethe	ernet					
ct Device						
Device	Dev Name	Location	Status	Order		🖹 Set Alias Nam
Sierra FC SN: 62009	Tahoe	172.16.133.150	Ready to connect	Unit 1	*	Disconnect
Sierra FC SN: 62062	FC8G	172.16.133.151	Ready	Unit 2	-	S Add Davies
Sierra FC SN: 62084	FC8G	66.238.94.184	Ready to connect	No Chained	-	
						Remove Devi.
						👃 IP Settings
lected Device Id: 0x00104	IC00F26E					
lected Device Id: 0x00104	IC00F26E				-	A Networks

Figure 3.78: Select Device Dialog to Add New Device

4. The Add Device with Static IP will appear. Enter the IP address to add the device.

Add Device with Stati	c IP							2	×
Device IP Address:	1	•	0	•	0	•	0		
OK	1			Car	rel		1		
<u> </u>	1			Car	icel				

Figure 3.79: Add New Device with Static IP Address

Once the IP address is added, the application will then send a connection request to that IP address to connect to the SierraFC M164 System.

Help Menu

Help Topics

Displays online help. You can also select F1.

Update License

A current license agreement with LeCroy entitles the Analyzer owner to continued technical support and access to software updates as they are published on the LeCroy website. When you obtain a license key, from the Help menu select Update License to display the Select License Key File dialog box. Enter the path and filename for the license key, or browse to the directory that contains the license key and select the *.lic file. Click Open.

Display License Information

Open a license information dialog to display a list of named features supported by the current software version Named features that are not enabled on your system are indicated by No in the Purchased column. Whether or not named features are enabled depends on the license key stored in your analyzer If you try to use a feature for which you do not yet have a license, the program displays the License Protection Message. To use the feature, you must purchase a license.

Check for Updates

Check whether a new software version is available. If so, you can download from the LeCroy web site. You can select to Check for updates at application startup.

About

Displays LeCroy FC Protocol Suite software version information.

Appendix A

China Restriction of Hazardous Substances Table

	有毒有害物质和元素							
	铅	汞	镉	六价铬	多溴联苯	多溴二苯醚		
部件名称	(Pb)	(Hg)	(Cd)	(Cr ⁶⁺)	(PBB)	(PBDE)		
PCBAs	X	0	X	Х	Х	Х		
机械硬件	0	0	X	0	0	0		
金属片	0	0	X	0	0	0		
塑料部件	0	0	0	0	Х	Х		
电源	Х	Х	Х	0	Х	Х		
电源线	Х	0	Х	0	Х	Х		
保护外壳(如有)	0	0	0	0	Х	Х		
电缆组件(如有)	Х	0	Х	0	Х	Х		
风扇(如有)	Х	0	X	0	Х	Х		
交流滤波器和熔丝组件(如有)	Х	0	Х	0	0	0		
外部电源(如有)	Х	X	Х	0	Х	Х		
探头 <mark>(</mark> 如有)	Х	0	Х	0	Х	Х		
O:表明该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T11363-2006标准规定的限量要求之下。								
X:表明该有毒有害物质至少在该部件的某一均质材料中的含量超过 SJ/T11363-2006标准规定的限量要求。								
EFUP(对环境友好的使用时间) 温度: 5摄氏度到40摄氏度	使用条件:							
湿度: 5% - 95%最大相对湿度(高度:最高2000米	(无冷凝)							

The following tables are supplied in compliance with China's Restriction of Hazardous Substances (China RoHS) requirements:

	Toxic or Hazardous Substances and Elements							
				Hexavalent	Polybrominated	Polybrominated		
	Lead	Mercury	Cadmium	Chromium	Biphenyls	Diphenyl Ethers		
Part Name	(Pb)	(Hg)	(Cd)	(Cr ⁶⁺)	(PBB)	(PBDE)		
PCBAs	х	0	X	Х	Х	X		
Mechanical Hardware	0	0	Х	0	0	0		
Sheet Metal	0	0	Х	0	0	0		
Plastic Parts	0	0	0	0	Х	Х		
Power Supply	Х	Х	Х	0	Х	Х		
Power Cord	Х	0	Х	0	Х	Х		
Protective Case (if present)	0	0	0	0	Х	Х		
Cable Assemblies (if present)	Х	0	Х	0	Х	Х		
Fans (if present)	х	0	X	0	Х	X		
AC Filter/Fuse Assy (if present)	Х	0	Х	0	0	0		
Ext Power Supply (if present)	Х	Х	Х	0	Х	Х		
Probes (if present)	х	0	X	0	Х	X		
O: Indicates that this toxic or haza	rdous substar	nce contained	in all of the h	omogeneous m	aterials for this part i	is below the		
limit requirement specified in	SJ/T11363-20	06.			_			
X: Indicates that this toxic or hazardous substance contained in at least one of the homogenous materials used for this part								
is above the limit requirement specified in SJ/T11363-2006.								

EFUP (Environmental Friendly Use Period) Use Conditions:

5C to 40C Temperature

Humidity

5% to 95% max RH (non-condensing) Up to 2000 meters Altitude

SierraFC M8-4 Protocol Analyzer User Manual

Appendix B

How to Contact LeCroy

Type of Service		Contact
Call for technical support	US and Canada:	1 (800) 909-7112
	Worldwide:	1 (408) 653-1260
Fax your questions	Worldwide:	1 (408) 727-6622
Write a letter		LeCroy
		Protocol Solutions Group
		Customer Support
		3385 Scott Blvd.
	Sa	anta Clara, CA 95054-3115
		USA
Send e-mail		psgsupport@lecroy.com
Visit LeCroy's web site		http://www.lecroy.com/

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