SierraFC M164
Fibre Channel Protocol Analyzer

User Manual

Software Version 4.0
Document Version 1.0

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LeCroy Protocol Solutions Group

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WEEE Program

LeCroy Corporation
3385 Scott Blvd.
Santa Clara, CA 95054
TEL: 800-909-7112 (USA and Canada)
TEL: 408-653-1260 (worldwide)

Contents

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
- 19-inch Rack Mountable. Refer to the *Rack Mount Installation Guide*.

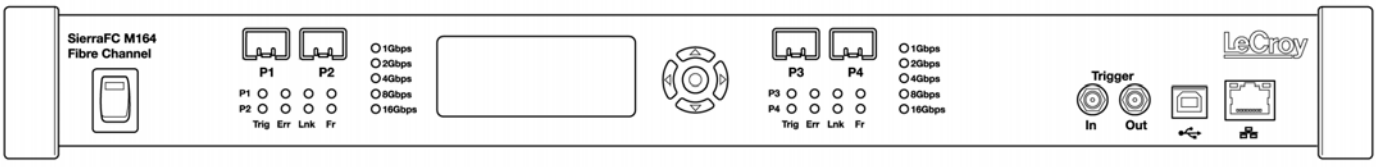


Figure 1.2: Front Panel

On the back, the Analyzer has:

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

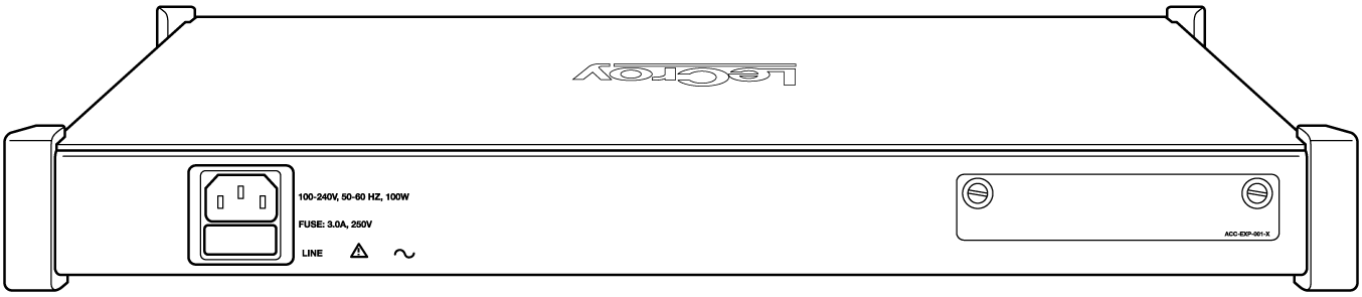


Figure 1.3: Back Panel

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).

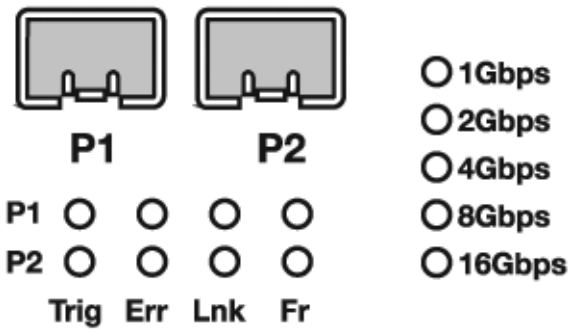


Figure 1.4: LEDs on the Left Front Panel

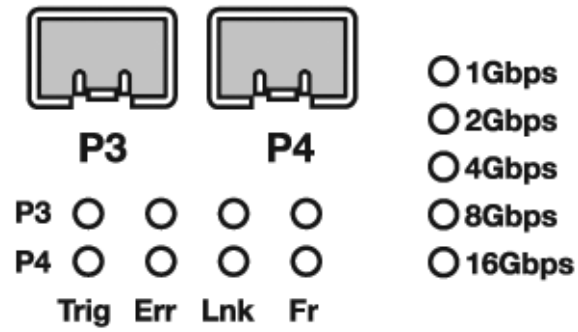


Figure 1.5: LEDs on the Right Front Panel

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.

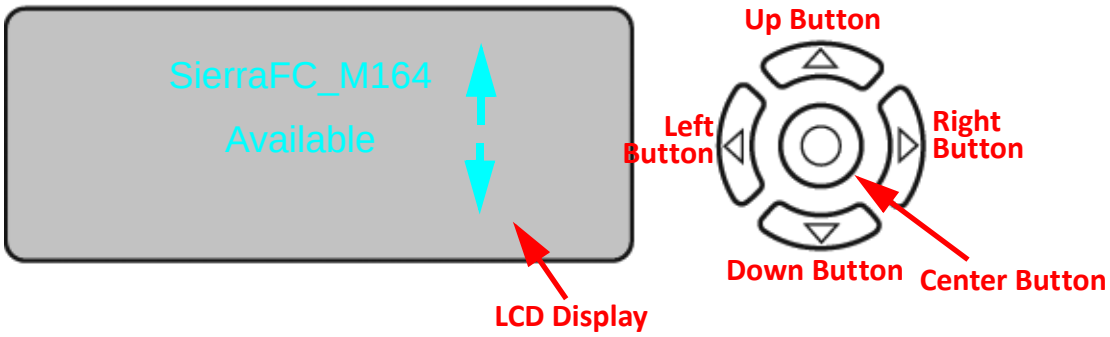


Figure 1.6: LCD Display and Button on the Front Panel

When connected via ethernet or USB, the **Up** ⇑ and **Down** ⇓ 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** ⟸ and **Right** ⟹ 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).
3. 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.
4. 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.
2. 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 **Next** 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.
2. 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.

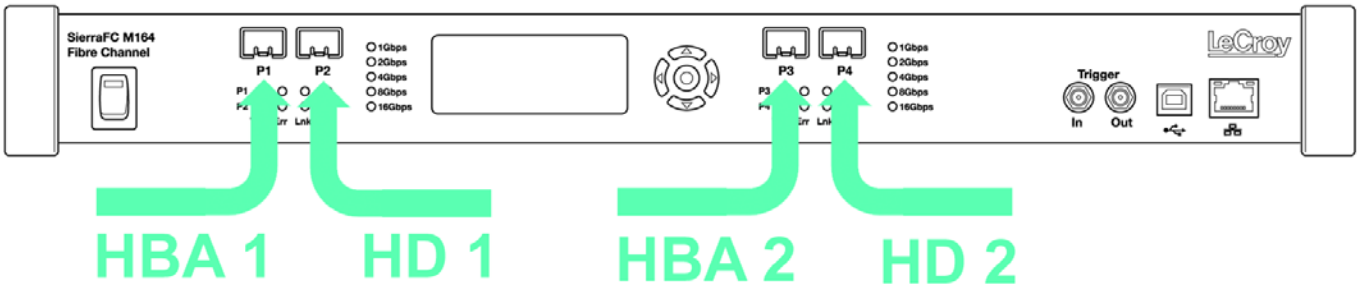


Figure 1.7: Analyzer Connections

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.

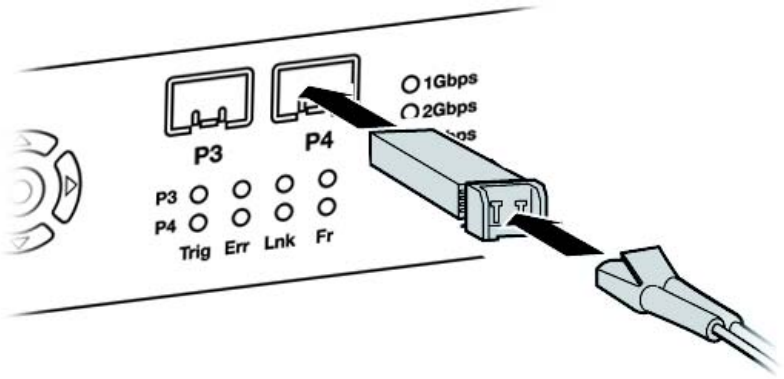


Figure 1.8: Analyzer Connections

Expandability

You can expand by:

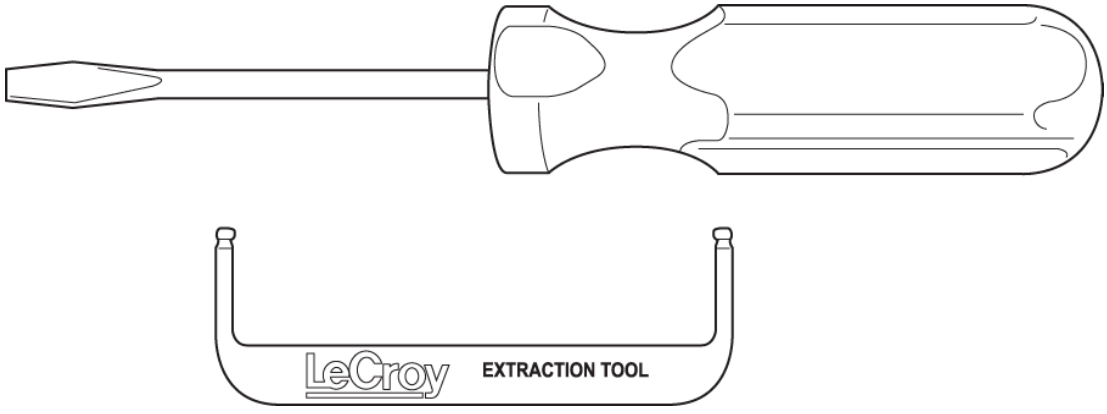
- Cascading with CATC SYNC Expansion Cards
- Using the Power Expansion Card (optional)

You can remove expansion cards with two simple tools.

Removing Expansion Cards

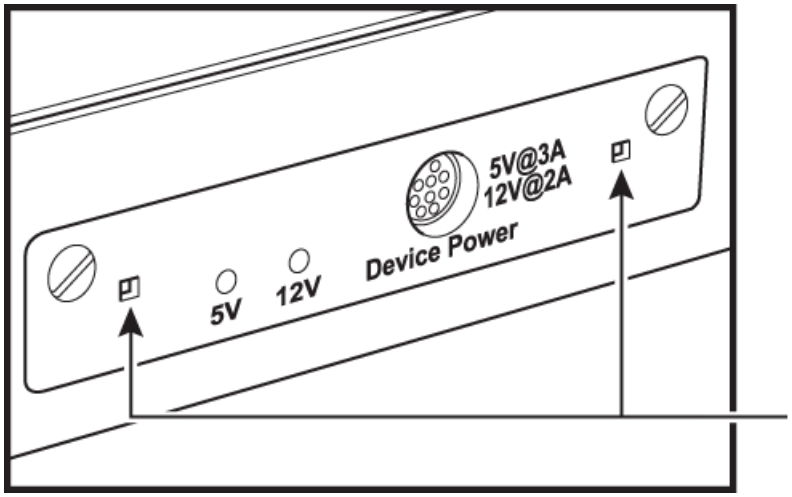
You can remove expansion cards using two tools:

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



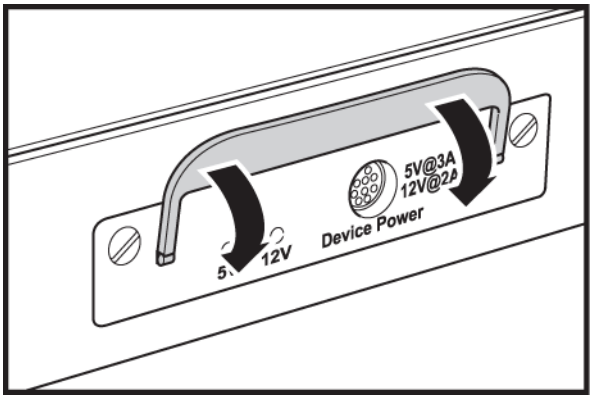
To remove an expansion card, follow these steps:

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.

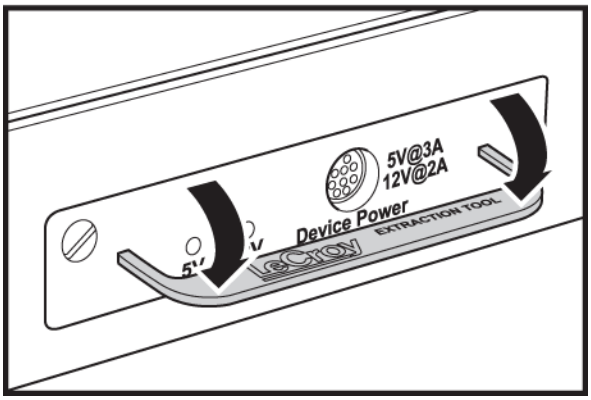


2. Insert the extraction-tool prongs into the holes in the expansion card panel.

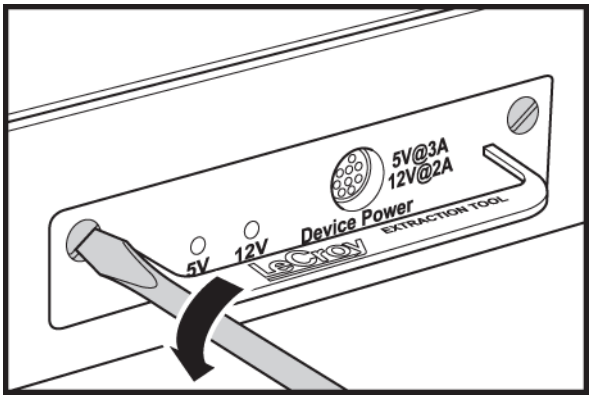
Note: If the prongs do not slip easily into the holes, use a small nail file or similar device to remove paint from the prongs



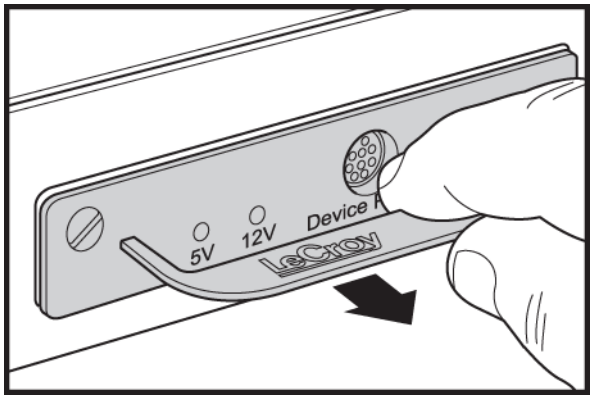
3. Rotate the extraction tool to a horizontal position to lock the prongs into place and make a handle



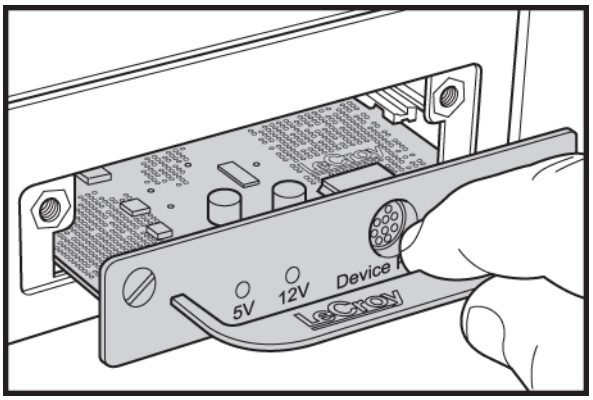
4. Using the screwdriver, loosen both retaining screws by rotating them counter-clockwise approximately two full turns, until feeling slight resistance. **Do not force the retaining screws** after two turns.



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.

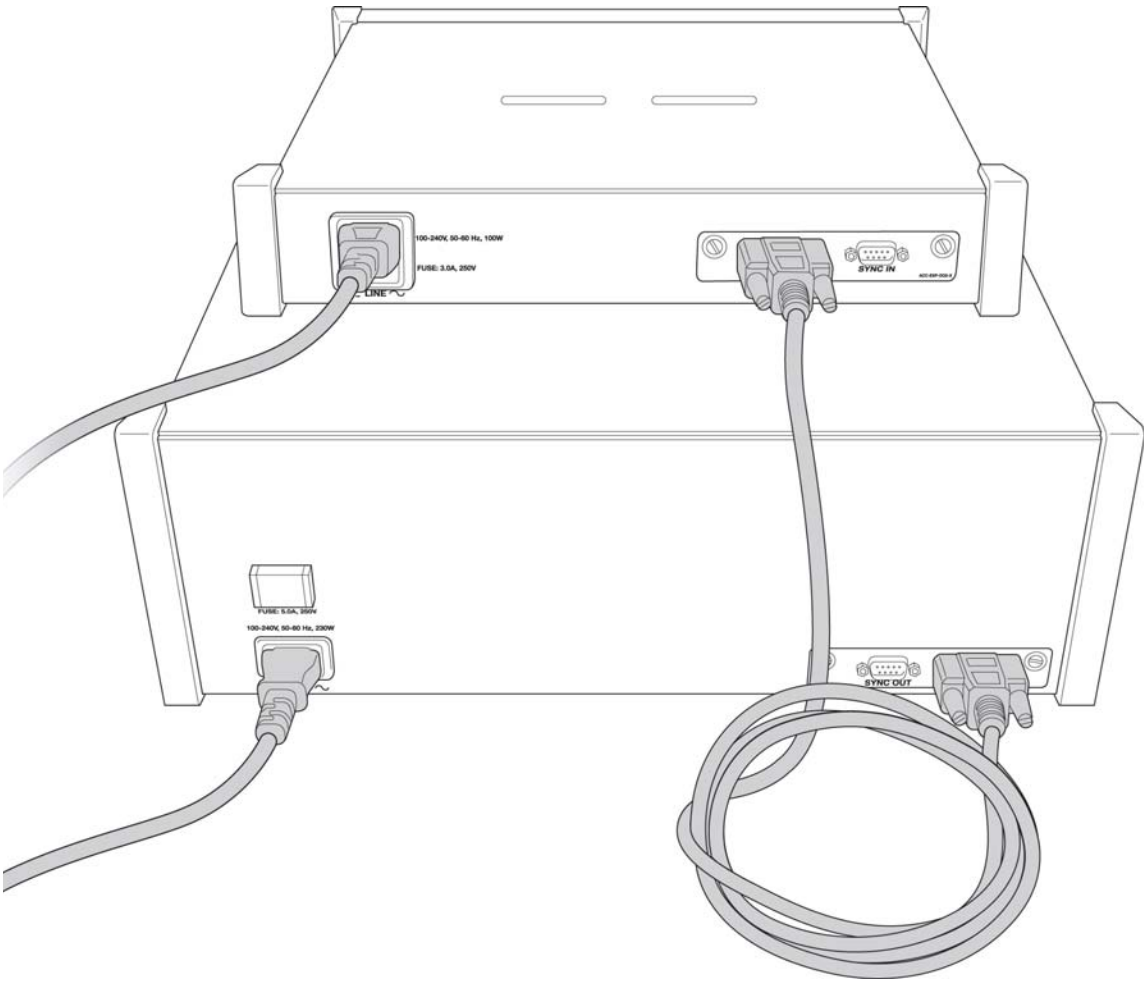


Figure 1.9: An Example of Connecting a SierraFC M164 and a Summit T3-16

Select Device

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

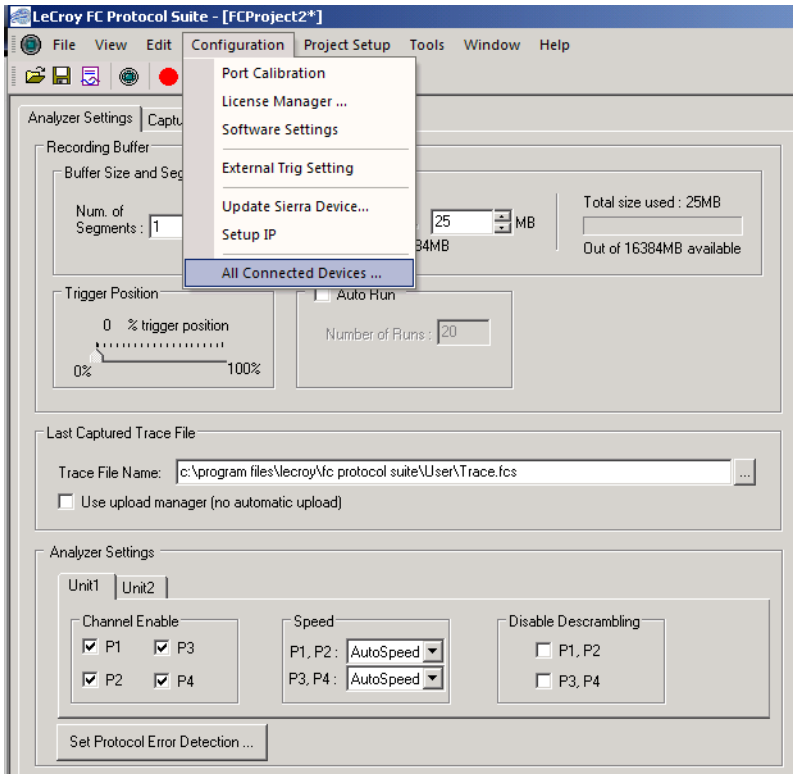


Figure 1.10: Connecting to Device(s)

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.

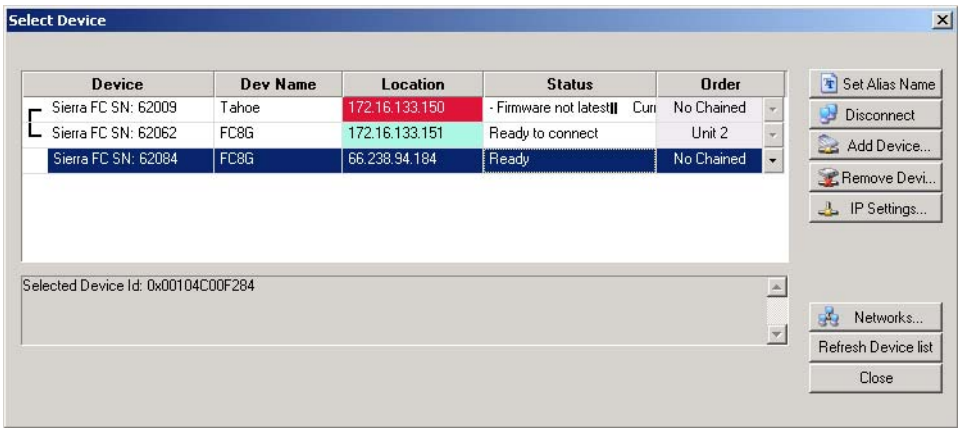


Figure 1.11: Select Device Dialog

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.

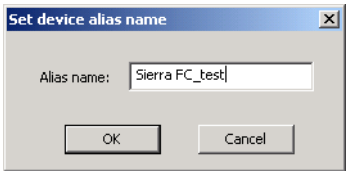


Figure 1.12: Set Device Alias Name Dialog

Disconnect

Click **Disconnect** to disconnect a device.

Add Device...

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

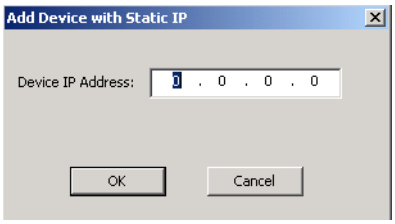


Figure 1.13: Add Device with Static IP Dialog

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.

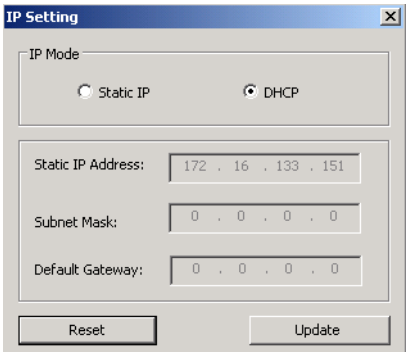


Figure 1.14: IP Setting Dialog

Networks...

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

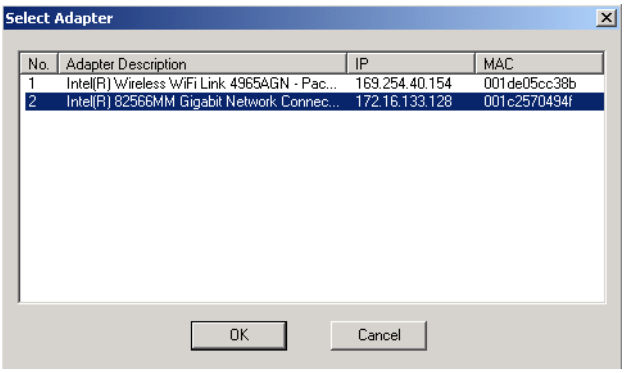


Figure 1.15: Select Adapter Dialog

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).

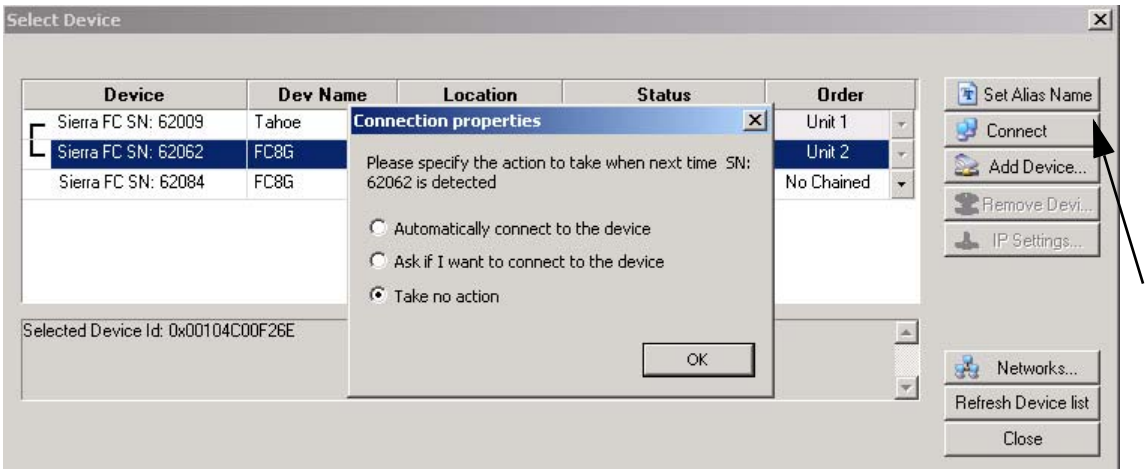


Figure 1.16: Connection Properties Dialog

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.

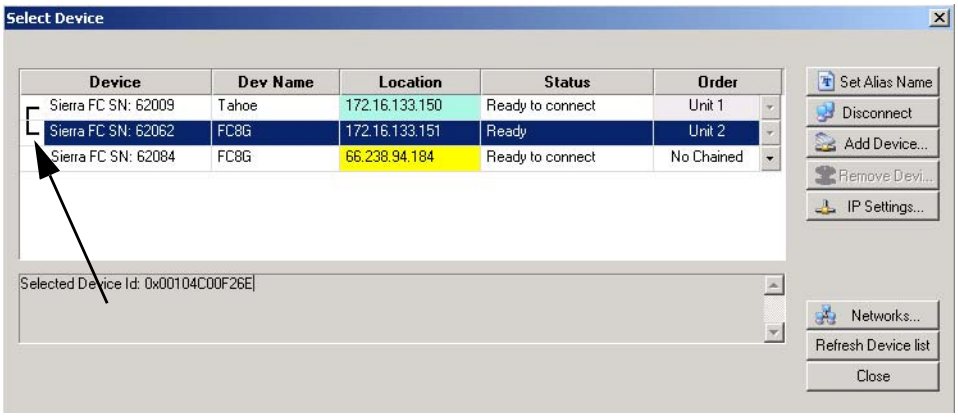


Figure 1.17: Select Device Dialog Displaying Unit 1 and Unit 2 Chained

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.
7. 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.)

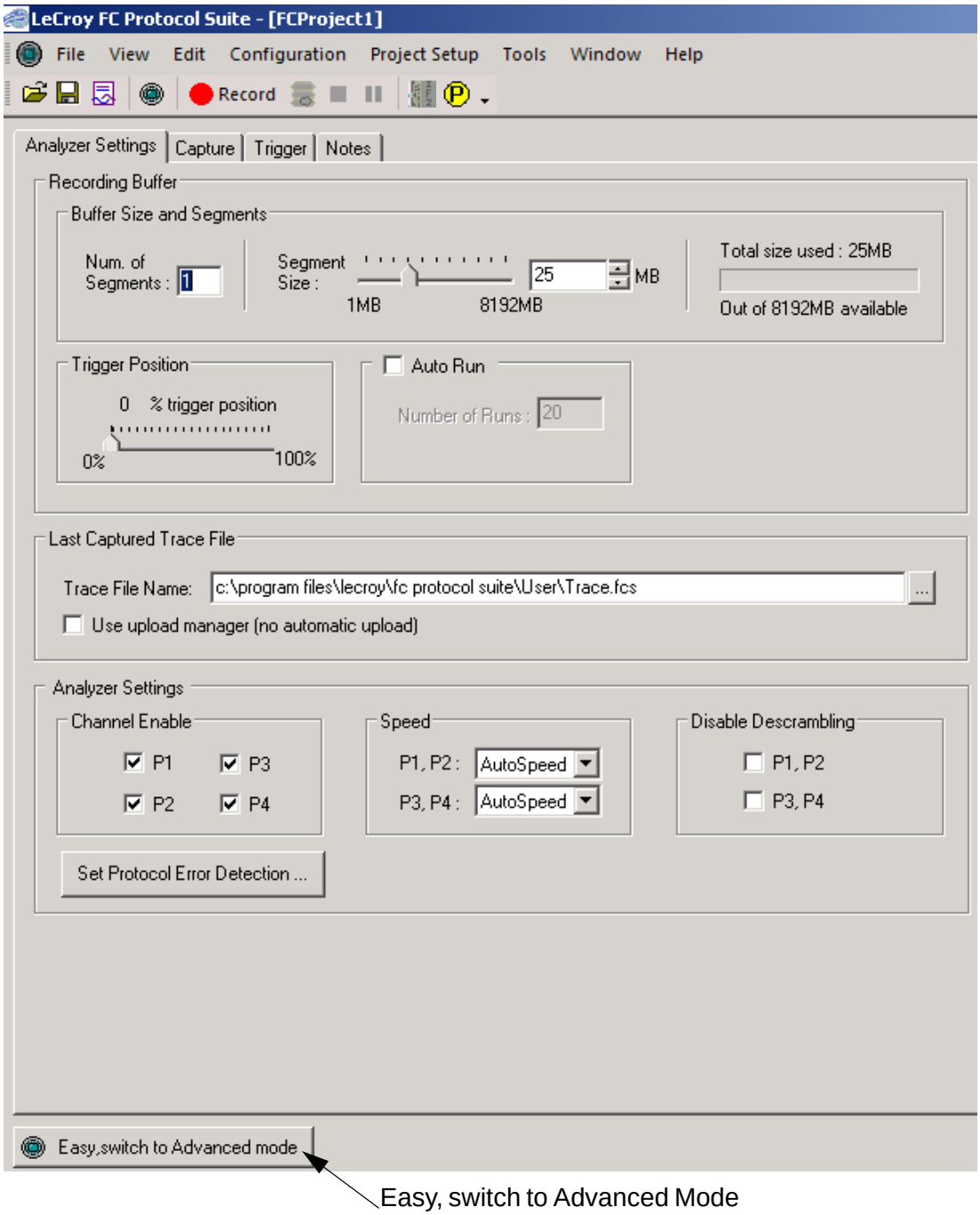


Figure 1.18: Easy/Advanced Mode Toggle Button

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:

- **Spreadsheet 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.

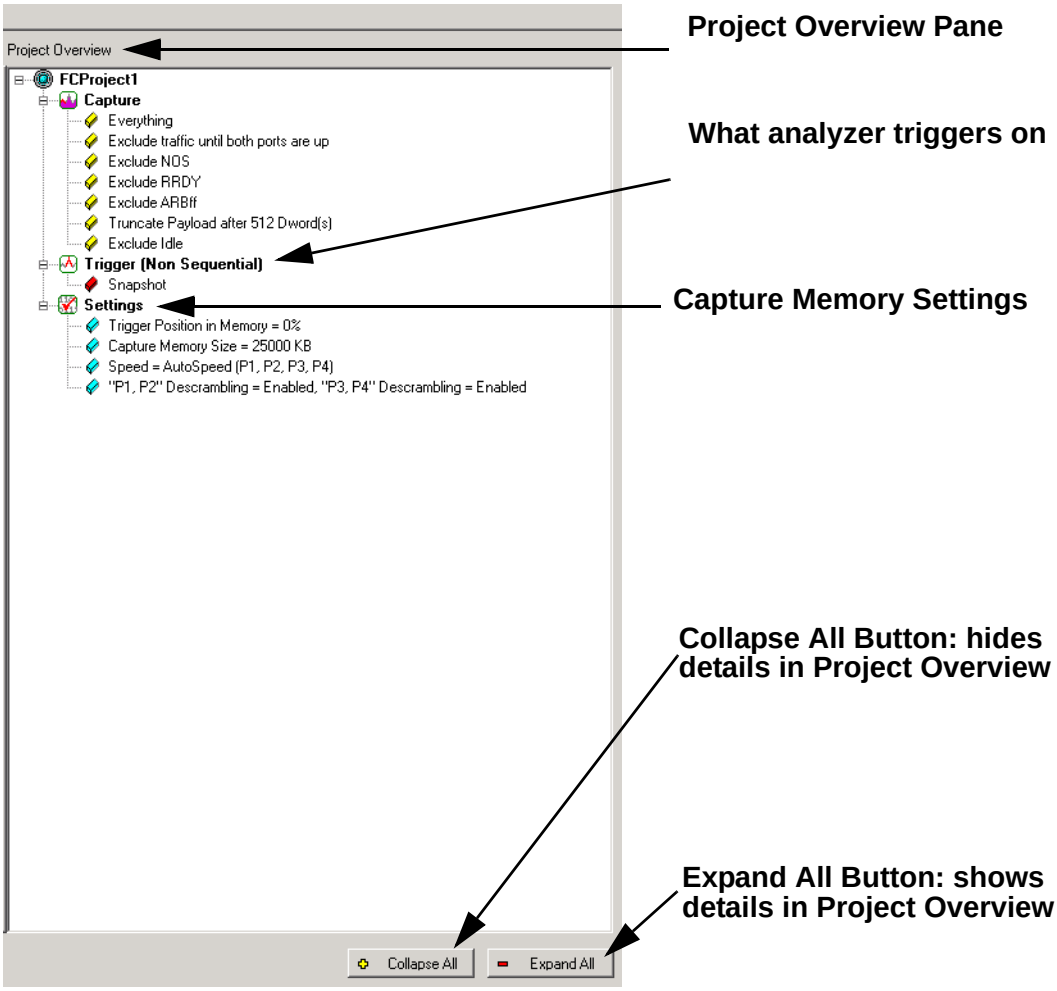


Figure 2.1: Protocol Analysis Project Dialog

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).

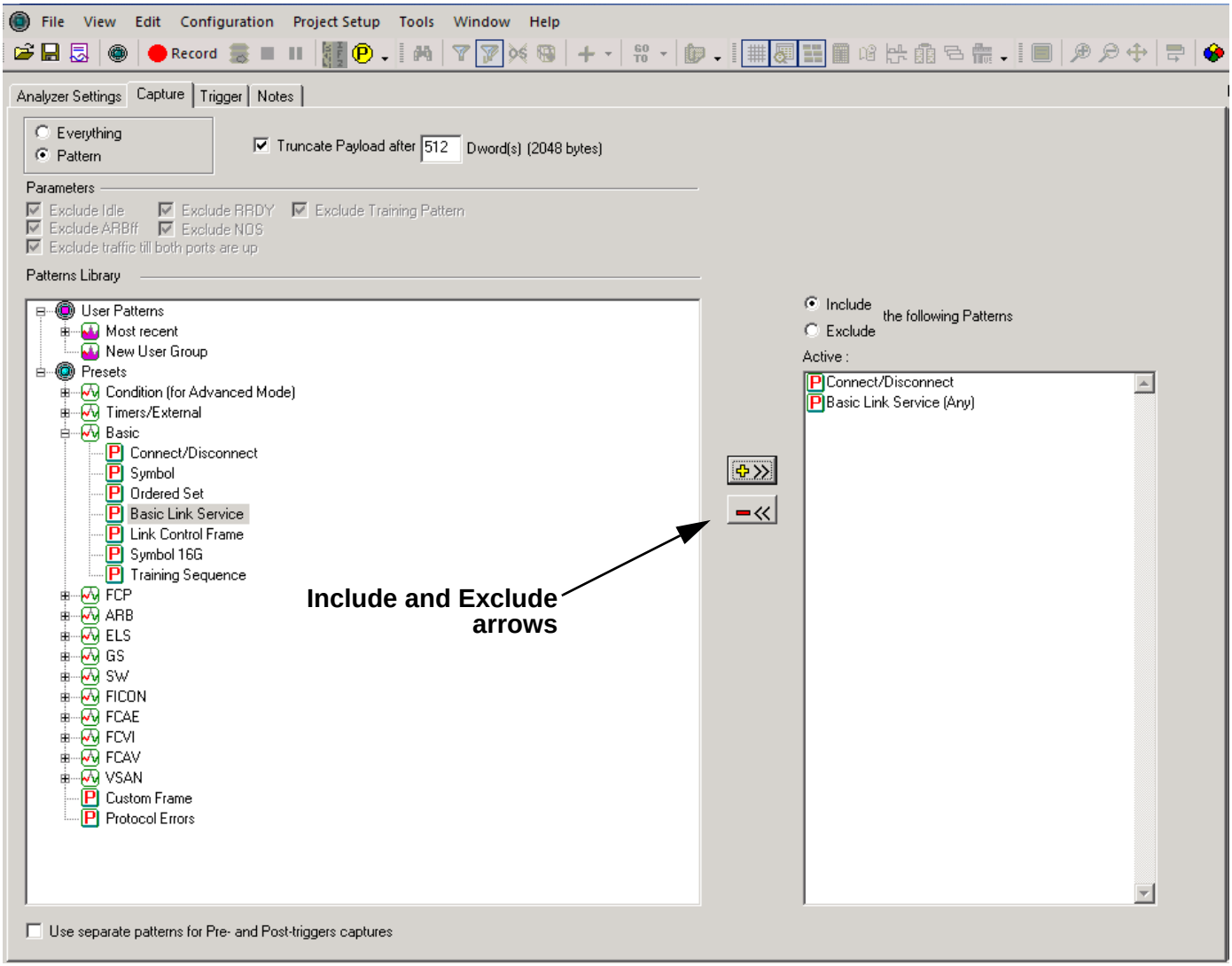


Figure 2.2: Capture Dialog

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.

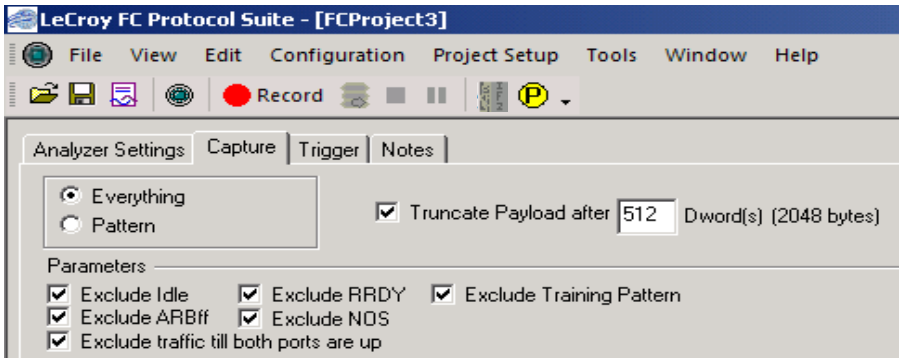


Figure 2.3: Protocol Analysis Capture Dialog

Software Menus and Toolbar

The software has the following main toolbar.

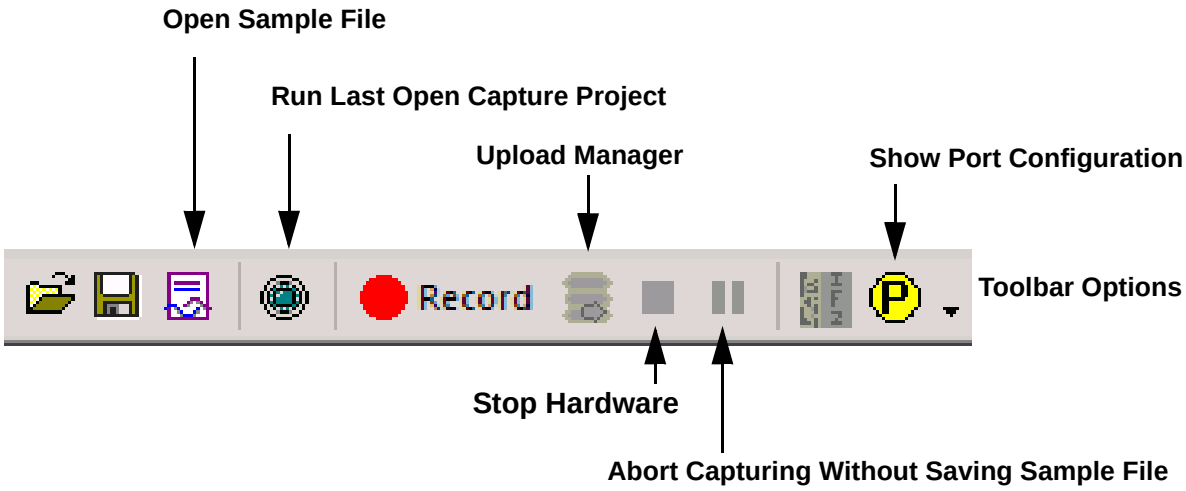


Figure 2.4: Main Toolbar

Run Hardware

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

1. Click the 

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.

3. 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:

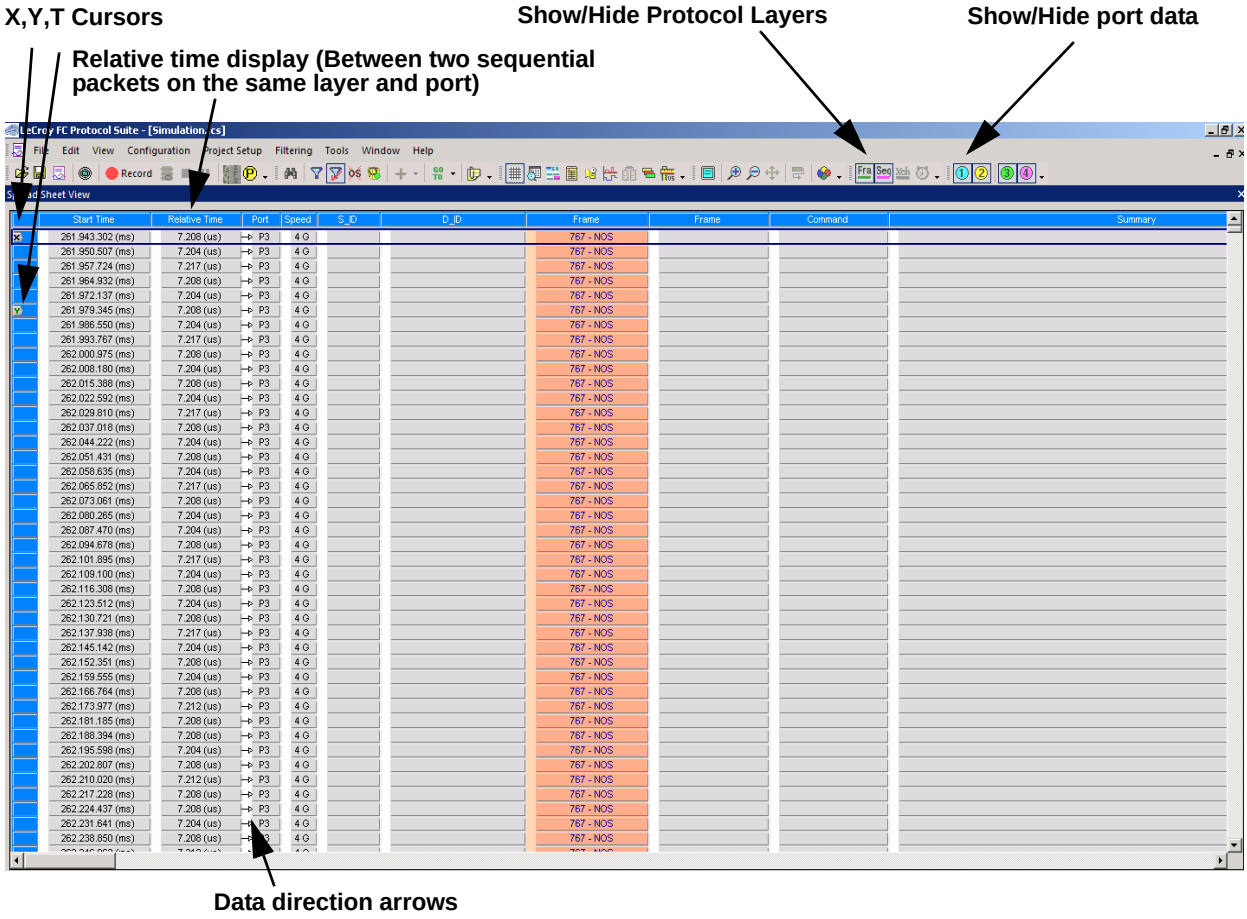


Figure 2.5: Typical Spreadsheet View Results Display

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: ⇐. Downstream traffic has an arrow left to right: ⇒.

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.

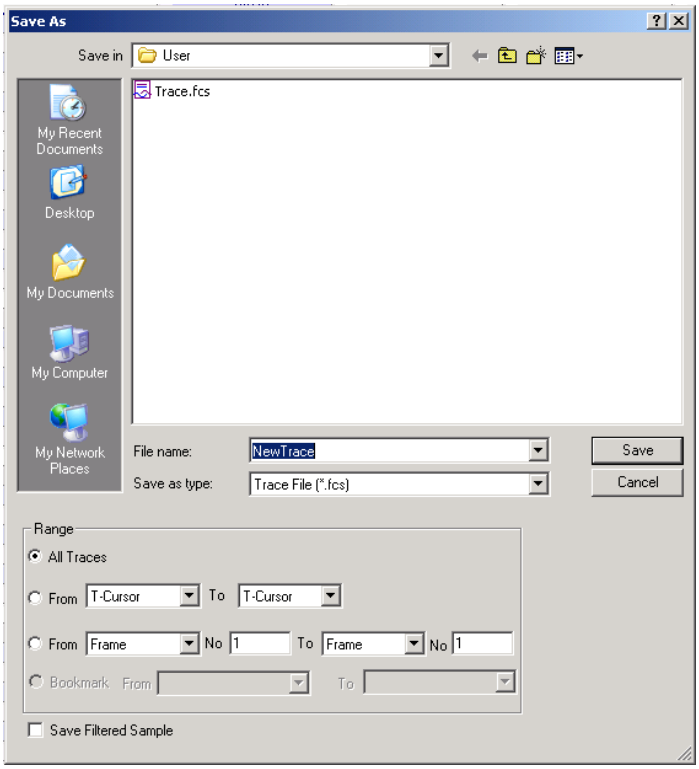


Figure 2.6: Save As Dialog

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.

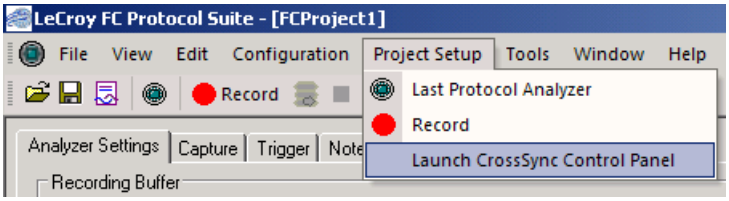


Figure 2.7: Launching CrossSync from the SierraFC M164 Protocol Suite Application

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 **File > Open.**
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.

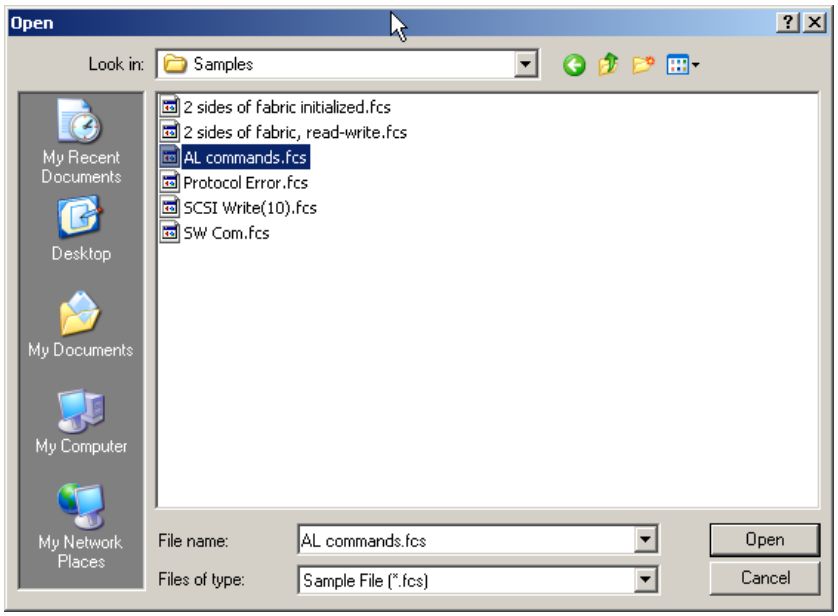


Figure 2.8: Open File Dialog

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

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

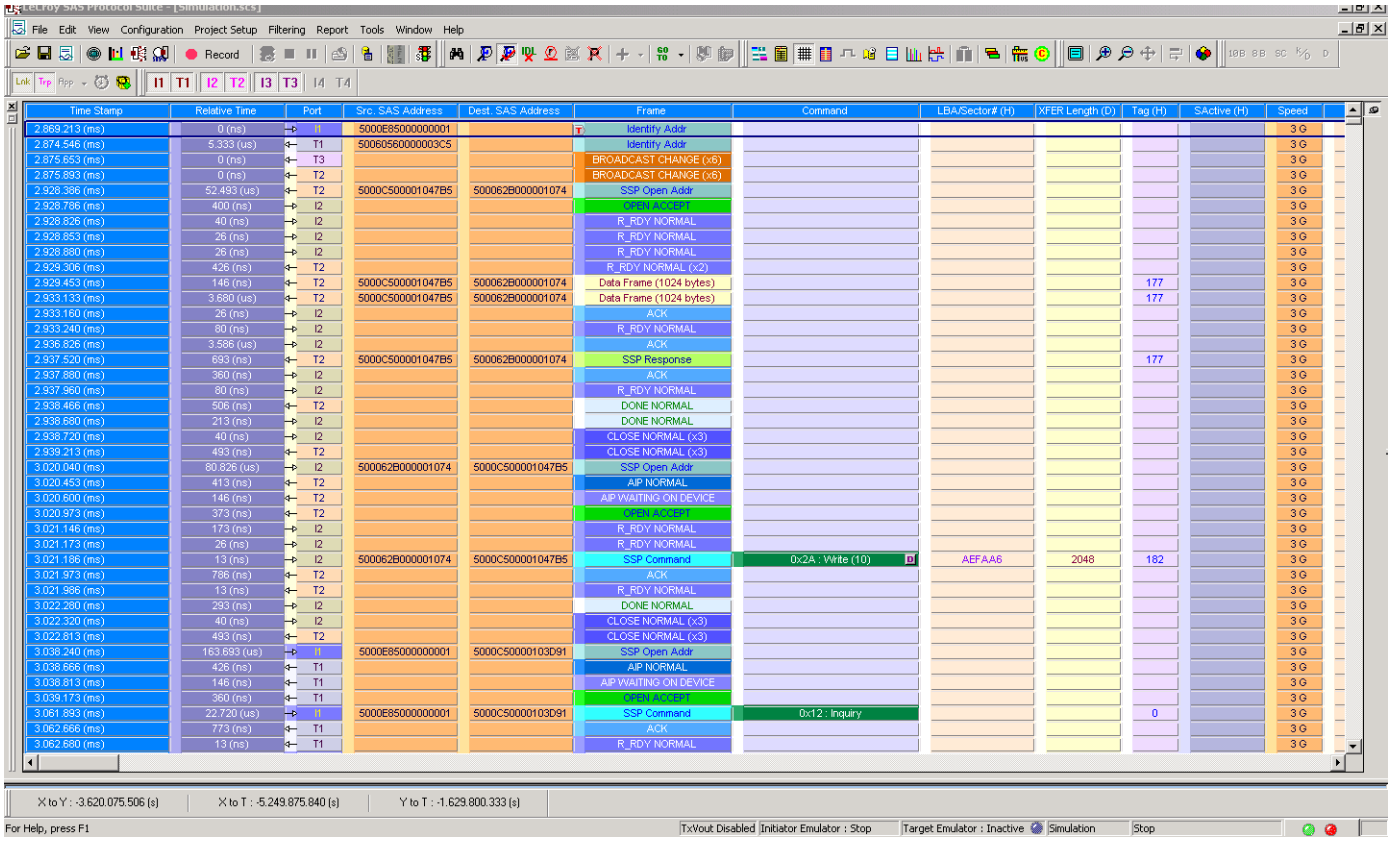


Figure 2.9: Analyzer Trace Capture Display

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.

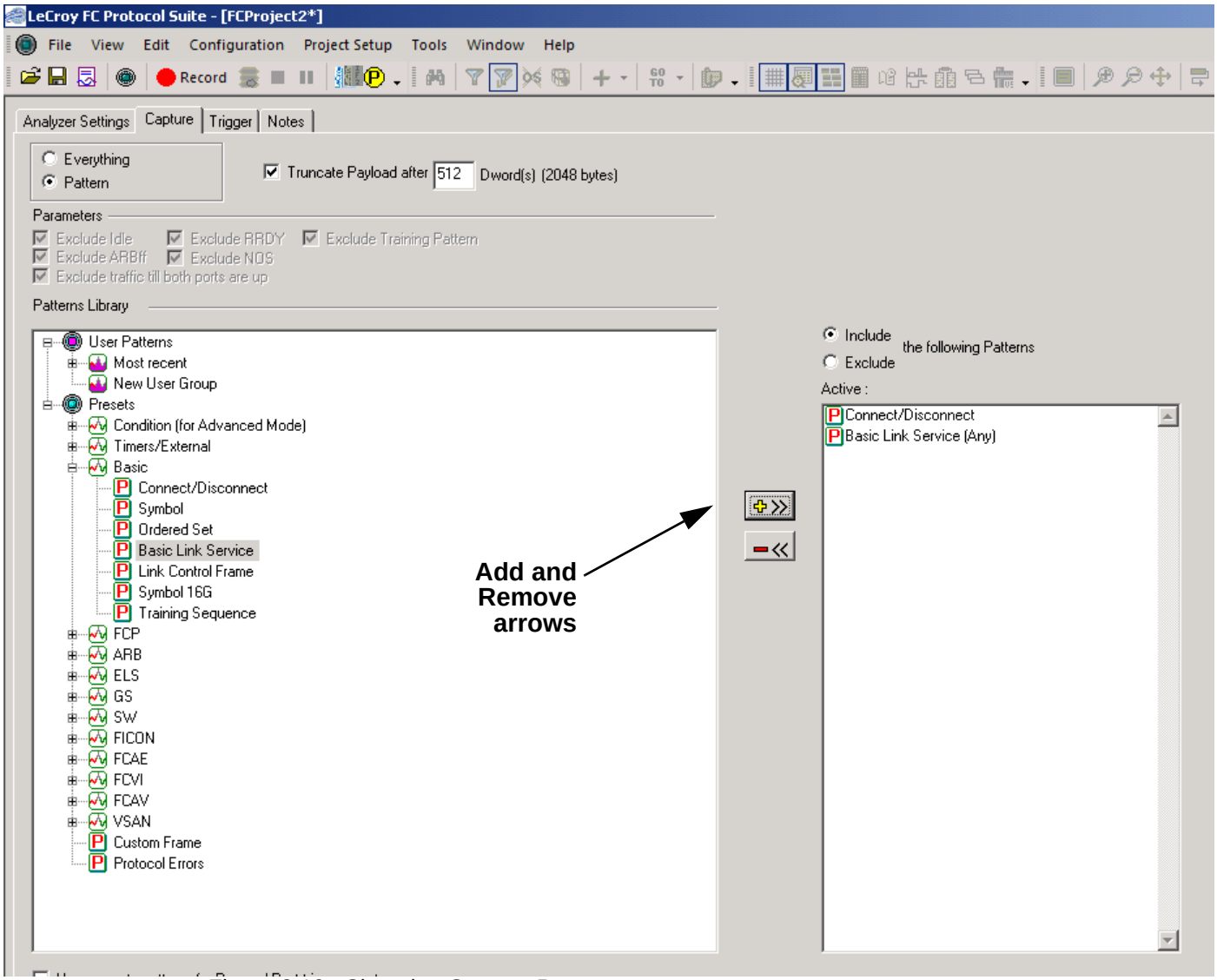


Figure 2.10: Choosing Capture Patterns

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.

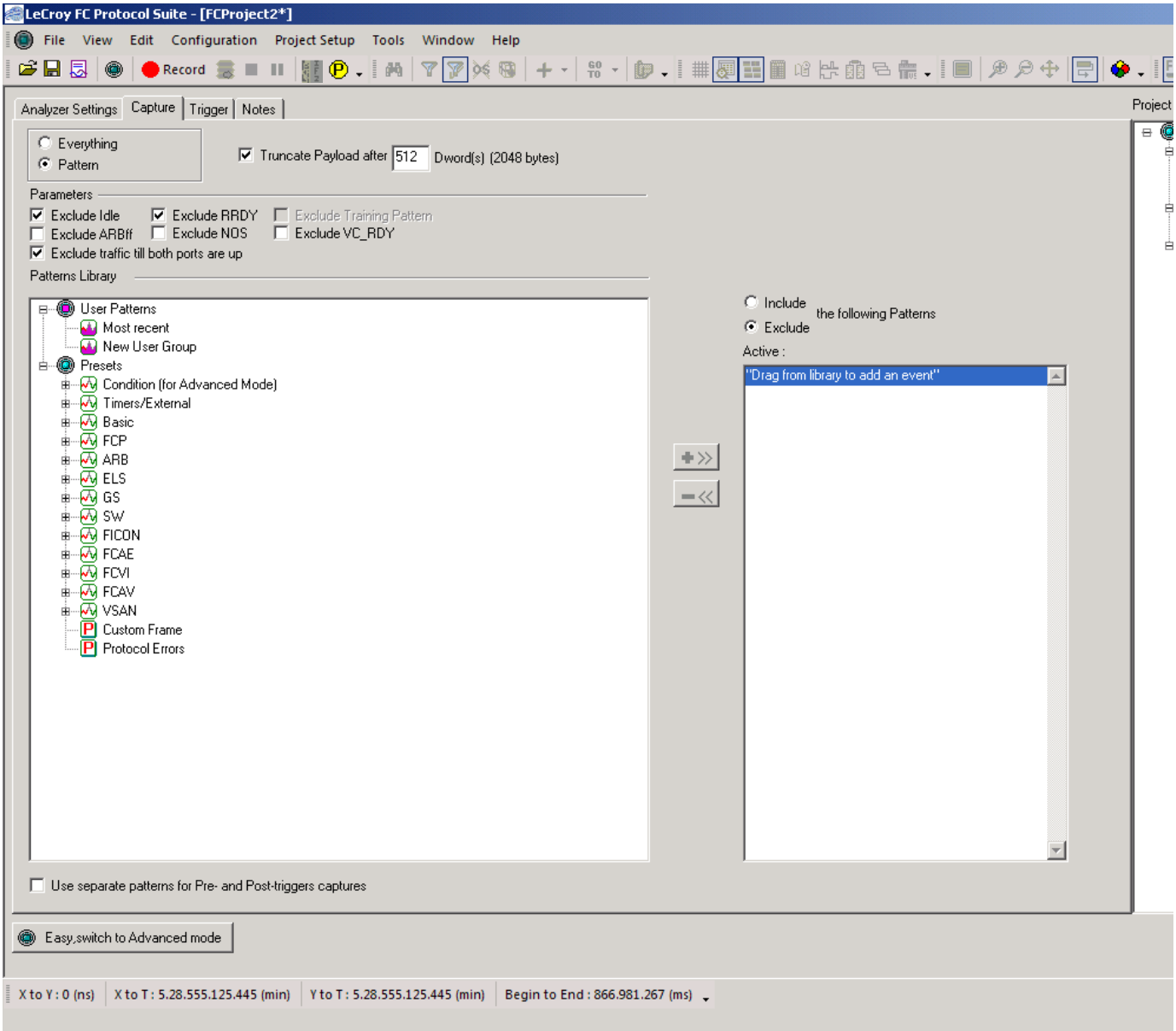


Figure 2.11: Exclude Patterns Checked

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).

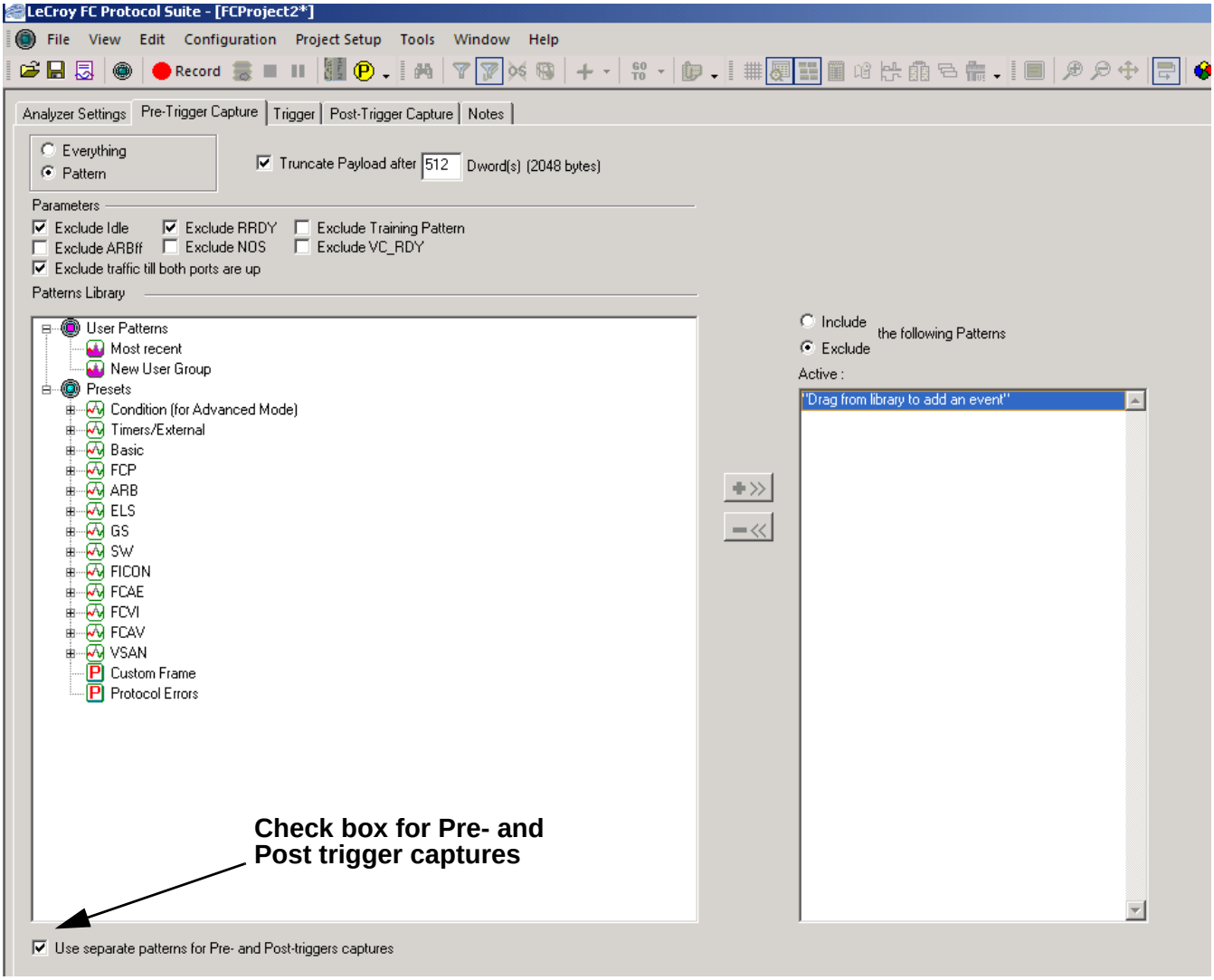


Figure 2.12: Pre-Trigger and Post-Trigger Capture Dialog Enabled

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.

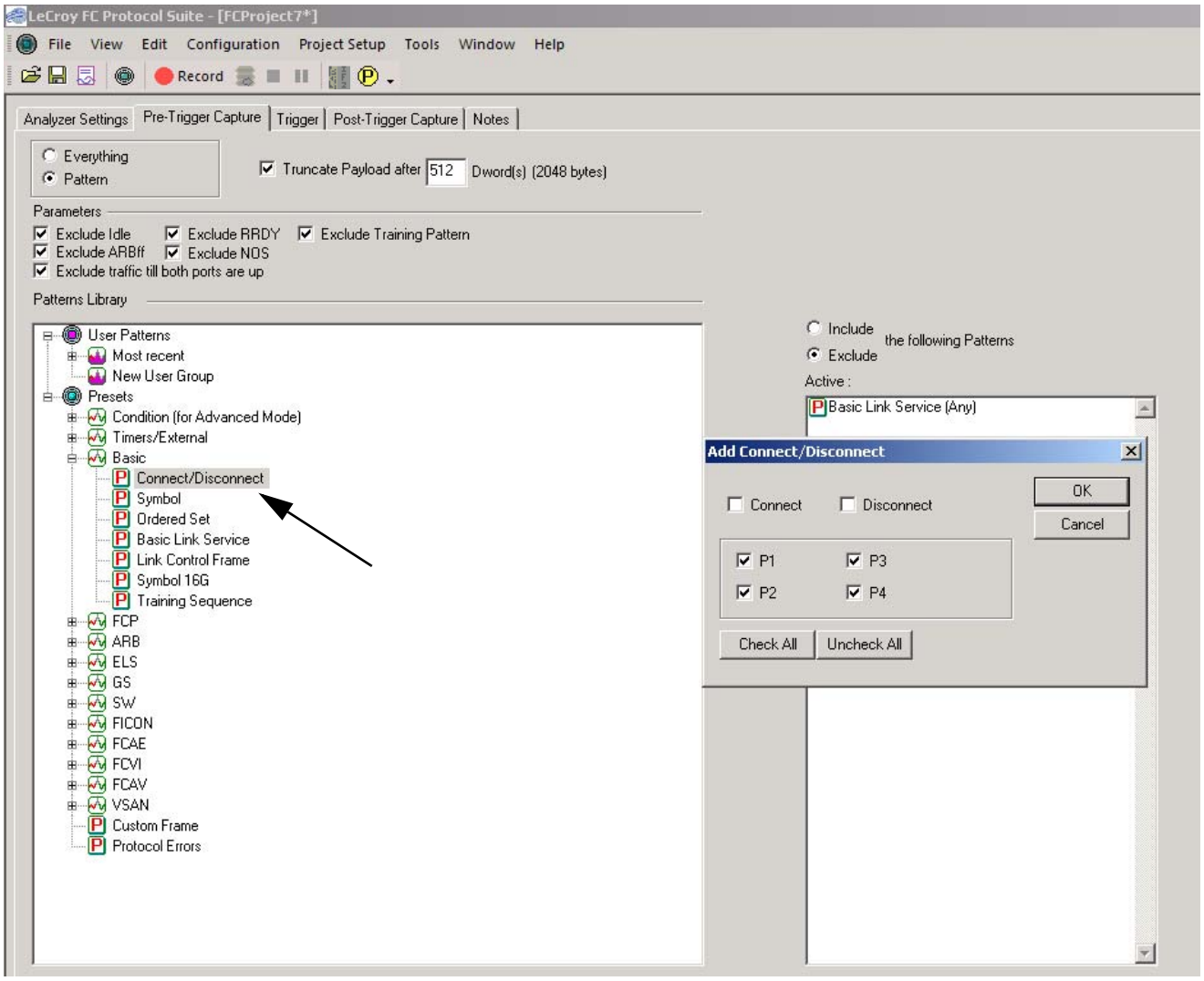


Figure 2.13: Connect Disconnect Pattern Dialog

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

Ordered Set

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

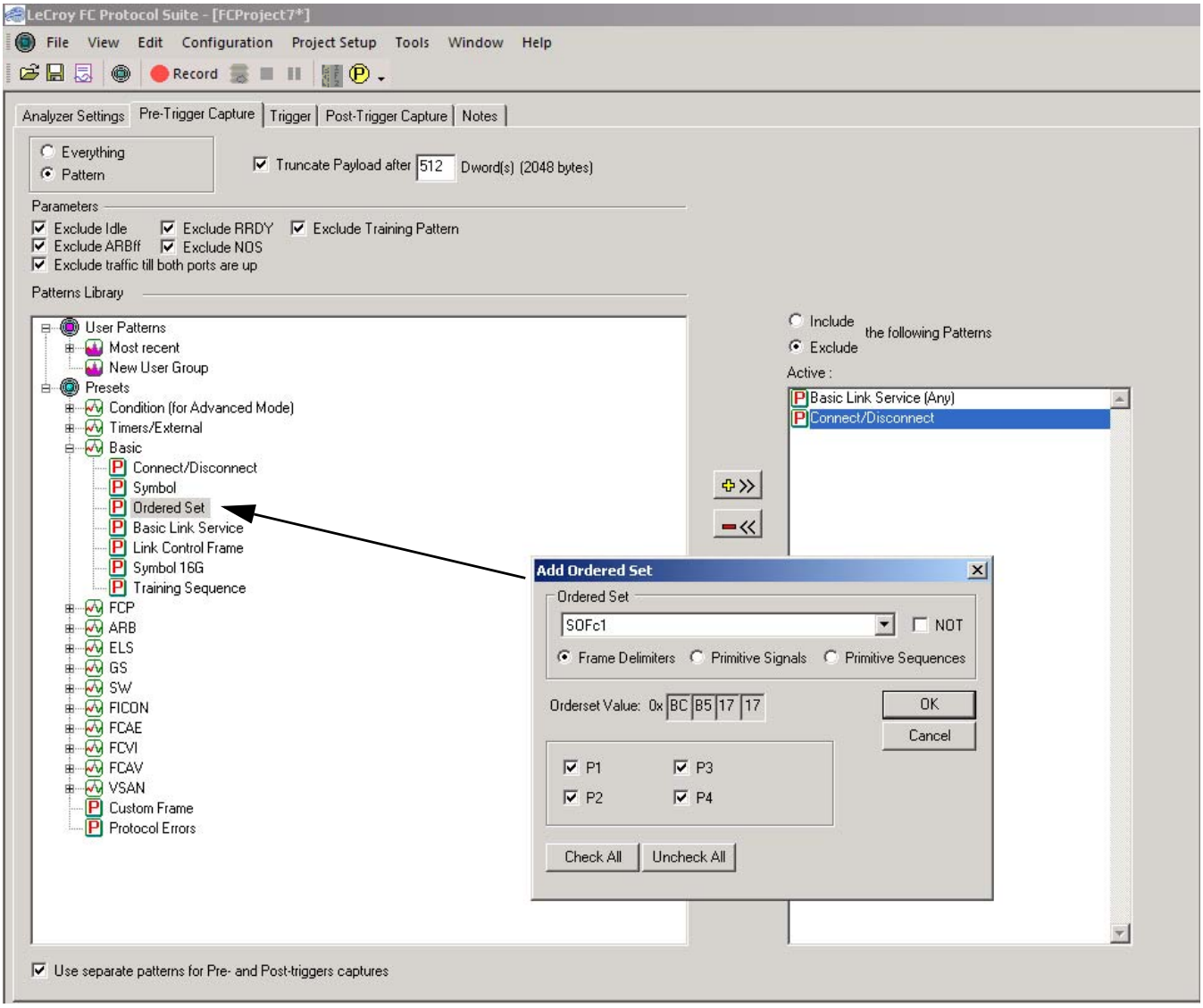


Figure 2.14: Ordered set Pattern Dialog

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.

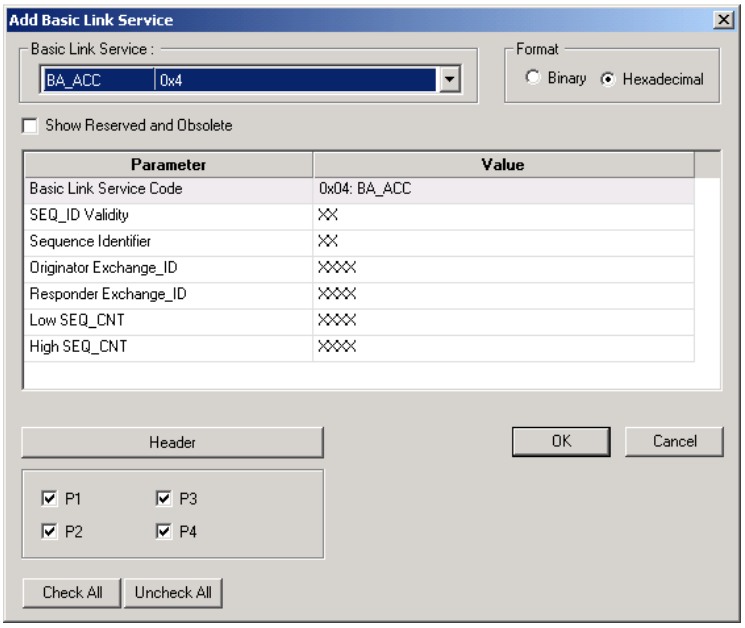


Figure 2.15: Basic Link Service Pattern Dialog

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.

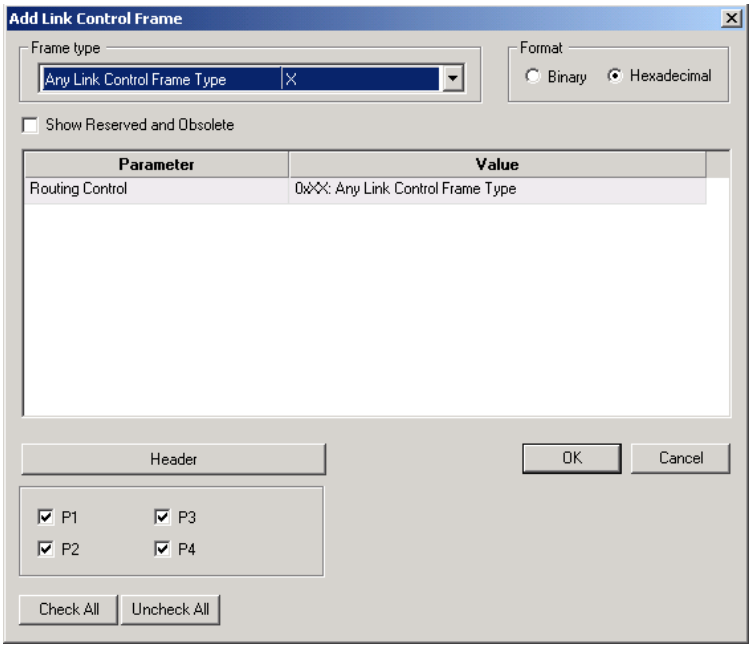


Figure 2.16: Link Control Frame Pattern Dialog

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.

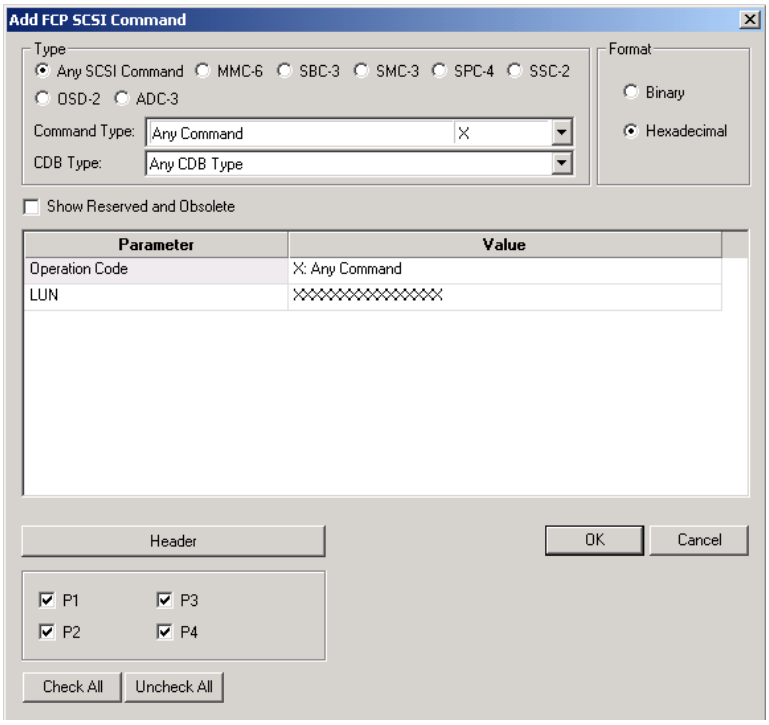


Figure 2.17: FCP SCSI Command Pattern Dialog

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.

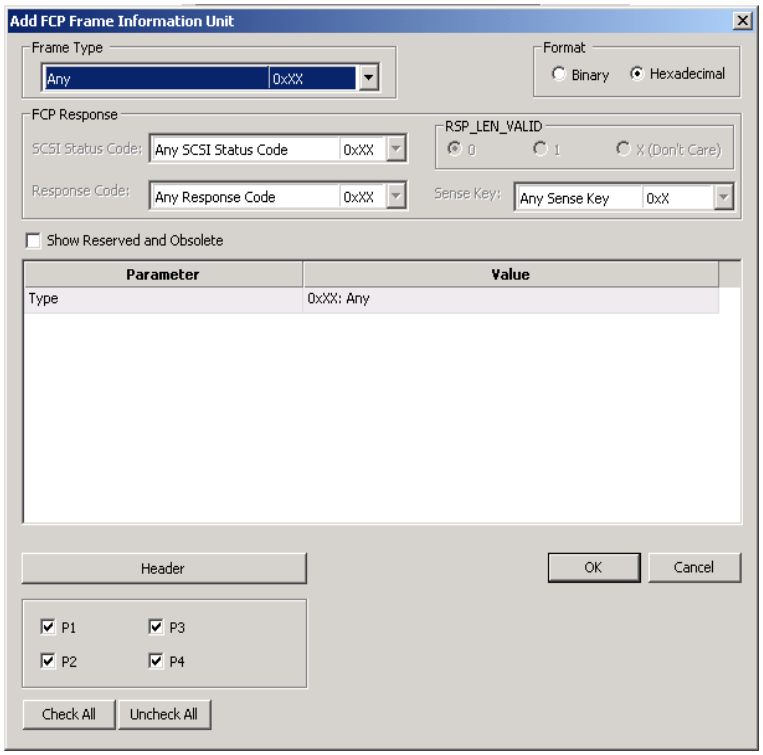


Figure 2.18: FCP Frame Information Unit Pattern Dialog

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.

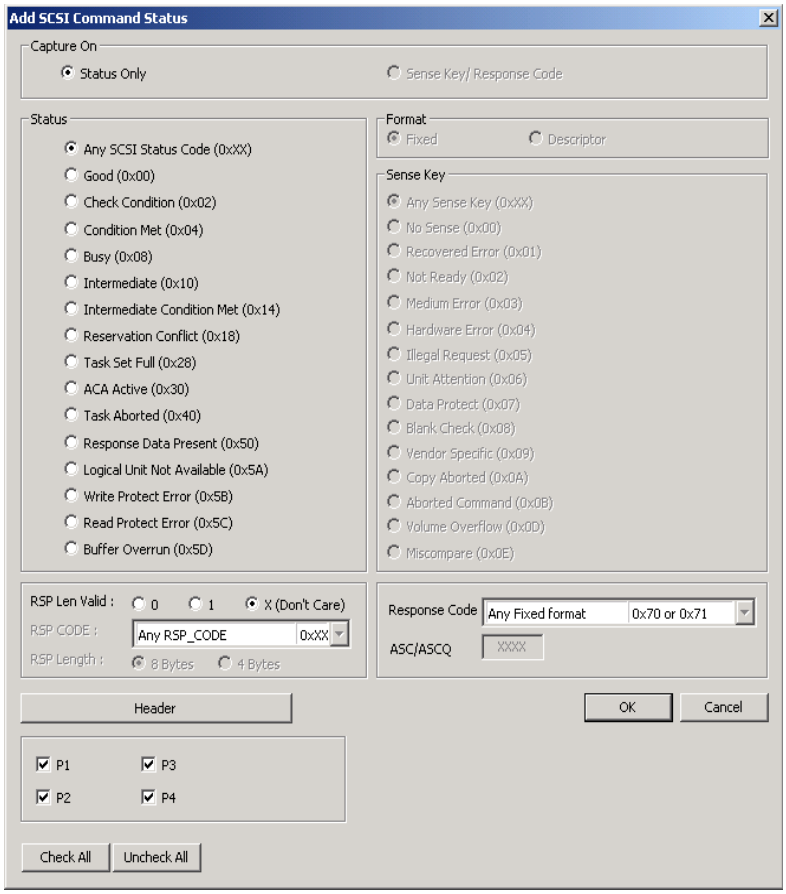


Figure 2.19: SCSI Command Status Pattern Dialog

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.

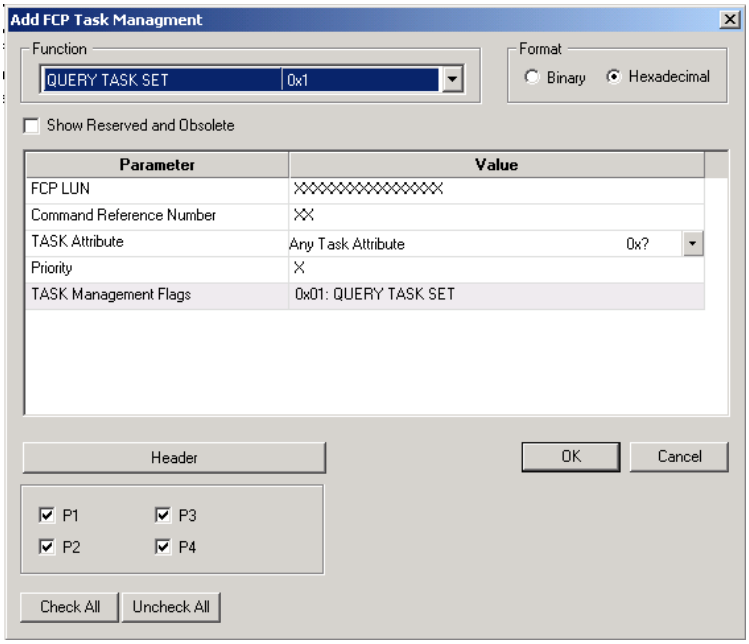


Figure 2.20: FCP Task Management Pattern Dialog

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.

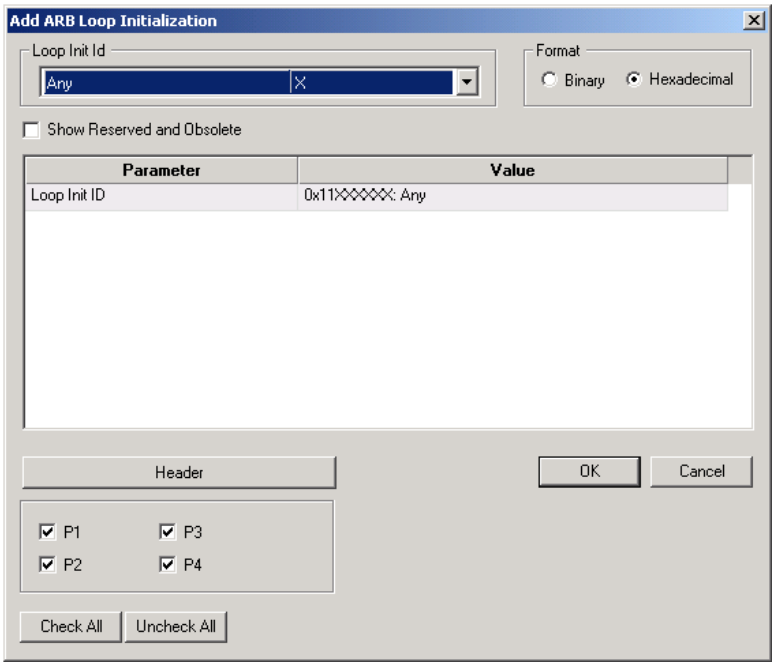


Figure 2.21: ARB Loop Initialization Pattern Dialog

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.

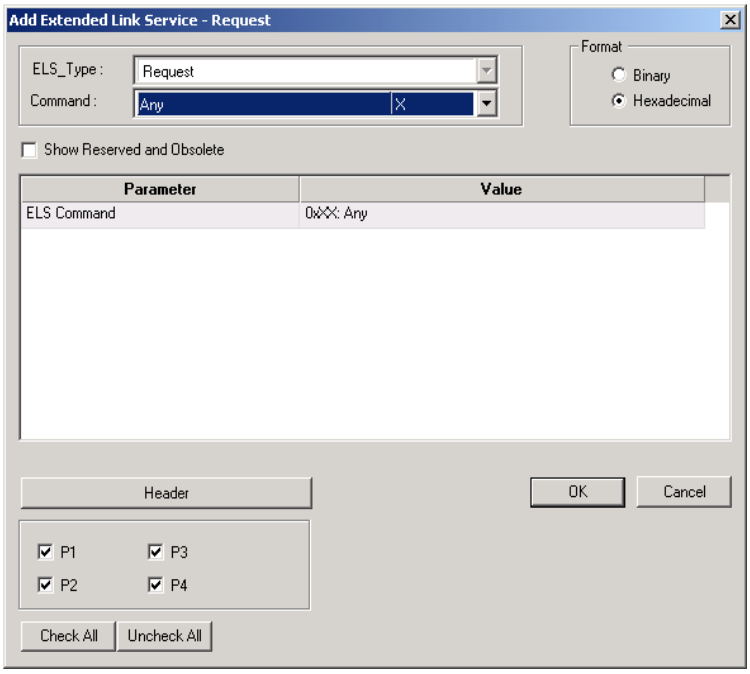


Figure 2.22: Extended Link Service - Request Pattern Dialog

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.

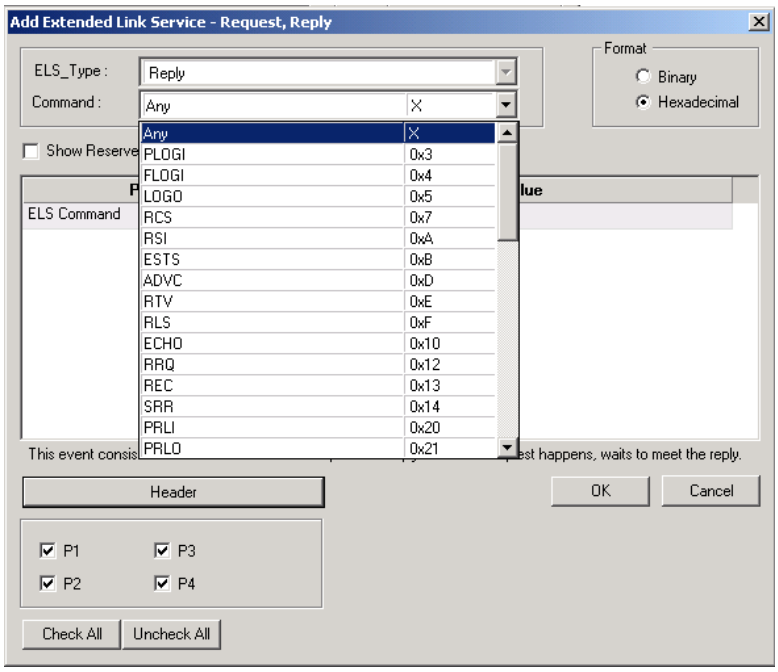


Figure 2.23: Add Extended Link Service - Request, Reply Pattern Dialog

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.

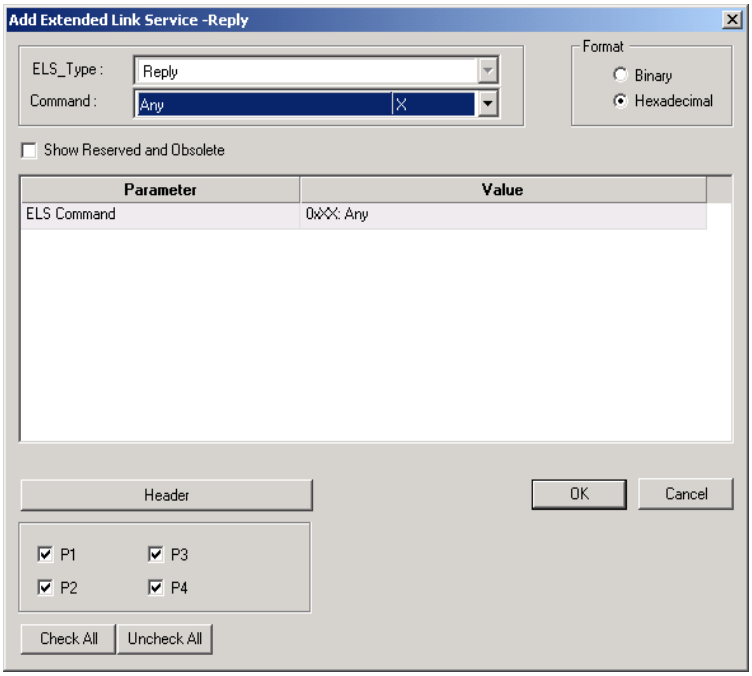


Figure 2.24: Extended Link Service - Reply Pattern Dialog

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.

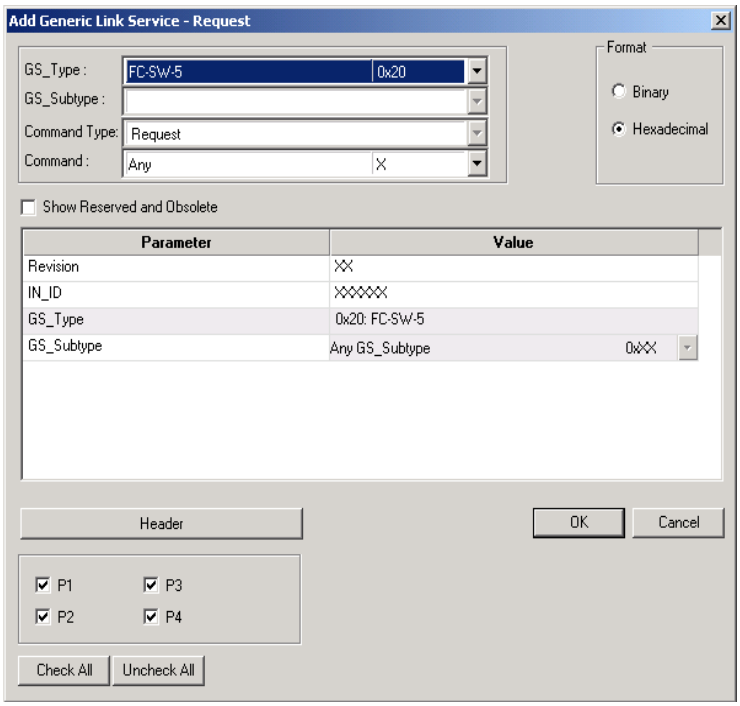


Figure 2.25: Generic Link Service Pattern Dialog

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.

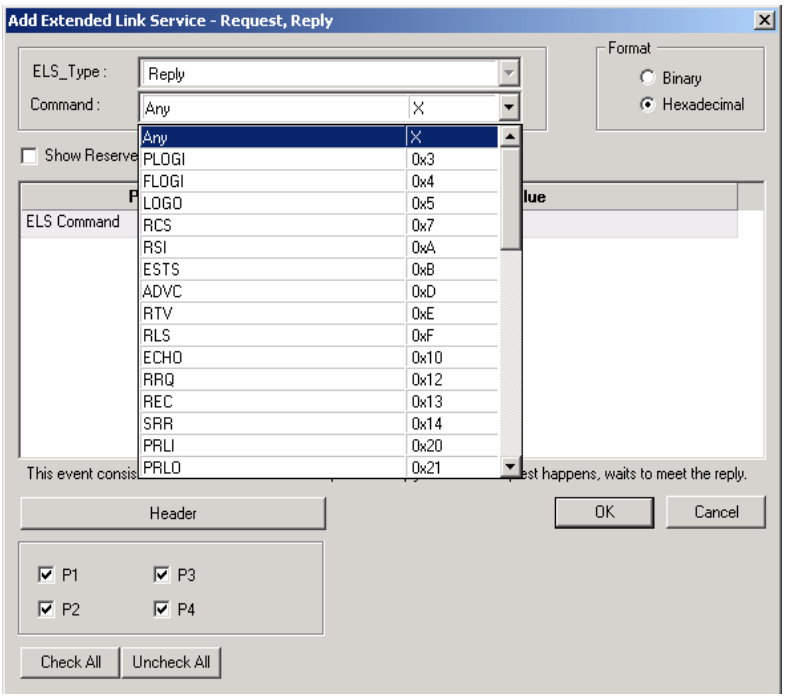


Figure 2.26: Generic Link Service-Request, Reply Pattern Dialog

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.

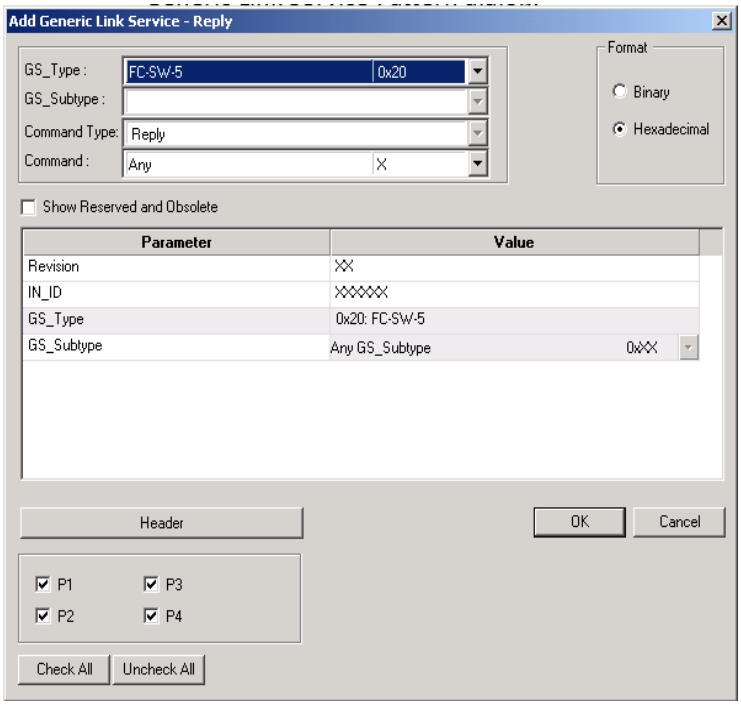


Figure 2.27: Generic Link Service Pattern Dialog

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.

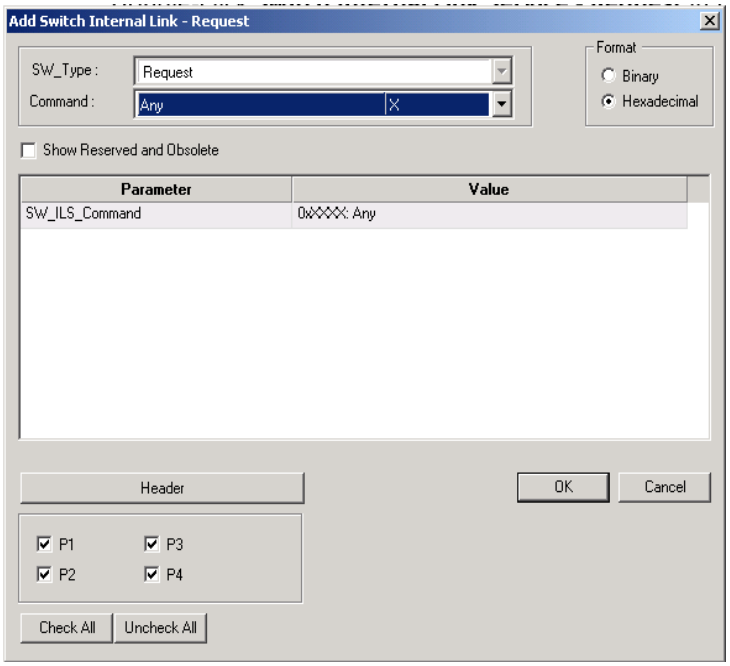


Figure 2.28: Switch Internal Link Service Pattern Dialog

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.

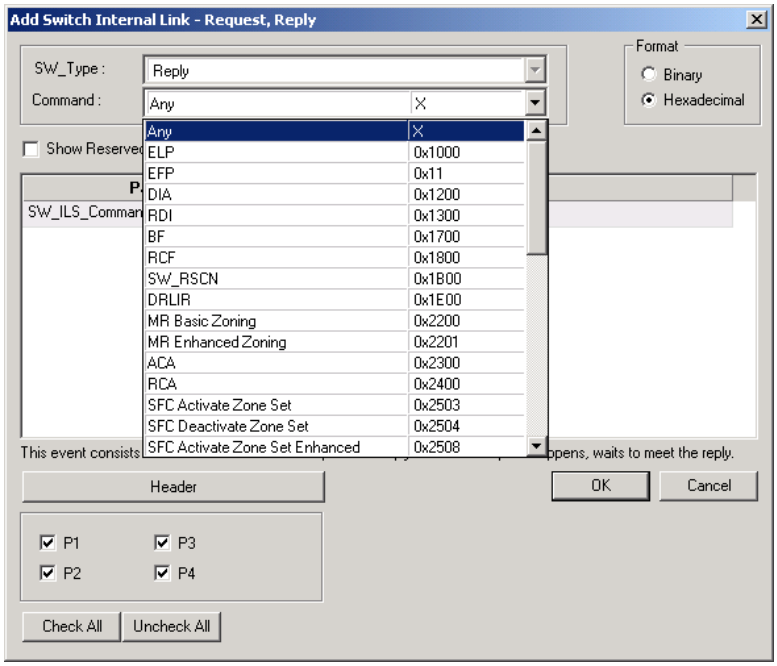


Figure 2.29: Switch Internal Link Service-Request, Reply Pattern Dialog

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.

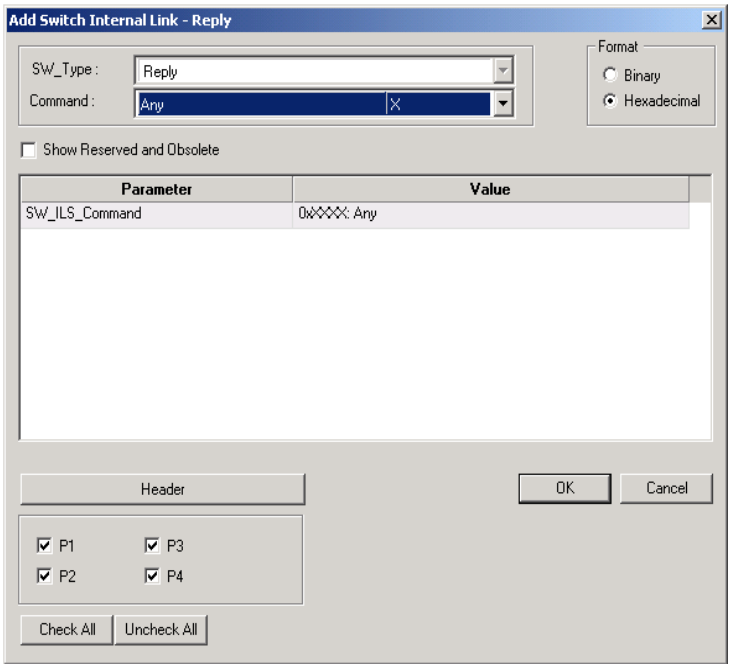


Figure 2.30: Switch Internal Link Service Pattern Dialog

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.

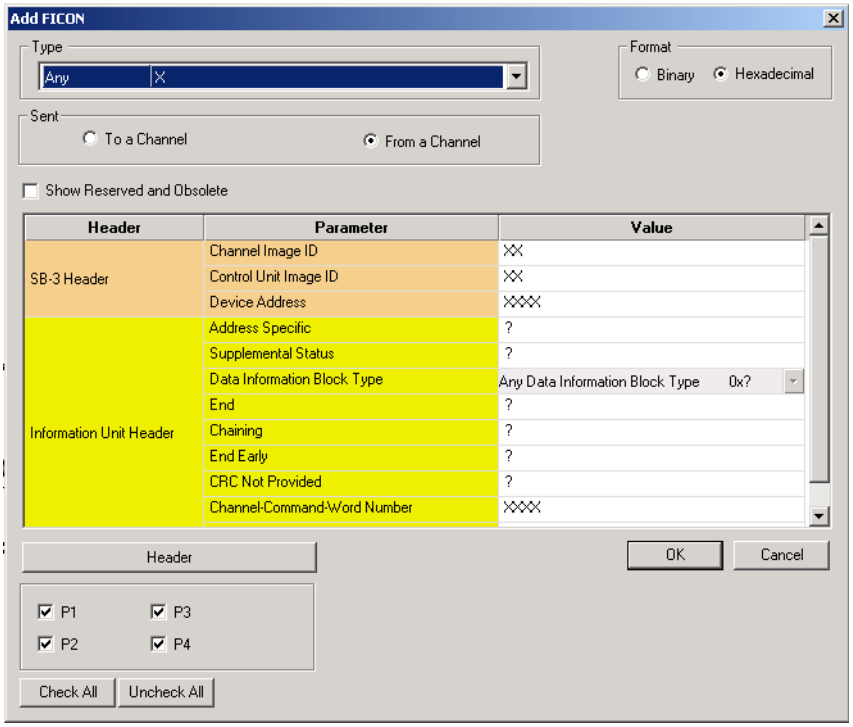


Figure 2.31: FICON - (Any Data Information Block Type) Dialog

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

To select a **Type** click the dropdown list which has the following options:

- 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.

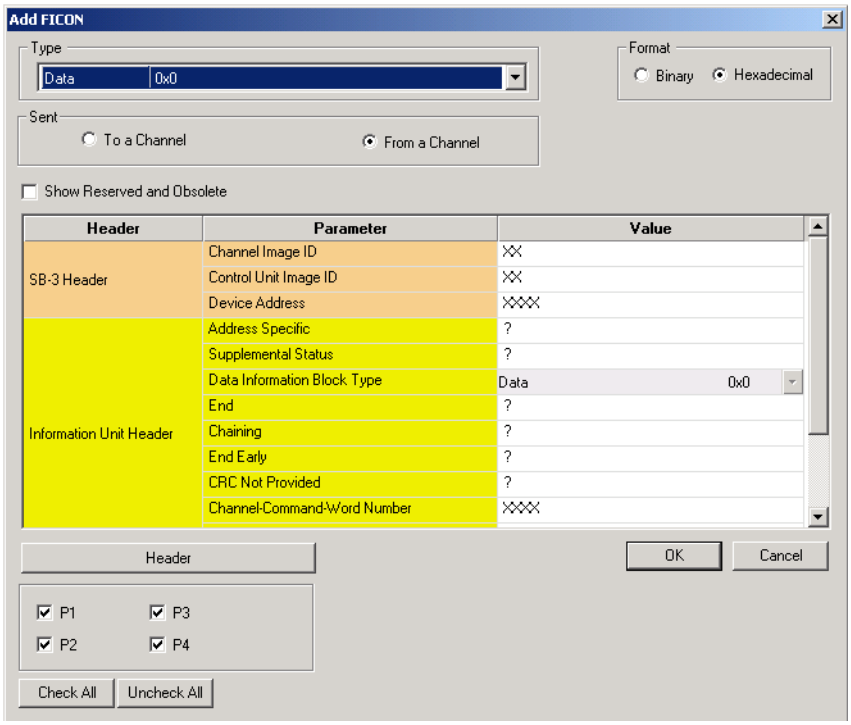


Figure 2.32: FICON (Data) Dialog

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

To select a **Type** click the dropdown list which has the following options:

- Any
- Data
- 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.

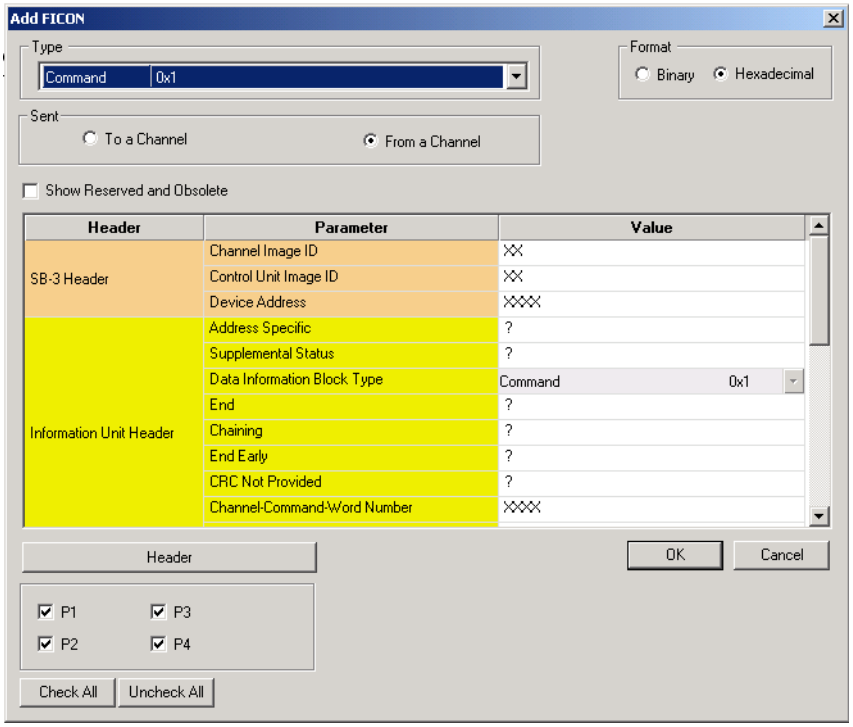


Figure 2.33: FICON (Command) Dialog

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

To select a **Type** click the dropdown list which has the following options:

- 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.

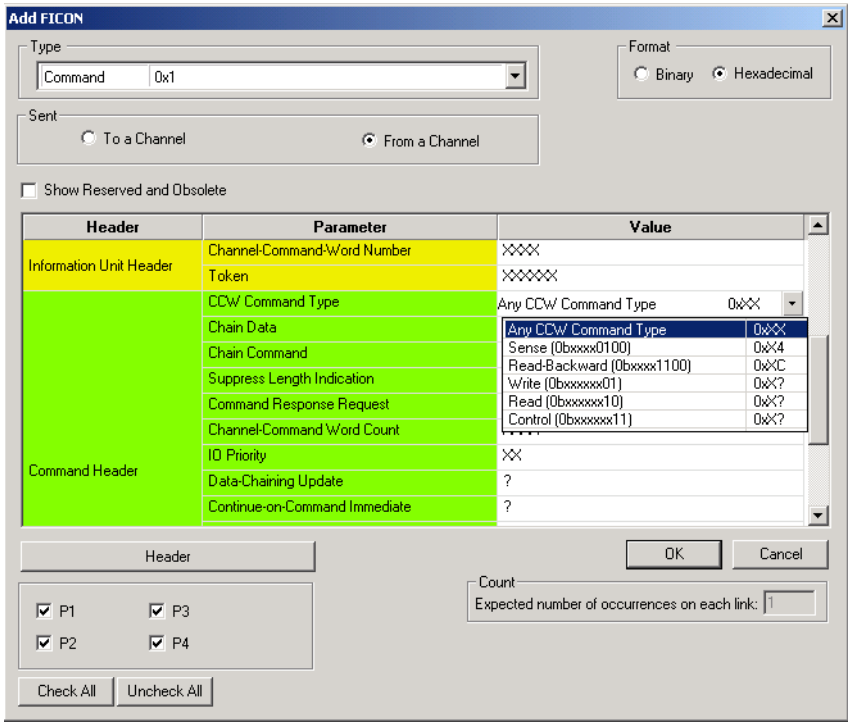


Figure 2.34: FICON[Command] - Any CCW Command Type Dialog

To select **Any CCW Command Type** click the dropdown list which has the following options:

- 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.

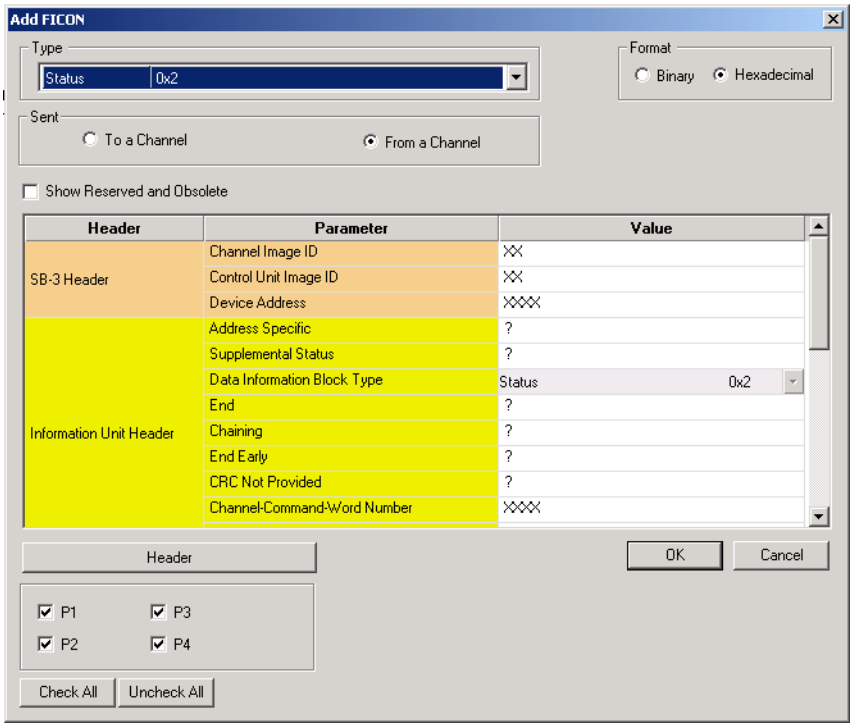


Figure 2.35: FICON (Status) Dialog

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

To select a **Type** click the dropdown list which has the following options:

- Any
- Data
- 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.

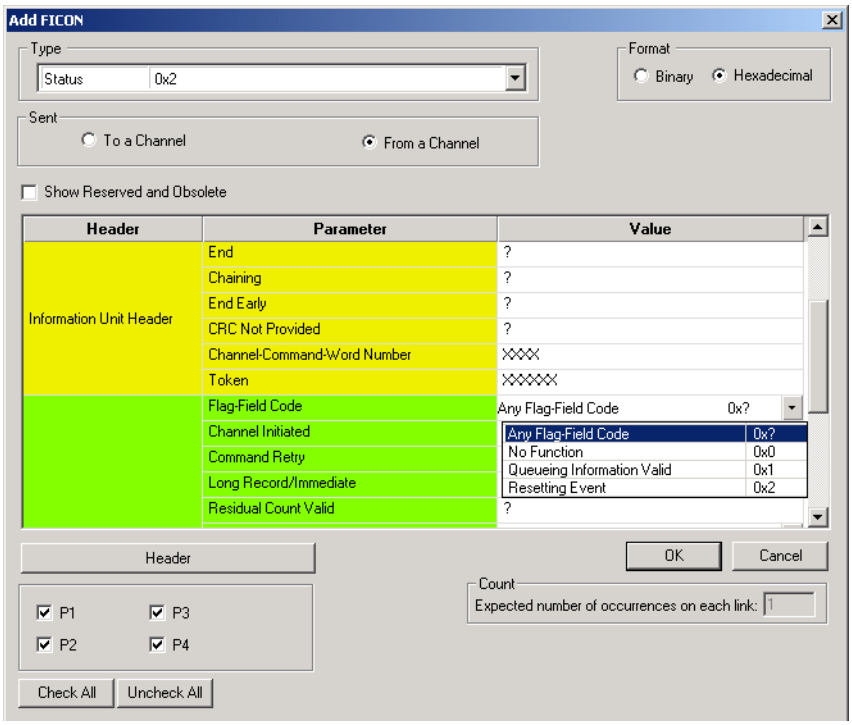


Figure 2.36: FICON[Status] - Any Flag-Field Code Dialog

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.

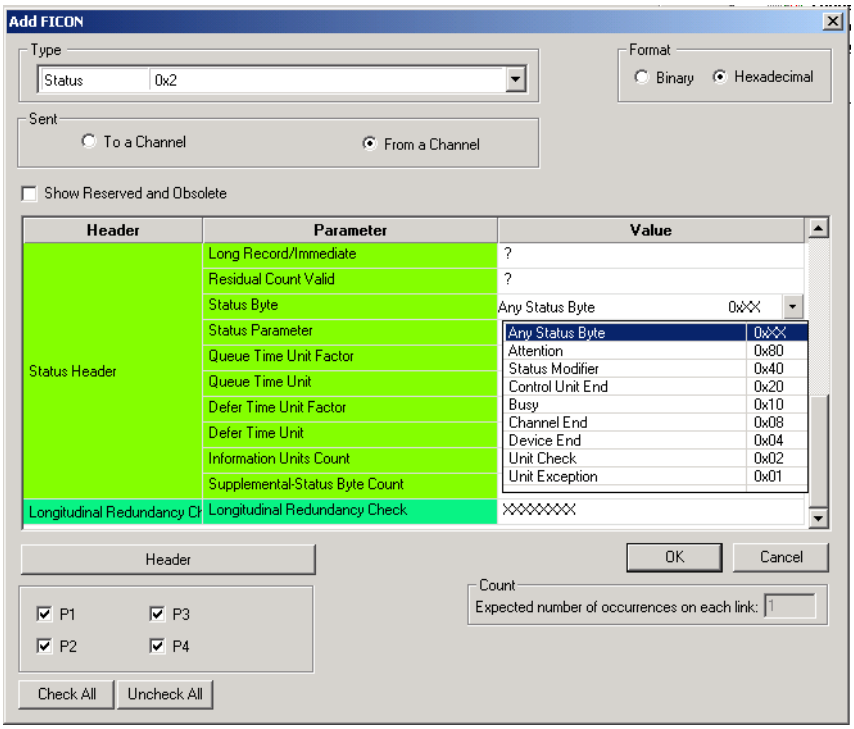


Figure 2.37: FICON[Status] - Any Status Byte Dialog

To select **Any Status Byte** click the dropdown list which has the following options:

- 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.

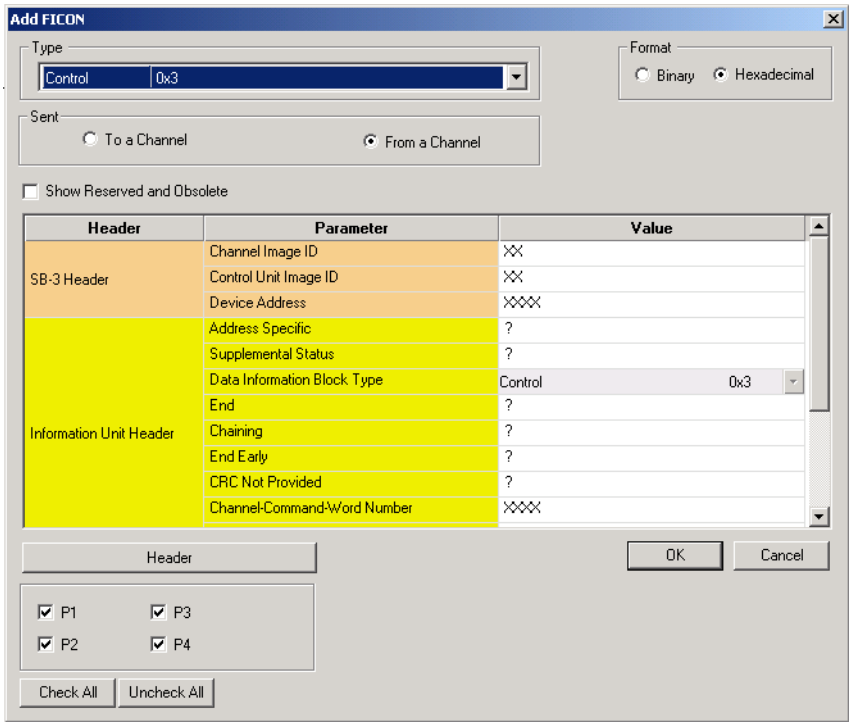


Figure 2.38: FICON (Control) Dialog

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

To select a **Type** click the dropdown list which has the following options:

- 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.

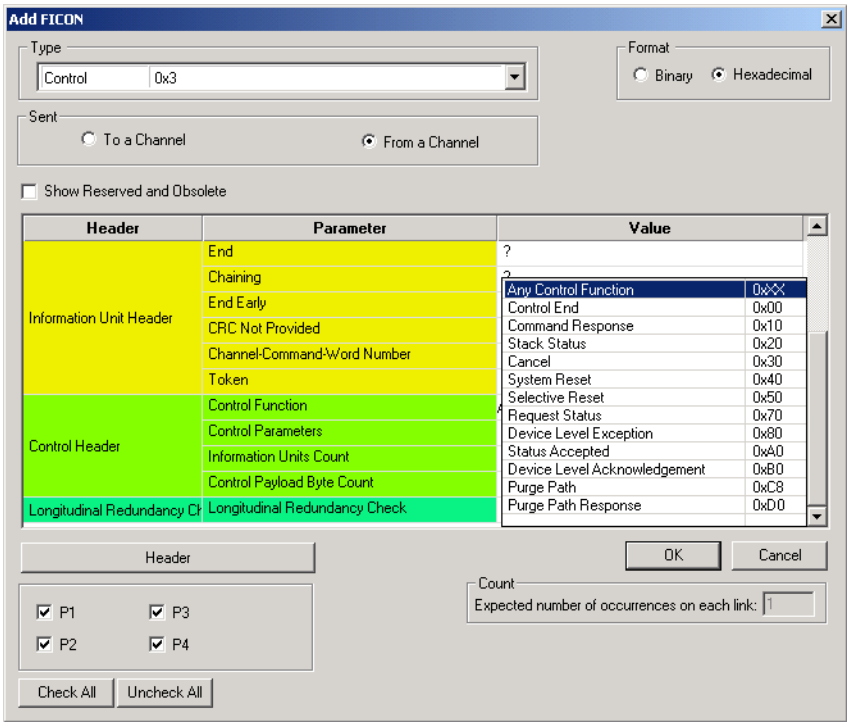


Figure 2.39: FICON[Control] - Any Control Function Dialog

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.

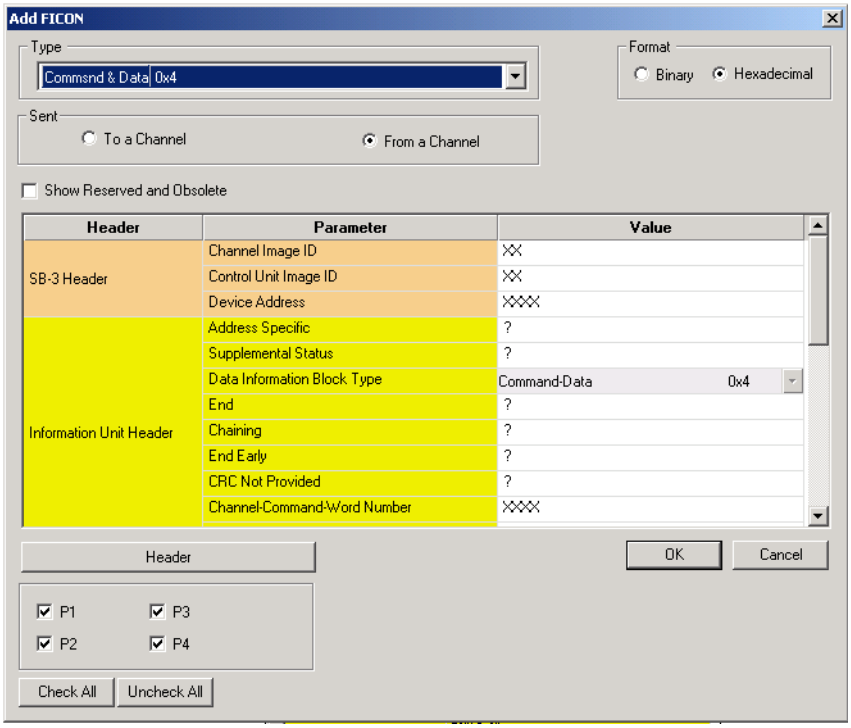


Figure 2.40: FICON (Command Data) Dialog

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

To select a **Type** click the dropdown list which has the following options:

- 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.

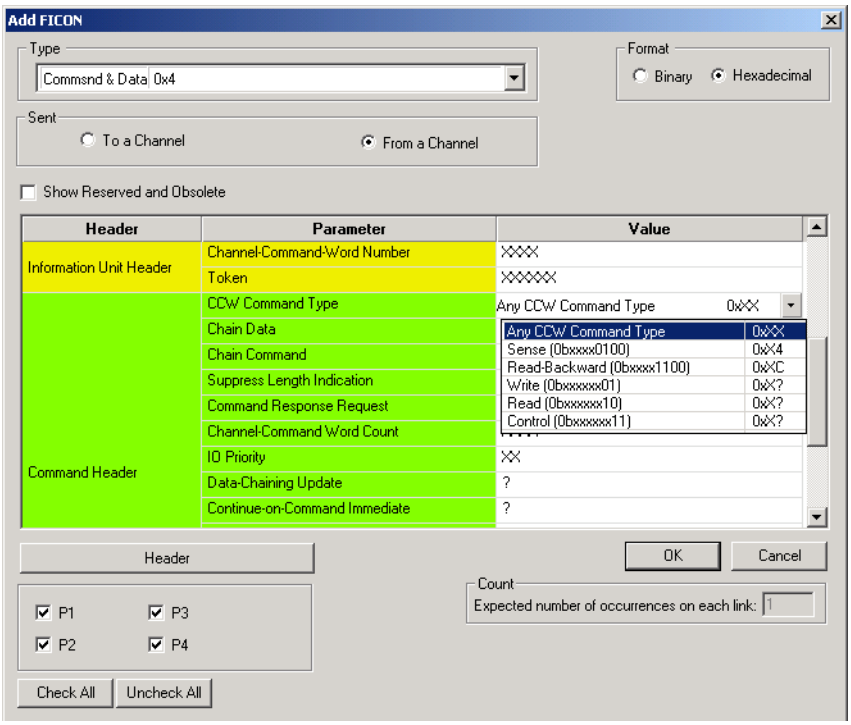


Figure 2.41: FICON[Command-Data] - Any CCW Command Type Dialog

To select **Any CCW Command Type** click the dropdown list which has the following options:

- 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.

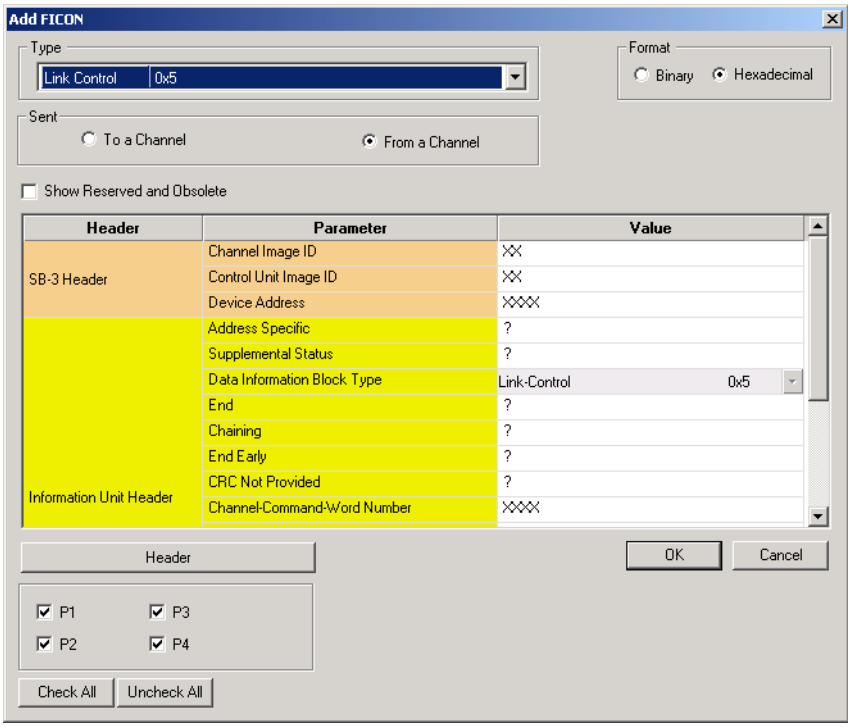


Figure 2.42: FICON (Link-Control) Dialog

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

To select a **Type** click the dropdown list which has the following options:

- 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.

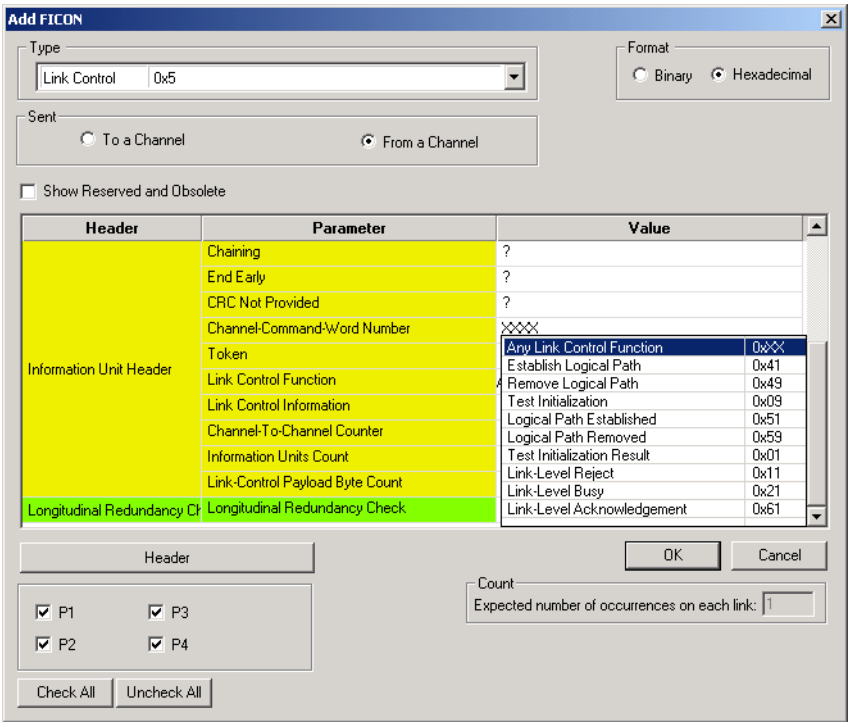


Figure 2.43: FICON[Link Control] - Any Link Control Function Dialog

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.

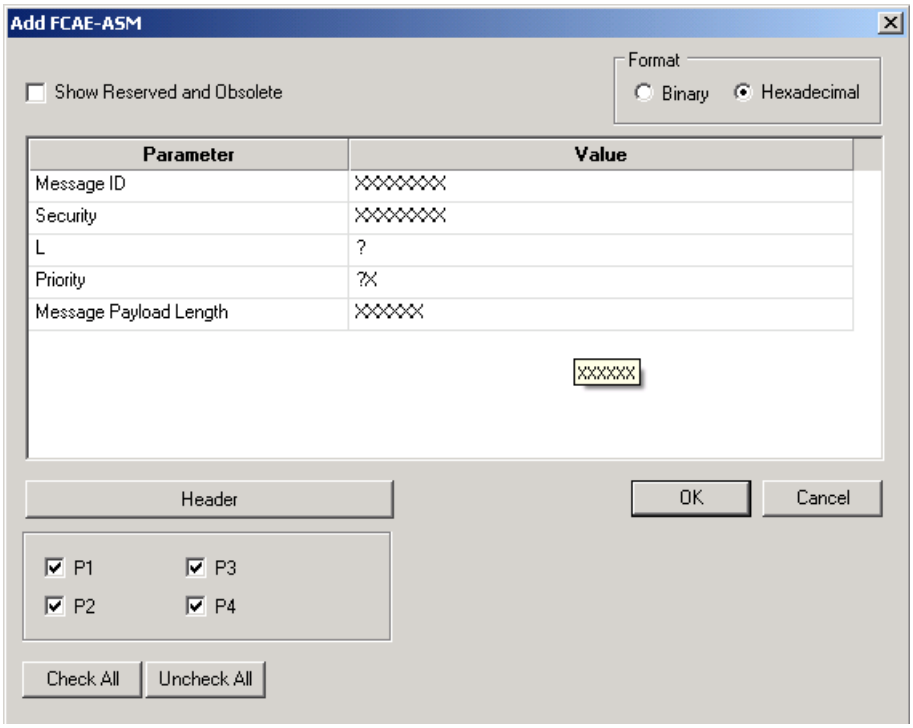


Figure 2.44: FCAE-ASM Dialog

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.

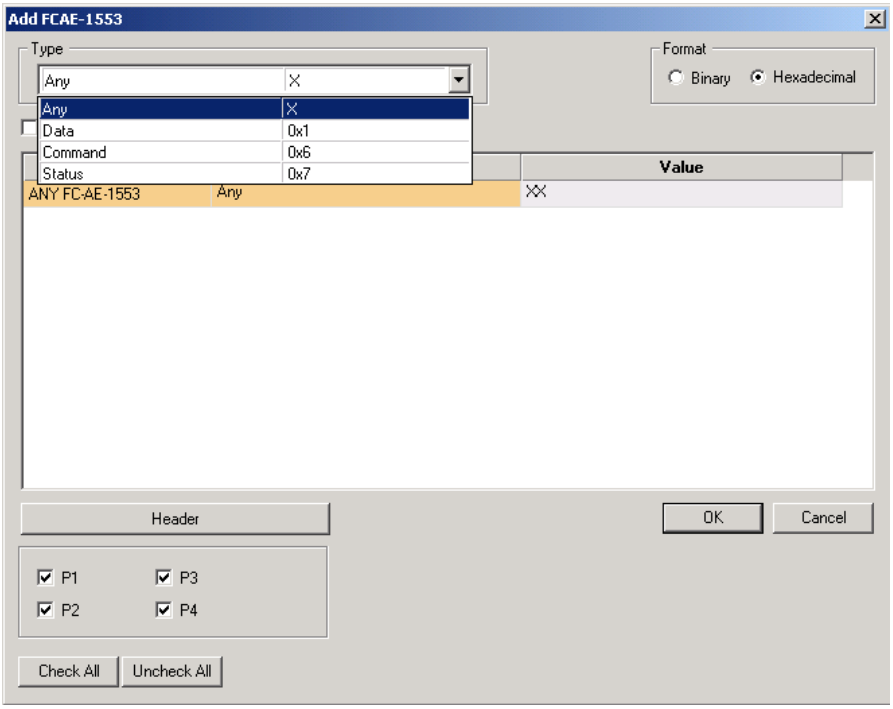


Figure 2.45: FCAE-1553 (Any) Dialog

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

To select a **Type** click the dropdown list which has the following options:

- 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.

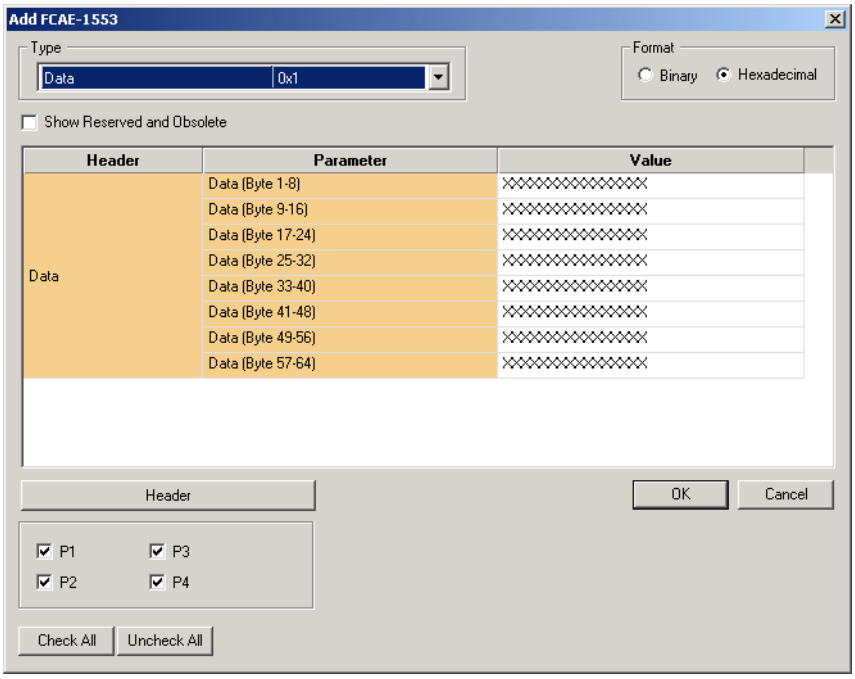


Figure 2.46: FCAE-1553(Data) Dialog

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

To select a **Type** click the dropdown list which has the following options:

- Any
- Data
- Command
- Status

Add FCAE-1553 Command

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

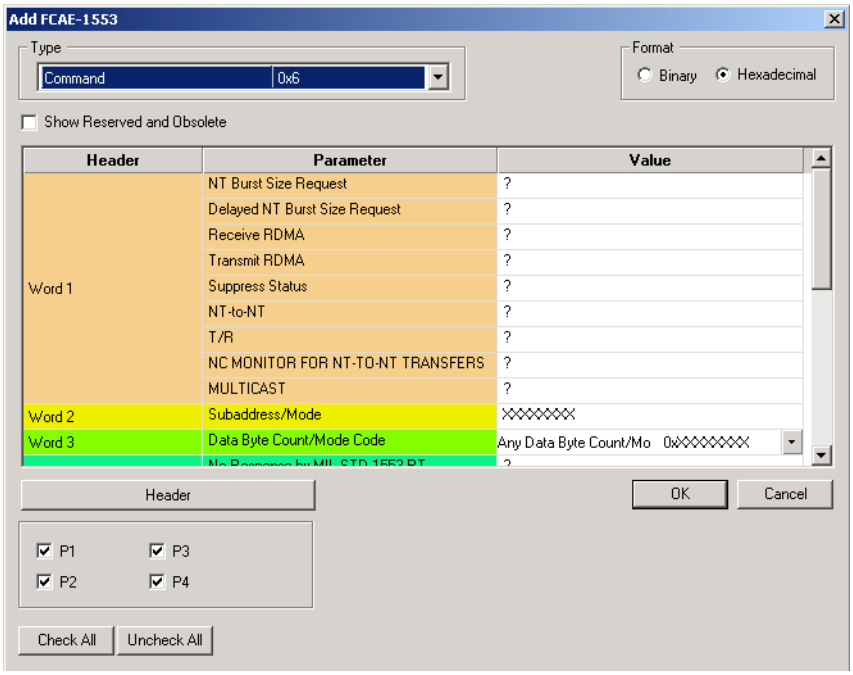


Figure 2.47: FCAE-1553 (Command) Dialog

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

To select a **Type** click the dropdown list which has the following options:

- 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).

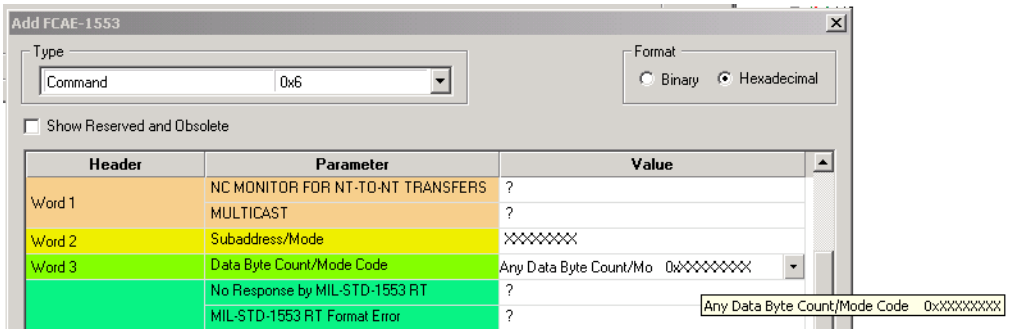


Figure 2.48: Hover the Mouse to see the Full Menu Option

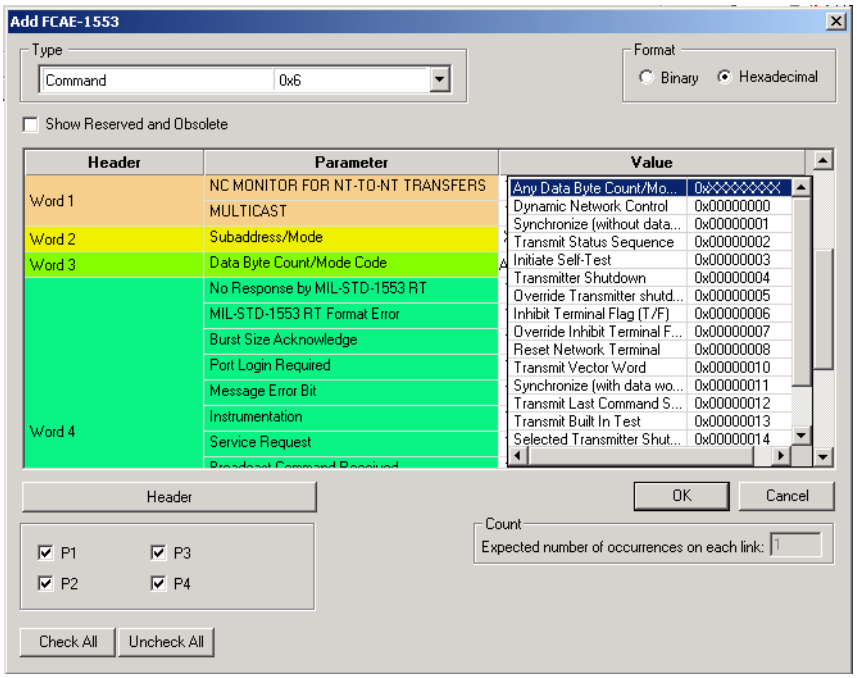


Figure 2.49: FCAE-1553[Command]- Any Data Byte Count/Mode Code Dialog

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.

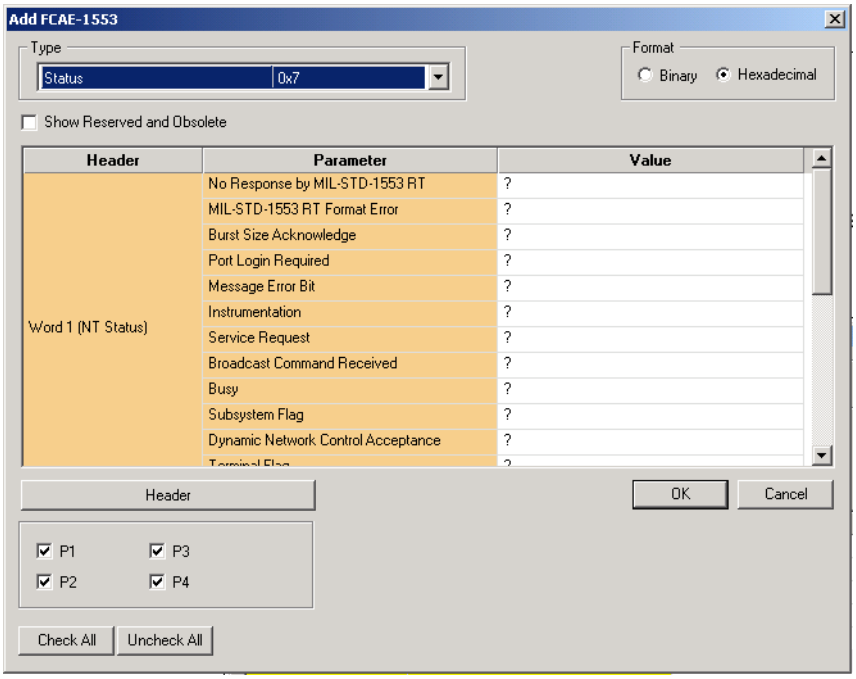


Figure 2.50: FCAE-1553 (Status) Dialog

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

To select a **Type** click the dropdown list which has the following options:

- 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(READ_RESP)

FCVI(CONNECT_RQST)

FCVI(DISCONNECT_RQST)

FCVI(CONNECT_RESP1)

FCVI(CONNECT_RESP2)

FCVI(CONNECT_RESP3)

FCVI(DISCONNECT_RESP)

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**.

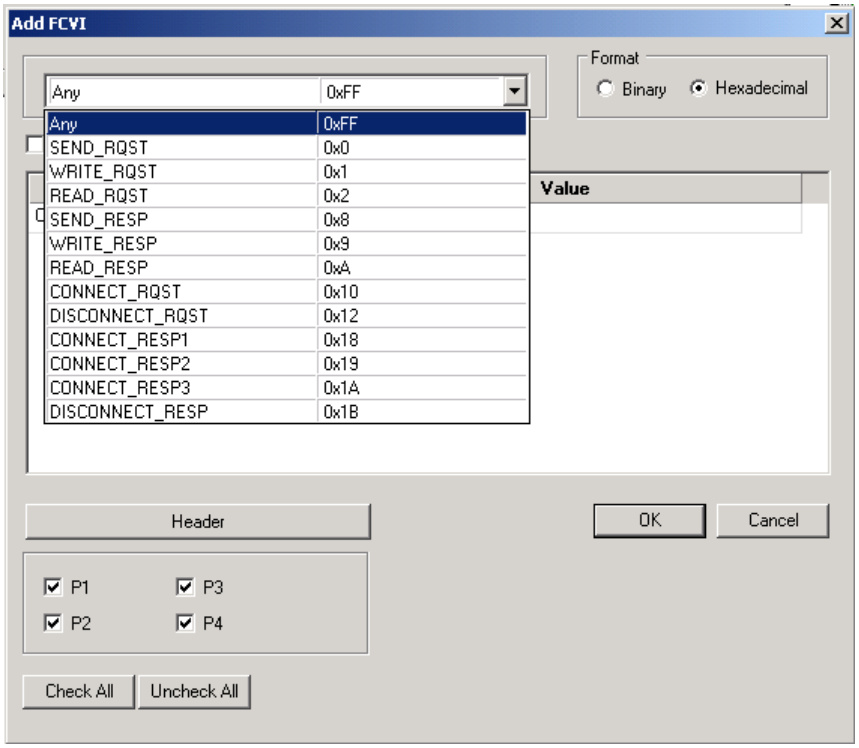


Figure 2.51: FCVI Service Dialog

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**.

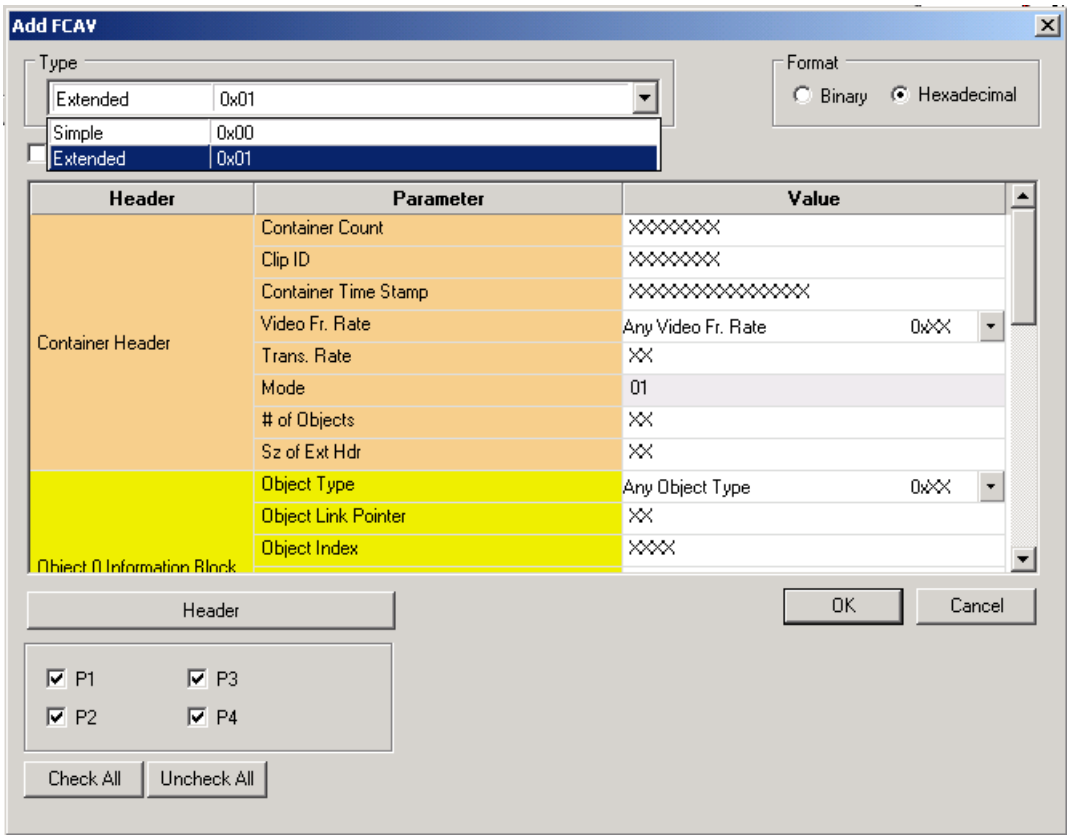


Figure 2.52: FCAV Service Dialog

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

- Any Video Fr. Rate
- Null
- 15
- 20
- 24
- 24*1000/1001
- 24 (Segmented frames)
- 24*1000/1001 (Segmented frames)
- 25 (PAL)
- 30
- 30*1000/1001 (29.97 NTSC)

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

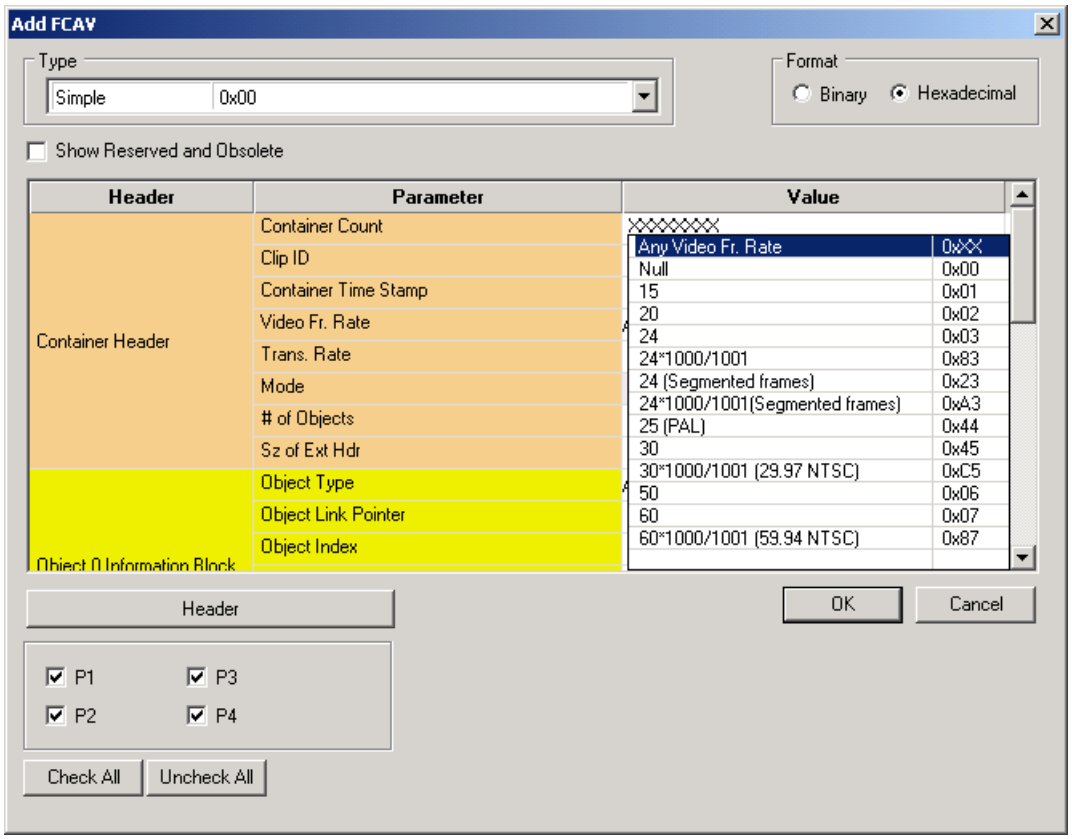


Figure 2.53: FCAV Container Header Values Dialog

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

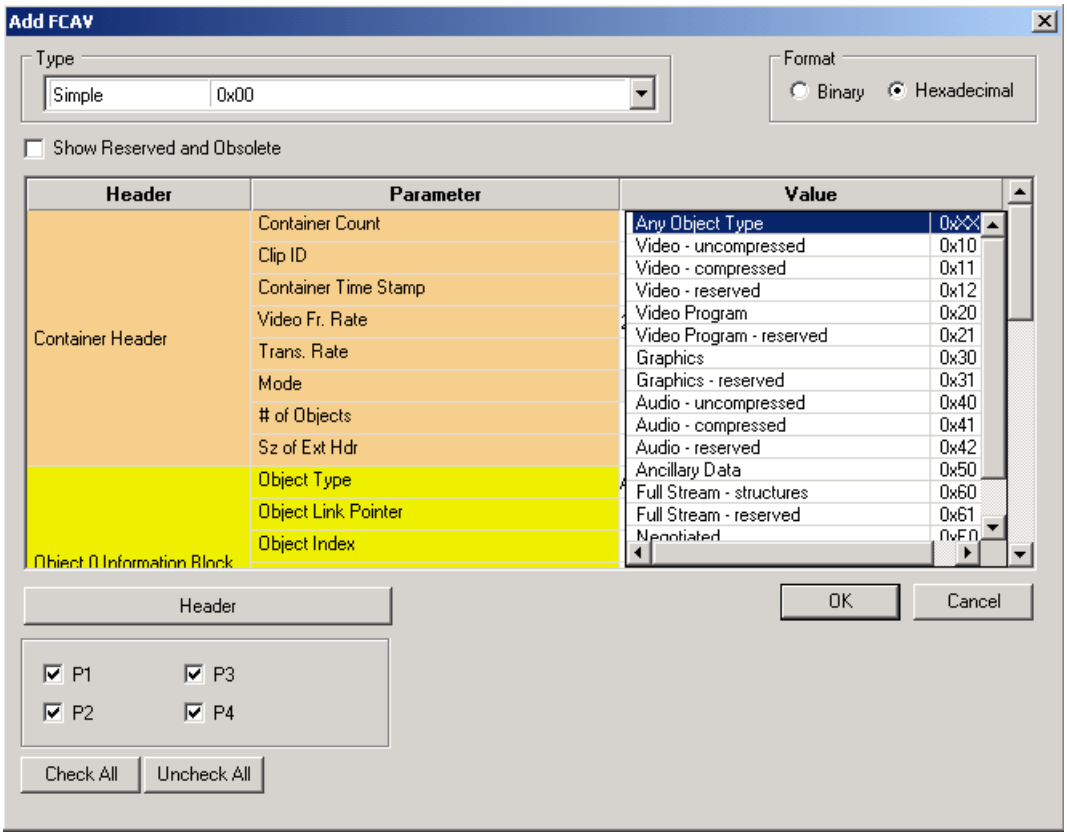


Figure 2.54: FCAV Object Information Values Dialog

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.

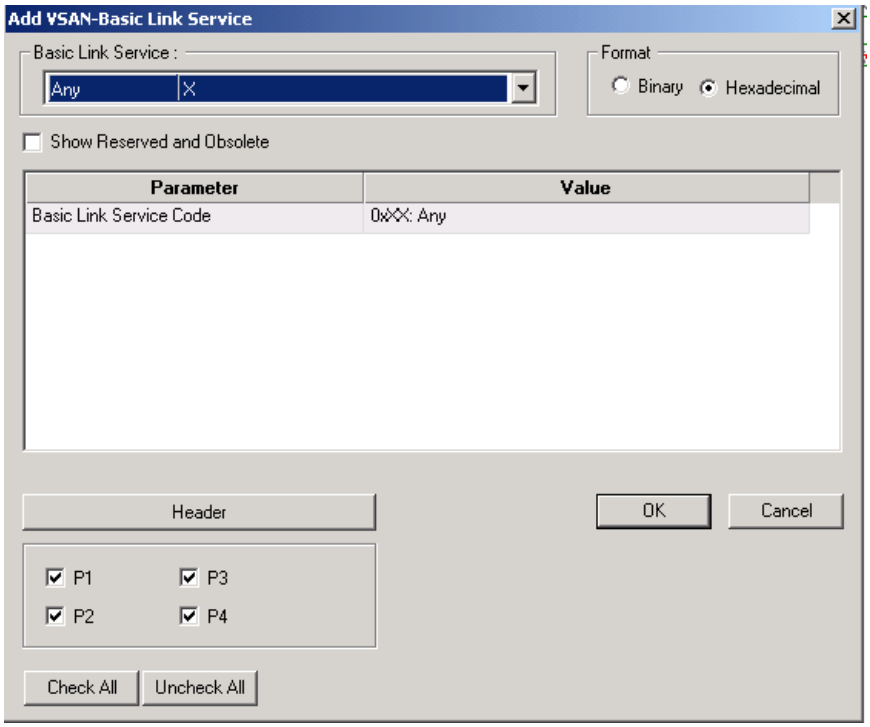


Figure 2.55: VSAN-Basic Link Service Dialog

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.

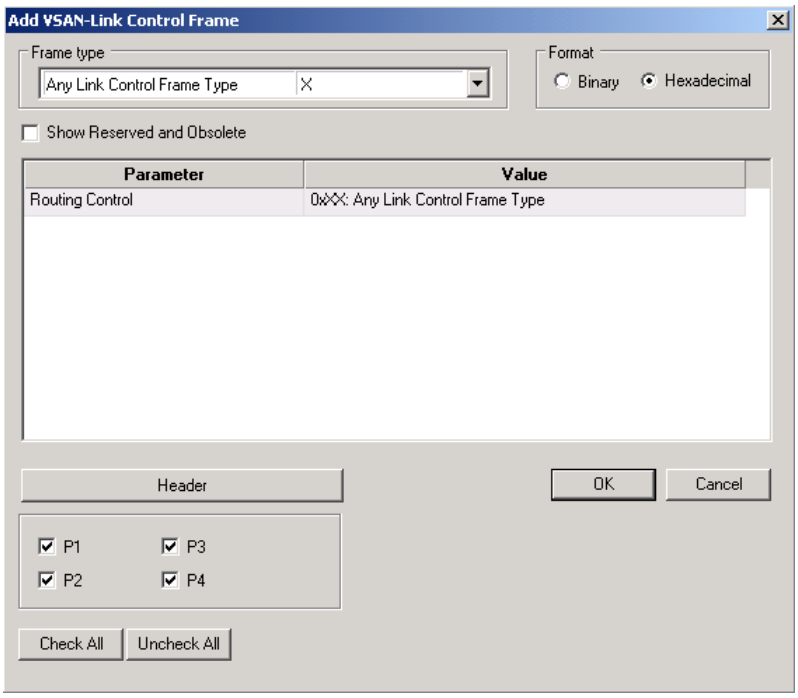


Figure 2.56: VSAN-Link Control Frame Dialog

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

To select a **Frame type** click the dropdown list which has the following options:

- Any Link Control Frame Type
- ACK_1
- ACK_0
- P_RJT
- F_RJT
- 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.

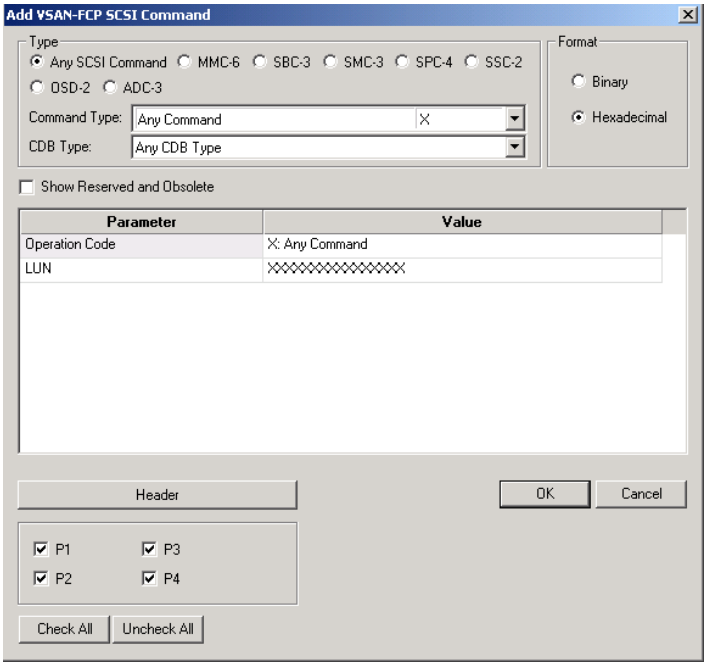


Figure 2.57: VSAN FCP SCSI Command Dialog

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
- SSC_2
- OSD_2
- 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.

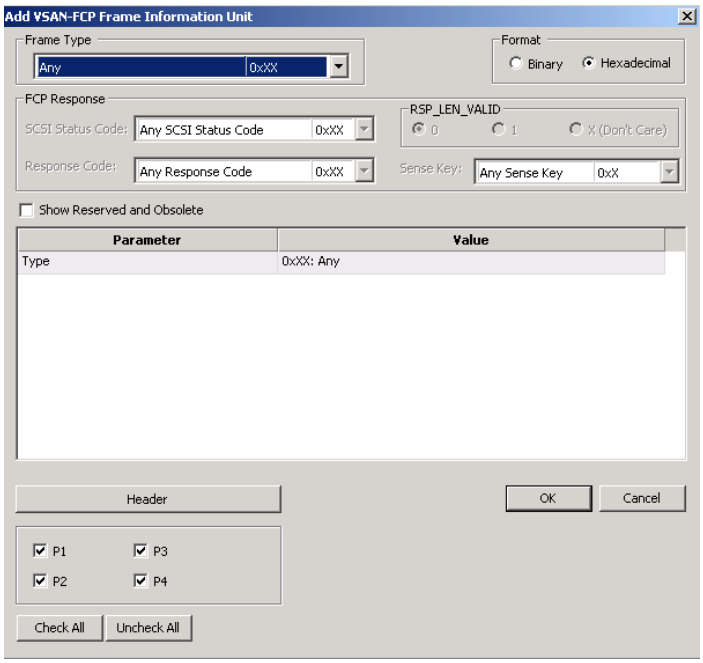


Figure 2.58: VSAN-Frame Information Unit Dialog

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.

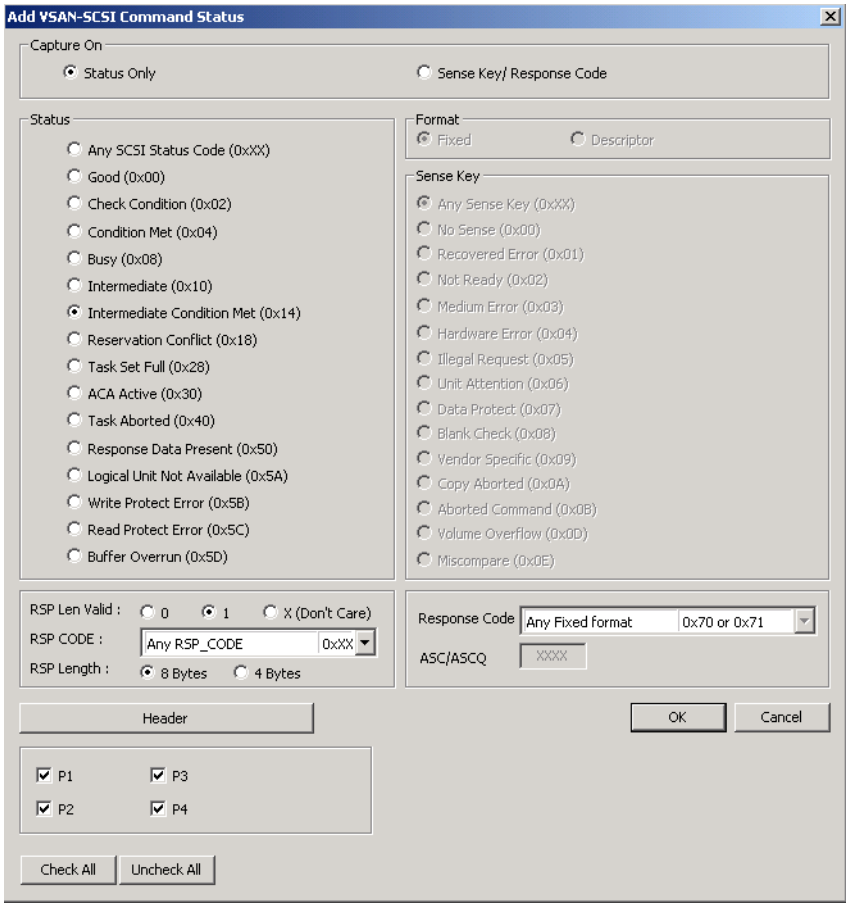


Figure 2.59: VSAN-SCSI Command Status Dialog

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.

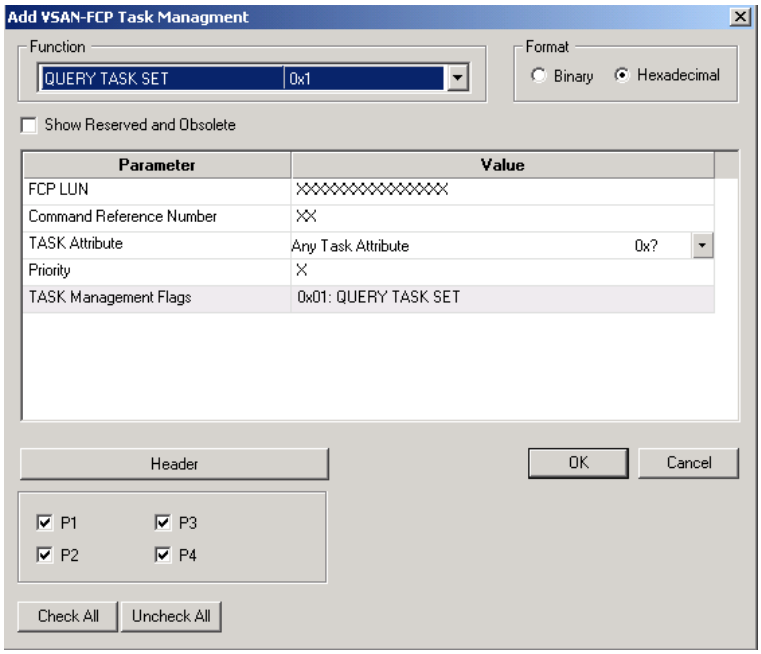


Figure 2.60: VSAN FCP Task Management Dialog

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

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

- 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.

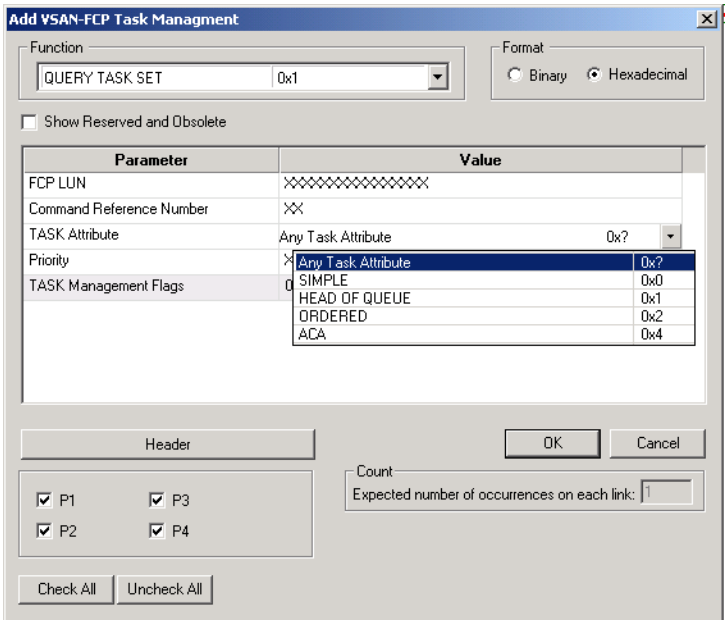


Figure 2.61: VSAN-FCP Task Management Any Task Attribute Dialog

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.

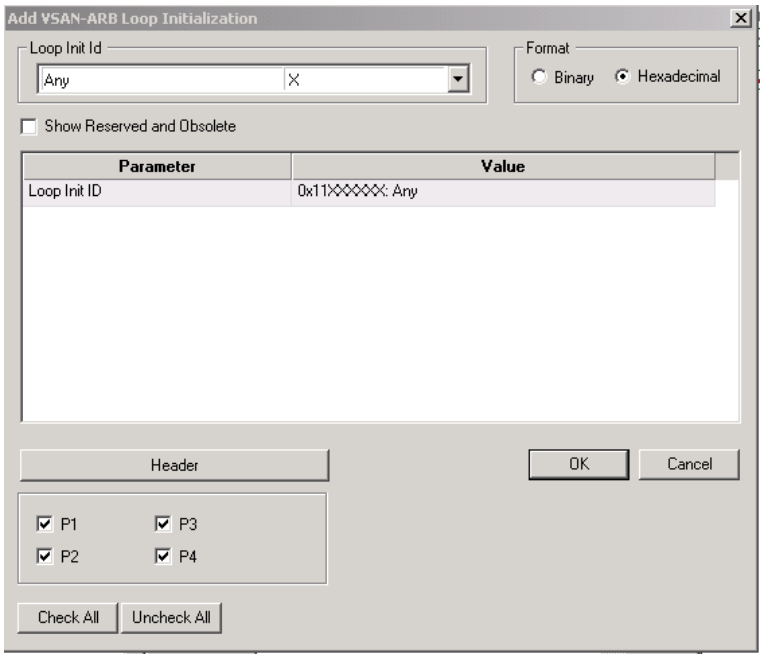


Figure 2.62: VSAN-ARB Loop initialization Dialog

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

To select a **Loop Init Id** click the dropdown list which has the following options:

- Any
- LISM
- LIFA
- LIPA
- LIHA
- LISA
- LIRP
- LILP

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.

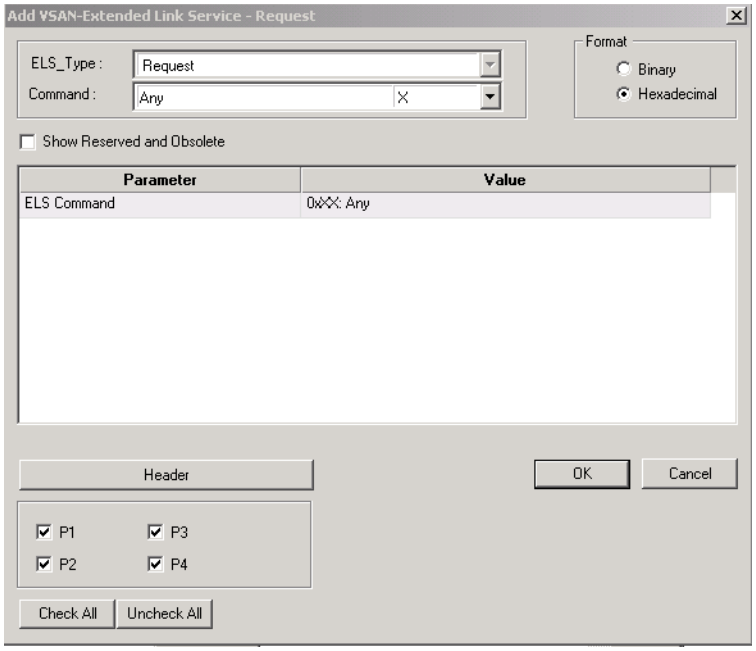


Figure 2.63: VSAN-Extended Link Service - Request Dialog

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.

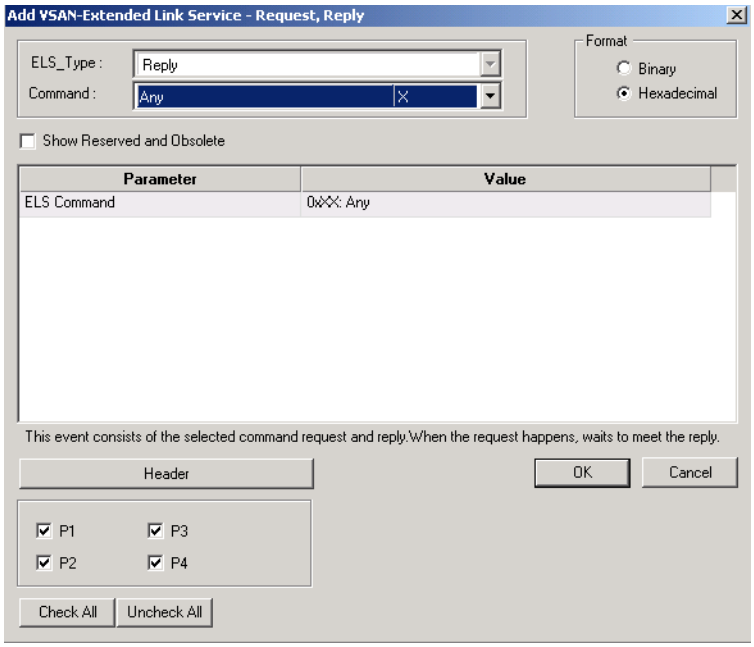


Figure 2.64: Add VSAN- Extended Link Service - Request, Reply Pattern Dialog

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.

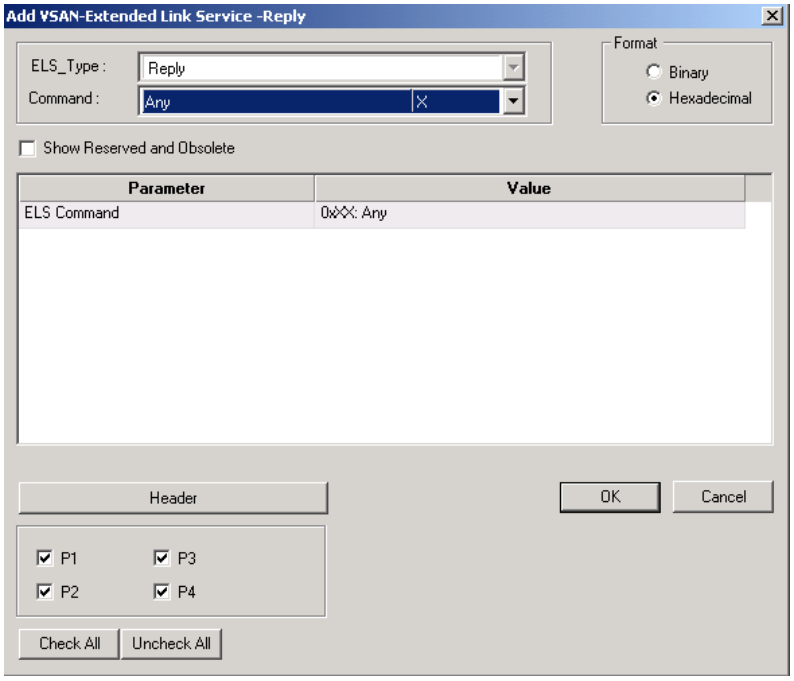


Figure 2.65: VSAN-Extended Link Service - Reply Pattern Dialog

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.

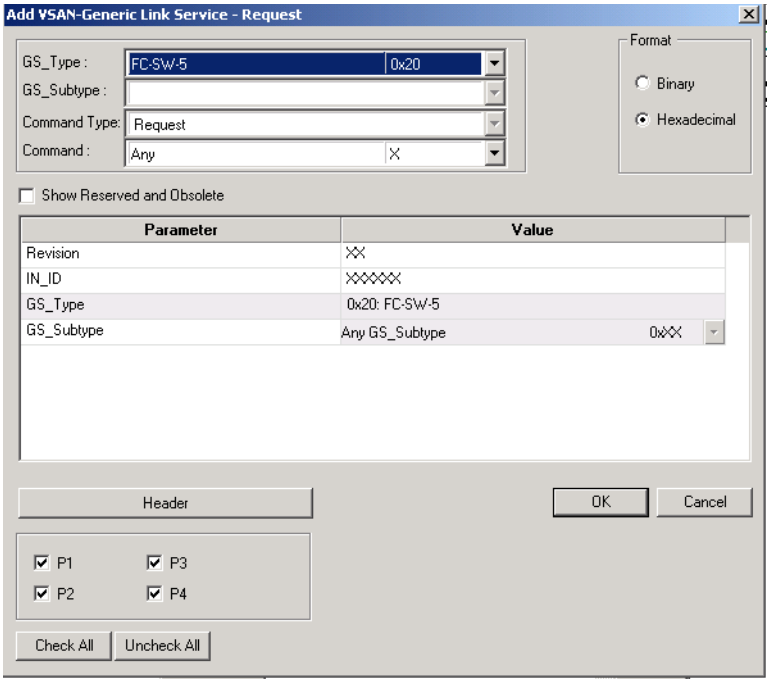


Figure 2.66: VSAN-Generic Link Service - Request Pattern Dialog

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.

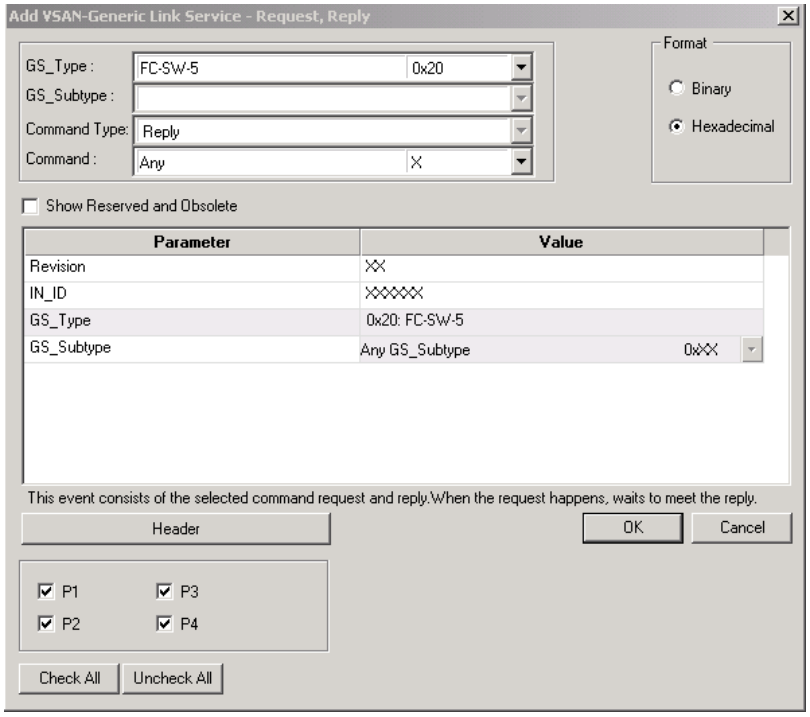


Figure 2.67: VSAN-Generic Link Service-Request, Reply Pattern Dialog

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.

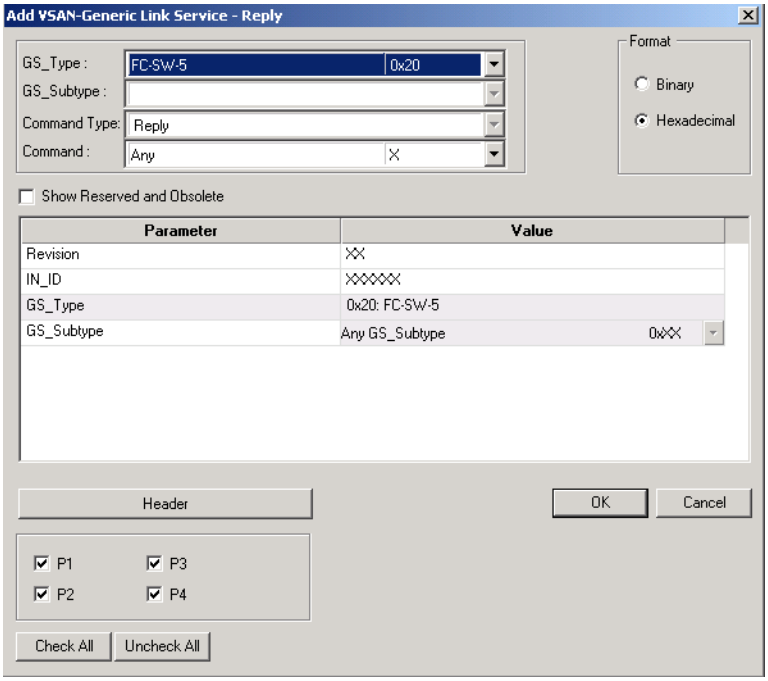


Figure 2.68: VSAN-Generic Link Service - Reply Pattern Dialog

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.

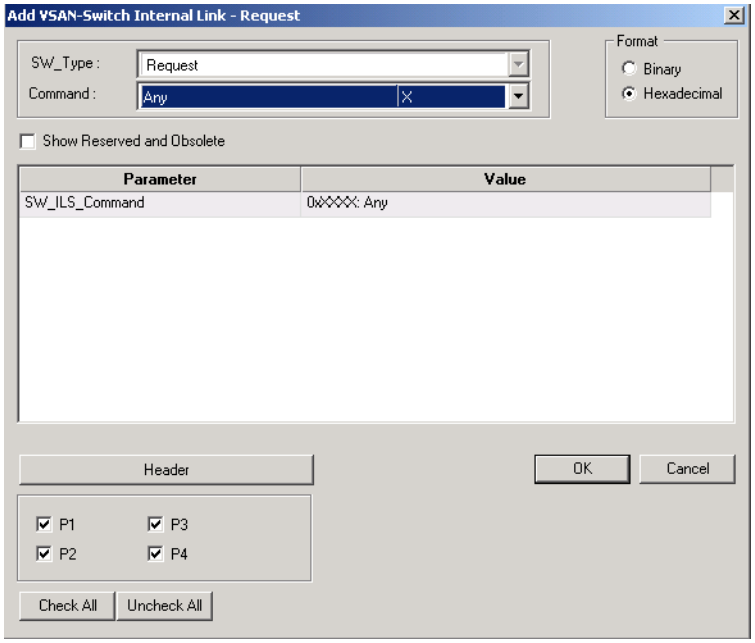


Figure 2.69: VSAN-Switch Internal Link - Request Dialog

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.

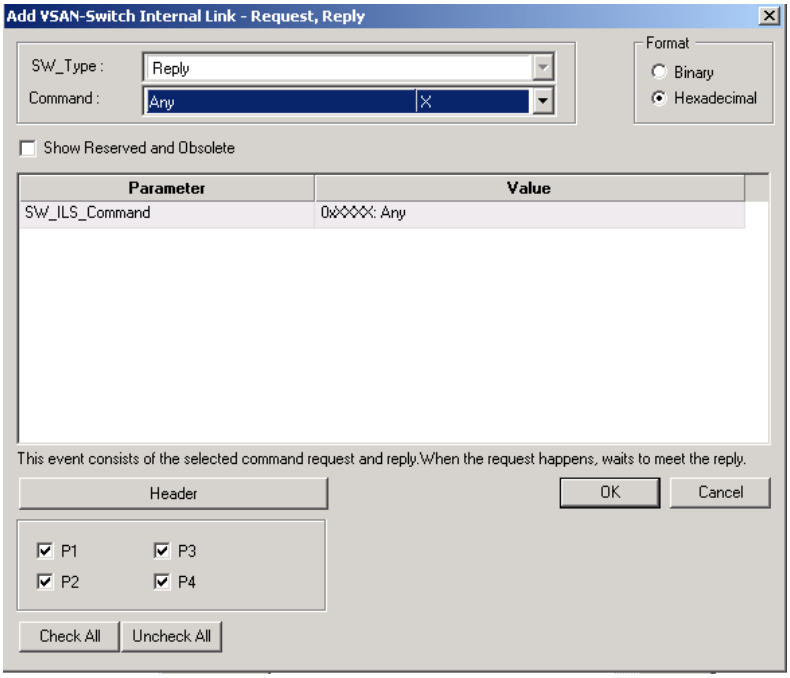


Figure 2.70: VSAN-Switch Internal Link Service - Request, Reply Dialog

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.

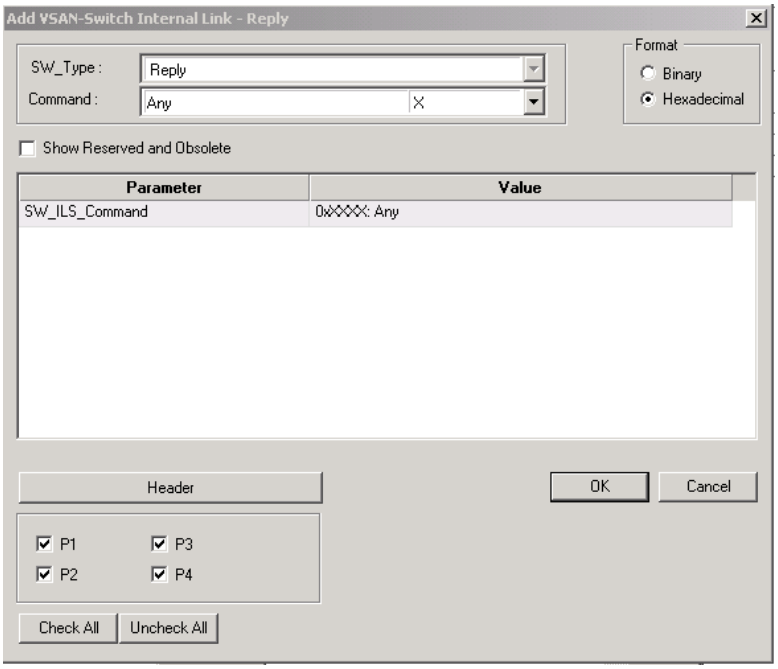


Figure 2.71: VSAN-Switch Internal Link Reply Dialog

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.

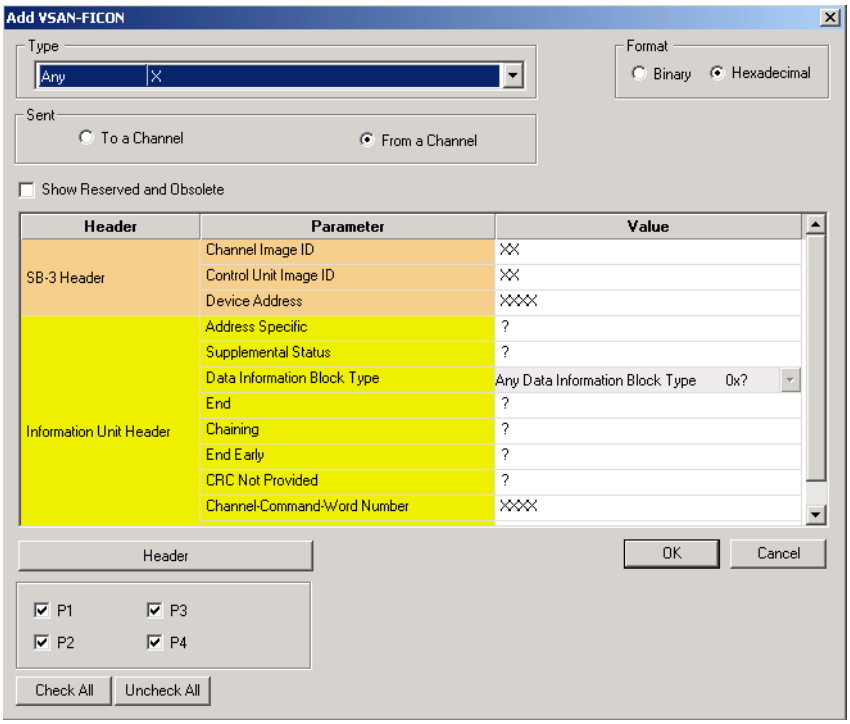


Figure 2.72: VSAN-FICON (Any Data Information Block Type) Dialog

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

To select a **Type** click the dropdown list which has the following options:

- 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.

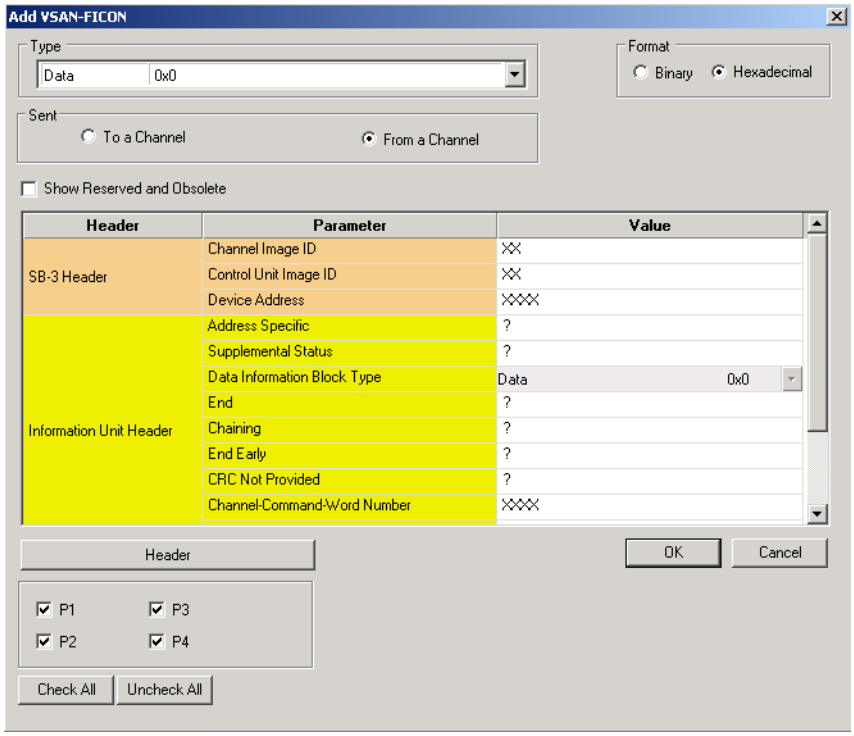


Figure 2.73: VSAN-FICON (Data) Dialog

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

To select a **Type** click the dropdown list which has the following options:

- 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.

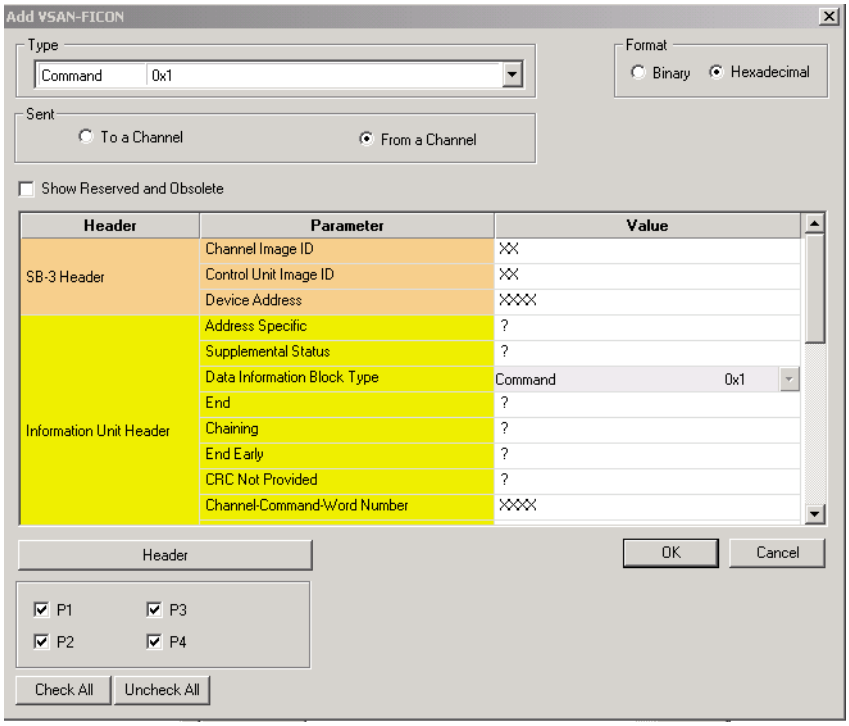


Figure 2.74: VSAN-FICON (Command) Dialog

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

To select a **Type** click the dropdown list which has the following options:

- 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.

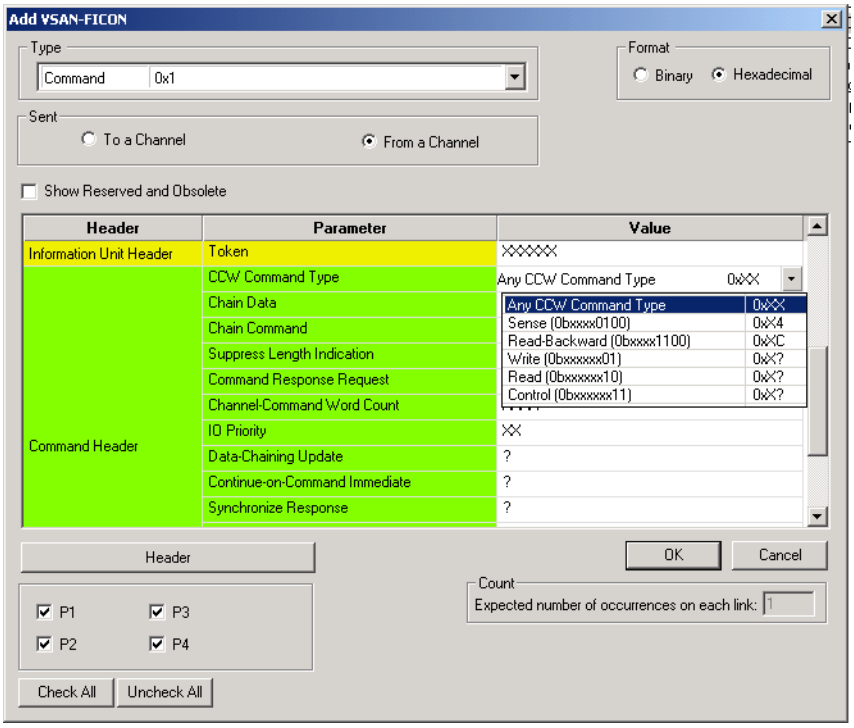


Figure 2.75: VSAN-FICON[Command] - Any CCW Command Type Dialog

To select **Any CCW Command Type** click the dropdown list which has the following options:

- 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.

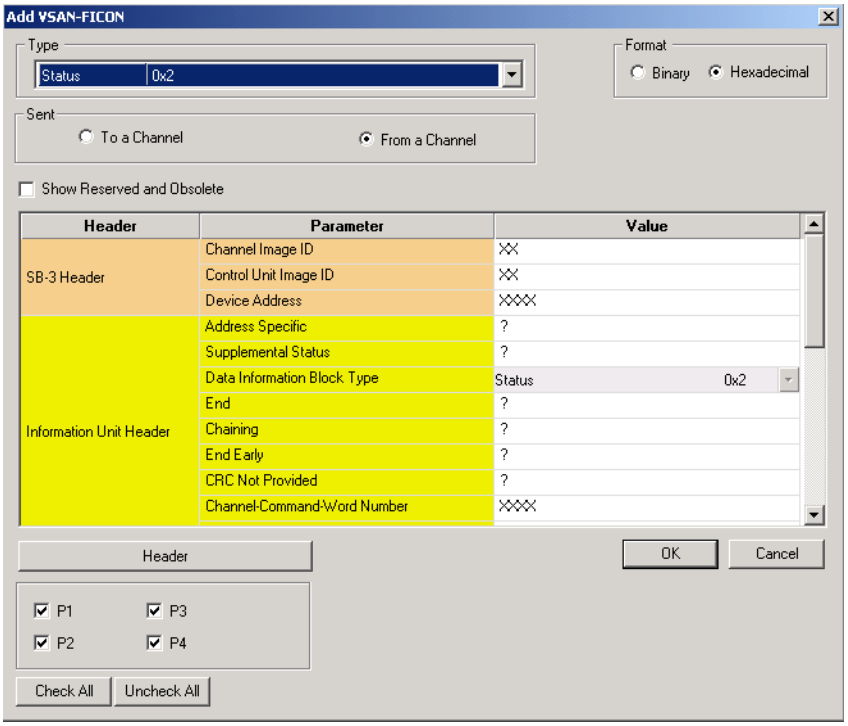


Figure 2.76: FICON (Status) Dialog

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

To select a **Type** click the dropdown list which has the following options:

- 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.

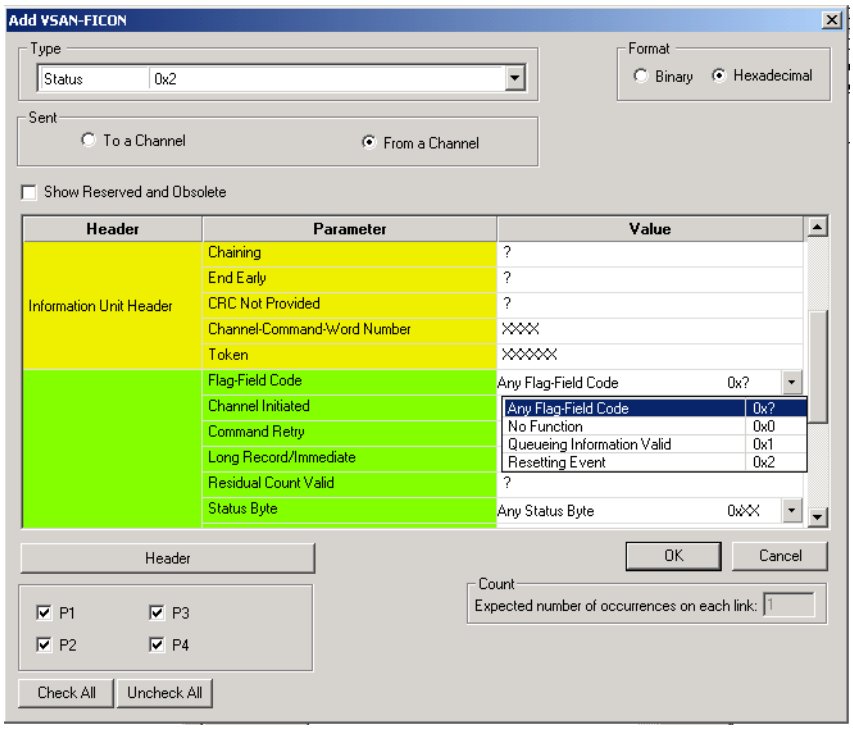


Figure 2.77: VSAN-FICON[Status] - Any Flag-Field Code Dialog

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.

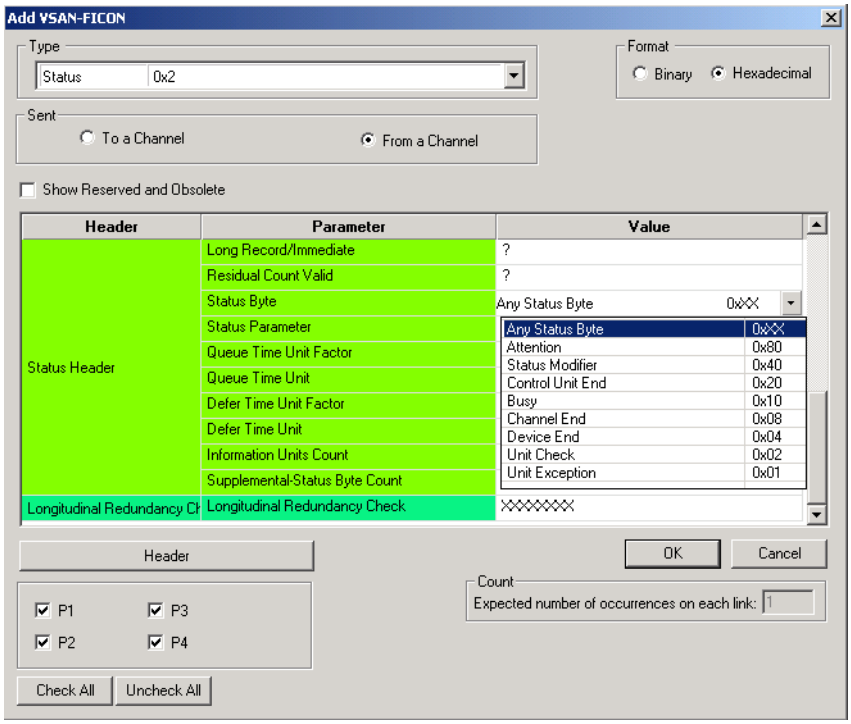


Figure 2.78: VSAN-FICON[Status] - Any Status Byte Dialog

To select **Any Status Byte** click the dropdown list which has the following options:

- 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.

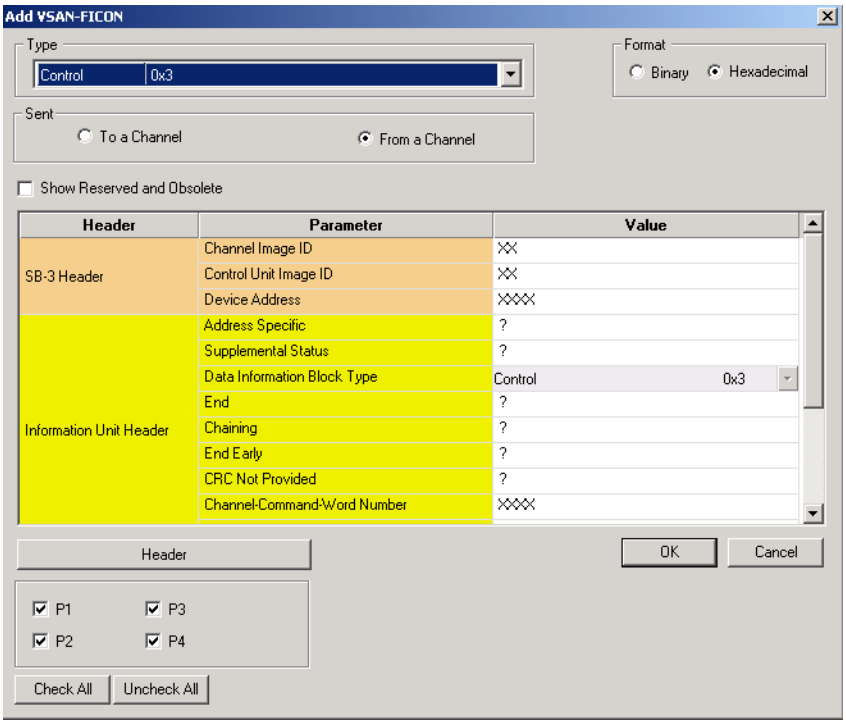


Figure 2.79: VSAN-FICON (Control) Dialog

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

To select a **Type** click the dropdown list which has the following options:

- 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.

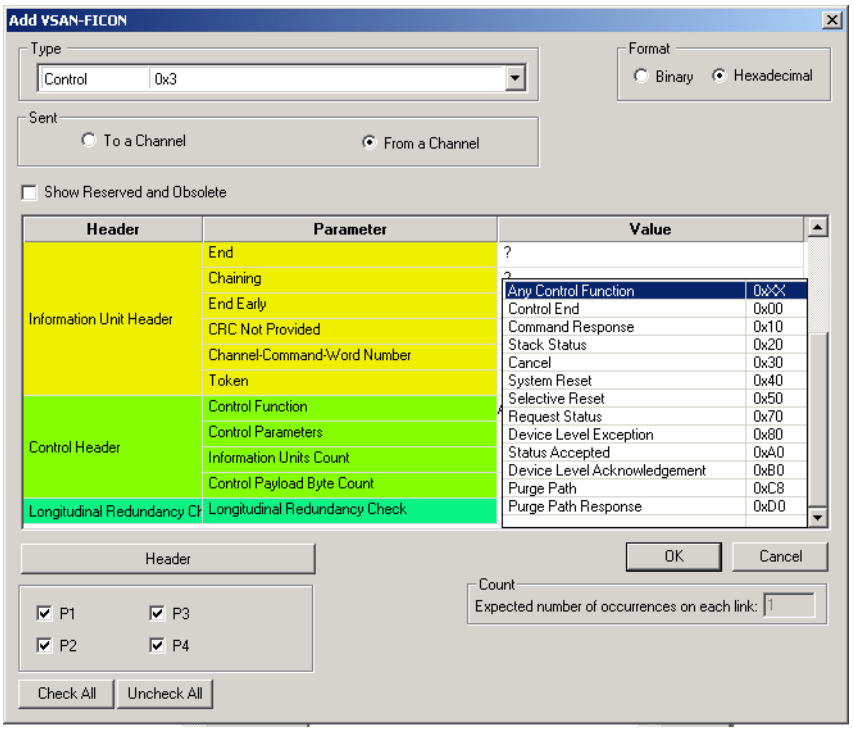


Figure 2.80: VSAN-FICON[Control] - Any Control Function Dialog

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.

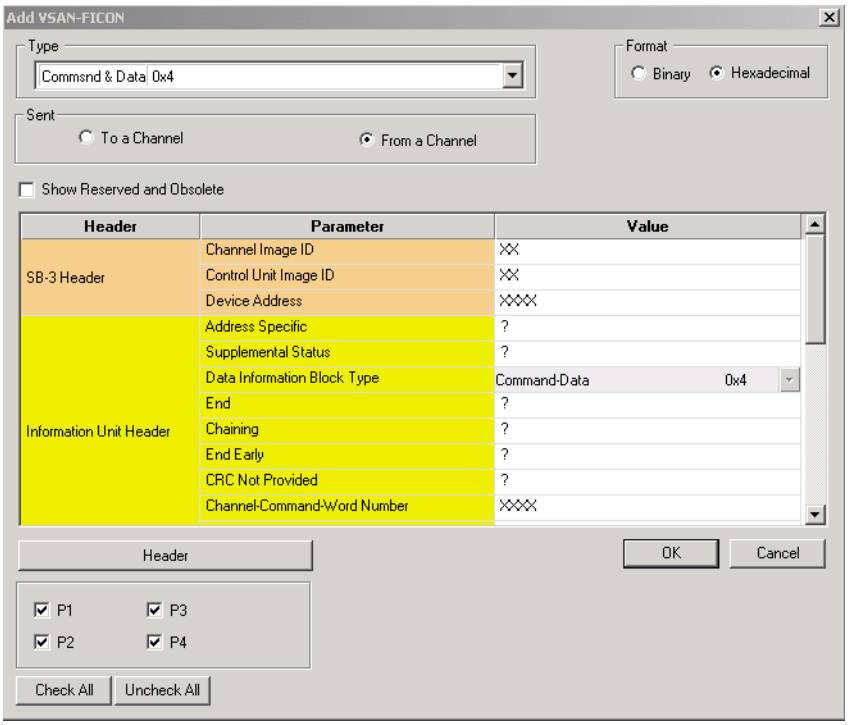


Figure 2.81: VSAN-FICON (Command Data) Dialog

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

To select a **Type** click the dropdown list which has the following options:

- 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.

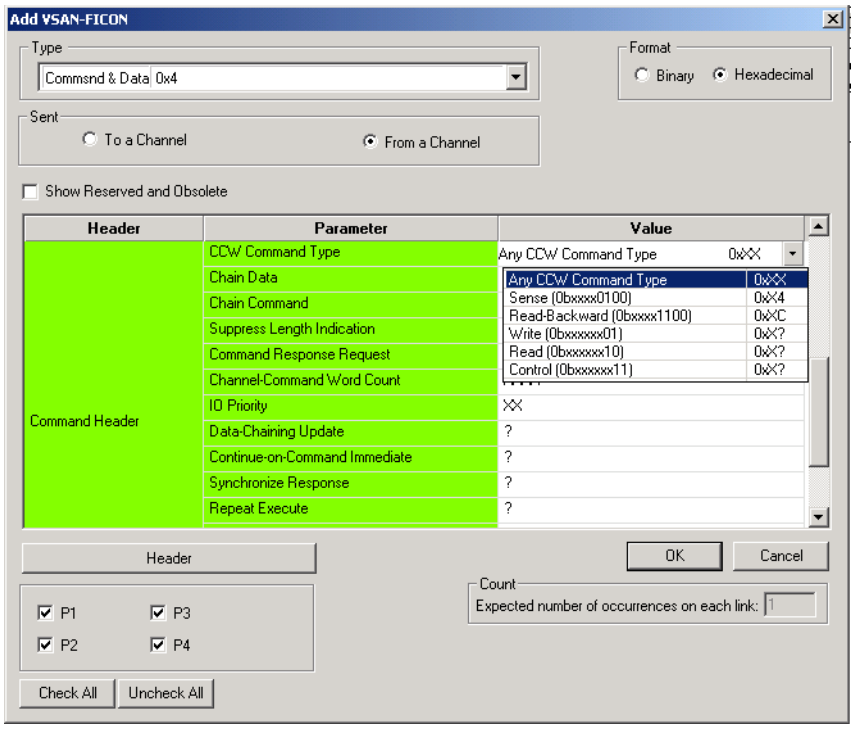


Figure 2.82: VSAN-FICON[Command-Data] - Any CCW Command Type Dialog

To select **Any CCW Command Type** click the dropdown list which has the following options:

- 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.

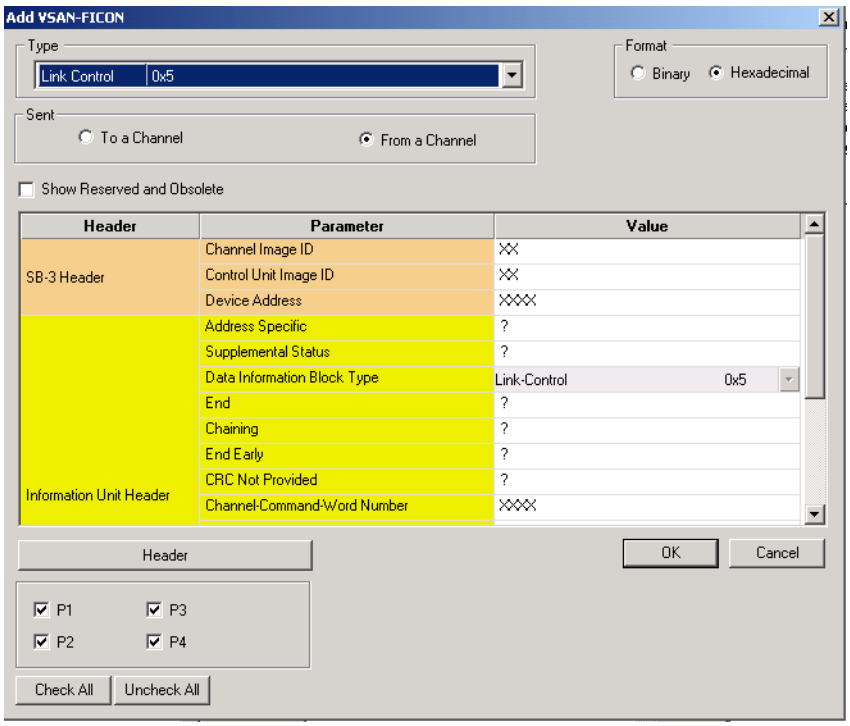


Figure 2.83: VSAN-FICON (Link-Control) Dialog

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

To select a **Type** click the dropdown list which has the following options:

- 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.

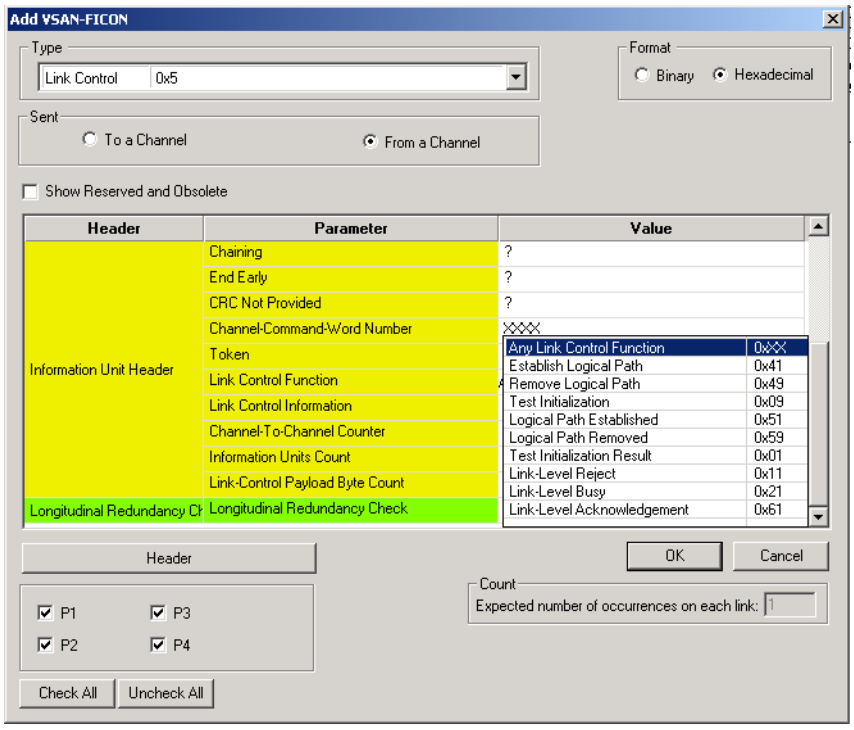


Figure 2.84: VSAN-FICON[Link Control] - Any Link Control Function Dialog

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.

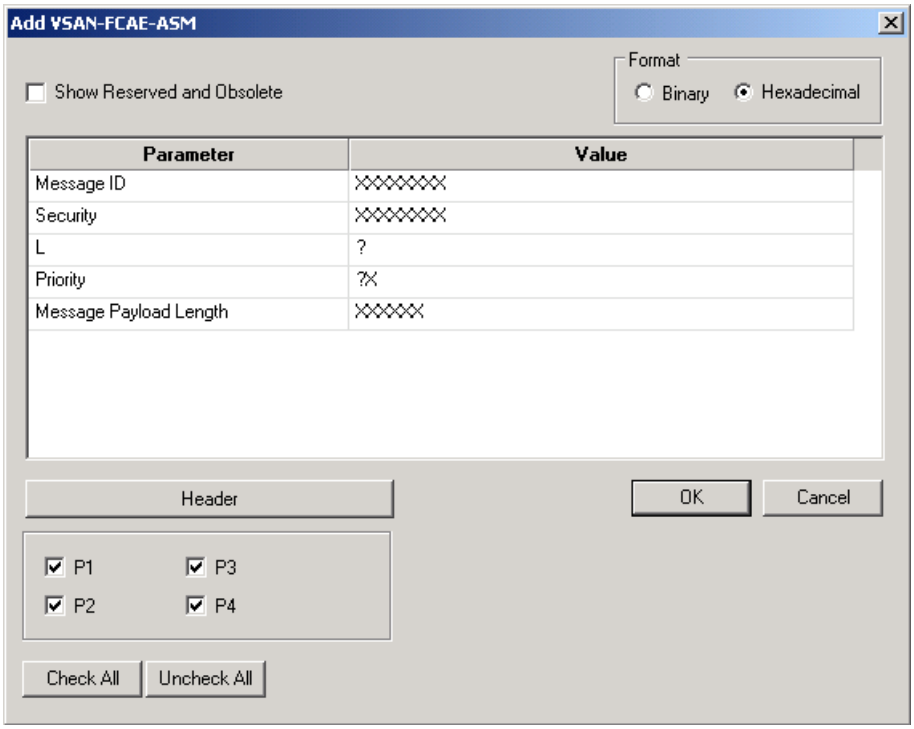


Figure 2.85: VSAN-FCAE-ASM Dialog

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.

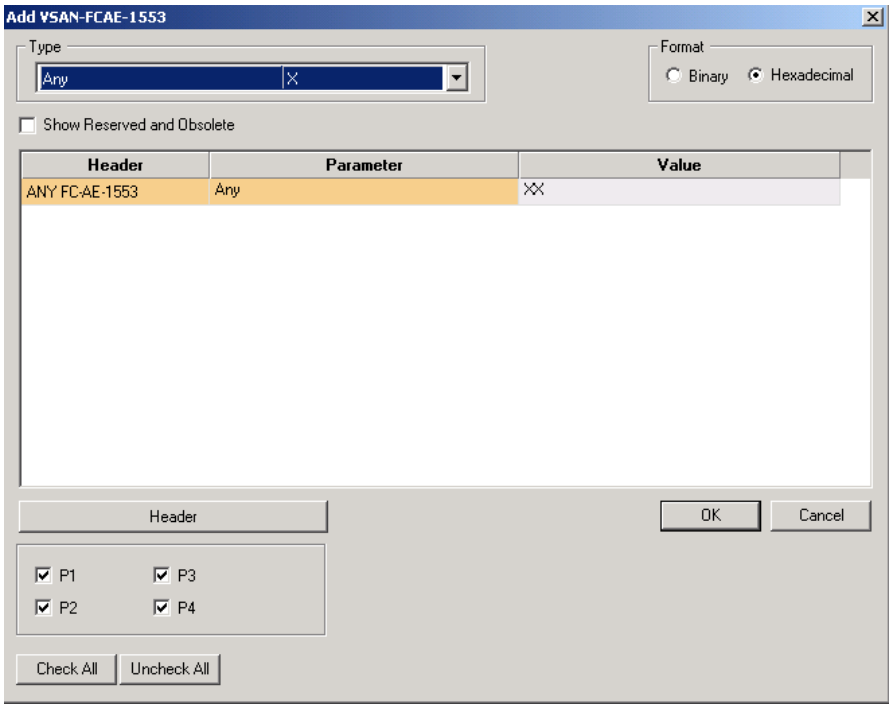


Figure 2.86: VSAN-FCAE-1553 (Any) Dialog

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

To select a **Type** click the dropdown list which has the following options:

- 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.

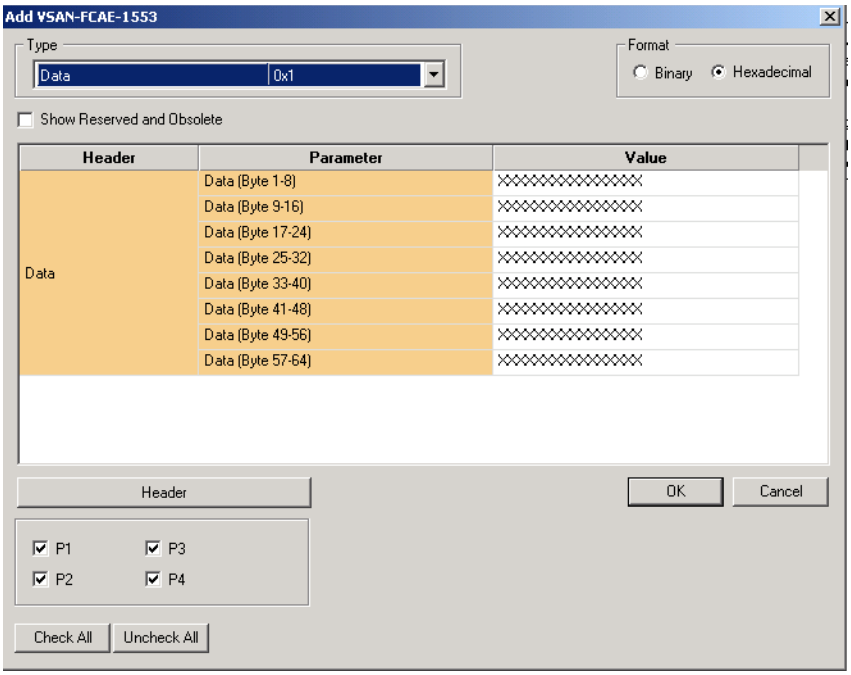


Figure 2.87: VSAN-FCAE-1553(Data) Dialog

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

To select a **Type** click the dropdown list which has the following options:

- 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.

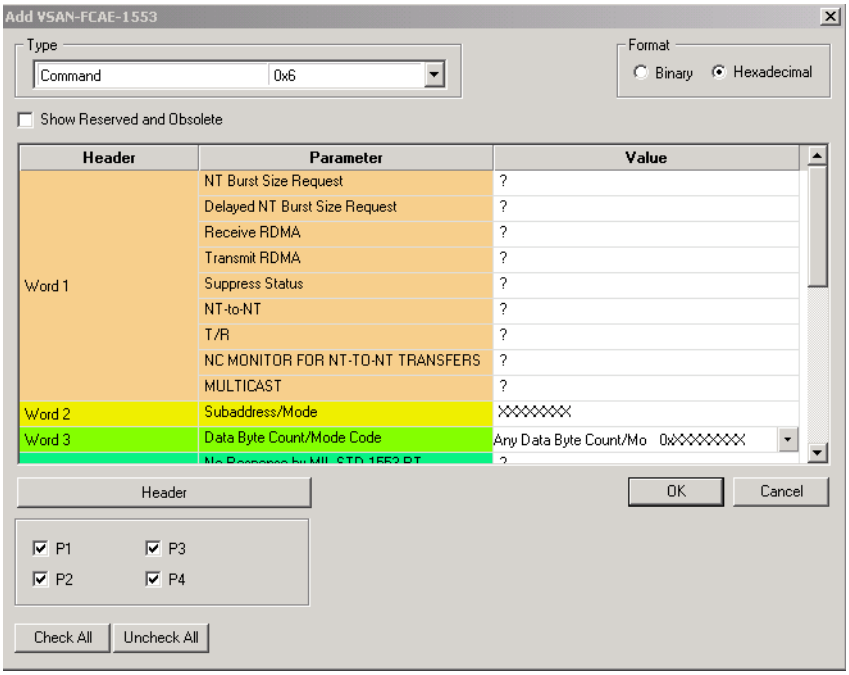


Figure 2.88: VSAN-FCAE-1553 (Command) Dialog

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

To select a **Type** click the dropdown list which has the following options:

- 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).

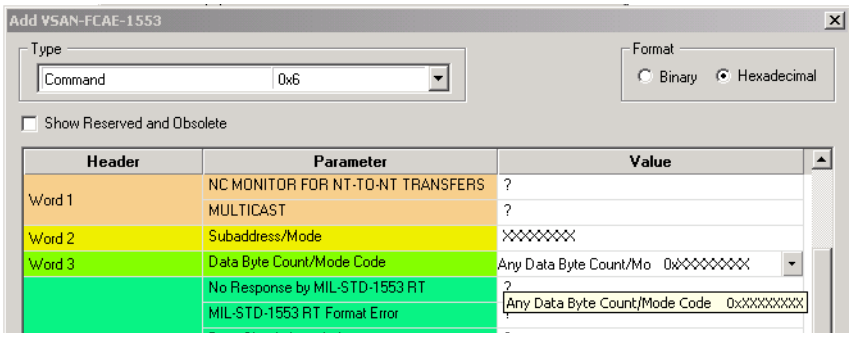


Figure 2.89: Hover the Mouse to see the Full Menu Option

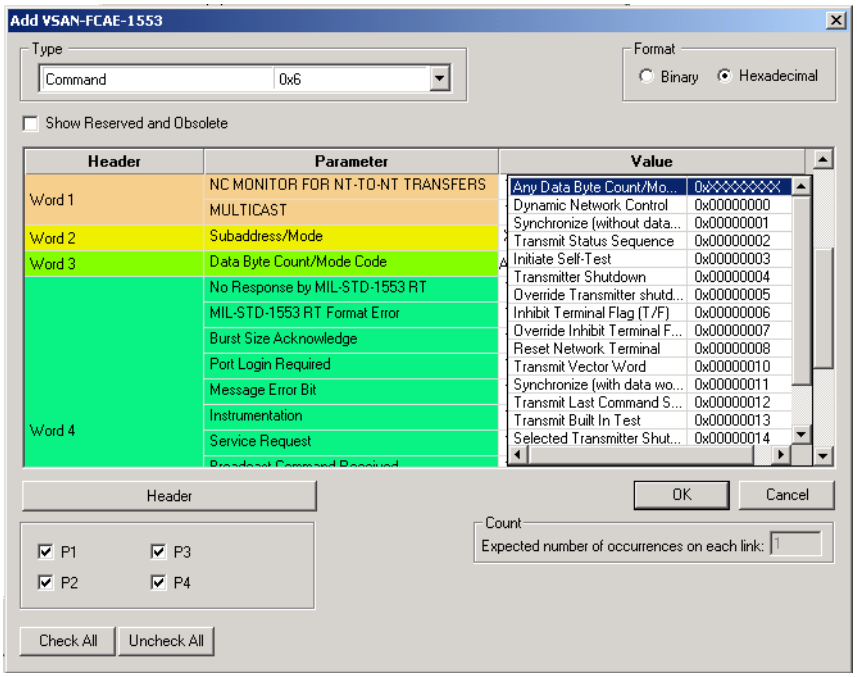


Figure 2.90: VSAN-FCAE-1553[Command]- Any Data Byte Count/Mode Code Dialog

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.

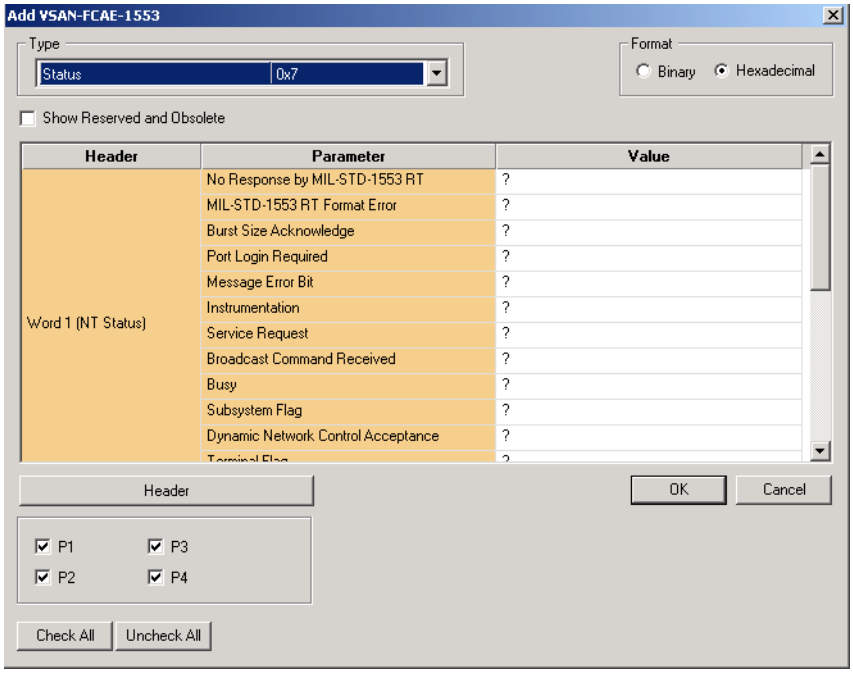


Figure 2.91: VSAN-FCAE-1553 (Status) Dialog

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

To select a **Type** click the dropdown list which has the following options:

- Any
- Data
- 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_RQST)

VSAN-FCVI(CONNECT_RESP1)

VSAN-FCVI(CONNECT_RESP2)

VSAN-FCVI(CONNECT_RESP3)

VSAN-FCVI(DISCONNECT_RESP)

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**.

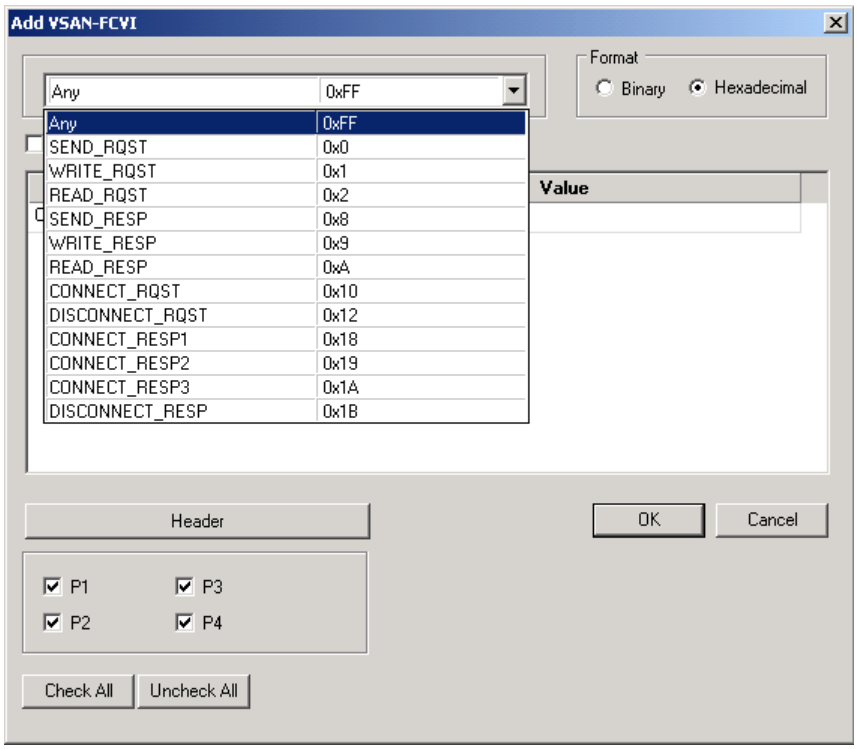


Figure 2.92: VSAN-FCVI Service Dialog

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**.

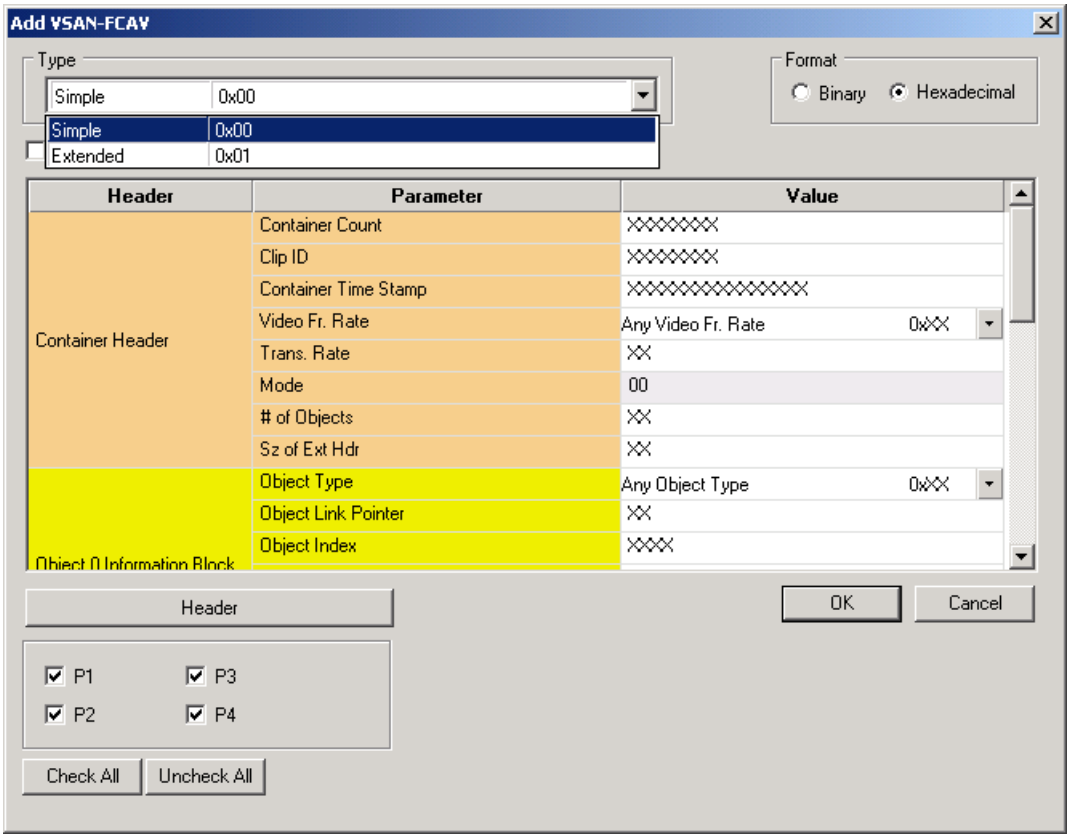


Figure 2.93: VSAN-FCAV Service Dialog

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
- 15
- 20
- 24
- 24*1000/1001
- 24 (Segmented frames)
- 24*1000/1001 (Segmented frames)
- 25 (PAL)
- 30
- 30*1000/1001 (29.97 NTSC)

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

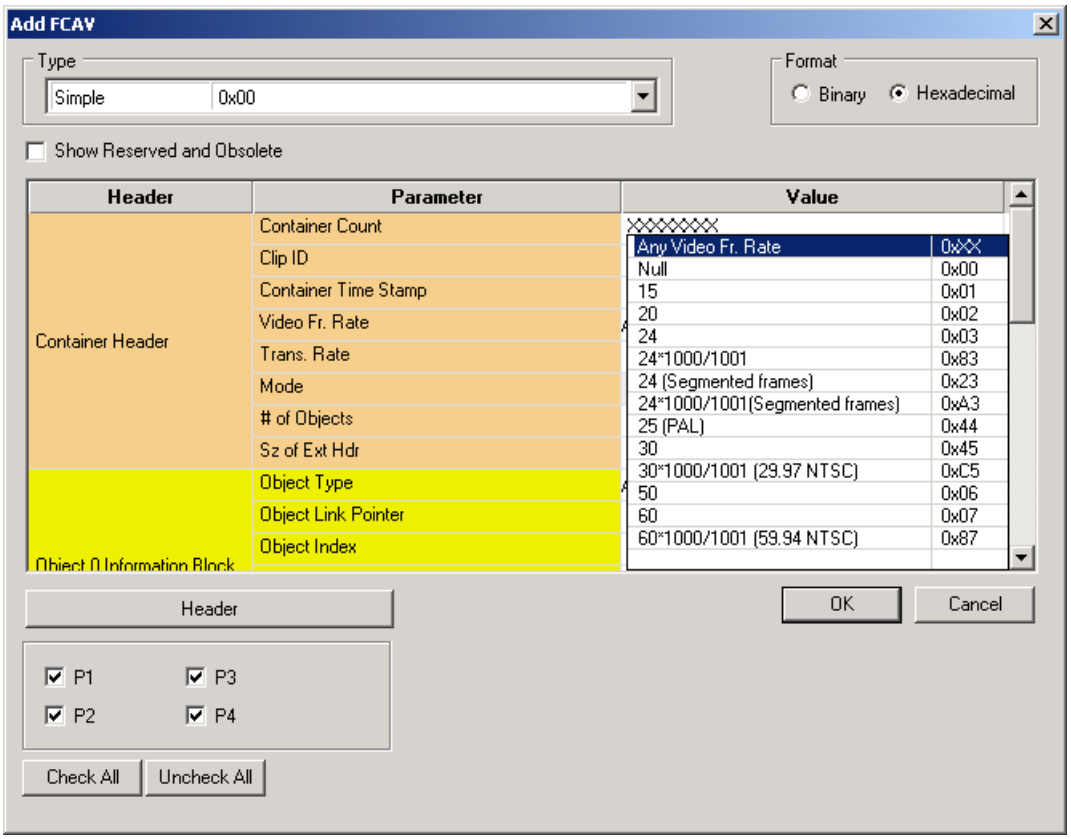


Figure 2.94: VSAN-FCAV Container Header Values Dialog

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

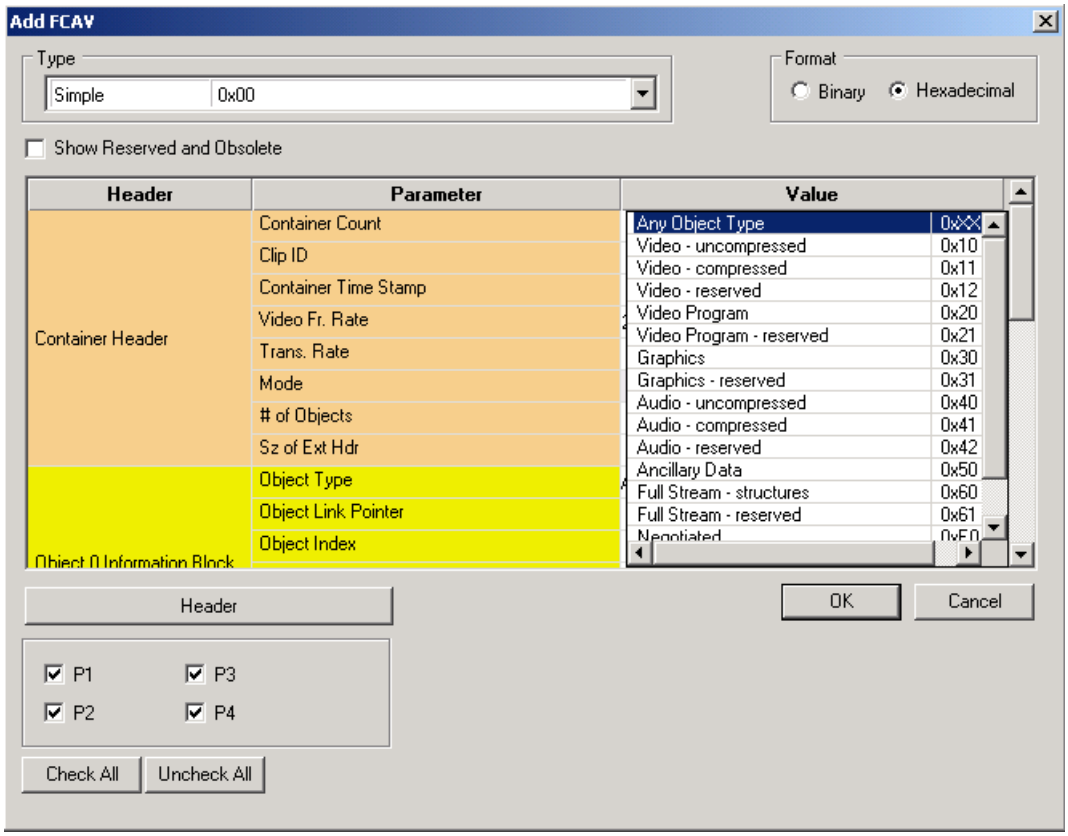


Figure 2.95: VSAN-FCAV Object Information Values Dialog

Custom Frame

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

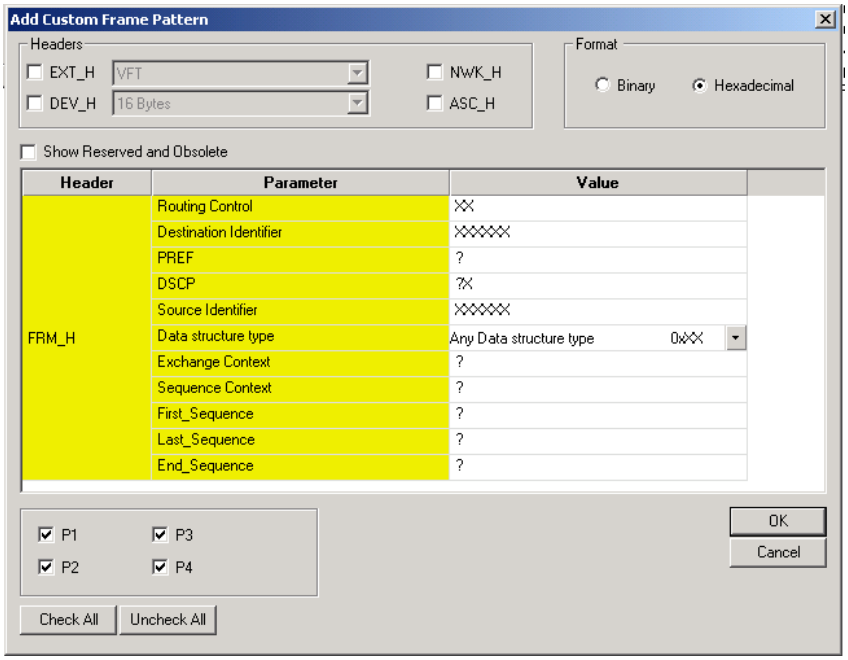


Figure 2.96: Custom Frame Pattern Dialog

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.

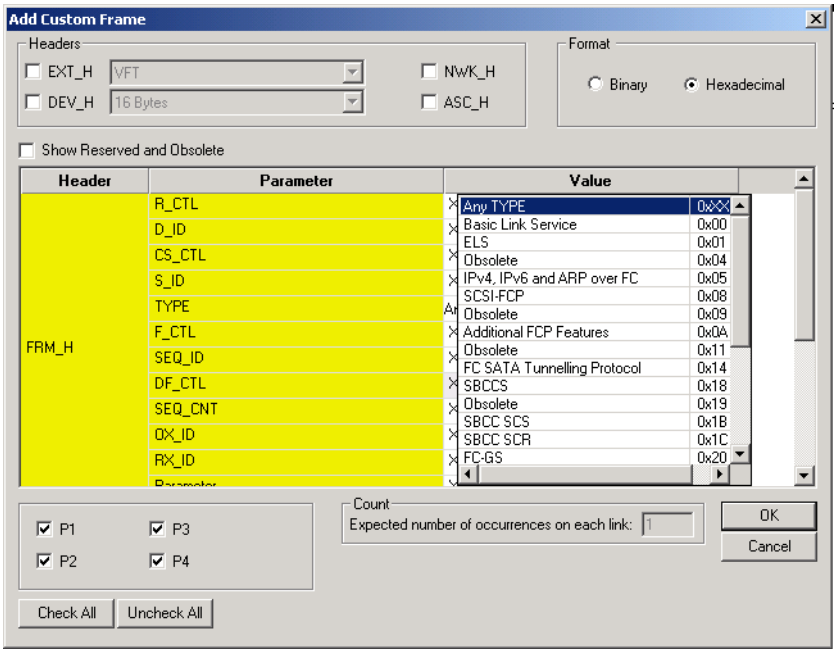


Figure 2.97: Add Custom Frame - Any Type Dialog

To select **Any Type** click the dropdown list which has the following options:

- 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.

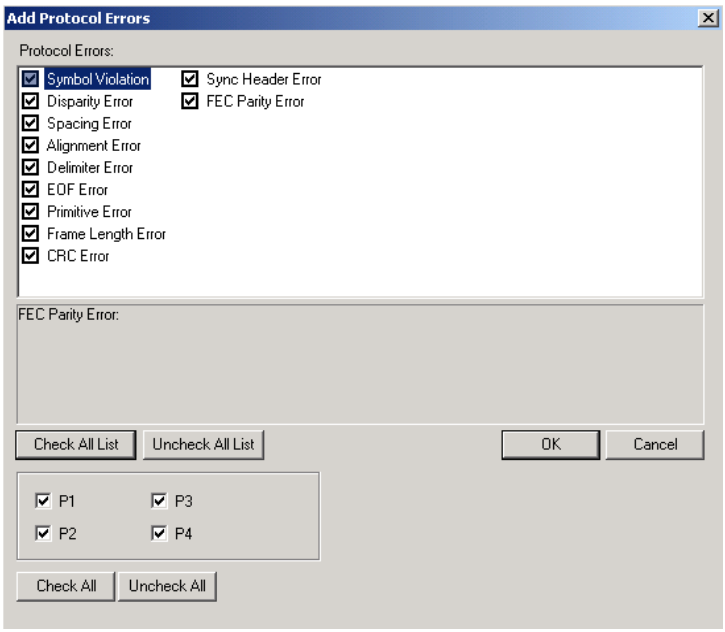


Figure 2.98: Protocol Error Pattern Dialog

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.

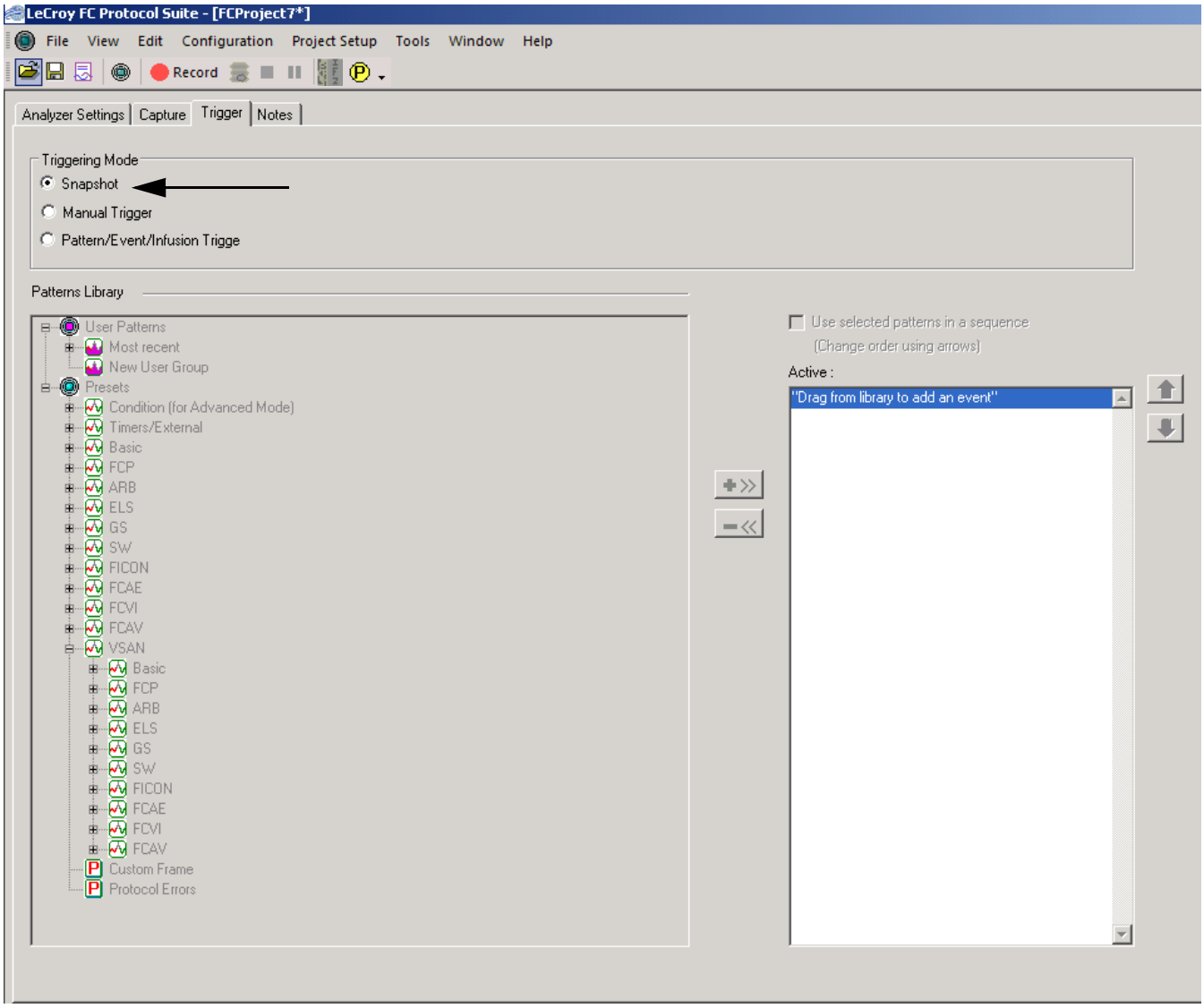


Figure 2.99: Default Trigger Snapshot Mode Selected

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.

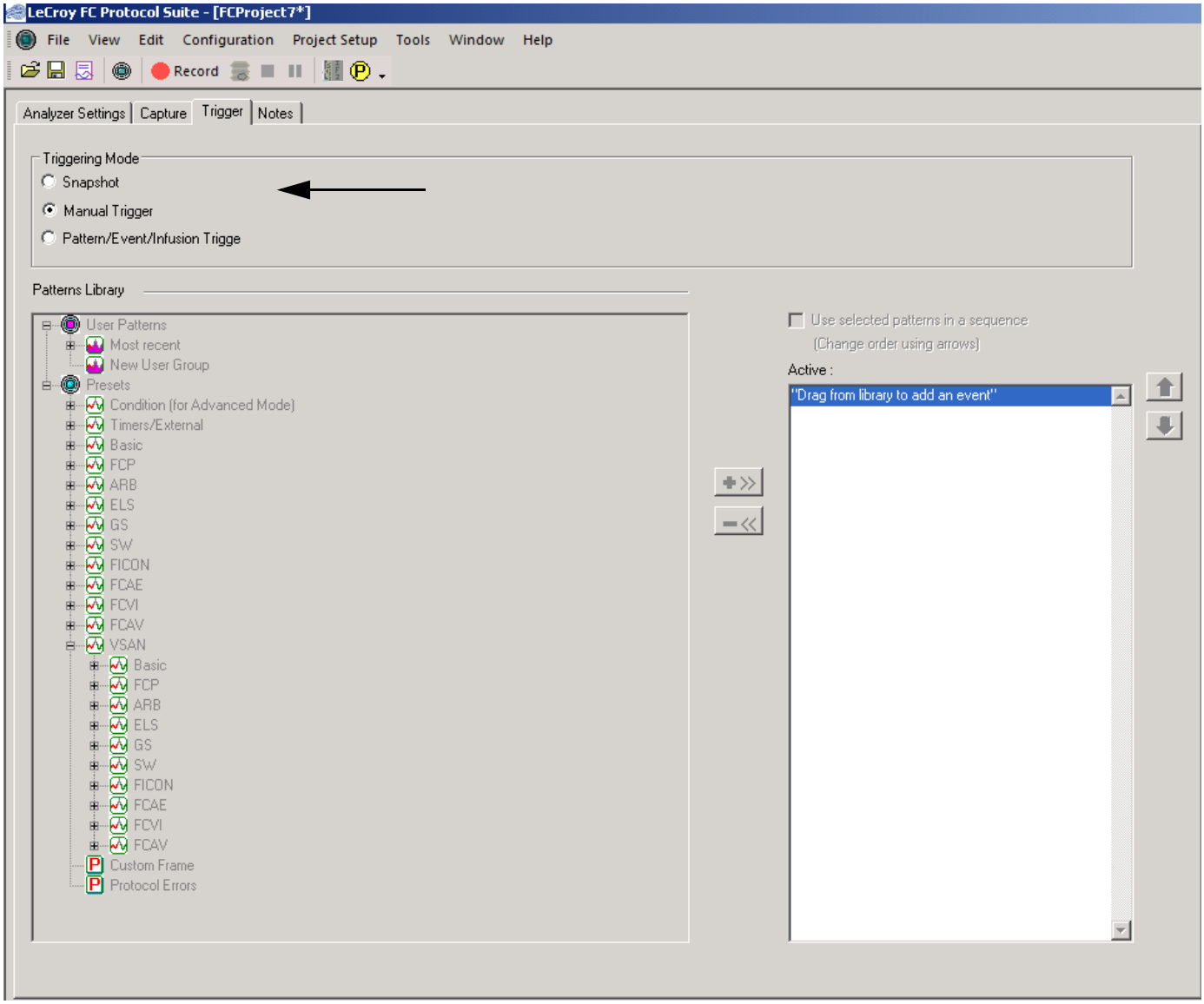


Figure 2.100: Manual Trigger Mode Selected

Pattern/Event/Infusion Trigger Mode

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.

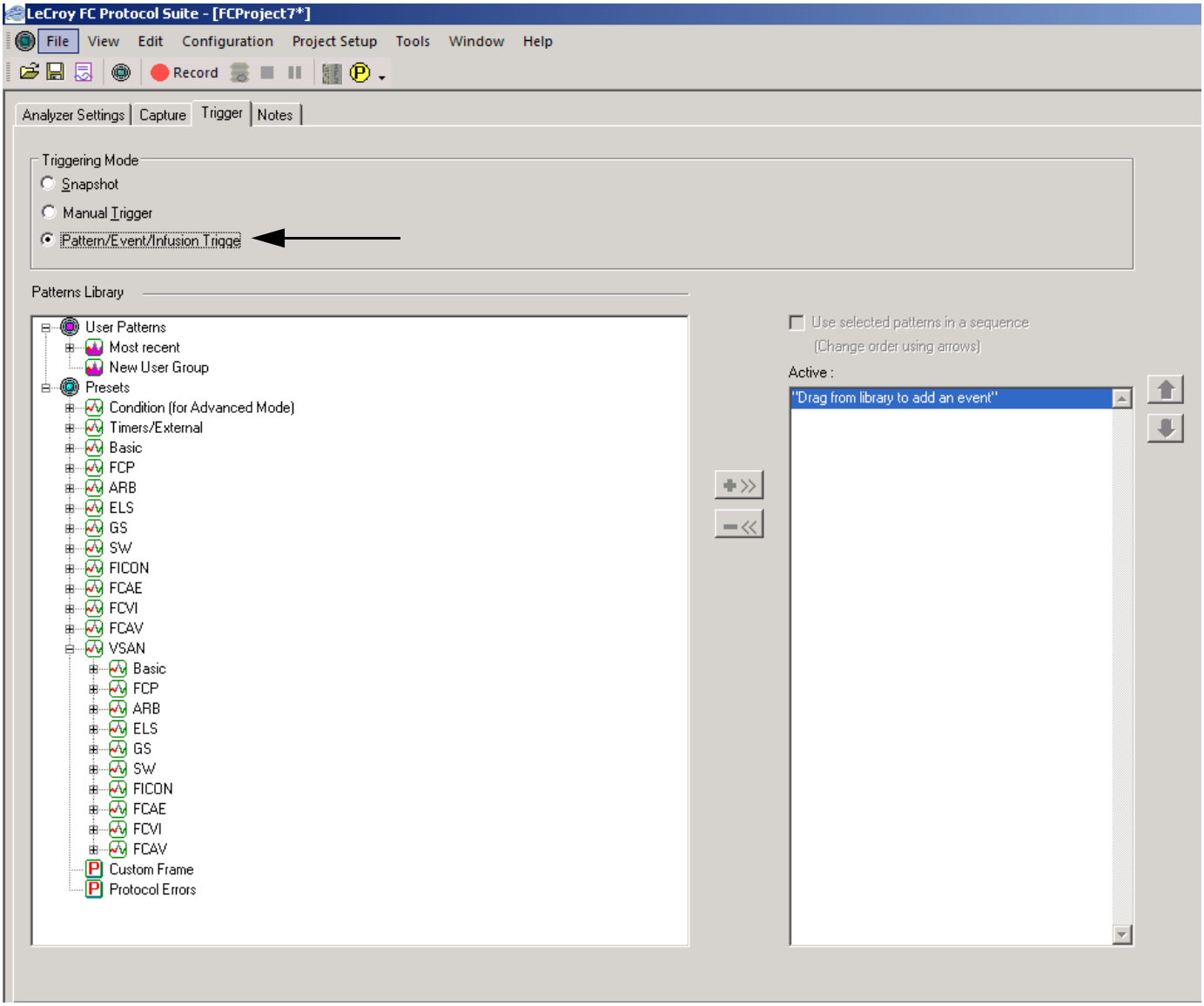


Figure 2.101: Select Patterns for Trigger

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.

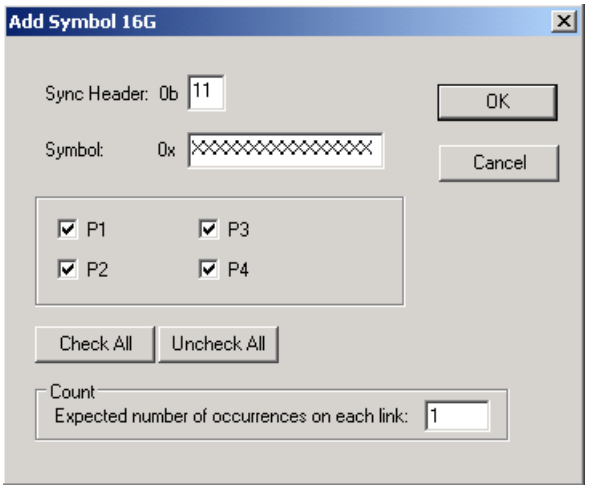


Figure 2.102: Add Symbol 16G Dialog

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.

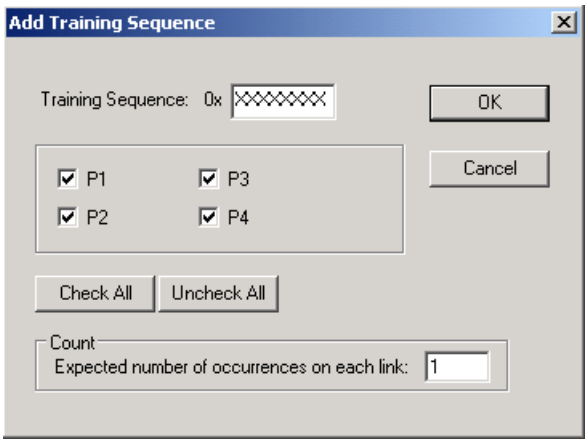


Figure 2.103: Add Training Sequence Dialog

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.

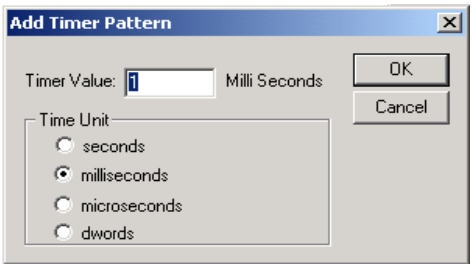


Figure 2.104: Add Timer Pattern Dialog

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.

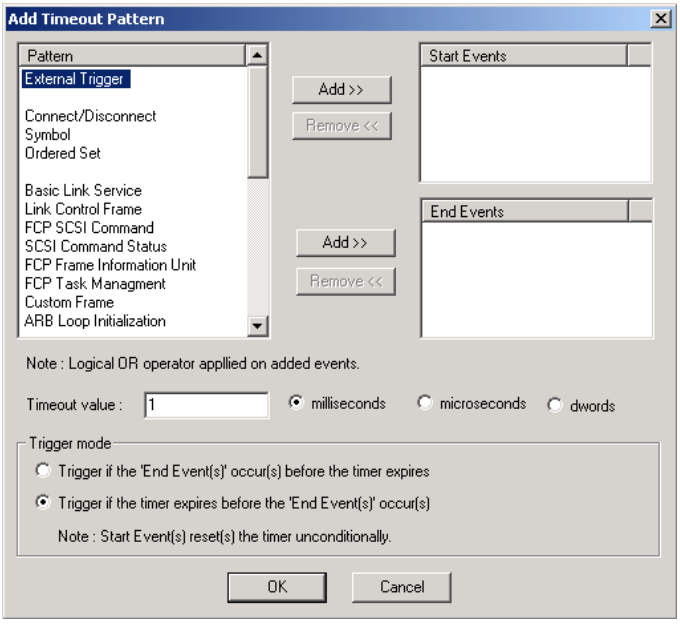


Figure 2.105: Add Timeout Pattern Dialog

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.

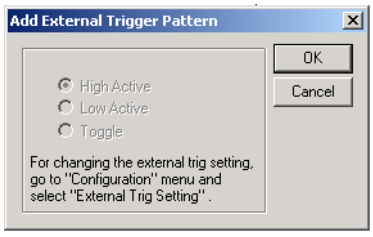


Figure 2.106: Add External Trigger Pattern Dialog

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.

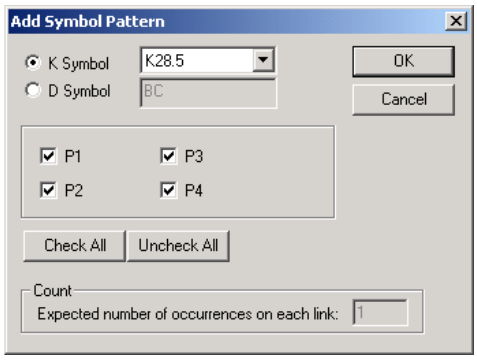


Figure 2.107: Add Symbol Pattern Dialog

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.

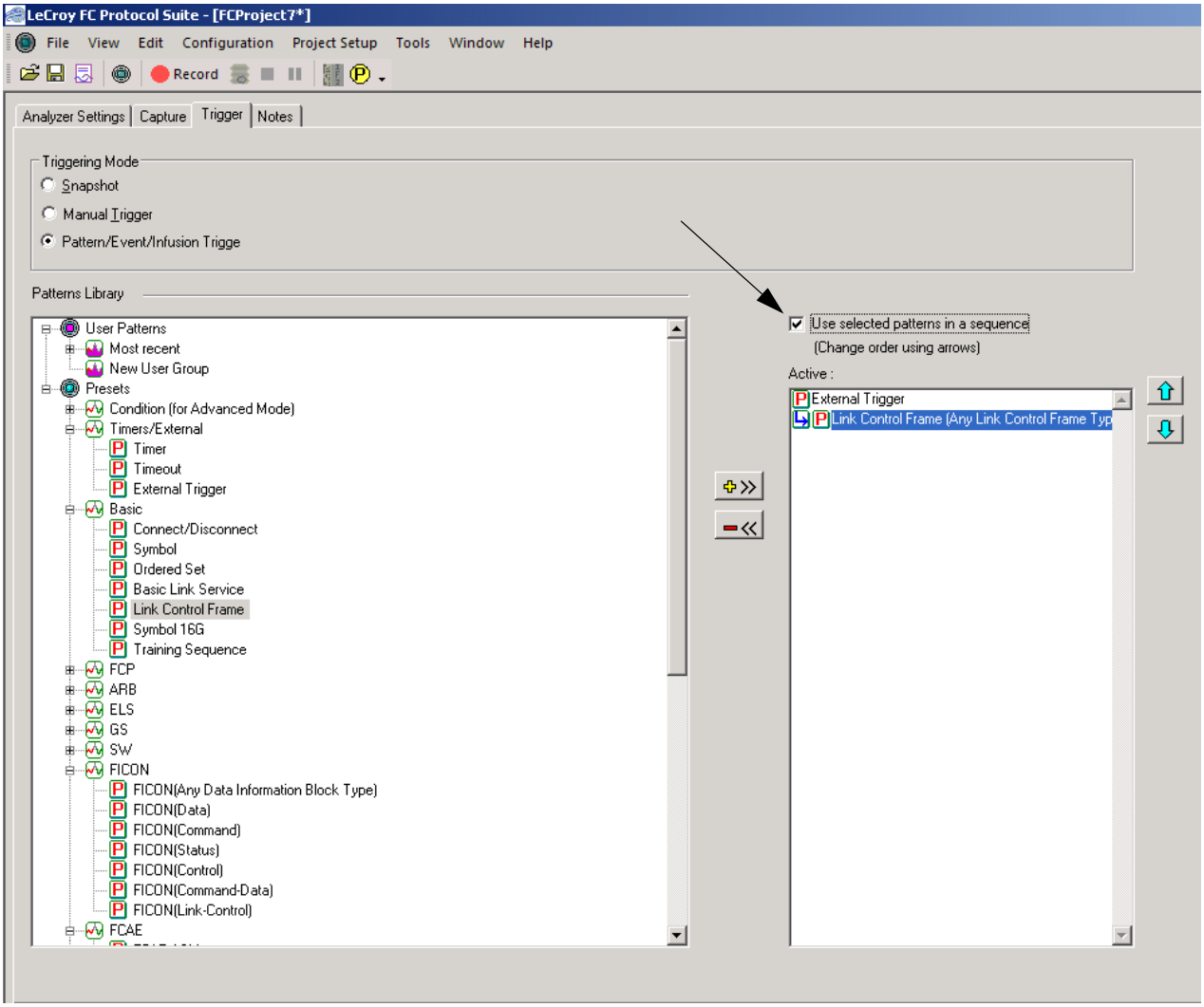


Figure 2.108: Select Sequential Trigger Mode

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.

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.

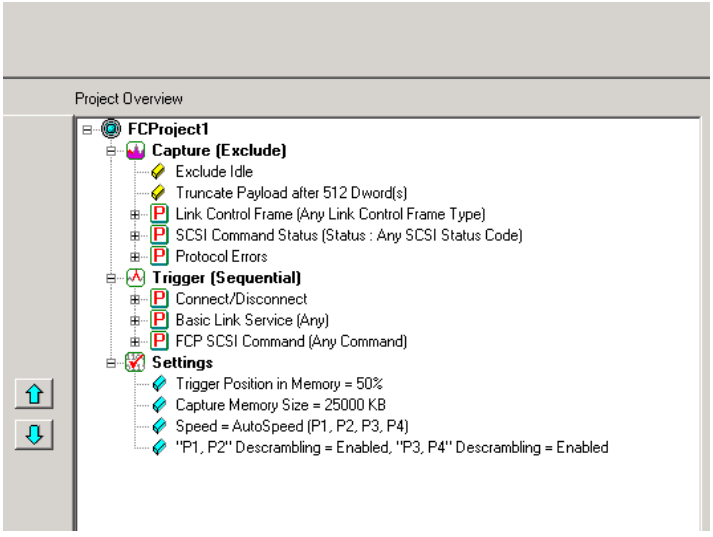


Figure 2.110: Triggering Order

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.

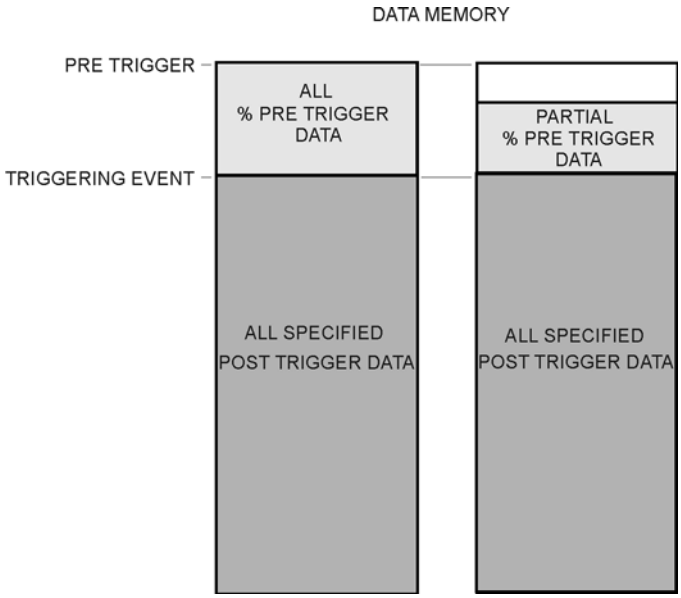


Figure 2.111: Pre-Trigger Example, 20% Pre-Trigger

Project Settings

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

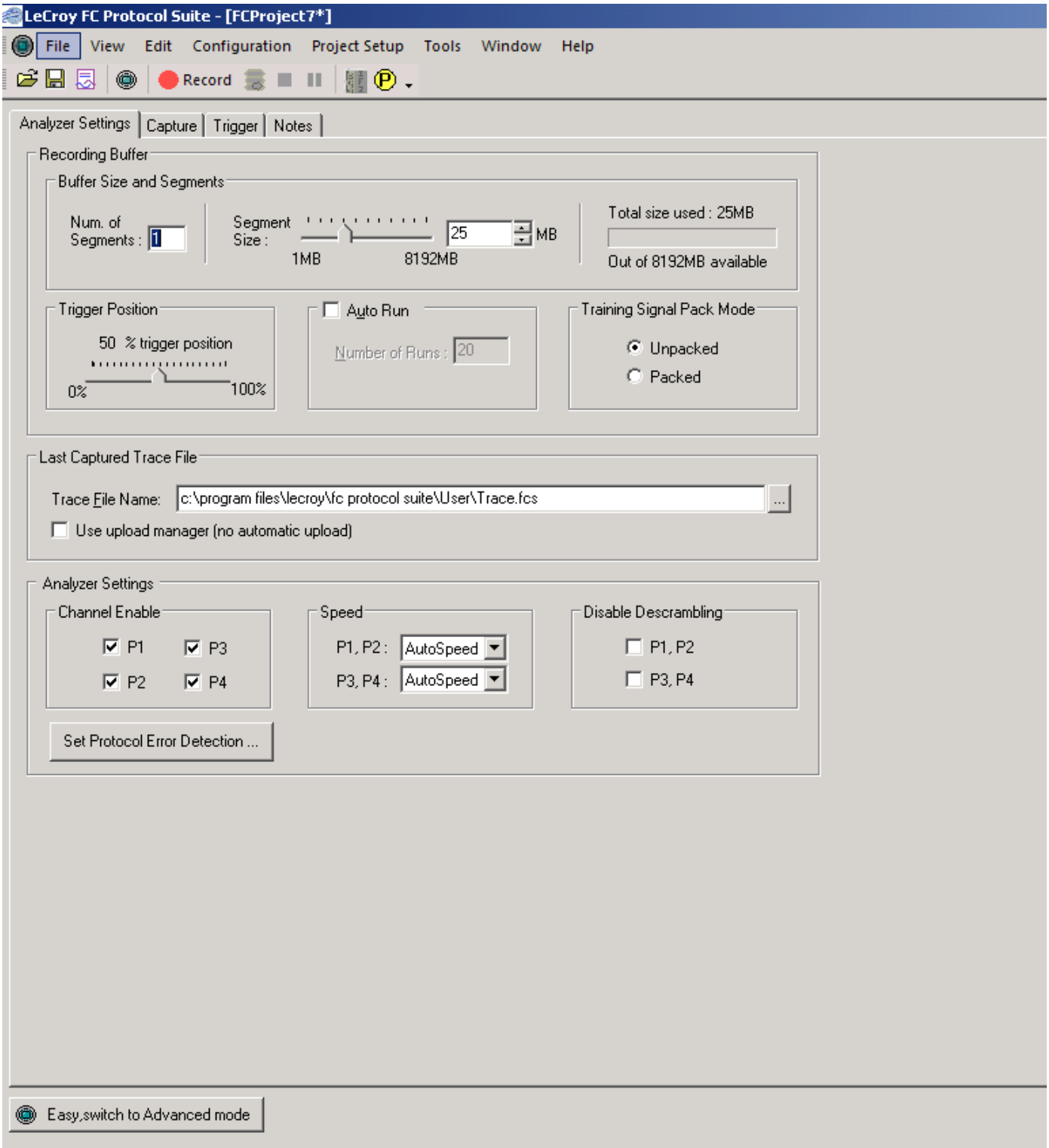


Figure 2.112: Setting Project Options

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.

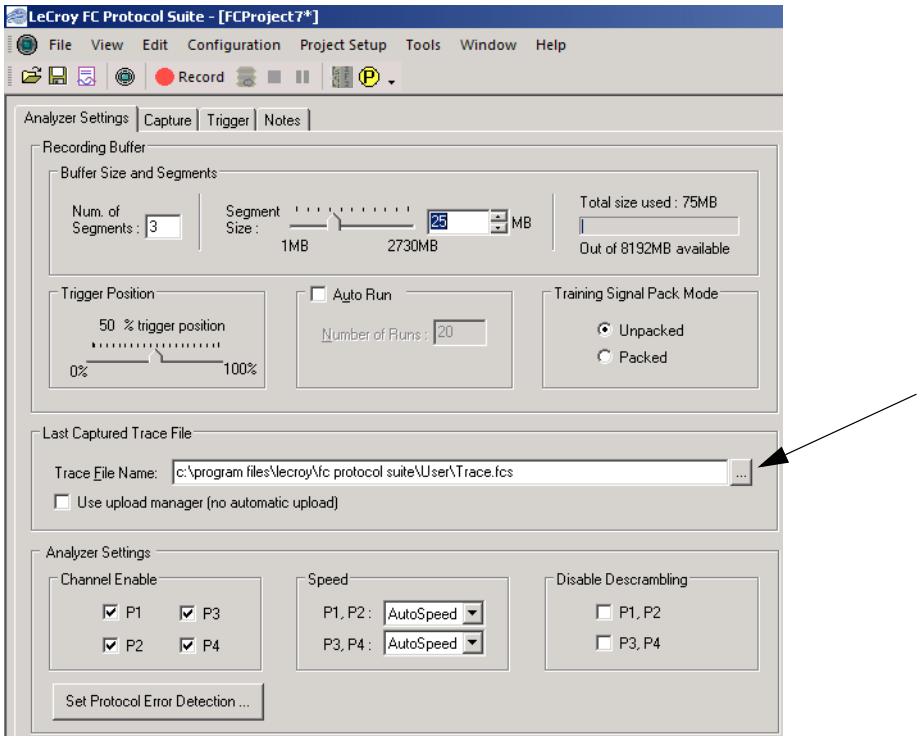


Figure 2.113: Trace File Name

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.

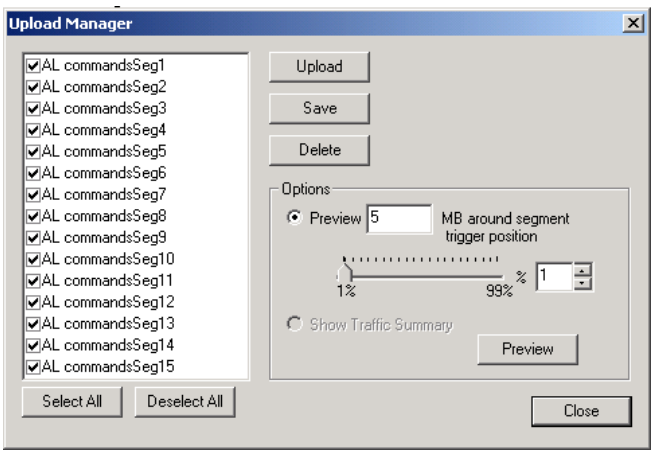


Figure 2.114: Upload Manager Dialog

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.

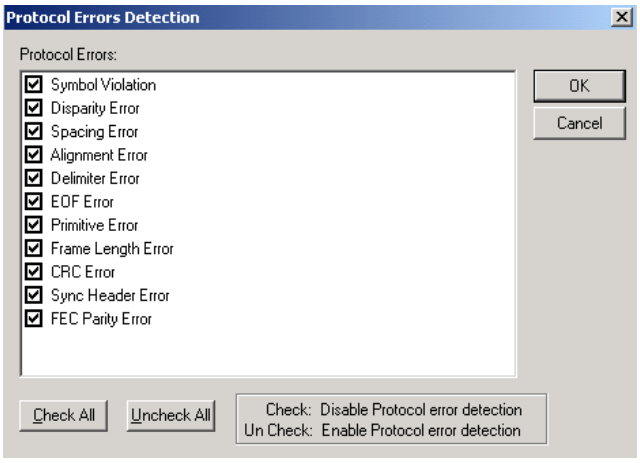


Figure 2.115: Protocol Errors Dialog

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.

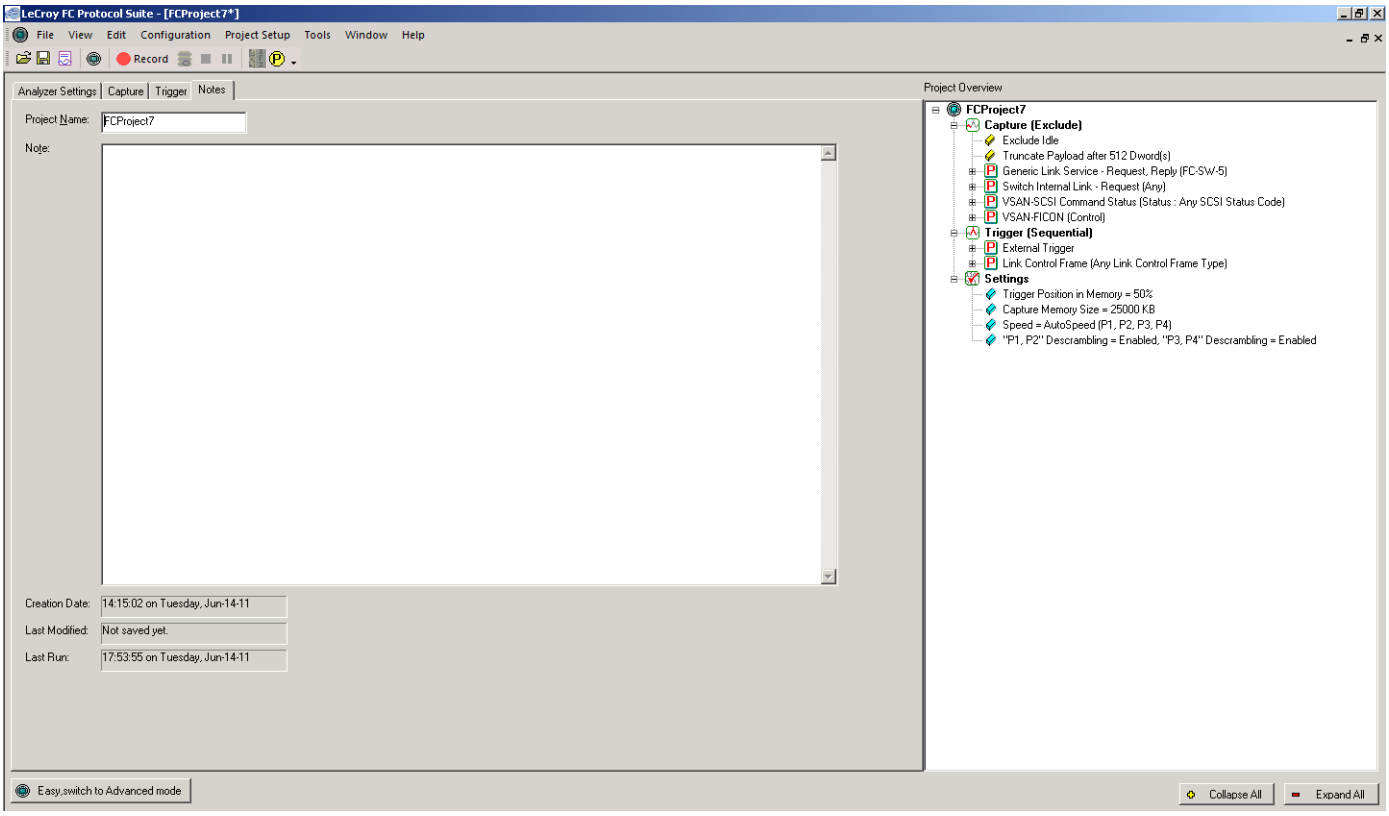


Figure 2.116: Project Notes Tab

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

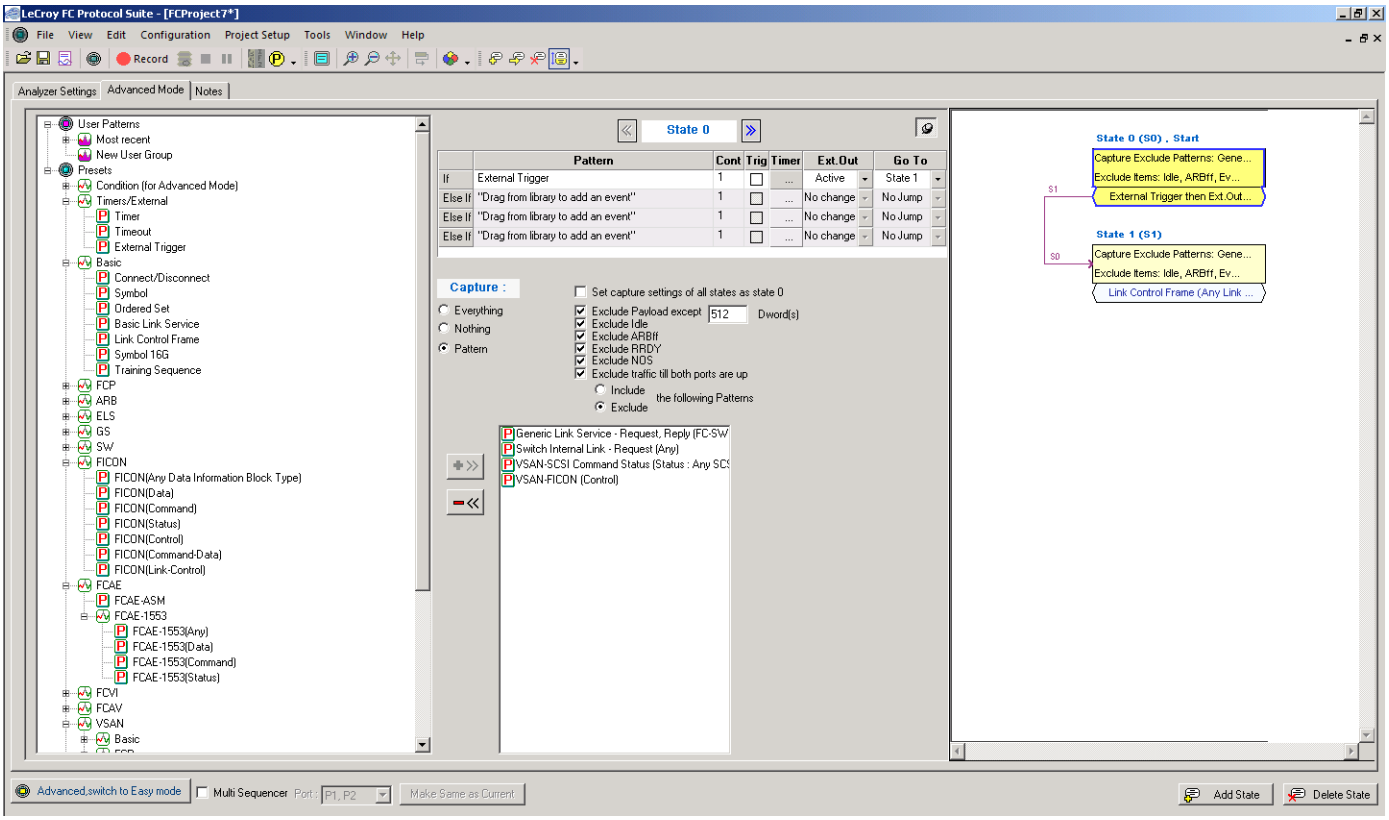


Figure 2.117: State Programming Dialog

Setting Trigger Conditions

To set the If and Else If trigger condition:

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

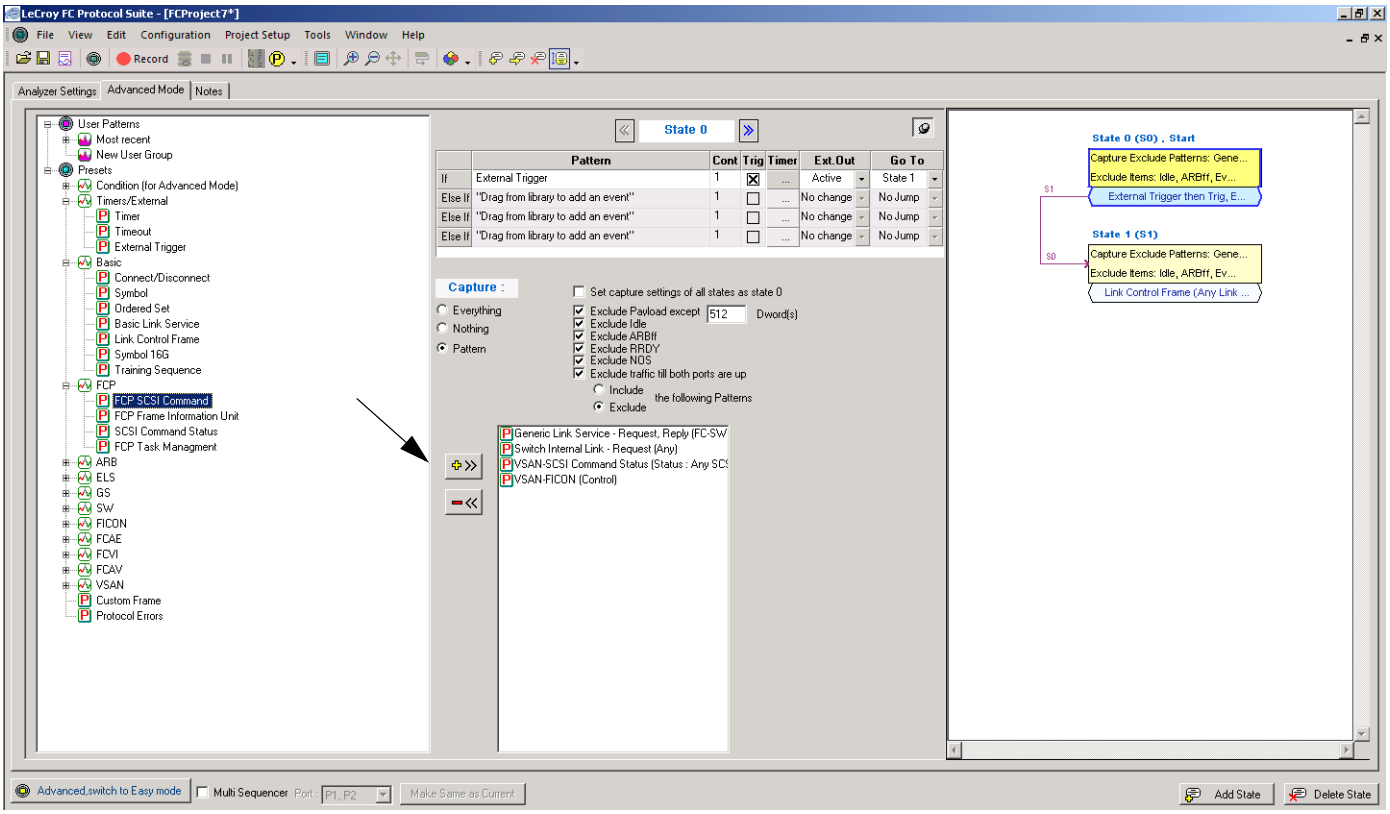


Figure 2.118: Choosing a Trigger Condition

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**.
5. 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.

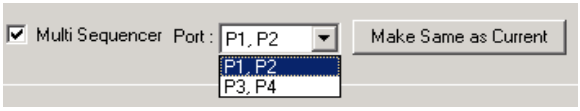


Figure 2.119: Multi-Link Triggering Setup

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.

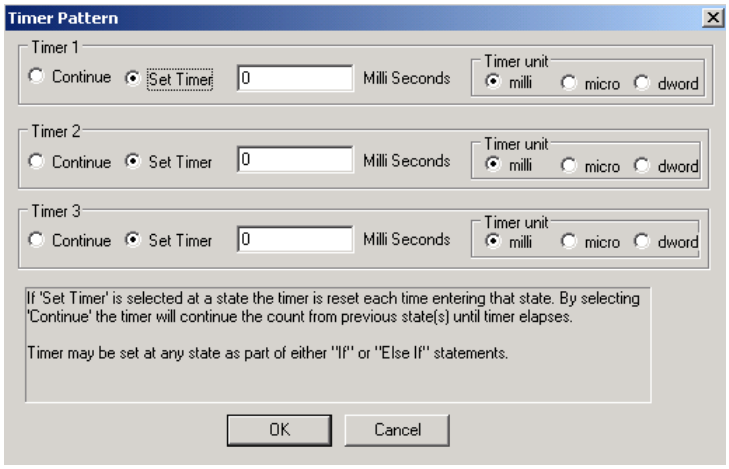


Figure 2.120: Timer Pattern Dialog

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	Copy
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.

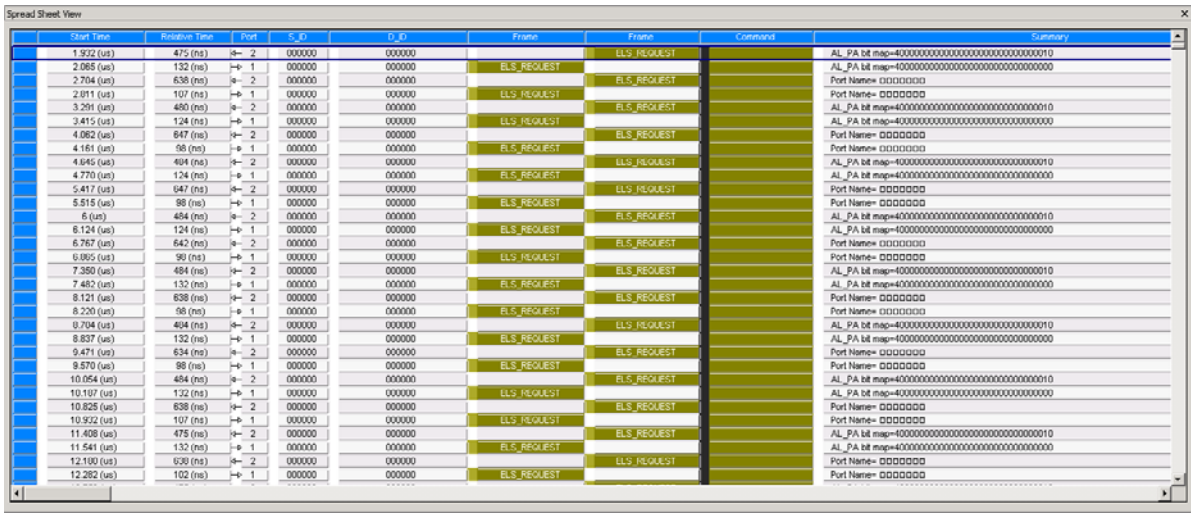


Figure 3.1: Spreadsheet View

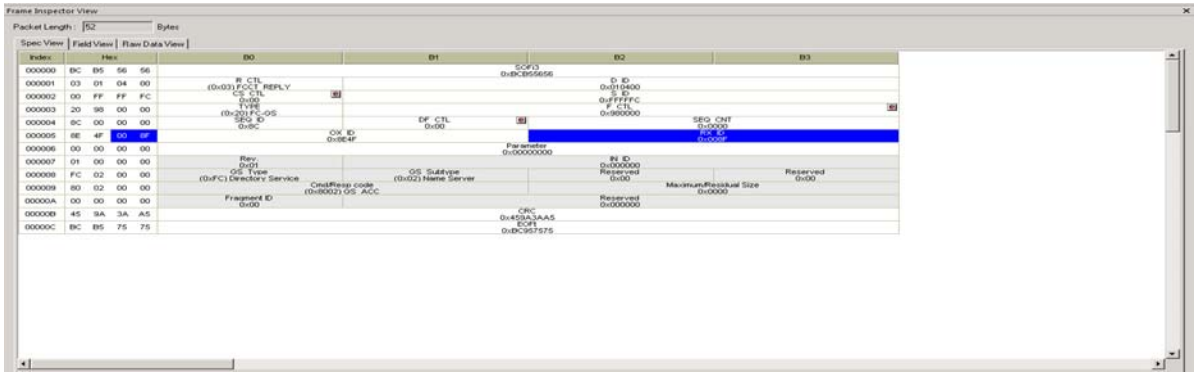


Figure 3.2: Frame Inspector View

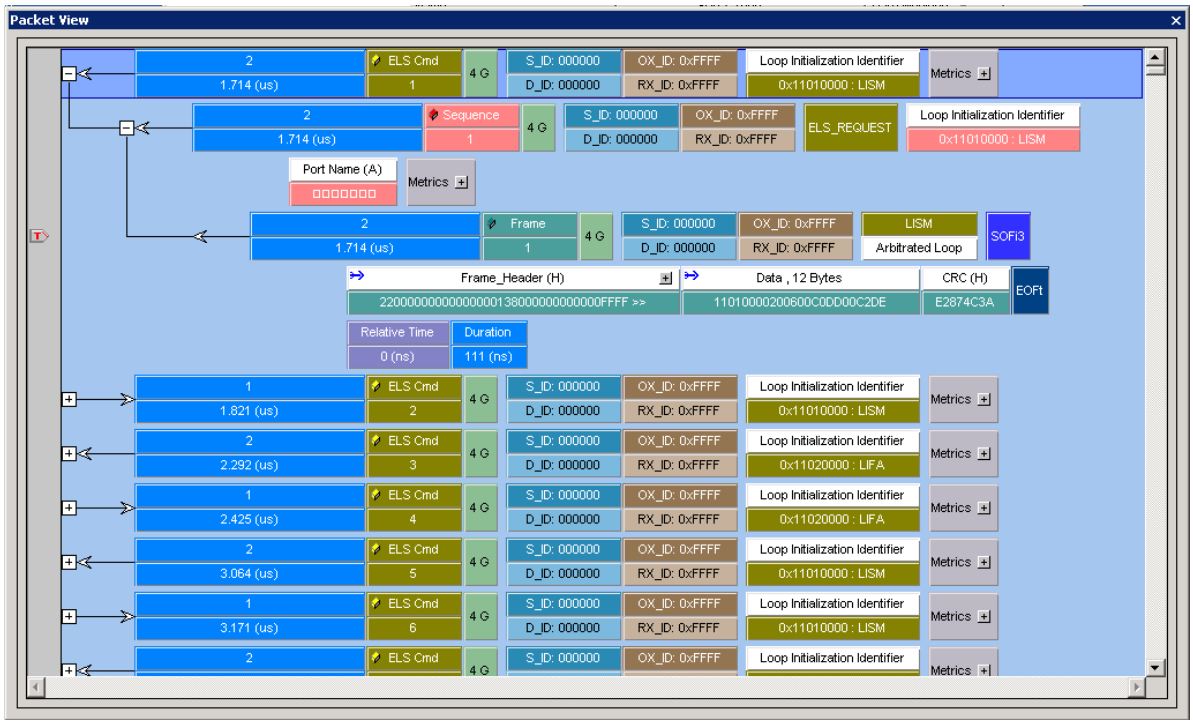


Figure 3.3: Packet View

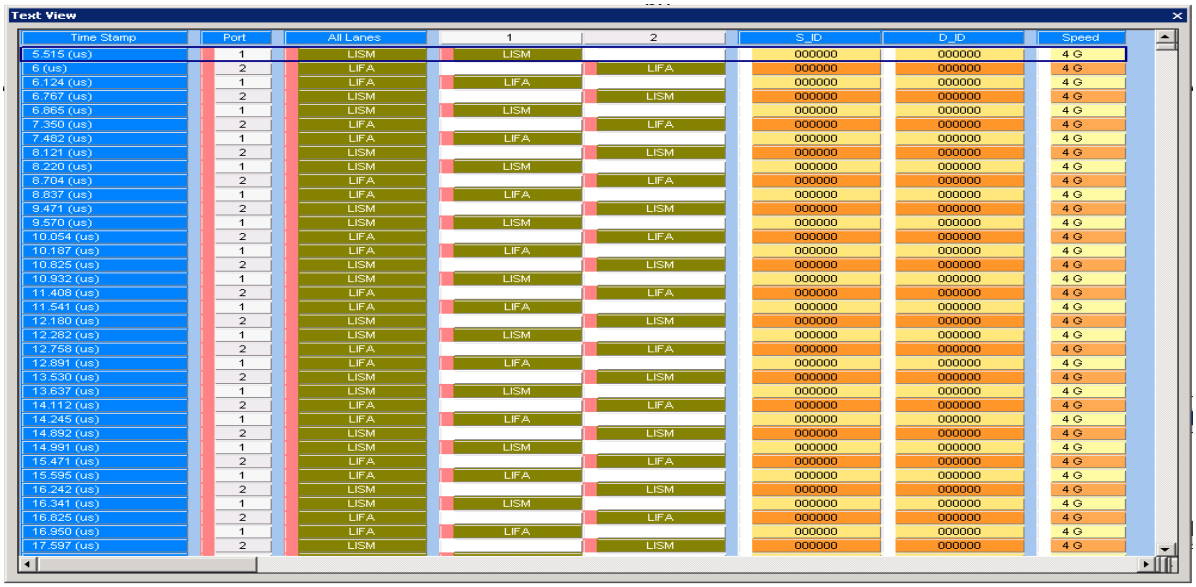


Figure 3.4: Text View

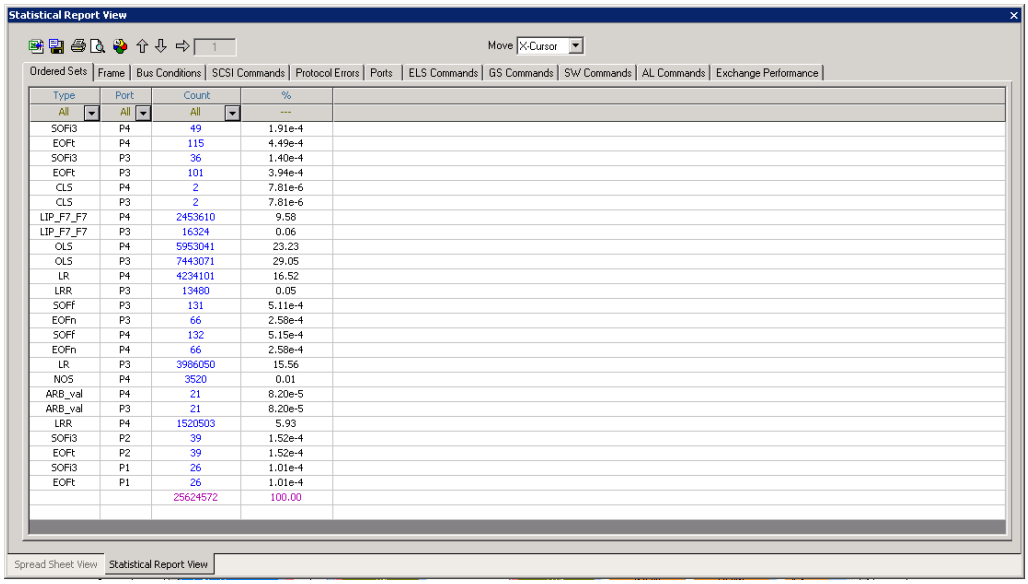


Figure 3.5: Statistical Report View

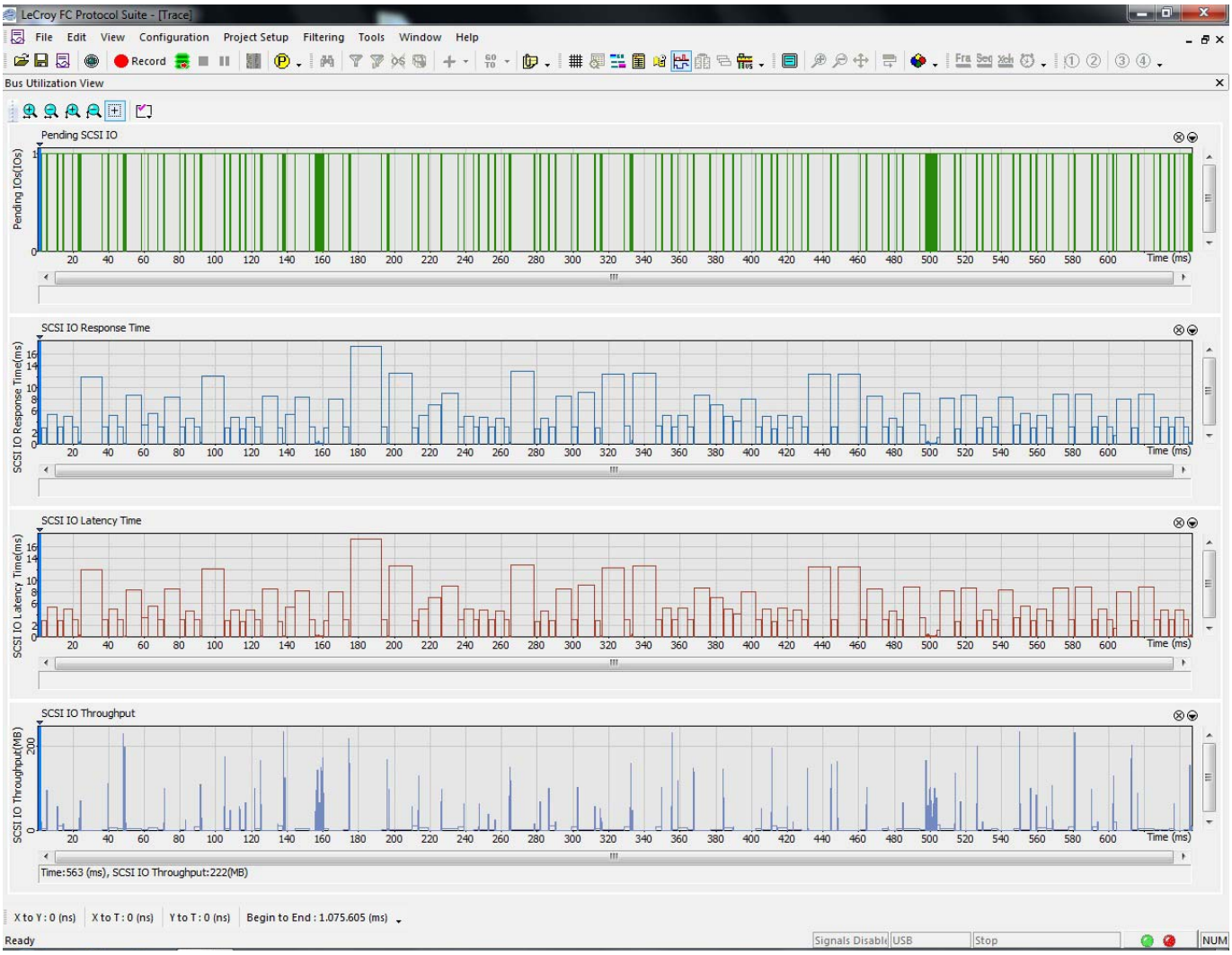


Figure 3.6: Bus Utilization View

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.

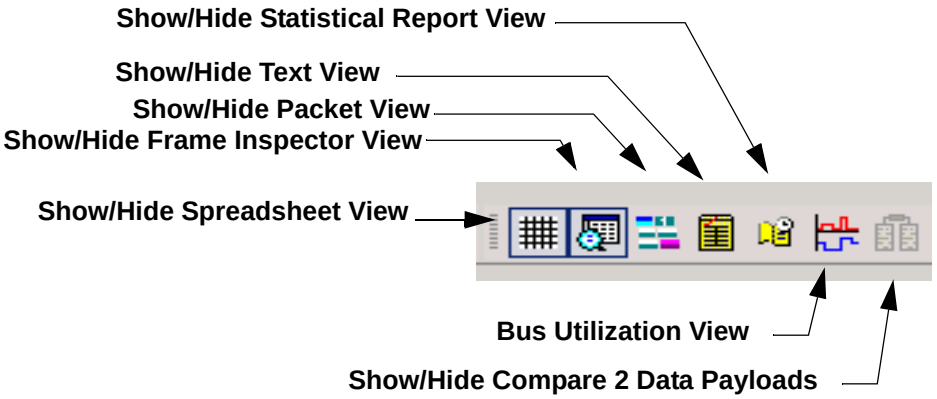


Figure 3.7: View Type Toolbar

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.

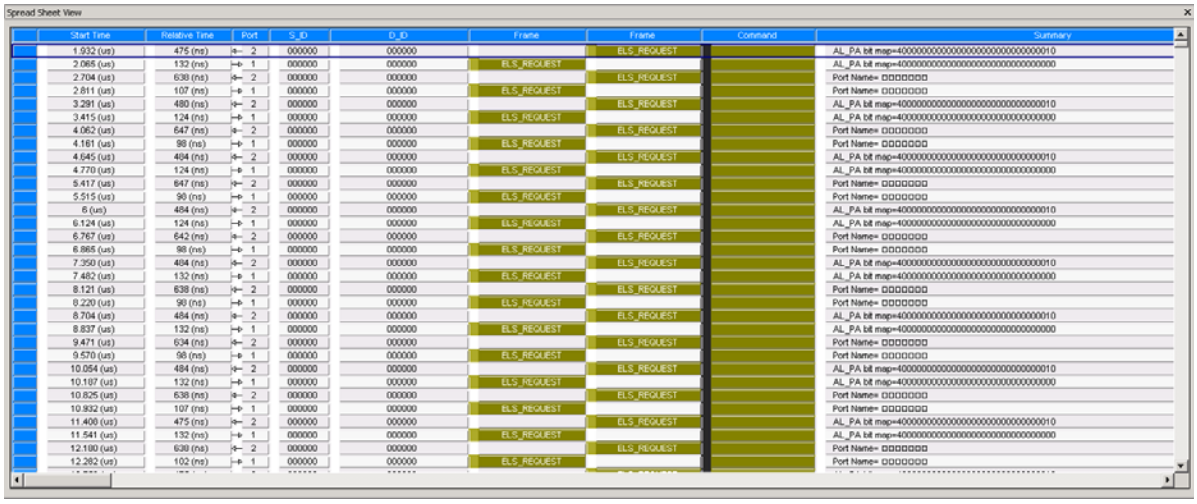


Figure 3.8: Spreadsheet View

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.

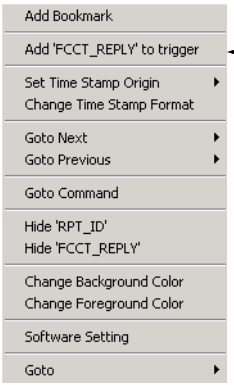
Trace Viewer Configuration

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**.



This **Add xxx to trigger** allows a quick setting of the trigger for the next recording as the item on which the right click was done

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.

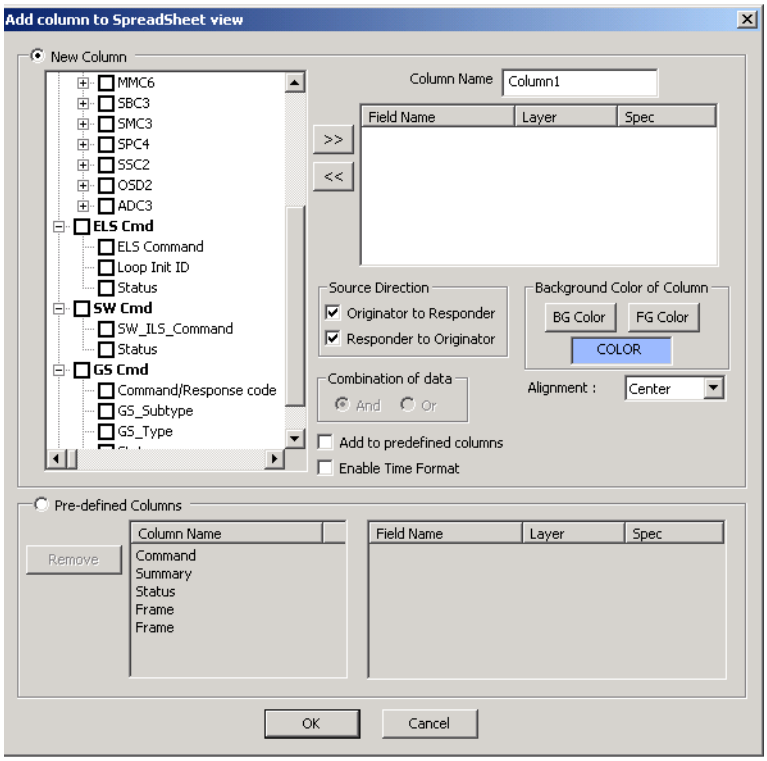


Figure 3.10: Add Column to Spread Sheet View Dialog

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 View** or click the  button on the View Type toolbar.

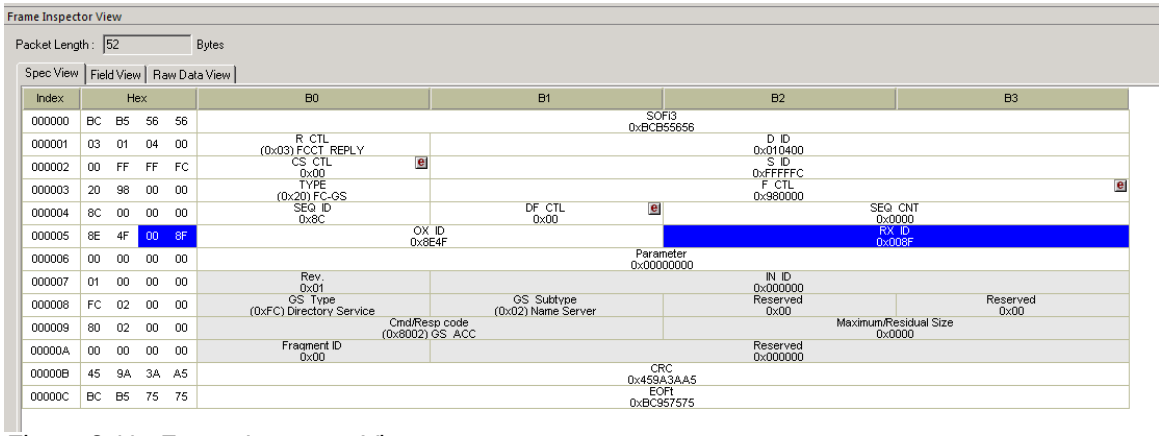


Figure 3.11: Frame Inspector View

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.

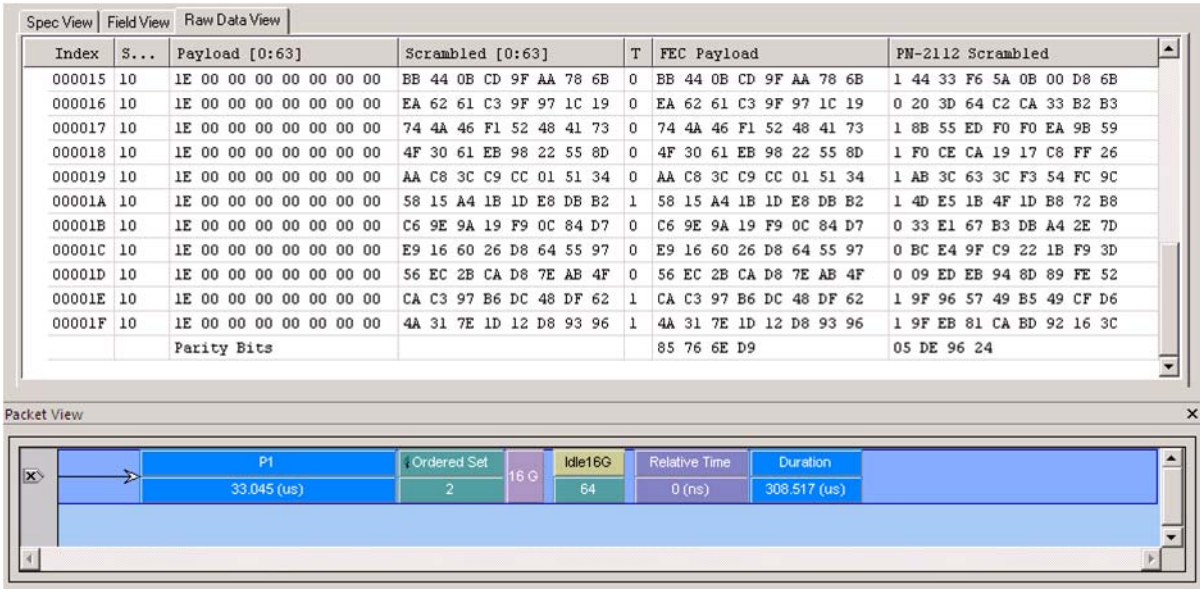


Figure 3.12: FC16 Raw Data View with FEC

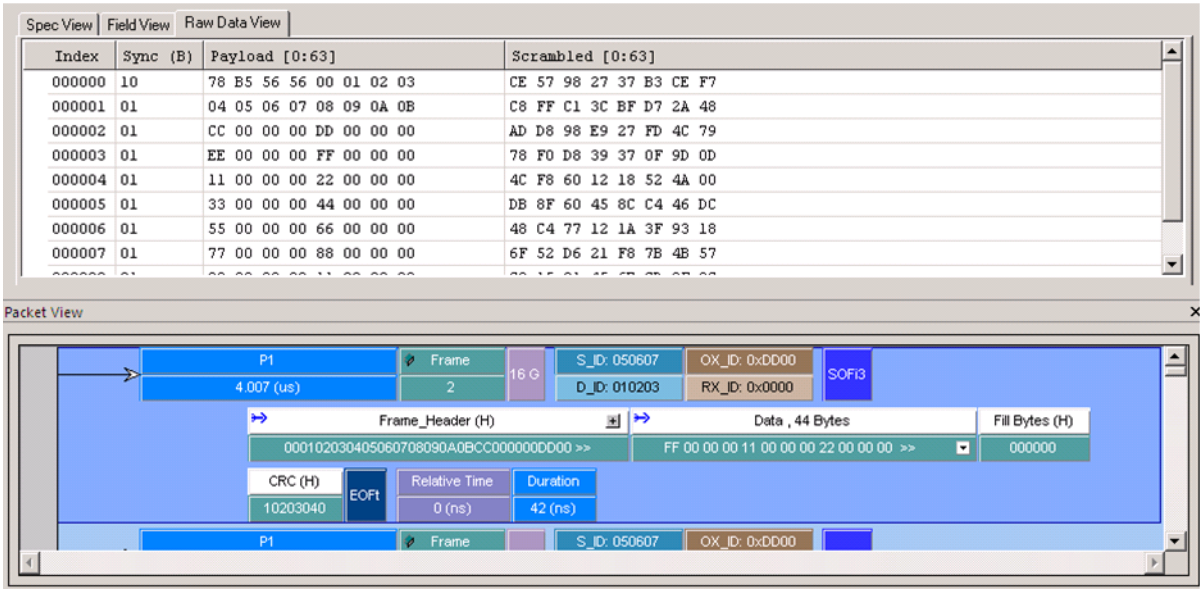


Figure 3.13: FC16 Raw Data View without FEC

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.

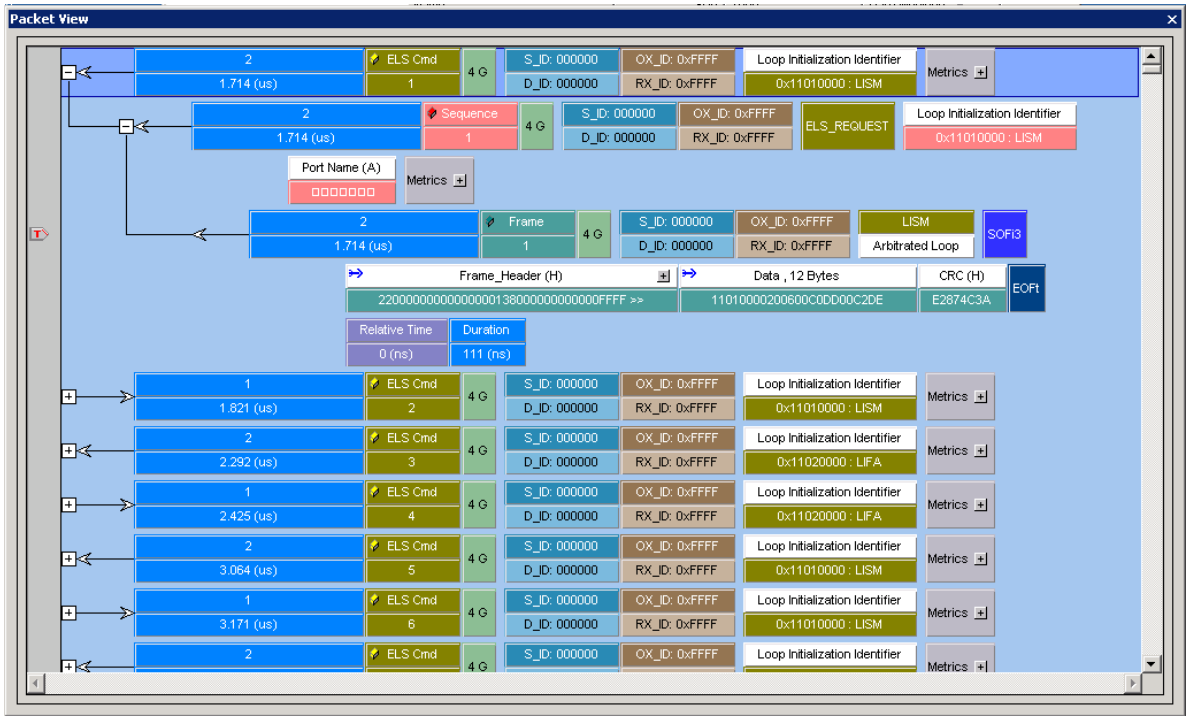


Figure 3.14: Packet View

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  button on the View Type toolbar.

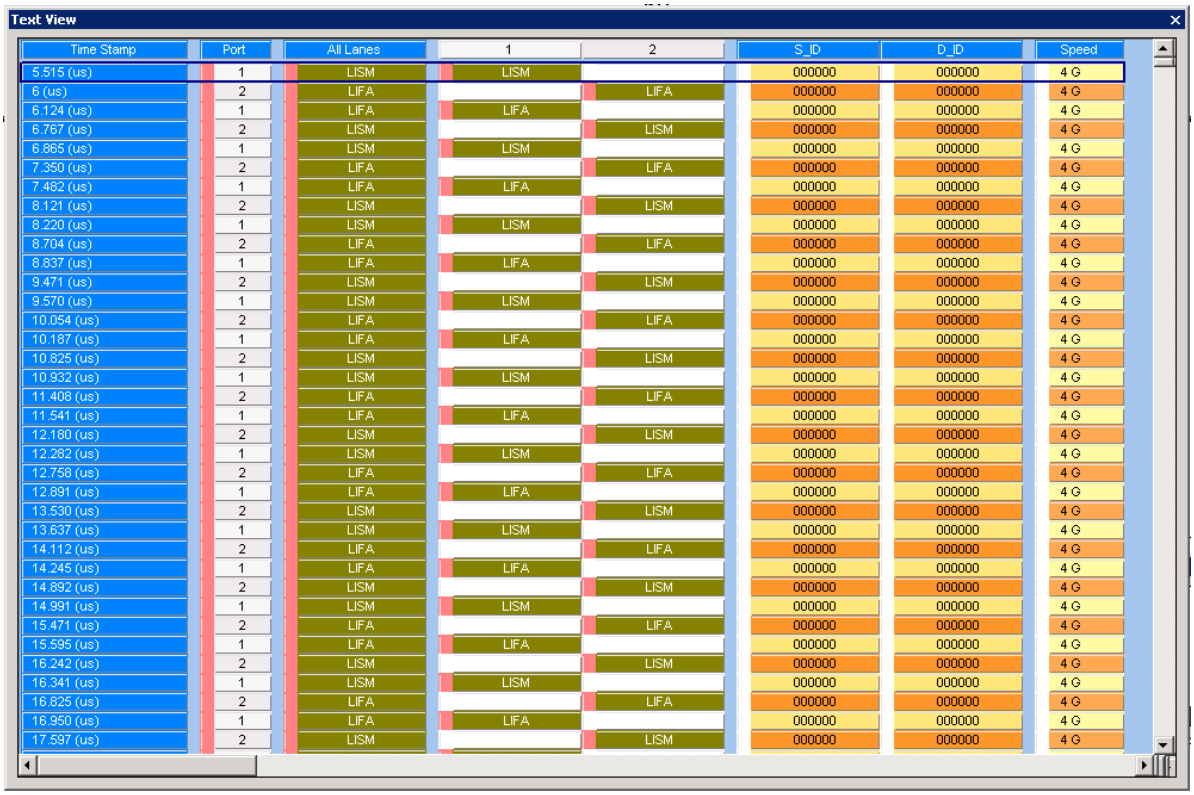
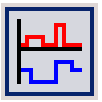


Figure 3.15: Text View

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.

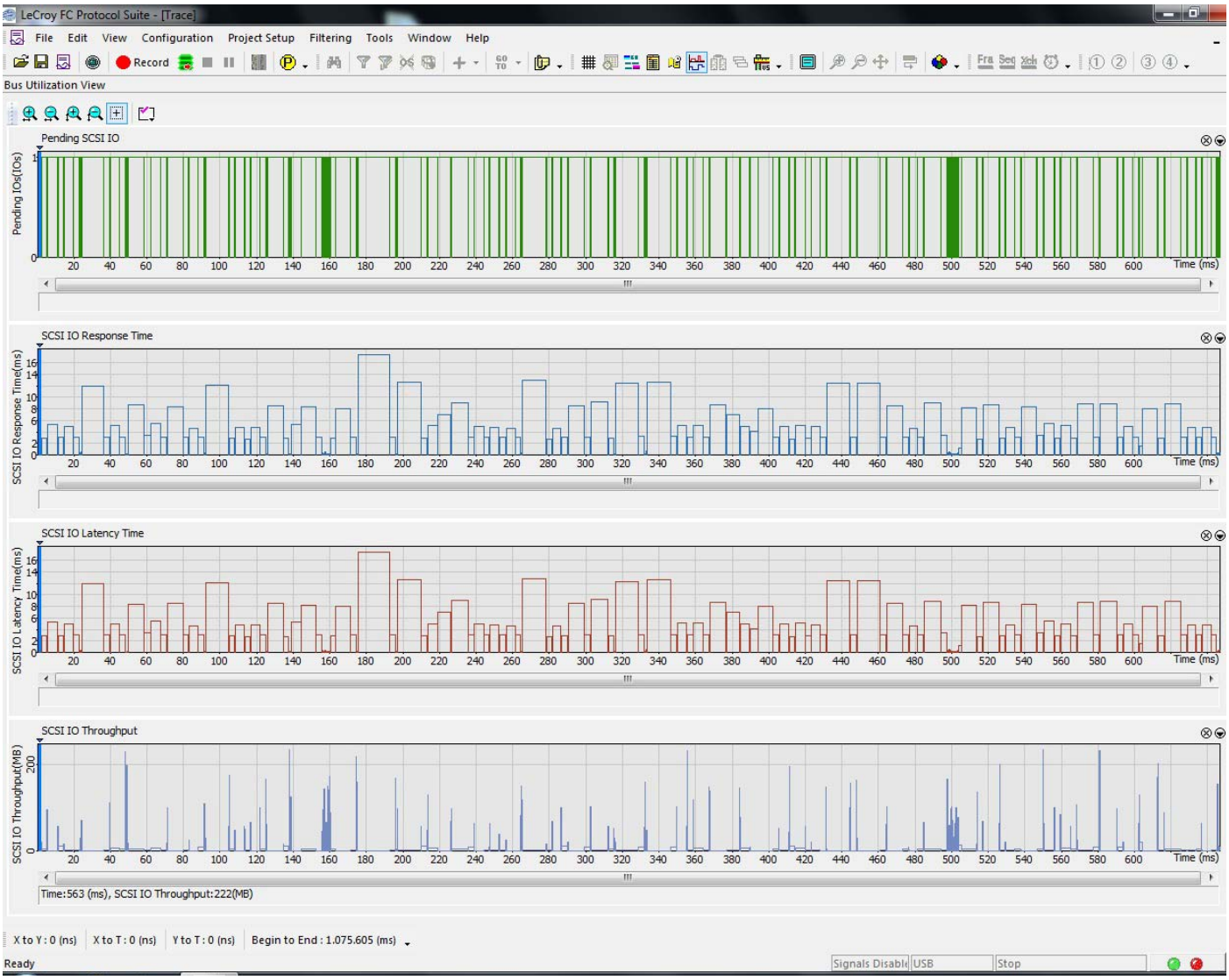
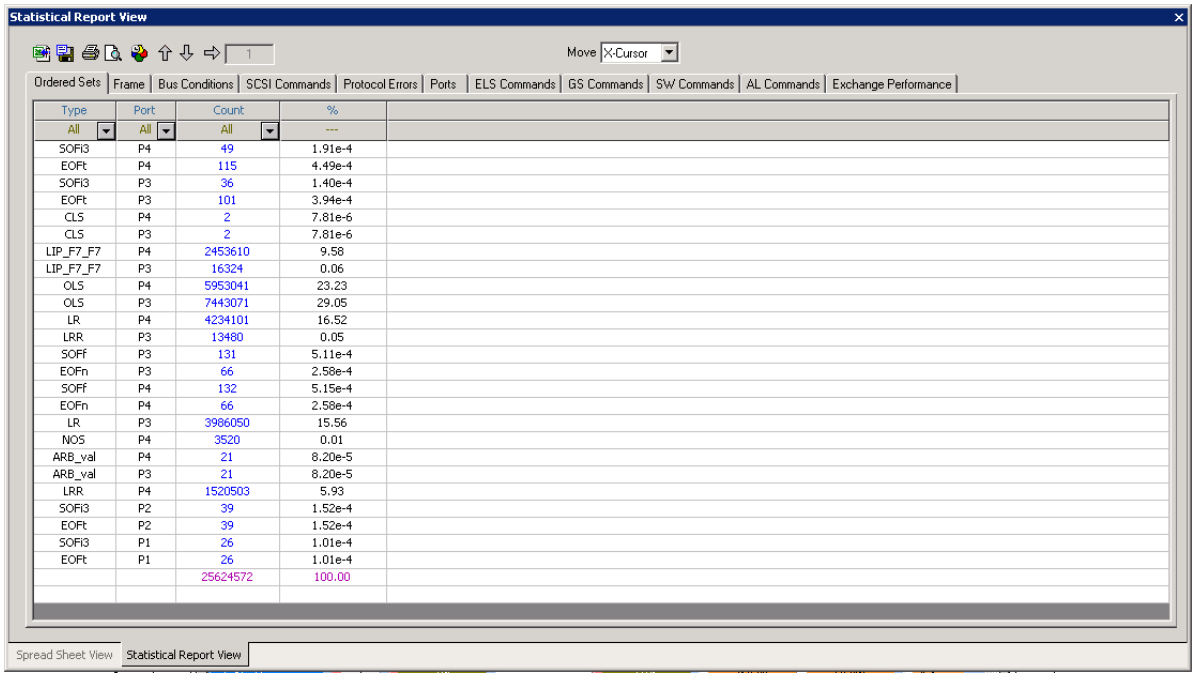


Figure 3.16: Bus Utilization View

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.



Type	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
LIP_F7_F7	P4	2453610	9.58
LIP_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 by hiding fields. Click the Filtering Setup button on the top toolbar to Show/Hide items.

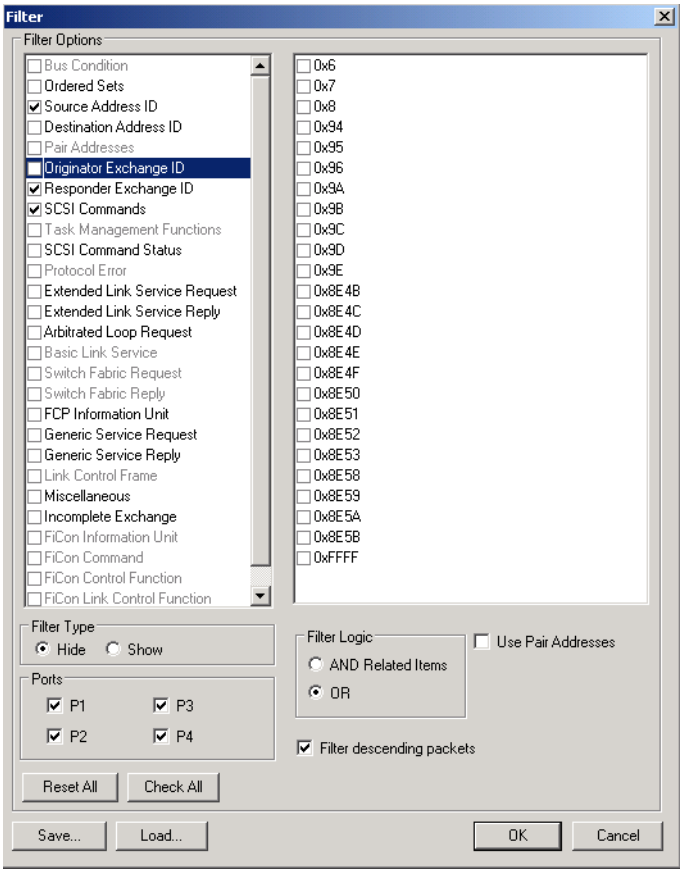


Figure 3.19: Show/Hide Field

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

Related Frames

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

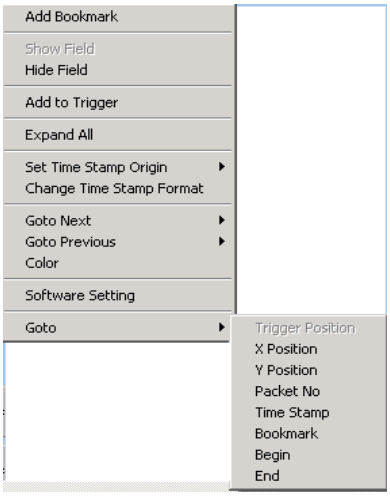


Figure 3.20: Goto Command

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.

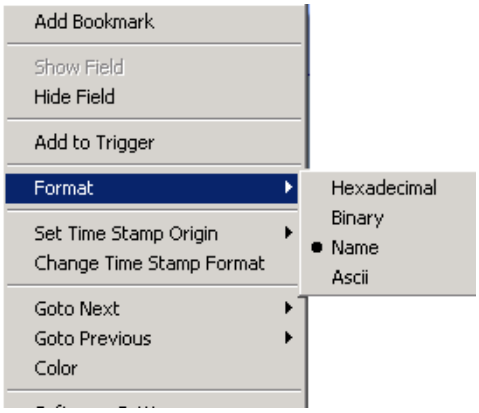


Figure 3.21: Format

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).

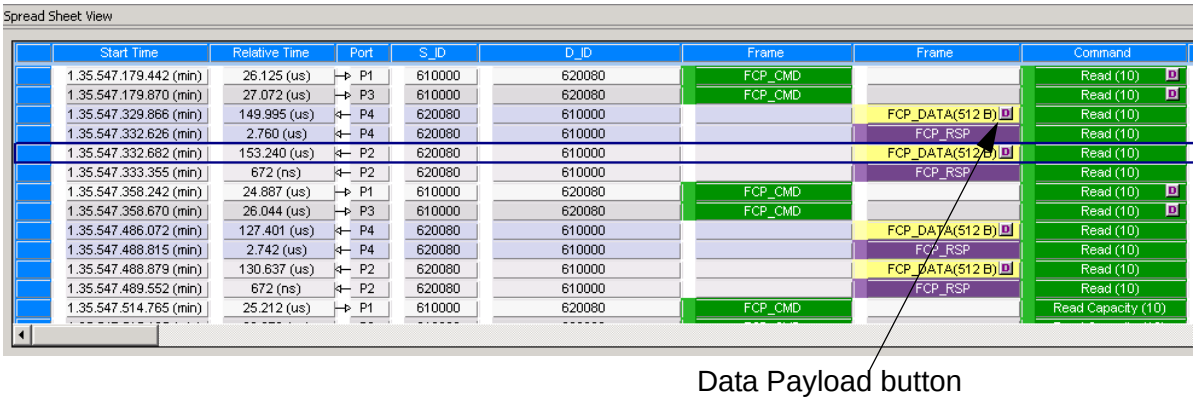
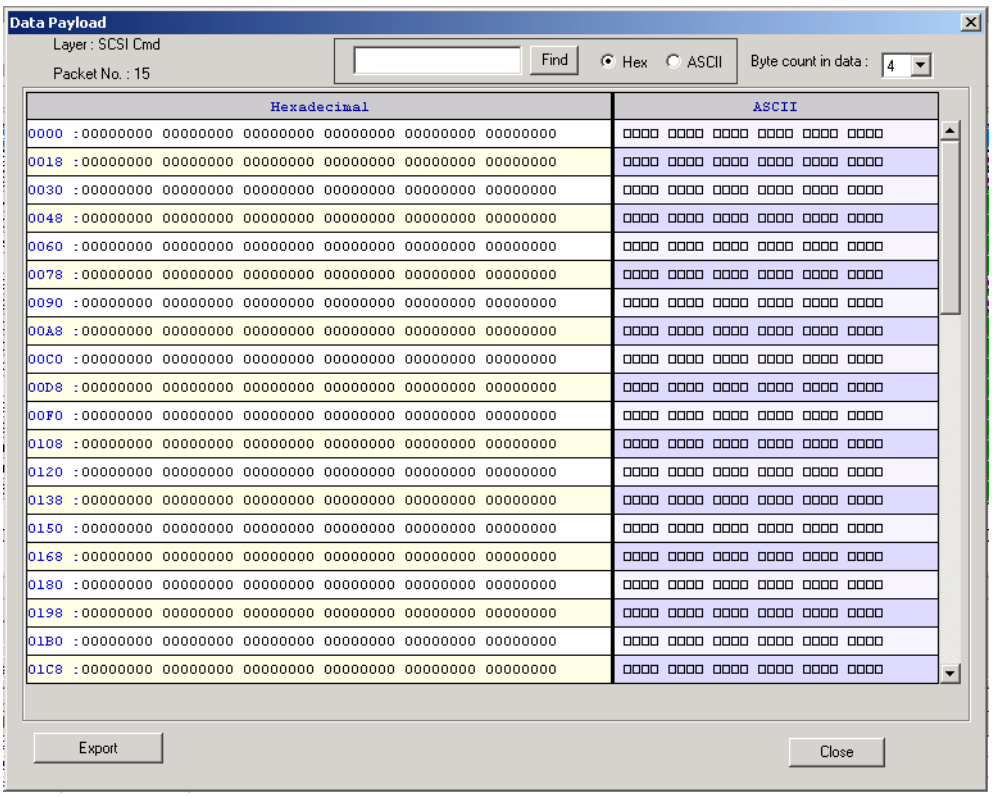


Figure 3.22: Data Payload Button Within the Data Payload Packet

The following Data Payload dialog is displayed.



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).

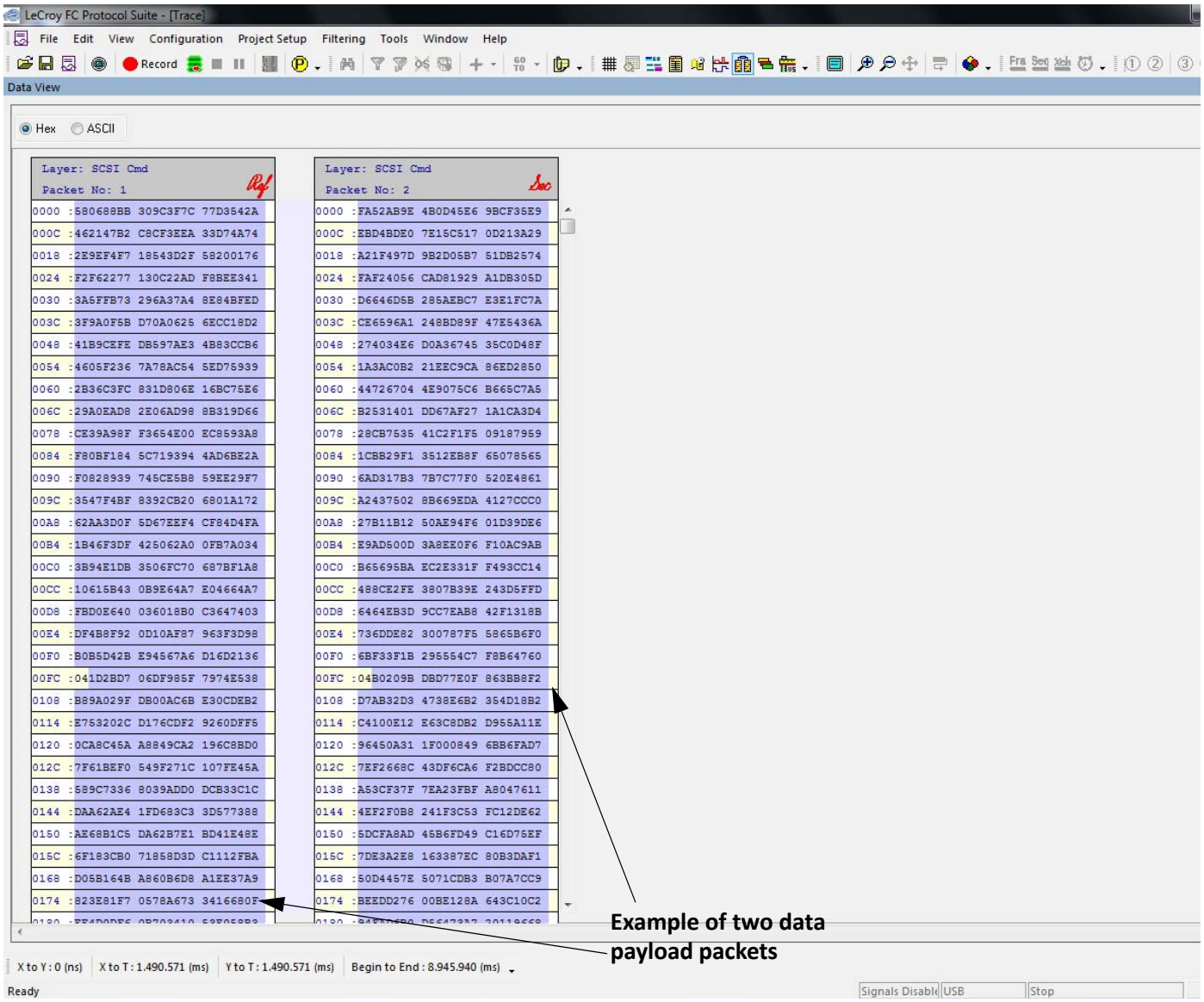


Figure 3.23: Two Data Payload Packets

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.

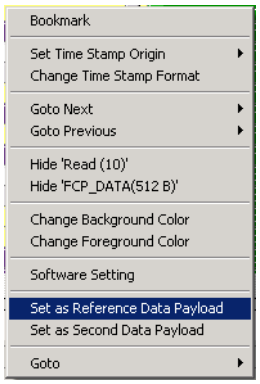
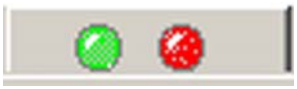


Figure 3.24: Set Reference and Second Data Payload Packets

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.

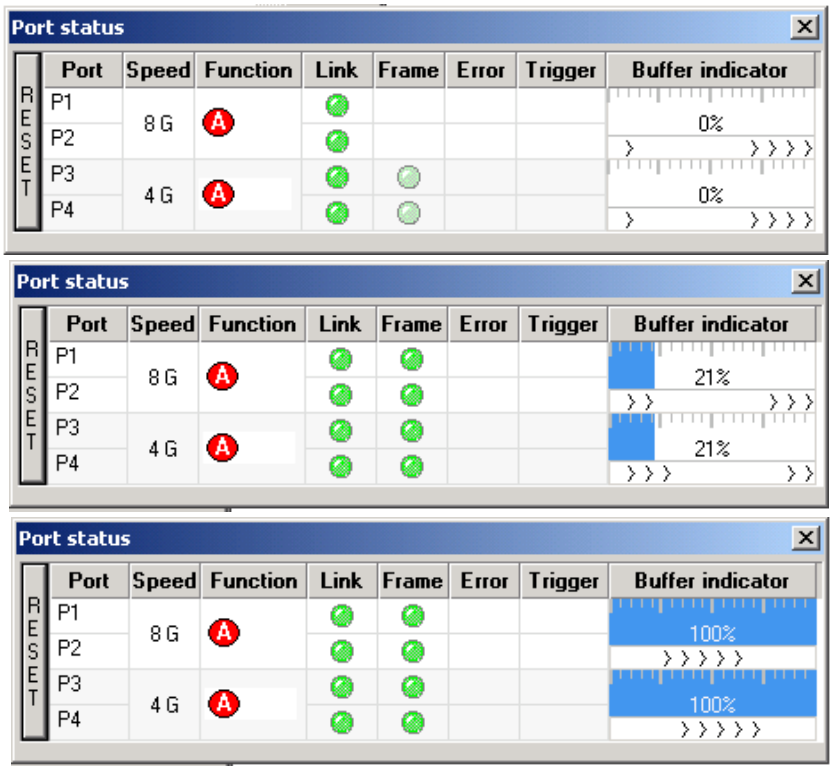


Figure 3.25: Port Status Window Displaying Buffer Indicator

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**.**

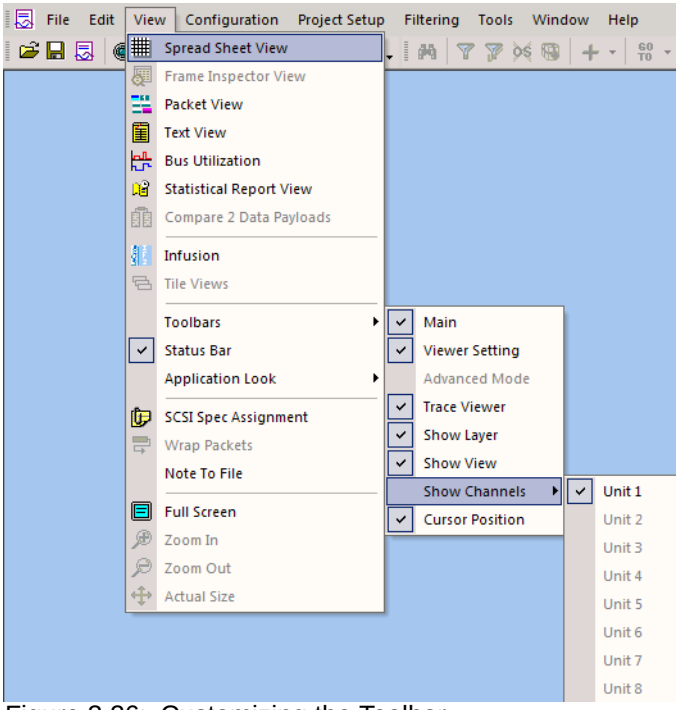


Figure 3.26: Customizing the Toolbar

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.

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

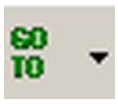
The **Filtering Setup** button opens the Filter dialog (see “Filtering” on page 206) and allows you to specify the criteria for filtering the result.

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.

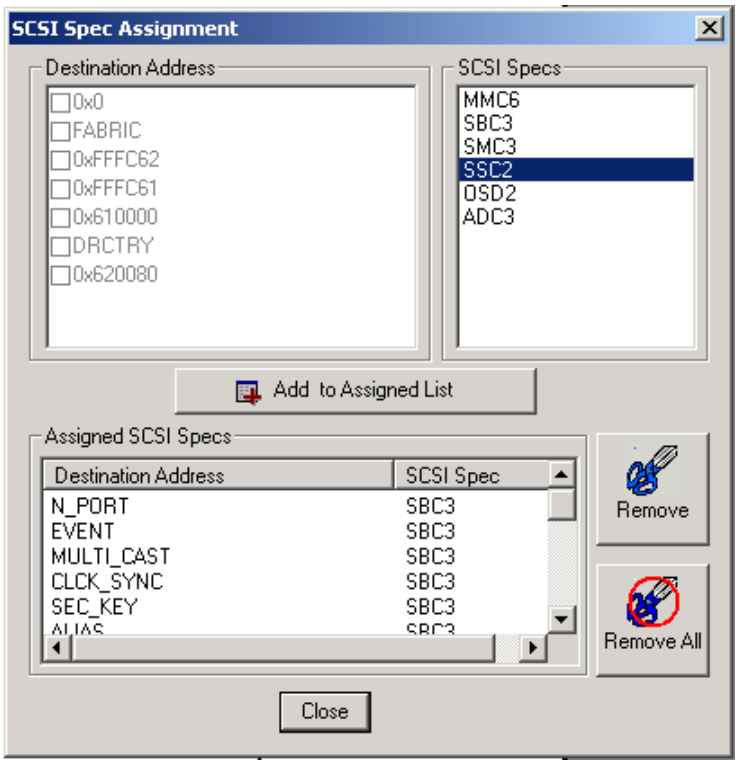
The **Pack Repeated Ordered Sets** button toggles packing repeated ordered sets in one port.

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.

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

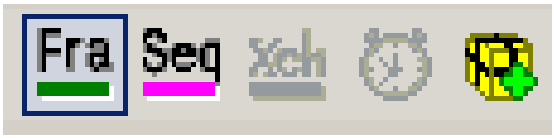
To display the cursor position status bar, select **View>Toolbars > Cursor Position**.

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.



The **Show/Hide Frame Packets** button displays/hides the frame packets layer.

The **Show/Hide Sequence Packet** button displays/hides the sequence packet.

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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:

- Press **Esc** on your keyboard

OR

- Again click  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.

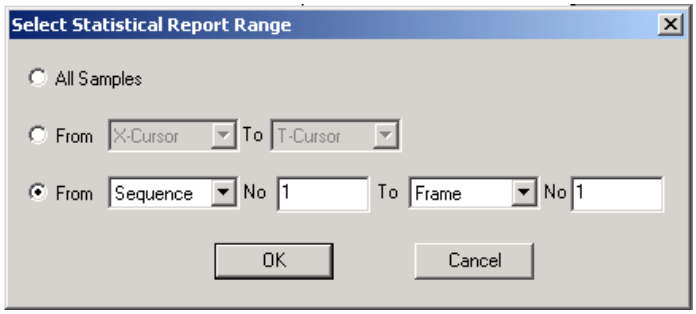


Figure 3.28: Statistical Report Range Dialog

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.

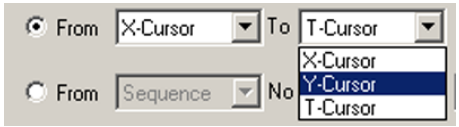


Figure 3.29: Report between Cursors

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.

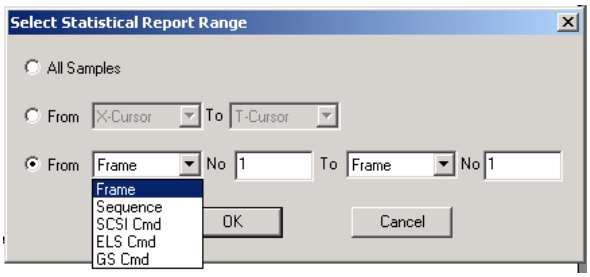


Figure 3.30: Report between Events

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

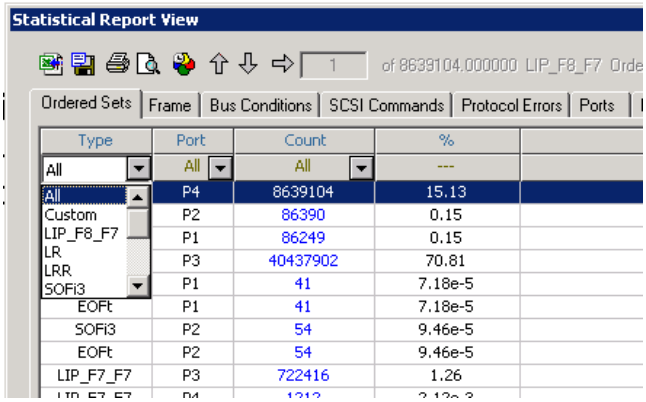


Figure 3.31: Ordered Sets Statistical Report View

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:

- **Port**: 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

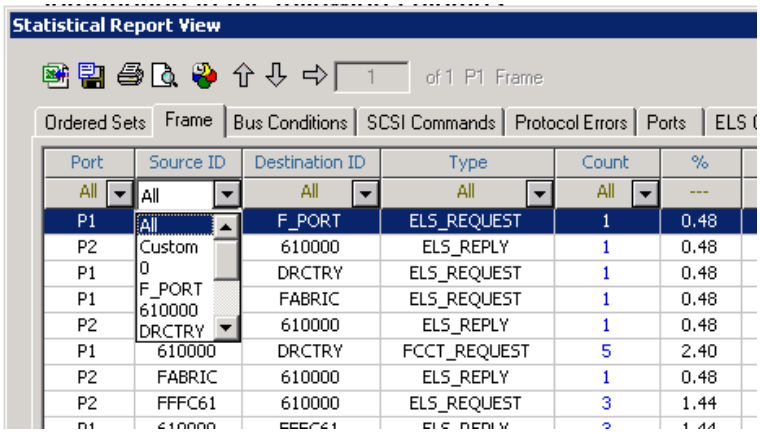


Figure 3.32: Frame Statistical Report

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.

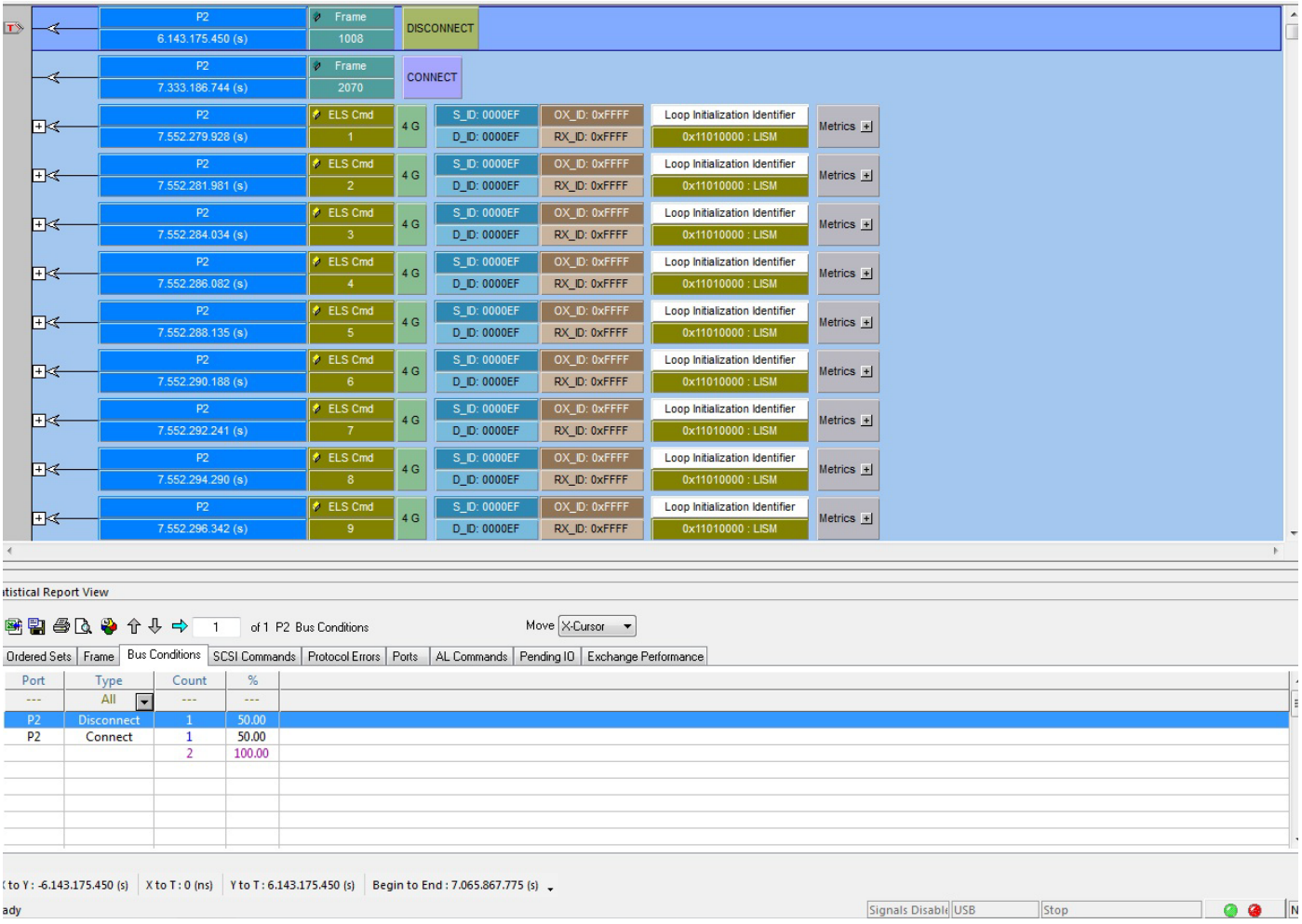
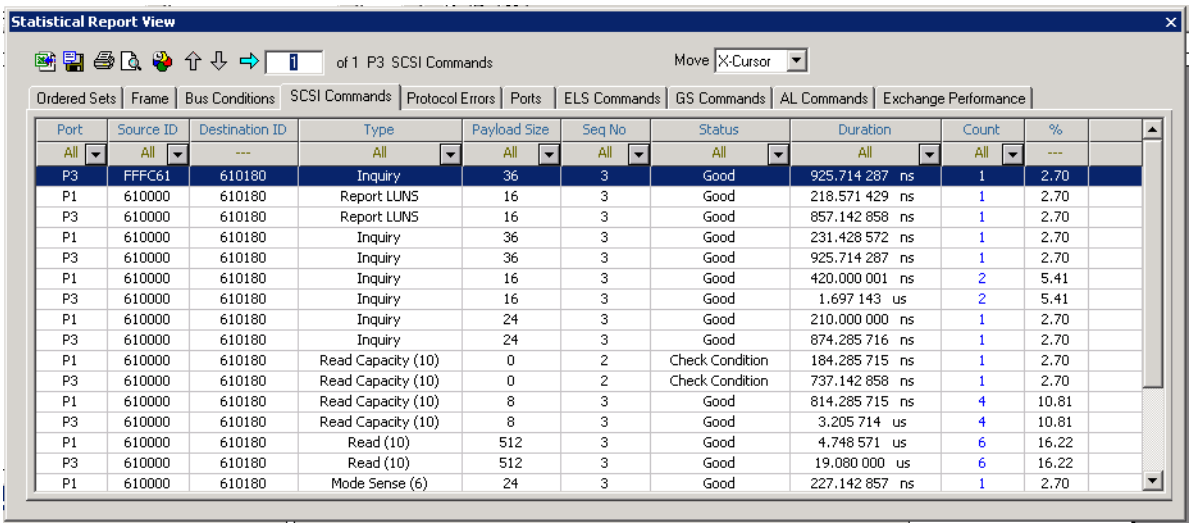


Figure 3.33: Bus Conditions Statistical Report

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)
- **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



Port	Source ID	Destination ID	Type	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.

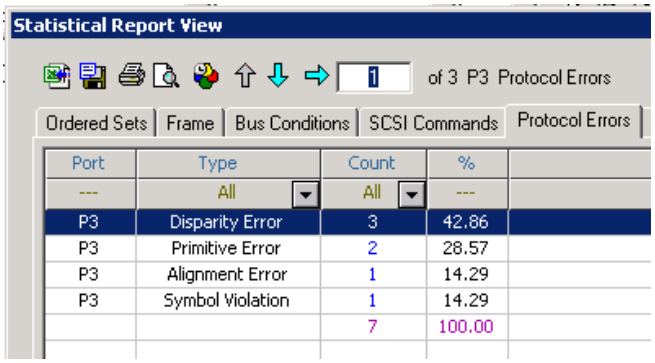
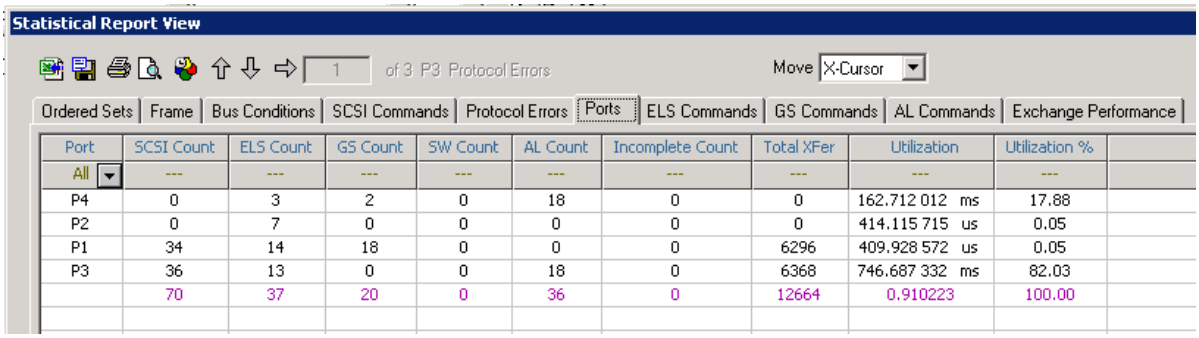


Figure 3.35: Protocol Errors Report

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 **%**



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

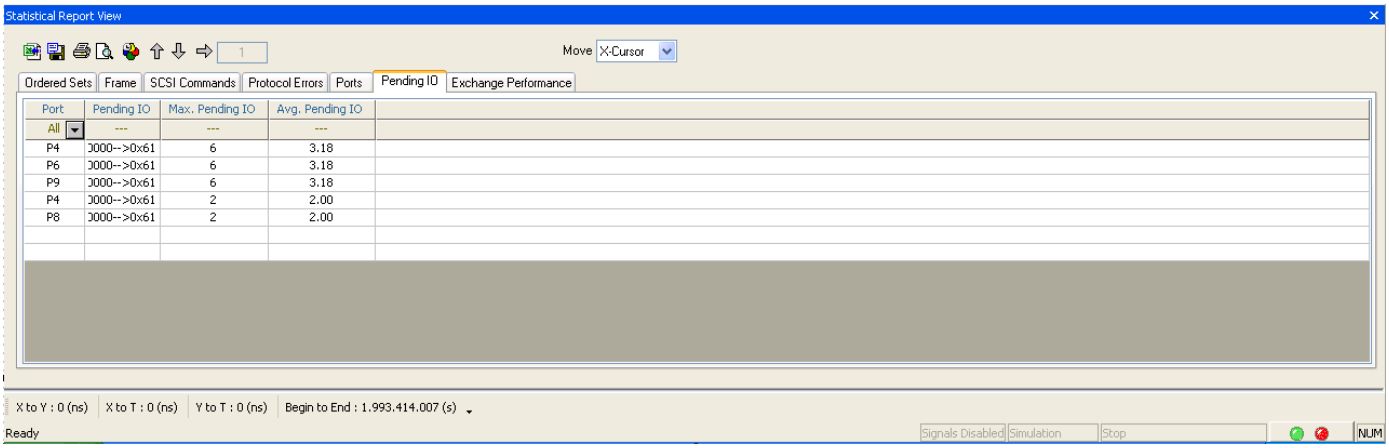
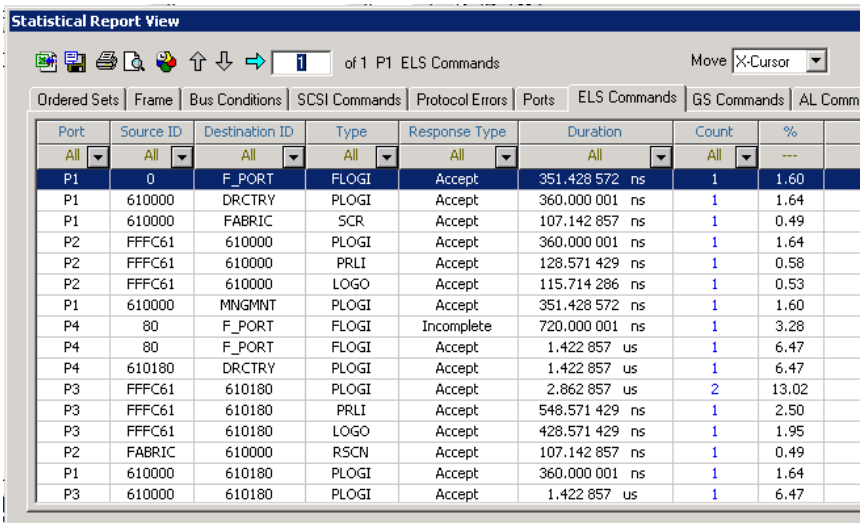


Figure 3.37: Pending IO Report

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:

- **Port**: 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



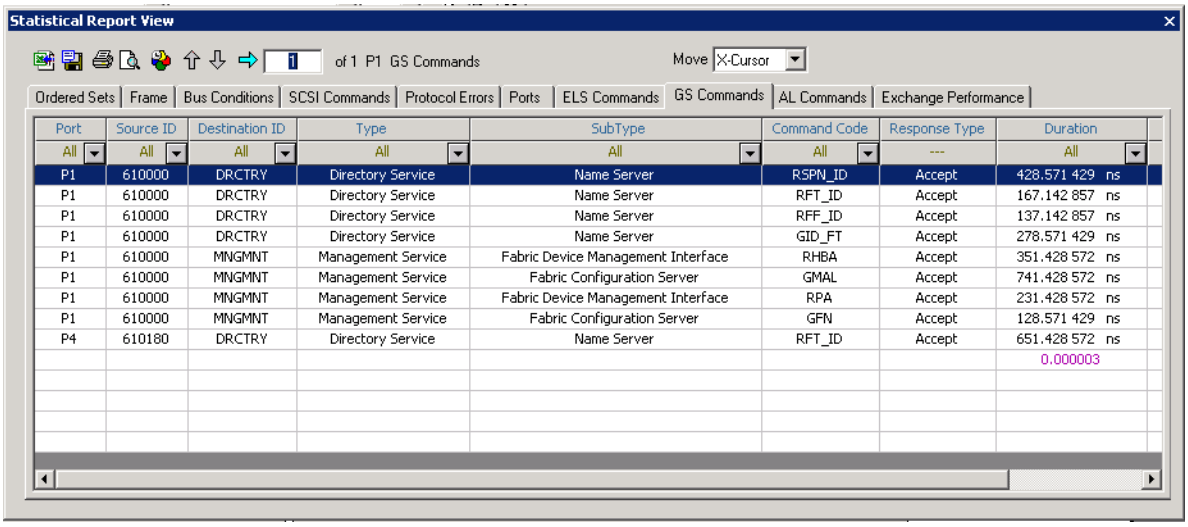
Port	Source ID	Destination ID	Type	Response Type	Duration	Count	%
All	All	All	All	All	All	All	---
P1	0	F_PORT	FLOGI	Accept	351.428 572 ns	1	1.60
P1	610000	DRCTRY	PLOGI	Accept	360.000 001 ns	1	1.64
P1	610000	FABRIC	SCR	Accept	107.142 857 ns	1	0.49
P2	FFFC61	610000	PLOGI	Accept	360.000 001 ns	1	1.64
P2	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



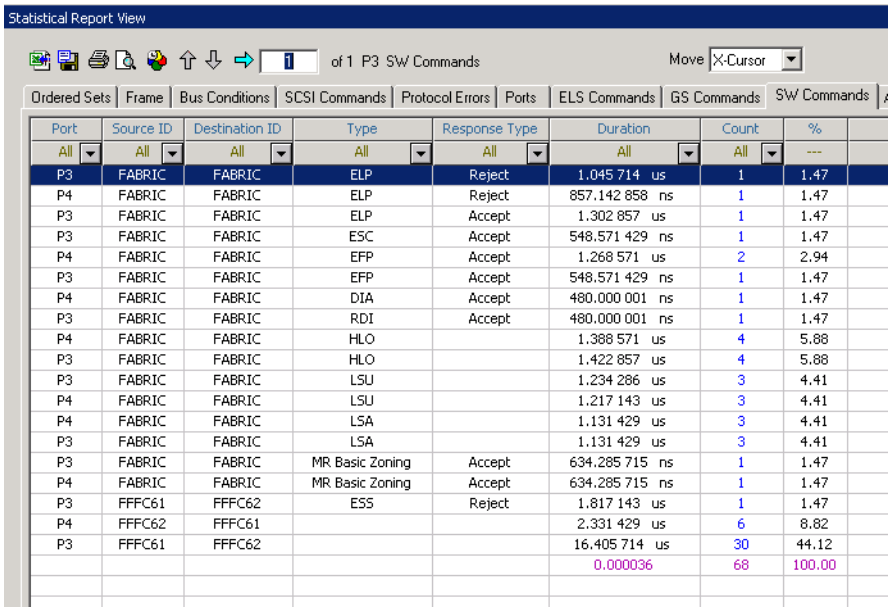
Port	Source ID	Destination ID	Type	SubType	Command Code	Response Type	Duration
All	All	All	All	All	All	---	All
P1	610000	DRCTRY	Directory Service	Name Server	RSPN_ID	Accept	428.571 429 ns
P1	610000	DRCTRY	Directory Service	Name Server	RFT_ID	Accept	167.142 857 ns
P1	610000	DRCTRY	Directory Service	Name 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	GFN	Accept	128.571 429 ns
P4	610180	DRCTRY	Directory Service	Name Server	RFT_ID	Accept	651.428 572 ns
							0.000003

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:

- **Port**: 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



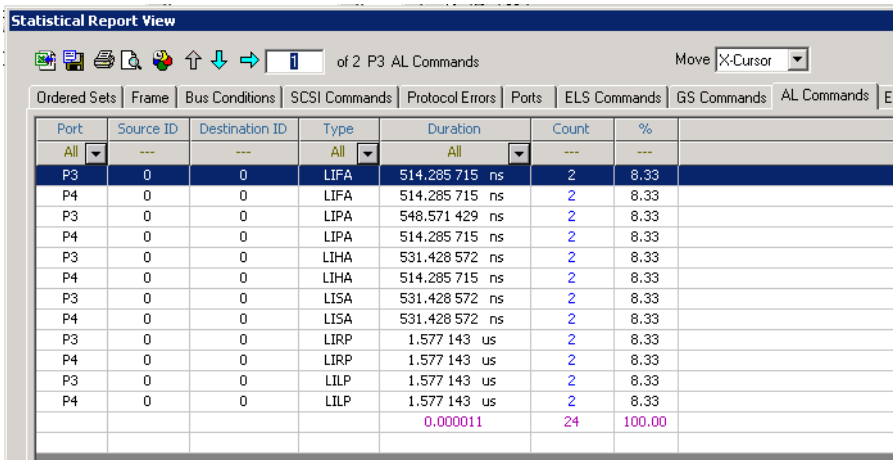
Port	Source ID	Destination ID	Type	Response Type	Duration	Count	%
All	All	All	All	All	All	All	---
P3	FABRIC	FABRIC	ELP	Reject	1.045 714 us	1	1.47
P4	FABRIC	FABRIC	ELP	Reject	857.142 858 ns	1	1.47
P3	FABRIC	FABRIC	ELP	Accept	1.302 857 us	1	1.47
P3	FABRIC	FABRIC	ESC	Accept	548.571 429 ns	1	1.47
P4	FABRIC	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
					0.000036	68	100.00

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:

- **Port**: All, Custom and ports that are selected
- **Source ID:**
- **Destination ID:**
- **Type**: All, Custom and other
- **Duration**: All, Custom and other
- Count
- %



Port	Source ID	Destination ID	Type	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:

- **Port**: 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

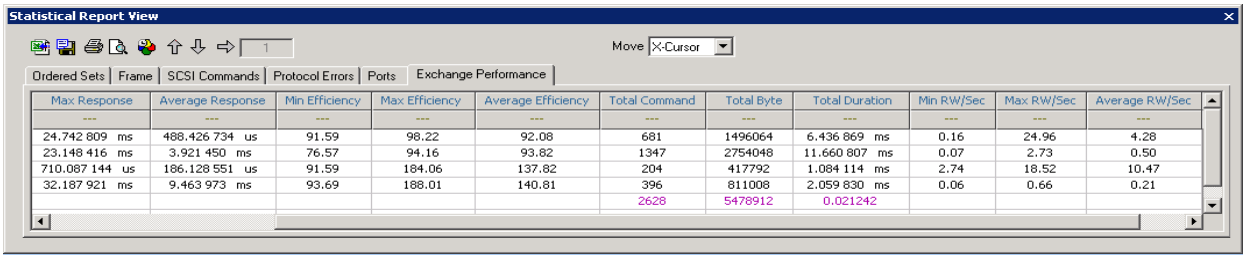


Figure 3.42: Exchange Performance Report

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

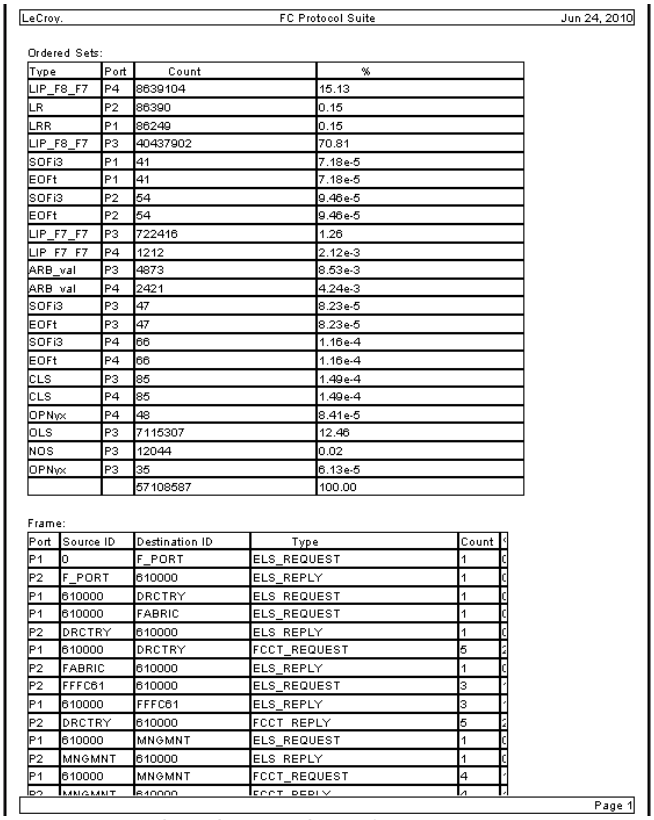
The **Save as Text** button opens the Export to Text dialog. Choose a folder in which to save the Text file, choose an appropriate file name, and click **Save.**

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. FC Protocol Suite Jun 24, 2010

Ordered Sets:

Type	Port	Count	%
LIP_F8_F7	P4	8639104	15.13
LR	P2	86390	0.15
LRR	P1	86249	0.15
LIP_F8_F7	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_F7	P3	722416	1.26
LIP_F7_F7	P4	1212	2.12e-3
ARB_val	P3	4873	8.53e-3
ARB_val	P4	2421	4.24e-3
SOFi3	P3	47	8.23e-5
EOFt	P3	47	8.23e-5
SOFi3	P4	66	1.16e-4
EOFt	P4	66	1.16e-4
CLS	P3	85	1.49e-4
CLS	P4	85	1.49e-4
OPNyx	P4	48	8.41e-5
OLS	P3	7115307	12.46
NOS	P3	12044	0.02
OPNyx	P3	35	6.13e-5
		57108587	100.00

Frame:

Port	Source ID	Destination ID	Type	Count
P1	0	F_PORT	ELS_REQUEST	1
P2	F_PORT	610000	ELS_REPLY	1
P1	610000	DRCTRY	ELS_REQUEST	1
P1	610000	FABRIC	ELS_REQUEST	1
P2	DRCTRY	610000	ELS_REPLY	1
P1	610000	DRCTRY	FCCT_REQUEST	5
P2	FABRIC	610000	ELS_REPLY	1
P2	FFFC61	610000	ELS_REQUEST	3
P1	610000	FFFC61	ELS_REPLY	3
P2	DRCTRY	610000	FCCT_REPLY	5
P1	610000	MNGMNT	ELS_REQUEST	1
P2	MNGMNT	610000	ELS_REPLY	1
P1	610000	MNGMNT	FCCT_REQUEST	4
P2	MNGMNT	610000	FCCT_REPLY	4

Page 1

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.

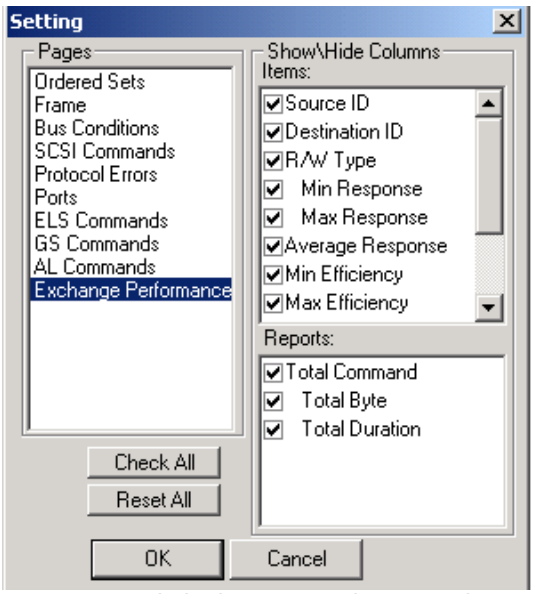


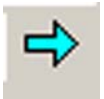
Figure 3.44: Statistical Report Column Setting

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, right-click 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.

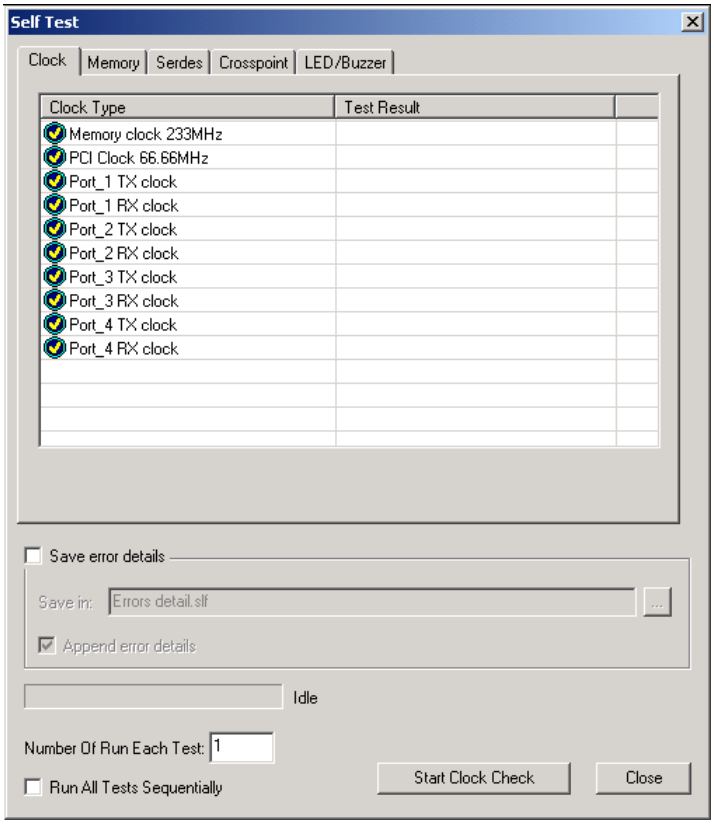


Figure 3.45: Tools - Self Test Dialog

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.

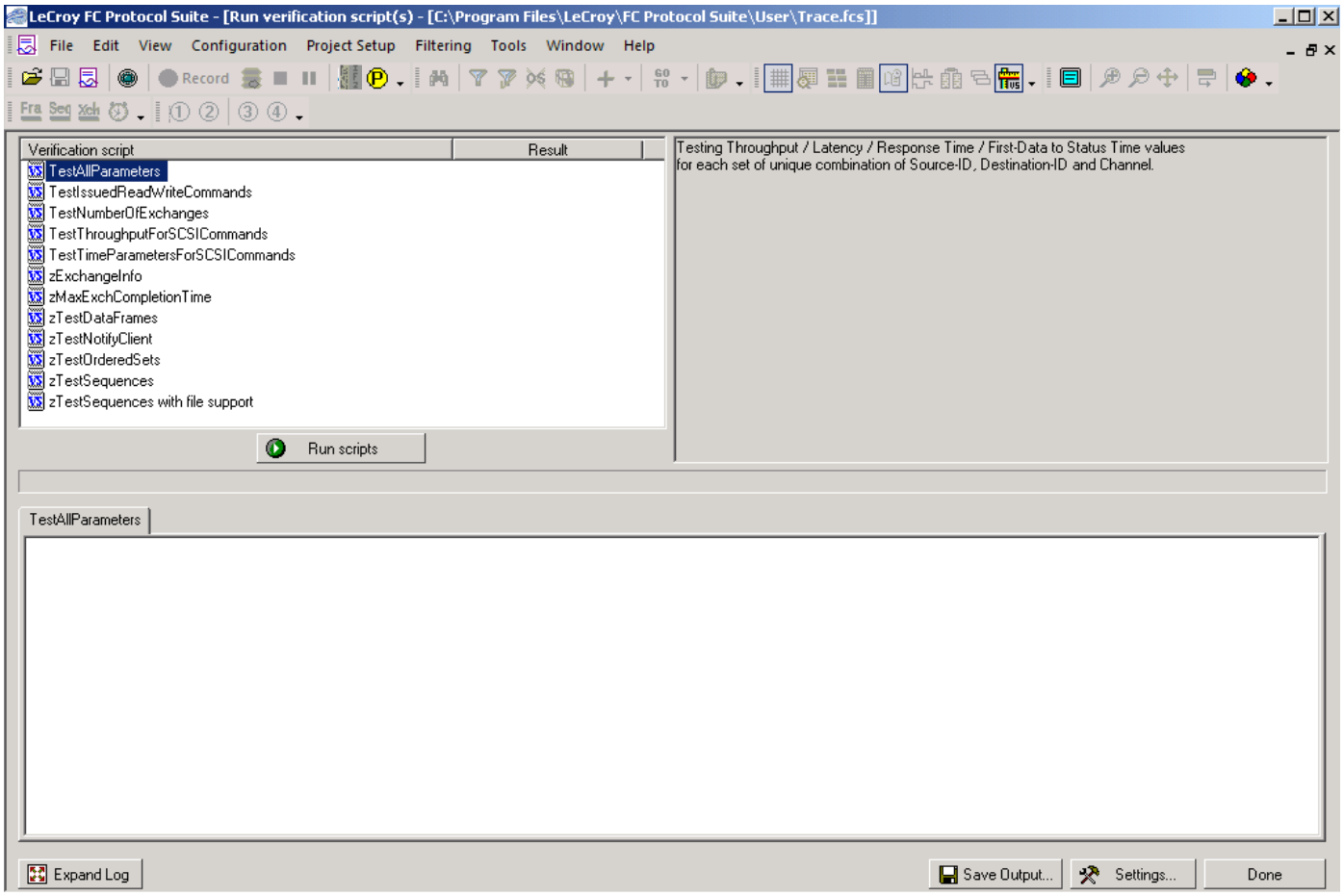


Figure 3.46: Tools - Verification Script Dialog

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.

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**.

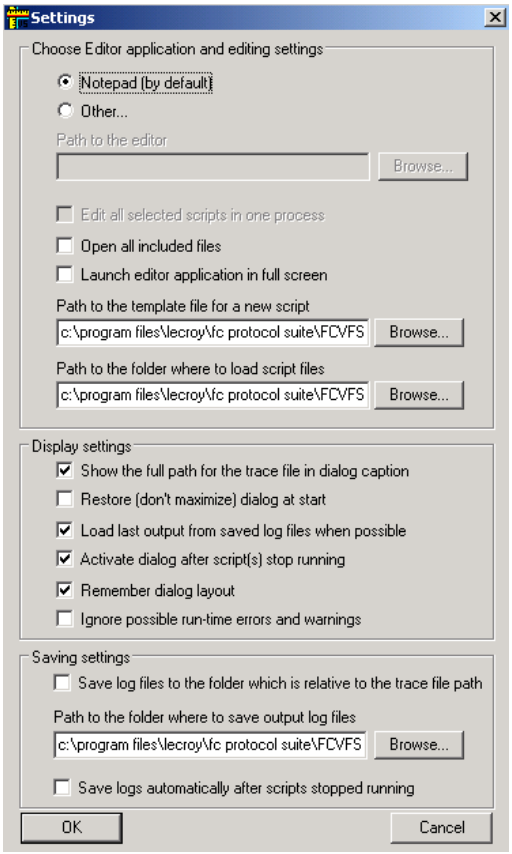


Figure 3.48: Settings Dialog

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  **Filter** button on the Viewer toolbar or select **Filtering > Filtering**.

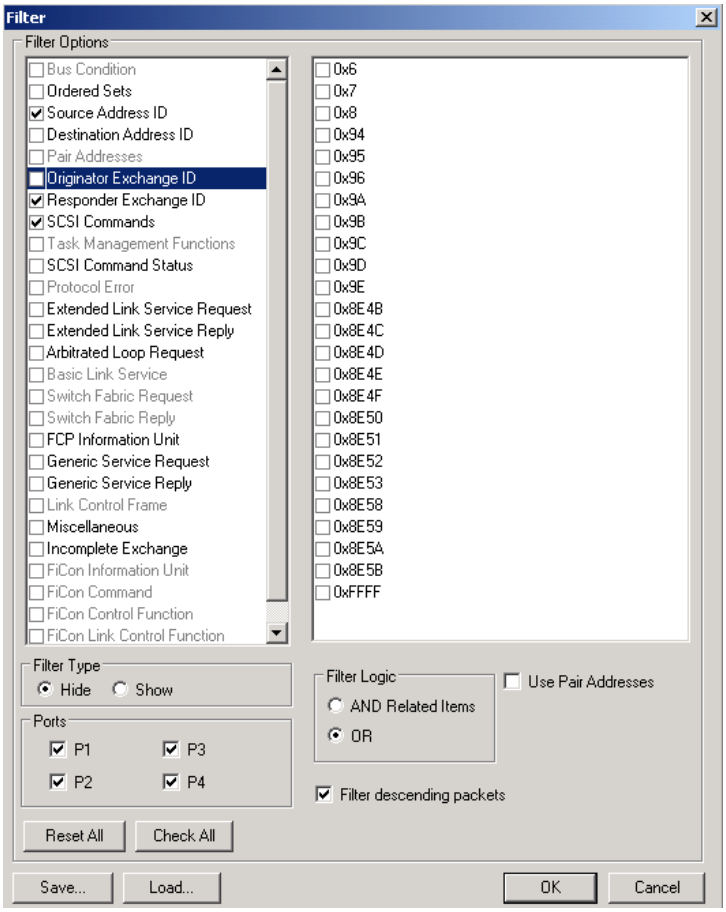


Figure 3.49: Filter Setup Dialog

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
- Task Management Functions
- SCSI Command Status (see "Filter Check Condition" below)
- 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.

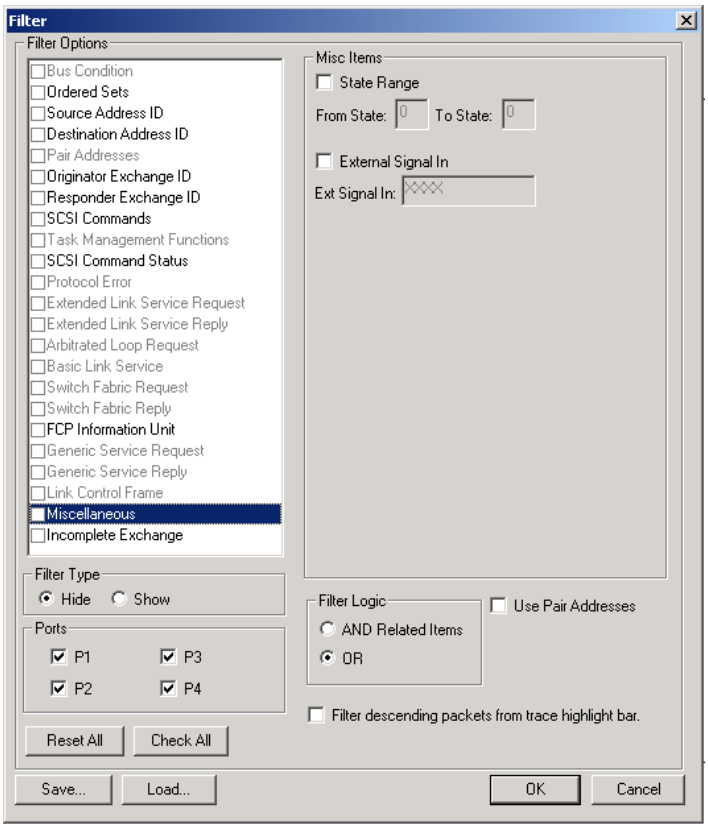


Figure 3.50: Filter State and/or External Signals

Enable Filter

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.

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.

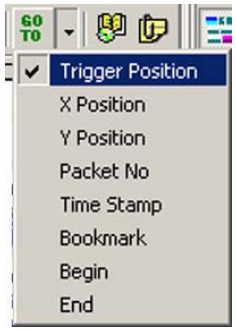


Figure 3.52: Locate Cursor

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**.

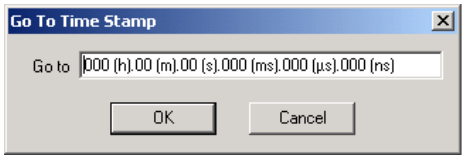


Figure 3.53: Go to Time Stamp

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.

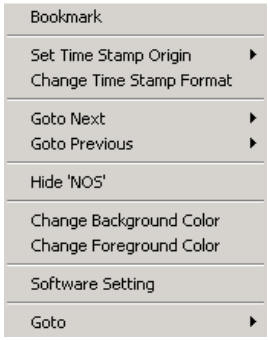


Figure 3.54: Bookmark

Click **Bookmark** from the fly out menu to open the Bookmark Comment Dialog.

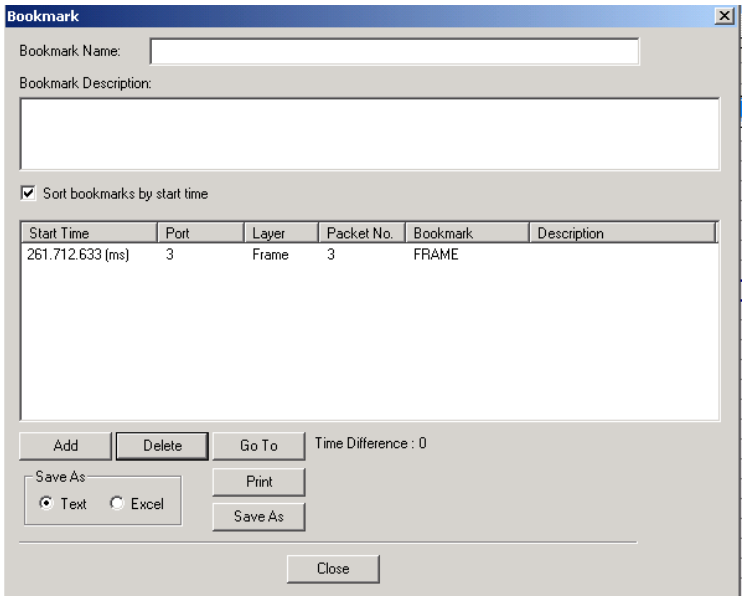


Figure 3.55: Bookmark Dialog

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**.

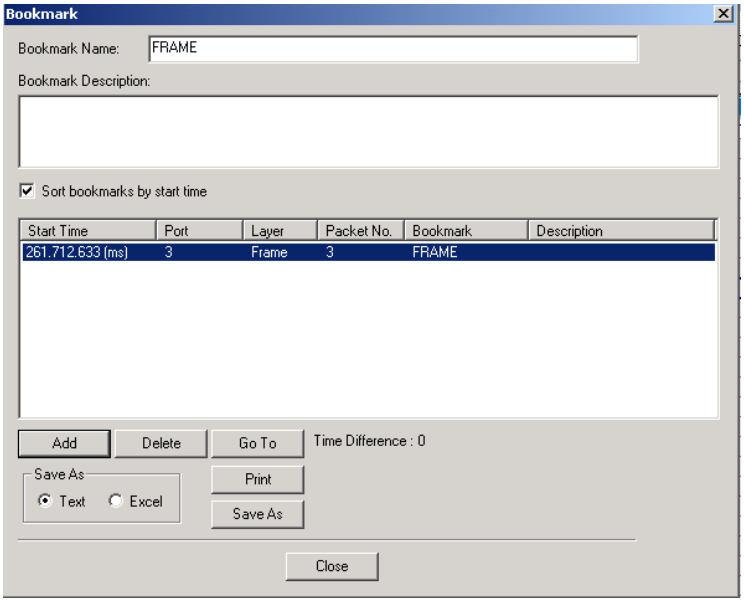


Figure 3.56: Go To Bookmark Dialog Box

Highlight the bookmark to which to go, then click the **Go To** button, or double-click the selection**.**

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:

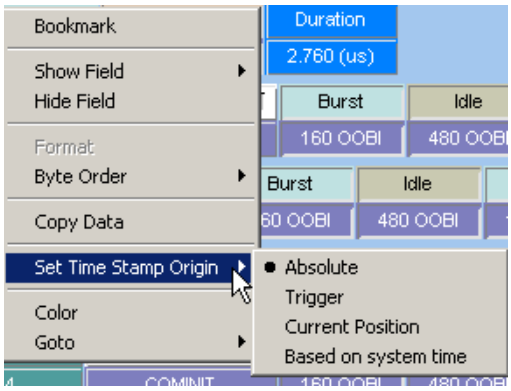


Figure 3.58: Bookmark Found Example in Data Viewer Display

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** or click the  **Search** button to open the Search setup dialog (see Figure 3.59 on page 215).

Note: Only items captured in the sample file are enabled for search.

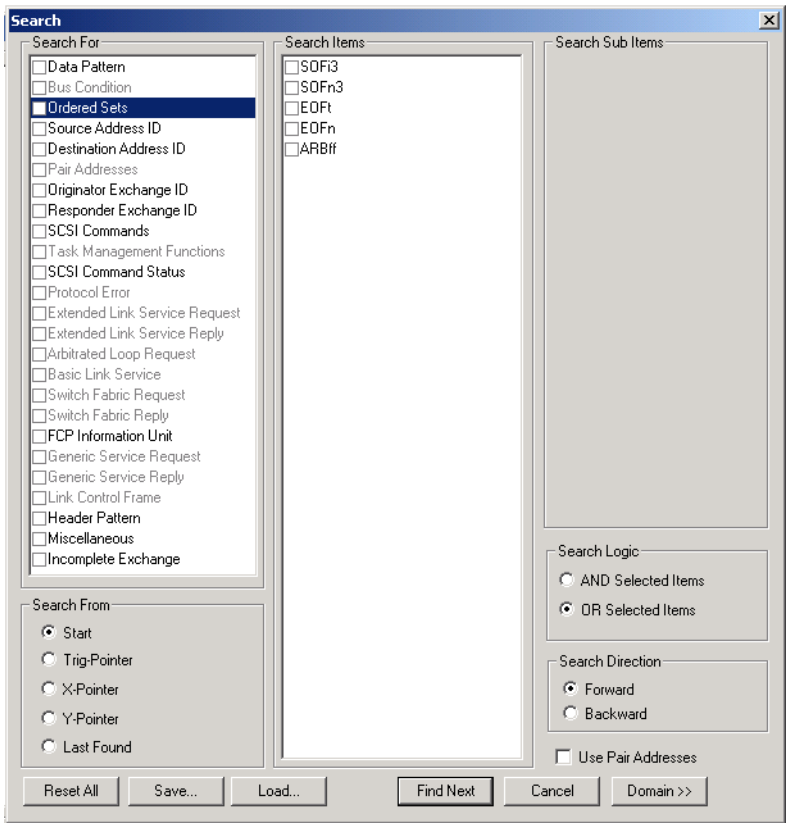


Figure 3.59: Search Data Pattern

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
- 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.

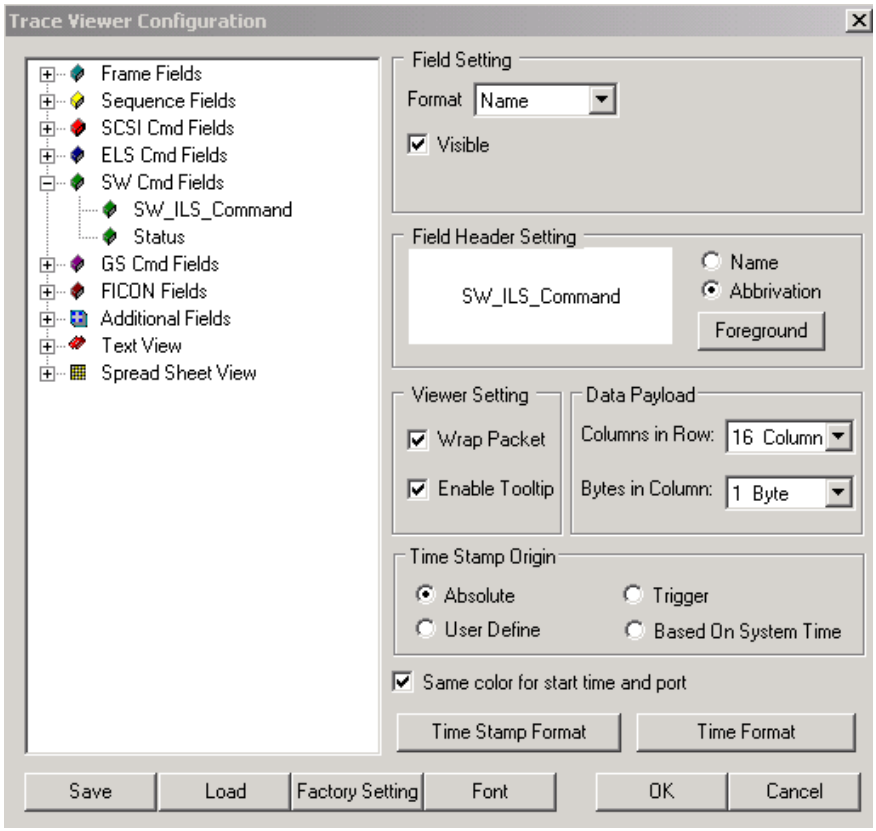


Figure 3.60: Trace Viewer Configuration

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

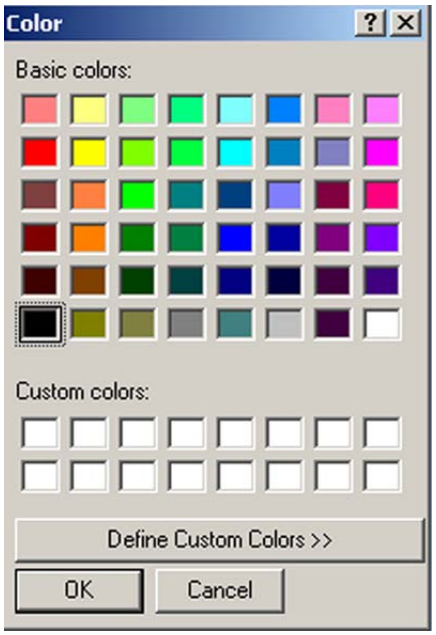


Figure 3.61: Color

Choose an appropriate color and click **OK.**

Font

To change display fonts, click the **Font** button to open the Font dialog box.

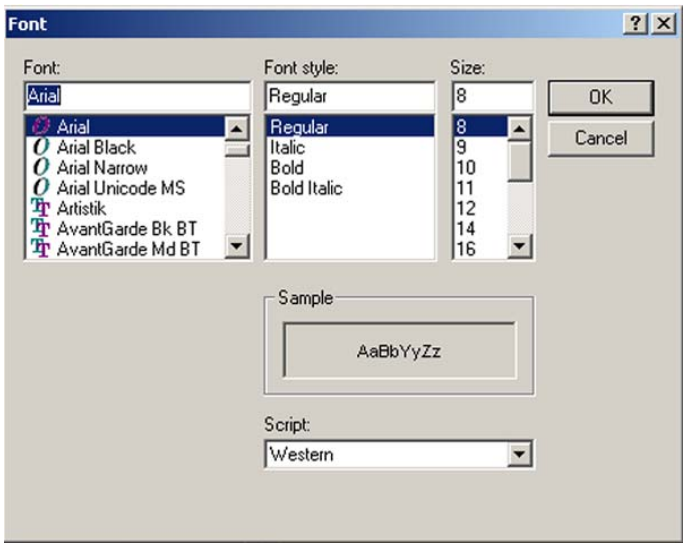


Figure 3.62: Font

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**.

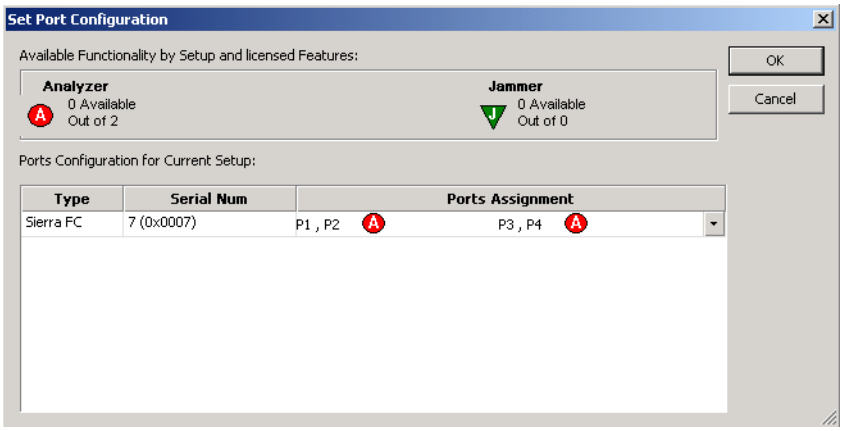


Figure 3.63: Set Port Configuration Dialog

Select a configuration from the drop down list in the Ports Assignment column and click **OK**. See Figure 3.65 on page 221.

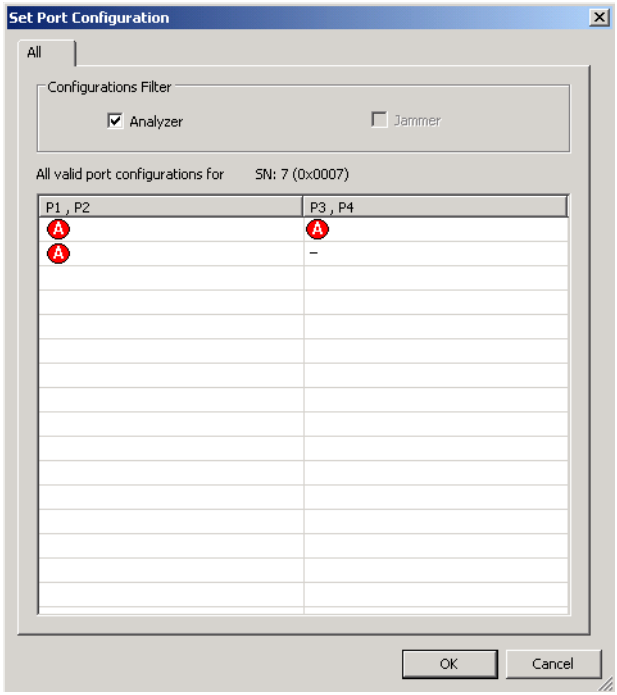


Figure 3.64: Set Port Configuration Dialog

Port Calibration

The Port Calibration dialog displays the Units and Ports Input and Output Signal parameters.

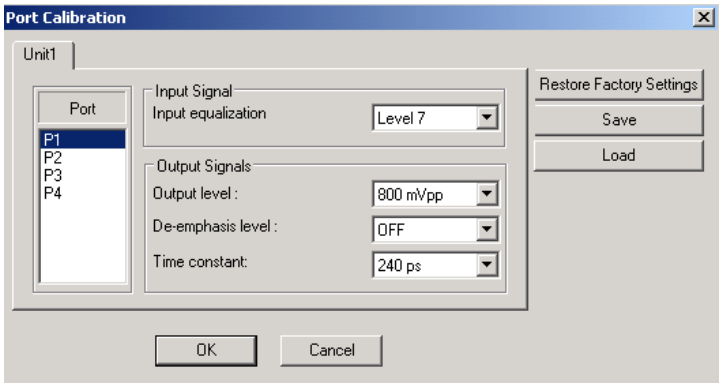


Figure 3.65: Port Calibration Dialog

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**.

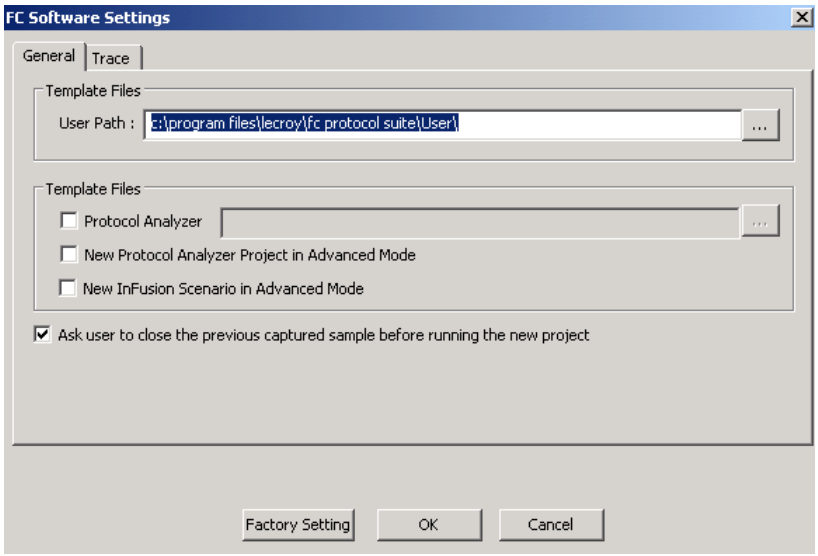


Figure 3.66: Software Settings Dialog General Tab

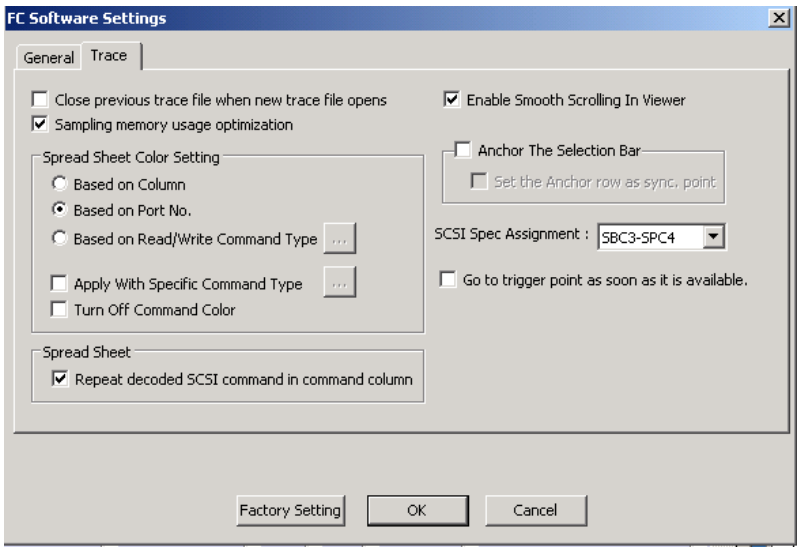


Figure 3.67: Software Settings Trace Tab

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**.

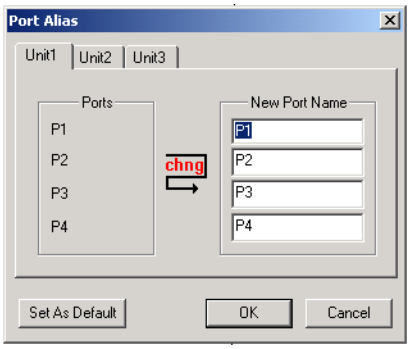


Figure 3.68: Assign Port Alias

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.

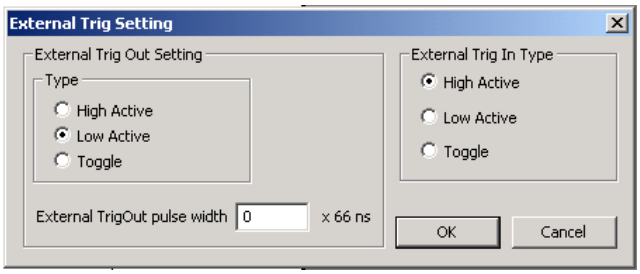


Figure 3.69: External Trigger Setting Dialog

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.

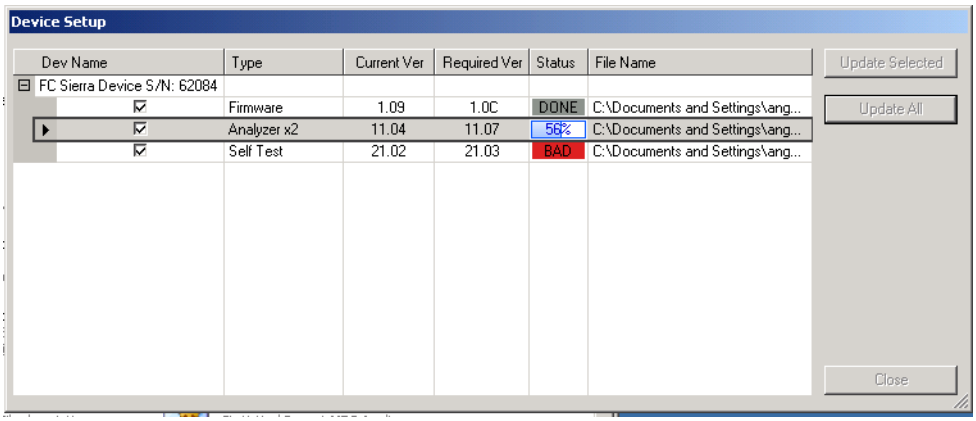


Figure 3.70: Device Setup Dialog with a Bad Device Status

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.

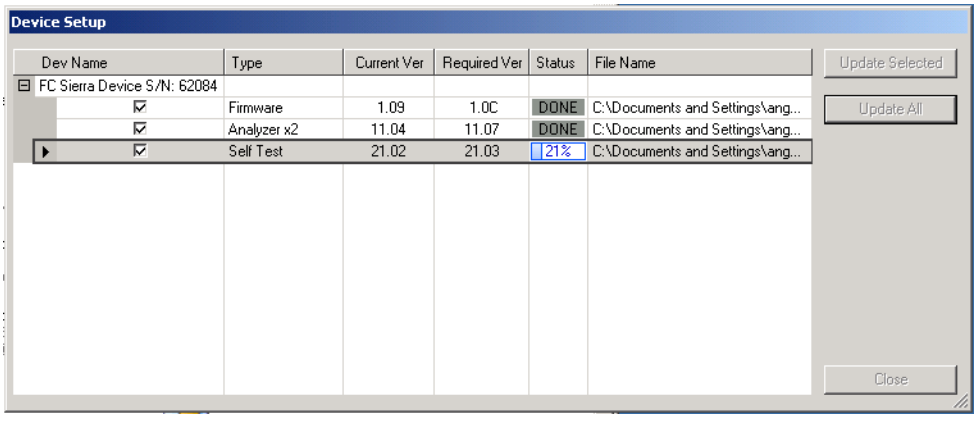


Figure 3.71: Device Setup Dialog Beginning to Update Status of a Device

After the update, the device must restart.

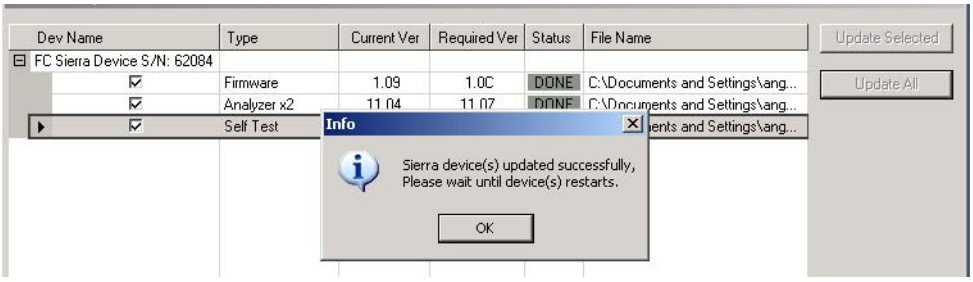


Figure 3.72: Info Dialog

Then the update is complete.

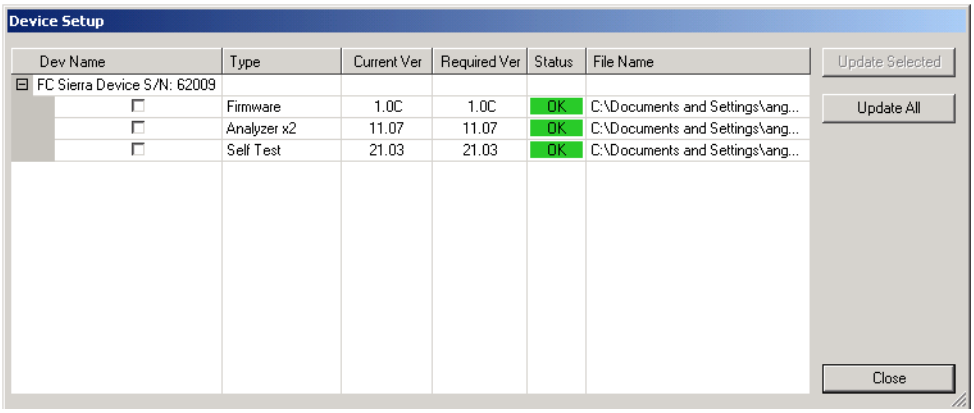


Figure 3.73: Device Setup Dialog with OK Device Status

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.**

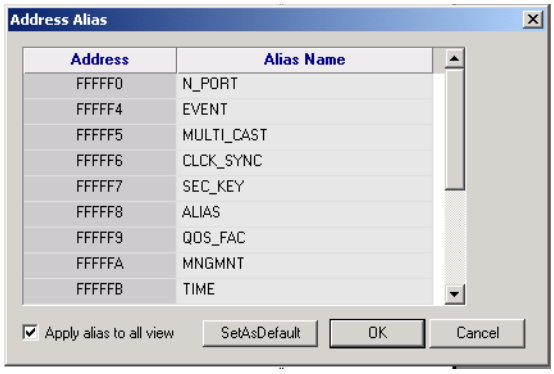


Figure 3.74: Assign Address ID

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

(000.000.000.000 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.

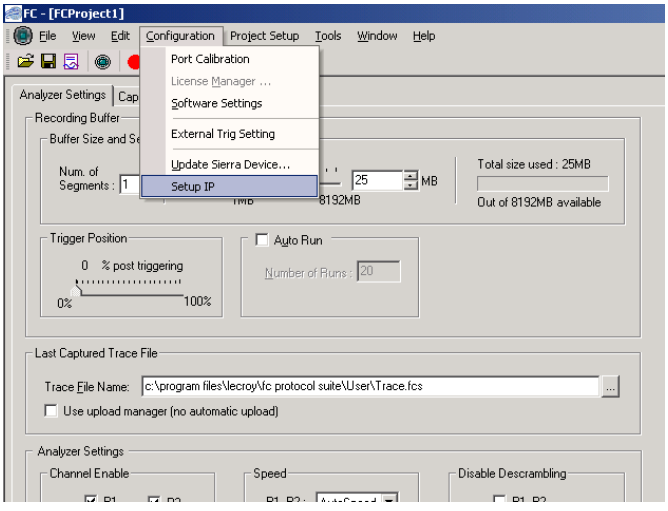


Figure 3.75: Configuration Menu with Setup IP Command

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.

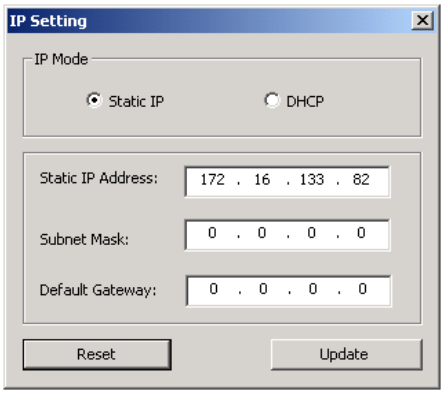


Figure 3.76: Static IP Setup Dialog

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.**

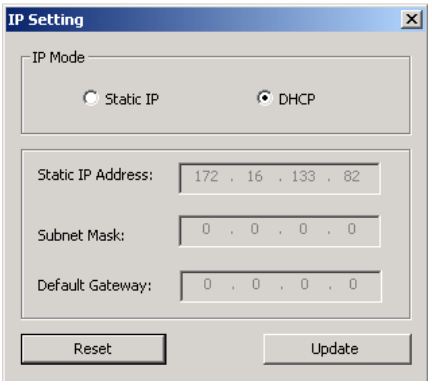


Figure 3.77: Dynamic IP Setup Success Message

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.

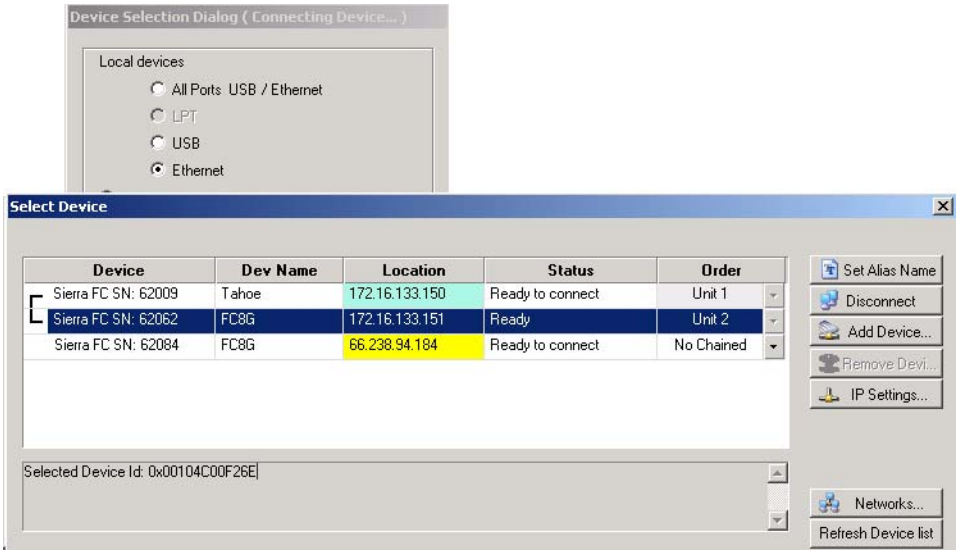


Figure 3.78: Select Device Dialog to Add New Device

4. The Add Device with Static IP will appear. Enter the IP address to add the device.

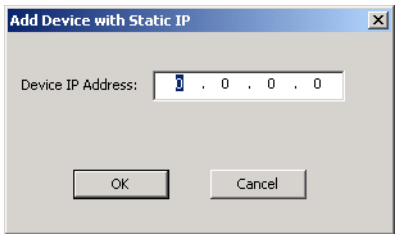


Figure 3.79: Add New Device with Static IP Address

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

The following tables are supplied in compliance with China's Restriction of Hazardous Substances (China RoHS) requirements:

	有毒有害物质和元素					
部件名称	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr^{6+})	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
PCBAs	X	O	X	X	X	X
机械硬件	O	O	X	O	O	O
金属片	O	O	X	O	O	O
塑料部件	O	O	O	O	X	X
电源	X	X	X	O	X	X
电源线	X	O	X	O	X	X
保护外壳(如有)	O	O	O	O	X	X
电缆组件(如有)	X	O	X	O	X	X
风扇(如有)	X	O	X	O	X	X
交流滤波器和熔丝组件(如有)	X	O	X	O	O	O
外部电源(如有)	X	X	X	O	X	X
探头(如有)	X	O	X	O	X	X
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) 使用条件:
温度: 5摄氏度到40摄氏度
湿度: 5% - 95%最大相对湿度 (无冷凝)
高度: 最高2000米

	Toxic or Hazardous Substances and Elements					
Part Name	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr^{6+})	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
PCBAs	X	O	X	X	X	X
Mechanical Hardware	O	O	X	O	O	O
Sheet Metal	O	O	X	O	O	O
Plastic Parts	O	O	O	O	X	X
Power Supply	X	X	X	O	X	X
Power Cord	X	O	X	O	X	X
Protective Case (if present)	O	O	O	O	X	X
Cable Assemblies (if present)	X	O	X	O	X	X
Fans (if present)	X	O	X	O	X	X
AC Filter/Fuse Assy (if present)	X	O	X	O	O	O
Ext Power Supply (if present)	X	X	X	O	X	X
Probes (if present)	X	O	X	O	X	X
O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement specified in SJ/T11363-2006.						
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:

Temperature	5C to 40C
Humidity	5% to 95% max RH (non-condensing)
Altitude	Up to 2000 meters

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. Santa Clara, CA 95054-3115 USA
Send e-mail		psgsupport@lecroy.com
Visit LeCroy's web site		http://www.lecroy.com/

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