TELEDYNE LECROY
Everywhereyoulook™

# SierraNet™ Product Family
## Protocol Verification Systems

**Fast, Flexible and Affordable!**

### SierraNet M168
10 Gbps Ethernet and 16G Fibre Channel

### SierraNet M408
10/40 Gbps Ethernet and 16G Fibre Channel

### SierraNet T328
100 Gbps Ethernet and 128G (Gen6) Fibre Channel


## Key Features

- 1U form-factor with optional rack mount kits
- Eight SFP+ FlexPorts supporting 10 Gbps Ethernet and 16G Fibre Channel (SierraNet M168 and M408)
- Eight SFP28 FlexPorts supporting 10/25/40/50 100Gbps Ethernet and 32/128G Fibre Channel (SierraNet T328)
- Integrated 40 Gbps Ethernet QSFP ports (SierraNet M408 Only)
- Optical or copper cable connections supported
- Advanced multi-state triggering and filtering
- Pass-through probe technology (not re-timed)
- Up to 32 GB recording buffers (M168/M408)
- Up to 128 GB recording buffers (T328)
- Dynamic memory allocation
- Extensive Ethernet protocols natively supported
- Multiple trace view formats
- Seamless WireShark integration
- USB 3.0 & Gigabit Ethernet host interfaces for fast upload and easy management

The SierraNet™ family of protocol test products supports high-speed fabric analysis for 10G to 100G Ethernet and 1GFC to 128GFC Fibre Channel. Initially designed for the requirements found in the SAN and NAS space, SierraNet has proven useful for rapid determination of root cause failures in Ethernet & Fibre Channel fabrics.

SierraNet's control and operation is accomplished with the industry's only consolidated software utility, Net Protocol Suite™. Net Protocol Suite integrates a comprehensive set of data capture, analysis and impairment tools for navigating the traffic under examination.

The SierraNet hardware platforms and graphical user interface provide the highest level of performance and flexibility available in the market.

## Flexibility to meet any Debug Challenge

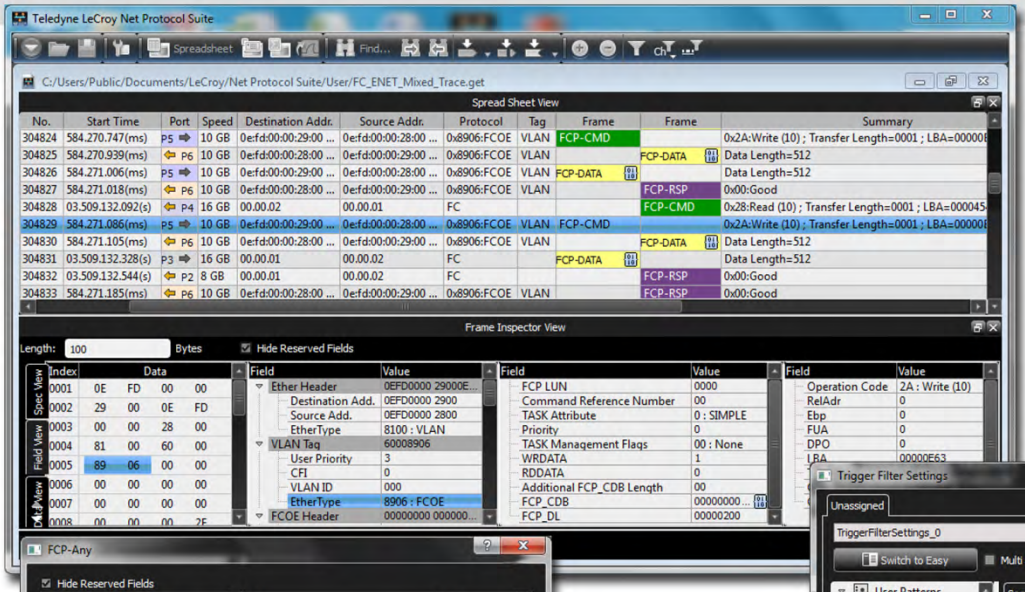
SierraNet products employ Teledyne LeCroy's FlexPort™ technology, offering ultimate flexibility in analysis of traditional or converged Ethernet and Fibre Channel fabrics in a single platform. Each FlexPort pair can probe Fibre Channel and Ethernet links on copper or optical cabling and eliminates the need for separate "single function" blades, pods or adapters found in competitive products—providing a highly compact, extremely flexible, multi-function protocol analyzer.

The Net Protocol Suite user interface provides unmatched flexibility with customized data displays that easily identify and navigate quickly to specific events of interest. Multiple trace views provide superior visibility for troubleshooting low level to application layer issues and decode per the supported specifications and their associated encoding schemes. Zero Time™ search and filter capabilities easily find Ethernet and Fibre Channel events in a contextual and intuitive way. In a multi-protocol environment, Teledyne LeCroy can also synchronize and correlate traces with our other leading protocol analysis tools, such as the PCI Express® Gen3 Summit™ analyzers, to understand how traffic, stimulus and/or errors propagate across bridges or adapters.

## SierraNet Platforms

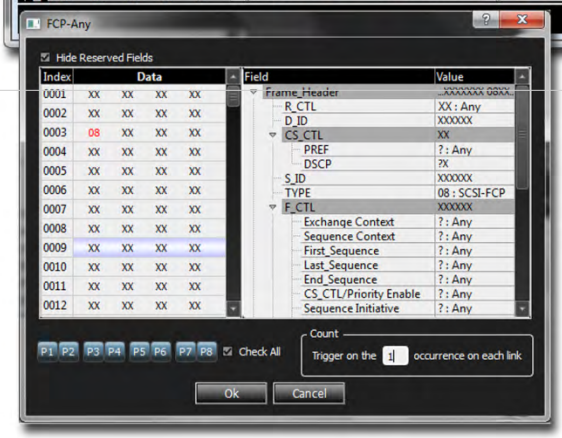
The SierraNet M168 and SierraNet M408 offer protocol analysis and error injection capabilities in a single platform. Both systems provide engineers with 100% recording of all Fibre Channel and Ethernet-related traffic at full line rates on all ports, while maintaining the link integrity through non-retimed pass-through probe technology. The SierraNet M408 is also the only analyzer in the market with integrated 40 Gbps QSFP analog pass-through ports, eliminating the complexity of external

# SOFTWARE OVERVIEW



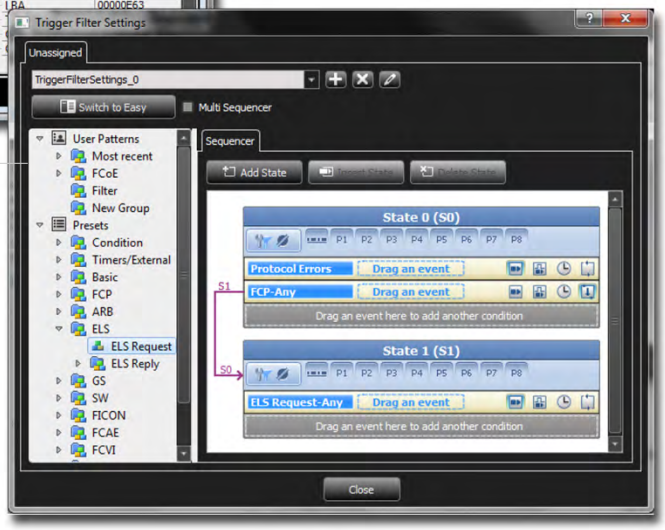

### *Spreadsheet View*

*The familiar spreadsheet view offers users an easy-to-understand columnar format that can be customized, add or delete columns, and mark frame and event types with user-defined colors to speed the eye through complex traces. An important adjunct to the Spreadsheet View is the Frame Inspector View which provides a detailed window into each frame and ordered set in several helpful formats. Spec View shows frames in the same format as you would see them in the technical specification documents.*




### *Intelligent Triggering*

*Intelligent triggering and real-time filtering are the keys to solving complex Fibre Channel problems in live SAN environments. SierraNet's easy-to-use and advanced triggering features save time and improve engineers' productivity with the ability to capture precise traffic conditions such as timing between events or changes in link state.*




### *Graphical State Machine*

*The Graphical State Machine view of the advanced triggering dialog makes it easy for users to visually construct and follow even the most complex scenarios.*

"octopus" cables used in some competitive products.

The SierraNet T328 analyzer supports up to 32G single lane and 128G multi-lane Fibre Channel and 10/25/40/50/100 Gbps Ethernet protocols in a single platform. The SierraNet T328 retains the Flex-Port™ technology found in the M168 and M408 platforms offering users analysis capabilities for all of today's emerging high-speed fabric analysis needs. SierraNet T328 analysis systems provide engineers with 100% recording of all Fibre Channel and Ethernet-related traffic at full line rates on all ports, while maintaining the link integrity through Teledyne LeCroys' patented T.A.P.3™ pass-through probe technology.

## Versatility and Performance

The SierraNet platforms are compact, portable and lightweight. SierraNet is the smallest (1U) and lightest (9.5 lbs) Fibre Channel and Ethernet protocol analyzer platform in the market, saving valuable real estate and rack space in customer labs and providing the best portable solution for engineers on the move.

The SierraNet family provides the fastest and most convenient access to the data that engineers need. A USB 3.0 host interface provides the fastest upload speeds available, delivering more than 5x transfer rate improvement over any competitive analyzer. Since USB is Plug and Play, this is particularly useful when capturing large amounts of data is necessary but a quick connection to the analyzer is required, such as at a customer site. In addition to the performance and ease-of-use of the USB 3.0 interface, a Gigabit Ethernet host interface is also standard, and the IP address set-up menus on the front panel eliminate the time and complexity required to configure an analyzer on competitive products.

SierraNet offers the best time-stamp resolution, enhanced with a 1 ns

time-stamp resolution/ accuracy, setting a new industry standard for trace analysis and for timing measurements required for testing high performance SAN products, particularly where latency is a key metric of success.

Additionally, the SierraNet family's advanced state machines are easy to use and help engineers trigger, filter and inject errors with surgical precision. With up to 4 sequencers and up to 24 states per sequencer, they concisely target areas of interest and save precious time. When the user cannot accurately define the conditions associated with a problem and needs to capture a broad swath of traffic to identify a cause of an issue, SierraNet can also dynamically assign up to 50% (depending on the model, up to 64 GB) of the largest and most flexible recording memory in the industry to one port or spread the entire system memory across all eight ports, based on the traffic profile.

## Specifications

| | |
|---|---|
| Host Machine Minimum Requirements | Microsoft® Windows® 10, Windows 8.1, Windows 7, Windows Server 2012, Windows Server 2008R2; 2 GB of RAM; Storage with at least 600 MB of free space for the installation of the software and additional space for recorded data; display with resolution of at least 1024x768 with at least 16-bit color depth; USB 2.0 port and/or 100/1000 Mbps Ethernet network interface. For optimal performance, please refer to our recommended configuration in the product documentation |
| Recording Memory Size | **M168/M408** – Up to 32 GB<br>**T328** – Up to 128 GB |
| Data Rates Supported | **M168/M408** – 1, 2, 4, 8 and 16G Fibre Channel; and 10/40 Gpbs Ethernet<br>**T328** – 1, 2, 4, 8, 16, 32 and 128G Fibre Channel and 10/25/40/50/100G Ethernet |
| No. of Ports Supported | **M168** – 8 SFP+ FlexPorts per system;<br>**M408** – 8 SFP+ FlexPorts per system and 2 QSFP ports per system<br>**T328** – 8 SFP28 FlexPorts per system<br>**All** – External Trigger IN/OUT SMA connectors |
| Cascade Capability | Up to 8 SierraNet systems<br>64 SFP+/SFP28 FlexPorts<br>Up to 16 QSFP ports (M408 only) |
| Host Machine Interface | USB 3.0 and 10/100/1000BaseT Ethernet |
| Front Panel Indicators | Three LEDs (Link, Speed, Status) for each TX & RX pair, Status LCD Panel, Power LED |
| Front Panel Controls | Power ON/OFF, Menu Navigation and Selection Wheel |
| Rear Panel Connectors | AC Power, Expansion Port<br>**M168/M408** – Expansion Cards are optional<br>**T328** – CATC Sync Ports Included |
| Dimensions (H x W x D) | Chassis: 44 x 432 x 358 mm (1.75" x 17" x 14.1")<br>With Bumpers: 52 x 455 x 367 mm (2" x 17.9" x 14.5") |
| Weight | 4.3 Kg (9.5 lb) |
| Power Requirements | 100-240 VAC, 50-60 Hz, 100W |
| Environmental Requirements | Operating: 0 to 55C (32 to 131F)<br>Non-operating: -20 to 80C (-4 to 176F)<br>Humidity: 10 to 90% RH (non-condensing) |

## Ordering Information

| Base Hardware Description Examples | Product Code |
|---|---|
| SierraNet M168 8-port Platform (Base HW platform with 16 GB memory) | NET-T016-168-X |
| SierraNet M408 10-port (8 + 2) Platform (Base HW platform with 32 GB memory) | NET-T010-328-X |
| SierraNet T328 8-port Platform (Base HW platform with 64 GB memory) | NET-T328-064-X |
| **M168/M408 License Option Examples** | |
| SierraNet Fibre Channel Protocol Analysis—License for 4 ports | NET-T016-004-A |
| SierraNet 10G Ethernet Analysis—License for 4 ports | NET-T010-004-A |
| SierraNet 40G Ethernet Analysis—Prerequisite: Licenses for 8 ports of 10G Ethernet | NET-T040-002-A |
| SierraNet 40G Ethernet InFusion (Jammer)—License for 2 ports | NET-J040-002-A |
| SierraNet 10G Ethernet InFusion (Jammer)—License for 4 ports | NET-J010-004-A |
| SierraNet 10G Ethernet InFusion (Jammer)—License for 2 ports | NET-J010-002-A |
| SierraNet Fibre Channel InFusion (Jammer)—License for 2 ports | NET-J016-002-A |
| **T328 License Option Examples** | |
| SierraNet 25G Ethernet Analysis—License for 4 ports | NET-T025-004-A |
| SierraNet 50G Ethernet Analysis—License for 4 ports | NET-T050-004-A |
| SierraNet 100G Ethernet Analysis—License for 8 ports | NET-T100-008-A |
| SierraNet Multi-speed Ethernet Analysis—License for 25G, 50G and 100G | NET-TALL-008-A |
| SierraNet 32G Fibre Channel Analysis—License for 2 ports | FC-T032-002-A |
| SierraNet 128G Fibre Channel Analysis—License for 8 ports | FC-T128-002-A |

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Local sales offices are located throughout the world.
Visit our website to find the most convenient location.