Agilent 1730 Series System Protocol Tester: 1733L 2 and 4 Gb/s SAN Director Tester

Technical Data Sheet

The most powerful, scalable, and realistic multi-port test system for verifying the performance of director-class switches

Agilent Technologies

Key Features

- Centralized control simplifies operation
- Industry's highest scalability
- Ability to generate full 4 Gb/s load on all ports
- Real time measurements and "live" monitoring
- Small foot print, low power consumption and lower total cost of ownership
- Backward compatible with existing SAN tester modules (1730B, 1733A, 1735A)
- Test customization and automation

The Agilent Technologies 1733L SAN director tester simplifies the testing of director-class switches in QA and manufacturing environments. Now you can easily generate I/O traffic to test the performance and availability of your director switches while lowering your overall cost of test.

The Challenge of Director-Class Switch Testing

Director-class switches form the backbone of enterprise storage area networks (SANs). To ensure the availability, performance and reliability of SANs, director-class switches need to be tested to ensure performance and robustness under all possible conditions.

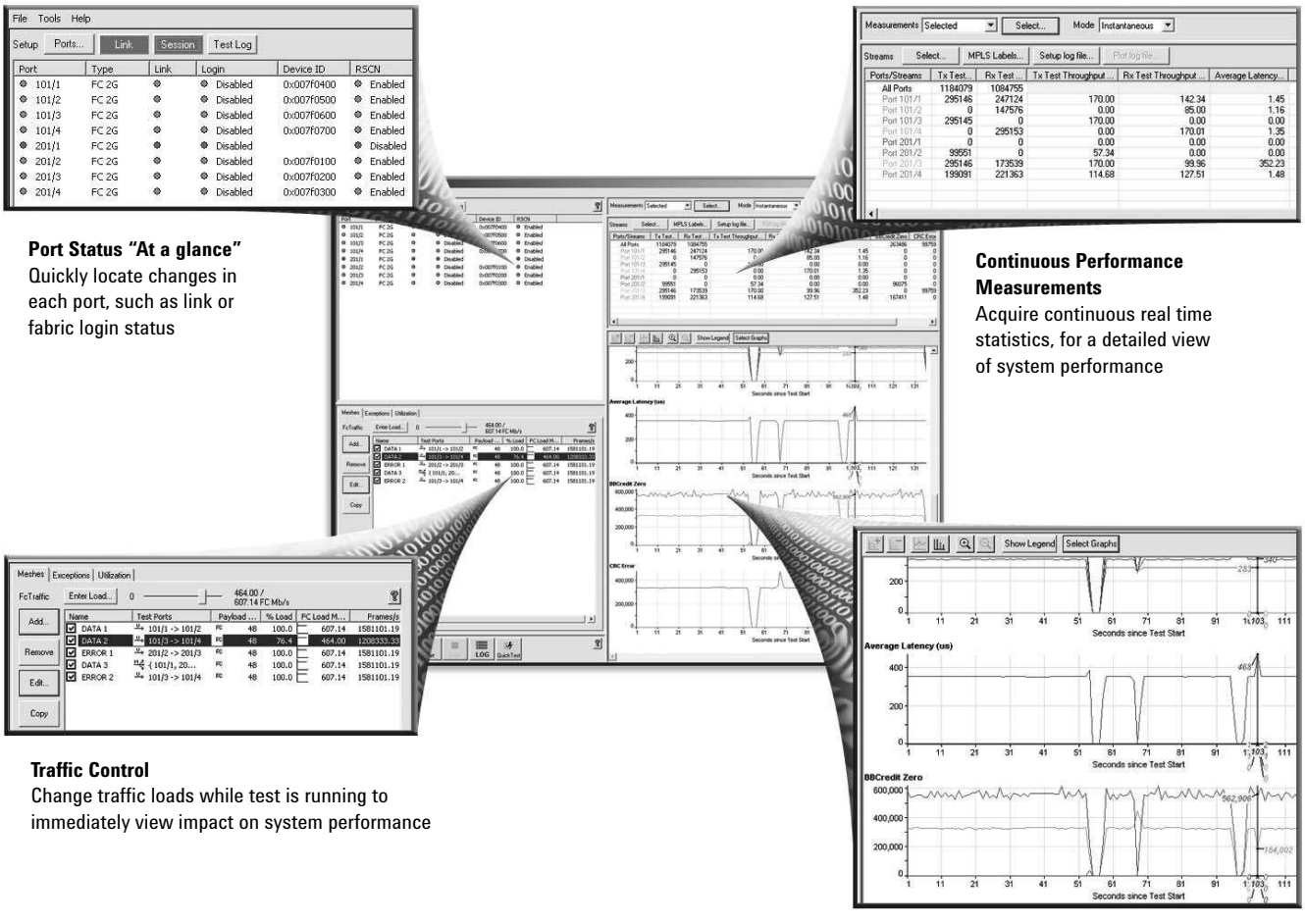
Director-class, switches currently on the market typically have more than 128 ports, and this port count number is increasing. As port counts grow, issues with the current test methodology intensify.

Existing test methods use a large number of PC controllers, or a "wall of PCs," to generate I/O traffic to stress the director switch. This method has a number of deficiencies. There is no easy way to co-ordinate the operations of all the PCs from a centralized view; you have to manually start the I/O traffic on each PC. There also is no easy way to collect results from the PCs. Each PC must be queried in turn to retrieve the results. Also, since typical PCs are not designed to run at wire speed due to software and driver limitations, testing under realistic conditions have become more challenging as director switches' port speed has increased to 4 Gb/s.

The 1733L SAN director tester is capable of 4 Gb/s traffic generation on 128 ports concurrently. By providing a centralized, multi-port control panel the 1733L SAN director tester simplifies test setup, execution and analysis, resulting in faster test completion.

Product Features

Centralized control simplifies operation
You can control all 128 ports on the 1733L from a centralized graphical user interface (GUI). The unified, multi-port control panel simplifies test setup, execution, and analysis. Without opening up multiple layers of windows, you can quickly set up and measure the device under test. You can save your specific test configuration for future reuse.



Port Status "At a glance"
Quickly locate changes in each port, such as link or fabric login status

Continuous Performance Measurements
Acquire continuous real time statistics, for a detailed view of system performance

Traffic Control
Change traffic loads while test is running to immediately view impact on system performance

Live Monitoring
Monitor performance changes and events over time for a historic overview

Figure 1. A centralized control panel simplifies SAN director testing

Industry's highest scalability

Each 1733L system has 128 ports capable of concurrent 2 Gb/s or 4 Gb/s traffic generation. This level of scalability is required to address the testing of director-class switches with their increasing port count, and performance requirements.

Real-time measurements and "live" monitoring

All data is processed on test cards for real-time measurements. You can monitor "live" measurement results while a test is running for better insight into how your DUT is performing. Real-time statistics include throughput, latency (min/avg/max), lost frames, and error counters. These end-to-end measurements are difficult to measure with a "wall of PCs" based solution. The real-time measurements are presented in both tabular and graphical format, allowing you to identify performance issues quickly.

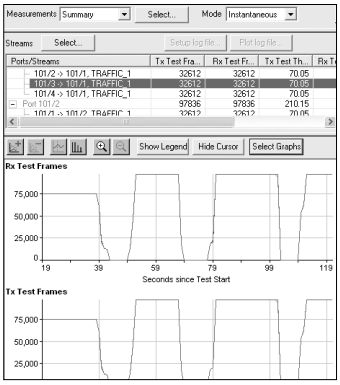


Figure 2. Real-time statistics monitoring

Realistic Fibre Channel traffic generation at wire speed on all 128 ports

To ensure that directors can provide full-line-rate switching, when deployed, it is important to test using realistic Fibre Channel SAN traffic conditions. Typical PCs are not designed to be able to run at wire speed due to software and driver limitations, and this has become more of a challenge as port speeds have increased to 4 Gb/s.

Hardware-based traffic generation technology enables all ports in the 1733L SAN director tester to generate full 4 Gb/s data traffic. Use this capability to generate stressful traffic loads for your director under test (DUT), to validate performance over long periods of operation.

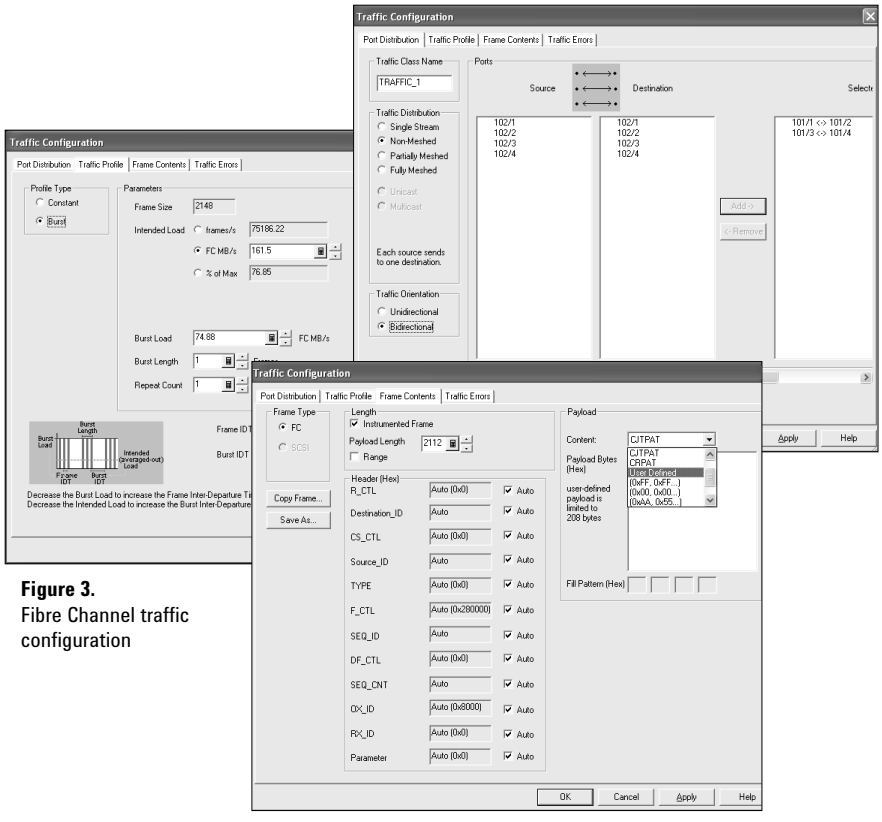


Figure 3.
Fibre Channel traffic configuration

Backward compatible with existing modules

The 1733L system is completely backward compatible with existing Fibre Channel test modules (1730B, 1733A and 1735A).

Test customization and automation

In addition to the test suites provided with the 1733L SAN director test system, you can develop your own test suite using the TCL/TK scripting language. The 1733L SAN director test system features and capability are accessible through the application programming interface (API). This enables you to:

- Automate tests that would be too tedious or imprecise to do manually or repeatedly through the GUI
- Repeat tests for subsequent product builds
- Automate tests to enable maximum product output in a manufacturing environment.

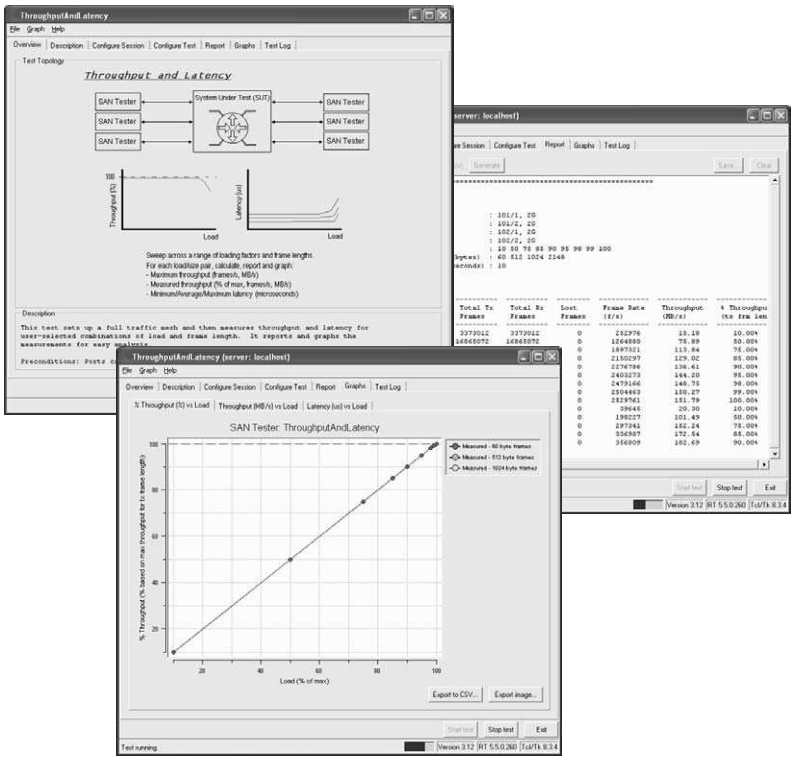


Figure 4. Packaged automation scripts to speed up test cycle

Small form factor and low operational cost

Compared to using a "wall of PCs" as a test tool, the 1733L has a much smaller form factor. This means savings in terms of power, space, infrastructure. Overall the SAN director tester is easier to manage, requiring less engineering resources, thus lowering the overall operational costs.

	1-U servers	1733L SAN director tester
Number of ports	128	128
Size	64 U (assuming 2 ports per server)	16 U
Weight	need to state metric units first (2496 lbs)	101.6 kg (240 lbs)
Power requirement	35.2 kW	5 kW

Note: Assuming industry average numbers for the 1-U servers

How to configure a system
The Agilent 1733L SAN director test system consists of a Windows®-based system controller and 8 chassis containing SAN director test cards. The system controller contains the 1733L SAN director test software application that drives the test cards.

System controller
The system controller is not included in the 1733L product; it can be purchased separate from Agilent. The controller provides an easy-to-use Windows environment for running the test system software.

SAN director test cards
High-density, scalable Fibre Channel SAN director test cards are equipped with powerful traffic-generation and measurement capabilities. Each test card houses four ports of Fibre Channel at 2 Gb/s and 4 Gb/s.

Each 1733L SAN director tester includes 32 SAN director test cards.

Chassis
The compact, 4-slot, 2U-high N2X chassis houses up to four SAN director test cards. The 1733L SAN director test system includes eight N2X chassis. You can easily daisy-chain all eight chassis together to ensure time synchronization of all the test ports in the SAN director test system.

Software
The 1733L includes one software license for one system controller.

Technical specifications

Physical interface

Number of ports	128 ports per SAN director test system. The 128 ports can be used as two separate 64-port test systems.
Line rate	2.125 or 4.25 Gigabits/second (Gb/s). Industry-standard SFP interface. Shipped with 850 nm SFP.

Traffic generation

Rate	Full line speed rate
Port type	Nμ Port emulation
Port behavior	FC support includes full parameter control of Flogi. Ability to enable or disable; NS registration, Discovery of devices, and PLOGI
Classes of service	Class 3 traffic
Traffic profiles	15
Traffic streams	256 streams per port
Interframe gap	Adjustable from 3 to 1000
Minimum frame length	Transmitted: 24 bytes Received: 24 bytes
Buffer-to-buffer credit	Adjustable from 1 to 256
Error generation	Aborted frame, CRC error, oversized frame, invalid SOF, invalid EOF

Measurements

Measurements	Real-time measurements including throughput, latency, dropped frames, disparity errors, BBC=0, failover recovery time
Result types	Cumulative: measurements are reported from the start of the measurement interval.
	Instantaneous: measurements are reported from the most recently completed sampling interval.
Measurement clock resolution	10 ns resolution; ± 0.5 ppm/year clock drift; 3 ppm maximum difference between cards
Measurement interval	Range: 1 second to 7 days
Display sampling interval	Range: 1 second to 1 hour
Test card synchronization	All measurements are synchronized across all test cards within the 1733L SAN director test system.

Programming languages

Languages supported	Tcl/Tk

Mechanical and electrical specifications

Physical

Width	45.4 cm (17.87") (mounts in EIA-standard 19" rack)
Depth	49.0 cm (19.29")
Height (per chassis)	8.89 cm (3.50" = 2U)
Height (total system)	71.12 cm (28" = 16U)
Weight (fully loaded chassis)	12.7 kg (28 lbs)
Weight (total system)	101.6 kg (224 lbs)

Electrical

AC voltage	100 to 120 $V_{nominal}$ 200 to 240 $V_{nominal}$
Frequency	47 to 63 Hz
Power consumption (per chassis)	630 W max
Power consumption (total system)	5040 W max

Environmental

Location	Indoor use only· Altitude up to 2000 m
Operating temperature	5°C to 40°C
Storage temperature	-40°C to 70°C
Cooling requirements	Air vents must remain unobstructed. Minimum clearance 7.62 cm (3 in). Inlet air temperature must not exceed the operating temperature limits.
Humidity	Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C - non-condensing
Safety	Installation category: II·Pollution degree: 2

For additional information please visit:

www.agilent.com/find/directortester

www.agilent.com/find/santester

Agilent Technologies' Test and Measurement Support, Services, and Assistance

Agilent Technologies aims to maximize the value you receive, while minimizing your risk and problems. We strive to ensure that you get the test and measurement capabilities you paid for and obtain the support you need. Our extensive support resources and services can help you choose the right Agilent products for your applications and apply them successfully. Every instrument and system we sell has a global warranty. Two concepts underlie Agilent's overall support policy: "Our Promise" and "Your Advantage."

Our Promise

Our Promise means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you receive your new Agilent equipment, we can help verify that it works properly and help with initial product operation.

Your Advantage

Your Advantage means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, extra-cost upgrades, out-of-warranty repairs, and on-site education and training, as well as design, system integration, project management, and other professional engineering services. Experienced Agilent engineers and technicians worldwide can help you maximize your productivity, optimize the return on investment of your Agilent instruments and systems, and obtain dependable measurement accuracy for the life of those products.

Agilent Email Updates

www.agilent.com/find/emailupdates

Get the latest information on the products and applications you select.

Agilent Direct

www.agilent.com/find/agilentdirect

Quickly choose and use your test equipment solutions with confidence.

www.agilent.com

For more information on Agilent Technologies' products, applications or services, please contact your local Agilent office. The complete list is available at:

www.agilent.com/find/contactus

Phone or Fax

United States:
(tel) 800 829 4444
(fax) 800 829 4433

Canada:
(tel) 877 894 4414
(fax) 800 746 4866

China:
(tel) 800 810 0189
(fax) 800 820 2816

Europe:
(tel) 31 20 547 2111

Japan:
(tel) (81) 426 56 7832
(fax) (81) 426 56 7840

Korea:
(tel) (080) 769 0800
(fax) (080) 769 0900

Latin America:
(tel) (305) 269 7500

Taiwan:
(tel) 0800 047 866
(fax) 0800 286 331

Other Asia Pacific Countries:
(tel) (65) 6375 8100
(fax) (65) 6755 0042
Email: tm_ap@agilent.com
Contacts revised: 09/26/05

Product specifications and descriptions in this document subject to change without notice.

Printed in the USA, May 22, 2006
5989-5050EN

Agilent Technologies