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VIAVI Solutions 5G

Enabling Australia's Field Technicians to build, troubleshoot and maintain better communications networks.

VIAVI MASTER Distributor

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FREECALL 1800 680 680

TestPad 2000™

2510 10-Gig Field Services Module

Product Highlights

- Smallest, lightest OC-192/STM-64 test set on the market
- Ensures quality of service with multiple modes of operation to terminate and monitor circuits from various network access points
- Easy-to-use touch-screen graphical user interface (GUI) simplifies and expedites testing
- Modular TestPad 2000 architecture enables up-to-date support for established and emerging technologies in a single platform
- Engineered for the field with rugged construction and lightweight design
- Dual PCMCIA slots support easy installation of future upgrades and bring added testing functionality and versatility

Application Highlights

- Turn up and maintain SONET/SDH rings and point-to-point links
- Provision 10-Gig signals carried across DWDM networks
- Verify end-to-end network performance by using bit error rate (BER) testing and a wide range of stress test patterns
- Assess network performance under abnormal conditions by inserting and simulating various errors and alarms
- Verify in-service network performance using Monitor and Through modes

Acterna's 2510 10-Gig Field Services Module is an all-in-one, integrated testing solution that helps translate rapid network deployment and service reliability into profitability. Designed specifically for field use, the rugged 2510 performs 10-Gig testing at OC-192/OC-192c and STM-64/STM-64c rates. It provides the flexibility, scalability, and upgradability to accommodate evolving testing needs while providing long-term protection for your test equipment investment.

ACTERNA™
The Keepers of Communications

Function Highlights

- Test optical interfaces at OC-192/OC-192c and STM-64/STM-64c rates.
- Perform mapping analysis for both SONET and SDH tributaries: OC-192c and STS-48c/12c/3c/1 and STM-64c and STM/16c/4c/1/0.
- Transmit and receive 10-Gig signals at either 1310 nm or 1550 nm.
- Manipulate K1 and K2 byte values to verify proper protection switching.
- Configure and monitor tests using remote control commands.

Features

The 2510 meets the ever-changing needs of today's transmission test workforce with powerful features that provide streamlined, reliable functionality across all applications. Because technicians can use this equipment with minimal training, testing objectives are addressed more quickly and costs of ownership are significantly reduced. Key features include:

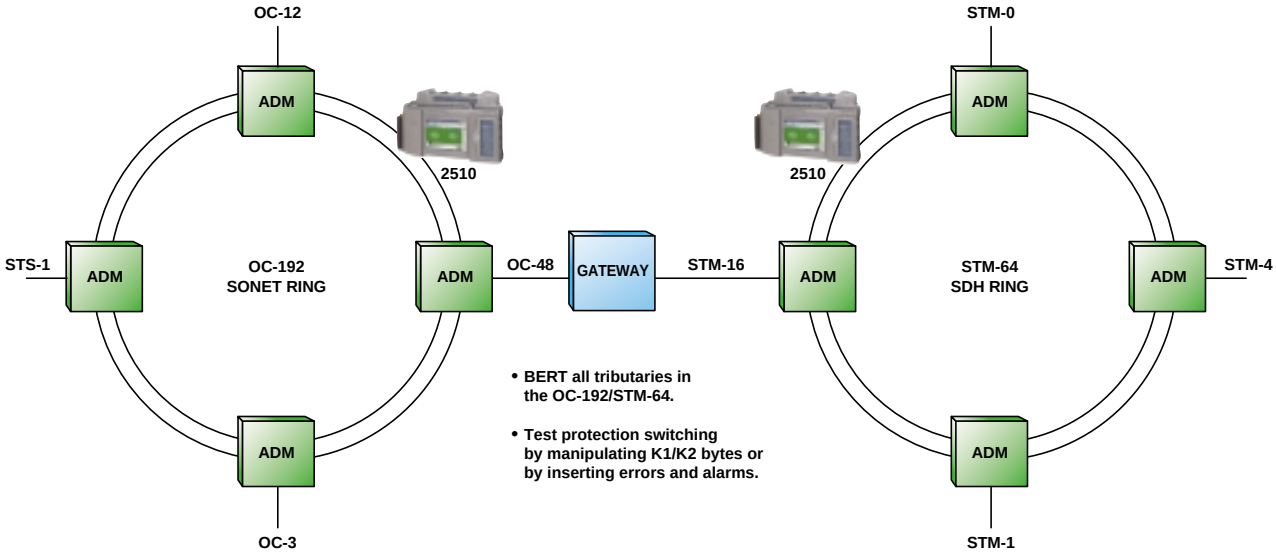
- Application-Driven Icons—test application buttons are labeled with icons which clearly depict the way the test is performed on the circuit (e.g., circuit termination tests are labeled "TERM"). The icons and quick set-up buttons enable technicians to use the 2510 effectively, with very little training.
- Configurable Results (Quad Results™)—the 2510 streamlines the process of correlating results and quickly assesses network performance. Technicians can analyze selected results simultaneously in up to four windows.
- Physical and Laser Active LEDs—a bright array of physical LEDs on the front panel summarizes results and clearly identifies errors detected during a test. Laser Active LEDs indicate when the transmit laser is active and when laser pulses are received.
- Through Mode Capability—gain access to SONET/SDH circuits even when no test access is provided. Through mode capability at 10-Gig for advanced SONET/SDH testing monitors circuits by channeling network traffic through the 2510 module.
- Signal Power and Frequency Verification—ensure optical power and frequency measurements received are within acceptable error limits.
- VT100 Terminal Emulation—perform VT100 terminal emulation to connect to network elements in order to execute configurations and monitor available statistics.

Applications

The 2510's easy-to-use interface streamlines the process of analyzing SONET/SDH network performance. It supports numerous mappings, which enable testing and verification of individual payloads inside a 10-Gig signal. Technicians can manipulate K1 and K2 bytes to test automatic protection switching, and they can use the 2510's support for user-configurable path trace messages to name and identify trace messages and payloads. The built-in attenuator connects to either the transmitted or received signal, so tests can be performed without saturating the network's or the 2510's optical receiver.

Commission SONET/SDH Rings and Point-to-Point Links

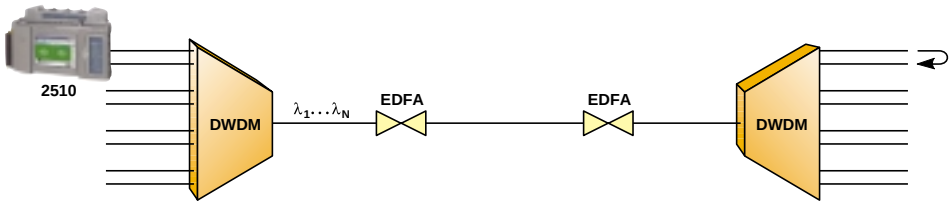
Manufacturers installing 10-Gig SONET/SDH rings must ensure proper network operation before the customer will accept the network elements. The 2510 tests the ADM transmitted and received signals and its response to errors, alarms, and protection switching. In addition, the 2510 tests lower rate tributaries running within the OC-192/STM-64 down to the STS-0/VC-3 level, verifying the proper mapping of these tributaries within the ring.



Test tributaries inside 10-Gig signal

Qualify 10-Gig Signals over DWDM Networks

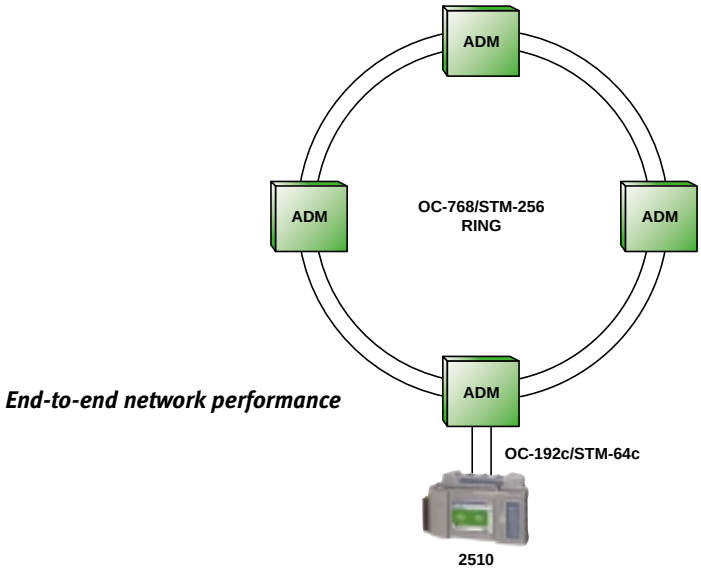
When DWDM networks are deployed, wavelengths carrying a 10-Gig SONET/SDH link must be qualified for carrying traffic. Turn up channels by using the 2510 to terminate test patterns over each wavelength via a BER test.



Provision DWDM wavelengths

Verify End-to-End Network Performance

In the future, OC-768/STM-256 networks will be deployed to carry traffic along capacity-starved routes. The 2510 provisions the OC-192c/STM-64c tributaries within to ensure the connectivity and quality of the service. Optical power measurements, BER testing, pointer justification measurements, and path trace identifiers ensure proper ADM mapping and tributary line card operation for error-free transmission.



Perform Network Analysis under Simulated Abnormal Conditions

Generate and analyze a comprehensive range of errors and alarms to simulate abnormal conditions. SONET errors include Bit, Section BIP, Line BIP, Path BIP, Line FEBE, Path FEBE, and Frame word. SONET alarms include Line AIS, Line RDI, Path AIS, Path LOP, and Path RDI. SDH errors include Bit, B1, B2, B3, MS RDI, HP RDI, and FAS word. SDH alarms include MS AIS, MS RDI, AU-4 AIS, AU-4 RDI, and AU-4 LOP.

Conduct In-Service Monitoring of OC-192/STM-64 Signals

The 2510's Monitor/Through mode allows visibility into the SONET/SDH signal while it carries revenue-generating customer traffic. Troubleshoot and sectionalize network problems by analyzing the overhead and payload—without incurring downtime.

Technical Specifications

PHYSICAL CHARACTERISTICS

Overall Dimensions .....7.5 x 11.5 x 2.25 inches (19 x 29.2 x 5.7 cm)

Overall Weight .....9 lbs. (4.1 kg), with battery

ENVIRONMENT

Temperature Range

Operating .....32° F to 104° F
0° C to 40° C

Storage.....-4° F to 158° F
-20° C to 70° C

Shock and vibration.....Meets IEEE-743

POWER REQUIREMENTS

AC Adapter .....19 VDC, 2.95 amps
90 - 240 VAC, 45 - 65 Hz

DISPLAY

.....6-inch diagonal graphic LCD color

OPTICAL SPECIFICATIONS FOR OC-192/STM-64

Optical Connectors

.....1 10-Gig Receive – FC, SC, or ST
1 10-Gig Transmit – FC, SC, or ST
1 Attenuator In – FC, SC, or ST
1 Attenuator Out – FC, SC, or ST

Transmitter (Single mode fiber compatible)

Wavelength .....Standard: 1550 nm
Optional: 1310 nm

Clock Frequency Accuracy .....± 3 ppm

High Power TX Output .....+ 3.0 dBm to –2.0 dBM

Attenuation.....10 dBm attenuator

Receiver (Single mode fiber compatible)

Wavelength.....1280-1580nm

Rx Clock Frequency .....± 3 ppm

Receive Level Sensitivity .....–1.0 dBm to –15.0 dBm

SONET SPECIFICATIONS

Rates OC-192

Line code.....Non-return to zero (NRZ)

Structure STS-192c, STS-48c, STS-12c, STS-3c, STS-1

Synchronization.....Internal, recovered, 2M reference, T1 reference

Error injection.....Section, Line, and Path BIP errors, Frame word errors, Line and Path FEBE, bit errors in a test pattern

Alarm generation .....Signal loss, loss of frame, Line-AIS, Line-RDI, Path-LOP, Path-AIS, Path-RDI

Triggering.....Single error or error rate: 1 X 10^{-4} to 1 X 10^{-9}

Trace identifier .....J1 has a programmable 64-byte ASCII sequence

Test patterns .....2^{23}-1, 2^{23}-1 (inverted), 2^{31}-1, 2^{31}-1 (inverted), auto

Pointer control.....± 1 increment or decrement, NDF, pointer value

SOH .....Interpretation of APS information in the K1 and K2 bytes

Results Display specifications

Event Log .....Displays all alarm and error events with a time stamp
50 ms resolution of error events and parameters
500-line memory capacity

Numerical Display.....Display of count (absolute) and rate (relative) values of error types

Display Update Rate.....1 second

Results Printout .....Manually triggered or timed print

Serial V.24/RS-232

SDH SPECIFICATIONS

Rates.....STM-64
Line code.....Non-return to zero (NRZ)
Mappings AU-4-64c, AU-4-16c, AU-4-4c, AU-4, AU-3
Synchronization.....Internal, recovered, 2M reference, T1 reference
Error injection .....B1, B2, and B3 parity errors, FAS, MS-REI, HP-REI, bit errors in a test pattern, code errors (single errors)
Alarm generation.....Signal loss, loss of frame, MS-AIS, MS-RDI, AU-LOP, AU-AIS, VC-4-RDI
Triggering.....Single error or error rate 1×10^{-4} to 1×10^{-9}
Trace identifier .....J1 has a programmable 64-byte ASCII sequence
Test patterns .....2^{23}-1, 2^{23}-1(inverted), 2^{31}-1, 2^{31}-1(inverted), auto
Pointer control.....±1 increment or decrement, NDF, pointer value
SOH .....Interpretation and manipulation of K1 and K2 bytes

Results Display Specifications

Event Log.....Displays all alarm and error events with a time stamp
50 ms resolution of error events and parameters
500-line memory capacity
Numerical display.....Display of count (absolute) and rate (relative) values of error types
Display update rate .....1 second
Results printout.....Manually triggered or timed print
Serial V.24/RS-232

Ordering Information

Package Descriptions

2510-P1*	10-Gig 1550 nm Field Service Package
2510-P2*	10-Gig 1310 nm Field Service Package (Includes LCD color display user interface module, soft carrying case, kickstand, AC adapter/charger, printer cable) * Specify type of optical connector: FC, SC, or ST

Additional Application Modules Available

Optical Modules

2310 SONET Field Services Module
2416 SDH Field Services Module

Access Modules

2209 T1/T3 Field Services Module
2230 E1 Data Communications Analyzer
2207 T1/T3 Wireless Field Services Module

Copper Modules

2109 Copper Analyzer Module
2357 DSL Broadband Services Module

Other Related Products

T-BERD® 310 SONET Communications Analyzer
ANT-10-Gig Advanced Network Tester

Optional Accessories

AC-31705	External Battery Charger
AC-31905	Cigarette Lighter Adapter/Charger
BA-014081	Replacement Battery
CC-45158	Carrying Case, Multi-Module, Soft

Note: Specifications, terms, and conditions are subject to change without notice.

251010G/PRE/TP/GER/03-01

Global Headquarters
20400 Observation Drive
Germantown, Maryland 20876-4023 USA
Toll Free 1-800-638-2049
Tel +1-301-353-1550
Fax +1-301-444-8468
www.acterna.com

Regional Sales Headquarters

North America
20400 Observation Drive
Germantown, Maryland 20876-4023 USA
Toll Free 1-800-638-2049
Tel +1-301-353-1550
Fax +1-301-444-8468

Western Europe
Arbachtalstrasse 6
72800 Eningen u.A.
Germany
Tel +49 7121 86 2222
Fax +49 7121 86 1222

Latin America
Av. Eng. Luis Carlos Berrini
936 8/9. Andar
04571-000 Sao Paulo, SP
Brazil
Tel +55 11 5503 3800
Fax +55 11 5505 1598

Eastern Europe, Middle East & Africa
Elisabethstrasse 36
PO Box 13
2500 Baden
Austria
Tel +43 2252 85 521 0
Fax +43 2252 80 727

Asia/Pacific
42 Clarendon Street
PO Box 141
South Melbourne, Victoria 3205
Australia
Tel +61 3 9690 6700
Fax +61 3 9690 6750

1st Neopalimovskiy Per. 15/7 (4th floor)
119121 Moscow
Russia
Tel +7 095 248 2508
Fax +7 095 248 4189

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