SUNRISE TELECOM®

SunSet® 10G
with Electrical Interface Ports

Data Sheet

With support for twelve different optical and electrical rates from 1.5/2 Mbps through 10 Gbps, the SunSet 10G covers all test interfaces for core and metro SONET/SDH rings and their tributaries. With all-inclusive solutions for SDH, SONET, PDH, T-carrier, electrical and optical, the SunSet 10G increases testing efficiency, consolidates training, and saves money. And as optical networks reach across international boundaries, the SunSet 10G can turn up SDH and SONET services around the world.

The SunSet 10G

Field engineers can verify proper hands-offs at SONET/SDH gateways; test network continuity across the 10G backbone network and analyze its tributaries; and test the OC-192/STM-64 wavelengths in the DWDM network. Applications include basic end-to-end performance testing with BERT, inservice performance monitoring, and simulating abnormal conditions to check the network's response. Regardless of line rate or transmission standard, everything from basic BERT to advanced APS and pointer testing is right at your fingertips.

KEY FEATURES

- 2 kg handheld test set for SONET and SDH
- SONET and SDH testing from STS-1/STM-0 to OC-192/STM-64
- T-carrier and PDH testing from DS1/E1 to E4
- Dual wavelength transmitter up to 2.5 Gbps
- Mapping/demapping from STS-192c, SPE/VC4-64c Bulk down to VT1.5, VT2, VC11, VC12
- Mux testing (SDH to SDH, SDH to PDH, SONET to SONET, SONET to T-carrier)
- SONET/SDH overheard byte access and control
- Battery operated: one hour operating time at 10 Gbps
- Economical for wide deployment
- Windows Remote Control
- Verify network continuity with BER testing
- Easily detect SDH/SONET errors and alarms with LEDs and Well-organized results
- Confirm proper frequency and power level
- Monitor pointer movement in the network and adjust pointer values to stress network elements

- Identify network synchronization problems by connecting the external clock input to the synchronization timing source of the network
- Check the network's automatic protection switch (APS) function and measure network switchover time
- Troubleshoot problems across multiple network operators with Tandem Connection Monitoring (TCM)

BENEFITS

- SONET/SDH/PDH/T-Carrier feature-rich
- Lightweight and highly portable
- Eliminates the need for multiple and heavier instruments without compromising test features or accuracy
- Intuitive and easy-to-use
- Cost-effective and future proof
- Increases efficiency
- Consolidates training and shortens learning curve
- Handles multiple tasks including installation, maintenance, troubleshooting, and commissioning
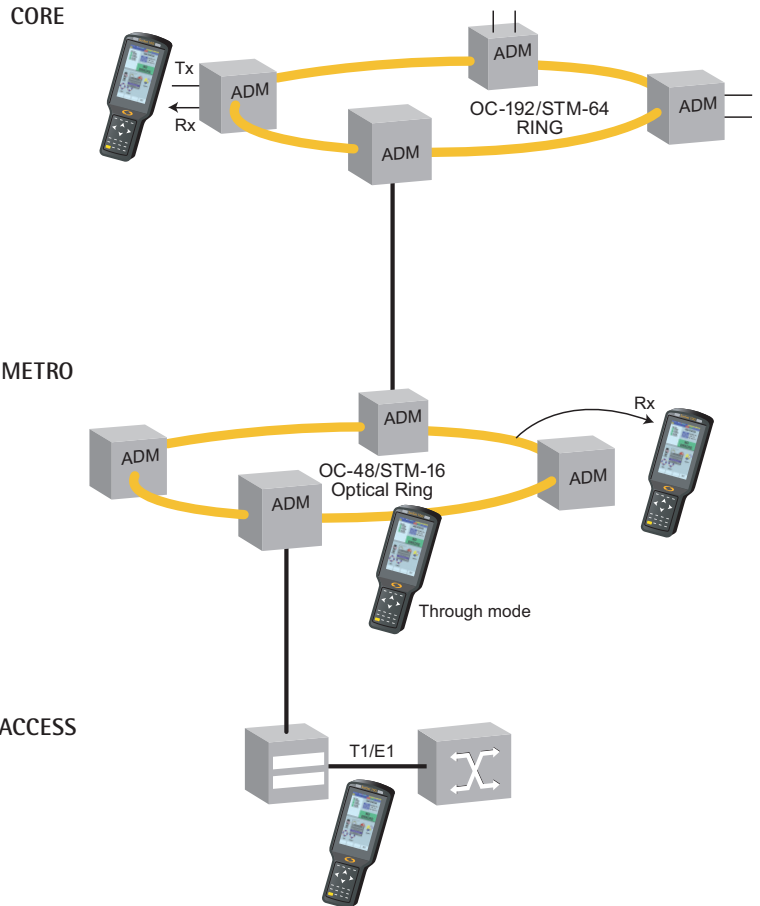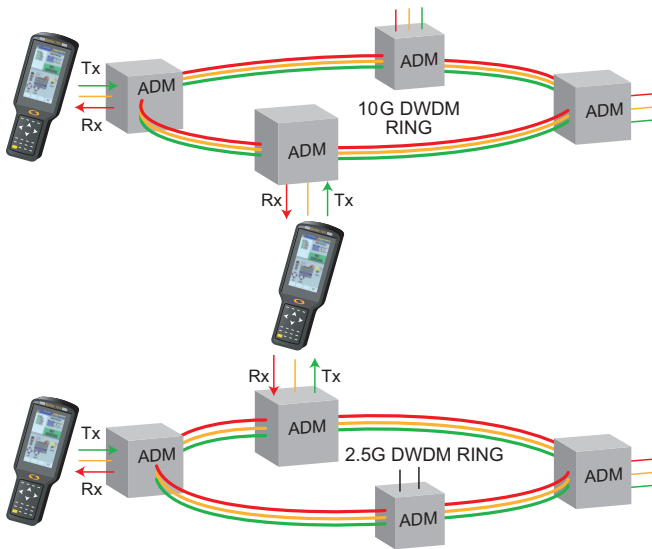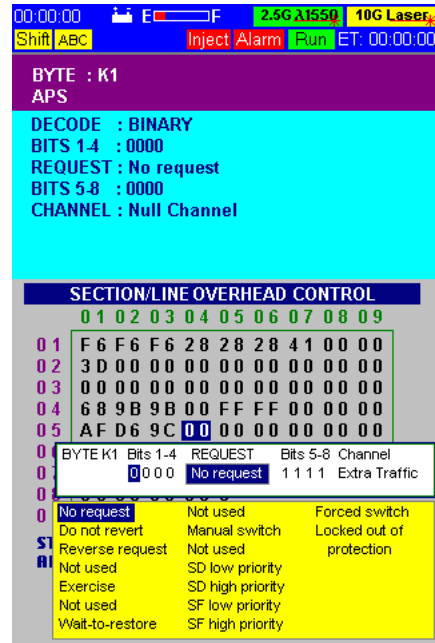
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APPLICATIONS

Out-of-Service testing

- End-to-end BER testing
- Network element verification
- Overhead control
- Pointer adjustment and test sequences
- Propagation delay measurements
- Mux testing (SDH–SDH, SONET–SONET, PDH–SDH, T-carrier–SONET)

In-service monitoring

- In-service performance analysis
- Overhead monitor and decode
- Pointer monitoring
- APS measurements
- Tandem Connection monitoring
- Tributary scan
- With splitter or through mode

SS10G+ OverHead Control Screen Shot

SPECIFICATIONS

Test Interfaces

SDH/SONET

10G Optical (STM-64/OC-192)
Connector: FCUPC or SCUPC

Transmitter
Clock source
    Internal, Receive, External: 2.048 MHz or 2.048 Mbit/s,
    1.544 Mbit/s
Wavelength: 1310/1550 nm
Test patterns
    PRBS, Fixed and User Programmable

Receiver
Frequency recovery range: 9.95328 $\pm$ 50 ppm
Wavelength: 1290 to 1600 nm

52M/155M/622M/2.5G Optical (STM-0/1/4/16 OC-1/3/12/48)
Connector: FCUPC or SCUPC

Transmitter
Clock source
    Internal, Receive, External: 2.048 Mbit/s or 2.048 MHz, or
    1.544 Mbit/s
Wavelength: 1310/1550 nm
Test patterns
    PRBS, Fixed and User Programmable

Receiver
Frequency recovery range:
    51.840 Mbit/s $\pm$ 50 ppm
    155.520 Mbit/s $\pm$ 50 ppm
    622.080 Mbit/s $\pm$ 50 ppm
    2.48832 Gbit/s $\pm$ 50 ppm
Wavelength: 1280 to 1580 nm

155M Electrical (STM-1/STS-3)
Connector: BNC

Transmitter
Clock source
    Internal, Receive, External: 2.048 MHz or 2.048 Mbit/s,
    1.544 MHz or 1.544 Mbit/s

Receiver
Frequency recovery range: 155.520 Mbit/s $\pm$ 50 ppm

52M Electrical (STM-0/STS-1)
Connector: BNC

Transmitter
Clock source
    Internal, Receive, External: 2.048 MHz or 2.048 Mbit/s,
    1.544 MHz or 1.544 Mbit/s
Receiver
Frequency recovery range: 51.840 Mbit/s $\pm$ 50 ppm

PDH/T-CARRIER

139M/E4
Connector: BNC

Transmitter
Clock source
    Internal, Receive
Error injection
Alarm generation

Receiver
Frequency recovery range: 139.264 Mbit/s $\pm$ 50 ppm

45M/DS3
Connector: BNC

Transmitter
Clock source
    Internal, Receive
Error injection
Alarm generation

Receiver
Frequency recovery range: 44.736 Mbit/s $\pm$ 50 ppm

34M/E3
Connector: BNC

Transmitter
Clock source
    Internal, Receive
Error injection
Alarm generation

Receiver
Frequency recovery range: 34.368 Mbit/s $\pm$ 50 ppm

2M/E1
Connector: RJ-45

Transmitter
Clock source
    Internal, Receive, External: 2.048 MHz or 2.048 Mbit/s
Error injection
Alarm Generation
Fractional E1

Receiver
Frequency recovery range: 2.048 Mbit/s $\pm$ 50 ppm

1.5M/DS1
Connector: RJ-45

Transmitter
Clock source
    Internal, Receive, External: 1.544 Mbit/s
Connector: RJ-45
Error injection
Alarm generation
Fractional T1

Receiver
Frequency recovery range: 1.544 Mbit/s ± 50 ppm

Test Features

Test Modes
Point-to-point
Unframed Mode
Through Mode Operation (up to 10G)

SDH-PDH Mux/Demux Testing

SDH-SDH Mux/Demux Testing

SDH (ITU-T G.707)
Rates: STM-64 (9.9 Gbit/s), STM-16 (2.5 Gbit/s), STM-4 (622 Mbit/s),
    STM-1 (155 Mbit/s), STM-0 (52 Mbit/s)
Payloads: From VC11/ VC12 Bulk to VC4-64c
Error Injection
Alarm Generation
Results Measurements
    Errors/Alarms
    Performance monitoring: G.821, G.826, G.828, G.829,
        M.2100/2110, M.2101/M.2120
    SDH Pointer
Automatic Tributary Scan

SONET (Telcordia GR-253-CORE)
Rates: OC-192 (9.9 Gbit/s), OC-48 (2.5 Gbit/s), OC-12 (622 Mbit/s),
    OC-3/STS-3 (155 Mbit/s), OC-1/STS-1 (52 Mbit/s)
Payloads: From DS1/VT1.5 up to STS-192c
Error Injection
Alarm Generation
Results Measurements
    GR-253 Bit Performance
    SONET defects
    SONET Pointer: Justification, Increase, Decrease

Measurements Common to SDH/SONET
Histogram Analysis
APS Timing
Service Disruption measurement
Propagation Delay measurement
Optical power level measurement
Frequency

SDH/SONET Overhead
Monitor and Transmit Section/Regenerator Section, Line/Multiplex
    Section, and Path Overhead bytes
Pointer Monitor
Pointer Adjustment
Pointer Test Control
Tandem Connections Monitoring

PDH Measurements (139M, 45M, 34M, 2M, 1.5M)
ITU-T G.821, G.826 and M.2100 Analysis
Frequency Measurements
Errors/Alarm Statistics

T-Carrier Measurements (DS1, E1, E3, DS3, E4)
Error Type
GR-253 Analysis
Frequency Measurements
Alarm Statistics

Propagation Delay Measurement

General

Display: TFT, 640 x 480 pixel color, Indoor/Outdoor readable
Network: 10/100Base-T RJ-45
Serial Port: RS-232C (V.24), RJ-11 connector
DC Power for battery charger and continuous operation
Battery: Built-in Li-Ion rechargeable field replaceable battery pack
Operating temperature: 0°C to 45°C [32°F to 113°F]
Storage temperature: -20°C to 70°C [-4°F to 158°F]
Operating humidity: 5% to 90% noncondensing
Size: 122 x 99 x 300 mm [4.8 x 3.9 x 11.8 in]
Weight: 2.2 kg [5 lbs]

ORDERING INFORMATION

Test Set
SS10GP-25   STM-64/OC-192 and STM-0/1/4/16/OC-1/3/12/
             48 SDH/SONET Test Set. 1.5M/2M testing, 8-pin
             RJ-45 connector. 34M/45M/52M/139M/155M
             testing, BNC connectors.

Includes Internal Li-Ion Battery (SA130), and Certificate of Compliance (SS10-GPCC), Software PSOS TM License, Operating Firmware (128MB)

STM-64 Optics Options
[These options are mutually exclusive]

SS10GP-13IR   10 Gb/s 1310m Intermediate Reach (24Km) Tx/Rx
               Pin Detector
SS10GP-15SR   10Gb/s 1550m Short Reach (20Km) Tx/Rx
               Pin Detector

STM-0/1/4/16 Optics Options
[These options are mutually exclusive]

SS10GP-25-SW1 2.5 Gb/s 1310 nm Intermediate Reach Tx/Rx
SS10GP-25-DW2 2.5 Gb/s 1310 nm Intermediate Reach Tx,
               1550 nm Intermediate Reach Tx, Intermediate
               Reach Rx
SS10GP-25-DW5 2.5 Gb/s 1310nm/1550 nm Long Reach Tx, Long
               Reach Rx

Optical Connector Options (SC or FC)
[These options are mutually exclusive, based on chassis selection. Must select only one]

SS10GP-25-SC   SS10GP-25 SCUPC Optical Connectors
SS10GP-25-FC   SS10GP-25 FCUPC Optical Connectors

For more information or a directory of sales offices: **info@sunrisetelecom.com** | **www.sunrisetelecom.com**