

SUNRISE TELECOM®

# SunSet® OCx

Powerful SONET Testing and Service Verification

Data Sheet



The SunSet OCx offers DS0 to OC-48 testing, along with all the service verification tools you need. Technicians can increase efficiency, consolidate training, and save time and money by testing all these rates and services with a single handheld unit. Incorporating the most popular and powerful features for testing T-carrier (T1 and T3) and Synchronous Optical Networks (SONET), the SunSet OCx analyzes Internet Protocol (IP), Asynchronous Transfer Mode (ATM), Primary Rate Integrated Services Digital Network (ISDN PRI), Bellcore GR-303-CORE, Frame Relay, and Signaling System 7 (SS7), as well as traditional voice frequency (VF) and Trunk conditioning functions.

## FEATURES

### Basic Testing

- BERT up to 2.5 Gbps
- Bidirectional DS1 drop/insert
- Loopback and span control
- VF/DS0 and fractional T1
- Full complement of test patterns
- Error injection and alarm generation
- 16 MB data storage

### Advanced Testing Tools

- Mux/Demux Testing and Emulation
- Pulse Mask Analysis
- SONET Overhead Control
- DS3 FEAC and C-bit Monitoring
- DS1 Data Link
- Remote Control
- Jitter Measurement on DS3, DS1

### Protocol Analysis/Emulation

- ATM/IP
- VF Dialing
- ISDN PRI
- GR-303
- SS7
- Frame Relay

## BENEFITS

- OCx/T-Carrier/ATM 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 the learning curve
- Handles multiple tasks including installation, maintenance, troubleshooting, and commissioning

## APPLICATIONS

### Installation, Maintenance, Troubleshooting and Commissioning

The SunSet OCX is the ideal product for installation and bringing into service tasks in the field and central office. Commissioning and acceptance tests can be performed with the same test set, as jitter features are part of the conformance procedures. Maintenance and troubleshooting in-service tasks can also be completed with the same handheld test set saving time and money.

### Out-of-Service Testing

- End-to-end BERT
- ATM testing
- Trace generation
- Round trip delay
- NE verification
- Pulse mask analysis at 1.5M and 45M
- Voice frequency testing: Talk/listen, send/receive tones
- MuxTest
- Jitter tests
  - Jitter measurement

### In-Service Monitoring

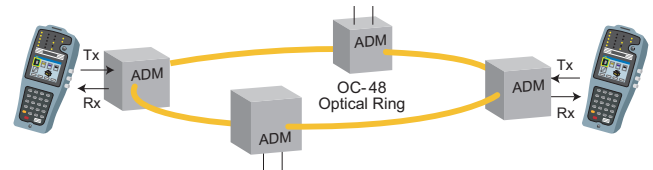
- Through protected monitoring points or optical splitters
- Line through and payload through mode
- Error performance analysis
- SDH overhead bytes decode
- Pointer monitoring
- APS timing measurement and APS capture
- In-service tributary scan
- Voice traffic monitoring
- Troubleshooting synchronization problems

## SPECIFICATIONS

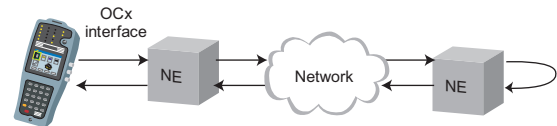
### Connectors

Optical: SCPC-SM-F (Default), FCPC-SM-F (Optional)  
 STS-1 and DS3: BNC  
 DS1: Bantam, Line 1 and Line 2  
 DS1 External Clock: BNC  
 Handset Port: 4-pin modular plug (N/A on SSOCx-E)  
 Serial Port: 8-pin Mini DIN RS-232C (V.24), DTE  
 DC Power

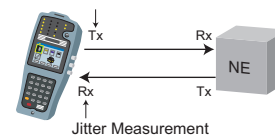
### Out-of-Service testing



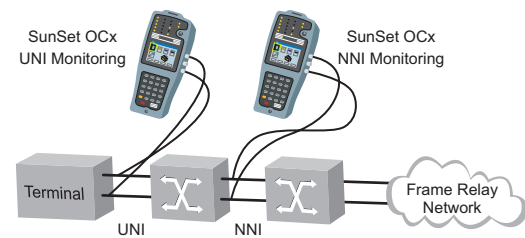
### Round trip delay



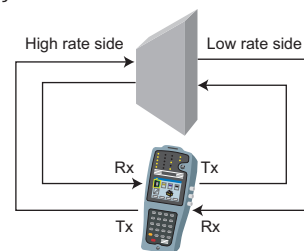
### Jitter measurement



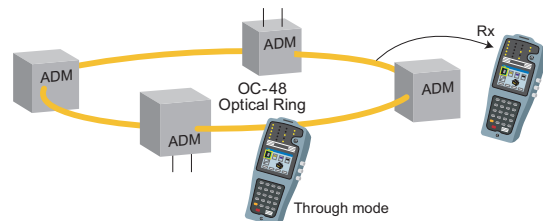
### Service verification



### MuxTest, Pointer jitter tests



### In-Service monitoring



## SONET

Rates: STS-1, OC-1, OC-3, OC-12, and OC-48  
Payloads: From DS1/VTI-5 to STS-48c  
Clock Source: Internal, Loop, BITS (T1 Line 2 Rx)

### SSOCx-E Optics

Rates: OC-48/12/3

### SSOCx-D/C/B/A Optics

Rates: OC-12/3/1

Single Mode Transmitter, Multimode-compatible Receiver

STS-1 Transmitter/Receiver

Optical Through Mode Operation

Line Through

Path Through (SSOCx-E only)

Test Patterns: PRBS, Fixed, User programmable

Error Injection

Alarm Generation

### DS3

Payloads: DS3, DS3/DS1

Clock Source: Internal, Loop

Test Patterns: PRBS, Fixed, User programmable

Error Injection

Alarm Generation

### Dual DS1

Payloads: DS1, Nx56k, Nx64k

Clock Source: Internal, Loop, External DS1, External TTL

Test Patterns: PRBS, Fixed, and User programmable

Error Injection

Alarm Generation

### Measurements

SONET Defects

### SSOCx-E Pointer Measurements

SONET STS Pointer

SONET VT Pointer

### SSOCx-D/C/B/A Pointer Measurements

SONET STS Pointer

SONET VT Pointer

SONET Signal, Electrical

SONET Signal, Optical

DS3 Defects

DS3 Path

DS3 Signal

DS1 Defects

DS1 Path

DS1 Signal

Bit Performance (G.821)

Service Disruption Measurement (SSOCx-E only)

Event Status Screen

### Loopback and Span Control

DS1 Loopback

HDSL Loopback

DS3 and DS3/DS1 Loopback

### SONET Features

Overhead Monitor

Overhead Control

J0/J1/J2 Traces

Pointer Control (SSOCx-E only)

Tributary Scan

Orderwire (SSOCx-E only)

Talk/Listen over E1 or E2 byte

Built-in microphone/speaker

### DS3 Features

View Received Data

C-Bit Monitor

Propagation Delay

### DS1 Features

View Received Data

Bridge Tap Detect

Quicktest I/II

Propagation Delay

### Voice Frequency Functions

Talk/Listen

VF Measurements

View Supervision Bits

Noise Measurements

### Other Features

Auto Configuration

Graphic Screen

Data Storage Card

System Profiles

## SOFTWARE OPTIONS

### VF Dialing (SWOCx-C)

Place/Receive Calls

MF/DTMF/DP Dialing

Bidirectional Call Analysis

ABCD signaling transition analysis

MF/DTMF Digit Analysis/Decode

### DS3 FEAC (SWOCx-D)

Monitor FEAC Codewords

Send FEAC Codeword

### Pulse Mask (SWOCx-E) [n/a SSOCx-E]

DS1 and DS3 Pulse Mask

### ISDN PRI (SWOCx-F)

Protocol: National ISDN-2, Northern Telecom, AT&T 5ESS

Emulation: NT and TE

Place/Receive up to 2 simultaneous calls

Data Calls

– Perform a BERT test with a data call towards loopback number or in self-call mode

– BERT (G.821) Measurements

Protocol Analysis

Pre and Post Filters

Backup D-Channel test for 46B+2D circuits (NFAS)

### Remote Control (SWOCx-M1, M2)

### VT100 (SWOCx-M1)

### Windows (SWOCx-M2)

## Intelligent Span Control (SWOCx-N)

## DS1 Data Link (SWOCx-O)

## CSU/NIU Emulation (SWOCx-P)

## Histogram Analysis (SWOCx-T)

## APS Measurement (SWOCx-U)

APS Switch Timing  
K1/K2 Byte Capture

## Pointer Test Sequences (SWOCx-X, SSOCx-E only)

## Jitter Measurement

Interfaces: DS3, DS1

## Frame Relay Basic (SWOCx-R1)

Interfaces: Dual T1  
LMI Standards: ITU-T Q.933, ANSI T1.617, LMI (DLCI 1023, GOF Vendors), NO LMI  
Modes: UNI DTE, UNI DCE  
LMI Analysis  
PING Test  
FOX Test  
Statistics Analysis

## Frame Relay NNI (SWOCx-R2)

Requires SWOCx-R1  
Modes: NNI USER, NNI NETWORK

## GR-303 Analysis (SWOCx-G1)

## GR-303 EOC Decode (SWOCx-G2)

## SS7 Protocol Analysis (SWOCx-S1)

Supports protocol analysis for SS7 TUP, ISUP, SCCP, SNM, and SNT messages  
Supports Bellcore TR-NWT-000246, ITU-T Q.700 series (General, Message Transfer Part, SCCP, TUP, ISUP, TCAP), Chinese (14 and 24 bits) standards  
Interfaces: Dual T1

## SS7 TCAP Analysis (SWOCx-S2)

ANSI T1.114  
TCAP Filter, TCAP Decode

## ATM Testing

Mapping  
DS1: HEC-based per ITU-T G.804  
DS3: PLCP-based per ITU-T G.804  
SONET: HEC-based per GR-253-CORE  
Interface: UNI and NNI per ITU-T I.361  
Quality of Service  
DSLAM Testing  
ATM/IP PING Test  
Traffic Generation  
Traffic Supervision

## GENERAL

Display: Backlit transfective 320 x 240 pixel color display; indoor and direct sunlight viewable

Operating temperature: 32°F to 104°F (0°C to 40°C)

Operating humidity: 5% to 90%, noncondensing

Storage temperature: -4°F to 158°F (-20°C to 70°C)

Size: 4.3 x 2.8 x 10.5 in (11 x 7 x 27 cm)

Weight: 3.3 lb (1.5 kg)

### Battery

Built-in NiMH rechargeable battery pack

Operation time: 0.5 to 3 hours

AC operation: 100 to 240 VAC, 50/60 Hz universal charger

## ORDERING INFORMATION

### Test Set

SSOCx-L	SunSet OCx Lite: DS1 to DS3, Not field-upgradeable to SONET and optical testing
SSOCx-A	SunSet OCx: DS1 to DS3
SSOCx-B	SunSet OCx: DS1 to STS-1
SSOCx-C	SunSet OCx: DS1 to OC-3c
SSOCx-D	SunSet OCx: DS1 to OC-12c
SSOCx-E	SunSet OCx: DS1 to OC-48c

### Hardware Option

SSOCx-FC-3	FC Optical Connector (SSOCx-C)
SSOCx-FC-12	FC Optical Connector (SSOCx-D)
SSOCx-FC-48	FC Optical Connector (SSOCx-E)
SSOCx-LR-3	Long Reach 1310 nm (SSOCx-C)
SSOCx-LR-12	Long Reach 1310 nm (SSOCx-D)
SSOCx-LR-48	Long Reach 1310 nm (SSOCx-E)
SSOCx-1550	Long Reach 1550 nm (SSOCx-C/D)
SSOCx-1550-48	Long Reach 1550 nm (SSOCx-E)
SSOCx-DW48-1	Long/Short Dual Wavelengths (SSOCx-E)
SSOCx-DW48-3	Long/Long Dual Wavelengths (SSOCx-E)

### Software Option

SWOCx-C	VF Dialing and Analysis
SWOCx-D	DS3 FEAC
SWOCx-E	Pulse Mask Analysis (N/A for SSOCx-E)
SWOCx-F	ISDN PRI Call Set Up and Monitor
SWOCx-G1	GR-303
SWOCx-G2	GR-303 eoc Decode
SWOCx-H	ATM Analysis at DS1
SWOCx-I	ATM Analysis at DS3
SWOCx-J	ATM Analysis at OC-3c
SWOCx-K	ATM Analysis at OC-12c
SWOCx-M1	Remote Control, VT-100
SWOCx-M2	Remote Control, Windows-based
SWOCx-N	Intelligent Span Control
SWOCx-O	DS1 Datalink
SWOCx-P	CSU/NIU Emulation
SWOCx-R1	Frame Relay
SWOCx-R2	Frame Relay NNI
SWOCx-S1	SS7 Protocol Analysis
SWOCx-S2	SS7 TCAP Analysis
SWOCx-T	Histogram Analysis
SWOCx-U	APS Timing
SWOCx-W	ATM Analysis at OC-48c (SSOCx-E only)
SWOCx-X	Pointer Test Sequences (SSOCx-E only)
SWOCx-Y	VT-100 Emulation
SWOCx-Z	DS3 and DS1 Jitter Measurement

For more information or a directory of sales offices: [info@sunrisetelecom.com](mailto:info@sunrisetelecom.com) | [www.sunrisetelecom.com](http://www.sunrisetelecom.com)

