



SunSet™ T10

The Complete T1 Testing Solution



SUNRISE TELECOM
INCORPORATED

...a step ahead

Unparalleled T1 transmission and service testing

The SunSet T10 offers unparalleled T1 transmission and service testing. The only hand-held full-duplex T1 test set on the market, the T10 employs advanced technologies to bring you the most convenient, economical, and versatile testing solution available. The T10 delivers one simple solution for your T1 testing requirements- from ISDN PRI to frame relay, voice, GR-303, HDSL, DDS, SS7, or GSM. And at two pounds, the T10 gives you the flexibility to bring full testing capability wherever you need to go. You can tailor the T10 to your testing needs for the most cost-effective solution. Field upgradeable software options conveniently add new features to your initial investment.

The complete T1 solution

- T1 transmission
- Datacom
- ISDN PRI
- Frame Relay
- SS7
- DTMF/MF/DP
- HDSL
- DDS
- GR-303
- GSM

1 Telco field technicians

Here's a 2 pound set that contains complete T1 transmission testing. It supports advanced telco equipment such as office and line repeaters, performance monitoring NIUs, and maintenance systems.

2 Private network data technicians

The SunSet T10 is the perfect frame relay installation tool. It provides full transmission testing over T1 and V.35 datacom interfaces. It verifies frame relay service and connectivity with LMI and PING testing.

3 SS7 field technicians

The SunSet T10 puts economical, first-pass SS7 protocol analysis into the field technician's hands. Powerful filters, combined with protocol decodes, help technicians determine a preliminary diagnosis to SS7 network problems.

4 ISDN Primary Rate Access (PRI) technicians

The SunSet T10 doubles as a complete T1 transmission and PRI test set to give you the best possible tool to install and troubleshoot your PRI circuits. The T10 offers switch/PBX call emulation, D-channel monitor and full decode, backup D-channel testing, and sequential call.

5 Exchange signaling technicians

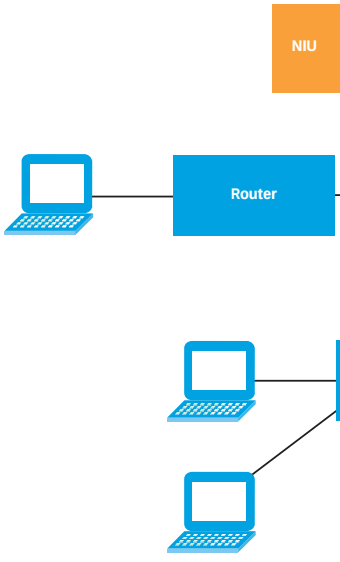
Whether it's by bi-directional monitoring, call emulation, or full-duplex drop & insert testing, the SunSet T10 verifies operation and troubleshoots line signaling and protocol problems. It provides a flexible and easy solution for E&M, ground-start, and loop-start circuits.

6 HDSL field technicians

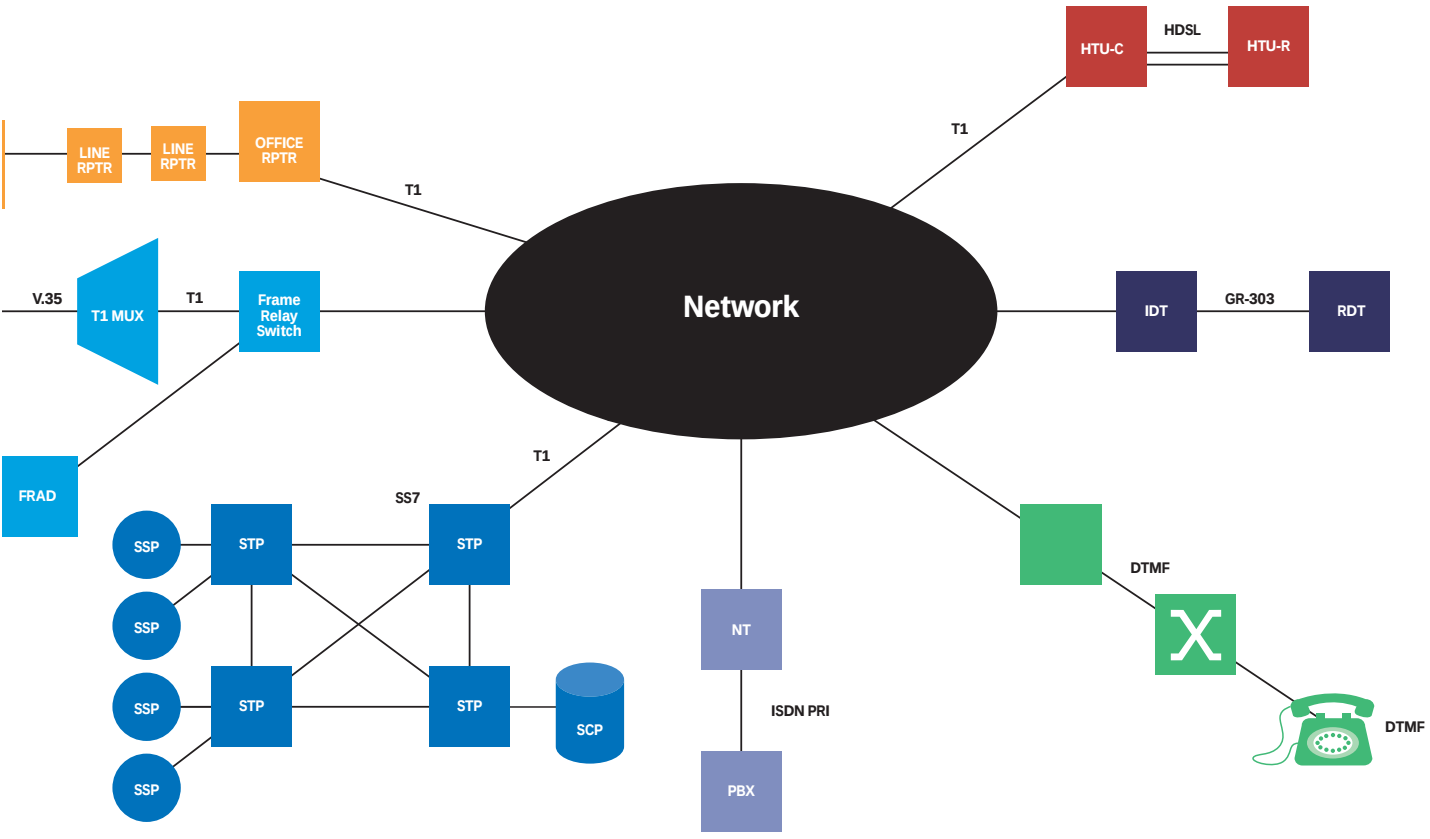
Use the T10 to troubleshoot and verify your HDSL circuits. The T10 loops up the HTU-C and HTU-R to isolate trouble before or after the HDSL span.

7 GR-303 Maintenance

The T10 offers testing for all aspects of GR-303 circuits: TMC/CSC monitor and decode, EOC verification, ABCD signaling, and T1 transmission. The GR-303 option can troubleshoot problems between the switch and remote terminal.






HTU-C
HDSL
HTU-R
T1
LINE RPTR
LINE RPTR
OFFICE RPTR
T1
V.35
T1 MUX
T1
Frame Relay Switch
Network
IDT
GR-303
RDT
FRAD
T1
SS7
SSP
STP
STP
SSP
SSP
STP
STP
SCP
SSP
NT
ISDN PRI
PBX
DTMF
DTMF

Two Pounds of Pure Testing Power

The first thing you'll notice is the size. The SunSet T10 fits perfectly in one hand. And whether it's carried down a man-hole, cross-town, or to a remote site, it's truly portable. Then, you'll realize that you don't need to sacrifice any testing capability for this convenient size. The chassis contains dual transmitters and receivers, a datacom interface, a NiMH battery providing over 3 hours of battery life, and a built-in microphone/speaker. Its testing features are unparalleled in the hand-held market for both transmission and service testing.

A Single Solution

If you are currently using separate test equipment to test your DS1, ISDN Primary Rate circuits, voice trunks, GR-303, frame relay installation- the SunSet T10 can give you a single solution. A single solution means you have all the testing tools you need at your fingertips for whatever service you encounter and you won't be stuck with the wrong equipment for the job; you won't miss underlying problems that can cause repeat visits; and you don't need to become an expert with multiple test gear. Best yet, a single test set provides the most cost-effective solution for these many requirements.

Signaling & protocol packages

You may easily increase your SunSet's versatility by adding signaling and protocol options to match your network. Such options include: ISDN PRI, frame relay, GR-303, DDS, SS7, and GSM/ PCS 1900. Options are software-based and can be installed easily in the field with a new SunWare™ card.

Field Upgrades with SunWare™ Cards

At home or in the office, a PCM CIA SunWare card provides instant software upgrades and new features. No factory installation is required. This means your SunSet can keep pace with new and emerging technologies in your network.



Simple Operation

The SunSet T10 has been designed to be as simple as possible, because we understand that impressive testing features are worthless if you are not comfortable using them. The following features help make sure you spend your time troubleshooting your network, not your test set.

- Auto set-up
- Configuration graphics
- Intuitive menu structure
- Storable configuration set-ups & results
- Bright dual-color LEDS for both lines, with current and history status
- Remote operation via serial port

The SunSet T10 is the perfect tool for installing or maintaining channelized voice trunks. Compact and lightweight, the T10 can easily be taken to the customer premise- providing full troubleshooting and diagnostic tools in the field, not just at the central office.

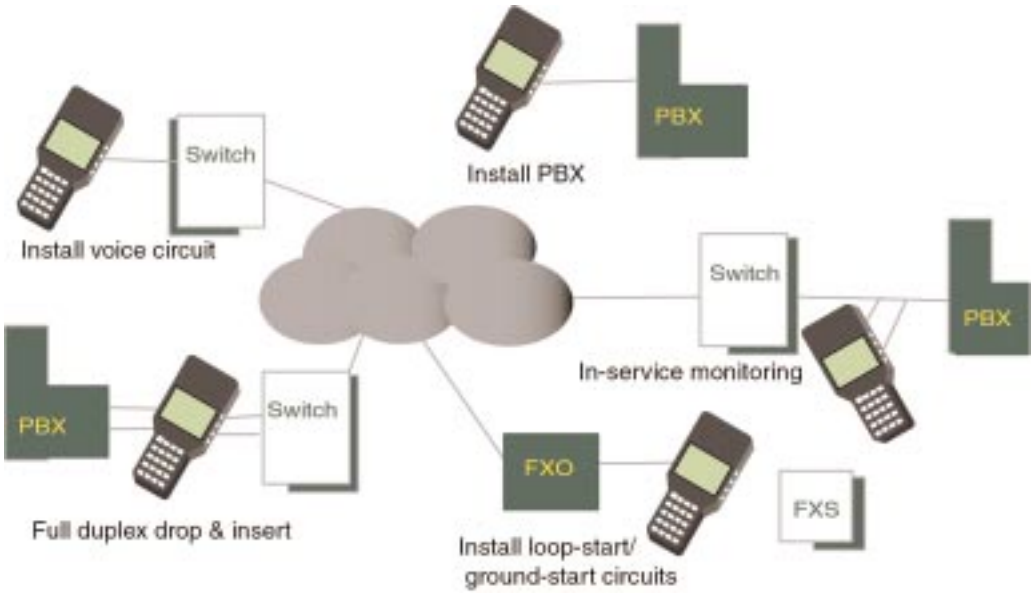
Testing channelized voice circuits

Installation

The SunSet T10 can place and receive voice calls to easily verify service and voice path when installing new trunks or PBX equipment. Whether it's DTMF/DP/MF dialing or E&M/ loop-start/ ground-start trunks, the SunSet T10 can support the wide variety of circuits you encounter. The integrated microphone and speaker check the voice path. Full physical layer results allow you to verify T1 transmission, signal level, and check for any error or alarm conditions during installation.

Troubleshooting

The SunSet T10 contains complete diagnostic tools necessary to troubleshoot your voice circuits. Bi-directional signaling analysis detects signaling problems like improper wink timing. Digit capture detects faulty dialing like missing digits or improper tone level. Noise analysis, complete with signal to noise, 3-k flat, c-message, and c-notch measurements, troubleshoots any noise on the circuit. Full duplex drop & insert testing allows you to place a call on one channel while the T1 remains in-service.



Highlights

- Drop & Insert testing
- Talk/listen
- E&M, loop-start, ground-start with FXO/FXS
- Dialing: DTMF, MF, pulse
- Digit capture and analysis
- Scan mode for receiving calls or digits
- Send/receive test tones
- Noise measurements: S/N, 3K-flat, C-msg, C-notch
- Monitor calls: voice, signaling sequences with time-stamps
- View traffic in both directions

Sunrise Telecom understands that physical layer testing is essential for any service or protocol testing. And that's why the heart of the SunSet™ T10 is transmission testing. From network timing to coding mismatch or signal level, the T10 makes sure even the most difficult physical layer problems are isolated and resolved.

Complete T1 Transmission Testing

BERT Testing

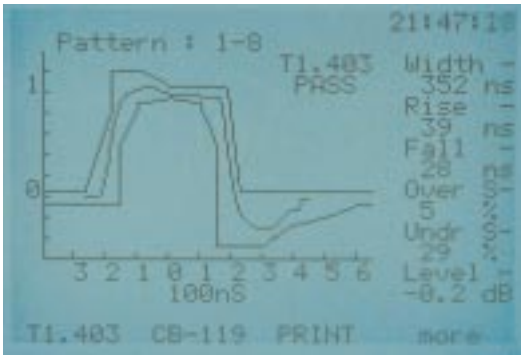
Perform T1 and FT1 BERT testing with all industry standard stress patterns- including FOX, 55Octet, 55Daly, and DDS patterns. Full measurements include bit error (G.821), alarms, signal level, frequency, frame, CRC, and BPV errors. Error injection and alarm generation are standard features to test your network's response.

Network Loopback Testing

Complete network loopback codes are installed in the SunSet T10 including: CSU, NIU, fractional CSU. User-programmable loopback codes provide extra flexibility. Isolate trouble on a T1 span by looping Westell/Teltrend intelligent office and line repeaters. The SunSet T10 can also emulate NIU/CSU equipment and respond to standard loopback commands.

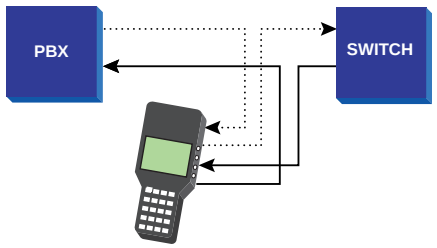
Pulse Mask Analysis

The pulse mask feature quickly verifies proper signal level. Mask templates- based on ANSI and other industry standards- determine if signal level conforms to specification.



Full Duplex DS1 Testing

The SunSet T10 is equipped with dual DS1 transmitters and receivers. Bi-directional monitoring is the quickest way to troubleshoot transmission, synchronization, signaling, or provisioning problems on your circuit. Full duplex drop and insert testing means you can place a call/send a test tone on one channel without affecting the other 23 channels.



Datalink Testing

Monitoring the ESF PRM datalink is an excellent way to discover errors which otherwise could not be detected at your monitoring point. Retrieve valuable performance reports from NIUs. *The SunSet T10 is the first hand-held T1 tester to support the new ANSI SPRM/NPRM datalink messages implemented in DS1 NIUs and terminating equipment.*

DDS Testing

The SunSet T10 can also be used to test your DDS circuits. Loopback DDS equipment- CSU, DSU, OCU, DSO-DP - to isolate faulty cards or sections. The T10 can decode the DDS control codes to detect abnormal conditions. Full BERT results, loopback commands, and send/receive DDS control codes are available.



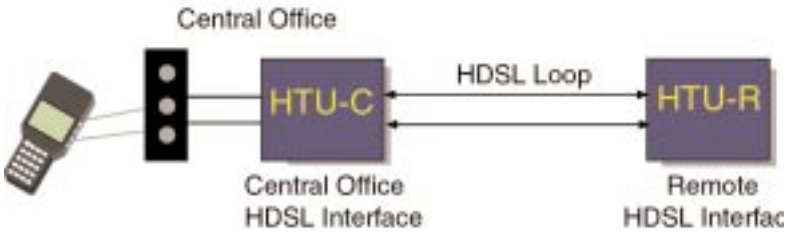
Transmission testing highlights

- Full duplex T1 testing: bi-directional monitoring and drop & insert testing
- Complete stress patterns and measurements
- Automated quick tests for easy installations
- Frequency graph illustrating clock slips & wander
- Intelligent repeater control/PM retrieval
- ESF and SLC-96 datalink
- Frequency and level measurements
- View & playback customer data
- Propagation delay
- Store results and configuration set-ups
- Unique “coding mismatch warning”

HDSL Testing

The SunSet T10 contains HDSL Span Control to support the ever-increasing prevalence of HDSL spans in today’s network. This feature allows you to verify your circuit before and after the HDSL loop. It can loop up the HTU-C/HLU in the Central Office to check the circuit before the HDSL segment, as well as the HTU-R/HRU at the remote end to test the complete span





Loopback the HTU-C or HTU-R to verify transmission before and after the HDSL loop.

Dual-color LEDs

Check your circuit's operation at a glance, making testing as simple as "green is go" status is dis
both T1 line

Straightforward

There is no need to de
or dig through results
SunSet T10 provides a
in an intuitive, straigh
manner.

GRAPHIC K

Avoid costly co
tion mistakes. A
keystroke provi
picture graphic
SunSet's configu

Printing and remote control

A serial port interface allows for direct printing or remote control from a computer or modem.

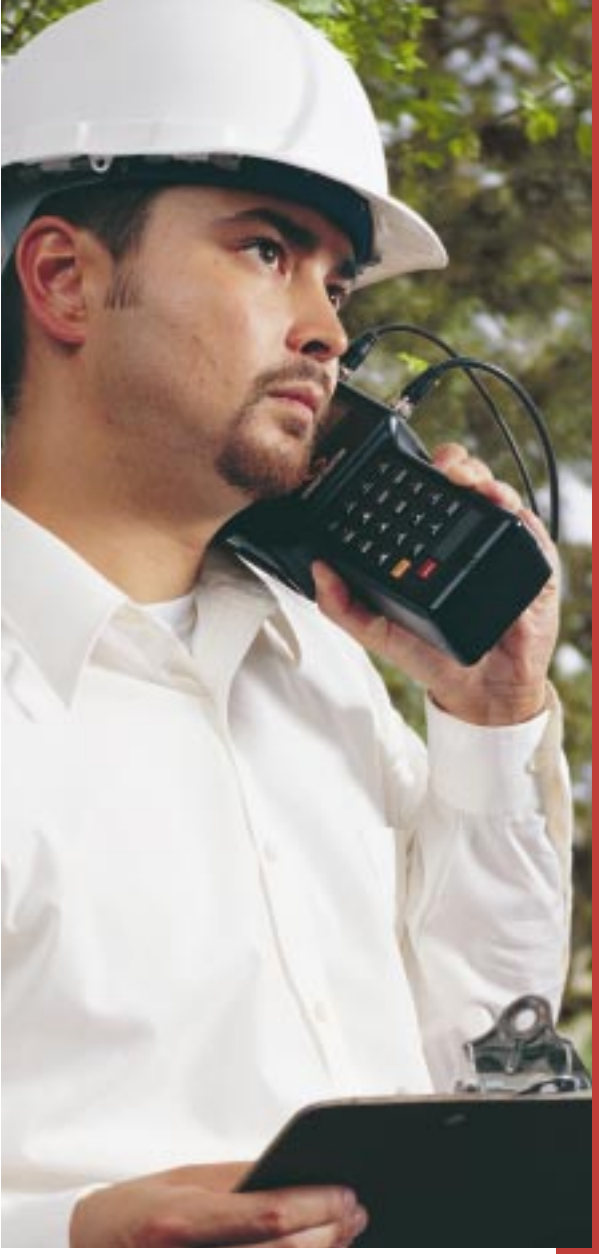


Dual DS1 and Datacom

The SunSet T10 is equipped with dual transmitters and receivers. An added datacom port enables testing at the V.35, RS232, RS449, X.21, or RS530 interfaces.

Integrated speaker and microphone

Check the voice path for DS0 or PRI calls. Monitor voice quality on channelized, PRI, or GSM circuits.



ISDN Primary Rate

If you've tested Primary Rate circuits, you know that PRI trouble can be caused by a variety of sources like physical layer errors, timing, or switch translations and protocol problems. A PRI tester that combines full-featured T1 and PRI testing is your best defense to identify the trouble the first time and avoid costly revisits. The SunSet T10's ISDN Primary Rate option rivals protocol analyzers and ISDN equipment dedicated solely to PRI testing.

The T10 can be used to install new PRI circuits or PBX equipment by placing/receiving voice and data calls. Talk/listen and BERT testing verifies the B-channel connection. In-service monitoring can troubleshoot problems with a full D-channel decode, message filters, and storage.

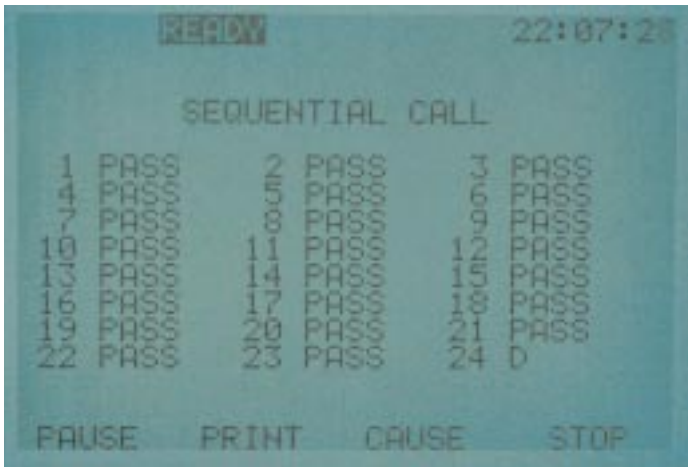
Highlights

- TE/NT Emulation
- Place/receive voice & data calls
- BERT data calls
- Talk/listen for voice calls
- 46B + 2D or 47B + D testing
- Backup D-channel test for NFAS circuits
- D-channel monitor with full decode
- Automated sequential call
- Trace filters
- National ISDN, AT&T Custom, Nortel DMS, and ETSI protocols

Sequential Call–

PRI Installation just got a little bit easier

Sequential Call—the first of its kind in a hand-held T1 test set- is an automated test designed to verify PRI circuits quickly. Instead of testing one B-channel during installation, the Sequential Call feature quickly verifies that all 23 B-channels are available. It provides a full report for each channel: including pass/fail, BERT results on data calls, and cause values for any failed calls.



Simplify your GR-303 installation and maintenance

The increased deployment of GR-303-based DLCs brings new maintenance challenges in provisioning and troubleshooting problems in the GR-303 network. The SunSet T10 has evolved to meet these new testing challenges. The T10 offers testing for all aspects of GR-303 systems: monitoring the TMC/CSC control channel, viewing robbed ABCD signaling and dialed digits, listening to voice channels, and thorough tests for the physical layer. Its GR-303 option troubleshoots signaling problems between the switch and remote terminal: to determine call status, monitor for any dropped calls, detect any abnormal conditions, and identify when service was unavailable.

GR-303 Highlights

- Bi-directional monitoring of TMC/CSC quickly trouble- shoots problems between the switch and remote terminal
- Full L3 decode of TMC/CSC messages including message type, customer, DS1#, DS0#, and cause values



- Statistics screen provides a quick summary of any abnormal or invalid conditions; i.e.channel unavailability, protocol problems, or ring failure
- EOC testing verifies an active eoc link and reports any errored or invalid eoc frames

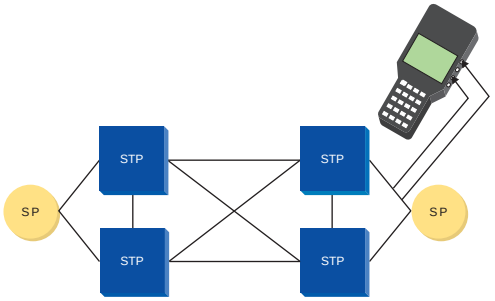
Protocol Analysis for Field Applications

GSM

The GSM Analysis option is designed for installing and maintaining GSM (PCS 1900) networks. A software option provides field technicians with the ability to monitor traffic, voice calls, as well as run verification tests during installation. A single screen displays the usage of all traffic channels- providing a clear picture of the network's traffic load. The set's speaker verifies speech quality by accessing both the GSM encoding and the 64 kbps µ-law encoding. For installation, the SunSet T10 can insert a GSM encoded voice message to check voice conversion. A 16 kbps BERT test verifies transmission.

SS7

The SS7 option places powerful SS7 protocol analysis and monitoring in the hands of the field technician. Protocol decodes help technicians determine a preliminary diagnosis to SS7 network problems. Statistics screens shows traffic utilization, frame types, and retransmission. Powerful filters aid in quick troubleshooting by focusing on a specific customer, message type, OPC/DPC, etc.





Datacom testing

Whether it's at the back of a router, bridge, modem, DSU, or CSU, customer premise testing often requires a datacom interface for complete end-to-end verification and troubleshooting. The SunSet T10 datacom option provides complete end-to-end verification testing and troubleshooting for V.35, RS530, RS449, RS232, and X.21 interfaces.

With DTE emulation, you can verify end-to-end services on your WAN and test through the customer equipment. DCE emulation easily verifies CSUs or other CPE equipment during installation. You may also invoke local or remote loopbacks to isolate trouble. The Datacom option contains excellent diagnostic tools, like the control/analysis of control leads, to troubleshoot faulty modems/equipment.

Solution for your data network

Frame relay testing

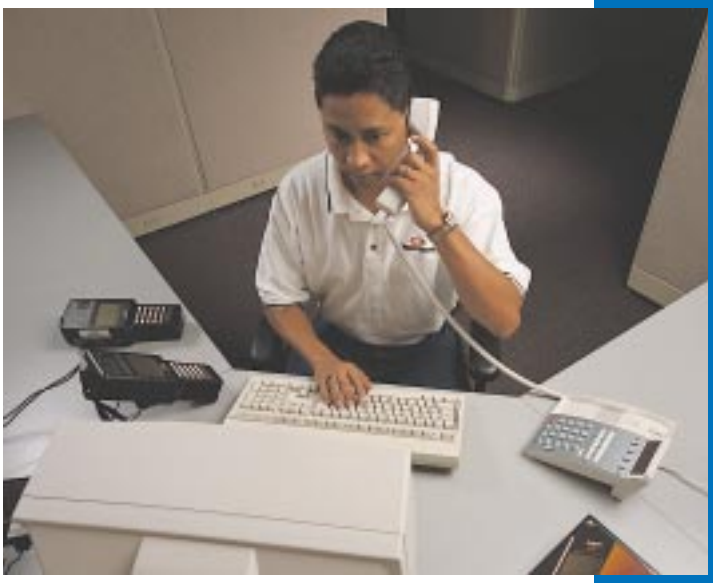
The SunSet T10 ensures successful frame relay deployment by combining physical layer testing with frame level simulation. Since frame relay lacks its own error- check capabilities, it is essential to perform transmission and frame relay service testing.

The SunSet T10's frame relay feature has been designed to make frame relay installation simple. Link management at the CPE verifies that service is active and the user to network link is properly connected and configured. The SunSet can even auto-configure to the protocol type (LMI, ANSI D, or CCITT A). LMI results show link status, any link errors, and all active PVCs.

TCP/IP PING tests connectivity all they way to the user's IP LAN connection. The T10 provides results on the roundtrip time (avg, max, min) and the counts of received, unreached, or errored responses. The SunSet T10 can even respond to PING messages.

Service & Support

Sunrise Telecom continues to impress its customers with excellent customer support. Sunrise Sales Representatives and Distributors extend worldwide- located in over 70 countries. Knowledgeable support staff and distributors work to ensure you find the best solution for your testing requirements. Complete technical documentation ranges from technology briefs to step-by-step applications. Technical support is available 24 hours a day from local representatives, factory experts, and on the internet.



Contact Sunrise Telecom to find out your local Sales Representative and discover how the SunSet T10 can solve your testing needs:

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