



**SUNRISE TELECOM**

*... a step ahead*



# SunSet<sup>®</sup> xDSL

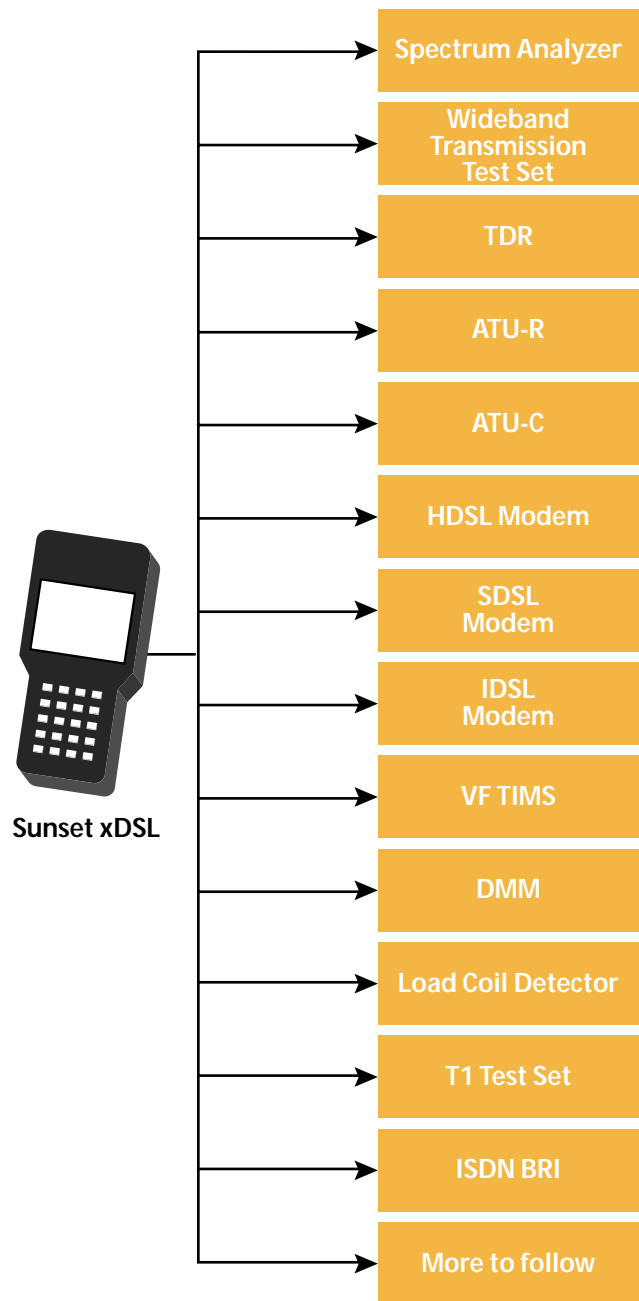
**A Modular, Handheld DSL Test Solution  
For Installation, Verification, and Troubleshooting**

## Incredible versatility in a handheld test set

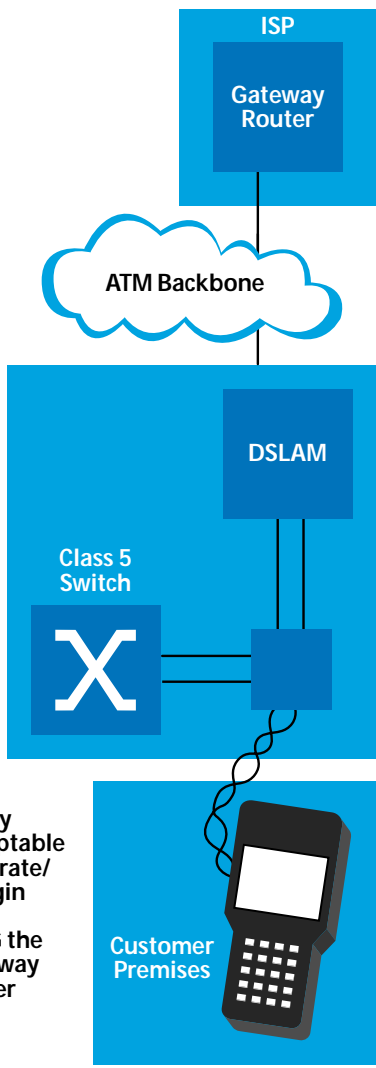
The SunSet xDSL applies powerful concepts in test modularity to the handheld test set arena. Through this flexible platform you can assemble the industry's most powerful handheld Digital Subscriber Line (DSL) test set, a simple inexpensive modem-emulation test set, a traditional T1 test set with HDSL applications, or the industry's most versatile handheld test set by combining all of these and more. The SunSet xDSL allows you to perform work formerly requiring 2 or 3 people, improving productivity, eliminating wasted time, reducing truck rolls for a service turn up, speeding up successful delivery of service, and improving customer satisfaction. You can acceptance-test a wide variety of services and enjoy powerful diagnostic capabilities for quickly determining the cause and location of failed service.

Take a look at some of these special capabilities:  
The SunSet xDSL contains the world's first handheld spectrum analyzer for twisted pair applications. The set also incorporates wideband transmission testing, Time Domain Reflectometer (TDR), load coil detector, and Digital Multimeter (DMM). A selection of DSL modems lets you most closely gauge the true rate and noise margins attainable by the customer. A Voice Frequency TIMS module lets you test VF transmission, draw dial tone, and place calls. Best of all, the modular platform extends the life of your test equipment investment by helping you add new test technologies over time without having to buy an entirely new set. Imagine doing so much of your telco testing capably on your own with just a single, convenient test tool.

## So Many Test Sets in One



## A One-Button ADSL Acceptance Test



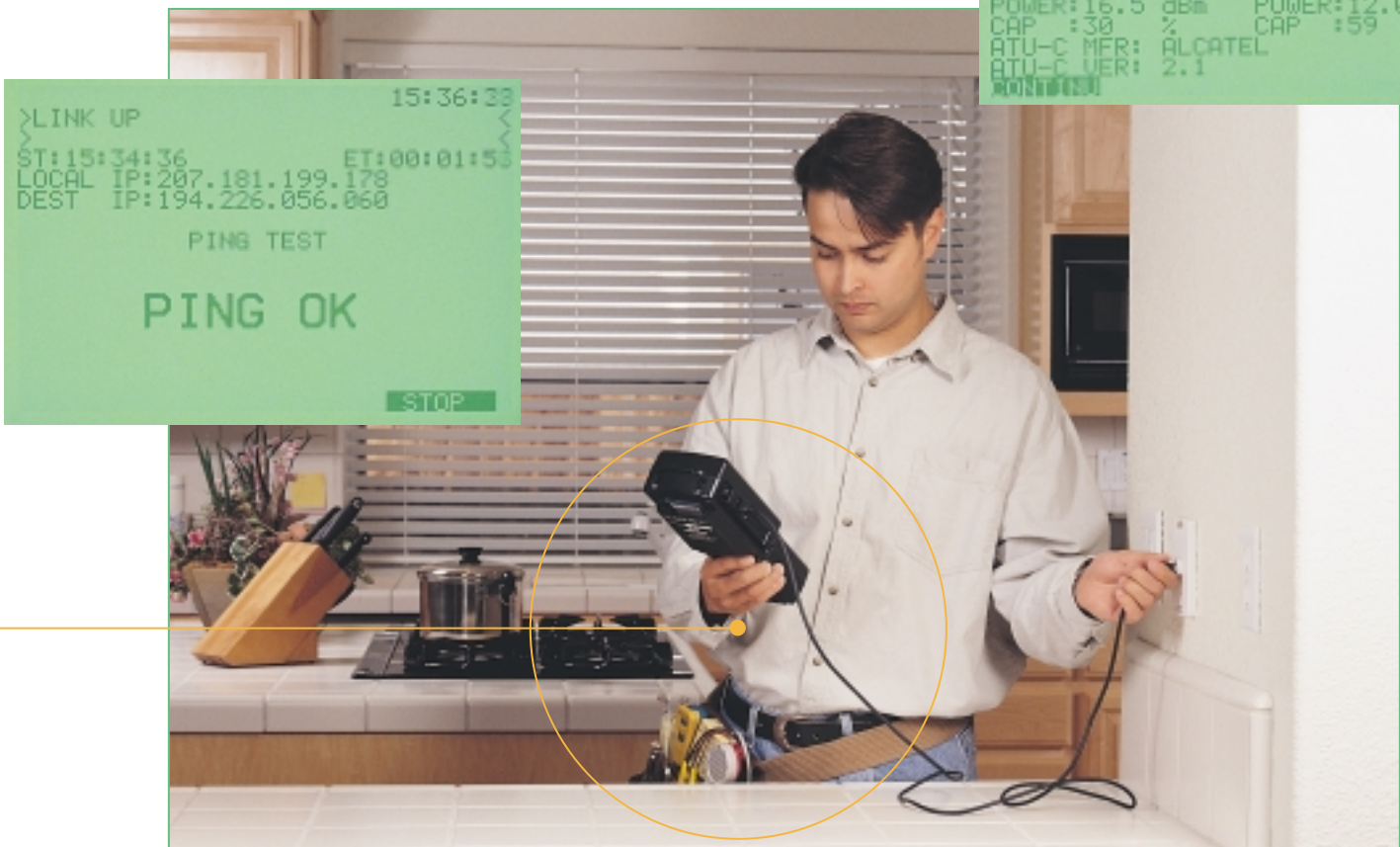
- Verify acceptable Link rate/ margin
- PING the gateway router

A fast, simple acceptance test is needed to handle the great majority of ADSL services that turn up trouble free. With the Sunset xDSL, all you need to do is press a power button, connect to your circuit, and read the display. In this one-button acceptance test, the set emulates a modem and turns up a link with the far end. It then automatically displays the rate and margin information for your review. Additional troubleshooting capability helps you when the modem fails or when the rate/margin readings are unsatisfactory, but in most cases, you are in and out quickly. You can also add a second step to this test by pinging the far end gateway router to verify completion of virtual circuit provisioning.

```

15:34:00
>LINK UP
>
LINK TURN-UP RESULTS
[DOWNSTREAM]      [UPSTREAM]
FAST :384 kbps    FAST :384 kbps
INTER:0 kbps     INTER:0 kbps
MAX :1280 kbps   MAX :650 kbps
MARGN:18.5 dB    MARGN:17.0 dB
ATTEN:59.0 dB   ATTEN:31.5 dB
POWER:16.5 dBm  POWER:12.0 dBm
CAP :30 %       CAP :59 %
ATU-C MER: ALCATEL
ATU-C VER: 2.1

```



```

15:36:39
>LINK UP
ST:15:34:36      ET:00:01:53
LOCAL IP:207.181.199.178
DEST IP:194.226.056.060
PING TEST
PING OK
STOP

```

Sunrise Telecom gives you the world's first handheld test set with plug-in software module, plug-in memory expansion card, and plug-in hardware modules. You assemble just the capabilities you want with unparalleled flexibility. Your test set investment endures the test of time with the ability to upgrade to new technologies as they evolve. For software upgrades, all you need to do is order a new software option. You'll then receive a new software card with an enclosed, self-addressed envelope. Simply enclose the old one and mail it back. For memory intensive applications, you can order the accompanying memory module. For new test modules that meet your latest requirements, simply order the desired plug-in module. You can quickly install the new module or card yourself without sending your test set back to the factory for an expensive and time-consuming retrofit. The extra test modules remain securely inside their storage cases in the accompanying carry case. Your total test equipment investment goes down with a wider variety of test technologies in a small, cost-effective platform. A common user interface simplifies testing, too.

With the SunSet xDSL, you can upgrade your software or system memory by swapping out a software card or memory card.



## Unprecedented Modularity in Software, Memory, Hardware



A growing family of plug-in modules provides a wide variety of modem emulation and test capabilities.



A full set of chassis, software options, Test Modules, and accessories ensure that you have everything you need to get your testing accomplished.



Even the battery is modular. A separate battery compartment makes it simple to upgrade your test set in the field without tools and without damaging the sensitive components in the interior of the set. You can even carry a spare battery for remote applications.



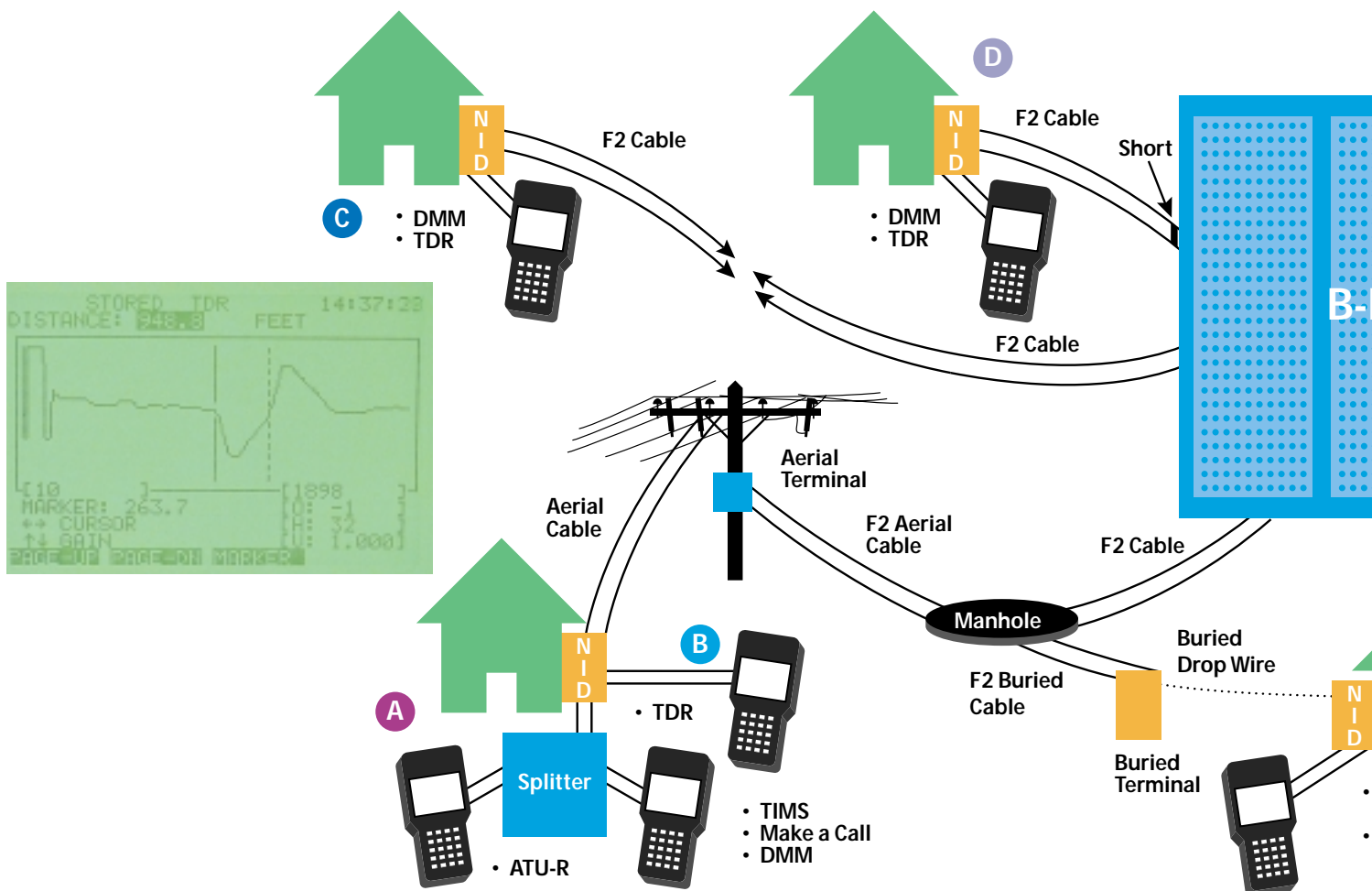
**A** At this house, the modem turned up fine, but the customer complained the circuit wouldn't let one of their phones dial. The VF TIMS drew dial tone and placed a call. A further check with the DMM showed tip/ring reversal. Reversing the inside wire at the NID fixed the problem.

**B** This circuit worked fine for voice but wouldn't turn up the modem at the data jack or the NID. The TDR showed the problem— a 400 foot (120 m) bridge tap was located just 200 feet (60 m) from the house.

**C** Service didn't turn up at this house either. First there was modem failure. A check with the DMM showed no battery voltage, indicating a possible open circuit. The diagnosis was confirmed by shooting the TDR and finding the distance to the open was much shorter than the distance to the central office.

**D** Tip and ring were accidentally shorted at the B-Box. After noting modem failure, the DMM showed no battery and the TDR showed a short about the same distance away as the B-Box. Within minutes, the short was lifted, the circuit tested clean, and service was up.

## Troubleshooting Problems on the Local Loop

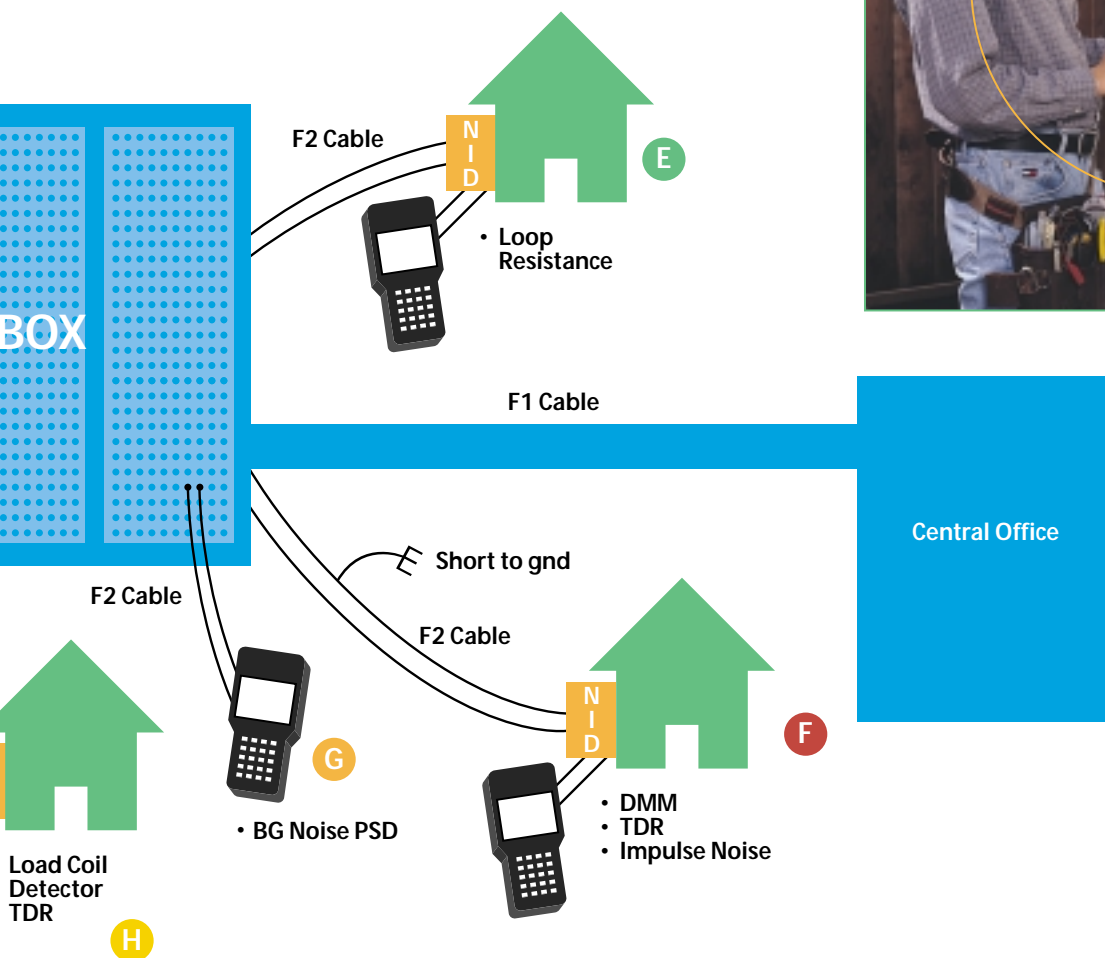


**E** This technician wanted to determine the loop length from the customer premises. So he called up the CO to place a hard metallic short on the line and used the loop resistance measurement to automatically calculate loop length. It was within specifications.

**F** This location was close to the central office and its circuit carried dial tone, but the modem would not synchronize. The DMM showed a short to ground on the tip lead, which has created a circuit imbalance that eliminates the high-frequency modem tones. A high impulse noise measurement also seemed to indicate a bad splice.

**G** What a noisy binder group on the feeder cable from the central office. A check at the B-box shows T1 and HDSL disturbers present on this cable pair.

**H** Why are there so many ways for a circuit to fail? Another modem failure at this home. But the technician remembered hearing that some load coils may be loaded on plant in this area. Sure enough, the load coil detector verified a coil was present. The TDR provided him distance to the coil, which led him to the nearby manhole for its removal.



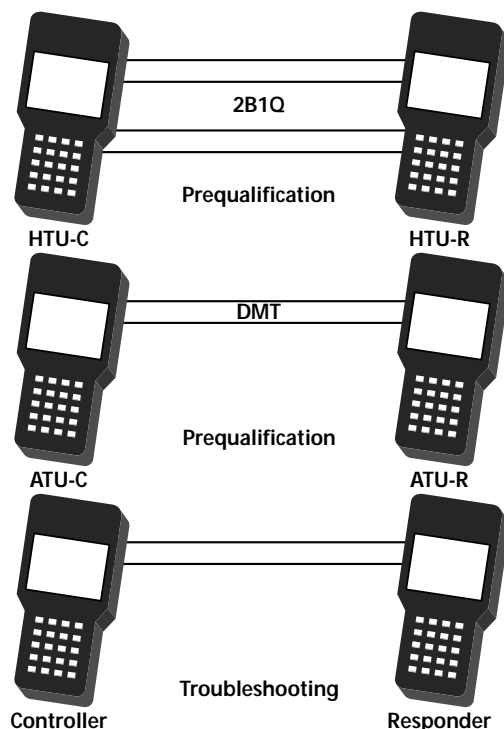
## Central office applications

The SunSet xDSL streamlines your central office operations as well. Modem emulation towards the customer premises lets the CO technician prequalify office wiring and span cable without the need of a working DSLAM and its remote system operator. Modem emulation towards the DSLAM provides a quick check of office wiring when installing new jumpers and troubleshooting failed turn ups.

# A Wide Variety of Test Applications for Today's Services

Physical layer testing is every bit as useful to pinpoint faults in the office as it is in the field. With today's multiple tenant central offices, the telephone company with binder group ownership can bridge onto other companies' modems and verify that these signals are within spectral masks. This non-intrusive measurement can be a useful check to ensure spectral compatibility among various neighbors.

Dual Ended Testing



## Dual-ended testing applications

The SunSet xDSL gives you three basic activities in dual ended testing modes. You can prequalify cable using the test set's modem emulation capabilities. This allows you to predict the cable pair's real rate and noise margin. Prequalification can help you systematize cable clean-up activities prior to installing service.

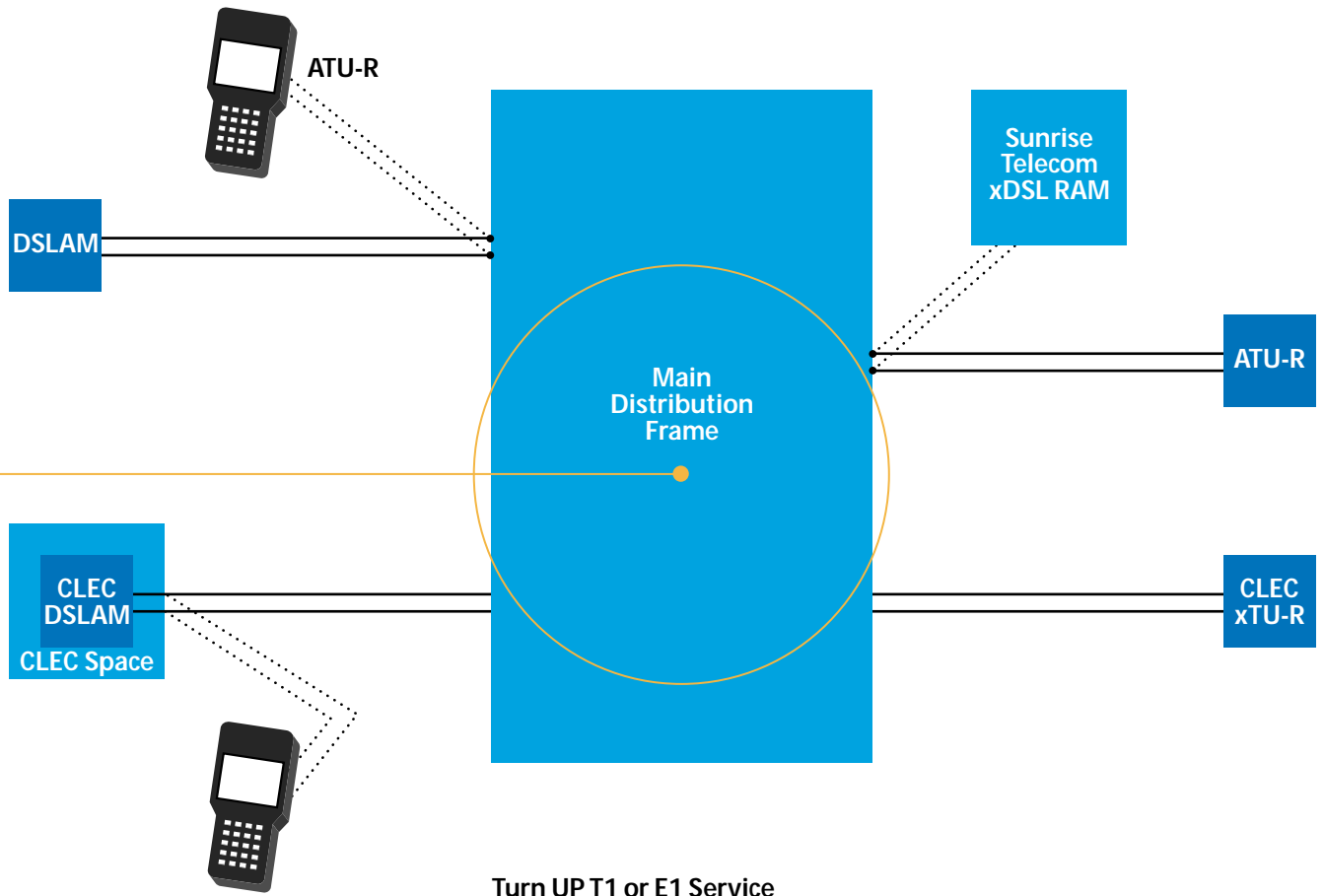
The test sets also provide an independent controller/responder transmission measurement capability. You can get a spectrum of results in the controller/responder mode at significantly greater distances than is possible with actual modems, including frequency response, background noise, and signal to background noise. Many automated tests are available for the popular DSL line codes such as HDSL, ADSL, IDSL, CAP, and others. Another convenient feature is the ability of one set to place a short on the line for the other so that a simple loop resistance measurement can be made. You can then verify conformance to the technology's maximum allowable loop resistance.

## T1 or E1 testing with HDSL, too

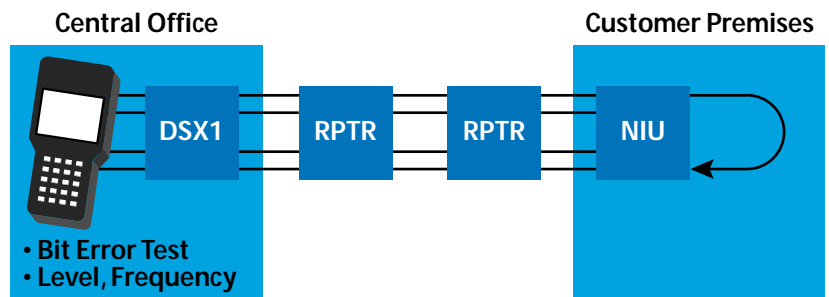
Turning the SunSet xDSL into a DS1 test set requires only an extra module. You can loop up a circuit, measure the bit error performance with a variety of test patterns, measure level, check for frequency synchronization, check for alarms and other errors, and perform other common tests. The module includes a built-in HDSL modem, for additional functionality and troubleshooting capability.



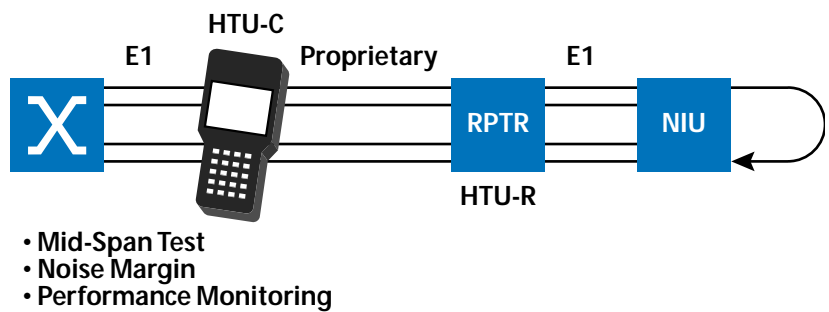
**Problems at the Central Office**



**Turn UP T1 or E1 Service**



**Troubleshooting HDSL Transmission Problems**



## A Simple Yet Powerful Test Set



These indicators show battery charging from AC charging and give an early warning of battery failure.

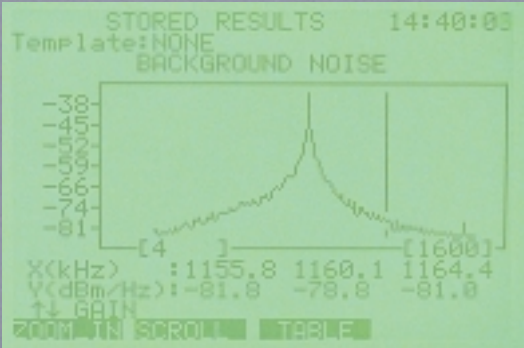
LED indicators quickly show you test set status – which test function is active, status of the line under test, error and synchronization indications.

The module measurements are made through this jack.

A large display moves you through test operations easily and quickly.

Function keys allow fast selection of desired items applicable to the function at hand.

Simple key presses take you directly to the main test functions of the test set.



## Service & Support

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Sunrise Telecom is proud to give its customers excellent service and support. Technical assistance is available from local representatives in over 70 countries, from factory experts, on the Internet, and via Sunrise's toll-free customer support line.

Contact Sunrise Telecom to find your local Sales Representative or Distributor and discover how the SunSet xSDL can solve your testing needs.

### Accessories

Several SunSet xDSL accessories are available for specific testing requirements. Ask your representative for ordering information and additional specifications.

### Order Direct

toll-free order hotline 1 888 242 7077 (US/Canada only)  
fax hotline 408 360 1958  
order@sunrisetelecom.com

### Customer Support

1 800 701 5208 (US/Canada only)  
1 408 360 2200 (International)

### e-mail

support@sunrisetelecom.com

### Visit our web site

www.sunrisetelecom.com



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