SUNRISE TELECOM BROADBAND

CaLan 3010/2010
SIGNAL/SWEEP MEASUREMENT SYSTEM

Time proven products for maintaining the networks of today and tomorrow.

Whether for routine maintenance or new interactive network installations, CaLan products offer a range of solutions. These products cover the entire 5 MHz to 1 GHz frequency range with exceptional speed – 60 channels of visual and aural carriers in less than 2 seconds.

MEASUREMENTS	2010B	3010B*	3010R*	3010H	3010H** Opt 050	3010H** Opt 052
Carrier						
Channel Scan						
w/four channel plans	•	•	•	•	•	•
Four Channel	•	•	•	•	•	•
Single Channel	•	•	•	•	•	•
Variable Dwell Time	•	•	•	•	•	•
Average Digital Power	•	•	•	•	•	•
TDMA Power	•	•	•	•	•	•
24 Hour Test w/Sleep Model	•	•	•	•	•	•
Spectrum Scan	•	•	•	•	•	•
Distortion						
C/N	•	•	•	•	•	•
Hum	•	•	•	•	•	•
Ingress						
Return Path Spectrum Display	•	•	•	•	•	•
Detection			•	•	•	•
Monitoring:			•	•	•	•
Burst Count			•	•	•	•
Average Noise Power			•	•	•	•
Spectrum Monitor			•	•	•	•
Sweep						
Agile Telemetry Pilot		•	•	•	•	•
Forward Sweep Receive		•	•	•	•	•
Forward Sweep Transmit			Opt 052		•	•
Return Path Sweep			•	•		•
Data Management						
Data Storage - 90 Files	•	•	•	•	•	•
FCC Reporting	•	•	•	•	•	•
Sleep Mode	•	•	•	•	•	•
Graphic File Storage	•	•	•	•	•	•
RS-232 Data Communications	•	•	•	•	•	•
Parallel Printer Port	•	•	•	•	•	•
Printer Support	•	•	•	•	•	•

* Backwards compatible with 1777
**Backwards compatible with 1776
3010R and 3010H have interchangeable functionality

3010H
This rack mounted headend unit supports up to ten field instruments simultaneously in a return path mode, and an unlimited number of field units as a forward sweep transmitter (Option 050). These functions may be dedicated or combined to allow forward and return sweep in a single unit (Option 052).

3010R
This portable field instrument includes forward sweep, return sweep and SLM capabilities. The 3010R can also function as a headend unit for troubleshooting intermittent problems in specific network segments. These functions may be dedicated or combined to allow forward and return sweep in a single unit (Option 052).

3010B
This portable field instrument with forward sweep and SLM capability can also receive ingress data transmitted by the 3010H.

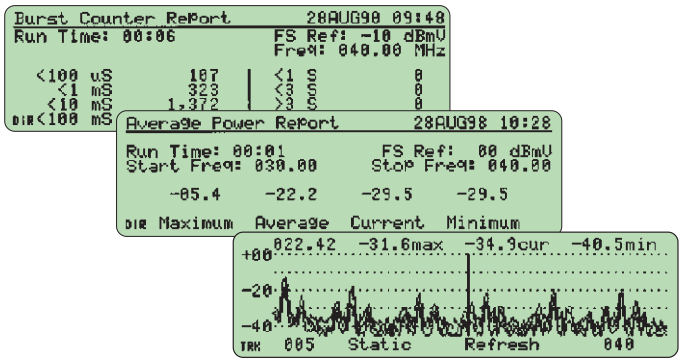
2010B
This SLM offers built-in comparison and analysis capability as well as the standard signal level measurements. It can also receive ingress data transmitted by the 3010H.

Cost-Effective Signal-Level Measurement

The portable, rugged 2010B SLM Plus provides an affordable, entry-level option for customers. Measurements include carrier amplitude, digital channel power, carrier-to-noise ratio, and hum. The four-channel adjustment mode allows technicians to view four channels at a glance, for a quick, system-wide check of the lowest, highest and AGC pilot frequencies.

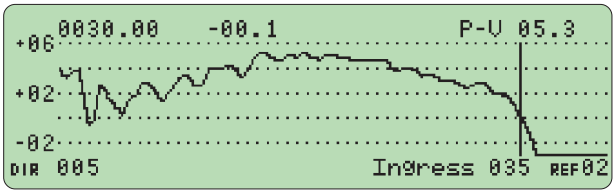
Ingress Measurements

The 3010R and 3010H now include three unique ingress measurements for ongoing monitoring of burst noise, integrated average noise power in the presence of active TDMA carriers, and spectrum scan. The results of these measurements can be exported via the serial port, or stored in internal history files for review and historical performance comparisons.



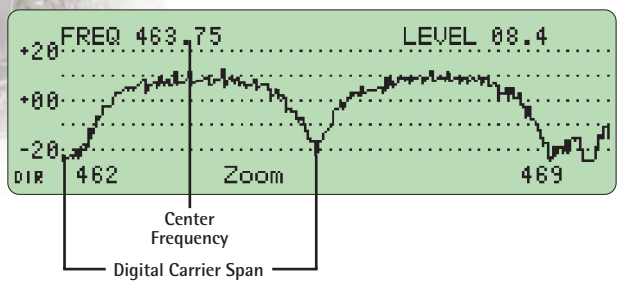
Return Path Alignment and Ingress Detection

The 3010H headend unit monitors communication with field units. When ingress interrupts communication, the 3010H instantly detects the problem and transmits a "picture" of the ingress via the forward data pilot that can be viewed on any field unit (2010B/3010B/3010R). This remote capability ensures that field personnel have immediate access to the information required to isolate problems, without the need to call for help or leave the site. The result is faster problem resolution and more efficient use of field resources.



Digital Power Measurement

Digital signals cannot be measured with conventional methods used for video carriers because their power is spread over a band unique to each form of digital signal. CaLan products incorporate a digital signal measurement capability – technicians need only enter the center frequency, span and format for each digital signals in the unit's channel table. The family also provides accurate average power measurement for return path TDMA (bursted) carriers.

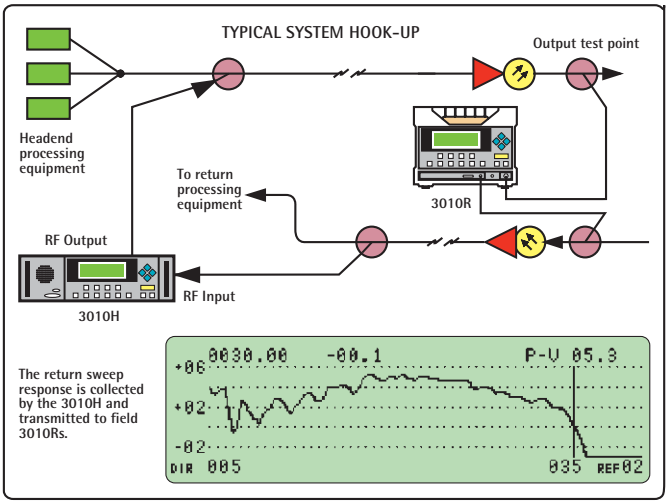


Digital signal power is the total average power over a channel bandwidth around its center frequency. The 3010R, 3010H, 3010B and 2010B can adapt to the unique bandwidth power characteristics of digital signals to make measurements as simple as reading a number on the display.

Return Sweep (3010R/3010H)

Return path maintenance is critical to optimizing systems for two-way services. The 3010R and 3010H incorporate DigiSweep technology, the industry's fastest, high resolution, digital services compatible sweep. DigiSweep's five-microsecond sweep pulses allow placement close to digital signals without interference. DigiSweep technology is compatible with cable modems, telephony, interactive TV, digital music services and Internet communications.

An easy-to-use insertion point (IP) automatically adjusts the sweep source level to compensate for varying test point losses. This, and other key features, allows accurate return path alignment in a matter of minutes.



DUAL PATH CAPABILITIES

The dual path option for the 3010H enables the same headend unit to perform both forward and return path testing, increasing bandwidth usage efficiency while saving valuable headend space and lowering test equipment costs. The headend unit (3010H with Option 052) cycles through transmission of a sweep signal on the forward path and monitoring of the signals on the return path. This cycle permits multiple field units to perform both forward and return sweep at the same time.

For applications that only require forward sweep, operators can utilize the 3010B and 3010H with Option 050, while still supporting future upgrades. This solution offers all SLM capabilities, with the addition of forward sweep and a telemetry pilot that can be adjusted to changing system requirements.

ORDERING INFORMATION

85960B **CaLan 2010B SLM plus -** SLM with comparison and analysis capability and ingress data display (transmitted by the 3010H).

85961B **CaLan 3010B Sweep/SLM plus** - SLM with forward sweep and ingress data display (transmitted by the 3010H).

85962A **CaLan 3010R Sweep/Ingress Analyzer** SLM with forward sweep, return sweep and ingress data display (transmitted by the 3010H).

(All 3 models include: Charger with Power Cord, English manual, StarData Software, 9-pin to 9-pin Data Cable, 25-pin to 9-pin adaptor, return path video tape, and Padded bag with carabineer and strap)

Options

85960B-114	50 Ohm Type N RF input for 2010B only
8596xx-020	Fiber-optic power meter
85962A-52	Dual path sweep for 3010R only

Accessories

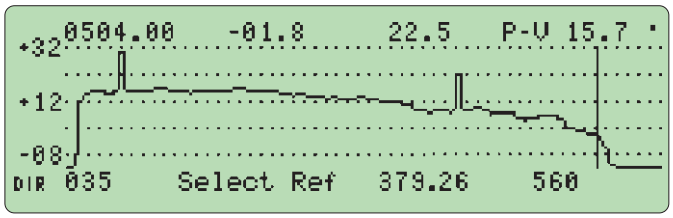
SB101	Replacement padded carrying case
SB102	RS-232 cable for 2010B, 3010B, 3010R & 3010H
SB103	Cloning cable for 2010B, 3010B, & 3010R
SB110-002	12Vdc/1.9AH Battery Pack
SB110-003	12Vdc/6.5AH battery pack with case
SB150-021	Fiber ST connector adapter cap
SB150-022	Fiber Biconic connector adapter cap
SB150-023	Fiber FC connector adapter cap
SB150-024	Fiber D4 connector adapter cap
SB150-025	Fiber RM connector adapter cap
SB150-026	Bare fiber adapter
SB150-027	Bare fiber adapter kit
SB150-028	Fiber SC connector adapter cap
SB160-903	Replacement Power Cord US

Upgrades

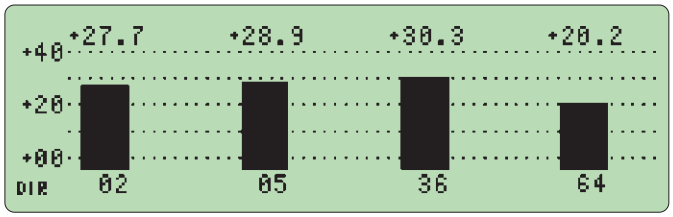
85960U-R02	2010-to-3010B upgrade
85960U-R03	2010-to 3010R upgrade
85960U-R04	2010B-to-3010B upgrade
85960U-R05	2010B-to-3010R upgrade
85960U-R12	2010-to-3010R with dual path sweep
85960U-R13	2010B-to-3010R with dual path sweep
85960U-R20	2010B Fiber-optic power meter upgrade
85960U-R40	2010B Shielded Case & software upgrade

Data Storage

The 2010/3010 products can store up to 90 history files in any one of six formats: level measurements, normalized channel scan traces, sweep traces, spectrum scan traces, return spectrum traces (3010R and 3010H only) and ingress measurement results. Each file includes time and date stamps with a 40-character, user-defined label. In addition, the 3010 products hold 12 special references for use in the normalized sweep mode, four sweep tables and four frequency plans.



The forward sweep display on the 3010R shows both AGC pilots and DigiSweep signals.



In this four channel display, channel 64 is a digital channel. Its average power level is automatically based on the signal's center frequency and bandwidth, yet it is displayed with the same accuracy as the other analog carriers.

85961U-R02	3010-to-3010R upgrade
85961U-R03	3010B-to-3010R upgrade
85961U-R11	3010B-to-3010B with fast sweep and TDMA
85961U-R12	3010-to-3010R with dual path sweep
85961U-R13	3010B-to-3010R with dual path sweep
85961U-R20	3010R Fiber-optic power meter upgrade
85962U-R11	3010R-to-3010R with ingress measurements
85962U-R12	3010R-to-3010R with dual path sweep
85962U-R20	3010R Fiber-optic power meter upgrade

85963A **3010H CaLan Sweep/Ingress Analyzer -** Rack mounted headend SLM for up to ten 2010s or 3010s simultaneously

Options

85963A-050	Forward sweep transmitter only (opt 050)
85963A-052	Dual path sweep (option 052)

Accessories

SB102	RS-232 cable for 2010B, 3010B, 3010R & 3010H

Upgrades

85963U-R11	3010H-to-3010H with Ingress measurements
85963U-R12	3010H-to-3010H with dual path sweep

Calibration Options for all units

8596xx-W32	2010/3010 3-Year Calibration Program
8596xx-W52	2010/3010 5-Year Calibration Program

Warranty for all units

8596xx-W30	2010/3010 3-Year Extended Warranty (Add 2 years for total 3 years)

Note: Replace xx with corresponding product codes:

0B for 85960B CaLan 2010B **1B** for 85961B CaLan 3010B
2A for 85962A CaLan 3010R **3A** for 85963A CaLan 3010H

CaLan 3010 / 2010 Signal/Sweep Measurement System

SPECIFICATIONS

SWEEP SOURCE AMPLITUDE ACCURACY*

Output Range: +10 dBmV to +50 dBmV in 1 dB steps
Absolute Accuracy: ±1.5 dB
Relative Accuracy: ±1 dB
Harmonic Output: <-30 dBc, 5 to 10 MHz; <-35 dBc, 10 to 1000 MHz
Spurious Output: <-30 dBc
Source Output Return Loss: >15 dB
Source Blanking During Sweep: >60 dBc

SWEEP CHARACTERISTICS*

Sweep Frequency Range: 5 MHz to 1 GHz
Sweep Width: Continuously variable
Frequency Resolution: 222 to 401 data points
Sweep Time: Sweep table dependent 650 msec (typical)

DATA TRANSMISSION PILOT CHARACTERISTICS*

Range: 5 MHz - 1 GHz
Programmable Resolution: 10 kHz
Data Carrier Modulation Bandwidth: -30 dBc <750 kHz, -50 dBc <1.8 MHz
Proximity of Equal Amplitude CW Carrier Without Communications Interruption: <300 kHz

MEASUREMENT SPECIFICATIONS

Digital Signal Power Levels Formats: QAM, QPR (DMX), QPSK, and VSB, bursted
Amplitude Accuracy: ±1.5 dB (typical)
TDMA Measurement Range
- **Burst width:** >50 µ sec
- **Burst repetition rate:** <1.5 sec

Frequency
- **Range:** 5 MHz to 1 GHz
- **Source Accuracy:** ±25 kHz
- **Resolution:** 10 kHz
- **Tuning Configuration:** Standard, off the air, HRC, IRC, PAL, SECAM, user-defined
- **IF bandwidth:** 230 kHz
- **Video bandwidth 300 kHz, automatic 10 Hz C/N**

Amplitude Accuracy For Sweep and Carrier Measurements
- **Range:** +70 to -45 dBmV
- **Typical Accuracy:** ±1.0 dB
- **Calibrator:** ±0.25 dB at 113.36 MHz, ±0.2 MHz
- **Frequency Flatness:** ±0.5 dB
- **Internal Preamp On:** ±1.0 dB
- **Attenuator:** ±0.5 dB
- **Log Linearity:** ±0.5 dB
- **Resolution:** 0.1 dB
- **Input Impedance:** 75 ohm
- **Input Match:** 0 dB attenuation, >14 dB; all other settings, >20 dB

MEASUREMENT SPECIFICATIONS (cont'd)

Ingress Measurements
- **Burst Count**
- **Minimum Burst Width:** <30 µSec
- **Capture Ranges:** < 100 µSec - < 1 Sec
- Sec in decades, < 3 Sec and > 3 Sec
- **Average Noise Power**
- **Maximum TDMA Pulse Width Not Captured:** >500 mSec

Hum
- **Range:** 0.5 to 5%
- **Resolution:** 0.1%
- **Accuracy:** ±0.2%, ±30% of reading

Carrier-to-Noise Ratio
- **Range:** 50 dB
- **Accuracy:** ±2 dB
- **Repeatability:** ±1 dB

Fiber Optic Power Meter Option (2010B, 3010B, 3010R)
- **Wavelength:** 1310 and 1550 nm
- **Measurement Range:** +20 to -38 dBm, 1310 nm; +18 to -38 dBm, 1550 nm
- **Resolution:** 0.1 dB
- **Accuracy:** ±5%
- **Display:** dB, dBm, nW, mW
- **Connector Styles:** ST, FC, SC, biconic, D4, SMA, or bare fiber, rotary splice, RM

GENERAL

Internal Memory For:
- **Data and Graphics Files:** Up to 90
- **Channel Plans:** 4
- **Reference Traces:** 12 (3010B, R, H only)
- **Sweep Table:** 4 (3010B, R, H only)

Printer Output of Screen Display: Parallel and RS-232
Temperature
- **Operating**
  - **2010B, 3010B, 3010R:** -20°C to +55°C
  - **3010H:** 0°C to +55°C
- **Storage:** -20°C to +70°C

Size
- **2010B, 3010B, 3010R:** 10.5"h x 12.5"w x 4.75"d
- **3010H:** 5.25"h x 19"w x 11.5"d

Weight
- **2010B, 3010B, 3010R:** 10.7 lb with battery
- **3010H:** 9.5 lb

Power
- **2010B, 3010B, 3010R:** +10 to +15 Vdc, 550 mA max
- **3010H:** 90 VAC to 264 VAC, 47 to 63 Hz 20 VA max

Display
- **Area:** 5.0 in x 1.33 in
- **Resolution:** 240 x 64 pixels
- **Type:** LCD with EL back light

Specifications subject to change without notice.

* Applies only to 3010R and 3010H

U.S. Office
Sunrise Telecom Broadband, Inc.
1-770-446-6086

North America Toll-Free: 1-800-297-9726
www.sunrisetelecom.com
Email: catv@sunrisetelecom.com

Canada & International Office
Sunrise Telecom Broadband Corp.
1-514-725-6652

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