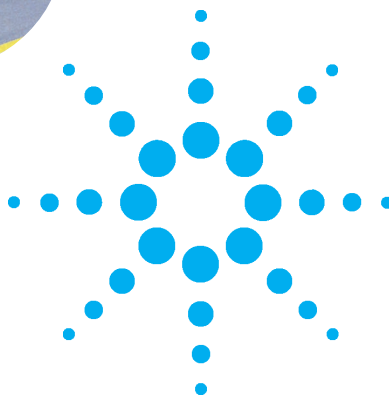




CaLan 3010/2010 Test Equipment

Install, Maintain and Troubleshoot Your
Interactive Broadband Cable Networks



Agilent Technologies
Innovating the HP Way

Improve Field Productivity and Increase Customer Satisfaction with Flexible, Integrated Agilent Solutions for Installing, Maintaining and Troubleshooting Interactive Broadband Networks

CaLan Solutions

Agilent's family of CaLan outside plant test products and options provides broadband network operators with flexible solutions for testing and monitoring the infrastructure used to deliver interactive services over cable systems.

CaLan products are designed to support a complete range of remote and field maintenance activities, from forward and return path alignment, to signal measurement, to ingress troubleshooting.

CaLan DigiSweep technology ensures fast and accurate sweep measurements, while integration with industry-leading monitoring systems supports transparent communication between portable and embedded test equipment.

Supporting Interactive Broadband Network Services

Broadband network operators face increasing competitive and market pressure to deploy new two-way digital, data and voice services, and to maintain high levels of satisfaction among these new customers. Network operations and field maintenance personnel are being called on to expand their role in ensuring that existing outside plant and equipment meet this maintenance challenge.

Outside Plant Test Products

Agilent's family of CaLan outside plant test products simplifies and speeds key field test functions such as signal level and digital carrier measurement, forward and return path alignment, and ingress detection and analysis, which are critical to successful delivery of Internet access, telephony and interactive video services. CaLan outside plant test products offer a wide range of solutions, from standalone, rugged field portable test and troubleshooting instruments to headend control units for automated, remote testing.

Maximize Your Budget

Operators can select from a variety of options to configure equipment for the specific requirements of their field maintenance force, maximizing the return on their test equipment budget. Many CaLan products can

also be easily upgraded, protecting testing and training investments, as needs expand in the future. Base level SLM or forward-only sweep instruments, for example, can be upgraded to support forward/return sweep and ingress testing. All products can be set up to measure the power levels for digital modulated carriers.

Network Monitoring Solutions

CaLan products are also leading the way in integrated system maintenance, allowing operators to combine use of CaLan's field instruments with network monitoring systems. Agilent's AccessCable monitoring solution and Cheetah Technologies' Phasor system use the CaLan 3010H and 3010R products in integrated solutions that enable field maintenance technicians and system control center operators to remotely request ingress measurements on specific nodes, and view spectrum analysis and return path test results, to isolate and solve problems such as return path interference.

World Leading Supplier

Agilent is the world's leading supplier of broadband test and measurement equipment. CaLan products ensure that Agilent's superior performance, quality and reliability are available and affordable for broadband system operators.

Complete Installation, Troubleshooting and Maintenance Support

Whether for routine maintenance or new interactive network installations, CaLan product 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.



Agilent's family of CaLan outside plant test products includes:

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.

3010B A portable field instrument with forward sweep and SLM capability. It 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.

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

* Backwards compatible with 1777

** Backwards compatible with 1776

3010R and 3010H have interchangeable functionality

State of the Art Features

CaLan outside plant test products offer a variety of unique features that enable operators to qualify cable plant for support of interactive services, and quickly identify and resolve plant issues which can interfere with upstream and downstream communications.



Industry Leading Sweep Time

Interference to system carriers is directly proportional to the time the interference is present. CaLan products reduce sweep update time for a typical 750 MHz system to 650 milliseconds, while their 5 μ second sweep pulse minimizes interference potential.

Slope and offset control of sweep references allows sweeping of trunk and bridger amplifiers and line extenders from a single reference, automatically eliminating the need for true-tilt networks and providing time savings on each field operation.

Cost-Effective Signal-Level Measurement

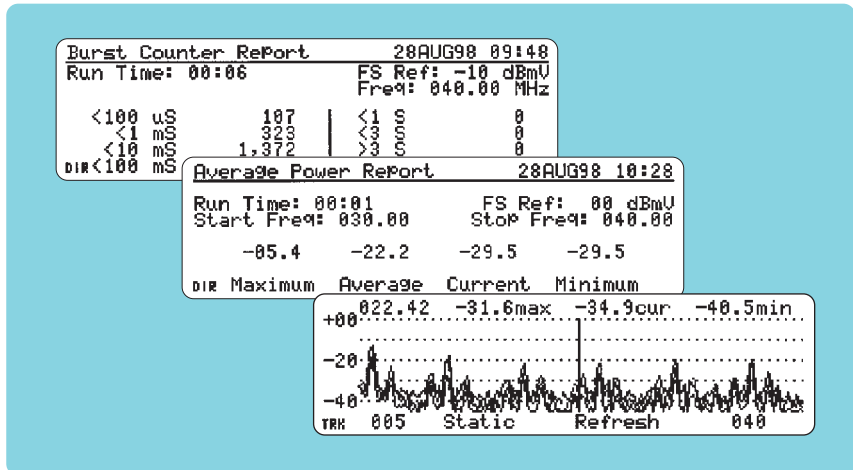
The portable, rugged 2010B SLM Plus provides an affordable, entry-level option for Agilent customers. Simple, one-button tests include carrier amplitude, digital channel power, carrier-to-noise ratio, and hum. The four-channel adjustment mode allows technicians to view four channels at a glance, for 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.

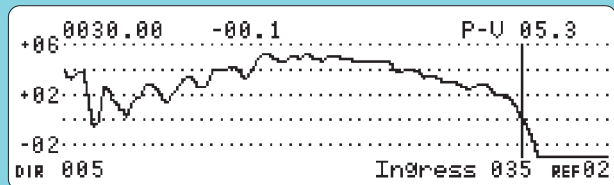
Return Path Alignment and Ingress Detection

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.



Return Path Alignment and Ingress Detection

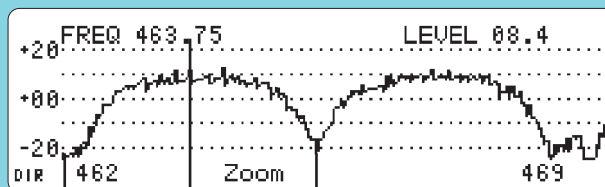
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The 3010R display alerts you to ingress. A menu message warns you that the data was corrupted by system ingress. Pressing the F3 function key activates the ingress troubleshooting display.

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 (burst) carriers.



Center Frequency
Digital Carrier Span

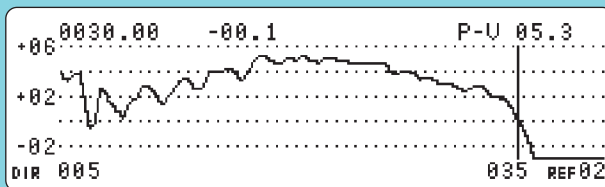
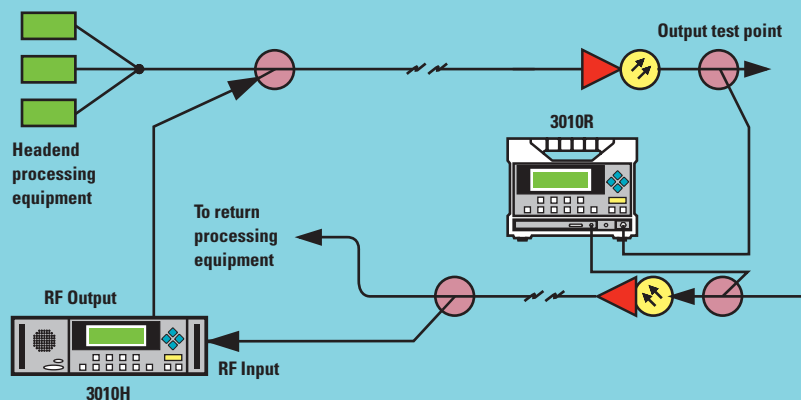
Digital signal power is the total average power over a channel bandwidth around its center frequency. The HP CaLan 3010R, 3010H, 3010B and 2010B can adapt to the unique bandwidth power characteristics of QAM, QPR (DMX), QPSK, and VSB digital formats to make measurements as simple as reading a number 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, allow accurate return path alignment in a matter of minutes.

Typical System Hook-Up



The return sweep response is collected by the 3010H and transmitted to field 3010Rs.

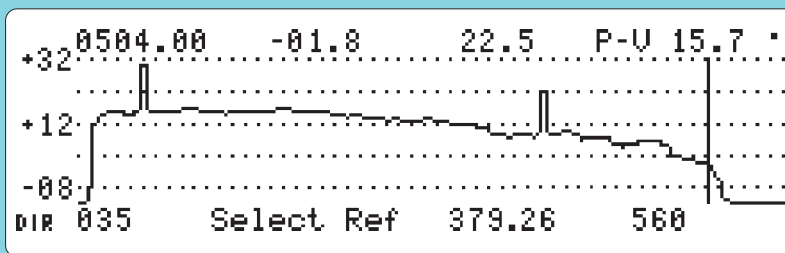
Increase Efficiency with Dual Path Capabilities

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.

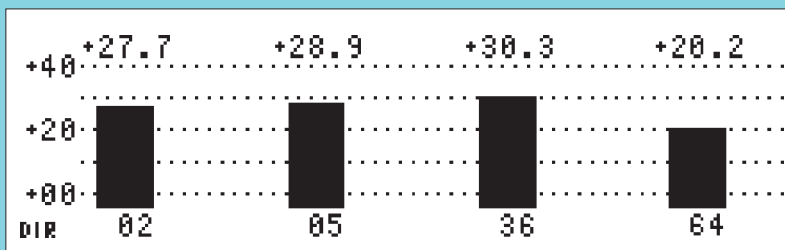
For applications that only require forward sweep, operators can utilize the 3010B and 3010H with Option 050, while still supporting future upgrades. This solution offers all SLM capabilities, with the addition of forward sweep and a telemetry pilot that can be adjusted to changing system requirements.

Data Storage

All CaLan 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.

Data Analysis

Optional CATV data management software (Option 031) automates transfer and facilitates long-term storage of measurement data. Direct data transfer saves time, simplifies report generation and analysis, and helps maintain the integrity of the data used to track system performance. Option 030 adds FCC compliance reporting. PC demonstration versions of the software are available for download from the Agilent CATV Web site at <http://www.agilent.com/comms/catv>.

Data and Screen Exports

BenchLink spectrum analyzer software (option B70) enables the transfer of bit mapped display screens and stored trace data over RS-232 to Windows PCs, via a standard RS-232 connection. Captured traces and screens can be cut and pasted to standard Windows applications, and trace data can be exported to common spreadsheet applications. Demonstration and evaluation copies of the software can be downloaded from the Agilent Web site at <http://www.agilent.com/comms/BenchLinksa>.

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, burst

Amplitude Accuracy: ± 1.5 dB (typical)

TDMA Measurement Range

Burst width: > 50 μ sec
Burst repetition rate: < 1.5 sec

Frequency

Range: MHz to 1 GHz
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 μ Sec
Capture Ranges: < 100 μ Sec - < 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: $\pm 0.2\%$, $\pm 30\%$ 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: $\pm 5\%$
Display: dB, dBm, nW, μ W, nW
Connector Styles: ST, FC, 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 $+55^{\circ}\text{C}$
3010H: 0°C to $+55^{\circ}\text{C}$
Storage: -20°C to $+70^{\circ}\text{C}$

Size

2010B, 3010B, 3010R: 12.5"h x 19"w x 3.75"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

* Applies only to 3010R and 3010H

Ordering Information

OPTIONS

Agilent 85960B - 2010B SLM Plus Options

Option 020: Fiber-Optic Power Meter
Option 030: Cable TV Data Management Software w/FCC Reporting
Option 031: Cable TV Data Management Software
Option 043: Computer Cable
Option 044: Cloning Cable
Option 045: Strand Hook Adapter
Option B70: BenchLink Spectrum Analyzer Software
Option H14: 50 ohm Type N RF Input w/ Measurements in dBm
Option H18: +18 / +13 VDC Internal Source for LMDS Power

Agilent 85961B - 3010B Sweep/SLM Plus Options

Option 020: Fiber-Optic Power Meter
Option 030: Cable TV Data Management Software w/FCC Reporting
Option 031: Cable TV Data Management Software
Option 043: Computer Cable
Option 044: Cloning Cable
Option 045: Strand Hook Adapter
Option B70: BenchLink Spectrum Analyzer Software

Agilent 85962A - 3010R

Sweep/Ingress Analyzer Options

Option 020: Fiber-Optic Power Meter
Option 030: Cable TV Data Management Software w/FCC Reporting
Option 031: Cable TV Data Management Software
Option 043: Computer Cable
Option 044: Cloning Cable
Option 045: Strand Hook Adapter
Option 052: Dual Path Sweep
Option B70: BenchLink Spectrum Analyzer Software

Agilent 85963A - 3010H

Sweep/Ingress Analyzer Options

Option 030: Cable TV Data Management Software w/FCC Reporting
Option 031: Cable TV Data Management Software
Option 043: Computer Cable
Option 050: Forward Sweep Transmitter (1777 replacement)
Option 052: Dual Path Sweep
Option B70: BenchLink Spectrum Analyzer Software

For Upgrade Ordering Information see page 8.

Related Products



accessCable

Agilent's accessCable system works with CaLan 3010 products to automatically scan and monitor interactive cable networks, identify and report return path problems and support remote troubleshooting and field maintenance.

CaLan Cable TV Data Management Software

This CaLan data management, reporting and storage software simplifies analysis and archiving of data collected by CaLan products. The Windows-based package can help identify system performance trends, highlight potential problems, graph data for easy visual analysis and speed FCC compliance reporting.

Upgrade Ordering Information

Agilent 85960U - 2010B Upgrade Options

- Option R02:** 2010-to-3010B Upgrade
- Option R03:** 2010-to-3010R Upgrade
- Option R04:** 2010B-to-3010B Upgrade
- Option R05:** 2010B-to-3010R Upgrade
- Option R10:** 2010B-to-2010B with Ingress Measurement Upgrade
- Option R12:** 2010-to-3010R with Dual Path Upgrade
- Option R13:** 2010B-to-3010R with Dual Path Upgrade

Agilent 85961U - 3010B Upgrade Options

- Option R02:** 3010-to-3010R Upgrade
- Option R03:** 3010B-to-3010R Upgrade
- Option R11:** 3010B-to-3010B with Faster Sweep Upgrade
- Option R12:** 3010-to-3010R with Dual Path Upgrade
- Option R13:** 3010B-to-3010R with Dual Path Upgrade

Agilent 85962U - 3010R Upgrade Options

- Option R11:** 3010R-to-3010R with Faster Sweep Upgrade
- Option R12:** 3010R-to-3010R with Dual Path Sweep Upgrade

Agilent 85963U - 3010H Upgrade Options

- Option R11:** 3010H-to-3010H with Faster Sweep Upgrade
- Option R12:** 3010H-to-3010H with Dual Path Sweep Upgrade

For more information about Agilent Technologies test and measurement products, applications, services, and for a current sales office listing, visit our web site: <http://www.agilent.com/find/tmdir>

You can also contact one of the following centers and ask for a test and measurement sales representative.

United States:

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Test and Measurement Call Center
P.O. Box 4026
Englewood, CO 80155-4026
(tel) 1 800 452 4844

Canada:

Agilent Technologies Canada Inc.
5150 Spectrum Way
Mississauga, Ontario
L4W 5G1
(tel) 1 877 894 4414

Europe:

Agilent Technologies
Test & Measurement
European Marketing Organisation
P.O. Box 999
1180 AZ Amstelveen
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(tel) (31 20) 547 9999

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5968-8749E



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