HP CaLan 2010B SLM *Plus*
HP CaLan 3010B Sweep/SLM *Plus*

Product Overview

Easy, accurate carrier analysis

The HP CaLan 2010B SLM *Plus* and 3010B Sweep/SLM *Plus* signal level measurement systems are advanced, easy-to-use amplitude level meters for system maintenance and performance testing. These instruments 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. The built-in digital carrier power measurement feature supports the latest, evolving technologies such as QAM, QPSK, QPR (DMX), and VSB.

More than just a signal level meter

The HP CaLan 2010B and 3010B are also data management systems. They have an RS-232 serial computer interface and support both serial and parallel printers. The automatic testing capability provides you with pass/fail reports and analysis. The SLM *Plus* features unattended 24-hour testing and optional compliance reporting. It is portable, rugged, and economically priced. An optional fiber-optic power meter lets you measure both coax and fiber with a single instrument.

In addition the HP CaLan 3010B includes a sweep receiver for operation with the HP CaLan 1777 or 1777P forward sweep transmitter. This combination gives you high-speed, non-interfering sweep capability for in-service system maintenance and troubleshooting tasks.

Other standard features of the HP CaLan 2010B/3010B include FCC pass/fail reporting and standby power mode to extend battery life for 24-hour testing.

New ingress measurement capability

With the addition of the new ingress measurement capability, the 3010B and 2010B (with Option 010) are compatible with the 3010H sweep/ingress analyzer and are capable of displaying return spectrum data broadcast by the 3010H located in the headend. In addition, when the need arises, both units are upgradable with full return sweep and return ingress capability.

Signal level measurement systems that save you time in the field

Whether you are installing, maintaining, or troubleshooting your cable TV system, the many features and built-in functions of the HP CaLan SLM's give you one-box solutions that save time and effort in the field.

Because the HP CaLan 2010B and 3010B are small and light-weight, they can be carried easily to any location. Long battery life and rugged packaging keep them running even in harsh environments. Large keys on the instrument front panels can be operated easily when you are wearing gloves. And the large, backlit, graphical liquid crystal display is highly readable, even in sunlight.

Very easy operation

The menu-driven user interface is easy to use and requires little training. Built-in, one-button tests include carrier amplitude, carrier-to-noise ratio, and hum. The four-channel-adjustment mode lets you view four channels at a glance, so that you can make a quick, system-wide check of the lowest, highest, and pilot frequencies.

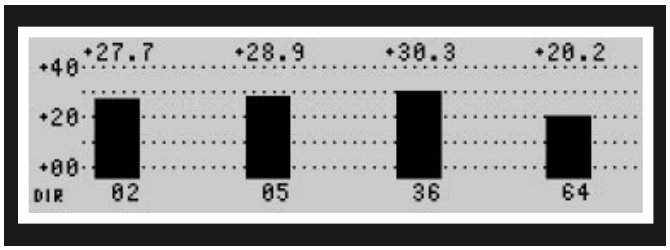
All digital carriers (QPSK, QAM, VSB, etc.) may be included in the channel table and instantly measured along with normal analog video carriers.

Frequency and amplitude markers add measurement flexibility. A spectral display lets you view the entire cable TV spectrum or zoom to a single channel to investigate problems.

HP CaLan introduces DigiSweep technology

DigiSweep is the industry's fastest high-resolution, non-interfering, digital services-compatible sweep. Its five microsecond duration pulses and 401 points of sweep resolution combine to give you the highest-available amplitude accuracy and frequency resolution of any sweep technology.

DigiSweep is compatible with cable modems, telephony, interactive TV, digital music services and Internet communications. Whether you are measuring digital signals now or planning for the future, DigiSweep technology comes standard in all of HP CaLan's sweep gear.



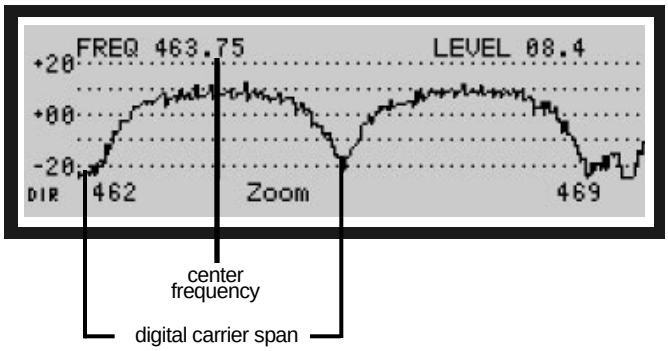
In this four channel display, channel 64 is a digital channel. Its average power level is automatically based on the signal's center frequency and bandwidth, yet it is displayed with the same accuracy as the other analog carriers.

Ample data storage and reporting

The file server memory stores 90 files, which can be retrieved as graphics or data, and four user-definable channel plans. The 3010B stores an additional four sweep tables and 12 sweep reference tables. Screen displays can be sent to a printer via the RS-232 or parallel interface, and formatted reports can be generated with ease.

Automatic measurements

Automatic 24-hour tests include measurements of levels and temperature as well as comparisons of differential levels. For FCC and other compliance testing, the HP CaLan 2010B and 3010B can be used to measure visual signal levels, relative aural signal levels, carrier-to-noise ratio, and hum.



Digital signal power is the total average power over a channel bandwidth around its center frequency. The HP CaLan 2010B and 3010B 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.

Upgradable systems that fit any need

The HP CaLan 2010B is the right choice when your job demands a fast operating, easy-to-use signal level meter. For greater versatility, the HP CaLan 3010B adds an integrated sweep receiver that is compatible with HP CaLan integrated sweep transmitters.

Both units feature modular upgrade capability, allowing you to add performance enhancements that will keep your tester up-to-date. And, if your measurement needs expand, the HP CaLan 2010B can be fully upgraded to an HP CaLan 3010B sweep/SLM *plus* or 3010R sweep/ingress analyzer.

Fiber-optic power meter option

An optional, built-in fiber-optic power meter adds trouble-shooting and maintenance capability for fiber-optic networks. You can test fiber-based systems quickly and accurately using field-interchangeable connectors and dual wavelength (1310 and 1550 nm) operation. Wide optical dynamic range and accurate power measure-ments are displayed on the SLM's in dBm and autoranging (nW, µW, mW).

Sweep capability for preventive maintenance and troubleshooting

The HP CaLan 3010B's built-in sweep receiver measures the sweep from an HP CaLan 1777 or 1777P forward sweep transmitter to create a stable, high-resolution sweep response. This capability allows you to test all or a portion of your cable TV system, so you can identify potential trouble sources before they become time-consuming problems.

Three DigiSweep modes are available:

Integrated sweep references the transmitter and active visual and aural carriers.

Phantom sweep references the transmitter only.

Normalization compares the sweep results at one test location with the stored results from another.

The HP CaLan 3010B/1777 sweep system automatically scans your cable TV system, verifies the location of all carriers, and sets up guard bands around these carriers — thereby protecting them from any sweep interference. In the integrated sweep mode, the swept signal is inserted around the carriers and then detected by the receiver in the field. As the receiver scans the swept signal, it automatically reads the level of the carriers, integrating this measurement with the sweep signal received without interference to any carrier on the system.

With the HP CaLan phantom carrier setup, you have the option of inserting the sweep signal at the outside edge of the channel, thereby eliminating interference on the home TV set. The sweep receiver ignores the active carriers with this technique.

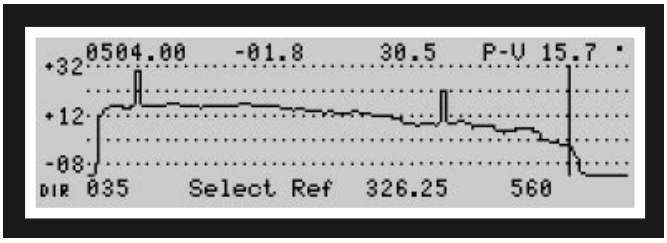
Once the sweep has been inserted at the headend, an absolute reference trace is established at the first trunk amplifier. All other measurements on the system can be normalized to this reference trace. In this way you can make all amplifier gain and tilt adjustments relative to a horizontal line at the center of the display.

If the sweep transmitter is not available, you can use the channel scan mode to measure the frequency response of the network using only the carriers on the system for reference.

The displayed trace of system frequency response is rapidly updated, allowing real-time adjustments of system amplifiers and filters. Digital readouts of the amplitude markers provide excellent resolution of ±0.1 dB.

DigiSweep features include

- 800 ms sweep rate
- 401 sweep data points
- zoom-in capability
- ability to instantly view absolute pilot levels during normalized phantom sweep



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

Performance Specifications

These specifications are for the HP CaLan 2010B SLM Plus and the HP CaLan 3010B Sweep/SLM Plus except where noted.

Frequency

Frequency Range	5 MHz to 1.0 GHz
Frequency Reference Stability	$\pm 5 \times 10^{-6}$ over full temperature range
Marker Frequency Accuracy	
Accuracy	±25 kHz
Resolution	10 kHz
Frequency Span	
Range	0 MHz to 999 MHz
Resolution	1 MHz
Resolution Bandwidth	230 kHz, ±30 kHz
Video Bandwidth	
Typical	300 kHz
Switchable	10 Hz
Internal Calibrator Frequency	113.36 MHz ±0.2 MHz

Amplitude

Amplitude Range	-45 dBmV to 70 dBmV
Maximum Safe Input Level	
Average Continuous Power	+70 dBmV
Peak Pulse Power	+70 dBmV
dc	300 Vdc
Residual Responses	Input terminated and FS Ref: -20 dBmV
5 MHz to 1.0 GHz	<-40 dBmV
Display Range	
Log Scale	0 to -45 dB from reference level is calibrated; 1, 2, 5, 10 dB/div; 4.5 divisions displayed.
Scale Units	dBmV, dBµV
Marker Readout Resolution	0.1 dB
Reference Level	
Range	-40 to +70 dBmV
Resolution	±1 dB
Accuracy	±0.5 dB
Frequency Response	10 dB input attenuation
1 MHz to 1.0 GHz	±0.5 dB
Calibrator Output Amplitude	±0.3 dB
Display Scale Fidelity	
Log Maximum Cumulative;	
0 to -40 dB from reference level	±0.5 dB
Input Return Loss	
0 dB Attenuation	>14 dB
All Other Settings	>20 dB

Cable TV Measurements (These specifications describe warranted performance of the instrument over the operating temperature range.)

Input Configuration	75 Ω replaceable type F female
Channel Selection	Analyzer tunes to specified channels based upon selected tune configuration.
Tune Configuration	Standard, off-the-air, HRC, IRC, PAL, SECAM, User-Defined
Frequency Range	5 to 1000 MHz (channel mode)
Visual Carrier Frequency	
Resolution	10 kHz
Accuracy	±25 kHz
Visual Carrier Level	The peak amplitude of the visual carrier is measured to an absolute standard traceable to the National Institute of Standards and Technology.
Typical Accuracy	±1 dB
Absolute Accuracy	±1.8 dB (ref level >5 dBmV), ±2.3 dB (ref level ≤5 dBmV)
Relative Accuracy	±0.7 dB relative to adjacent channels in frequency ±1.5 dB relative to all other channels (ref level >5 dBmV) ±2.0 dB relative to all other channels (ref level ≤5 dBmV)

Visual-to-Aural Carrier Level Difference	The difference between peak amplitudes of the visual and aural carrier is measured.
Difference Range	0 to 40 dB
Resolution	0.1 dB
Accuracy	±0.7 dB
Digital Channel Power Characteristic	
Maximum Channel Bandwidth	8 MHz
Additional Error	±0.2 dB
Measurement Speed	125 ms / 2 MHz of BW
Hum/Low Frequency Disturbance	Power line frequency and low frequency disturbance measured on modulated and/or unmodulated carriers; may not be valid for scrambled channels.
AM Range	0.5 to 5%
Resolution	0.1%
Accuracy	±0.2%, ±30% of reading
Visual Carrier-to-Noise Ratio (C/N) (See note 1)	
C/N Accuracy	±2 dB for carriers >5 dBmV
Range	50 dBc, 55 dBc with carrier turned off (measured in band)
Repeatability	±1 dB

Forward Sweep Measurements (3010B only)

System amplitude variations are measured relative to a reference trace stored during the setup.

Sweep Setup	
Frequency Range	5 MHz to 1 GHz
Sweep Width	Continuously variable
Minimum Sweep Time	800 ms
Frequency Resolution	222 to 401 data points
Sweep Tables	Four user definable sweep tables of 248 carriers

Fiber-Optic Power Meter Option

Wavelength	1310 and 1550 nm
Measurement Range	
1310 nm	+20 to -38 dBm
1550 nm	+18 to -38 dBm
Resolution	0.1 dB
Accuracy (characteristic)	±5%
Display Units	dB, dBm, nW, µW, mW
Connector Styles	ST, FC, biconic, D4, SMA, bare fiber, rotary splice, RM

General Specifications

Temperature Range	
Operating	-20°C to 55°C
Storage	-20°C to 70°C
Power Requirements	+10 to +15 Vdc, 550 mA max
Battery	
Type	12 V @ 1.9 Ah rechargeable sealed lead acid
Usage Time	4 hours continuous; 12 hours typical intermittent duty
Display	
Area	5.0 in x 1.33 in (127 mm x 34 mm)
Resolution	240 x 64 pixels
Type	LCD with EL backlight
Internal Memory	
Data and Graphic Files	90
Channel Plans	4
Reference Traces	12
Printer Output of Screen Display	Parallel and RS-232

Physical Characteristics

Remote Interface	
RS-232	9 pin subminiature D-shell, female
Parallel Printer Port (PCL compatible)	25 pin subminiature D-shell, female
Weight	
Net	4.9 kg (10.7 lb) with battery
Shipping	8.6 kg (19.0 lb)
Dimensions	H 10.5 in. (267 mm) W 12.5 in. (318 mm) D 3.75 in. (95 mm)

1. A preselector filter may be required to archive specifications.

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Ordering Information

85960B	**2010B SLM *Plus***
Option 003	External 12Vdc/6.5AH Battery With Case
Option 010	Ingress Measurement
Option 020	Fiber-Optic Power Meter
Option 045	Strand Hook Adapter
85960U	**2010B Upgrade Options**
Option R01	2010-to-2010B Upgrade
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	2010-to-2010B with Ingress Measurement Upgrade
85961B	**3010B Sweep/SLM *Plus***
Option 003	External 12Vdc/6.5AH Battery With Case
Option 020	Fiber-Optic Power Meter
Option 045	Strand Hook Adapter
85961U	**3010B Upgrade Options**
Option R01	3010-to-3010B Upgrade
Option R02	3010-to-3010R Upgrade
Option R03	3010B-to-3010R Upgrade

For more information on HP CaLan's products, applications or services in the U.S. please call 1-800-452-4844 Ext. HPTV. For international inquires, please contact your local Hewlett-Packard sales office. A current listing is available via the Worldwide Web through AccessHP at http://www.hp.com. A listing of the complete HP CaLan product offering is also available on the Worldwide Web at http://www.hp.com/go/catv.

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