

# **HP CaLan Product Family**

# **Product Overview**



- 2010B SLM Plus
- 3010B Sweep/SLM Plus
- 3010R Sweep/Ingress Analyzer
- 3010H Sweep/Ingress Analyzer

Quickly and accurately troubleshoot your cable system, regardless of the presence of ingress.

With increasing competition and customer demand for new services – digital, data, telephony – you need to make the most of your field test time. These new services will help stretch your maintenance budget as well as your patience, if you do not have the right tools. Fortunately, the HP CaLan family was designed to help you get the job done right the first time, every time, even when ingress is present.

- Are you
  - measuring basic signal level?
  - measuring digital carriers including TDMA (bursted) carriers?
  - aligning the forward path?
  - aligning the reverse path?

The fully featured, rugged, economically priced HP CaLan product family will help you with all these tasks with the performance, quality and reliability you expect from HP.

## For All Your Installation, Troubleshooting and Maintenance Needs

Whether you are performing routine maintenance or installing a new network to offer interactive services, we have products to fit your needs. This family of products covers 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 family consists of these four products:

3010H - This rack mounted headend unit supports up to ten field instruments as a return path monitor 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 reverse sweep in one box (Option 052). All sweep functions require a 3010H.

3010R - This portable field instrument has forward sweep receive, reverse sweep transmit and SLM capability. The 3010R can also function as a headend unit to allow you to troubleshoot isolated portions of your network.

3010B - Portable field instrument with forward sweep receive and SLM capability.

2010B - This SLM offers builtin comparison and analysis capability as well as the standard signal level measurements. It can also receive ingress data transmitted by the 3010H (Option 010).

**Functionality To Fit All Your Needs** 







	2010B	3010B*	3010R*	3010H	3010H** Opt 050	3010H** Opt 052
Measurements						-
Carrier						
Channel scan						
w/ four channel plans	Х	х	Х	х	Х	Х
Four channel	Х	х	Х	х	Х	Х
Single channel	Х	Х	Х	х	Х	Х
Variable dwell time	Х	х	х	х	Х	х
Average digital power	Х	х	х	х	Х	х
TDMA power	Х	х	Х	х	Х	х
24 Hour test w/ sleep mode	Х	х	Х	х	Х	х
Spectrum scan	X	х	х	х	Х	х
Distortion						
C/N	Х	Х	Х	х	Х	Х
Hum	Х	х	Х	х	Х	х
Ingress						
Ingress detection	Opt 010	х	Х	х	Х	х
Ingress monitor				х	Х	Х
Sweep						
Agile telemetry pilot		х	Х	х	Х	х
Forward sweep receive		х	Х	х	Х	х
Forward sweep transmit					Х	х
Return path			х	х		х
Data Management						
Data storage- 90 files	Х	х	Х	х	Х	х
FCC reporting	Х	х	Х	х	Х	х
Sleep mode	x	х	х	х	х	х
Graphic file storage	Х	х	х	х	Х	Х
Parallel printer port	х	х	х	Х	Х	х
HP printer support	х	х	х	Х	Х	х

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

### **Family Features**

In addition to being easy to use and menu driven, the HP CaLan product family has these unique features:

#### • Ingress Detection

The HP CaLan 3010H headend unit monitors communication with the field units. When ingress interrupts communication the 3010H instantly detects the problem and transmits a "picture" of the ingress through the forward data pilot. Any of the field units (2010B/3010B/3010R) can display this picture. With other alignment systems, ingress could make you call for help or leave the site without completing your alignment. Understanding the source and location of the ingress allows you to continue your work and effectively align the system without overcompensating for the disturbance.

#### Digital Power

Digital signals cannot be measured with the same techniques used for video carriers because their power is spread over a band unique for each form of digital signal. Fortunately the HP CaLan family makes measuring digital signals just as easy as the rest of its SLM functions. Just enter the center frequency, span and format for each of the digital signals in the unit's channel table. From then on, digital signal power is read out as accurately as analog carrier power. The guess work is gone. The HP CaLan family can adapt to the unique bandwidth power characteristics of QAM, QPR (DMX), QPSK and VSB digital formats. The family also allows accurate average power measurements of return path TDMA (bursted) carriers.



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.



on the display.

# One look will show you the many features the HP CaLan family offers...

- <u>small light-weight box</u> for transport with you in the field or up a pole (strand hook and carrying case available)
- $\frac{401 \text{ points of resolution}}{\text{reflection, diplexer and other response problems}}$  / not visible with lower resolution approaches
- temperature sensor rugged package to withstand tough D HEWLE field conditions [ALAN speaker monitors 3010R audio information backlit, LCD display highly wide display lets readable even you see the entire in sunlight frequency spectrum or zoom in to see one section in fast update rate greater detail (650 msec) prevents inadvertently adjusting the 8-10 hours of device before the battery life under response settles normal use • optional fiber-optic power meter (+20 to -38 dBm range) · large keys easily operated when wearing gloves Centronix port supports HP PCL and Epson • RS-232 port supports serial printers and cloning between field units parallel printers

## What Else Is Included?

Our goal is to get you up and running quickly. All products include a users manual, universal charger, battery, power cable, padded carrying case and pre-programmed frequency tables. You will be equipped with everything you need to begin sweeping and fighting ingress immediately.

## Upgrades

System changes are prevalent and necessary to keep up with the changing technology and competitive pressure. HP CaLan offers inexpensive, quick-turnaround upgrades to meet this requirement. Use your 2010B or 3010B today as a fast easy-to-use SLM or forward sweep, then upgrade it to a 3010R for forward/reverse sweep and ingress testing. 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. Our sweep technology is compatible with cable modems, telephony, interactive TV, digital music services and Internet communications.

Speed is critical to minimizing the frustration of adjusting a component before the response is measured. HP CaLan continues to improve on its industry leading sweep time. The latest revision drops sweep time from 1.1 seconds to 650 milliseconds. The next time you make an adjustment you can see the results in 650 milliseconds for a typical 750 MHz system.

New slope and offset control of sweep references allows sweeping trunk, bridges, and line extenders from a single reference automatically, eliminating the need for true tilt networks.

All this adds up to a time savings for each field operation.

#### **Reverse Sweep - 3010R and 3010H**

To deliver the interactive services your customers are requesting, you will need to optimize your system for two-way communication. The 3010R and 3010H bring DigiSweep technology to your return path. Among the comprehensive features are the easy-to-use insertion point (IP) which automatically adjusts the sweep source level to compensate for varying test point losses. You can now easily and accurately align your return path.



Typical system hook-up.



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

## Dual Path - 3010R and 3010H with Option 052

Dual path (Option 052) allows you to work on both the forward and return path from the same headend unit. Dual path sweep lets you make the most efficient use of your

**b** bandwidth while saving you both headend space and the cost of your test equipment. The headend unit (3010H with Option 052) cycles through transmitting a sweep signal on the forward path and monitoring the signal on the return path. This cycle permits multiple field units to perform both forward and return sweep at the same test point at the same time.

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#### Forward Sweep 3010B and 3010H with Option 050

If you only need forward sweep then the 3010B and 3010H with Option 050 will satisfy your needs and offer you an upgrade path for future systems. This solution offers all the SLM capability with the addition of forward sweep. The agile telemetry pilot in the 3010H lets you change the pilot to adapt to the changing requirements of your spectrum.

## Signal-Level Measurements 2010B SLM *Plus*

The 2010B SLM *Plus* forms the basis of the HP CaLan family. It is portable, rugged and economically priced. 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 AGC pilot frequencies.

#### **Data Storage**

All HP CaLan units store up to 90 history files. Data stored in the files can be in one of five formats: level measurements, graphic normalized traces, graphic sweep traces, graphic spectrum scan traces and return spectrum (only in 3010R and 3010H). Each file includes a time and date stamp with a 40-character, user defined label. In addition, the 3010s 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 - Option 030 and 031

The HP 85921B cable TV data management software automates the transfer and long-term storage of your measurement data. Direct data transfer saves time, simplifies report generation and analysis and helps you maintain the integrity of the data used to track cable TV system performance. These general reporting and graphical analysis features are available with Option 031. Option 030 adds FCC compliance reporting.

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#### Sweep Source Amplitude Accuracy\*

Output range:

Absolute accuracy: Relative accuracy: Harmonic output:

Spurious output:

Source blanking

during sweep:

+10 dBmV to +50 dBmV in 1 dB steps ±1.5 dB ±1 dB <-30 dBc, 5 to 10 MHz; <-35 dBc, 10 to 1000 MHz <-30 dBc >15 dB >60 dBc

#### Sweep Characteristics\*

Source output return loss:

Sweep frequency range: Sweep width: Frequency resolution: Sweep time: 5 MHz to 1 GHz Continuously variable 223 to 401 data points Sweep table dependent 650 msec (typical)

#### **Data Transmission Pilot Characteristics\***

 Range:
 5 MHz - 1 GHz

 Frequency agile with 10 kHz resolution

 Data carrier

 modulation bandwidth:
 -30 dBc <750 kHz</td>

 -50 dBc <1.8 MHz</td>

 Proximity of equal amplitude CW carrier without

 communications interruption:
 <300 kHz</td>

#### Signal Level Meter

Digital signal power levels QAM, QPR (DMX), QPSK, Formats: 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 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 in 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 0 dB attenuation, >14 dB; all other Input match: settings, >20 dB

Hum Range: 0.5 to 5% Resolution: 0.1 % ±0.2%, ±30% of reading Accuracy: 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, µW, 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 °C
3010H:	0 to +55 °C
Storage:	-20 °C to +70 °C
Size	
2010B, 3010B, 3010R:	12.5 in (H) x 10.5 in (W) x 3.75 in (D)
3010H:	5.25 in (H) x 19 in (W) x 11.5 in (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
Туре:	LCD with EL back light

\* Applies only to 3010R and 3010H



## **Ordering Information**

## **HP CaLan Product Family**

85960B	2010B SLM <i>Plus</i>
Option 010	Ingress Measurement
Option 020	Fiber-Optic Power Meter
Option 030	Cable TV Data Management Software w/FCC Reporting
Option 031	Cable TV Data Management Software
Option 044	Cloning Cable
Option 045	Strand Hook Adapter
85961B	3010B Sweep/SLM <i>Plus</i>
Option 020	Fiber-Optic Power Meter
Option 030	Cable TV Data Management Software w/FCC Reporting
Option 031	Cable TV Data Management Software
Option 044	Cloning Cable
Option 045	Strand Hook Adapter
85962A	3010R Sweep/Ingress Analyzer
Option 020	Fiber-Optic Power Meter
Option 030	Cable TV Data Management Software w/FCC Reporting
Option 031	Cable TV Data Management Software
Option 044	Cloning Cable
Option 045	Strand Hook Adapter
Option 052	Dual Path Sweep
0950-2955	Universal AC Voltage Charger
85963A	3010H Sweep/Ingress Analyzer
Option 030	Cable TV Data Management Software w/FCC Reporting
Option 031	Cable TV Data Management Software
Option 050	Forward Sweep Transmitter (1777 replacement)

## Upgrades

Option 052

#### 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 85961U **3010B Upgrade Options** 3010-to-3010R Upgrade **Option R02 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 85962U HP CaLan 3010R Upgrade Options **Option R11** 3010R-to-3010R with Faster Sweep Upgrade **Option R12** 3010R-to-3010R with Dual Path Sweep Upgrade HP CaLan 3010H Upgrade Options

Dual Path Sweep

#### 85963U

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

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 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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