

# Digital Cable Meter

## SLM 1456

### The only meter you need to completely test and troubleshoot your digital and analog cable system

Today's cable systems have changed dramatically. In fact, they are no longer just cable systems, they are broadband cable networks featuring HD video programming, high-end audio, high-speed data, and telephony. All this new technology requires more sophisticated, more detailed methods of testing by maintenance techs and installation techs. The new SLM 1456 answers these needs by providing complete measurement of both analog and digital signals.



**-How do you test both your digital and analog channels?**

**-Can you test for Ingress?**

**-Are you testing analog and digital parameters?**

### Introducing the New Sencore SLM 1456 "Channelizer".

When designing the new SLM 1456 Channelizer, we realized that in order to provide a meter the industry needed, we had to provide a variety of testing capabilities that would allow a technician to test anywhere in the system. Here's a quick rundown on the features the SLM 1456 provides for you:

- **All channel/frequency tuning:** From 5 to 878 MHz; allows you to test return path signals and up to your highest channel or frequency with ease.
- **Auto attenuation:** From -40 dBmV to +60 dBmV for full signal measuring capabilities
- **Analog Signal Measurements:** That include signal level, audio-to-video ratio, and carrier-to-noise for full analog signal analyzing.
- **Digital Signal Measurements:** That include: Average peak power, MER, bBER, and Constellation. Includes digital signal demodulation for QAM 16, 32, 64, and 256, plus demodulates 8 VSB Broadcast signals. Includes Constellation display.
- **Signal leakage:** Testing capabilities with audible tone, leakage level adjustment, and adjustable threshold.
- **Ingress testing capabilities:** Test both forward and return signals for unwanted noise.
- **Full featured spectral display:** Provides you with a complete channel spectrum, or bar display for quick review of all carriers to verify if one is missing. Plus, a quick and easy tilt check.
- **Data Logger system:** Allows you to save and print all data for future reference or drop point comparisons.

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# SPECTRAL DISPLAY

## Single Channel Display

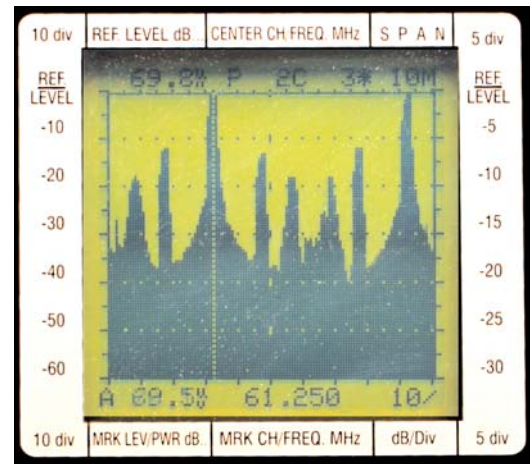
It is often a necessity to look at a single channel spectrum display to look for interference. The SLM 1456 allows you to tune to a single 6 Mhz channel anywhere in the 5-870 Mhz band and to display a full spectrum view of that channel.

## Full Spectral Display

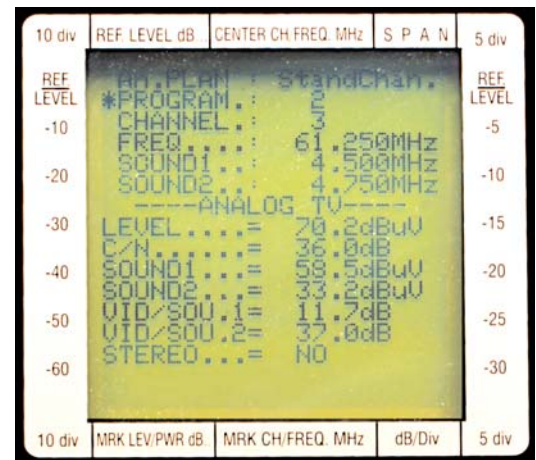
Many technicians also want to see a spectral view of all the frequencies on a display so they can see if there is interference between the carriers. Some also like a quick glance to look at system balance or just to verify that all the carriers are present. The SLM 1456's full spectral display allows you to view your full channel line-up or a specific channel or frequency for quick and accurate signal troubleshooting and verification, including the sub-band reverse path.

## Troubleshoot RF:

Simple and easy to understand displays for both analog and digital signal parameters provide you with all the information you need to troubleshoot and analyze RF signals. Includes level, C/N and A/V ratio.



**Spectral Display**



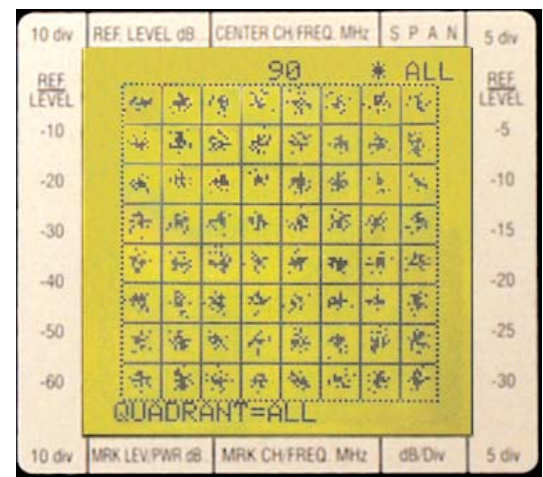
**Summary Display**

# DIGITAL SIGNALS

## Digital Measurements:

Digital has become a buzz word in the industry. But digital can mean many different types of signals. There are several different types of digital signals available on today's cable networks: QAM, used in several different formats that could include 16, 32, 64, or 256. QPSK is used in the return side of hi-speed cable modems and even 8VSB (typically used by off-air broadcasters for HD signals). A cable system could include any of these "digital" signals or variation of these signals. To truly test and troubleshoot digital signals you need to measure several parameters including:

- Average Peak Power
- BER
- MER or SNR
- Constellation



**Constellation Display**

# INGRESS MEASUREMENT

Having the ability to test both analog and digital parameters is very important in providing a good clean signal to the subscriber, but there is another area that has always been important and, with the advent of digital signals, has come to the forefront: system ingress.

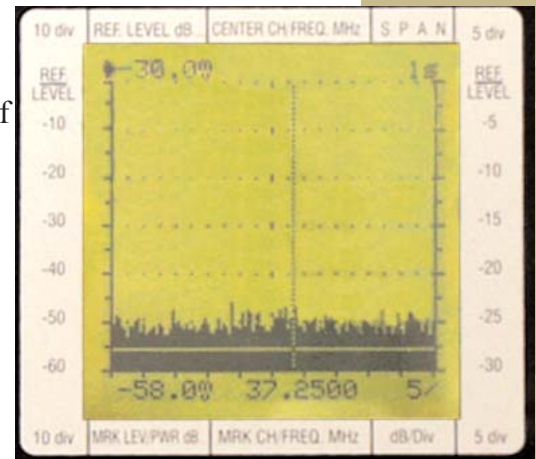
Ingress can cause ghosting, co-channel and a variety of other problems with the typical analog signal. But with digital signals, ingress could mean a complete loss of picture. A large portion of ingress type problems come directly from the subscriber's side of the drop. Operators are recognizing this fact, and have begun to require all technicians and installers to test for system ingress. In order to provide a quality digital signal to the subscriber, testing for ingress has become almost a must in the industry.

## ANALOG SIGNALS

### Analog Measurements:

Most cable systems still provide basic RF signals. In fact a majority of the programming that is available is still analog, or at least are being provided in analog at this point. Advanced analog testing is still vital to every cable system. The SLM 1456 includes the following measurements:

- Video Level
- Audio level
- C/N
- A/V ratio



Ingress Display

## CONVENIENT FEATURES

### Portable and Lightweight:

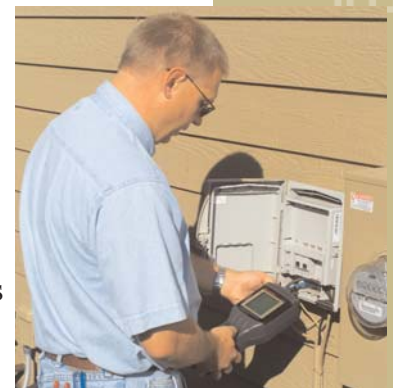
The SLM 1456 provides complete portability and a light-weight design for easy field use. It weighs less than 3 lbs and offers up to 6 full hours of continuous battery use. An easy-to-read backlit LCD display provides you with either a full spectral display or a quick bar scan of your channel plan to verify that all frequencies are present.

### Data Storage:

The SLM 1456 provides data storage and printing capabilities for system documentation and future data reference.

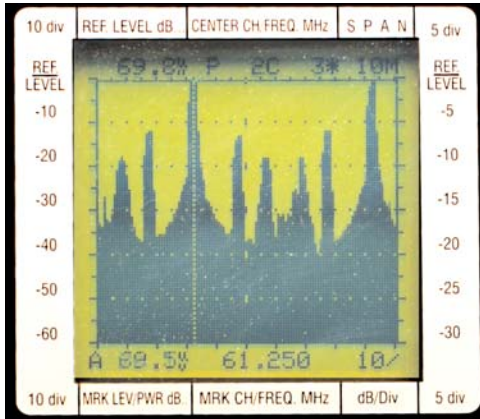
### Built-in Voltmeter:

Built-in voltmeter for quick testing for voltage that may be present on the cable, especially handy for systems that are providing telephony and high-speed data, as well as video.

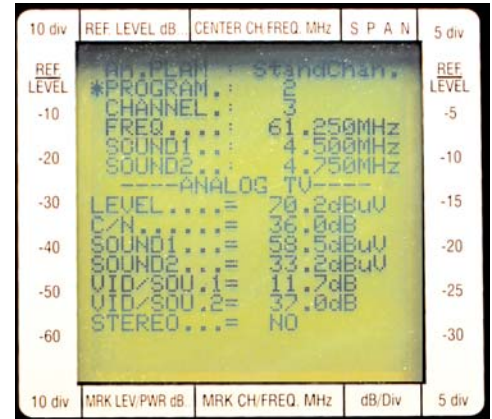


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# Specifications



**Spectral Display**



**Summary Display**

## Automatic or Manual Spectrum Analysis:

Frequency range: 5-870MHz  
 Dynamic range: >60dB  
 Resolution bandwidth: 100KHz  
 Reference level: TV from 10dBuV to 125dBuV  
 Marker Frequency: 5-870MHz  
 Marker Analog or Digital: Automatic  
 Bar Scan: From 19 to 120 channels (selectable)  
 Storage of bar scan: Up to 20 pictures

## Analog Measurements:

Frequency band: TV and Radio 5-870MHz  
 Frequency resolution: 62.5KHz  
 Input impedance: 75 Ohms  
 Dynamic range measu.: 15dBuV to 126dBuV  
 or -45 to +66dBmV  
 or -93 to +18dBm  
 Measurement resolution: 0.1dB  
 Level measurement acc.: 1dB typ. (2dB max)  
 A/V ratio: 1.5dB typ (2dB max)  
 C/N ratio: 2dB typ (4dB max)  
 Measur. filter bandwidth: 100KHz @ -3dB  
 Channel plan memory: 600 memory positions  
 Multi standard: NTSC-PAL-SECAM  
 M-N-B-G-I-D-K

## Digital Measurement:

(Digital measurement for 8VSB, QAM 64-128-256)  
 Frequency band: 47-870 MHz  
 Power measurement dynamic range: From 25dBuV to 116dBuV  
 BER measurement: bBER up to 1x10-8  
 (After RS) aBER up to 2x10-9  
 MER measurement: 17 dB to 36 dB  
 Constellation display: 64-128-256 (on graphics display)

## General Specifications:

Voltmeter function: AC (Square wave), DC, 0 to 100V  
 Channel plan master copy function (optional or via PC)  
 Power supply:  
 -Built-In NI-MH rechargeable battery: 8 Batteries  
 -External power supply: 17 Vac or 20 Vdc 1A  
 -AC/AC adapter: 120V  
 Battery duration at 25 degree C: 4-6 hours in analog mode  
 3-4 hours in digital  
 Size: H 11.8" x W 4.33" x D 2.36"  
 Weight: 2.7 Lbs  
 Download port: RS232 standard serial port  
 Display: 128 x 128 pixels, 3" square

**For more information call:**  
**1-800-SENCORE (1-800-736-2673)**  
**or 1-605-339-0100**  
**Fax: 1-605-367-1006**  
**Email: cable@sencore.com**

**Sencore Inc**  
**3200 Sencore Drive**  
**Sioux Falls, SD 57107**  
**U.S.A.**  
**www.sencore.com**