

CM500 INSTALLATION AND SERVICE SLM



*Ensure Quality Installations of
Analog and Digital Video, Cable
Modem and VoIP services*

Reduce costs, increase installation reliability and customer satisfaction by using the CM500 to verify and qualify network performance. Identify and eliminate analog and digital impairments in your video, VoD, VoIP and cable modem services. Simple, one-button tests analyze downstream and upstream signal paths with real time results.

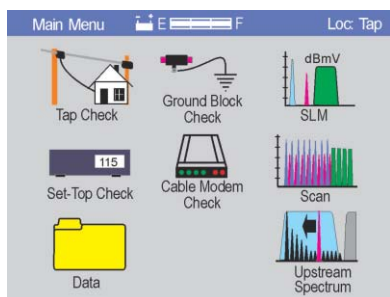
- Consistent, one-button SMART tests with programmable pass/fail limits
- Easy-to-interpret color bar graphs with pass/fail indicators
- Proven reliability with all the digital experience you need to address VoIP and DOCSIS/EuroDOCSIS 1.1 services
- Simplify workforce operations by downloading meter configurations and uploading test results—all over your network
- Verify, test and troubleshoot the distribution network, drop, in-home wiring, cable modem and customer premises equipment—with one test tool

**JUST ANOTHER WAY
WE'RE UNCOMPLICATING CABLE**


SUNRISE TELECOM
B R O A D B A N D

...it's ready to work whenever and wherever your technicians need it.

OVERVIEW



Main menu

With Operations deploying new premium services almost daily, your workforce must work smarter not harder. New digital services demand full qualification not only for downstream and upstream levels, but digital margins must be assured too. Digital signals work right up to the point of catastrophic failure. Why risk poor installs, dissatisfied customers and expensive service calls? Only the CM500 provides automated, comprehensive analog and digital tests that measure operational performance, ensure appropriate safety margins, reduce installation time and prevent costly callbacks. The CM500 is your bridge to the digital network.

The CM500 is a complete installation and service SLM that fully tests analog, digital and cable modem services. The CM500 has the power to test cutting edge services, such as VoIP and QoS enabled networks. Exercise both the upstream and downstream paths with the built-in cable modem. Options allow the CM500 to be configured to meet your performance and network requirements, both today and tomorrow.

SMART tests with pass/fail results reduce your training investment and ensure your technicians quickly zero in on the problem. Locating elusive intermittent problems is easy with the CM500's in-band capabilities, continuous measurements and test repeatability.

The CM500's rugged construction ensures it is ready to work whenever and wherever your technicians need it. Integrated cooling and sub-30 second boot time ensure that your technicians don't waste time waiting on overheated meters to cool down. The CM500 will operate continuously at up to 120°F ambient, even in the heaviest rain.

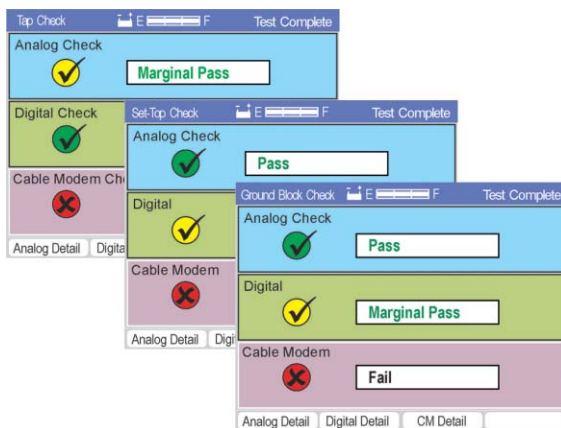
Test anywhere in the network—at the tap, ground block or set top—even use the CM500 to substitute for the customer's cable modem or PC and troubleshoot in-home wiring, routers, firewalls and hubs. Lighten your workforce's load with the CM500—it's more versatile and easier to carry than a meter and a laptop for field testing. By using the Web Browser option your technicians can be more efficient by accessing your workforce management system.

The CM500 can verify and troubleshoot VoIP services and the all important network QoS that VoIP requires. The CM500 establishes the specified QoS connection to the CMTS and measures critical service parameters from the customer premises to the CMTS and or the media gateway.

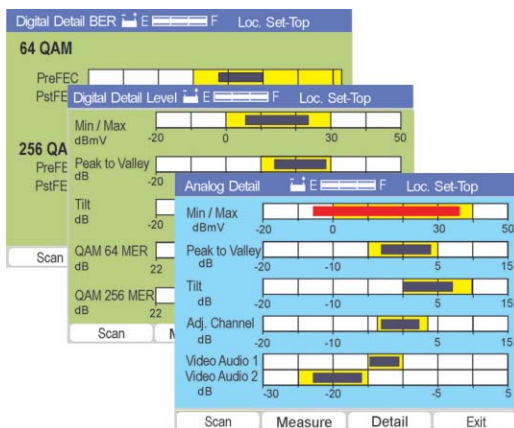
Ensure that your team can meet the digital testing demands of newly deployed premium services. The CM500 not only provides analog and digital network testing in both directions, it is the solution of choice for testing emerging services such as VoIP. The CM500 puts your technicians on the bridge to the digital future.

...a great way to run a series of tests, quickly and consistently.

SMART ONE-BUTTON TESTS



Simple Pass/Fail displays



Measurement summaries

The CM500 provides three SMART test locations, one each for the tap, ground block and set-top. The user may select the set of measurements to be performed at each of the three SMART test locations and the pass/fail limits for each measurement. The CM500 provides the ultimate in setup flexibility and consistent, clear test results.

Comprehensive DOCSIS network checks may be included with the SMART tests or initiated manually. The CM500 qualifies analog and digital signals and will establish a bi-directional cable modem connection; thus ensuring that network operation is within programmed limits. Pass/Fail indication is provided for each test to ensure clear and accurate results.

SIMPLE TO PROGRAM

Using the CM500's front panel keypad or the PC-IP software, the administrator can select the appropriate channel table, desired tests and set pass/fail limits for each SMART test. Additional test detail screens can be enabled too. These screens provide detailed test results to aid in network troubleshooting.

Once an instrument configuration is developed, it can be cloned to multiple CM500s. Cloning ensures consistency across units and may be accomplished by connection to a PC or by downloading over the network. The integrated cable modem allows the CM500 to access configurations over the network, thus ensuring every unit is up to date with the latest changes—even when it's in the field.

SMART TEST RESULT SCREENS

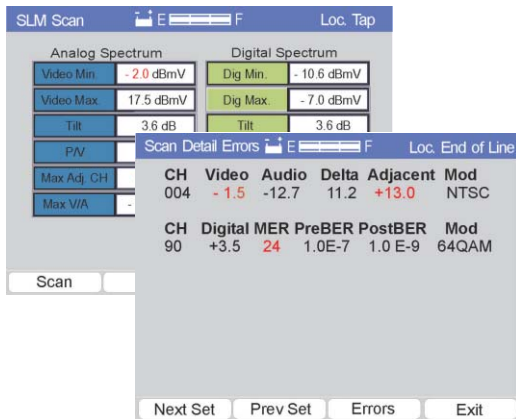
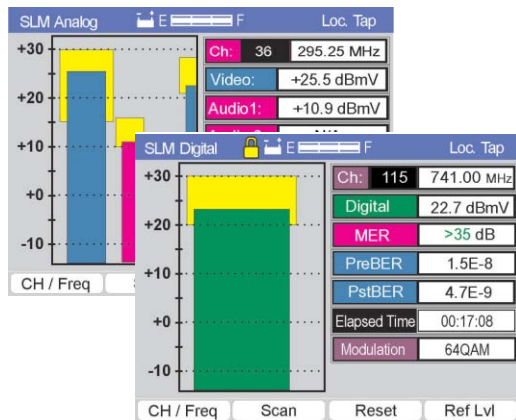
Simple pass/fail results displays are provided by each SMART test. These screens give the user "at a glance" pass/fail results for the analog, digital and cable modem tests.

DETAIL RESULT SCREENS

The CM500 can also display a summary of the test results for each SMART test. If enabled, easy-to-interpret color bar graphs provide a summary of the measurements and include the pass/fail limits. The bar graph scales are auto-ranging. Detail screens are provided for analog, digital and cable modem tests.

...the true one-meter solution for installing and testing analog and digital networks.

FULL FEATURED ANALOG AND DIGITAL SLM



The SLM mode provides state-of-the-art analog and digital measurement, data storage and results analysis. The CM500 is the true “one-meter-solution” for installation and testing of analog and digital networks.

SINGLE CHANNEL MODE

The CM500 accurately measures common carrier levels for formats that include: NTSC (standard and H-sync suppressed), QPSK, 16/64/256 QAM, AM, FM and CW. The unit automatically switches from analog to digital mode as the channels are tuned.

Analog measurements include: Digital measurements include:

- Video and audio carrier level
- Video-to-audio ratio
- Adjacent channel ratio
- Signal level
- MER
- Pre- and Post-FEC BER

SLM SCAN MODE

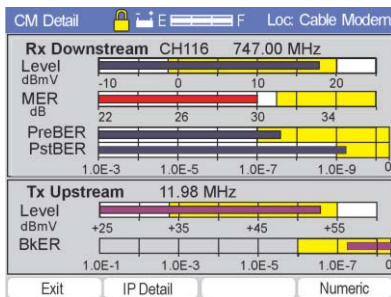
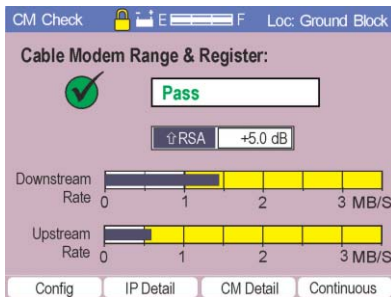
Sixteen programmable channel tables simplify setting up the CM500 for SLM scans. All analog and digital channels in the selected channel table are automatically scanned. Two markers make it simple to analyze the graphical scan results. Three additional levels of measurement detail are available.

Analog and digital measurements are automatically made during the scan and presented on a summary screen. The summary information includes:

- Minimum and maximum level
- V/A ratio (analog only)
- Adjacent channel max (analog only)
- Tilt and peak-to-valley ratio
- Analog-to-digital ratio

All channel measurements are presented in tabular format on the second level detail screen. These channel-by-channel results meet the requirements for FCC Proof of Performance. The third level provides an errors only display and lists all channels with results outside of the pass/fail limits.

DOCSIS TESTS



CABLE MODEM CHECK

The CM500 integrates a cable modem to fully verify and test the DOCSIS/EuroDOCSIS network connection. The upstream and downstream paths are completely tested by ranging and registering with the CMTS. SMART cable modem tests provide one-button test and verification of cable modem services.

Downstream measurements include:

- Signal level
- MER
- Pre-FEC BER and Post-FEC BER
- Downstream data rate

Upstream measurements include:

- Transmit level
- BkER (upstream BER)
- Data transfer rate

Bar graphs and numeric displays provide additional measurement detail. Your technician can use the CM500 to emulate a cable modem or the customer's PC and troubleshoot customer premises problems.

DOWNSTREAM TROUBLESHOOTING

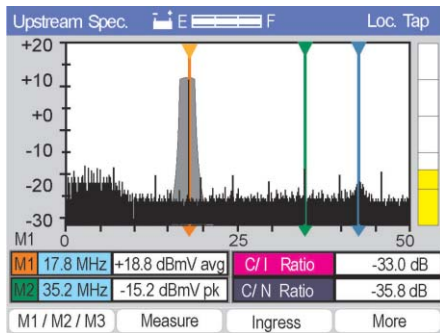
Modems operating at lower Modulation Error Ratios (MER) can have reduced throughput due to packet retransmissions. MER provides early detection of non-transient impairments such as: system noise, CSO, CTB, ingress and modulator problems. In addition, low MER puts the point of operation near the "digital cliff" where catastrophic service failure can occur.

The CM500 allows your technicians to quickly determine the MER for 64/256 QAM signals and provides them with a pass/fail display. Your technicians can, with a glance, verify that your customer has an adequate operating margin and his digital services will continue to operate reliably.

Hard to identify transient problems, such as intermittent ingress and laser clipping, are easy to identify with the CM500's pre- and post-FEC BER measurement.

...technicians can detect, isolate and repair network issues long before they affect your customers.

...the simplest, semi-automated test method for testing and troubleshooting the return path.



Upstream spectrum screen

UPSTREAM TROUBLESHOOTING

Characterize the return path from any point in the network by measuring the in-service performance with the Upstream Block Error Rate (BkER) measurement. Characterize the upstream performance to ensure that noise and ingress do not impair upstream data rates.

Upstream Spectrum

The Upstream Spectrum measures “bursty” TDMA return signals, intermittent ingress, noise and CPD (common path distortion). Simply set the markers and the CM500 does all the work, reading out the carrier level of TDMA signals, CPD or ingress, C/I ratio and C/N ratio.

Similarly, an ingress screen provides the ingress level, noise level and margin between these and the programmed acceptable limits. Markers are pre-programmed, but may be repositioned by the user.

Your technicians know the return path is often the most demanding portion of the network. Let the CM500 simplify their job with the simplest, automated return path test and troubleshooting process in the field. Set the markers and let the CM500 provide a simple pass/fail indication or use it to troubleshoot any portion of the return path.

Upstream spectrum measurements include:

- Carrier levels
- CPD or ingress
- C/I ratio
- C/N ratio

Ingress measurements include:

- Level
- Noise margin
- Ingress margin

PC-IP SOFTWARE



Set up user configuration databases and view test results with the PC-IP software

The PC-IP software is a Windows® application used to build CM500 configuration databases and view uploaded test results. PC-IP is compatible with the CM1000 for sharing database information. One program will interface to all CM series SLMs and is available free from the Internet.

PC-IP allows your technicians to:

- Clone multiple CM500s or other CM series SLM configurations
- Develop channel tables and limit criteria on your PC and upload them to the CM500 or place them on an FTP server for download over the network
- Document test results, save the data and upload it on an FTP server for viewing
- Ensure that all your CM500s and other CM series SLMs have identical configurations and pass/fail limits
- Provide faster and more reliable configuration than setting up each SLM manually

...the one-meter solution for North America and worldwide.

FIRMWARE OPTIONS

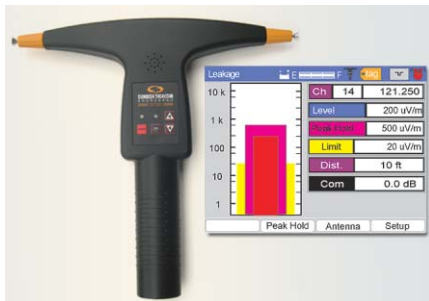
VoIP			
E F Loc: Cable Modem			
DOCSIS Mode:	1.1		
Security Mode:	BPI+		
QoS Class:	3 Platinum		
Downstream		Upstream	
Rx Level	10.5 dBmV	Tx Level	35.5 dBmV
MER	36 dB	BkER	01.5 E-4
PreBER	1.0E-8	Disc. Pkts	00006
PstBER	1.0E-9	Lost Pkts	00002
Freq.	747.000 MHz	Latency	50 mSec
Mod	256 QAM	Jitter	<5 mSec
Reset		Exit	

VoIP Services Testing including Latency, Jitter and Lost Packets



Web Browser/PC emulator option

HARDWARE OPTIONS



LP100 leakage option

VOIP TESTING

The VoIP Testing option adds testing capabilities that allow the user to establish a second service flow to verify QoS. Both upstream and downstream paths are assigned high priority. These service flows are used to test the network between the CM500 and the Media Gateway. Measurements include latency, jitter and lost packets.

realVIEW

Test and troubleshoot the return path from anywhere in the network all the way back to the headend. Connect to a realWORX controller to view upstream spectrum displays from Sunrise AT2000/2500 analyzers located at a headend or hub. Communications via the Internet connection allows multiple users to access realWORX with no loss of valuable spectrum. Test and troubleshoot any node back to the hub or headend by viewing the results from any location in the network. Simply select a node and view its return spectrum.

WEB BROWSER

Use the web browser and PC emulation to test in-home RF and Ethernet wiring, routers, PCs or other components. Demonstrate network operation by accessing external web sites. The web browser may also be used to access employee e-mail or workforce management applications via the network. Use the browser for set-top and cable modem provisioning or to view the modem's diagnostic page. Administrator controls allow unlimited browsing or access to specified URLs only.

RETURN PILOT GENERATOR FIRMWARE

Perform return path alignment, test drop cables, and check passives by inserting test signals into the return path with the Return Pilot Generator. This option includes alternating two-tone mode, selectable frequency, level and CW or 16 QAM modulation.

LP100 LEAKAGE OPTION

The LP100 Leakage Profiler is the simplest, most comprehensive leakage location and measurement solution on the market. The LP100 employs a wireless link so problems with tangled cable are avoided. Monitor and locate signal leakage and perform FCC required leakage measurements at the drop—or any network location—save the results, along with other measurements, and upload them over the network.

The LP100 Leakage Profiler provides a calibrated dipole antenna required for FCC measurements and a calibrated collapsed dipole for safely working indoors or on congested sidewalks. Operation of the LP100 Leakage Profiler requires a CM500 equipped with the CM-W wireless interface option. Order the LP100 Leakage Profiler separately and use it with any CM-W equipped CM500.

DEEP INTERLEAVE OPTION

Some digital video modulators utilize a deep interleave on 256 QAM modulation. Adding this option allows the CM500 to make BER measurements on deep interleave (i=4, j=128) digital video signals.

CM500 ADVANTAGES

QUALITY INSTALLATION

Programmable SMART tests can verify a few key channels or the entire channel plan. Tests can range from a few simple level measurements to a full complement of comprehensive tests suitable for FCC proof-of-performance certification. Quick and comprehensive testing will ensure safe operating margins, reduce call backs and solve problems other meters leave behind. All this while increasing the number of installations performed in a day.

SAVES TIME AND EXPENSE

Save time and expense by letting the CM500 guarantee the job is done right the first time. Whether you do your own installs or use contractors, the CM500 will reduce your costs and help retain customers. The test results are not open to interpretation; they are clear, consistent, and easily documented. Your return on investment can be realized in as little as thirty days.

PRE-QUALIFY DROPS FOR DIGITAL SERVICES

With today's rush to deploy new revenue generating services, it is advantageous to pre-qualify the network and drop system before the customer is looking over your shoulder. The CM500 will ensure that new cable modem or VoIP services will be functional when they are rolled out.

DOCUMENT INSTALLATION PERFORMANCE

The CM500 makes all your tests and stores all of the test data, not just the display. Installers or contractors can document their work or bring back data for their supervisor to review. The CM500 can be programmed to automatically save up to 100 sets of data. The CM500 allows the user to upload stored data to a central server over the network using the cable modem or an Ethernet connection.

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International 1-514-725-6652		
www.sunrisetelecom.com catv@sunrisetelecom.com	Canada & International Office Sunrise Telecom Broadband Corp. 10281 Renaude-Lapointe Anjou, QC Canada H1J 2T4	

FIELD-PROVEN SOLUTIONS

For detailed information on the CM500 and its options or the name of your local Sunrise representative visit our website at www.sunrisetelecom.com. Or telephone us at 1-800-297-9726 (Int'l calls: 1-514-725-6652).

Sunrise Telecom Broadband is a leader in digital broadband and DOCSIS test instruments for the broadband industry. As part of the Sunrise Telecom family, we leverage the strength of one of the world's largest communications test and measurement companies to make your job easier. Sunrise Telecom Broadband's field-proven solutions include installation and maintenance instruments, portable headend analyzers and network test systems and software. Our goal is to enable service providers to rapidly deploy television, high-speed Internet, voice and digital video applications.

Based on our core strength in RF testing, we have established a successful track record as a provider of leading edge solutions that incorporate innovative test methods, intuitive user interfaces, and thorough product training. At Sunrise Telecom Broadband, we uncomplicate the engineer's and field technician's day.

SPECIFICATIONS

DIGITAL SIGNAL LEVEL METER

Tuning Range: 50 to 870 MHz and 5 to 50 MHz Upstream Spectrum
Input Level: -40 to +60 dBmV Auto Ranging
Level Accuracy: ± 0.75 dB Flatness
 ± 0.75 dB Log Linearity
 ± 0.75 dB Temp variation
 ± 1.5 dB Overall (typical)
Display: Color Active Matrix LCD 320 by 240
Operating Time: 3 hours continuous (typical)

GENERAL

Size: 10.5" x 4.4" x 2.7"
Weight: 3.1 lb
Operating Temperature Range: 0°-50° C

DIGITAL SIGNAL ANALYSIS

Modulation Type Downstream: 64/256 QAM (DVS-031, ITU-T J.83 & DOCSIS)
Note: The CM500A is Annex A and the CM500 is Annex B and C

Warranty: 2 years
Specifications subject to change without notice.

ORDERING INFORMATION

CM500 SLM w/ MER & BER & cable modem tests
CM500A EuroDOCSIS 8 MHz IF SLM w/ MER & BER & cable modem tests

Software/Firmware Options

CM-RPG Integrated Return Pilot Generator – CW or 16 QAM (no PRBS)
CM-RVIEW realVIEW remote view of upstream spectrum
(realWORX & AT2500R or H required)

CM-WB Web Browser

CM-VoIP Provides measurements of latency, jitter and lost packets on VoIP services

Hardware Options

CM-W Wireless interface for leakage detection (LP100 required)
CM-DVM Deep Interleave (4, 128) Digital Video BER Measurements



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