



Acterna DSAM-2500

Digital Service Activation Meter

The Acterna DSAM-2500 (Digital Service Activation Meter) is a lightweight, durable, handheld meter for DOCSIS/EuroDOCSIS cable modem installation. The meter enables installation technicians to install and service high-speed data and video services while onsite. It features an intuitive graphical interface complete with an informative online help system.

Exclusive DSP, DOCSIS and analog technology provides great future flexibility.

Upgrading the meter can be as simple as downloading a file from the Web and installing it onto the device using optional DSAM-PC software. Additionally, cable operators can expand the meter's capabilities to meet the needs of new technologies as they are added to the network.

Highlights

- DOCSIS ver. 1.0 and 1.1 compatible
- Ranging and registration confirm physical and network connectivity
- Quick QAM summary of digital carrier performance (MER/EVM and pre/post FEC BER)
- Install autotests allow preconfigured automated tests for digital, analog and DOCSIS channels
- Weather and shock resistant enclosure; weighs less than 3 lb (1.4 kg)
- 4 to 1000 MHz range analog Signal Level Meter, 8 MHz and 6 MHz models

Digital Service Activation Meter (DSAM)

is a lightweight, durable, handheld meter that includes extensive analog and digital capabilities

DOCSIS/EuroDOCSIS install capabilities include:

- In-service ranging with network CMTS to prove physical upstream path
- Transmit margin displayed and compared with limits for easy Pass/Fail results
- Downstream QAM measurements (average power level, MER/EVM, and pre- and post-FEC BER tested against limits)
- Multiple DOCSIS carriers handled in a single autotest selection
- Configuration settings that allow test flexibility based on network deployment procedures:
“Range” stops at physical layer verification results
“Range+Register” also returns IP addresses for cable modem and network servers

DSAM ranging capability uses the DOCSIS transmission paths, downstream and upstream, to verify performance from the install location. Test results are compared against limits set by network engineering.

DSAM registration capability fully connects the DSAM internal cable modem to the DOCSIS network. Results display shows assigned IP and network IP addresses as well as any error messages encountered.

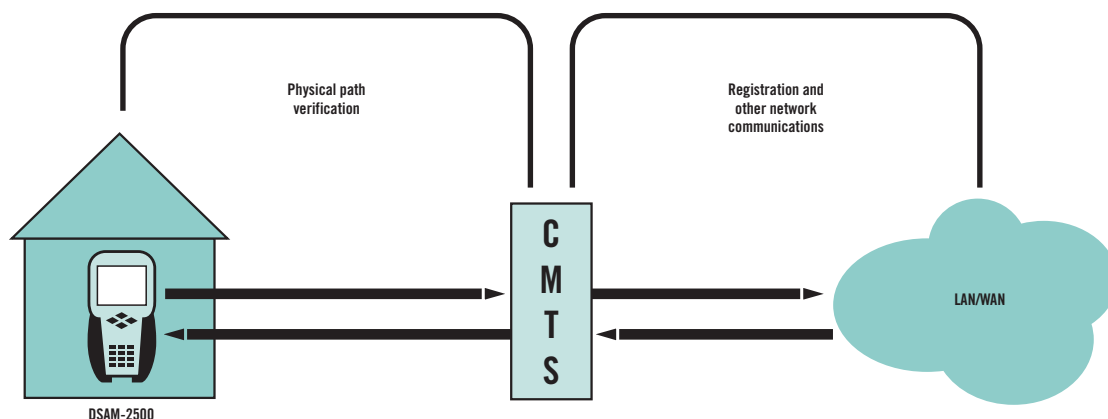
These tests assure network connectivity and sufficient physical layer margins for reliable performance even after the installer leaves the job, thus resulting in fewer callbacks and happier customers.

SLM (signal level meter)

capabilities include:

- Ingress spectrum scan with zoom for analyzing local upstream ingress
- Up to 12-channel miniscan that can contain mix of analog and digital channels
- Extensive channel plan flexibility to cover analog, digital and DOCSIS channel parameters all in one plan
- Multiple video standards include NTSC, PAL, SECAM – including scrambled formats
- Multiple channel types include single and dual audio, CW, QAM, QPSK and others

Additional configurable parameters include QAM standard (selectable, ITU J.83 annex A, B or C), symbol rates, inverted spectrum, signal bandwidths and audio offset. These provide a high degree of flexibility on hybrid systems that mix modulation technologies and video standards.



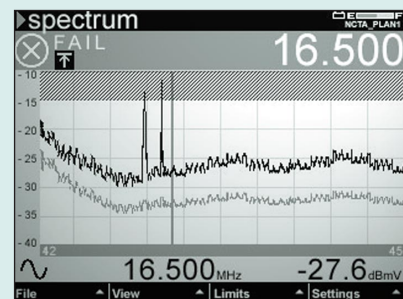


The cable modem autotest function provides an immediate Pass/Fail message

The results focused meter

Simplified installation

DOCSIS cable modem installation is simplified for even the novice installer. Not just one, but multiple downstream DOCSIS carriers can be tested in a single, automated cable modem test. Immediate Pass/Fail message is displayed. Details of failed parameter(s) are noted in the autotest results.



The DSAM upstream spectrum display makes identifying ingress quick and easy

Fast ingress identification

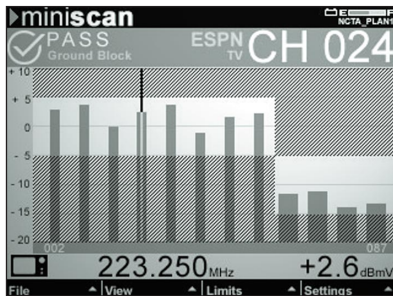
Checking the install for ingress is easy with a before and after approach that uses the DSAM upstream spectrum display. Unwanted carriers can be quickly located and measured (center frequency, level and graphical view). Interference from intermittent sources can be captured with the peak hold feature. For the greatest amount of detail a 10 MHz zoom can be used at the marker position.



The DSAM 2500 shown here with and without the optional protective sleeve



Single channel level view displays all modulation types in a common format for all users



With limits "on", key digital and analog channels are quickly checked in miniscan view

Comprehensive SLM capabilities

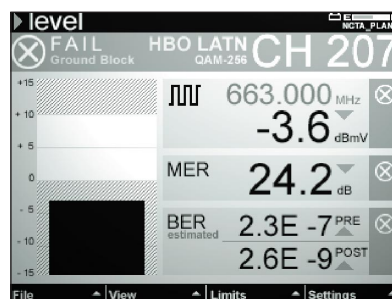
The DSAM's SLM capabilities handle all of the traditional needs of the cable installer. The meter not only provides a single-channel level display, it also delivers a 12-channel miniscan ensuring the fastest evaluation of levels at an install. As with all measurements and autotests, limits can be turned on to quickly indicate Pass or Fail. Limits are preconfigured for four test locations: tap, ground block, TV and cable modem. These may be configured and locked by install management or network engineering to ensure maximum test reliability and consistency. Channel plans may also be locked.

Digital carriers integrated with analog carriers

All channel types, including digital QAM carriers, are included in the same integrated channel plan. Users simply enter in the channel number (or frequency), or scroll through the channels with the arrow keys, to access the channel of interest. The appropriate measurement capability is automatically accessed with the results displayed in the correct display format.

Optimized performance for all users

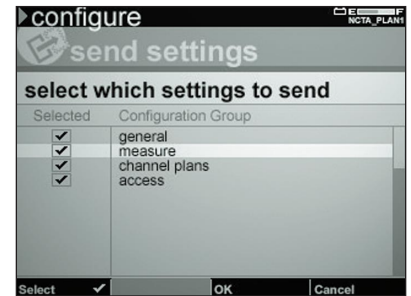
The meter's file management system is designed for sophisticated operators that employ proactive work force management processes and smaller organizations that require fundamental on-board file management. Meter files can be saved into individual folders that are user-labeled. Possible folder labels include: work order, test point, or whatever else the user wishes. Icons help the user quickly identify the file type within the folder and its synchronization status.



Channel plan integration of digital QAM channels with analog channels provides a common, easily understood, user interface for installers



Synchronizing the meter with the optional DSAM PC software is an easy operation understood by all users



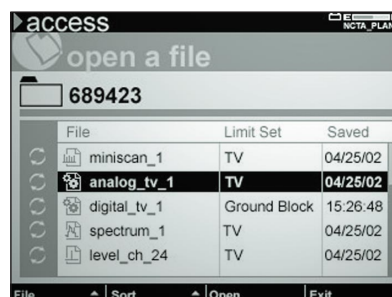
The cloning function allows specific configuration groups to be exchanged with another meter

Rapid synchronization

Exchanging files with a PC is as simple as synchronizing a PDA with a desktop computer with the optional DSAM-PC utility software. An administrator can easily set up a procedure where the individual meters are just plugged into the PC via RS232 or Ethernet. Ethernet connections can be conducted remotely on the same local area network.

Swift settings reproduction

Meter settings may be exchanged directly with another meter through the cloning capability. All settings, or selected groups of configuration settings, may be selected for transfer.



The DSAM's file management system allows users to save, label and organize information as needed

Specifications (preliminary)

Frequency

Range	4 to 1,000 MHz
Accuracy	±10 ppm at 77°F (25°C)
Tuning resolution	Analog 10 KHz Digital 50 KHz
Channel bandwidth	DSAM-2500A 8 MHz DSAM-2500B 6 MHz

Level measurement, analog

Signal types	CW, video and audio (NTSC, PAL, and SECAM)
Range	−40 to +60 dBmV ⁽¹⁾
Resolution	0.1 dB
Resolution bandwidth	330 KHz
Accuracy ⁽²⁾	±1.5 dB typical @ 25°C

Level measurement, digital

Modulation types	QPR, QPSK, QAM (DVB/ACTS)
Range	−40 to +60 dBmV ⁽¹⁾
Resolution	0.1 dB
Resolution bandwidth	330 kHz
Accuracy ⁽²⁾	±2.0 dB typical @ 25°C

Upstream spectrum (ingress scan)

Spans	DSAM-2500A 4 to 65 MHz DSAM-2500B 4 to 45 MHz
Sweep rate	1.8 seconds or faster
Display scaling and range	5 and 10 dB/division; 6 vertical divisions
Resolution bandwidth	330 kHz
Sensitivity	−35 to 60 dBmV ⁽¹⁾

DOCSIS/EuroDOCSIS compatibility

Version	DOCSIS 1.0 and 1.1
Upstream transmit range and diplexer crossover (DOCSIS modes only)	DSAM-2500A 5 to 65 MHz 65/96MHz (min. downstream DOCSIS center freq. 100 MHz) DSAM-2500B 5 to 42 MHz 42/88 MHz (min. downstream DOCSIS center freq. 91 MHz)
Upstream modulation	QPSK and 16 QAM as instructed by CMTS
Transmitter output	At 25°C, maximum 55 dBmV with 16 QAM and 58 dBmV with QPSK, (typical)

Downstream QAM demodulation

Modulation type	64 and 256 QAM, ITU-T J.83 Annex A, B or C (selectable)
Input range (lock range)	−15 to +50 dBmV total integrated power ⁽³⁾ from 55 to 1000 MHz
BER ⁽⁴⁾	Pre- and Post-FEC 10 ^{−4} to 10 ^{−9}
MER ⁽⁴⁾	Range 64 QAM: 21 to 35 dB Accuracy ±2 dB (typical) Range 256 QAM: 28 to 35 dB Accuracy ±2 dB (typical)
EVM ⁽⁴⁾	Range 64 QAM: 1.2% to 5.8% Accuracy ±0.5% (1.2% to 2.0%) ±1.0% (2.1% to 4.0%) ±1.4% (4.1% to 5.8%) Range 256 QAM: 1.1% to 2.4% Accuracy ±0.6%
Symbol rate	Annex A, 5.057 to 6.952 Msps for 64 and 256 QAM Annex B, 5.057 Msps for 64 QAM and 5.361 Msps for 256 QAM Annex C, 5.274 Msps for 64 QAM and 5.361 Msps for 256 QAM

Interfaces

RF	75 ohm, F81 or BNC option Max. sustained voltage 100 VAC, 140 VDC
RS232	Standard via DB9 on charger module or optional direct cable
Printer compatibility	Epson and Citizen
Ethernet	RJ45, 10 base T, TCP/IP and UDP supported
USB	v1.1 host mode, 150 mA maximum slave (future firmware release)

Standards compliance

Shock and vibration	IEC 60068
Drop	IEC 61010
Handle stress	IEC 61010
Water resistance	MIL-STD-810E
Safety – emissions	EN 55022
Safety – immunity	EN 61000

General

Display	320 x 240, grayscale selectable back light
Language support (user interface and help system)	English in all models No-charge second language option of Spanish, French or German
Dimensions	4.75 x 9.75 x 2.75 in (12 x 25 x 7 cm)
Weight	2 lb 12 oz (1.3 kg)
Storage and operating temperature range	0 to 120°F; −20 to +50°C
Power	NiMH removable pack, standard Li-Ion removable pack, optional
Battery life	NiMH, 3 hours (typical) Li-Ion, 4.5 hours (typical)
Charge time	NiMH, 5 hours (typical) Li-Ion, 6.5 hours (typical)
Power supply input	90–264 VAC, 47–63 Hz

⁽¹⁾ Typical, detectable range

⁽²⁾ Accuracy for levels between −20 to 60 dBmV
Additional uncertainty ±0.5 dB across −20°C to 50°C
Additional uncertainty ±1.0 dB from 4 MHz to 15 MHz

⁽³⁾ At 64 QAM

⁽⁴⁾ Accuracy and behavior from 100 MHz to 1000 MHz for levels between −5 to 50 dBmV (typical)

Acterna is the world's largest provider of test and management solutions for optical transport, access and cable networks, and the second largest communications test company overall. Focused entirely on providing equipment, software, systems and services, Acterna helps customers develop, install, manufacture and maintain optical transport, access, cable, data/IP and wireless networks.



figure 10 The DSAM meter and accessories shown here within the optional transit soft case

Acterna Basic Service packages

To ensure the highest levels of support for DSAM purchasers, Acterna offers the Basic Service for instrument package. Designed to provide the foundation for maximizing the features and usage of DSAM equipment, Acterna's Basic Service package offers the following

degrees of service and support only Acterna can provide.

This includes:

- An extended warranty of up to five years
- Annual calibration – fully traceable to meet NIST standards

These core services provide the foundation for a longer product life, help you realize greater meter functionality and maximize your Acterna investment.

Ask your sales representative or call the Acterna Customer Care Center for more information.

Ordering instructions

The DSAM-2500 models listed below include the following:

- 1 NiMH rechargeable battery
- 2 hand straps
- 1 shoulder strap
- 1 charger module
- 1 universal power supply
- 1 power cord
- 1 12 VDC in-vehicle power cable
- 5 replacement lenses
- 1 quick start manual

Models	Part number	Description
DSAM-2500A	1010-00-0531	Cable modem installation meter, 4 to 1000 MHz, 8 MHz channel spacing
DSAM-2500B	1010-00-0516	Cable modem installation meter, 4 to 1000 MHz, 6 MHz channel spacing

Options	Part number	Description
DSAM-LITH-OPT	1019-00-1456	Substitute extra long life lithium ion battery, 4.5 hrs (typical)
DSAM-BNC-OPT	1019-00-1455	Substitute 75 ohm BNC connector in place of F81
DSAM-FRN-OPT	1019-00-1457	Second language French
DSAM-GER-OPT	1019-00-1458	Second language German
DSAM-SPN-OPT	1019-00-1459	Second language Spanish

Optional accessories and replacement parts

Optional accessories and replacement parts	Part number	Description
DSAM-PC	1010-00-0610	PC based utility software for file management, display and analysis, meter configuration and channel plan management.
RS232-STD-CBL	1019-00-1427	Standard RS232 cable, shielded, M and F 9-pin D connectors, 10 ft
DSAM-RS232-CBL	1019-00-1429	DSAM RS232 cable, direct meter to PC, 14-pin to 9-pin, 6 ft
MSCLI-CBC	1019-00-0557	12 Vdc in-vehicle cable to power standard charger module
DSAM-SLEEVE	1019-00-1420	Protective sleeve to fit over DSAM meter
DSAM-CASE	1019-00-1421	Transit soft case for DSAM meter and accessories
ETRNT-CBL-KIT	1019-00-1423	Ethernet patch cable, and crossover cable, RJ45 to RJ45, 5 ft
STD-CHGR	1019-00-1422	Standard charger module with universal power supply
DSAM-NIMH-BATT	1019-00-1424	NiMH battery, 3 hrs (typical)
DSAM-LIION-BATT	1019-00-1425	Lithium ion battery, 4.5 hrs (typical) (not for extreme cold climates, <0°F/-20°C)
DSAM-LENSKIT	1019-00-1426	Set of 5 replacement snap-in lenses
SKY-3	1019-00-1366	Strand hook

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