



## DSAM Digital Services Activation Meter

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# Designed for your business

- **All-in-one tester incorporating state-of-the-art DSP and DOCSIS® technologies to test cable modem service, digital video, analog video and PacketCable™ VoIP (optional)**
- **Addresses the demands of IP testing with TruPacket™ suite of IP tests, both over RF and Ethernet interfaces**
- **Rugged lightweight design can withstand rain, cold, heat, hits, drops and other accidental mishaps**
- **Optional PC software platform provides advanced tool to manage test activities, maintain an accurate inventory of DSAM meters and baseline performance of network and technician/contractor performance**
- **Unique Workforce Automation (WFA) Browser option allows web-based applications to be viewed and controlled by a field technician. Eliminates extra field equipment and speeds completion of technician's tasks**

Simply being able to test complete digital and IP services is not enough in today's market. You need test equipment that empowers your field work force, improving productivity, efficiency and customer satisfaction. Customers demand the highest levels of service and support. Service providers need to deploy services quicker and ensure quality installations the first time, every time.

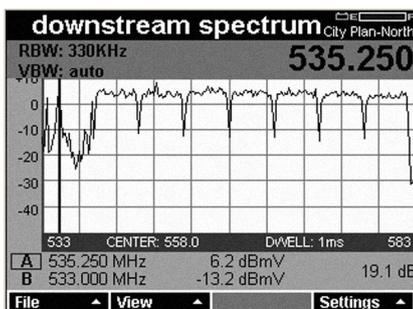
Enter the JDSU Digital Services Activation Meter. The Digital Services Activation Meter (DSAM) advanced and unique test features help assure customer satisfaction. DSAM performs both traditional tests and advanced services tests during the same call by the same technician using the same meter.

The DSAM incorporates state-of-the-art DSP and DOCSIS® technologies to test cable modem services, digital video, analog video and PacketCable™ VoIP. With just one meter you can test virtually all of your services. There is no need for multiple meters or to change test equipment—even with VoIP services.

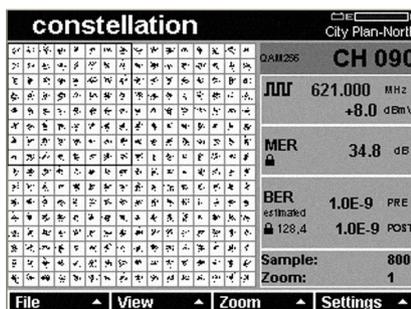
Technicians can certify homes are “digital 2-way ready” during routine installations assuring customer “self installs” of HSD to be more reliable, therefore reducing future service calls.

The DSAM's automated test capability can be custom configured and protected by an administrator to assure specific tests are conducted the same way by all technicians. Results of the test may be saved for further analysis and archiving on a PC. Upgrading the meter can be as simple as downloading a file from the Web.

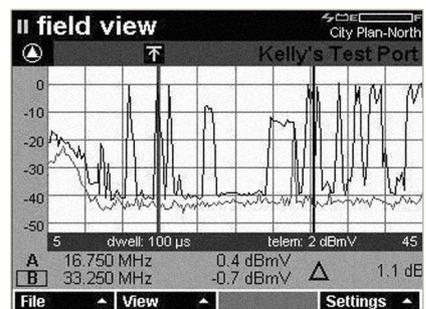
Designed for use in conditions that your field workforce will encounter, the DSAM meters are rugged, reliable and ready to use by even the lowest skilled technician. Reduce repeat calls by finding, and fixing the problems the first time. Whether the problem is at the home or in the network, the DSAM can perform the tests needed to help identify and correct the problem, thus eliminating the need for future calls.



A full downstream spectrum capability is included in the DSAM-3500 and DSAM-3600 models. Carrier characteristics and relationships to adjacent carriers can be quickly seen



Constellation displays of 64 and 256 QAM carriers are included in the DSAM-3500 and DSAM-3600 models. Demodulation of carriers up to 128,4 deep interleave is supported



The optional Field View capability greatly improves the success rate and efficiency in chasing down ingress on the return path. Field technicians can view the return spectrum as received by the PathTrak Return Path Monitoring System. Both the remote spectrum and the local spectrum view can be compared on the tech's meter.

# Solutions that improve your bottom line

## Advanced Productivity Functions

Achieve large productivity gains and make managers' and technicians' jobs easier and more efficient with the DSAM's unique functions and available software.

## Enhanced Management of Field Testing

With Field Data Management (FDM), a next-generation PC Software platform, Field Service Supervisors and Managers have an advanced tool to manage testing activities, maintain an accurate inventory of DSAM's, and baseline performance of network and technician/contractor performance. With the available IAS Instrument Application Software packages the technician's time is maximized and productivity increased. It even provides the ability to tie into back office systems with third party vendor applications.

## Remote RF Synchronization

Technicians can save 30 to 45 minutes of time every day with the DSAM's unique Remote RF Synchronization function. This feature allows technicians to synchronize data both ways with the FDM central server software over the RF plant via a DOCSIS® channel.

Channel plans and pass/fail limit plans for the DSAM can be configured and stored in the FDM software program. With just one push of the "synchronize" function on the meter, all channel plans, limit plans, and test data are synchronized with the FDM management PC server with little effort by the field technician. There is no need for techs to physically go to a single PC to synchronize their meters. Alternatively, any LAN connection on

the network can be used when the Ethernet jack on the DSAM is selected for the synchronization process. The DSAM makes it practical for a large number of technicians to effectively up-load test results at end of day, every day, or even after every job.

## Meter Asset Manager

Monitor meters at a glance with the Meter Asset Manager function of the FDM software. Quickly determine:

- How many and what version of meters they have in inventory
- Which meters in the field have the correct test setups and firmware
- Which technicians routinely synchronize their data with the FDM server (and which ones don't!)

Field Data Management software provides a simplified way to configure test setups for your DSAM meters. When channel lineups are changed supervisors can ensure all instruments are updated with the new channel plan quickly and ensure the correct autotest is used with the latest limit plan.

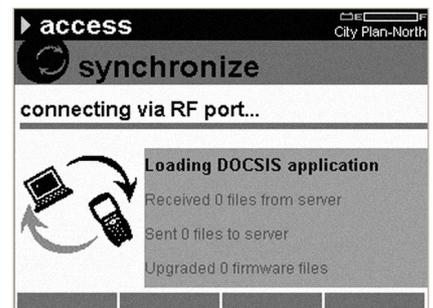
## Improved Reporting

The FDM's unique synchronization process and structure also serves as a central repository for managing all of the valuable test data gathered in the field. Traditionally underutilized because of its difficulty to retrieve and store, test data is easily maintained and can provide much valuable information. Data is easily retrieved with the synch process from the instruments. The FDM's robust database and unique file structure maintains all the test data in a single database that can be easily mined for value added reports.

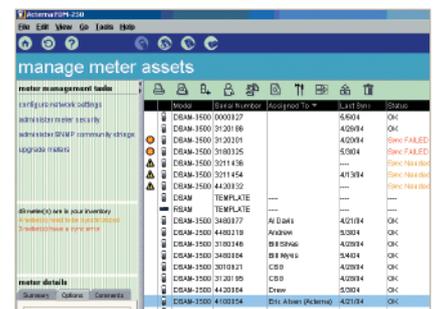
## Rugged and Reliable

JDSU understands the environment in which you work. The DSAM is designed to work in your environment. Rugged. The DSAM is built to withstand a four-foot drop on all sides. Reliable. The DSAM can withstand 75 mph wind driven rain at up to four inches of rain over a one-hour period.

What does this mean for you? Technicians love to use the DSAM. With its lightweight design and ergonomic body, technicians prefer to use the DSAM to other meters. Easy to understand and learn, technicians can usually use the DSAM with minimal training.



Synchronization of test files from the field and updated channel plans from test administration can be performed with optional Field Data Management (FDM) software over Ethernet or DOCSIS® RF



Management of DSAM meters, and analysis of measurements and tests captured by those meters, can be handled by the optional Field Data Management (FDM) software

# Designed for your technicians

## **DSAM-1500 Installer meter for video and 2-way verification**

The DSAM-1500 Digital Service Activation Meter is a lightweight, durable, handheld meter for installation and troubleshooting. It features an intuitive graphical interface complete with an informative online help system.

## **Analog and Digital Signal Level Meter**

The DSAM-1500 provides traditional SLM test functions of analog video and audio levels and digital power levels. The video auto-test feature allows administrators to pre-program a test plan for multiple channels that a field technician can execute consistently with a single test selection. Additional features include a tilt screen and the Mini-scan feature; a simple one-key test that shows a summary of 1 to 12 channels.

## **Digital QAM Analyzer**

The DSAM-1500 provides digital analysis on QAM downstream carriers including digital video and cablemodem services. The DSAM provides MER and Pre and Post FEC BER so installers can be sure that digital services are being received with proper margin and quality. It also includes a complete two-way signal test that confirms connectivity and level verification of both the upstream and downstream channel. Non-disruptive to services, it uses the DOCSIS® communication channel to execute connectivity test and provide the transmit levels on the upstream required to reach the headend Cable Modem Termination System (CMTS) from the test location. Test results include margin of transmit and receive levels.

## **Work Force Terminal via Optional Browser Function**

The DSAM-1500 offers an optional Browser Function that allows users the ability to access a large variety of applications through the test instrument.

## **Upgradeable to DSAM-2500**

Being a part of the DSAM family of test instruments, the DSAM-1500 can be quickly and easily upgraded to the award winning DSAM-2500.

## **DSAM-2500 Install and Service Tech Meter for DOCSIS® Services**

The DSAM-2500 contains ALL the benefits of the DSAM-1500 plus the addition of full DOCSIS® Service Verification and IP Performance tests with TruPacket™. Test virtually all of your high-speed services with just one meter the DSAM-2500.

## **Physical Layer Verification**

Quickly and easily verify the functionality of the customer's cable modem. Connect to an active Internet site via the Web Access Test, thus verifying Internet access directly over RF or through the customer's cable modem via an Ethernet jack on the DSAM. The DSAM-2500 can also use its own MAC address or the MAC address of a previously provisioned cable modem.

## **IP Performance Testing with TruPacket™**

Throughput, Packet Loss and Ping tests on both the upstream and downstream can be performed in the DOCSIS/EuroDOCSIS® channel with the DSAM-2500. See section on IP Testing With TruPacket™.

## **Upgradeable to DSAM-3500**

Being a part of the DSAM family of test instruments, the DSAM-2500 can be quickly and easily upgraded to the fully featured DSAM-3500, which includes full spectrum, constellation and TruPacket™ IP performance tests over the DSAM Ethernet jack.

## **DSAM-3500 and DSAM-3600 Service and Network Tech Meters for DOCSIS® Services**

The DSAM-3500 and 3600 are lightweight, durable, handheld meters for cable modem installation and service. The meter enables service and network technicians to troubleshoot and service high-speed data and video services at the install location and on the distribution network, such as a tap or first active. The DSAM-3500 and DSAM-3600 contain ALL the benefits of the DSAM -1500 and DSAM-2500 plus the addition of IP testing through the Ethernet jack. This series also includes a full downstream spectrum view as a convenient means of observing the carrier shape or checking for off-air forward ingress. Digital QAM carriers may be closely scrutinized with a constellation view, complete with zoom levels and display of level, MER/EVM and estimated pre and post FEC BER.

## Deep Interleave

The DSAM-3600 adds advanced digital boards with deep interleave capabilities. Typically used on 256 QAM digital video carriers that utilize an interleave depth of 128, 4. This new board also offers the potential of future digital test features with simply a software upgrade. For deep interleave capabilities on a DSAM-2500, order the DSAM-2600.

## IP Performance Testing with TruPacket™ over Ethernet

The DSAM-3500/3600 may be directed to test IP performance through the Ethernet jack in addition to TruPacket™ testing performed over the RF thus further emulating the subscriber's PC. IP tests are conducted through the installed modem. This capability allows the user to exercise even a DOCSIS® 2.0 modem.



Summary Feature / Model	DSAM-1500 6&8 MHz Models	DSAM-2500 6&8 MHz Models	DSAM-2600 6 MHz Models	DSAM-3500 6&8 MHz Models	DSAM-3600 6 MHz Models
Channel Bandwidth					
Standby Mode	X	X	X	X	X
Analog Video - Signal level, Mini-Scan, Full Scan, Tilt	X	X	X	X	X
Digital Video - Same as Analog plus QAM, MER/BER	X	X	X	X	X
2-Way Upstream Test (DOCSIS® Ranging) and Upstream Spectrum	X	X	X	X	X
Dynamic DOCSIS® Range/Register, Packet Loss, Throughput, & Ping		X	X	X	X
Web Access Test		X	X	X	X
BER for Deep Interleave (128,4)			X		X
Full Downstream Spectrum				X	X
Constellation				X	X
IP Tests via Ethernet Jack				X	X
Open Web Browser <sup>(1)</sup>	Option	Option	Option	Option	Option
PathTrak Field View with RSG	Option	Option	Option	Option	Option
VoIP Test Package <sup>(2)</sup>		Option	Option	Option	Option
Closeout Test <sup>(1)</sup>	Option	Option	Option	Option	Option
Battery Included	Standard NiMH	Standard NiMH	Long life Lithium Ion	Standard NiMH	Long life Lithium Ion
<b>From:</b>	<b>Upgrades to: -&gt;</b>				
DSAM-1500		DSAM-2500 Field	DSAM-2600 Factory	DSAM-3500 Field	DSAM-3600 Factory
DSAM-2500			Factory	Field	Factory
DSAM-3500					Factory

### Notes:

<sup>(1)</sup> Function integrated with FDM-100/250 Field Data Management Software, a client/server based PC application software used to manage DSAM field meters and test data from a central location.

<sup>(2)</sup> VoIP available late calendar year 2004 for North American PacketCable™ based systems. Contact Local JDSU office for compatibility and availability for specific systems.

## IP Performance Testing with TruPacket™

Throughput, Packet Loss and Ping tests on both the upstream and downstream can be performed with the DSAM-2500 to identify IP problems in the physical plant. Upstream and downstream rates are separate, simultaneous, results. The configuration file name is displayed for the user to check if provisioning corresponds to the measured rates. Upstream throughput is between the test point and the CMTS. Downstream throughput is between a remote HTTP server and the test point. Server IP addresses and the test file name and path are specified in the FDM PC configuration software to be deployed to specific meters. The TruPacket™ Packet Loss test uses a series of pings to the CMTS to test packet loss. It operates in two modes:

Basic Mode and SNMP Mode. Basic Mode measures and displays the total loop count of sent and lost packets and a ratio of the sent-to-lost packets as a percent. Basic mode does not distinguish between sent and lost packets on the upstream and downstream; it provides a loop count. TruPacket™ continues to count lost packets even if there is steady downstream and upstream noise. The SNMP mode displays a loop count of sent and lost packets, individual upstream and downstream lost packets, and a ratio of each. SNMP mode also offers an upstream SNR measurement. Like the Basic mode, the SNMP will continue counting lost packets even with steady noise on the downstream or upstream. It is also not fooled by downstream noise, meaning that it will never count downstream packet losses as upstream packet losses.

To enable the SNMP mode, a secure, read-only public community string for the CMTS must be configured into the meter with FDM PC software. Ping is generally used simply to test connectivity between two devices such as the DSAM and an Internet web server, but it is also used to test delay between these devices. The ping connectivity test allows the technician to connect beyond the CMTS or MSO network to an Internet server of their choice. The technician may pre-set up to 10 different IP target addresses for the test. These IP addresses may be HTTP or FTP servers. The user also has the ability to select different packet sizes, in bytes, and time between pings.

docsis City Plan-North			
P A S S Cable Modem DOC64 CH 085			
test complete			
downstream	6MHz QAM64	591.000 MHz	
LEVEL	7.1dBmV		
MER	34.8dB	MER Headroom	6.8dB
BER estimated	1.0E-9PRE	1.0E-9POST	
upstream	3.2MHz QPSK	30.000 MHz	
LEVEL	41.8dBmV	LEVEL Headroom	16.2dB

DSAM-2500, -3500 and -3600 provide a full set of physical parameters for a DOCSIS® connection, downstream and upstream.

docsis City Plan-North	
test complete	
network assignments	
DHCP server:	162.30.38.34
TOD server:	162.30.38.35
TFTP server:	162.30.38.35
Gateway:	10.82.242.1
modem assignments	
CM IP address:	10.82.254.126 - 255.255.244.0
config file:	mdaz8001f_v1_pro
SID:	2667
Meter IP address:	68.56.31.74

DSAM-2500, -3500 and -3600 provide complete network parameters for a DOCSIS® registration, including configuration file served and service identifier number (SID)

docsis City Plan-North	
packet loss test	
packet loss	
	loop
sent	11378
lost	36
ratio (%)	0.316

Once a DOCSIS® connection is established, the assigned channel can be stressed based on the configuration file served (based on system provisioning for the MAC address used). Packet Loss (shown above), Throughput and Ping tests can be performed. The same tests can be performed additionally over the DSAM Ethernet port with models -3500 and -3600

# Workforce management

## TechComplete™ Closeout Testing Solution

With the workforce management capabilities of the DSAM, TechComplete Closeout Testing Solutions provide technicians with electronic methods and procedures that automate closeout testing. Results are uploaded remotely over existing RF plant to a central, management-accessible, results database. By enforcing consistent and clear procedures for closeout testing, uploading results immediately to a central database, integrating test results with work order detail, and providing reports on the test data, operators can significantly reduce their repeat service call rates. This saves valuable time and money as well as proactively establishes a repeatable quality work process. With the DSAM closeout testing option in conjunction with the FDM software and TechComplete Coaching Reports, a complete end-to-end solution is available. Contact JDSU sales representative for more information.

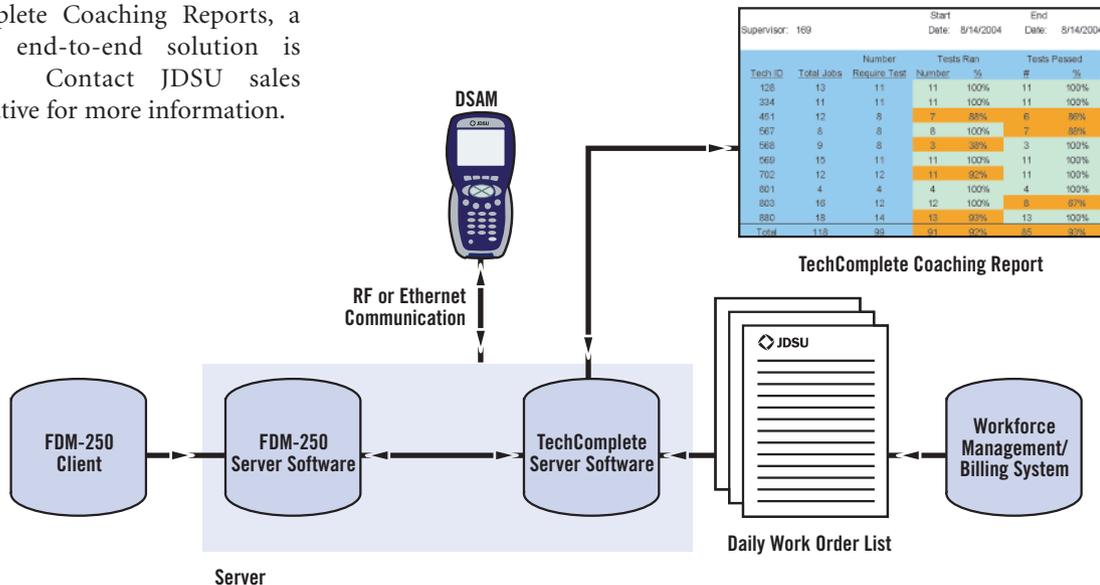
## Options and Accessories

The DSAM comes loaded with features but also has many options and accessories to choose. From battery type to your choice of several languages to the type of bag your technicians need, the DSAM is designed to meet your business needs.

## Service Packages

To ensure the highest levels of support for DSAM purchasers, JDSU offers service packages designed to provide the foundation for maximizing the features and usage of DSAM equipment. Packages include the following:

- Extended warranty of up to a total of five years
- Annual calibration, fully traceable to meet NIST standards
- Service ValuePaks that combine calibration and extended warranty into one economical package when accompanied with initial product purchase



Typical work force management process



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