 JDSU

DSAM XT and DOCSIS® 3.0 Upgrade
Customer Reference Guide

Digital Service Analysis Meters (DSAMs) have a remarkable life span that leads to a low cost of ownership. Customers like you are extending the life span of their DSAMs by upgrading them with XT and DOCSIS 3.0 hardware to keep pace as technology evolves. This Customer Reference Guide provides helpful information for use in planning your XT and DOCSIS 3.0 upgrades.
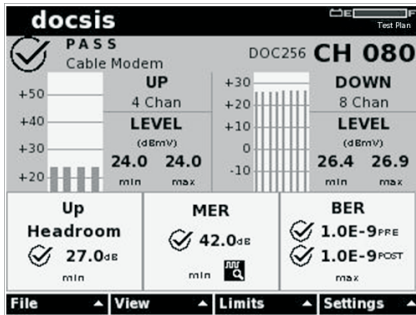
Faster Test Capability with XT Hardware

DSAMs with XT hardware operate with an updated, more powerful processor that operates faster and shortens test and repair time. A color display provides vivid, crisp results for easier interpretation. The XT hardware prepares the way for new, advanced tests and procedures letting you take advantage of the latest developments through firmware updates. Upgrading to XT hardware will extend the life of your meter and your investment, lowering the total cost of ownership.

Benefits of the XT upgrade include:

- Complete more jobs in less time with:
  - boot times of ~15 seconds, three times (3x) faster than non-XT DSAM
  - noticeably faster screen transitions, two times (2x) faster than non-XT DSAM.
- See vivid measurement results with:
  - new, crisper display that is easier to read, does not fade in sunlight, and is unaffected by extreme temperatures
  - improved screen contrast
  - a color display that simplifies measurements.
- Test multiple service tiers quickly and efficiently with dual media access control (MAC) address capability with baseline privacy interface plus (BPI+) and Cable-Labs® certificates.
- Take advantage of the new innovative testing options for XT DSAMs with:
  - **SmartID™**: Advanced coax probes enable extremely quick, comprehensive home network qualification, eliminating repeat truck rolls, for more affordable and effective troubleshooting.
  - **Field View QAM™**: Technicians see an upstream carrier impairments dashboard at field test points to speed fault diagnosis and to determine root causes. They can quickly verify fixes with a real-time view of headend signal quality transmitted from field test points.
  - **Equalizer Mode**: Graphs the DOCSIS receiver equalizer taps for a quicker view of problems causing reflections, and displays in-channel response and group delay for the tuned downstream channel.
  - **WiFi**: Verifies WiFi network strength and connectivity in addition to testing data communication.
  - **Optical power meter**: Connects to a USB power meter (JDSU MP60A or MP80A) to verify or troubleshoot node light levels.

Note: All new and future advanced digital testing tools for the DSAM platform require XT hardware.

- Speeds testing and troubleshooting with faster boot and navigation
- Enables time-saving, innovative features and options such as the latest firmware upgrades and updates (for example, Digital Quality Index [DQI])

2

Summary view provides a quick view into overall performance

Advantages of Complete Service Testing with DOCSIS 3.0

- Conduct testing on the highest tiers of service, which also have highest revenue and profitability
- Conduct full DOCSIS 3.0 performance testing
- Perform 8 downstream x 4 upstream bonded carrier testing
- Verify service quality
- Generate home certification reports
- Conduct legacy testing of DOCSIS 1.x and 2.0
- Conduct Ethernet testing of customers' service

DOCSIS® 3.0 performance testing: Quickly and efficiently test bonded channel performance, signal levels, MER (including headroom), BER, and full-range throughput with 8 downstream by 4 upstream channels. A built-in DOCSIS 3.0- cable modem lets you perform quick and accurate DOCSIS RF and IP tests, or test a full DOCSIS 3.0 "gold" system complete with 8 bonded downstream signals and 4 bonded upstream signals.

Faster Range and Registration: A DOCSIS 3.0 equipped DSAM lets you quickly perform a complete test of bonded channels, without the need to remember which signal frequencies are part of the bonded set, or without tuning to individual channels for measurement. Testing all D3 bonded signals without a D3 meter requires configuring all signals as "primary," consuming unnecessary overhead.

DOCSIS 3.0 IP Tests: Perform IP tests, including packet loss, throughput, and ping, over the DOCSIS 3.0 connection.

DSAM DOCSIS 3.0 Upgrade Options

JDSU provides a wide variety of flexible DSAM platform upgrade options to support your needs. To keep pace with ever-changing DOCSIS testing requirements, we have upgraded the cable modem chipset used in the DSAM platform several times over the years from the DOCSIS 1.0/1.1 to the full DOCSIS 3.0 8x4 chipset of today. Along with the new chipset, the DSAM platform's advanced digital testing capabilities require XT hardware, which supports both current and future test functions and features. There are two general options for upgrading to DOCSIS 3.0, you can:

1. upgrade your existing unit, if supported, through the service department.

2. purchase a new model via trade-in or upgrade-by-exchange option.

3

Factory, On-site DOCSIS 3.0 Upgrades, and Priority Service Options for Existing Units

JDSU provides both factory and on-site upgrade options. An on-site visit generally requires a minimum of 40 transactions, which can include a variety of unit services. On-site upgrades:

- reduce costly technician downtime
- eliminate shipping costs
- lessen equipment management hassles.

Priority service is available for DOCSIS 3.0 factory upgrades. Both 24-hour and 48-hour turnaround times from factory receipt are available upon request for an additional cost. Normal turnaround time is approximately 10 working days.

Ordering information

Part Number	Description
DSAM_24_PRI	24-hour turnaround time from factory receipt
DSAM_48_PRI	48-hour turnaround time from factory receipt

Not included in the DOCSIS 3.0 Upgrades for Existing Units or Units Obtained via Upgrade-by-Exchange Option:

- QAM Ingress option (must be purchased separately)
- DSAM XT updated processor and display (XT upgrade must be purchased separately)
- changes in analog measurement capability
- battery or charger.

Note: Because PacketCable® VoIP is at end of life, it is not transferable to new models. However, all new model package upgrades include VoIPCheck™.

Purchase a New Model DOCSIS 3.0

In some cases, the best alternative is to purchase a new model with a trade-in credit or upgrade-by-exchange option. A new DSAM with the DOCSIS 3.0 option provides the following advantages:

- industry-leading 8x4 DOCSIS 3.0 bonded testing
- throughput testing up to 400 Mbps over RF
- GE Ethernet option compatible
- improved MER up to 45 dB
- deep interleave support
- DQI standard (optional on DSAM 2000)
- pre-amp in spectrum (optional on DSAM 2000 and 2300)
- QAM Ingress option compatible
- 3x faster boot time
- better display in sunlight with color support
- battery and charger
- maintain serial number and CM MAC address (upgrade-by-exchange option only)
- future enhancements support
- sleeve/fitted bag
- warranty (1 year)
- calibration

Upgrade-by-Exchange Option or Trade-in for a New DSAM

The upgrade-by-exchange option differs from the trade-in program.

Upgrade-by-Exchange

Purchase a new DSAM-3300 or DSAM-6300 and have it configured with the same serial number and MAC addresses as the trade-in unit. (Upgrade-by-exchange units do not include battery and charger.)

Trade-in

Purchase a new DSAM-3300 or DSAM-6300 and get a trade-in credit (new serial number and MAC addresses) for your old DSAM meter regardless of its model or age.

Trade-in Other Products

- **SDA-4040D and SDA-5000**
  JDSU offers a trade-in credit for any SDA-4040D and SDA-5000 unit that you can use toward the purchase of a new DSAM-6300 from the factory.

- **MicroStealth/CLI Series and Competitor Products**
  JDSU offers a trade-in credit for any MicroStealth/CLI-series meter (JDSU or comparable competitor product) that you can use toward the purchase of a DSAM-3300 or DSAM-6300.

Trade-in Terms

Standard JDSU trade-in terms apply. Customers will be invoiced for the full amount of a new DSAM, based on the model and package pricing. Customers must return the trade-in meter to JDSU within 60 days to receive trade-in credit.

5

Currently Supported DOCSIS 3.0 Upgrade Paths

Upgrade Options

Existing Unit	Modem-Only	Modem + XT	Trade-In for New Model	Upgrade-by-Exchange to a New Model
D1.x	N/A	N/A	✓	✓
D2 Non-XT	✓	✓*	✓	✓
D2 XT	✓	N/A	✓	✓

*Recommended

Typical Upgrade Scenarios

Upgrading DOCSIS 1.0/1.1 DSAM Units to DOCSIS 3.0
Purchase a New DOCSIS 3.0 DSAM Model
This is the *only* route with long-term investment protection and new software feature support for now and in the future.

The DSAM DOCSIS 1.0/1.1 meters are generally 7 to 9 years old and **cannot be effectively upgraded in stages** to the equivalent of a new DOCSIS 3.0 meter. To take full advantage of the DSAM XT processor together with DOCSIS 3.0 features, **JDSU recommends replacing DOCSIS 1.x DSAM meters with one of the following two new DOCSIS 3.0 DSAM trade alternatives.**

1. Trade-in option: Receive a trade-in credit toward the purchase of a new model with a new serial number and MAC addresses

2. Upgrade-by-Exchange option: Purchase a new unit configured with the same serial number and MAC addresses as the trade-in unit.

Upgrading DOCSIS 2.0 DSAMs to DOCSIS 3.0
The following upgrade options are available:

- DOCSIS 2.0 DSAM with XT: D3 Modem-only upgrades
- DOCSIS 2.0 DSAM Non-XT: D3 Modem and XT upgrade
- New DOCSIS 3.0 Model: Through trade-in or upgrade-by-exchange option.

Serial Number Guidance

Various changes over the years make it difficult to associate specific features with the range in serial numbers. Here are some general rules that you may find helpful:

Identifying D1/D2 units

- Serial numbers between 3000000 and 7999999 are probably D1.
- Serial numbers above 8100000 or below 2000000 are almost certainly D2.
- Serial numbers starting with 80 may be either D1 or D2.

Identifying XT units

- Serial numbers between 3000000 and 8999999 were likely not shipped as XTs.
- Serial numbers below 2000000 should be XT.
- Serial numbers above 9000000 may or may not be XT.
- An XT brow label, shown below, appears on meters with XT hardware

XT brow label

Hardware Revision-Identification Guideline

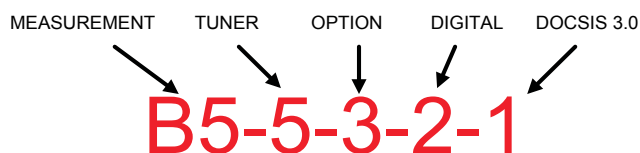Identifying the hardware inside DSAM units:

- To find DSAM hardware information, press the blue (shift) key and then press "6".
- Press the third soft-key corresponding to the "Details" tab.
- Find the row labeled "hardware version".

You can also use the TPP to obtain DSAM hardware information for units that were previously synchronized with the TPP server. To do this:

- from TPP Thick Client, Meter Assets shows the meter's hardware information, also known as the hardware string. To export the hardware string, choose Meter Assets and then Export (Note: exported information can only be saved as an HTML file.)
- from TPP v4.8 Web Client, Asset Inventory shows the meter's hardware information. To export, choose Asset Inventory and then Export (Note: exported information can be saved as an Excel, CSV, or PDF file.)

Interpreting Hardware Codes

The hardware code consists of five characters separated by hyphens. The following describes what each of the five characters indicates:

MEASUREMENT   TUNER   OPTION   DIGITAL   DOCSIS 3.0

B5-5-3-2-1

The first character in the hardware code indicates the DSAM configuration.

A = 8 MHz
B = 6 MHz

The second character indicates the release level of measurement board.

Revision

1 = DOCSIS 1.1
2 = DOCSIS 1.1
3 = DOCSIS 2.0
4 = DOCSIS 2.0
5 = New version minus Broadcom circuitry (2000, 2300, 3300, and 6300 only)

The third character indicates the release level of tuner board.

Revision

1 =
2 =
3 = Carrier to noise and hum
4 = Carrier to noise and hum
5 = Carrier to noise and hum
6 = In-band carrier to noise

The fourth character indicates the release level of the option board. (If no option board exists, an X is used.)

Revision

1 = 6 MHz only
2 = 6 MHz only
3 = 6 or 8 MHz, see character 1
4 = MPEG capable, 6 or 8 MHz, see character 1

The fifth character indicates the release level of the digital board.

Revision

1 = Original digital board
2 = XT digital board
3 = XT digital board MPEG capable (RSAM only)
4 = XT digital board MPEG capable (DSAM only, U33 SRAM removed)

The sixth character indicates the DOCSIS 3.0 modem board. (If no modem board exists, no character is used.)

1 = Modem board installed

The following tables provide the ordering information for options and packages.

9

Pre-Configured Packages*

Packages for the Americas or 42-MHz Return Path

Part Number	Description	Notes/Ordering Information
DSAM-D2TECH1PKG-42	Fulfillment Tech/Installer Package, DSAM 2000 with DOCSIS 2.0 w/ 42 MHz diplexer, software upgradeable to DOCSIS 3.0. Includes high-capacity battery (standard) as well as browser and VoIPCheck options.	Does not include DOCSIS 3.0 software option or DSAM-DPERFOPT, which must be separately, or order Tech2 Package.
DSAM-D3TECH1PKG-42	Fulfillment Tech/Installer Package, DSAM 2000 with DOCSIS 3.0 w/ 42 MHz diplexer. Includes high-capacity battery (standard) as well as browser and VoIPCheck options.	Includes DOCSIS 3.0 software option as well as browser and VoIPCheck. Does not include DSAM-DPERFOPT, which must be ordered separately, or order Tech2 Package.
DSAM-D3TECH2PKG-42	Fulfillment Tech Package, DSAM 2300 with DOCSIS 3.0 w/ 42 MHz diplexer. Includes DQI and high-capacity battery (standard) as well as SmartScan, browser and VoIPCheck options.	Includes DOCSIS 3.0 SW option and DQI, ES/SES, and AGC Stress, as well as browser and VoIPCheck. Does not include QAM ingress, order Tech4 Package if QAM ingress is needed.
DSAM-D3TECH3PKG-42	Service Tech Package, DSAM 3300 with DOCSIS 3.0 w/ 42 MHz diplexer. Includes DQI, SmartScan, and high-capacity battery (standard) as well as browser and VoIPCheck options.	Includes DOCSIS 3.0 SW option and DQI, ES/SES, and AGC Stress, as well as browser and VoIPCheck. Does not include QAM ingress, order Tech4 Package if QAM ingress is needed.
DSAM-D3TECH4PKG-42	Maintenance Tech Package, DSAM 3300 with DOCSIS 3.0 w/ 42 MHz diplexer. Includes DQI, SmartScan, and high-capacity battery (standard) as well as QAM Ingress, browser and VoIPCheck.	Includes DOCSIS 3.0 SW option, QAM Ingress, DQI, ES/SES, and AGC Stress, as well as browser, VoIPCheck, and SmartScan.
DSAM-D3SWPPKG-42	Sweep Tech Package, DSAM-6300 with DOCSIS 3.0 w/ 42 MHz diplexer. Includes DQI, SmartScan, Return Loopback, Return Alignment, and Sweepless Sweep (standard). Package includes Forward Sweep, Reverse Sweep, QAM Ingress, browser, and VoIPCheck.	Includes DOCSIS 3.0 SW option, QAM Ingress, DQI, ES/SES, and AGC Stress, as well as browser, VoIPCheck and SmartScan, and Forward and Reverse Sweep.

Packages for Europe, Asia, or Systems with 65-MHz Return Path

Part Number	Description	Notes/Ordering Information
DSAM-D2TECH1PKG-65	Fulfillment Tech/Installer Package, DSAM 2000 with DOCSIS 2.0 w/ 65 MHz diplexer; software upgradeable to DOCSIS 3.0. Includes high-capacity battery (standard). Package includes browser and VoIPCheck options.	Does not include DOCSIS 3.0 software option. Includes browser and VoIPCheck. Does not include DSAM-DPERFOPT, which must be ordered separately, or order Tech2 Package.
DSAM-D3TECH1PKG-65	Fulfillment Tech/Installer Package, DSAM 2000 with DOCSIS 3.0 w/ 65 MHz diplexer. Includes high-capacity battery (standard). Package includes browser and VoIPCheck options.	Includes DOCSIS 3.0 software option as well as browser and VoIPCheck. Does not include DSAM-DPERFOPT, which must be ordered separately, or order Tech2 Package.
DSAM-D3TECH2PKG-65	Fulfillment Tech Package, DSAM 2300 with DOCSIS 3.0 w/65 MHz diplexer. Includes DQI + SmartScan and high-capacity battery (standard). Package includes browser and VoIPCheck options.	Includes DOCSIS 3.0 software option as well as DQI, ES/SES, and AGC Stress, as well as browser and VoIPCheck. Does not include QAM ingress, order Tech4 Package if QAM ingress is needed.
DSAM-D3TECH3PKG-65	Service Tech Package, DSAM 3300 with DOCSIS 3.0 w/ 65 MHz diplexer. Includes DQI, SmartScan and high-capacity battery (standard). Package includes browser and VoIPCheck options.	Includes DOCSIS 3.0 software option as well as DQI, ES/SES, and AGC Stress, as well as browser and VoIPCheck. Does not include QAM ingress, order Tech4 Package if QAM ingress is needed.
DSAM-D3TECH4PKG-65	Maintenance Tech Package, DSAM 3300 with DOCSIS 3.0 w/ 65 MHz diplexer. Includes DQI, SmartScan and high-capacity battery (standard). Package includes QAM Ingress, browser, and VoIPCheck.	Includes DOCSIS 3.0 software option as well as QAM ingress, DQI, ES/SES, and AGC Stress, as well as browser, VoIPCheck and SmartScan.
DSAM-D3SWPPKG-65	Sweep Tech Package, DSAM-6300 with DOCSIS 3.0 w/ 65 MHz diplexer. Includes DQI, SmartScan, Return Loopback, Return Alignment, and Sweepless Sweep (standard). Package includes Forward Sweep, Reverse Sweep, QAM Ingress, browser, and VoIPCheck.	Includes DOCSIS 3.0 software option as well as QAM ingress, DQI, ES/SES, and AGC Stress, browser, VoIPCheck, SmartScan, Forward Sweep, and Reverse Sweep.

*Additional hardware and software can be added to any of these packages.
  JDSU recommends that you work with your sales contact to build the DSAM for your needs. Packages have been created for convenience and savings to simplify the ordering process and to bundle multiple popular features. Additional options are available to add to the pre-configured packages. These packages have factory-configured hardware that cannot be substituted or modified.

DSAM Detailed Feature Matrix		Model			
	Feature	2000	2300	3300	6300
Analog and Digital Carrier Level Verification	Analog video and audio power levels	✓	✓	✓	✓
	Digital power level	✓	✓	✓	✓
	Tilt (1 to 12 channels)	✓	✓	✓	✓
	Mini-scan (1 to 12 channels)	✓	✓	✓	✓
	Full-scan (1 to 999 channels)	✓	✓	✓	✓
	Analog carrier-to-noise	✓	✓	✓	✓
	Hum	✓	✓	✓	✓
	SmartScan™	Opt	Opt	✓	✓
	Spectrum analyzer with auto pre-amp	Opt	Opt	✓	✓
Digital Carrier Quality (QAM Carriers)	MER/EVM measurements	✓	✓	✓	✓
	Pre- and post-FEC BER (64, 128, 256)	✓	✓	✓	✓
	BER for deep interleave (128,4 or 128,5)	✓	✓	✓	✓
	Constellation (64, 128, 256)	Opt	Opt	✓	✓
	Digital Quality Index (DQI)	Opt	✓	✓	✓
	AGC stress	Opt	✓	✓	✓
	Errored/severely errored seconds	Opt	✓	✓	✓
	Equalizer Stress, in-channel response, group delay			Opt	Opt
	QAM Ingress	Opt	Opt	Opt	Opt
Upstream Physical Verification	Return loopback				✓
	Local upstream spectrum for ingress check	✓	✓	✓	✓
	Return QAM generator	Opt	Opt	✓	✓
	Spectrum analyzer w/auto pre-amp	Opt	Opt	✓	✓
	Field View of the PathTrak return spectrum	Opt	Opt	Opt	Opt
	Field View QAM of PathTrak MACTrack	Opt	Opt	Opt	Opt
DOCSIS/EuroDocsis Testing	DOCSIS 2.0/1.1/1.0 testing 1 downstream x 1 upstream	✓	✓	✓	✓
	DOCSIS 3.0 bonded carrier testing 8 downstream x 4 upstream	Opt	Opt	Opt	Opt
	Downstream MER/EVM, pre- and post-FEC BER	✓	✓	✓	✓
	Dynamic DOCSIS range and registration	✓	✓	✓	✓
	Cable modem configuration file verification	✓	✓	✓	✓
	Upstream channel selection	✓	✓	✓	✓
	Upstream transmit level and headroom	✓	✓	✓	✓
	Cable modem and CPE MAC cloning	✓	✓	✓	✓
	CableLabs-issued certificates	✓	✓	✓	✓
	IPv6 compatibility — cable modem	✓	✓	✓	✓
	Dual MAC/BPI+ certificates	✓	✓	✓	✓

DSAM Detailed Feature Matrix		Model			
	Feature	2000	2300	3300	6300
DOCSIS/EuroDocsis Service Tests	Packet loss	Opt	✓	✓	✓
	Throughput — upstream and downstream (up to DOCSIS 3.0 rates)	Opt	✓	✓	✓
	Ping	Opt	✓	✓	✓
	VoIPCheck — voice over IP testing (MOS, packet loss, jitter, delay)	Opt	Opt	Opt	Opt
Ethernet Testing	Throughput — (DOCSIS 2.0 rates)	Opt	Opt	✓	✓
	Packet loss	Opt	Opt	✓	✓
	Ping	Opt	Opt	✓	✓
	View CM diagnostics page	✓	✓	✓	✓
	Gig-E option throughput — (DOCSIS 3.0 rates) up to 400 Mbps down	Opt	Opt	Opt	Opt
RF Network Verification	Forward Sweepless Sweep™	Opt	Opt	Opt	✓
	Reverse alignment				✓
	Forward (downstream) sweep				Opt
	Reverse (upstream) sweep				Opt
	Return loopback				✓
HFC Network Verification	Scheduled autotest	✓	✓	✓	✓
	Proof test	✓	✓	✓	✓
Home Network Verification	IP tests via 10/100/1000 Ethernet jack	Opt	Opt	✓	✓
	Ingress resistance test (IRT)	✓	✓	✓	✓
	Fault location using FDR feature in LST-1700 remote transmitter	✓	✓	✓	✓
	Test point compensation	✓	✓	✓	✓
	SmartID advanced coax probe support*	✓	✓	✓	✓
	WiFi support (USB)*	Opt	Opt	Opt	Opt
Autotest	Home certification	Opt	Opt	Opt	Opt
	Video autotest	✓	✓	✓	✓
	Cable modem autotest	✓	✓	✓	✓
	Combination autotest (video and cable modem)	✓	✓	✓	✓
	Proof of performance (scheduled autotest)	✓	✓	✓	✓
	Web browser	Opt	Opt	Opt	Opt
Miscellaneous	RF, WiFi, or Ethernet synchronization with TPP	✓	✓	✓	✓
	Secure Sync™ — RF Synchronization through firewalls	✓	✓	✓	✓
	Optical power meter support (USB) MP-60A and MP-80A*	✓	✓	✓	✓

*This firmware option requires the purchase of a separate, additional hardware accessory.

Test & Measurement Regional Sales

NORTH AMERICA	LATIN AMERICA	ASIA PACIFIC	EMEA	WEBSITE: www.jdsu.com/test
TOLL FREE: 1 855 ASK-JDSU (1 855 275-5378)	TEL: +1 954 688 5660 FAX: +1 954 345 4668	TEL: +852 2892 0990 FAX: +852 2892 0770	TEL: +49 7121 86 2222 FAX: +49 7121 86 1222	