

## JDSU DSAM 2000/2300/3300/6300

### Digital Service Analysis Meter



Das DSAM 2000/2300/3300/6300 bietet neben allen wichtigen analogen und digitalen HF-Messfunktionen umfangreiche Möglichkeiten Tests auf Docsis-bzw. IP-Ebene durchzuführen. Seine extrem robuste Bauweise und große Funktionsvielfalt machen das DSAM zu dem idealen Messinstrument für Triple Play-Dienste und den täglichen Feldeinsatz.

Mittels dem bewährten Forward-Sweep-Systems (Vorweg-Wobbelung) werden über analoge und digitale Video-Träger Referenzen gebildet und das ganze Spektrum über diese ständig gescannt und analysiert. Beim Return Sweep erfolgt in Verbindung mit dem SDA 5500 (HE-Unit) die Prüfung des Rückwegs an beliebigen Stellen des Netzes.

*The DSAM 2000/2300/3300/6300 combines all important analog and digital measurement functions with overall testing capabilities for high speed data and voice services. Due to its rugged & light-weight design and overwhelming testing capabilities the DSAM is the perfect field measurement unit for triple play services.*

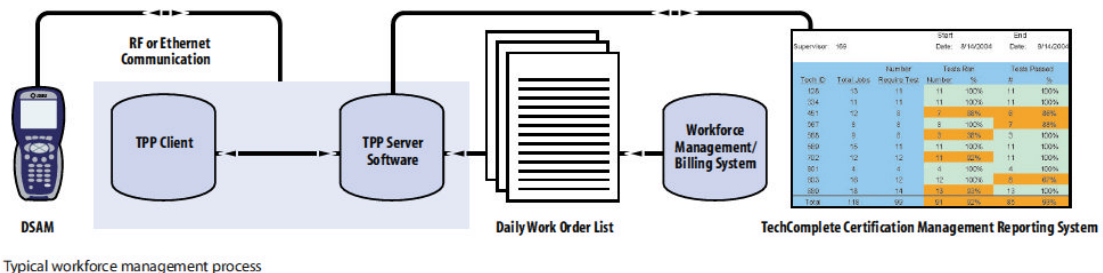
*Through the well-known JDSU forward sweep concept analog and digital carriers are continuously referenced and the spectrum scanned. The return sweep option of the DSAM 6300 together with the SDA 5500 headend unit enable a single technician to check and align the return path all by himself.*

#### Features

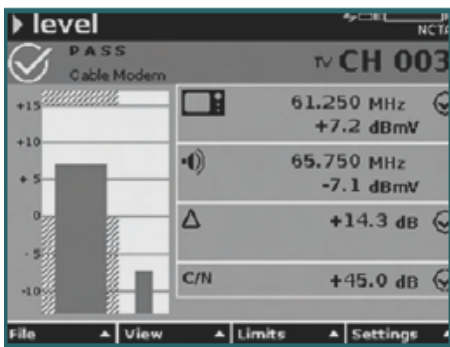
- Messung von Docsis 3.0 (8xDS/4xUS)
- Datendurchsatz-Messung von gebondeten Kanälen:
  - Bis zu 400 Mbps DS/120 Mbps US
- Gigabit-Ethernet-Port
- Optionaler GbE-Port für Datendurchsatz-Messung
- Verbesserte Messung von digitalen Trägern
- Deep Interleave Video BER
- MER bis 45 dB möglich
- DQI-Messungen (Digital Quality Index)
- Integrierter Vorverstärker
  - -45 dBmV Ingress Scan
  - Verbesserter C/N an 20dB-Testpunkten
- Verfügbar mit 42, 65 oder 85 MHz-Diplexer
- Zertifiziert mit CableLabs
- Rückwärts-kompatibel mit Docsis 1.0, 1.1, 2.0
- Inklusive aller Features von vorhergehenden Modellen

#### Features

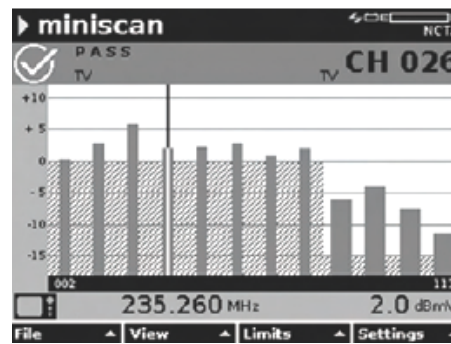
- 8 downstream & 4 upstream DOCSIS 3.0 testing
- Throughput testing of bonded services
  - Up to 400 Mbps down, 120 Mbps up (8 MHz carriers)
- Gigabit Ethernet port standard
  - Optional GbE Throughput testing available
- Improved Digital Carrier testing
  - Deep interleave video BER
  - MER range up to 45 dB
  - DQI measurement capability
- Integrated Pre-amp
  - -45 dBmV ingress scan
  - Improved C/N on 20 dB test points
- Available with 42, 65, or 85 MHz diplexer
- CableLabs-compliant certificates
- Legacy support for DOCSIS 1.0, 1.1, and 2.0
- Includes all measurements and features of previous models



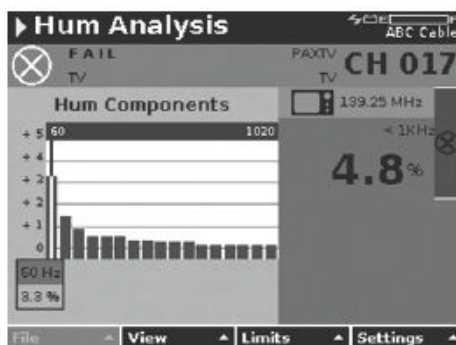
Features (abhängig vom DSAM Modell / depending on DSAM model)



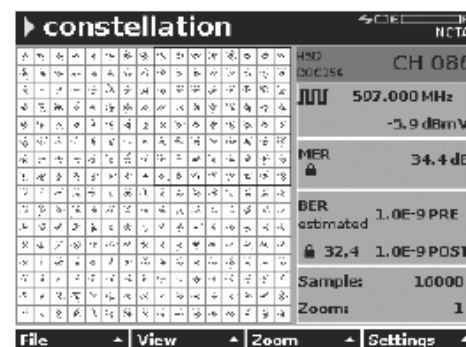
Pegel- und C/N-Darstellung bei analogen Signalen/  
Level- und C/N display of analog signals



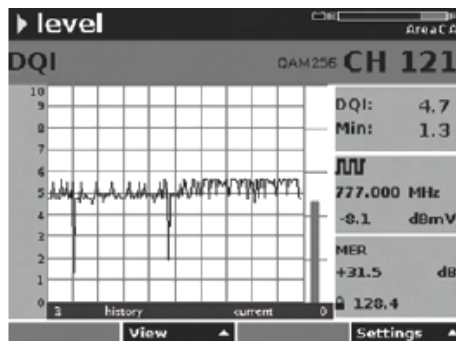
MiniScan misst Pegel bei bis zu 12 Kanälen gleichzeitig/  
MiniScan measures level of up to 12 channels simultaneously



Anzeige von Brumm-Abstand (elektrische Interferenzen)/  
Hum analysis: electrical interferences on channels



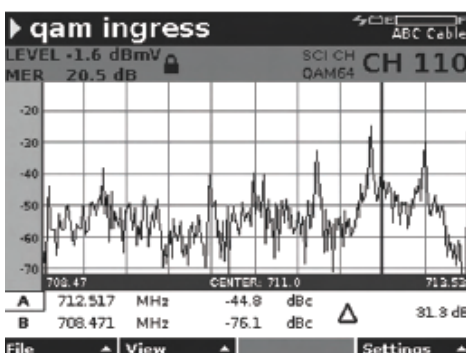
Konstellationsdiagramm/  
Constellation diagramm



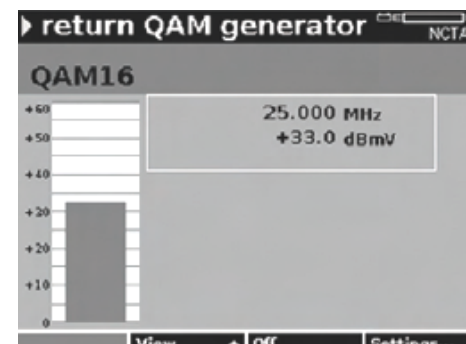
Digital Quality Index – zeigt kurzfristige digitale Fehler/  
Digital Quality Index – shows short time digital impairments



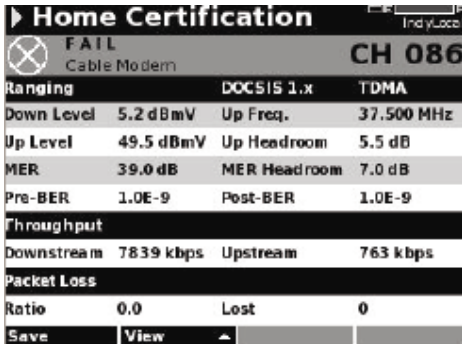
MER / BER / Errored Seconds-Anzeige/  
Display of MER, BER and Errored Seconds



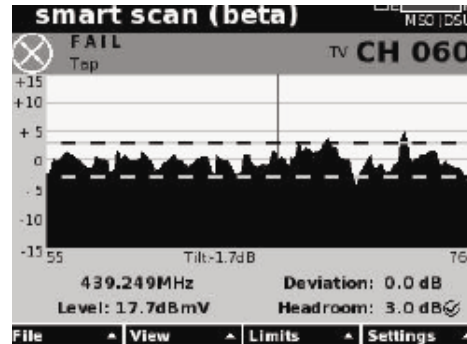
QAM Ingress: schwer sichtbarer Ingress an digitalem Träger/  
QAM Ingress: enables analysis of ingress on live digital carrier



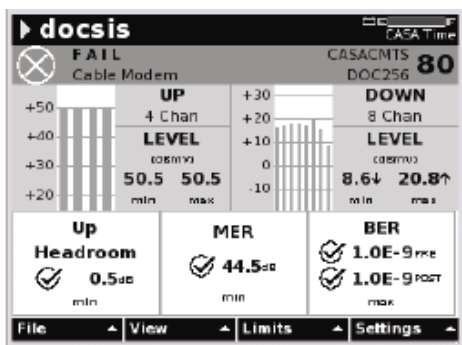
QAM16-Transmitter überträgt Signal retour zum HE/  
QAM16-test signal is transmitted back to headend



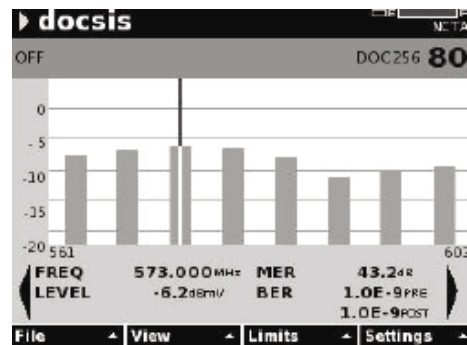
Home Certification sorgt für einheitliche Messungen/  
Home Certification provides consistent test methods



Smart Scan bietet übersichtliche Darstellung zur Problemanalyse zwischen Tap und Modem/  
Smart Scan provides an overview for the problem analysis between Tap and Modem



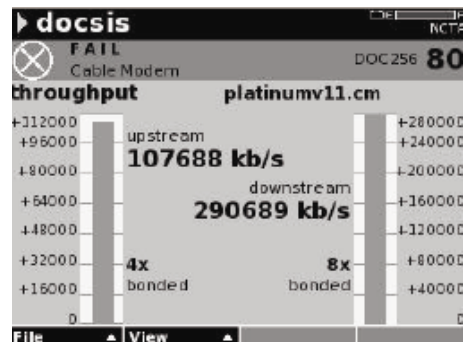
Worst Performance Darstellung bei Docsis 3.0-Trägern/  
Worst Performance display of Docsis 3.0 carriers



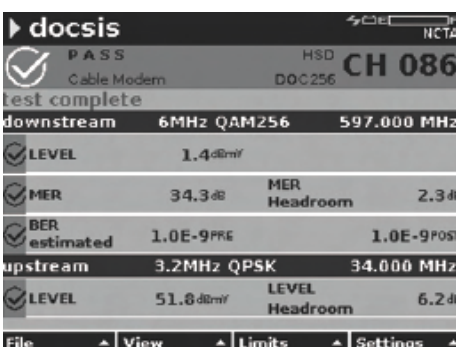
Docsis 3.0 Detail-Darstellung der gebondeten Kanäle/  
Docsis 3.0 view provides details about bonded channels

UCD	Freq(MHz)	Width(MHz)	Mod	Type
6	37.5	3.2	QAM16	TDMA
5	37.5	3.2	QAM16	TDMA
4	34.0	3.2	QAM16	TDMA
3	34.0	3.2	QAM16	TDMA

Analyse von einzelnen RW-Trägern bei Docsis 3.0/  
User can choose which channel to select at Docsis 3.0 measurements



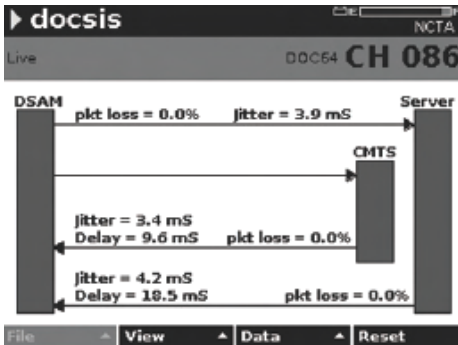
Docsis 3.0-Datendurchsatz-Messungen bis zu 8 DS- und 4 US-Kanäle/  
Docsis 3.0 throughput testing of up to 8 DS and 4 US channels



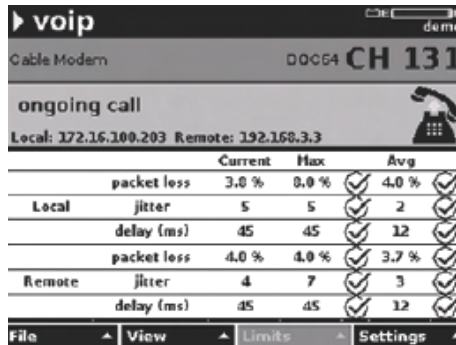
Anzeige der HF-Parameter v. DSAM-Kabelmodem/  
Shows RF parameters of DSAM cable modem

docsis FAIL Cable Modem DOC256 CH 086  
packet loss test  
packet loss  
sent up down loop  
lost 30 14 44  
ratio (%) 1.069 0.499 1.569  
upstream modulation QAM-16  
upstream SNR 34.6dB

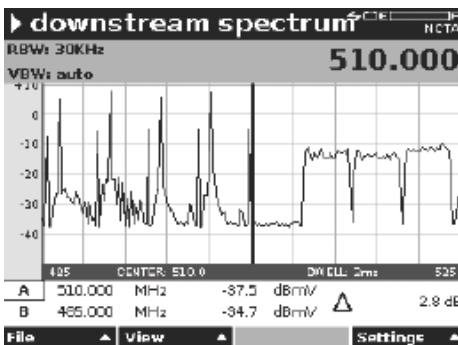
Packet Loss bei Up- und Downstream / Upstream SNR/  
Packet Loss at up- and downstream / upstream SNR data received by CMTS



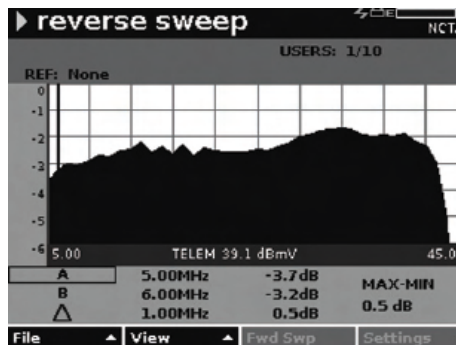
**VoIP Check: Packet Loss, Jitter, Delay, MOS, R-value/**  
*VoIP Check: Packet loss, jitter, delay, MOS, R-value*



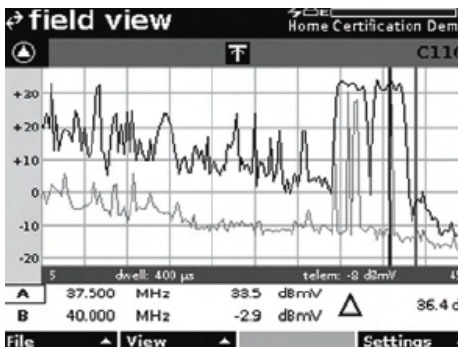
**True VoIP Check: Live-Analyse durch DSAM eMTA/**  
*True VoIP Check: analyzing live calls of DSAM eMTA*



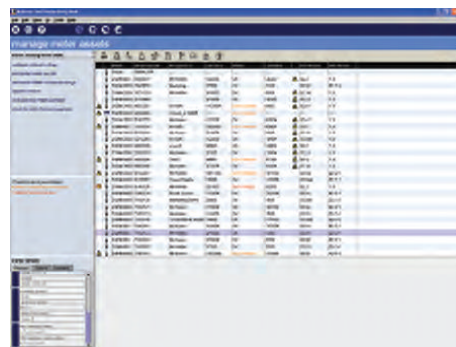
**Analyzer-Funktion für Down- und Upstream/**  
*display of down- and upstream*



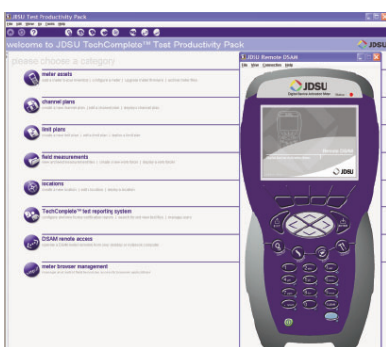
**Vorwärts- und Rückweg-Wobbeln (DSAM6000)**  
*möglich! Forward and Return Sweeping (DSAM6000)*



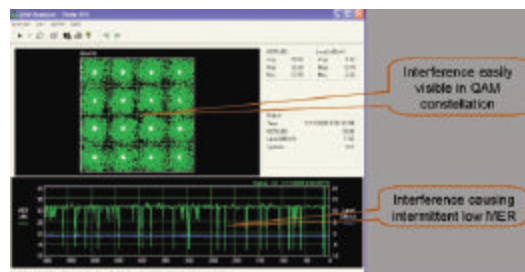
**FieldView: Rückweg-Spektrum vom PathTrak-System/**  
*FieldView: display of return path spectrum of PathTrak system*



**TPP: DSAM-Auswertungs- und Management-Tool/**  
*TPP: Reporting and management tool of DSAM units*



**TPP Software ermöglicht Technikern die DSAMs von der**  
*Ferne aufzugraden und zu konfigurieren! TPP software lets technicians remotely configure, update and upgrade DSAM meters*



**Verwendung des DSAM mit PT und RPM-3000-**  
*Karten! PathTrak with RPM-3000 can be used in conjunction with the DSAM*

**Eigenschaften / Feature matrix**

Model		DSAM-2000	DSAM-2300	DSAM-3300	DSAM-6300
<b>Analog and digital carrier level verification</b>	Analog video and audio power levels	X	X	X	X
	Digital power level	X	X	X	X
	Schräglage / Tilt (1 ... 12 Channels)	X	X	X	X
	Mini-Scan (1 to 12 Channels)	X	X	X	X
	Full-Scan (1 to 999 Channels)	X	X	X	X
	Analog carrier-to-noise	X	X	X	X
	Brummabstand / HUM	X	X	X	X
	SmartScan	Opt.	Opt.	X	X
<b>Digital QAM carrier quality</b>	Spectrum Analyzer with Auto Pre-Amp	Opt.	Opt.	X	X
	MER/EVM measurements	X	X	X	X
	Pre and Post FEC BER (64, 128, 256)	X	X	X	X
	BER for Deep Interleave (128,4 or 128,5)	X	X	X	X
	Konstellationsdiagramm / Constellation Diagramm (64, 128, 256)	Opt.	Opt.	X	X
	DQI – Digital Quality Index	Opt.	X	X	X
	AGC Stress	Opt.	X	X	X
	Errored/severely errored seconds	Opt.	X	X	X
<b>Upstream physical verification</b>	QAM Ingress	HW Opt.	HW Opt.	HW Opt.	SW Opt.
	Return Loopback	Opt.	Opt.	Opt.	X
	Local upstream spectrum for ingress check	X	X	X	X
	Return QAM Generator	Opt.	Opt.	X	X
	Spectrum Analyzer w/Auto Pre-Amp	Opt.	Opt.	X	X
<b>Docsis/EuroDocsis Testing</b>	Field View of the PathTrak Return Spectrum	Opt.	Opt.	Opt.	Opt.
	Docsis 2.0/1.1/1.0 testing 1 Downstream x 1 Upstream	X	X	X	X
	Docsis 3.0 Bonded Carrier testing 8 Downstream x 4 Upstream	SW Opt.	SW Opt.	SW Opt.	SW Opt.
	Downstream MER/EVM, Pre- and Post-FEC BER	X	X	X	X
	Dynamic Docsis Range and Registration	X	X	X	X
	Cable modem configuration file verification	X	X	X	X
	Upstream channel selection	X	X	X	X
	Upstream transmit level and headroom	X	X	X	X
<b>Docsis/EuroDocsis Service Tests</b>	Cable modem and CPE MAC cloning	X	X	X	X
	CableLabs issued certificates	X	X	X	X
	Packet Loss	X	X	X	X
	Throughput – Upstream and Downstream (Up to Docsis 3.0 rates)	Opt.	X	X	X
<b>Basic Ethernet Testing</b>	Ping	Opt.	X	X	X
	VoIPCheck – Voice over IP testing (MOS, Packet Loss, Jitter, Delay)	Opt.	Opt.	Opt.	Opt.
	Throughput – (Docsis 2.0 rates)	Opt.	Opt.	X	X
	Packet Loss	Opt.	Opt.	X	X
<b>Gigabit Ethernet Testing</b>	Ping	Opt.	Opt.	X	X
	View CM diagnostics page	X	X	X	X
	Throughput – (Docsis 3.0 rates)	Opt.	Opt.	Opt.	Opt.
	Packet Loss	Opt.	Opt.	Opt.	Opt.
<b>RF Network Verification</b>	Gig-E testing – Docsis 3.0 Support up to 400 Mb/s down	Opt.	Opt.	Opt.	Opt.
	Forward Sweepless Sweep	Opt.	Opt.	Opt.	X
	Reverse Alignment				X
	Forward (Downstream) Sweep				Opt.
	Reverse (Upstream) Sweep				Opt.
<b>HFC Network Verification</b>	Return Loopback (requires QAM Ingress Option)	Opt.	Opt.	Opt.	X
	Scheduled Autotest	X	X	X	X
<b>Home Network Verification</b>	Proof Test	X	X	X	X
	IP Tests via 10/100/1000 Ethernet jack	Opt.	Opt.	X	X
	Ingress Resistance Test (IRT)	X	X	X	X
	Fault Location using FDR feature in LST-1700 remote transmitter	X	X	X	X
<b>Autotest</b>	Test Point Compensation	X	X	X	X
	Home Certification	Opt.	Opt.	Opt.	Opt.
	Video Autotest	X	X	X	X
	Cable Modem Autotest	X	X	X	X
	Combination Autotest (Video and Cable Modem)	X	X	X	X
	Proof of Performance (Scheduled autotest)	X	X	X	X
<b>Miscellaneous</b>	Web Browser	Opt.	Opt.	Opt.	Opt.
	RF or Ethernet synchronization with TPP	X	X	X	X
	Secure Sync – RF Synchronization through firewalls	X	X	X	X

**Technische Daten / Technical data**

Frequency		Upstream Spectrum (Ingress Scan)	
Range	4 to 1000 MHz	Spans 4 to 42 MHz, 4 to 65 MHz, 4 to 85 MHz	
Accuracy	± 10 ppm at 25°C	Sweep rate <2 s	
Channel bandwidth	Models ending in A,8 MHz	Display scaling and range 1, 2, 5 and 10 dB/division;	
Level measurements analog		Downstream Spectrum (Forward Scan)	
Signal types	CW, Video & Audio (PAL, SECAM, NTSC)	Resolution bandwidth 280 kHz	
		Sensitivity -45 to +60 dBmV (typical)	
Range	-40 to +60 dBµV	Frequency range	4 to 1000 MHz
Resolution	0,1 dB	Sweep rate	Less than 2.5 seconds; Display
Resolution bandwidth	280 kHz	Display scaling and range	1, 2, 5 and 10 dB/division, 6 vertical divisions
Accuracy	± 1,5 dB Linearität @ 25°C	Resolution bandwidth	30 or 280 kHz
Carrier to noise	30 ... 45 dB ± 2 dB	Span	10 or 50 MHz
	45 ... 48 dB ± 3 dB	Sensitivity	-35 to 60 dBmV (typical)
	Input at >0 dBmV (up to 750 MHz) Input at >0 dBmV (750-1000 MHz)	Low-pass filter	(matches Diplexer frequency)
Hum		Reverse path sensitivity	-45 to +60 dBmV
Accuracy	Up to 5% hum: ±0,8% From 5 to 10%: ±1.0%	Constellational (optional)	
		Modulation type	64, 128 and 256 QAM
Level measurement digital		Constellation points	2000, 4000, 8000, 16000, 32000 or 64000
Modulation types	QPSK, QAM (DVB, ACTS), QPR	Return QAM Generator	
Range	-40 to +60 dBµV	Signal modulation	16 QAM, 64 QAM
Resolution	0,1 dB	Symbol rates (Msps)	1.28, 2.56, 5.12
Accuracy	± 2.0 dB typical @ 25°C	Frequency range	5-42 MHz, 5-65 MHz, 5-85 MHz
Downstream-QAM Demodulation		Supported Levels	8.0-58.0 dBmV
Modulation type	64, 128 and 256 QAM, ITU-T J.83 Annex A, B or C (selectable)	DSAM Sweep Spezifikationen (optional)	
		Forward Sweep	
Input range (lock range)	-15 to +50 dBµV total integrated power from: 57-1000 MHz (42 MHz Diplexer 6 MHz Channel spacing) 83-1000 MHz (65 MHz Diplexer 6 MHz Channel spacing) 108-1000 MHz (85 MHz Diplexer 6 MHz Channel spacing) 58-1000 MHz (42 MHz Diplexer 8 MHz Channel spacing) 84-1000 MHz (65 MHz Diplexer 8 MHz Channel spacing) 109-1000 MHz (85 MHz Diplexer 8 MHz Channel spacing) 50 kHz tuning resolution	Requires SDA-5500 (SDA Compatible mode)	
		Reverse Sweep	
		Requires SDA-5500 (Single Reverse) or SDA-5510 (Multiple Reverse) (SDA Compatible mode)	
		Sweep Modes	
		Frequency range	5 to 1000 MHz Forward 5-65 Reverse
		Display span	user definable
		Display scale/range	6 vertical divisions 1,2,5, or 10 dB/division
		Sweep pulse occupied bandwidth	30 kHz
		Stability	±0.5 dB, normalized (dependent on stability of referenced carriers)
		Sweep rate	~ 1 s (78 channels, including scrambled and digital signal types)
BER	Pre- and Post-FEC 10 <sup>-4</sup> ... 10 <sup>-9</sup>	Return Loopback	
MER	Range 64 QAM: 21 to 45 dB (± 2 dB) Range 128/256 QAM: 28 to 45 dB (± 2 dB)	Frequency range	5-55 MHz, 5-65 MHz
		Transmit level	8-58 dBmV
		Standard Compliance	
Symbol rate	Annex A, 5.057 to 6.952 Msps (64/128/256 QAM) Annex B 5.057 Msps (64 QAM) and 5361 Msps (256 QAM) Annex C 5.274 Msps (64 QAM) and 5361 Msps (256 QAM)	Shock and vibration 5 Gs at 2 Hz to 5 Hz	
		Transportation packaging I.S.T.A – Procedures 1C and 1G	
		Drop IEC 61010	
		Handle stress IEC 61010	
		Water resistance MIL-STD-810F	
		Safety emissions EN 55022, CE, FCC	
		Safety immunity EN 61000, CE, FCC	

**General**

Display	320 x 240, grayscale, Selectable back light	Dimensions with battery (with QAM HW option) (W x H x D)	12 x 25 x 12.1 cm
Language support (user Interface and help system) English in all models No-charge second language option of Spanish, French, German, Hungarian, Japanese, Polish or Chinese		Weight without battery (without QAM HW option)	1.2 kg
		Weight without battery (with QAM HW option)	1.4 kg
		Battery weight	0.6 kg
Dimensions with battery (without QAM HW option) (W x H x D)	12 x 25 x 12.1 cm	Storage and operating temperature range	-20 to +50°C

**Zubehör / Accessories:**

- **Akku / Battery**
- **Ladeteil / Charger**
- **Schutz-Tasche / Protective Bag**
- **Bedienungsanweisung / Manual**

