

DS2500Q Digital TV QAM Analyzer

Key Benefits

- High-speed Spectrum Analysis: 4 ~ 1000 MHz
- Integrated DOCSIS 3.0 Cable Modem
- Integrated Upstream Signal Generator (no FEC)
- Supports ITU-T J.83 Annex A/B/C
- Error Vector Spectrum: identifies interference signals under QAM carriers, with no break in service
- Auto Test

Overview

Integrating multiple functions in a single handheld instrument, the new DS2500Q is a powerful Digital TV QAM Analyzer with a comprehensive measurement suite specifically designed for HFC network testing, troubleshooting, and maintenance.

The DS2500Q's main functions include Enhanced Spectrum Analysis, Analog & Digital TV analysis, DOCSIS 3.0 analysis, Upstream Signal Generation, Ethernet testing, and Auto Test. The revolutionary EVS function enables users to detect coherent distortions hiding under QAM carriers - without interrupting service. The DS2500Q supports Deviser's PC software toolkit, included with each unit, to make data transfer a snap.





RF Input USG Output







DVB-C Signal Analysis

The DS2500Q supports the ITU-T J.83 Annex A/B/C standard, providing Channel Power, MER, BER, and Constellation. It also offers Digital HUM distortion measurements, from thefundamental frequency to 4th harmonic components.

Measurement us	rpln00 TP=0.0dB	16:37:17
CH (DVB-C)	119	60
FREQ	315.00MHz	50-
BW	6.00MHz	40-
SR	5.361MS/s	30-
MODE	256QAM/J.83B	20-
POWER:	29.6dBmV	0-
MER/EVM:	34.5dB/1.15%	-10-
Pre-BER:	<1.0E-09	- 20-
Post-BER:	<1.0E-09	- 30-
LONG EQUALIZER	I128-J4 🖶	- 40
GOTO	VIEW	

Figure 1: DVB-C Channel Measurement



Figure 3: Digital HUM

BER	devise	-01 TP=	0.0dB		_	00:34:23
CH:8/323.00	MHz/J.838/0	54QAU/5.05	57MS/s	Ĩ	IME:	1 Mins
°F5.						50
1E4		••••••				
1 ES 1 ES						
'E1						22
1						
Ŭ			_			HER
85 200	1111		1			
POVER/IIEK:	17.6dBm/	// 38.5dB	ES(S):	7	COR:	2.270E+04
				<u> </u>		
BER:	<1.0E-09/	<1.0E-09	SES(S):	6	UNCOR:	1.519E+07
BER(Sun):	8.3E-03/	8.3E-03	TIME:	00:01:00	SUM:	1.823E+09
TINE		START	-	HISTORY		RETURN

Figure 2: BER and MER Statistical Analysis

Measurement u	srpln00 TP=0.0dB									i-		Ì		16	:3	6:	58
CH (DVB-C)	119	-							~	L.				5		~	
FRE0	315.00MHz	×.	*	10 10	-4	*	4.	4	a,	*	8	2		*	12	\$ 01	5
		3	\$	4	*	3	, à	4	9	*	1	Ł	5	8	6	n	4
BW	6.00MHz	*	-	-*	-2	W.	4	*	*		*	•	9	N	8		2
SR	5.361MS/s	4		*	*		4.	2	*			4		5° 15	-	•	2
		-		2	7	*	۰.	4	À	*	54	4	14	\$	•,	.4	*
MODE	256QAM/J.83B	л,	18	-46	٠	ĝ.		4	+	~	r	1	•	×.	2	74	4
POWER:	29.7dBmV	*	ł.	ę	۶	*	3	2	*	•	*	L	2	*	*	-	*
		e. >	11	4	11	-4 -4	-	7	. 11	1	3	4	2	10	2	*	8
MER/EVM:	34.5dB/1.15%	->	٠	-	4		Ŧ	5	1	e	*	*	T	18	•		-
Pre-BER:	<1.0E-09	.5	٦	۲	4	4	-	4	4	3	5	¥	٩	*		ii)	3
Post-BER:	<1.0E-09	•	*	л	N	3	۴	×	*	-1	۲	•.	3	٤	۶	*	8
			5	4	-35	Ð	۲	*	4	Ķ.	n'	\$		25	*	51	55
LONG EQUALIZER	I128-J4 📥	-4	÷.	π.	R	•	÷	۶		۶.	-	ŝ	Ą;	6	э.	Ŧ	ŝ.
GOTO	VIEW		SI	ELI	EC	T						Z	00		IN		

Figure 4: Constellation Display

High-Speed Spectrum Analysis

The DS2500Q offers an enhanced spectrum analysis function, with a frequency range from 4MHz to 1000MHz and sensitivity down to -55dBmV (@300KHz). The spectrogram provides a scrolling three-dimensional display, allowing users to track frequency and level over time - excellent for analyzing intemittent signals.

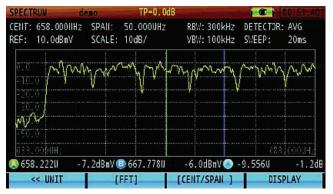


Figure 5 Spectrum Analysis

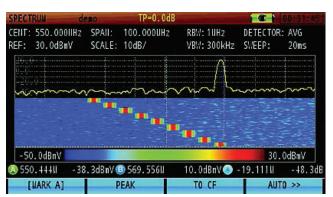
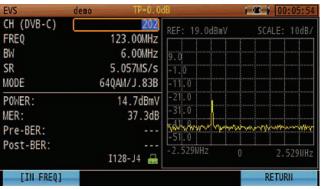
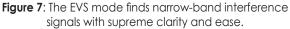


Figure 6: Spectrograph

EVS In-Service Interference Detection

The Error Vector Spectrum feature can find interference signals under a QAM carrier without service interruptions.





Cable Modem Measurement

The DS2500Q incorporates a standard DOCSIS 3.0 cable modem, compatible with DOCSIS 1.X, 2.0 & 3.0. The built-in modem supports 8x DS and 4x US bonded carriers. Figure 8 (below) shows the CM statistical info screen - including downstream signal level, modulation type, bandwidth, symbol rate, MER, BER, upstream signal level, symbol rate, & UCD (Upstream Channel Descriptor).

Users can select the desired DOCSIS mode, downstream channel, and UCD. Basic network test tools include Ping, Traceroute, PPPoE, FTP, and a web browser.

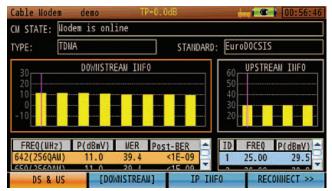


Figure 9 DOCSIS 3.0 Statistical Information Display

Upstream Signal Generator

The D\$2500Q can generate a CW carrier or QAM signal. Sweep mode is also available.



Figure 8: Upstream Signal Generator

Auto Test

The DS2500Q comes equipped with a wide range of regionstandard channel plans spanning (in part) North America, Asia, and Europe, as well as several sets of limit profiles - allowing users to design automatic tests. Tasks that can be automated include Analog TV, Digital TV and Cable Modem testing. Once the analyzer completes an auto test, all items in the test results will indicate Pass or Fail according to the limit profile. Results are automatically saved for later analysis.

AUTOTEST	deviser01	TP=0.0)d8		00	:28:51
PROJECT						
PLAN NAME	usrpln03	- LIMI	IT	Amplifier		-
LOCATION						
SELECT	ITEM		NAME	VAL	JE	
	SPECTRUM		START	966.	.750MHz	
	SCAN		STOP	967.	750MHz	
	TILT		CENT	967.	250MHz	
	CH MEAS		SPAN	1.00)OMHz	
	CNR		DETECTOR	SAM		
	НИМ	-	RBW	30k	lz	-
SAVE	I	TEM	LIN	IT	SEL-AL	L

Figure 10: Auto Test Project

Specifications

Downstream Spectrum Analysis							
Frequency Ro		4 ~ 1000 MHz					
Frequency St	ability	± 1 PPM (0°C ~ 50°C)					
Frequency Sp	an	Zero span ~ full span					
Frequency St	ер	1kHz					
Resolution BW	/ filters (-3dB)	30kHz; 100kHz; 300kHz; 1 MHz; 3 MHz					
Display Scale	& Range	1, 2, 5, 10, 20dB/division; 8 vertical divisions					
Sweep Time		20ms ~ 25s					
Input Level Ro	ange	-60 ~ +60dBmV					
Dynamic Rar	ige	65dB (300kHz RBW)					
Sensitivity		-50dBmV (300kHz RBW, pre-amplifier on)					
Attenuation		0 ~ 40dB in 1dB steps					
Pre-amplifier		Manual; 18dB gain					
Accuracy		< ±1dB @ 25 ± 5°C (typical)					
Measuremen	t Detector	Positive/negative peak; sample; average; RMS					
Reference Le	vel	-80 ~ +70dBmV					
Markers		2 vertical markers					
Upstream	Spectrum A	nalvsis					
Frequency Ro	-	4 ~ 210 MHz					
Resolution Ba		4 ~ 210 MHz 100kHz; 300kHz					
Resolution bu		30 Hz; 100Hz; 300Hz; 1kHz; 3kHz; 10kHz; 30kHz;					
Video Bandw	ridth	100kHz; 300kHz; 1 MHz; 3 MHz					
Display Scale & Range		1, 2, 5, 10, 20dB/division					
Sweep Time		20ms ~ 25s					
Input Level Range		-60 ~ +60dBmV					
Attenuation		Automatic, 0 ~ 40dB					
Pre-amplifier		Manual, 18dB gain					
Accuracy		< ±1dB @ 25 ± 5°C (typical)					
Measuremen	t Detector	Positive/negative peak; sample; average					
Markers		2 vertical markers					
Digital TV I	Measureme	nt					
Frequency Ro	ange	46 ~ 1000 MHz					
Power Level F	Range	-30 ~ +50dBmV					
Level Resoluti		0.1dB					
Accuracy		< ±1.5dB @ 25 ± 5°C (typical); C/N > 20dB					
Modulation	J.83 Ax. A/C	16 / 32 / 64 / 128 / 256 QAM					
Туре	J.83 Ax. B	64 / 256 QAM					
Interleave	J.83 Ax. A/C	(12, 17)					
Depth J.83 Ax. B		(128, 1) ~ (128, 4)					
Symbol Rate		4 ~ 7 MS/s					
MER		>41dB; accurate to within ± 2dB					
BER		1E-3 ~ 1E-9					
Constellation		16 / 32 / 64 / 128 / 256 QAM					

Supported StandardsB/G: I: D/K: U'I: M/NColor StandardsNISC. PAL, SECAMFrequency Stey10kHzPower Level Rumanne Standards40 ~ 460dBmVAccuracy< 41dB @ 25 ± 5°C (typical): S/N >30dBLevel Resolution Burner Standards00kHzConster Standards300kHzCCN> 51dB (@ 110dBmV carrier level)CTB/CSO< 61dB; accurate to within ±2dBHUM Measurer II1 = 15%; ±5% (1 ~ 5%); ±1.0% (5 ~ 20%)TillUp to 16 channelsAttenuationAutomatic, 40dBPre-amplifierAutomatic, 40dBPre-amplifierAutomatic, 40dBPre-amplifierDOCSIS 1.1, 2.0, 3.0; EuroDOCSIS 1.0, 1.1, 2.0, 3.0Domotel Standards54/ 256 GAMFrequency Terr54/ 256 GAMFrequency Terr54/ 256 GAMFrequency Terr10 for 300 Mbtg (EU)Max Speed64/ 256 GAMSupported StandardsUp to 304 MbpsMax Speed15 ~ 15 dBmVBandardstr15 ~ 15 dBmVInput Level Terr15 ~ 15 dBmVUpstream15 ~ 15 dBmVSignal Bandwitt160/ 3200 / 4600 HzSignal Bandwitt160/ 3200 / 4600 HzSignal Bandwitt8 ~ 58 dBmVQuiptut8 / 16 dAMSignal Mandur Lindoards8 ~ 58 dBmVSignal Bandwitt8 ~ 58 dBmVSignal Bandurut <t< th=""><th>Analog TV</th><th>Measureme</th><th>ent</th></t<>	Analog TV	Measureme	ent				
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Frequency Step 1 MHz Power Level Range 8 ~ 58dBmV (CW, QPSK)	MER		>38dB; accurate to within ± 2dB				
Power Level Range 8 ~ 58dBmV (CW, QPSK)	Frequency Range		5 ~ 85 MHz				
	Frequency Ste	ep	1 MHz				
Power Step 1dB	Power Level R	lange	8 ~ 58dBmV (CW, QPSK)				
	Power Step		ldB				

Specifications (cont'd)

General							
RF Input		75Ω F-type connector					
USB		USB 1.1					
LAN		RJ45, 10/100T Ethernet					
Display		4.3" 480x272 TFT LCD					
Power AC 100~240V/ 50~60 Hz							
Adapter	DC	12V / 3A					
Battery		Li-ion, 7.4V / 7.8Ah					
Charging Tim	e	~4 hours					
Operation Tir	ne	>6 hours					
Storage Temp	oerature	-20 ~ +60°C					
Operation Temperature		-10 ~ +50°C					
Dimensions (LxWxH)		9.6" x 5.1" x 2.4" (245mm x 130mm x 60mm)					
Weight		3.3 lbs (~1.5kg)					

Ordering Information

DS2500Q Base Model
DS2500Q Digital Cable TV QAM Analyzer, 4 \sim 1000 MHz, 75 Ω or BNC
Options
DOCSIS 3.0 8x4 Cable Modem and Upstream Signal Generator (no FEC)
SYNCOR Asset Management
SYNCOR Certificate
ATSC (8VSB) Measurement
2-Prong Power Cord plus Ground (Europe except UK)
3-Prong Power Cord plus Ground (US)
3-Prong Power Cord plus Ground (UK)
3-Prong Power Cord plus Ground (Australia)
English Instruction Manual (hard copy)
Toko Type F(f) to F(f) Connector

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