

# DS2460Q QAM Analysis Meter

## Key Benefits

- Comprehensive tool for installation and maintenance of cable networks
- Fast spectrum analysis, 5~1220 MHz
- 5~1052MHz (Analog TV), 46~1052MHz (Digital TV)
- Digital TV tests include Average Power, MER, BER, BER Statistics, Constellation
- Analog TV measurements include: Level, V/A, HUM, C/N
- Auto-generates and saves up to 20 custom channel plans from a cable drop
- Auto test with pass/fail limits speeds up tests and simplifies results interpretation
- Client-based Toolbox management software for quick unit configuration
- USB Micro 2.0 port for PC data transfer
- Ethernet port for Ping function
- Optical Power Measurement and VFL (Visual Fault Location) available by option

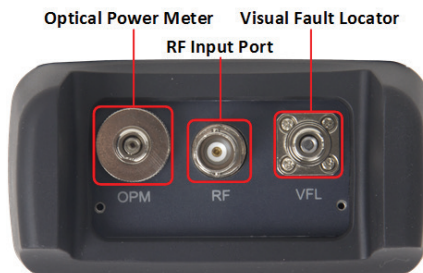


## Overview

The DS2460Q is a multi-functional instrument that supports digital QAM and analog signals in CATV networks. It is the ideal tool for initial network installations, service, and troubleshooting tasks. The ruggedized design includes an outer chassis protector, while the icon-based GUI features programmable preset pass/fail limits. The easy-flowing menus are designed for increased efficiency and productivity for all levels of technicians.

Other features - including return path & forward spectrum scan, 12 favorite tilt frequencies, AC line voltage test, HUM and DC voltage measurements, combined with complete data logging and management software - make the DS2460Q a versatile tool for cable installations.

MER, Pre-Post BER measurements, and statistics features allow quick verification of loose connections, generally related to pixelated pictures or slow DS internet data flow. The digital measurement functions also help identify mismatches caused by open coaxial lines or impedance mismatch.



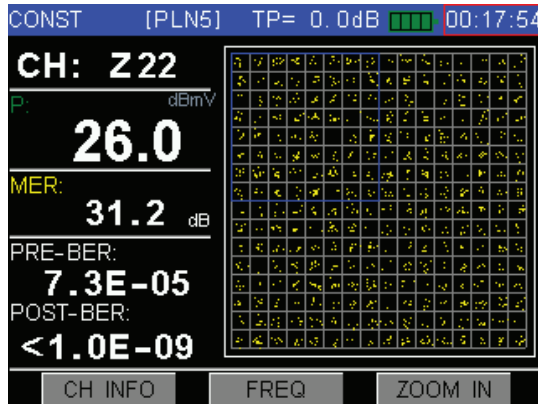


Figure 1: MER, Pre-BER, Post-BER, & Constellation

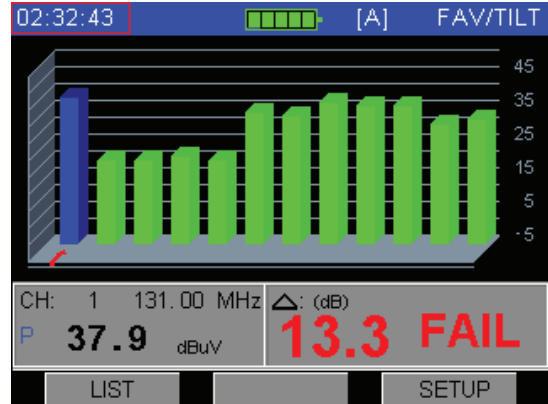


Figure 5: Tilt (Max 12 channels)

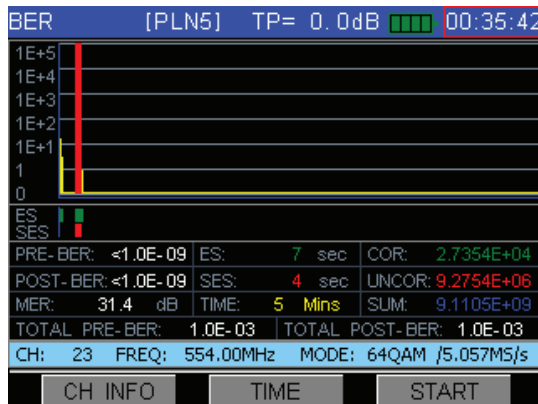


Figure 2: BER

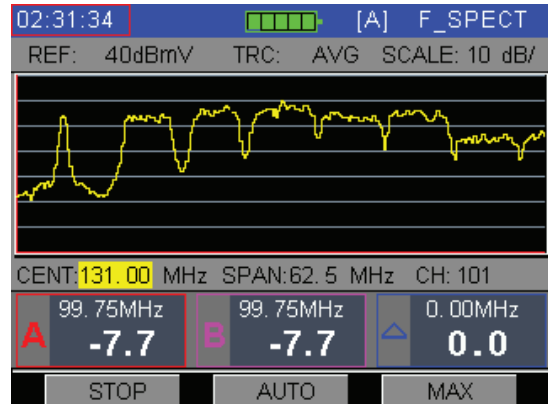


Figure 6: Forward Spectrum Analysis

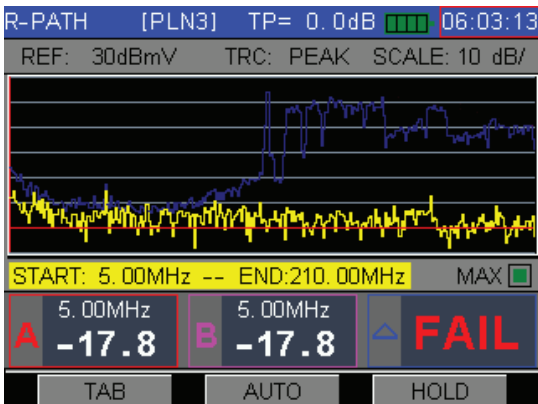


Figure 3: Return Path Spectrum Analysis (5 ~ 210 MHz)

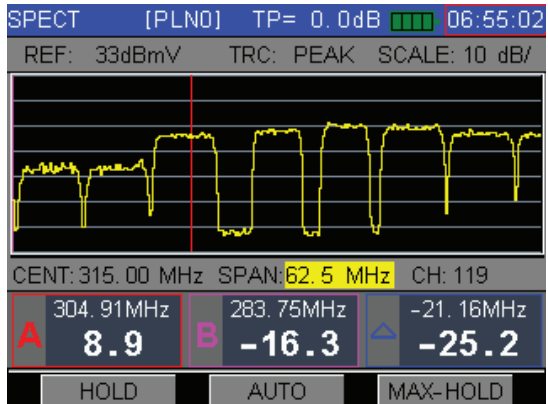


Figure 7: Normal Spectrum Analysis

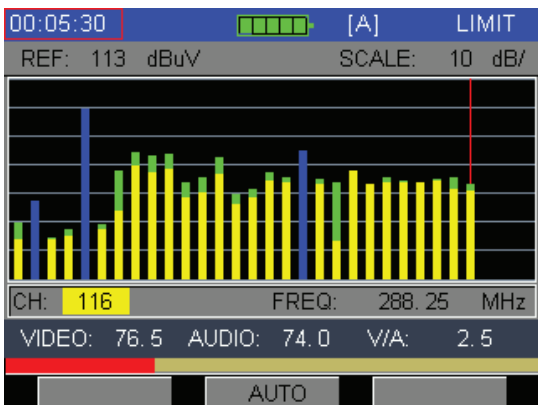


Figure 4: Channel Scan



Figure 8: Optical Power Meter

## Up to 20 Stored Channel Plans

For technicians and contractors who work in multiple HFC networks, having a choice of different channel plans is a must. The DS2460Q can learn a selection of up to twenty (20) different channel plans. When connected to an RF drop, the DS2460Q learns analog/digital channels and custom frequencies through the built-in automated channel plan learning tool - or downloads them via Deviser's Toolbox PC software. The user can select up to 12 channels in each of the 20 user-defined plans and assign them to a favorite tilt/channel plan.

## QAM Analysis & Channel Measurements

The DS2460Q measures and analyzes channel power, MER, and Pre-Post BER, including constellation display. It is compatible with 16/32/64/128/256 QAM modulation (for frequencies up to 1 GHz), and can also provide power measurements for QPSK and COFDM digital carriers.

## Spectrum Analysis

The DS2460Q offers three distinct spectrum analysis modes: normal, fast, and return path. Fast spectrum analysis allows technicians to view a frequency range of 5~1220MHz; while normal spectrum analysis optimizes amplitude accuracy at a lower sweep speed. For troubleshooting upstream problems, the unit can display frequency spans of 5~65 MHz, providing an additional tool to technicians dealing with upstream data signals. All modes have access to the Marker and Max Hold features, making it easy to capture and analyze transient anomalies.

## Full Spectrum Scans & Marker Feature

The DS2460Q can scan 160 channels, allowing users to quickly and efficiently measure flatness and amplitude of the HFC network. Using markers, technicians can quickly identify mismatch-related anomalies caused by poor grounding or damaged transmission lines.

## HUM Measurement

The HUM measurement helps technicians identify and troubleshoot anomalies that may result from defective capacitors, faulty line splitters, or overloaded couplers (caused by weather conditions or excessive current). Both 60 & 120 Hz tests are performed @400Hz LPF measurements.

## Auto-Diagnostic Custom Limit Tests

The auto test feature simplifies the technician's work by displaying pass/fail results. End users can set limits on Power Level, MER, Pre-Post BER, Spectrum Analysis, Tilt, and HUM measurements. With the simple Save function, the technician no longer must manually record results, saving more time for installations and service calls in a day. In addition, measurement data is saved instantly to ensure performance accountability for each location - reducing the need to return to previously tested sites.

## File Management / Data Storage

Multiple test data files can be saved and stored as analog carriers or frequencies, QAM carriers or digital frequencies, channel scan, tilt, frequency spectrum measurements, and/or HUM. Results are saved to the File Directory by timestamp. Records can be uploaded to a PC via the Toolbox software for report generation, printing, and analysis.

## Voltage Measurement

The DS2460Q measures battery voltage, trunk, & distribution line voltage of the cable system, accurately identifying AC or DC anomalies. The smart power management system enables approximately 5 hours' continuous operation from battery on a full charge.

## Specifications

Normal Spectrum Analysis		
Frequency Range	45 ~ 1052 MHz	
Frequency Span	2.5, 6.25, 12.5, 25, 62.5 MHz; full span	
Fast Spectrum Analysis		
Frequency Range	5 ~ 1220 MHz	
Frequency Span	12.5, 25, 62.5 MHz; full span	
Return Path Spectrum Analysis		
Frequency Range	5 ~ 210 MHz	
Channel Scan		
Max Channels	160	
Scale	1, 2, 5, 10dB/division	
Zoom	1x, 2x, 3x, 4x, 5x	
Analog TV Measurement		
Supported Standards	PAL, NTSC, FM Radio (single-frequency)	
Power Level	Range	-30 ~ +60dBmV
	Accuracy	± 2dB
	Resolution	0.1dB
Frequency	Range	5 ~ 1052 MHz
	Accuracy	± 50ppm
	Resolution	10kHz
Resolution Bandwidth	280kHz	
C/N	> 50dB	
HUM Measurement Range	2 ~ 5%	
Digital TV Measurement		
Supported Standards	ITU-T J.83 Annex A, B, C	
Power Level	Range	-30 ~ +60dBmV
	Accuracy	± 2dB
	Resolution	0.1dB
Frequency	Range *	46 ~ 1052 MHz
	Accuracy	± 2dB
	Resolution	0.1dB
QAM Demodulation	Annex A	16, 32, 64, 128, 256 QAM
	Annex B/C	64, 256 QAM
Interleave Depth	Annex B	128x1 ~ 128.4
	Annex A/C	12x17
Symbol Rate Change	4 ~ 7 MS/s	
MER	41dB, accurate to ±2dB	
BER	1E-3 ~ 1E-9	
Constellation Display	64, 256 QAM (with zoom)	
Line Voltage Measurement		
Range	0 ~ 100V (AC/DC), accurate to ±2V	

\* Note: QAM demodulation up to 1 GHz.

Optical Power Meter		
Accuracy	± 0.23dB (± 5%)	
Detector Type	InGaAs Φ 300μm	
Range	-50 ~ +27dBm	
Linearity	0.07dB/10dB	
Resolution	0.01dBm, mW, μW, nW	
Wavelength	850, 980, 1300, 1310, 1490, 1550, 1610nm	
Interface	FC/SC/ST universal connector	
Visual Fault Locator (VFL)		
Output Power	10mW	
Output Wavelength	650 ± 10nm	
Safety Standards	IEC 60825-1: 2007	
Interface	FC/PC	
Miscellaneous		
RF Input	75Ω	
USB	MicroUSB 2.0, Type B	
Ethernet	10/100M	
Display	2.8", 320 x 240 TFT LCD	
Battery	7.4V, 2.5Ah Li-ion battery	
Charge Time	~ 5 hrs	
Operation Time	> 5 hrs	
Adapter	AC	100 ~ 240V, 50 ~ 60Hz
	DC	15V / 0.9A
Temperature	Operation	-10 ~ +40°C
	Storage	-20 ~ +70°C
Dimensions (LxWxH)	7.9" x 4.2" x 2.1" (200mm x 106mm x 54mm)	
Weight	1.3 lbs (~600g)	

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