

# DS2460Q QAM Analyzer

## Key Benefits

- D3.1 ready (1.2 GHz frequency range)
- Rugged construction and installation tool; designed and built field-tough
- Built-in auto channel scan and learning tool
- Auto test with pass/fail limits speeds up tests and simplifies results interpretation
- Ethernet and microUSB ports
- Client-based Toolbox management software for quick unit configuration



## 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 this unit a versatile tool for cable installations.

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 this unit 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.

## Main Features

- 5 MHz - 1052 MHz range (analog signals)
- 46 MHz - 1052 MHz range (digital signals)
- Multiple channel plans with learn mode
- QAM MER constellation display
- Pre and Post BER analysis
- BER, ES, SES, Corrected/Uncorrected bit error
- Return Path & Forward spectrum scan
- Pass/Fail limit test functions AUTO storage
- Tilt measurements display (12 channels)
- AC/DC voltage measurements, including HUM
- Measurement data storage
- Ethernet and micro USB ports
- Color display 2.8" (320x240 TFT LCD)
- Management Toolbox PC software

# DS2460Q QAM Analyzer



## Features

### Up to 10x Stored Channel Plans

For technicians & 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 ten (10) 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 10 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. The unit is compatible with 16/32/64/128/256 QAM modulation, and in addition, provides power measurements for QPSK and COFDM digital carriers.

### Auto Diagnostic User-Defined Limit Test

The auto test simplifies the technician's work by displaying pass/fail results. Limits can be set by the end user for Power Level, MER, PREBER, POST-BER, Spectrum Analysis, Tilt, and HUM measurements. With the simple Save function, the technician is no longer required to manually note results, allowing more installations or service calls to be performed in a day. In addition, measurements are saved instantly to ensure performance accountability for each location - and reduce the need to return to previously tested sites.

### Full Spectrum Scans with 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.

# DS2460Q QAM Analyzer

## Spectrum Analysis / Measurements

The DS2460Q offers a spectrum analysis mode that allows viewing of the full spectrum up to 1.2 GHz. For troubleshooting reverse path challenges, the DS2460Q can be set up to display frequency spans from 5~110 MHz. Spectrum mode includes marker tools for improved measurement interpretation, while the max hold feature helps capture transient anomalies.

## File Management - Test 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 measurement and/or HUM Results are saved to the File Directory with unique names and timestamps. Records can be uploaded to a PC via the Toolbox software for report generation, printing, and analysis.

## User-Defined Auto Tests

With ten (10) programmable channel plans and the ability to conduct multiple tests with the touch of a button, the DS2460Q significantly boosts a technician's efficiency and productivity. Tests include Level, Tilt, Spectrum Analysis, HUM, and Performance-related Test Limits for both analog and digital carriers. Once stored in the instrument, test data can easily be recalled for full 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 when fully charged.

## 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.



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

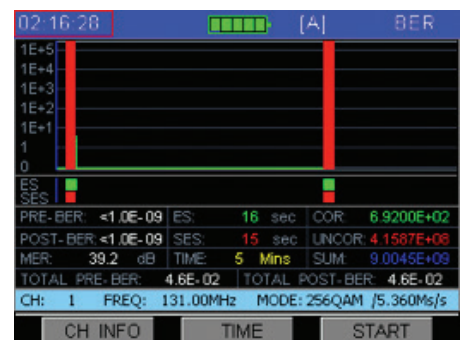


Figure-2: BER & MER Statistical

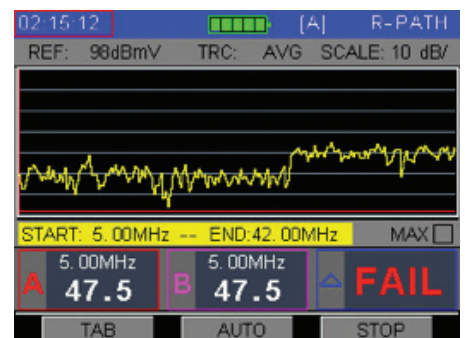


Figure-3: Return Path Spectrum (5~65MHz)



Figure-4: Channel Scan



Figure-5: Tilt (Max 12 Channels)

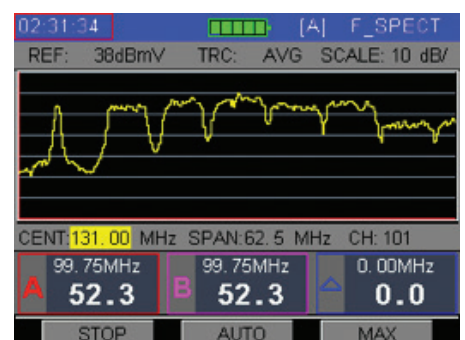


Figure-6: Forward Spectrum

## Specifications

<b>Frequency</b>	
Frequency Range	5 MHz ~ 1052 MHz
Frequency Accuracy	± 50 PPM
Frequency Resolution	10kHz
Resolution Bandwidth (-3dB)	280kHz
<b>Normal Spectrum Analysis</b>	
Frequency Range	45 MHz ~ 1052 MHz
Span	Min. Span; 2.5 MHz; 6.25 MHz; 12.5 MHz; 25 MHz; 62.5 MHz; Full Span
<b>Fast Spectrum Analysis</b>	
Frequency Range	5 MHz - 1220 MHz
Span	Min. Span; 12.5 MHz; 25 MHz; 62.5 MHz; Full Span
<b>Channel Type</b>	
Analog TV	PAL, NTSC
Digital TV	QAM 16/32/64/128/256
FM Radio	Single frequency
<b>Channel Scan</b>	
Number of Channels	160 channels max
Scale	1, 2, 5, 10dB/div
Zoom	1X, 2X, 3X, 4X, 5X five levels
<b>Analog TV</b>	
Level Measurement Range	-30dBmV ~ +60dBmV
Level Accuracy	± 2dB
Level Resolution	0.1dB
Resolution Bandwidth	280kHz
C/N	>50dB
HUM Measurement Range	2% to 5%
<b>Digital TV</b>	
Frequency Range	46 MHz to 1052 MHz
Power Level Range	-30dBmV ~ +60dBmV
Power Level Resolution	0.1dB
Power Level Accuracy	±2 dB
Demodulation Type	Standard ITU-T J.83 Annex A, B and C
Interleave Depth	128x1~128x4(J.83B);12x17(J.83A/C)
Symbol Rate Range	4 MS/sec to 7 MS/sec
Max MER	41dB
MER Accuracy	± 2dB
BER	1E-3 to 1E-9
Constellation Display Mode	QAM64 and QAM256 with zoom capability
<b>Spectrum Analysis</b>	
Bandwidth	2.5MHz; 6.25 MHz; 12.5 MHz; 25 MHz; 62.5 MHz; Full Span
Scale	1dB, 2dB, 5dB, 10dB
<b>Line Voltage Measurement</b>	
Range	0V to 100V (AC/DC) with accuracy ± 2V
<b>Others</b>	
RF Input	75Ω
USB	USB Micro 2.0
Ethernet	10/100Mbps
Display	2.8" 320x240 TFT LCD
AC/DC Adapter	AC 100V to 240V 50-60Hz ,DC 15V/0.9A
Battery	7.4V 2.5Ah Lithium Battery
Charge Time	5 hours
Working Time	>5 hours
Dimensions (W x H x L)	200mm × 106mm × 54mm (7.9" x 4.2" x 2.1")
Weight	~0.6 kg (1.3 lbs)
Working Temperature	-10 ~ +40°C
Storage Temperature	-20 ~ +70°C