

# VideoQ VQTS-200 Training



May 2011



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## VQTS 200 Training Agenda

- I VQTS Concept and Architecture (VQL + VQMA + PC + Video Capture and Playback)
  - I Main Features and Specifications
  - I HW Specification
  - I SW Specification
- I VQL - Comprehensive library of sophisticated static and dynamic test patterns and live sequences
  - I Main Features
  - I Key Test Patterns examples
- I VQMA Video Quality Measurement & Analysis Software Tool
  - I Main Features
  - I Target Applications
  - I Examples of usage with reflectance test chart
  - I Multi-camera white/gray/black level balance
  - I Automated Modes of Measurements (Command Line)
- I Q&A

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## VQTS-200 Features and Parameters

**VQTS-200 - Complete self-contained PC based Video Quality Test System to measure the objective quality of cameras and/or video processors**

### VQTS-200 Main Modules:

- | **2 RU Industrial Case PC**, including high-capacity, high-speed HDD RAID
- | **AJA KONA** – Video Capture and Playback Card
- | **VQTS** – Preview, Capture and Analysis Control Panel
- | **VQMA3** – Software Video Analyzer and Scope

### Single Click Operations including:

- | Video data captured into .YUV file for expedient quality test
- | Optional .YUV files archiving for further detailed analysis
- | Nearly instant (few seconds) automated measurement of the video signal performance
- | Short Test Report data, which can be appended to machine-readable log file with time and date stamps
- | Off-line Windows GUI Mode Analysis of captured video files with optional print-out of detailed report.
- | Customizable .INI files allow editing of file locations and video quality tolerance values

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## VQTS-200 HW Specifications

- | PSU: Single, 460 Watt, 115-230 V, 50/60 Hz
- | Asus P55 SATA3 USB 3.0 GbE ATX Motherboard
- | 500GB SATA II 7200rpm Boot Drive
- | 600 GB (150GB x4) SATA2 10k rpm 16MB HDD RAID
- | USB2 ports x 6, USB3 ports x 2
- | Intel Core i5 Processor i5-750 2.66GHz 8MB LGA1156 CPU
- | 4 GB RAM
- | DL +/-RW DVD Drive

### Physical

- | 2U case:
- | Weight: 10 kg
- | Dimensions (D x W x H): 560 mm x 430 mm x 89 mm (22." x 16.9" x 3.5 ")

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## VQTS-200 Audio/Video Specification

### Analog Video:

- | BNCs via break-out cable
- | HD and SD: YPbPr, RGB, SD: YPbPr, RGB (component mode)
- | CVBS/YC (composite mode)
- | 12-bit A/D

### Digital Video:

- | **BNC:** HD-SDI/SDI, SMPTE-259/292/296, HD-SDI 1.5Gb and 3Gb
- | **mini HDMI:** HDMI v1.3, 30 bits/pixel, RGB or YUV, 2.25Gbs, SD, HD, 1080p50/60

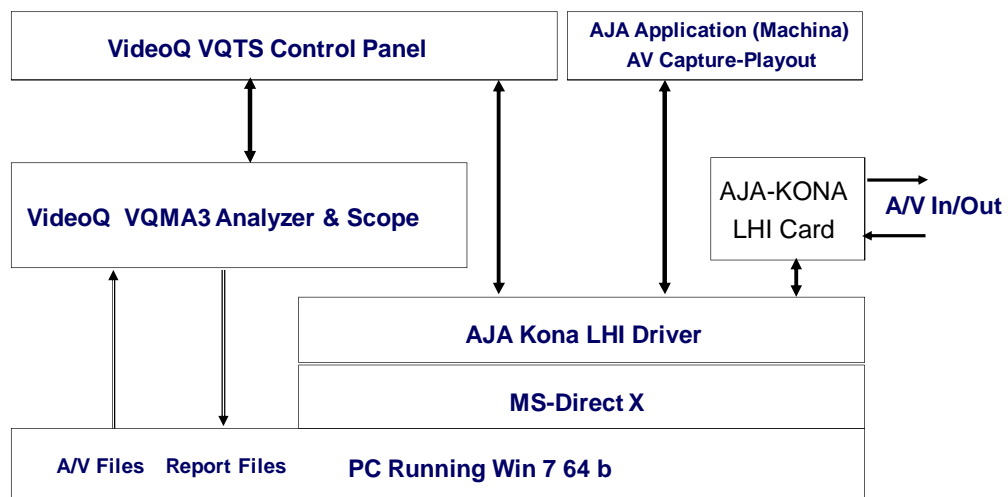
### Video Formats

- | **SD:**
- | 525i 29.97, 625i 25
- | **HD:**
- | 720p 23.976, 24, 25, 29.97, 30, 50, 59.94, 60
- | 1080i 25, 29.97, 30
- | 1080psf 23.976, 24, 25, 29.97, 30
- | 1080p 23.976, 24, 25, 29.97, 30, 50, 59.94, 60

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## VQTS-200 SW Architecture



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## Video Quality Measurement & Analysis Software Tool

*Smart • Easy • Affordable*



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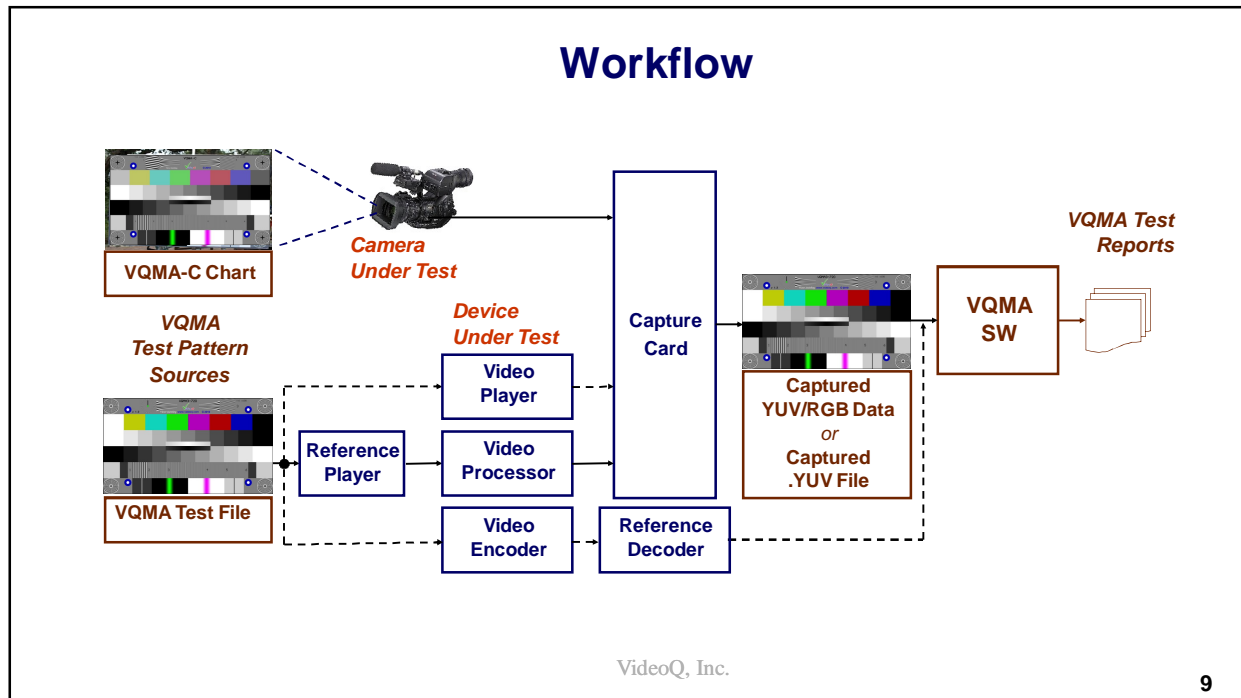
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### Applications

- Software Video Analyzer & Scope to measure captured video files from any HD source; with the VideoQ VQMA-C Reflectance Chart it measures video cameras
- VQMA3/VQMA3U is a self-contained software solution, replacing expensive and bulky competitive boxes
- Ideal tool for development labs, software developers and high volume manufacturers
- Easy-to-use tool, instantly revealing performance of your video devices:  
media players, STBs, video cameras, etc.
- User-selectable reporting modes:
  - a) machine-readable file with Pass/Fail marks,
  - b) detailed multi-page PDF document
- Combined with the appropriate Unigraf capture device, VQMA3U measures quality of HD-SDI, DVI/HDMI, DisplayPort or LVDS video signals

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## Features

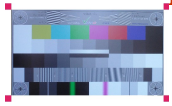
- Software executable under Windows™ (XP, Vista, Windows 7)
- USB dongle copy-protected, dongle-per-seat
- Auto-analysis on the companion VQMA-C Matrix Test Pattern
- VQMA-C formats: Optical Chart, File, Test Signal, Test Stream
- Built-in Software Scope: YUV/RGB waveform monitor
- Noise Measurement and Scope work on any static .YUV image
- Windows GUI mode for R&D and product verification
- DOS batch mode for automated QA/QC operation

## Analyzed Parameters

PASS



FAIL



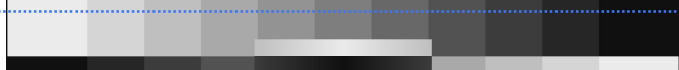
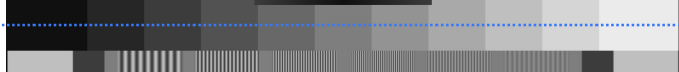

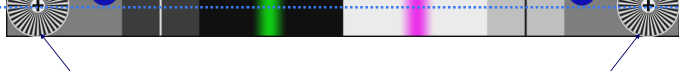

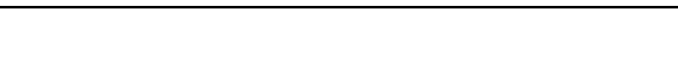



- **Geometry:** Scaling, Position, Tilt, Keystone
- **Levels:** Black, White, Color Balance, Gamma
- **H & V Shading** (Levels Spatial Uniformity)
- **Frequency Response:** in dB vs. scalable tvl
- **UV vs. Y Gain** (Color Saturation)
- **K-rating** on needle pulse
- Comprehensive **Noise Analysis**

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## VQMA-C Test Pattern Composition

All-In-One: Single pattern allows automatic measurement of multiple video signal parameters

Test Signals:	Oblique Bursts and Vertical Resolution Wedges	Parameters:
0		
Color Bars		UV Vectors
2		
Grayscales, Near-Whites, Near-Blacks		Black & White Levels, Y Gamma, Y Range Overload
3		
Multi-Burst		Frequency Response
4		
Multi-pulses		Y vs. UV Gain 2T pulse K-rating
5		

Geometry (Scale/Position/Tilt/Keystone), Sharpness (Focus), Shading  
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## VQMA-C Test Pattern Features

- ÿ VQMA-C exists in a variety of formats: Optical Chart, File, Test Signal, Test Stream
- ÿ VideoQ methodology allows triple usage: visual, instrumental and fully automated
- ÿ Test pattern contains specially designed components making video calibration an easy and straight forward procedure
- ÿ The test pattern components are designed to be compatible with a majority of video cameras, software or hardware codecs and media players
- ÿ VQMA-C contains 6 relatively large bands, so it remains suitable for accurate measurements even after low bitrate coding and severe position and/or scaling errors, e.g. zoom-out down to 50% or overscan up to 105%

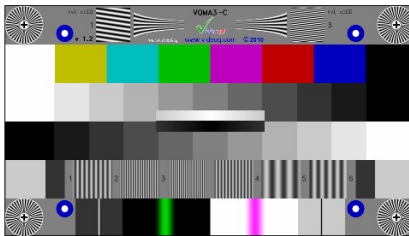
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## Automatic Test - Summary Page Screenshot

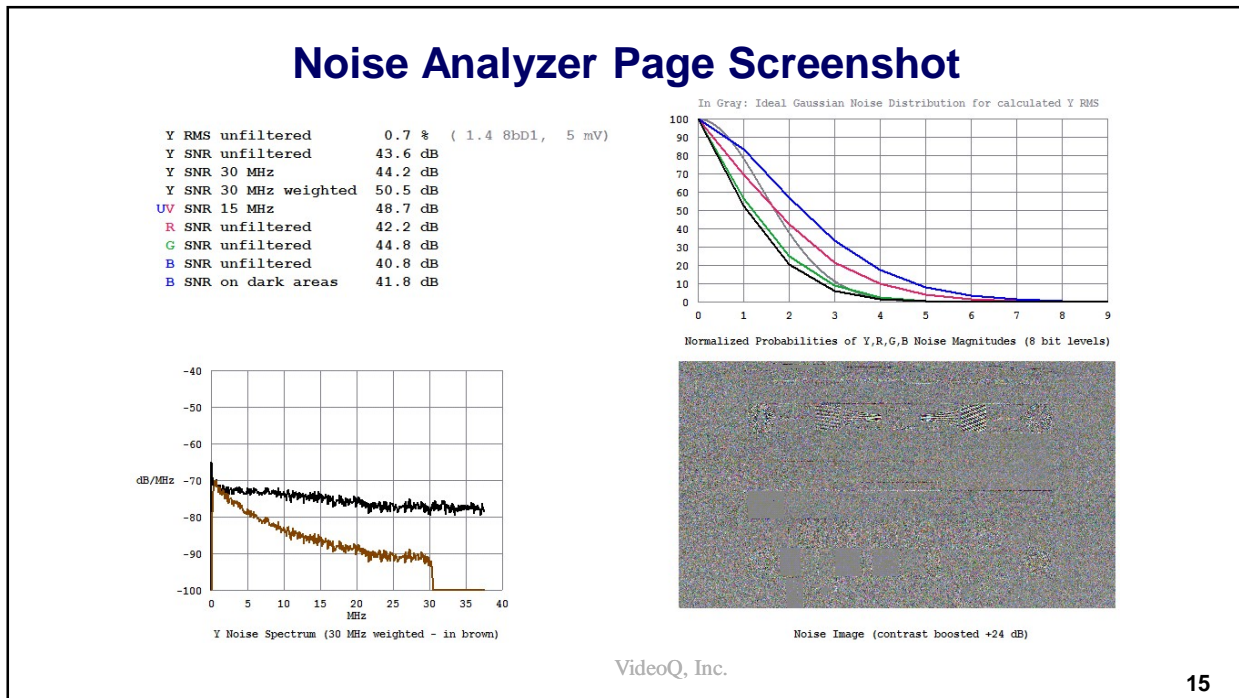
Frame Size: 1920x1080 1. Test Summary VQMA Test Result: **PASSED**

Parameter	Measurement	Unit	Target	Pass
Black Level	0.0 % (16.0)	% (0.0-255.0)	-5.0 -- +5.0 %	✓
White Level	100.0 % (235.0)	% (0.0-255.0)	95.0 -- 105.0 %	✓
Unfiltered Y SNR	100.0	dB	> 40 dB	✓
K Rating on 2T Pulse	0.0	%	< 3.0 %	✓
UV vs. Y Gain	0.0	dB	-1.0 -- +1.0 dB	✓
Luminance Gamma	2.2		1.8 -- 2.5	✓
RGB Balance Error	0.0	%	< 10 %	✓
Y Range Overload	0.0	%	< 15 %	✓
Sharpness (Avg. Corner Focus)	99.9	%	50.0 -- 150.0 %	✓
Freq. Response @ 100 tvl	0.0	dB	-3.0 -- +1.0 dB	✓
Freq. Response @ 200 tvl	-0.0	dB	-5.0 -- +1.0 dB	✓
Freq. Response @ 300 tvl	0.0	dB	-6.0 -- +1.0 dB	✓
Freq. Response @ 400 tvl	-0.0	dB	-9.0 -- +1.0 dB	✓
Freq. Response @ 500 tvl	0.0	dB	-12.0 -- +1.0 dB	✓
Freq. Response @ 600 tvl	-0.0	dB	-22.0 -- +1.0 dB	✓



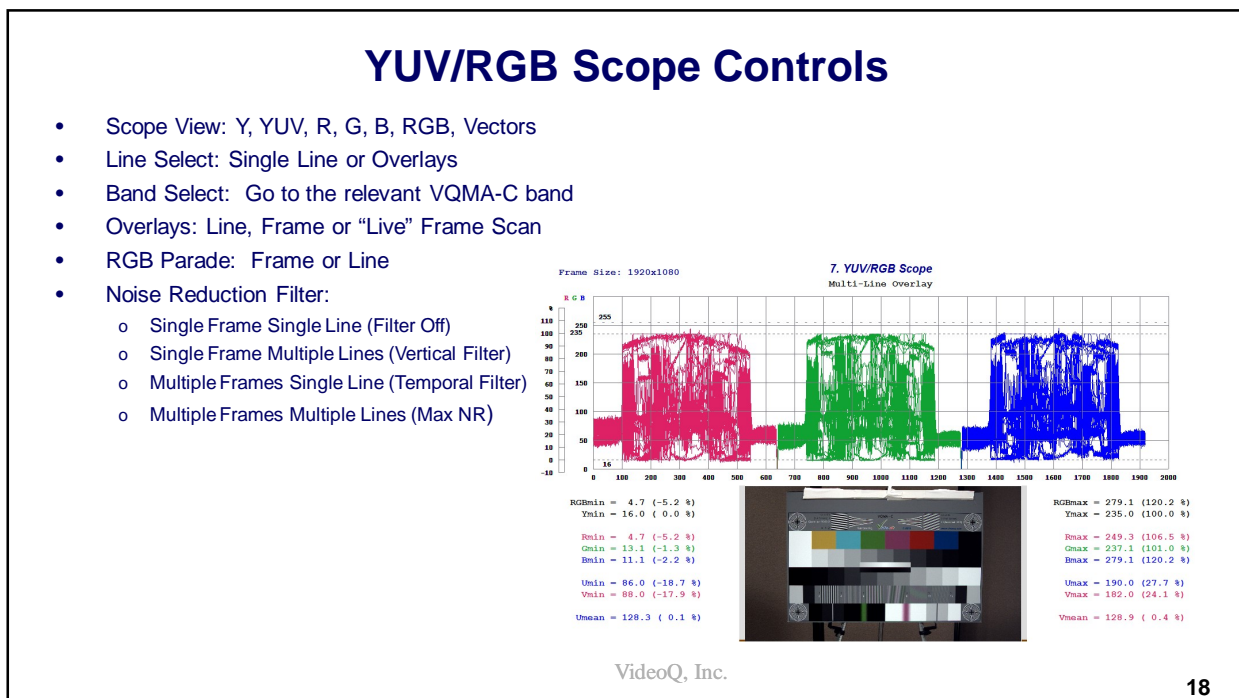
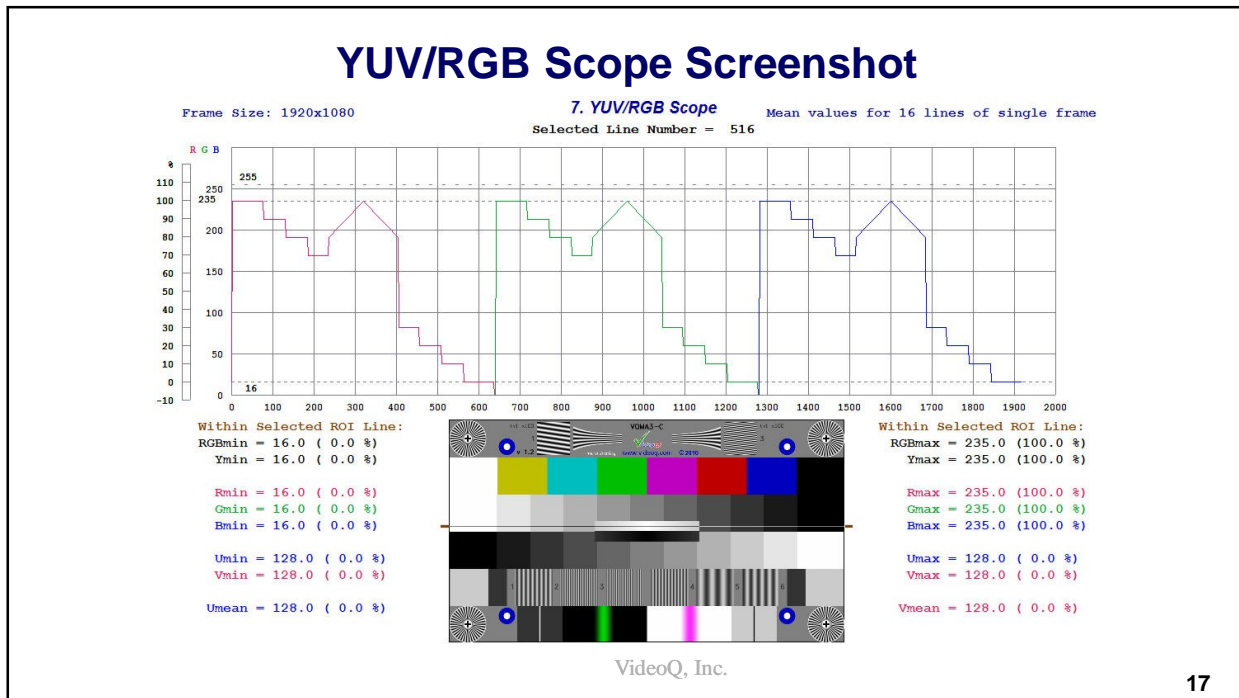
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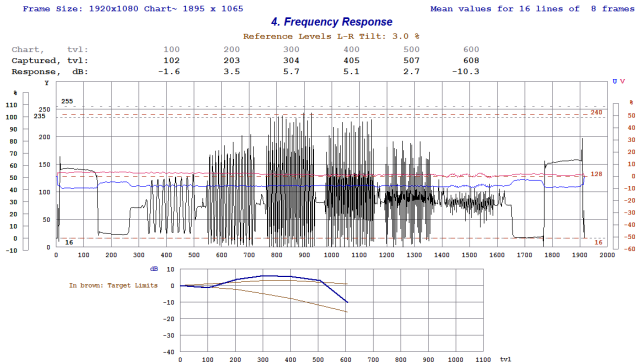
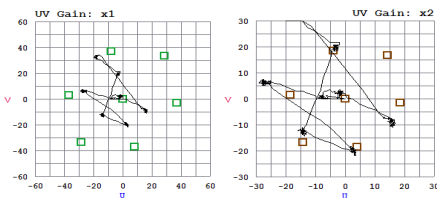
- ### Noise Analyzer Features
- Y SNR: unfiltered, band-limited and weighted
  - UV, R, G, B and "Dark B" SNR values
  - Y Noise Spectral Density plots in dB/MHz
  - Noise Image, +24dB boost for better visibility
  - Y, R, G, B Noise Histograms Display
  - Reference true Gaussian noise curve overlay
  - 0.1 dB accurate SNR measurement
  - SNR Read-out match industry standard tools
  - Noise measurement on just 8 frames of video
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## YUV/RGB Scope Features

- Cursor: Selected Line Position Highlight
- Graticules: YUV/RGB, in % and 8 bit levels
- Horizontal Grid: Line Pixel Number (0-1079)
- Smart Read-out: YUV & RGB in 8b and in %
- Smart Analytics: Min, Max, Mean for ROI
- Smart Display: Shows relevant data only
- Smart Navigation: Persistent display mode



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## Related VideoQ Products

### VQL - Comprehensive library of sophisticated static and dynamic test patterns and live sequences

Library files are in compressed and uncompressed formats. VQL provides basis for

- I Instant visual-aural quality estimation
- I Objective measurements of video and audio performance
- I Fully automated (robotic) Quality Control Analysis

<http://www.videoq.com/Downloads/VideoQ%20VQL.pdf>

### VQDM100

- I Test Pattern Generator with Delay & AV Sync Analyzer
- I Instant visual-aural quality estimation plus automatic latency, AV sync and 3D LR sync measurement
- I Multi-channel real-time analysis

<http://www.videoq.com/vqdm100.html>

### VQMA2

- I NTSC/PAL Software Video Analyzer that measures the quality of captured video files
- I Ideal tool for video development labs, software developers and high volume manufacturing

<http://www.videoq.com/Downloads/VideoQ%20VQMA-2.pdf>

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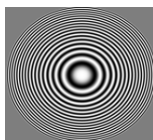
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VideoQ is a California-based company, focused on video test & measurement and video enhancement technologies, products and services.

More than 50 man-years of award-winning experience in the field of Broadcast, Consumer Electronics, Transcoding and Video Data Compression.

Experts in Video Calibration, Critical Picture Quality Technologies for Broadcast, Consumer Electronics, Transcoding, Video Data Compression, SDTV, HDTV, Digital Cinema, Mobile TV, IPTV.

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