

# Picture Quality Analysis System

## PQA200

### ★ Features and Benefits

- Provides Fast, Accurate and Repeatable Objective Picture Quality Measurements
- Allows Use of Any Video for Evaluating and Optimizing Digital Video Compression Systems
- Replaces Time-consuming and Expensive Human Assessment with a Reliable Alternative



### Picture Quality Analysis System

Introducing the PQA200...the industry's only objective picture quality measurement tool that actually looks at video.

The PQA200 delivers analysis of picture quality with repeatable objective measurements that directly replicate subjective human visual assessments. This provides invaluable information to enable optimum video compression without compromising picture quality.

Based on a Windows NT™ workstation, the PQA200 is both a generator and analyzer of reference test material for testing compressed video systems. Standard inputs and outputs are 270 MB/s serial component (Rec. 601). Option 01 provides analog composite NTSC/PAL inputs and outputs.

#### COMPRESSED VIDEO REQUIRES A NEW METHOD OF TESTING

The best measure of any analog or digital television system is the viewer's satisfaction with the image received. Traditionally, the quality of analog and full-bandwidth digital video systems has been measured indirectly by measuring the distortions of static test signals.

Compressed television systems, however, pose a far more difficult measurement challenge. Picture quality in these systems changes dynamically based on the data rate, picture complexity and encoding algorithm employed. The static nature of test signals does not provide true characterization of picture quality. Natural test scenes that are far more complex than test signals must be used to stress the capabilities of compressed video systems.

Until now, subjective testing using human viewers has been the only accurate method for evaluating compressed video systems. But, while useful for establishing academic reference data, subjective testing has been impractical for operational, manufacturing, and trouble-shooting applications — Until the development of the Tektronix PQA200, which provides a fast, practical and repeatable objective measurement alternative to subjective evaluation of picture quality.

#### HOW IT WORKS

The PQA200 measures a 2-second portion of a 5-second video test sequence. The video test sequences may be downloaded from supplied CD-ROMs, or recorded from your own video, and played out to the system under test. While serial digital interfaces are standard, analog composite and S-Video (Y/C) interfaces can also be accommodated with the addition of Option 01.

The output of the system under test is then stored and analysis performed with DSP-accelerated hardware on the 2-second sequence. The measurement results in a single numeric value of picture quality called Picture Quality Rating (PQR). Utilizing a human vision system model, JNDmetrix™, based on years of research by the Sarnoff Corporation, the PQA200 contains the three necessary dimensions for evaluation of dynamic and complex motion test sequences; spatial analysis, temporal analysis and full-color analysis.

In addition to reporting the Picture Quality Rating, the PQA200 provides an animated map whose intensity is related to the perceived differences between the original and captured image. This provides invaluable information for evaluation and optimization of digital video compression systems.

#### Characteristics

##### SERIAL DIGITAL VIDEO CHANNELS

**Format** – 270 MB/s serial component digital video. Complies with ITU-R BT.601, BT.656, SMPTE 259M, 272M, 165.

**Video Inputs** – Active loop-through, 75  $\Omega$  compensated, BNC connector (channel 1), SMB connector (channel 2).

**Video Output** – 75  $\Omega$  compensated, BNC connector.

**Return Loss** – < 15 dB (1-270 MHz), with power on.



See Tektronix on the World Wide Web:  
<http://www.tektronix.com>

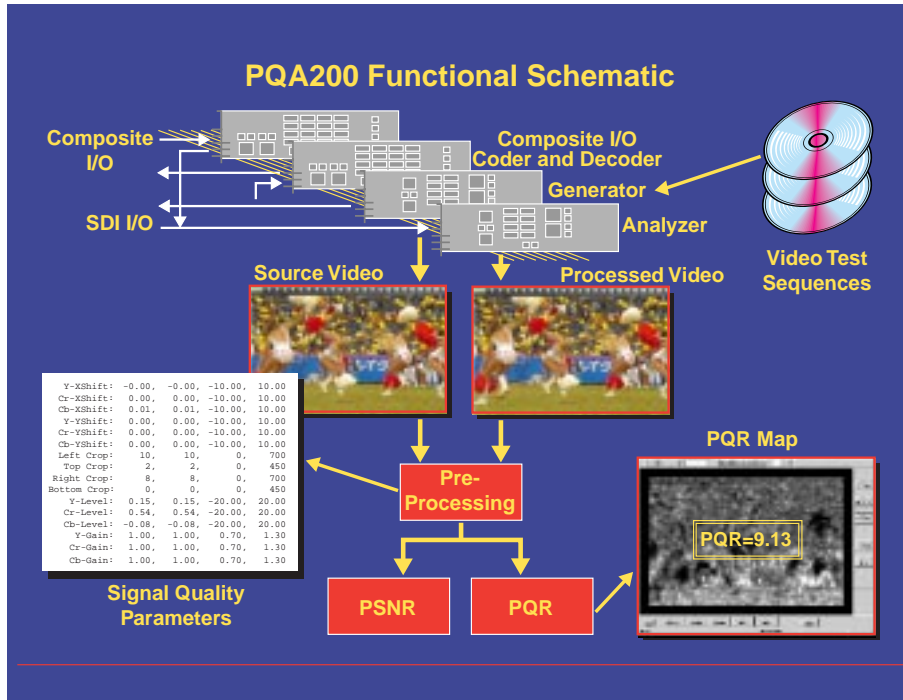


ISO 9001 Tektronix measurement products  
are manufactured in ISO  
registered facilities.

# Picture Quality Analysis System

## PQA200

### CHARACTERISTICS



Example application of Picture Quality testing using the PQA200 with Option 01.

**Serial Receiver Equalization Range** – Proper operation with coaxial cable up to 14.5 dB loss at 135 MHz.

#### ANALOG VIDEO CHANNEL (OPTION 01)

**Format** – Analog composite baseband NTSC/PAL or S-Video.

**Video Inputs** – Passive loop-through, 75  $\Omega$  compensated, BNC connector, and S-Video connector.

**Genlock Input** – Passive loop-through, 75  $\Omega$  compensated, BNC connector.

**Video Outputs** – Analog composite, BNC connector, and S-Video connector.

#### POWER

**Voltage Range** – 100 to 240 VAC.

**Frequency** – 50 or 60 Hz.

**Power Consumption** – < 200 W.

#### SYSTEM COMPONENTS

**Computer** – Compaq ProLiant 2500 with 200 MHz Pentium®Pro processor, 128 MB RAM, 9 GB SCSI hard disk drive, 3.5 in. floppy disk drive, CD-ROM drive.

**Monitor** – Tektronix 17 in. SVGA.

**Network Connection** – Ethernet.

#### ENVIRONMENTAL CHARACTERISTICS

**Operating Temperature** – +10°C to +35°C (+50°F to +95°F).

**Storage Temperature** – -20°C to +50°C (+12°F to +122°F).

**Operating Altitude** – 0 to 10,000 feet (0 to 3,048 meters).

**Storage Altitude** – 0 to 30,000 feet (0 to 9,144 meters).

**Transportation** – Qualified under NATA Test Procedure 1A, Category II (15 in. drop).

#### SAFETY

**Designed and tested for compliance with** – IEC 950, CAN/CSA C22.2 No. 950 M89, UL 1950, 73/23/EEC, 93/68/EEC

#### PHYSICAL CHARACTERISTICS

Dimensions	cm	in.
Height	45.52	17.92
Width	22.43	8.83
Depth	57.58	22.67
Weight	kg	lb.
Net	29.54	65
Shipping	45.45	100

(Base unit only – does not include monitor, keyboard or mouse)

### ORDERING INFORMATION

#### PQA200

Picture Quality Analysis System.

#### OPTIONS

**Opt. 01** – Analog Video Inputs/Outputs for PQA200.

**Opt. A1** – Universal Europe power cord.

**Opt. A2** – United Kingdom power cord.

**Opt. A3** – Australia power cord.

**Opt. A5** – Switzerland power cord.

#### For further information, contact Tektronix:

**Worldwide Web:** for the most up-to-date product information visit our web site at: [www.tektronix.com](http://www.tektronix.com)

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