Complete Video and Audio Monitoring for Broadcast and Transmission Quality Control
The OmniTek TQ was designed specifically for all SD and HD broadcast monitoring applications. The feature set combines state-of-the-art waveform generation technology with a comprehensive range of audio and video monitoring features. The main graphics display is completely configurable, to enable the user to present the exact information required for their monitoring application, while user-defined presets allow rapid switching between configurations.

**Video Proxy**

A high-resolution real-time proxy of the SDI input can be displayed alongside the waveform data. This 'Mini-Pic' has a real-time update and displays SD images at full resolution and full frame rate. HD images may be displayed at ½ resolution. A "pulse-cross" function allows viewing of the contents of the H & V blanking areas. Timing cursors can be overlaid on the proxy, and there are "burn-in" windows for timecodes, closed captions and teletext (see below).

**Timecode Display**

Where required, the Mini-Pic can display the timecode associated with the video, positioned to the left, in the centre or to the right at the top, at the bottom or in the middle of the display. The TQ is able to read and display VITC and ATC timecodes. When fitted with a suitable LTC reader, it can also display LTC timecodes.

**Closed Caption Decoding**

The TQ is capable of decoding Line 21, EIA-608-A, and EIA-708-B closed caption data from SD or HD input signals. The decoded captions may be "burned in" to the mini-pic proxy window, listed in the closed-caption window and/or saved to an XML-format log file for archival purposes. The EIA-708-B support is provided through an optional extra decoding package. This package checks the validity of all the 708 data embedded in an SDI signals. It also supports the display of 708 windowing commands.

**Teletext Subtitle Decode**

The TQ can also detect teletext subtitles in the video being analysed. Where the source is PAL format or where OP-47 teletext is used, it is also possible to decode the subtitles and show them on the Mini-Pic display.

**Cage Generator**

A flexible safe-title and safe-action cage overlay system is provided, with advanced features such as masks and video wipes. The cages can be displayed on the Mini-Pic and are adjustable in size, position and aspect ratio.

**Waveform Monitor & Data Analyzer**

The OmniTek TQ uses the signal processing technology that is used in the OmniTek XR, to give "extreme resolution" waveform and vectorscope displays. The frequency response at 10 bits per pixel is flat to 30MHz and 256 times oversampling is used to ensure the most accurate monitoring.

**Waveform Displays**

Novel waveform generation algorithms give high-quality, user-adjustable displays. Full 1024-pixel high waveforms may be generated, giving true 10-bit resolution. Arbitrary combinations of components may be displayed simultaneously. A unique region-of-interest control allows continuously-variable H and V magnification and selection of video lines. This enables the user to accurately select different areas of the image to analyse. The zoom works smoothly from a few pixels to a full line, 2 lines, 1 field through to full frame displays. The TQ also features low-pass, differential and "bowtie" filters, and can generate pseudo-composite SD waveform displays from HD or SD sources in real time.

**Vectorscope**

The TQ provides a high-resolution vectorscope display, available with 75% or 100% graticule and luma-masking capability. The vectorscope is fully scalable and may also operate on the selected region-of-interest. Graticules are automatically adjusted for the appropriate 601 or 709 colour matrix.

**Picture Quality Display**

The TQ includes a macro block detector, which looks at the video that is being analysed and assigns every frame a number between 0 and 5. A score of 5 indicates no visible macro blocks, while a score of 0 indicates the likelihood of significant numbers of visible macro block artefacts.

**Colour Gamut Display**

Colour gamut is monitored in both RGB and YCbCr colour spaces. The results are displayed on a custom gamut display, which indicates the total excursion of the signals and also the percentage of pixels that are outside recommended limits (as specified, for example, in EBU Recommendation 103).

**Video Status Display**

Input video signals are continuously monitored for errors and changes of state. Transport stream faults such as mistimed TRS words, EDH, CRC, LIN and ANC checksum errors are all reported. The video streams are further examined to ensure pixels conform to valid YCbCr, RGB and PAL/NTSC composite ranges and structures such as active format descriptions and RP186/ARD video indexes are identified and interpreted. Monochrome, freeze and black video are also detected. Errors are highlighted both in the video status window and in the pixel data display.
Pixel Data Display

The pixel data display shows the exact values present on the SDI input in decimal, hex, or binary format. The different display colours indicate the type of video segment: active picture, blanking, ANC packets, TRS words etc. A red bar indicates an error has been detected at this pixel value.

The display can be extended to provide automatic interpretation of TRS and ANC packets detected in the input video stream. This includes packet types such as CRC/EDH, embedded audio, SMPTE 352M video payload ID, and RP188 ANC timecode. In addition, the user can install XML-format descriptor files for decoding custom ANC packets.

Event Logs

All the video and embedded audio parameters monitored by the TQ may be entered into an XML-format event log file, with time-stamping from input timecode or the PC internal clock. In addition, events may be configured to trigger alarms or as SNMP network traps. Thresholds and timeouts for each monitored parameter are adjustable. The TQ further uses a ‘traffic light’-type system to indicate whether sessions are free from error or errors have occurred.

Audio Monitoring

Several audio monitoring options are available for the TQ system. The Standard Audio option provides 16-channel embedded audio PPM displays plus input group status. The Advanced Audio option gives 16-channel embedded PPMs plus Lissajous and audio phase meters that indicate if any stereo pair contains a mono, inverted mono, or uncorrelated signal. These conditions may be used to trigger an alarm.

The AES parameters of all groups are presented on the Audio Status display, with per-channel peak-hold, overload, and silence detection. The PPM displays have user-adjustable meter ballistics, the option of surround-sound view, and a choice of graticules including dBFS, DIN, EBU, BBC, and Scandinavian options. A user-selectable channel pair may be routed to the PC analog stereo output for easy monitoring. (Note that 1RU chassis require a separate audio output connection, via USB or similar.)

Dolby-E and AES Support

The Dolby-E option, when used in conjunction with the Advanced Audio option, provides PPM displays, frame timing checks, and a full metadata decode package for Dolby-E data streams. The External Audio option, which may be ordered together with Standard or Advanced options, provides a second PCI card with support for up to 16 channels of external AES/EBU digital audio input.
The OmniTek TQ is a PC-based system, comprising a state-of-the-art real time signal processing PCI plug-in card plus application software running under the Microsoft® Windows® 2000 or XP operating systems.

OmniTek can supply the TQ system as card-plus-software only, for the user to install in the PC system of their choice, or alternatively TQ can be supplied pre-installed in a 1RU rackmount PC chassis, portable PC with integrated screen, or “Magma” laptop expansion chassis.

The application may be used either in a standard "Windows" mode or in a “full screen” mode in which a selection of windows are neatly tiled to give a clear, uncluttered display. All windows are adjustable in size and colour on the graphics display. The user may also customize the selection and position of windows shown in “full screen” displays. To maximize the resolution and clarity of the display, the TQ can drive up to two DVI or VGA monitors at resolutions of 1920 x1200 and beyond.

The TQ features two SDI outputs and an analog component video output for monitoring purposes. Regions of the image with any gamut error may be flashed on the output displays. In addition, cursors and graticules may be shown.

There are a range of options available with the TQ system – please contact your local dealer for more information.
OmniTek TQ with 708 CC closed caption option offers both caption display on the mini-pic proxy and detailed logging of caption data.

OmniTek TQ with Advanced Audio and Dolby-E options, showing embedded audio PPM, Dolby-E PPM with metadata status, lissajous, and A/V delay.
OmniTek PCI Card

**Specification**
- PCI revision 2.2

**Type**
- 32-bit, 33 or 66 MHz bus speed

**Size**
- Full length (33cm long)

**Power**
- 15W max. (±12V, ±5V and +3.3V supplies required)

**Bracket**
- Industry-standard size

**Analog Sync Input**
- Connection: BNC with 75ohm termination
- Return Loss: >20dB up to 100MHz
- Signal: Black with bi-level sync (0.3V pk-pk) or tri-level sync (0.6V pk-pk)

**Serial Digital Inputs**
- Connection: BNC with 75ohm termination
- Return Loss: >20dB up to 100MHz
- Bit Rates: 270Mbit, 540Mbit & 1.485Gbit (SMPTE 259M, 344M, 292M)

**Serial Digital Outputs**
- Connection: BNC with 75ohm termination
- Bit Rates: 270Mbit, 540Mbit & 1.485Gbit (SMPTE 259M, 344M, 292M)
- Jitter: <0.2UI, 10Hz to 100kHz

**Analog Monitor Output**
- Connection: 9-pin mini-DIN
- Video: RGB with bi- or tri-level sync on green, 0.7Vp-pk video; or YPbPr with bi- or tri-level sync on Y, 0.7Vp-pk video; or Composite & S-Video (in PAL or NTSC modes) 0.7Vp-pk video.
- Syncs: H & V separate syncs, TTL level, positive-going pulses.

**Environmental**
- Power: 90...250Vac 47...63Hz autodetect. 300W maximum
- Size/Weight: Rack chassis: 440mm x 430mm x 40mm, 8Kg
- Temperature: Operational: +5...+35C, humidity <95% non-condensing
- Storage: -20...+50C, humidity <95% non-condensing

The OmniTek TQ can be supplied in a variety of mechanical configurations:

- **PCT Card & Software Only**
  - For user installation.
- **Cardbus Interface Chassis**
  - With cardbus interface. Laptop not included.

**Performance**

- Formats:
  - 486i / 59.94 (ITU-R BT.601)
  - 576i / 50 (ITU-R BT.601)
  - 483p / 59.94 (ITU-R BT.1358)
  - 576p / 50 (ITU-R BT.1358)
  - 720p: 23.98, 24, 25, 29.97, 30, 50, 59.94, 60Hz (SMPTE 296M)
  - 1035i: 59.94, 60Hz (SMPTE 260M)
  - 1080i: / 59.94, 60Hz (SMPTE 274M)
  - 1080p: 23.98, 24, 25, 29.97, 30Hz (SMPTE 274M)

- Resolution: 10-bit per pixel

- Error Control: EDH checking in SDTV modes; Line CRCs in HDTV

- Genlock: Output timing adjustable (with respect to sync input) in clock increments from 0 to 1 video frame.

**Audio Performance**

- Embedded: 4 groups / 16 channels (SMPTE 272M, 299M);
  - 48kHz synchronous, 20 bits / sample (SDTV), 24 bits/sample (HDTV);
  - Dolby E: PPM and metadata monitoring

- External: 16 channels / 8 pairs AES/EBU, 110ohm input impedance, transformer coupled;
  - All standard sampling rates up to 192kHz; 16, 20 or 24 bits/sample

**Computer System**

- Processor: Intel Pentium-M or Core 2 Duo, >1.8GHz
- RAM: 512Mbyte
- Graphics: Intel 915 chipset or better. Separate graphics card recommended
- Hard Disk: 80Gbyte minimum
- Software: Microsoft Windows 2000 or XP
- Ethernet: 100Base-T or 1000Base-T on RJ45 connector
- SNMP: Protocols conform to SNMP version 1.
- USB: Minimum 1 x Type A connector, USB 2.0
- Serial Port: RS232 on 9-pin TP plug
- Video Out: SXGA (1280x1024) minimum, 15-pin high density TP
- Keyboard: USB compatible
- Mouse: USB compatible

Please consult your dealer for specifications on the laptop/PCI-expansion product.

**System Configurations**

OmniTek products use an advanced PCI signal processing engine plus application software running under the Microsoft Windows XP or 2000 operating systems. The TQ system has a number of system configuration options, please consult your local dealer for more information.

- **Standard Audio Option**
  - 16 channel embedded audio PPM displays plus status on 4 input groups.
- **Advanced Audio Option**
  - 16 channel embedded audio PPM displays plus group status, analog stereo monitoring output, Lissajous display, and audio phase meters.
  - Support for Dolby-E PPM displays and metadata decoding only.
- **External Audio Input Card**
  - 16 channels / 8 pairs AES/EBU: Requires 1 additional PCI slot.
- **708 CC Option**
  - Full decode and logging of EIA-708-B.

- **Dolby-E Option**
- **USB Option**
- **708 CC Option**
- **External Audio Input Card**
- **Laptop Expander Chassis**
- **Cardbus Interface Chassis**

**Warranty**

OmniTek systems are warranted for one year from date of purchase. This includes all feature upgrades and bug fixes to the application software, plus repair or replacement of the hardware (at the discretion of OmniTek). Extended warranty agreements are also available; please consult your local dealer.

**Technical Specifications**

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