OmniTek

www.omnitek.tv

Advanced Measurement Technology

LAB

Advanced Signal Generator and Waveform Monitor for Video Engineers

Introducing OmniTek ***LAB***. The world's most advanced digital TV test signal generator and data analyzer. Supporting all SDTV and HDTV serial digital video formats, the ***LAB*** is unique in providing all the functions of a high-end signal generator totally integrated with a full-featured waveform monitor and audio/video data analyzer. With the ***LAB***, video engineers now have access to a complete test and measurement system in a single, easy-to-use, PC-based package. The system is completely software-programmable, to allow new features and formats to be installed via a download.

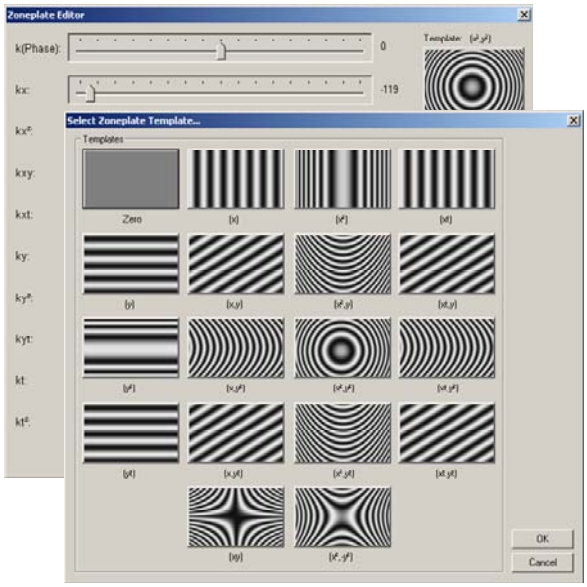
Digital Signal Generator

Internal Line Patterns

The advanced signal generator in the ***LAB*** contains 64 industry-standard test patterns including bars, sweeps, ramps, pathological, pulse & bar etc. Up to 6 patterns may be on-screen at once.

Zone Plates

LAB contains a full-motion zone plate generator, providing a complete set of X, Y, and T adjustments. The basic waveform is adjustable to sine, square, or triangular. User settings can be saved in custom setup files.

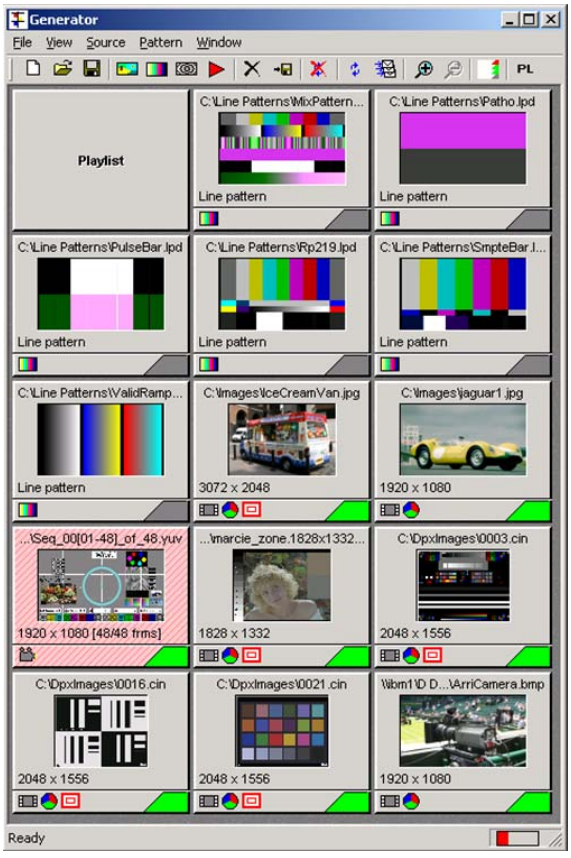


Frame Images

The PC internal hard disk can store thousands of full-frame images, which can be read by the generator in any standard PC file format (.bmp, .jpg, .tif, .gif, .avi, .wmv, .yuv, .yuv10, .dpx, etc.). The images can be re-sized to fit the current video format, and the correct colour matrix is used when converting from RGB (i.e. BT.601 or BT.709).

Full-Motion Capture & Playback

LAB contains a real-time uncompressed video capture and playout system capable of storing up to 45 seconds of SD, or 7 seconds of HD source material. Image sequences may be loaded as individual frames, .avi or .wmv files, or captured from the live SDI input.



Playlists

LAB can play out a user-defined sequence of images or motion segments. Each image has programmable duration, and can have different embedded audio tones or engineering settings such as gain or noise. The playlist can be executed in a continuous loop or as a single sequence, and is fully remote-controlled via SNMP network commands.

Embedded Audio Generator

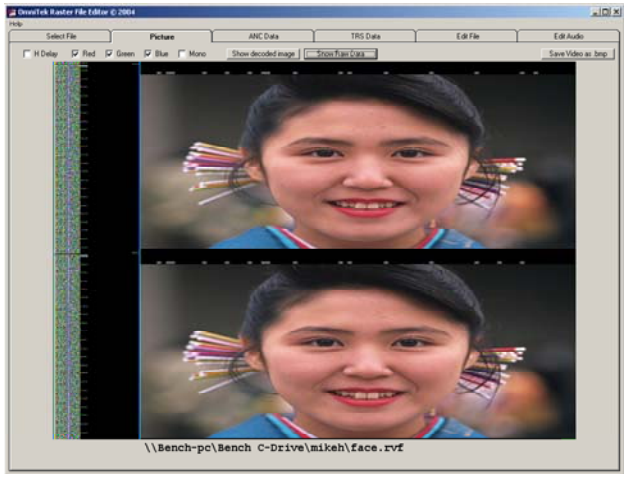
LAB contains a programmable tone generator supporting 8 channels (2 groups) of embedded audio, with 20- or 24-bits per sample at 48kHz. Frequency and wave shape is user-selectable, and the generator can create single-frame "blips" synchronized to the video sequence playout.

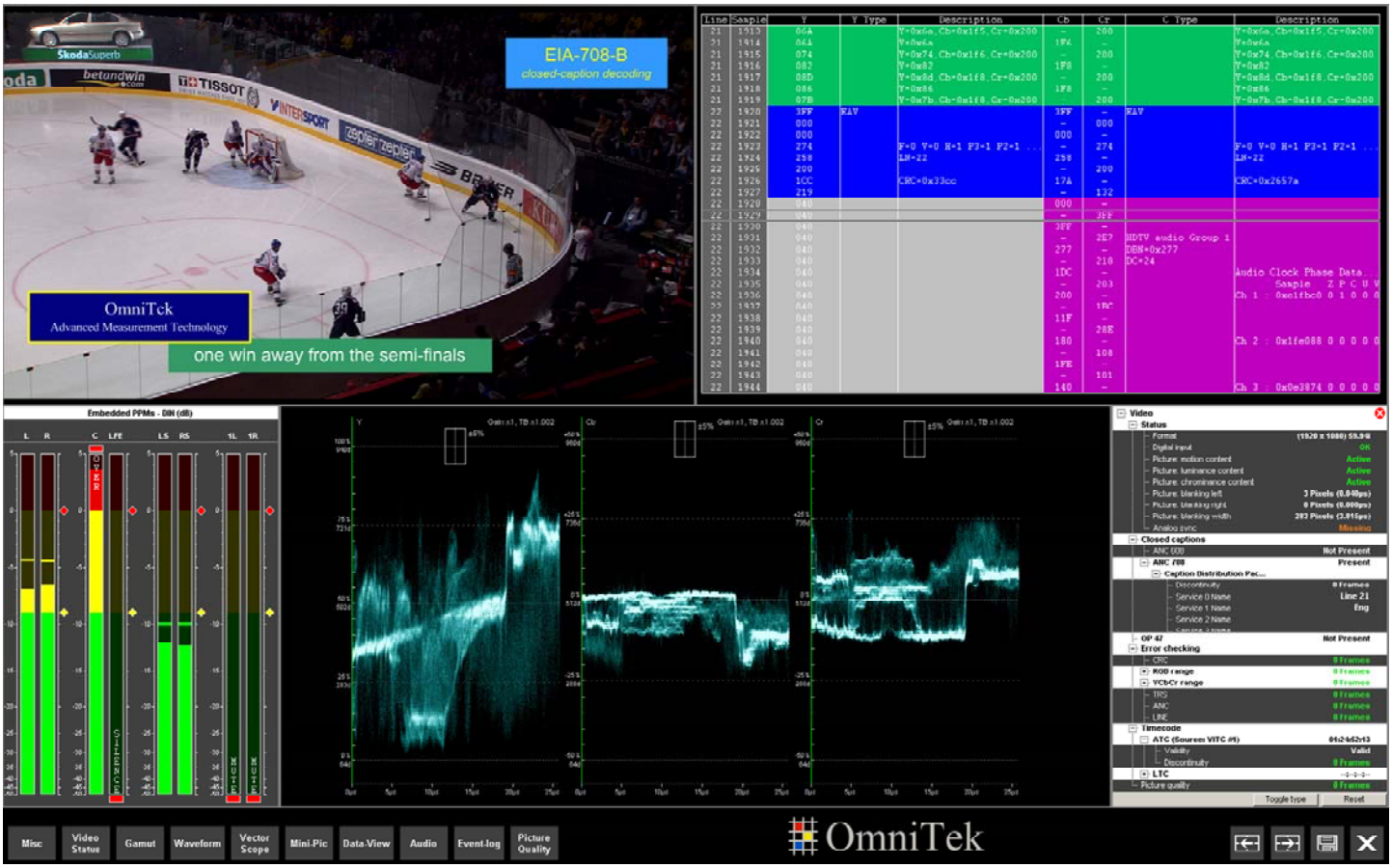
Timecode, Video Index & Widescreen Signalling

LAB contains VITC and ATC timecode generators, which may free-run or be slaved to timecodes from the SDI input. When set to 525 or 625 line formats, the LAB can also generate user-configurable Video Index (SMPTE RP186) and Widescreen Signalling (EN 300294) codes. Protocol extensions from ARDSPEC1 are also supported.

Raster Video Files

A unique feature of the ***LAB*** is the ability to capture, edit, and playout “full-raster” video files, which contain the entire video signal including all blanking and ancillary data. This allows the user to analyze all aspects of a signal, or to create signals containing data errors or proprietary ANC data packets.





Full-screen display, showing mini-pic with 708 closed-caption decoding, enhanced pixel data, waveforms, PPMs, video status, and configuration controls

Waveform Monitor & Data Analyzer

LAB contains an advanced, high-resolution waveform monitor and data analyzer. This provides a full range of real-time video and audio status monitoring displays, plus SNMP network alarms may be configured to alert external systems to detected errors.

Waveform Displays

High-resolution waveform displays are provided in both YCbCr and RGB colour spaces. Each video component may be displayed individually or together as a parade, using a single selected line or integrating all raster lines together. A vertical frame-rate display is also available. Horizontal timebase and vertical amplitude gain controls are provided, plus adjustable interpolation, colour, persistence, and decay of the display traces. A range of graticules are provided, and accurate timing and amplitude cursors are available for detailed measurements.

Vectorscope

LAB provides a high-resolution vectorscope display, available with 75% or 100% graticule and luma-masking capability. Graticules are automatically adjusted for the appropriate 601 or 709 colour matrix.

Mini-Pic

A high-resolution real-time proxy of the SDI input or signal generator source is provided, with a “pulse-cross” function to allow 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 VITC and ATC timecodes. The proxy can also display closed-captions from the built-in EIA 608 and 708 closed-caption decoder modules.

Video Status Display

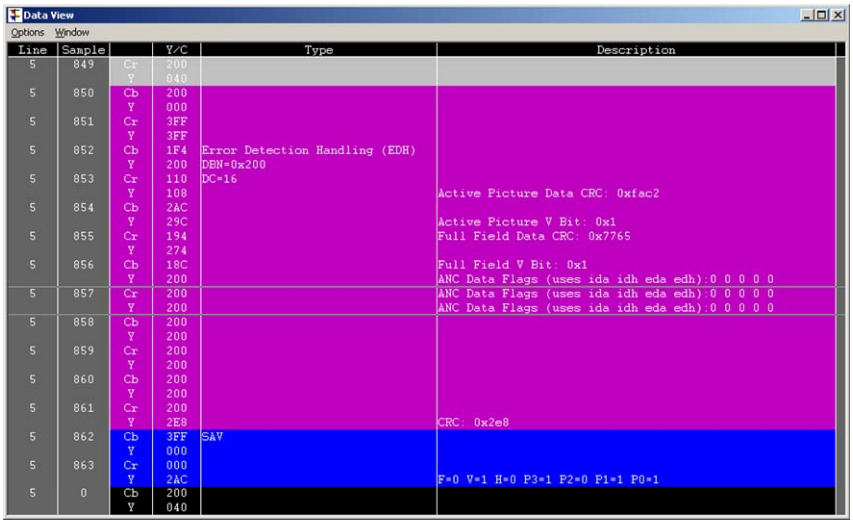
The video status display gives a comprehensive, real-time indication of the condition of signals being monitored by the ***LAB*** system. Parameters displayed in this window include the SDI input status (transport errors plus content checks), blanking width, closed-caption status, RGB and YCbCr range checks, timecode and widescreen signalling. Structures such as active format descriptions and RP186/ARD video indexes are also identified and interpreted.

Audio Status Display and PPM Monitors

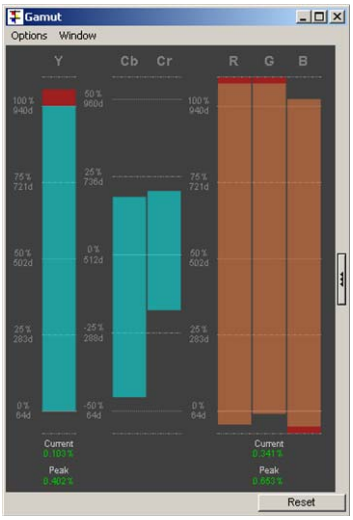
LAB monitors 16 channels (4 groups) of embedded audio. The AES parameters of all groups are presented on the Audio Status display, with per-channel peak-hold, overload, and silence detection. A separate PPM display has user-adjustable meter ballistics and a choice of graticules including dBFS, DIN, EBU, BBC, and Scandinavian options.

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 stream. This includes packet types such as embedded audio, SMPTE 352M payload ID, EDH, and RP188 timecode. In addition, the user can install XML-format descriptor files for decoding custom ANC packets.



Colour Gamut Display

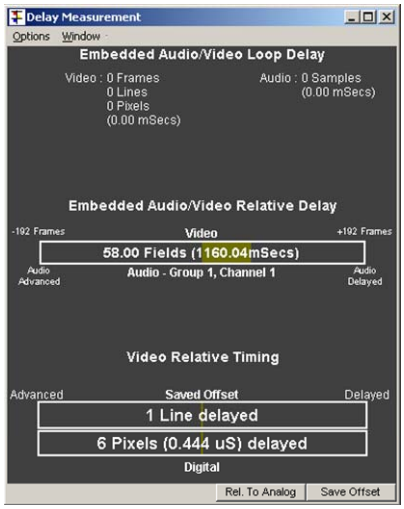
The ***LAB*** monitors colour gamut in both RGB and YCbCr colour spaces. The results are displayed on a custom gamut display, which indicates the total excursion of the signals and also the percentage of pixels that are outside recommended limits (as specified, for example, in EBU Recommendation 103).

Event Logs

All the video and embedded audio parameters monitored by the ***LAB*** may be entered into an XML-format event log file, with time-stamping from input timecode or the PC internal clock. Thresholds and timeouts for each monitored parameter are adjustable.

Closed Caption and Teletext Subtitle Decoding

The ***LAB*** system is capable of decoding Line 21, EIA-608-A, and EIA-708-B closed caption data and OP-47 teletext subtitles from SD or HD input signals. The decoded captions may be “burned in” to the mini-pic proxy window. They can also be saved to an XML-format log file for archival purposes.



Audio/Video/Reference Delay Measurements

The ***LAB*** system has the capability to measure SDI loop delay through an external processing path, for both video and embedded audio signals. In addition, the ***LAB*** can also measure relative audio/video “lip-sync” delay when displaying the standard OmniTek full-motion test sequence. The ***LAB*** can also measure the time delay between analog sync reference and SDI input signals.

“Timeshift” Event-Based Video Capture

A feature of the ***LAB*** is the ability to capture live video sequences from the SDI input, based on detection of input errors or particular timecode ranges. The user may select which errors trigger a recording, and multiple recordings may be made up to the total memory capacity of the system. It is also possible to capture full-raster data including all blanking areas.

System Options and Configurations

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

There are a range of options available with the ***LAB*** system – please contact your local dealer for more information.


Main Control Toolbar
Sequence Play & Record
With "Timeshift" error record mode
Video Format Select
All SD & HD formats, with auto-detect capability
Mini-Pic Window
High resolution real-time proxy with pulse-cross & timecode
Signal Routing Control Toolbar
Waveform Monitor
YCbCr or RGB; Parade or stacked
Video Status Window
Audio Status Window
Generator Window
Line patterns, images and full-motion sequences
Crosshair Toolbar
Cursor Control Toolbar
System Status Overview
User Interface Page Select
Vectorscope Display
75% & 100% graticules
Audio PPM Displays
Wide range of ballistics & graticules
Pixel Data Display
With colour-coded data interpretation
ATC (Source: VITC #1)
01:18:06:14

TECHNICAL SPECIFICATIONS

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 30MHz
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	>15dB up to 1.5GHz
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, 0.7Vpk-pk video; or YPrPb with bi- or tri-level sync on Y, 0.7Vpk-pk video; or Composite & S-Video (in PAL or NTSC modes) 0.7Vpk-pk video.
Syncs	H & V separate syncs, TTL level, positive-going pulses.

Environmental (Complete systems only)

Power	90...250Vac 47...63Hz autodetect. 300W maximum	
Size/Weight	Rack chassis:	440mm x 430mm x 40mm, 8Kg
	Portable:	400mm x 220mm x 340mm, 12Kg
Temperature	Operational:	+5...+35C, humidity <95% non-condensing
	Storage:	-20...+50C, humidity <95% non-condensing

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) 1080sF / 23.98, 24Hz (SMPTE 274M, RP211) 1080i / 50, 59.94, 60Hz (SMPTE 274M) 1080p / 23.98, 24, 25, 29.97, 30Hz (SMPTE 274M)		
Resolution	10-bits per pixel		
Error Control	EDH checking in SDTV modes; Line CRCs in HDTV		
Generators	Storage capacity	525-line:	1150 frames
		625-line:	970 frames
		720p modes:	436 frames
		1080 modes:	194 frames
	Note: Capacity is reduced for full-raster images		
Genlock	Output timing adjustable (with respect to sync input) in clock increments from 0 to 1 video frame.		

Computer System

Processor	Intel Pentium-M or Core 2 Duo, >1.8GHz
Main 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 'D' plug
Video Out	SXGA (1280x1024) minimum, 15-pin high density 'D'
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 individual components of the ***LAB*** system are available separately, or the whole system may be purchased as a complete package at a discounted price. Consult your local dealer for more information.

*** Signal Generator**
Line patterns; Zone plate generator; Image import and resize.

*** Signal Analyzer**
Waveforms; Vectorscope; Audio PPMs; Status monitoring; Error logging.

*** Motion/Capture Option**
Capture, storage and playout of full-motion uncompressed sequences.

*** Advanced Option**
Full-raster file capture/storage/playout; "Timeshift" data capture; Timecode, video index & WSS generation.

*** 708 CC Option**
Full decode and logging of EIA-708-B.

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

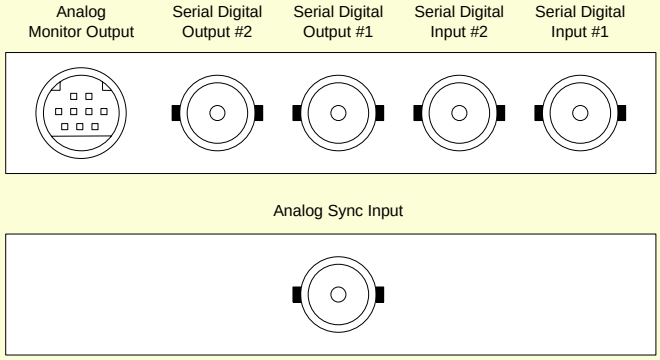
*** PCI Card & Software Only**
For user installation.

*** 1RU Rack-Mount Chassis**
Display, mouse & keyboard not included.

*** Portable (luggable) PC**
With integrated display, touchpad & keyboard.

*** Laptop Expander Chassis**
With cardbus interface. Laptop not included.

PCI CARD CONNECTIONS



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.

DEALER INFORMATION

All specifications are subject to change without notice.

OmniTek

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