



VI.VI

Video Stream Analyzer (VSA)

**An Integral Part of the Viavi Solutions™
Video Monitoring Solution**

The VSA Solution

The VSA combines Viavi digital video-monitoring software with commercially available, off-the-shelf hardware to create an easily-maintained, upgradeable video probe. Specifically developed for video service providers who must ensure quality of service (QoS) and quality of experience (QoE), VSA is a highly cost-effective and scalable solution that unites a system-integrated monitoring probe with all the features of a standalone digital video analyzer. This ensures monitoring results are consistent with troubleshooting information, enabling a seamless transfer of information to Tier 2 and 3 groups and preventing repeat investigations with different tools.

Loudness Monitoring

The VSA monitors audio levels of AC-3 audio and the associated dialnorm to pinpoint excessively loud sections of programming. The VSA will generate alarms and notifications based upon configured thresholds, alerting operators to the presence of perceived audio loudness issues. Developed to address the issue of excessive audio loudness during commercial advertisements, proactive notification reduces customer calls, saving the time and effort of responding to complaints and saving money by averting fines (for example, CALM legislation in North America) through the early detection of issues and documented proof of compliance.

SimulTrak™ Monitoring

SimulTrak lets users monitor MPEG digital video with a breadth, depth, and accuracy never before available. The simultaneous monitoring does not rely on any scanning techniques, giving an uninterrupted view of transport-stream QoS. The highly-accurate timing measurements and PID rate monitoring give a constant reflection of QoE as they use the same algorithms as the integrated MPEG analyzer.

Stream	Program	Number	OC Errors	PMT Errors	PID Errors	PCR Rate	PCR Discontinuity Errors	PCR Accuracy Errors	PCR Jitter (ms)	PCR Accuracy (ms)	PCR Freq (Hz)	PCR Dm R.
12	World Eating Network HD	708	0	0	0	0	0	0	19	25	0	0.000
7	Velvet	897	0	0	0	0	0	0	23	21	0	0.000
4	Thriller Man	652	0	0	0	0	0	0	32	41	4	0.000
6	Thriller Man (Velvet)	895	0	0	0	0	0	0	19	19	0	0.000
23	The Tennis Channel HD	720	0	0	0	0	0	0	19	21	0	0.000
12	The Tennis Channel HD	707	0	0	0	0	0	0	30	44	42	0.000
19	TMC (Rea) (Velvet)	721	0	0	0	0	0	0	22	26	0	0.000
20	TMC (Rea) East	724	0	0	0	0	0	0	19	21	0	0.000
17	TMC HD (Velvet)	718	0	0	0	0	0	0	30	38	0	0.000
22	Speed HD	729	0	0	0	0	0	0	29	33	0	0.000
19	Showtime Extreme (Velvet)	720	0	0	0	0	0	0	29	45	21	0.000
20	Showtime Extreme East	722	0	0	0	0	0	0	31	38	0	0.000
19	Showtime HD (Velvet)	719	0	0	0	0	0	0	17	22	0	0.000
19	Showtime HD East	722	0	0	0	0	0	0	31	37	6	0.000
17	Sho! HD (Velvet)	717	0	0	0	0	0	0	19	23	0	0.000
24	QVC HD	731	0	0	0	0	0	0	19	22	0	0.000
4	Outer Man	899	0	0	0	0	0	0	21	22	0	0.000
11	Movie Man	706	0	0	0	0	0	0	21	41	4	0.000
8	Movie Man (Velvet)	700	0	0	0	0	0	0	21	25	0	0.000
15	Man TV HD	712	0	0	0	0	0	0	23	26	0	0.000
14	MGM Channel HD	712	0	0	0	0	0	0	20	26	0	0.000
15	Hallmark Movie Channel	714	0	0	0	0	0	0	22	22	0	0.000
2	HBO Zone	897	0	0	0	0	0	0	20	40	3	0.000
2	HBO Zone (Velvet)	899	0	0	0	0	0	0	20	16	0	0.000
19	HBO Signature	704	0	0	0	0	0	0	24	49	2	0.000
7	HBO Signature (Velvet)	698	0	0	0	0	0	0	34	38	0	0.000

Key Benefits

- Robust video-stream monitoring reduces subscriber complaints and decreases MTTR
- Loudness monitoring ensures compliance with local regulations, avoiding fines while reducing trouble tickets
- An integrated video analyzer enables seamless problem escalation across workgroups, decreasing MTTR
- Dense multi-port support decreases per-port analysis and deployment costs
- Integration (via a powerful API and an open platform) with in-house systems streamlines processes

Applications

- Video monitoring and troubleshooting for IPTV, cable, and satellite service providers
- 24x7 audio loudness monitoring
- 24x7 video stream QoS/QoE monitoring
- Segmentation using probes distributed from ingest headends to the network edge
- Remote, real-time analysis

VIAVI PathTrak™ Video Monitoring

ethernet test point summary

video monitoring / New Site / 145_card3

Site: **New Site** Test Point: **145_card3** Description:

MPEG Status (current): **Critical** MPEG Status (24-hour): **Critical**

MPEG Stream Status | MPEG Measurements

Sort by Worst Offenders

6 streams found, displaying all.

MPEG (current)	MPEG (24-hour)	TSID	ID	Label	Source	Destination	VLAN	Date/Time of Most Recent Event	Message from Most Recent Event
OK	Critical	0	1	v403-1	10.115.49.6:8000	232.255.33.1:7024		Sep 23 10:13 PM	The rate of bad PCR values
Critical	Critical	0	2	v410-1	10.115.41.6:8000	232.255.34.1:8024		Sep 24 05:19 AM	PCR drift rate
Major	Critical	2	4	Ktech-TWC-1	10.115.46.6:49152	232.255.37.1:17024		Sep 24 05:18 AM	PCR frequency offset
Critical	Critical	575	5	Ktech-TWC-2	10.115.46.6:49153	232.255.37.1:17025		Sep 24 05:18 AM	The rate of bad PCR values
Major	Critical	576	6	Ktech-TWC-3	10.115.46.6:49154	232.255.37.1:17026		Sep 24 05:19 AM	PCR overall jitter
OK	Critical	577	7	Ktech-TWC-4	10.115.46.6:49155	232.255.37.1:17027		Sep 24 05:14 AM	PCR overall jitter

6 streams found, displaying all.

Export a list of items found: CSV | Excel | PDF

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7 programs

Selected Stream: KTech-12164-TWC-3 (238.255.203.3:23026-10.115.203.6:49154)

Program	Streams ID	MPEG No.	STB No.	PMT PID	Events	OC Errors	PMT Errors	PID Errors	PCR Repetition Errors
(UNCLD)	8	3	3	800	103	157920	0	0	0
(UNCLD)	8	5	5	800	229	173744	0	0	0
(UNCLD)	8	6	6	800	154	203594	0	0	0
(UNCLD)	8	2	2	580	203	417556	0	0	0
(w/UNCLD)	8	7	7	1080	424	365155	0	0	0
(UNCLD)	8	1	1	490	117	193947	0	0	0

Selected Program: (UNCLD) [Program/PID 3/682]

PID	MPEG No	Program	Scrambled	Dialnorm	Ungated	Gated	Gated Delta	Speech	Speech Delta	Cum Sp.	Dolby G.	Dolby Gated
682	3	(UNCLD)	No	-24.0	-21.1	-31.7	-7.7			-23.2	-31.7	-7.7
683	3	(UNCLD)	No	-24.0	-27.3	-29.0	5.0	-26.5	-2.5	-23.1	-26.5	-2.5

Speech Delta (LKFS) / PID 682

Graph showing Speech Delta (LKFS) over Time (24:30 to 01:30).

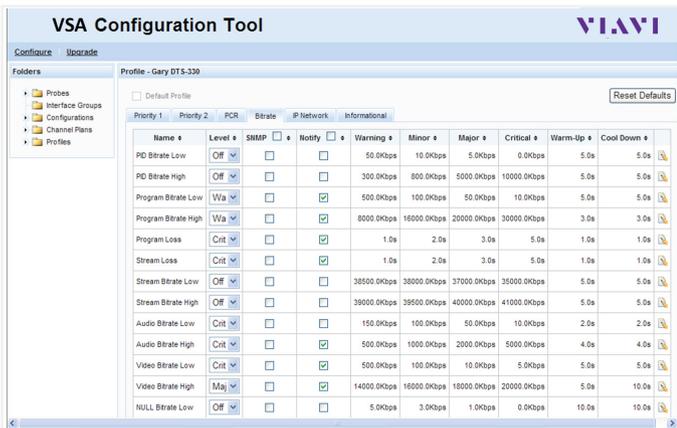
Actionable Information, Not a Sea of Data

The ability to customize monitoring profiles based on program source and content is vital to ensure the usefulness of the monitoring system. For example, VSA supports unique monitoring profiles for high definition (HD) content, standard definition (SD) content, as well as international and local programming. It also enables customizing thresholds for each program and for each monitoring point in the network to avoid alarms on programs not controlled by the service provider.

The VSA provides the following event-threshold capabilities:

- Unique monitoring profiles for over 40 measurements
- Multiple levels of threshold violation: warning, minor, major, and critical
- User-definable violation levels for each item monitored that generates an event

A web-based configuration tool lets users create, store, and distribute configurations to probes. This tool supports a user-defined grouping of units and interfaces along with status indicators. The VSA configuration tool enables easy distribution of changes such as channel lineups and event thresholds to probes throughout the network.

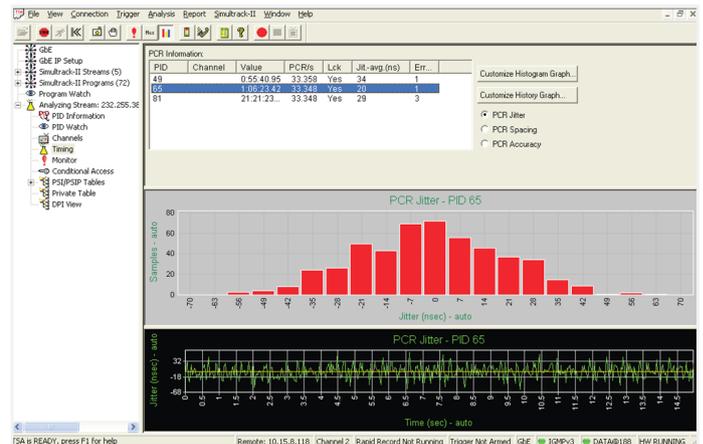


The flexibility of the VSA lets users define the method used to join transport streams for monitoring. Users may choose to employ Internet group management protocol (IGMP) from the VSA to actively join transport streams or connect to the network using passive methods such as SPAN ports or network TAPs.

Troubleshooting Analysis

When needed, users can access a detailed analysis and troubleshooting mode. This gives users the ability to remotely isolate problems and troubleshoot specific issues. Analysis of tables and metadata, PID-based utilization graphs, PCR timing graphs, and much more lets local experts troubleshoot issues remotely, preventing costly dispatches.

The troubleshooting mode has no impact on monitoring functions such as SimulTrak or loudness, eliminating the need for users to choose between monitoring functions and troubleshooting analysis.



Real-time loudness displays show the severity of loud sections and can be used to verify the resolution of issues as well. Historical data confirms or refutes reported violations and reveals the affected content when violations are found, enabling operators to understand the origin of an issue. For example, does the problem occur during an ad inserted by the operator or was this content passed through from the content provider?

Scalability

Multiple VSA units can be deployed in a system environment for monitoring at key points in the network. This scalability lets providers leverage their initial investment as needs grow and evolve from a few units to a large, centralized monitoring system with full analysis capabilities. In addition, operators can size the hardware for future expansion, enabling field upgrades for additional monitoring and troubleshooting capacity.

API

Integration of the VSA can enhance monitoring systems for many users.

Viavi provides an open, XML-based API for complete integration of monitoring functionality. The API lets the VSA integrate with third-party monitoring/OSS platforms from vendors like Miranda®, SkyLine®, and Cisco® as well as with custom, in-house solutions. In addition, a SNMP trap-generation feature provides alternate ways to integrate VSA with additional systems.

Related Products

Viavi PathTrak Video Monitoring (PVM) Software helps segment video problems in minutes, not hours, by proactively monitoring across RF and Ethernet test points. PVM supports RSAM, MVP200, and VSA probes, providing a centralized access point and a common, intuitive GUI for users to see current network status, alarms, events, and historical data.

For more information please call your local Viavi representative.

PathTrak™ Video Monitoring

ethernet test point summary

video monitoring / New Site / 145_cabd3

Site: **New Site** Test Point: **145_cabd3** Description:

MPEG Status (current): **Critical** MPEG Status (24-hour): **Critical**

MPEG Stream Status MPEG Measurements

Sort by Worst Offenders

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MPEG current	MPEG (24-hour)	TSID	ID	Label	Source	Destination	VLAN	Date/Time of Most Recent Event	Message from Most Recent Event
OK	Critical	0	1	v409-1	10.115.49.8:6000	232.255.33.1:7024		Sep 23 10:13 PM	The rate of bad PCR values
Critical	Critical	0	2	v410-1	10.115.41.8:8000	232.255.34.1:9024		Sep 24 05:19 AM	PCR drift rate
Major	Critical	2	4	k3ech-TWC-1	10.115.46.8:49152	232.255.37.1:17024		Sep 24 05:18 AM	PCR frequency offset
Critical	Critical	575	5	k3ech-TWC-2	10.115.46.8:49153	232.255.37.1:17025		Sep 24 05:18 AM	The rate of bad PCR values
Major	Critical	576	6	k3ech-TWC-3	10.115.46.8:49154	232.255.37.1:17026		Sep 24 05:19 AM	PCR overall jitter
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i streams found, displaying all.

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Program Status Event Log MPEG Live

Stop [Reset] Remaining: 1 min 38 sec

TSID: 10 Program Count: 9 Duration: 0 min 27 sec

Error Counts	PCR Error Counts	Rates
Sync Loss: 0	PCR Repetition: 0	IPD: 271 µs
Sync Byte: 0	PCR Discontinuity: 0	IPD Std Dev: 0 µs
PAT: 0	PCR Accuracy: 0	IP Rate: 43.8 Mbps
Continuity Count: 0	PCR Bad: 0	MPEG Rate: 41.3 Mbps
PMT: 0	PCR Lock: 0	Null Rate: 7.6 Mbps
Referred PID: 0	PCR Overall Jitter: 0	Video Rate: 30.4 Mbps
Transport: 0	PCR Freq Offset: 0	Audio Rate: 3.003 Mbps
CAT: 0	PCR Drift Rate: 0	PAT Rate: 2.9 /s
RTP: 0		
Other: 0		

Status	Name	Program	STB	Rate (Mbps)	Cost	Count	Ref PID	PCR Rep	PCR Dis	PCR ACC	PCR Bad	PCR Lock	PCR Ret Jitter	PCR ACC (ns)	PCR Overall Jitter (ns)	PCR Freq Offset (Hz)	PCR Drift Rate (Hz)	PID Rate	Video Rate (Mbps)	Audio Rate (Mbps)	Data Rate (Mbps)	PMT Rate (ns)	PCR Rate (ns)	Other
Critical	CNN	1	5	6.2	0	0	0	0	0	0	0	0	0	5219330	25499900	-144871.9	0.0	0	5.9	0.208	0.0	16.0	31.0	0



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