Product Catalog 2012

Video Service Providers Video Test and Monitoring Products





Where Cutting Edge Technology Meets Comprehensive Video Quality Monitoring

Digital video service infrastructure continues to evolve to include the best in video, RF, and IP networking technologies. While historically the object of Headend monitoring has been oriented towards Quality of Service measures, there are new concerns. With the growth of HD content, and the need to economize on bandwidth, Quality of Experience from a consumer's perspective is now the main objective of Headend monitoring. More than any other attribute, Video Quality is the key measure of the subscriber's preferred video service provider. Understanding how to measure Video Quality encompasses many network factors including encoder compression trade offs, MPEG timing, IP network transmission, MPEG/IP cross layer correlation, and Picture Quality measures like DMOS. When your video isn't performing like you expect, you need a partner that has a deep understanding of the technology components of Video Quality, and can easily help you see the weak links.

Video Test and Monitoring Product Selection Guide					
	Video Quality Monitors	Automated Content Verification	RF Video Monitors	MPEG Analyzers	MPEG Software Tools
RF Transmission Monitoring - Satellite					
RF Transmission Monitoring - Transmitter					
Headend Ingest Monitoring					
Multi-stream IP Video Monitoring					
Video & Audio (QoE) Diagnostics					
Video & Audio (QoE) Monitoring with Perceptual Video Quality (PVQ)					
Audio Loudness Monitoring					
tru2way / OCAP Monitoring					
EBIF Monitoring					
Ad Insertion Monitoring					
Carousel Monitoring					
Ad Content Encode/Transcode Verifications					
VoD Asset Verification					
Headend Troubleshooting & Diagnostics					
QAM Edge Monitoring					
Encoder/Transcoder Evaluation & Field Test					
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Tektronix Video Quality and Service Assurance products uniquely provide the ability to monitor digital video services from a terrestrial or satellite ingest, through IP transport, to the QAM access network, and across hundreds of channels at a time.

Tektronix' Sentry product line provides the most reliable and comprehensive video quality and content monitoring solutions, helping you ensure delivery of digital services across hundreds of channels with the highest quality for your subscribers. Sentry has proven to be effective in the field by reducing the mean time to detection and recovery of major subscriber impacting events (QoE errors) including video freeze/black, tiling, audio silence and audio level issues. In addition, Sentry also captures issues related to over-compression, such as blockiness with Perceptual Video Quality (PVQ) monitoring (also known as effective-MOS or eMOS). Software for Ad Insertion verification allows ad sales groups to provide higher levels of customer service resulting in greater revenue potential, and allows engineering teams to ensure proper function of insertion technology by identifying and correcting system errors when they occur. EBIF Monitoring of carousel data, eTV events and associated metadata by service and/or location allows you to deliver enhanced capabilities to your subscribers and is a way to monetize advanced digital services in a broad range of digital set top boxes.

The **MTM400A family** provides in-depth Transport Stream monitoring and diagnostics with a range of RF network interfaces including DVB-S2, DVB-T, ATSC 8-VSB and QAM A, B & C. Software additions allow Network Management System integration (VQNet) and Video and Audio Quality Analysis (VQS1000). If your content is file-based, like in today's VOD systems, Tektronix **Cerify Filebased Content Analysis software** ensures that the audio and video quality of VoD/TSTV content meets QoS guidelines prior to distribution across all video servers. Cerify validates the encode / transcode quality of all ad spots at the encode location prior to distribution to ad servers.

Our **MPEG Analysis** tools are the industry standard for MPEG stream analysis and testing. A key part of delivering a quality experience is finding the root cause of problems in the transport stream. Tektronix MPEG Analysis tools allow you to go as deep as you need into the transport and elementary streams to track down sources of picture anomalies or Transport Streams with errored syntax. The ability to capture events for deep analysis is critical to identifying the root cause of problems, and our QoE software analysis tools shorten the time to finding the root cause by identifying impairments and artifacts that can be traced directly to network issues.

Tektronix **Picture Quality Analyzers** provide dependable evaluation and qualification of H.264 video encoders for deployment in digital television services. These measurements provide valuable information to engineers working to optimize video compression and recovery, and to maintain a level of common carrier and distribution transmission service to clients and viewers. Use the PQA600's perceptual-based objective picture quality measurements to demonstrate the differences in picture quality between H.264 encoders during your lab evaluations.

Tektronix Video Test and Monitoring products test the largest range of measures of Video Quality in a digital video service infrastructure. Contact your local Account Manager to find out how Tektronix can help you to evaluate, install and operate your digital video network.

Ensure the quality of the viewing experience for your subscribers, increase uptime and reduce operational expenditures.

Tektronix Video Quality Monitoring solutions are more intelligent, robust and comprehensive than traditional monitoring solutions. An industry-best number of critical issues are detected (most often before subscribers experience them),

detailed reports are generated for historical/trending analysis and our products offer scalability and an easy-to-use web interface.

Sentry QoS/QoE Video Quality Monitoring Selection Guide				
	Sentry (ASI & GigE)	Sentry Verify	Sentry Assure	Sentry Edge
Comprehensive MPEG Quality of Service (QoS) Monitoring				
Transport Stream QoS Monitoring				
IP statistics				
Closed captioning (708, 608, SCTE-20), DVB Subtitle, Teletext reporting				
Error Seconds and Program Availability Reporting				
GOP length reporting				
Video and Audio PID metadata				
Program/PID discontinuity				
Program/PID/Transport Stream/Program Group bandwidth graphing				
PCR interval & jitter	ASI Only			
MPEG-PSI, DVB-SI, ATSC-PSIP table detect, bit rate, cycle time				
TR 101 290 (priority 1, 2, 3) reporting				
Scalable RF Monitoring (64/256QAM / 8VSB)				
Comprehensive MPEG Quality of Experience (QoE) Monitoring				
Video QoE real time monitoring				Option
Video eMOS/PVQ real time monitoring	Option			Option
Audio QoE real-time monitoring				Option
Audio loudness & AC-3 Dialnorm (ITU-R BS.1770) monitoring			•	
Video freeze detection				Option
Audio silence detection				Option
Software Options				
QoE Monitoring				Option
Carousel monitoring (tru2way / OCAP/MHP / DSM-CC)	Option	Option	Option	Option
Ad Insertion/Digital Program Insertion	Option	Option		Option
EBIF Monitoring	Option	Option	Option	Option
SA-BFS Monitoring	Option	Option	Option	Option
Perceptual Video Quality (eMOS) on MPEG-2 & H.264	Option			Option
Audio Loudness Monitoring (includes CALM Compliance)			•	Option
Video & Audio				
Video: HD, SD, MPEG-2, MPEG-4 AVC (H.264), VC1				
Audio: Dolby AC-3, MPEG-1 Layer II, AAC, HE-AAC, and HE-AAC v2				
Interfaces				
ASI				
GigE				
8VSB & QAM-B				
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Legend	
	Included as standard
	Not available

Video Quality & Service Assurance: Video Quality Monitors

2012 Product Catalog





Sentry

Sentry is a comprehensive and scalable video quality monitoring solution that enables multichannel service providers to deliver services with optimum quality and to reduce operational expenditures.

Sentry automatically & continuously evaluates all video programs in real time, and provides alerts on hundreds of SD/HD programs simultaneously. Sentry identifies anomalies in the network at the IP and MPEG layers, as well as in quality of experience (QoE), identifying issues including frozen video, tiling/ macro-blocking, black screen and audio disruptions or audio level issues, which represent the bulk of trouble calls from subscribers. Sentry's multi- threshold-based alerting capability enables a flexible alert configuration from subscribers. In addition, Sentry includes a video artifact detection capability. This makes Sentry the only solution that detects video and audio errors in MPEG-2 and H.264 digital programs while generating metrics that correlate to Mean Opinion Scores (MOS). Sentry uses this approach for alerting, because it is effective in detecting problems in their developing stages before a subscribers experience is impacted. This capability, combined with detailed root-cause troubleshooting information appended in the actual alert, allows engineers to resolve problems quickly and often before subscribers experience any quality deterioration or outage.

Applications

- Audio and Video Quality of Experience Scoring System
- IP Network Impairment Analysis
- Alert Filtering and Resolution Tracking
- Carousel Monitoring (SA-BFS, DSM-CC, tru2way)
- Digital Program Insertion Monitoring
- EBIF Monitoring
- Program Statistics and Availability Reporting

Features and Benefits

- Audio and Video Quality of Experience Scoring (1 to 100) with reason codes for quality degradations. Scores QoE independently from transmission errors to avoid missing events or false alarming
- Audio Silence and Audio Level Issue Detection (supports ITU-R BS.1770)
- Detect Black Video, Frozen Video, Tiling / Macro-blocking
- Detect artefacts due to over compression with Perceptual Video Quality (eMOS) monitoring on MPEG-2 and H.264 Elementary Streams
- HD/SD programs, SPTS or MPTS, multicast (IGMP v3) & unicast
- MPEG-PSI, DVB-SI, ATSC-PSIP table support
- GOP length reporting (avg, min, max)
- Error Second and Program Availability Reporting
- Live Thumbnails
- Triggered Alert Stream Capture
- 60-day historical graphing with real time alerting capability
- Transport Stream Bandwidth Graphing
- Program Group Bandwidth Graphing
- IP Network Impairment Analysis
- Alert Filtering and Resolution Tracking
- Carousel Monitoring (SABFS, DSM-CC, tru2way[™])
- Digital Program Insertion SCTE-35 (local ads)
- Software Add-Ons for Ad Insertion (DPI), tru2way[™], EBIF Monitoring, SA-BFS Monitoring, Carousels (MHP / DSM-CC)
- TR 101 290 (priority 1,2,3) reporting
- Compliant with RTP network protocols

Specifications

- Video: MPEG-2, MPEG-4 AVC (H.264), VC-1
- Audio: Dolby AC-3 (5.1 Surround), MPEG audio, AAC, HE-AAC, HE-AAC v2
- Carousels: tru2way[™] (OCAP), SA-BFS, MHP / DSM-CC
- Interfaces: GigE (1000BASE-T Ethernet) and ASI
- Browser support: Firefox, Safari, and IE

For further details visit: www.tektronix.com/sentry

Video Quality & Service Assurance: Video Quality Monitors

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Sentry Verify

Sentry Verify[™] enables video service providers to accurately determine the health of the MPEG/IP transport network. Sentry Verify provides alerts and generates useful reports in the same fashion as our flagship product, Sentry Verify detects subscriber impacting events during MPEG-over-IP transport and offers a historical database to assist with troubleshooting and trending analyses. Sentry Verify also offers a multiple alert trigger capture capability to quickly identify and visualize issues as they arise.

Sentry Verify is specially designed for operational staff and is a cost-effective solution for largescale deployments to hub sites and other remote locations. It provides necessary, accurate and timely information to assist in the identification of faults within the IP network and has been integrated with industry leading management solutions to accelerate troubleshooting and root cause analysis.

Sentry Verify is part of the S2E (Source-to-Edge) monitoring solution, which provides the most comprehensive, 24/7 real-time monitoring system with a 60-day historical database, executive reports and trending analysis capabilities. It can be easily integrated with Medius to provide a seamless monitoring package.



Applications

 Monitor and validate MPEG transport stream quality at hub sites

Features and Benefits

- QoS Monitoring
- HD/SD programs, SPTS or MPTS, multicast (IGMP v3) & unicast
- MPEG-PSI, DVB-SI, ATSC-PSIP table support
- Historical Reporting and Graphing
- Live Thumbnails
- Triggered Alert Stream Capture
- Real-time Detection and Alerting
- Transport Stream Bandwidth Graphing
- Program Group Bandwidth Graphing
- IP Video Network Impairment Analysis
- Alert Filtering and Resolution Tracking
- Software Add-Ons for Ad Insertion (DPI)

Specifications

- Video: MPEG-2, MPEG-4 AVC (H.264), VC-1
- Audio: Dolby AC-3 (5.1 Surround), MPEG audio, AAC, HE-AAC, HE-AAC v2
- Interfaces: GigE (1000BASE-T Ethernet)
- Browser support: Firefox, Safari, and IE

For further details visit: www.tektronix.com/sentryverify

Sentry Assure

Sentry Assure offers Sentry Verify functionality with Digital Program Insertion (DPI) monitoring and Audio Loudness Monitoring (ALM) options included in the base product.

Sentry Assure is cost effective and future proofed for large-scale post-splice monitoring deployments. To better support CALM Act (US) and CRTC (Canada) audio loudness regulations, Sentry Assure offers reports that present a synchronized display of the audio loudness graph and the ad cue/splice display, providing quick insight into the changes of audio loudness during transitions into and out of commercial segments.

Applications

- Post-splice Monitoring
- QoS Monitoring
- Audio Loudness Monitoring
- Digital Program Insertion Monitoring
- EBIF Monitoring
- CALM Compliance Monitoring
- Regulatory Compliance Monitoring

Features and Benefits

- Digital Program Insertion Validation
- CALM Compliance Monitoring
- Regulatory Compliance Monitoring
- Detect MPEG and IP Issues
- Historical Reporting and Graphing
- Error Seconds and Program Availability Reporting
- Program Group Bandwidth Graphing
- Live Thumbnails
- Triggered Alert Stream Capture
- Real-time Detection and Alerting

For further details visit:

www.tek.com/datasheet/digital-content-monitors-9

Video Quality & Service Assurance: Video Quality Monitors

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Sentry Edge

Sentry Edge provides critical monitoring at the edge of your network, providing specific reporting and alerting capabilities for services in the RF domain. Sentry Edge detects transport stream and RF modulation errors. Transport stream errors are typically related to the bandwidth/bit rate, embedded data, applications or video and audio. The RF modulation errors include those related to the Signalto-Noise Ratio (SNR) and signal strength.

Applications

- Scalable RF Monitoring (64/256QAM (Annex B) / 8VSB)
- Historical Reporting and Graphing
- Designed for Large Deployments
- Intelligent Tuning including RF parking
- Alert Filtering and Resolution Tracking
- Integration with Sentry, Sentry Verify, and Medius Units provides Comprehensive View of Network Health
- Dual Tuner Configuration to Monitor All RF Channels Efficiently

Features and Benefits

- Monitor Linear Broadcast Programs
- Be Alerted to RF and TS Errors
- Generate Historical and Trending Reports

For further details visit: www.tektronix.com/sentryedge



Medius

Medius is ideal for Network Operation Centers (NOCs) and provides a single interface for consolidated status, alerts and reports from multiple Sentry and/or Sentry Verify, Sentry Assure and Sentry Edge units across the network. Medius is designed to be flexible, so operators won't experience any limitations as their network evolves and grows. For example, Medius program grouping allows operators to group programs (e.g., logically by content provider or physically by location) from any or all connected units for alerting, problem isolation and trending analysis. The alert configuration on Medius allows you to apply alerts to multiple programs and get an aggregated status to rapidly drill down to specific problem areas.

Medius offers an advanced reporting package that is particularly helpful in capturing detailed QoE information that quickly highlights the top offending programs and/or locations. The reporting capabilities allow each user to generate customized reports that provide as much or as little detail as required, from monthly high level reports for executive staff to immediate notices for technicians as incidents occur.

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CALA Westside -				
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PAPPiladelpha -	73.000	58,500 Legend	75,000	100.000

Applications

 Consolidation of status, alerts and reports from multiple Sentry and/or Sentry Verify, and Sentry Edge units across the network.

Features and Benefits

- QoE Reporting
- Customizable Dashboard Display
- Centralized Alarm Reporting
- Historical Reporting and Graphing
- Alert Filtering and Resolution Tracking
- User-defined Reporting Template
- Ability to Upgrade Multiple Sentry Units
- Automated Report Generation and Email
- GigE (1000BASE-T Ethernet) interface

For further details visit: www.tektronix.com/medius



Consul

Consul[™] aggregates reports and trending data from multiple Medius units and offers video service providers an effective way of utilizing monitoring data in large-scale monitoring deployments. Consul can be used by service providers to gain a quick understanding of the quality of experience they are providing on a local, regional or national level. Key features of Consul include its ability to provide an understanding of the video quality degradation from location to location and identifying the top offending programs at each location.

Capturing detailed QoE (Quality of Experience) information is a function of Consul's advanced reporting package. The reporting capabilities allow each user (i.e., a national NOC/operation center) to generate customized reports that provide as much or as focused detail as required, from monthly high level reports for executive staff to immediate notices for technicians as incidents occur.

Users can create a schedule template so that reports can be generated automatically and emailed to designated recipients. Examples of the reports include alert counts by location, trending reports and distributions by alert type.

Applications

 Network Operation Center (NOC) based correlation and data management from Medius units located throughout the network.

Features and Benefits

- Supports multiple Medius Units
- Generates Alert analysis reports with roll-up data collected from multiple Medius
- Automatic report generation and email in PDF file format per user defined schedule
 GigE (1000BASE-T Ethernet) interface

For further details visit: www.tektronix.com/consul



Sentry Support Services

World-Class Support When You Need It

Tektronix best practices, specialized competencies and industry-leading expertise ensure your success. Tektronix system architecture and integration teams help design and deploy your monitoring solution, train your staff, and reduce your exposure to failure risks. We are experts at integrating systems that incorporate multiple technologies and our goal is simple: deliver world-class monitoring without extending your resources.

Support Contract

A support contract from Tektronix provides you with all of the tools you need to make sure your monitoring deployment becomes more of a success for your organization over time. Support is provided to upgrade the core software with new features in intermediate releases. Tektronix field technicians are experts in all of the disciplines required to configure, test and operate our monitoring solutions in realworld settings. Our support team is thoroughly trained in the real-world performance characteristics of Tektronix equipment, as well as those of many other vendors, and offers extensive experience in digital networks.



Simply put, the level of support provided in a Tektronix support contract is unmatched by any other company.

Our standard agreement includes the following:

- Hardware warranty
- Software warranty
- Intermediate releases and enhancements
- Pre-deployment engineering support
- Installation
- Configuration of system
- On-site training
- Phone support
- Email support
- On-site support

Professional Services

Tektronix field technicians and engineering teams are experts in MPEG infrastructure, monitoring, NOC procedures and troubleshooting. Take advantage of our expertise when you are planning your next short-term or long-term project. Tektronix offers professional services for items such as, but not limited to, monitoring assessments, issue/problem resolution, tru2way[™] or EBIF deployment and bandwidth management.

For further details visit: www.tek.com/digital-content-monitor

Video Quality & Service Assurance: File Based Content Analysis

2012 Product Catalog



Cerify Content Validation System

Cerify automatically verifies Content Interchange the quality of file-based, compressed digital audio & video content, metadata, & ancillary data. Cerify can help you deal with your content explosion by checking content at the input of your workflow, and ensure that the quality and integrity of the content being sent to your transmission system meets your quality standards. Cerify fully tests all aspects of the video and audio elements to make certain it meets quality and compliance for video and audio standards, and can automatically verify and validate that the file content is ready and adheres to userdefined format templates. Cerify's video quality measurement fidelity means that you can maintain the QoE for your viewers that you have set as your organization's standard. Automated, repeatable, objective testing of your content library ensures that you can efficiently process all your content in a 24X7 operation with minimal human intervention and without any of the subjectivity of human QC.

Cerify supports the widest range of Video Server vendors, reducing your system integration complexity. Cerify is a software solution that is based on Tektronix industry leading video compression testing technologies. Interfacing to 3rd party automation or asset management systems, Cerify provides automated, 24x7, unattended content verification that is seamlessly integrated into your workflow.

Applications

- Checking that post production content has been correctly encoded and is compliant with the broadcaster's content quality agreement. Checking audio and video after encoding, at ingest, after editing, and before playout for terrestrial, satellite, cable, internet/Content-on-Demand and VoD. Checking integrity before and after archiving.
- Ensuring that the audio and video quality of VoD/ TSTV content meets QoS guidelines prior to distribution across all video servers
- Validate the encode/transcode quality of all ad spots at the encode location prior to distribution to ad servers



Features and Benefits

- Runs automatically 24/7 to perform consistent and thorough checks of incoming video files against user defined content templates
- All aspects are checked, including encoding, compliance/correctness to video and audio standards, video formats, resolutions, bitrates, adherence to transmission system limits, and also video and audio quality (including the presence of faults such as black frames, blockiness, audio silence/incorrect levels, audio loudness and true peak levels)
- Simultaneous testing of multiple files ensures the workflow does not get backed up because of QC operations
- Logs errors, informs automation systems, plus programmable actions such as email user alert, and file quarantine
- Web-browser user interface and control provides the flexibility of command and control from anywhere and the ability to allow required personnel/partner access to check compliance from anywhere
- CeriTalk API for integration with management systems allows workflow integration
- Multi-track audio testing reduces the amount of time it would take to process assets with multiple audio tracks by efficiently processing all audio tracks with a single pass QC
- Flexible audio loudness test duration allows different groups of channels to be tested against different loudness thresholds
- Ensures presence and compliance of Ancillary Data: Closed captions, Teletext, DVB Subtitles, & Timecode
- Ensures regulatory and legal compliance to Photosensitive Epilepsy (PSE) standards by detecting flash/pop sequence in video that might trigger epileptic seizures
- Workflow efficiency technologies built in ensure that time-sensitive materials are QC'ed in parallel to other operations such as ingest thus removing serialized operations and reducing overall workflow time

Video Formats:

All frame format sizes, bit rates and resolutions for SD/HD and mixed workflows (including QCIF, CIF, D1, 720p, 1080i, 1080p)

Resolutions:

QCIF, CIF, SD, D1, 720p, 1080i/50, 1080i/60, 1080p (and non-standard sizes from 16X16 to HD+)

Wrappers:

MPEG-2 Transport Stream, MPEG-2 Program Stream, MPEG-4 Parts 1, 14 & 15, 3GPP, MOV, ASF, GXF, MXF, QuickTime and AVI

Video:

MPEG-2, IMX 30/50, D10, XDCAM, MPEG-4 AVC (H.264), AVC-Intra (All profiles), VC-1/WMV9, MPEG-4 Part 2, H.263, DV/DVCPro25, DV/DVCPro50, DVCPro100/HD, Apple ProRes, JPEG-2000⁻¹, DNxHD⁻¹, raw YUV and RGB

Audio:

MPEG-1, MPEG-2, MPEG-2 AAC, AAC-Plus (MPEG-4 AAC) , HE–AAC, PCM, WMA, Dolby E, AC3

With Tektronix' Cerify, you can be assured that your content conforms to your standards for quality, and know that your content is correct before it is distributed to your customers, broadcasted to your viewers, or streamed to your subscribers.

For further details visit: www.tektronix.com/cerify

^{*1} There are no syntax checks for these codecs



MTM400A Transport Stream Monitor

The MTM400A Transport Stream Monitor is a scalable solution that detects Digital TV system degradation, and enables operators to easily perform diagnostics and rapidly pinpoint problems, ensuring an error-free network and minimal downtime.

FlexVuPlus[™] is a browser enabled, user definable interface that is powerful, personal and enables improved productivity. Up to four panels can be displayed in the UI window and can be sized and repositioned based on operational needs. FlexVuPlus provides a user definable "button strip," "historical views," and "short-cuts" that intuitively guide a user to key areas of interest to accelerate video delivery fault root cause analysis. Thumbnail displays with performance indicators show overall program status in addition to video PID status.

Applications

- Terrestrial distribution
- Contribution and primary distribution
- Cable headend monitoring
- DTH or network operator satellite uplink monitoring
- Combine with the Opt. TSCL (DVB/ATSC/ARIB TS Compliance Analyzer Software) for off-line analysis of recorded TS files to 192 Mb

RF Monitoring Features and Benefits

- Monitor key measurements according to DVB standard with real-time monitoring of key TR 101 290 parameters
- Embedded real time operating system provides a high-reliability system for unattended 24x7 operation
- User-defined template monitoring option to ensure right content at the right place at the right time
- Confidence monitoring at the RF layer with optional QPSK, COFDM, Turbo 8PSK, and DVB-S2 interfaces
- RF diagnostic mode enables measurements on signals where lock cannot be achieved
- Critical RF Measurements, MER, and EVM provide early indication of signal degradation before any picture impairment is visible to the end customer, without additional costly RF test equipment

RF Video Selection Guide				
	MTM400A	RFM300	RFM220	QAM400A
Measurements		,		
Advanced RF measurements				
MPEG Transport Stream Analysis				•
Video/Audio content checking for MPEG-2 and H.264/AVC				•
PSIP and EPG Analysis				•
Dual-level alarming and seven day trending				
TR-101-290 tests and results				•
ATSC A/78 Monitoring modes				•
ISDB-Tb 204 Byte TS analysis				•
Interfaces				
DVB-S/S2	Option S2			
Turbo 8PSK/QPSK Interface	Option EP			
8VSB				
QAM A				Option QA
QAM B				Option QB2
QAM C				Option QC
ISDB-Tb				
DVB-T	Option CF			
ASI Input				
ASI Output				
Options				
Diagnostics*1	Option DIAG	Option DIAG		Option DIAG
Complementary Products				
DVB/ATSC/ARIB TS Compliance Analyzer Software (TS file size limited to 192 MB)	MTS4SA Opt. TSCL	MTS4SA Opt. TSCL		MTS4SA Opt. TSCL
QoE Analysis (using optional VQS1000)				
VQNet Network Element Manager				
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_egend	
	Included as standard
	Not available

- *1 Deep-dive MPEG diagnostic analysis. Includes: Triggered recording capability up to 160 MB, Template testing (for user-defined service plan testing), In-depth PCR analysis with graphical result views, Bit rate testing functionality, Service logging, RF polling functionality
- Video and Audio backhaul for content checking and verification allows viewing transmitted content in the native, uncompressed format
- Use the QoE Dashboard to detect Video impairments and artifacts like Stuck Frame, Black Frame, Blockiness, as well as Visible Compression Artifacts.

By monitoring the quality of the broadcast video at any network access point, broadcasters and network operators can improve network performance and deliver superior quality of service to customers.

For further details visit: www.tek.com/datasheet/digital-tv-monitor-0

Video Quality & Service Assurance: RF Video Monitors 2012 Product Catalog



RFM220 ISDB-T/Tb Measurement Demodulator

The RFM220 RF Channel Analyzer is ideally suited for ISBD-Tb broadcasters who manage Digital TV services and need tools to remotely monitor broadcast network QoS with capabilities to remotely diagnose network issues. With both RF and ASI inputs, the RFM220 can monitor a transmitter before and after modulation.

Applications

- RF performance monitoring of local and remote ISDB-Tb transmitter sites
- Off-air monitoring at local and national operation centers and headends

Features and Benefits

- Comprehensive ISDB-Tb RF measurement and monitoring capabilities including overall and separate MER per layer (one for HDTV, one for the 1-seg),
- TMCC information monitoring, and Channel Impulse Response display with SFN window measurements
- Constellation and Spectrum displays with shoulder measurements help to identify degradations in transmitter performance and efficiency before viewers are impacted
- High-performance tuner/demodulator with MER measurement performance to 36 dB typ. offers the flexibility needed for use in both transmitter monitoring and off-air ISDB-Tb broadcast applications
- Remote access to monitoring functionality with user-configurable alarm reporting, event logs, and 7-day trending enables remote notification and reporting to engineers and operators of transmission system problems
- Transport Stream output enables connection to MPEG TS monitoring products, offering a flexible and affordable monitoring solution to quickly identify and isolate problems in either the Transport Stream or the RF signal
- Transport Stream output enables connection to the VQS1000 Video Quality software, enabling real time analysis of the program QoE

For further details visit: www.tek.com/datasheet/rfm220-isdb-tbmeasurement-demodulator-0



RFM300 ATSC DTV Monitor

The RFM300 provides a complete solution for realtime DTV monitoring. The comprehensive RF and PSIP confidence-monitoring capability provides a powerful and cost-effective solution for monitoring DTV transmitter sites along with contribution and distribution feeds at local and national operation centers for FCC compliance.

Applications

 Monitoring DTV transmitter sites along with off-air monitoring, as well as contribution and distribution monitoring at local and national operation centers and head-ends

Features and Benefits

- Comprehensive confidence monitoring at the 8VSB modulated layer. This includes monitoring of the symbol distribution waterfall chart and MER, BER and SNR measurements for continuous monitoring of signal quality.
- PSIP analysis and repetition-rate graphing allows broadcasters to determine whether the system information is present and correct in the transport stream, ensuring FCC compliance
- Detect errors that impact viewer's video quality according to ATSC A/78, including Closed Captioning (CC) and Regional Ratings Table (RRT)
- Multilayer, multi-channel, remote monitoring and measurements at the RF, and MPEG transport stream layers, to ATSC A/65 standards
- Service logging supports verification of servicelevel agreements to ensure that all contractual obligations are met



- Unique dual-level alarming and seven-day trend information proactively identifies impending problems before they become visible to the viewer without additional costly RF test equipment
- Video and Audio backhaul for content checking and verification allows a broadcaster to view transmitted content in the native, uncompressed format
- Use the QoE Dashboard to detect Video impairments and artifacts like Stuck Frame, Black Frame, Blockiness, as well as Visible Compression Artifacts.
- Unique learning capability creates a true "monitor by exception" mode of operation. This reduces operational expenditure by eliminating noncustomer-impacting alarms to focus resources only on critical activities.
- FlexVuPlus[™] uniquely empowers operations staff with the simplest information necessary to prove their service is delivering above their defined thresholds for FCC compliance

For further details visit: www.tektronix.com/rfm300



QAM400A QAM Video Monitor

The QAM400A QAM Digital TV Monitor is a scalable solution that detects system degradation, and enables operators to easily perform diagnostics and rapidly pinpoint problems, ensuring an error-free network and minimal downtime. FlexVuPlus[™] is a browser enabled, user definable interface that is powerful, personal and enables improved productivity. Up to four panels can be displayed in the UI window and can be sized and repositioned based on operational needs. FlexVuPlus provides a user definable button strip, historical views, and short-cuts that intuitively guide a user to key areas of interest to accelerate video delivery fault root cause analysis.

Applications

 Monitoring digital video services at the output of the QAM modulator

Features and Benefits

- Verify RF and TS integrity on a QAM channel with the ability to tune to any QAM channel for verification and diagnostics
- Ideal for monitoring the output of headend SEM or EdgeQAM devices at the RF combiner, with support for both MPEG-2 and H.264 at either constant bit rate (CBR) or variable bit rate (VBR)
- In-depth, real-time MPEG analysis option allows diagnostics to be performed on live payload without always having to use labor-intensive deferred-time analysis of captured streams
- Filter and display only errors that require immediate attention from the SCTE-142 five distinct levels of importance.
- No additional analysis software is required all confidence and diagnostic analysis can be carried out with the QAM400A

For further details visit: www.tektronix.com/qam400a



VQNet Service Assurance Manager

The VQNet video service assurance manager is an Element Management System for Tektronix RF and IP Video probes to alert, locate and diagnose video network problems. It provides alarms, logs, trending and reporting of key performance metrics from a system of distributed probes. It identifies services impacted and enables engineers to drill down for rapid root-cause analysis of video service delivery issues.

Applications

- Network-wide diagnostics for video/network operations centers and head-end operations teams responsible for video delivery through their networks
- Cable, Telco, Terrestrial and Satellite video delivery networks required to maintain quality of service and ensure signal integrity, reducing subscriber dissatisfaction and protect subscriber and advertiser revenues

Features and Benefits

- Identify and resolve real-time video network errors with facility and network-wide views, and view thumbnails or backhaul video content from any probe within the network
- Identify the location and root cause of underlying systemic service delivery problems across a head-end network with statistical logging, report generation and trending analysis
- Provides an integrated network view of multiple network elements into Network Management Systems and to existing DataMiner Network Management Systems (including encoders, multiplexers, routers, STB's etc) enables
- Install, configure and maintain your own monitoring system with automatic discovery of probe availability, configuration and diagnostic capabilities

For further details visit: www.tektronix.com/vqnet

2012 Product Catalog

RF, IP & MPEG Diagnostics & Troubleshooting

Tektronix MPEG Analyzers are the industry standard for MPEG stream analysis and interoperability testing. A key part of delivering a quality experience is finding the root cause of problems in the transport stream. Tektronix MPEG Analyzers allow you to go as deep as you need into the transport, PES and elementary streams to track down sources of picture anomalies or Transport Streams with errored syntax. The ability to capture events for deep analysis is critical to identifying the root cause of problems, and our QoE software analysis tools shorten the time to finding the root cause by identifying impairments and artifacts that can be traced directly to network issues.

MPEG Analyzer Selection Guide					
Capability	MTS4000	IPM400A	MTS4SA		
TS Player and Recorder			Option		
Real Time TS Analyzer with Triggering Recording			Option		
Real Time Video over IP			Option		
Real Time Video over NIC: Generation			Option		
Deferred Time Analyzer			Option		
Transport Stream Editing including Multiplexer, TS Editor, DVB Carousel Generator, and Tclips Test Streams	Option		Option		
Electrical Interface Output: ASI	Option (up to 4)				
Electrical Interface Input: ASI Monitor	2	1			
Electrical Interface Input/Output: 1000BaseT NIC RJ-45					
IP Interfaces Input: IPTV GigE interface	Option				
IP Interfaces Input/Output: IPTV 10GigE	Option				
RF Interfaces Input: 8VSB or QAM-B	Option				
RF Interface Input: DVB-S/S2 Interface supporting QPSK, 8PSK, 16APSK and 32APSK Demodulation	Option				
PES & T-STD Buffer Analyzer	Option		Option		
DVB Carousel Analyzer			Option		
DVB Carousel Generator	Option		Option		
MTS4EAB ES Analyzer	Option		Option		
MTS4CC ES Analyzer	Option		Option		
MPEG-2 ES Analyzer (includes AC-3 and 608/708 Closed Captioning and DVB Subtitles)	Option		Option		
Picture Quality Analysis Software, Single and Double Ended. Includes PQASW with IP option	Option				
Video and Audio QoE software, Single Ended. Includes VQS1000 with all options	Option	Option			
See Page	13	13	14		

Legend	
	Included as standard
	Not available

MPEG Video: MPEG Analyzers

2012 Product Catalog



MTS4000 MPEG Test System

Targeting a range of design, validation and test, field diagnostics and troubleshooting applications, the MTS4000 MPEG Test System offers unparalleled analysis to examine the video and audio quality of IP and RF Video services. Cross layer and cross domain analysis of the video and audio quality is possible through an extensive software suite that includes real-time video and audio QoE analysis, human vision model based picture quality analysis, and advanced Elementary Stream Analysis. Network interface options include 1G IP, 10G IP, ATSC 8-VSB, DVB-C, DVB-S2, and a Quad port ASI interface.

Applications

- Complex Timing Problems in Video over IP and IPTV Network equipment
- Flexible Test Stream Creation and Modification
- Confirm Functionality and Compliance to Standards
- Set-top Box Buffer Testing and Verification
- Codec Design and Optimization
- Device Design Optimization and Fault Diagnosis
- System Troubleshooting at any Point in the Network
- Isolation of Intermittent Network Problems that other Analyzers would not be Capable of Isolating
- Distinguish between Impairments Resulting from Network Distribution versus Artifacts Resulting from Compression
- Evaluating Different Vendors' Compression Equipment and Diagnosing Faults

Features and Benefits

- Industry's Fastest Analysis Engine enables Reduced Time to Insight, Rapid Development, Evaluation, Deployment, and Diagnostics of Next-generation DTV and IPTV Systems and Services
- A Wide Range of DTV Standards are Supported, including MPEG, DVB, ATSC, ISDB, and ISDB-TB (Brazil). Specific SI for Terrestrial, Cable, and Satellite, plus Regional Variations of these Standards are also Supported
- Range of Interfaces and Analysis Capabilities provide the Necessary Connectivity to Diagnose Problems Anywhere in the Network
- Environment, whether that be Transmission Links (RF or IP Layer) or Content Processing (TS Layer)
- Connect to both IP Version 4 and 6 Networks, including those using IGMP and MLD Multicast Protocols Respectively
- Analyze both Constant and Variable Bit Rate Streams (CBR and VBR)
- Integrated Cross-layer Fault Analysis and Logging provides One-box Solution for Fault Diagnosis, Reducing Time to Insight when Troubleshooting
- Playout Functionality provides Stimulus with Parametric Capabilities and IP Multisession Replication to Characterize Behavior of Network or Device Under Test
- CaptureVu[™] Technology Captures and Analyzes System Events in Real Time and Deferred Time to Debug the Intermittent and Complex Problems that Traditional Analyzers Miss
- H.264 Buffer Analysis, Multiplexing, and ES Compliance Checking provide the Most Powerful Suite of Tools for Creation and Analysis of Transport Streams containing H.264 Content
- Video and Audio Quality Analysis that Helps Distinguish between Impairments Resulting from Network Distribution versus Artifacts Resulting from Compression

For further details visit: www.tek.com/datasheet/mpeg-test-systems-0



IPM400A IP Video Remote Analyzer

The IPM400A helps video network operators efficiently deliver superior quality of service (QoS) levels by providing an intuitive and simplified representation of video quality and diagnostic information. Simultaneously verify IP and TS integrity on all IP Video sessions on a GigE link, for monitoring networks which carry either single program, or multi-program transport streams.

Applications

- Diagnostic monitoring of IP Video contribution and primary distribution (head-end monitoring, Terrestrial distribution and DTH or network operator satellite uplink monitoring)
- IPTV ingest and head-end monitoring

Features and Benefits

- Ensure IP and TS integrity for all services on a GigE link by monitoring up to 500 IP sessions including all essential parameters, such as continuity count, sync byte, and packet interarrival time (PIT).
- Analyze program utilization over time to determine if overwhelmed routers are dropping packets
- In-depth analysis of transport stream, syntax, timing and content to support root-cause analysis of system errors with comprehensive TR 101 290 Priority 1, 2 & 3 MPEG measurements
- Filter and display only errors that require immediate attention from the SCTE-142 five distinct levels of importance
- Analyze and diagnose "splice" advertising and other local content from SCTE 35 DPI monitoring
- Feed back actual content to a central monitoring point to see and hear the actual content being broadcast with the Video/Audio backhaul
- Use the QoE Dashboard to detect Video impairments and artifacts like Stuck Frame, Black Frame, Blockiness, as well as Visible Compression Artifacts.
- Provide early visibility of problems to predetermined, key individuals, supporting quicker corrective action with the simultaneous connection of multiple remote users and network management systems (NMS)

For further details visit: www.tektronix.com/ipm400a

MPEG Video: MPEG Software Tools

2012 Product Catalog





MTS4SA PC based MPEG Analysis

The MTS4SA can be purchased as a bundle or as individual software tools to run on stand alone PCs running Microsoft Windows. This provides a flexible and cost-effective way to purchase only those tools required for the job. These tools operate on filebased streams. A real-time version of the Transport Stream analyzer (TSCA) is also available for analyzing streams received through the PC's Ethernet (IP) interface.

Applications

Equipment Manufacturers - Research & Development

- Multiplexer/Re-Multiplexer allows test stream creation and modification for transmissions not yet on-air. Create custom streams for Set Top Box and Multiplexer testing offline.
- In-depth analysis of selected elements of transport streams to confirm functionality and compliance to standards
- Set Top Box buffer testing and verification
- Codec optimization

Service Providers

- Encoder and other equipment fault diagnosis and evaluation
- Analysis of transport streams to confirm correct system operation and isolate faults during installation and commissioning

MPEG Software Selection Guide						
Capability	MTS4SA	MTS4EAB	VQS1000	PQASW		
TS Analysis						
Formats: MPEG-2 & H.264						
Quality assessment method		Single or Double stimulus	Single stimulus	Double stimulus		
Video syntax testing						
Audio syntax testing						
Audio level/loudness testing			Option			
Real Time Video Analysis (IP input)						
Deferred Time Analysis						
Video artifact testing						
Triggered stream capture						
Video Bandwidth testing						
IP Generation/Capture						
PSNR measurements						
PQR and DMOS measurements						
See Page	14	15	16	16		
Legend						

Summary of MTS4SA Options

Transport Stream Compliance Analyzer (TSCA) The TSCA enables monitoring and interpretation of the contents of real-time or previously recorded or synthesized transport streams using the latest ATSC, DVB, ISDB-S, ISDB-T, ISDB-Tb and MPEG standards. The analyzer is optimized to quickly locate and identify problems within a transport stream with minimum intervention. The TSCR is a real-time version of the TSCA analyzer operating on Transport Streams received through the PC's Ethernet port. The real-time analysis also includes Cross Layer time-correlated IP and TS measurements, alarms and error logging together with stream recording. A batch mode operation allows for inclusion in an automated test system.

Included as standard Not available

Multiplexer

Use the Multiplexer/Re-multiplexer/De-multiplexer application to create and modify multi-program Transport Streams with custom SI/PSI/PSIP information for DVB, ATSC, ISDB, and MPEG compliant Transport Streams. Video and audio Elementary Streams may also be multiplexed into a Transport Stream.

T-STD Buffer Analyzer

Determines adherence to the buffer model used by the receiver which is signaled within the Elementary Stream itself. The T-STD method is based upon the DTS values within the PES header and can be used for any contained CODEC type. Additionally, certain video CODECs such as MPEG-2 and H.264/AVC may signal buffer parameters within the ES. The Buffer Analyzer verifies conformance of a stream to the T-STD model. (Refer to the MTS4EA for verification of the H.264/AVC HRD method).

Packetized Elementary Stream (PES) Analyzer

The PES Analyzer analyzes the header associated with each PES packet, as it contains the decode and presentation timestamps (DTS and PTS) for the contained Elementary Stream. Additionally it can verify conformance of the PES header contents to the MPEG, DVB and ATSC standards.

MPEG-2 Elementary Stream (ES) Analyzer

Analyzes and views the moving picture from within a PES stream and carry out a whole range of sophisticated tests on the lower layers of an elementary stream within a Transport Stream. In addition, it both analyses and displays a range of extended media formats, including ATSC Closed Captions, DVB Subtitles and Teletext associated with video Elementary Streams.

Carousel Analyzer

Analyses carousels compliant with MPEG-2 DSM-CC, DVB (including MHP), DTT (MHEG-5) or ARIB standards.

Carousel Generator

Creates object carousel contents within an output Transport Stream conforming to the MPEG-2, DVB, DTT (MHEG-5) or MHP standards.

For further details visit:

www.tek.com/datasheet/mpeg-test-systems-1



MTS4EAB Compressed Video Elementary Stream Analyzer

MTS4EAB Elementary Stream Analyzer is a powerful PC-based software package for the deferred time analysis of encoded audio and video elementary streams. Supported video standards include H.264/ AVC, VC-1, MPEG-2, MPEG-4 part 2 and H.263. Supported audio standards include MPEG-2 audio, AAC and AC-3.

Applications

Video Content Delivery

 CODEC and equipment evaluation and comparison in cable, satellite, terrestrial, and Video over IP applications

Features and Benefits

- Next Generation (VC-1, H.264/AVC, MPEG-4 & 3GPP) and Legacy (MPEG-2, H.261, H.263) CODEC support
- Frame-by-Frame and Block-by- Block analysis to allow easy CODEC comparison
- Easy-to-Interpret Detailed Graphical Displays (requires user installed Microsoft Excel)
- Comprehensive semantic trace file output to determine Block-by- Block encoder decision making



- Real-time and non real-time decoding and analysis of compressed video streams (dependent on PC performance)
- Elementary Stream Editing
- Extraction of Elementary Stream from Transport Stream
- Batch mode operation allows for inclusion in an automated test system.
- The Audio Analysis Option checks for compliance to the standards and quickly provides full analysis of all aspects of the performance of the compression used
- H.264/AVC Intra profiles, High10, High422, High444 and CALVC at Levels 1 to 5.1
- H.264/AVC Scalable Video Coding (SVC) extensions - Baseline, High and High Intra Profiles at Levels 1 to 5.1

MTS4CC Compliance Checker

MTS4CC is a PC-based software package capable of displaying and analyzing encoded audio and video streams for the VC-1, H.264/AVC, MPEG-4, MPEG-2, and H.263 video compression standards. The MTS4CC is intended as a more cost-effective solution for those customers who do not require the advanced diagnostic capabilities of the MTS4EAB ES Analyzer.

For further details visit: www.tek.com/datasheet/mts4eab-elementarystream-analyzer

MPEG Video: MPEG Software Tools

2012 Product Catalog



VQS1000 Video Quality Software

The Video Quality Software is for single ended QoE analysis of video and audio content. It is used with Tektronix IP & RF Video monitoring probes to stream back live video, or with MPEG Analyzers for live and time deferred analysis of captured video files.

Applications

- Affordable QoE Monitoring live monitoring.
- Network performance optimization in service tuning of network.
- Network diagnostics in service troubleshooting.

Features and Benefits

- Reliable and sophisticated analysis algorithms applied to decoded MPEG 2 or H.264 video to identify stuck, black, macro-blocking and blocky compression artifacts. This enables operators to distinguish between impairments resulting from network distribution versus artifacts resulting from over-compression.
- Industry First unique visualization tool with innovative impairment displays highlights the location and severity of video defects enabling engineers to clearly see and validate the presence of impairments on the image.
- User defined graticule area of visual interest to exclude unwanted areas of the screen, such as news tickers, so as to focus QoE analysis on area of the frame that will be of highest interest to the human eye.
- Measurements on the fully decoded live or filebased video gives reliable, objective impairment and artifact detection while eliminating false alarms.
- Triggered capture with pre-trigger buffer enables archive of impairments or offline video quality analysis to be performed.

- QoE measurements can be correlated to problems at the Transport Stream and IP or RF Transmission Layers at each location, and across the network.
- Can be used as stand alone PC analysis software for offline file analysis on Multi or Single Program Transport Streams or integrated into the MTS4000 MPEG Analyzer.
- Analysis of decoded MPEG-2, AC-3, MPEG-2 AAC and MPEG-4 AAC audio in accordance with ITU-R BS.1770/1771 and ATSC A/85 allows operators to analyze audio loudness related problems
- Connect directly to an Ethernet switch using IGMP v3 support for analysis of multicast streams beyond the local router

For further details visit:

www.tek.com/datasheet/video-quality-analysissoftware

Picture Quality Analysis Software

Based on the concepts of the human vision system, the PQASW Picture Quality Analysis Software provides a suite of repeatable, objective quality measurements that closely correspond with subjective human visual assessment. These measurements provide valuable information to engineers working to optimize video compression and recovery, and maintaining a level of common carrier and distribution transmission service to clients and viewers.

Applications

- Codec and Transcoder Design, Optimization and Verification
- Conformance Testing, Transmission Equipment and System Evaluation
- Video Compression Services



Features and Benefits

- Fast, Accurate, Repeatable, and Objective Picture Quality Measurement
- Predicts DMOS (Differential Mean Opinion Score) Model
- Picture Quality Measurements Can be Made on a variety of HD (1080i, 720p) and SD Video Formats (525 or 625)
- Makes Picture Quality Comparison across Different Resolutions from HD to SD, or HD/SD to CIF
- User-Configurable Viewing Condition and Display Models for Reference and Comparison
- Attention/Artifact Weighted Measurement
- Automatic Temporal and Spatial Alignment
- Region Of Interest (ROI) on Measurement Execution and Review
- Easy Regression Testing and Automation using XML Scripting with "Export/Import" File from GUI
- Multiple Results View Options
- Pre-Installed Sample Reference and Test Sequences
- User-configurable Viewing Condition and Display ADV)
- Attention/Artifact Weighted Measurement (Option ADV)
- Easy Regression Testing and Automation using XML Scripting (Option ADV) with "Export/Import" File from GUI
- IP Interface with Simultaneous Generation/ Capture and 2-Ch Capture (Option IP)
- Embedded Sample Reference and Test Sequences

For further details visit: www.tektronix.com/pqa600

Your Tektronix Service Advantage

You can trust Tektronix to offer unequalled engineering expertise and a customercentric approach to ensure the optimal performance of your Tektronix products and maximize the lifetime value of your Tektronix investment.

- Tektronix Factory Experts Access to the engineering expertise that designed and built your products to ensure they are in peak performance. Over 20 man years of training per support engineer.
- Comprehensive and Thorough Treatment Software updates, safety and reliability modifications, and cosmetic enhancements are included if applicable. Products are returned to you in a "like new" condition. Worldwide support is available through the Tektronix network.
- Efficiency and Convenience
 Team of professionals focused on getting your
 instruments back to you as soon as possible
 to keep your downtime to a minimum and your
 service management easy.
- Flexible Repair and Calibration Service Choice of cost effective, flexible options and service packages to meet your needs.

For further details visit: www.tektronix.com/service



Summary of Service Plans

Repair Service Extended Coverage	Calibration Service Coverage	Multi-Vendor Calibration Services
Save money with multi-year	Accredited calibration	Single point of contact for all of user collibration panels
coverage	 Traceable calibration 	your calibration needs
Priority service	 Functional verification 	Simplify your operations and reduce administrative costs
 Covers equipment, parts, labor and transportation 	 Applicable software, safety and reliability updates 	 On-site delivery for convenience and reduced downtime.
 Applicable software, safety and reliability updates 	 Calibration records retention 	

Contact Tektronix:



Glossary of Terms

Download our free Glossary of Video Terms & Acronyms. This comprehensive reference book has been compiled from material gathered over time and from numerous sources.

To download your free copy of this glossary, please visit: www.tek.com/video/glossary

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> > Contact List Updated 10 February 2011

For Further Information

Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology. Please visit www.tektronix.com

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