

Capture Performance



**MEDIA
SOLUTIONS**

2019: VOL. 1

Next Generation Media
Test & Monitoring Solutions
Accelerating Global Innovation

Today, video is embedded into every facet of rapidly modernizing society - radically changing our view into the world. As video continues to surround us in entertainment, socializing, shopping, exercise, work, education, and even healthcare, its quality has become more significant to the total experience of our lives.

We believe that proactively assuring a flawless media experience captivates your customers. And from that technical strength, you can create your competitive market advantages.

Whatever your video format, workflows or role, discover the experiential advantage with Tektronix.

REVOLUTION **ENGINEERING**

Software | Services | Hardware

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LIVE IP VIDEO PRODUCTION SOLUTIONS

Tektronix hybrid IP / SDI infrastructure solutions enable a smooth transition from SDI-based to networked IP-based production workflows. Our solutions promote collaboration between broadcast engineers and IT experts and effectively bridge the gap between the SDI and IP worlds. We provide scalable solutions that can grow with your evolving needs, and the software-based designs of our products can accommodate ongoing changes of standards.

RECOMMENDED PRODUCTS



PRISM IP / SDI MEDIA ANALYSIS PLATFORM

- Real time IP/SDI analysis and monitoring support for ST2022-6, ST2110/20/30/40 and PTP Precision Time Protocol
- Detect IP packet errors, monitors the packet inter arrival time (PIT) and time stamped delay factor (TS-DF)
- Timing display showing the relative timing of the ST2022-6/-7 and ST2110-20 input signals against PTP reference
- Simultaneous two paths monitoring to ensure proper SMPTE 2022-7 redundant system operation
- NMOS (IS-04/IS-05) discovery and registration support for interoperability
- Use SDI/ST2110 test signal generation to test the basic functions of networks and receivers
- Up to 12Gbps SDI with optional eye-pattern/ jitter demodulated waveform display



SPG8000A HYBRID MASTER SYNC AND PTP GRANDMASTER CLOCK GENERATOR

- PTP (IEEE 1588) support, including SMPTE ST 2059-2 and AES67 profiles
- Multiple independent black burst and HD tri-level sync outputs
- Four LTC outputs, VITC on black burst outputs, and NTP server
- GPS / GLONASS-based synchronization with holdover recovery that prevents synchronization shock when external reference input, PTP, or GPS / GLONASS signal is temporary lost
- 4K / UHD format support with full frame 100% and 75% color bars (quad link square division)
- HDR test patterns for HLG and PQ based on ITU-R BT.2111

For more information and to download application resources such as technical papers application notes, e-books and posters, go to: tek.com/ip

4K HDR PRODUCTION AND DELIVERY SOLUTIONS

With the adoption of 4K / Ultra High Definition (UHD) with High Dynamic Range (HDR) displays by the consumers and the competitive needs of content providers and distributors to differentiate themselves, there is an increasing demand to produce and deliver more 4K HDR content with stunning picture quality. Tektronix 4K HDR-ready solutions enable the creation and delivery of highly realistic image content that offers outstanding customer viewing experiences, and compliance of regulatory standards.

RECOMMENDED PRODUCTS



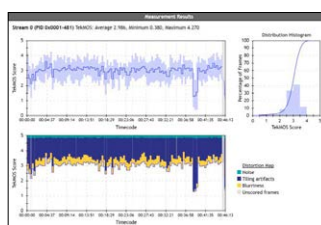
PRISM

- 4K / UHD format support through 12G-SDI and Quad 3G-SDI (square division and 2-sample interleave formats)
- High Dynamic Range (HDR) support including support for Hybrid Log Gamma (HLG), SMPTE ST 2084 PQ and SLog3
- Wide Color Gamut (WCG) support per ITU-R BT.2020
- Optional production tool set and SDI physical Layer measurements



WFM8300

- 4K / UHD format support (square division and 2-sample interleave formats)
- High Dynamic Range (HDR) support including support for Hybrid Log Gamma (HLG) and SMPTE ST 2084 PQ
- Wide Color Gamut (WCG) support per ITU-R BT.2020
- Most comprehensive ANC data support, audio loudness monitoring, and physical layer measurements



AURORA / HYDRA

- Automated file-based QC of 4K / UHD content
- Configurable, automated workflows
- QC report analytics
- Frame accurate real-time video playout of 4K content (Hydra)



SENTRY

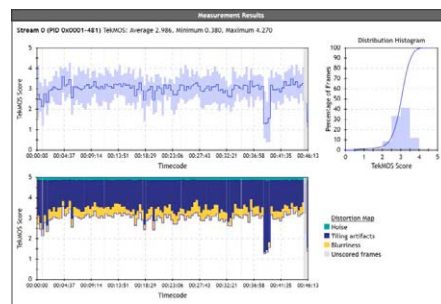
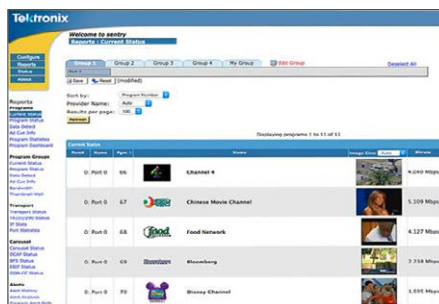
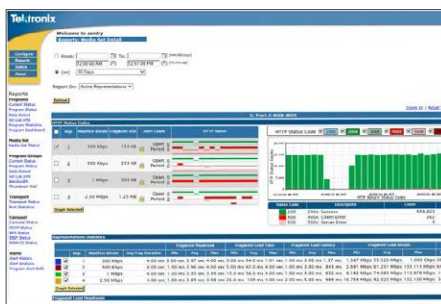
- Quality of Service (QoS) and Quality of Experience (QoE) analytics and alerts for 4K content
- Real-time monitoring of HEVC (H.265) streams
- Regulatory compliance
- Checks for overcompression artifacts

For more information and to download application resources such as technical papers application notes, e-books and posters, go to: tek.com/4k

LIVE AND FILE-BASED VIDEO CONTENT DELIVERY SOLUTIONS

Whether through live streaming or on-demand file-based delivery, the goal is always to provide a quality viewing experience. Tektronix helps video service providers understand the health of the entire adaptive bit rate (ABR) workflow for both live streaming and file-based content with end-to-end Quality of Service (QoS), Quality of Experience (QoE) and perceptual video quality (PVQ) measurement, monitoring and analysis.

RECOMMENDED PRODUCTS



SENTRY ABR

- Availability of all services, profiles/ bitrates
- HLS, Dash, MSS support
- QoE and PVQ measurements
- ABR decryption and DRM support

SENTRY

- QoS and QoE analytics and alerts throughout the entire workflow
- IDR/EBP presence, cadence and alignment
- Regulatory compliance
- Checks for over-compression artifacts

AURORA

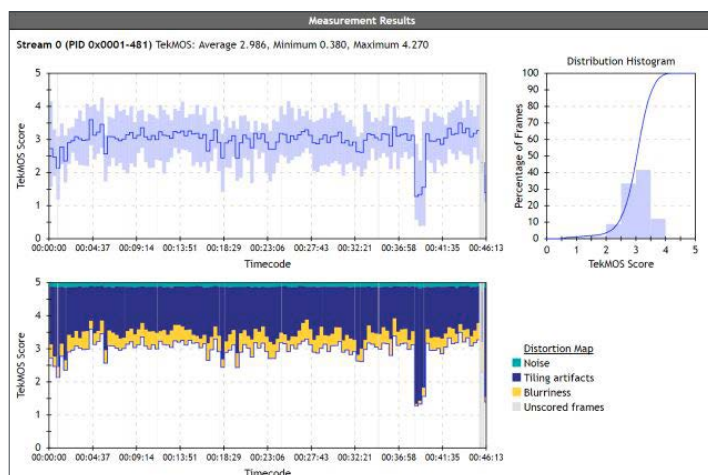
- Automated file-based QC
- Configurable, automated workflows
- Most file formats, IMF and ABR support
- QC report analytics
- TekMOS picture quality

For more information and to download application resources such as technical papers application notes, e-books and posters, go to: tek.com/video-quality-monitors and tek.com/file-based-validation-suite

FILE-BASED QUALITY CONTROL SOLUTIONS

With the volume of file-based content growing exponentially, service providers are challenged with ensuring the quality and correctness of all media files. To solve this challenge, Tektronix offers a range of file-based QC solutions that ensure compliance of the media files to all quality, regulatory and workflow requirements.

RECOMMENDED PRODUCTS



AURORA

- Scalable speed and ease of use
- Efficient workflows
- Perceptual video quality tests
- Integrated audio loudness correction

For more information and to download application resources such as technical papers application notes, e-books and posters, go to: tek.com/file-based-validation-suite

MOBILE AND STUDIO PRODUCTION SOLUTIONS

In order to produce live content that offers stunning images and a highly realistic viewing experience, proper setup, including alignment and matching of cameras, is of the utmost importance. Tektronix offers solutions to meet these applications—from local studio productions to global live sporting events, from HD workflow to emerging 4K HDR workflow.

RECOMMENDED PRODUCTS



PRISM

- Base unit supports SD/HD/3G formats through SDI and IP
- Option to support 4K formats through 6G/12G-SDI and Quad SDI
- Optional production tool set to support content creation in HDR and WCG
- Dual display accessory for larger display area in limited space



SPG8000A HYBRID MASTER SYNC AND PTP GRANDMASTER CLOCK GENERATOR

- GPS / GLONASS-based synchronization with holdover recovery that prevents synchronization shock when external reference input, PTP, or GPS / GLONASS signal is temporarily lost
- Multiple independent black burst and HD tri-level sync outputs
- PTP (IEEE 1588) support, including SMPTE ST 2059-2 and AES67 profiles
- Four LTC outputs, VITC on black burst outputs, and NTP server
- 4K / UHD formats support with full frame 100% and 75% color bars (quad link square division)



WFM5200

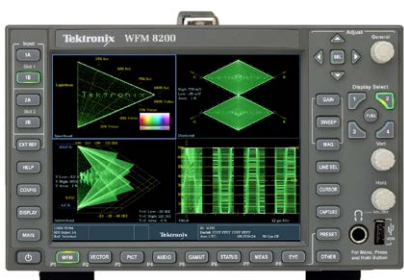
- SD/HD SDI format support in base unit
- Optional High Dynamic Range (HDR) provides HDR waveform graticules supporting Hybrid Log Gamma (HLG) and SMPTE ST2084 PQ
- Option 3G to add 3G SDI support that can be used to monitor 4K in 2 sample interleave (2SI) by proxy
- Option CAM to balance luminance level of four cameras

For more information and to download application resources such as technical papers application notes, e-books and posters, go to: tek.com/waveform-monitor/wfm-wvr8000-series and tek.com/spg8000a-master-sync-master-clock-reference-generator

POST-PRODUCTION SOLUTIONS

Color correction is an important process in post-production. One of the key aspects of color correction is ensuring that images comply with color gamut specifications so that they can be properly reproduced and delivered to a variety of media and screens. Tektronix waveform monitors offer a set of tools that can help editors and colorists easily adjust the color fidelity of images and maintain the video signal within suitable gamut limits.

RECOMMENDED PRODUCTS



WFM / WVR 8000 SERIES WAVEFORM MONITORS

- 4K / UHD format support (square division and 2-sample interleave formats)
- High Dynamic Range (HDR) support including support for Hybrid Log Gamma (HLG) and SMPTE ST 2084 PQ
- Wide Color Gamut (WCG) support per ITU-R BT.2020
- Most comprehensive ANC data support and audio loudness monitoring for content QC



PRISM

- Base unit supports SD/HD/3G formats through SDI and IP
- Option to support 4K formats through 6G/12G-SDI and Quad SDI
- Optional production tool set to support content creation in HDR and WCG
- Mouse / Keyboard interface for seamless operation in post production
- Remote operation to install the equipment into machine room

For more information and to download application resources such as technical papers application notes, e-books and posters, go to: tek.com/waveform-monitor/wfm-wvr8000-series

FACILITY OPERATIONS SOLUTIONS

Whether transitioning a facility from HD to 4K / UHD, from Standard Dynamic Range (SDR) to High Dynamic Range (HDR), or from an SDI infrastructure to an all-IP infrastructure, there will likely be a period that you must manage a hybrid environment. Tektronix offers a range of multi-format, multi-standard content monitoring and analysis solutions that provide trusted test solutions no matter the phase of your transition.

RECOMMENDED PRODUCTS



WFM / WVR 8000 SERIES WAVEFORM MONITORS

- 4K / UHD format support (square division and 2-sample interleave formats)
- HDR support including support for Hybrid Log Gamma (HLG) and SMPTE ST 2084 PQ
- Wide Color Gamut (WCG) support per ITU-R BT.2020
- Most comprehensive ANC data support, audio loudness monitoring, and physical layer measurements



PRISM IP/SDI MEDIA ANALYSIS PLATFORM

- Specifically designed for IP (ST 2210 and ST 2022-6) and or SD/HD/3G/6G/12G SDI environments. Connect any signal in in the facility and lock to PTP or Black Burst references for Timing analysis
- Comprehensive support for 4K/HDR/ WCG production through software upgrades, and simple upgrades to 25G in IP environments when needed
- A base unit featured to meet the operations needs of live production and broadcast editing plus a full set of SW options that allow the instrument to scale to high end Engineering requirements
- A full API, NMOS/SDP support, a variety of form factors, extended display options and optional high-quality speaker option means PRISM can be easily integrated into any operational or engineering environment.



SPG8000 HYBRID MASTER SYNC AND PTP GRANDMASTER CLOCK GENERATOR

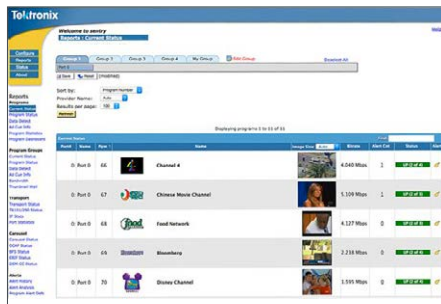
- PTP (IEEE 1588) support, including SMPTE ST 2059-2 and AES67 profiles
- Multiple independent black burst and HD tri-level sync outputs
- Four LTC outputs, VITC on black burst outputs, and NTP server
- GPS / GLONASS-based synchronization with holdover recovery that prevents synchronization shock when external reference input, PTP, or GPS / GLONASS signal is temporary lost
- 4K / UHD format support with full frame 100% and 75% color bars (quad link square division)

For more information and to download application resources go to: tek.com/prism, tek.com/waveform-monitor/wfm-wvr8000-series, and tek.com/spg8000a-master-sync-master-clock-reference-generator

VIDEO SERVICE PROVIDER SOLUTIONS

Whether you are streaming video to your customers using linear broadcast, OTT or VOD, Tektronix has you covered. Our solutions support a wide variety of compression standards, including HEVC and we offer uncompromised scalability and a range of inputs to meet the needs of any network. Our software-based solutions offer in depth reporting and analysis to ensure you are delivering the best quality products and achieving compliance.

RECOMMENDED PRODUCTS



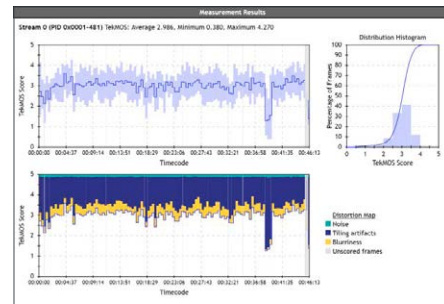
SENTRY

- Real-time transport stream monitoring providing QoS & QoE monitoring and analysis
- OTT/TV Everywhere monitoring with IDR/EBP alignment checks
- Compliance monitoring for audio loudness and closed-captioning
- Scalability to meet the needs of any network



SENTRY ABR

- Availability of all services, profiles/bitrates
- HLS, DASH, and MSS support
- QoE and PVQ measurements
- ABR decryption and DRM support



AURORA

- Consistent performance and ease of use
- Most file formats, 4K, IMF and ABR support
- Perceptual video quality tests and integrated audio loudness correction
- Cloud enabled
- TekMOS picture quality

For more information and to download application resources such as technical papers application notes, e-books and posters, go to: tek.com/video-test-and-monitoring-equipment



PRISM Media Analysis Platform for IP/SDI Infrastructure

Tektronix PRISM media analysis platform offers the single solution for Engineering and Operations. The base unit is provided with a broad range of connectivity solutions enabled for both SDI and multiple IP standards to address the needs of Production and Editing but can be easily scaled up to address high end Technical QC and Engineering.

MODEL	IP FORMATS	SDI FORMATS	AUDIO FORMAT	DISPLAYS	MEASUREMENTS
MPI2-10 (3RU with integrated display)	ST2022-6 ST2022-7 ST2110-20/30/40 ST2059-2 RFC3550	SD HD 3G Level A/B Quad 3G (MP2-FMT-4K) 6G (MP2-FMT-4K) 12G (MP2-FMT-4K)	SDI Embedded ST2022-6 ST2110-30	Waveform Vector Audio Video Session Event Log Diamond Lightning Stop (MP2-PROD) CIE (MP2-PROD)	IP Status IP Session (MP2-IP-MEAS) IP Graph (MP2-IP-MEAS) PTP Graph (MP2-IP-MEAS) Timing (MP2-IP-MEAS) Stream Timing (MP2-IP-MEAS) PIT Histogram (MP2-IP-MEAS) IP Capture (MP2-IP-MEAS) Eye (MPI2 PHY, MPX2 PHY)
MPX2-10 (1RU that requires external display)					

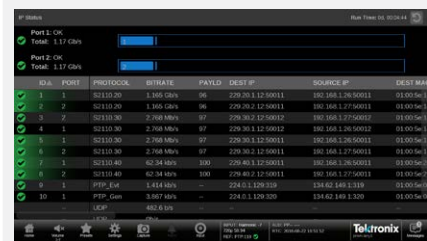
RECOMMENDED OPTIONS

MP2-IP-MEAS	Add IP Measurements
MP2-FMT-4K	Add 4K formats, enable 6G/12G SDI
MP2-PROD	Add Production feature sets
MP2-GEN	Add Signal Generators
MP2-EXTNDSP	Enable 2nd Display
MPI2-10 PHY-12G, MPX2-10 PHY-12G	Add SDI Physical layer measurements
MPX2-10 SPKR	Integrated stereo speaker set

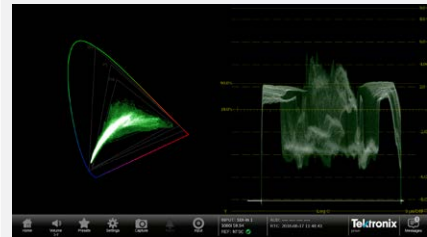
RECOMMENDED ACCESSORIES

MPI2-PTBL	Portable cabinet includes handle, feet, tilt bail
MPI-RACK-MM	19 inch, 3RU dual rack cabinet for one MPI unit or two MPI units in a side-by-side installation,
MPI2-RACK-MD	19 inch, 3RU rack cabinet with second display unit
MPX2-DUALDSP	3RU Dual display unit with touch panel

PRODUCT HIGHLIGHTS



IP Status application showing all sessions in a 10G Ethernet link.



Production tool set to simplify HDR / WCG work flow.

OVERVIEW

- Real time IP, SDI analysis and monitoring
- Graphical displays of streams, PTP and packet errors in 10GE Ethernet link
- Production tools for 4K, HDR, WCG content creation
- Baseband engineering tool set including SDI physical layer measurement
- Accessories for further flexibility in system installation
- Multi-point or remote site monitoring

SHIPS WITH PRODUCT

- Power Cord

WFM – WAVEFORM MONITORS AND WVR – RASTERIZERS

Tektronix is the worldwide leader in Waveform Monitors and Rasterizers, offering the most complete line from portable measurement to 4K HDR production.



	2000 SERIES	5000 SERIES	7000 SERIES	8000 SERIES
Description	Portable I and M tools with replaceable battery	Best value Short depth for multi-camera production	Most versatile with wide range of video and audio configurations	Highest performance with 4K/ UHD and HDR support
Form Factor	Portable battery powered	Rack mount Waveform monitor or Rasterizer AC and DC Power	Rack mount Waveform monitor or Rasterizer AC Power	Rack mount Waveform Monitor or Rasterizer AC Power
Video Formats	HD/SD-SDI 3G-SDI (Option 3G) Optical (Option SFP) ASI (Option ASI)	HD/SD-SDI 3G-SDI (Option 3G) HDMI (5250)	HD/SD-SDI 3G-SDI (Option 3G) NTSC/PAL (Option CPS)	HD/SD-SDI 3G-SDI (Option 3G) 4K HDR (Option 4K, 3G, 2SDI, and PROD) NTSC/PAL (Option CPS)
Audio Formats	Embedded AES/EBU Dolby (Option DBE)	Embedded (Option AUD) AES/EBU (5000)	Embedded (Option AD) AES/EBU (Option AD) Analog (Option AD) Dolby Decode (Option DPE)	Embedded (Option AD) AES/EBU (Option AD) Analog (Option AD) Dolby Decode (Option DPE)
Measurements	Waveform, Vector and Gamut Loudness Metering (Option LOUD) Closed Caption / Subtitles (Option DATA) ANC Data (Option DATA) Physical Layer (2300)	HD/4K 2SI HDR Monitoring (PROD)	Waveform, Vector and Gamut Loudness Metering (Option AD or DPE) Closed Caption / Subtitles Simultaneous Input Monitoring (Option SIM) ANC Data (Option DAT) Physical Layer (Option PHY3)	Waveform, Vector and Gamut Loudness Metering (Option AD or DPE) Closed Caption / Subtitles ANC Data (Option DAT) Physical Layer (Option PHY3) 4K Quad Link Timing (Option 4K, 3G, and 2SDI)

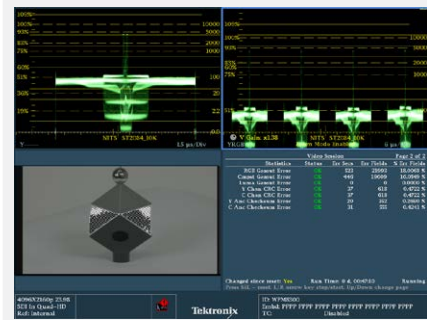


WFM / WVR 8000 Series Waveform Monitors and Rasterizers

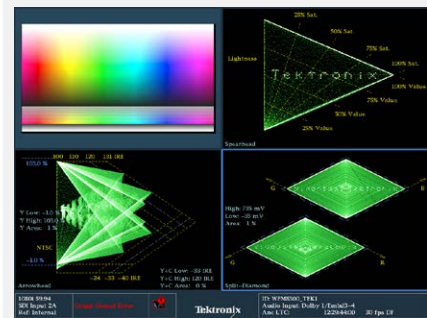
The 8200 can perform any job in the facility, on the mobile truck, or in the post house and is the trusted tool for high-end production and post-production. It can be optioned to suit a range of capabilities including 4K and HDR support.

The 8300 includes a wide range of standard capabilities for engineering and R&D applications, including 4K and HDR support.

PRODUCT HIGHLIGHTS



High Dynamic Range Display



Tektronix patented Diamond, Spearhead, and Arrowhead gamut monitoring displays

MODEL	FORM FACTOR	VIDEO FORMATS	AUDIO FORMATS	MEASUREMENTS	SPECIAL FEATURES
WFM8200	1/2 Rack x 3RU x 18.25", Integrated Display	SD, HD, Dual Link, 3G (Option 3G), 4K/UHD (Option 3G, 2SDI, 4K), NTSC/PAL (Option CPS)	Embedded (Option AD), AES/EBU (Option AD), Analog (Option AD), Dolby Decode (Option DPE)	Waveform and Vector, Loudness Analysis, Closed Caption, Subtitles, ANC Data (Option DAT), Gamut, Physical Layer (Option PHY3), 4K Quad Link timing (Option 4K, 3G, and 2SDI)	Highest Performance 4K (Option 4K, 3G, and 2SDI), HDR (Option PROD)
WFM8300	1/2 Rack x 3RU x 18.25", Integrated Display	SD, HD, Dual Link, 3G (Option 3G), 4K/UHD (Option 3G, 2SDI, 4K), NTSC/PAL (Option CPS)	Embedded (Option AD), AES/EBU (Option AD), Analog (Option AD), Dolby Decode (Option DPE)	Waveform and Vector, Loudness Analysis, Closed Caption, Subtitles, ANC Data (Option DAT), Gamut, Physical Layer (Option PHY3), 4K Quad Link timing (Option 4K, 3G, and 2SDI) Physical Layer (Option PHY)	Data Analysis (Standard), SIM (Standard), Audio Video Delay Measurement (Standard), 4K (Option 4K, 3G, and 2SDI), HDR (Option PROD)
WVR8200	Full Rack x 1RU x 19.63", External Display	SD, HD, Dual Link, 3G (Option 3G), 4K/UHD (Option 3G, 2SDI, 4K), NTSC/PAL (Option CPS)	Embedded (Option AD), AES/EBU (Option AD), Analog (Option AD), Dolby Decode (Option DPE)	Waveform and Vector, Loudness Analysis, Closed Caption, Subtitles, ANC Data (Option DAT), Gamut, Physical Layer (Option PHY3), 4K Quad Link timing (Option 4K, 3G, and 2SDI)	Highest Performance 4K (Option 4K, 3G, and 2SDI), HDR (Option PROD)
WVR8300	Full Rack x 1RU x 19.63", External Display	SD, HD, Dual Link, 3G (Option 3G), 4K/UHD (Option 3G, 2SDI, 4K), NTSC/PAL (Option CPS)	Embedded (Option AD), AES/EBU (Option AD), Analog (Option AD), Dolby Decode (Option DPE)	Waveform and Vector, Loudness Analysis, Closed Caption, Subtitles, ANC Data (Option DAT), Gamut, Physical Layer (Option PHY3), 4K Quad Link timing (Option 4K, 3G, and 2SDI) Physical Layer (Option PHY)	Data Analysis (Standard), SIM (Standard), Audio Video Delay Measurement (Standard), 4K (Option 4K, 3G, and 2SDI), HDR (Option PROD)

RECOMMENDED ACCESSORIES

WFM Rack-NN	19 inch, 3RU, full-depth, Dual Rack Cabinet that accommodates a combination of one or two WFM4xxx, WFM5xxx, WFM6xxx, WFM7xxx, or WFM8xxx Series products
WFM50F06	Filler panel; covers unused half of WFM Rack-NN
WFM7F02	Portable cabinet with handle, feet, tilt bail and front panel cover
WVR8RFP	Remote Front Panel for WVR8xxx Series Waveform Rasterizer (includes 25 foot cable)
WVR8RFP Opt. 01	100 foot cable for WVR8RFP Rasterizer Remote Front Panel

SHIPS WITH PRODUCT

- Power Cord

OVERVIEW

- Supports 4K / UHD formats with HDR and WCG
- Most comprehensive audio monitoring including audio loudness monitoring (ITU-R BS.1770-3) and full Dolby support
- Most in-depth data analysis including ANC, closed captioning and subtitle analysis
- Patented gamut displays
- Superior physical layer signal integrity analyzer



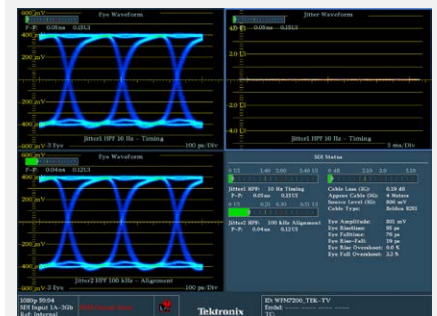
WFM / WVR 7200 Waveform Monitors and Rasterizers

The 7200 is a workhorse instrument capable of both operations and engineering applications with its flexible configuration and wide range of capabilities. Audio and video choices from analog to digital 3G/HD/SD mean that this instrument can be employed in nearly every use case, providing a consistent tool through a complex environment.

PRODUCT HIGHLIGHTS



Audio monitoring with Lissajous display, Channel Status information, Loudness Session, and Audio Session



Eye and Jitter display, along with automated measurements of physical layer parameters

MODEL	FORM FACTOR	VIDEO FORMATS	AUDIO FORMATS	MEASUREMENTS
WFM7200	1/2 Rack x 3RU x 18.25", Integrated Display	HD, SD, 3G (Option 3G), NTSC/PAL (Option CPS)	Embedded (Option AD), AES/ EBU (Option AD), Analog (Option AD), Dolby Decode (Option DPE)	Waveform and Vector, Loudness Analysis, Closed Caption, Subtitles, ANC Data (Option DAT), Gamut, Physical Layer (Option PHY3)
WVR7200	Full Rack x 1RU x 19.63", External Display	HD, SD, 3G (Option 3G), NTSC/PAL (Option CPS)	Embedded (Option AD), AES/ EBU (Option AD), Analog (Option AD), Dolby Decode (Option DPE)	Waveform and Vector, Loudness Analysis, Closed Caption, Subtitles, ANC Data (Option DAT), Gamut, Physical Layer (Option PHY3)

RECOMMENDED ACCESSORIES

WFMRAK- NN	19 inch, 3RU, full-depth, Dual Rack Cabinet that accommodates a combination of one or two WFM4xxx, WFM5xxx, WFM6xxx, WFM7xxx, or WFM8xxx Series products
WFM50F06	Filler panel; covers unused half of WFMRAK-NN
WFM7F02	Portable cabinet with handle, feet, tilt bail and front panel cover
WVR8RFP	Remote Front Panel for WVR7200 Series Waveform Rasterizer (includes 25 foot cable)
WVR8RFP Opt. 01	100 foot cable for WVR8RFP Rasterizer Remote Front Panel

OVERVIEW

- Multi-format, multi-standard video monitoring
- Comprehensive audio monitoring including audio loudness monitoring (ITU-R BS.1770-3) and full Dolby support
- Most in-depth data analysis including ANC, closed captioning and subtitle analysis
- Patented gamut displays
- Superior physical layer signal integrity analyzer

SHIPS WITH PRODUCT

- Power Cord



WFM / WVR 5000 Series Waveform Monitors and Rasterizers

The industry standard for monitoring content quality at an affordable price, WFM/WVR5000 models are ideal for production and post with basic video and audio monitoring needs. The 5000 series offers uncompromised quality, HD/SD support, a range of software options, and the capability to handle 3G-SDI (WFM/WVR5200) and HDMI (WFM/WVR5250).

MODEL	FORM FACTOR	VIDEO FORMATS	AUDIO FORMATS	MEASUREMENTS	SPECIAL FEATURES
WFM5000	1/2 Rack x 3RU x 5.5"	HD, SD	Embedded, AES/EBU	Waveform and Vector, Audio Bars	Basic HD and SD Monitoring (two SDI inputs)
WFM5200	1/2 Rack x 3RU x 5.5"	HD, SD, 3G (Option 3G)	Embedded (Option AUD)	Waveform and Vector, Loudness Metering (Option AUD and LOUD), Closed Caption / Subtitles / ANC Data (Option DATA), Gamut, HDR Monitoring (Option PROD)	Four SDI input multi-camera monitoring (Option CAM), Stereoscopic 3D Video Displays (Option S3D)
WFM5250	1/2 Rack x 3RU x 5.5"	HDMI, HD, SD, 3G (Option 3G)	Embedded (Option AUD)	Waveform and Vector, Loudness Metering (Option AUD and LOUD), Closed Caption / Subtitles / ANC Data (Option DATA), Gamut, HDR Monitoring (Option PROD)	Two SDI inputs and two HDMI inputs with HDCP support, Stereoscopic 3D Video Displays (Option S3D)
WVR5000	1/2 Rack x 1RU x 18"	HD, SD	Embedded, AES/EBU	Waveform and Vector, Audio Bars	Basic HD and SD Monitoring (two SDI inputs)
WVR5200	1/2 Rack x 1RU x 5.5"	HD, SD, 3G (Option 3G)	Embedded (Option AUD)	Waveform and Vector, Loudness Metering (Option AUD and LOUD), Closed Caption / Subtitles / ANC Data (Option DATA), Gamut, HDR Monitoring (Option PROD)	Four SDI input multi-camera monitoring (Option CAM), Stereoscopic 3D Video Displays (Option S3D)
WVR5250	1/2 Rack x 1RU x 5.5"	HDMI, HD, SD, 3G (Option 3G)	Embedded (Option AUD)	Waveform and Vector, Loudness Metering (Option AUD and LOUD), Closed Caption / Subtitles / ANC Data (Option DATA), Gamut, HDR Monitoring (Option PROD)	Two SDI inputs and two HDMI inputs with HDCP support, Stereoscopic 3D Video Displays (Option S3D)

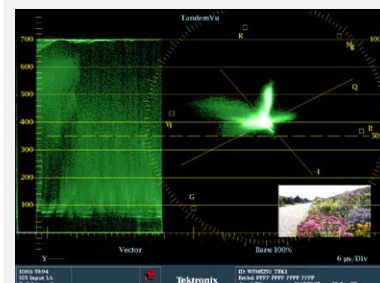
RECOMMENDED ACCESSORIES

WFMRAK-NN	19 inch, 3RU, full depth, Dual Rack Cabinet that accommodates a combination of one or two WFM4xxx, WFM5xxx, WFM6xxx, WFM7xxx, or WFM8xxx Series products
WFM50F06	Filler panel; covers unused half of WFMRAK-NN
WFMRAK-S2	Full rack (19 inch), short depth, 3RU rackmount to fit one or two WFM5xxx Series products
WFM50F01	Portable cabinet for WFM5xxx Series products
WFM50FSC	Soft carrying case for WFM5xxx Series products (WFM50F01 is required)

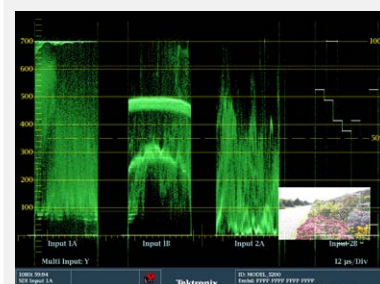
RECOMMENDED ACCESSORIES

WFM50FGM	Anton Bauer Battery Adapter Plate (Gold - Mount) for WFM5xxx Series products - Battery and Charger NOT included
WFM50FVM	Sony / IDX Battery Adapter Plate (V - Mount) for WFM5xxx Series products - Battery and Charger NOT included
VTSRAK-S2	Full rack (19 inch), short depth, 1RU adapter (with zero clearance mounting) to fit one or two (side by side) WVR52xx
VTSRAK-L1	Full rack (19 inch), full depth, 1RU adapter (with zero clearance mounting) to fit one WVR5xxx
VTSRAK-L2	Full rack (19 inch), full depth, 1RU adapter (with zero clearance mounting) to fit one or two (side by side) WVR5xxx Series products

PRODUCT HIGHLIGHTS



TandemVu® allows camera alignment of luma and chroma within Full Screen display



Multiple Input Mode display showing four luma signals, ideal for multi-camera balancing

OVERVIEW

- Compact size, ideal for space-constrained environments
- Allows monitoring of up to four SDI inputs simultaneously (Option CAM)
- Patented gamut displays and HDR Monitoring for PQ and HLG (Option PROD)
- Comprehensive audio monitoring (Options AUD and LOUD)
- ANC data monitoring including closed caption and teletext subtitle (Option DATA)

SHIPS WITH PRODUCT

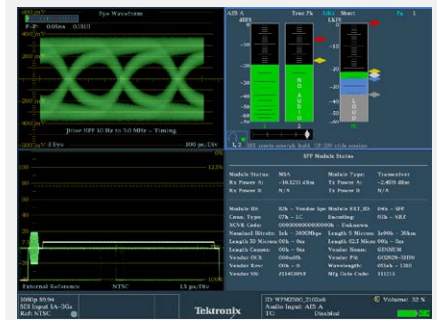
- Power Cord
- AC Power Adaptor for both AC/DC Operation



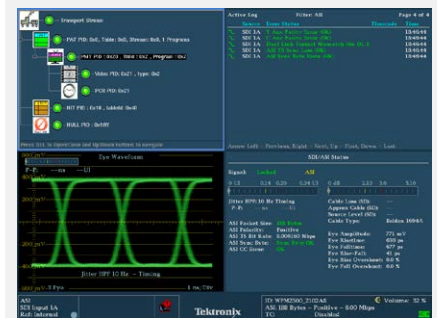
WFM2200A / WFM2300 Waveform Monitor

The WFM2200A and WFM2300 are ideal for field applications, offering basic video/audio monitoring and test signal generation and supporting a wide range of interfaces to quickly isolate, diagnose and resolve system issues. Eye and jitter measurements, cable simulation and margin test capabilities in the WFM2300 further expand its versatility.

PRODUCT HIGHLIGHTS



Eye display (SDI input), Audio display (AES input), Waveform display (external input), SFP status (optical input)



ASI monitoring (MPEG2 PID Tree, Error Log status, Eye Pattern Measurement, SDI/ASI status)

MODEL	FORM FACTOR	VIDEO FORMATS	AUDIO FORMATS	MEASUREMENTS	SPECIAL FEATURES
WFM2200A	Portable, Battery	SD, HD, Dual Link, 3G (Option 3G), Optical (Option SFP), HDMI (Option SFP-HDMI)	Dolby E Monitoring (Option DBE)	Waveform and Vector, Loudness Metering (Option LOUD), Closed Caption (Option DATA) Subtitles (Option DATA), ANC Data (Option DATA), Gamut	Portability, Replaceable Battery
WFM2300	Portable, Battery	HD, SD, 3G (Option 3G), Optical (Option SFP)	Dolby E Monitoring (Option DBE)	Waveform and Vector, Loudness Metering (Option LOUD), Closed Caption (Option DATA) Subtitles (Option DATA), ANC Data (Option DATA), Gamut, Physical Layer, ASI Monitoring (Option ASI)	Portability, Replaceable Battery, Physical Layer Measurement

RECOMMENDED ACCESSORIES

WFM200BA	Li-Ion rechargeable battery pack for replacement
WFM200BC	External battery recharge unit
WFM200FSC	Soft carrying case for WFM2xxx

OVERVIEW

- Portable and powerful
- Multi-format, multi-standard support
- HDMI signal monitoring (Option SFP-HDMI)
- Optical SDI input and output (Option SFP)
- 3G/HD/SD color bar and pathological signal generator with Genlock and moving picture
- SDI and ASI (Option ASI) Eye and Jitter measurements (WFM2300)

SHIPS WITH PRODUCT

- WFM200BA Li-Ion rechargeable battery pack
- AC power adapter
- Power cord

SPG SYNC AND REFERENCE GENERATORS

Tektronix Sync and Timing Reference Generators provide facility reference signals and ensure a stable timing source. Signal generators provide test signals for equipment verification and calibration applications. For sync and timing redundancy in a facility, the ECO8000 series provides a highly reliable automatic changeover unit.



	ECO8000 SERIES	SPG8000A	SPG700	TG8000 PLATFORM
Description	Automatic changeover for master sync and timing application	Hybrid sync generator and PTP grandmaster clock for sync and timing application of SDI-based and / or IP-based media infrastructure	Best value mid-range sync generator for traditional analog and/or SDI-based media infrastructure	Modular platform to create configurations for broadcast and video equipment testing applications
Sync Formats	Black burst, HD Tri-Level Sync, SD, HD, 3G-SDI	Black burst, HD Tri-Level Sync, SD, HD, 3G-SDI	Black burst, HD Tri-Level Sync, SD, HD, 3G-SDI	Black burst, HD Tri-Level Sync, SD, HD, 3G-SDI
Test Signal Formats	Composite NTSC/PAL, SD, HD, 3G-SDI	Composite NTSC/PAL, SD, HD, 3G-SDI (including 4K/UHD) Embedded Dolby E	SD, HD, 3G-SDI	Composite NTSC/PAL, SD, HD, 3G-SDI (including 4K/UHD)
Features	Electronic Fast Switch for Analog Sync / AES Switching (Option REF) High bandwidth (up to 3Gbps) SDI relay switching (Option HREF) Linear Timecode switching (Option LTC)	GPS/GLONASS master clock synchronization (Option GPS) Precision Time Protocol IEEE 1588 support (Option PTP) 3G/HD/SD-SDI signal outputs including 4K/UHD (Opt SDI)	3G/HD/SD-SDI signal outputs (Opt SDI)	GPS/GLONASS synchronization(GPS7) 3G/HD/SD-SDI test signal module including 4K/UHD support (SDI7) * * 4K/UHD support requires 2 x SDI7 modules
Dual Power Supply System	Option DPW	Option DPW	Option DPW	Not Available



SPG8000A Master Sync / Master Clock Reference Generator

The SPG8000A is a precision multi-format master sync and master clock generator and is suitable for hybrid sync generator and PTP (IEEE 1588) grandmaster clock reference generator applications. It addresses the emerging needs of customers who plan to migrate, in stages, from SDI-based to IP-based video infrastructure (including live production).

PRODUCT HIGHLIGHTS



Hot-swappable, redundant (backup) power supply system (Option DPW)



Adapter cable to 4 XLR male connectors for LTC input/outputs, 3 BNC male connectors for GPI (Option XLR)

MODEL	FORMATS	FEATURES	GENERATOR OPTIONS	FORM FACTOR
SPG8000A	Composite NTSC/ PAL, SD, HD, 3G-SDI, 4K	Sync for Genlock / GPS and GLONASS synchronization, Black burst / HD Tri-level Sync, 48 kHz Word Clock, NTP Server, PTP (IEEE 1588) Grandmaster Clock, LTC and ANC Time Code, Burn-in Time code, Embedded Audio, ANC Data, ID Text/Circle, Color Logo Overlays, Web UI, SNMP Status and Alarm Reporting, Dual Redundant Power Supply System (Option DPW), Rackmount slides and rails kit for SPG8000A (Option RACK)	GPS Synchronization and NTP Server (Option GPS), Analog Black and Composite Test Signal Generator (Option BG), 3G/HD/SD-SDI Test Signal Generator including Embedded Dolby E test signal (Option SDI), Digital AES Audio Generator plus DARS (Option AG), PTP (IEEE 1588) support (Option PTP), Gb Ethernet 1310nm single-mode SFP (Option LX), Gb Ethernet 850nm multi-mode SFP (Option SX), Adapter Cable with 4 XLR connectors for LTC Input/Outputs (Option XLR), GPS/GLONASS rooftop Antenna -5VDC, 1588MHz range (SPG8000ANT)	Rack Mount – 1 RU height, 19 inches width, standard depth

RECOMMENDED ACCESSORIES

SPG8000ANT	GPS / GLONASS rooftop antenna (5.0 VDC, 1588 MHz range signals, F connector) for receiving GPS and/or GLONASS satellite signals. The antenna works with the integrated internal GPS / GLONASS receiver of a SPG8000A with Option GPS.
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OVERVIEW

- GPS / GLONASS-based synchronization with holdover recovery to prevent synchronization shock when reference signal is temporary lost
- Multiple independent black burst and HD tri-level sync outputs
- PTP (IEEE 1588) support
- Four LTC outputs, VITC on black burst outputs, and NTP server
- 4K / UHD format support

SHIPS WITH PRODUCT

- Power cord



SPG700 Multi-Format Reference Sync Generator

The SPG700 is a multi-format reference sync generator with optional 3G/HD/SD-SDI test signal support for SDI-based video infrastructure. It provides multiple audio and video reference signals and various timecode formats for time reference generator applications.

MODEL	FORMATS	FEATURES	GENERATOR OPTIONS	FORM FACTOR
SPG700	Composite, SD, HD, 3G-SDI, 4K	Sync for Genlock, Black burst / HD Tri-level Sync, 48 kHz Word Clock, DARS, LTC and VITC Time Code, Burn-in Time code, Embedded Audio, ANC Data, ID Text/Circle, Color Logo Overlays, Web UI, SNMP Status and Alarm Reporting, Dual Redundant Power Supply System (Option DPW), Rackmount slides and rails kit for SPG700 (Option RACK)	3G/HD/SD-SDI Test Signal Generator (Option SDI), Adapter Cable with 4 XLR connectors for LTC Input/Outputs (Option XLR)	Rack Mount – 1 RU height, 19 inches width, standard depth

PRODUCT HIGHLIGHTS



Hot-swappable, redundant (backup) power supply system (Option DPW)



Adapter cable to 4 XLR male connectors for LTC input/outputs, 3 BNC male connectors for General Purpose Interface

OVERVIEW

- Multiple independent sync outputs
- Four LTC outputs and VITC on black burst outputs
- Stay GenLock™ prevents synchronization shock when reference input is temporarily lost
- Wide selection of video test patterns
- 4K / UHD format support
- Dual hot-swappable power supplies to ensure continuous availability of reference signals

SHIPS WITH PRODUCT

- Power cord



ECO8000 Series Automatic Changeover Units

The ECO8000 series products are highly versatile automatic signal changeover units with configurations and capabilities required to address modern master sync and other advanced sync timing applications. They are designed with optional high bandwidth input changeover capabilities for HD/SD and/or 3G-SDI signal environments.

PRODUCT HIGHLIGHTS



Hot-swappable, redundant (backup) power supply system (Option DPW)



High-density BNC to standard BNC adapter cables (Option CBL)

MODEL	FORMATS	FEATURES	CHANGEOVER OPTIONS	FORM FACTOR
ECO8000	Composite NTSC/ PAL, SD, HD, 3G-SDI	Switches analog black burst, HD Tri-Level Sync, AES/DARS, Word Clock, LTC, 3G-SDI, HD-SDI, SD-SDI Signals, User-configurable channels, Amplitude Detection on all channels, Automatic or Manual changeover, Fault and Operating Mode front-panel indicators, Electronic Fast Switch Function for Sync Signals, Web UI, SNMP Status and Alarm Reporting, Dual Redundant Power Supply System (Option DPW), Maximum number of BNC channels: 9	Analog BNC Channels (Option REF), High Bandwidth Digital BNC Channels (Option HREF), LTC Channels (Option LTC), Adapter Cable with 4 XLR connectors for LTC Input/Outputs (Option XLR), Rackmount Slides and Rail Kit (Option RACK)	Rack Mount – 1 RU height, 19 inches width, standard depth
ECO8020	Composite NTSC/ PAL, SD, HD, 3G-SDI	Switches analog black burst, HD Tri-Level Sync, AES/DARS, Word Clock, LTC, 3G-SDI, HD-SDI, SD-SDI Signals, User-configurable Channels, Amplitude Detection on all channels, Automatic or Manual Changeover, Fault and Operating Mode front-panel indicators, Electronic Fast Switch Function for Sync Signals, Web UI, SNMP Status and Alarm Reporting, Dual Redundant Power Supply System (Option DPW), Maximum number of BNC channels: 20	Analog BNC Channels (Option REF), High Bandwidth Digital BNC Channels (Option HREF), LTC Channels (Option LTC), Adapter Cable with 4 XLR connectors for LTC Input/Outputs (Option XLR), Rackmount Slides and Rail Kit (Option RACK), 10 x High-Density BNC Connectors to Standard BNC Connectors Cables (Option CBL)	Rack Mount – 1 RU height, 19 inches width, standard depth

OVERVIEW

- Switches all timing and synchronization signals required in modern production facilities
- Electronic Fast Switch minimizes disruption
- Front panel LED fault indicators for each individual channel and status of the power supplies
- Dual hot-swappable power supplies ensure continuous availability of reference signals

SHIPS WITH PRODUCT

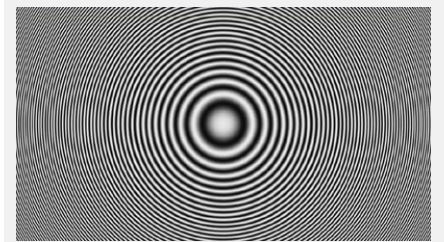
- Power cord



TG8000 Multi-Format Video Test Signal Generator

The TG8000 is a precision multi-format analog and digital signal generation platform. This product is designed for sync and timecode generation in broadcasting applications and reference test signal generation in video equipment testing applications.

PRODUCT HIGHLIGHTS



TG8000 Zone Plate Test Signal



TG8000 Removable Power Supply Module

MODEL	FORMATS	FEATURES	GENERATOR OPTIONS	FORM FACTOR
TG8000	Composite, SD, HD, 3G, 4K (with 2 x SDI7 modules)	Embedded Audio, Time Code, ANC Data, Text/Circle, Synch for Genlock / GPS / Black Burst / Tri-level,8 Application Modules, AV Delay Test Sequence	AGL7 Analog Genlock, GPS7 GPS Synchronization and Time Code, AG7 Audio Generator, BG7 Analog Black Generator, HD3G7 HD/3G-SDI Test Signal Generator, SDI7 SD/HD/3G-SDI Test Signal Generator, 3G-SDI Support (Option 3G), Embedded Dolby E support (Option DBT)	1 RU Full Depth, Full Width

RECOMMENDED ACCESSORIES

SPG8000ANT	GPS / GLONASS rooftop antenna (5.0 VDC, 1588 MHz range signals, F connector) for receiving GPS and/or GLONASS satellite signals. The antenna works with the integrated internal GPS / GLONASS receiver of a GPS7 module of the TG8000.
TG8UP Option PW	Power Supply replacement module for TG8000

OVERVIEW

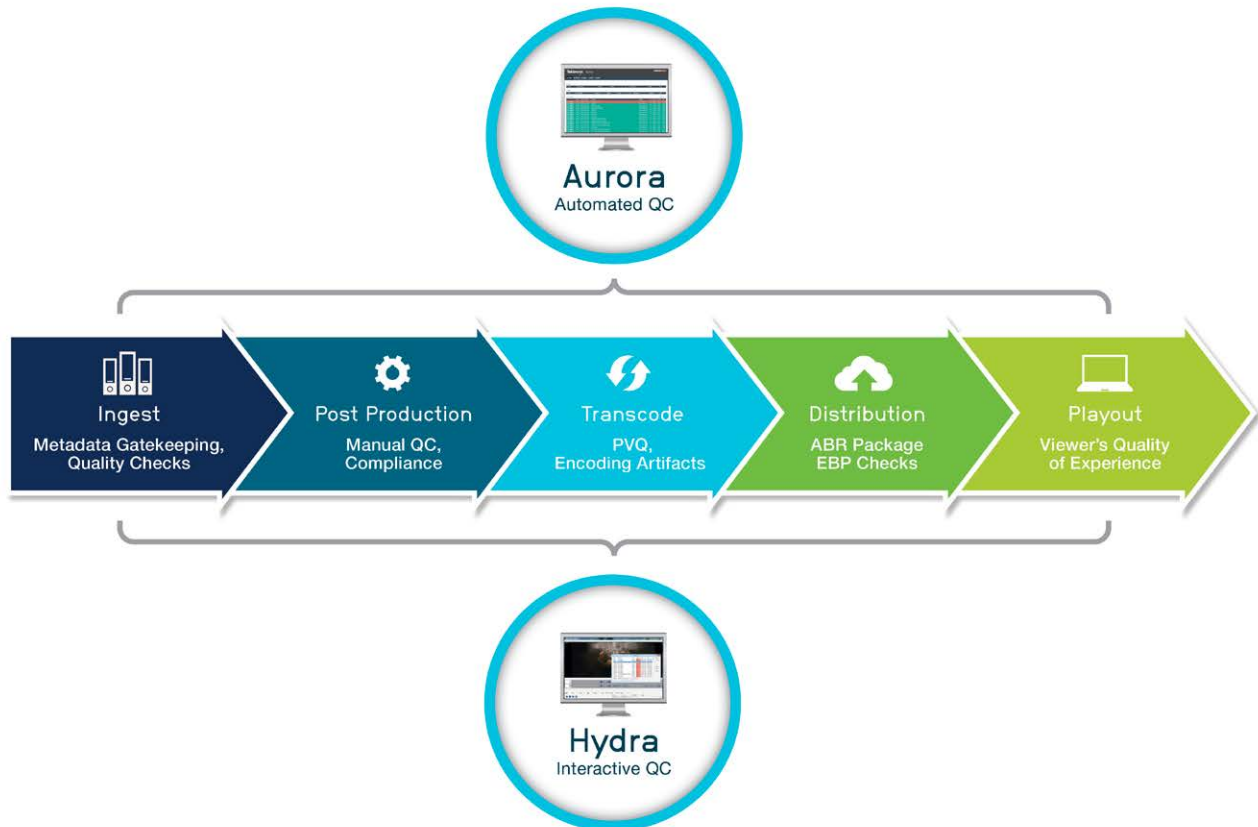
- Multi-format analog and digital test signal generation
- Flexible channel configuration and reliable performance to support reference generator needs
- Modular configurable platform
- Stay GenLock™ - Unique, robust Genlock mode provides stable synchronization signals for digital and traditional broadcast facilities

SHIPS WITH PRODUCT

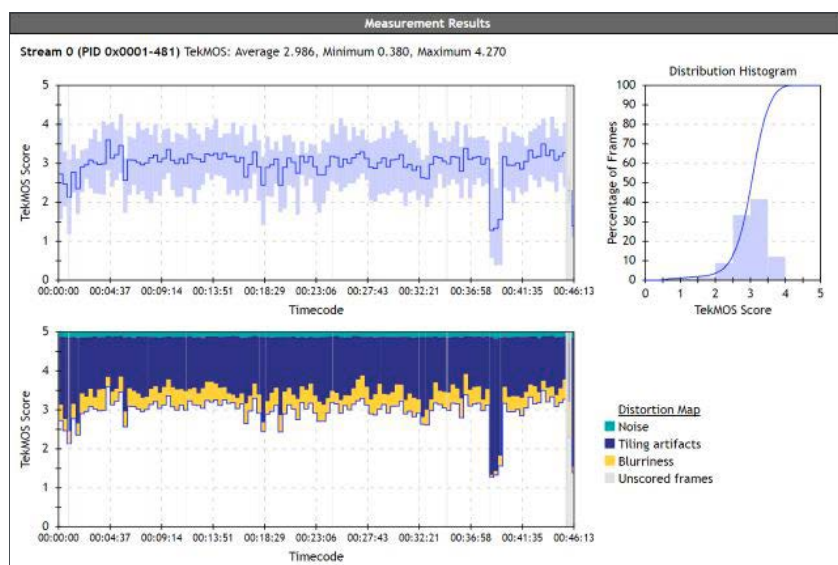
- Power cord

FILE-BASED QUALITY CONTROL SOLUTIONS

With the migration to file-based workflows as well as the increased adoption of multi-screen and over-the-top (OTT) Media Services, the volume of file-based content continues to grow exponentially. Tektronix solves the problem of ensuring the quality and compliance of all this content by offering the most comprehensive validation solutions on the market. Our software operates on industry standard IT platforms, including virtual environments. Our products can operate independently or work together to provide a powerful QC solution.



	AURORA	HYDRA
Description	Next-generation automated, file-based QC	Frame accurate player that performs reliable playback of key file types
Key Features	Unparalleled, scalable speed, Up to faster than real-time 4K analysis, Enhanced Adaptive Bit Rate (ABR) support, Configurable automated workflows, QC report analytics, Integrated audio loudness correction	Frame accurate real-time video playback, Audio playback and visualization, Caption / subtitle / text playback, Metadata visualization, HDMI or SDI output, Audio service mapping
Container Wrappers	MXF (All OP, including AMWA defined AS, RDD-9, P2, SxS), Transport Stream, Elementary Stream, Program Stream/VOB, AVI, WMV/ASF, QuickTime/MOV, GXF, MP4, 3GPP, LXF, R3D, DPX, DXW, HLS, DASH, Smooth Streaming, IMF, and DCP (unencrypted)	MXF (All OP, including AMWA defined AS, RDD-9, P2, SxS), Transport Stream, Elementary Stream, Program Stream/VOB, AVI, WMV/ASF, QuickTime/MOV, GXF, MP4, 3GPP, LXF, R3D, DPX, DXW, HLS, DASH, Smooth Streaming, IMF, DCP (unencrypted)
Video Codecs	H.264 (AVC/AVC-Intra/XAVC), MPEG-2 (including XDCAM, IMX and D-10), ProRes, JPEG 2000, DNxHD (VC-3), DNxHD/DNxHR (VC-3), Cineform (VC-5), VC-1 (and WMV), DV/DVCPro, Flash VP-6/7, RAW (Huffman, YUV, RGB, Blackmagic), EXR, DPX, RED, Canopus, and H.265 (HEVC)	H.264 (AVC/AVC-Intra/MVC 3D), MPEG-2 (including XDCAM, IMX and D-10), ProRes, JPEG 2000, DNxHD (VC-3), DNxHD/DNxHR (VC-3), Cineform (VC-5), VC-1 (and WMV), DV/DVCPro, Flash VP-6/7, RAW (Huffman, YUV, RGB, Blackmagic), EXR, DPX, Canopus, H.265 (HEVC)
Audio Codecs	PCM Audio (WAV/AES/BWF), AAC, HE-AAC, Dolby Digital (AC-3), Dolby Digital Plus (EAC-3), Dolby TrueHD (MLP), Dolby E, WMA Standard Pro, MPEG-2 (L1, 2, 3) and MPEG-1. Audio correction is available on constant bit rate codecs only	PCM Audio (WAV/AES/BWF), Dolby Digital (AC-3), DD+ (EAC-3), Dolby TrueHD (MLP), Dolby E, AAC, HE-AAC, WMA Standard/Pro, MPEG-2 (L1, 2, 3), MPEG-1
Captions/Subtitles/Text	CEA-608/CEA-708 in Line 21 video, ATSC 53, SCTE 20, SCTE 128 and SMPTE 436M; SMPTE Timed Text and variations, including DFXP; EBU Subtitles, including STL; SRT; SCC	Line 21, CEA-608, CEA-708, Timed Text / DFXP, STL, SRT, SCC



PRODUCT HIGHLIGHTS



The Aurora dashboard reports on all jobs in process, queued and completed.

Aurora Automated File-based QC Software

Aurora is a next generation automated file-based QC product that offers scalable concurrent file analysis, ease of use, a 4K production workflow, and all of the tools and capabilities necessary for increasing the efficiency of file-based QC testing and decision-making.

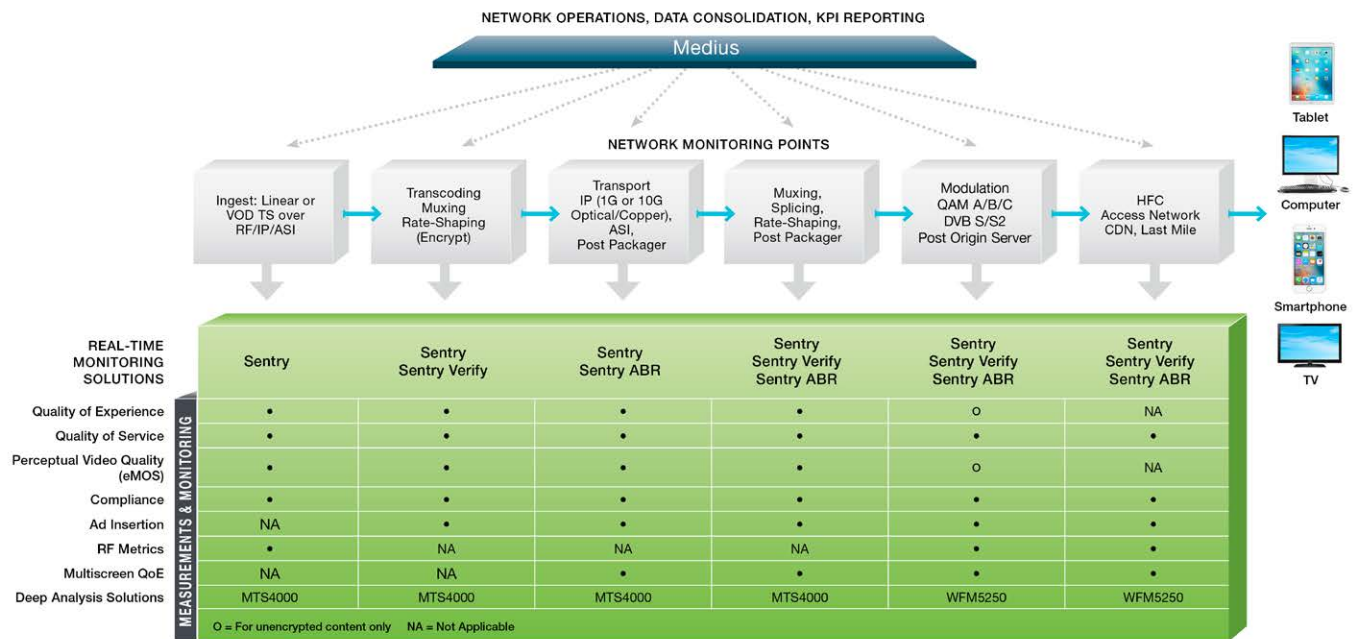
MODEL	KEY FEATURES	CONTAINER WRAPPERS	VIDEO CODECS	AUDIO CODECS	CAPTIONS/ SUBTITLES/TEXT
Aurora	Unparalleled, scalable speed; Faster than real-time 4K analysis; Enhanced Adaptive Bit Rate (ABR) support; Configurable automated workflows, QC report analytics	MXF (All OP, including AMWA defined AS, RDD-9, P2, SxS), Transport Stream, Elementary Stream, Program Stream/VOB, AVI, WMV/ASF, QuickTime/MOV, GXF, MP4, 3GPP, LXF, R3D, DPX, DXW, HLS, DASH, Smooth Streaming, IMF, and DCP (unencrypted)	H.264 (AVC/AVC-Intra/XAVC), MPEG-2 (including XDCAM, IMX and D-10), ProRes, JPEG 2000, DNxHD (VC-3), Cineform (VC-5), VC-1 (and WMV), DV/DVCPro, Flash VP-6/7, RAW (Huffman, YUV, RGB, Blackmagic), EXR, DPX, RED, Canopus, and H.265 (HEVC)	PCM Audio (WAV/AES/BWF), AAC, HE-AAC, Dolby Digital (AC-3), Dolby Digital Plus (EAC-3), Dolby TrueHD (MLP), Dolby E, WMA Standard Pro, MPEG-2 (L1,2,3) and MPEG-1. Audio correction is available on constant bit rate codecs only	CEA-608/CEA-708 in Line 21 video, ATSC 53, SCTE 20, SCTE 128 and SMPTE 436M; SMPTE Timed Text and variations, including DFXP; EBU Subtitles, including STL; SRT; SCC

OVERVIEW

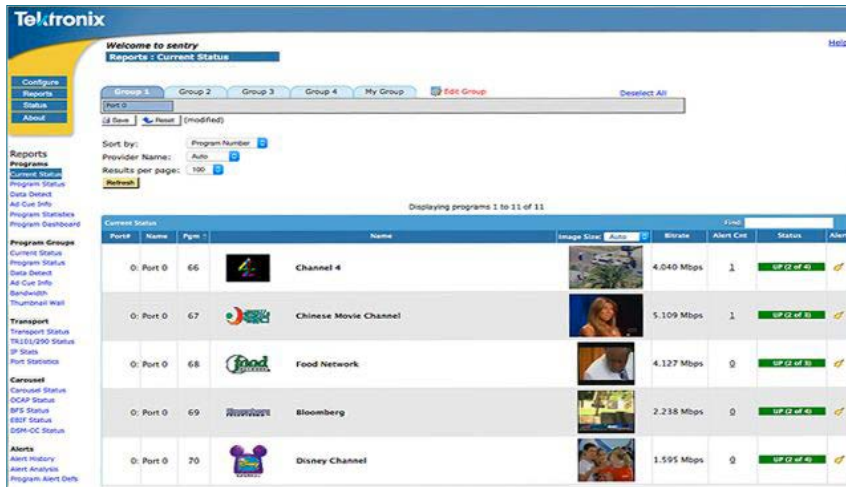
- Unparalleled, scalable speed
- Faster than real-time 4K analysis
- Enhanced Adaptive Bit Rate (ABR) support
- Configurable automated workflows
- QC report analytics
- Integrated audio loudness correction

SENTRY VIDEO NETWORK MONITORS

The Sentry portfolio of Video Network Monitoring Solutions enables you to deliver an outstanding customer viewing experience. Gain confidence knowing that your content will meet all regulatory compliance standards, reduced downtime and lower operational costs. Our software-based solutions offer scalability and an easy-to-use web interface.



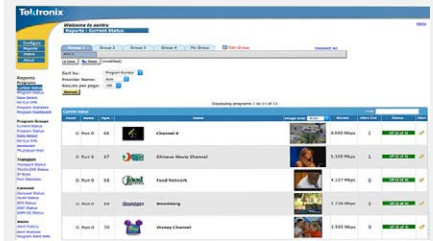
	SENTRY	SENTRY VERIFY	SENTRY ABR	MEDIUS
Description	Scalable and comprehensive QoE and QoS video network monitoring solution	Scalable and comprehensive QoS video network monitoring solution	Active ABR post-fragmentation monitoring with QoS and QoE metrics	Medius: Multi-sight video management across entire network
Software Specs	Supports MPEG-2, VC-1, H.264, H.265, and JPEG2000 video formats; provides QoS and QoE measurement, monitoring and analysis; performs PVQ measurements on H.264 and H.265 advanced codecs	Supports MPEG-2, VC-1, H.264, H.265, and JPEG2000 video formats; provides QoS measurement, monitoring and analysis	Supports MPEG-2, VC-1, H.264 and H.265 video formats; supports Apple's HTTP Live Streaming, Microsoft's Smooth Streaming and MPEG DASH Protocols with HTTP statistics	Multiple-view alert dashboard reporting; QoS and QoE reporting.
Hardware Specs	Supported interfaces include 1G copper + 1/10G SFP+ options, 1 and 4 port ASI, DVB S/S2, 4 or 8-tuner QAM A/B/C; RAID hard drives, AC Power, 1RU	Supported interfaces include 1G copper + 1/10G SFP+ options, 1 and 4 port ASI, DVB S/S2, 4 or 8-tuner QAM A/B/C; RAID hard drives, AC Power, 1RU	Firefox, Safari and IE browser support. MPEG/IP input port is 1000BASE-T Ethernet interface or 10GBASE-(LR or SR) interface. Management port is 1000BASE-T Ethernet interface	Firefox, Safari and IE browser support. MPEG/IP input port and Management port are 1000BASE-T Ethernet interfaces



Sentry - Scalable and Comprehensive QoE and QoS Video Network Monitoring Solution

Sentry is a scalable and comprehensive quality of experience (QoE) and quality of service (QoS) video network monitoring solution for advanced video networks. Sentry enables video service providers to deliver optimum quality while reducing operational expenditures.

PRODUCT HIGHLIGHTS



High performance QoS, QoE and PVQ monitoring for data center and central broadcast locations with Sentry Premium



Our next-generation software solutions facilitate error detection and problem resolution

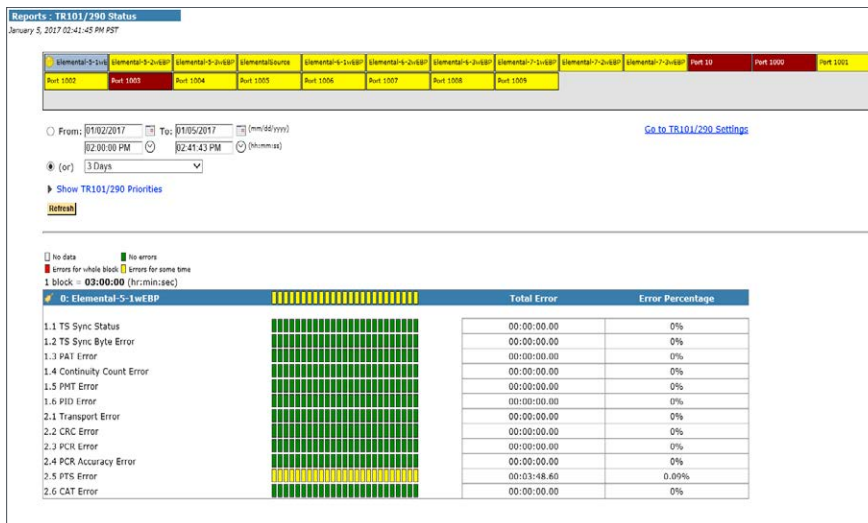
MODEL	FORM FACTOR	VIDEO FORMATS
Sentry	Supported interfaces include 1G copper + 1/10G SFP+ options, 1 and 4 port ASI, DVB S/S2, 4 or 8-tuner QAM A/B/C; RAID hard drives, AC Power, 1RU	Supports MPEG-2, VC-1, H.264, H.265, and JPEG2000 video formats. Provides QoS and QoE measurement, monitoring and analysis. Performs PVQ measurements on H.264 and H.265 advanced codecs.
Sentry Premium	Supported interfaces include 1G copper + 1/10G SFP+ options; RAID SSD drives, Dual AC or DC Power, 1RU	Supports MPEG-2, VC-1, H.264, H.265, and JPEG2000 video formats. Provides twice the amount of QoS and QoE measurement and monitoring. Performs triple the PVQ measurements on H.264 and H.265 advanced codecs.
Cloud / Virtual	AWS, Google, Azure, or VM	Supports MPEG-2, VC-1, H.264, H.265, and JPEG2000 video formats. Provides QoS and QoE measurement, monitoring and analysis. Performs PVQ measurements on H.264 and H.265 advanced codecs.

RECOMMENDED SOFTWARE

DPI	Digital Program Insertion Monitoring
ADV-DPI	Advanced DPI Monitoring
PVQ	Perceptual Video Quality Monitoring for MPEG-2 codec
PVQ-H264	Perceptual Video Quality Monitoring for H.264 codec
PVQ-H265	Perceptual Video Quality Monitoring for H.265 codec
IDR-EBP	Instantaneous Decoder Refresh and Encoder Boundary Point Module
NEX	Advanced Closed-Caption Monitoring
DCU-OCAP	Monitoring support for tru2way (OCAP), MHP and DSM-CC in-band carousels
EBIF	EBIF (eTV) monitoring

OVERVIEW

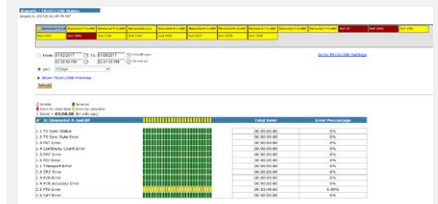
- Real-time 24/7 QoS and QoE monitoring and analysis of entire channel line-up
- In-depth monitoring for compliance to regulatory standards
- PID-level IDR/EBP reporting and alerting
- User-triggered and alert-triggered stream captures
- Performs perceptual video quality measurements on H.264 and H.265 advanced codecs



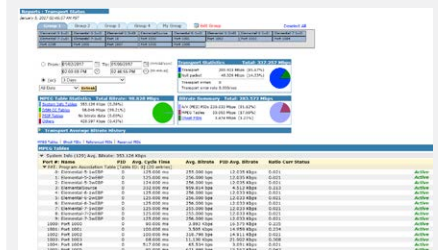
Sentry Verify

Sentry Verify is a cost-effective solution for large-scale deployments at hub sites and other remote locations. It provides necessary, accurate, and timely information to help identify faults within the IP network and is integrated with industry-leading management solutions to accelerate troubleshooting and root-cause analysis.

PRODUCT HIGHLIGHTS



High performance QoS monitoring for large data center and central broadcast locations with Sentry Verify Premium



Sentry Verify monitors and validates MPEG transport stream integrity and reports video-over-IP transport errors

MODEL	HARDWARE SPECIFICATIONS	SOFTWARE SPECIFICATIONS
Sentry Verify	Supported interfaces include 1G copper + 1/10G SFP+ options, 1 and 4 port ASI, DVB S/S2, 4 or 8-tuner QAM A/B/C; RAID hard drives, AC Power, 1RU	Supports MPEG-2, VC-1, H.264, H.265, and JPEG2000 video formats. Provides QoS measurement, monitoring and analysis.
Sentry Verify Premium	Supported interfaces include 1G copper + 1/10G SFP+ options; RAID SSD drives, Dual AC or DC Power, 1RU	Supports MPEG-2, VC-1, H.264, H.265, and JPEG2000 video formats. Provides high performance QoS measurement, monitoring and analysis for large data center and central broadcast locations.

RECOMMENDED SOFTWARE

DPI	Digital Program Insertion Monitoring
ADV-DPI	Advanced DPI Monitoring
NEX	Advanced Closed-Caption Monitoring
DCU-OCAP	Monitoring support for tru2way (OCAP), MHP and DSM-CC in-band carousels
EBIF	EBIF (eTV) monitoring
ALM	Audio loudness module

OVERVIEW

- Detect MPEG and IP Issues
- Comprehensive TR 101 290 measurements
- Live thumbnails and thumbnail wall
- Alert-triggered stream captures
- Achieve regulatory compliance
- Program availability reporting



Sentry ABR

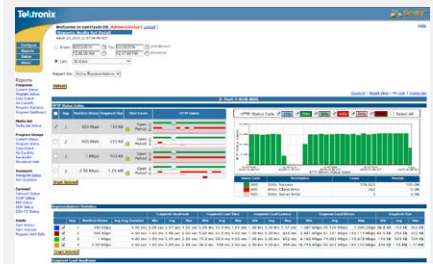
Sentry ABR is part of our end-to-end video quality and service assurance solutions for monitoring over-the-top (OTT), TV Everywhere and multi-screen services. Sentry ABR provides a comprehensive and scalable QoS and QoE monitoring solution for post-fragmented adaptive bit rate (ABR) streams for coverage throughout the network.

MODEL	PLATFORMS	KEY BENEFITS	VIDEO CODECS	AUDIO CODECS
Sentry ABR	Cloud (AWS, Google or Azure), Virtual Machine (VM) or Appliance	QoE and PVQ measurements for multi-screen, OTT and TV Everywhere services; enables quantifying and comparing video quality across profiles	MPEG-2, H.264, H.265, VC-1	Dolby AC-3 (5.1 Surround), E-AC-3 MPEG-1 Layer II (Mono, Stereo) AAC, HE-AAC, and HE-AAC v2

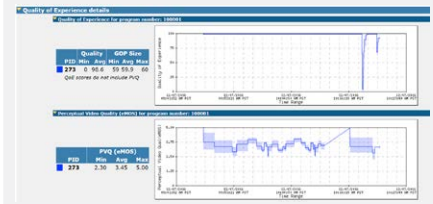
RECOMMENDED SOFTWARE

PVQ	Perceptual Video Quality
PVQ-H264	Perceptual Video Quality for H264
PVQ-H265	Perceptual Video Quality for H265
DECRYPT	Decryption support for DRMs
QOE	Quality of Experience Module

PRODUCT HIGHLIGHTS



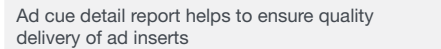
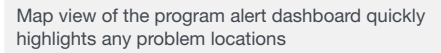
Media set detail report shows HTTP status codes, representation statistics and fragment statistics



ABR decryption capabilities enable QoE and PVQ measurements.

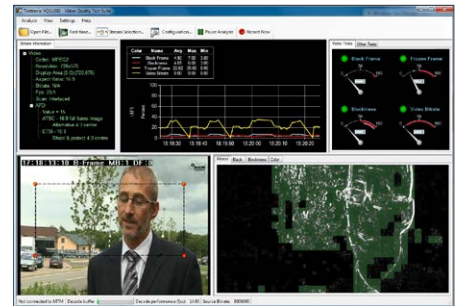
OVERVIEW

- ABR decryption and DRM Support provide QoE and PVQ measurements for decrypted and decoded video and audio
- Supports Apple's HLS, Microsoft's Smooth Streaming and MPEG DASH Protocols with HTTP statistics
- Proactively monitors all available ABR media from the source to the edge of the network



MPEG ANALYZERS AND MPEG SOFTWARE SOLUTIONS

Tektronix MPEG Analysis Instruments are the industry standard for MPEG stream analysis and interoperability testing. Tektronix MPEG Analyzer Software allows 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 syntax errors. Our QoE software analysis tools shorten the time needed to find root causes of issues by identifying impairments and artifacts that can be traced directly to network issues.



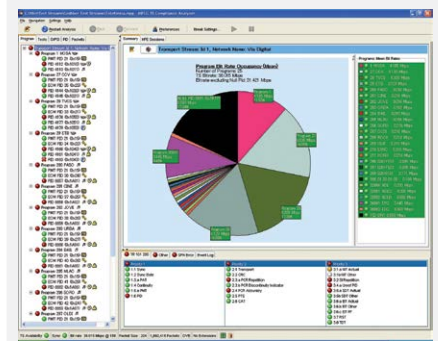
	MTS4000	MTS4EAV7	MTS4SAV3	VQS
Description	MPEG test system providing comprehensive MPEG transport stream analysis and interoperability testing. Captures events for deep analysis to find the root cause of problems.	HEVC / AVC Video and Compressed Audio Analyzer—a powerful PC-based software package for deferred time analysis of encoded video and audio elementary streams and closed captions	Software-based MPEG transport stream analyzer with an innovative high-speed analysis engine and built-in intelligence for ultrafast pinpointing and debugging of intermittent faults in MPEG transport streams	Video quality monitoring software for MPEG-2 or H.264 video that identifies stuck, black, macroblocking, and compression artifacts. Innovative impairment displays highlight the location and severity of video defects enabling faster mean time to detect and repair issues.
Analysis	TSCA (real-time and deferred), Carousel, IP Video, T-STD Buffer Analyzer (optional), PES (optional), Elementary Stream (optional), QoE (optional), Picture Quality (optional), Closed Caption (optional)	Stream Compliance Verification, Buffer Analysis with Graphical Plots, Audio Analysis, Closed Caption. Text Analysis: Closed Caption (CEA 608, CEA 708, SCTE 20/21)	TSCA with CaptureVu™, PES, T-Std Buffer, Carousel, ES, Closed Caption	Identifies stuck, black, macro-blocking, and compression artifacts in MPEG-2 or H.264 video. Log live data captures min, max, and average impairment values and bit rates at user-definable time intervals. Analyzes decoded MPEG-2, AC-3, MPEG-2 AAC, and MPEG-4 AAC audio to identify loudness problems per ITU-R BS.1770/1771.
Network Interfaces	GbE (NIC), Multiport ASI (optional), 8VSB (optional), QAM-B(optional), IPTV 1Gb Ethernet (optional), 10Gb Ethernet (optional), DVB-S/S2 (optional), Optical Ports (optional)	Ethernet	Ethernet	Ethernet
Multiplex Layers	Transport Stream, Elementary Stream and Baseband (optional)	Elementary Streams	Transport Stream, Program Stream, Elementary Stream and Baseband(optional)	Elementary Streams, Baseband



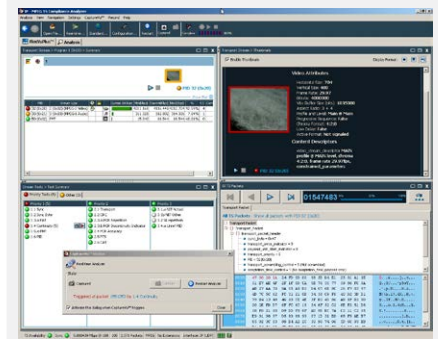
MTS4000 MPEG Test System

The MTS4000 MPEG Test System provides MPEG transport stream analysis and interoperability testing. Its deep analysis of the transport streams, PES, and elementary streams tracks down sources of picture anomalies and identifies streams with syntax errors. The optional QoE analysis tool identifies impairments that can be traced to network issues.

PRODUCT HIGHLIGHTS



Transport Stream Compliance Analyzer



MTS4000 CaptureVu®

MODEL	DESCRIPTION	GENERATION	ANALYSIS	NETWORK INTERFACES	MULTIPLEX LAYERS
MTS4000	MPEG test system providing comprehensive MPEG transport stream analysis and interoperability testing. Captures events for deep analysis to find the root cause of problems.	IP, Transport Stream, TS Cutter, Multiplexer (optional), TS Editor (optional), Make Seamless (optional), Carousel (optional), Tclips (optional)	TSCA (real-time and deferred), Carousel, IP Video, T-STD Buffer Analyzer (optional), PES (optional), Elementary Stream (optional), QoE (optional), Picture Quality (optional), Closed Caption (optional)	GbE (NIC), Multipoint ASI (optional), 8VSB (optional), QAM-B (optional), IPTV 1Gb Ethernet (optional), 10Gb Ethernet (optional), DVB-S/S2 (optional), Optical Ports (optional)	Transport Stream, Elementary Stream and Baseband (optional)

RECOMMENDED SOFTWARE

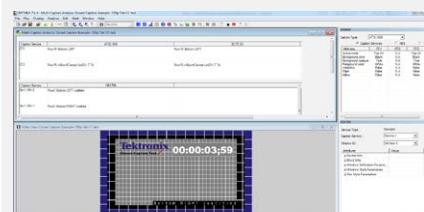
PQ	Picture quality analysis software
PB	Adds PES and T-STD Buffer Analyzers; includes HEVC buffer analysis and PES with AVC, HEVC and AC-3 codec analysis
CA	Adds Closed Caption Analyzer for CEA608, CEA708, SCTE20/21
FLT	Add floating license (all floating licenses include the same capabilities)

OVERVIEW

- Supports a wide range of DTV standards including MPEG, DVB, ATSC, ISDB, and ISDB-TB (Brazil)
- Analyzes constant bit rate (CBR) and variable bit rate (VBR) streams
- Captures and analyzes system events to debug intermittent and complex problems
- H.265 (HEVC) and H.264 buffer analysis, multiplexing, and ES compliance checking



PRODUCT HIGHLIGHTS



Caption decode and analysis ensures regulatory compliance

MTS4EAV7 HEVC / AVC Video and Compressed Audio Analyzer

MTS4EAV7 HEVC / AVC Video and Compressed Audio Analyzer is a powerful PC-based software package for deferred time analysis of encoded video and audio elementary streams and closed captions. Supported video standards include HEVC (H.265), AVC / H.264, VC-1, MPEG-2, MPEG-4 part 2, and H.263. Supported audio standards include MPEG-2 audio, AAC, and AC-3.

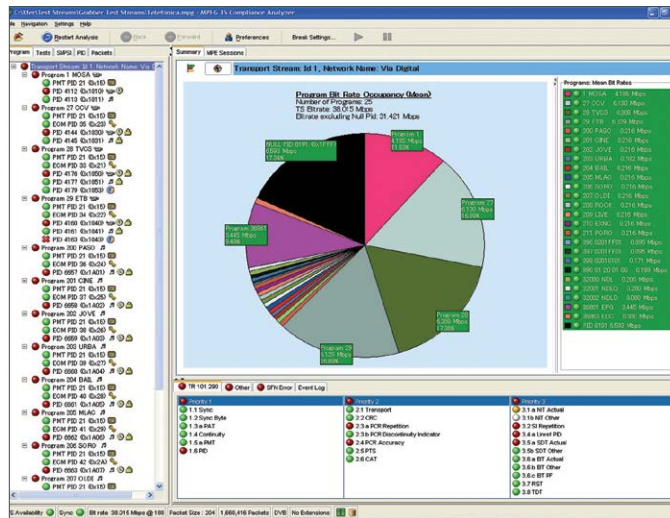
MODEL	DESCRIPTION	ANALYSIS	MULTIPLEX LAYERS	AUDIO STANDARDS	VIDEO STANDARDS
MTS4EAV7	Powerful PC-based software package for deferred time analysis of encoded video and audio elementary streams and closed captions.	Stream compliance verification, Buffer analysis with graphical plots, Audio analysis, Closed caption text analysis: (CEA 608, CEA 708, SCTE 20/21)	Elementary Streams	MPEG-1 Part 3 Layers I and II; MPEG-2 Part 3 Layers I and II; MPEG-2 Part 7 (AAC) Main (Excludes LC and SSR); MPEG-4 Part 3 AACMain, AAC LC, AAC LTP, SBR; Dolby Digital (AC-3) Baseline Standard, Annex D: Extended/Alternate Bit Stream	HEVC/H.265, AVC/H.264, AVC Intra, SVC, VC-1, MPEG-4 Part 2,3GPP, MPEG-2, H.263, H.261, Closed Caption (CEA 608, CEA 708, SCTE 20/21)

RECOMMENDED SOFTWARE

HEVC	Adds HEVC / H.265 codec support, main profile, all levels
CA	Adds enhanced closed caption analysis capabilities; supports CEA608, CEA708 and SCTE20/21 captions
FLT	Adds one additional floating license

OVERVIEW

- Base software includes support for AVC / H.264 baseline, main, extended and high (plus Intra) profiles codec, MPEG-4 advanced simple profile (Level 0 to 5), MPEG-2 main and 4:2:2 profiles at high level, and VC1 all profiles, all levels.
- Audio decode and analysis (including MPEG-2 Layer 1 and 2, AAC, HE AAC, and AC-3), and A/V delay measurement;
- One floating license



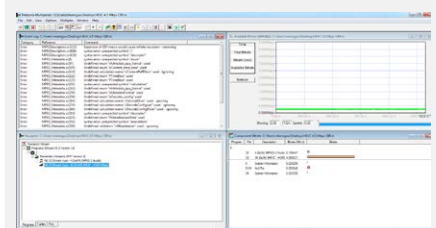
MTS4SAV3 Transport Stream Analyzer

MTS4SAV3 Transport Stream Analyzer is a digital video debugger/analyzer that includes Tektronix CaptureVu® technology, a capability that captures and analyzes system events in real time to debug the intermittent and complex problems that traditional analyzers miss.

PRODUCT HIGHLIGHTS



Transport Stream Compliance Analyzer user interface



Offline multiplexer provides support for manipulating H.265 (HEVC) and H.264/AVC content into Transport Streams

MODEL	DESCRIPTION	ANALYSIS	MULTIPLEX LAYERS	AUDIO STANDARDS	VIDEO STANDARDS
MTS4SAV3	Software-based MPEG transport stream analyzer with an innovative high-speed analysis engine and built-in intelligence for ultrafast pinpointing and debugging of intermittent faults in MPEG transport streams.	TSCA with CaptureVu™, PES, T-STD Buffer, Carousel, ES, Closed Caption	Transport Stream, Program Stream, Elementary Stream and Baseband (optional)	MPEG-1, MPEG-2, MPEG-4, AC-3	MPEG-2, MPEG-4, H.264, H.265/HEVC, JPEG2000, VC-1

RECOMMENDED SOFTWARE

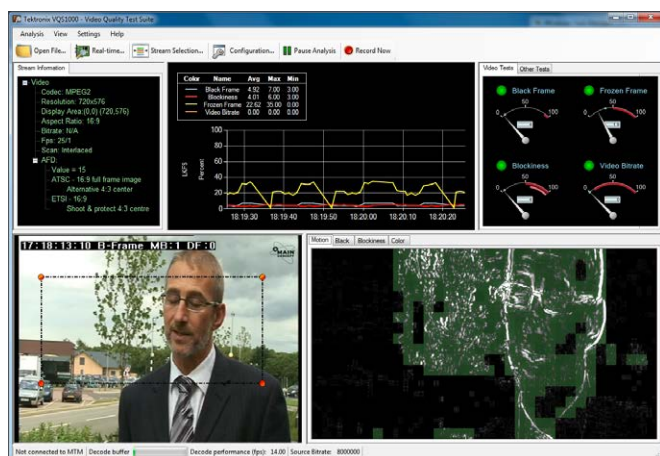
TCMP	Adds real time and deferred time Transport Stream Compliance Analyzer, Carousel Analyzer, TS Cutter, and MPEG Player
PB	Adds PES and T-STD Buffer Analyzer; includes HEVC buffer analysis and PES with AVC, HEVC and AC-3 codec analysis
CA	Adds Closed Caption Analyzer for CEA608, CEA708, SCTE20/21
GEN	Adds stream generation capabilities – includes deferred time Multiplexer, Carousel Generator, ISDB-T Remux, and TS Editor; also includes HEVC stream generation capabilities
ESB	Adds enhanced ES analysis – includes MTS4EAV7 base software (single user license only) and ES Analyzer

RECOMMENDED SOFTWARE

ESE	Adds enhanced ES analysis – includes MTS4EAV7 software with all options including HEVC codec support (single user license only) and ES Analyzer
VQ	Adds video quality monitoring software, single ended – includes VQS1000 software with all options
PQ	Adds picture quality analysis, single and double ended – includes PQASW software with Option IP
FLT	Adds floating license (all floating licenses include the same capabilities); for multiple licenses, order multiple Option FLT

OVERVIEW

- Deferred-time and real-time analysis modes
- Support for legacy and next generation compression standards
- Transport stream compliance uses latest ATSC, DVB, ISDB and MPEG standards
- CaptureVu® technology debugs intermittent and complex problems
- Triggered recording
- HEVC/AVC elementary stream analysis



VQS1000 Video Quality Monitoring Software

VQS1000 is video quality monitoring software for MPEG-2 or H.264 video that identifies stuck, black, macro-blocking and compression artifacts. Innovative impairment displays highlight the location and severity of video defects enabling faster mean time to detect and repair issues.

MODEL	DESCRIPTION	ANALYSIS	MULTIPLEX LAYERS	AUDIO STANDARDS	VIDEO STANDARDS
VQS1000	Video quality monitoring software for MPEG-2 or H.264 video that identifies stuck, black, macro-blocking and compression artifacts. Innovative impairment displays highlight the location and severity of video defects enabling faster mean time to detect and repair issues.	Log live data to capture min, max, and average impairment values and bit rates, at user-definable time intervals. Analysis of decoded MPEG-2, AC-3, MPEG-2 AAC, and MPEG-4 AAC audio to identify loudness problems per ITU-R BS.1770/1771.	Elementary Streams, Baseband	MPEG-2, AC-3, MPEG-2 AAC, MPEG-4 AAC, ITU-R BS.1770/1771	MPEG-2, H.264

RECOMMENDED SOFTWARE

AUD	Audio analysis option for VQS series software
LUD	Installation on a pre-existing MTS/PQA series dongle
USB	USB security dongle supplied with stand-alone software package

PRODUCT HIGHLIGHTS



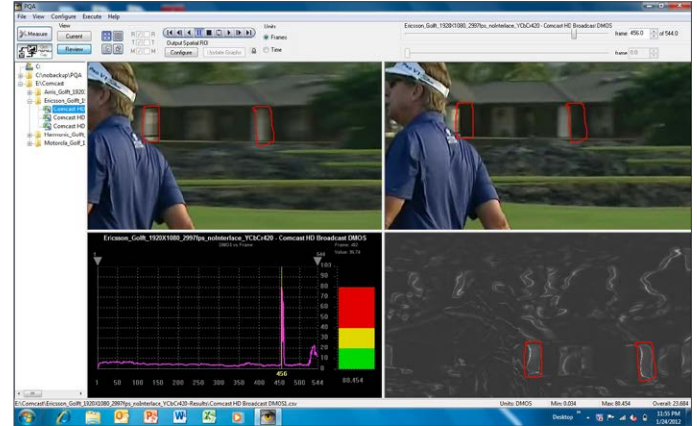
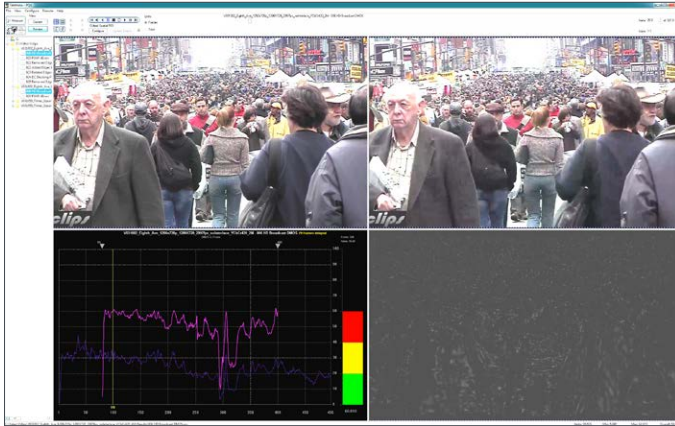
Video quality analysis detecting blockiness in the picture

OVERVIEW

- MPEG-2 and H.264 codec support
- Stuck/frozen video detection
- Black video detection
- Detects macro-blocking and compression artifacts
- Color display using Tektronix Diamond display
- QoE dashboard

PICTURE QUALITY ANALYSIS SOLUTIONS

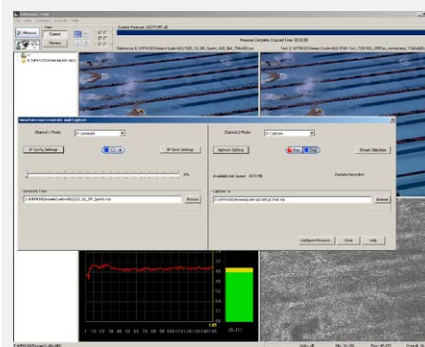
The true measure of any television system is viewer satisfaction. Based on the concepts of the human vision model, Tektronix Picture Quality Analyzers (PQAs) provide a suite of repeatable, objective quality measurements that closely correspond with subjective human visual assessment.



	POASW
Description	Picture quality analysis software based on the concepts of the human vision system. Provides a suite of repeatable, objective quality measurements that closely correspond with subjective human visual assessment.
Key Features	Fast, accurate, repeatable, and objective picture quality measurement; Predicts Differential Mean Opinion Score (DMOS) based on human vision system model; IP interface with simultaneous Generation/Capture and 2-Ch capture (Option IP); Picture quality measurements can be made on a variety of UHDTV1/4K formats (3840×2160, 4096×2160), HD video formats (1080p, 1080i, 720p) and SD video formats (525i or 625i)
Applications	Codec design, optimization, and verification; Conformance testing, transmission equipment, and system evaluation; Digital video mastering; Video compression services; Digital consumer product development and manufacturing



PRODUCT HIGHLIGHTS



PQA software running on the MTS4000

PQASW Picture Quality Analysis Software

Picture quality analysis software (PQASW) is based on the concepts of the human vision system which provides a suite of repeatable, objective quality measurements that closely correspond with subjective human visual assessment.

MODEL	DESCRIPTION	ADDITIONAL KEY FEATURES	APPLICATIONS
PQASW	Picture quality analysis software based on the concepts of the human vision system. Provides a suite of repeatable, objective quality measurements that closely correspond with subjective human visual assessment.	Region of interest (ROI) on measurement execution and review; Automatic temporal and spatial alignment; Embedded reference decoder; Easy regression testing and automation using XML scripting (Option ADV) with "Export/Import" file from GUI; Multiple results view options; Embedded sample reference and test sequences; Installs on your own PC	Codec design, optimization, and verification; Conformance testing, transmission equipment, and system evaluation; Digital video mastering; Video compression services; Digital consumer product development and manufacturing

RECOMMENDED SOFTWARE

ADV	Advanced measurement package (script operation, measurement configurability, weighting measurements)
IP	IP generation / capture
USB	USB dongle
PPD	Parallel port dongle
LUD	Adds permissions to an existing dongle

OVERVIEW

- Fast, accurate, repeatable, and objective picture quality measurement
- Predicts DMOS based on human vision system model
- Embedded reference decoder
- Multiple results view options
- Embedded sample reference and test sequences
- Installs on your own PC

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