

Multiformat, Multistandard Waveform Rasterizers

WVR7120 • WVR7020 • WVR6020 Data Sheet



WVR7x20 Note: LCD display not included.

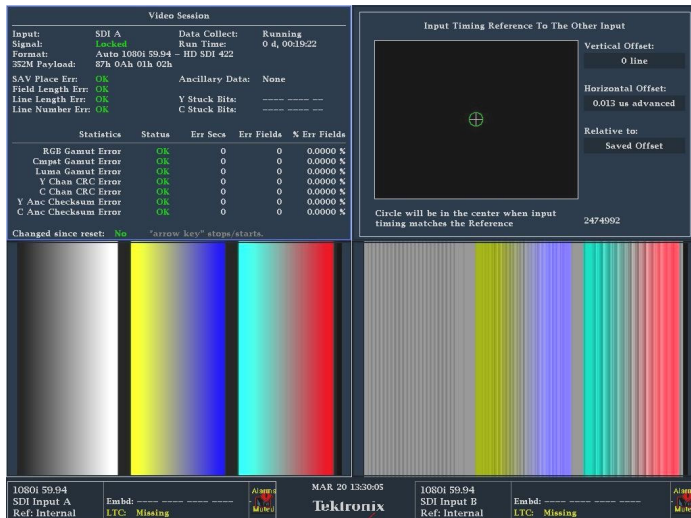
Features & Benefits

- The WVR7x20 Series offers Dual Link, SD, HD, analog video, and audio monitoring options in one platform
- The WVR7120 measurement and monitoring options provide a flexible range of configurations to maximize productivity
 - Industry-leading Loudness monitoring capabilities
 - Loudness Trend Chart with adjustable display window
 - Simultaneous CEA608 and CEA708 Closed Caption monitoring
 - Adjustable Dolby Guard Band limits with Dolby Guard Band metering
 - Automatic Format Description (AFD) detection with automatic graticule display
 - Broadcast Flag/CGMS detection
 - Black/Frozen picture detect

- Numerical and graphical display of A/V delay for analog, digital, and Dolby audio formats
- Simultaneous A/B input support to extend monitoring functions
- High-performance physical layer measurements are essential to resolve difficult troubleshooting tasks
- CaptureVu® advanced video capture simplifies troubleshooting of intermittent errors
- Monitoring of three user-defined Vertical Ancillary (VANC) data types on the Auxiliary Data Status display – including user-definable names for the three VANC data packets with reference to their respective DID/SDID values
- Simultaneous monitoring of 16 channels of embedded AES audio on the audio level bar display. Option AD, DDE, or DPE required
- Preset Save Confirmation
- Exceptional audio monitoring with options for analog, digital, and Dolby Digital, Dolby E, and Dolby Digital Plus
- Tektronix See and Solve™ displays facilitate compliance verification with FlexVu™, the most powerful four-tile display available
- SNMP and Ethernet remote interface capabilities to facilitate centralized monitoring and control
- Instrument presets for quick recall of commonly used configurations
- Digital cursors for precise time and amplitude measurement
- Teletext decode and display capability helps operators quickly verify these data services
- Standard and user-definable Safe Area Graticules facilitate editing tasks reducing the need for reworks and format conversions

Applications

- Monitoring and compliance checking in content distribution and broadcasting
- Quality control in the content production and post production
- Equipment qualification and troubleshooting in the installation and maintenance of content creation and distribution facilities and systems



Multiformat support grows with your needs

WVR7120

Precision and leading-edge capabilities such as Physical Layer Measurement, Patented See and Solve™ Displays, CaptureVu, A/V Delay Monitoring, and Simultaneous Input Display make Tektronix the brand of choice for applications that require deep signal analysis and unquestionable accuracy.

The WVR7120 features the complete range of options of the product family and comes standard with SD video. It provides high-performance monitoring and measurement for applications from Analog Composite to SD-SDI, HD-SDI, and Dual Link video inputs with support for a variety of audio formats:

- Video Monitoring
 - DL (Dual Link)
 - HD (High Definition SDI)
 - SD (Standard Definition SDI)
 - CPS (Composite Analog)
- Audio Monitoring
 - AD (AES, Embedded, and Analog)
 - DDE (Dolby Digital and Dolby E)
 - DPE (Dolby Digital, Dolby Digital Plus, and Dolby E)
- Measurement and Analysis
 - EYE, PHY (Physical Layer)
 - SIM (Simultaneous Inputs)
 - AVD (A/V Delay)

This instrument supports flexible combinations of options and upgrades, providing an excellent solution for multiformat environments while protecting

your investment. For complete details regarding option and feature availability by model please refer to the section of this document on ordering information.

WVR7020

The WVR7020 provides an ideal solution for basic monitoring of Analog, Digital, SD, HD, and Multiple Audio formats. This flexible solution comes standard with SD-SDI video monitoring and can be equipped with options and upgrades to monitor different combinations of HD-SDI, Dual Link, and Composite Analog video. WVR7020 is an intelligent choice that prepares you for format transitions, growing with your needs.

Available audio options include support for Analog, AES/EBU, Embedded, Dolby Digital Plus, and Dolby E formats.

WVR6020

The WVR6020 offers performance monitoring capabilities for SD and Analog Video formats.

The AD audio option available for WVR6020 offers monitoring for Analog and Digital Embedded or AES/EBU audio.

Available monitoring options include Composite and Analog/Digital Audio.

From Analog to Advanced Digital Video in One Platform

Ideal for multiformat environments, the Tektronix family of waveform rasterizers provides flexible options and field-installable upgrade kits to monitor diverse video types including Dual Link, SD/HD-SDI, and Composite Analog.

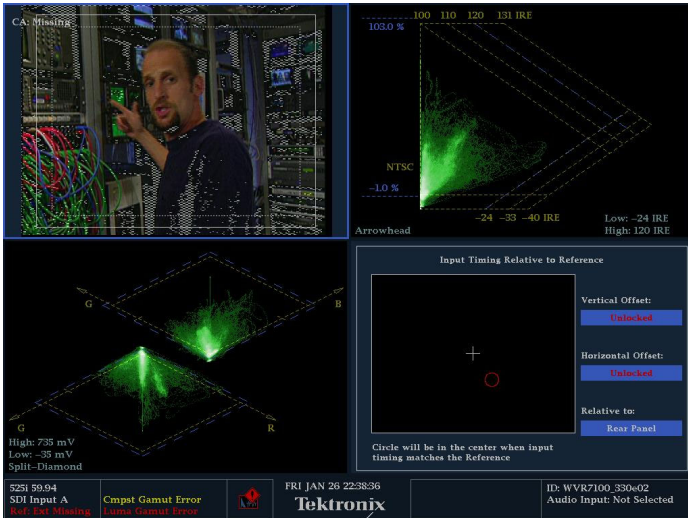
The WVR7020 and WVR7120 Option DL features Dual Link SMPTE 372M compliant monitoring with SMPTE 352M automatic format detection and selectable display of Alpha Channel. The latest WVR7x20 firmware includes monitoring for 2K Dual Link with XYZ Color Space on Option DL.

These instruments allow for monitoring of link A, B, or the combined input with a comprehensive set of displays and status report tools.

The Tektronix Timing display proves a valuable ally in maintaining correct timing between links A and B. This simple indication on the Timing display confirms the links are correctly connected.

Monitoring display modes such as Waveform, Vector, Gamut, Timing, Status, and Audio are available for the monitoring of Dual Link and other formats.

Each WVR7x20 Series instrument supports any combination of video and audio format options, so the platform excels on multiformat environments and evolves with your needs to protect your investment.



See and Solve™ displays detect and address problems quickly and efficiently

See and Solve™ with Tektronix Displays

Tektronix See and Solve™ displays simplify video monitoring tasks such as calibration, error detection, and content correction allowing users to detect errors at a glance and troubleshoot them efficiently.

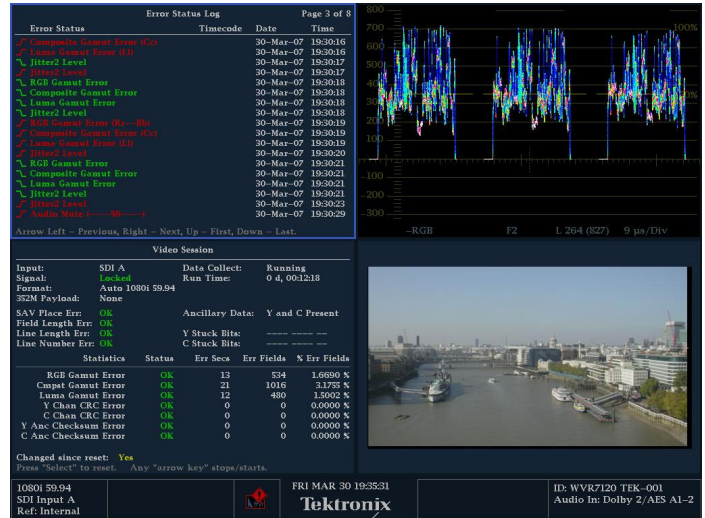
Specialized session and status displays provide summarized, yet comprehensive reports of conditions and measurements of content parameters. The powerful Error Log is configurable and provides detailed reports for up to 10,000 events which can be downloaded using a web browser. Alarms can also activate ground closures and SNMP traps simplifying centralized monitoring of multiple programs.

The FlexVu™ four-tile display provides maximum flexibility to increase your productivity.

Unlike instruments with predetermined view combinations or limited choices, FlexVu™ lets you create a multiview display tailored to your specific needs and work practices.

Each tile can be configured to enable easy signal analysis such as multiple alarm and status screens, different Safe Area Graticules and cursors on each tile, and more.

Tektronix displays offer the sharpest CRT-like trace quality for clear waveform monitoring without pixelation distortions.



FlexVu™, the display that adapts to your work practices

The patented Tektronix Diamond, Split Diamond, and Arrowhead gamut displays simplify the process of verifying gamut compliance.

The Diamond and Split Diamond displays help easily identify and correct RGB gamut errors in digital video signals. The Arrowhead display saves time in verifying composite gamut compliance on analog and digital video signals.

User-selectable gamut thresholds let you tailor these displays and the associated gamut alarms to your particular compliance standards.

You can also select bright-up conditions to see the location of gamut errors on the picture display.

The picture display can simultaneously detect and decode CEA608/708 Closed Caption. Teletext subtitle pages can also be decoded in either 625 formats or using OP47 Ancillary data. Flexible Safe Area Graticules allow for quick placement of graphics, titles, or logos. Using FlexVu™, users can see two or more pictures with different graticules or closed caption displays. Screen captures can be made through the local network. These can be initiated:

1. Manually
2. Automatically at specified intervals
3. By an error trigger



Physical Layer options provide precise measurements and powerful displays

Top Reliability on Physical Layer Measurements

Tektronix is the technological leader for eye/jitter measurement solutions.

Option EYE and PHY provide unique capabilities such as reporting jitter levels above 1 UI and jitter filters from 10 Hz to 100 kHz.

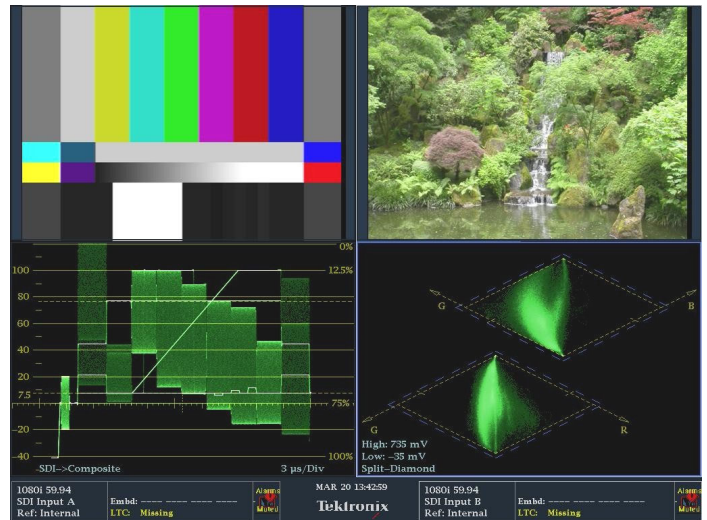
An easy-to-interpret gauge provides direct readout for jitter measurements.

The user can configure timing and alignment readouts to be displayed simultaneously to effectively isolate the sources of jitter.

The SDI Signal Status display summarizes key signal parameters such as signal strength, cable loss, and estimated cable length measurements.

Additionally, Option PHY provides exclusive Tektronix jitter waveform displays to view the jitter related to line and field rates. This option automatically measures eye amplitude, rise/fall time, and overshoot/undershoot.

With FlexVu™, you can simultaneously display timing and alignment jitter values, cable parameter measurements, and display different eye patterns to help quickly diagnose and resolve problems related to SDI timing jitter or cable attenuation.



Simultaneous Display, virtually two instruments in one

Simultaneous Input Display Boosts Monitoring Versatility

Option SIM takes multiformat monitoring to a new level.

This capability helps operational staff quickly determine if a video quality problem existed in the input signal or arose in their facility. It lets engineering staffs quickly detect, diagnose, and resolve technical problems introduced by a piece of video equipment by quickly comparing the input and output signals at each point of a chain.

This feature is especially helpful when checking for transparency during format conversion or for comparison of simulcast HD and SD programs.

FlexVu™ enables flexible and intuitive configuration of displays from two monitored inputs.

With WVR7120 Option SIM, you can display simultaneous fault detection, status reporting, alarm generation, and error logging.

The patented Tektronix Timing display can be used for each source to time each input relative to the reference or measure the timing between each input.

Audio and video signals can be displayed independently for each input.



Specialized tools like CaptureVu™ provide detailed content analysis

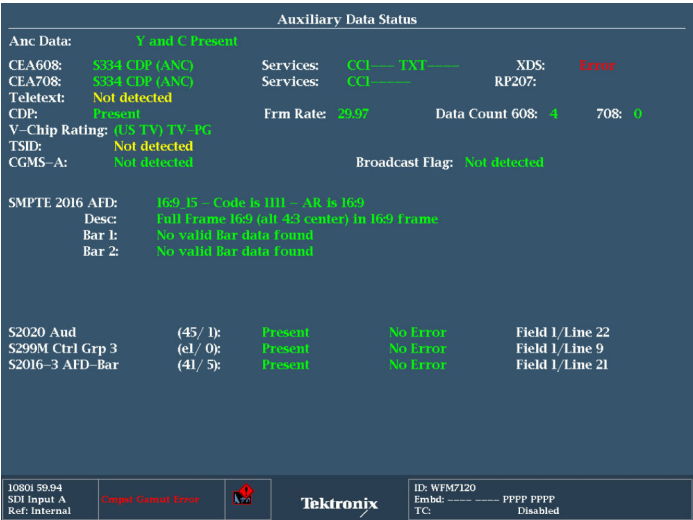
Monitoring of Auxiliary Data

New tools to monitor Ancillary data are now available on the WVR6020, WVR7020, and WVR7120 instruments.

With FlexVu each tile can display different CEA608/708 Closed Caption and individual Teletext subtitles or pages. The Auxiliary Data display decodes Ancillary data such as Active Format Description (ARIB information and aspect ratio that can be monitored using Active Format Descriptor, Video Index, or WSS) and ARIB information.

Aux Data Status provides summary information on a variety of metadata such as CEA608 or CEA708 Closed Caption, Broadcast Flag/CGMS, Teletext, ARIB, Time Code, Active Format Description (AFD), Video Index Aspect Ratio, and Wide Screen Signaling.

Today there is a wide variety of metadata providing information to various equipment through the processing chain. Monitoring of this metadata is critical to ensure that the processing equipment correctly handles the signal. For instance, correct format of the AFD ensures that the aspect ratio on the display is correctly formatted and automatic graticule display is available



Aux Status Display

for the picture display of the waveform monitor along with the binary data and text description.

Option DPE enables the display of VANC Dolby in Dolby Status display.

CaptureVu™, standard on WVR7120, captures the data of a video frame to recreate any trace display and analyze its digital structure. Captured data can be downloaded through the Ethernet port, using a web browser.

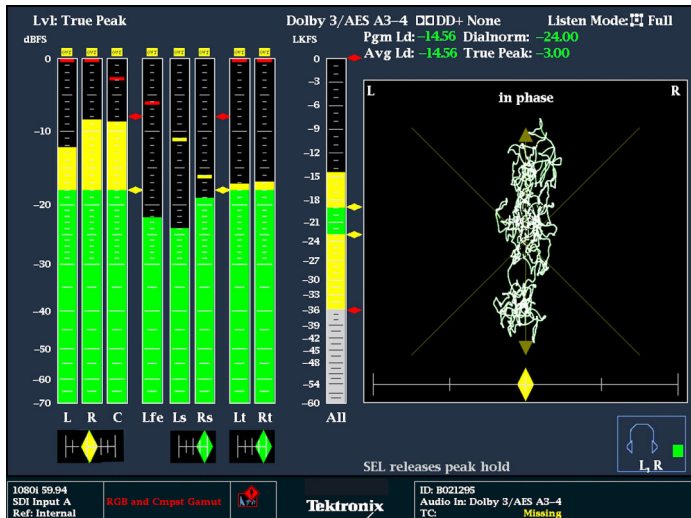
AFD Detection on Aux Status display, with automatic graticule and descriptive information in the picture display.

Asset protection using the Broadcast Flag/CGMS – A presence is displayed in the Aux Status display.

Monitoring of three user-defined Vertical Ancillary (VANC) data packets on the Auxiliary Data.

Black/Frozen Picture Detect (Alarm only)

The Black and Frozen frame alarm detect can be used to alert the operator to a problem in the transmission chain. These and other errors can automatically be logged in the error log and provided as a report.



Loudness Meter



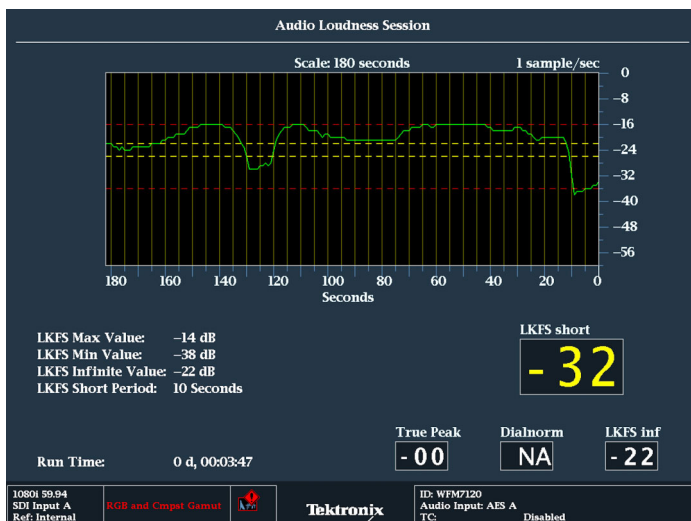
User-selectable Time Intervals

Loudness Monitoring

- Measure Loudness and true peaks per ITU-R BS.1770-2/1771 and ATSC RP A/85 recommendations
- Measure Loudness and true peaks of combination of discrete audio channels
- Measure Loudness of Dolby D, Dolby Digital Plus, and Dolby E audio channels
- Measure Loudness using infinite or short-term measurement techniques per ITU-R-BS.1770-2 specifications, and display both values simultaneously (user-selectable integration time in increment of seconds for short-term measurements)
- Start/Stop capability for the duration of the segment, showing infinite and short-term measurements
- Simultaneously display Dialnorm value from Dolby metadata and the measured Loudness value on the same display
- Loudness measurement value in LKFS per ITU-R-BS.1770-2
- Loudness meter is available on the audio-level meter display

Trend Analysis Features

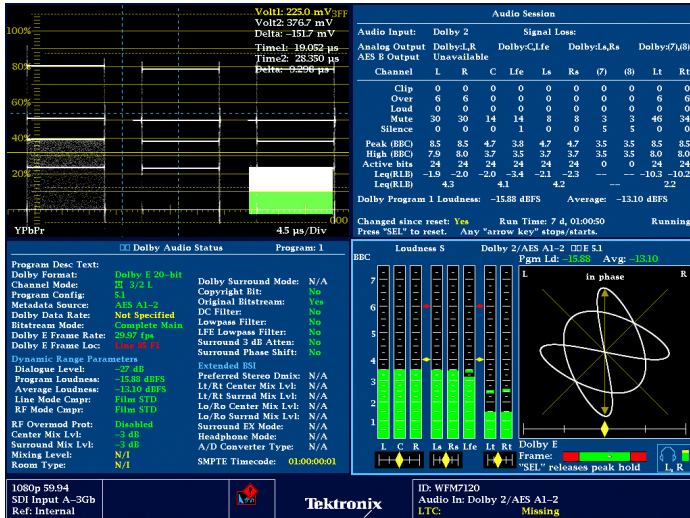
- Loudness Trend Chart with adjustable display window
- Storage of Loudness measurement values to USB or through Web UI



Audio Loudness Session



User-selectable Vertical Scaling



Comprehensive surround, Dolby, loudness, and channel status

Monitoring Tools for Optimum Sound Quality

The WVR Series provides high-quality digital filtering and oversampling to insure precise, reliable, and repeatable audio measurements.

For easy monitoring, the WVR audio options provide format auto-detection and flexible mapping of audio inputs to analog or digital audio outputs for connection to external devices.

The Tektronix Surround Display*1 provides an excellent means for viewing special audio relationships.

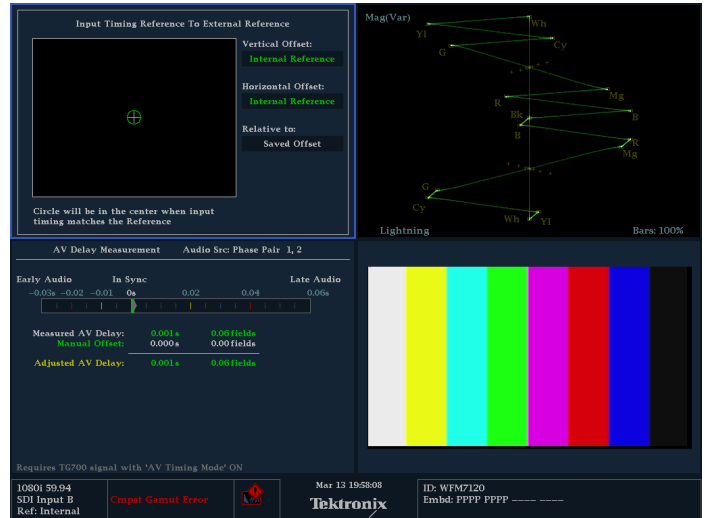
Specialized audio displays provide deeper insight of the signal. The audio session display summarizes levels, faults, and number of active bits for each channel. The user can select from three loudness filters: flat, A-weighted, and RLB (BS.1770-2). These instruments also feature Audio Control Packet Data and Channel Status displays.

The Dolby Status display (in Option DPE) gives an in-depth view of integrated or VANC metadata and Dolby E Guard Band A/V timing and synchronization.

User-configurable threshold for the Dolby E Guard Band timing measurement (WVR7120/7020 Option DPE): The user can monitor the Dolby E Guard Band timing and trigger alarms based on their specific guard band parameters.

Simultaneous monitoring of 16 channels of embedded AES audio on the audio level bar display – with Option AD or DPE.

*1 Audio Surround Sound Display licensed from RadioTechnische Werksstätten GmbH and Co. KG (RTW).



Timing and Lightning displays simplify timing tasks

Facility Timing Made Easy

Audio/Video synchronization is an important challenge in the processing of video materials.

Option AVD displays the A/V delay on a graphical bar indicator. The measurement readout gives facility engineers the tool to insure system integrity and facilitate A/V delay compliance.

This option provides out-of-service measurement of A/V delay for analog or digital audio and video formats.

A TG700 is typically used/required to generate the SDI signal which contains the audio and video sequence that can be distributed through the system and measured by the waveform monitor.

The patented Tektronix Timing display makes facility timing easy through a simple graphical representation which shows the relative timing of the input signal and reference signal on an X-Y axis.

The Lightning display shows luma and chroma amplitudes and helps you verify component timing using a color bar header signal. The SCH Phase display helps quickly verify the relationship of the subcarrier to H sync. composite analog video signals.



WVRFP provides flexibility for remote monitoring applications

Remote Interfaces Facilitate Centralized Monitoring

The WVR Series instruments can be remotely accessed and controlled through a remote front panel, web interface, ground closures, and SNMP, helping users to integrate these instruments into a variety of remote monitoring applications.

The remote front panel, WVRFP, with the same user interface as the front panel on the instrument, allows operators to access and control the base unit from a distance of up to 100 feet.

Users can control the WVR from the base unit and from the remote front panel simultaneously.

Through the Ethernet port, users have full control of the monitoring functions and download the alarm log and for detailed analysis or record keeping. This feature allows users to control an unlimited number of WVR instruments from a single Windows computer through a web browser.

The SNMP interface allows easy integration with network management software and advanced remote operation through a MIB browser. For applications in design and manufacturing or master control, this capability also enables automated tasks managed by an SNMP script.

Characteristics

Serial Digital Video Interface

Vertical Measurement Accuracy –

At 1X gain, $\pm 0.5\%$ of 700 mV full $\pm 1\%$ all gain settings scale.
At 5X gain, $\pm 0.2\%$ of 700 mV full scale.

Gain – 1X, 5X, variable.

Range 1X, 5X, variable.

Range 0.25X to $>7.5X$.

Frequency Response –

SD: Luminance (Y) channel $\pm 0.5\%$ Flat to 5.75 MHz, $\pm 1\%$ to 5.75 MHz, Color Difference channels (Pb, Pr) $\pm 0.5\%$ to 2.75 MHz.

HD: Luminance (Y) channel $\pm 0.5\%$ to 30 MHz, Color Difference channels (Pb, Pr) $\pm 0.5\%$ to 15 MHz.

Inputs – Two. The input auto-detects between HD and SD signals WVR7x20 (Option HD).

Option SIM – Enables two active channel configurations.

Input Type – Passive loopthrough BNC, 75 Ω compensated.

Input Level – 800 mV, $\pm 10\%$.

Return Loss –

≥ 25 dB from 1 MHz to 270 MHz (typical) power on.

≥ 15 dB from 1 MHz to 270 MHz (typical) power off.

> 15 dB from 1 MHz to 1.5 GHz (typical) power on.

> 10 dB from 1 MHz to 1.5 GHz (typical) power off.

Loopthrough Insertion Loss – For HD, equivalent to 10 m of type 8281 cable.

Loopthrough Isolation – > 50 dB to 300 MHz.

Receiver Equalization Range –

Typically:

for SD, to 250 m of type 8281 cable.

for HD, to 100 m of type 8281 cable.

Composite Video Interface (Option CPS)

Only available at time of the original order, not as an upgrade

Formats Supported – NTSC, NTSC no setup; PAL.

Inputs – Two, only one active at a time. Option SIM enables simultaneous monitoring of two SDI signals or one composite and one SDI channel.

Input Type – Passive loopthrough BNC, 75 Ω compensated.

Input Dynamic Range – ± 6 dB.

Maximum Operating Amplitude – -1.8 V to $+2.2$ V, DC + peak AC.

Absolute Maximum Input Voltage – -6.0 V to $+6.0$ V, DC + peak AC.

DC Input Impedance – 15 k Ω , nominal.

Return Loss – > 40 dB (typical) to 6 MHz, inputs and power on, typical 35 dB with power off.

Crosstalk between Channels – > 60 dB to 6 MHz.

Loopthrough Isolation – > 70 dB to 6 MHz.

DC Offset with Restore On – < 2 mV.

DC Restore 50 Hz and 60 Hz Attenuation –

Fast mode $> 95\%$ attenuation.

Slow mode $< 10\%$ attenuation.

Lock Range – ± 50 ppm remains locked.

Vertical Measurement Accuracy – $\pm 1\%$ all gain settings.

Gain – 1X, 5X, variable.

Range 1X, 5X, variable.

Range 0.25X to $> 10X$.

External Reference

Sync Formats – NTSC and PAL and tri-level sync.

Input Type – Passive loopthrough BNC, 75 Ω compensated.

DC Input Impedance – 15 k Ω , nominal.

Return Loss – >40 dB (typical) to 6 MHz, >35 dB to 30 MHz.

Lock Range – ± 50 ppm.

Monitor Output

Signal Format (XGA D-sub Output) – 1024 $\times$ 768, 60 Hz vertical rate.

Waveform Horizontal Deflection

Sweep Timing Accuracy – $\pm 0.1\%$.

Sweep Linearity – $\pm 0.1\%$.

Vector Characteristics

Vector Amplitude Accuracy – $\pm 2\%$.

Vector Phase Accuracy – $\pm 2^\circ$.

Audio Characteristics (Optional Capability)

Level Meter Resolution – 0.056 dB steps at 30 dB scale, from full scale to –20 dBFS.

User-selectable Scales –

Analog: dBu, Din, Nordic, VU, IEEE PPM, BBC Scale, and user definable.

Digital: dBFS, Din, Nordic, VU, IEEE PPM, BBC Scale, and user definable.

Meter Ballistics – Selectable from true peak, PPM type 1, PPM Type 2, and Extended VU.

Defined/Programmable Level Detection – Mute, clip user-programmable silence, over.

Level Meter Accuracy over Frequency – +0.1 dB (Digital), +0.5 dB (Analog) from 20 Hz to 20 kHz 0 to –40 dBFS sine wave, Peak Ballistic mode (except for within 5 Hz of some submultiples of the sampling frequency).

Digital Audio (Option DDE/DPE and AD)

Inputs – 2 sets with 8 channels each, 32-192 kHz, 24 bit. Meets requirements of AES 3-ID and SMPTE 276M-1995.

Input Characteristics – BNC, 75 Ω terminated, unbalanced, 0.1 V_{p-p} to 2 V_{p-p} .

Input Return Loss – 25 dB relative to 75 Ω_{p-p} from 0.1 to 24 MHz (typical).

Outputs – Up to 8 channels, AES3-ID output, 48 kHz 20 bit for embedded, 48 kHz 24 bit for analog to AES. For AES to AES loopthrough, output format equals input format. Meets requirements of SMPTE 276M-1995 (AES 3-ID). For decoded Dolby Digital, output is 24 bits at a rate of 32, 44.1, or 48 kHz for any one decoded pair. For decoded Dolby E, the output is 24 bits at 48 kHz or 47.952 kHz for up to 4 pairs.

Output Characteristics – BNC, 75 Ω terminated, unbalanced, 0.9 V_{p-p} to 1.1 V_{p-p} into 75 Ω .

Output Return Loss – >25 dB relative to 75 Ω_{p-p} from 0.1 to 6 MHz (typical).

Output Jitter – 3.5 ns, peak, typical, with 700 Hz high-pass filter per AES specification.

Analog Audio (Option DDE/DPE and AD)

Analog Inputs – 2 sets of 6 channels each.

Analog Input Characteristics – Balanced, unterminated through the rear-panel connector.

Cross Talk – <90 dB.

Input Impedance – 24 k Ω typical.

Analog Outputs – 8 channels.

Analog Output Characteristics – Balanced: unterminated through the rear-panel connector.

Maximum Output Level – Balanced: +24 dBu ± 0.5 dB.

Digital Input to Analog Output Gain Accuracy –

Over Frequency: ± 0.5 dB, 20 Hz to 20 kHz, 0 to –40 dBFS, 20- or 24-bit inputs.

Analog Input to Analog Output Gain Accuracy –

Over Frequency: +1.0 dB, 20 Hz to 20 kHz, 24 dBu to –16 dBu.

Output Impedance – 50 Ω , nominal.

Features

Feature	WVR7120	WVR7020	WVR6020	WVR7100	WVR7000	WVR6100
Eye Overshoot/Undershoot Automated Measurement (Option PHY)	X			X		X
Dual Link 2K Format XYZ Color Space Support (Option DL)	X	X				
Audio Channel Status Display (with any audio option)	X	X	X	X	X	X
Audio Loudness and Peak Measurement (ITU BS.1770-2) (with any audio option)	X	X	X	X	X	X
Dolby E Audio/Video Timing and Synchronization Measurement (Option DDE or DPE)	X	X		X		X
VANC Dolby Metadata Display (Evertz and Norpak Implementation) (Option DDE or DPE)	X	X		X		X
Audio/Video Delay Measurement Enhancement (Out-of-Service) (Option AVD)	X			X		
Teletext Detect and Decode (Closed Caption / Subtitle only)	X	X	X	X	X	X
Active Format Description (AFD) Decode – in ANC (SMPTE 2016)	X	X	X	X	X	X
Video Index Decode – Aspect Ratio Only (SMPTE RP186)	X	X	X	X	X	X
Wide Screen Signaling (WSS) Decode – both in PAL and in Digitized SD-SDI (ITU-BT.1119-2)	X	X	X	X	X	X
Simultaneous CEA608/708 Closed Caption Decode	X	X	X	X	X	X
Get/Load Captured Data through Network	X			X		X
Active Format Description (AFD) Decode and Display Enhancements (SMPTE 2016)	X	X	X	X	X	X
Decode and Display Broadcast Flag/CGMS	X	X	X	X	X	X
Dolby E Guard Band Monitoring with User-selectable Thresholds and Intuitive Bar Display (Requires Option DDE or DPE)	X	X		X		
Black and Frozen Picture Detect	X	X	X	X	X	X
ANC-LTC and ANC-VITC Time Code Detection and Selection	X	X	X	X	X	X
Infinite Persistence Mode for Trace, including Eye-pattern Trace (Requires Option EYE or PHY, and waveform trace)	X	X	X	X	X	X

Video Input and External Reference Formats Supported

Automatic Detection of a Wide Range of Signal Formats

The WVR7120, WVR7020, and WVR6020 waveform rasterizers accept a wide variety of input signal formats and external references. The monitor will automatically

detect the signal format and establish the appropriate settings for the various displays.

Supported Digital Formats (SD Standard on all units)

Standard	Format	Frame Rate (Hz)							
		60	59.94	50	30	29.97	25	24	23.98
292M (HD)	1920 × 1080i	X	X	X					
	1920 × 1080p				X	X	X	X	X
	1920 × 1080sF				X	X	X	X	X
	1920 × 1035i	X	X						
	1280 × 720p	X	X	X				X	X
259M (SD)	720 × 576i (625)			X					
	720 × 483i (525)		X						

The following chart illustrates the SDI (SD/HD) and Composite Analog video inputs (first column), cross referenced with their compatible external references.

Standard	Format	Frame Rate (Hz)							
		60	59.94	50	30	29.97	25	24	23.98
292M (HD)	1920 × 1080i	X	X	X					
	1920 × 1080p				X	X	X	X	X
	1920 × 1080sF				X	X	X	X	X

Supported Dual Link Formats

Format	Sample Structure	Frame/Field Rates
Dual Link		
1920 × 1080	4:2:2 YCbCr 10 bit	60, 60/1.001, and 50 progressive
	4:4:4 RGB	30, 30/1.001, 25, 24 and 24/1.001 progressive, PsF
	4:4:4:4 RGB+A 10 bit	
	4:4:4: RGB 12 bit	
	4:4:4 YCbCr	60, 60/1.001, and 50 fields interlaced
	4:4:4:4 YCbCr+A 10 bit	
	4:4:4 YCbCr 12 bit	
	4:2:2 YCbCr 12 bit	
2048 × 1080	4:2:2:4 YCbCr+A 12 bit	30, 30/1.001, 25, 24 and 24/1.001 progressive, PsF
	4:4:4 RGB 10 bit	
	4:4:4:4 RGB+A 10 bit	
	4:4:4 RGB 12 bit	
	4:4:4 YCbCr 10 bit	
	4:4:4:4 YCbCr+A 10 bit	
	4:4:4 YCbCr 12 bit	
	4:2:2 YCbCr 12 bit	
	4:2:2:4 YCbCr+A 12 bit	

Note: 2K XYZ Color Space is supported in Dual Link and 3 Gb/s.

Physical Characteristics

Dimension	mm	in.
Height	43.7	1.72
Width	482.6	19
Depth (Front to back, including handles and BNCs)	514.4	20.25
Weight, Typical	kg	lb.
Net	4.0	8.75
Shipping, approximate	7.2	15.7
Power 100 to 240 V AC ±10%, 50/60 Hz		

Ordering Information

All units come with SD-SDI Standard.

WVR7120

Performance base unit equipped for SD monitoring and optional capabilities to monitor HD Serial Digital Monitoring, Dual Link and Composite Analog video formats; options for Analog/Digital and Dolby Audio plus Physical Layer and Measurement.

WVR7020

Basic monitoring unit equipped for SD video with optional capabilities to monitor HD Serial Digital Monitoring, Dual Link and Composite Analog video formats plus Analog/Digital and Dolby Audio formats.

WVR6020

Basic monitoring unit equipped for SD video with optional capabilities to monitor Composite Analog video and Analog/Digital Audio.

Video Options

Option	Description	WVR6020	WVR7020	WVR7120
SD	STANDARD ON ALL UNITS	STD	STD	STD
CPS*2	Add support for monitoring NTSC/PAL composite analog video, 2 inputs with passive loopthrough outputs	X	X	X
HD	Add support for monitoring High Definition digital video formats, 2 auto-sensing SDI inputs		X	X
DL	Adds full Dual Link support		X	X
SIM	Adds support for simultaneous Channel 1, Channel 2 inputs			X
AVD	Adds support for AV delay measurements (requires signals provided from the TG700 with either the DVG7 or an HDVG7 module with A/V Timing mode enabled)			X
Audio Options (Customer can order only one audio option)				
AD	Add support for monitoring digital audio, embedded and AES/EBU inputs, up to 8 AES/EBU inputs (16 channels), up to 4 AES/EBU outputs (8 channels) capabilities available, plus support for monitoring analog audio, up to 12 analog audio inputs, up to 8 analog audio outputs	X	X	X
DPE	Add capabilities available in Option AD, plus support for monitoring Dolby Digital (AC-3), Dolby Digital Plus, and Dolby E		X	X
Analysis Options (Customer orders either EYE or PHY, not both)				
EYE	Add support for eye diagrams, jitter measurement, cable parameter measurements			X
PHY	Add capabilities available on Option EYE, plus jitter waveform and eye parameter measurements			X

*2 Only available at time of original order, not available as an upgrade.

Service Options

Option	Description
CA1	Provides a single calibration event or coverage for the designated calibration interval, whichever comes first
C3	Calibration Service 3 Years
C5	Calibration Service 5 Years
D1	Calibration Data Report
D3	Calibration Data Report 3 Years (with Option C3)
D5	Calibration Data Report 5 Years (with Option C5)
G3	Complete Care 3 Years (includes loaner, scheduled calibration and more)
G5	Complete Care 5 Years (includes loaner, scheduled calibration and more)
R3	Repair Service 3 Years (including warranty)
R5	Repair Service 5 Years (including warranty)

Power Options

Option	Description
A0	North America power plug
A1	Universal Euro power plug
A2	United Kingdom power plug
A3	Australia power plug
A5	Switzerland power plug
A6	Japan power plug
A10	China power plug
A11	India power plug
A12	Brazil power plug
A99	No power cord or AC adapter

Language Options

Option	Description
L0	English manual
L5	Japanese manual
L7	Simplified Chinese manual

Accessories

Option	Description
WVRRFP	Remote Front Panel for use with WVR7x20 and WVR6020 (includes 25 ft. cable)
	100 ft. cable for use with WVRRFP (same as 012-1682-xx)
	R3 – Repair Service 3 Years (including warranty)
	R5 – Repair Service 5 Years (including warranty)

Audio Cable

Opt. 62	Analog audio breakout cable, 6 ft. male 62-pin connector to 8 XLR male output connectors and 12 XLR female input connectors
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Post Sales

012-1688-xx	Audio breakout cable, 6 ft. male 62-pin connector to 8 XLR male connectors
012-1682-xx	100 ft. cable for use with Remote Front Panel (WVRRFP)

Upgrade Kit Nomenclature**Post Sale Upgrades**

Customers can upgrade previously purchased instrument by ordering the appropriate options from the upgrade kit associated with the product model as shown in the following table.

Upgrade	Description
WVR602UP	Upgrade kit for WVR6020 Upgrade by ordering WVR602UP with appropriate option: AD
WVR702UP	Upgrade kit for WVR7020 Upgrade by ordering WVR702UP with appropriate options: HD, DL, AD, and/or DPE
WVR712UP	Upgrade kit for WVR7120 Upgrade by ordering WVR712UP with appropriate options: HD, DL, SIM, AD, DPE, AVD, EYE, and/or PHY
Opt. IFC	Upgrade installation with calibration service

Video Upgrade Options

Option	Description	WVR712UP	WVR702UP	WVR602UP
HD	Add support for monitoring High Definition digital video formats, 2 auto-sensing SDI inputs	X	X	
DL	Add support for monitoring of Dual Link (requires Option HD)	X	X	
SIM	Add simultaneous monitoring of two HD/SD-SDI inputs or one HD/SD-SDI input and one CPS input. Option HD required for HD-SDI format support.	X		
AD	Add support for analog, embedded, and discrete AES/EBU audio, 8 digital and 12 analog inputs	X	X	X
DPE	Add capabilities in Option AD plus monitoring for Dolby Digital (AC-3), Dolby Digital Plus, and Dolby E	X	X	
ALOG	Add support for Audio Loudness Session display with trend chart and audio loudness data-saving capability. Audio option AD or DPE also required	X	X	X
AVD	Add support for out-of-service audio/video delay measurements. Audio option AD or DPE also required	X		
EYE	Add support for eye diagrams, jitter measurement, cable parameter measurements (for WVR7120)	X		
PHY	Add capabilities on Option EYE plus jitter waveform and automated eye measurements (for WVR7120)	X		



Tektronix is registered to ISO 9001 and ISO 14001 by SRI Quality System Registrar.

Contact Tektronix:

- ASEAN / Australasia (65) 6356 3900
- Austria 00800 2255 4835*
- Balkans, Israel, South Africa and other ISE Countries +41 52 675 3777
- Belgium 00800 2255 4835*
- Brazil +55 (11) 3759 7627
- Canada 1 800 833 9200
- Central East Europe and the Baltics +41 52 675 3777
- Central Europe & Greece +41 52 675 3777
- Denmark +45 80 88 1401
- Finland +41 52 675 3777
- France 00800 2255 4835*
- Germany 00800 2255 4835*
- Hong Kong 400 820 5835
- India 000 800 650 1835
- Italy 00800 2255 4835*
- Japan 81 (3) 6714 3010
- Luxembourg +41 52 675 3777
- Mexico, Central/South America & Caribbean 52 (55) 56 04 50 90
- Middle East, Asia, and North Africa +41 52 675 3777
- The Netherlands 00800 2255 4835*
- Norway 800 16098
- People's Republic of China 400 820 5835
- Poland +41 52 675 3777
- Portugal 80 08 12370
- Republic of Korea 001 800 8255 2835
- Russia & CIS +7 (495) 7484900
- South Africa +41 52 675 3777
- Spain 00800 2255 4835*
- Sweden 00800 2255 4835*
- Switzerland 00800 2255 4835*
- Taiwan 886 (2) 2722 9622
- United Kingdom & Ireland 00800 2255 4835*
- USA 1 800 833 9200

* European toll-free number. If not accessible, call: +41 52 675 3777

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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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