

Multistandard, Multiformat Waveform Monitors

WFM7120 • WFM7020 • WFM6120 Data Sheet



Features & Benefits

- The WFM7x20 Series offers 3G, Dual Link, SD, HD, analog video, and audio monitoring options in one platform
- The WFM7120 measurement and monitoring options provide a flexible range of configurations to maximize productivity
 - Simultaneous CEA608 and CEA708 Closed Caption Monitoring
 - ANC Inspector simplifies ANC Data Monitoring
 - Settable Dolby Guard Band Limits with Dolby Guard Band Metering
 - AFD (Automatic Format Description) 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
 - In-depth digital data analysis helps quickly resolve difficult quality and reliability issues
 - High-performance physical layer measurements of Eye and Jitter are essential to resolve difficult troubleshooting tasks
 - CaptureVu® advanced video capture simplifies troubleshooting of intermittent errors

- Exceptional audio monitoring, with options for analog, digital, and Dolby Digital or Dolby-E (on WFM7120 and WFM7020) formats reduce time and effort in verifying multichannel audio content
- 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 monitoring
- 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
- Front-panel USB and headphone ports provide fast access to commonly used tasks

Applications

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



Multiformat support grows with your needs

WFM7120

The measurement and monitoring capabilities of the WFM7120 provide precision capabilities such as Physical Layer Measurement, Digital Data Analysis, 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 WFM7120 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 for a wide range of formats from Analog Composite to SD-SDI or HD-SDI and support for 3 Gb/s or Dual Link video signals. The WFM7120 offers support for a variety of audio formats for analog, digital, Dolby Digital, and Dolby-E:

- Video Monitoring
 - 3G (3 Gb/s)
 - 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)
- Measurement and Analysis
 - JIT (Jitter for 3 Gb/s)
 - EYE, PHY (physical layer)
 - DAT (data analysis)
 - 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.

WFM7020

The WFM7020 provides an ideal solution for basic monitoring of Analog, Digital, High Frame-rate Digital Video, and Multiple Audio formats. This flexible solution comes standard with SD video monitoring and can be equipped with options and upgrades to monitor different combinations of 3 Gb/s, Dual Link, HD, and Composite Analog video. WFM7020 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, and Dolby-E formats.

WFM6120

The WFM6120 offers performance monitoring and measurement capabilities for SD-SDI and analog composite video formats.

The AD audio option available for WFM6120 offers monitoring for analog and digital embedded or AES/EBU audio.

Available measurement options include Eye/Jitter (EYE or PHY), Video Data Analysis (DAT), and AV Delay measurement (AVD).



3G Monitoring, jitter measurement, and loop-test generator

From Analog to Advanced Digital Video in one Platform

Ideal for multiformat environments, the Tektronix family of waveform monitors provides flexible options and field-installable upgrade kits to monitor diverse video types including 3G, Dual Link, SD/HD SDI, and Composite Analog.

The WFM7020 and WFM7120 Option DL features SMPTE 372M compliant monitoring with 352M automatic format detection and selectable display of Alpha Channel. The latest WFM7x20 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 to maintain correct timing between links A and B.

To support the latest production trends for high-definition 1080p 50/59.94/60 content, WFM7120 and WFM7020 provide optional capabilities to monitor this 3 Gb/s format.

Option 3G for the WFM7120 and WFM7020 enables monitoring of SMPTE 425M Level A (directly mapped) and Level B (mapped from Dual Link) signals.

Monitoring display modes such as waveform, vector, gamut, timing, data analysis, status, and audio are available for the monitoring of 3 Gb/s and other formats.

Tektronix exclusive Option JIT for WFM7120 provides jitter measurement for 3G video and includes basic test-loop signal generator (with color bars and pathologic signals) to simplify quick verification tasks on 3G facilities.

Each WFM7x20 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.

ANC Data Inspector				
Name	DID/SDID	Presence	Status	Location
299M Ctrl Grp 4	E0/--	Missing	--	--
299M Ctrl Grp 3	E1/--	Missing	--	--
299M Ctrl Grp 2	E2/--	Present	OK	Field 1 / Line 9
299M Ctrl Grp 1	E3/--	Present	OK	Field 1 / Line 9
299M Audio Grp 4	E4/--	Missing	--	--
299M Audio Grp 3	E5/--	Missing	--	--
299M Audio Grp 2	E6/--	Missing	--	--
299M Audio Grp 1	E7/--	Present	OK	Field 1 / Line 54
OP-47 SDP	43/02	Present	OK	Field 2 / Line 12
RP188	60/60	Present	OK	Field 1 / Line 10

Detail		View Mode: Watch List		Time Elapsed Since Last Reset: 0 d, 00:22:49	
Format: SMPTE 299M Ctrl	Presence: Present				
DID: e2 Type: 1	Field: 1	Line: 9	Sample: --		
DBN: 200 DC: 11	Link: --	Stream: Y			
Exp/Act Chksum: 1f0 / 1f0	Error: OK				
000 201 200 200 201 200 200 201 200 200 200 200					

1080i 50 SDI Input A Ref: Internal		ID: Embd: FPPP Anc TC: 060721318
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ANC Data Inspector and CaptureVu provide detailed content analysis

Extended Digital Analysis Capabilities

The new ANC Data Inspector (available on option DAT), provides an industry-leading solution to help broadcasters easily and accurately ensure that all required ANC data is present and correctly configured through an intuitive ANC data display.

In contrast to existing solutions, the ANC Data Inspector enables operators to easily and quickly ensure that the ANC data is present and free of errors. When errors are detected, engineers are quickly guided to a more detailed view of the data packet content for further analysis. With FlexVu™ each tile can display different EIA 608/708 closed caption and individual Teletext subtitles or pages.

CaptureVu, standard on WFM7120 and WFM6120, captures the data of a video frame to recreate any trace display and analyze its digital structure. Captured data can be downloaded through the USB port or through the Ethernet port.

Auxiliary Data Status			
Anc Data:	Y and C Present		
CEA608:	\$334 CDP (ANC)	Services: CCI-3- TXT-----	XDS: Present
CEA708:	\$334 CDP (ANC)	Services: CCI-----	RP207:
Teletext:	None		
CDP:	Present	Frm Rate: 59.94	Data Count 608: 2 708: 6
V-Chip Rating:	(US TV) TV-G		
TSID:	Absent	CGMS-A: Missing	Broadcast Flag: Missing
SMPTE 2016 AFD:	16:9.8 - Code is 1000 - AR is 16:9		
Desc:	Full Frame 16:9		
Bar 1:	No valid Bar data found		
Bar 2:	No valid Bar data found		

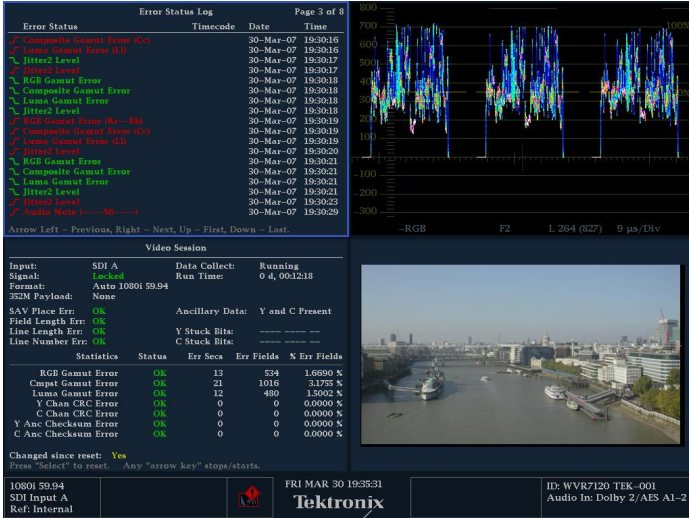
Aux Status Display

The Auxiliary Data Status Display decodes ancillary data such as Active Format Description (AFD), Video Index aspect ratio, WSS, and ARIB information.

Aux Data Status provide summary information on a variety of metadata such as Closed Caption CEA608 or CEA708, Broadcast Flag/CGMS, Teletext, ARIB, Timecode, AFD (Active Format Description), Video Index aspect ratio, and Wide Screen Signalling.

Today there is a wide variety of metadata that provides information to a wide variety of 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 for the picture display of the waveform monitor along with the binary data and text description.

Option DDE enables the display of VANC Dolby metadata. The SIM (Simultaneous Input) Option allows simultaneous display of two inputs and is like having two instruments in one.



FlexVu, the display that adapts to your work practices

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.

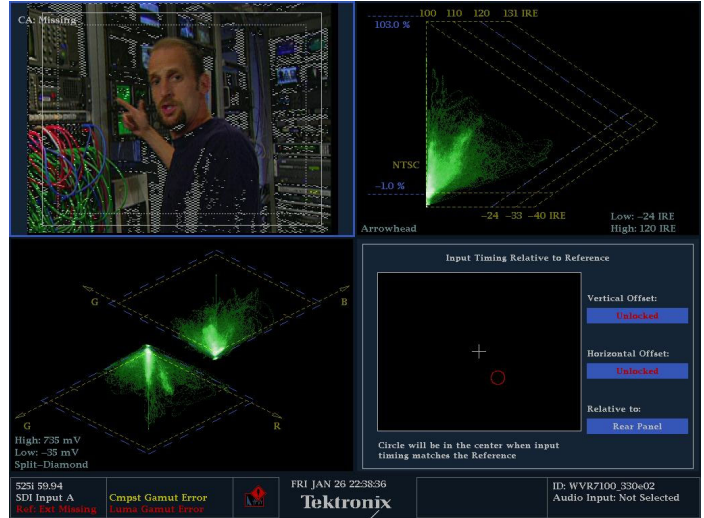
Specialized session and status displays provide summarized, yet comprehensive reports of conditions and measurements of content parameters. The powerful Error Log is configurable and provides detailed reports for up to 10,000 events which can be downloaded using a web browser. Alarms can also activate 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 pixilation distortions.



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

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

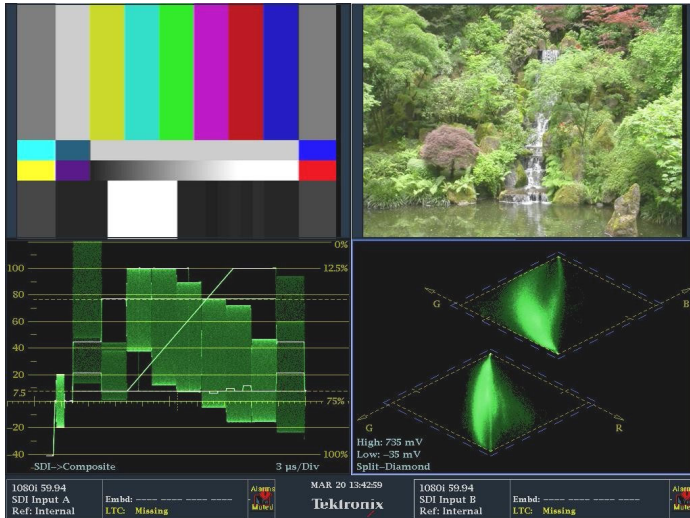
The Diamond and Split Diamond displays help easily identify and correct RGB gamut errors in digital video signals. The Arrowhead display saves time in verifying composite gamut compliance on analog and digital video signals.

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 when used in the SIM (Simultaneous Input Mode) mode can simultaneously detect and decode EIA608/708 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.

CaptureVu, on the WFM7120 and WFM6120, allows the user to capture, store, and download the data of a video frame to recreate displays and compare the live signal to captured data for easy troubleshooting of intermittent errors or for analyzing fault conditions at remote sites.



Simultaneous Display, virtually two instruments in one.

Simultaneous Input Display Boosts Monitoring Versatility

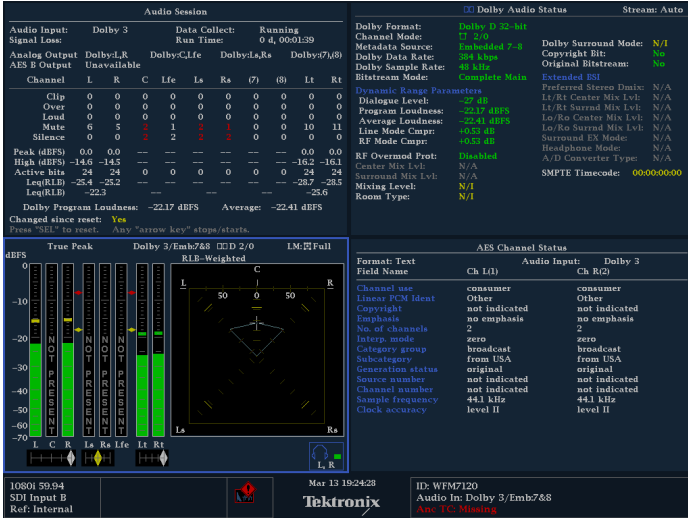
Option SIM takes multiformat monitoring to a new level. This capability helps operational staff quickly determine if a video quality problem existed in the input signal or arose in their facility. It lets engineering staffs quickly detect, diagnose, and resolve technical problems introduced by a piece 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. FlexVu enables flexible and intuitive configuration of displays from two monitored inputs. With WFM7120 option SIM, you can display simultaneous fault detection, status reporting, alarm generation, and error logging. The SIM option is ideal for transmission monitoring of simultaneous HD and SD programs. 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. 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.



Physical Layer options provide precise measurements for video signals.

Top Reliability on Physical Layer Measurements

Tektronix is the technological leader for Eye/Jitter measurement solutions. Option JIT enables jitter measurement for 3 Gb/s video with jitter waveforms and readings with alignment, timing, and filters from 10 Hz to 100 kHz. Options EYE and PHY provide unique capabilities such as reporting jitter levels above 1 UI and jitter filters from 10 Hz to 100 kHz for SD and HD SDI. 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 Tektronix exclusive 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. The infinite persistence mode of the waveform monitor can be used to more easily view the eye opening of the physical layer signal.



Comprehensive surround, Dolby, loudness, and channel status

Monitoring Tools for Optimum Sound Quality

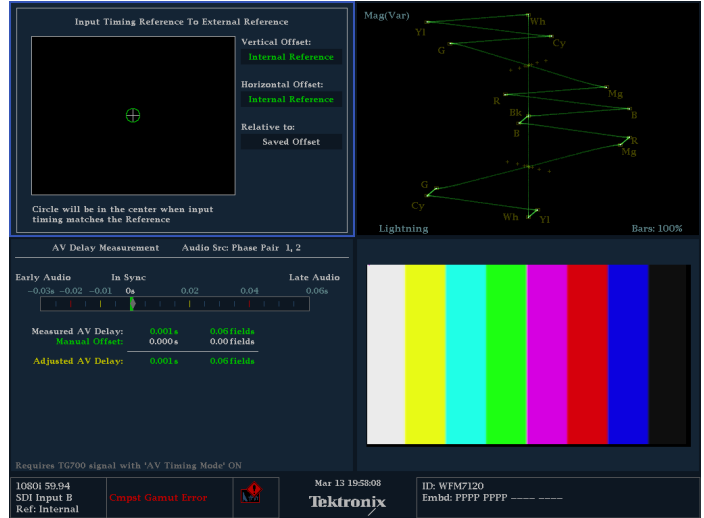
For precise audio measurements, the WFM Series provides high-quality digital filtering and oversampling fully compliant with ITU-R BS.1770 and 1771.

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

The Surround Sound*1 display, the most comprehensive audio analyzer, provides intuitive graphical representation of the channels' interaction in a system. The Bars display provides indicators for faults, audio levels, and Dolby format information. The Flexible Lissajous display allows the selection of any two audio channels.

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). These instruments also feature Audio Control Packet Data and Channel Status displays.

The Dolby Status display (in option DDE) gives an in-depth view of integrated or VANC metadata and Dolby A/V timing and synchronization. User-configurable threshold for the Dolby-E guard band timing measurement (WFM7120/7020 option DDE): The user can monitor the



Timing and Lightning displays simplify timing tasks

Dolby-E guard band timing and trigger alarms based on their specific guard band parameters.

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 ensure 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 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 this critical timing parameter of composite analog video signals.

*1 Audio Surround Sound Display licensed from Radio Technische Werksütten GmbH and Co. KG (RTW).

Characteristics

Composite Video Interface (Opt. CPS)

Formats Supported – NTSC, NTSC no setup, PAL.

Inputs – Two, only one active at a time.

Input Type – Passive loop through 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 – 20 k, nominal.

Return Loss –

>40 dB to 6 MHz, power on (Typical).

>40 dB to 10 MHz (Typical).

>46 dB to 6 MHz (Typical).

35 dB, power off (standard amplitude video).

Crosstalk between Channels – >60 dB to 6 MHz.

Loophrough Isolation – >70 dB to 6 MHz.

DC Offset with Restore Off –

<7 mV. DC Restore 50 Hz and 60 Hz Attenuation:

Fast Mode >95% attenuation, Slow Mode <10% attenuation, <10% peaking.

Slow mode Typ peaking 8% at 50 Hz and 60 Hz.

Lock Range: ± 50 ppm remains locked.

External Reference

Input Type – Passive loop through BNC, 75 Ω compensated.

DC Input Impedance – 20 k Ω , nominal.

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

User Interface

1024 (H) \times 768 (V) pixels LCD.

Serial Digital Waveform Vertical Characteristics

Vertical Measurement Accuracy – At 1X, $\pm 0.5\%$; at 5X, $\pm 0.2\%$ of 700 mV full scale mode.

Gain – X1, X2, X5, and X10.

Frequency Response

HD –

Luminance Channel (Y): 50 kHz to 30 MHz $\pm 0.5\%$.

Chrominance Channels (Pb,Pr): 50 kHz to 15 MHz $\pm 0.5\%$.

SD –

Luminance Channel (Y): 50 kHz to 5.75 MHz $\pm 0.5\%$.

Chrominance Channels: 50 kHz to 2.75 MHz $\pm 0.5\%$.

Analog Composite Waveform Vertical Characteristics (Opt. CPS)

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

Gain – X1, X2, X5, and X10.

Frequency Response – Flat to 5.75 MHz, $\pm 1\%$.

Waveform Horizontal Sweep Characteristics

Sweep Timing Accuracy – $\pm 0.5\%$, all rates, fully digital system.

Sweep Linearity – 0.2% of time displayed on screen, fully digital system.

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 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 (Options DDE and AD)

Inputs – Two 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, 0.2 V_{p-p} to 2 V_{p-p} .

Input Return Loss – 25 dB relative to 75 Ω from 0.1 to 6 MHz. Typically better than 30 dB to 24 MHz.

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 loophrough, 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 four 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 from 0.1 to 6 MHz (Typical).

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

Analog Audio (Opts DDE and AD)

Analog Inputs – Two sets of 6 channels each.

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

Cross Talk – <90 dB.

Input Impedance – 24 k, 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 – $+0.8$ dB, 20 Hz to 20 kHz, 24 dBu to -16 dBu.

Output Impedance – 50 Ω nominal.

Features

Feature	WFM7120	WFM7020	WFM6120	WFM7100 (with FP)	WFM7000 (with FP)	WFM6100 (with FP)
3 Gb/s Single Link SDI Format Support (New Option 3G)	X	X				
3 Gb/s Single Link SDI Interface Jitter Measurements (New Option JIT)	X					
Eye Overshoot/Undershoot Automated Measurement (Option PHY)	X		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) (with any audio option)	X	X	X	X	X	X
Dolby-E Audio/Video Timing and Synchronization Measurement (Option DDE)	X	X		X		X
VANC Dolby Metadata Display (Evertz and Norpak Implementation) (Option DDE)	X	X		X		X
Audio/Video Delay Measurement Enhancement (Out-of-Service) (Option AVD)	X		X	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 and Display (Option SIM required)	X	X	X	X	X	X
Get/Load Captured Data through Network	X		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)	X	X		X		
Black and Frozen Picture Detect	X	X	X	X	X	X
ANC-LTC and ANC-VIT Timecode detection and selection	X	X	X	X	X	X
Infinite Persistence Mode for trace, including Eye-pattern trace (requires Option EYE or Option 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 WFM7120, WFM7020, and WFM6120 waveform monitors 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	30, 30/1.001, 25, 24 and 24/1.001 progressive, PsF	
4:2:2:4 YCbCr+A 12-bit		
2048 × 1080	4:4:4 RGB 10-bit	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 10-bit	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	
4:2:2:4 YCbCr+A 12-bit		
Single Link		
1920 × 1080	4:2:2 YCbCr 10-bit Level A and Level B	50, 59.94, 60 progressive

Note: 2K XYZ Color Space is supported in Dual Link and 3G but requires Option DL.

3G Formats

Format	Sample Structure	Frame/Field Rates
2048 × 1080	4:2:2 YCbCr 10-bit 60, 59.94, and 50 4:4:4:4 RGB (A) 10-bit 4:4:4 RGB or XYZ 12-bit 4:4:4 YCbCr 12-bit	1080P 59.95/60/50

Physical Characteristics

Dimensions	mm	in.
Height	44.5	1.75
Width	482.6	19
Depth (front to back, including handles and BNCs)	514.35	20.25
Weight	kg	lb.
Net	3.97	8.75
Power 100 to 240 VAC ±10%, 50/60 Hz		

Ordering Information

SD-SDI standard on all units.

WFM6120

CaptureVu™ XGA display with FlexVu™, AV Delay Capable, front-panel USB and headphone port, remote control port, external display output, picture monitor outputs, network access and control, SNMP.

WFM7020

HD-capable, 3G Capable Dual Link Capable (WFM only), AV Delay capable, XGA display with FlexVu™, front-panel USB (WFM only) and headphone port, remote control port, external display output, picture monitor outputs, network access and control, SNMP.

WFM7120

HD-capable, 3G Capable, Dual Link Capable, Simultaneous Input Capable, AV Delay Capable, CaptureVu™, XGA display with FlexVu™, front-panel USB and headphone port, remote control port, external display output, picture monitor outputs, network access and control, SNMP, 3G Jitter Capable.

Video Options

Option	Description	WFM6120	WFM7020	WFM7120
SD	STANDARD ON ALL UNITS	STD	STD	STD
CPS	Add support for monitoring NTSC/PAL composite analog video, 2 inputs with passive loophrough outputs	X	X	X
HD	Add support for monitoring High Definition digital video formats, 2 auto-sensing SDI inputs with switched output of selected input		X	X
3G	Support for Single Link 3G SDI		X	X
DL	Adds Full Dual Link Support		X	X
SIM	Adds support for Simultaneous Chan 1, Chan 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		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
DDE	Add capabilities available in Option AD, plus support for monitoring Dolby Digital (AC-3) 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		X
PHY	Add capabilities available on Option EYE, plus jitter waveform and Eye parameter measurements	X		X
DAT	Add in-depth video data and ancillary data analysis	X		X
IT	Adds Jitter Measurement Capability			X

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 3 Years (with option C5)
R3	Repair service 3 years (including warranty)
R5	Repair service 5 years (including warranty)

Power Options

Option	Description
A0	Power connection – North America
A1	Power connection – Universal Euro
A2	Power connection – United Kingdom
A3	Power connection – Australia
A4	Power connection – 240 V, North America
A5	Power connection – Switzerland
A6	Power connection – Japan
A10	Power connection – China
A99	Power connection – No power cord or AC adapter

Language Options

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

Accessories

The WFM6120, WFM7020, and WFM7120 use the same portable and rack cabinets as those currently used for the WFM7000 Series products. Customer must order one of Option NRC, 01, 02, or 05.

Option	Description
NRC	No portable cabinet or rack cabinet
01	Portable cabinet (same as WFM7F02)
02	Dual rack cabinet (same as WFM7F05 option NN)
05	Dual rack cabinet (same as WFM7F05 option ON)
62	Analog audio breakout cable, 6 feet, male 62 pin connector to 8 XLR male output connectors and 12 XLR female input connectors

Video Upgrade Options

Option	Description	WFM712UP	WFM702UP	WFM612UP
CPS	Add support for monitoring of NTSC/PAL composite analog video, 2 inputs	x	x	x
HD	Add support for monitoring High Definition digital video formats, 2 auto-sensing SDI inputs	x	x	
3G	Add support for Single Link 3 Gb/s SDI (HD Required)	x	x	
DL	Add support for monitoring of Dual Link (HD Required)	x	x	
SIM	Add support for monitoring of Dual Link (HD Required)	x		
AD	Add support for Analog embedded and AEA/EBU audio, 8 digital, and 12 analog inputs	x	x	x
DDE	Add capabilities in Opt. AD plus Monitoring for Dolby Digital AC-3 and Dolby-E	x	x	
AVD	Add support for out of service Audio/Video Delay Measurements	x		x
EYE	Add support for Eye diagrams, jitter measurement, cable parameter measurements (for Wxx20)	x		
JIT	Adds support for 3 Gb/s Jitter Measurement (Opt 3G required)	x		
PHY	Add capabilities on Opt EYE plus jitter waveform and automated Eye Measurements (for WFMxx20)	x		
EYE	Add support for Eye diagrams, jitter measurement, cable parameter measurements (for WFM6120)			x
PHY	Add capabilities on Opt EYE plus jitter waveform and automated Eye Measurements (for WFM6120)			x
DAT	Add in-depth video data and ancillary data analysis	x		x

Upgrade Kit Nomenclature

Post-sale Upgrades

Customers can upgrade previously purchased instruments by ordering the appropriate options from the upgrade kit associated with the product model as shown in the following table. Customer must order with at least one option from the table below.

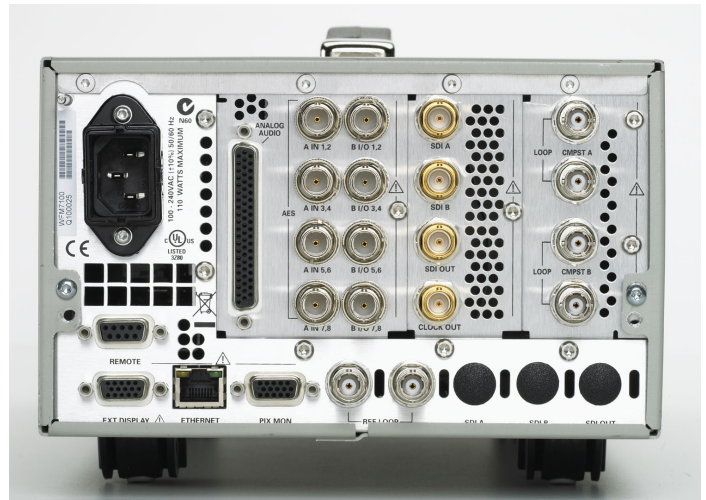
Upgrade	Description
WFM612UP	Field-installable, post-sale upgrades for WFM6120
WFM702UP	Field-installable, post-sale upgrades for WFM7020
WFM712UP	Field-installable, post-sale upgrades for WFM7120

Optional Accessories

Accessory	Description
WFM7F02	Portable cabinet includes handle, feet, tilt bail, and front-panel cover
WFM7F05 (Option ON or NN)	Dual rack cabinet
071-1896-xx	Service manual for the WFM6120 and the WFM7020 Series products

Service Offerings

Service	Description
WFM6120	
WFM6120-CA1	Provides a single calibration event or coverage for the designated calibration interval, whichever comes first
WFM6120-R1PW	Repair service 1 year (postwarranty)
WFM6120-R2PW	Repair service 2 years (postwarranty)
WFM6120-R3DW	Repair service 3 years (including warranty)
WFM6120-R5DW	Repair service 5 years (including warranty)
WFM7020	
WFM7020-CA1	Provides a single calibration event or coverage for the designated calibration interval, whichever comes first
WFM7020-R1PW	Repair service 1 year (postwarranty)
WFM7020-R2PW	Repair service 2 years (postwarranty)
WFM7020-R3DW	Repair service 3 years (including warranty)
WFM7020-R5DW	Repair service 5 years (including warranty)
WFM7120	
WFM7120-CA1	Provides a single calibration event or coverage for the designated calibration interval, whichever comes first
WFM7120-R1PW	Repair service 1 year (postwarranty)
WFM7120-R2PW	Repair service 2 years (postwarranty)
WFM7120-R3DW	Repair service 3 years (including warranty)
WFM7120-R5DW	Repair service 5 years (including warranty)



Product(s) are manufactured in ISO registered facilities.

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