

TVM9100PKG

Multiformat HD/SD-SDI Video and Audio Signal Analyzer



The Videotek® TVM9100PKG multiformat, HD/SD-SDI analog composite and ASI video and audio rackmount (or portable) signal analyzer with integral XGA TFT color LCD display is the most cost-effective, versatile, modular, and intuitive test instrument available in a half-rack scope package. In comparison to the TVM9140PKG, the TVM9100PKG can display and evaluate only one input source at a time.

One hundred percent digital signal processing enables a precision presentation of waveform, vector, gamut, audio, picture timing, and optional data analyzer screens, each of which can be viewed in any quadrant. Combined with full-screen, picture thumbnail and powerful MULTI mode, complete display flexibility is provided.

PRODUCT DETAILS

The TVM9100PKG has impressive features: illuminated controls, a modular platform for easy upgrades, HD/SD-SDI auto-detect, passive looping inputs that accept 1080i, 1080p and 720p formats at popular frame rates including SD-525/625, real-time alarms (with time stamp, adjustable limits and peak value report), frame capture/transfer, EIA 608 and 708 closed captioning, teletext, OP-47 subtitles, XDS, and alarm status and metadata displays.

Options include dual HD/SD-SDI eye pattern display with jitter bar graph, dual SD-SDI eye pattern display with jitter bar graph, dual HD/SD-SDI, dual SD-SDI, dual ASI and dual analog composite inputs, advanced audio analysis with CineSound® Surround display and comprehensive Dolby® decoding. The advanced analysis package function upgrade adds pixel locator/data word analyzer. The SD-SDI and SD-SDI eye pattern inputs can be field-upgraded to HD/SD with the purchase of an unlock key.

Q-SEE™, Harris Corporation's patented display technology, enables users to configure their screen for any specific need. Whether full-screen, quadrant with picture thumbnail, or the convenient MULTI mode, Q-SEE can make it happen. Choose from waveform, vector, gamut, audio, picture and timing displays, and place each in any quadrant on the screen.

The TVM9100PKG integrates seamlessly into any broadcast, post production, telecine, satellite or cable facility, making it the smart choice for any quality control, troubleshooting or compliance check applications.

The TVM9100PKG can be quickly and easily configured, with direct access to display functions, selectable screen location and context-sensitive pop-up menus, as well as the industry's most intuitive navigation system. Complete presentation changes can be instantly applied with any of the 16 front-panel preset selections.

FEATURES

- Dual, auto-detecting HD/SD-SDI inputs
- Dual, analog composite inputs for NTSC/PAL
- Single-input ASI monitoring option
- Standards: SMPTE 292M, SMPTE 259M-C, NTSC/PAL
- Multiple reference inputs
- Display one input source
- Customizable display functions and screen location
- Patented gamut display
- Picture thumbnail
- A/B parade and overlay
- 608, 708 closed captioning, detect, alarm, display
- Teletext detect, alarm, display
- OP-47 HD subtitle display
- Comprehensive alarm set, peak level report
- 16 direct-access user presets
- Integral high-brightness XGA TFT color LCD display
- Illuminated controls and indicators
- DVI-I output
- USB port for control and data transfer
- 10/100Base-T Ethernet, SNMP agent
- Web server
- SpyderWeb II remote control and logging software
- GPI control
- Patented video relative timing display

SELECTABLE OPTIONS CATEGORIES

- Selectable video input modules
 - Dual HD/SD-SDI input
 - Dual HD/SD-SDI input with eye pattern
 - Dual HD/SD-SDI input with eye pattern and jitter waveform and spectrum display
 - Dual ASI input module
 - Dual composite analog input
 - Advanced analysis package with pixel locator/data word analyzer
- Selectable audio options
 - Meter and monitor up to eight-channels of analog, AES/EBU and embedded
 - Dolby® Digital, Dolby® Surround EX™, Dolby®-E, Pro-Logic I formats
 - Dolby® decoded outputs
 - Loudness metering and alarm
 - Multiple audio Lissajous display

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SPECIFICATIONS

Specifications are subject to change without notice.

Video

HD/SD-SDI Input Module (TVM-VTM-SDI-H)

2 dual-standard inputs accepting standard-definition SMPTE 259M-C formats or high-definition SMPTE 292M formats including: 525/59.94, 625/50, 1080i/60, 1080i/59.94, 1080i/50, 1080p/30, 1080p/29.97, 1080p/25, 1080p/24, 1080p/23.98, 1080p/30sF, 1080p/29.97sF, 1080p/25sF, 1080p/24sF, 1080p/23.98sF, 720p/60, 720p/59.94, 720p/50, 720p/30, 720p/29.97, 720p/24, and 720p/23.98

Data Rate	270 Mb/s, 1.485 Gb/s, auto-detect
Connectors	4 BNCs, Hi-Z passive-looping
Level	800 mV, nominal
Input EQ	270 Mb/s: 250 m, Belden 8281 1.485 Gb/s: 100 m, Belden 8281
Return Loss	≤-15 dB 5 MHz to 1.485 GHz
SDI Monitor Output	Follows the selected digital input
Data Rate	270 Mb/s and 1.485 Gb/s
Connector	BNC
Level	800 mV, nominal

SD-SDI Input Module (TVM-VTM-SDI-S)

2 SMPTE 259M-C inputs, auto-detect 525/59.94, 625/50

Input Impedance	Hi-Z, looping
Input EQ	Up to 250 m, Belden 8281 at 270 Mb/s
Return Loss	≤-25 dB 5 to 270 MHz

Analog Input Module (TVM-VTM-ACV-2)

2 NTSC/PAL composite video, auto-detect

Signal Level	1 V pk-pk
Input Impedance	Hi-Z, looping
Return Loss	≤-45 dB 100 kHz to 5 MHz
DC Restore Clamp Time	Back porch
DC restorer level shift due to pres. or absence of burst	≤1 IRE/unit
DC restorer level shift with change from 50% APL to 10% APL or to 90% APL	≤1 IRE/unit
DC restorer 60 Hz attenuation	Slow: ≤5% fast: >90%
Maximum input amplitude	2.5 V to -1.5 VDC restorer off, ±3 VDC (AC +DC) restorer on

Reference

Analog blackburst, NTSC/PAL composite video, tri-level

Levels	286 mV pk-pk ±6 dB (blackburst NTSC) 300 mV pk-pk ±6 dB (PAL sync and burst) 600 mV pk-pk ±3 dB (tri-level sync)
Impedance	Selectable Hi-Z looping or 75 ohms terminating
Return Loss	≤-40 dB, 100 kHz to 5 MHz
Connectors	BNC

ASI Input Module (TVM-VTM-ASI)

2 dual-standard inputs accepting DVB-ASI or SMPTE 310M signals, auto-detect; monitoring of ATSC PSIP or DVB PSI tables; ETSI TR 101-290 priority 1, 2 and 3 alarms including buffer errors

Input Data Rate	DVB-ASI: 270 Mb/s, maximum payload 120 Mb/s SMPTE 310M: 19.393 or 38.785 Mb/s
Input Connectors	4 BNCs, Hi-Z passive looping

Input Level	800 mV, nominal
Input EQ	250 m, Belden 8281
Return Loss	≤-15 dB 5 to 270 MHz
Monitor Output	Follows the selected digital input
Output Level	800 mV, nominal
Output Data Rate	DVB-ASI: 270 Mb/s, maximum payload 120 Mb/s SMPTE 310M: 19.393 or 38.785 Mb/s
Output Connector	BNC
ATSC/DVB Display Tables	PAT (Program Association Table) INFO (from the Program and System Information Protocol (PSIP)) PMT (Program Map Table) MGT (Master Guide Table) VCT (Virtual Channel Table) RRT (Region Rating Table) STT (System Time Table) EIT (Event Information Table) EPG (Electronic Program Guide) BW (Bandwidth)
DVB Display Tables	PAT (Program Association Table) INFO (from the Program and Information Table (SI)) PMT (Program Map Table) EIT (Event Information Table) CAT (Conditional Access Table) NIT (Network Information Table) SDT (Service Description Table) BW (Bandwidth)

Jitter Evaluation Input Module (TVM-VTM-JEM)

2 dual inputs accepting standard-definition SMPTE 259M-C formats or high-definition SMPTE 292M formats

Data Rate	270 Mb/s, 1.485 Gb/s, auto-detect
Connectors	4 BNCs, Hi-Z active-looping
Level	800 mV, nominal
Input EQ	270 Mb/s: 250 m, Belden 8281 1.485 Gb/s: 80 m, Belden 8281
Return Loss	≤-15 dB 5 MHz to 1.485 GHz
SDI Monitoring Output	Follows the selected digital input
Output Data Rate	270 Mb/s and 1.485 Gb/s
Output Connector	BNC
Output Level	800 mV, nominal
Jitter Demod	Displays pk-pk jitter as a bar graph and numeric readout, jitter waveform or frequency spectrum
Bar Graph	0 to 1 UI or 0 to 0.2 UI with numeric readout
Filter	10 Hz ±2 Hz 1 kHz ±5% 10 kHz ±5% 100 kHz ±5%
Waveform	Synchronized with video 1 H, 2 H, 1 or 2 sweep rate Line-select may be applied
Frequency Plot	Displays a frequency histogram from the filter setting up to a maximum frequency of 1 or 5 MHz
Eye Parameter Measurement	Amplitude, rise time, fall time

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Measurement Bandwidth	250 kHz to 2250 MHz -3 to +1 dB relative to 750 MHz
Filters	10 Hz \pm 2 Hz 100 Hz \pm 10 Hz 1 kHz \pm 100 Hz
Amplitude	\pm 2% with a displayed waveform of 800 mV
Overshoots	\pm 2% with a displayed overshoot of 10% 20% maximum
Rise and Fall Time	Within 2% of the displayed rise/fall time

DVI-I Output

Digital Levels	Per DDWG DVI rev1
Pixel Rate	65 Mp/s
R, G, B Levels	Selectable 0.7 or 1 pk-pk, nominal
R, G, B Impedance	75 ohms
Horizontal Sync	Negative TTL pulse @ 48,363 Hz \pm 1%
Vertical Sync	Negative TTL pulse @ 60.004 Hz \pm 1%
Display Accuracy	\pm 1% waveform \pm 1° vector \pm 37 ns timing, digital \pm 300 ns timing, analog
Connector	29-pin DVI-I, female

Audio

Inputs (Analog)	8 monophonic or 4 stereo channels, balanced or unbalanced
Maximum Input Level	+24 dBu
Input Connector	37-pin D-sub, male
Impedance	>20 k ohms
Inputs (Digital)	4 or 8 AES/EBU serial digital pairs, 16 embedded audio channels; Dolby® E or Dolby® Digital (AC-3) stream (option dependent)
Input Connectors	4 or 8, BNC, female
Impedance	75 ohms
Outputs (Analog)	8 monophonic or 4 stereo channels, balanced or unbalanced, follows selected audio input; Dolby® inputs produce a 2-channel mix down or full 8-channel decode
Output Level	+24 dBu maximum +6 to -50 dB adjustable around reference point; for digital audio, -20 dBFS produces a +4 dBu analog output level
Output Connector	37-pin D-sub, male, shared with inputs
Impedance	10 ohms unbalanced or 20 ohms balanced, nominal
Signal to Noise	100 dB (relative to signal level out of +24 dBu), typical
Outputs (Digital)	4 AES/EBU and 1 Dolby® Digital, Dolby® E or AES stream
Output Connector	4 BNC, female shared with input
Impedance	75 ohms

Control

GPI	9 total with 4 input and 5 preset recall selections or individually user alarm input
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GPO	2 alarms, user configured
Connector	26-pin HD (high-density) D-sub, female
Input Impedance	10 k ohms returned to 5 VDC
Alarm Output	Relay closure
Maximum Relay Current	350 mA @ 30 VDC
External Router Control	1 RJ11 female, for use with Videotek RS-12A analog router for input expansion
Peripheral Interface	USB 1.1 supporting storage devices, and keyboard
Connector	USB 1.1, Type A, female
Communications	Ethernet port: 10/100Base-T
Connector	RJ-45 Ethernet, female

Timecode

Input	LTC, VITC from composite inputs, DVITC extracted from SD inputs, ANC LTC, ANC DVITC 0, ANC DVITC 1 from HD inputs
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Display

General	A quadrant display for viewing an input on up to 4 different displays as picture, waveform, vector, optional audio, alarm status, timing, and optional eye pattern, simultaneously or individually as a full-screen display of each separately; optional data analyzer display for pixel analysis
Waveform	Composite, YC _B C _R or RGB, parade/overlay of like formats
Sweep Time Base	1 or 2 H with x1, x5 and x10 horizontal magnification 1 or 2 V with x1, x5 and x25 horizontal magnification
Waveform Accuracy	\pm 1%
Waveform Frequency Response	
Analog	25 Hz to 5.75 MHz within \pm 1% of amplitude at 50 kHz
SD	\pm 0.5% to 5.75 MHz Y, \pm 0.5% to 2.50 MHz C _B , C _R
HD	\pm 0.5% to 30 MHz Y, \pm 0.5% to 15 MHz C _B , C _R

Eye (Optional)

Sweep Time Base	Overlay (3 eye) or 10 eye (SD) or 20 eye (HD)
Filters	10 Hz, 100 Hz, 1 kHz
Display Accuracy	\pm 1%
Measurement Analog Bandwidth	250 kHz to 2250 MHz, -3 to +1 dB relative to 750 MHz
Jitter Overshoot	\leq 20% for all frequencies up to 300 kHz
Intrinsic Jitter	<70 ps for HD, <150 ps for SD
Intrinsic Wander	<150 ps for HD, <300 ps for SD
Jitter	Bar graph showing jitter magnitude
Display Range	0 UI to 1 UI
Vector	R - Y vs. B - Y for analog, C _B Vs. C _R for HD and SD
Vector Accuracy	\pm 1°
Gamut	Encoded or RGB gamut displays with upper and lower limit selection
Audio (Optional)	2, 4, 6 or 8 channels displayed simultaneously

Power Requirements

Power Input	90 to 260 VAC, 50/60 Hz
Power Consumption	180 WAC

Mechanical

Dimensions (H x W x D)	.525 x 8.25 x 16.63 in. (13.34 x 21.6 x 42.24 cm)
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Environmental

Operating Temperature	32° to 122° F (0° to 50° C) 32° to 113° F (0° to 45° C) for JEM
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Storage Temperature -40° to 149° F (-40° to 65° C)
 Humidity 85% maximum (non-condensing)
 Operating Altitude 6562 ft (2000 m)

Standard Accessories

Operator's manual on CD
 One 26-pin D-sub, male for GPI/LTC breakout
 DVI to VGA adapter
 North American power cord unless optional power cord is specified at time of order

ORDERING INFORMATION

Package Descriptions

TVM9100PKG TVM Series multiformat analyzer with a TVM-VTM-SDI-H HD/SD-SDI input module
 TVM9100PKG-EH TVM Series multiformat analyzer with a TVM-VTM-EYE-H HD/SD-SDI eye pattern input module
 TVM9100PKG-EJ TVM Series multiformat analyzer with a TVM-VTM-JEM HD/SD-SDI with eye pattern and jitter waveform or jitter spectrum input module
 TVM9100PKG-ES TVM Series multiformat analyzer with a TVM-VTM-EYE-S SD-SDI eye pattern input module (can be upgraded later to HD/SD with the TVM-VTM-ES2H-F)
 TVM9100PKG-SD TVM Series multiformat analyzer with a TVM-VTM-SDI-S SD-SDI input module (can be upgraded to HD/SD later with the TVM-VTM-S2H-F)

Video Options

TVM-VTM-SDI-H 2 looping SMPTE 292M (HD-SDI) and SMPTE 259M-C (SD-SDI) inputs, auto-detect and monitor output
 TVM-VTM-AAP Advanced analysis package, adds data analyzer function
 TVM-VTM-EYE-H 2 active looping SMPTE 292M (HD-SDI) and SMPTE 259M-C (SD-SDI) inputs, auto-detect with eye pattern and monitor output
 TVM-VTM-JEM 2 active looping SMPTE 292M (HD-SDI) and SMPTE 259M-C (SD-SDI), auto-sensing inputs; eye pattern display or jitter waveform or spectrum can be viewed individually
 TVM-VTM-SDI-S 2 looping SMPTE 259M-C (SD-SDI) inputs, auto-detect and monitor output (can be upgraded to HD/SD later with the TVM-VTM-S2H-F)
 TVM-VTM-EYE-S 2 active looping SMPTE 259M-C (SD-SDI) inputs, auto-detect with eye pattern and monitor output (can be upgraded to HD/SD later with the TVM-VTM-ES2H-F)
 TVM-VTM-ACV-2 2 looping analog composite video inputs for NTSC or PAL format, auto-detect
 TVM-VTM-ASI 2 looping DVB-ASI/SMPTE 310M transport stream inputs with MPEG table analysis and monitor output

Advanced Audio Options

TVM-A³-OPT 2 Advanced audio analysis option; bar graphs and CineSound[®]; view up to 8 audio channels, includes 4 analog stereo inputs, 4 AES/EBU shared input/output pairs and 16 channels of embedded audio; analog monitoring outputs of up to 8 channels simultaneously
 TVM-A³-4004 Audio expansion module, adds 4 AES/EBU input pairs to TVM-A³-OPT 2

TVM-A³-OPT 3 Advanced audio analysis option; bar graphs and CineSound[®]; view up to 8 audio channels, includes 4 analog stereo inputs, 8 AES/EBU inputs with 4 shared outputs and 16 channels of embedded audio; analog monitoring outputs of up to 8 channels simultaneously; custom meter labels
 TVM-A³-OPT 3TL Advanced audio analysis option; bar graphs and CineSound[®]; view up to 8 audio channels, includes 4 analog stereo inputs, 8 AES/EBU inputs with 4 shared outputs and 16 channels of embedded audio; analog monitoring outputs of up to 8 channels simultaneously, includes loudness monitoring and audio true peak metering to ITU-R BS.1770
 TVM-A³-OPT 5 Advanced audio analysis option; bar graphs and CineSound[®]; view up to 8 audio channels, includes 4 analog stereo inputs, 8 AES/EBU inputs with 4 shared outputs and 16 channels of embedded audio; analog monitoring outputs of up to 8 channels simultaneously; custom meter labels; full decoding of Dolby[®] Digital or Dolby[®] E with up to 8 analog outputs and Dolby[®] metadata display
 TVM-A³-OPT 5TL Advanced audio analysis option; bar graphs and CineSound[®]; view up to 8 audio channels, includes 4 analog stereo inputs, 8 AES/EBU inputs with 4 shared outputs and 16 channels of embedded audio; analog monitoring outputs of up to 8 channels simultaneously; custom meter labels; full decoding of Dolby[®] Digital or Dolby[®] E with up to 8 analog outputs and Dolby[®] metadata display, includes loudness monitoring and audio true peak metering to ITU-R BS.1770
 TVM-A³-OPT 3TO5 Adds Dolby[®] Digital or Dolby[®] E decoding and Dolby[®] metadata display to TVM-A³-OPT 3 or TVM-A³-OPT 3TL
 TVM-A³-OPT V2A Adds video-to-audio timing measurement (lip sync) to the TVM-A³-OPT 3TL or TVM-A³-OPT 5TL; requires a source of the V2A test signal

Other Product Options

Remote Control Options

RCU-1000 Remote control panel for TVM Series, VTM Series and AVM-717

Mounting Options

PTC-2 Portable case with handle and folding stand
 DRC-2A Double rackmount case
 BLK-1 Blank panel for DRC-2A

Power Options

NOTE: North America power cord supplied unless otherwise specified at time of order
 EPC Euro power cord
 EPC-AA Australia power cord
 EPC-UK United Kingdom power cord