Videotek® VTM4150PKG

Multiformat, Modular Rasterizer Monitor

Videotek® VTM4150 packages are predefined module groupings designed to quickly deliver the onscreen monitoring solution you need. Select among 3 Gb/s, HD/SD-SDI, SD-SDI, analog composite and ASI video monitoring, advanced physical layer jitter analysis, Dolby®, advanced audio and lip sync monitoring options to build a system customized to your requirements.

The perfect solution for today's multiformat environments, the VTM4150PKG features the first user-configurable, field-upgradeable, multiformat test and measurement console. The innovative modular platform makes the VTM series fully customizable and affords broadcasters unprecedented flexibility.

When fully equipped, the VTM Series is the only test instrument of its kind that monitors and displays as many as four inputs simultaneously. The Imagine Communications proprietary graphic display engines enable multiple input configurations to accommodate any environment. 3 Gb/s, HD/SD, DVB-ASI/SMPTE 310M and composite analog inputs options are available. Users can mix and match the appropriate options, such as eye pattern with jitter display and audio packages featuring Dolby decoding, to create the ideal tool for their specific application. A further benefit is a clear upgrade path when monitoring requirements change.

Features

- User-configurable hardware
- Dual auto-detecting inputs for 3G/HD/SD-SDI or analog composite
- Single-input ASI monitoring option
- Standards: SMPTE 424M, SMPTE 292M, SMPTE 259M-C, NTSC/PAL
- Multiple reference inputs
- Simultaneous display of up to four pictures
- Simultaneous display of up to four different inputs
- Customizable display functions, including screen location and multiple displays
- Patented video relative timing display
- Patented gamut display
- Ancillary data processing (including AFD, WSS, SourceID, VITC, LTC, and ANC TC)
- Pixel locator/data word analyzer
- Multiple-picture thumbnail
- A/B parade and overlay
- 608, 708 closed-caption detect, alarm, display
- Teletext and OP-47 detect, alarm, display
- Comprehensive alarm set with peak level report
- 16 direct-access user presets
- Illuminated controls and indicators
- DVI-I output
- Front and back USB ports for data transfer
- Bypass function enable
- 10/100Base-T Ethernet, SNMP agent
- Web server
- SpyderWeb II remote control and logging software
- GPI and router control

Selectable Options

- Video Inputs
  - Dual HD/SD-SDI
    Dual 3G/HD/SD-SDI with eye pattern and jitter waveform or spectrum display
  - Dual 3G/HD/SD-SDI
  - Dual ASI
  - Dual composite analog

- Audio
  - Metering and monitoring of up to eight channels of analog, AES/EBU or embedded audio
  - Dolby® Digital, Dolby Surround EX, Dolby E, Dolby Pro-Logic® I formats
  - Dolby decoded outputs
  - Loudness metering and alarm
  - Multiple audio Lissajous displays

Details

The VTM Series is loaded with features designed to enhance the user experience, including illuminated controls, simple navigation and a compact 1RU console. Favorite display configurations are instantly recalled using assignable one-touch presets. Whether customized with specially selected options or preconfigured by Imagine Communications experts, the VTM4150 is the ideal choice for any facility. The console is easily configured via direct access to display functions, selectable screen location and context-sensitive pop-up menus. The intuitive navigation system enables easy access to all functions for even the most inexperienced users.

All VTM4150PKG base models feature the patented Q-SEE™ technology, which enables users to configure a common XGA monitor for any specific need. Whether the desire is for 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.

Q-SEE is just one more way the VTM Series proves itself as the most versatile instrument in its class. When equipped with the proper input options, the VTM Series can output four different waveforms to the Q-SEE display, from four distinct signals — in essence, handling a job that used to require four separate monitoring systems.

VTM4150PKG options include dual 3G/HD/SD-SDI eye pattern with jitter display, dual 3G/HD/SD-SDI, dual HD/SD-SDI, dual ASI and dual analog composite inputs, advanced audio analysis with CineSound® Surround display and comprehensive Dolby decoding. The SD-SDI and SD-SDI eye pattern inputs can be field-upgraded to HD/SD with the purchase of an unlock key.

Specifications

Specifications and designs are subject to change without notice

VIDEO	
HD/SD-SDI Input Module (TVM-VTM-SDI-H-F)	
Two looping inputs accepting SD SMPTE 259M-C formats or HD 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 of 8281 1.485 Gb/s: 100 m of 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

3G/HD/SD-SDI INPUT MODULE (TVM-VTM-3GB-F)	
Two looping inputs accepting 3 Gb/s SMPTE 424M inputs, SD SMPTE 259M-C formats or HD SMPTE 292M formats, including 525/59.94, 625/50, 1080i/60, 1080i/59.94, 1080i/50, 1080p/60, 1080p/59.94, 1080p/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, 2.97 Gb/s, auto-detect
Input Impedance	75 ohms, active looping
Input EQ	Up to 250 m, Belden 8281 at 270 Mb/s, 100 m, Belden 8282 at 1.485 Gb/s or 800 m, Belden 1694A at 2.97 Gb/s
Return Loss	≤-25 dB, 5 to 270 MHz; ≤-15 dB, 270 MHz to 1.5 GHz; ≤-10 dB, 1.5 to 2.97 GHz
Connector	BNC

ASI INPUT MODULE (TVM-VTM-ASI-F)	
Two looping 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 Mb/s, 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 SMPTE 310M: 19.393 or 38.785 Mb/s
Output Connector	BNC
ATSC 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 EVALUATIONINPUT MODULE(TVM-VTM-JEM3-F)	
Two looping inputs accepting SD SMPTE 259M-C, HD SMPTE 292M and 3G SMPTE 424M formats	
Data Rate	270 Mb/s, 1.485 Gb/s, 2.97 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 2.97 Gb/s: 40 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, 2.97 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 V or 2 V 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
Measurement Bandwidth	250 kHz to 2250 MHz -3 to +1 dB relative to 750 MHz
Filters	10 Hz ±2 Hz 100 Hz ±10 Hz 1 kHz ±100 Hz
Amplitude	±2% with a displayed waveform of 800 mV
Overshoots	±2% with a displayed overshoot of 10% 20% maximum
Rise and Fall Time	Within 2% of the displayed rise/fall time

ANALOGINPUT MODULE (TVM-VTM-ACV-2-F)

Two looping inputs, 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 (AC+DC) 2.5 to -1.5 VDC restorer off, ±3.0 VDC restorer on

REFERENCE

Analog blackburst, NTSC/PAL composite video, tri-level sync auto detect (per SMPTE 274M)	
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

DVI-I OUTPUT

Digital Levels	Per DDWG DVI rev1
R, G, B Levels	Selectable 0.7 or 1 V pk-pk, nominal
Pixel Rate	65 Mp/s
R, G, B Impedance	75 ohms
Horizontal Sync	Negative TTL pulse @ 48,363 Hz ±1%
Vertical Sync	Negative TTL pulse @ 60.004 Hz ±1%

Display Accuracy	±1% waveform ±1° vector ±37 ns timing digital ±300 ns timing analog
Connector	29-pin DVI-I, female

AUDIO OPTIONS	
Inputs (Analog)	8 monophonic or four stereo channels, balanced or unbalanced
Maximum Input Level	+24 dBu
Input Connector	37-pin D-sub, male
Impedance	>20 k ohms
Inputs (Digital)	16 embedded audio channels, 4 or 8 AES/EBU serial digital pairs, (option dependent) Optional Dolby® E or AC-3 stream
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 and/or full 8-channel decode
Output Level	+24 dBu max +6 to -50 dB adjustable 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: Outputs (Digital)	100 dB (relative to signal level out of +24 dBu), typical 4 AES/EBU and one Dolby® Digital, Dolby® E, or AES stream embedded in the selected digital video source
Output Connector	4 BNC, female shared with input
Impedance	75 ohms

CAPTIONING	
CC608	EIA/CEA-608-E
CC708/DTVCC	EIA/CEA-708-D
Teletext	EN 300 706 Presentation Level 1 teletext and subtitles
HD Teletext	OP-47 delivery of EN 300 706 teletext and subtitles

CONTROL	
GPI	9 total with 4 input and 5 preset recall selections or individually user configured
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 RJ-11 female, for use with Videotek RS-12A 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, Ancillary Timecode (HD only), DVITC extracted from SD inputs

DISPLAY	
General	A quadrant display for viewing an input on up to 4 different displays as picture, waveform, vector, audio, alarm status, timing, optional eye pattern, simultaneously or individually as a full-screen display of each separately. Additional data analyzer display for pixel analysis. Also view multiple waveform and vectors of the same or different inputs
Waveform	Composite, YC_BC_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	≤1%
Waveform Frequency Response	Analog: 25 Hz to 5.75 MHz within ±1% of amplitude at 50 kHz SD: ±0.5% to 5.75 MHz Y ±0.5% to 2.50 MHz C_B, C_R HD: ±0.5% to 30 MHz Y ±0.5% to 15 MHz C_B, C_R

POWER REQUIREMENTS	
Power Input	90 to 260 VAC, 50/60 Hz
Power Consumption	180 VA

MECHANICAL	
Dimensions (H x W x D)	1.75 x 19.0 x 19.0 in. (4.5 x 48.3 x 48.3 cm)

ENVIRONMENTAL	
Operating Temperature	32° to 113° F (0° to 45° C)
Storage Temperature	-40° to 149° F (-40° to 65° C)
Humidity	85% maximum (non-condensing)
Operating Altitude	To 6,562 ft (2,000 m) above sea level
Polution Degree	2
Standard Accessories	Operator's manual on CD GPI/LTC breakout terminal board DVI to VGA adapter Rackmount kit Power cord* Spyderweb II software on CD *North America cord supplied unless optional cord selected at time of order

Ordering Information

PACKAGE DESCRIPTIONS	
VTM4150PKG	VTM Series rasterizer package supporting four picture display with HD/SD-SDI inputs
VTM4150PKG-3G	VTM Series rasterizer package supporting four picture display with 3Gb/HD/SD-SDI inputs

VIDEO OPTIONS	
Note : All options apply for factory install or field upgrade '-F':	
TVM-VTM-3GB-F	2 active looping SMPTE 424M (3 Gb/s), SMPTE 372 (dual line), SMPTE 292M (HD-SDI) and SMPTE 259M-C (SD-SDI) inputs, auto detect and monitor output
TVM-VTM-JEM3-F	2 active-looping triple-rate SMPTE 424M (3 Gb/s), SMPTE 372 (dual line), SMPTE 292M (HD-SDI) and SMPTE 259M-C (SD-SDI) input signals for display and analysis. It also supplies additional support for dual-link HD-SDI 12-bit YCBCR and RGB video formats. One triple-rate SDI monitor output follows the selected SDI video input, or an internal Test Signal Generator can be selected. The internal Test Signal Generator can display color bars, pathological checkfield, or color bars with motion, and is free-running (no genlock capability). The Test Signal Generator allows jitter to be deliberately injected into the output signal. Embedded audio and Video Payload ID per SMPTE ST352-2002 ancillary data insertion is also supported, as is EYE pattern with advanced jitter analysis
TVM-VTM-SDI-H-F	Provides two passive looping SMPTE 292M (HD-SDI) and SMPTE 259M-C (SD-SDI) inputs, auto detect, line select, internal, blackburst or tri-level references. Field upgrade.
TVM-VTM-ACV-2-F	2 passive looping analog composite video inputs for NTSC or PAL format, auto detect
TVM-VTM-ASI-F	Dual DVB-ASI/SMPTE 310 input module with MPEG data analysis. Provides single transport stream program information and bandwidth measurements. Monitors MPEG and ATSC tables for errors and repetition rates. Alarms for ETSI TR-101-290 first, second and third priority errors

ADVANCED AUDIO OPTIONS	
Note: All options apply for factory install or field upgrade use 'F' or '-F'	
VTM-A^3-OPT 2-F	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
VTM-A^3-OPT 3TLF	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
VTM-A^3-OPT 5TLF	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® D or Dolby® E with up to 8 analog outputs, Dolby® metadata display; includes loudness monitoring and audio true peak metering to ITU-R BS.1770
VTM-A^3-OPT 3TO5F	Adds Dolby® Digital or Dolby® E decoding and Dolby® metadata display to VTM-A3-OPT 3 or VTM-A3-OPT 3TL

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

POWER CORD OPTIONS	
EPC	European power cord
EPC-UK	United Kingdom power cord
EPC-AA	Australian power cord

Note: North America power cord supplied unless otherwise specified at time of order