Release Notes

Selenio™ VMG

Build 74349

Release 3.7.0 P4

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Publication Information

Trademarks

Patents

The products described herein are covered by one or more U.S. and foreign patents pending. The Selenio™ VMG is protected by U.S. Patents. 6,996,129; 7,046,677. Other US and foreign patents pending.

Contact Information

Imagine Communications has office locations around the world. For domestic and international location and contact information see: http://www.imaginecommunications.com/contact-us/

Support Contact Information

For domestic and international support contact information see:

- Support Contacts: http://www.imaginecommunications.com/services/technical-support/

Contents

Current Release Details

This document describes the latest software release for Imagine Communications' Selenio™ Video Multiprocessing Gateway (VMG), release 3.7.0 P4. It is intended to document the current supported features, capabilities, system interoperability, and known issues for this specific release.

This release supports three platform types and two module types. The supported platforms include VMG-8, VMG-14 and VMG-14+. The three module types are the Network Processing Module (NPM), Video Processing Module (VPM), and Transcoding Module (TCM).

Upgrade Designation

VMG 3.7.0 P4 has addressed a few bugs reported by customers.

As based on criteria that qualify upgrade designations, VMG 3.7.0 P4 is determined to be an Optional upgrade for customers.

Upgrade Designation Definitions

Upgrade Designation	Definition
Mandatory	A release is given this designation when Imagine Communications has addressed critical product issues that it believes all customers will experience on the currently deployed releases.
Recommended	A release is given this designation when Imagine Communications has addressed product issues that it believes some customers may experience on the currently deployed releases or there are important performance improvements that could benefit customers.
Optional	A release is given this designation when Imagine Communications has addressed product issues that it believes certain customers may experience or that an upgrade provides potential benefits over existing product releases.

Selenio™ VMG Overview

The VMG product line offers the industry's first high-density, carrier- class platform for the delivery of advanced video services, including high definition (HD) and standard definition (SD) video, as well as lower-resolution H.264 video streams for multi-screen applications. The VMG is an integrated solution specifically designed to address a number of critical applications, including advanced ad insertion, transrating, transcoding, and re-coding, in a highly integrated and flexible configuration. The VMG's modular blade architecture provides a flexible platform that scales well in the rapidly-evolving video marketplace.

Hardware documents associated with release 2.5.2 are valid for Release 3.7 as there have been no changes to that hardware since those documents were released. Please also reference user guide Selenio VMG User Guide 3.7.0_20150416.pdf and the previous software upgrade guide Selenio VMG Software Upgrade Guide 3.6.1_20140724.pdf.

Contacting Imagine Customer Support

Imagine Communications has office locations around the world. For domestic and international locations and contact information, visit our Contact page:

(http://www.imaginecommunications.com/company/contact-us.aspx)

Changes in the VMG 3.7.0 P4 Release

The following changes were made with VMG release 3.7.0 P4, build 74349.

VMG 3.7.0 P4 is a patch release on top of VMG v3.7.0 P3 patch release. There is only BCT change in this release, without any changes to NPM & TCM SW.

New Features and Enhancements

There is no new feature added in this patch release.

For a list of all the previously added new features and enhancements, please refer to the New Feature History section later in this document.

Supported Upgrades

The following upgrades were tested on the VMG. Future releases of the VMG will require the "easyUpgrade tool" to get to 3.6.3 and then use the "Upgrade from Local" procedure from 3.6.3 onward.

From VMG Release	TO VMG Release
• **Release 3.6.0_70406**	**Release 3.7.0 P4_74349**
• **Release 3.7.0_72817**	
• **Release 3.7.0 P2_73548**	

All release upgrades prior to 3.0.3 require a multistep upgrade.

The VMG configuration database will be erased following an attempt to upgrade from any unsupported release. As always it is advised to back up the database prior to upgrading.

Potential Upgrade Issues

The following changes to the VMG specification occurred in VMG release 3.1.0. If you are upgrading from a 3.1.0, 3.1.1, 3.1.2, 3.1.3, 3.2.0, 3.3.0, 3.4.0 or 3.5.0 release you have already encountered these changes. If you are upgrading from a 3.0.3 or 3.0.4 release to 3.6.0 please review the following:

Dolby's AC-3 audio encoder no longer supports encoding of AC-3 outputs with 32 kHz or 44.1 kHz sample rates.

If the VMG was previously configured for AC-3 outputs with 32 or 44.1 kHz sample rates, they must be modified to 48 kHz in order to transcode audio for those outputs after the upgrade to VMG 3.1.0 or later.

The VMG's possible range of audio gain adjustment has been changed from +24 dB to -24 dB to +12 dB to -12 dB to avoid issues associated with excessive clipping or attenuated audio.

The range will not be changed during the upgrade process. After upgrading to VMG 3.1.0 or later you must set the audio gain to a value between -12 and +12 dB to avoid any potential audio issues.

Newly Resolved Issues

The following issues have been resolved with VMG G1 Release 3.7.0 P4.

ID	Summary
4776	VMG3.7.0: BCT uploads fail to groom approximately 35% of the outputs
4778	VMG3.0.7P2: Multiple channels not Xcoding audio and affecting packagers

To see all previously resolved issues, see Previously Resolved Issues section.

New Known Issues and Workarounds

There is no new known issue created in this release.

New Product Constraints

For a complete list of product constraints please refer to Product Constraints Specifications section.

External Dependencies

Syslog Server

In order for Imagine to provide the best possible customer support, the VMG supports the logging of events to an external syslog server. It is highly recommended that you connect the VMG to an external Syslog server due to the capacity constraints of the VMG's internal local syslog.

NTP Server

The VMG requires an external Network Time Protocol (NTP) server to maintain the precise date and time. The precise time is required for accurate Digital Program Insertion and alarm and event messages.

POIS Server

The VMG requires an external Placement Opportunity Information Service (POIS) server to support the Event Signaling And Management (ESAM) functions on the VMG. The POIS server is required to review the Ad Cue events sent from the VMG and notify the VMG of any actions to take regarding those events. It may also notify the VMG to insert Cues for blackout events.

Product Specifications

Input/Output Interfaces—NPM

Gigabit Ethernet

- 1-Gigabit Ethernet, 8 x SFP ports (copper or fiber), IEEE-802.3z compliant Ingress only: up to 800 Mbps per port
- Egress only: up to 710 Mbps per port
- Ingress & Egress: up to 700 Mbps in and 700 Mbps out per port
- 10-Gigabit Ethernet, 2 XFP ports (fiber), IEEE-802.3ae compliant
- 10.0.1.x and 10.0.2.x subnets are reserved for internal VMG usage and must not be used for the Management Interface or on other Ethernet ports

Fast Ethernet

- 1 10/100 BaseT control and management interface, RJ-45 connector

Inputs

Compression Formats

- MPEG-2 up to Main Profile at High Level
- H.264 up to High Profile at Level 4.1

Transport Level

- Multi Program Transport Stream (MPTS)
- Single Program Transport Stream (SPTS)
- Up to 8,192 Elementary Streams

Resolutions and Frame Rates

- 480i60 (30 or 29.97fps) (Vertical: 480; Horizontal: 720, 704, 544, 528, 352)
- 720p60 (60 or 59.94fps)
- 1080i60 (30 or 29.97fps)
- 576i50 (Vertical: 576; Horizontal: 720, 25fps)
- 720p50 (50fps)
- 1080i50 (25fps)

PCRs

Common and external PCRs are supported for transcoding, they are not supported for transrating

Outputs

Compression Formats

- MPEG-2 Main Profile up to High Level
- H.264 High Profile up to Level 4.1
- H.264 Main Profile up to Level 4.1
- H.264 Baseline Profile up to Level 4.1 (PIP, MBR-TS output modes)

Transport Stream Level

Single Program Transport Stream (SPTS) (TCM/AMP)

Video Bit Rates—TCM

- MPEG-2 HD: 8 – 15 Mbps
- MPEG-2 SD: 1 – 7 Mbps
- H.264 HD: 2 – 15 Mbps
- H.264 SD: 0.2 – 7 Mbps
- H.264 PIP: 0.1 – 1 Mbps
- H.264 MBR-TS: 0.1 – 8 Mbps

Output Resolution and Frame Rates—TCM

VTX or AVTX Transcoding HD to HD

- Horizontal resolution: Full, 1920, 1440, 1280, 960
- Vertical resolution: follow-input
- Frame rate: follow-input

VTX or AVTX Transcoding HD to SD

- Horizontal resolution: D1, VGA, 3/4D1, 2/3D1, 1/2D1
- Vertical resolution:
  - 25 or 50 fps input: 576
    29.97 or 59.94 fps input: 480
  - Frame rate: follow-input
  - Vertical resolution: follow-input
  - Frame rate: follow-input

VTX or AVTX Transcoding SD to SD

- Horizontal resolution: D1, VGA, 3/4D1, 2/3D1, 1/2D1
- Vertical resolution: follow-input
- Frame rate: follow-input

PIP (Picture-in-Picture): VTX+PIP, AVTX+PIP, or PIP Transcoding

- 352x288 (25 or 50fps input)
- 352x240 (29.97 or 59.94fps input)
- 192x192
- 128x96
- 96x96

MBR Transcoding

All outputs are p30/25 unless otherwise noted. The list of possible output resolutions is color-coded according to the following schemes:

- With HD inputs:
  - Green: 1920x1080, 1280x720p60/50
  - Yellow: 1280x720, 1024x576, 960x720, 960x540
  - Blue: 864x486, 848x480, 768x432, 640x480
  - Red: 640x360, 624x352, 512x288, 480x368, 480x320, 480x272, 416x240, 320x240, 320x180, 320x176, 192x192,128x96, 96x96
- With SD inputs:
  - Yellow: 1024x576
  - Blue: 768x432, 720x576, 720x480, 640x480
  - Red: 640x360, 624x352, 512x288, 480x368, 480x320, 480x272, 448x336, 416x240, 400x360, 400x224, 352x288,
  - - 352x240, 320x240, 320x180, 320x176, 192x192, 128x96, 96x96
- Only one output profile per MBR TS groom is allowed for Full HD Output:
  - 1 green
- The following are allowed combinations for four output profile TS grooms:
  - 1 yellow + 1 blue + 2 red
  - 1 yellow + 3 red
  - 2 blue + 2 red
  - 1 blue + 3 red
  - 4 red

Video Processing

Input Video Bitrate—TCM

Up to 24 Mbps per video input.

Processing Density

- Up to 36 SD input programs per TCM may be transcoded to SD or PIP outputs
- Up to 12 SD or HD input programs per TCM and 24 outputs in full-screen transcode + PIP mode
- Up to HD input programs per TCM when transcoding HD-HD, HD-SD or HD-PIP
- Up to 12 SD or HD input programs per TCM and 48 outputs in MBR-TS mode

Up to 12 TCMs per VMG-14 chassis [1]

- Up to 6 TCMs per VMG-8 chassis

Transcode Modes—TCM

- MPEG-2 input to MPEG-2 or H.264 output
- H.264 input to MPEG-2 or H.264 output
- PIP and MBR-TS outputs are transcoded to H.264 outputs regardless of input

Video Processing—TCM

- Programmable GOP structure
- Adaptive GOP based on scenes [for IPTV only]
- All intra prediction modes
- ¼ pixel interpolation
- Multiple reference frames
- P and B pictures
- Block sizes: 16 x 16, 8 x 8, 16 x 8, 8 x 16
- Coding: CABAC entropy coding

Rate Control—TCM

- CBR or VBR input
- CBR output

Noise Reduction—TCM

- Motion Compensated Temporal Filter (MCTF) noise reduction for non-MBR

Film Processing—TCM

- Telecine (MPEG-2)

[1] Consult Imagine Communications for configuration-specific maximum texted TCMs per VMG14 chassis. MRB-TS mode bench-marked with 0+1 redundant TCM configuration (54 inputs, 432 outputs in 1:8 profile ratio).

Maximum Output Programs—VPM

- 320 per VPM, subject to chassis-level constraints

Error Correction—VPM

- Pro-MPEG COP3r2 FEC decoding and encoding
- Two-dimensional checksum (L x D <= 100)

Multiplexing Capacity—MPTS Output, per VPM

- 16 MPTS at 38Mbps, 8 MPTS at 52Mbps
- Includes MPEG-2 statistical multiplexing, as well as mixed mode H.264/MPEG-2 MPTS outputs

Transrating—VPM

- MPEG-2 SD and HD statistical multiplexing of frame encoded content
- Mixed mode MPEG-2 / H.264 SD and HD statistical multiplexing (H.264 re- multiplexed, not transrated)

Quality of Service (QoS)—VPM

Ability to set priority for level of transrating desired (including transrate bypass), as well as maximum video bitrate for MPEG-2 video streams

Program Substitution Capacity—VPM

- 200 SD or 100 HD

Audio Processing

Input Audio Codecs

- MPEG-1 LII
- MPEG-2 LII
- AAC-LC
- HE-AACv1
- HE-AACv2
- Dolby Digital (AC-3)
- Dolby Digital Plus (E-AC-3)

Output Audio Codecs

- Pass-through of any input (in all modes other than MBR and PIP)
- Pass-through of Dolby Digital (in all modes other than PIP)
- MPEG-1 LII
- MPEG-2 LII
- AAC-LC
- HE-AACv1
- HE-AACv2
- Dolby Digital (AC-3)
- Dolby Digital Plus (E-AC-3)

Audio Transcoding Capacity (per program)

Up to 8 audio elementary steams per program:

- HD AVTX and VTX supports up to 4 audio outputs per program.
- SD AVTX and VTX supports up to 2 audio outputs;
- If 3 or 4 are required, set the input type to HD.
- MBR TS groups with 4 profiles support up to 2 audio outputs per profile.
- MBR TS groups with only 2 profiles support up to 4 audio outputs per profile
- MBR TS groups with only 1 profile support up to 8 audio outputs per profile

Audio Transcoding Capacity (per chassis)

- Input: Mono (1.0), Stereo (2.0), Surround (5.1)
- Outputs from E-AC-3 inputs: 123 - 147 Mono (1.0), 91 - 134 Stereo (2.0) and 60 - 82 Surround (5.1) dependent on output codec
- Outputs from inputs without E-AC-3: 290 - 409 Mono (1.0), 187 - 409 Stereo (2.0) and 95 - 173 Surround (5.1) dependent on output codec

Transcoded Output Data Rate

- 6 – 512 kbps depending on codec and sample rate

Transcoded Output Sampling Rates

- 8, 11.0, 12, 16, 22.1, 24, 32, 44.1, 48 kHz depending on output codec

Transcoded Audio Gain Control

- -12 dB to +12 dB, increments of 1dB

Ancillary Data Processing

Close Captioned Support on Input and Output

- SCTE-20 (CEA-608) for MPEG-2
- SCTE-21 (CEA-608 and CEA-708) for MPEG-2
- SCTE-128 (CEA-608 and CEA-708) on H.264

SCTE-35 Support

- Selectable PID pass-through
- SCTE-35 Cues will create a Cue induced IDR at the splice point specified in MBR outputs
- ESAM processing (issues with POIS server may delay Cue)

EBP Support

Encoding Boundary Point

- Enable or disable employment of Encoder Boundary Points in MBR output streams. When enabled in the GUI:
- An EBP fragment marker will be inserted at every IDR interval.
- An EBP fragment and segment marker will be inserted at every cue-induced boundary (SCTE-35) and at the EBP Segment Length interval.

EBP Segment Length

- Value, in the range 0 to 30, to define the number of segments between Instantaneous Decoding Refresh (IDR) fragment markers. At the specified interval, there will be a marker that indicates that the boundary is both a fragment marker and a segment marker.
- For example: Assume GOP = 1 second and IDR = 2 seconds. This means there will be a closed GOP every 2 seconds (approximately). Setting an EBP Segment Length of 5 will set a segment marker every 5 fragments (1 fragment = 1 IDR). In this case, setting the EBP length to 5 will render a segment marker every 10 seconds (or 5 fragments/IDRs). (GOP x IDR) x EBP Segment Length = Segment Marker location.

- When EBP is configured, roughly 20bytes of EBP info data is added to the transport adaptation header field belonging to the video PID for every IDR interval.

- EBP in carried in the Adaptation Field NAL-HRD Setting

- ISO 639 Language Descriptor Add/Modify Data PID Pass-through (EBIF)

Control and Management

Module Redundancy

- All modules hot swappable
- 1:1 NPM, AMP module redundancy
- N+M TCM module redundancy

Program/Service Redundancy

- Yes. Common to VMG platform.
- Backup program pre-defined and used in case of loss of primary input.

Management

- Embedded Web-based UI using XML/RPC protocols
- Java-basedapplication
- SNMPv1 / v2c
- Multi-user access control
- AAA (Radius, TACACS+)

Management Interface IP Address

- The Management Interface IP address is user configurable.
- 10.0.1.x and 10.0.2.x subnets are reserved for internal VMG usage and must not be used on the Management Interface or other Ethernet ports.

System

IP Networking

- IP/UDP, RTP, IGMPv3

Device Latency

- <1.5 sec (no transcoding)
- <4 sec (with transcoding)

Multiplexing and Table Processing

- MPEG-2 and MPEG-4/H.264 multiplexing and re-multiplexing
- MPTS, SPTS, multicast and unicast support
- CBR and VBR support
- PAT and PMT generation
- PID filtering and re-mapping
- Generation and pass-through of ATSC PSIP tables (incl. A/65)
- DVB-SI table regeneration

Network Jitter Tolerance

- +/- 100 msec

Max Unique IP Multicast Inputs

- 600

Max Unique IP Multicast Outputs

- 508

Electrical–VMG Input Power

VMG-14+ DC

- DC: -48 VDC nominal (-41 to -60 VDC range)
- 70 Amps per power feed (total 4 feeds)
- Overcurrent protection: 70 Amp circuit breaker on PEM
- Power consumption: 6000 Watts maximum – fully loaded

VMG-14+ AC

- AC: 220 VAC nominal (180 to 264 VAC range)
- 11 Amps per power feed (total 4 feeds)
- Overcurrent protection: 15 Amp fuses on PEM
- Power consumption: 6000 Watts maximum – fully loaded

VMG-14

- DC: -48 VDC nominal (-41 to -60 VDC range)
- 30 Amps per power feed (total 4 + 4 feeds)
- Overcurrent protection: 30 Amp fuses on PEM
- Power consumption: 2700 Watts maximum – fully loaded

VMG-8 DC+

- DC: -48 VDC nominal (-41 to -60 VDC range)
- 60 Amps per power feed (total 1 + 1 feeds)
- Overcurrent protection: 60 Amp circuit breaker per feed
- Power consumption: 1700 Watts maximum – fully loaded

VMG-8 AC+

- 120/220 VAC nominal

Note: 220 VAC nominal may be required for future VMG modules

- 15 Amps per power feed (total 2 + 2 feeds)
- Overcurrent protection: 15 Amp circuit breaker per feed Power consumption: 2000 Watts maximum– fully loaded.

Compliance

Safety

- UL/CUL/CB 60950-1

Electro Magnetic

- FCC part 15 Class A
- FCC - Title 47 CFR Part 15, Subpart B
- Canada - ICES-003, Issue 2, April 1995
- CE Mark - EN55022 2006 and EN55024:1998 + A1:2001 + A2:2003
- FCC Part 15, Class A, EN55022, EN55024, EMC, EMI

Mechanical

Dimensions

VMG-14+ DC

- 13 rack units
- 22.75” H X 19.00” W X 21.00” D (578.0 H x 482.6 W x 533.4 D mm)

VMG-14+ AC

- 14 rack units
- 24.50” H X 19.00” W X 21.00” D (622.3 H x 482.6 W x 533.4 D mm)

VMG-14

- 13 rack units
- 22.51” H X 19.00” W X 19.94” D (571.6 H x 482.6 W x 506.54 D mm)

VMG-8 DC+ and 8 AC+

- 7 rack units
- 12.2” H X 17.6” W X 20.0” D (309.9 H x 447.1 W x 508.0 D mm)

Weights (Assembled)

- VMG-14+-DC: 103.7 lbs. (47.1 kg)
- VMG-14+-AC: 111.6 lbs. (50.7 kg)
- VMG-14: 67 lbs. (30.6 kg)
- VMG-8-DC+: 55.7 lbs. (25.3 kg)
- VMG-8-AC+: 67.3 lbs. (30.6 kg)

Cooling (Air Flow Direction)

- VMG-14+-DC: Front (bottom) to rear (top)

- VMG-14+-AC: Front (bottom) to rear (top)
- VMG-14: Front (bottom) to rear (top)
- VMG-8-DC+: Right to left (as viewed from front)
- VMG-8-AC+: Right to left (as viewed from front)

Environmental

Storage Temperature

- -40º C to 70º C (-40º to 158º F)

Operating Temperature

- 0º to 45º C (32º to 113º F)

Ambient Temperature (Transient Operation)

- 0º to 55º C (32º to 131º F)

Humidity

- 5% to 85%, non-condensing;
- Transient operation: +5% to +90%, non-condensing

Product Constraints

System Constraints

- If a VMG currently has a TCM or VPM in a slot and that card is replaced with a non-matching card, the VGM chassis may need to be rebooted as the card may continuously reset. E.g. Slot 5 has a TCM and is replaced with a VPM or visa versa, may cause the card to continuously reset requiring a complete system reboot.

- All the output TSs that belong to the same MBR-TS must be on the same GigE port.
- Port mirroring limitations
    - Since ingress traffic on mirrored port is currently not being monitored, link flap on mirrored port could result in unrecoverable mirrored port traffic.
        - No ping support on the mirrored port.
- Input SCTE-35 Cue messages are ignored if the PTS value contained in those messages is close to the PCR rollover value. The following equation specifies the error condition: |(SCTE_35_PTS – PCR_RolloverValue)| <= 2*IDR_interval + 4*Frame_Duration at 29.97fps (or 25fps).
- The 10GigE ports may be used for transrating or multiplexing but may not be used for transcoding.
- 10.0.1.x and 10.0.2.x subnets are reserved for internal VMG usage and must not be used for the Management Interface or on other Ethernet ports.
- Video transrating does not support switching between MPEG and H.264 format inputs unless the operator deletes the current input, waits 5 seconds, then adds another program with a different type to the TS. This also means that different program types should not be used for program substitution or the regroom

operation will fail.

- The sum of all TS and video ES streams within an MBR TS must not exceed 12 Mbps and 10 Mbps respectively.
- The VMG does not support non-standard input resolutions such as 480p30, or non-standard frame rates.
- H.264 inputs must have 1 PES every AU and must have the sequence parameter set fully contained within a single TS packet.
- MPEG inputs must either have one PES per every AU, or one PES per GOP.
- The VMG does not support inputs with changing video codec formats (ex: MPEG2 <-> H.264), changing video resolutions (ex: 1080i <-> 720p <-> SD), or changing audio codec formats (ex: AC- 3 <-> AAC-LC).
- The number of AMP modules must be the same as the number of NPM modules.
- There will be a 3 minute outage after NPM switchover or reboot on programs that are running from backup inputs at the time of switchover or reboot in order to insure the system is stable prior to switching to those backups.
- If audio outputs are assigned specific PID values the VMG will reserve those output audio PIDs even if the input audio is temporarily missing, if the language descriptor changes or the audio stream type changes. During this time the VMG will continue to provide audio service by creating another temporary audio output.
- For example if the language descriptor changes or the audio stream type changes on a transcoded audio input which has been groomed to an output with an assigned PID value the following will occur:
    - An audio stream with the new language descriptor or stream type will be temporarily added to the output with a PID value the same as the input audio PID value unless that PID value was already used in the output. If the PID value was already used in the output transport stream the VMG will assign it the next available PID greater than 32 (if perfect match is enabled).
    - The original audio output with the assigned PID will continue to be displayed—as a grey icon— even though it is not present in the output.
    - If the input reverts to its previous language descriptor or stream type it will be output on the PID reserved for the originally groomed audio and the temporary audio output will be removed.
- The insertion of Hypothetical Reference Decoder (HRD) parameters into the video elementary streams of H.264 MBR outputs is intended for use by downstream packagers to automatically determine the bitrates of each of the profiles. It is not intended for other uses as some non-bitrate parameters may be inaccurate.

Transcoding Constraints

- H.264 output with GOP value M = 8 is supported with fixed N = 32 and IDR interval = 96, and is applicable to SD and 720p HD inputs only. M = 8 is not supported for 1080i HD inputs. If it is not known whether an HD input is 720p or 1080i do not use M = 8. Imagine has determined that setting M= 8 often degrades the video quality of SD video compared with M = 4. Due to the above constraints and degradation of video quality setting M = 8 is not recommended.
- VTX+PIP, AVTX+PIP, PIP and MBR TS formats support transcoding to H.264 only.
- When the VMG is configured for MBR any SCTE-35 Cues from the selected SCTE-35 PID will cause a Cue induced IDR at the splice point time specified by the Cue. This will cause the creation of irregular IDR intervals after the Cue induced IDR.
- The VMG may be configured for MBR with ESAM processing and SCTE-35 Cue forwarding selected as the action to take if the POIS server notification is not received in time. In this case if the POIS server notification is not received in time, the VMG will forward the SCTE-35 Cue but it will be late per SCTE-35 specifications (less than 4 seconds ahead of splice point).

Stream Constraints for Seamless Ad Insertion

As the possible configurations are extremely varied it is recommended that you call Imagine Product Marketing for Ad Insertion constraints.

New Feature History

In addition to the New Features and Enhancements listed on page 9, the following New Features were added in previous releases.

VMG 3.7.0P2	• Added the following namespaces for POIS agent: ns2 through ns6. (previous patch P1 only supported ns2 & ns6)
VMG 3.7.0P1	• Added the following namespaces for POIS agent: NS2, NS6, COND and CORE
VMG 3.7.0	• The ASICs code in the TCM chip was updated to handle situations that resulted in video breakup. Several improvements have been made to address field reported issues.
VMG 3.6.3	• TCM and VPM modules in the same chassis is now supported.
VMG 3.6.2P1	• Upgrading the VMG software is now possible with an HTTP URL • NPM failover while programs were in a substituted state would previous result in the main program being outputted instead of the substitution program. DB's between NPM cards is now synchronizing the substitution state of a program. • Correct "Apply button" that was grayed out in modify VTR TS dialog • Enhanced networking configuration to allow for larger number of multicast services to be joined in an IGMP query on a specific port. (240 services tested) • Adjusted the severity of the Shelf Manager alarm • Corrected PCR repetition rate to fall within spec for the specified TS.
VMG 3.6.1	• Support for both VPMs and TCMs in separate VMG chassis devices • Support for upgrade and restore DB from local file, from GUI (for both system and AMP • Function to Restore DB now added to GUI. • Support for locking HD output resolution to 720p (AVTX, VTX, MBR). • Support for Audio PID only tracking for MBR and PIP TSs. • Audio only MUX and language descriptor modification (VTR). • Enhanced elementary stream management (All TS types).
VMG 3.6.0	• Searchable Programs on the Grooming Input and Output Panes This release allows searching for desired transport streams and programs on the input or output grooming panes. The search is case-insensitive and will match on partial-strings. The search will result in a list of all of the transport stream names and all of the program names that match the search criteria. The user can select a transport stream or program from the list and the tree will be expanded to show the selected transport stream or program in the input or output grooming pane. • Display GigE Port Names in the Grooming Panes

	This release will show the GigE port names as supplied by the user on both the input and output grooming panes. • Allow grooming of Elementary Streams with PID values less than 32 Previously the VMG would not allow grooming of Elemenatry Streams with PID values less than 32. In this release it is possible to create ghost PIDS less than 32 that may be groomed. • Option to treat Teletext as Asynchronous Data In some systems the Teletext data has inaccurate time stamps. The normal operation would be to delay outputting this data until the proper time or dropping the data if the delay was too large. In this release there is an option to ignore the invalid time stamps by treating the data as Asynchronous Data. This will cause the Teletest data to pass through but without any time adjustments. • Audio only Multiplexing Previous releases require output programs to include video. In this release it is possible to create output programs that only have audio content as long as one of the audio streams contains PCRs. • VMG time is automatically set when connected to NTP server Previously the user had to set the time even thought the VMG was connected to an NTP server.

VMG 3.5.1.P1	The VMG 3.5.1.P1 release contains no new features over 3.5.1, but reliability has improved due to the resolution of issue **4343**, VMG crashes after upgrading to 3.5.1 as described in *Previously Resolved Issues,* on page 42.

VMG 3.5.0.P3	The VMG 3.5.0.P3 release contains no new features over 3.5.0.P2, but reliability has improved due to the resolution of issue **4232**, MBR encoding crash on services as described in *Previously Resolved Issues*, on page 42.

VMG 3.5.1	• Reduced Audio/Video Interruptions via Audio PID Tracking This release provides options to minimize video interruptions due to PMT changes at the input. There is a new “PMT Update” tab under “Global Configuration”. On that tab there are three new options available to allow the user to determine how PMT updates will be processed. The first option allows users to suppress video resets when the input PMT changes. The second option enables the user to determine if changes in the input audio streams should be treated as new inputs or as existing inputs with different PIDs, formats or language descriptors. The third option allows data to be processed in a similar way as the audio. By appropriate configuration for the user’s system it is possible to minimize disruptions to the output due to changing inputs. • Support Changing Input Resolutions for (A)VTX In some systems HD video inputs switch between 1080i and 720p content. When the VMG follows the changing resolution it requires a reset of the encoding for the new resolution which causes a video interruption. This release provides the user with the option of always forcing the output to 1080i to avoid these video resets. When enabled the output will always be 1080i regardless of the input resolution and changes in the input resolution will not cause video resets or interruptions. • Support for GOP M value of 4 This release allows setting the GOP M value to 4 with corresponding new GOP N

	values. • Support for India Time Zone Added support for India Time Zone which is UTC + 5:30.
VMG 3.5.0.P2	The VMG 3.5.0.P2 release contains no new features over 3.5.0.P1, but reliability has improved due to the resolution of issue **24046** (see also *Previously Resolved* Issues, on page 43).

VMG 3.5.0.P1	The VMG 3.5.0.P1 release contains no new features over 3.5.0, but reliability has improved due to the resolution of issue **4221** see also *Previously Resolved Issues*, on page 43).

VMG 3.5.0.	• 1.50 Frame IDR Support It is now possible to select a GOP N value of “25” frames or “Optimized x25” frames for MBR transcoding. If either of these GOP N values are selected the IDR interval may be set to any integer multiple of 25 frames, up to 250 frames. When GOP N is set to “Optimized x25” the VMG will use longer GOP N values up to the IDR interval to improve the VQ and bitrate. • Reduced Video Bitrate The VMG now allows the un-packetized Video Elementary Stream bitrate to be set as low as 50 Kbps (0.050 Mbps). Please be aware that all Transport Streams have a fair amount of overhead even when the Audio and Video Elementary Streams have been set to a very low bitrate. For example with a 50 Kbps video ES the TS may need to be set at 175 Kbps in order to accommodate PCRs, PMTs, audio ES and other data ESs. • Hide WSS “White Lines” on Active Video Some encoded content incorrectly contains WSS data in the first few lines of what should be the active video. In order to hide this artifact the VMG now allows the first few lines of active video to be masked with black. There is a new menu option, “Masked top lines:”, in the create and modify grooming screens which may be set from 0 lines (indicating no masking) up to masking of the first 3 lines of video. • Support for "ES_RATE" field in the PES layer Some packager devices require the “ES_RATE” field to be included in the PES layer. With this release it is possible to enable this feature. Please contact Imagine Customer Support for assistance with this

VMG 3.4.0	The following new features below are introduced in software release VMG 3.4.0 for transcoding applications. • SCTE-27 Subtitling Support Previous VMG releases pass through selected data PIDs but do not support the timing corrections required to support SCTE-27 subtitle contents. With this release the VMG will process the SCTE-27 timing to insure that it is correctly displayed in synchronization with the audio and video.

VMG 3.3.0	The following new features below are introduced in software release VMG 3.3.0 for transcoding applications. • Enhanced Event Signaling and Management (ESAM) Support With this 3.3.0 release the VMG extends ESAM support to include Out-of-Band Blackouts, user configurable option to drop or pass Cues whose POIS notification timed out and handling splice immediate Cues. Out-of-Band Blackouts are supported where the request for blackout is received asynchronously from the POIS server. The VMG will then create a Cue induced IDR and inject the specified Cue into the output transport stream. A new GUI option allows customers to select whether to drop or pass Cues when the VMG fails to receive a notification from the POIS server before timing out. The VMG now supports Splice Immediate Cues which require the calculation and insertion of PTS for the splice point time. • True Mirrored Output Ports VMG 3.3.0 supports true mirrored output ports where the mirrored output port has the same Source IP address, Group IP address and UDP port as the primary output port.

VMG 3.2.0	The following new features below are introduced in software release VMG 3.2.0 for transcoding applications. • CEA-708 Pass-through Previous VMG releases output only CEA-608, either from CEA-608 inputs or by converting CEA-708 content to CEA-608. This was done for compatibility with older Set Top Boxes (STBs). In this release there is an option to either output CEA-608 for compatibility or to output CEA-708 if it appears on the input. This may be required to comply with legal mandates to provide CEA-708 when available. • SCTE-20 Ingest Previous VMG releases process SCTE-21 closed caption content on MPEG-2 input sources and output the closed caption content via SCTE-21 and optionally SCTE-20 on MPEG-2 outputs. With this release the VMG will process SCTE-20 in addition to SCTE-21 closed caption content on MPEG-2 input sources. • Ability to Configure UDP Port on Redundant Output VMG 3.2.0 adds the ability to uniquely configure the UDP port in addition to configuring the Source and Group IP addresses of redundant output ports. • Event Signaling and Management (ESAM) Support With this 3.2.0 release the VMG now supports an Event Signaling and Management (ESAM) interface with Placement Opportunity Information System (POIS) servers. This interface allows the VMG to confirm SCTE-35 Cues with a POIS server and delete, pass or modify those Cues as requested by the POIS servers. The resultant SCTE-35 Cues will cause the VMG to insert an IDR frame at the SCTE-35 splice point to support seamless ad insertion downstream. In order to verify integration with third party POIS servers please contact Imagine. Refer the Contacting Imagine Customer Support section at the top of this document for contact information. • SCTE-35 PID Selection

In some cases an input program may include more than one SCTE-35 PID. With this enhancement the VMG allows the operator to select which of the SCTE-35 PIDs should be passed through and optionally processed by a POIS server via the ESAM interface.

- Dolby Digital Plus Encoder

  VMG 3.2.0 uses a new version of Dolby's Digital Plus encoder which resolves some incompatibility issues with certain STB and provides additional audio transcoding capacity as illustrated by the chart below.

  When Dolby Digital Plus decoding is not enabled the capacity is the same as previous releases. When Dolby Digital Plus decoding is enabled the capacity is 30% to 120% better than in previous releases. In addition this release supports the new lower bitrates available with the latest Dolby Digital Plus encoder.

Audio Encoder Type	Channels per audio program	Audio program transcodes			
		DD+Decode not enabled		DD+decode enabled	
		3.1x	3.2.0	3.1x	3.2.0
AAC-LC	1	375	375	128	250
	2	250	250	105	183
	5.1	155	155	81	128
HE-AACv1	1	333	333	128	225
	2	214	214	100	157
	5.1	100	100	64	86
HE-AACv2	2	250	250	109	204
MPEG1 L2	1	409	409	147	321
	2	409	409	134	281
MPEG2 L2	1	409	409	147	321
	2	409	409	128	281
AC-3	1	391	391	138	264
	2	300	300	113	214
	5.1	173	173	82	155
E-AC3	1	290	290	123	230
	2	187	187	91	160
	5.1	95	95	60	104

VMG 3.1.3

- 1.VMG-14+ Chassis Support

  This release supports the newer VMG-14+ chassis. In addition to supporting all of the current VMG modules, this chassis will support up to 14 higher power, "+", modules. The chassis is available as either a 13 RU DC powered chassis or as a 14 RU AC powered chassis with an integrated redundant AC power supply. Please note that the AC version requires 220 VAC.

VMG 3.1.2.p1

The VMG 3.1.2.p1 release contains no new features over 3.1.2, but reliability has improved due to the resolution of issues **18994**, **19036**, **19228** and **19239**.

VMG 3.1.2	The new feature below was introduced in software release VMG 3.1.2 for Multi Bit Rate (MBR) transcoding applications. • GUI Configuration of Encoder Boundary Point Insertion Encoder Boundary Point (EBP) insertion which was added in VMG 3.1.1 is now configurable by the user via the Transcoder tab under Global Configuration. The EBP Structure is a signaling mechanism in the private field of the adaptation field of an MPEG TS packet for video or audio. It is intended to assist in creation of adaptive streaming content from continuous streams.

VMG 3.1.1	The features and enhancements below are introduced in software release VMG 3.1.1 are primarily centered on IPTV and Multi Bit Rate (MBR) transcoding applications. **1.**New MBR Resolutions 1024x576 and 512x288 resolutions have been added for both SD and HD MBR profiles. The 768x432 resolution, which was previously available for only for HD MBR profiles, is now also available for SD MBR profiles as well. • Smooth Video Bitrate This new Global Configuration option enables all VTX and AVTX outputs to be transcoded with a more constant video bitrate. It is also recommended that Automatic Video Bitrate be enabled to obtain the best results. • HRD Parameter Insertion This new Global Configuration option enables the insertion of Hypothetical Reference Decoder (HRD) parameters into the video elementary streams of H.264 MBR outputs. This information is intended for use by downstream packagers to automatically determine the bitrates of each of the profiles. It should only be used for this purpose as some non-bitrate parameters may be inaccurate. • Encoder Boundary Point Insertion The Encoder Boundary Point (EBP) Structure is a signaling mechanism in the private field of the adaptation field of an MPEG TS packet for video or audio. It is intended to assist in creation of adaptive streaming content from continuous streams.. • Display of Hardware, Driver and Software Version of VMG Modules The VMG now displays the Hardware and Driver version of NPM, TCM and AMP modules when they are selected on the Chassis view. In addition the VMG will also display the Software version of the NPM and AMP modules. • More robust upgrade process With this release the VMG insures that the upgrade process avoids an incompatibility between the upgraded software version and the database. Supported upgrades from previous versions will automatically convert the database to be compatible with the upgraded software version. In the case that an upgrade from a currently installed version is not supported by the software version the upgrade will clear the database in order to avoid the VMG attempting to reboot with the upgraded software version and an incompatible database.

VMG 3.1.0

The features and enhancements below are introduced in software release VMG 3.1.0 are primarily centered on IPTV and Multi Bit Rate (MBR) transcoding applications.

- 1080p30 and 720p60 MBR Profiles

"Full HD" mode allows creation of a 1080p30/25 or a 720p60/50 MBR profile. This allows VMG MBR outputs to be used in applications serving multi-screen applications and typical IPTV applications simultaneously.

Use of this mode allows only one "Full HD" profile per MBR TS group and transcoding ASIC (12 per TCM).

NOTE: The use of these "Full HD" profiles will reduce the number of profiles available per TCM.

- 768x432 MBR Profile
  This is a new 16:9 MBR resolution for HD content.
- Up to 8 audio outputs per program
  - Enhanced flexibility by allowing up to 8 audio outputs to some programs where previously all outputs were limited to 2 audio.
  - HD AVTX and VTX supports up to 4 audio outputs per program.
  - SD AVTX and VTX still only support 2 audio outputs; if 3 or 4 are required set the input type to HD. MBR TS groups with 4 profiles support up to 2 audio outputs per profile as before.
  - MBR TS groups with only 2 profiles support up to 4 audio outputs per profile. MBR TS groups with only 1 profile support up to 8 audio outputs per profile.
- Improved NPM Switchover time
  Improved the NPM switchover time for transcoded streams with transcoded audio content (MBR or AVTX). The switchover time for transcoded streams without transcoded audio content (VTX or PIP) remains the same, less than 10 seconds VMG 3.0.3 switchover times for MBR or AVTX: IP gap< 18 seconds
  - Video gap was <21 seconds Audio gap was < 21 seconds
  - VMG 3.1.0 switchover times for MBR or AVTX (dependent on transcodes per VMG): IP gap 3 to 13 seconds
  - Video gap is 6 to 15 seconds Audio gap is9 to 18 seconds
- NPM Switchover triggered by input link failure
  The user may configure the VMG to switchover to standby NPM based on failure of selected input ports.
- Configurable Group IP addresses on "Mirrored" Outputs
  The Group IP address on "Mirrored" outputs may be set to any address, either the same as or different than the primary output's Group IP address
- Enhanced AC-3 transcoding
  VMG 3.1.0 provides support for E-AC-3 (also referred to as Dolby Digital Plus or DD+) inputs and outputs. In order to support E-AC-3 audio inputs for transcoding the VMG must be globally configured to support E-AC-3 inputs which are significantly more complex to decode.

Note: When globally configured for E-AC-3 inputs the VMG assumes that all inputs

may be E- AC-3 and the audio transcoding capacity is effectively cut in half.

Audio Encoder Type	Channels per audio program	Audio program transcodes		
		Pre 3.1.0	3.1.0 w/o E-AC-3 decode	3.1.0 w/ E-AC-3 decode
AAC-LC	1	375	375	128
	2	243	250	105
	5.1	132	155	81
HE-AACv1	1	300	333	128
	2	187	214	100
	5.1	83	100	64
HE-AACv2	2	230	250	109
MPEG1 L2	1	409	409	147
	2	409	409	134
MPEG2 L2	1	409	409	147
	2	409	409	128
AC-3	1	243	391	138
	2	155	300	113
	5.1	96	173	82
E-AC3	1	na	290	123
	2	na	187	91
	5.1	na	95	60

- Additional SNMP traps
  The following error events are now trapped to the SNMP interface. Refer to the VMG Element Manager User Guide 3.1.0, *List of VMG Events*, for an explanation of each of these events

Note: These are events, not alarms, and therefore do not have an associated clear trap.

  - CARD_RESET_DL_DOWN
  - CARD_RESET_PPC_LOST
  - PGRED_FAILOVER_TO_BCKUP
  - PGRED_FAILOVR2BKUP_FAIL
  - PG_RED_RECOVER_TO_PRIM VIDEO_LOSS AUDIO_LOSS (was INPUT_AUDIO_UNDERFLOW) INPUT_TS_MISSING
  - OUTPUT_ES_ERROR V6_OUTQUEUE_90PERCENT
  - PGRED_FAILOVR2BKUP_FAIL
  - OUTPUT_ES_ERROR (was OUTPUT_RESPLICE)
  - OUTPUT_ES_ERROR (was Output_TM_RESET)

- Input and Output ES Statistics
  A number of input and output Elementary Stream statistics may be instantaneously viewed or selected to be monitored and displayed graphically. The input ES statistics are only updated on inputs that are groomed.
  - Input Audio ES Statistics
    - Service Interruptions: Audio Losses
    - Errors: CC Errors, Packets Dropped
    - Transport Errors: Input TS Missing Count
  - Input Video ES Statistics
    - Service Interruptions: DTS Jumps, Video Losses, PCR Errors, PCR Resets

	▪ Errors: CC Errors, Packets Dropped, Packets Lost, Decoder Errors, Frames List, TWI Errors ▪ Transport Errors: Input TS Missing Count o Output Audio ES Statistics ▪ Service Interruptions: Audio Underflows ▪ Errors: CC Errors, Packets Dropped o Output Video ES Statistics ▪ Service Interruptions: DTS Jumps, Video Underflows, PCR Errors, PCR Resets ▪ Errors: CC Errors, Packets Lost, Packets Dropped, Decoder Errors, Frames List, TEI Errors ▪ Traffic: Pipeline Latency, Incoming Packets, Outgoing Packets • Ability to overwrite or create input Audio Language Descriptors This feature allows users to change inaccurate, or create missing, Audio Language Descriptors of input programs. This feature allows users to set audio descriptors on primary and backup inputs to match. This can insure audio from backup is carried after regroom to backup in case of NPM switchover or loss of primary program.
VMG 3.0.4.P3	The VMG 3.0.4 release contained no new features but resolved the issue described in *Previously Resolved Issues* on page 48.

VMG 3.0.4.P1	The VMG 3.0.4 release contained no new features but resolved the issue described in *Previously Resolved Issues*, on page 48.

VMG 3.0.4.	The *VMG* 3.0.4 release contained no new features but resolved the issues described in *Previously Resolved Issues*, on page 49.
VMG 3.0.3.	The features and enhancements below are introduced in software release VMG 3.0.3 are primarily centered on IPTV and Multi Bit Rate (MBR) transcoding applications. For a list of previously added new features and enhancements please refer to Appendix B: New Feature History. • Support for either One-IP or Three-IP configuration on GigE ports This release supports the use of either One-IP GigE port configuration similar to VMG releases prior to VMG 3.0.0 or Three-IP GigE port configuration like VMG 3.0.0 to VMG 3.0.2.p1. When upgrading from a One-IP configuration (releases prior to VMG 3.0.0) the VMG will boot up in the One-IP mode after upgrade. When upgrading from a Three-IP configuration (releases including and after VMG 3.0.0) the VMG will boot up in the Three-IP mode after upgrade. Once upgraded in either configuration it is possible to change from one to the other. Please refer to the VMG 3.0.3 Element Manager User Guide for details. • SDT Support: This release supports either the pass through, modification or creation of the Service Name in the Service Descriptor Table.

VMG 3.0.2.P1	The VMG 3.0.2.p1 release contains no new features over 3.0.2, but video quality has improved due to the resolution of issue **2960** (see also *Previously Resolved Issues*, on page 50).
VMG 3.0.2.	The VMG 3.0.2 release contains no new features over 3.0.1 but reliability has improved due to the resolution of issues **2692**, **2731**, **2798** and **2854** (see also *Previously Resolved Issues*, on page .50).
VMG 3.0.1.	The features and enhancements below were introduced in software release VMG 3.0.1, which primarily centered on IPTV and Multi Bit Rate (MBR) transcoding applications. For a list of previously added new features and enhancements please refer to Appendix B: New Feature History. • Single Click Reset for Transcoded Transport Streams This feature allows the operator to quickly reset currently groomed transcoded transport streams. Right clicking on a groomed transcoded transport stream will bring up a menu that now includes a "Reset Grooming" option. If this option is selected a confirmation dialog will pop up informing the operator that the action will momentarily interrupt service and wait for confirmation. After confirmation, the VMG will tear down the grooming and rebuild it with the previously configured parameters. • Drag and drop Regroom for Transcoded Programs This new feature allows an operator to easily change the input source of an existing output program by dragging an input program to a previously groomed output. The new input program must be similar to the previous input program with regard to the number of streams, type of streams, and PMT order. A confirmation dialog will pop up informing operator that the action will momentarily interrupt the service and wait for confirmation. If confirmed this will open a grooming dialog with the new input information. All fields will be read-only except for the Output ES (component PIDs) area and Audio Setting (if applicable). If the "Apply" button is clicked the output program(s) will be recreated with the existing output grooming configuration with the new source input program. **Note:** *If PID changes are made to the selected output, the operator may also want to make changes to any TS(s) associated with it through a shared audio profile or MBR group ID.* • Support for 32 character names Input and Output Transport Names, MBR Group IDs and Audio Profile names have been extended to support up to 32 characters.

VMG 3.0.0.	The features and enhancements below are introduced in software release VMG 3.0.0, primarily centered on IPTV and Multi Bit Rate (MBR) transcoding applications. For a list of previously added new features and enhancements please refer to Appendix B: New Feature History. • Triple non-MBR SD to SD transcode density from 12 SD per TCM to 36 SD per TCM This release supports up to 36 SD transcodes per TCM for use in VTX and AVTX transcoding. In order to provide this performance increase the VMG groups three

similar videos on one video processor. In order for the VMG to know which videos are similar the VMG requires information on the resolution, video type and standard of each input and the desired output video type.

Note: *As mentioned above, this release adds new information associated with each stream to the VMG database. After upgrading to VMG 3.0.0 the input resolution class defaults to HD and must be changed to SD in order to take advantage of this improved SD transcoding density.*

Note: *Transcoding from SD to SD + PIP using AVTX+PIP is not supported in this release. If it is desired to transcode SD to SD + PIP using AVTX+PIP you must specify in the VMG Element Manager that the SD inputs you wish to transcode are HD. Please refer to the VMG 3.0.0 Software Upgrade Guide for more information.*

- NPM switchover time has been drastically reduced in all modes
  The IP interruption for NPM switchover has been reduced to less than 10 seconds for VTX modes and VPM grooming and t less than 18 seconds for AVTX and MBR modes.
- Additional low resolutions for MBR
  Reintroduced 192x192, 128x96, and 96x96 output resolutions for MBR transcoding.
- Increased maximum MBR TS and ES rates
  This feature increases the maximum allowed TS bitrate to 10 Mbps and the maximum allowed video ES bitrate to 8 Mbps. With these bitrate increases it is necessary to cap the sum of all TS and video ES streams within an MBR TS to a maximum of 12 Mbps and 9 Mbps respectively.
  Warning! These rate caps are new and may not support some existing configurations.
- Improved video quality
  Improved scene change detection, especially for slow fades.
  Improved the mode selection algorithm for processing the scene changes.
- Added support for AC-3 encoding and AC-3 pass-through
  Pass-through supports duplication of AC-3 input on the output and simultaneous audio transcoding to simpler audio codecs to support a range of client devices.
- Auto Video Bitrate for non-MBR modes
  This allows the operator to specify a maximum allowed bit rate for asynchronous data and enables the video bitrate to automatically adjust to use as much of the TS bitrate as possible. The result it that video quality will be optimized in the presence of bursty asynchronous data.
- Save Bulk Configuration Tool excel file
  This enhancement allows the administrator to save the current VMG MBR configuration to the Excel file format used by the Bulk Configuration Tool (BCT). This can be used for several purposes: create a human readable snapshot of the VMG MBR configuration, create an updated BCT file reflecting MBR configuration changes made via the GUI, and create an upgraded BCT file after a system upgrade. Please refer to the VMG Bulk Configuration Tool Administrator's Guide Release 3.0.0 for more information.
- Virtual IP and unique physical IP addresses supported on GigE ports
  Unique physical IP addresses allow the ports of both NPMs in a redundant configuration to be active at all times. This greatly reduces the switchover time required if there is an NPM failure.
  Virtual IP addresses on the GigE ports allow downstream devices to receive VMG outputs regardless of which NPM is active. Virtual IP addresses also allow upstream devices to send unicast outputs (instead of multicast) to the virtual IP address of the

	VMG without having to be aware of which NPM is active. Please refer to the VMG 3.0.0 Software Upgrade Guide for more information **Warning!** *This upgrade will clear all current IP address configuration from the GigE ports. The VMG must be configured with 3 IP addresses per GigE port used; one physical IP address for each NPM and one Virtual IP address that are shared for a total of 3 IP addresses per GigE port. Due to this requirement the VMG will not work in /30 subnets. Please refer to the VMG 3.0.0 Software Upgrade Guide for more information on configuring the GigE ports.* • Improved Audio Robustness Added monitoring for two potential issues within the AMP module.

Previously Resolved Issues

In addition to the Newly Resolved Issues listed on page 10, the following issues were resolved in previous releases.

VMG 3.7.0 P3

ID	Summary
4768	Unexpected restart (NPM cards crash)
4770	MIB compile issue – RGBN-VIDEO-MIB
4769	Upgrade issue from 3.6.0 to 3.7.0 (VPM cards)

VMG 3.7.0 P2

ID	Summary
4757	ESAM parsing error with depth greater than 0. This fix supports ESAM messages with all namespaces: ns2 through ns6

VMG 3.7.0 P1

ID	Priority	Summary
4747	Maj	VMG v3.7 EM : Charter ESAM integration issue. Remove some name spaces from XML parser.

VMG 3.7.0

ID	Priority	Summary

4730/4731	High	Modify grooming dialog shows wrong GOP settings. Modify grooming GUI show N=36 when configured M2H HD with Main profile: M3 and N15 or with Base profile: M1 N12.
4558	High	While creating MBR output TS, VMG is throwing "Invalid PMT id" for PMT PID = 8175. Corrected error message to state "the pid specified xxx is already in use as network PID".
4551	High	MBR IDR Alignment mismatch with short GOPs
4542	High	Aspect Ration inconsistencies in MBR modes
4717	High	New tuning parameter to control ASIC's behavior of decode operation. TUNE_TCM_H264_REDECODE_CONTROL= Valid values are: 0 (no redecode at all) 1 (SMEM availability based) 2 (VCAP Q length based allow) – **For Gen2 only** **3 (allow redecode whenever needed)** 4 (SMEM based for non-MBR, VCAP Q based for MBR) – **For Gen2 only** **Default: 3** Setting this value to 0 behaves exactly the same way as in prior releases, no redecode at all, values 2 and 4 are only for VMG GEN2 and will only be valid on GEN 2 platforms.

VMG 3.6.3

ID	Priority	Summary
4694	High	Shelf manager alarm was optimized to reduce excessive logging.
4656	Med	Export BCT does not show errors if saving of excel file fails.
4564	High	Excessive CC errors on audio/video PIDs during simultaneous substitution have been remedied by setting discontinuity flag. Tuning parameter required to turn on this functionality: **TUNE_VPM_MARK_SPLICE_AS_DISCONTINUITY=0 (default)** disables this functionality, while setting to 1 will enable it. Reboot required for tuning parameters to take effect.

VMG 3.6.2

ID	Priority	Summary
4595/4630	Crit	VMG: Multiple outputs down: Inputs had excessive jitter/PCR errors, RESET command sent by host processor to MUX did not get processed resulting in duplicated PAT/PMT on output. Communication improvements made to increase reliability and robustness when signaling to MUX processor.
4596	Maj	VMG: PIP programs not being outputted due to a host to MUX communication issue. Auto recovery implemented.
4572	Min	VMG: Manual program re-groom results in PMT's version increase by a value of 2 instead of 1
4594	Maj	VMG: Index value for output program incorrectly set under certain conditions; prevents VMG from outputting programs.
4584	Maj	VMG: loss of the sound at the STB and the picture freezes at times due to excessive jitter on inputs.
4593	Maj	VMG: Actual audio channels are swapped when input audio PIDs are listed in reverse order in substituted service. Main:=ENG(51)+FRE(52), Sub:=FRE(52)+ENG(51), GUI shows ENG(51)+FRE(52) but actual output is FRE on PID 51 and ENG on PID 52.
4623	Maj	VMG grooming programs with names that partially match existing program names results in failed groom. Data validation check enhanced to now validate entire program name vs partial.
4631	Min	Active NPM h/w, driver versions are shown "Not Found" in the EM GUI

VMG 3.6.1

ID	VMG G1–3.6.1 Resolved Issues
737,	The trap receiver information is currently stored in /mnt/traphost.txttext file, which is not archived with database backup. As a result, DB backup/restore to another VMG system did not

ID	VMG G1–3.6.1 Resolved Issues
739	restore trap receiver information. Reboot using factory default configuration option in the VMG GUI did not clear the configured trap receiver information.
3113	If client switched from MBR profile with p30 (or p25) to MBR profile with p60 (or p50), visual artifacts occurred if GOP M not set to 1.
3114	IDR alignment could offset by +/- 1 between MBR profile with p30 (or p25) and MBR profile with p60 (or p50) for interlaced inputs with telecined content.
3242	After an NPM SWO, the GUI failed to display the current trap server entries in Configuration --> Trap Configuration.
3247	Auto/Video bitrate for PIP TS did not work for SD inputs.
3295	When automatic AR set, our MBR output resolution would set to 4:3 for SD even if input video was marked as 16:9.
3662	TS name change not propagated to the standby NPM following switchover.
3832	The VMG *Element Manager* would freeze after an NPM switchover.
3920	Automatic aspect ratio not correct for all H.264 inputs.
4205	Incorrect uniqueness check of mirrored IP/UDP for Full HD MBR in one profile.
4313	Unable to delete pre-configured ESs from the Manage Elementary Streams screen.
4314	Unable to change Stream Type or language code for already saved pre-configured ESs (after clicking the Apply button).
4315	The Audio Type always defaulted to MPEG-1 audio when modifying the Language selection.
4318	Not all active audio PIDS showed up in the Modify Grooming screen after PMT updated.
4319	Changes in Modify Grooming screen caused pre-configured ESs or Not-in-Use ESs to be deleted.
4320	The Reboot screen did not close automatically after change to options in PMT Update tab of Global Configuration.

VMG 3.6.0

ID	VMG G1–3.6.0 Resolved Issues
167	Unreferenced/Reserved PID range is 32-8175 instead of the full 1-8190.aaaa
848	After changing the Time Zone field in the VMG GUI, the system time is not automatically adjusted according to the time zone offset calculations from UTC/GMT (especially during the daylight savings time period) and time zone identifier acronym usage.
1305	VPM intermittently resets during system boot-up or NPM switchover, resulting in a longer bring-up time.
2635	The Modify Program Mapping screen may incorrectly show status of audios programs after input PMT changes. The VMG 3.0.0 software allows up to two audio programs to be transcoded in MBR, AVTX, or AVTX+PIP modes. This problem may appear due to one of two conditions: If there are two audio programs in the input when initially groomed but later the input changes to three or more audio programs via PMT update. If there is one AC-3 audio in the input and Audio Pass-Through AC-3 with Start PID is selected, but later the input changed to three or more audio programs via PMT update. The VMG 3.0.0 software still transcodes two audios, but after a PMT update with additional audio programs, the GUI will incorrectly show that the new audio(s) are selected for transcoding and/or pass-through respectively.
2701	VPM Admin State up but Operational state down occasionally after NPM switchover. No alarm is generated.
3241	Reserved Audio Output PID not greyed out when input audio language or stream type changes.
3719	All programs deleted from VTR TS after duplicating PIDs.
4017	VMG fails to Groom program with more than 2 data PIDS to VTR.
4138	Getting False event alarm for "none of DC PEMs is present.
4166	Duplicate redundant UDP caused dummy and dead output TS (GUI shows video transcoded output TS null).
4240	NPM loging GigE link on fiber.
4242	Program Substitution channel with AC-3 and E-AC-3 cause PID changes.
4184, 3095	The VMG may drop IGMP queries.

VMG 3.5.1.P2

ID	VMG G1–3.5.1.P2 Resolved Issues
4471	PIP not working when creating VTX+PIP with input PCR in an independent PCR PID

VMG 3.5.1.P1

ID	VMG G1–3.5.1.P1 Resolved Issues
*43**43***	VMG crashes after upgrade to 3.5.1

VMG 3.5.0.P3

ID	VMG G1–3.5.0.p3 Resolved Issues
4232	VMG MBR encoding crash on services.

VMG 3.5.1

ID	VMG G1–3.5.1 Resolved Issues
4081	CC errors may cause audio drops
4173	Input Audio PIDs changing to Data
4184, 3095	The VMG may drop IGMP queries
4185	IDR interval of 225 is not available
4218	On 1280x720p Full HD profiles with a GOP N set to Optimize x60 and an IDR Interval of 300, the VMG will not create the IDR Interval as requested, instead it generates IDR Intervals of 304 or 288
4220	SCTE-20 inputs that are in Telecined video with incorrectly marked field values will cause garbled captions on output
4224	High density SD transcoding (3xSD) configurations do not follow the GUI's configuration for GOP structure
4248	Error message pops up saying "Invalid GOP N value..." with GOP M=8 and N=16
4259	Video resolution of 1080 shows as 1088 in the GUI
4237	720x576 MBR profile doesn't work when combined with any other resolution profiles

VMG 3.5.0.P2

ID	VMG G1–3.5.0.P2 Resolved Issues
24046	The output appears greyed out, requiring the customer to regroom program

VMG 3.5.0.P1

ID	VMG G1–3.5.0.P1 Resolved Issues
4221	The Bulk Configuration Tool (BCT) does not import the Program Redundancy configuration from the Program Redundancy tab of the BCT excel spreadsheet

VMG 3.5.0

ID	VMG G1–3.5.0 Resolved Issues
3934, 4074	Service cannot be joined at input by VMG
4005	Output has CC errors only on the SCTE-35 PIDs
4089	PTS Interpolation fails for 720p59.94 streams with One PES per GOP
4090	Small AU's, combined with CPB=1sec will cause short splice outs (~2 sec)
4098	Output on mirrored port is not using configured UDP ports
4156	Auto aspect ratio changes with 12:11 or 16:11 are not working
4160	Channel freezing with audio popping
4161	Lip Sync issue on several channels
4164	Sporadic outages on primary audio
4168	Rewind stream causes "Decoder stopped functioning" errors
4176	Source is 16:9 encoder output is 4:3 instead of 16:9
4217	Service Descriptor Table (SDT) values are not on MBR outputs

VMG 3.4.0

ID	VMG G1–3.4.0 Resolved Issues
4086	Error message when grooming program to VTX-PIP Output TS.

VMG 3.3.0

ID	VMG G1–3.3.0 Resolved Issues
3952	TCM critical alarm not cleared when fixed.
4077	If the VMG time zone selected is: GMT+00 Universal Time Coordinated (UTC)time the VMG will incorrectly show the time zone as: GMT+11 Midway Island Time (Samoa) Time Zone All alarms and events on UI will have the Samoa time

VMG 3.1.3P5

ID	VMG G1–3.1.3P5 Resolved Issues
3858	MBR Automatic aspect ratio not working properly for PAL inputs
3925	Sequence header inserted by Mux has wrong value for flag load_quant_matrix which may cause an issue with downstream devices
3943	VMG MBR transcode has full-screen momentary blockiness occurs every few minutes or so when scene change occurs on I frame when M=1
15576	Inputs with splices on P frames may cause corruption of PTS/DTS output values when transcoding MPEG-2 to H.264

VMG 3.1.3

ID	VMG G1–3.1.3 Resolved Issues
2953	The VMG Element Manager will now accept and display decimal values as commonly displayed for the language (and country) selected as the “Format” in the “Region and Language” menu from the control panel of Windows 7. In addition, either a period or a comma will be accepted during input of fields allowing a fractional value but will be displayed based on the “Format” defined by the selected language (and country).
3496	Resolved issue where 720x576 content with a 16:9 aspect ratio was output with a 16:11 aspect ratio.
3640	Resolved issue in VMG where an internally duplicated configuration resulted in loss of program output.
3691	Improved video decoder robustness to insure that it continues operation with corrupted inputs.

VMG 3.1.2.P1

ID	VMG G1–3.1.2.p1 Resolved Issues
3522	VMG 3.1.2 Observed about 1 Hour difference between the EBP time reported by the tool and current time
3533	Audio loss in VTR and VTX
3590	Protection of NULL write pointer caused by the live scanner logic
3598	Wrap point issue in the A6 command buffer & scrambling detection

VMG 3.1.2

ID	VMG G1–3.1.2 Resolved Issues
3191	VMG drops grooming on certain channels.
3279	BCT Save function does not save the audio language descriptors to the configuration file.
3301	Standby NPM database may become inconsistent with active NPM database due to runtime database sync issue.
3328	“Collect Diagnostic Info for Tech Support” on the VMG splash screen may cause an NPM crash if there is a large number of inputs or a large number of tables in the inputs.
3381	When using the Bulk Configuration Tool to “Replace Current Database” it will not delete input TS’s which have a redundant input configured.
3469	Setting discontinuity indicator when there is jump in the input time domain causes interoperability issues with certain downstream devices.
18551	Encrypted inputs cause transcoder to drop output. No user warning or alarm.

VMG 3.1.1

ID	VMG G1–3.1.1 Resolved Issues
2568	The 3.0 release does not support H.264 720p60 HD to SD downscale transcoding to MPEG2 for non-MBR.
2691	A redundant NPM in the boot process may assume primary status prior to fully coming-up. An NPM inserted into an active redundant VMG-14 chassis, apparently detected a lack of heartbeat from the active NPM and assumed primary status prior to completing its boot process and without implementing its database parameters.
3160	When saving the current database to new file using the Bulk Configuration Tool the new data associated with "Redundant Output IP" or Dolby parameters are missing from the spreadsheet.

VMG 3.1.0

ID	VMG G1–3.1.0 Resolved Issues
2471	Dialnorm loss of about 6 dB when transcoding AC-3. NOTE: This will cause the level of audio transcoded from AC-3 inputs to increase by 6 dB after upgrading to VMG 3.1.0. After the upgrade you should decrease the audio gain settings by 6 dB on all outputs transcoded from AC-3 inputs in order to maintain the same audio output levels that existed prior to the upgrade.
2840	If grooming, regrooming, or resetting a groom of an input audio with a non-standard language code (less than three characters), and the user sets a different PID for the output, the VMG will not use the user defined PID but use the PID from the input instead.
2948	The VMG-8-AC incorrectly generates the "PowerSupply_Not_Present" alarms: "No power supply (DC) present in slot 1" and "No power supply (DC) present in slot 2". The VMG-8-DC incorrectly generates the "PowerSupply_Not_Present" alarms: "No power supply (AC) present in slot 1" and "No power supply (AC) present in slot 2".
2992	Discontinuity_indicator is not set in MBR output when there is a PCR discontinuity.
3020	Unnecessary regrooms when PMT version changes but no actual ES change
3171	No trap on PCR error.
3924	Occasional failure setting Dolby configuration

VMG 3.0.4.P3

ID	VMG G1–3.0.4.P3 Resolved Issues
4045	Video Quality issue on VTR output (macroblock artifacts).

VMG 3.0.4.P1

ID	VMG G1–3.0.4.P1 Resolved Issues
3667	New tuning parameter was introduced to fix VPM dropping grooms in heavily loaded systems.

VMG 3.0.4

ID	VMG G1–3.0.4 Resolved Issues
3251	Modifying VTR TS Rate causes dropped channels.
3422	Reduced VPM 4 second delay for H.264 decoding delay to 3 seconds.
3503	VMG cannot enable mirror ports without deleting all TSs on source port.
3518	AVTX Not allowed to modify audio profile or create a new one through Modify Grooming screen.
3550	Output GUI doesn't show changes if the newly added language descriptor has been removed for VTR and VTX.
3583	NPM switches over if substituted program not found.
3697	"Apply Config" button disappeared if stretching Create VTR output with DVB type screen.
3698	Modify TS Name(Add or Remove name) caused PCR Accuracy errors.
19120	Program substitution goes back the original program after reboot.

VMG 3.0.3

ID	VMG G1–3.0.3 Resolved Issues
2209	On the fully loaded system few MBR groups lost audio after NPM switchover or VMG reboot.
2726	DB sync: Input program name is lost after manual NPM switchover.
2845	Regrooming an MBR group with more than 4 profiles by dragging a "similar" input to a previously groomed output takes about 50 seconds compared to about 7 seconds for a regular grooming or modify grooming operation.
2901	All TCMs reset after switch to BKP inputs on VMG with 108 MBR TS.
2918	NPM had a switchover when TCM were removed from VMG in a fully loaded setup.
2953	GUI does not allow decimal point for non-English locales.
16281	Ad insertion with 60p to network 30p.
2956	PAL input reported as NTSC.
2960	RC Panic caused by overproduction of bits.
19266	Unnecessary regrooms when PMT version changes but no actual ES change.

VMG 3.0.2.P1

ID	VMG G1–3.0.2.p1, build 48101 Resolved Issues
2960	Video flashing or degraded quality may occur when doing non-MBR transcoding of interlaced material. The following table summarizes the use cases under which this issue may occur in release 3.0.0, 3.0.1 and 3.0.2.

VMG 3.0.2

ID	VMG G1–3.0.2, build 47456 Resolved Issues
2962	When doing H.264 to MPEG-2 transcoding and turning Inverse-telecine on/off, output PTS/ DTS may not be correct.
2731	The VMG does not always restore groom after input source is lost and returns.
2798	If a GigE interface is disabled, the IP addresses (VIP and both physical IP) are changed and then the GigE interface is re-enabled the GigE interface on the GUI shows up but the multicast program never recovers. Program stays greyed out.
2854	Video Quality issue, the end credit seems to be pulsating on multiple channels.

VMG 3.0.1

ID	VMG G1–3.0.1, build 46702 Resolved Issues
2556	When VMG generates TS output for VTX/AVTX transcoding or transrating, a TS analyzer may complain about a +/- 1 90KHz tick jitter to nominal audio PTS value.
2688	For IPTV SD an additional 3-second delay may occur about one out of 48 times when deleting and regrooming sessions due to reloading of A6 code.
2796	When VMG generates TS output for VTX/AVTX transcoding or transrating, a TS analyzer may complain about a +/- 1 90KHz tick jitter to nominal video PTS value.

VMG 3.0.0

ID	VMG G1–3.0.0, build 46296 Resolved Issues
47	Sometimes VPMs don't come up after system reboot or NPM switchover.
1263	VPM/TCM intermittently resets due to data link (DL) error, with a resulting switchover or module reboot.
2179	IDR may be off by 1 tick on four of eight MBR profiles with H.264 720p input video.
2485	During the software upgrade from 2.5.1 to 2.5.2 all TCMs lost HB and reset causing a temporary service outage.

VMG 2.5.1

ID	VMG G1–2.5.1, build 43838 Resolved Issues
1817	VMG does not recognize card removal & other type card insertion
1850	MBR-TS: 1080i60 H.264 to H.264 transcode may fail
2134	IDR alignment breaks when input 720p59.94 contains 720p29.97 and inverse telecine patterns. The IDR alignment is currently only guaranteed for 720p59.94 input. (note that issue ID 13689 still exists: 720p IDR may be off by 1 tick on 4 of 8 MBR profiles with H.264 720p inputs)

VMG 2.5.0

ID	VMG G1–2.5.0, build 41060 Resolved Issues
259	Motorola VIP1200 STB cannot decode H.264 HD streams from TCM if it is more than 8Mbps. The root cause is that Motorola cannot absorb longer decoding delay.
461	Visible artifacts on Avail feeds every 5 to 15 seconds during 1080i transcoding on the TCM
794	When the "Automatic Video Bitrate Assignment" GUI option is enabled, video may have visual artifacts for around 10 seconds when first grooming to the TS output. Artifacts may persist for 20 seconds during NPM switch over.
1596	If the same input program is used for VPM & IPTV TS, then on VPM TS when switched to secondary, video is stuck while played
1644	VPM MPTS all videos play Stop & Start, if there are any common programs on IPTV or MBR -TS.
1723	AMP Red : Lost few MBR TS o/p on pulling active AMP card
1752	MBR-TS PAL: one profile resolution configured for 416x240 but actual resolution is coming as 416x288
1761	TCM went down on power cycle fully loaded VMG.
1768	The internal log/messages is flooding by events
1791	No PCR referenced in PIP video ES for input programs with independent PCR PID

VMG 2.4.1

ID	VMG G1–2.4.1, build 39584 Resolved Issues
1755	Dual HE-AAC audio on SD stream had no audio output when MBR transcoded to AAC-LC

VMG 2.4.0

ID	VMG G1–2.4.0, build 38377 Resolved Issues
4115	Video buffering issues with some encoder streams may limit the number of streams VMG Mux can process. The VMG requires streams that are DPI ready must have a decode buffering delay (PTS-PCR delay) less than one second and the network video sequence duration between two IDR-pictures is less than two seconds. For streams that do not meet the parameters, DPI splice quality may vary.
529	Grooming transcoded programs immediately after the TCM card is operational causes the grooming to fail. But an output program is still created in the output TS GUI view. This happens on grooming a transcoded session immediately after deleting an existing transcoded stream under the same output TS.
10644	H.264 video output always in Baseline profile when M = 1.
1346	NPM intermittently resets due to shelf controller error, resulting in an interruption until switchover or module reboot.
1383	MBR-PIP program redundancy is limited to input-redundancy, with no support for grooming-level redundancy.

Previously Known Unresolved Issues

In addition to the New Known Issues and Workarounds listed in the previous section, the table below contains a list of all unresolved previously known issues and workarounds. Bugs fixed in this release have been removed from this list.

ID	Priority	Status/Res.	Description	Workaround
4690	Maj	Open	Bulk Config Tool (BCT): setting MBR SDT "Pass-through" option configures SDT as "Generate" instead of “Pass-through”	Manually update configuration on VMG post bulk load.
4654	Maj	Open	After NPM failover, substituted program may play original program for 7-10 sec before switching to substituted programs.	None
4695	Maj	Open	Replacing a TCM with a VPM in the same slot may cause continuous card reset	Reboot VMG chassis if card continuously resets.
4691	Min	Open	After program sub, EIT table shows EPG from original program. Not substituted program.	None
4696	Min	Open	Transcode AC-3 (5.1) to HE-AAC v1 (5.1) (192Kbps, 48kHz) generates HE-AAC v2 audio instead of v1.	None
141	Maj	In Prog: Unresolved	In VPM applications where TS’s have different output bandwidth settings, some TSs stay unassigned after system reboot.	Admin-reset heavily loaded VPM’s, identified in the GUI via the Grooming Group indicator in Chassis view as Yellow or Red.
259	Maj	In Prog: Unresolved	Motorola VIP1200 STB cannot decode H.264 HD streams over 8Mbps. The root cause is that Motorola cannot absorb longer decoding delay.	Set TCM output to less than 8Mbps when feeding a Motorola VIP1200 STB.
276	Maj	In Prog: Unresolved	FEC-enabled inputs are not decoded by the VMG (VPM). FEC is functional on the output, but not the input.	None
520	Maj	In Prog: Unresolved	Certain H.264 decoders (including VLC PC decoders) cannot handle sub-GOP M = 8 and either completely drop the video or drop frames while decoding. Closed captioning data also does not pass properly when M=8 and transcoding SD.	Set M = 1, 2, 3, or 4 (not 8).

581	Maj	In Prog: Unresolved	When telecine is enabled with 720p59.94 input, output timestamps can get corrupted.	Disable telecine if 720p is used as the input.
742	Min	In Prog: Unresolved	VMG GUI response to adding / deleting trap receiver is slow.	None
866	Maj	In Prog: Unresolved	SNMP actions cannot use the virtual management IP address.	SNMP actions need to use the active physical IP address.
890	Maj	In Prog: Unresolved	AAA Authentication fails if the IP address sent to AAA server is the physical IP of the VMG and not the virtual IP.	Configure the physical IP of the VMG on the AAA server.
901	Maj	In Prog: Unresolved	Grooming is not evenly distributed across Power PC's on VPM's in the VMG, and grooming is allocated to the VPM's coming up first. This issue happens during upgrades and also occasionally during reboots.	Reboot the system until all VPM's come up and grooming is complete.
1160	Min	Open: Unresolved	Certain IP addresses assigned for use as the management interface interfere with the internal addresses of the VMG	Do not use IP addresses from the subnets 10.0.1.x or 10.0.2.x for the Management Interface IP address

1250, **1252**	Min	Open: Unresolved	HD-to-SD down conversion center-cut not supported for 960 x 1080i input	None
1312	Not assigned	New: Unresolved	Program substitution operation takes up to 4 seconds. This was a result of allowing program substitution to lower bitrates.	None
1320	Maj	Open: Unresolved	When transcoder bitrate is set using "Automatic bitrate", occasional video freezes may result when data PIDs in the program exhibit high variability in data rate ("VBR" data PIDs).	Use user-input video ES bitrate instead of Automatic Bitrate, accounting for max data PID bitrate.
1370	Min	Open: Unresolved	(System) Active/standby NPM's automatically switch roles after a software upgrade and reboot, with system working as normal.	If original NPM role is desired, a manual switchover is recommended (stream- affecting, so suggested during a maintenance window).
1396	Maj	Open: Unresolved	(System) Regrooming an input ghost program onto an existing output program is not supported, with the GUI saying that the PIDs are already in use.	Delete the output program, and then groom the input ghost program.
1439	Maj	Open: Unresolved	(System) GigE interface does not go link- down when the cable is removed from the SFP when auto negotiation is on.	Remove the SFP, along with the cable, to bring the interface down.
1448	Maj	Open: Unresolved	(Transcoding) Possible video impairments when the video ES bitrate is set at more than 12Mbps, or when automatic bitrate is selected for programs exceeding 13Mbps.	Reduce video output bitrate to 12Mbps.
1638	Maj	Open: Unresolved	(MBR Transcoding) H.264 Baseline profile implies no CABAC and no B frames. Main/high profile enables CABAC. High profile also enables 8x8 transform. Main and High profiles can be mixed in an MBR group. However, when Baseline profile is selected for any of the 4 transcoded output, M is automatically set equal to 1 for all other 3 TSs in the MBR-TS group. M=1 will result in sub-optimal video quality due to the absence of B frames	Avoid Baseline profile configuration in MBR- TS.
1715	Maj	Open: Unresolved	Motorola DCT-22xx has interoperability issues due to buffering with video being delivered 0.5 sec ahead of PCR, resulting in video breakup	None
1727	Min	Open: Unresolved	(Transcoding) In input program redundancy, if backup program has different stream types (video, audio) or language descriptor (audio), the program redundancy operation will fail with output TS containing null packets.	Ensure backup program has matching stream types and language descriptor.

1729	Maj	Open: Unresolved	Failed to transcode MPEG-2 720p/30 content.	None
1734	Maj	Open: Unresolved	(Transcoding) PIP output inserts IDR frame at scene transitions even though no IDR option is selected from GUI.	None
1823	Min	Open: Unresolved	After swap a VPM with a TCM, sometimes the TCM automatically reset, due to a DL error.	Unplug and re-insert the TCM card.
2057	Maj	Re-opened: Unresolved	If a user mistakenly grooms an HD input to an MBR-TS with an input resolution class of SD, no alarm or event is generated. As of VMG release 3.0.2 the MBR icon will be colored orange to indicate an issue.	User should groom HD input as an HD class TS.
2071	Min	Open: Unresolved	If an input has any audio streams that are encrypted, the AVTX output will have no audio.	Only groom programs with unencrypted audio.
2079	Maj	Open: Unresolved	GOP size N may exceed what is configured in VTX, VTX+PIP, AVTX, AVTX+PIP or PIP modes.	If the GOP must be limited to a certain maxGOP value, set the N value to (maxGOP -7) or less or run in MBR mode
2098	Maj	Open: Unresolved	Audio PID is missing on output transcoding from AC-3 to MPEG2-L2 stereo (sampling rate: 22.05 kHz, bitrate: 8kbps).	Encode audio at higher bitrate.
2103	Crit	Open: Unresolved	In redundant systems with AMP modules, the previously active NPM may become the standby NPM after the reboot.	None
2214	Min	Open: Unresolved	IDR can be off by 1 tick among 4 of 8 MBR profiles with some H.264 PAL input video sources.	None
2286	Maj	Open: Unresolved	Video artifacts on the output when using Avail HD H264 streams on MBR- TS.	None
2480	Crit	Open: Unresolved	After the NPM switch over, the now redundant NPM (formerly the active NPM) did not come back up.	Power cycle the now redundant NPM by re-seating the card.
2700	Min	New: Unresolved	When AVTX-PIP is used, VMG PCR intervals may be more than 40ms, even when DVB TS is selected.	This is not service impacting. If 40ms is required use a higher TS bandwidth to provide flexibility for PCR insertion.
2813	Min	Open: Unresolved	When AC-3 input uses a stream type of 0x06 (DVB mode), VMG may not handle it correctly as it may require a larger buffer than the VMG currently supports.	Use System A specification for AC-3 encoding only.
3030	Maj	Open: Unresolved	The video descriptor is not updated on MBR output, so it doesn't match to the actual profile/level of the output.	None

3287	Maj	Resolved: Won't Fix	If a video profile with fewer pixels is mixed with a video profile that has more pixels but a fewer horizontal pixels or vertical lines, the video output with fewer pixels will be limited by the smaller horizontal or vertical size of the video with more pixels and the remaining areas becomes a long strip of repeated pixel data.	Don't mix 16:9 and 4:3 profiles in the same MBR transport stream.
3292	Maj	Open: Unresolved	CC_error in bitrate monitoring does not work correctly.	None
3298	Min	Open: Unresolved	The GUI incorrectly shows the Program Redundancy status as "PR Active: N" instead of "PR Active: B" after system reboot if the backup input was active.	None
3473	Maj	Open: Unresolved	If the language descriptor is modified at the input TS it will be updated in any transcoded outputs but not in already groomed "Pass Through" outputs.	Groom or re-groom outputs with audio pass through after modifying the language descriptor.
3922	Maj	Open: Unresolved	Slow VMG GUI response if input stream is severely corrupted	Resolve issue in input stream
4219	Min	Open: Unresolved	On 1280x720p Full HD profiles the CUE- induced IDRs may not be created correctly when the GOP N is Otimized x32 and the IDR Interval is 288 or 320	Choose an IDR Interval of 256 or less when using the Full HD profile for 1280x720p
5955	Min	Open: Unresolved	PSIP: For ATSC outputs, EIT tables are not generated by default and do not pass the event information on output TS.	For ATSC output TSs, the STT table must be explicitly selected in the UI for the EIT tables to be generated.
5996	Min	Open: Unresolved	In Program Substitution and DPI, an H.264 program cannot be substituted by an MPEG2 program and vice versa. Substituting a H.264 program for a MPEG-2 program still plays the original MPEG-2 program video, but the PMT indicates an H.264 video type. The reverse situation applies.	None
6079	Min	Open: Unresolved	Video glitches can occur at splice in/out of network streams if the bandwidth disparity between the network and Ad exceeds 20%.	Regroom and allocate additional bandwidth for the output TS