



From

Product Management

(BT-VS/XSW-SEC)

Nuremberg

18.05.2021

## Release Letter

Product:	<b><i>Video Recording Manager</i></b>
Version:	<b><i>4.00</i></b>

This document contains latest information about the Bosch Video Recording Manager (VRM) release 4.00. This version is designed to be used in a BVMS 11.0 environment. Product boundaries are also described in the datasheet which can be found on the Bosch web page. VRM 4.00 Software is included in BVMS 11.0 download.

**Important Note:** The most recent version of Video Recording Manager (incl. all VRM sub-components and VRM eXporter Tool) can be downloaded from:

<https://www.boschsecurity.com/> (Product Catalog → Video Systems → Video Software → Video Management Systems).

### 1. General

VRM Video Recording Manager provides a Distributed Network Video Recorder solution, eliminating the need for dedicated NVRs and signaling the second generation of IP Network Video Recording. VRM supports iSCSI-based storage systems and the Bosch Video IP devices (IP cameras and IP video servers). VRM Video Recording Manager comprises the following software packages:

- VRM Server including VRM Monitor
- Configuration Manager
- VRM eXporter Tool

**Please note:** For VRM Video Recording Manager the Bosch Video Security Client “VSC” or BVMS Viewer can be used as standalone replay client. For playback of unencrypted video data exported by VRM eXport Wizard BVMS has to be used.

VRM offers system-wide recording monitoring and management of Bosch iSCSI storage, video IP encoder and IP cameras. VRM software supports Bosch H.264/H.265 and MPEG-4 IP video devices including all Bosch video encoders, Dinion and FlexiDome IP cameras, as well as AutoDome and Extreme IP cameras and the Bosch HD cameras.

Supported storage subsystems are the Bosch DSA and DLA disk array systems (iSCSI-based DVA storage systems still will work). iSCSI disk arrays are not attached directly to VRM, but instead can be attached anywhere on a standard IP network via a 1 GbE uplink as well depending on iSCSI storage model via 10 GbE (e.g. DSA E-Series E2700 or E2800).



From

Product Management

(BT-VS/XSW-SEC)

Nuremberg

18.05.2021

## 2. New Features

- Increased scalability of the VRM limit (up to 4PB total storage per VRM)
- User management for access to restricted video in BVMS
- UI Styleguide adaptation of VRM Monitor
- Increased integrity/robustness of VRM track database

## 3. Changes / Bug Fixes

- Fix: VRM Monitor page - Periphery-Camera's sort order problem
- Fix: invalid error message appears on startup
- Fix: Operator client cannot retrieve track id of some cameras under VSG

## 4. Restrictions; Known Issues

- Installation, Upgrade, Downgrade
  - VRM 3.82 or higher is available as 64 bit version only (no 32 bit version available). When upgrading from a VRM 32 bit version to a 64 bit version SSL certificates will be removed and have to be added manually to the system. Exception: self-signed certificates will be replaced automatically.
  - For proper installation certain prerequisites e.g. latest Windows updates are required. For further information please refer to the [knowledge base article](#).
  - **Important Note:** Downgrade from version 4.00 to an earlier version is not possible.
  - For VRM-managed cameras the replace functionality is supported since BVMS 9.0 using Configuration Client. The Configuration Manager does not support any device replacement of VRM managed cameras.  
(Note: In case the device replace is not performed via BVMS Configuration Client and to grant access to the recordings of a defective VRM-managed camera, keep the camera's IP address as offline camera. Once the minimum retention time has expired, the IP address is free to use. The camera replacement has to be added as new device to the VRM system.) For non-VRM-managed cameras, a replace function is available in the Configuration Manager.
  - To swap to existing IP cameras in their physical installation location including the swap of their IP addresses while keeping the recording footage linked to the original IP address is not supported. Customers in the need to perform such a swap of two operational cameras, are requested to contact the local BOSCH technical support.
  - When upgrading an existing VRM server installation a message might be shown that the "rms service" could not be stopped. Enter "retry" in the message box and the installation routine will properly be continued.
  - Up to 64 replay sessions tunnelled through VRM are supported. Same applies for the fail-over VRM, if exists.



From

Product Management

(BT-VS/XSW-SEC)

Nuremberg

18.05.2021

- Storage

- “LUN Size”: Size of a single LUN may not exceed 64 TB. If LUN-size exceeds 2000 GB, the pool needs to be configured properly in Configuration Manager.  
**Note:** VRM uses a virtualization layer and manages 1GB blocks out of all LUNs. Thus, for the functionality it makes no difference how many LUNs are configured within one storage subsystem as long as the maximum of 4.000.000 blocks (4PB storage) is not exceeded for the total VRM system.
- Maximum number of 120 iSCSI targets
- Maximum number of 254 LUNs per target
- Restrictions for LUNs larger than 2000 GB:
  - Requires camera firmware version 6.30 or later; usage of Firmware 6.44 or later is recommended due to improved Firmware security.  
(Knowledge Base <https://community.boschsecurity.com/t5/Security-Video/-/ta-p/4387>)
- Changing IP-Addresses for iSCSI-storage on the fly is not supported. Please refer to the Bosch Security Knowledge Base or consult your local support for manual alternatives.

- Recording

- When using recording encryption the VSG has to be installed on a separate hardware than the VRM. Otherwise, neither failover VRM nor a redundancy key will be able to decrypt encrypted recordings.
- Switching recording encryption on/off multiple times frequently may lead to wrong state on current recording block.
- The new recording encryption format introduced with camera firmware 7.60 is supported by VRM 3.82.0049 or higher
- Recording encryption is supported for camera firmware 7.10 and higher.
- Bosch cameras produced before January 2014 may not be able to encrypt their recordings. The VSG can encrypt the recordings for these cameras if this is required.
- Bosch cameras produced before January 2014 may not be able to encrypt their multicast traffic.
- For recording encryption a redundancy key is mandatory. The redundancy key is the only way to decrypt encrypted recordings in case of loss of the VRM decryption certificate with its private key.
- Short enabling (for a few moments) and disabling of encrypted recording leads to the effect that the current recording block may be only in a consistent state after being released by the IP camera.
- Encryption is supported on all BOSCH DIVAR IP systems except for DIVAR IP 2000
- The current version of the VRM exporter tool does not support export of encrypted video in native format. But it is possible to convert encrypted video into MP4 files.
- H.265 encoded video recording and playback is supported
- Time Server: VRM expects a Windows Time Server running. For the BVIP cameras/encoders and the VRM a common time server must be configured to ensure an



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Product Management

(BT-VS/XSW-SEC)

Nuremberg

18.05.2021

application-wide, uniform time-base. The VRM Server must synchronize with the same Time Server used for all VRM managed BVIP cameras/encoders.

- "Prioritization Live Viewing vs. Recording": Recording and live viewing are independent processes and do not have a prioritization. The number of replay sessions started may influence the recording, i.e. system resources of storage array may be getting low and unrecognized by the VRM.  
**Note:** Recording must be manually configured in a way to allow for the required recording sessions and/or replay sessions.
- "Automatic/Failover": On failure of the primary storage and switching to the failover storage a recording gap of multiple seconds will occur.
- Alarm recording: sometimes an active pre-alarm recording will be shown twice in the recording list.
- Firmware 5.0 and higher: Prealarm may be set to a minimum value of 1s and post alarm to 5s. Firmware versions prior to 5.0 pre- and postalarm recording: the minimum time that can be configured for prealarm recording is 15 seconds and 5 seconds for postalarm recording.
- Failover: switching the primary and secondary iSCSI target may result in a span list with incorrect quota
- Failover (Backup) server must not execute "format" jobs
- Recording Migration: Recordings that were created in a direct iSCSI environment with FW 3.52 cannot be migrated directly to a VRM solution but recordings will be ignored. Local recordings of BVIP devices with Firmware 4.10 or higher may be migrated to VRM environments.
- Changing devices from M2 to M4 mode:  
Due to the additional channels in M4 mode the recordings from encoder input 3 that were accessible under channel 2 in M2 mode are now accessible under channel 3. Old recordings of channel 3 created in M2 mode are still accessible under channel 2.
- Changing devices from M4 to M2 mode:  
Recordings from channel 3 and 4 in M4 mode will not be accessible anymore in M2 mode. Please backup any relevant data before switching from M4 to M2. Once the device has been set to M2 mode data of channel 3 and 4 will be deleted.
- FTP Export of Recording: If FTP export for local recording of a BVIP device has been configured this must be deactivated manually before the camera/encoder is moved to a VRM environment
- Authenticity check is not available if ANR is enabled.
- During alarm recording, authenticity check is only available within the recordings.
- In case function "Secondary target usage" in a storage pool is enabled, this consumes blocks from other storages in that pool. Each IP camera and IP encoder gets extra blocks from one additional storage system assigned for usage in case primary is not reachable. By default this function is disabled (off) at each new pool. For each camera channel 2x 1GB blocks are reserved/assigned to the block list when having this feature enabled. E.g. VIP X1600 XFM4 would get 2x4 = 8 blocks from secondary storage. 16-channel encoder would get 32 blocks assigned. As the situation that the VRM and a complete storage go offline at the same time is seen on low risk, the secondary target usage is by default set to "off" and can be enabled if desired anyhow.

From			Nuremberg
Product Management	(BT-VS/XSW-SEC)		18.05.2021

- Restrict video functionality not supported for cameras/encoders based on platform CPP3 or older.
- Video Streaming Gateway
  - See separate release note, due to the fact that VSG is now an independent product.
- Configuration
  - “GUI”: Device tabs block on some PCs when camera privileges are modified and a device of different type is selected without saving the changes.  
**Note:** Workaround → privilege changes should be saved before selecting a device of another type.
  - Mass operations might not work reliably when more than 200 devices are selected.
- Trouble Shooting
  - To avoid high CPU loads while zipping system log files in case of trouble shooting the zipping process is running with lowest priority and may take a while.
  - If extended logging is activated and disk space is running below 1 GB free space, VRM automatically deactivates extended logging.
  - RCP+ logging must not be activated for more than 2000 devices. In this case extended logging must be turned off.
- IntuiKey
  - “Replay”: IntuiKey can't start replay of media files stored on local PC
  - “UI Display”: IntuiKey user interface displays ISO-Latin1 characters only
- Network Configuration
  - After licensing VRM no changes on the network links from different adapters should be done else VRM might encounter problems with license and/or block management
  - Network interfaces without a cable plugged in do not show an IP address on Windows Server 2008 based systems and therefore will be ignored by VRM. If a cable is plugged in at a later time, this may cause reordering of the detected network interface ports and can cause problems with licensing (s. above). Windows Server 201x unused NIC should be disabled (different to Windows Server 2008)
  - Assigning multiple IP addresses to one ethernet interface is not supported.

## 5. Installation Notes

**Important note:** For full feature compatibility VRM 3.82 requires the BVIP firmware version 6.50, 6.51 and 6.60 or later for encrypted recording even FW version 7.10. DSA E-Series Dual Controller in Dual-Simplex configuration and high-density expansion shelf products are not supported in earlier firmware versions and VRM version below VRM 3.20. VRM 3.82 itself is backward compatible with firmware versions 4.15 or higher.

## 6. Configuration Notes

- “Retention Time”:
  - The **maximum** Retention Time is lower prioritized than actual recording. This means, if the preset maximum retention time is longer than the available storage capacity allows for the older recordings are overwritten.

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Product Management

(BT-VS/XSW-SEC)

Nuremberg

18.05.2021

- The **minimum** Retention Time has a higher priority than recording. If the preset minimum retention time is longer than the available storage capacity allows for recording will be stopped and data is **not** deleted.
- **Note:** Capacity necessary must be calculated manually depending on the desired retention time values

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## 7. System Requirements

### VRM Server

The service “VRM Server” must be installed on a Microsoft® Windows Server based platform. No other Web server application may be installed:

Hardware	Server
Operating System	Windows (Storage) Server 2012 R2, Windows (Storage) Server 2016, Windows Server 2019 (for Storage)
CPU	Intel Xeon E5-2620v3 (2.4 GHz, 6-core, 15MB, 85W) or faster
RAM	min. 8 GB
Ethernet Card	1 Gbps
Free Disk Space	1000 MB
VRM on DIVAR IP	VRM can be installed on DIVAR IP 6000 R2 systems with reduced number of camera channels; e.g. up to 128 camera channels with Intel Xeon Processor E3-1275 V3, (8 MB Cache, 3.5 GHz), 8 MB Intel Smart Cache, Memory installed: 8 GB, DDR3-1666 ECC UNB (1 x 8 GB) Microsoft Operating System Windows Storage Server 2012 R2

### VRM Monitor

VRM Video Recording Manager provides a HTML interface to be used with a Web GUI within the VRM Video Recording Manager network. This VRM Monitor module is installed automatically together with VRM Server. System requirements for VRM Monitor are:

Browser	Google Chrome 30 or higher; Mozilla Firefox 25 or higher; Internet Explorer 10 or higher; Safari 7 or higher;
Ethernet Card	1 Gbps (recommended)

### Component Versions

- Video Streaming Gateway: Depends on the BVMS version – See release letter of BVMS
- Transcoder: Depends on the BVMS version – See release letter of BVMS
- Microsoft® .Net Framework 4.6.2

From		Nuremberg
Product Management	(BT-VS/XSW-SEC)	18.05.2021

### Configuration Manager

System requirements for Configuration Manager can be found in the Configuration Manager release letter.

### VRM eXport Wizard

The VRM eXport Wizard for disk--based backup is a stand-alone application. To guarantee maximum performance of the video recording system, it is recommended to run the VRM eXport Wizard on a separate hardware (PC). The tested OS platforms are:

- Windows Server 2012R2
- Windows Storage Server 2012R2
- Windows Server 2016
- Windows Storage Server 2016
- Windows 10

### eXport Restrictions

- If overall backup time is longer then the respective retention time for a camera not all video data might be exported before being overwritten/deleted.

From Product Management	(BT-VS/XSW-SEC)	Nuremberg 18.05.2021
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## 8. History

### **VRM 3.83**

#### ***New Features***

(Build 21)

- VRM Monitor with new Export Log page for easy selecting and exporting required log files including span data of up to 32 selected cameras and transcoder logging
- Extended replay information on VRM Monitor
- VRM eXport Wizard 2.10 introducing a new UI enhancing the usability of exporting VRM recordings and converting the exported data to mp4

#### ***Bug Fixes***

(Build 21)

- Fix: Optimized diagrams on VRM Monitor for monitoring iSCSI targets, cameras, and recordings
- Fix: Increased stability for secondary target usage
- Fix: Correct multipathing status is displayed on VRM Monitor
- Fix: Enhanced installer script code execution
- Replay page in VRM Monitor has been removed
- Login to VRM Monitor is no longer possible for user type "live"

### **VRM 3.82**

#### ***New Features***

(Build 55)

- No new features

#### ***Bug Fixes***

(Build 55)

- Fix: Increased stability for secondary target usage
- Fix: Optimized diagrams on VRM Monitor for monitoring iSCSI targets, cameras, and recordings
- Fix: Correct multipathing status is displayed on VRM Monitor
- Fix: Correct VRM version is displayed on VRM Monitor

### **VRM 3.82**

#### ***New Features***

(Build 52)

- New VRM eXport Wizard 2.0 introducing mp4 conversion of encrypted and unencrypted VRM recording exports (VRM block exports)

#### ***Bug Fixes***

(Build 52)

- Fix: Increased multipathing stability when switching between preferred and non-preferred path
- Fix: More robust VRM block distribution in case of multipathing



From

Product Management

(BT-VS/XSW-SEC)

Nuremberg

18.05.2021

### **VRM 3.82**

#### ***New Features***

(Build 49)

- No new features

#### ***Bug Fixes***

(Build 49)

- Fix: Support of new recording encryption format introduced with camera firmware 7.60
- Fix: VRM start-up phase is improved when using DHCP IP addresses
- Fix: Updated VRM notification for Video Data Packet allocation failure
- Fix: Improved network scan functionality
- Fix: Increased multipathing stability
- Fix: Improved block allocation on secondary target in case of failover scenario
- Fix: Enhanced handling of CHAP password
- Fix: Enhanced data rate handling of VRM eXporter
- Fix: Improved multiple export functionality of VRM eXporter
- Fix: Improved logging in case of multiple device responses

### **VRM 3.82**

#### ***New Features***

(Build 38)

- Recording Encryption for VRMs managed by BVMS 10 and replay of the recording always via the VRM server.

#### ***Bug Fixes***

(Build 38)

- Fix: Enhanced and optimized device replacement functionality
- Fix: Extended monitoring functionality for video retention time control
- Fix: Enhanced HTTP connection handling for improved licensing
- Fix: Improved handling of "Live"-viewing of the VRM monitor page

### **VRM 3.81**

#### ***Bug Fixes***

(Build 64)

- Fix: Increased multipathing stability when switching between preferred and non-preferred path
- Fix: More robust VRM block distribution in case of multipathing

### **VRM 3.81**

#### ***New Features***

(Build 54)

- No new features

From		Nuremberg
Product Management	(BT-VS/XSW-SEC)	18.05.2021

**Bug Fixes**

(Build 54)

- Fix: Improved logging in case of multiple device responses
- Fix: Enhanced debug information about camera recording status
- Fix: Improved VRM monitor page to prevent VRM crash
- Fix: Extended monitoring functionality for video retention time control
- Fix: Enhanced and optimized device replacement functionality

**VRM 3.81**

**New Features**

(Build 50)

- No new features

**Bug Fixes**

(Build 50)

- Security Fix: CVE-2019-11684: Unauthenticated Certificate Access

**VRM 3.81**

**New Features**

(Build 48)

General:

- Support of IP camera Firmware 6.60
- Support of IP camera Firmware 6.61

**Bug Fixes**

(Build 48)

- Security Fix: CVE-2019-6957: Buffer Copy without Checking Size of Input
- Security Fix: CVE-2019-6958: Improper Access Control
- Fix: Improved handling for the deleting of multiple IP camera/encoder devices
- Fix: Improved handling of CSV Export for protected recordings
- Fix: Improved logging and enhancements for debug level

**VRM 3.81**

**New Features**

(Build 32)

- Support of firmware 6.50 and firmware 6.51
- Device replacement feature offered via BVMS Configuration Client: You are able to replace a camera or an encoder without losing any recording of the camera
- Motion based recording for Sony cameras (7<sup>th</sup> generation) via RTSP streaming

**Bug Fixes**

(Build 32)

- Communication Issue between BVMS and VRM fixed. Microsoft® components like .Net Framework 4.6.2 and Redistributables for Visual Studio 2015 are included in the VRM

From			Nuremberg
Product Management	(BT-VS/XSW-SEC)		18.05.2021

package.

(see Knowledge Base <https://community.boschsecurity.com/t5/Security-Video/-/ta-p/416>)

- Several minor additional bug fixes

### VRM 3.71

#### **New Features**

(Build 32)

- No new features

#### **Bug Fixes**

(Build 32)

- Security Fix: CVE-2019-6957: Buffer Copy without Checking Size of Input
- Security Fix: CVE-2019-6958: Improper Access Control
- Security Fix: CVE-2019-8952: Path Traversal

### VRM 3.71

#### **New Features**

(Build 29)

No new features

#### **Bug Fixes**

(Build 29)

- Bug Fix reporting storage blocks as empty but carrying video is fixed. Gaps in timeline could be shown and video footage could not be replayed. (#VRM-3016: blocks with a multiple of 256 slices were interpreted as empty blocks. Now corrected)
- Corrected display and replay of recorded clips in continuous and alarm recording
- If E2800 multipathing iSCSI targets used a new VRM eXport Wizard version is available to export during “alternate active path”.

### VRM 3.71

#### **New Features**

(Build 22)

- Support of the new NetApp E-Series 2800 in “Full duplex mode” inclusive iSCSI multipathing
- Support of large GOPs for Bosch intelligent streaming
- Support H.265 for recording and replay
- Support of the new NetApp E-Series 2800 in Simplex mode.
- Performance optimizations for large LUNs and for many slices (alarm recording)

Enhanced connectivity:

- Single Port access through VRM (relays, alarms)

Security Enhancements

- Increased security for use login mechanism
- Update of the “HTTP security headers”
- Enable usage of the Windows cert store for SSL certificates

From			Nuremberg
Product Management	(BT-VS/XSW-SEC)		18.05.2021

- Enhanced configuration encryption to protect VRM

**Bug Fixes**

(Build 22)

- Fix: Enhanced iSCSI block distribution in case of temporary camera mal function.
- Fix: Time zone configuration
- Fix for invalid local time offset
- Fix: Time Server IP in managed devices is no longer automatically set by VRM
- Fix for max retention time deletion when restoring old database and data folder
- Fix: Consistent load balancing mode display in Configuration Manager and VRM monitor webpage
- Fix: inconsistency in VSG camera list handling fixed
- Fixed bitrate calculation for VIP X1/X2
- Fixed open redirect in http server
- BVMS User logins optimized for Client authentication
- Removed weak SSL protocol versions and cipher suites

**VRM 3.70**

**New Features:**

(Build 60)

General:

- Support of large GOPs for Bosch intelligent streaming
- Support H.265
- Support of the new NetApp E-Series 2800 Simplex mode.
- Performance optimizations for large LUNs and for many slices (alarm recording)

Enhanced connectivity:

- Single Port access through VRM (relays, alarms)

Security Enhancements

- Increased security for use login mechanism
- Update of the “HTTP security headers”
- Enable usage of the Windows cert store for SSL certificates
- Enhanced encryption to protect VRM configuration

**Bug Fixes**

(Build 60)

- Fixed transcoding issue for replay
- Fixed backward channel for bandwidth check
- Fixed https issues (SSL certificate management)
- Fix to prevent video deletion caused by manual restore of old database
- Consistent load balancing mode display in Config Manager and VRM monitor
- Removed weak SSL protocol versions and cipher suites
- Fixed bitrate calculation for VIP X1/X2
- Fixed open redirect in http server
- BVMS User logins optimized



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(BT-VS/XSW-SEC)

Nuremberg

18.05.2021

### **VRM 3.70**

#### ***New Features***

(Build 56)

General:

- Support of large GOPs for Bosch intelligent streaming
- Support H.265 for recording and replay
- Support of the new NetApp E-Series 2800 in Simplex mode.
- Performance optimizations for large LUNs and for many slices (alarm recording)

Enhanced connectivity:

- Single Port access through VRM (relays, alarms)

Security Enhancements

- Increased security for use login mechanism
- Update of the "HTTP security headers"
- Enable usage of the Windows cert store for SSL certificates
- Enhanced configuration encryption to protect VRM

#### ***Bug Fixes***

(Build 56)

- Fix: Time zone configuration
- Fix for invalid local time offset
- Fix: Time Server IP in managed devices is no longer automatically set by VRM
- Fix for max retention time deletion when restoring old database and data folder
- Fix: Consistent load balancing mode display in Configuration Manager and VRM monitor webpage
- Fix: inconsistency in VSG camera list handling fixed
- Fixed bitrate calculation for VIP X1/X2
- Fixed open redirect in http server
- BVMS User logins optimized for Client authentication
- Removed weak SSL protocol versions and cipher suites

### **VRM 3.62 (DIP 2000/5000 only)**

#### ***New Features***

(Build 13)

- Support for large update files

#### ***Bug Fixes***

(Build 13)

- Storage configuration could be broken, if system ran out of memory

### **VRM 3.61 (DIP 2000/5000 only)**

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Product Management	(BT-VS/XSW-SEC)		18.05.2021

**New Features**

(Build 08)

- Support FW 6.40 (password enforcement, bitrate optimization mode)
- Support for CPP 7.3 cameras
- Support of „signed firmware files“ for DIP 5000 in addition to the unsigned firmware files.
- Improved “save and restore of configuration”

**Bug Fixes**

(Build 08)

- Replay contacts of connected cameras can be controlled again

(Build 10)

- VideoSDK download from VRM was not working
- Improvements for download store

**VRM 3.60**

**New Features**

(Build 51)

- Support for large LUN-sizes with up to 64 TB
- Increased maximum supported block count from 1 million to 2 millions

**Bug Fixes**

(Build 51)

- Changed: Support for larger camera block lists (512 instead of 128) so that also cameras with high bitrate can record long enough if VRM is down
- Fixed: Failover server was not working as expected if it was restarted while the master server was down
- Fixed: VRM could crash if cameras send unexpected response payloads
- Fixed: VSG compatibility issue with VSDK 6.03
- Fixed: VSG didn't work properly, if service was started without network connectivity
- Fixed: VSG export issue, if alarm recording is used
- Fixed: Log file download issue via VRM web page

(Build 53)

- Fixed: VRM overwrites device timeserver setting which could lead to recording gaps when used with Bosch Video Management Software (BVMS) and external TimeServer.

**VRM 3.51**

**New Features**

(Build 0057)

- Maintenance Release with no new features

**Bug Fixes**

(Build 0057)

- Fixed: VSG and TimeZones with UTC- causes VSG to use wrong date

**VRM 3.50**

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Nuremberg

18.05.2021

***New Features***

(Build 0038)

- Transcoder in DIVAR IP 6000 rev. 2 is supported
- Block consumption monitoring: Camera with exceptional high block-usage are excluded to prevent system overloading

***Bug Fixes***

(Build 0038)

- Fixed: Unused channels of an multichannel encoder are no longer taken into consideration for forecast calculation
- Fixed: PTZ control of Bosch Autodomes connected to VSG