



# **GV I/O®**

LIVE INGEST & PLAYOUT SERVER

## **Topic Library**

Software Version 4.0

2021-03-05

[www.grassvalley.com](http://www.grassvalley.com)

## FCC Compliance

In order to comply with FCC/CFR47: Part 15 regulations, it is necessary to use high-quality, triple-screened Media or Monitor cable assemblies with integrated ferrite suppression at both ends.

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# Release Notes

## GV I/O Version 4.0

- **High Dynamic Range (HDR) metadata** — GV I/O supports recording and playback with HDR metadata for 2160p and 1080p video formats with both 50 Hz / 59.94 Hz frame rates via SMPTE 2110 IP channels.
- **VDCP support** — Introduces support of VDCP protocol in addition to AMP for GV I/O channel automation settings.
- **Web UI configuration** — Enhancements to the web-based configuration utility for GV I/O servers without the need of configuration via GV STRATUS Control Panel application. For more info, refer to [Configuring the GV I/O Live Ingest and Playout Server](#) on page 39.

## Not supported in this GV I/O release

The following functionality is not supported with this version of GV I/O software. Check with your Grass Valley representative regarding availability.

- Multi-cam or ganging
- Live-streaming
- Quota limits with any storage configuration
- K2 SAN fail-over features for GV I/O iSCSI clients. However, the fail-over works with GV I/O LAN Connect clients.

## Changes and features in the previous release

The following section describes changes and features in the previous release.

## GV I/O Version 3.0

- **UHD workflow** — Introduces UHD workflow that supports up to 2160p (XAVC-I Class 300) video format with 2 Recorders and 1 Player via SMPTE 2110 IP channels.
- **1080p support** — Supports 1080p ingests and playback via an additional license with no more than two channels simultaneously on a single GV I/O unit.
- **NMOS (IS-04/05) support** — Provides the option to use standard NMOS (Networked Media Open Specifications) IS-04 and IS-05 for device connection management.
- **STRATUS-less configuration** — Introduces a web-based configuration utility without the need of GV STRATUS Control Panel settings to configure the GV I/O UHD workflow.
- **64 audio channels** — Supports 64 audio channel recordings only via SMPTE 2110 IP channels. The channel configuration can only be done via the GV I/O web-based configuration utility. More than 16 audio track options only appear when GV I/O channel is configured for Record mode with SMPTE 2110 input type selected.

## GV I/O Version compatibility

Versions qualified for compatibility with this version of GV I/O software are summarized in the following sections.

### Grass Valley products compatible with GV I/O

Grass Valley products are compatible with this release of GV I/O software as follows:

Product	4.0 Compatibility	Comments
GV STRATUS	6.11.1 and above	<b>NOTE: GV STRATUS does not support HDR metadata workflow with GV I/O 4.0 in this release.</b>
K2 Summit/SAN 3G Plus system software	10.1.5.2699 and above	Compatible with SNFS version 6.0.6.b75382-14
GV STRATUS Rundown	11.11.0.6 and above	—
GV STRATUS VTR Ingest	11.11.0.1 and above	—
GV I/O-Prerequisite Files	5.0	—
GV Engine	2.7.0.2332	—
EDIUS	9.3.3.7095	—
SiteConfig	2.2.0.671 and above	—
SiteConfig Discovery Agent	2.2.0.217 and above	—
Grass Valley Embedded Security Manager	1.0.0.26	—
SabreTooth	2.7.1.33	—

### Third party products compatible with GV I/O

Products by manufacturers other than Grass Valley are compatible with this release of software as follows:

Product	4.0 Compatibility	Comments
AJA Corvid 88 driver	14.3.2	—
AJA Corvid 88 firmware	34	—
Mellanox ConnectX-5 driver (with Rivermax)	2_940_22655_23	—
Mellanox Firmware Tools (MFT)	4_14_2_17	—

Product	4.0 Compatibility	Comments
VyDriver	1.5.0.28	—
s2059 Client	1.3.0.33	—
NVIDIA Quadro driver	452.57	—
Matrox M264 driver	0.0.0.25499	—
Microsoft Windows Server	2016	—
Zulu Java JDK	11.41.23 (11.0.8)	—

## GV I/O Known Problems

The following limitations are present in this release of software. If you wish to obtain more information about these limitations, please mention the reference numbers.

STR-67687	Description:	GV I/O channel fails to record after switching the video format.
	Workaround:	When changing a video feed on the GV I/O appliance, the signal feed on the SDI input of the AJA card must be set first. Then in GV STRATUS Control Panel, change the <b>Channel Format</b> in <b>General   Channels   GV I/O</b> settings to match the format of the new video feed.
STR-67999	Description:	GV I/O channel fails to cue and playout a clip that has both 16-bit and 24-bit audio tracks.
	Workaround:	Make sure all audio tracks in the clip are of the same type.
STR-68445	Description:	GV I/O channel's Record and Playout-specific options do not update in the Channel Panel tool after changing them in the GV STRATUS Control Panel.
	Workaround:	The GV STRATUS desktop application needs to be restarted after changing a GV I/O channel from Playout to Record or from Record to Playout in order to see updated configuration options in the Channel Panel tool.
STR-69574	Description:	When setting mark in/out for a 720p XDCAM Long GOP asset using a GV I/O channel, the marks will be forced to the nearest even video frame.
	Workaround:	None.
STR-69723	Description:	Changing a GV I/O channel input to SMPTE 2110 from either SDI, SMPTE 2022-6, or Web Stream, after previously saving a different SMPTE 2110 channel allows saving the channel configuration without uploading a new SDP file.
	Workaround:	Set the SDP file for the particular channel before saving your settings. If not, the channel will be configured with an incorrect SDP file from another SMPTE 2110 channel.
STR-71412	Description:	For GV I/O channels configured for SMPTE 2110 Playout, if the Audio Format setting is configured for "L16/48000 Hz", loading a clip to the channel for playout will fail.

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Workaround: For GV I/O channels configured for SMPTE 2110 Playout, set the Audio Format setting to "L24/48000 Hz".

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# Using GV I/O Live Ingest and Playout Server

## About the GV I/O Live Ingest and Playout Server

### Introduction

The GV I/O Live Ingest and Playout Server provides the ability to build a non-K2 Summit based production system on COTS (Commercial Off the Shelf) IT hardware and storage. Users can now purchase a commodity hardware solution and add the baseband HD-SDI support via an on-board video card, or the HD/UHD network adapter card for IP ingests and playouts. The GV I/O server may also be configured as a standalone device with local storage, or a shared storage client with K2 Summit SAN system or GV AMS Pro - Advanced Media Storage system.

The GV I/O Live Ingest and Playout Server supports production requiring cost effective Ingest and Replay in a fast paced News or Sports workflow. In addition, it supports studio and web production, live audience studio shows, and any operation that requires multi-channel ingests and playbacks in the editing and production system.

The GV I/O Live Ingest and Playout Server has up to four Recorder and Player channels that support SD, 720p, 1080i, and 1080p video formats. The UHD GV I/O Live Ingest and Playout Server supports up to 2160p (XAVC-I Class 300) video format with 2 Recorders and 1 Player via SMPTE 2110 IP channels. While the 1080p option supports no more than two channels simultaneously on a single GV I/O server. HDR work flows are also supported with HLG or PQ dynamic range type for 1080p and 2160p assets via SMPTE 2110 IP channels only.

As an alternative to K2 Summit systems, the GV I/O Live Ingest and Playout Server utilizes Dell PowerEdge R640 servers with an AJA® Corvid 88 card for SDI connections to support channel ingests and playback, or the Mellanox ConnectX®-5 10/25 GigE network adapter card that supports IP ingests and SMPTE 2110 playouts. The 1G/10G network adapters are provided for Control, and shared storage connections. The GV I/O Live Ingest and Playout Server also supports common SD and HD codecs without additional licenses.

The GV I/O Live Ingest and Playout Server includes the NVIDIA® Quadro video card to support proxy file acceleration for the video and 8 audio pairs for the audio. While the UHD GV I/O Live Ingest and Playout Server includes the Matrox® M264 video card, which can encode proxy for high-resolution files up to 2160p video format. With GV I/O generating proxy files automatically for ingest channels, fast editing and playback-to-air can easily be done on the fly in any production environment.

### Standard features

The GV I/O Live Ingest and Playout Server offers high performance, expansion options, and high reliability outlined in the summary below.

- The system comes ready to use with quick connections for the duplex LAN, USB, and monitor connections.

- The USB Recovery Flash Drive is provided in a clip inside the front panel of the hardware.
- The main enclosure is rack-mountable and the main components are easy to install.
- GV I/O options include:
  - AJA Corvid 88 SDI card that supports up to 4 channels of Ingest and 4 channels of Playout via SD/HD/3G-SDI with the NVIDIA Quadro video card for proxy generation.

**OR**

- Mellanox ConnectX-5 10/25 GigE network adapter card that supports up to 4 channels of Ingest or Playout via SMPTE 2110 media streams or Ingest via SMPTE 2022-6 media streams with the NVIDIA Quadro video card for proxy generation.

**OR**

- Mellanox ConnectX-5 25 GigE network adapter card that supports up to 2 UHD channels for Ingest and 1 UHD channel for Playout via SMPTE 2110 media streams with the Matrox M264 video card for proxy generation, which can encode high-resolution files up to 2160p video format.
- Able to be configured as a standalone device with local storage, or a shared storage client with GV AMS Pro - Advanced Media Storage and K2 Summit SAN system. (With K2 SAN version 10.1.3 and later only)
- Support for 2160p UHD (XAVC-I Class 300 video format) via SMPTE -ST 2110 IP channels only.
- Support for 1080p high-resolution workflow with no more than two channels simultaneously on a single GV I/O unit.
- Support for HDR metadata with HLG or PQ dynamic range type for 1080p and 2160p assets via SMPTE -ST 2110 IP channels only. This option allows writing of HDR metadata into CMF, MXF and GXF file formats. Rec 2020 colorspace with Hybrid Log Gamma (HLG/Rec2100) and PQ (HDR10/SMPTE ST2084 – 1,000cd/m<sup>2</sup>) transfer curves are the formats supported.
- Support for common SD and HD codecs without additional licenses.
- Support for standard NMOS (Networked Media Open Specifications) IS-04 and IS-05 for device connection management.
- Support a web-based configuration utility for 64 audio tracks, UHD, HDR metadata, and NMOS work flow settings.
- High performance features include a powerful central processor and high speed Ethernet interface and disk access from SAS (Serial Attached SCSI) disk drives.
- The following GV AMS Pro - Advanced Media Storage network-attached storage systems are qualified for use with the GV I/O Live Ingest and Playout Server:
  - S210
  - X210
  - X410
  - H400
  - H500
  - H600

**NOTE:** *GV I/O UHD support requires GV AMS Pro storage or the available internal SSD storage. However, it is not supported on existing GV AMS Elite (K2 SAN) storage.*

## Product component summary

The main components of the GV I/O Live Ingest and Playout Server are the following:

- One RU rack-mountable chassis.
  - One USB Recovery Flash Drive located inside the front panel of the GV I/O
  - Dual processors.
  - Two hot-plug, redundant, and high-efficiency power supply units.
  - Two RAID 1 Solid State Drives (240 GB drives, configured as **RAID 1** with **128k stripe** size)
  - Five RAID 5 drives - Only for Standalone device with these 2 options:
    - Internal SSD storage (960 GB drives). Provides ~4 TB RAID-5 (~79 hours @ 100 Mb)
    - Internal SSD storage (1.92 TB drives). Provides ~7.6 TB RAID-5 (~157 hours @ 100 Mb)
  - 1G/10G Ethernet LAN connectors.
  - One monitor connector for connecting a display device.
  - 3 USB ports for connecting devices.
  - NVIDIA® Quadro video card for SD/HD proxy generation.
  - Matrox® M264 video card to provide hardware-accelerated UHD XAVC-I 300 recording and play functionality.
  - I/O options include:
    - AJA® CORVID 88 PCIe 2.0 I/O card for SDI connections.
- OR**
- Mellanox ConnectX®-5 10/25 GigE network adapter card for IP connections.

## Front view

The front view of the GV I/O Live Ingest and Playout Server front bezel is shown below. The front bezel should be installed after rack mounting the server. It should remain installed during normal operation for proper cooling of the unit.

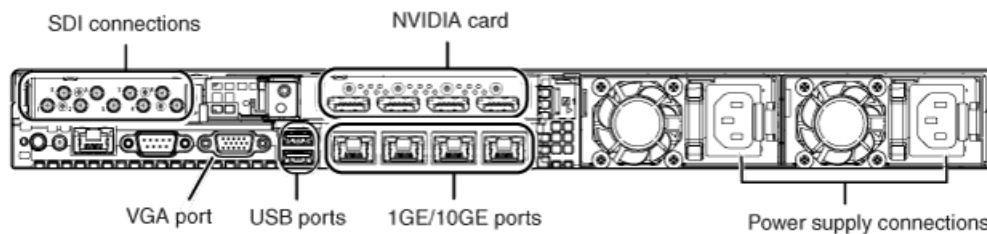


## Rear view components

GV I/O Live Ingest and Playout Server supports either the AJA Corvid 88 card for SDI connections or the Mellanox ConnectX-5 10/25 GigE network adapter card for IP connections.

### Rear view components for GV I/O SDI option

A rear view of the GV I/O Live Ingest and Playout Server with SDI channel option is shown below.



The system backplane includes the AJA Corvid 88 card for SDI connections, NVIDIA Quadro video card for proxy acceleration, 1GE/10GE ports for Control, and shared storage connections, USB ports for mouse and keyboard control, a VGA port to connect to a monitor, and redundant AC power supply units.

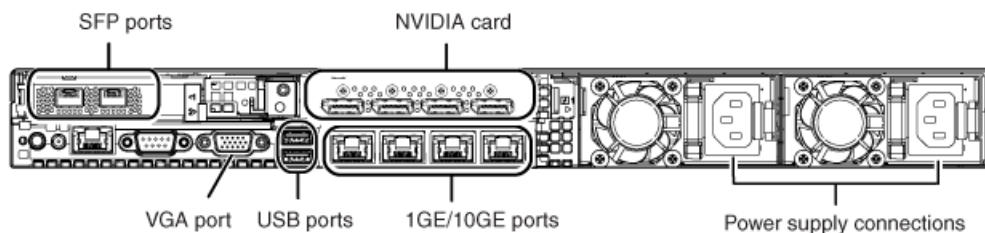
#### **Rear view components for GV I/O IP option**

The system backplane includes the Mellanox ConnectX-5 10/25 GigE network adapter cards connected to SFP ports for IP connections, NVIDIA Quadro video card for proxy acceleration, 1GE/10GE ports for Control, and shared storage connections, USB ports for mouse and keyboard control, a VGA port to connect to a monitor, and redundant AC power supply units.

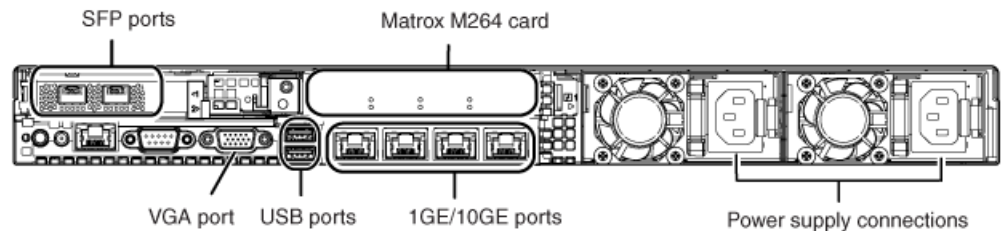
The UHD GV I/O Live Ingest and Playout Server includes the Matrox M264 video card, which replaces the NVIDIA Quadro card to encode high-resolution proxy files up to 2160p video format.

Rear view components of the GV I/O Live Ingest and Playout Server for IP options are shown below:

##### **1. GV I/O rear view with the NVIDIA card option**



## 2. GV I/O rear view with the Matrox M264 card option



## Cabling GV I/O Live Ingest and Playout Server

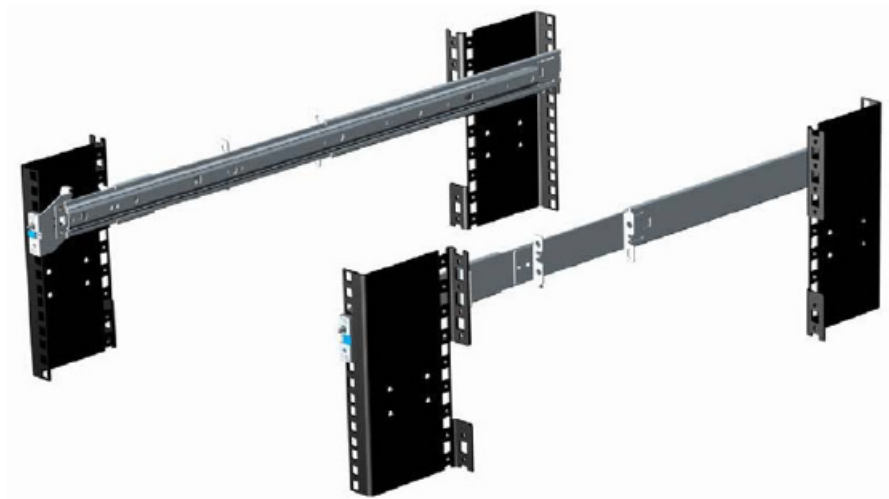
### Rack mounting

#### Prerequisites

- Make sure the installation meets the detailed physical and environmental requirements for the installation site.
- A #2 Phillips screwdriver is required to install Phillips head screws for the rack rails.
- A standard flat-head screwdriver is required to install flat head screws for the rack rails.
- Ensure adequate air flow around the chassis to provide sufficient cooling. Operating ambient temperature will affect the amount of air circulation required to keep the system within its temperature limitations.
- Ensure that safety labels located on the top of the unit are visible after installation. This requires sufficient open space over the unit without cables or other devices impeding the view.
- If the system is installed with its ventilation intakes near another system's exhaust or in a closed or multi-unit rack assembly, the operating ambient temperature inside the chassis may be greater than the room's ambient temperature. Install the system in an environment compatible with this recommended maximum ambient temperature.
- Ensure that the power socket-outlet is installed near the equipment and is easily accessible.
- Ensure the rack is anchored to the floor so that it cannot tip over when the system is extended out of the rack.
- Be sure to mount the system in a way that ensures even weight distribution in the rack. Uneven mechanical loading can result in a hazardous condition. Secure all mounting bolts when installing the chassis to the rack.

#### Rack-mount device

Follow the instructions you received with the rack-mount hardware to install the system.



**Dell R640 Rack specifications**

Use the following specifications to determine load, spacing, power, and other factors when planning system racks.

**Table 1: Mechanical specifications**

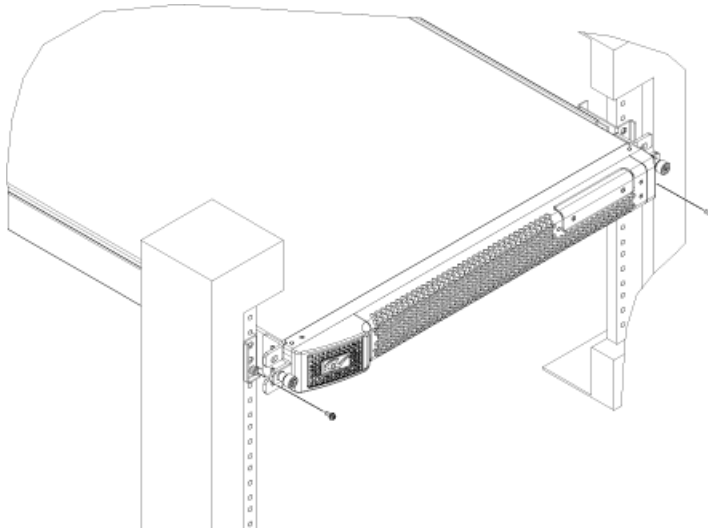
Characteristic	Specification
Cabinet Type	Rack-mount
Rack units	1
External Dimensions	482.0 (w) x 42.8 (h) x 683.05 (d) mm
Weight	Maximum 21.9 kg

**Table 2: Power specifications**

Specification	750W AC
Current consumption	10A-5A
Supply voltage	100-240VAC
Frequency	50/60Hz
Heat dissipation (BTU/hr max)	2891
Maximum inrush current	55A

**Securing a server to a rack**

Follow the instructions provided in the shipping box to install the rack rails and position the server in the rack. For the Dell 1RU PowerEdge Server, follow the illustration below to secure the system to the rack.



Install a screw in the bottom hole of the bracket on each side. Do not attempt to install a screw in the top hole of the bracket.

## **Cabling GV I/O server**

These cabling instructions apply to GV I/O Live Ingest and Playout Server, specified as follows:

### **Cabling GV I/O server: SDI option**

The GV I/O server supports the AJA Corvid 88 card for SDI connections to ingest and playout of simple clips, not including playlists. Up to four channels are supported in a box, with four top SDI connectors dedicated for inputs (recorder channels) and four bottom SDI connectors dedicated for outputs (player channels). Connect SDI IN or OUT to each channel appropriately, as shown in the illustration below. You can easily connect dedicated SDI INs and SDI OUTs to your routers, and with channel configuration being done via the GV STRATUS Control Panel, there is no need to move cables around for any channel changes later.

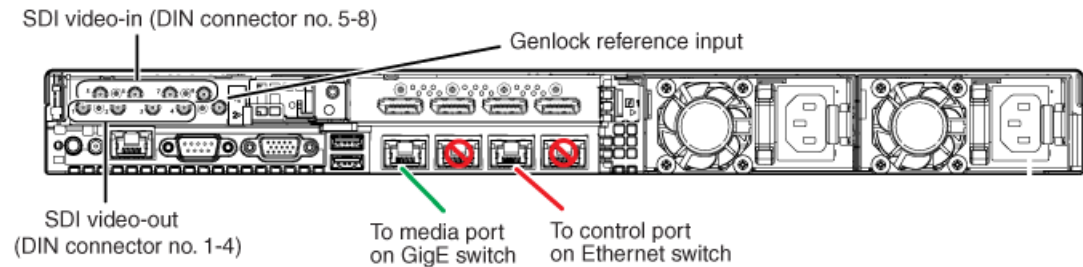
A valid reference signal is required for proper GV I/O product operation with SDI work flows.

The Genlock Reference Input is able to auto-detect and accept black burst or tri-level sync. Both NTSC and PAL timing are supported and should match the NTSC or PAL timing setting of the GV STRATUS system.

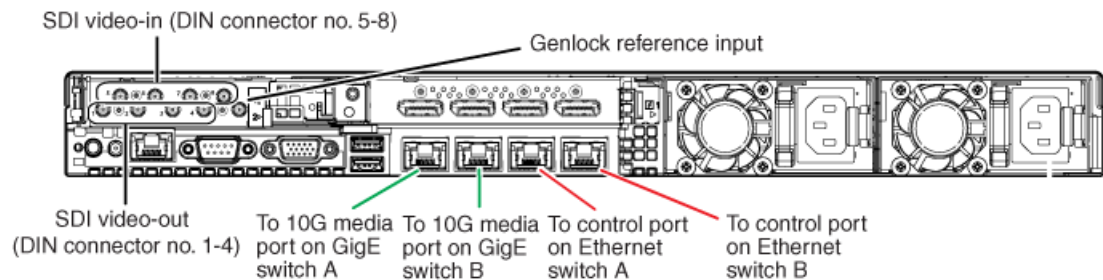
The GV I/O server supports media connections to K2 Summit SAN storage and GV AMS Pro - Advanced Media Storage systems.

These cabling instructions apply to GV I/O Live Ingest and Playout Server with SDI option, specified as follows:

### 1. GV I/O cabling connections with GV AMS Pro - Advanced Media Storage system



### 2. GV I/O redundant LAN Connect or iSCSI connections with K2 Summit SAN storage system



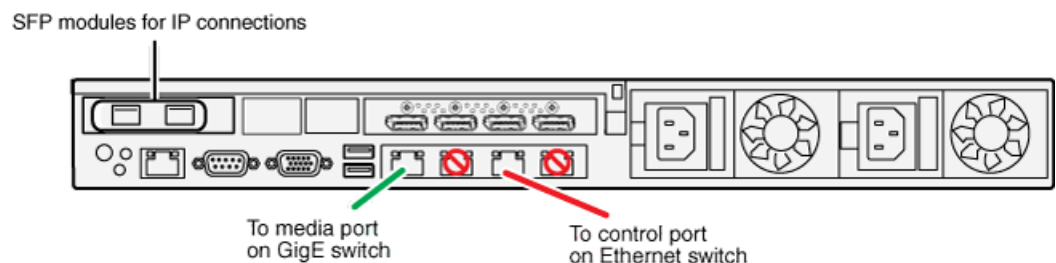
#### Cabling GV I/O server: IP option

The GV I/O server supports the Mellanox ConnectX-5 10/25 GigE network adapter card for IP connections to ingest and playout of simple clips, not including playlists. However, only SMPTE 2110 option is supported for playouts. Each channel (C1, C2, etc.) can be an input (recorder channel) or an output (player channel). Connect video/audio IN and OUT to each channel, as appropriate for your intended use.

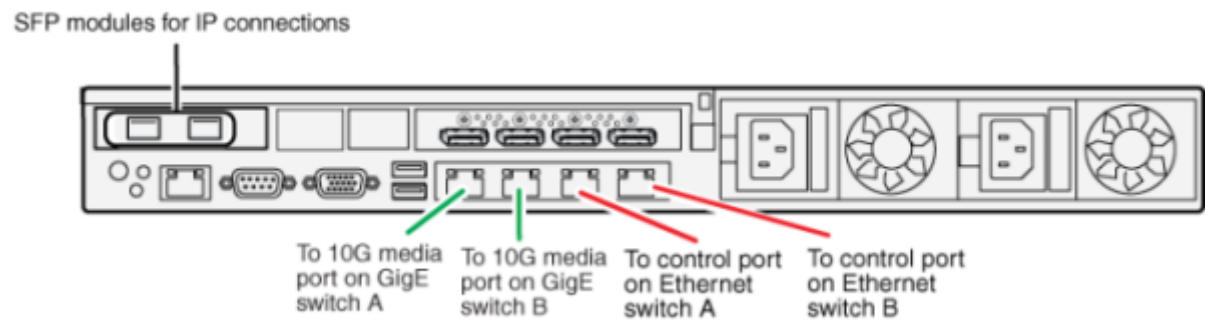
The GV I/O server also supports media connections to K2 Summit SAN storage and GV AMS Pro - Advanced Media Storage systems.

These cabling instructions apply to GV I/O Live Ingest and Playout Server with IP option, specified as follows:

### 1. GV I/O cabling connections with GV AMS Pro - Advanced Media Storage system



## 2. GV I/O redundant LAN Connect or iSCSI connections with K2 Summit SAN storage system





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# Installing GV I/O Live Ingest and Playout Server

If you have received your GV I/O Live Ingest and Playout Server from the factory for use in a GV STRATUS Media Workflow system, it has been configured with all the necessary software and server functionality such as duplexed LANs and Rapid Disk Resync (RDR) has been performed at the factory. Refer to these topics for further installation instructions.

## BIOS startup

If you received your GV I/O server from the factory, it has been configured with the necessary software and all server functionalities. Refer to [Preparing for GV I/O installation](#) on page 22 to continue with the installation.

### Prerequisite:

- Verify that the AJA Corvid 88 card or Mellanox ConnectX-5 card is installed with the desired feeds attached
- The Control and shared storage network cables are connected to 1G and 10G ports respectively
- Verify that the NVIDIA card or Matrox M264 card is installed with the relevant driver

After the power-up of GV I/O Live Ingest and Playout Server, the VGA monitor displays BIOS information, with instructions on how to access settings.

1. Press the F2 key on the keyboard to enter System Setup pages.
2. On the System Setup screen, select **System BIOS**.

3. Configure settings as below:

- **Boot Settings:** Boot Mode set to **BIOS** (not UEFI)
- **System Profile:**
  - System Profile set to **Custom**
  - Energy Efficient Policy set to **Performance**
  - Disable the **C1E** option
  - Disable the **C States** option
- **Processor Settings:** Enable the **Logical Processor** option
- **Memory Settings:** Disable the **Node Interleaving** option
- **Integrated Devices:** (For SMPTE 2110 playout)
  - If the NVIDIA card is installed : Disable the **Embedded Video Controller** option
  - If the Matrox M264 card is installed : Enable the **Embedded Video Controller** option

***NOTE:** After disabling the on-board graphics and restarting the GV I/O system, it may start up with no graphics adapters enabled. In this case, you must hard power cycle the system for the NVIDIA GPU or Matrox M264 card to become active. It is also advisable to have both on-board VGA connector and a connector for the GPU to be connected to a single monitor, in case only the VGA connector is active.*

When BIOS settings have been completed, the Windows operating system begins to load.

4. Open Computer Management, Disk Management and do the following:

- Split the C: and D: drive equally on the RAID 1 SSDs.
- For Standalone client only - Create the V: Media drives on the four RAID 5 drives.

## Preparing for GV I/O installation

If you received your GV I/O server from the factory, it has been configured with the necessary software and all server functionalities.

Then, do the following:

- Procure the software installation files for this release via the appropriate distribution method, such as download, network drive, or external drive.
- Connect the Control and FTP/SMB network cables to RJ45 10G network ports.
- Allow the GV I/O Live Ingest and Playout Server to boot up for the first time, and name the server when prompted to after the first log in.
- Configure the Control network. Work with the IT personnel at the site to configure Domain, DNS, DHCP, or any other settings required by the site's LAN.
- Add the GV I/O Live Ingest and Playout Server to a domain, or update and use hosts files.
- Install the latest SiteConfig application.
- Install the latest Discovery Agent.

- Install all Important Windows updates.

### Preparing for GV I/O installation of SDI option

- Verify that the AJA Corvid 88 card is installed with the desired feeds attached.
- Procure the **GVIO-Prerequisites-5.x.zip** file that includes all GV I/O prerequisite files. This .zip file contains software components that will be used later in the procedure.
- Verify that the **ntv2firmwareinstaller.exe** and **corvid\_88\_34.bit** files must be in the same directory as the .bat file BEFORE you run **UpdateAjaFirmware.bat**.

This procedure is not required if you received your GV I/O server from the factory. Otherwise, proceed with the steps below:

1. Install this AJA driver manually: **ntv2driver-14.3.2.msi**
2. Run the **UpdateAjaFirmware.bat** file.
3. Power Cycle the system.
4. Run the **NetworkAdapters** PowerShell script after reviewing its associated README.txt file and enter the names of your adapters as follows:
  1. Control Connection
  2. FTP Connection (for internal storage) OR Media Connection (for shared storage)
  3. Unused 1
  4. Unused 2

### Preparing for GV I/O installation of IP option

- Verify that the Mellanox ConnectX-5 card is installed.
- Procure the **GVIO-Prerequisites-5.x.zip** file that includes all GV I/O prerequisite files. This .zip file contains software components that will be used later in the procedure.
- Verify that Windows Server 2016 Base Image version 20190822-340-2016w or later has been installed. The base image should contain McAfee Solidifier 8.2.1.143 and GV Embedded Security Manager 1.0.0.26 or later versions of these software components.

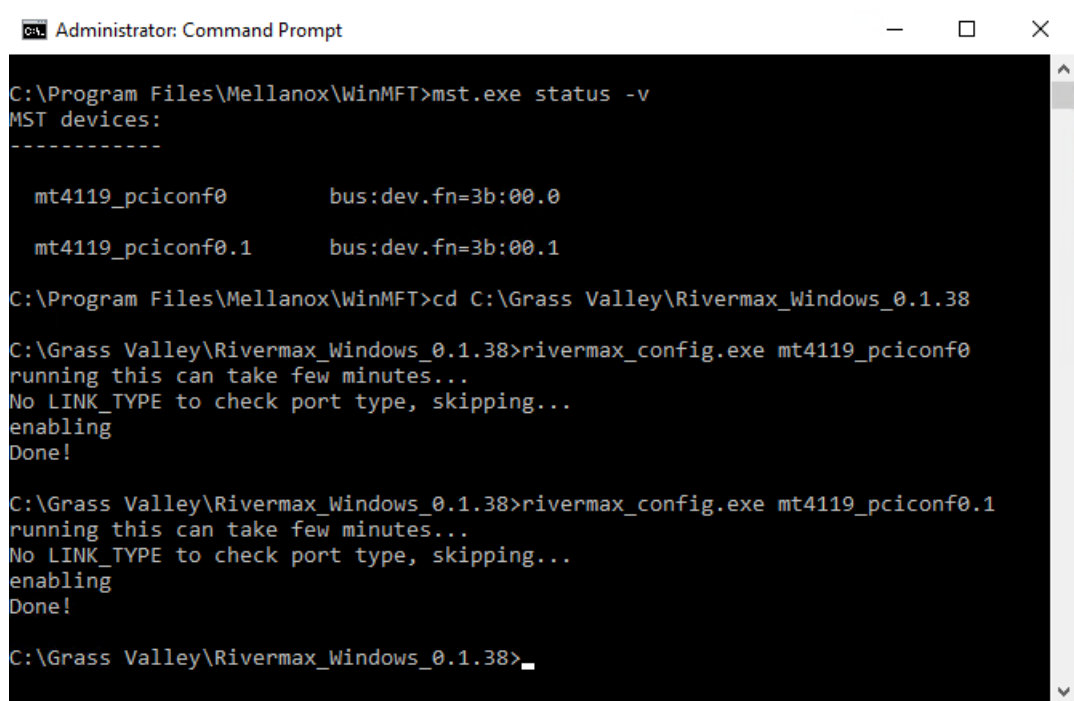
This procedure is not required if you received your GV I/O server from the factory. Otherwise, proceed with the steps below:

1. Enter the Update mode in the Embedded Security Manager, and install this Mellanox driver manually: **MLNX\_WinOF2\_All\_AIOS\_x64\_release\_x\_xxx\_xxxx\_xx.exe**
2. After the installation is done, select the **Solidify** button in the Embedded Security Manager.

**NOTE:** *The Solidifying step is optional on a new system and not needed if McAfee was never in Disabled Mode.*

3. Reboot the system.
4. In the system setting, rename those two network ports associated with Mellanox network interface cards as **HBR Media Port 1** and **HBR Media Port 2**.

5. Run the **NetworkAdapters** PowerShell script after reviewing its associated README.txt file and enter the names of your adapters as follows:
  1. Control Connection
  2. FTP Connection (for internal storage) OR Media Connection (for shared storage)
  3. HBR Media Port 1
  4. HBR Media Port 2
  5. Unused 1
  6. Unused 2
6. Install the Mellanox Firmware Tools file manually: **WinMFT\_x64\_x\_xx\_x\_x.exe**
7. Open a Command Prompt and run **mst status -v** to identify Mellanox board as below:



```
Administrator: Command Prompt

C:\Program Files\Mellanox\WinMFT>mst.exe status -v
MST devices:
-----

    mt4119_pciconf0      bus:dev.fn=3b:00.0

    mt4119_pciconf0.1    bus:dev.fn=3b:00.1

C:\Program Files\Mellanox\WinMFT>cd C:\Grass Valley\Rivermax_Windows_0.1.38
C:\Grass Valley\Rivermax_Windows_0.1.38>rivermax_config.exe mt4119_pciconf0
running this can take few minutes...
No LINK_TYPE to check port type, skipping...
enabling
Done!

C:\Grass Valley\Rivermax_Windows_0.1.38>rivermax_config.exe mt4119_pciconf0.1
running this can take few minutes...
No LINK_TYPE to check port type, skipping...
enabling
Done!

C:\Grass Valley\Rivermax_Windows_0.1.38>_
```

8. Then at the command prompt, enter **mlxburn -vpd -dev <adaptername>** to get the information about the adapters including the serial number needed for the license.

**NOTE:** A Mellanox Rivermax license file should be provided and installed at:

**c:\License\rivermax.lic**

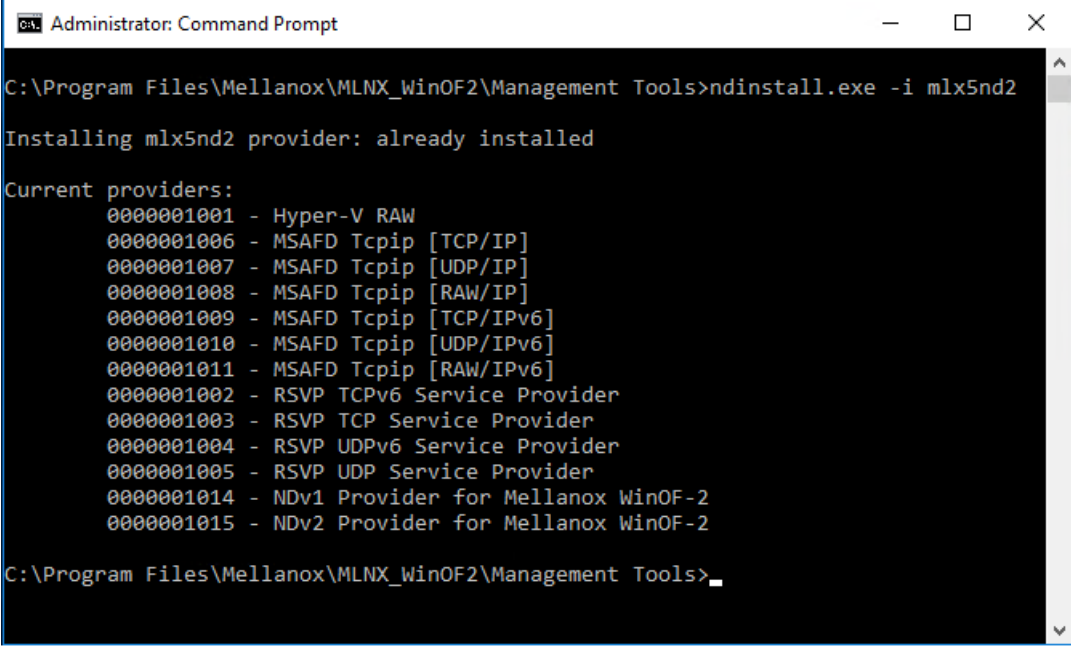
If you do not have a rivermax.lic file, then obtain a copy of the rivermax.lic file via instructions at [Licensing the Mellanox ConnectX-5 card](#) on page 36.

9. Run **rivermax\_config-<version>.exe** with correct identifiers to configure each Mellanox card.
10. Reboot GV I/O after the configuration is done.

11. Using the Command Prompt, go to `C:\Program Files\Mellanox\MLNX_WinOF2\Management Tools` and run the **ndinstall.exe** file.

This will list all the current providers.

If the required provider "NDv2 Provider for Mellanox WinOF-2" is not in the list, run **ndinstall.exe -i mlx5nd2** to add it.



```

Administrator: Command Prompt
C:\Program Files\Mellanox\MLNX_WinOF2\Management Tools>ndinstall.exe -i mlx5nd2

Installing mlx5nd2 provider: already installed

Current providers:
0000001001 - Hyper-V RAW
0000001006 - MSADF Tcpip [TCP/IP]
0000001007 - MSADF Tcpip [UDP/IP]
0000001008 - MSADF Tcpip [RAW/IP]
0000001009 - MSADF Tcpip [TCP/IPv6]
0000001010 - MSADF Tcpip [UDP/IPv6]
0000001011 - MSADF Tcpip [RAW/IPv6]
0000001002 - RSVP TCPv6 Service Provider
0000001003 - RSVP TCP Service Provider
0000001004 - RSVP UDPv6 Service Provider
0000001005 - RSVP UDP Service Provider
0000001014 - NDv1 Provider for Mellanox WinOF-2
0000001015 - NDv2 Provider for Mellanox WinOF-2

C:\Program Files\Mellanox\MLNX_WinOF2\Management Tools>

```

12. Run **ndinstall.exe** again at the Command Prompt, and make sure you see the required provider: **NDv2 Provider for Mellanox WinOF-2**

13. Run the **NetAdapterConfig\_VersionX.ps1** file for NIC configuration.

**NOTE:** *Reinstalling or updating the Mellanox driver will reset the NIC configuration settings, so this script must be executed again after any future driver updates.*

14. Install the S2059 client manually: **S2059ClientInstaller-x.x.x.xx.exe**
15. Install the VyDriver manually: **VyDriver-x.x.x.xx.exe**
16. Open Network and Sharing Center in the Control Panel, then right-click and select Properties on the first Mellanox ConnectX network port.
17. Disable all protocol and services except **Vy** and **Internet Protocol Version 4 (TCP/IPv4)**.

**NOTE:** *VyDriver's configuration for CPU core selection can be left at the default automatic setting.*

18. Go to the second Mellanox ConnectX network port, then disable all protocol and services except **Vy** and **Internet Protocol Version 4 (TCP/IPv4)**.
19. For all non-Mellanox network ports, right-click on Properties and uncheck **Vy** for each network port.
20. Set up and assign IP addresses for the Mellanox network interface controller (NIC).
21. In the Embedded Security Manager, leave the Update mode and set it to Enabled mode.
22. Reboot the GV I/O unit.

## SiteConfig placeholder setup for GV I/O

This process is required. You must add placeholder device for GV I/O Live Ingest and Playout Server to the SiteConfig system description.

### Adding a GV I/O Client - Standalone to the system description

- The system description must contain a group.
1. In the **Network Configuration | Devices** tree view, right-click a group and select **Add Device**.  
The Add Device dialog box opens.

The screenshot shows the 'Add Device' dialog box with the following configuration:

Family:	Type:	Model:
EDIOUS	GV STRATUS All-In-One Device	<Custom>
<b>GV STRATUS</b>	GV STRATUS Client	GVIO Standalone Device
Infrastructure	GV STRATUS Server	
K2	GVIO Client - Shared Storage	
System Management	<b>GVIO Client - Standalone</b>	

Below the selection lists, the following fields are present:

- Name: SITEGVIO
- Amount: 1
- Platform: x64
- Control Network: Control
- Starting Address: 10.251.50.2

Buttons: OK, Cancel

2. Configure settings for the device you are adding as follows:
  - Family – Select **GV STRATUS**.
  - Type – Select **GV I/O Client - Standalone**.
  - Model – Select **GV I/O Standalone Device**
  - Name – This is the device name, as displayed in the SiteConfig device tree view and device list view. This name can be different than the host name (network name). You can accept the default name or enter a name of your choice. Devices in the tree view are sorted alphabetically.
  - Amount – You can add multiple devices, as currently defined by your settings in the Add Device dialog box. An enumerator is added to the name to create a unique name for each device added.
  - Platform – Select **x64** for 64-bit operating system.
  - Control network – Select **Corporate LAN** or **Control**, as appropriate for the PC's network connection.
  - Starting Address – Select from the list of available addresses on the selected control network. If adding multiple devices, this is the starting address, with addresses assigned sequentially to each device added.
3. Click **OK** to save settings and close.
4. Repeat these steps for each of your devices.

5. If the server is on the control network, verify that unmanaged control network interfaces are configured correctly and modify if necessary.

## Adding a GV I/O Client - Shared Storage to the system description

- The system description must contain a group.
1. In the **Network Configuration | Devices** tree view, right-click a group and select **Add Device**.  
The Add Device dialog box opens.

The screenshot shows the 'Add Device' dialog box with the following configuration:

Family:	Type:	Model:
EDIUS	GV STRATUS All-In-One Device	<Custom>
<b>GV STRATUS</b>	GV STRATUS Client	GV I/O Client (non-redundant iSCSI)
Infrastructure	GV STRATUS Server	GV I/O Client (redundant iSCSI)
K2	<b>GV I/O Client - Shared Storage</b>	<b>GV I/O Client (SMB)</b>
System Management	GV I/O Client - Standalone	

Below the lists, the following fields are visible:

- Name: SITEGVIO
- Amount: 1
- Platform: x64
- Control Network: Control
- Starting Address: 10.251.49.249

Buttons: OK, Cancel

2. Configure settings for the device you are adding as follows:
  - Family – Select **GV STRATUS**
  - Type – Select **GV I/O Client - Shared Storage**
  - Model – Select as follows:
    - If the server is to be connected to redundant iSCSI or LAN Connect network for access to high-resolution assets in K2 SAN system, select **GV I/O Client (redundant iSCSI)**
    - If the server is to be connected to the GV AMS Pro - Advanced Media Storage system, select **GV I/O Client (SMB)**
  - Name – This is the device name, as displayed in the SiteConfig device tree view and device list view. This name can be different than the host name (network name). You can accept the default name or enter a name of your choice. Devices in the tree view are sorted alphabetically.
  - Amount – You can add multiple devices, as currently defined by your settings in the Add Device dialog box. An enumerator is added to the name to create a unique name for each device added.
  - Platform – Select **x64** for 64-bit operating system.
  - Control network – Select **Corporate LAN** or **Control**, as appropriate for the PC's network connection.
  - Starting Address – Select from the list of available addresses on the selected control network. If adding multiple devices, this is the starting address, with addresses assigned sequentially to each device added.
3. Click **OK** to save settings and close.

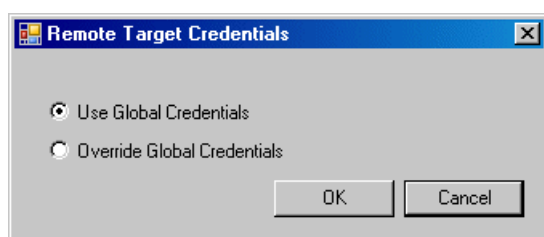
4. Repeat these steps for each of your devices.
5. If the server is on the control network, verify that unmanaged control network interfaces are configured correctly and modify if necessary.

### Setting credentials for a specific device

For servers on the corporate LAN, override global credentials so that SiteConfig has access to the PC for software deployment.

1. In the tree view, right-click a device and select **Credentials**.

The Remote Target Credentials dialog box opens.



2. Select **Override Global Credentials** and click **OK**.  
The Set Device Logon Credentials dialog box opens.
3. Enter the user name and password for the device and click **OK**. To test the credentials, right-click on the device and choose **Remote Desktop** to start a session to the device.

### Adding GV I/O to the control network with SiteConfig

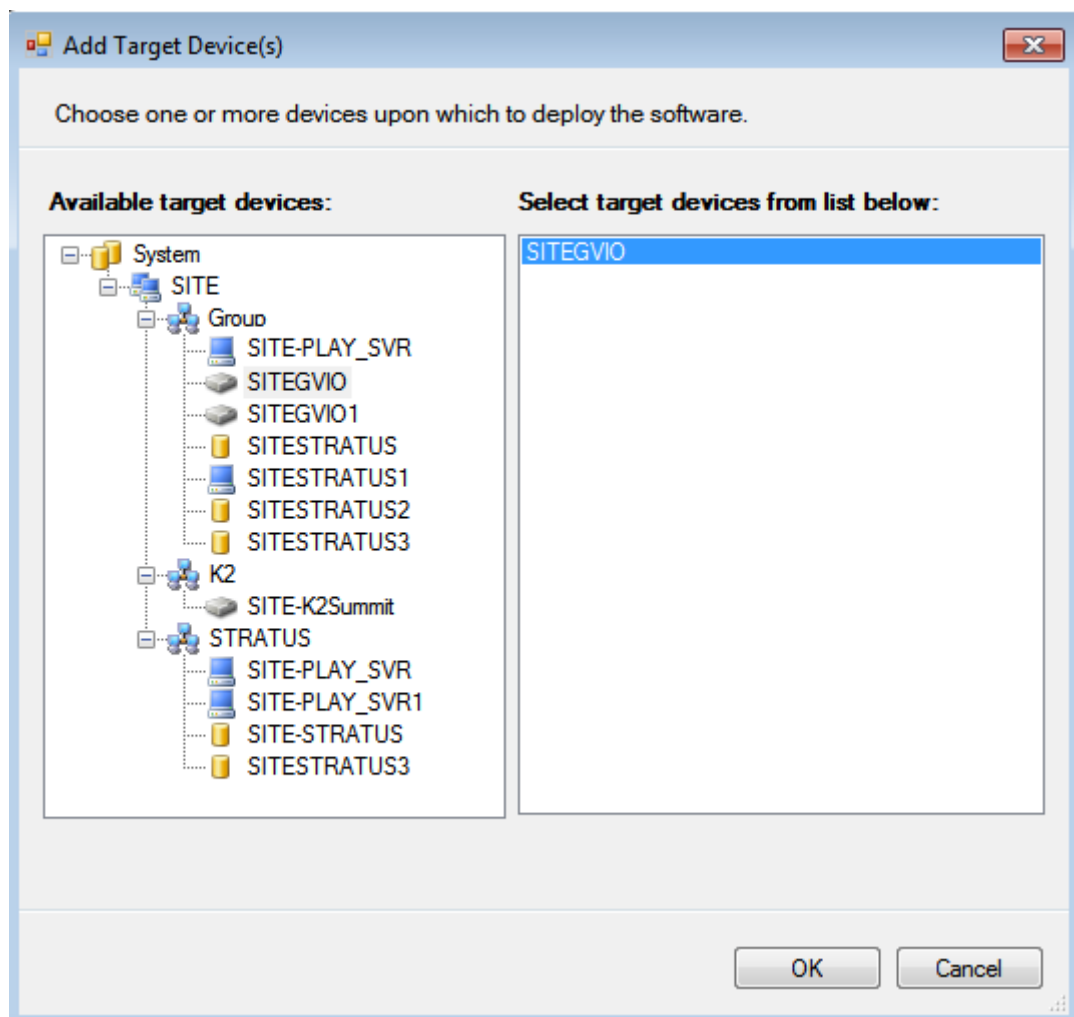
Before doing this task, make sure the GV I/O Live Ingest and Playout Server is added as a placeholder device to the SiteConfig system description.

The following steps are the standard tasks for adding a device to the control network using SiteConfig. Use these steps for the GV I/O Live Ingest and Playout Server you are adding.

1. Discover the device using SiteConfig device discovery.
2. Assign the discovered device to the placeholder device in the SiteConfig system description.
3. Modify the control network interface to ensure communication on the control network.
4. Modify the host name and/or device name as desired.
5. Ping the device to verify network communication.
6. Verify credentials to ensure SiteConfig can install software on the device.

## Configuring deployment groups

- The device must be assigned in the SiteConfig system description and network connectivity must be present.
- In the **Software Deployment | Deployment Groups** tree view, right-click the top node and select **Add Deployment Group**.  
A deployment group appears in the tree view.
  - Right-click the deployment group, select **Rename**, and enter a name for the deployment group.
  - Right-click the deployment group and select **Add Target Device**.  
The Add Target Device(s) wizard opens.



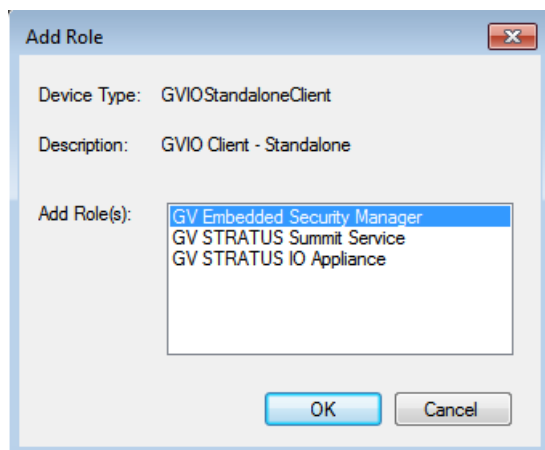
- In the Available Target Devices tree view, select the node that displays the devices that you are combining as a deployment group.
- In the right-hand pane, select the device that you are adding to the deployment group.
- Click **OK**.

The devices appear in the Deployment Groups tree view under the deployment group. Before you perform a software deployment, you must check software on the devices that will be receiving new software.

## Adding software roles to a GV I/O Client

1. In the **Software Deployment | Devices** tree view, right-click the device and select **Add Role**.

The Add Role dialog box opens.



The Add Role dialog box displays only those roles that SiteConfig allows for the selected device type.

2. Select the role or roles that you want to add to the device. Use Ctrl + Click or Shift + Click to add multiple roles.

**NOTE:** *If you added the correct GV I/O Client device (either for standalone or shared storage system), then the default roles are automatically added in SiteConfig.*

- GV I/O Live Ingest and Playout Server roles for standalone client:
  - GV Embedded Security Manager
  - GV STRATUS Summit Service
  - GV STRATUS IO Appliance
- GV I/O Live Ingest and Playout Server roles for GV AMS Pro - Advanced Media Storage system or third party shared storage client with SMB connection:
  - GV Embedded Security Manager
  - GV STRATUS IO Appliance
- GV I/O Live Ingest and Playout Server roles for shared storage client of K2 Summit SAN system with LAN Connect or iSCSI connection:
  - GV Embedded Security Manager
  - GV STRATUS IO Appliance
  - StorNext File System Client
  - K2 iSCSI Client (For iSCSI connection only)

3. Click **OK** to save settings and close.  
The new roles appear under the device in the tree view.

## Installing software into a GV I/O Live Ingest and Playout Server

- The device on which you are installing software is in the SiteConfig system description and communicating on the control network.
- The device on which you are installing software has its credentials set in SiteConfig to allow access.
- The device to which you are deploying software must have their SiteConfig roles correctly configured.

1. Launch the SiteConfig application.
2. In the **Software Deployment | Deployment Groups** tree view, select a deployment group.
3. Click the **Add** button.  
The Add Package(s) dialog box opens.

4. Add the following cab files to the deployment group:

- *GrassValley\_GVIO\_X.X.XX.XXXX.cab*
- *GVEEmbeddedSecurityManager\_X.X.XX.XXXX.cab*
- *DiscoveryAgent\_X.X.XX.XXXX.cab*

Refer to [Grass Valley products compatible with GV I/O](#) on page 8 and [Third party products compatible with GV I/O](#) on page 8 for specific version numbers.

5. If one or more EULAs are displayed, accept them to proceed. If you do not accept a EULA, the associated software is not assigned to the deployment group.

SiteConfig adds the package to the deployment group.

6. Verify that deployment tasks are set to **Install** for the files listed above.
7. Run a **Check Software** on the GV I/O device.
8. Deploy software to the server.
9. Restart when prompted and log on to the GV I/O device.
10. Save SiteConfig to push the configuration to the core server.
11. On each GV I/O device, manually install the following:

- **GVEngineInstaller-x.x.x.xx\_vcxxx.exe**
- **zulu11.41.23-ca-jdk11.0.8-win\_x64.msi**
- **452.57-quadro-winserv-2016-2019-64bit-international-whql.exe** if you have the NVIDIA card on your GV I/O device
- **dsx-matrox-setup.bat** if you have the Matrox M264 card on your GV I/O device

The Grass Valley AppService console application will start automatically when a user logs on to the GV I/O device.

**NOTE:** *Ensure the Grass Valley AppService stays running during normal operation of the GV I/O device.*

Next, license the GV I/O Live Ingest and Playout Server.

## About the Grass Valley AppService

To establish a connection between GV STRATUS software and the GV I/O Live Ingest and Playout Server, a user must log in to the GV I/O device and allow a console application named **Grass Valley AppService** to execute.

The **Grass Valley AppService** console application will start automatically when a user logs in to the GV I/O host. The user must stay logged in with the **Grass Valley AppService** running during normal operation of the GV I/O device.

**NOTE:** *Only a single instance of Grass Valley AppService will execute on the host even if another user logs in to the same GV I/O host.*

When using GV I/O Live Ingest and Playout Server with the GV AMS Pro - Advanced Media Storage, the user that executes the **Grass Valley AppService** console application must have read and write permissions to the UNC path configured for the GV I/O device to use in storing high resolution media files.

For proper operation of ingest and playout operation with GV AMS Pro - Advanced Media Storage, the UNC path used for media storage must be mapped to a V:\ drive on the GV I/O host.

## Shutting down the Grass Valley AppService

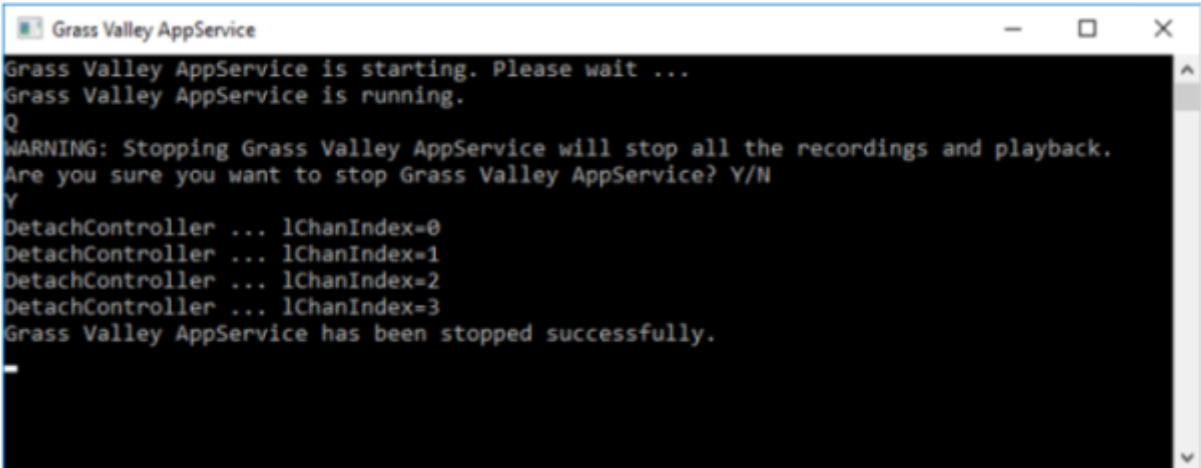
Prior to logging out of the GV I/O host, a user is recommended to shut down the Grass Valley AppService console application gracefully using the procedure below.

However, it is acceptable to reboot the GV I/O host without executing this shutdown process.

1. In the command line window for **Grass Valley AppService**, enter **Q** to start the shutdown process.

A warning message appears to inform all recordings and playback will be stopped, and the user must confirm the decision to shutdown the **Grass Valley AppService**.

2. Enter **Y** to stop the **Grass Valley AppService**.



```
Grass Valley AppService
Grass Valley AppService is starting. Please wait ...
Grass Valley AppService is running.
Q
WARNING: Stopping Grass Valley AppService will stop all the recordings and playback.
Are you sure you want to stop Grass Valley AppService? Y/N
Y
DetachController ... lChanIndex=0
DetachController ... lChanIndex=1
DetachController ... lChanIndex=2
DetachController ... lChanIndex=3
Grass Valley AppService has been stopped successfully.
```

A message appears to inform that the **Grass Valley AppService** has been stopped successfully.

3. Close the window.

4. Log out of the GV I/O host.



---

# Licensing GV I/O Live Ingest and Playout Server

Licenses are requested through email and managed through the SabreTooth License Manager, which is installed on the Grass Valley product with the Grass Valley software. The SabreTooth License Manager must be located on the Grass Valley product.

License information is stored in XML files that you can manage just like any other file on your system. Node-locked licenses are unique to the system for which they are requested and cannot be used on any other machine. You should back up the license text files to a separate drive or as part of a recovery image.

Licenses are based on your system's unique identifier, which is partially derived from your system's Media Access Control (MAC) address. If you change your system's MAC address by performing operations such as changing networking hardware, you must obtain a new license based on the new MAC address.

## SabreTooth GV I/O license process

The **GVIO-SVR-SW** license is required for each GV I/O Live Ingest and Playout Server device.

The **GVIO-SVR-ISCSI** license is required for GV I/O Live Ingest and Playout Server with iSCSI or LAN Connect media connection.

The **GVIO-SVR-SDI** license is required for GV I/O Live Ingest and Playout Server to record and playout via SDI channels. One license is required for each channel.

The **GVIO-SVR-IP** license is required for GV I/O Live Ingest and Playout Server to record via IP channels and playout via SMPTE 2110 channels. One license is required for each channel.

The **GVIO-SVR-WEB** license is required for GV I/O Live Ingest and Playout Server to record via Web Stream channels. One license is required for each channel.

The **GVIO-UHD-CH** license is required for GV I/O Live Ingest and Playout Server to record and playback assets up to 2160p support via SMPTE 2110 channels only. One license is required for each channel. Only up to 2 ingest channels and 1 playout channel are supported for UHD workflow per each GV I/O device.

The **GVIO-1080P-CH** license is not required for UHD systems of GV I/O Live Ingest and Playout Server as the feature is included with the UHD license. For other GV I/O systems, this license is required to record and playback of 1080p assets. The **GVIO-SVR-SDI** license or the **GVIO-SVR-IP** license is a prerequisite to installing this license. One 1080p license is required for each channel, and only 2 instances of this license is supported per each GV I/O device.

**NOTE:** *When using 1080p channels, a maximum of 2 channels is recommended in your system.*

The **GVIO-SW-OPT-HDR** license is required for GV I/O Live Ingest and Playout Server to record, playback, and transfer 1080p or 2160p assets with HDR metadata. The HDR software option is only supported for 1080p and UHD work flows via SMPTE 2110 channels in each GV I/O device.

If you received your system pre-configured from Grass Valley, licenses are already installed, so you can skip these tasks. Otherwise, do the following:

1. Refer to the license sheet that you received with your GV I/O license. The license sheet has the Sales Order number that you need.
2. On each GV I/O device, run the SabreTooth License Manager, generate a unique ID, and send the email to Grass Valley requesting your license or licenses.
3. When you receive your license file, use the SabreTooth License Manager and install it on the GV I/O Live Ingest and Playout Server.
4. Reboot each GV I/O Live Ingest and Playout Server device after installing the license.

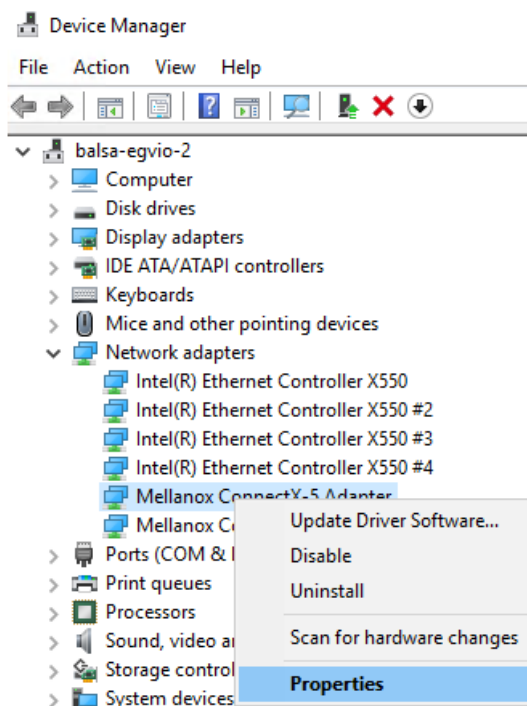
### Licensing the Mellanox ConnectX-5 card

- This is applicable to GV I/O Live Ingest and Playout Server with the IP option only.

This procedure is not required if you received your GV I/O server from the factory.

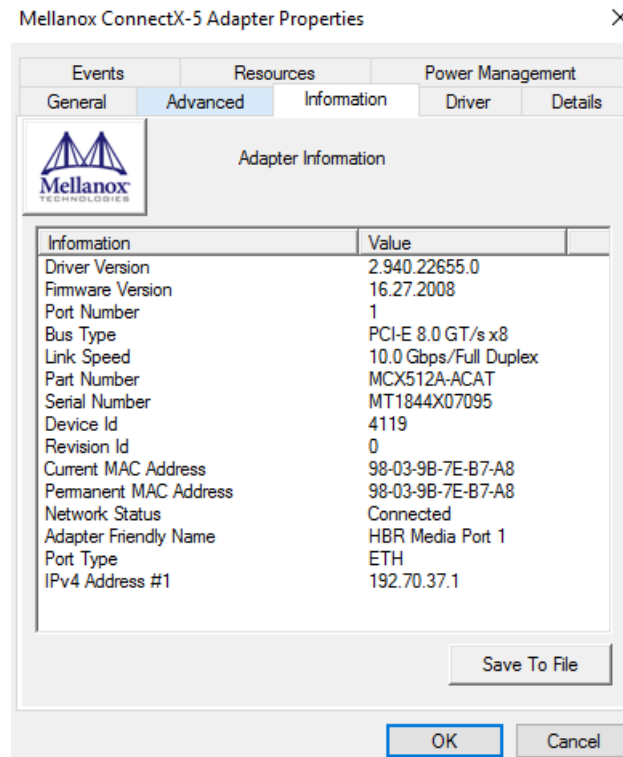
However, proceed with the procedure below if there is a problem with the Mellanox's Rivermax license.

1. On the GV I/O server, launch the Windows Device Manager.
2. On the tree-view, right-click on the **Mellanox ConnectX-5 Adapter** and select **Properties**.



The Mellanox ConnectX-5 Adapter Properties window opens.

- On the Properties window, select the Information tab.



- Copy the Serial Number of the Adapter.

You can also click the **Save to File** button to save the information to a file and access it later.

- Obtain both files below from the GV FTP site - <ftp://ftp.grassvalley.com/Networking/Mellanox/>

- **rivermax.lic**
- **grass\_valley\_rX.txt**

**NOTE:** These files are updated from time to time and the “rX” portion of the file name will be incremented to show a new revision number with each update.

- Open and view the content of the **grass\_valley\_rX.txt** file to determine if the serial number of the adapter in your GV I/O appears in the **grass\_valley\_rX.txt** file.

You can paste the copied Serial Number on a Search dialog to find the match.

**NOTE:** If the serial number does not appear in the **grass\_valley\_rX.txt** file, please reach out to your Grass Valley support personnel to discuss obtaining a license for the GV I/O Live Ingest and Playout Server.

If the serial number is present in the **grass\_valley\_rX.txt** file, proceed to the next step.

- Check that the **c:\license** directory exists on the GV I/O unit.

If the directory does not exist, create the directory.

- Copy the **rivermax.lic** file from the FTP site to **c:\license\rivermax.lic** on the GV I/O unit.
- Reboot the GV I/O unit to make sure that the software is initialized with the Rivermax license in place.



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# Configuring the GV I/O Live Ingest and Playout Server

The GV I/O Live Ingest and Playout Server supports a web-based configuration utility that can be accessed on each GV I/O device. The web configuration utility is required to configure GV I/O devices for UHD, HDR, and NMOS workflows. For other existing workflows, you can still use GV STRATUS Control Panel to configure the GV I/O server and its channels for broadcast operations.

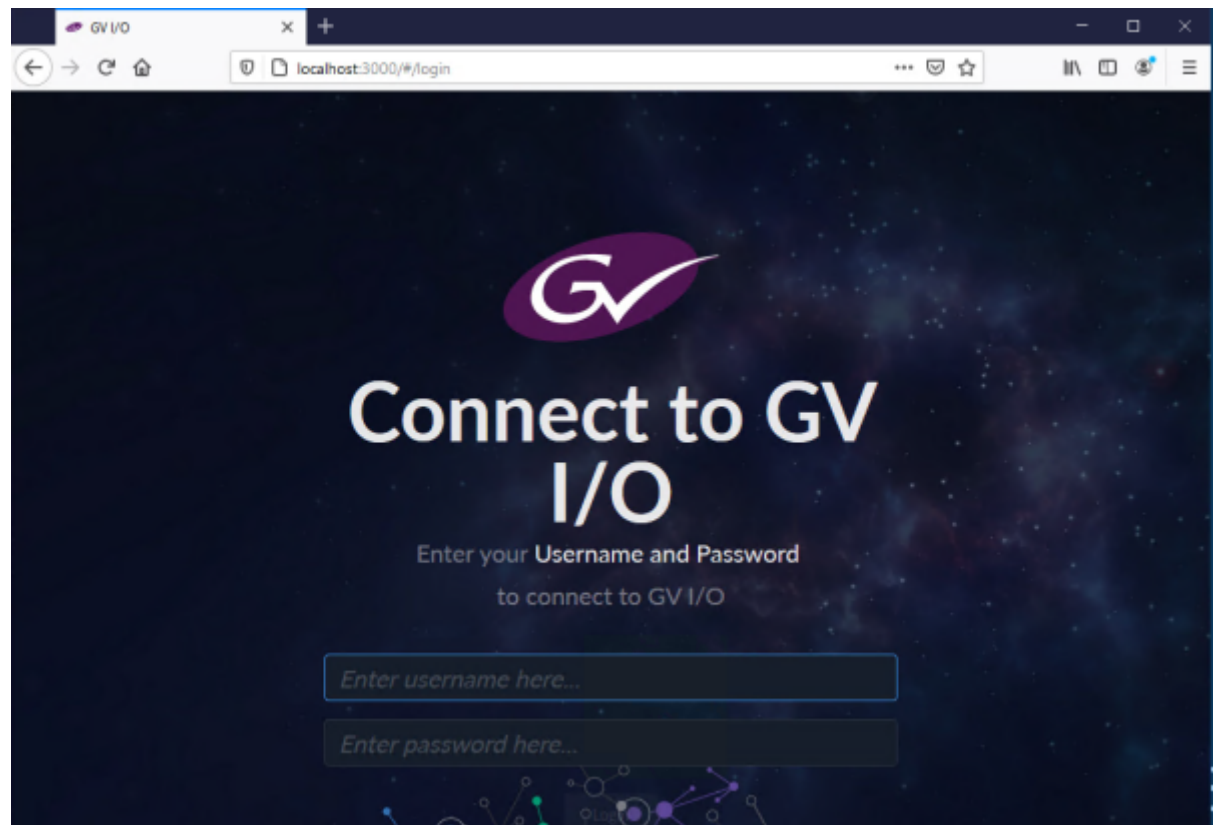
## Logging on to the GV I/O web configuration utility

You can open the GV I/O web configuration utility in a supported web browser, such as Google Chrome or Mozilla Firefox, using the following web address template:

**http://<gvio\_server\_name>:3000/#/login**

1. On the GV I/O Live Ingest and Playout Server, launch your web browser and enter the web address as above.

A Login dialog displays.



2. Enter your username.

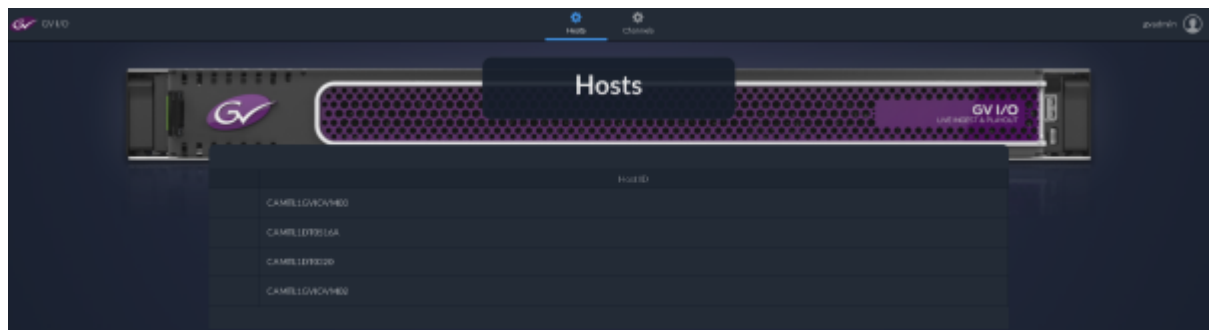
If you use domain credentials, enter in format <domain>\<username>. For example, if your domain is "gv" and your username is "GVuser", enter gv\GVuser.

3. Enter your password.



4. Click **Login**.

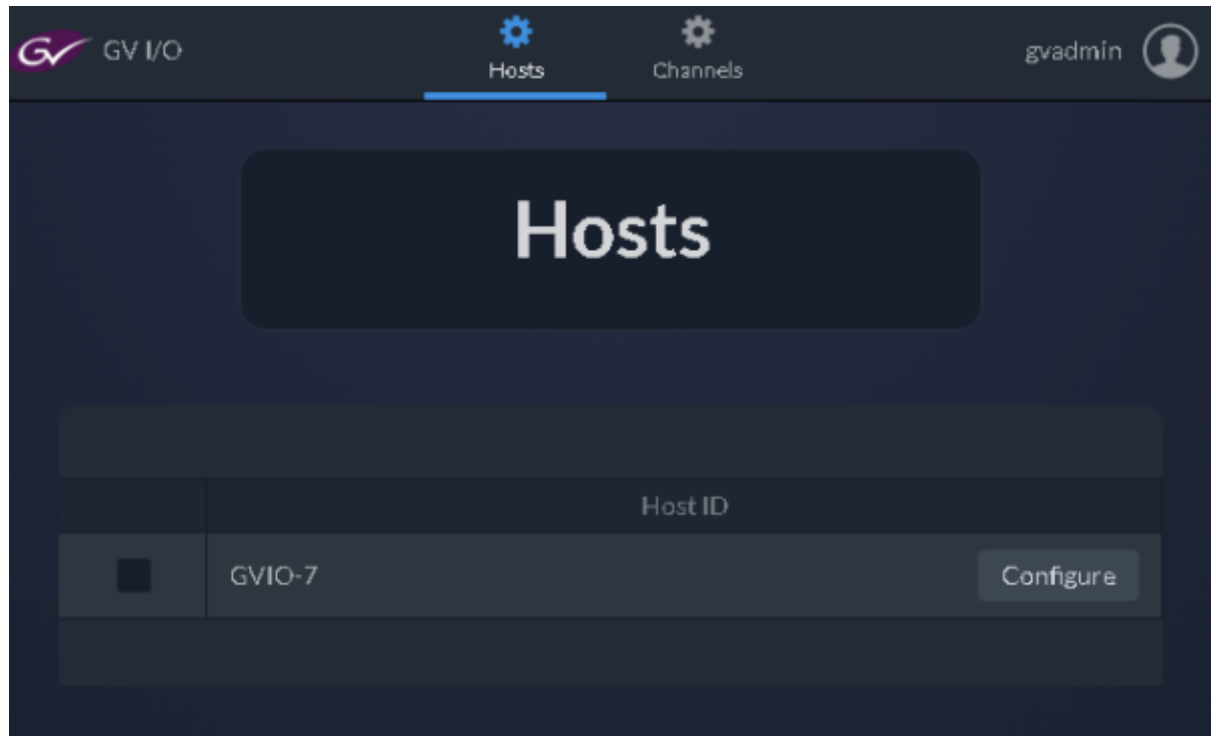
The GV I/O web configuration utility opens with the display of the **Hosts** tab.



## Configuring a GV I/O Host

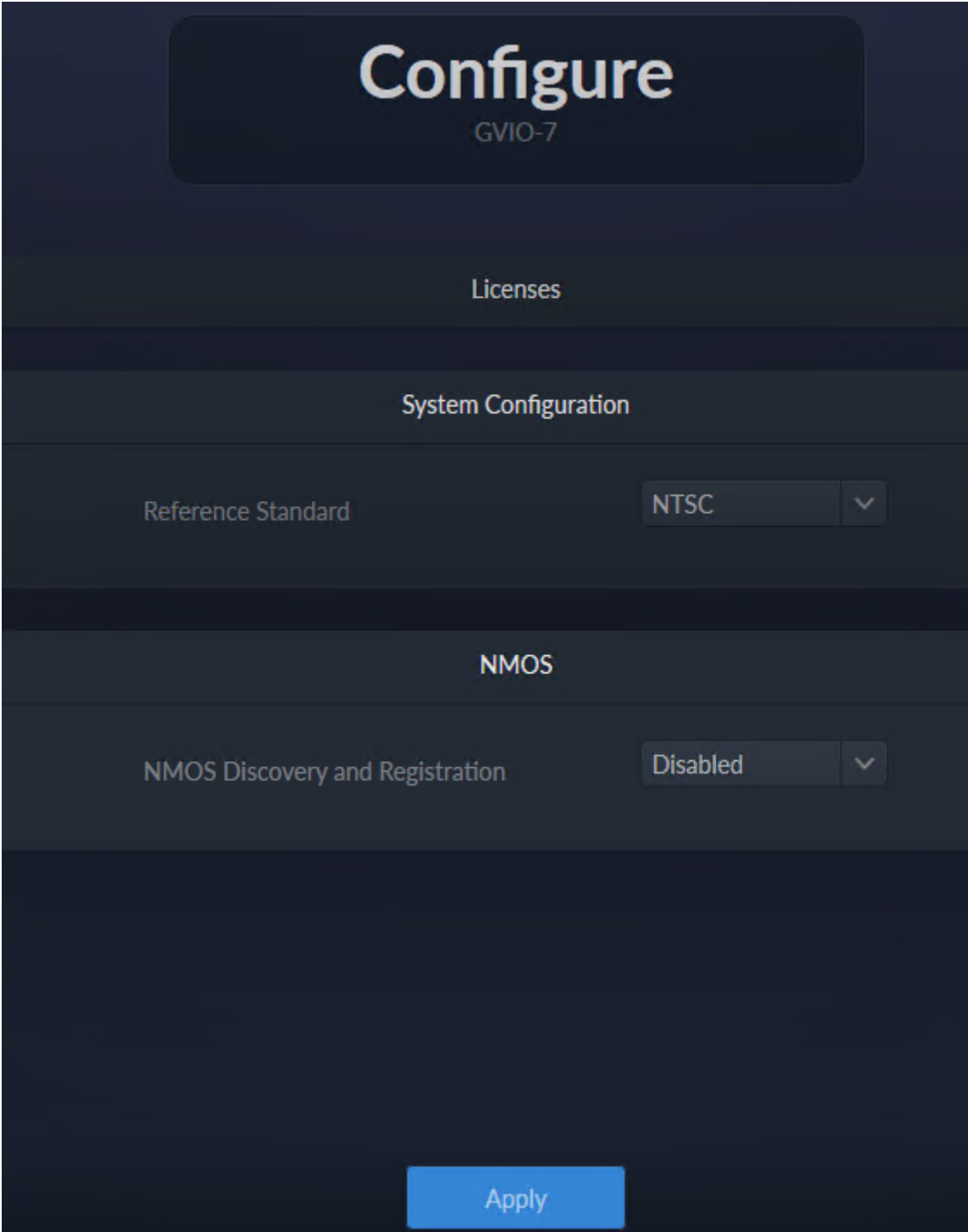
You must install GV I/O licenses before starting the configuration.

1. On the **Hosts** tab, select the specific GV I/O host that you want to configure.



2. Click the **Configure** button.

The configuration page displays.



The screenshot shows a web interface for configuring the GVIO-7 server. The page has a dark theme. At the top, there is a large, rounded rectangle with the word "Configure" in a large, light-colored font, and "GVIO-7" in a smaller font below it. Below this, the page is divided into several sections. The first section is labeled "Licenses". The second section is labeled "System Configuration". Under "System Configuration", there is a row with the label "Reference Standard" on the left and a dropdown menu on the right showing "NTSC" with a downward arrow. Below this, there is a section labeled "NMOS". Under "NMOS", there is a row with the label "NMOS Discovery and Registration" on the left and a dropdown menu on the right showing "Disabled" with a downward arrow. At the bottom of the page, there is a blue button labeled "Apply".

3. For **System Configuration** and **NMOS** settings, click on the drop-down list and select the appropriate option as below:

Setting	Description
Reference Standard	Select the reference standard to be used on the GV I/O device, either <b>NTSC</b> or <b>PAL</b> .
NMOS Discovery and Registration	Select to enable or disable the NMOS (IS-04/05) specification for GV I/O device discovery and registration. The GV I/O must have the <b>GVIO-SVR-IP</b> license to enable the NMOS setting.

4. If NMOS Discovery and Registration setting is enabled and NMOS Registry Selection is set to **Manual**, select other additional setting as follows:

The screenshot shows a dark-themed configuration window titled "NMOS". It contains five rows of settings, each with a label on the left and a control on the right:

- NMOS Discovery and Registration**: A dropdown menu set to "Enabled" with a downward arrow.
- NMOS Registry Selection**: A dropdown menu set to "Manual" with a downward arrow.
- NMOS Registry IP Address**: An empty text input field.
- NMOS Registry Registration Port Number**: A text input field containing "-1".
- NMOS Registry Query Port Number**: A text input field containing "-1".

Setting	Description
NMOS Registry Selection	Select the NMOS Registry selection to be Auto or Manual.  Select <b>Auto</b> for an automatic NMOS Registry discovery.  The <b>Manual</b> selection can be used to manually select an NMOS Registry, overriding the automatic NMOS Registry discovery for the site.
NMOS Registry IP Address	Enter the IP address of the NMOS Registry to be used by the GV I/O unit.
NMOS Registry Registration Port Number	Enter the port number that the NMOS Registry is configured to use for the NMOS IS-04 Registration API.
NMOS Registry Query Port Number	Enter the port number that the NMOS Registry is configured to use for the NMOS IS-04 Query API.

5. To view installed licenses on the GV I/O device, click the **Licenses** panel.  
Details of installed licenses are displayed as below.

Licenses	
Name	Count
GV I/O Server	1
ISCSI Option	1
HDR Option	1
IP Channels	4
Web Channels	4
1080p Channels	2
UHD Channels	2

6. Click **Apply** to save your current settings, or click **Back** to return to the last saved settings.

## Configuring more than one GV I/O Host

You must install GV I/O licenses before starting the configuration.

When working with multiple GV I/O units, each GV I/O unit can be configured by accessing the web configuration utility for each GV I/O unit and logging in to each GV I/O unit one at a time.

Alternatively, there is another method to configure multiple GV I/O units on a LAN via a single log-in to the web configuration utility.

1. Choose a GV I/O unit whose web configuration utility will be used to access the configuration of the other GV I/O units.

2. On the designated GV I/O unit, access the `C:\profile\config\GVIOHosts.txt` file for editing.  
By default, there is a single GV I/O hostname in the file, referencing the local GV I/O hostname. Leave the local GV I/O hostname as the first entry in the file.
3. Add additional GV I/O hostnames to the `GVIOHosts.txt` file, with one hostname per line.

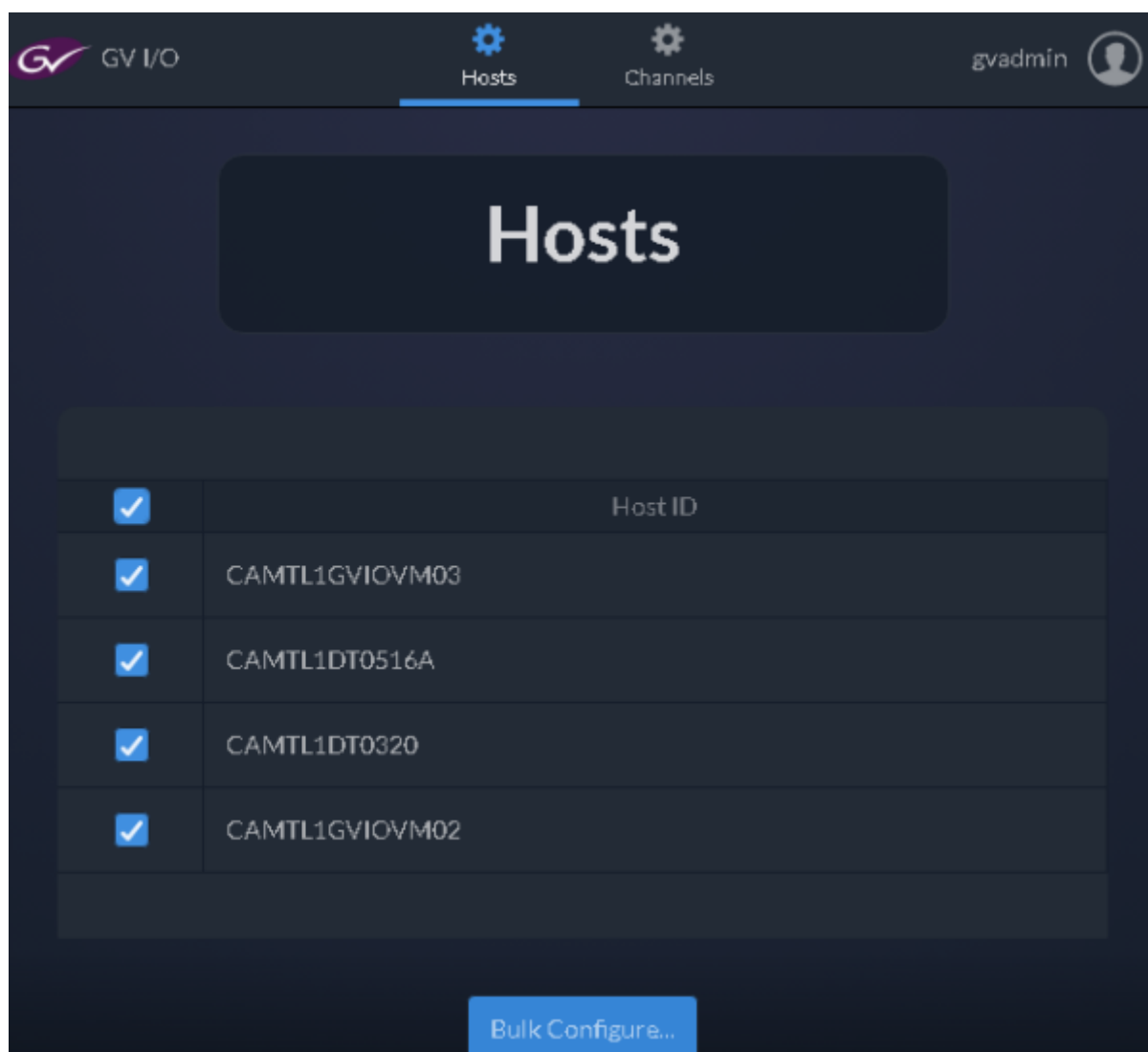
GVIOHosts.txt - Notepad

File Edit Format View Help

BALSA-EGVIO-1  
BALSA-EGVIO-2  
|

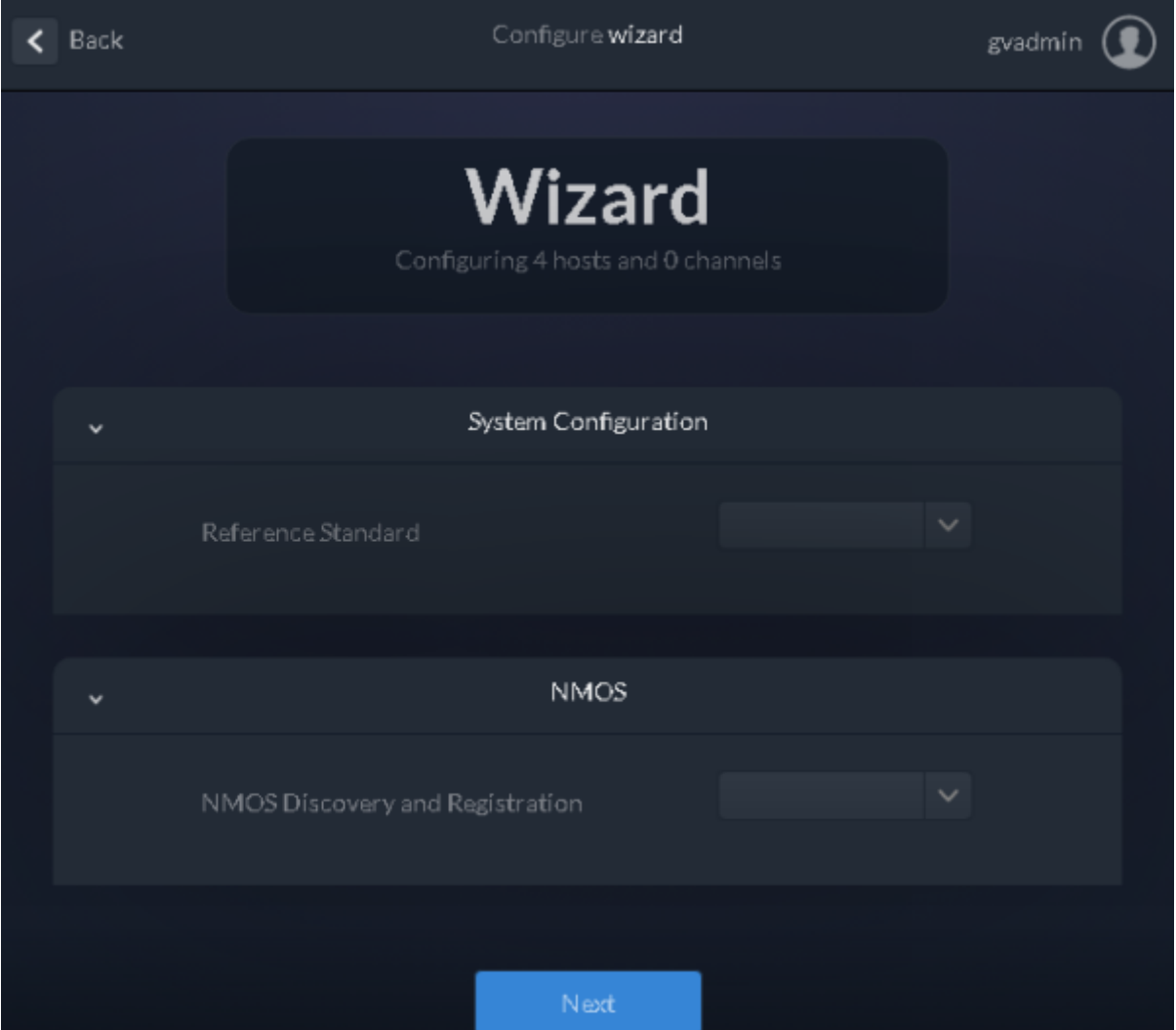
4. Save the `GVIOHosts.txt` file.
5. Reboot the GV I/O unit.
6. Log in to the web configuration utility after the GV I/O unit has been rebooted.

The additional GV I/O units appear on the **Hosts** tab.



7. Select multiple GV I/O units or select the top check-box to select all GV I/Os in the list.
8. Click **Bulk Configure** to configure all selected GV I/O units at a time.

The Configuration Wizard appears.



The screenshot shows the 'Configure wizard' interface. At the top, there is a 'Back' button with a left arrow, the title 'Configure wizard', and a user profile icon labeled 'gadmin'. The main heading is 'Wizard' with the subtitle 'Configuring 4 hosts and 0 channels'. Below this, there are two expandable sections. The first section, 'System Configuration', is expanded and shows a 'Reference Standard' dropdown menu. The second section, 'NMOS', is also expanded and shows an 'NMOS Discovery and Registration' dropdown menu. At the bottom right, there is a blue 'Next' button.

9. Select the **Reference Standard** and **NMOS Discovery and Registration** setting for all the GV I/O units.

10. Click **Next** to continue with the configuration.

The configuration summary appears.

Back Configure wizard gadmin

## Summary

Click Apply to confirm your changes

Hosts 4

CAMTL1GVIOVM03  
CAMTL1DT0516A  
CAMTL1DT0320  
CAMTL1GVIOVM02

Host Settings

Reference Standard	PAL
NMOS Discovery and Registration	Enabled
NMOS Registry Selection	Auto

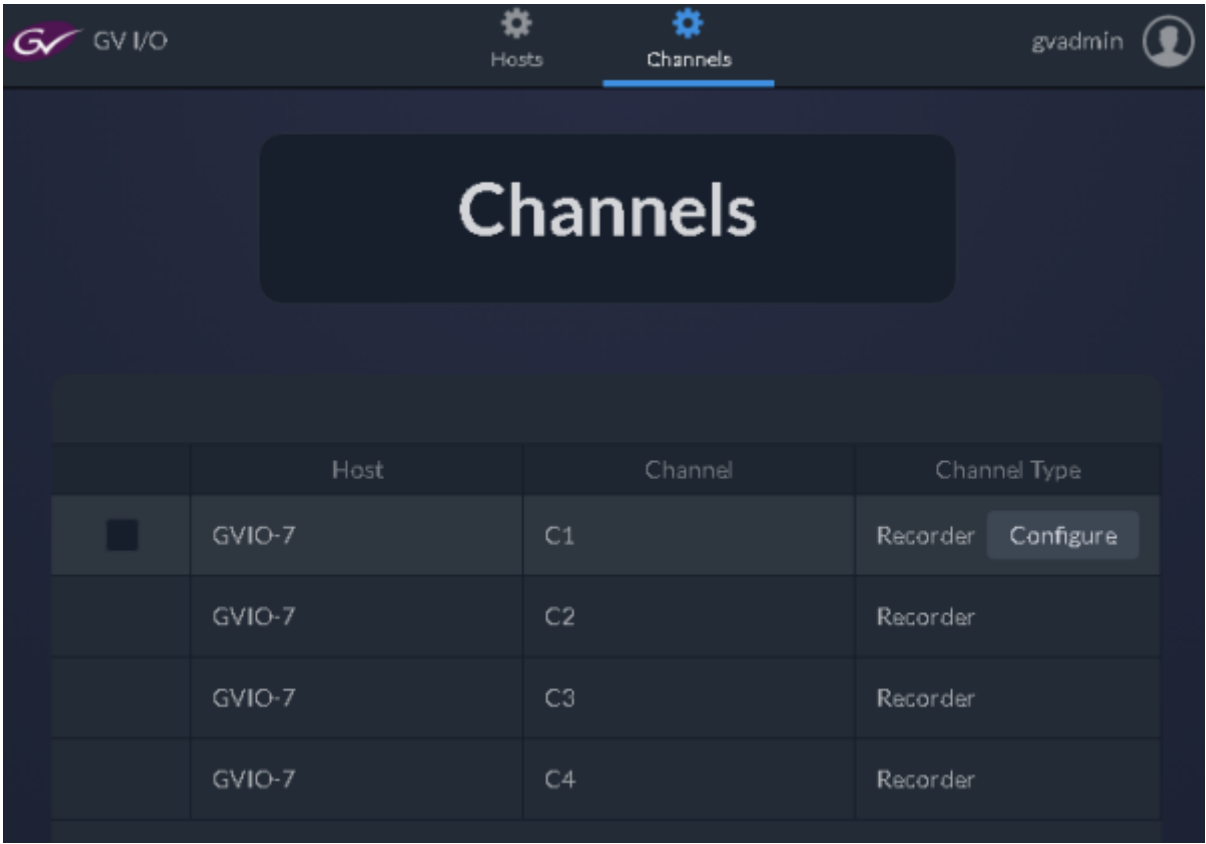
Apply

11. Check the configuration summary and click **Apply** to save your current settings, or click **Back** to return to the last saved settings.

## Configuring a GV I/O Record channel

You must install GV I/O licenses before configuring the channels. UHD, HDR, and NMOS configurations require specific licenses on the GV I/O device.

1. Click on the **Channels** tab, and select the specific GV I/O channel that you want to configure.



2. Click the **Configure** button.

The Channel Configuration page displays.

The screenshot shows a web interface for configuring a channel. At the top, there's a dark blue header with the word 'Configure' in large white letters, and 'GVIO-7:C1' below it. Below the header is a section titled 'Licenses'. The main content area is titled 'Channel Configuration: C1'. It contains a list of configuration items, each with a label and a value, some of which are in dropdown menus.

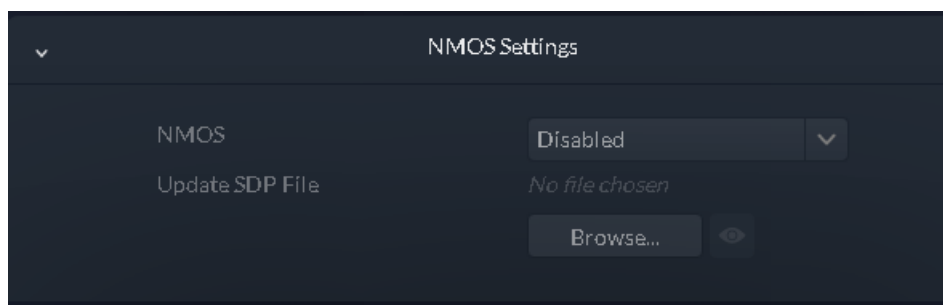
Label	Value
Type	Record
Timecode Mode	Time of Day
Input	SMPTE 2110
Label	
Receiving Interface	192.70.27.17
2022-7 Redundancy	Enabled
2022-7 Receiving Interface	192.70.21.17
Channel Format	1080p
Video Compression Format	Avci
Dynamic Range Type	SDR
Data Rate	100

3. Click on the drop-down list and select the appropriate option for each setting:

Setting or button	Description
Type	Select the Type as <b>Record</b> to configure a GV I/O recorder channel.
Timecode Mode	The timecode mode for the channel can be set at <b>Fixed Format</b> or <b>Time of Day</b> .
Input	<p>Input signal type that has been connected to the channel at the GV I/O Live Ingest and Playout Server. Available input signals are in the list below:</p> <ul style="list-style-type: none"> <li>• <b>Unassigned</b> - The channel input is set to this initial setting by default. No other settings are configurable when this option is selected.</li> </ul> <p><i><b>NOTE: Changing a channel's I/O configuration to Unassigned will set channel configuration information to a default state and release any SabreTooth licenses associated with the channel.</b></i></p> <ul style="list-style-type: none"> <li>• <b>SDI</b> - Configures the channel to use SDI input. Requires the GVIO-HW-CORVID88 hardware configuration and GVIO-SVR-SDI license per channel.</li> <li>• <b>SMPTE 2110</b> - Configures the channel to use 10/25GigE SFP input and allows for SDP file import. Requires the GVIO-HW-CX5 hardware configuration and GVIO-SVR-IP license per channel.</li> <li>• <b>SMPTE 2022-6</b> - Configures the channel to use 10/25GigE SFP input and allows for a single RTP URL entry of the form <code>rtp://ip_address:port_number</code> as described below. <ul style="list-style-type: none"> <li>• <b>ip_address</b> : The multicast IP address of the SMPTE 2022-6 media stream to be recorded</li> <li>• <b>port_number</b> : The UDP port configured for the media stream</li> </ul> <p>For example, “<code>rtp://239.100.100.1:10000</code>”.</p> <p>Requires the GVIO-HW-CX5 hardware configuration and GVIO-SVR-IP license per channel.</p></li> <li>• <b>Web Stream</b> - Configures the channel to use 10GigE RJ45 input and allows for a single RTP URL entry of the form <code>rtp://ip_address:port_number</code> as described below. <ul style="list-style-type: none"> <li>• <b>ip_address</b> : The multicast IP address of the media stream to be recorded</li> <li>• <b>port_number</b> : The UDP port configured for the media stream</li> </ul> <p>For example, “<code>rtp://239.100.100.1:10000</code>”.</p> <p>Requires the GVIO-HW-CX5 hardware configuration and GVIO-SVR-WEB license per channel.</p></li> </ul>
Label	The label that you want to assign to the GV I/O channel.

Setting or button	Description
Receiving Interface	For a channel configured for SMPTE 2110 or SMPTE 2022-6 input signal type, enter the IP address that goes with the SFP connector used to receive the media stream.
2022-7 Redundancy	Select to enable or disable redundancy of ingests. This is only applicable when SMPTE 2110 is selected for the channel Input.
2022-7 Receiving Interface	When the 2022-7 redundancy option is enabled, a 2022-7 Receiving Interface (IP address) is also required, and it represents the IP address of a second GV I/O input as the backup.
Channel Format	Select a format for the channel from the drop-down list. The setting determines the video format expected at the GV I/O channel's input.
Video Compression Format	Select a format for the channel from the drop-down list. This setting also determines the video codec used to compress the video while recording.
Dynamic Range Type	<p>Select a dynamic range type for the channel from the drop-down list. The default is set to <b>SDR</b>, as this is the only available option if you selected SDI, SMPTE 2022-6, or Web Stream for the channel's input.</p> <p>If you selected SMPTE 2110 for the channel's input and already installed the GVIO-SW-OPT-HDR license, you can select either <b>HLG</b> or <b>PQ</b> dynamic range type for the HDR work flow.</p> <p><b>NOTE: HLG or PQ option can only be selected if the channel format is set to 1080p or 2160p.</b></p>
Data Rate	Select a data rate for the channel.

4. If SMPTE 2110 is selected as the channel's input, NMOS settings display as follows:



Setting	Description
NMOS	Select to enable or disable the NMOS option for the channel.
Update SDP File	If NMOS is disabled, click <b>Browse</b> and select the location to import the SDP file from. This is only applicable to SMPTE 2110 option as it requires an import of data from a .sdp file for the GV I/O channel configuration.

5. Configure Automation Settings as follows:

Automation Settings

Protocol

AMP

Setting	Description
Protocol	Select <b>AMP</b> or <b>VDCP</b> protocol for automation control of the channel.

6. Configure Audio Settings as follows:

Audio Settings

Digital Ref Level

-20

Audio Format

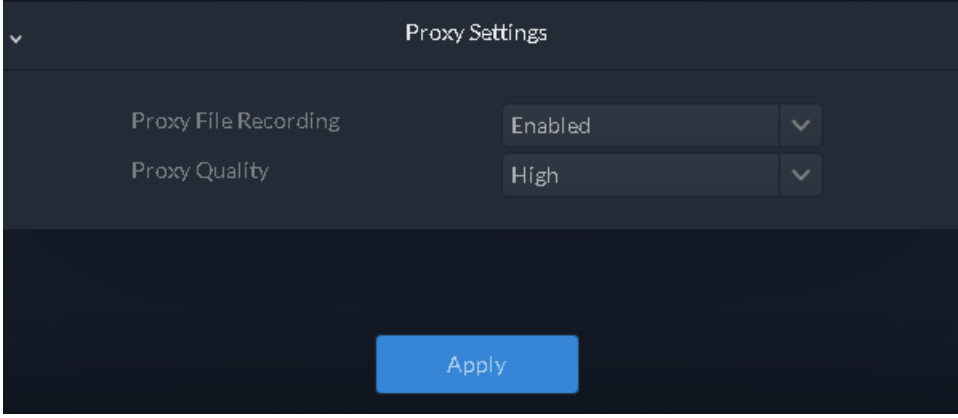
24bit

Tracks to Record

2

Setting	Description
Digital Ref Level	Select the digital reference level for the audio of the channel.
Audio Format	Select the audio format to be either 16bit or 24 bit.
Tracks to Record	Select the number of tracks to record, up to 64 tracks.

7. Configure Proxy Settings as follows:



Proxy Settings

Proxy File Recording: Enabled

Proxy Quality: High

Apply

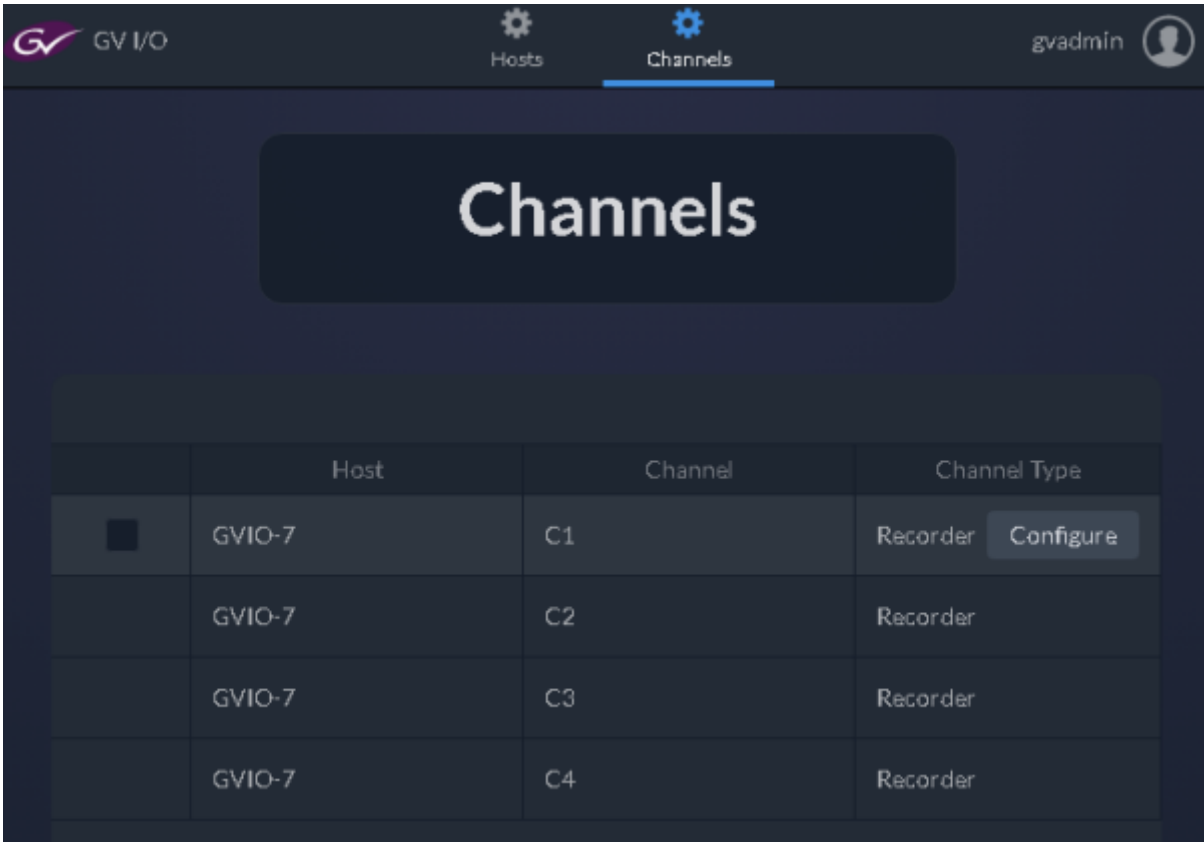
Setting	Description
Proxy File Recording	Select to enable or disable the proxy file recording for the channel.
Proxy Quality	Select the proxy quality to be Low, Medium, or High.

8. Click **Apply** to save your current settings, or click **Back** to return to the last saved settings.

## Configuring a GV I/O Playout SDI channel

You must install GV I/O licenses before configuring the channels. UHD, HDR, and NMOS configurations require specific licenses on the GV I/O device.

1. Click on the **Channels** tab, and select the specific GV I/O channel that you want to configure.



2. Click the **Configure** button.

The Channel Configuration page displays.



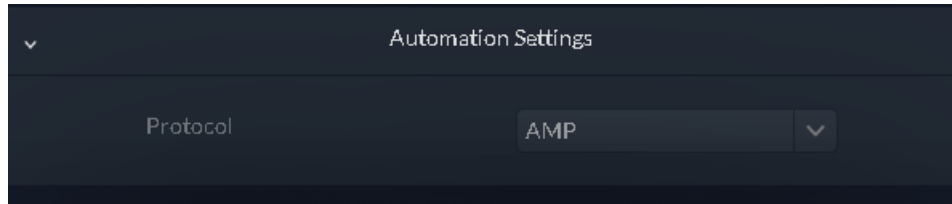
The screenshot shows the 'Channel Configuration: C3' window. It features a list of settings on the left and their corresponding values on the right. The settings include Type (Playout), Output (SDI), Label (empty), Channel Format (1080i), Aspect Ratio (16:9), Aspect Ratio Conversion (Stretch), Dynamic Range Type (SDR), and Loop (Disabled). Below these are three offset settings: LipSync Offset (0), Horizontal Offset (4096), and Vertical Offset (2048), each with a slider and a numeric input field.

Setting	Value
Type	Playout
Output	SDI
Label	
Channel Format	1080i
Aspect Ratio	16:9
Aspect Ratio Conversion	Stretch
Dynamic Range Type	SDR
Loop	Disabled
LipSync Offset	0
Horizontal Offset	4096
Vertical Offset	2048

3. Click on the drop-down list and select the appropriate option for each setting:

Setting or button	Description
Type	Select the Type as <b>Playout</b> to configure a GV I/O playout channel.
Output	<p>Output signal type for the selected channel of the GV I/O Live Ingest and Playout Server. Select the channel output as below:</p> <ul style="list-style-type: none"> <li>• <b>Unassigned</b> - The channel output is set to this initial setting by default. No other settings are configurable when this option is selected.</li> </ul> <p><i><b>NOTE: Changing a channel's I/O configuration to Unassigned will set channel configuration information to a default state and release any SabreTooth licenses associated with the channel.</b></i></p> <ul style="list-style-type: none"> <li>• <b>SDI</b> - Configures the channel to use SDI output. Requires the GVIO-SVR-SDI license per channel and GVIO-HW-CORVID88 hardware configuration.</li> </ul>
Label	The label that you can assign for the GV I/O channel.
Channel Format	Select a format of either SD, 720p, 1080i, 1080p, or 2160p.
Aspect Ratio	Select an available aspect ratio of either 4:3 or 16:9.
Aspect Ratio Conversion	<p>Select an aspect ratio conversion for the playout channel from the list below:</p> <ul style="list-style-type: none"> <li>• Bars</li> <li>• Half Bars</li> <li>• Crop</li> <li>• Stretch</li> </ul>
Dynamic Range Type	Select a dynamic range type for the channel from the drop-down list. The default is set to SDR, as this is the only available option for a SDI channel.
Loop	Select to enable or disable the Loop mode for the Playout channel
LipSync Offset	Move the slider bar between -500ms to +500ms to adjust the lip sync of clip audio relative to the video rendering during playout.
Horizontal Offset	Move the slider bar to adjust the horizontal timing of the SDI signal output relative to the External Sync present at the GV I/O unit.
Vertical Offset	Move the slider bar to adjust the vertical timing of the SDI signal output relative to the External Sync present at the GV I/O unit.

4. Configure Automation Settings as follows:



The image shows a dark-themed interface titled "Automation Settings". Below the title is a label "Protocol" followed by a dropdown menu currently displaying "AMP".

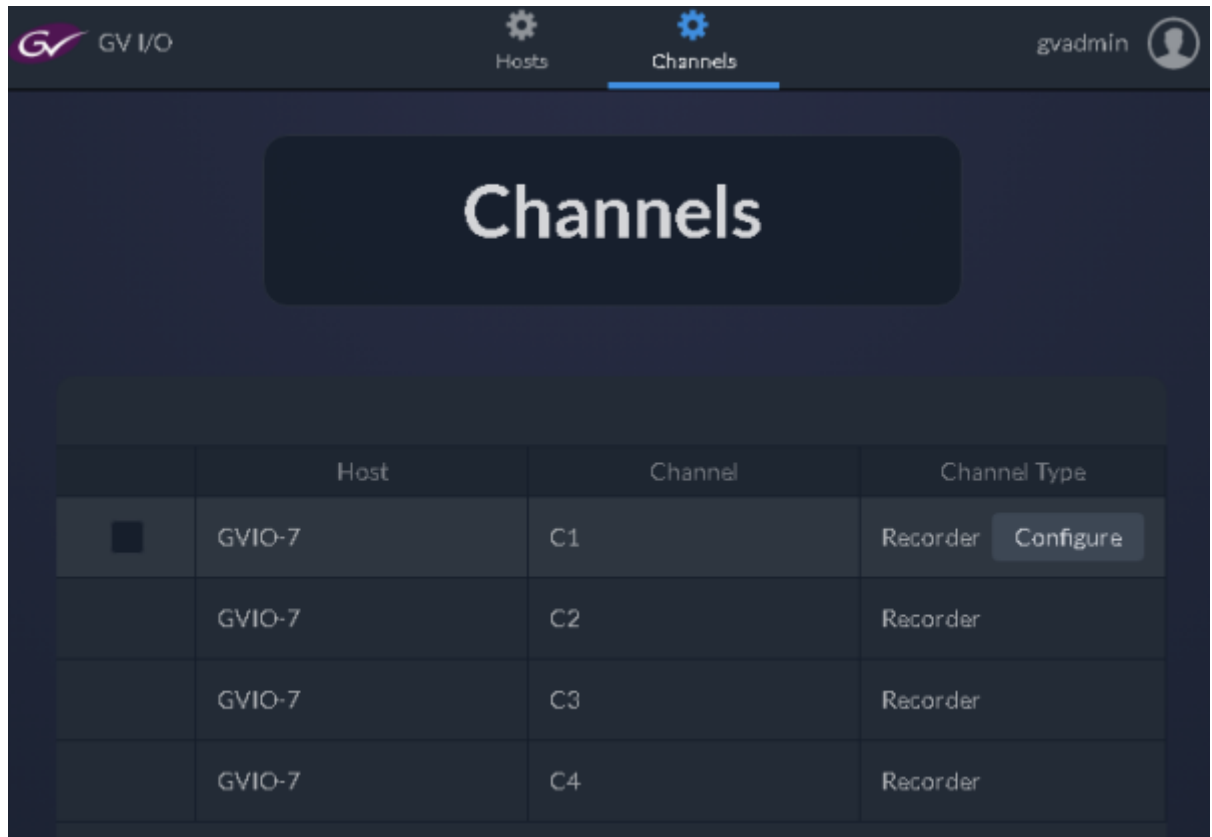
Setting	Description
Protocol	Select <b>AMP</b> or <b>VDCP</b> protocol for automation control of the channel.

5. Click **Apply** to save your current settings, or click **Back** to return to the last saved settings.

## Configuring a GV I/O Playout IP channel

You must install GV I/O licenses before configuring the channels. UHD, HDR, and NMOS configurations require specific licenses on the GV I/O device.

1. Click on the **Channels** tab, and select the specific GV I/O channel that you want to configure.

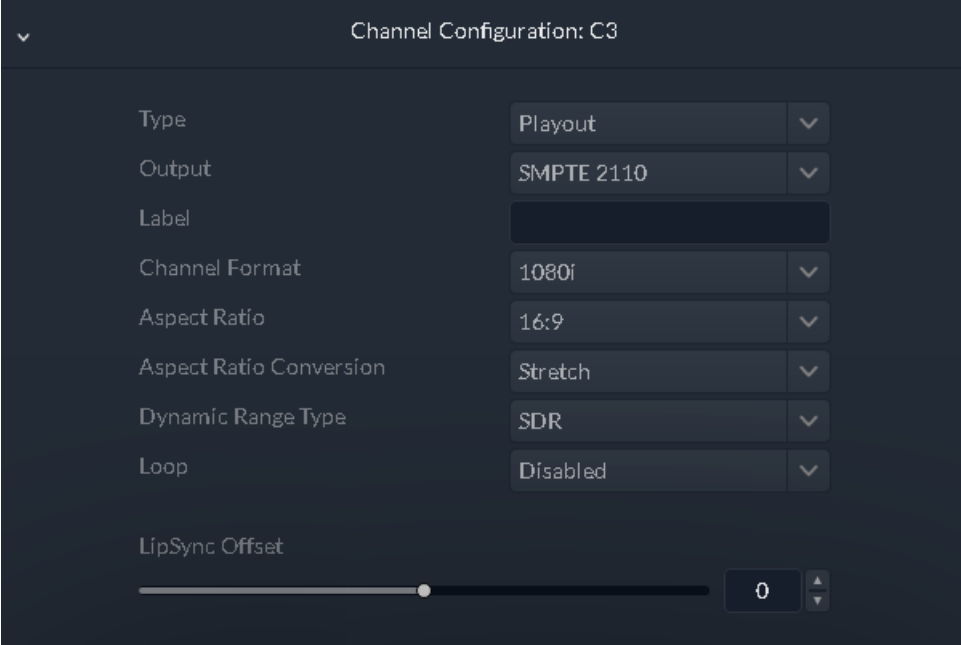


The screenshot shows the GV I/O web interface. At the top, there's a navigation bar with the GV I/O logo, "Hosts" and "Channels" tabs (with "Channels" selected), and a user profile "gadmin". Below the navigation bar is a large "Channels" header. Underneath is a table with columns: Host, Channel, and Channel Type. The first row is highlighted, showing "GVIO-7" as the host, "C1" as the channel, and "Recorder" as the channel type, with a "Configure" button next to it. Below this are three more rows with channels C2, C3, and C4, all also of type "Recorder".

Host	Channel	Channel Type
GVIO-7	C1	Recorder <a href="#">Configure</a>
GVIO-7	C2	Recorder
GVIO-7	C3	Recorder
GVIO-7	C4	Recorder

2. Click the **Configure** button.

The Channel Configuration page displays.



The image shows a 'Channel Configuration: C3' dialog box with a dark theme. It contains several settings, each with a label on the left and a control on the right. The settings are: Type (Playout), Output (SMPTE 2110), Label (empty text field), Channel Format (1080i), Aspect Ratio (16:9), Aspect Ratio Conversion (Stretch), Dynamic Range Type (SDR), and Loop (Disabled). At the bottom, there is a 'LipSync Offset' section with a horizontal slider and a numeric input field set to 0.

Setting	Value
Type	Playout
Output	SMPTE 2110
Label	
Channel Format	1080i
Aspect Ratio	16:9
Aspect Ratio Conversion	Stretch
Dynamic Range Type	SDR
Loop	Disabled
LipSync Offset	0

3. Click on the drop-down list and select the appropriate option for each setting:

Setting or button	Description
Type	Select the Type as <b>Playout</b> to configure a GV I/O playout channel.
Output	<p>Output signal type for the selected channel of the GV I/O Live Ingest and Playout Server. Select the channel output as below:</p> <ul style="list-style-type: none"> <li>• <b>Unassigned</b> - The channel output is set to this initial setting by default. No other settings are configurable when this option is selected.</li> </ul> <p><i><b>NOTE: Changing a channel's I/O configuration to Unassigned will set channel configuration information to a default state and release any SabreTooth licenses associated with the channel.</b></i></p> <ul style="list-style-type: none"> <li>• <b>SMPTE 2110</b> - Configures the channel to use 10/25GigE SFP output. Requires the GVIO-SVR-IP license per channel and GVIO-HW-CX5 hardware configuration.</li> </ul>
Label	The label that you can assign for the GV I/O channel.
Channel Format	Select a format of either SD, 720p, 1080i, 1080p, or 2160p.
Aspect Ratio	Select an available aspect ratio of either 4:3 or 16:9.
Aspect Ratio Conversion	<p>Select an aspect ratio conversion for the playout channel from the list below:</p> <ul style="list-style-type: none"> <li>• Bars</li> <li>• Half Bars</li> <li>• Crop</li> <li>• Stretch</li> </ul>
Dynamic Range Type	<p>Select a dynamic range type for the channel from the drop-down list. The default is set to <b>SDR</b>.</p> <p>When SMPTE 2110 is selected for the channel's output and the GVIO-SW-OPT-HDR license is installed, you can select either <b>HLG</b> or <b>PQ</b> dynamic range type for the HDR work flow.</p> <p><i><b>NOTE: HLG or PQ option can only be selected if the channel format is set to 1080p or 2160p.</b></i></p>
Loop	Select to enable or disable the Loop mode for the Playout channel
LipSync Offset	Move the slider bar between -500ms to +500ms to adjust the lip sync of clip audio relative to the video rendering during playout.

4. If SMPTE 2110 is selected as the channel's Output, NMOS settings display as follows:

▼

NMOS Settings

NMOS

Disabled

▼

Destination

No file chosen

Browse...

👁

Setting	Description
NMOS	Select to enable or disable the NMOS option for the channel.
Destination	Click <b>Browse</b> and select the destination of the UDP file to be uploaded. This is only applicable to SMPTE 2110 option when the NMOS setting is disabled for the GV I/O channel configuration.

5. Configure Automation Settings as follows:

▼

Automation Settings

Protocol

AMP

▼

Setting	Description
Protocol	Select <b>AMP</b> or <b>VDCP</b> protocol for automation control of the channel.

6. Click **Apply** to save your current settings, or click **Back** to return to the last saved settings.

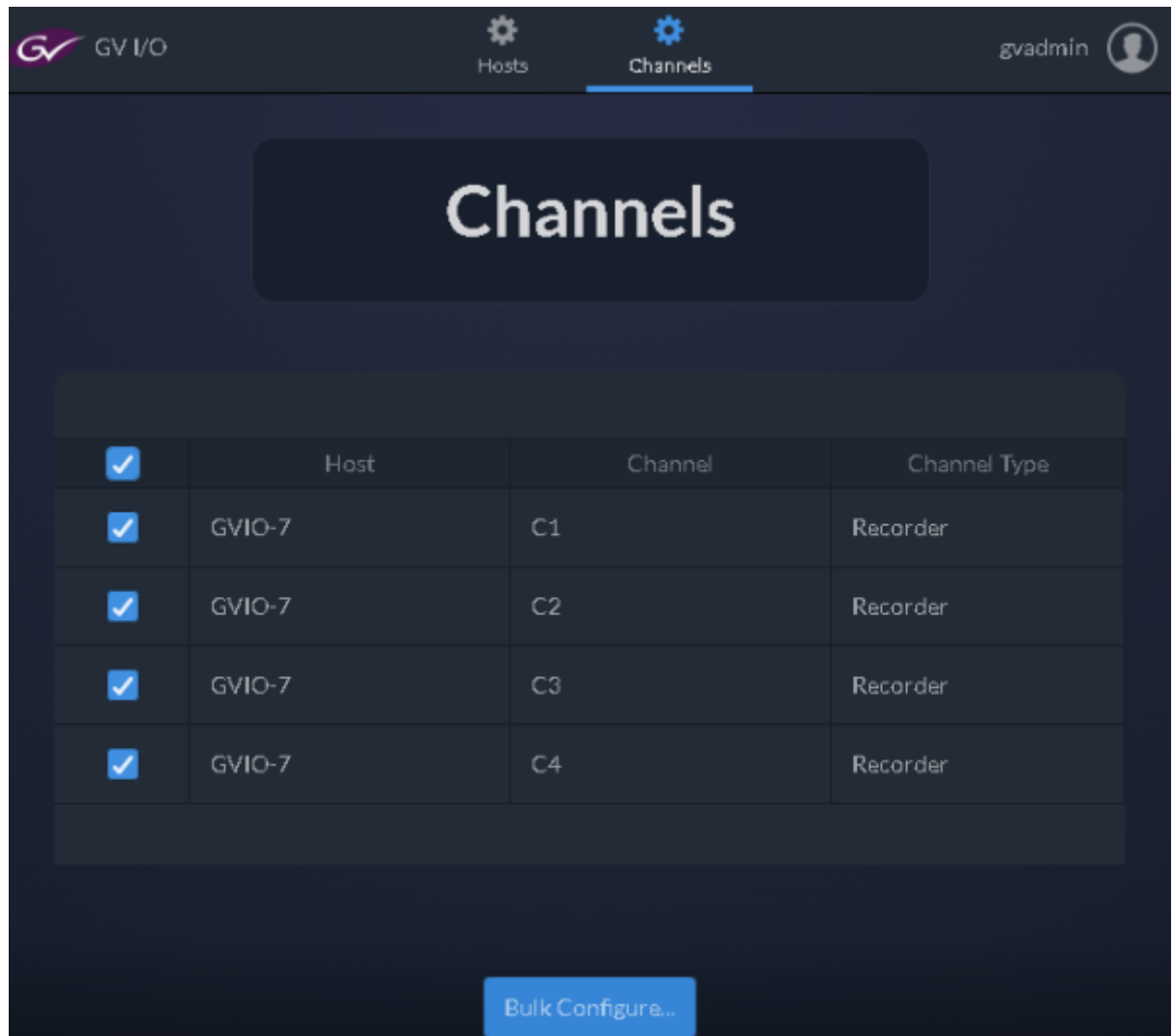
## Configuring multiple GV I/O channels in a single operation

You must install GV I/O licenses before starting the configuration.

To save time during GV I/O channel configuration, you can configure multiple GV I/O channels via a single operation in the web configuration utility.

1. Choose a GV I/O unit whose web configuration utility will be used to access the configuration of the other GV I/O units.
2. On the designated GV I/O unit, log on to the web configuration utility.

3. Go to the **Channels** tab and select multiple GV I/O channels or select the top check-box to select all channels in the list.



4. Click **Bulk Configure** to configure all selected channels at a time.

The Configuration Wizard appears.

The screenshot shows the 'Configure wizard' interface. At the top, there is a 'Back' button and a user profile icon labeled 'gadmin'. The main heading is 'Wizard' with the subtitle 'Configuring 0 hosts and 4 channels'. Below this, there are two expandable sections. The first section, 'Channel Configuration: Cx', contains six rows of configuration options: 'Type', 'Output', 'Label', 'Channel Format', 'Dynamic Range Type', and 'Data Rate'. Each row has a text input field and a dropdown arrow. The second section, 'Automation Settings', contains one row for 'Protocol' with a dropdown menu currently showing 'AMP'. At the bottom of the wizard is a blue 'Next' button.

5. Select the Type to be **Record** or **Playout** channels and continue the configuration as described in the topics below.

- Click **Next** and continue the configuration on the next page.

The screenshot shows the 'Summary' page of a configuration wizard. At the top, there is a 'Back' button and the text 'Configure wizard'. The user 'gadmin' is logged in. The main heading is 'Summary' with a subtext 'Click Apply to confirm your changes'. Below this, there are two expandable sections. The first section, 'Channels', shows 4 channels: GVIO-7:C1, GVIO-7:C2, GVIO-7:C3, and GVIO-7:C4. The second section, 'Channel Settings', shows a table of settings for the selected channel.

Type	Record
Timecode Mode	Time of Day
Input	SDI
Label	
Channel Format	1080i
Video Compression Format	Avci
Dynamic Range Type	SDR
Data Rate	100
Protocol	AMP

An 'Apply' button is located at the bottom right of the 'Channel Settings' section.

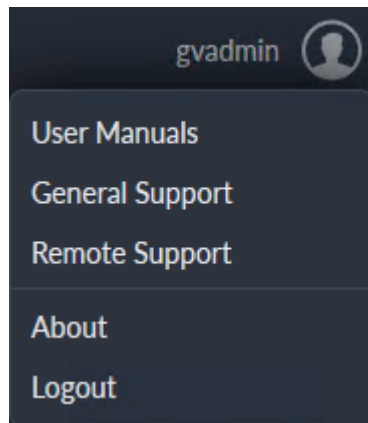
- Check the configuration summary and click **Apply** to save your current settings, or click **Back** to return to the last saved settings.

## Viewing software version number and support information

You can view the GV I/O software version number and support information from the web configuration utility. If necessary, you can also copy the version information and send it to Grass Valley support.

- To access support information do the following:
  - a) On the GV I/O web configuration utility, click the user profile icon on top-right of the page.

A dialog box opens with these options below.



- b) Select one of the options below:

- **User Manuals** - To access online manuals on the Grass Valley website.
- **General Support** - To go to the Grass Valley Support Resources page.
- **Remote Support** - To go to the Grass Valley Remote Support portal.

-

- To access software version information do the following:
  - a) Click **About**.

The GV I/O window appears.



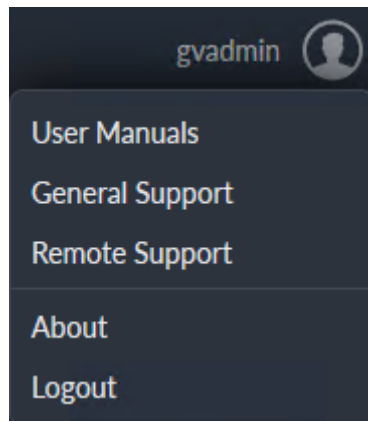
- b) To copy the information, high-light the version number and press **Ctrl + C**.
- c) When finished viewing or copying the information, click **x**.

The window closes.

- d) Paste the copied information into a text file or email, and send it to Grass Valley support.

## Logging off from GV I/O web configuration utility

1. On the GV I/O web configuration utility, click the user profile icon on top-right of the page.  
A dialog box opens with these options below.



2. Click **Logout** to log off from the web configuration utility.  
The window closes and the Login page automatically appears.
3. Enter the user credential if you want to log on as another user.

## Additional notes

The following topics contain additional information about GV I/O configuration via GV STRATUS Control Panel.

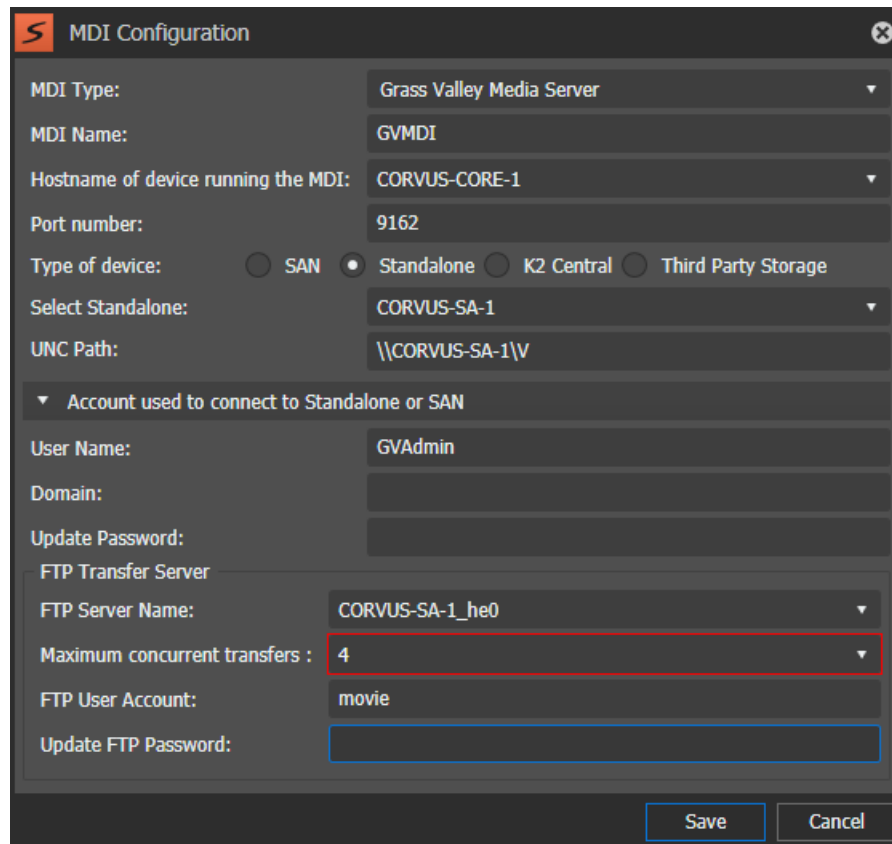
### Grass Valley Media Server MDI standalone settings



These Grass Valley Media Server MDI settings for standalone and/or Grass Valley Media Server MDI settings for SAN are required on all GV STRATUS systems.

This type of MDI manages a GV I/O and K2 Summit system. This topic describes settings when the type of system is specified as Standalone.

To locate these settings, click **Core | MDI Configuration | Add | Grass Valley Media Server**

A screenshot of the 'MDI Configuration' dialog box in the GV STRATUS Control Panel. The dialog has a dark gray background and a title bar with the 'S' logo and 'MDI Configuration' text. It contains several fields and sections: 'MDI Type' is set to 'Grass Valley Media Server'; 'MDI Name' is 'GVMDI'; 'Hostname of device running the MDI' is 'CORVUS-CORE-1'; 'Port number' is '9162'; 'Type of device' has four radio buttons: 'SAN', 'Standalone' (selected), 'K2 Central', and 'Third Party Storage'; 'Select Standalone' is set to 'CORVUS-SA-1'; 'UNC Path' is '\\CORVUS-SA-1\\V'; there is a section 'Account used to connect to Standalone or SAN' with fields for 'User Name' (GVAdmin), 'Domain', and 'Update Password'; an 'FTP Transfer Server' section with 'FTP Server Name' set to 'CORVUS-SA-1\_he0', 'Maximum concurrent transfers' set to '4' (highlighted with a red box), 'FTP User Account' set to 'movie', and an 'Update FTP Password' field. At the bottom right are 'Save' and 'Cancel' buttons.

When you have multiple Grass Valley Media Server MDIs, they must each have their own process port number. For this purpose, numbers 9160 - 9169 increment in the **Port** field.

Setting or button	Description
MDI Type	The Managed Device Interface (MDI) type to which these settings apply.
MDI Name	A name for this instance of the MDI type. Do not use spaces in the MDI name. The MDI name could be renamed later, if desired.  <b>NOTE: After renaming the MDI, you must restart the Render Engine server and its services. Then, reconfigure other settings on the Control Panel (such as Send Destinations, Rules, K2 Central storage, etc.) to use the new Grass Valley Media Server MDI name.</b>
Hostname of device running the MDI	The name of the GV STRATUS server that hosts this MDI.
Port number	The process port for this instance of the MDI type. Each instance must have its own process port. Port numbers must be in range 9160-9169.
Type of device	Specifies either SAN-attached Grass Valley system, Standalone Grass Valley system, K2 Central system, or Third Party Storage system. When Standalone is selected, settings are as follows.
Select Standalone	The standalone Grass Valley system that this MDI accesses.
UNC Path	The UNC path to the standalone GV I/O or K2 Summit system.
User Name	The user name that this MDI uses to access the Grass Valley system. This is the internal system account, which by default is GVAdmin.
Domain	If on a domain, the domain that manages the account that this MDI uses to access the Grass Valley system.  <b>NOTE: Do not enter a domain or otherwise modify account settings except under the supervision of qualified Grass Valley Support personnel. Extensive system configuration is required to achieve a working GV STRATUS system.</b>
Update Password	The password that this MDI uses to access the Grass Valley system.
FTP Server Name	The FTP server name for the remote Grass Valley system. For the typical system where there is a separate FTP network, this is the name of the K2 SAN's FTP server with the _he0 suffix added. The _he0 suffix specifies the FTP network.
Maximum concurrent transfers	The maximum number of concurrent transfers allowed. The maximum is set in K2Config. You may select the maximum or a lesser number as designed for your system. The number of concurrent transfers as well as the device status can be checked once the system is configured in Resource Monitor of the GV STRATUS Control Panel.
FTP User Account	The FTP user name for the Grass Valley system this MDI accesses. Typically this is movie.
Update FTP Password	The FTP password for the Grass Valley system this MDI accesses. When this field is blank the system automatically uses the default password.

If you changed a standalone MDI setting, you must restart the GV STRATUS Core server system and the K2 Summit or GV I/O system. If SAN MDI settings, you must restart the entire K2 SAN system, including K2 Media Servers, attached K2 Summit systems, and other SAN clients. If you are changing multiple Grass Valley Media Server MDI settings, you can make all those settings first before restarting these systems. Restarting the systems once is sufficient for multiple Grass Valley Media Server MDI settings changes.

When adding back a previously deleted MDI, you can re-sync the MDI with all data retained in the GV STRATUS database by doing the following:

- Reuse the same MDI name that was previously deleted
- Reuse the same port number that was used with the deleted MDI

GV I/O Record Channel settings

These settings are optional on GV STRATUS systems, and only applicable to GV I/O record channels. To locate these settings, click **General | Channels | GV I/O** and select a channel type configured to **Record**.

Channel:

iota-clio-1:C3

Channel Type:

Record

Channel Input:

SMPTE 2110

Label:

CLIO1-3

Receiving IP:

192.70.27.191

Enable 2022-7 Redundancy

☒

2022-7 Receiving Interface:

192.168.7.100

Update SDP File:

Z:\11\_POJoe\SDP Files\PSI-GVIO - 1080i - A.sdp

...

Channel Format:

NT\_1080

Audio Tracks:

16

Save

Revert

Setting or button	Description
Channel	The name of the GV I/O channel.
Channel Type	<div>The Channel Type selected is <b>Record</b> for the GV I/O Live Ingest and Playout Server.</div> <div><i><b>NOTE:</b> The GV STRATUS desktop application needs to be restarted after changing a GV I/O channel type from Playout to Record or from Record to Playout in order to see updated configuration options in the Channel Panel tool.</i></div>

Setting or button	Description
Channel Input	<p>Input signal type that has been connected to the channel at the GV I/O Live Ingest and Playout Server. Available input signals are in the list below:</p> <ul style="list-style-type: none"> <li>• <b>Unassigned</b> - The channel input is set to this initial setting by default. No other settings are configurable when this option is selected. <i><b>NOTE: Changing a channel's I/O configuration to Unassigned will set channel configuration information to a default state and release any SabreTooth licenses associated with the channel.</b></i></li> <li>• <b>SDI</b> - Configures the channel to use SDI input. Requires the GVIO-HW-CORVID88 hardware configuration and GVIO-SVR-SDI license per channel.</li> <li>• <b>SMPTE 2110</b> - Configures the channel to use 10/25GigE SFP input and allows for SDP file import. Requires the GVIO-HW-CX5 hardware configuration and GVIO-SVR-IP license per channel.</li> <li>• <b>SMPTE 2022-6</b> - Configures the channel to use 10/25GigE SFP input and allows for a single RTP URL entry of the form <code>rtp://ip_address:port_number</code> as described below. <ul style="list-style-type: none"> <li>• <b>ip_address</b> : The multicast IP address of the SMPTE 2022-6 media stream to be recorded</li> <li>• <b>port_number</b> : The UDP port configured for the media stream</li> </ul> <p>For example, “<code>rtp://239.100.100.1:10000</code>”.</p> <p>Requires the GVIO-HW-CX5 hardware configuration and GVIO-SVR-IP license per channel.</p> </li> <li>• <b>Web Stream</b> - Configures the channel to use 10GigE RJ45 input and allows for a single RTP URL entry of the form <code>rtp://ip_address:port_number</code> as described below. <ul style="list-style-type: none"> <li>• <b>ip_address</b> : The multicast IP address of the media stream to be recorded</li> <li>• <b>port_number</b> : The UDP port configured for the media stream</li> </ul> <p>For example, “<code>rtp://239.100.100.1:10000</code>”.</p> <p>Requires the GVIO-HW-CX5 hardware configuration and GVIO-SVR-WEB license per channel.</p> </li> </ul>
Label	The label of the GV I/O channel.
Receiving IP	For a channel configured for SMPTE 2110 or SMPTE 2022-6 input signal type, enter the IP address that goes with the SFP connector used to receive the media stream.
Enable 2022-7 Redundancy	Select this box to enable redundancy of ingests. This is only applicable when SMPTE 2110 is selected for the Channel Input.
2022-7 Receiving Interface	When the enable 2022-7 redundancy check-box is selected, a 2022-7 Receiving Interface (IP address) is also required, and it represents the IP address of a second GV I/O input as the backup.

Setting or button	Description
Update SDP File	Select the location to import the SDP file from. This is only applicable to SMPTE 2110 option as it requires an import of data from a .sdp file for the GV I/O configuration.  Upon updating the .sdp file and clicking <b>Save</b> , or after clicking another SMPTE 2110 channel, the field becomes blank and does not display the existing SDP file configuration.
IP Stream / Web Stream	Enter the URL in the form of <code>rtp://ip_address:port_number</code> as described for SMPTE 2022-6 or Web Stream in the Channel Input description above.
Channel Format	Select a format for the channel from the drop-down list. Available formats are as configured in Format settings in the GV STRATUS Control Panel. The setting determines the video format expected at the GV I/O channel's input. This setting also determines the video codec used to compress the video while recording.
Audio Tracks	Select the number of audio tracks supported for recordings via the channel. You can select up to 16 audio tracks for each channel.

Click **Save** to save the current settings. If you click **Revert**, the application discards any new settings and reverts to the last saved settings.

## GV I/O Playout Channel settings

These settings are optional on GV STRATUS systems, and only applicable to GV I/O playout channels.

To locate these settings, click **General | Channels | GV I/O** and select a channel type configured to **Playout**.

### GV I/O Playout SDI Channel settings

These settings are optional on GV STRATUS systems, and only applicable to GV I/O playout SDI channels.

Channel: mykul-gvio03:C4

Channel Type: Playout

Channel Output: SDI

Video Format: 720p

Video Aspect Ratio: 16:9

Aspect Ratio Conversion: Bar

Lip Sync Adjustment: -200 ms 0 ms 200 ms 0

Horizontal Timing Offset: 2048 4096 6144 4096

Vertical Timing Offset: 1024 2048 3072 2048

Save Revert

Setting or button	Description
Channel	The name of the GV I/O channel.
Channel Type	<p>The Channel Type selected is <b>Playout</b> for the GV I/O Live Ingest and Playout Server.</p> <p><b>NOTE: The GV STRATUS desktop application needs to be restarted after changing a GV I/O channel type from Playout to Record or from Record to Playout in order to see updated configuration options in the Channel Panel tool.</b></p>
Channel Output	<p>Output signal type for the selected channel of the GV I/O Live Ingest and Playout Server. Select the channel output as below:</p> <ul style="list-style-type: none"> <li><b>Unassigned</b> - The channel output is set to this initial setting by default. No other settings are configurable when this option is selected.</li> </ul> <p><b>NOTE: Changing a channel's I/O configuration to Unassigned will set channel configuration information to a default state and release any SabreTooth licenses associated with the channel.</b></p> <ul style="list-style-type: none"> <li><b>SDI</b> - Configures the channel to use SDI output. Requires the GVIO-SVR-SDI license per channel and GVIO-HW-CORVID88 hardware configuration.</li> </ul>
Video Format	Select a format of 480i (NTSC), 576i (PAL), 720p, or 1080i.
Video Aspect Ratio	<p>Select an available aspect ratio of either 4:3 or 16:9.</p> <p>Only the 16:9 aspect ratio is available if HD video format is selected.</p>

Setting or button	Description
Aspect Ratio Conversion	Select an aspect ratio conversion for the playout channel from the list below: <ul style="list-style-type: none"><li>• Bar</li><li>• Half Bar</li><li>• Crop</li><li>• Stretch</li></ul>
Lip Sync Adjustment	Move the slider bar between -200ms to +200ms to adjust the lip sync of clip audio relative to the video rendering during playout. You can also enter a value manually or click the <b>Revert to Default</b> button to load the default value.
Horizontal Timing Offset	Move the slider bar to adjust the horizontal timing of the SDI signal output relative to the External Sync present at the GV I/O unit. You can also enter a value manually or click the <b>Revert to Default</b> button to load the default value.
Vertical Timing Offset	Move the slider bar to adjust the vertical timing of the SDI signal output relative to the External Sync present at the GV I/O unit. You can also enter a value manually or click the <b>Revert to Default</b> button to load the default value.

Click **Save** to save the current settings. If you click **Revert**, the application discards any new settings and reverts to the last saved settings.

#### GV I/O Playout SMPTE 2110 Channel settings

These settings are optional on GV STRATUS systems, and only applicable to GV I/O playout SMPTE 2110 channels.


Channel:

Channel Type:

Channel Output:

Video Format:

Video Aspect Ratio:

Aspect Ratio Conversion: 

Lip Sync Adjustment:

Enable 2022-7 Redundancy ☒

Sending Interface:

2022-7 Sending Interface:

SMPTE 2110-20 Video Data

Destination IP:  Port:  TTL:  Payload ID:

2022-7 Destination IP:  2022-7 Port:  2022-7 TTL:

SMPTE 2110-40 Ancillary Data

Destination IP:  Port:  TTL:  Payload ID:

2022-7 Destination IP:  2022-7 Port:  2022-7 TTL:

SMPTE 2110-30 Audio Data

Packet Time (µs):

Audio Format:

Audio Track Mapping Mode: ☐ Single Stream (16 tracks) ☒ Dynamic Stream Count (2 tracks each)

Destination IP:  Port:  TTL:  Payload ID:

2022-7 Destination IP:  2022-7 Port:  2022-7 TTL:

Setting or button	Description
Channel	The name of the GV I/O channel.
Channel Type	<p>The Channel Type selected is <b>Playout</b> for the GV I/O Live Ingest and Playout Server.</p> <p><b>NOTE:</b> The GV STRATUS desktop application needs to be restarted after changing a GV I/O channel type from <i>Playout</i> to <i>Record</i> or from <i>Record</i> to <i>Playout</i> in order to see updated configuration options in the Channel Panel tool.</p>

Setting or button	Description
Channel Output	<p>Output signal type for the selected channel of the GV I/O Live Ingest and Playout Server. Select the channel output as below:</p> <ul style="list-style-type: none"> <li><b>Unassigned</b> - The channel output is set to this initial setting by default. No other settings are configurable when this option is selected.</li> </ul> <p><i><b>NOTE: Changing a channel's I/O configuration to Unassigned will set channel configuration information to a default state and release any SabreTooth licenses associated with the channel.</b></i></p> <ul style="list-style-type: none"> <li><b>SMPTE 2110</b> - Configures the channel to use 10/25GigE SFP output. Requires the GVIO-SVR-IP license per channel and GVIO-HW-CX5 hardware configuration.</li> </ul>
Video Format	Select a format of 480i (NTSC), 576i (PAL), 720p, or 1080i.
Video Aspect Ratio	<p>Select an available aspect ratio of either 4:3 or 16:9.</p> <p>Only the 16:9 aspect ratio is available if HD video format is selected.</p>
Aspect Ratio Conversion	<p>Select an aspect ratio conversion for the playout channel from the list below:</p> <ul style="list-style-type: none"> <li>Bar</li> <li>Half Bar</li> <li>Crop</li> <li>Stretch</li> </ul>
Lip Sync Adjustment	Move the slider bar between -200ms to +200ms to adjust the lip sync of clip audio relative to the video rendering during playout. You can also enter a value manually or click the <b>Revert to Default</b> button to load the default value.
Enable 2022-7 Redundancy	<p>Select this box to enable redundancy as a playout backup. This setting is only available when <b>SMPTE 2110</b> is selected for the channel output.</p> <p>When the 2022-7 redundancy check-box is selected, a 2022-7 Sending Interface (IP address) is also required, and it represents the IP address of a second GV I/O output. The 2022-7 Destination IP, 2022-7 Port, and 2022-7 TTL of video, audio, and ancillary data must also be entered to support playout redundancy.</p>
Sending Interface	For a channel configured for SMPTE 2110 output signal type, enter the IP address that goes with the SFP connector used to transmit the media stream.
SMPTE 2110-20 Video Data	<b>SMPTE 2110 Video stream settings</b>
Destination IP	Enter the multicast IP address of the multicast group to send the video_type media stream to.
Port	Enter the port number on the specified multicast IP address for the video stream.

Setting or button	Description
TTL	Enter the Time-To-Live (TTL) value that tells a network router whether or not the video data has been in the network too long and should be discarded.
Payload ID	Enter the payload identification number for the video stream.
SMPTE 2110-40 Ancillary Data	<b>SMPTE 2110 Ancillary data settings</b>
Destination IP	Enter the multicast IP address of the multicast group to send the ancillary_data_type media stream to.
Port	Enter the port number on the specified multicast IP address for the ancillary data stream.
TTL	Enter the Time-To-Live (TTL) value that tells a network router whether or not the ancillary data has been in the network too long and should be discarded.
Payload ID	Enter the payload identification number for the ancillary data stream.
SMPTE 2110-30 Audio Data	<b>SMPTE 2110 Audio stream settings</b>
Packet Time	Select the delay time between 125 to 4000 (micro-seconds) for the audio data.
Audio Format	Set the audio format to <b>L24/48000 Hz</b> .  <i><b>NOTE: Loading a clip to the channel for playout will fail if audio format is set to "L16/48000 Hz".</b></i>
Audio Track Mapping Mode	Select the audio track mapping mode either a single audio stream with 16 tracks, or a dynamic stream of up to 8 audio streams, with 2 tracks each.
Destination IP	Enter the multicast IP address of the multicast group to send the audio_type media stream to.
Port	Enter the port number on the specified multicast IP address for the audio stream.
TTL	Enter the Time-To-Live (TTL) value that tells a network router whether or not the audio data has been in the network too long and should be discarded.
Payload ID	Enter the payload identification number for the audio data stream.
Add Audio Stream	Click the Add Audio Stream button if you want to add more streams of audio data. Then enter the destination IP, port number, and TTL value of the audio stream.

Click **Save** to save the current settings. If you click **Revert**, the application discards any new settings and reverts to the last saved settings.

## Verifying the GV I/O configuration

- Valid signal feed must be connected to the inputs of GV I/O server.
- The required licenses have been added to the GV I/O Live Ingest and Playout Server. For more info, refer to [SabreTooth GV I/O license process](#) on page 35.
- Embedded Security Manager on the GV I/O device had been set to Enabled mode.
- For the GV I/O client of GV AMS Pro - Advanced Media Storage system, the V: drive of the GV I/O had been mapped to the UNC path of the system's hi-res media storage.
- For GV I/O Standalone devices, share the V: drive with "Everyone".
- For GV I/O devices with SD and HD workflows, the configuration can be done via GV STRATUS Control Panel or the GV I/O web configuration utility.
- For GV I/O devices that support UHD, HDR, and NMOS workflows, configuration must only be done via the GV I/O web configuration utility. For more info, refer to [Configuring the GV I/O Live Ingest and Playout Server](#) on page 39.

Within the GV STRATUS system, do the following to verify the GV I/O Live Ingest and Playout Server is configured properly. Grass Valley recommends the GV STRATUS Control Panel is only configured on the Core Server:

- For GV I/O Live Ingest and Playout **Standalone** Servers, do the following:
  - Create a new **Grass Valley Media Server MDI** in the GV STRATUS Control Panel for each GV I/O under MDI Configuration settings, just as you would a K2 Summit Standalone. For more info, refer to [Grass Valley Media Server MDI standalone settings](#) on page 66.
  - Reboot the GV I/O devices and Core Server before continuing.
- For GV I/O Live Ingest and Playout Server with iSCSI or LAN Connect media connection, do the following:
  - Run the iSCSI Initiator on each GV I/O server with iSCSI connection before attempting to configure them in K2Config.
  - Add the GV I/O server(s) as **GV I/O Live Ingest & Playout** devices in K2Config and configure them as you would a K2 Summit client. GV I/O supports either LAN Connect or iSCSI connection.
  - Sync K2Config to the GV STRATUS Core server.

- In the GV STRATUS Control Panel application, do the following:
  - In **Core | MDI Configuration** settings, re-save all Grass Valley Media Server MDIs with GV I/O servers attached.
  - In **Core | Proxy Config | Proxy Settings** tab, re-select check-boxes, resave the proxy settings and verify in **Test Connections** tab that the **STRATUS GV I/O Client** Device Types are connected with the proxy server. This must be done to push proxy settings to the GV I/O.
  - Reboot the GV I/O servers.
  - After the GV I/O servers have finished booting, log in manually to each GV I/O server. You must log in with a user account that has full permissions to the proxy share. If shared storage is used for high resolution media, the user account must also have full permissions to the shared storage location used for high resolution media storage.
  - Then, reboot the GV STRATUS Core server. This sequence is required for the changes to take effect.
  - Verify that you can see the **STRATUS GV I/O Appliance** in the **Core | K2 Storage | K2 Standalone Storage** tab for the GV I/O standalone server.
  - Verify that you can see the **STRATUS GV I/O Client** in the **Core | K2 Storage | K2 SAN Storage** tab for the GV I/O client in K2 Summit SAN or GV AMS Pro - Advanced Media Storage system.
  - Then in **General | Format** tab, add formats according to input/output signal feed, if they are not readily available.
  - In the **General | Channels | GV I/O** tab, verify that the GV I/O channels are displayed. The **Channel Format** should be set according to signal feeds configured to each channel. Change the **Channel Format** setting to match the format of signal feed already connected to the channel.
  - Configure GV I/O channels according to [GV I/O Record Channel settings](#) on page 68 or [GV I/O Playout Channel settings](#) on page 70.
  - To add GV I/O channels to the Scheduler tool: In the **Applications | Ingest | Channel Setup** tab, add one or more **GV I/O Device** channels:
    - **Type of device:** Select either **SAN Client** or **Standalone Client**.
    - **SAN Name:** Choose a SAN with one or more GV I/O devices.
    - **Primary Device:** Select the desired GV I/O device in the drop-down list.
    - **Select Standalone:** Select the standalone GV I/O device in the drop-down list.
    - **Channel Type:** Select **Recorder**.
    - **Client Channel:** Select a channel from the drop-down list.
    - **Router Destination:** Select a router destination, if applicable.
    - **Timecode Format:** Select **Time of Day**.
- In the GV STRATUS application, do the following:
  - In the Scheduler tool, verify that GV I/O channels configured in Ingest settings of the GV STRATUS Control Panel are displayed and able to record.

- To add GV I/O channels to the Channel Panel: In the Navigator panel, expand the Tools node and select Channel Panels. Right-click on the desired Channel Panel and select **Open With | Inspector**.
  - Verify that all configured GV I/O Live Ingest and Playout Servers are displayed.
  - Add one or more channels from a GV I/O Live Ingest and Playout Server.
  - Verify that GV I/O channels have a ... button and you can set the Timecode Source to **Time of Day** or a specific **Start Time** for each GV I/O channel.
  - Verify that you can record on those GV I/O channels.
- To add GV I/O servers to the GV STRATUS Rundown application: In the GV STRATUS Control Panel, go to **Applications | Rundown | Media** tab. Add one or more **GV I/O Device** as the Playout Server(s) and click **Save**.

Then, launch the GV STRATUS Rundown application and go to **Tools | Options | Channel Configuration** tab to add GV I/O channels as playout channels.

Verify that GV I/O channels configured in GV STRATUS Rundown are able to playback assets.

---

# Upgrading GV I/O Live Ingest and Playout Server systems

This section contains the tasks necessary for upgrading to this release of GV I/O software using the SiteConfig application. Work through the tasks sequentially to complete the upgrade.

**NOTE:** *These upgrade instructions assume that current software is at version 3.0. If you have a lower version of software, first follow the upgrade instructions for lower versions of software as appropriate to upgrade to version 3.0. Then upgrade to this release of GV I/O software.*

**⚠ CAUTION:** *If you upgrade a server and then decide you do not want to stay with this version of software, you must use the recovery disk image process to downgrade to your previous version.*

With the installation instructions in this section, you use SiteConfig from a network connected control point PC and remotely install/upgrade software simultaneously on your system devices. This is the recommended process for software installation and upgrades. You must uninstall before installing.

The following installation tasks provide information specifically for the upgrade to this version of software. Read the information in these sections carefully before attempting any upgrade to software.

## Upgrading GV I/O system from version 3.0 to version 4.0

Follow the topics in the section sequentially to perform the upgrade.

### Creating a recovery disk image

Before creating a recovery image, determine the storage location for the image. Grass Valley recommends that you store the recovery image on the Recovery Flash Drive, and this task provides instructions for that location. If you use a different location, such as a network connected drive or another connected USB drive, alter the steps in this task as appropriate.

1. Make sure that media access is stopped and that the system on which you are working is not being used.
2. If you have not already done so, connect keyboard, monitor, and mouse.
3. Do the following:
  - a) Insert the Recovery Flash Drive into the front USB port.
  - b) Restart the machine, or power on if currently shut down.

The machine boots from the Recovery Flash Drive, into a version of Windows stored on the drive.

A MS-DOS command window opens.

- c) Press the **F11** key to enter Boot options.
- d) When prompted with a list of options, select the Acronis option and then press **Enter**.

The Acronis program loads.

4. In the Acronis main window, click **Backup**.  
The Create Backup Wizard opens.
5. On the Welcome page, click **Next**.
6. On the Partitions Selection page, do the following:
  - a) Select the **(C:)** and the **(D:)** partitions and then click **Next**.
7. On the Backup Archive Location page, do the following:
  - a) In the tree view select the Recovery Flash Drive and enter the name of the image file you are creating.  
  
As an alternative, you can also save the backup into the **Backup (E:)** partition.  
  
Create the file name using the machine hostname and the date. Name the file with the .tib extension.  
  
For example, if the hostname is MySystem1, in the File name field you enter  
`E:\MySystem1_20180327.tib`.
  - b) Click **Next**.
8. On the Select Backup Mode page, select **Create a new full backup archive** and then click **Next**.
9. On the Backup Options page, do not change any settings. Click **Next**.
10. On the Archive Comment page, if desired, enter image comments such as the date, time, and software versions contained in the image you are creating. Click **Next**.
11. On the "...ready to proceed..." page, do the following:
  - a) Verify that you are creating images from the C: and D: partitions and writing to the E: partition or an USB drive, then click **Proceed**.
12. On the Operation Progress page, observe the progress report.
13. When a message appears indicating a successful backup, click **OK**.
14. Click **Operations | Exit** to exit the Acronis True Image program.  
The machine restarts automatically.
15. Remove the recovery media while the machine is shutting down.

## Prepare for upgrade via SiteConfig

Before upgrading, do the following:

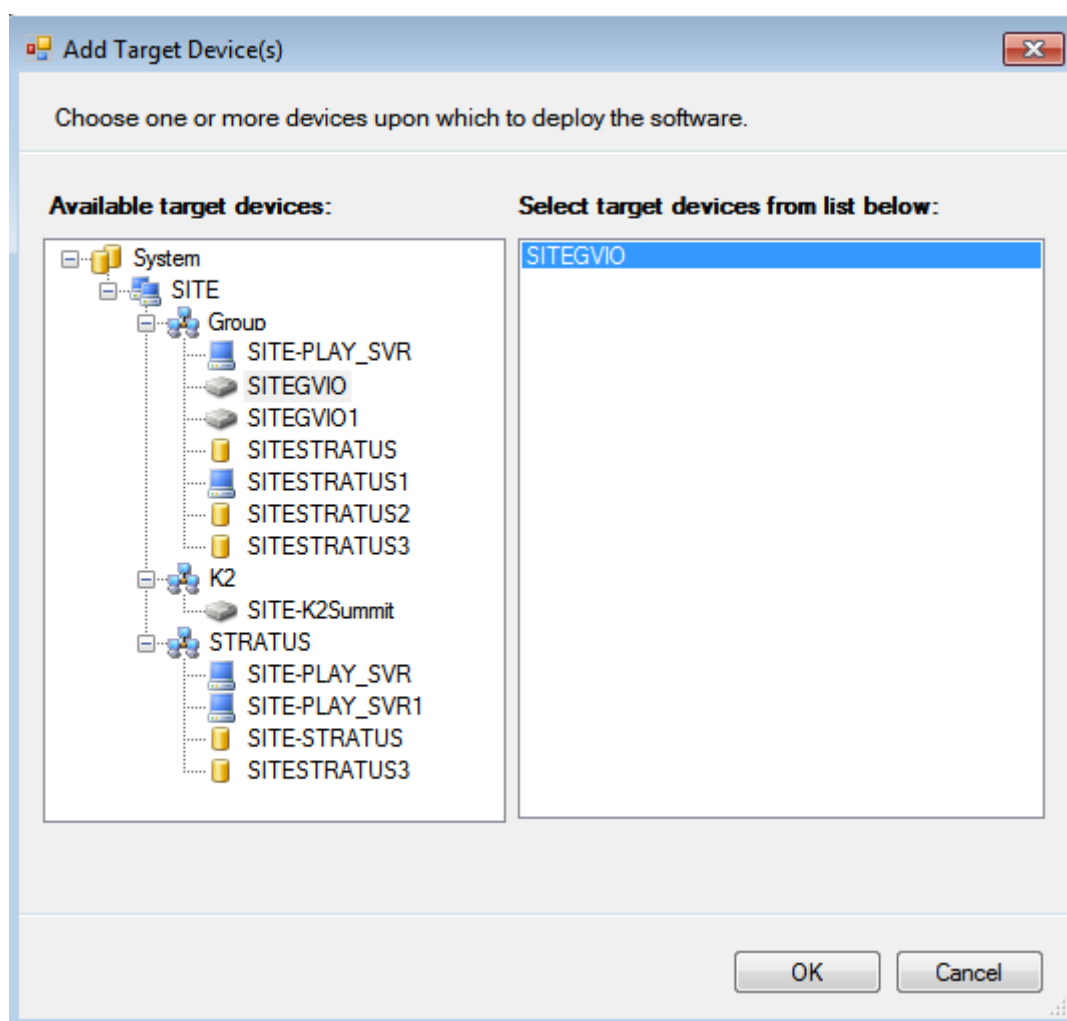
- All GV I/O systems must be configured according to these latest cabling instructions.
  - [Cabling GV I/O server: SDI option](#) on page 17
  - [Cabling GV I/O server: IP option](#) on page 18
- Connect the Control and FTP/SMB network cables to RJ45 10G network ports.
- Procure the software installation files for this release via the appropriate distribution method, such as download, network drive, or removable media drive.
- Install the latest SiteConfig application and Discovery Agent.
- Install all Important Windows updates.
- Using the Windows Programs and Features Control Panel, uninstall the Java JDK software from Oracle.
- Stop all media access on the GV I/O devices you are upgrading.

- Shut down all applications on the GV I/O devices you are upgrading.
- Reboot the GV I/O device and access the BIOS settings to change **Node Interleaving = Disabled** in the Memory Settings section.
- Open the Embedded Security Manager and set the GV I/O device into **Update mode**.

## Configuring deployment groups

- The GV I/O device must be assigned in the SiteConfig system description and network connectivity must be present.
1. Open the SiteConfig application.
  2. In the **Software Deployment | Deployment Groups** tree view, right-click the top node and select **Add Deployment Group**.  
A deployment group appears in the tree view.
  3. Right-click the deployment group, select **Rename**, and enter a name for the deployment group.
  4. Right-click the deployment group and select **Add Target Device**.

The Add Target Device(s) wizard opens.



5. In the Available Target Devices tree view, select the node that displays the devices that you are combining as a deployment group.
6. In the right-hand pane, select the GV I/O devices that you are combining as a deployment group. To select multiple devices, you can drag through the devices, use Ctrl + Click, or use Shift + Click.
7. Click **OK**.

The devices appear in the Deployment Groups tree view under the deployment group. Before you perform a software deployment, you must check software on the devices that will be receiving new software. If you have already added packages to the group, on the Deployment Groups tab you will also see deployment tasks generated for every device with roles that match the package contents.

### Add software package to deployment group for GV I/O devices

- The GV I/O devices to which you are deploying software must have their SiteConfig roles correctly configured.
- The GV I/O devices to which you are deploying software must be in a deployment group.
- The following software upgrade system cab files apply to GV I/O devices, if already added as a standalone device or a shared storage client with K2 Summit SAN or GV AMS Pro - Advanced Media Storage system.
  - `GrassValley_GVIO_X.X.X.XXX.cab`

Refer to release notes for version information.

1. In the **Software Deployment | Deployment Groups** tree view, select a deployment group.
2. Click the **Add** button.

The Add Package(s) dialog box opens.
3. Do one of the following to select the software package:
  - Select from the list of packages then click **OK**.
  - Click **Browse**, browse to and select the package, then click **Open**.
4. If one or more EULAs are displayed, accept them to proceed. If you do not accept a EULA, the associated software is not assigned to the deployment group.

SiteConfig adds the package to the deployment group.

The package appears in the Managed Packages list for the selected deployment group. SiteConfig creates new software deployment tasks for the package and displays them in the Tasks list view.

### Upgrade software with SiteConfig

- The devices that you are upgrading must be in a deployment group.
- For the software you are upgrading, a newer version of that managed software package must be added to the deployment group.
- A SiteConfig "Check Software" operation must be performed on the devices you are upgrading.

- If the Embedded Security Manager shows Uninstall/Install tasks after adding systemcabs to the deployment group(s), then put the associated GV I/O servers into **Update mode** in order to allow the upgrade to occur.

If you are upgrading multiple software components for which there is a required sequence, you must check and uncheck tasks and run multiple deployment sessions to control the sequence. For some software components, SiteConfig aids you by enforcing dependencies. For each individual software component, SiteConfig enforces an uninstall of the current version of software before installing the upgrade version. SiteConfig provides uninstall deployment tasks and install deployment tasks to indicate the taskflow. SiteConfig can do the uninstall/install in a single deployment session.

1. In the **Software Deployment | Deployment Groups** tree view, select the device or the group of devices to which you are deploying software.  
The corresponding software deployment tasks are displayed in the Tasks list view.
2. For the software you are deploying, verify that the desired Uninstall/Install tasks are all checked in the Deploy column.

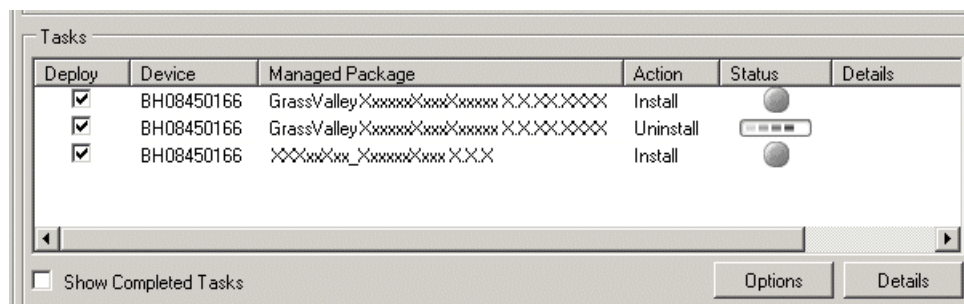
If a WRegMon install task appears, install it as well. It is required to support Grass Valley software installers. There is no uninstall task.

3. Check the area next to the Start Deployment button for a message.



If a message instructs you to upgrade the Discovery Agent, on the control point PC go to the directory to which SiteConfig is installed, find the *DiscoveryAgent\_x.x.x.x.cab* file, add it to the deployment group, and deploy the Discovery Agent software as well.

4. Click the **Start Deployment** button.



Deployment tasks run and software is uninstalled. Progress is reported and next steps are indicated in both the Status and Details columns. If an error appears regarding prerequisite software, install the Grass Valley Prerequisite Files on the control point PC and then repeat this step.

SiteConfig uninstalls/install software in the proper sequence.

5. When the Status or Details columns indicate next steps, identify the software in the row, then do one of the following:
  - If Details displays a **Restart required** link (but not "Visible dialog pending..."), click the link and when prompted "...are you sure...", click **Yes**.
  - If Details does not display any indication of additional steps required, proceed with the next step in this task.
6. Monitor progress as indicated by both the Status and Details column. When finished, the Status column indicates complete.

### Install software manually for GV I/O with SDI option

- Verify that the AJA Corvid 88 card is installed with the desired feeds attached.
- Verify that SDI cabling is done according to these latest cabling instructions:
  - [Cabling GV I/O server: SDI option](#) on page 17
- You have procured the necessary GV I/O software and prerequisite files for the upgrade. Go to [Grass Valley products compatible with GV I/O](#) on page 8 and [Third party products compatible with GV I/O](#) on page 8 to determine the compatible software versions required.

This procedure is not required if you received your GV I/O server from the factory. Otherwise, proceed with the steps below:

1. Obtain **GVIO-Prerequisites-5.x.zip** file from <ftp.grassvalley.com> and unzip to a temporary folder on the GV I/O unit.

This .zip file contains software components that will be used later in the procedure.

2. Stop AppCenter if it is running.
3. Stop the AppService application.
4. Change Embedded Security Manager to Update Mode.
5. Execute the installer for the Zulu Java JDK: **zulu11.41.23-ca-jdk11.0.8-win\_x64.msi**
6. Execute the GV Engine installer: **GVEngineInstaller-x.x.x.xx\_vcxxx.exe**
7. Execute the NVIDIA installer: **452.57-quadro-winserv-2016-2019-64bit-international-whql.exe**
8. Change Embedded Security Manager to Enabled Mode.
9. Reboot the GV I/O unit.

### Install software manually for GV I/O with IP option

- Verify that the Mellanox ConnectX-5 card is installed with the desired feeds attached.
- Verify that Windows Server 2016 Base Image version 20190822-340-2016w or later has been installed. The base image should contain McAfee Solidifier 8.2.1.143 and GV Embedded Security Manager 1.0.0.26 or later versions of these software components.

- You have procured the necessary GV I/O software and prerequisite files for the upgrade. Go to [Grass Valley products compatible with GV I/O](#) on page 8 and [Third party products compatible with GV I/O](#) on page 8 to determine the compatible software versions required.

This procedure is not required if you received your GV I/O server from the factory. Otherwise, proceed with the steps below:

1. Obtain **GVIO-Prerequisites-5.x.zip** file from <ftp.grassvalley.com> and unzip to a temporary folder on the GV I/O unit.

This .zip file contains software components that will be used later in the procedure.

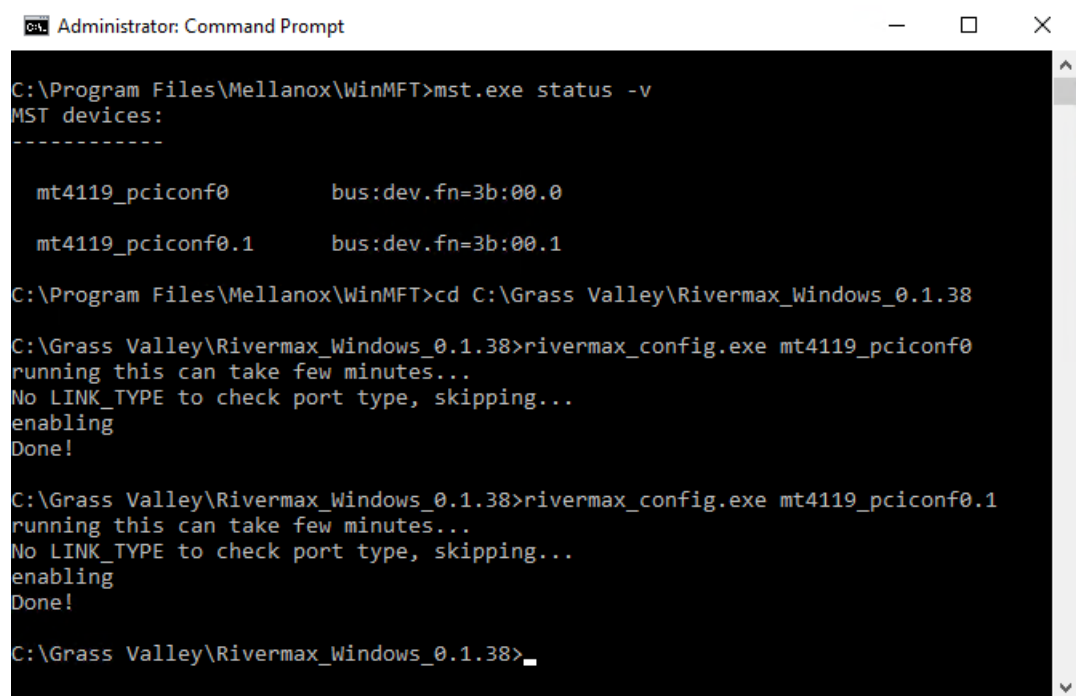
2. Stop AppCenter if it is running.
3. Stop the AppService application.
4. Stop the S2059Client application.
5. Change Embedded Security Manager to Update Mode.
6. Execute the installer for the Zulu Java JDK: **zulu11.41.23-ca-jdk11.0.8-win\_x64.msi**
7. Execute the GV Engine installer: **GVEngineInstaller-x.x.x.xx\_vcxxx.exe**
8. Execute the NVIDIA installer: **452.57-quadro-winserv-2016-2019-64bit-international-whql.exe**
9. Execute S2059 Client installer: **S2059ClientInstaller-1.3.0.33.exe**
10. Execute VyDriver installer: **VyDriver-1.5.0.28.exe**
11. Use the Windows Programs and Features Control Panel to uninstall the MLNX\_WinOF2 component.
12. Use the Windows Programs and Features Control Panel to uninstall the WinMFT64 component.
13. Execute the installer for the new WinMFT64 component for this release:  
**WinMFT\_x64\_4\_14\_2\_17.exe**
14. Execute the installer for the new MLNX\_WinOF2 component for this release:  
**MLNX\_WinOF2\_All\_AIOS\_x64\_release\_2\_940\_22655\_23.exe**

**NOTE:** *If the firmware on the Mellanox ConnectX-5 card is of an older revision, this installation step may include a firmware update that can take up to 30 minutes to complete.*

15. Open a Windows Command Prompt, making sure to choose "Run as administrator".

16. From the command line prompt, execute the command **mst status -v** to identify details of each port for the Mellanox ConnectX-5 card as below:

The output from the command will include port IDs of the form "mt4119\_pciconf0" and "mt4119\_pciconf0.1". You will need to use these IDs in the next steps.



```
Administrator: Command Prompt

C:\Program Files\Mellanox\WinMFT>mst.exe status -v
MST devices:
-----

    mt4119_pciconf0      bus:dev.fn=3b:00.0

    mt4119_pciconf0.1    bus:dev.fn=3b:00.1

C:\Program Files\Mellanox\WinMFT>cd C:\Grass Valley\Rivermax_Windows_0.1.38
C:\Grass Valley\Rivermax_Windows_0.1.38>rivermax_config.exe mt4119_pciconf0
running this can take few minutes...
No LINK_TYPE to check port type, skipping...
enabling
Done!

C:\Grass Valley\Rivermax_Windows_0.1.38>rivermax_config.exe mt4119_pciconf0.1
running this can take few minutes...
No LINK_TYPE to check port type, skipping...
enabling
Done!

C:\Grass Valley\Rivermax_Windows_0.1.38>_
```

17. Execute the rivermax\_config program once for each port ID from the step above.  
For the GV I/O 3.0 release, the executable is named **rivermax\_config-2\_940\_22655\_23.exe**  
An example of executing the command: **rivermax\_config-2\_940\_22655\_23.exe mt4119\_pciconf0**
18. Go to `c:\License` and check whether `rivermax.lic` file exists in the directory.  
If you do not have a rivermax.lic file, then obtain a copy of the rivermax.lic file via instructions at [Licensing the Mellanox ConnectX-5 card](#) on page 36.
19. Run the **NetAdapterConfig\_VersionX.ps1** file for NIC configuration.  
**NOTE: Reinstalling or updating the Mellanox driver will reset the NIC configuration settings, so this script must be executed again after any future driver updates.**
20. Open Network and Sharing Center in the Control Panel, then right-click and select Properties on the first Mellanox ConnectX network port.
21. Disable all protocol and services except **Vy** and **Internet Protocol Version 4 (TCP/IPv4)**.  
**NOTE: VyDriver's configuration for CPU core selection can be left at the default automatic setting.**
22. Go to the second Mellanox ConnectX network port, then disable all protocol and services except **Vy** and **Internet Protocol Version 4 (TCP/IPv4)**.
23. For all non-Mellanox network ports, right-click on Properties and uncheck **Vy** for each network port.

24. Set up and assign IP addresses for the Mellanox network interface controller (NIC).
25. Execute the **WeightNetworkAdapters2345678.ps1** script to optimize the general network adapter configuration for the GV I/O unit.

Please refer to **WeightNetworkAdapters\_README.txt** for details about executing this script.

26. Change Embedded Security Manager to Enabled Mode.
27. Reboot the GV I/O unit.

## Verifying the GV I/O configuration

- Valid signal feed must be connected to the inputs of GV I/O server.
- The required licenses have been added to the GV I/O Live Ingest and Playout Server. For more info, refer to [SabreTooth GV I/O license process](#) on page 35.
- Embedded Security Manager on the GV I/O device had been set to Enabled mode.
- For the GV I/O client of GV AMS Pro - Advanced Media Storage system, the V: drive of the GV I/O had been mapped to the UNC path of the system's hi-res media storage.
- For GV I/O Standalone devices, share the V: drive with "Everyone".
- For GV I/O devices with SD and HD workflows, the configuration can be done via GV STRATUS Control Panel or the GV I/O web configuration utility.
- For GV I/O devices that support UHD, HDR, and NMOS workflows, configuration must only be done via the GV I/O web configuration utility. For more info, refer to [Configuring the GV I/O Live Ingest and Playout Server](#) on page 39.

Within the GV STRATUS system, do the following to verify the GV I/O Live Ingest and Playout Server is configured properly. Grass Valley recommends the GV STRATUS Control Panel is only configured on the Core Server:

- For GV I/O Live Ingest and Playout **Standalone** Servers, do the following:
  - Create a new **Grass Valley Media Server MDI** in the GV STRATUS Control Panel for each GV I/O under MDI Configuration settings, just as you would a K2 Summit Standalone. For more info, refer to [Grass Valley Media Server MDI standalone settings](#) on page 66.
  - Reboot the GV I/O devices and Core Server before continuing.
- For GV I/O Live Ingest and Playout Server with iSCSI or LAN Connect media connection, do the following:
  - Run the iSCSI Initiator on each GV I/O server with iSCSI connection before attempting to configure them in K2Config.
  - Add the GV I/O server(s) as **GV I/O Live Ingest & Playout** devices in K2Config and configure them as you would a K2 Summit client. GV I/O supports either LAN Connect or iSCSI connection.
  - Sync K2Config to the GV STRATUS Core server.

- In the GV STRATUS Control Panel application, do the following:
  - In **Core | MDI Configuration** settings, re-save all Grass Valley Media Server MDIs with GV I/O servers attached.
  - In **Core | Proxy Config | Proxy Settings** tab, re-select check-boxes, resave the proxy settings and verify in **Test Connections** tab that the **STRATUS GV I/O Client** Device Types are connected with the proxy server. This must be done to push proxy settings to the GV I/O.
  - Reboot the GV I/O servers.
  - After the GV I/O servers have finished booting, log in manually to each GV I/O server. You must log in with a user account that has full permissions to the proxy share. If shared storage is used for high resolution media, the user account must also have full permissions to the shared storage location used for high resolution media storage.
  - Then, reboot the GV STRATUS Core server. This sequence is required for the changes to take effect.
  - Verify that you can see the **STRATUS GV I/O Appliance** in the **Core | K2 Storage | K2 Standalone Storage** tab for the GV I/O standalone server.
  - Verify that you can see the **STRATUS GV I/O Client** in the **Core | K2 Storage | K2 SAN Storage** tab for the GV I/O client in K2 Summit SAN or GV AMS Pro - Advanced Media Storage system.
  - Then in **General | Format** tab, add formats according to input/output signal feed, if they are not readily available.
  - In the **General | Channels | GV I/O** tab, verify that the GV I/O channels are displayed. The **Channel Format** should be set according to signal feeds configured to each channel. Change the **Channel Format** setting to match the format of signal feed already connected to the channel.
  - Configure GV I/O channels according to [GV I/O Record Channel settings](#) on page 68 or [GV I/O Playout Channel settings](#) on page 70.
  - To add GV I/O channels to the Scheduler tool: In the **Applications | Ingest | Channel Setup** tab, add one or more **GV I/O Device** channels:
    - **Type of device:** Select either **SAN Client** or **Standalone Client**.
    - **SAN Name:** Choose a SAN with one or more GV I/O devices.
    - **Primary Device:** Select the desired GV I/O device in the drop-down list.
    - **Select Standalone:** Select the standalone GV I/O device in the drop-down list.
    - **Channel Type:** Select **Recorder**.
    - **Client Channel:** Select a channel from the drop-down list.
    - **Router Destination:** Select a router destination, if applicable.
    - **Timecode Format:** Select **Time of Day**.
- In the GV STRATUS application, do the following:
  - In the Scheduler tool, verify that GV I/O channels configured in Ingest settings of the GV STRATUS Control Panel are displayed and able to record.

- To add GV I/O channels to the Channel Panel: In the Navigator panel, expand the Tools node and select Channel Panels. Right-click on the desired Channel Panel and select **Open With Inspector**.
  - Verify that all configured GV I/O Live Ingest and Playout Servers are displayed.
  - Add one or more channels from a GV I/O Live Ingest and Playout Server.
  - Verify that GV I/O channels have a ... button and you can set the Timecode Source to **Time of Day** or a specific **Start Time** for each GV I/O channel.
  - Verify that you can record on those GV I/O channels.
- To add GV I/O servers to the GV STRATUS Rundown application: In the GV STRATUS Control Panel, go to **Applications | Rundown | Media** tab. Add one or more **GV I/O Device** as the Playout Server(s) and click **Save**.

Then, launch the GV STRATUS Rundown application and go to **Tools | Options | Channel Configuration** tab to add GV I/O channels as playout channels.

Verify that GV I/O channels configured in GV STRATUS Rundown are able to playback assets.

## Installing GV I/O Field Kit upgrades

GV I/O Live Ingest and Playout Server supports these field kit upgrades:

- **GVIO-HW-CX5-FK (Field Kit)** - includes Mellanox ConnectX-5 10/25 GigE network adapter card installed for IP channels
- **GVIO-HW-M264-FK (Field Kit)** - includes Matrox M264 video card that provides hardware acceleration for UHD video work flows

## Upgrading to a GV I/O with IP option

This section provides instructions for the following field kit:

Upgrade Nomenclature	Description
GVIO-HW-CX5-FK	ConnectX-5 NIC – Dual 25G/10G Mellanox IP interface card. Required for upgrading from a GV I/O SDI to IP server (replaces AJA card). Includes Rivermax license and silver 1 year support.

**⚠ CAUTION:** *This system contains board-level components that must be protected from static discharge and physical shock. Wear a wrist strap grounded to the system chassis when handling system components.*

### Replacing the AJA card with the Mellanox card

- Make sure the recovery image has been created for GV I/O and saved into the USB Recovery Flash Drive.

Do not do this task if:

- You only use the GV I/O system for SD and HD workflows in your broadcast operation.

Do this task if:

- You plan to have the UHD workflow in your broadcast operation.

- You are currently using GV I/O system with SDI option, and you need to upgrade to a GV I/O system with IP option.

For UHD workflow, the AJA card in your GV I/O must be replaced with the Mellanox ConnectX-5 25 GigE card as the workflow is only supported on a GV I/O system with IP option.

1. Power down the GV I/O unit.
2. Disconnect power cables from the GV I/O unit.
3. Open the GV I/O chassis and remove the AJA Corvid 88 SDI I/O card.
4. Insert the Mellanox ConnectX-5 card to replace the AJA Corvid 88 card.
5. Close the GV I/O chassis and reconnect power to the GV I/O unit.
6. Next, install software components manually according to instructions in [Install software manually for GV I/O with IP option](#) on page 84.

### Upgrading a GV I/O with IP option to UHD support

To use the UHD workflow, GV I/O systems require the following upgrade:

- Mellanox ConnectX-5 25 GigE network adapter card installed for UHD SMPTE 2110 IP channels
- Matrox M264 video card installed to provide hardware acceleration for UHD video work flows
- The latest Windows 2016 OS image installed on all Dell R640 servers

GV I/O Live Ingest and Playout Server supports the UHD work flow only with SMPTE 2110 IP channels in this release.

This section provides instructions for the following field kit:

Upgrade Nomenclature	Description
GVIO-HW-M264-FK	Matrox M.264 codec card upgrade for UHD support. Replaces the NVIDIA Quadro video card.

**⚠ CAUTION:** *This system contains board-level components that must be protected from static discharge and physical shock. Wear a wrist strap grounded to the system chassis when handling system components.*

#### Replacing the NVIDIA card with the Matrox card

- Make sure you already created the recovery image for GV I/O and save the backup on your USB Recovery Flash Drive.

Do not do this task if:

- You only use the GV I/O system for SD and HD work flows in your broadcast operation.

Do this task if:

- You plan to have the UHD work flow in your broadcast operation.

For GV I/O upgrade to UHD support, you must replace the NVIDIA card with the Matrox M264 card, which provides hardware acceleration for UHD video work flows.

1. Obtain **GVIO-Prerequisites-5.x.zip** file from [ftp.grassvalley.com](http://ftp.grassvalley.com) and unzip to a temporary folder on the GV I/O unit.

This .zip file contains software components that will be used later in the procedure.

2. Power down the GV I/O unit.
3. Disconnect power cables from the GV I/O unit.
4. Open the GV I/O chassis and remove the NVIDIA card.
5. Insert the Matrox M264 card to replace the NVIDIA card.
6. Close the GV I/O chassis and reconnect power to the GV I/O unit.
7. After powering on the GV I/O unit and booting the system, change Embedded Security Manager to Update Mode.
8. Install the Matrox M264 driver by executing the **dsx-matrox-setup.bat** script.

The **DSX-TopologyUtils-0.0.0.25499.exe** file should be in the same directory as the script.

9. Change Embedded Security Manager to Enabled Mode.
10. Reboot the GV I/O unit.



---

# ***Setting backup and recovery of the GV I/O Live Ingest and Playout Server***

## **About the recovery image process**

An image of the GV I/O Live Ingest and Playout Server system drive is provided with the product package. You can restore the GV I/O Live Ingest and Playout Server from this image. This simplifies the process of rebuilding a system in a disaster recovery scenario.

When you receive your GV I/O Live Ingest and Playout Server new from the factory, you receive a system-specific image for that particular GV I/O Live Ingest and Playout Server. This factory image is stored on a bootable USB Recovery Flash Drive located inside the front panel of the hardware. Also on the Recovery Flash Drive is the Acronis True Image software necessary to create and restore an image.

After your GV I/O Live Ingest and Playout Server is installed, configured, and running in your system environment, you should create new recovery disk images for the machine to capture settings changed from default. These “first birthday” images are the baseline recovery image for the machine in its life in your facility. There is enough space on the Recovery Flash Drive to store the first birthday image along with the factory image.

You should likewise create new recovery disk images after completing any process that changes system software or data, such as a software upgrade. In this way you retain the ability to restore to a recent “last known good” state.

## **Creating a recovery disk image**

Before creating a recovery image, determine the storage location for the image. Grass Valley recommends that you store the recovery image on the Recovery Flash Drive, and this task provides instructions for that location. If you use a different location, such as a network connected drive or another connected USB drive, alter the steps in this task as appropriate.

1. Make sure that media access is stopped and that the system on which you are working is not being used.
2. If you have not already done so, connect keyboard, monitor, and mouse.

3. Do the following:
  - a) Insert the Recovery Flash Drive into the front USB port.
  - b) Restart the machine, or power on if currently shut down.

The machine boots from the Recovery Flash Drive, into a version of Windows stored on the drive.

A MS-DOS command window opens.
  - c) Press the **F11** key to enter Boot options.
  - d) When prompted with a list of options, select the Acronis option and then press **Enter**.

The Acronis program loads.
4. In the Acronis main window, click **Backup**.

The Create Backup Wizard opens.
5. On the Welcome page, click **Next**.
6. On the Partitions Selection page, do the following:
  - a) Select the **(C:)** and the **(D:)** partitions and then click **Next**.
7. On the Backup Archive Location page, do the following:
  - a) In the tree view select the Recovery Flash Drive and enter the name of the image file you are creating.

As an alternative, you can also save the backup into the **Backup (E:)** partition.

Create the file name using the machine hostname and the date. Name the file with the .tib extension.

For example, if the hostname is MySystem1, in the File name field you enter  
`E:\MySystem1_20180327.tib`.
  - b) Click **Next**.
8. On the Select Backup Mode page, select **Create a new full backup archive** and then click **Next**.
9. On the Backup Options page, do not change any settings. Click **Next**.
10. On the Archive Comment page, if desired, enter image comments such as the date, time, and software versions contained in the image you are creating. Click **Next**.
11. On the "...ready to proceed..." page, do the following:
  - a) Verify that you are creating images from the C: and D: partitions and writing to the E: partition or an USB drive, then click **Proceed**.
12. On the Operation Progress page, observe the progress report.
13. When a message appears indicating a successful backup, click **OK**.
14. Click **Operations | Exit** to exit the Acronis True Image program.

The machine restarts automatically.
15. Remove the recovery media while the machine is shutting down.

## Restoring from a system-specific recovery image

- Use Ctrl+R options during boot up to re-initialize the RAID1 and RAID5 virtual drives and wipe any previous configurations.

Use this task to restore using an image made from the particular GV I/O Live Ingest and Playout Server.

Before restoring from a recovery image, make sure that the GV I/O Live Ingest and Playout Server has access to the image from which you are restoring. This task provides instructions for accessing an image on the Recovery Flash Drive. If you access an image from a different location, such as a network connected drive or another connected USB drive, alter the steps in this task as appropriate.

1. Make sure that media access is stopped and that the system on which you are working is not being used.
2. Do the following:
  - a) Insert the Recovery Flash Drive into the front USB port.
  - b) Restart the machine, or power on if currently shut down.

The machine boots from the Recovery Flash Drive, into a version of Windows stored on the drive.

A MS-DOS command window opens.

- c) Press the **F11** key to enter Boot options.
  - d) When prompted with a list of options, select the Acronis option and then press **Enter**.  
The Acronis program loads.
3. In the Acronis main window, click **Recovery**.  
The Restore Data Wizard opens.
  4. On the Welcome page, click **Next**.
  5. On the Backup Archive Selection page, in the tree view expand the node for the Recovery Flash Drive and select the image file, then click **Next**.
  6. On the Restoration Type Selection page, select **Restore disks or partitions** and then click **Next**.
  7. On the Partition or Disk to Restore page, select **MBR and Track 0** and then click **Next**.
  8. On the Disk Selection page, select **Disk 1** and then click **Next**.
  9. On the Next Selection page, select **Yes, I want to restore another partition or hard disk drive** and then click **Next**.
  10. On the Partition or Disk to Restore page, select **(C:)** and then click **Next**.
  11. On the Restored Partitions Resizing page, select **Yes, I want to resize partitions** and then click **Next**.
  12. On the Restored Location page, select **(C:)** and then click **Next**.
  13. On the Restored Partition Type page, select **Active** and then click **Next**.
  14. Do one of the following:
    - If the Restored Partition Size page does not appear. Skip ahead to the Next Selection page.
    - If the Restored Partition Size page appears. Continue with the next step.

15. On the Restored Partition Size page, do one of the following:
  - If **Free space after** reports 0 bytes, leave settings as they are. Click **Next**.
  - If **Free space after** does not report 0 bytes, increase **Partition size** until **Free space after** reports 0 bytes. Click **Next**.
16. On the Next Selection page, select **No, I do not** and then click **Next**.
17. On the Restoration Options page, do not make any selections. Click **Next**.
18. On the "...ready to proceed..." page, verify that you are restoring the correct image to the correct location. Click **Proceed**.
19. On the Operation Progress page, observe the progress report.
20. When a message appears indicating a successful recovery, click **OK**.
21. Click **Operations | Exit** to exit the Acronis True Image program.

The machine restarts automatically.
22. Remove the recovery media while the machine is shutting down.
23. When prompted, enter the GV I/O Live Ingest and Playout Server machine name.

Make sure the name is identical to the name it previously had.

At first start up after reimage, the system is in Embedded Security Update mode by default.

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# Troubleshooting the GV I/O Live Ingest and Playout Server

## Troubleshooting tools

You can use the following to troubleshoot your GV I/O system:

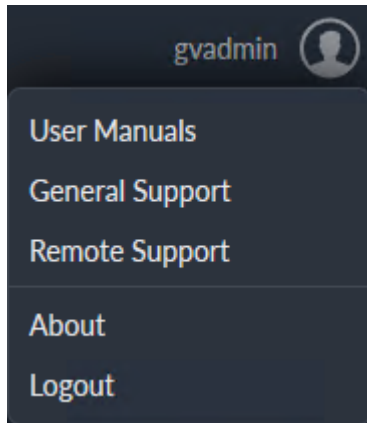
- GV I/O controller log at `c:\logs\mlog.mmf`.
- GV I/O directory and configuration files at `c:\profile\config`
- GV I/O user logs at `..%AppData%\Grass Valley`
- The GV Log Viewer application, on GV STRATUS servers.
- On Windows Event Viewer, these logs can be accessed under **Applications and Services Logs**:
  - GVIOConfigServiceEventLog
  - NmosNodeServiceEventLog
- Use Mozilla Firefox or Google Chrome web browsers to check NMOS configurations via these links below:
  - `http://<gvio-hostname>:4040/x-nmos`
  - `http://<nmos-node-hostname>:<port-number>/x-nmos`
  - `http://<nmos-registry-hostname>:<port-number>/x-nmos`

Also refer to GV STRATUS documentation for GV STRATUS troubleshooting information.

## Viewing version information and technical support

You can view version information and access technical support on the GV I/O web utility. If necessary, you can also copy the information and send it to Grass Valley support.

- To access version information do the following:
  - a) On the GV I/O web configuration utility, click the user profile icon on top-right of the page.  
A dialog box opens with these options below.



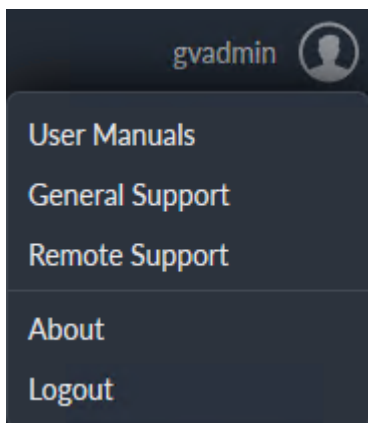
- b) Select **About**.

The GV I/O window appears and displays version information.



- c) Highlight the version number and press **Ctrl + C** to copy the information.
  - d) When finished viewing or copying the information, click **x**.  
The GV I/O window closes.
  - e) Paste the copied information into a text file or email, and send it to Grass Valley support.

- To access support information do the following:
  - a) On the GV I/O web configuration utility, click the user profile icon on top-right of the page.  
A dialog box opens with these options below.



- b) Select the appropriate support information that you need as follows:
  - **User Manuals** - To access online manuals on the Grass Valley website.
  - **General Support** - To go to the Grass Valley Support Resources page.
  - **Remote Support** - To go to the Grass Valley Remote Support portal.

## About host files

The hosts file is used by the control network and the streaming/FTP network for name resolution, which determines the IP address of a device on the network when only the device name (hostname) is given. The hosts file is located at `C:\Windows\system32\drivers\etc\hosts` on the GV I/O Live Ingest and Playout Server. The hosts file must be the same on all network devices. It includes the names and addresses of all the devices on the network.

For FTP transfers on a K2 SAN system, transfers go to/from K2 Media Servers that have the role of FTP server. No transfers go directly to/from the shared storage GV I/O clients that are on the K2 SAN system. To support FTP transfers, in the hosts file of the GV I/O Live Ingest and Playout Server hostname must have the `_he0` extension added at the end of the name and that hostname must be associated with the FTP/streaming network IP address.

Here is an example of IP addresses and names associated in a hosts file:

```
10.251.53.178 MYKUL-GVIO03 MYKUL-GVIO03_he0
10.251.53.179 MYKUL-GVIO04 MYKUL-GVIO04_he0
```

Each GV I/O Live Ingest and Playout Server has its hostname associated with its control network IP address. In addition, each GV I/O Live Ingest and Playout Server has its `_he0` hostname associated with its streaming/FTP network address.

Use SiteConfig to define your networks and devices. When you do so, SiteConfig creates the correct hosts file and copies the hosts file to each network device. This enforces consistent hosts files across networks and reduces errors introduced by editing and copying hosts files on individual devices. You can also view hosts files from SiteConfig for troubleshooting purposes.



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# Safety Summary

Read the following sections for important safety information.

## Safety Summary

Read and follow the important safety information below, noting especially those instructions related to risk of fire, electric shock or injury to persons. Additional specific warnings not listed here may be found throughout the manual.



**WARNING:** Any instructions in this manual that require opening the equipment cover or enclosure are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

---

## Safety terms and symbols

### Terms in this manual

Safety-related statements may appear in this manual in the following form:



**WARNING:** Warning statements identify conditions or practices that may result in personal injury or loss of life.

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**CAUTION:** Caution statements identify conditions or practices that may result in damage to equipment or other property, or which may cause equipment crucial to your business environment to become temporarily non-operational.

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### Terms on the product

These terms may appear on the product:

**DANGER** — A personal injury hazard is immediately accessible as you read the marking.

**WARNING** — A personal injury hazard exists but is not immediately accessible as you read the marking.

**CAUTION** — A hazard to property, product, and other equipment is present.

### Symbols on the product

The following symbols may appear on the product:







Indicates that dangerous high voltage is present within the equipment enclosure that may be of sufficient magnitude to constitute a risk of electric shock.

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Indicates that user, operator or service technician should refer to product manual(s) for important operating, maintenance, or service instructions.

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	This is a prompt to note fuse rating when replacing fuse(s). The fuse referenced in the text must be replaced with one having the ratings indicated.
	Identifies a protective grounding terminal which must be connected to earth ground prior to making any other equipment connections.
	Identifies an external protective grounding terminal which may be connected to earth ground as a supplement to an internal grounding terminal.
	Indicates that static sensitive components are present which may be damaged by electrostatic discharge. Use anti-static procedures, equipment and surfaces during servicing.

## Warnings

The following warning statements identify conditions or practices that can result in personal injury or loss of life.

**Dangerous voltage or current may be present** — Disconnect power and remove battery (if applicable) before removing protective panels, soldering, or replacing components.

**Do not service alone** — Do not internally service this product unless another person capable of rendering first aid and resuscitation is present.

**Remove jewelry** — Prior to servicing, remove jewelry such as rings, watches, and other metallic objects.

**Avoid exposed circuitry** — Do not touch exposed connections, components or circuitry when power is present.

**Use proper power cord** — Use only the power cord supplied or specified for this product.

**Ground product** — Connect the grounding conductor of the power cord to earth ground.

**Operate only with covers and enclosure panels in place** — Do not operate this product when covers or enclosure panels are removed.

**Use correct fuse** — Use only the fuse type and rating specified for this product.

**Use only in dry environment** — Do not operate in wet or damp conditions.

**Use only in non-explosive environment** — Do not operate this product in an explosive atmosphere.

**High leakage current may be present** — Earth connection of product is essential before connecting power.

**Dual power supplies may be present** — Be certain to plug each power supply cord into a separate branch circuit employing a separate service ground. Disconnect both power supply cords prior to servicing.

**Double pole neutral fusing** — Disconnect mains power prior to servicing.

**Use proper lift points** — Do not use door latches to lift or move equipment.

**Avoid mechanical hazards** — Allow all rotating devices to come to a stop before servicing.

## Cautions

The following caution statements identify conditions or practices that can result in damage to equipment or other property

**Use correct power source** — Do not operate this product from a power source that applies more than the voltage specified for the product.

**Use correct voltage setting** — If this product lacks auto-ranging power supplies, before applying power ensure that the each power supply is set to match the power source.

**Provide proper ventilation** — To prevent product overheating, provide equipment ventilation in accordance with installation instructions.

**Use anti-static procedures** — Static sensitive components are present which may be damaged by electrostatic discharge. Use anti-static procedures, equipment and surfaces during servicing.

**Do not operate with suspected equipment failure** — If you suspect product damage or equipment failure, have the equipment inspected by qualified service personnel.

**Ensure mains disconnect** — If mains switch is not provided, the power cord(s) of this equipment provide the means of disconnection. The socket outlet must be installed near the equipment and must be easily accessible. Verify that all mains power is disconnected before installing or removing power supplies and/or options.

**Route cable properly** — Route power cords and other cables so that they are not likely to be damaged. Properly support heavy cable bundles to avoid connector damage.

**Use correct power supply cords** — Power cords for this equipment, if provided, meet all North American electrical codes. Operation of this equipment at voltages exceeding 130 VAC requires power supply cords which comply with NEMA configurations. International power cords, if provided, have the approval of the country of use.

**Use correct replacement battery** — This product may contain batteries. To reduce the risk of explosion, check polarity and replace only with the same or equivalent type recommended by manufacturer. Dispose of used batteries according to the manufacturer's instructions.

**Troubleshoot only to board level** — Circuit boards in this product are densely populated with surface mount technology (SMT) components and application specific integrated circuits (ASICs). As a result, circuit board repair at the component level is very difficult in the field, if not impossible. For warranty compliance, do not troubleshoot systems beyond the board level.

## Sicherheit – Überblick

Lesen und befolgen Sie die wichtigen Sicherheitsinformationen dieses Abschnitts. Beachten Sie insbesondere die Anweisungen bezüglich

Brand-, Stromschlag- und Verletzungsgefahren. Weitere spezifische, hier nicht aufgeführte Warnungen finden Sie im gesamten Handbuch.





**WARNUNG:** Alle Anweisungen in diesem Handbuch, die das Abnehmen der Geräteabdeckung oder des Gerätegehäuses erfordern, dürfen nur von qualifiziertem Servicepersonal ausgeführt werden. Um die Stromschlaggefahr zu verringern, führen Sie keine Wartungsarbeiten außer den in den Bedienungsanleitungen genannten Arbeiten aus, es sei denn, Sie besitzen die entsprechende Qualifikationen für diese Arbeiten.

## Sicherheit – Begriffe und Symbole

### In diesem Handbuch verwendete Begriffe

Sicherheitsrelevante Hinweise können in diesem Handbuch in der folgenden Form auftauchen:

---

	<b>WARNUNG:</b> <i>Warnungen weisen auf Situationen oder Vorgehensweisen hin, die Verletzungs- oder Lebensgefahr bergen.</i>
	<b>VORSICHT:</b> <i>Vorsichtshinweise weisen auf Situationen oder Vorgehensweisen hin, die zu Schäden an Ausrüstungskomponenten oder anderen Gegenständen oder zum zeitweisen Ausfall wichtiger Komponenten in der Arbeitsumgebung führen können.</i>

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### Hinweise am Produkt

Die folgenden Hinweise können sich am Produkt befinden:

**GEFAHR** – Wenn Sie diesen Begriff lesen, besteht ein unmittelbares Verletzungsrisiko.







**WARNUNG** – Wenn Sie diesen Begriff lesen, besteht ein mittelbares Verletzungsrisiko.

**VORSICHT** – Es besteht ein Risiko für Objekte in der Umgebung, den Mixer selbst oder andere Ausrüstungskomponenten.

### Symbole am Produkt

Die folgenden Symbole können sich am Produkt befinden:

---

	Weist auf eine gefährliche Hochspannung im Gerätegehäuse hin, die stark genug sein kann, um eine Stromschlaggefahr darzustellen.
	Weist darauf hin, dass der Benutzer, Bediener oder Servicetechniker wichtige Bedienungs-, Wartungs- oder Serviceanweisungen in den Produkthandbüchern lesen sollte.
	Dies ist eine Aufforderung, beim Wechsel von Sicherungen auf deren Nennwert zu achten. Die im Text angegebene Sicherung muss durch eine Sicherung ersetzt werden, die die angegebenen Nennwerte besitzt.
	Weist auf eine Schutzerdungsklemme hin, die mit dem Erdungskontakt verbunden werden muss, bevor weitere Ausrüstungskomponenten angeschlossen werden.
	Weist auf eine externe Schutzerdungsklemme hin, die als Ergänzung zu einem internen Erdungskontakt an die Erde angeschlossen werden kann.
	Weist darauf hin, dass es statisch empfindliche Komponenten gibt, die durch eine elektrostatische Entladung beschädigt werden können. Verwenden Sie antistatische Prozeduren, Ausrüstung und Oberflächen während der Wartung.

---

## Warnungen

Die folgenden Warnungen weisen auf Bedingungen oder Vorgehensweisen hin, die Verletzungs- oder Lebensgefahr bergen:

**Gefährliche Spannungen oder Ströme** – Schalten Sie den Strom ab, und entfernen Sie ggf. die Batterie, bevor sie Schutzabdeckungen abnehmen, löten oder Komponenten austauschen.

**Servicearbeiten nicht alleine ausführen** – Führen Sie interne Servicearbeiten nur aus, wenn eine weitere Person anwesend ist, die erste Hilfe leisten und Wiederbelebungsmaßnahmen einleiten kann.

**Schmuck abnehmen** – Legen Sie vor Servicearbeiten Schmuck wie Ringe, Uhren und andere metallische Objekte ab.

**Keine offen liegenden Leiter berühren** – Berühren Sie bei eingeschalteter Stromzufuhr keine offen liegenden Leitungen, Komponenten oder Schaltungen.

**Richtiges Netzkabel verwenden** – Verwenden Sie nur das mitgelieferte Netzkabel oder ein Netzkabel, das den Spezifikationen für dieses Produkt entspricht.

**Gerät erden** – Schließen Sie den Erdleiter des Netzkabels an den Erdungskontakt an.

**Gerät nur mit angebrachten Abdeckungen und Gehäuseseiten betreiben** – Schalten Sie dieses Gerät nicht ein, wenn die Abdeckungen oder Gehäuseseiten entfernt wurden.

**Richtige Sicherung verwenden** – Verwenden Sie nur Sicherungen, deren Typ und Nennwert den Spezifikationen für dieses Produkt entsprechen.

**Gerät nur in trockener Umgebung verwenden** – Betreiben Sie das Gerät nicht in nassen oder feuchten Umgebungen.

**Gerät nur verwenden, wenn keine Explosionsgefahr besteht** – Verwenden Sie dieses Produkt nur in Umgebungen, in denen keinerlei Explosionsgefahr besteht.

**Hohe Kriechströme** – Das Gerät muss vor dem Einschalten unbedingt geerdet werden.

**Doppelte Spannungsversorgung kann vorhanden sein** – Schließen Sie die beiden Anschlußkabel an getrennte Stromkreise an. Vor Servicearbeiten sind beide Anschlußkabel vom Netz zu trennen.

**Zweipolige, neutrale Sicherung** – Schalten Sie den Netzstrom ab, bevor Sie mit den Servicearbeiten beginnen.

**Fassen Sie das Gerät beim Transport richtig an** – Halten Sie das Gerät beim Transport nicht an Türen oder anderen beweglichen Teilen fest.

**Gefahr durch mechanische Teile** – Warten Sie, bis der Lüfter vollständig zum Halt gekommen ist, bevor Sie mit den Servicearbeiten beginnen.

## **Vorsicht**

Die folgenden Vorsichtshinweise weisen auf Bedingungen oder Vorgehensweisen hin, die zu Schäden an Ausrüstungskomponenten oder anderen Gegenständen führen können:

**Gerät nicht öffnen** – Durch das unbefugte Öffnen wird die Garantie ungültig.

**Richtige Spannungsquelle verwenden** – Betreiben Sie das Gerät nicht an einer Spannungsquelle, die eine höhere Spannung liefert als in den Spezifikationen für dieses Produkt angegeben.

**Gerät ausreichend belüften** – Um eine Überhitzung des Geräts zu vermeiden, müssen die Ausrüstungskomponenten entsprechend den Installationsanweisungen belüftet werden. Legen Sie kein Papier unter das Gerät. Es könnte die Belüftung behindern. Platzieren Sie das Gerät auf einer ebenen Oberfläche.

**Antistatische Vorkehrungen treffen** – Es gibt statisch empfindliche Komponenten, die durch eine elektrostatische Entladung beschädigt werden können. Verwenden Sie antistatische Prozeduren, Ausrüstung und Oberflächen während der Wartung.

**CF-Karte nicht mit einem PC verwenden** – Die CF-Karte ist speziell formatiert. Die auf der CF-Karte gespeicherte Software könnte gelöscht werden.

**Gerät nicht bei eventuellem Ausrüstungsfehler betreiben** – Wenn Sie einen Produktschaden oder Ausrüstungsfehler vermuten, lassen Sie die Komponente von einem qualifizierten Servicetechniker untersuchen.

**Kabel richtig verlegen** – Verlegen Sie Netzkabel und andere Kabel so, dass Sie nicht beschädigt werden. Stützen Sie schwere Kabelbündel ordnungsgemäß ab, damit die Anschlüsse nicht beschädigt werden.

**Richtige Netzkabel verwenden** – Wenn Netzkabel mitgeliefert wurden, erfüllen diese alle nationalen elektrischen Normen. Der Betrieb dieses Geräts mit Spannungen über 130 V AC erfordert Netzkabel, die NEMA-Konfigurationen entsprechen. Wenn internationale Netzkabel mitgeliefert wurden, sind diese für das Verwendungsland zugelassen.

**Richtige Ersatzbatterie verwenden** – Dieses Gerät enthält eine Batterie. Um die Explosionsgefahr zu verringern, prüfen Sie die Polarität und tauschen die Batterie nur gegen eine Batterie desselben Typs oder eines gleichwertigen, vom Hersteller empfohlenen Typs aus. Entsorgen Sie gebrauchte Batterien entsprechend den Anweisungen des Batterieherstellers.

Das Gerät enthält keine Teile, die vom Benutzer gewartet werden können. Wenden Sie sich bei Problemen bitte an den nächsten Händler.

## Consignes de sécurité

Il est recommandé de lire, de bien comprendre et surtout de respecter les informations relatives à la sécurité qui sont exposées ci-après, notamment les consignes destinées à prévenir les risques d'incendie, les décharges électriques et les blessures aux personnes. Les avertissements complémentaires, qui ne sont pas nécessairement repris ci-dessous, mais présents dans toutes les sections du manuel, sont également à prendre en considération.



**AVERTISSEMENT:** *Toutes les instructions présentes dans ce manuel qui concernent l'ouverture des capots ou des logements de cet équipement sont destinées exclusivement à des membres qualifiés du personnel de maintenance. Afin de diminuer les risques de décharges électriques, ne procédez à aucune intervention d'entretien autre que celles contenues dans le manuel de l'utilisateur, à moins que vous ne soyez habilité pour le faire.*

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## Consignes et symboles de sécurité

### Termes utilisés dans ce manuel

Les consignes de sécurité présentées dans ce manuel peuvent apparaître sous les formes suivantes :



**AVERTISSEMENT:** *Les avertissements signalent des conditions ou des pratiques susceptibles d'occasionner des blessures graves, voire même fatales.*

---



**MISE EN GARDE:** *Les mises en garde signalent des conditions ou des pratiques susceptibles d'occasionner un endommagement à l'équipement ou aux installations, ou de rendre l'équipement temporairement non opérationnel, ce qui peut porter préjudice à vos activités.*

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### Signalétique apposée sur le produit

La signalétique suivante peut être apposée sur le produit :







**DANGER** — risque de danger imminent pour l'utilisateur.

**AVERTISSEMENT** — Risque de danger non imminent pour l'utilisateur.

**MISE EN GARDE** — Risque d'endommagement du produit, des installations ou des autres équipements.

### Symboles apposés sur le produit

Les symboles suivants peuvent être apposés sur le produit :

	Signale la présence d'une tension élevée et dangereuse dans le boîtier de l'équipement ; cette tension peut être suffisante pour constituer un risque de décharge électrique.
	Signale que l'utilisateur, l'opérateur ou le technicien de maintenance doit faire référence au(x) manuel(s) pour prendre connaissance des instructions d'utilisation, de maintenance ou d'entretien.
	Il s'agit d'une invite à prendre note du calibre du fusible lors du remplacement de ce dernier. Le fusible auquel il est fait référence dans le texte doit être remplacé par un fusible du même calibre.
	Identifie une borne de protection de mise à la masse qui doit être raccordée correctement avant de procéder au raccordement des autres équipements.
	Identifie une borne de protection de mise à la masse qui peut être connectée en tant que borne de mise à la masse supplémentaire.
	Signale la présence de composants sensibles à l'électricité statique et qui sont susceptibles d'être endommagés par une décharge électrostatique. Utilisez des procédures, des équipements et des surfaces antistatiques durant les interventions d'entretien.

## Avertissements

Les avertissements suivants signalent des conditions ou des pratiques susceptibles d'occasionner des blessures graves, voire même fatales :

**Présence possible de tensions ou de courants dangereux** — Mettez hors tension, débranchez et retirez la pile (le cas échéant) avant de déposer les couvercles de protection, de défaire une soudure ou de remplacer des composants.

**Ne procédez pas seul à une intervention d'entretien** — Ne réalisez pas une intervention d'entretien interne sur ce produit si une personne n'est pas présente pour fournir les premiers soins en cas d'accident.

**Retirez tous vos bijoux** — Avant de procéder à une intervention d'entretien, retirez tous vos bijoux, notamment les bagues, la montre ou tout autre objet métallique.

**Évitez tout contact avec les circuits exposés** — Évitez tout contact avec les connexions, les composants ou les circuits exposés s'ils sont sous tension.

**Utilisez le cordon d'alimentation approprié** — Utilisez exclusivement le cordon d'alimentation fourni avec ce produit ou spécifié pour ce produit.

**Raccordez le produit à la masse** — Raccordez le conducteur de masse du cordon d'alimentation à la borne de masse de la prise secteur.

**Utilisez le produit lorsque les couvercles et les capots sont en place** — N'utilisez pas ce produit si les couvercles et les capots sont déposés.

**Utilisez le bon fusible** — Utilisez exclusivement un fusible du type et du calibre spécifiés pour ce produit.

**Utilisez ce produit exclusivement dans un environnement sec** — N'utilisez pas ce produit dans un environnement humide.

**Utilisez ce produit exclusivement dans un environnement non explosible** — N'utilisez pas ce produit dans un environnement dont l'atmosphère est explosible.

**Présence possible de courants de fuite** — Un raccordement à la masse est indispensable avant la mise sous tension.

**Deux alimentations peuvent être présentes dans l'équipement** — Assurez vous que chaque cordon d'alimentation est raccordé à des circuits de terre séparés. Débranchez les deux cordons d'alimentation avant toute intervention.

**Fusion neutre bipolaire** — Débranchez l'alimentation principale avant de procéder à une intervention d'entretien.

**Utilisez les points de levage appropriés** — Ne pas utiliser les verrous de la porte pour lever ou déplacer l'équipement.

**Évitez les dangers mécaniques** — Laissez le ventilateur s'arrêter avant de procéder à une intervention d'entretien.

## Mises en garde

Les mises en garde suivantes signalent les conditions et les pratiques susceptibles d'occasionner des endommagements à l'équipement et aux installations :

**N'ouvrez pas l'appareil** — Toute ouverture prohibée de l'appareil aura pour effet d'annuler la garantie.

**Utilisez la source d'alimentation adéquate** — Ne branchez pas ce produit à une source d'alimentation qui utilise une tension supérieure à la tension nominale spécifiée pour ce produit.

**Assurez une ventilation adéquate** — Pour éviter toute surchauffe du produit, assurez une ventilation de l'équipement conformément aux instructions d'installation. Ne déposez aucun document sous l'appareil – ils peuvent gêner la ventilation. Placez l'appareil sur une surface plane.

**Utilisez des procédures antistatiques** - Les composants sensibles à l'électricité statique présents dans l'équipement sont susceptibles d'être endommagés par une décharge électrostatique. Utilisez des procédures, des équipements et des surfaces antistatiques durant les interventions d'entretien.

**N'utilisez pas la carte CF avec un PC** — La carte CF a été spécialement formatée. Le logiciel enregistré sur la carte CF risque d'être effacé.

**N'utilisez pas l'équipement si un dysfonctionnement est suspecté** — Si vous suspectez un dysfonctionnement du produit, faites inspecter celui-ci par un membre qualifié du personnel d'entretien.

**Acheminez les câbles correctement** — Acheminez les câbles d'alimentation et les autres câbles de manière à ce qu'ils ne risquent pas d'être endommagés. Supportez correctement les enroulements de câbles afin de ne pas endommager les connecteurs.

**Utilisez les cordons d'alimentation adéquats** — Les cordons d'alimentation de cet équipement, s'ils sont fournis, satisfont aux exigences de toutes les réglementations régionales. L'utilisation de cet équipement à des tensions dépassant les 130 V en c.a. requiert des cordons d'alimentation qui

satisfont aux exigences des configurations NEMA. Les cordons internationaux, s'ils sont fournis, ont reçu l'approbation du pays dans lequel l'équipement est utilisé.

**Utilisez une pile de remplacement adéquate** — Ce produit renferme une pile. Pour réduire le risque d'explosion, vérifiez la polarité et ne remplacez la pile que par une pile du même type, recommandée par le fabricant. Mettez les piles usagées au rebut conformément aux instructions du fabricant des piles.

Cette unité ne contient aucune partie qui peut faire l'objet d'un entretien par l'utilisateur. Si un problème survient, veuillez contacter votre distributeur local.

## **Certifications and compliances**

### **Canadian certified power cords**

Canadian approval includes the products and power cords appropriate for use in the North America power network. All other power cords supplied are approved for the country of use.

### **FCC emission control**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Changes or modifications not expressly approved by Grass Valley can affect emission compliance and could void the user's authority to operate this equipment.

### **Canadian EMC Notice of Compliance**

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

### **EN55103 1/2 Class A warning**

This product has been evaluated for Electromagnetic Compatibility under the EN 55103-1/2 standards for Emissions and Immunity and meets the requirements for E4 environment.

This product complies with Class A (E4 environment). In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

### **FCC emission limits**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesirable operation.

Laser compliance

Laser safety requirements

This product may contain a Class 1 certified laser device. Operating this product outside specifications or altering its original design may result in hazardous radiation exposure, and may be considered an act of modifying or new manufacturing of a laser product under U.S. regulations contained in 21CFR Chapter 1, subchapter J or CENELEC regulations in HD 482 S1. People performing such an act are required by law to recertify and reidentify this product in accordance with provisions of 21CFR subchapter J for distribution within the U.S.A., and in accordance with CENELEC HD 482 S1 for distribution within countries using the IEC 825 standard.

Laser safety

Laser safety in the United States is regulated by the Center for Devices and Radiological Health (CDRH). The laser safety regulations are published in the “Laser Product Performance Standard,” Code of Federal Regulation (CFR), Title 21, Subchapter J.

The International Electrotechnical Commission (IEC) Standard 825, “Radiation of Laser Products, Equipment Classification, Requirements and User’s Guide,” governs laser products outside the United States. Europe and member nations of the European Free Trade Association fall under the jurisdiction of the Comité Européen de Normalization Electrotechnique (CENELEC).

Safety certification

This product has been evaluated and meets the following Safety Certification Standards:

Standard	Designed/tested for compliance with:
ANSI/UL 60950-1	Safety of Information Technology Equipment, including Electrical Business Equipment (Second edition 2007).
IEC 60950-1 with CB cert.	Safety of Information Technology Equipment, including Electrical Business Equipment (Second edition, 2005).
CAN/CSA C22.2 No. 60950-1	Safety of Information Technology Equipment, including Electrical Business Equipment (Second edition 2007).
BS EN 60950-1	Safety of Information Technology Equipment, including Electrical Business Equipment 2006.

ESD Protection

Electronics today are more susceptible to electrostatic discharge (ESD) damage than older equipment. Damage to equipment can occur by ESD fields that are smaller than you can feel. Implementing the information in this section will help you protect the investment that you have made in purchasing Grass Valley equipment. This section contains Grass Valley’s recommended ESD guidelines that should be followed when handling electrostatic discharge sensitive (ESDS) items. These minimal recommendations are based on the information in the [Sources of ESD and Risks](#) on page 111 area. The information in [Grounding Requirements for Personnel](#) on page 112 is provided to assist you in selecting an appropriate grounding method.

## Recommended ESD Guidelines

Follow these guidelines when handling Grass Valley equipment:

- Only trained personnel that are connected to a grounding system should handle ESDS items.
- Do not open any protective bag, box, or special shipping packaging until you have been grounded.

***NOTE: When a Personal Grounding strap is unavailable, as an absolute minimum, touch a metal object that is touching the floor (for example, a table, frame, or rack) to discharge any static energy before touching an ESDS item.***

- Open the anti-static packaging by slitting any existing adhesive tapes. Do not tear the tapes off.
- Remove the ESDS item by holding it by its edges or by a metal panel.
- Do not touch the components of an ESDS item unless it is absolutely necessary to configure or repair the item.
- Keep the ESDS work area clear of all nonessential items such as coffee cups, pens, wrappers and personal items as these items can discharge static. If you need to set an ESDS item down, place it on an anti-static mat or on the anti-static packaging.

## Sources of ESD and Risks

The following information identifies possible sources of electrostatic discharge and can be used to help establish an ESD policy.

### Personnel

One of the largest sources of static is personnel. The static can be released from a person's clothing and shoes.

### Environment

The environment includes the humidity and floors in a work area. The humidity level must be controlled and should not be allowed to fluctuate over a broad range. Relative humidity (RH) is a major part in determining the level of static that is being generated. For example, at 10% - 20% RH a person walking across a carpeted floor can develop 35kV; yet when the relative humidity is increased to 70% - 80%, the person can only generate 1.5kV.

Static is generated as personnel move (or as equipment is moved) across a floor's surface. Carpeted and waxed vinyl floors contribute to static build up.

### Work Surfaces

Painted or vinyl-covered tables, chairs, conveyor belts, racks, carts, anodized surfaces, plexiglass covers, and shelving are all static generators.

### Equipment

Any equipment commonly found in an ESD work area, such as solder guns, heat guns, blowers, etc., should be grounded.

### Materials

Plastic work holders, foam, plastic tote boxes, pens, packaging containers and other items commonly found at workstations can generate static electricity.

## Grounding Requirements for Personnel

The information in this section is provided to assist you in selecting a grounding method. This information is taken from ANSI/ESD S20.20-2007 (Revision of ANSI/ESD S20.20-1999).

### Product Qualification

Personnel Grounding Technical Requirement	Test Method	Required Limits
Wrist Strap System*	ANSI/ESD S1.1 (Section 5.11)	$< 3.5 \times 10^7$ ohm
Flooring / Footwear System – Method 1	ANSI/ESD STM97.1	$< 3.5 \times 10^7$ ohm
Flooring / Footwear System – Method 2 (both required)	ANSI/ESD STM97.1	$< 10^9$ ohm
	ANSI/ESD STM97.2	$< 100$ V

Product qualification is normally conducted during the initial selection of ESD control products and materials. Any of the following methods can be used: product specification review, independent laboratory evaluation, or internal laboratory evaluation.

### Compliance Verification

Personnel Grounding Technical Requirement	Test Method	Required Limits
Wrist Strap System*	ESD TR53 Wrist Strap Section	$< 3.5 \times 10^7$ ohm
Flooring / Footwear System – Method 1	ESD TR53 Flooring Section and ESD TR53 Footwear Section	$< 3.5 \times 10^7$ ohm
Flooring / Footwear System – Method 2 (both required)	ESD TR53 Flooring Section and ESD TR53 Footwear Section	$< 1.0 \times 10^9$ ohm

\* For situations where an ESD garment is used as part of the wrist strap grounding path, the total system resistance, including the person, garment, and grounding cord, must be less than  $3.5 \times 10^7$  ohm.

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# ***Trademarks and Agreements***

## **Patent Information**

This product may be protected by one or more patents.

For further information, please visit: <https://www.grassvalley.com/patents/>

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