



grass valley

A **BELDEN** BRAND

GV FABRIC

COMPACT HIGH-SPEED ETHERNET SWITCHES FOR
BROADCAST IP ROUTING SYSTEMS

Installation Manual

13-06157-030

2019-07-23

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.

Patent Information

This product may be protected by one or more patents.

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

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Title	GV Fabric Installation Manual
Part Number	13-06157-030
Revision	2019-07-24, 09:40

Electrostatic Discharge (ESD) Protection



Electrostatic discharge occurs when electronic components are improperly handled and can result in intermittent failure or complete damage adversely affecting an electrical circuit. When you remove and replace any card from a frame always follow ESD-prevention procedures.

- Ensure that the frame is electrically connected to earth ground through the power cord or any other means if available.
- Wear an ESD wrist strap ensuring that it makes good skin contact. Connect the grounding clip to an unpainted surface of the chassis frame to safely ground unwanted ESD voltages. If no wrist strap is available, ground yourself by touching the unpainted metal part of the chassis.
- For safety, periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms.
- When temporarily storing a card make sure it is placed in an ESD bag.
- Cards in an earth grounded metal frame or casing do not require any special ESD protection.

Certification and Compliance

Safety of Laser Modules

This equipment incorporates modules containing Class 1 lasers. These modules are certified by the manufacturer to comply with:

- IEC/EN 60825-1 Safety of laser products
- IEC 60950-1 Safety of information technology equipment

Restriction on Hazardous Substances (RoHS)

GVF-1032-100G		有毒有害物质或元素 (Toxic or Hazardous Substances and Elements)					
部件名称 Part name	铅 (Pb)	汞(Hg)	镉(Cd)	六价铬 (Cr6)	多溴联苯 (PBB)	多溴二苯 (PBDE)	
电缆及电缆组件 Cables and Cable Assemblies	O	O	O	O	O	O	
电路模块 Circuit Modules	X	O	O	O	O	O	
组装风扇 Fan Assemblies	X	O	O	O	O	O	
GVF-1032-100G		有毒有害物质或元素 (Toxic or Hazardous Substances and Elements)					
部件名称 Part name	铅 (Pb)	汞(Hg)	镉(Cd)	六价铬 (Cr6)	多溴联苯 (PBB)	多溴二苯 (PBDE)	
电路模块 Circuit Modules	X	O	O	O	O	O	

O: 表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T 11363-2006规定的限量要求以下。

O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T 11363-2006规定的限量要求。

X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006.

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Technical explanations:

This statement is based on the information provided by our suppliers of components and collected through Grass Valley's environmental management system. Grass Valley believes this environmental information to be correct but cannot guarantee its completeness or accuracy as it is based on data received from sources outside our company. All specifications are subject to change without notice.

Electromagnetic Compatibility



This equipment has been tested for verification of compliance with FCC Part 15, Subpart B requirements for Class A digital devices.

Note: 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.



This equipment has been tested and found to comply with the requirements of the EMC directive 2004/108/CE:

- EN 55022 Class A radiated and conducted emissions
- EN 61000-3-2 Harmonic current emission limits
- EN 61000-3-3 Voltage fluctuations and flicker limitations
- EN 61000-4-2 Electrostatic discharge immunity
- EN 61000-4-3 Radiated electromagnetic field immunity - RF
- EN 61000-4-4 EFT immunity
- EN 61000-4-5 Surge immunity
- EN 61000-4-6 Conducted immunity
- EN 61000-4-8 EMP immunity
- EN 61000-4-11 Voltage-dips, short-interruption and voltage variation immunity

Environmental Information

European (CE) WEEE directive.



This symbol on the product(s) means that at the end of life disposal it should not be mixed with general waste.

Visit www.grassvalley.com for recycling information.

Grass Valley believes this environmental information to be correct but cannot guarantee its completeness or accuracy since it is based on data received from sources outside our company. All specifications are subject to change without notice.

If you have questions about Grass Valley environmental and social involvement (WEEE, RoHS, REACH, etc.), please contact us at environment@grassvalley.com.

1 Introduction

Introduction to GV Fabric (GVF-1032-100G & GVF-516-100G models)

GV Fabric is a COTS (commercial-off-the-shelf) IP switch enabling format agnostic signal routing for small to enterprise-wide installations. Operation has been rigorously tested with Grass Valley IP edge devices and in typical workflow scenarios, thus ensuring all the main equipment for an “end-to-end” IP solution can now be sourced from a single leading supplier. Its seamless integration with proven and established GV Convergent router control and Orbit configuration and monitoring systems dramatically reduces deployment timelines, system upgrading, fault finding and customizing workflows. GV Fabric's scalable technology means it's equally at home in spine-and-leaf or monolithic type structures both for single or redundant network schemes. It's non-blocking architecture exhibits zero packet loss at very low latency and is fully compliant with PTPv2 timing protocol for device and network timing offering alternative clock distribution schemes including transparent and boundary clock mechanisms.

Two versions of GV Fabric are available: A 1 RU full rack width 32x QSFP28 port switch and a 1 RU half-rack width 16x QSFP28 port switch providing the equivalent of up to 2048x2048 HD (256x256 4K UHD-1) and 1024x1024 HD (128x128 4K UHD-1) signal switching capacities, respectively. All ports are fully independent and auto-sensing supporting Ethernet speeds of 1/10/25/40/50 and 100 GbE.

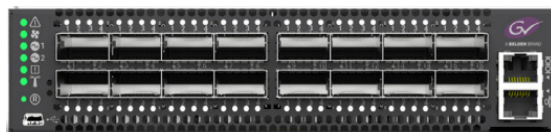
GVF-1032-100G Front View

GV Fabric 100 GbE 1 RU Ethernet switch, 32 QSFP28 ports with 2 power supplies (AC). Includes rail kit.



GVF-516-100G Front View

GV Fabric 100 GbE 1 RU half-width Ethernet switch, 16 QSFP28 ports with 2 power supplies (AC). Rail kit must be purchased separately.



GVF-1032-100G Rear View



GVF-516-100G Rear View



Speed and Switching Capabilities

The table below describes maximum throughput and interface speed per system model.

Model	10/25GbE SFP28 Interfaces*	40/50/56/100GbE QSFP28 Interfaces*	Max Throughput
GVF-1032-100G	64 (using QSFP to SFP splitter cables)	32	6.4Tb/s
GVF-516-100G	64 (using QSFP to SFP splitter cables)	16 (or 32 50GbE interfaces when using QSFP to 2xQSFP splitter cables)	3.2Tb/s

Management Interfaces, PSUs and Fans

The table below lists the various management interfaces, PSUs and fans per system model.

Model	USB	MGT	Console	PSU	Fan
GVF-1032-100G	Rear	Rear (2 ports)	Rear	2 Units	4 Units
GVF-516-100G	Front (mini USB)	Front (1 port)	Front	2 Units (non replaceable)	4 Units (non replaceable)

2 Installation

System Installation and Initialization

Installation and initialization of the system require attention to the normal mechanical, power, and thermal precautions for rack-mounted equipment.

Note: The rack mounting holes conform to the EIA-310 standard for 19-inch racks. Take precautions to guarantee proper ventilation in order to maintain good airflow at ambient temperature.

Note: Unless otherwise specified, Grass Valley products are designed to work in an environmentally controlled data center with low levels of gaseous and dust (particulate) contamination. The operation environment should meet severity level G1 as per ISA 71.04 for gaseous contamination and ISO 14644-1 class 8 for cleanliness level.

The installation procedure for the system involves the following phases:

Step	Procedure	See
1	Follow the safety warnings	Safety Warnings
2	Pay attention to the air flow consideration within the system and rack	Air Flow
3	Make sure that none of the package contents is missing or damaged	Package Contents
4	Mount the system into a rack enclosure	19" System Mounting Options
5	Power on the system	Initial Power On
6	Perform system bring-up	System Bring-up
7	[Optional] FRU replacements	FRU Replacements

Air Flow

Note: The following information does not apply to GVF-516-100G. In the GVF-516-100G systems, the fan units are non-replaceable.

GVF-1032-100G air flow pattern:

- Connector (front) side inlet to power side outlet - marked with red power supplies/fans FRUs' handles.

GVF-1032-100G Air Flow Direction Marking - Connector Side Inlet to Power Side Outlet



Note: All servers and systems in the same rack should be planned with the same airflow direction.

All FRU components need to have the same air flow direction. A mismatch in the air flow will affect the heat dissipation.

Package Contents

Before installing your new system, unpack it and check against the parts list below that all the parts have been sent. Check the parts for visible damage that may have occurred during shipping.

The GVF-1032-100G package content is as follows:

- 1 - System
- 1 - Rail kit
- 1 - Power cable for each power supply unit - Type C13-C14
- 1 - Cable retainer for each power supply unit
- 1 - DB9 to RJ-45 2m harness

The GVF-516-100G package content is as follows:

- 1 - System
- 1 - Power cable for each power supply unit - Type C13-C14
- 1 - DB9 to RJ-45 2m harness

Note: A designated rail kit for the GVF-516-100G systems can be purchased separately

Note: If anything is damaged or missing, contact your sales representative at support@GrassValley.com

19" System Mounting Options

- By default, the GVF-1032-100G systems are shipped with the static rail kit described GVF-1032-100G Static Rail Kit.
- The GVF-516-100G system is shipped without a rail kit and a designated rail kit can be purchased separately.
- For installation instructions, see GVF-516-100G Side by Side Mounting Rail Kit.

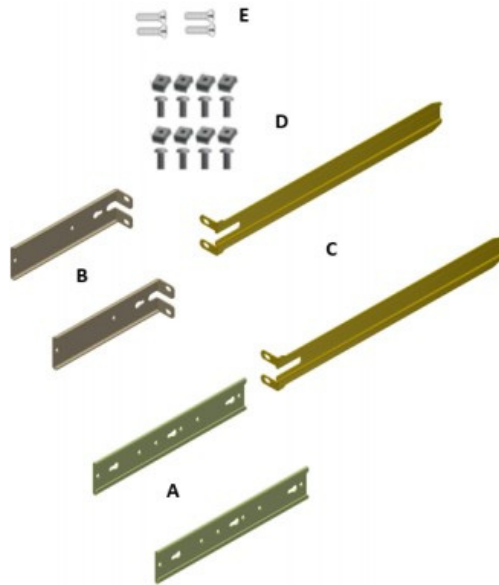
GVF-1032-100G Static Rail Kit

The following parts are included in the static rail kit (see figure below):

- 2x Rack mount rails (A)
- 2x Rack mount brackets (B)
- 2x Rack mount blades (C)
- 8x M6 Standard cage nuts^{1 2} and 8x M6 Standard pan-head Phillips screws¹ (D)
- 4x Phillips100 DEG F.H TYPE-I ST.ST 6-32 X 1/4 screws with a round patch (E)

¹Other threads are available by special order: M5, 10-32, 12-24. ²G-type cage-nut is available by special order.

Rack Rail Kit Parts



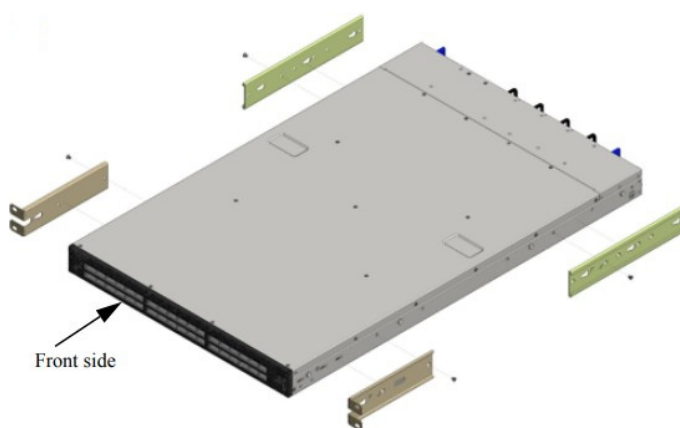
Prerequisites:

Before mounting the system to the rack, select the way you wish to place the system. Pay attention to the airflow within the rack cooling, connector and cabling options.

While planning how to place the system, consider the two installation options shown in the figure below, and review the following points:

- Make sure the system air flow is compatible with your installation selection. It is important to keep the airflow within the rack in the same direction.
- The FRU side is extractable. Mounting the rack brackets inverted to the FRU side (Option 2) will allow you to slide the FRUs, in and out.

Installation and Mounting Brackets

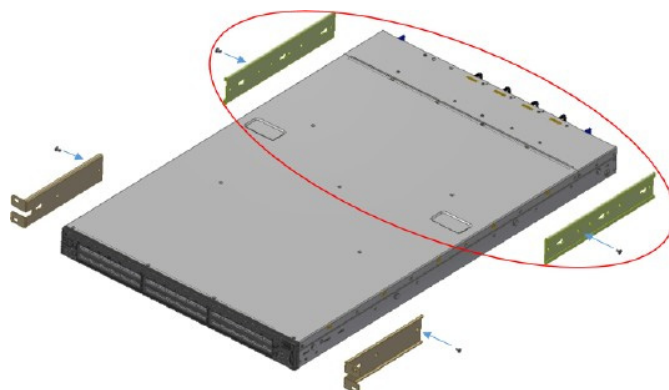


To mount the system into the rack:

IMPORTANT: At least two people are required to safely mount the system in the rack

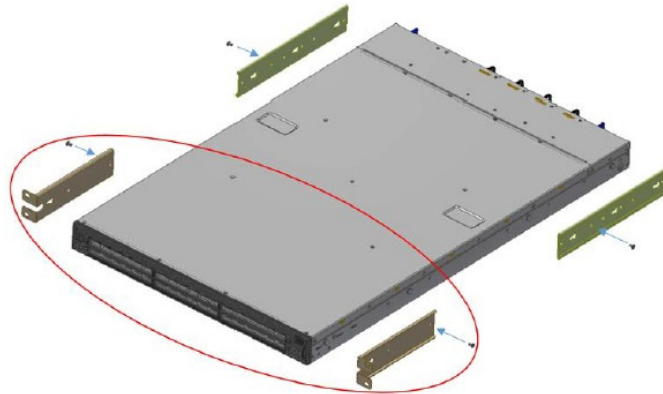
1. Attach the left and right rack mount rails (A) to the switch, by gently pushing the switch chassis' pins through the slider key holes, until locking occurs.
2. Secure the chassis in the rails by screwing 2 flat head Phillips screws (E) in the designated points with a torque of 1.5 ± 0.2 Nm.

Attaching the Rails to the Chassis



3. Attach the left and right rack mount brackets (B) to the switch, by gently pushing the switch chassis' pins through the slider key holes, until locking occurs. Secure the system in the brackets by screwing the remaining 2 flat head Phillips screws (E) in the designated points with a torque of 1.5 ± 0.2 Nm.

Attaching the Brackets to the Chassis



4. Install 8 cage nuts in the desired slots of the rack: 4 cage nuts in the non-extractable side (in the top and bottom holes only) and 4 cage nuts in the extractable side.

Installing the Cage Nuts

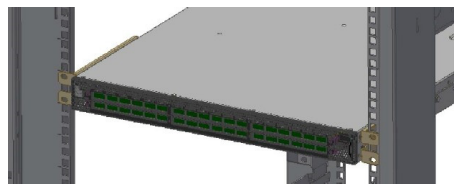


Note: While each rack U (unit) consists of three holes, the cage nut should be installed vertically with its ears engaging the top and bottom holes only.

While your installation partner is supporting the system's weight, perform the following steps:

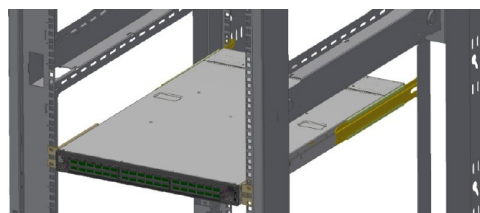
5. Mount the system into the rack enclosure, and attach the brackets installed on the system to the rack's posts. Secure the brackets to the rack's posts by inserting four M6 screws in the designated cage nuts, as described in the figure below. Do not tighten the screws yet.

Attaching the Brackets to the Rack



6. Slide the two blades into the left and right rails, and adjust them to fit your rack's depth. Use four M6 screws (D) to fix the blades into the rack. Do not tighten the screws yet.

Sliding the Blades in the Rails



7. Secure the system in the rack by tightening the 8 screws inserted in Step 5 and Step 6 with a torque of 4.5 ± 0.5 Nm.

Removing the System from the Rack

To remove a unit from the rack:

- 1 Turn off the system and disconnect it from peripherals and from the electrical outlet.

While your installation partner is supporting the system's weight:

- 2 Loosen the screws attaching the brackets to the rack. Do not remove them yet.
- 3 Loosen the screws attaching the blades to the rack, and pull the blades towards you, while your partner is holding the system.
- 4 Extract the loosened screws from Step 2 and dismount the system from the rack.
- 5 Remove the rails and brackets from the chassis by unscrewing 8 screws.

GVF-516-100G Side Slide Mounting Rail Kit

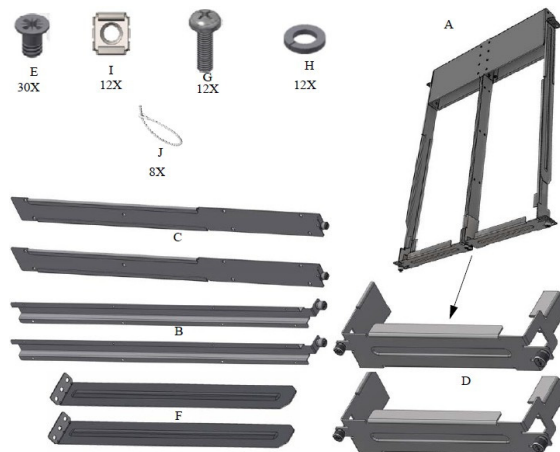
Note: A designated rail kit for the GVF-516-100G systems can be purchased separately.

This section is relevant to short-depth systems that allow such a form of installation only.

Model	Description
GVF-5XX-RK2	Rack installation kit for GV Fabric 1U half width switches allows installation of one or two switches side-by-side into standard depth racks

The following parts are included in the rail kit (see figure below):

- 1 metal frame for two systems (A)
- 2 system mounting blades with 8 screw holes - the kit contains enough rails to install 2 systems (B)
- 2 system mounting blades with 7 screw holes - the kit contains enough rails to install 2 systems (C)
- 2 blank (installed) covers (D)
- 30 flat head 4-40 screws - the kit contains enough screws to install 2 systems (E)
- 2 frame rail slides (F)
- 10 (+2 spare units) M6 pan head screws (G)
- 10 (+2 spare units) M6 spring washers (H)
- 10 (+2 spare units) M6 spring steel cage nuts (I)
- 6 (+2 spare units) cable-ties (J)



Prerequisites:

Before mounting the system to the rack, select the way you wish to place the system. Pay attention to the airflow within the rack cooling, connector and cabling options.

- The installation kits come with enough system mounted rails and flat head screws to install two systems.
- The 2 system metal frame will fit into racks with from 23.6" (600mm) to 31.5" (800mm) space between the vertical supports.
- You may choose to install your system in the right or in the left part of the metal frame. The following instructions apply to installation in the right part. For installation in the frame's left part, follow the same instructions, while replacing "right" with "left", and vice versa.

To Mount The System into the Rack:

IMPORTANT: At least two people are required to safely mount the system in the rack.

1. Insert the SE (single ended) plugs to the dedicated inlets in the system's rear panel.
2. Carefully position the SE (single ended) cables one on top of the other, and use three cable ties to pair them together (shown in figure).

Note: While pairing the cables, make sure the cables are paired in symmetry to the switch, in order to avoid damaging the cables.

Coupling the Cables with Cable-ties

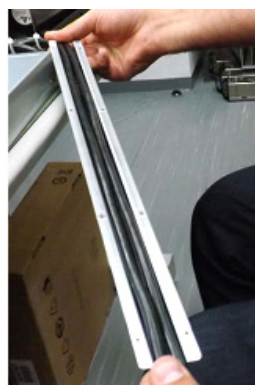


Coupled Cables - Rear View



3. Place the coupled cables in the designated area within the right flat blade (the blade with 7 screw holes).

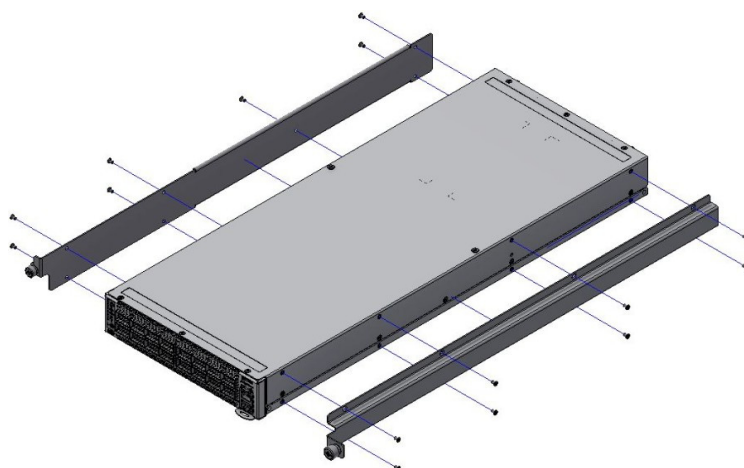
Cables within the Rail



Note: In the next step you will be attaching the mounting rails to the switch sides. Before doing that, make sure the cables are laid properly within them. Avoid using excessive pressure, as it can damage the cables.

4. While holding the cables stably together in the blade's rail with one hand, use your other hand to secure the blades to the chassis. Screw the right blade with eight 4-40 flathead screws, and the left blade with seven 4-40 flathead screws. The recommended torque is 0.49-0.54 Nm.

Attach the Blades to the System



Attached Rail with Threaded Cables - Top View



5. Slide the two frame slides into the dedicated rails in the metal frame.

Sliding the Frame Sliders into the Rails



6. Install ten cage nuts in the desired slots of the rack: three cage nuts in the front part of each cabinet post, and two cage nuts in the rear part of each cabinet post.

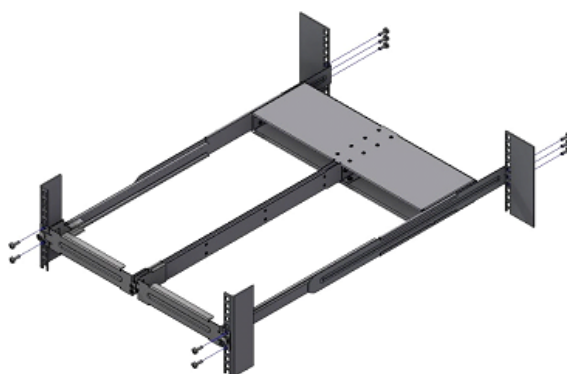
Installing the Cage Nuts



7. Attach the frame to the rack by using ten spacer cage nuts, and screw ten M6 pan head screws - four in the front part of the rack, and 6 in its rear part. The recommended torque is 6.55-7.35 Nm. See figure above.

8. Place the frame in the cabinet.

Attaching the Frame to the Rack

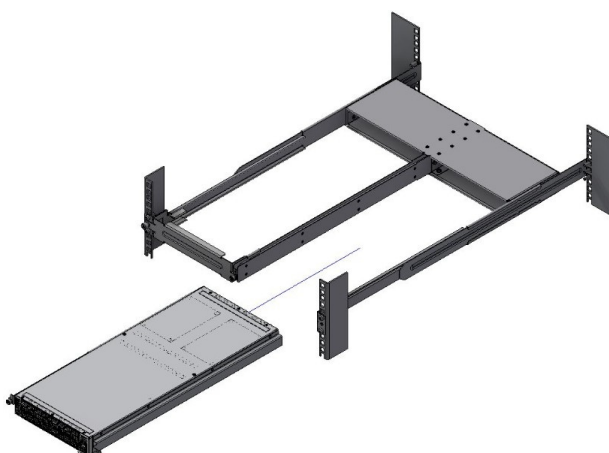


IMPORTANT: Do not remove both of the blank covers at the same time. When no system is installed, at least one of them should be present to support the frame's partition.

9. Remove the blank cover from the selected slot in the frame, and mount the system by sliding its mounting blades into the frame. Repeat this step to install an additional system in the other side of the frame, if needed.

10. Tighten the capture nuts to secure the system in the frame. The recommended torque on the right screw is 3.0-3.36 Nm while on the left screw recommended torque is 0.89-0.98 Nm.

Sliding the System's Blades in the Rails



3 Cable Installation

Cable Installation Overview

All cables can be inserted or removed with the unit powered on.

To insert a cable, press the connector into the port receptacle until the connector is firmly seated. The LED indicator, corresponding to each data port, will light when the physical connection is established. When a logical connection is made, the relevant port LED will turn on.

To remove a cable, disengage the locks and slowly pull the connector away from the port receptacle. The LED indicator

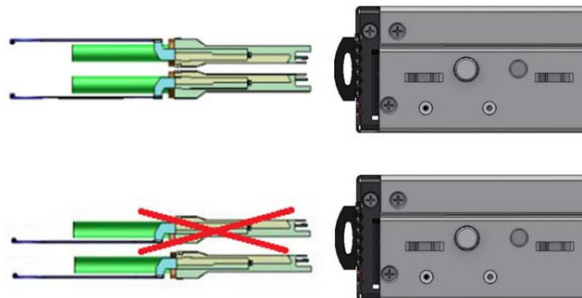
for that port will turn off when the cable is unseated.

For full cabling guidelines, ask your Grass Valley representative for a copy of Grass Valley Cable Management Guidelines.

For more information about port LEDs, refer to Port LEDs.

IMPORTANT: Do not force the cable into the cage with more than 40 newtons / 9.0 pounds / 4kg force. Greater insertion force may cause damage to the cable or to the cage.

GVF-1032-100G and GVF-516-100G QSFP Cable Orientation



Splitter (Breakout) Cables and Adapters

A 100GbE port can be split to two 50GbE ports, or to four (or less) 25GbE ports, using a Grass Valley splitter cable. For GVF-1032-100G systems, splitting a 100GbE QSFP28 port to 4 separate 25GbE ports (using a splitter cable) disables (unmaps) the 100GbE port below it. See "GVF-1032-100G Splitting Options" below.

Using Splitter (Breakout) Cables

When using this feature, you should log into the CLI and configure the individual ports to be 'split-2' or 'split-4'.

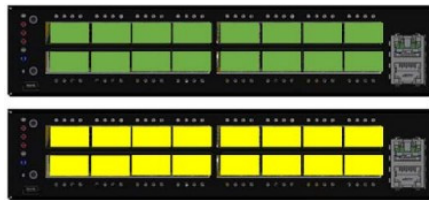
GVF-1032-100G Splitting Options

The top QSFP28 ports marked in green are splittable to 4 SFP28 ports, each.
The bottom QSFP28 ports (gray) are blocked when the upper ports are in split mode.
All QSFP28 ports can be split to 2 QSFP28 ports.



GVF-516-100G Splitting Options

All QSFP28 ports are splittable. Each port can be split into 4xSFP28 (10/25G) or 2xQSFP28 (50G) ports. There are no blocking requirements.



Initial Power On

Each system's input voltage is specified in the Specifications chapter.



The power cords should be standard 3-wire AC power cords including a safety ground and rated for 15A or higher.

IMPORTANT: The system platform will automatically power on when AC power is applied. There is no power system. Check all boards, power supplies, and fan tray modules for proper insertion before plugging in a power cable.

1. Plug in the first power cable.
2. Plug in the second power cable.
3. Wait for the System Status LED to turn green.

IMPORTANT: It may take up to five minutes to turn on the system. If the System Status LED shows red after five minutes, unplug the system and call your Grass Valley representative for assistance.

4. Check the System Status LEDs and confirm that all of the LEDs show status lights consistent with normal operation (initially flashing, and then moving to a steady color) as shown in the figures below. For more information, refer to LED Notifications.

System Status LEDs 5 Minutes After Power On in GVF-1032-100G	System Status LEDs 5 Minutes After Power On in GVF-516-100G
	

IMPORTANT: After inserting a power cable and confirming the green System Status LED light is on, make sure that the Fan Status LED shows green. If the Fan Status LED is not green, unplug the power connection and check that the fan module is inserted properly and that the mating connector of the fan unit is free of any dirt and/or obstacles. If no obstacles were found and the problem persists, call your Grass Valley representative for assistance.

Two Power Inlets - Electric Caution Notifications:

IMPORTANT: Risk of electric shock and energy hazard. The two power supply units are independent. Disconnect all power supplies to ensure a powered down state inside of the switch platform.

ATTENTION Risque de choc et de danger e'lectriques. Le de'branchment d'une seule alimentation stabilise'e ne de'branch uniquement qu'un module "Alimentation Stabilise'e". Pour isoler completement le module en cause, Il faut de'brancher toutes les alimentations stabilise'es

System Bring-Up

For bring-up of a switch system, see Configuring Network Attributes.

Configuring Network Attributes

The procedures described in this chapter assume that you have already installed and powered on the system according to the instructions in this document. The system comes with a pre-configured DHCP. If you wish to disable it, refer to Disable Dynamic Host Configuration Protocol (DHCP). In case a manual configuration is required, please refer to the instructions in Manual Host Configuration.

3.13.1.1 Manual Host Configuration

To perform initial configuration of the system:

Step 1. Connect a host PC to the Console RJ45 () port of the system, using the supplied harness cable (DB9 to RJ45). Make sure to connect to the Console RJ45 port and not to the (Ethernet) MGT () port.

Step 2. Configure a serial terminal program (IOIOxample, HyperTerminal, minicom, or Tera Term) on your host PC with the settings described in the table below. Once you perform that, you should see the CLI prompt of the system.

Serial Terminal Program Configuration

Parameter	Setting
Baud Rate	115200
Data bits	8
Stop bits	1
Parity	None
Flow Control	None

Step 3. Login as admin and use admin as password. On the first login, the configuration wizard will start.

Step 4. To configure network attributes and other initial parameters to the system, follow the configuration wizard as shown in the Configuration Wizard Session table on the next page.

Configuration Wizard Session

Wizard Session Display	Comments
Grass Valley configuration wizard Do you want to use the wizard for initial configuration? yes	You must perform this configuration the first time you operate the system or after resetting the system. Type 'y' and then press <Enter>.
Step 1: Hostname? [switch-1]	If you wish to accept the default hostname, press <Enter>. Otherwise, type a different hostname and press <Enter>.
Step 2: Use DHCP on mgmt0 interface? [no] yes	Perform this step to obtain an IP address for the system. (mgmt0 is the management port of the system). If you wish the DHCP server to assign the IP address, type 'yes' and press <Enter>. If you type 'no' (no DHCP), then you will be asked whether you wish to use the 'zeroconf' configuration or not. If you enter 'no' (no Zeroconf), you must enter a static IP, and the session will continue.
Step 3: Enable IPv6? [yes]	The management interface will be able to use IPv6 addresses. If you enter "no" (no IPv6), you will automatically be referred to Step 6.
Step 4: Enable IPv6 auto-config (SLAAC) on mgmt0 interface? [no]	This turns on auto-configuration of the IPv6 addresses. This is unsuitable for DHCPv6.
Step 5: Enable DHCPv6 on mgmt0 interface? [no]	To enable DHCPv6 on the MGMT0 interface.
Step 6: Admin password (Press <Enter> to leave unchanged)? <new_password> Step 6: Confirm admin password? <new_password>	To avoid illegal access to the machine, please type a password and then press <Enter>. Then confirm the password by re-entering it. Note that password characters are not printed.
You have entered the following information: <A summary of the configuration is now displayed.> To change an answer, enter the step number to return to or hit <enter> to save changes and exit. Choice: <Enter> Configuration changes saved.	The wizard displays a summary of your choices and then asks you to confirm the choices or to re-edit them. Either press <Enter> to save changes and exit, or enter the configuration step number that you wish to return to. Note:To re-run the configuration wizard, run the command "configurationjump-start" in Config mode.

The table below shows an example of static IP configuration for mgmt0 interface.

Configuration Wizard Session - Static IP Configuration

```
Grass Valley configuration wizard

Do you want to use the wizard for initial configuration? yes

Step 1: Hostname? []
Step 2: Use DHCP on mgmt0 interface? [yes] no Step 3: Use zeroconf on
mgmt0 interface? [no]
Step 4: Primary IP address? [for example 192.168.10.4] 10.10.10.10 Mask
length may not be zero if address is not zero (interface eth0) Step 5:
Netmask? [0.0.0.0] 255.255.255.0
Step 6: Default gateway? [for example 192.168.10.1] 10.10.10.255 Step 7:
Primary DNS server?
Step 8: Domain name?
Step 9: Enable IPv6? [yes]
Step 10: Enable IPv6 autoconfig (SLAAC) on mgmt0 interface? [no] Step
11: Admin password (Enter to leave unchanged)?

To change an answer, enter the step number to return to. Otherwise hit
<enter> to save changes and exit.
Choice:
Configuration changes saved.

To return to the wizard from the CLI, enter the "configuration jump-
start"
command from configure mode. Launching CLI...
```

Step 5. Before attempting a remote (for example, SSH) connection to the system, check the mgmt0 interface configuration. Specifically, verify the existence of an IP address. To check the current mgmt0 configuration, enter the following command:

```
switch01 (config) # show interfaces mgmt0
Interface mgmt0 status:
Comment:
Admin up:          yes
Link up:yes
DHCP running:     yes
IP address:       192.168.1.100
Netmask:          255.255.255.0
IPv6 enabled:     yes
Autoconf enabled: no
Autoconf route:   yes
Autoconf privacy: no
DHCPv6 running:  no
IPv6 addresses:   1
IPv6 address:     fe80::202:c9ff:fe63:b55a/64
Speed:            1000Mb/s (auto)
Duplex:           full (auto)
Interface type:   ethernet
Interface source: physical
MTU:              1500
HW address:       00:02:C9:63:B5:5A

RX bytes:          968810197      TX bytes:      1172590194
RX packets:        10982099      TX packets:    10921755
RX mcast packets: 0                TX discards:  0
RX discards:      0                TX errors:     0
RXerrors:         0                TX overruns:   0
RX overruns:      0                TX carrier:    0
RX frame:         0                TX collisions: 0
                                      TX queue len: 1000

switch01 (config) #
```

Step 6. Check the software version embedded in your system, using the command 'show version'. Compare this version to the latest version that can be retrieved from Grass Valley support site.

Disable Dynamic Host Configuration Protocol (DHCP)

DHCP is used for automatic retrieval of management IP addresses.

If a user connects through SSH, runs the wizard and turns off DHCP, the connection is immediately terminated, as the

management interface loses its IP address. In such a case, the serial connection should be used.

```
Note: <localhost># ssh admin@<ip-address>
Grass Valley Switch
Management Password:
Grass Valley Switch
Grass Valley configuration wizard
Do you want to use the wizard for initial
configuration? yes
Step 1: Hostname? [my-switch]
Step 2: Use DHCP on mgmt0 interface? [yes] no
<localhost>#
```

Remote Connection

Once the network attributes are set, you can access the CLI via SSH or the WebUI via HTTP/HTTPS. To access the CLI, perform the following steps:

1. Set up an Ethernet connection between the system and a local network machine using a standard RJ45 connector.
2. Start a remote secured shell (SSH) using the command: `ssh -l <username> <IP_address>`

```
# ssh -l <username> <ip_address>
Grass Valley Switch Management

Password:
```

3. Login as admin (default username is admin, password is admin).
4. Once you get the CLI prompt, you are ready to use the system.

FRU Replacements

Note: The following information does not apply to the GVF-516-100G. The GVF-516-100G includes two non-replaceable power supply units and four non-replaceable fan units

Power Supply

Grass Valley systems that are equipped with two replaceable power supply units work in a redundant configuration. Either unit may be extracted without bringing down the system.

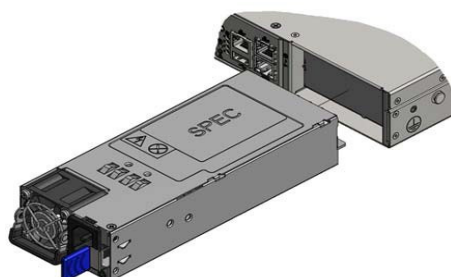
IMPORTANT: Make sure that the power supply unit that you are NOT replacing is showing green for the power supply unit LED.

IMPORTANT: Power supply units have directional air flows similar to the fan module. The fan module airflow must coincide with the airflow of all of the power supply units. If the power supply unit airflow direction is different from the fan module airflow direction, the system's internal temperature will be affected. For power supply unit air flow direction, refer to Air Flow.

To extract the power supply unit:

IMPORTANT

1. Remove the power cord from the power supply unit.
2. Grasping the handle with your hand, push the latch release with your thumb while pulling the handle outward. As the power supply unit unseats, the power supply unit status LEDs will turn off.
3. Remove the power supply unit. PS Unit Pulled Out



To insert a power supply unit:

1. Make sure the mating connector of the new unit is free of any dirt and/or obstacles.

IMPORTANT: Do not attempt to insert a power supply unit with a power cord connected to it

2. Insert the power supply unit by sliding it into the opening, until a slight resistance is felt.
3. Continue pressing the power supply unit until it seats completely. The latch will snap into place, confirming the proper installation.
4. Insert the power cord into the supply connector.
5. Insert the other end of the power cord into an outlet of the correct voltage.

IMPORTANT: The green power supply unit indicator should light. If it does not, repeat the whole procedure to extract the power supply unit and re-insert it.

Fans

The system can fully operate if one fan FRU is dysfunctional. Failure of more than one fan is not supported.

IMPORTANT: Make sure that the fans have the air flow that matches the model number. An air flow opposite to the system design will cause the system to operate at a higher (less than optimal) temperature. For power supply unit air flow direction, refer to Air Flow.

To remove a fan unit:

1. Grasping the handle with your right hand, push the latch release with your thumb while pulling the handle outward. As the fan unit unseats, the fan unit status LEDs will turn off.
2. Remove the fan unit.

To insert a fan unit:

1. Make sure the mating connector of the new unit is free of any dirt and/or obstacles.
2. Insert the fan unit by sliding it into the opening until slight resistance is felt. Continue pressing the fan unit until it seats completely.

IMPORTANT: The green Fan Status LED should light. If not, extract the fan unit and reinsert it. After two unsuccessful attempts to install the fan unit, power off the system before attempting any system debug.

Fan Module Latches



4 Interfaces

Interfaces Overview

The systems support the following interfaces:

- Data interfaces - Ethernet: 1/10/25/40/50/56/100GbE
- USB port (mini USB in SN2100)
- RS232 Console port
- Management interface(s) (Eth. RJ45) - 100MbE/1GbE
- Reset button
- Status and Port LEDs

In order to review the full configuration options matrix, refer to Management Interfaces, PSUs and Fans.

Data Interfaces

The data interfaces use QSFP28 connectors. The full list of interfaces per system is provided in Speed and Switching Capabilities.

Each QSFP28 port can be connected with a QSFP28 cable or connector for 25/40/50/56/100GbE, or 1/10/25GbE when connecting through Grass Valley QSFP28 to SFP28 adapters, hybrid or split cables. The systems offer support of up to 3.5W transceivers in all QSFP28 ports, and support of up to 1.5W in all SFP28 ports.

Some QSFP28 ports and SFP28 ports support higher power consumption transceivers, as detailed in the following table:

Model Family	Ports	Maximum High Power Support
GVF-1032-100G	1, 2, 31, 32	4.5W(a)
GVF-516-100G	1, 2, 15, 16	4.5W(a)

Speed

Ethernet speed must be set manually. The system's ports can be manually configured to run at speeds ranging from 10GbE to 100GbE (for more details, see Specifications). To change the port speed configuration, use the command "speed" under interface configuration mode.

RS232 (Console)

The port labeled "Console" is an RS232 serial port on the back side of the chassis in GVF-1032-100G and on the front side of GVF-516-100G. It is used for initial configuration and debugging. Upon first installation of the system, you need to connect a PC to this interface and configure network parameters for remote connections.

Management

The RJ45 Ethernet ports labeled "MGT" provide access for remote management. The management ports are configured with auto-negotiation capabilities by default (100MbE to

1GbE). The management ports' network attributes (such as IP address) need to be pre-configured via the RS232 serial console port or by DHCP before use.

Note: In the GVF-516-100G systems there is only one MGT port

IMPORTANT: Make sure you use only FCC compliant Ethernet cables.

USB

The USB interface is USB 2.0 (mini USB in GVF-516-100G) compliant (USB 1.0 is not supported) and can be used by the software to connect to an external disk for software upgrade or file management. The connector comes in a standard USB shape.

To view the full matrix of the USB configuration options, refer to Management Interfaces, PSUs and Fans.

Note: Do not use excessive force when inserting or extracting the USB disk to and from the connector.

Reset Button

The reset button is located on the rear side of the system next to the fan status LEDs in GVF-1032-100G, and on the front side of the GVF516-100G. This reset button requires a tool to be pressed.

IMPORTANT: Do not use a sharp pointed object such as a needle or a push pin for pressing the reset button. Use a flat object to push the reset button.

To reset the system and the CPU of its management board, push the reset button and keep it pressed for up to 15 seconds.

To reset the system, the CPU of its management board, and the "admin" password, push the reset button and keep it pressed for at least 15 seconds. When using this system, this should allow you to enter without a password and set a new password for the user "admin".






Status and Port LEDs

See LED Notifications.

LED Notifications

The system's LEDs are an important tool for hardware event notification and troubleshooting.



LEDs Symbols

Symbol	Name	Description	Normal Conditions
	System Status LED	Shows the health of the system.	Green/Flashing green when booting
	Fan Status LED	Shows the health of the fans.	Green
a 	Power Supply Units LEDs	Shows the health of the power supply units.	Green
	Bad Port LED	Lights up when a symbol error is detected on one of the ports	Off
	Unit Identifier LED	Lights up on command through the CLI.	Off or blue when identifying a port


a. There are two PSU LEDs in GVF-516-100G.

System Status LED

Both of the System Status LEDs (front and back, if exist) supply identical information. System Status LEDs - Front and Rear Sides in GVF-1032-100G

Front Panel	Description	Rear Panel
	Both of these LEDs in the red ovals show the system's status	

System Status LED in GVF-516-100G

Front Panel	Description
	The LED in the read oval is located on the front panel of GVF-516-100G. There are no LEDs in the rear panel of GVF-516-100G.



IMPORTANT: It may take up to five minutes to turn on the system. If the System Status LED shows red after five minutes, unplug the system and call your Grass Valley representative for assistance.

System Status LED Assignments


LED Behavior	Description	Action Required
Solid Green	The system is up and running normally	N/A
Flashing Green	The system is booting up	Wait up to five minutes for the end of the booting process.
Solid Red	Major error has occurred. For example, corrupted firmware, system is overheated etc.	If the System Status LED shows red five minutes after starting the system, unplug the system and call your Grass Valley representative for assistance.

Fan Status LED

Fan Status LED in GVF-1032-100G - Front and Rear Sides

	<p>Both of these LEDs in the red ovals show the fans' status.</p>	
--	---	--

Fan Status LED in GVF-516-100G

<p>The GVF-516-100G systems have a front fan LED only.</p>	
--	--

Fan Status Front LED Assignments

LED Behavior	Description	Action Required
Solid Green	All fans are up and running.	N/A
Solid Red	Error, one or more fans are not operating properly.	The faulty FRUs should be replaced.
Off	System boot	N/A

Fan Status Rear LED Assignments (One LED per Fan)

LED Behavior	Description	Action Required
Solid Green	A specific fan unit is operating.	N/A
Solid Red	A specific fan unit is missing or not operating properly.	The fan unit should be replaced.
Off	System boot	N/A

Note: The table on the previous page - Fan Status Rear LED Assignments (One LED per Fan) - does not apply to the GVF-516-100G.

IMPORTANT: Risk of Electric Shock! With the fan module removed, power pins are accessible within the module cavity. Do not insert tools or body parts into the fan module cavity.

Power Supply Status LEDs

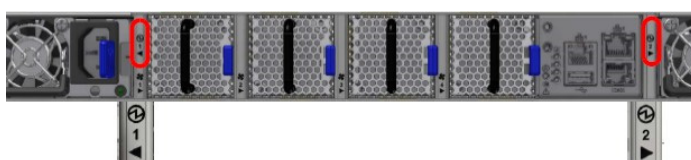
Note: The following information does not apply to the GVF-516-100G. In these systems, the power supply units are non-replaceable, and there is a designated LED for each unit in the system's front panel. (Front panel figures are located in the Introduction.)

Power Status LED



There are two power supply inlets in the system (for redundancy). The system can operate with only one power supply connected. In case the power supply is an FRU, a second power supply unit can be added to support hot-swap ability. Each power supply unit has a single 2 color LED on the right side of the unit, that indicates the status of the unit.

GVF-1032-100G Rear Side Panel



The primary power supply (PS) unit is located on the left side, and the secondary unit is located on the right side.

Power Supply Unit Status Front LED Assignments for GVF-1032-100G

LED Behavior	Description	Action Required
Solid Green	All plugged (one or two) power supplies are running normally.	N/A
Solid Red	PSU is faulty or disconnected.	Make sure the AC cable is plugged in and active. If the problem resumes, the FRUs might be faulty, and should then be replaced.
Off	N/A	N/A

Power Supply Unit Status Front LED Assignments for GVF-516-100G

LED Behavior	Description	Action Required
Solid Green	Power supply is running normally.	N/A
Solid Red	PSU is faulty or disconnected.	Make sure the AC cable is plugged in and active. If the problem resumes, the PSU might be faulty.
Off	PSU not present	N/A

The power supply status LEDs on the rear side of the system (in GVF-1032-100G only) are located on the PSUs themselves. Each PSU has one LED of its own.

Power Supply Unit Status Rear LED Assignments

LED Behavior	Description	Action Required
Solid Green	Power supply is running normally.	N/A
Flashing Green 1Hz	AC present / Only 12VSB on (PSU off) or PSU in Smart-on state	Call your Grass Valley representative for assistance.
Amber	AC cord unplugged or AC power lost while the second power supply still has AC input power.	Plug in the AC cord of the faulty PSU.
Flashing Amber	Power supply warning events where the power supply continues to operate; high temp, high power, high current, slow fan.	Call your Grass Valley representative for assistance.
Off	No AC power to all power supplies.	Call your Grass Valley representative for assistance.

Note: The table above (Power Supply Unit Status Rear LED Assignments) does not apply to the GVF-516-100G

Unit Identification LED

The UID LED is a debug feature, that the user can use to find a particular system within a cluster by turning on the UID blue LED.

To activate the UID LED on a switch system, run:

```
switch (config) # led MGMT uid on
```

To verify the LED status, run:

```
switch (config) # show leds
Module LED Status
-----
MGMT UID Blues
```

To deactivate the UID LED on a switch system, run:

```
switch (config) # led MGMT uid on
```

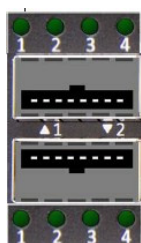
Bad Port LED

The Bad Port LED indicator is used to indicate symbol errors in one or more system ports.

Bad Port LED Assignments

LED Behavior	Description	Action Required
Off	No symbol errors have been received in last few seconds (normal condition).	N/A
Flashing Amber	Error, one or more ports have received symbol errors. Possible causes are: <ul style="list-style-type: none"> • Bad cable • Bad connection • Bad connector 	Check symbol error counters on the system UI to identify the ports. Replace the cable on these ports.

Port LEDs



Port LEDs in Ethernet System Mode

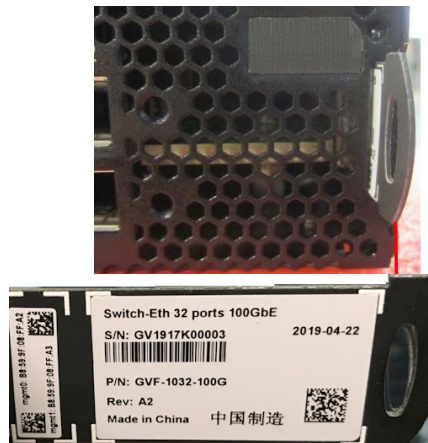
LED Behavior	Description	Action Required
Off	Link is down	Check the cable
Solid Green	Link is up with no traffic.	N/A
Flashing Green	Link is up with traffic.	N/A
Flashing Amber	A problem with the link.	Check the cable, and replace it if needed.

Inventory Information

The system's inventory parameters (such as Serial Number, Part Number, GUID and MAC address) can be extracted from the inventory pull-out tab on the lower right side of the front panel.

In some systems, there is no pull-out tab, and the information is provided on labels in several locations.

GVF-1032-100G Pull-out Tab



GVF-516-100G Pull-out Tab



5 Software Management

Software Management Overview

The system includes an embedded management CPU card that runs management software. This system includes a CLI, WebUI, SNMP, system management software, Ethernet protocols and IB management software (OpenSM).

IMPORTANT: The Ethernet ports for remote management connect to Ethernet systems. These systems must be configured to 100Mb/1Gb auto-negotiation.

Note: No more than two subnet managers are recommended for any single fabric

Upgrading Software

Software Upgrade

Software and firmware updates are available from the Grass Valley Support website. Check that your current revision is the latest one available on the Grass Valley Support website. If you do not have the latest revision, upgrade your software using the CLI or the GUI. Copy the updated software to a known location on a remote server within the user's LAN.

Prior to updating, read and follow all of the instructions regarding the updating of the software on your system.

Switch Firmware Update

The systems do not require firmware updating. Firmware updating is done through the management software.

6 Troubleshooting

Troubleshooting Guide

Problem Indicator	Symptoms	Cause and Solution
LEDs	System Status LED is blinking for more than 5 minutes	Cause: Software did not boot properly and only firmware is running. Solution: Connect to the system via the console port, and check the software status. You might need to contact an FAE if the software did not load properly.
	System Status LED is red	Cause: <ul style="list-style-type: none"> • Critical system fault (CPU error, bad firmware) • Over temperature Solution: <ul style="list-style-type: none"> • Check environmental conditions (room temperature)
	Fan Status LED is red	Cause: Possible fan issue Solution: <ul style="list-style-type: none"> • Check that the fan is fully inserted and nothing blocks the airflow • Replace the fan FRU if needed (possible in GVF-1032-100G only)
	PSU Status LED is red	Cause: Possible PSU issue Solution: <ul style="list-style-type: none"> • Check/replace the power cable • Replace the PSU if needed (possible in GVF-1032-100G only)

Problem Indicator	Symptoms	Cause and Solution
System boot failure while using the software	Software upgrade failed on x86 based systems	<p>Solution:</p> <ul style="list-style-type: none"> • Connect the RS232 connector (CONSOLE) to a laptop. • Push the system's reset button. • Press the ArrowUp or ArrowDown key during the system boot. GRUB menu will appear. For example: <pre> Default image: 'SX_X86_64 SX_3.4.0008 2014-11-10 20:07:51 x86_64' Press enter to boot this image, or any other key for boot menu Booting default image in 3 seconds. Boot Menu ----- 0: SX_X86_64 SX_3.4.0008 2014-11-10 20:07:51 x86_64 1: SX_X86_64 SX_3.4.0007 2014-10-23 17:27:34 x86_64 ----- Use the ArrowUp and Arrowdown keys to select which entry is highlighted. Press enter to boot the selected image or 'p' to enter a password to unlock the next set of features. Highlighted entry is 0: " </pre> <ul style="list-style-type: none"> • Select previous image to boot by pressing an arrow key and choosing the appropriate image.

7 Specifications

GV Fabric Models Specifications

GVF-1032-100G

Feature		Value
Mechanical	Size:	Standard - 1.72" (H) x 16.84" (W) x 27" (D). 43.8mm (H) x 427.83mm (W) x 686.8mm (D)
	Mounting:	19" Rack mount
	Weight:	1 PSU: 10.23kg, 2 PSUs: 11.1kg
	Speed:	10/25/40/50/56/100GbE per port
	Connector cage:	32 QSFP28
Environmental	Temperature:	Operational: 0° to 40°C Non-Operational: -40° to 70°C
	Humidity:	Operational: 10% - 85% non-condensing Non-Operational: 10% - 90% non-condensing
	Altitude:	3050m
	Noise level:	71.6 dB(A)
Regulatory	Safety/ EMC:	CB, cTUVus, CE, CU, S_Mark, CE, FCC, VCCI, ICES, RCM, BSMI, KCC, CCC
	RoHS:	RoHS compliant
Power	Input Voltage:	100-127VAC; 50/60Hz 3.5A; 200-240 50/60Hz 2.9A/ 192-288VDC (not certified)
	Global Power Consumption:	100GbE Model Typical power with passive cables (ATIS): 150W Max power with optical cables (assuming 3.5W per port): 398W
Main Devices	CPU:	Intel x86 1.40GHz Dual Core
	PCIe:	4x Gen2.0
	Switch:	GV Fabric™
	Memory:	8GB DDR3 RAM, 32G SSD for systems based on Switch rev. B1 and earlier 8GB DDR3 RAM, 16G SSD for systems based on Switch rev. B2 and higher
Throughput		6.4Tb/s

GVF-516-100G

Feature		Value
Mechanical	Size:	43.8mm (H) x 200mm (W) x 508mm (D) 1.72" (H) x 7.87" (W) x 20" (D)
	Mounting:	19" Rack mount
	Weight:	4.540kg
	Speed:	10/25/40/50/56/100GbE per port
	Connector cage:	16 QSFP28
Environmental	Temperature:	Operational: 0° to 40°C Non-Operational: -40° to 70°C
	Humidity:	Operational: 10% - 85% non-condensing Non-Operational: 10% - 90% non-condensing
	Altitude:	3050m
	Noise level:	73.7 dB(A)
Regulatory	Safety/ EMC:	CB, cTUVus, CE, CU, S_Mark, CE, FCC, VCCI, ICES, RCM, BSMI, KCC, CCC
	RoHS:	RoHS complaint
Power	Input Voltage:	100-127VAC 50/60Hz 4.5A; 200-240 50/60Hz 2.9A
	Global Power Consumption:	100GbE Model Typical power with passive cables (ATIS): 94.3W Max power with optical cables (assuming 3.5W per each QSFP28 port): 248.6W
Main Devices	CPU:	Intel x86 2.40GHz Quad Core
	PCIe:	4x Gen2.0
	Switch:	GV Fabric™
	Memory:	SDRAM: 8GB DDR3L 1600 MT/s SO-DIMM Storage: 16GB Dual Channel MLC M.2-SATA SSD
Throughput		3.2Tb/s



Grass Valley Technical Support

For technical assistance, contact our international support center, at 1-800-547-8949 (US and Canada) or +1 530 478 4148.

To obtain a local phone number for the support center nearest you, please consult the Contact Us section of Grass Valley's website (www.grassvalley.com).

An online form for e-mail contact is also available from the website.

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