



grass valley

A **BELDEN** BRAND

GV MATRIX

COMPACT ADVANCED SDI ROUTER WITH
INTEGRATED MULTIVIEWER

User Manual v1.4

M6103-9700-140

2017-06-26

www.grassvalley.com

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Warranty information is available in the Support section of the Grass Valley Web site (www.grassvalley.com).

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Important Safeguards and Notices

This section provides important safety guidelines for operators and service personnel. Specific warnings and cautions appear throughout the manual where they apply. Please read and follow this important information, especially those instructions related to the risk of electric shock or injury to persons.

Symbols and Their Meanings



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



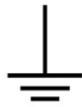
Indicates that the user, operator or service technician should refer to the product manuals for important operating, maintenance, or service instructions.



This is a prompt to note the fuse rating when replacing fuses. 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.



Indicates that the equipment has more than one power supply cord, and that all power supply cords must be disconnected before servicing to avoid electric shock.



The presence of this symbol in or on Grass Valley equipment means that it has been tested and certified as complying with applicable Canadian Standard Association (CSA) regulations and recommendations for USA/Canada.



The presence of this symbol in or on Grass Valley equipment means that it has been tested and certified as complying with applicable Underwriters Laboratory (UL) regulations and recommendations for USA/Canada.



The presence of this symbol in or on Grass Valley equipment means that it has been tested and certified as complying with applicable Intertek Testing Services regulations and recommendations for USA/Canada.



The presence of this symbol in or on Grass Valley product means that it complies with all applicable European Union (CE) directives.



The presence of this symbol in or on Grass Valley product means that it complies with safety of laser product applicable standards.

Warnings



A warning indicates a possible hazard to personnel, which may cause injury or death. Observe the following general warnings when using or working on this equipment:

- Appropriately listed/certified mains supply power cords must be used for the connection of the equipment to the mains voltage at either 120 V AC or 240 V AC.
- This product relies on the building's installation for short-circuit (over-current) protection. Ensure that a fuse or circuit breaker for 120 V AC or 240 V AC is used on the phase conductors.
- Any instructions in this manual that require opening the equipment cover or enclosure are for use by qualified service personnel only.
- Do not operate the equipment in wet or damp conditions.
- This equipment is grounded through the grounding conductor of the power cords. To avoid electrical shock, plug the power cords into a properly wired receptacle before connecting the equipment inputs or outputs.
- Route power cords and other cables so they are not likely to be damaged. Properly support heavy cable bundles to avoid connector damage.
- Disconnect power before cleaning the equipment. Do not use liquid or aerosol cleaners; use only a damp cloth.
- Dangerous voltages may exist at several points in this equipment. To avoid injury, do not touch exposed connections and components while power is on.
- High leakage current may be present. Earth connection of product is essential before connecting power.
- Prior to servicing, remove jewelry such as rings, watches, and other metallic objects.
- To avoid fire hazard, use only the fuse type and rating specified in the service instructions for this product, or on the equipment.
- To avoid explosion, do not operate this equipment in an explosive atmosphere.
- 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.
- Have qualified service personnel perform safety checks after any service.

Cautions



A caution indicates a possible hazard to equipment that could result in equipment damage. Observe the following cautions when operating or working on this equipment:

- This equipment is meant to be installed in a restricted access location.

- When installing this equipment, do not attach the power cord to building surfaces.
- The power supply cord is used as the main disconnect device. Ensure that the socket-outlet is located/installed near the equipment and is easily accessible.
- Use the correct voltage setting. If this product lacks auto-ranging power supplies, before applying power ensure that each power supply is set to match the power source.
- Provide proper ventilation. To prevent product overheating, provide equipment ventilation in accordance with the installation instructions.
- Do not operate with suspected equipment failure. If you suspect product damage or equipment failure, have the equipment inspected by qualified service personnel.
- 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. Refer all servicing to qualified service personnel. Servicing should be done in a static-free environment.
- This unit has more than one power supply cord. Disconnect both power supply cords before servicing to avoid electric shock.
- Follow static precautions at all times when handling this equipment.

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.

Battery Handling



This product includes a backup battery. There is a danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions. Before disposing of your Grass Valley equipment, please review the *Disposal and Recycling Information* appendix.

Cautions for LCD and TFT Displays



Excessive usage may harm your vision. Rest for 10 minutes for every 30 minutes of usage.

If the LCD or TFT glass is broken, handle glass fragments with care when disposing of them. If any fluid leaks out of a damaged glass cell, be careful not to get the liquid crystal fluid in your mouth or skin. If the liquid crystal touches your skin or clothes, wash it off immediately using soap and water. Never swallow the fluid. The toxicity is extremely low but caution should be exercised at all times.

Mesures de sécurité et avis importants

La présente section fournit des consignes de sécurité importantes pour les opérateurs et le personnel de service. Des avertissements ou mises en garde spécifiques figurent dans le manuel, dans les sections où ils s'appliquent. Prenez le temps de bien lire les consignes et assurez-vous de les respecter, en particulier celles qui sont destinées à prévenir les décharges électriques ou les blessures.

Signification des symboles utilisés



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.



Avertit l'utilisateur, l'opérateur ou le technicien de maintenance que des instructions importantes relatives à l'utilisation et à l'entretien se trouvent dans la documentation accompagnant l'équipement.



Invite l'utilisateur, l'opérateur ou le technicien de maintenance 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 mise à la terre de protection. Il faut relier cette borne à la terre avant d'effectuer toute autre connexion à l'équipement.



Identifie une borne de mise à la terre externe qui peut être connectée en tant que borne de mise à la terre 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.



Le symbole ci-contre signifie que l'appareil comporte plus d'un cordon d'alimentation et qu'il faut débrancher tous les cordons d'alimentation avant toute opération d'entretien, afin de prévenir les chocs électriques.



La marque C-UL-US certifie que l'appareil visé a été testé par l'Association canadienne de normalisation (CSA) et reconnu conforme aux exigences applicables en matière de sécurité électrique en vigueur au Canada et aux États-Unis.



La marque C-UL-US certifie que l'appareil visé a été testé par Underwriters Laboratory (UL) et reconnu conforme aux exigences applicables en matière de sécurité électrique en vigueur au Canada et aux États-Unis.



La marque ETL Listed d'Intertek pour le marché Nord-Américain certifie que l'appareil visé a été testé par Intertek et reconnu conforme aux exigences applicables en matière de sécurité électrique en vigueur au Canada et aux États-Unis.



Le marquage CE indique que l'appareil visé est conforme aux exigences essentielles des directives applicables de l'Union européenne en matière de sécurité électrique, de compatibilité électromagnétique et de conformité environnementale.



Le symbole ci-contre sur un appareil Grass Valley ou à l'intérieur de l'appareil indique qu'il est conforme aux normes applicables en matière de sécurité laser.

Avertissements



Les avertissements signalent des conditions ou des pratiques susceptibles d'occasionner des blessures graves, voire fatales. Veuillez vous familiariser avec les avertissements d'ordre général ci-dessous :

- Un cordon d'alimentation dûment homologué doit être utilisé pour connecter l'appareil à une tension de secteur de 120 V CA ou 240 V CA.
- La protection de ce produit contre les courts-circuits (surintensités) dépend de l'installation électrique du bâtiment. Assurez-vous qu'un fusible ou un disjoncteur pour 120 V CA ou 240 V CA est utilisé sur les conducteurs de phase.
- Dans le présent manuel, toutes les instructions qui nécessitent d'ouvrir le couvercle de l'équipement sont destinées exclusivement au personnel technique qualifié.
- N'utilisez pas cet appareil dans un environnement humide.
- Cet équipement est mis à la terre par le conducteur de mise à la terre des cordons d'alimentation. Pour éviter les chocs électriques, branchez les cordons d'alimentation sur une prise correctement câblée avant de brancher les entrées et sorties de l'équipement.
- Acheminez les cordons d'alimentation et autres câbles de façon à ce qu'ils ne risquent pas d'être endommagés. Supportez correctement les enroulements de câbles afin de ne pas endommager les connecteurs.
- Coupez l'alimentation avant de nettoyer l'équipement. Ne pas utiliser de nettoyeurs liquides ou en aérosol. Utilisez uniquement un chiffon humide.
- Des tensions dangereuses peuvent exister en plusieurs points dans cet équipement. Pour éviter toute blessure, ne touchez pas aux connexions ou aux composants exposés lorsque l'appareil est sous tension.

- Avant de procéder à toute opération d'entretien ou de dépannage, enlevez tous vos bijoux (notamment vos bagues, votre montre et autres objets métalliques).
- Pour éviter tout risque d'incendie, utilisez uniquement les fusibles du type et du calibre indiqués sur l'équipement ou dans la documentation qui l'accompagne.
- Ne pas utiliser cet appareil dans une atmosphère explosive.
- Présence possible de courants de fuite. Un raccordement à la masse est indispensable avant la mise sous tension.
- Après tout travail d'entretien ou de réparation, faites effectuer des contrôles de sécurité par le personnel technique qualifié.

Mises en garde



Les mises en garde signalent des conditions ou des pratiques susceptibles d'endommager l'équipement. Veuillez vous familiariser avec les mises en garde ci-dessous :

- L'appareil est conçu pour être installé dans un endroit à accès restreint.
- Au moment d'installer l'équipement, ne fixez pas les cordons d'alimentation aux surfaces intérieures de l'édifice.
- Le cordon d'alimentation est utilisé comme interrupteur général. La prise de courant doit être située ou installée à proximité de l'équipement et être facile d'accès.
- Les produits qui n'ont pas d'interrupteur marche-arrêt et qui disposent d'une source d'alimentation externe doivent être installés à proximité d'une prise de courant facile d'accès.
- Si l'équipement n'est pas pourvu d'un modules d'alimentation auto-adaptables, vérifiez la configuration de chacun des modules d'alimentation avant de les mettre sous tension.
- Assurez une ventilation adéquate. Pour éviter toute surchauffe du produit, assurez une ventilation de l'équipement conformément aux instructions d'installation.
- N'utilisez pas l'équipement si vous suspectez un dysfonctionnement du produit. Faites-le inspecter par un technicien qualifié.
- Pour réduire le risque de choc électrique, n'effectuez pas de réparations autres que celles qui sont décrites dans le présent manuel, sauf si vous êtes qualifié pour le faire. Confiez les réparations à un technicien qualifié. La maintenance doit se réaliser dans un milieu libre d'électricité statique.
- L'appareil comporte plus d'un cordon d'alimentation. Afin de prévenir les chocs électriques, débrancher les deux cordons d'alimentation avant de faire le dépannage.
- Veillez à toujours prendre les mesures de protection antistatique appropriées quand vous manipulez l'équipement.

Protection contre les décharges électrostatiques (DES)



Une décharge électrostatique peut se produire lorsque des composants électroniques ne sont pas manipulés de manière adéquate, ce qui peut entraîner des défaillances intermittentes ou endommager irrémédiablement un circuit électrique. Au moment de remplacer une carte dans un châssis, prenez toujours les mesures de protection antistatique appropriées :

- Assurez-vous que le châssis est relié électriquement à la terre par le cordon d'alimentation ou tout autre moyen disponible.
- Portez un bracelet antistatique et assurez-vous qu'il est bien en contact avec la peau. Connectez la pince de masse à une *surface non peinte* du châssis pour détourner à la terre toute tension électrostatique indésirable. En l'absence de bracelet antistatique, déchargez l'électricité statique de votre corps en touchant une surface métallique *non peinte* du châssis.
- Pour plus de sécurité, vérifiez périodiquement la valeur de résistance du bracelet antistatique. Elle doit se situer entre 1 et 10 mégohms.
- Si vous devez mettre une carte de côté, assurez-vous de la ranger dans un sac protecteur antistatique.
- Les cartes qui sont reliées à un châssis ou boîtier métallique mis à la terre ne nécessitent pas de protection antistatique spéciale.

Remplacement et élimination des piles



L'appareil 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 directives du fabricant. Avant de vous défaire de l'équipement, assurez-vous d'avoir lu l'appendice *Disposal and Recycling Information*.

Précautions pour les écrans LCD et TFT



Regarder l'écran pendant une trop longue période de temps peut nuire à votre vision. Prenez une pause de 10 minutes, après 30 minutes d'utilisation.

Si l'écran LCD ou TFT est brisé, manipulez les fragments de verre avec précaution au moment de vous en débarrasser. veillez à ce que le cristal liquide n'entre pas en contact avec la peau ou la bouche. En cas de contact avec la peau ou les vêtements, laver immédiatement à l'eau savonneuse. Ne jamais ingérer le liquide. La toxicité est extrêmement faible, mais la prudence demeure de mise en tout temps.

Recycling

Visit www.grassvalley.com for recycling information.

Certification and Compliance

Safety Compliance



c

This equipment complies with the requirements of CSA/UL/IEC/EN 60950-1, 2nd Ed. + AM1, Safety of information technology equipment.

us The power cords supplied with this equipment meet the appropriate national standards for the country of destination.

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

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/EC:

- EN 55022 Class A Radiated and conducted emissions
- EN 61000-3-2 Limits for harmonic current emissions
- EN 61000-3-3 Limitation of voltage fluctuations and flicker
- EN 61000-4-2 Electrostatic discharge immunity
- EN 61000-4-3 Radiated, radio-frequency, electromagnetic field immunity
- EN 61000-4-4 Electrical fast transient immunity
- EN 61000-4-5 Surge transient immunity
- EN 61000-4-6 Conducted disturbances immunity
- EN 61000-4-8 Power frequency magnetic field immunity
- EN 61000-4-11 Voltage dips, short interruptions and voltage variations immunity

Environmental Compliance

| 部件名称 Part name | 有毒有害物质或元素 (Toxic or hazardous substances and elements) | | | | | |
|-------------------------------------|--|--------|--------|-----------|------------|-------------|
| | 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 | | | | | | |
| 电路模块 Circuit modules | | | | | | |
| 显示装置 Display assemblies | | | | | | |

| 部件名称 Part name | 有毒有害物质或元素 (Toxic or hazardous substances and elements) | | | | | |
|--------------------------------------|--|--------|--------|-----------|------------|-------------|
| | 铅 (Pb) | 汞 (Hg) | 镉 (Cd) | 六价铬 (Cr6) | 多溴联苯 (PBB) | 多溴二苯 (PBDE) |
| 组装风扇 Fan assemblies | | | | | | |
| 金属零件 Metal parts | | | | | | |
| 塑料和聚合物零件 Plastic and polymeric parts | | | | | | |

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 GB/T 26572-2011 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 GB/T 26572-2011.

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 GB/T 26572-2011 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 GB/T 26572-2011.

技术条款解释：此声明所依据之数据由 Grass Valley 环境管理部门向我们的部件供应商获取。Grass Valley 公司相信此信息的正确性，但由于数据来源于公司外部，我们无法保证它的完整和准确。所有这些特性可能在未获通知的情况下更改。

Technical explanations: This statement is based on the information provided by our suppliers of components and collected through our 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.

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1 Getting Started

About this Document

The GV Matrix User Manual is intended to help you set up your GV Matrix to maximize its flexibility and efficiency in the most common scenarios.

Note: In line with our commitment to environmental preservation, only minimal documentation (e.g. welcome letters, warranty cards) are distributed in printed form. You can obtain the latest version of the User Manual (this document), the Release Notes, as well as software and useful data, from the *Documentation Library* section, and from the *Downloads* section of Grass Valley's website.

If your GV Matrix is equipped with one or more KMX-4911 multiviewer cards, you must consult the **KMX-4911 Quick Start Guide** for their initial configuration.

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About GV Matrix

Frame

The 4 RU GV Matrix frame incorporates dual redundant power supplies, a frame controller and the fabric module, as well as 16 modular card slots. All signal and control connections are made on the rear panel. The front door opens to provide access to the controller, fabric module and power supplies for maintenance, and also to the modular card slots. The controller card's touch screen interface is accessible through an aperture in the door.

Power supplies and modular cards are hot-swappable. The frame is front-to-back air-cooled and all modules, redundant PSUs and fans are monitored to provide status via GPI or the Ethernet port.

Controller

The GVN-CPU-ETH3 controller installed in the GV Matrix frame supports all in-frame communication between cards, and incorporates a touch-screen panel for local control and adjustment of the frame and installed cards. The GVN-CPU-ETH3 controller serves as the

communications port for control and alarm information entering and leaving the frame. The GVN-CPU-ETH3 controller features two Ethernet ports for system-wide monitoring and control of the frame. This controller card is compatible with the TCP/IP protocol and can support polling or report on error modes (unsolicited messaging).

Fabric Module

The IFM-2T fabric module is the internal router of the GV Matrix. It is configured as a 288×288 video router, along with a 4608×4608 audio router. This provides 9 inputs and 9 outputs for each of the 16 slots in the frame (i.e. 144 total in and 144 total out) allowing full routing capacity between all of the frame's GV Matrix modular cards.

XIO-4901 SDI I/O Interface Card

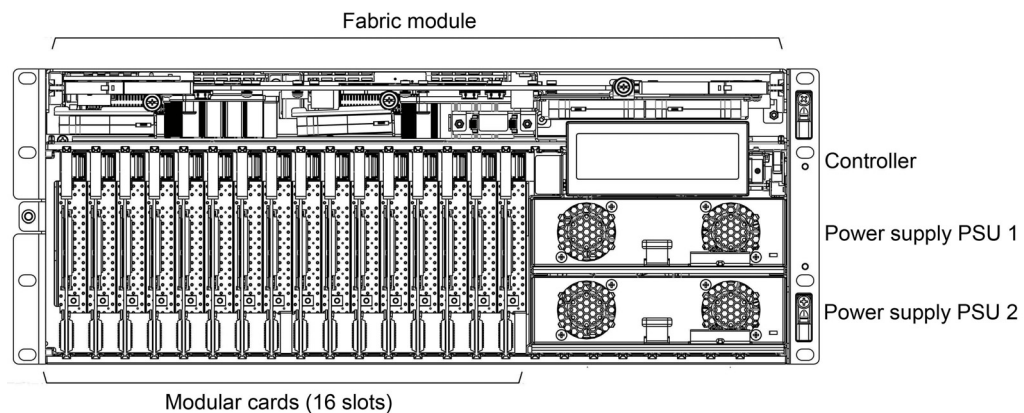
The XIO-4901 SDI interface modular card provides 9 SDI inputs and 9 SDI outputs to the GV Matrix. It includes timing alignment for synchronous signals and format detection and management, plus probing and status reporting.

KMX-4911 Multiviewer Card

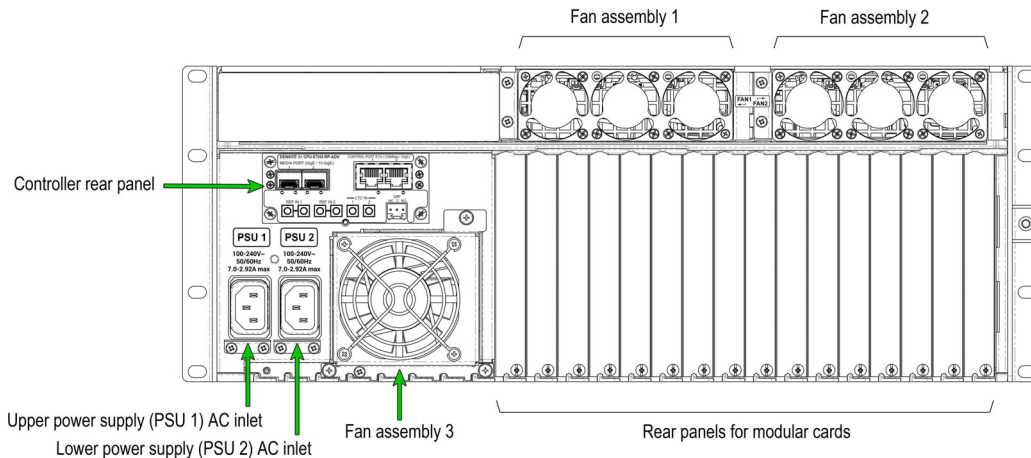
The KMX-4911 is a member of the Kaleido family of multiviewers, designed to be integrated into GV Matrix. Its inputs are sourced from the fabric module, and thus from any SDI input to the GV Matrix.

Part Locations

The following images identify the front and rear panel components and features of the GV Matrix frame.



Part locations—front of frame (door removed)



Part locations—rear of frame

Getting Organized

This section provides information about system requirements, and items shipped with your GV Matrix.

Required Materials

Your GV Matrix package includes the following:

- GV Matrix frame, with the following components factory-installed:
 - Power supplies (2).
 - GVN-CPU-ETH3 Controller and rear connector panel.
 - IFM-2T fabric module.
 - Modular cards per order.
 - Fan assemblies (3).
- Rear rack adapters (2).
- Power cords (2).
- Power cord retaining clips (2).
- Thumb drive with documentation and other support materials.

These items are required but are not supplied:

- Rack-mounting screws (8)

Modular cards and their rear panels that are part of your order are **installed** in the GV Matrix when shipped. Modular cards ordered separately must be user-installed. See [Install the Optional Modular Cards](#), on page 6, for modular card installation instructions.

Physical Installation

Follow these steps to install and power up your GV Matrix:

- [Open and Remove the Front Door](#), on page 4.

- [Install the GV Matrix in a Rack](#), on page 4.
- [Verify that the Cards and Power Supplies are Properly Seated](#), on page 5.
- [Install the Optional Modular Cards](#), on page 6.
- [Install the Power Cords with their Retaining Clips](#), on page 7.
- [Power Up the GV Matrix](#), on page 7.

Open and Remove the Front Door

The front door of the GV Matrix frame is hinged on the right-hand side, and latched by a captive thumbscrew on the left-hand side. There are no electrical connections to the door.

To open and remove the door

- 1 Turn the thumbscrew counterclockwise until it releases, and pull the door open.
- 2 Slide the door vertically off the hinge pins on the right-hand side to remove it.

Install the GV Matrix in a Rack

Note: You may choose to install the GV Matrix in a rack either before or after the other steps in this section, whichever is most convenient. However, power up the frame last.

The GV Matrix housing frame occupies 4 RU in a standard 19-inch rack.

The GV Matrix is supplied with a pair of rear rack adapters that provide additional support for the GV Matrix frame when it is installed in a rack. Their use is optional.

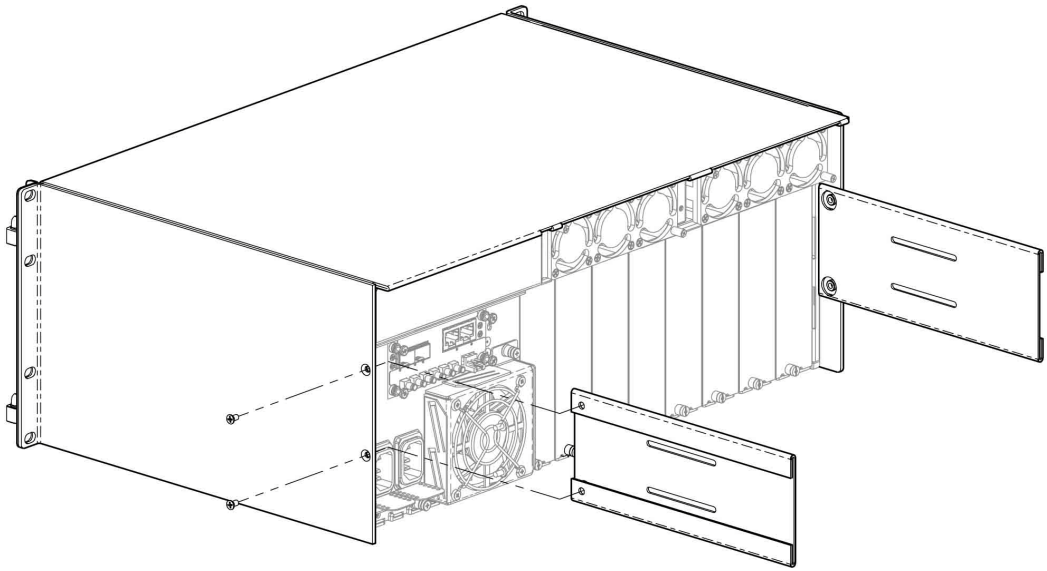
To mount the frame

- Position the frame in the rack and secure it in place using 8 standard rack-mounting screws (not supplied) .

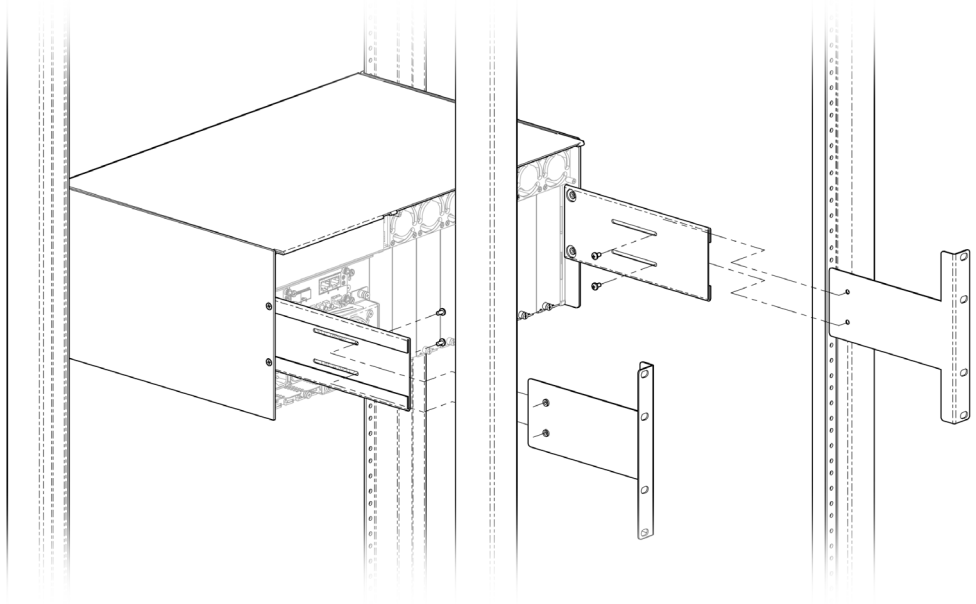
To install the rear rack adapters

- 1 Install the 2 extender sections on the rear of the frame, using the supplied screws.

Note: You will need a T15 (Torx) bit or screwdriver to install the screws supplied with the adapters.



- 2 Starting from outside the rear rack columns, slide the two bracket sections into the slots of the extender sections.
- 3 Secure the bracket sections to the rack using rack mounting screws (not supplied).
- 4 Fasten the extender and bracket sections together using the supplied screws.



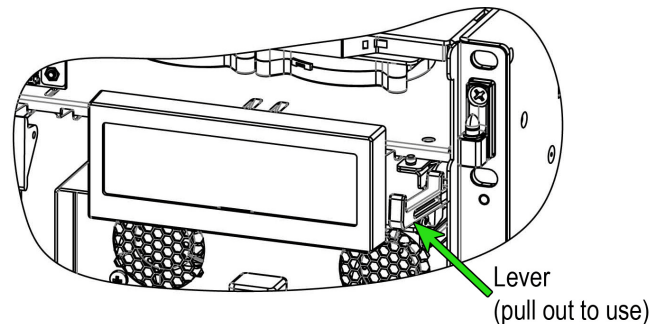
Verify that the Cards and Power Supplies are Properly Seated

Despite solid packaging, pre-installed components may have been disturbed in transit. Take a moment to verify that the power supplies, fabric module, modular cards and controller are securely installed.

To verify that components are securely installed

- 1 Open the front door of the frame.

- 2 Inspect the components for signs that they are not properly installed.
- 3 Attempt to move them with your fingers; they should feel solid and stable.
- 4 If a power supply is loose, push it gently back into position.
- 5 If the fabric module is loose, push gently on the two handles located on outside corners of the card until it is fully engaged in its slot.
- 6 If a modular card is loose, push gently on the swivel handle at the top to reseat it.
- 7 If the controller module is loose, do not push on the display to reseat it. Instead, proceed as follows:
 - a Grasp the lever on the lower right-hand side of the controller beside the display, and pull it straight out until it is fully extended.



- b Firmly push the lever down to seat the card in its connectors.
- c Slide the lever back into the chassis.

Install the Optional Modular Cards

Each modular card has an associated rear panel for inputs and outputs.

IMPORTANT

The rear panel must be installed before the card is inserted into the frame.

To install the rear connector panel

- 1 Remove any existing panel (either blank or belonging to an existing card that is being changed) by releasing the captive screw(s) on the bottom.
- 2 Slide the top edge of the new panel under the lip at the top of the empty space and secure the panel in place with the captive screw(s) on the bottom.

To install the modular card

- 1 Open the front door of the frame.
- 2 Position the card with the swivel handle at the top.
- 3 Slide the card into the slot and push gently on the swivel handle to seat the connectors.

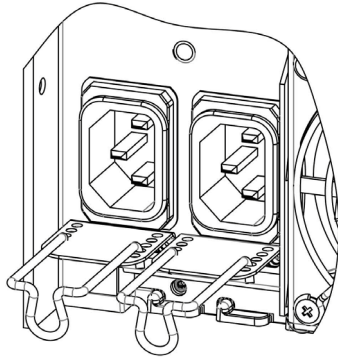
Note: If the card requires a double-width rear panel or larger, it should be inserted into the rightmost slot (as seen from the front of the frame). Inserting the card into the wrong slot will not damage the card, but will be flagged by the on-card status LED flashing red when power is applied, to indicate that there is no connection to the rear panel.

Install the Power Cords with their Retaining Clips

Each power inlet has a retaining clip that holds the power cord in place to prevent inadvertent disconnections.

To install a retaining clip and power cord

- 1 Slip both ends of the retaining clip into a pair of holes in the plate that extends out beneath the power inlet on the rear of the frame. Use the holes that position the clip closest to the body of the power cord connector.



- 2 Position the clip horizontally and insert the power cord connector into the inlet.
- 3 Rotate the clip up and press the cord into the gripping loop of the clip.

Power Up the GV Matrix

- To power up the GV Matrix, connect the two power supply cords to AC power.

Notes

- There is no Power switch; the GV Matrix is powered up as soon as either power supply is plugged into an AC source.



For safety, ensure that the AC supply sockets are located near the equipment and are easily accessible.



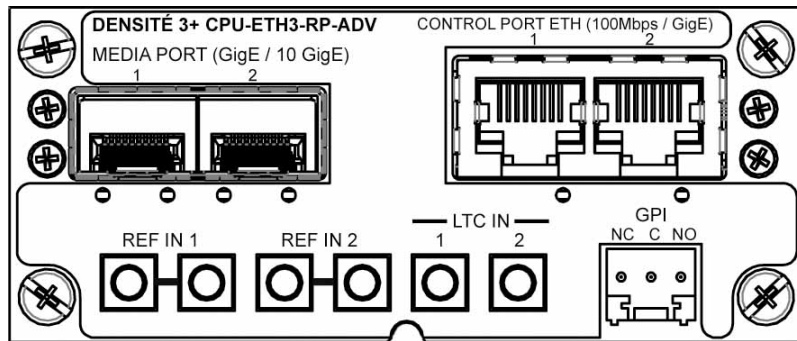
Be sure to disconnect both supply cords before servicing to avoid electric shock

- Connect the two (redundant) power supplies to separate circuits, if available, for enhanced failure protection.
-

Connections

All of GV Matrix's inputs and outputs are connected on the rear of the frame.

Controller Panel

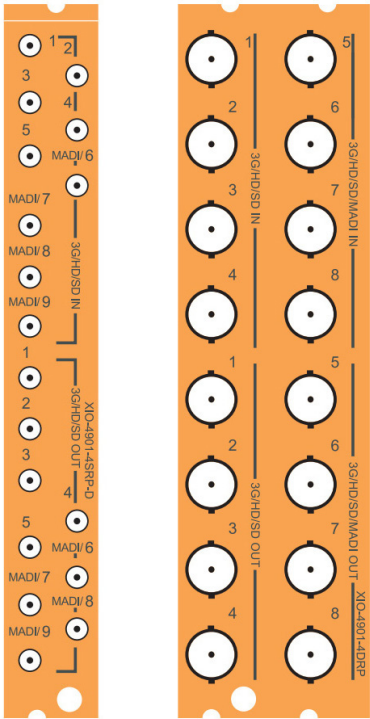


The following signal connections are available on the panel:

| Connector Name | Function |
|----------------------------------|--|
| CONTROL PORT ETH 1, 2 | Dual GigE Ethernet ports for connection to external control systems (e.g. , iControl, GV Convergent) on RJ45 connectors. <ul style="list-style-type: none"> • ETH1 is the primary control port. • ETH2 is used for ethernet link redundancy. |
| MEDIA PORT (GigE / 10 GigE) 1, 2 | Dual streaming ports for internal/external connectivity to the modular cards, on SFP+ interfaces. <i>(Future use)</i> |
| REF IN 1 (2 connectors) | External reference signal for the frame, with a loop-through, on DIN connectors. |
| REF IN 2 (2 connectors) | <i>(Future use)</i> |
| LTC IN 1 | External time code on DIN connector. |
| LTC IN 2 | <i>(Future use)</i> |
| GPI | Alarms generated on the controller card may be reported on this GPI connector. |

XIO-4901 Rear Panel

Two rear panels are available for the XIO-4901SDI I/O module.



XIO-4901-4SRP-D

XIO-4901-4DRP

| | XIO-4901-4SRP-D | XIO-4901-4DRP |
|-------------------|-----------------|---------------|
| Width - # slots | 1 | 2 |
| SDI IN | 9 DIN | 8 BNC |
| SDI OUT | 9 DIN | 8 BNC |
| MADI I/O channels | 8 & 9 | 7 & 8 |

The MADI-enabled I/O channels can be assigned to function as MADI inputs and outputs through the GV Matrix Manager in iControl. Otherwise, they function as normal SDI I/O channels. They are indicated by the white-on-black channel labels.

Networking and Control Setup

For the GV Matrix to join a TCP/IP network, it must be configured with an IP address, a network mask, and a gateway. Use the local control panel to configure ethernet port ETH1 so that you can connect to the GV Matrix online.

GV Matrix is shipped with the following default settings:

| | ETH1 | ETH2 |
|--------------|---------------|---------------|
| IP address | 192.168.3.3 | 192.168.4.3 |
| Network Mask | 255.255.255.0 | 255.255.255.0 |
| Gateway | 0.0.0.0 | 0.0.0.0 |

See [Setting the GV Matrix's IP Address](#), on page 10 for instructions on replacing these with settings that apply to your local network, so that the GV Matrix can be located by control applications such as Grass Valley's iControl.

Note: The GV Matrix should be located in the same subnet as the iControl Application Server that will control it.

Once the ETH1 port settings have been configured, you can connect your GV Matrix to the network via the rear controller connection panel. See [Connecting the GV Matrix to your Network](#), on page 12.

You must install and configure iControl or iControl Solo before you can configure your GV Matrix.

Notes

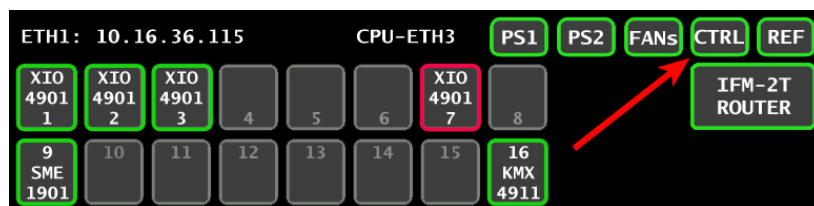
- For detailed information about iControl , refer to the iControl User Guide, available from the Documentation Library section of Grass Valley's website.
 - For detailed information about iControl Solo, refer to the iControl Solo User Guide, available from the the Documentation Library section of Grass Valley's website.
iControl Solo is available from the Downloads section of the Grass Valley website.
 - GV Matrix is compatible with iControl version 7.20 and later, and iControl Solo version 7.20 build 52 and later.
-

Once the GV Matrix is connected to the network, you can use iControl or iControl Solo to configure the GV Matrix. See [Registering your GV Matrix to iControl](#), on page 12, for detailed instructions on setting up the connection between your GV Matrix and iControl.

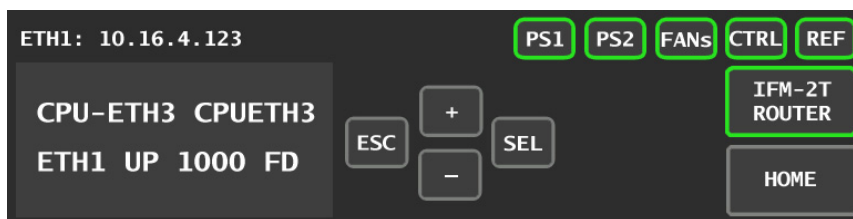
Setting the GV Matrix's IP Address

To set the GV Matrix's IP Address

- 1 On the GV Matrix control panel, touch CTRL.



The GV Matrix controller menu appears on the display.



Note: You can navigate the menu by using the four virtual buttons on the touch display:

- Touch the [+] and [-] buttons to navigate between menu options or between parameter values.
- Touch SEL to access the next menu level. When a parameter value is shown on the display, modify the value by using the [+] and [-] buttons, and then touch SEL to apply the value.
- Touch ESC to go back to the previous menu level.
- Once you have completed your changes, touch CTRL again to exit the menu.

- 2 Touch [-] repeatedly until ETH1 OPTIONS appears on the display, and then touch SEL. IP ADDRESS appears on the display.
- 3 Touch SEL.
The current IP address value appears on the display.
- 4 Change the current values using the virtual buttons:
 - Touch [+] and [-] to change the value at the current input position.
 - Touch SEL to move one position to the right, and to accept the current value.
 - Touch ESC to move one position to the left and leave the current value unchanged.

Note: Touching ESC when the input focus is in the first position returns you to the previous menu level.

- 5 Once you have accepted all values in the desired address, touch ESC repeatedly to move to the first position, and then touch ESC again to move back to the previous level. IP ADDRESS appears on the display.
- 6 Touch [-] until NETWORK MASK appears on the display, and then touch SEL.
The current network mask value appears on the display.
- 7 Repeat [step 4](#) and [step 5](#) to change the network mask values.
- 8 Touch [-] until GATEWAY appears on the display, and then touch SEL.
The current gateway value appears on the display.
- 9 Repeat [step 4](#) and [step 5](#) to change the gateway values.
- 10 Touch CTRL on the display to exit the Controller menu.

Notes

- If you do not touch any buttons on the local control panel, the controller will revert to its normal standby mode after 30 seconds.

Notes

- If you changed a parameter from the control menu, but have not applied your change (you did not touch the SEL button on the control panel), once the 30-second timeout has occurred, the parameters will be confirmed as if you had touched the SEL button.
-

You have changed the IP settings for the ETH1 port.

Connecting the GV Matrix to your Network

To connect the GV Matrix to your network

- 1 Connect CONTROL PORT ETH1 to your local TCP/IP network via an RJ45 connector.
- 2 Connect a local reference signal (black burst or tri-level sync) to REF IN 1.
You may use either of the two connectors; the second connector is a loop-through and does not require termination.

Registering your GV Matrix to iControl

To register your GV Matrix to iControl

- 1 Open iControl Navigator.
- 2 In **Logical** view, open the **Managers** folder.
- 3 In the **Managers** folder, locate the Densité Manager associated with your application server and double-click its icon.
The Densité Manager window opens.
- 4 In the **Configuration** tab, click **Add**.
The **Target Information** window opens.
- 5 In **Target Information**, enter the IP address that you have given your GV Matrix, and a Densité name for the GV Matrix (e.g., DNAME).
- 6 Click **OK**.

The **Target Information** window closes.

Your GV Matrix appears in the **Configuration** tab.

The GV Matrix's status is Online, and its icon is green.

- 7 Close the Densité Manager window.
The frame and its cards are now accessible from iControl Navigator.
- 8 Look for these four devices in iControl Navigator :

- The GV Matrix frame controller.

By default, the controller is identified as follows:

| | |
|-------------|----------------------------|
| Label | Frame ControllerDNAME |
| Short label | Frame Co |
| Type | GV Matrix Frame Controller |

| | |
|----------|-----------------------|
| Comments | Densité Frame Service |
| Frame | DNAME |

DNAME is the Densité name you created in [step 5](#) on page 12.

- The GV Matrix frame reference module, incorporated into the controller, but with its own control panel.

| | |
|-------------|------------------------------|
| Label | Frame Reference |
| Short label | Frame Re |
| Type | Frame Reference |
| Comments | HD/SD Frame Reference Module |
| Frame | DNAME |

- IFM-2T - the GV Matrix fabric module.

| | |
|-------------|----------------------|
| Label | IFM-2T |
| Short label | IFM-2T |
| Type | IFM-2T |
| Comments | Internal Router card |
| Frame | DNAME |

- The GV Matrix Manager associated with your GV Matrix is found in the GV Matrix Manager folder.

The modular cards installed in the GV Matrix are also now available in the iControl Navigator window.

Together, these devices make up the iControl presence of your GV Matrix.

GV Matrix Initial Configuration

You will configure three elements of your GV Matrix in this initial setup:

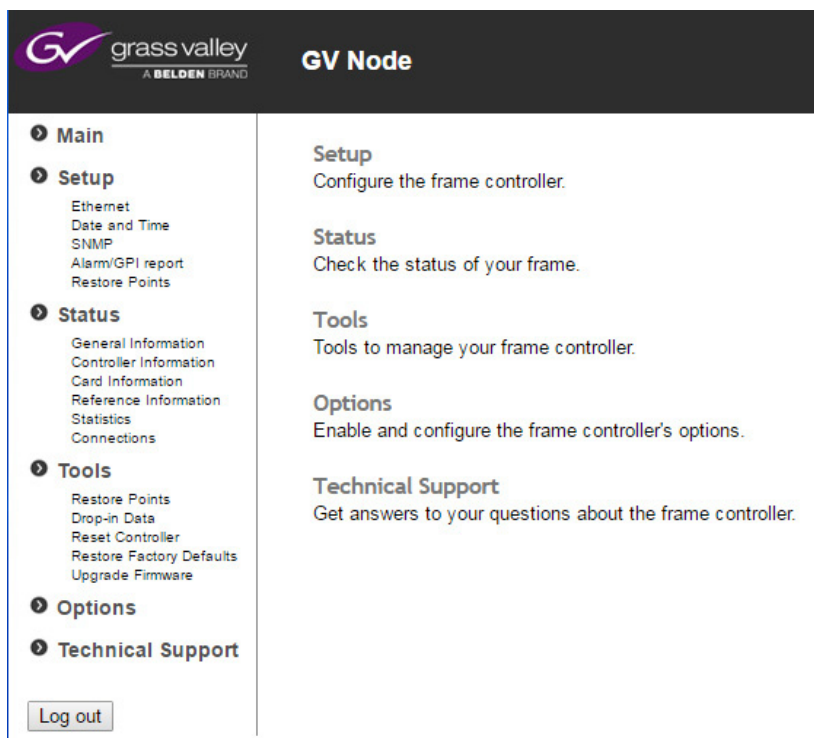
- [Configure the Controller](#), on page 13.
- [Configure the Frame Reference](#), on page 15.
- [Configure the Fabric Module I/O](#), on page 15.

Configure the Controller

Use the CPU-ETH3 Web client application to perform the configuration steps that follow.

To configure the GV Matrix controller

- 1 Open a Web browser window and enter your GV Matrix's IP address in the address bar. The home page of the CPU-ETH3 Web client appears.



- 2 Under Setup, in the navigation area on the left of the page, click **Ethernet**.
The Ethernet setup page appears.
- 3 Modify the Hostname for the GV Matrixs controller, if needed.
- 4 If you plan to use Channel Bonding for ethernet link redundancy, select **Enabled** in the Channel Bonding section. See [Ethernet Link Redundancy \(Channel Bonding\)](#) for more details about this feature.
- 5 Verify that MII status for eth1 is set to AUTONEGOTIATION.
- 6 Click **Apply** to save your changes.
- 7 Click **Setup - Time/Date** in the navigation area.
The Time/Date setup page appears.
 - If you have an NTP server's IP address, enter it and select **Enabled**.
 - If you do not have an NTP server's IP address, manually enter the current date and time, and select **Disabled**.
- 8 Click **Apply**.
- 9 Click **Alarm/GPI Report** in the navigation area.
The Alarm/GPI Report setup page appears.
- 10 Set the values shown in this table:

| | |
|--|----------|
| Include power supply failure in Alarm Report | Enabled |
| Include fan failure in Alarm Report | Enabled |
| Report card alarm on GPI | Disabled |

- 11 Click **Apply**.

- 12 Click **Restore Points** in the navigation area.
The Restore Points setup page appears.

- 13 Set the values shown in this table:

| | |
|----------------------------------|--------------------|
| Default action for card inserted | Keep card settings |
| Auto save | Disabled |

- 14 Click **Apply**.
- 15 Click **Options** in the navigation area.
- 16 **Verify** that the Ethernet Link Redundancy option, which is standard on the GV Matrix, is present and activated. If it is not, please contact Customer Support.

This completes the initial configuration of the frame controller.

Configure the Frame Reference

- 1 In iControl Navigator, locate the GV Matrix's frame reference and double-click its icon.

Note: In the presence of multiple frame references, locate yours by checking the Frame column—it will have the DNAME you chose for your GV Matrix. See [step 5](#) under [Registering your GV Matrix to iControl](#).

The frame reference module's iControl panel opens.

- 2 To set the timecode and reference sources:
 - a Click the **Input** tab.
 - b In the **Reference Source** list, select **Auto**.
 - c In the **Timecode Source** list, select **Auto**.

Changes are applied immediately.

- 3 To set the URS Generation Mode:
 - a Select the **Mode** tab.
 - b In the **URS Generation Mode** list, select **Normal**.

Note: The URS (Universal Reference Signal) is the timing reference distributed within the GV Matrix to all modular cards.

Changes are applied immediately.

Configure the Fabric Module I/O

To manage the inputs and outputs between the Fabric Module and the modular cards

- 1 In iControl Navigator, locate the GV Matrix Manager associated with your GV Matrix and double-click its icon.

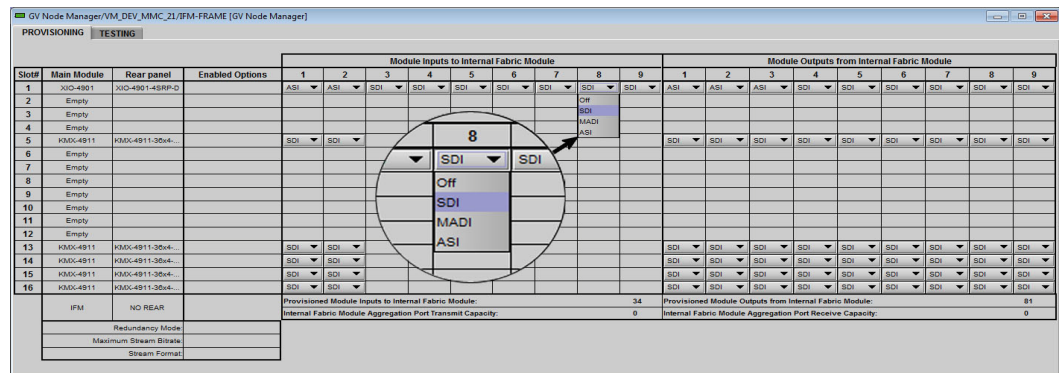
The GV Matrix's **GV Matrix Manager** panel opens.

Note: In the presence of multiple GV Matrix managers, locate yours by checking the Comments column—the DNAME you chose for your GV Matrix will be the last element in the comment. See [step 5](#) under [Registering your GV Matrix to iControl](#).

- In the row beside each GV Matrix modular card, select the status of each of the 9 inputs to the fabric module and 9 outputs from the fabric module from the pulldown lists.

XIO-4901: The available choices depend on whether the MDX option is activated on the XIO-4901 card.

| MDX Option | I/O CH 1-7 | I/O CH 8 & 9 |
|---------------|-------------------|---------------------------|
| NOT ACTIVATED | OFF SDI ASI | OFF SDI MADI ASI |
| ACTIVATED | OFF SDI MDX | OFF SDI MDX |



Changes are applied immediately.

Ethernet Link Redundancy (Channel Bonding)

GV Matrix incorporates ethernet link redundancy as a standard feature.

Channel Bonding uses the controller's ETH2 port as a redundant active backup for the ETH1 port.

When Channel Bonding is enabled, the two Ethernet interfaces are seen as one:

- ETH2 settings are disabled, and both ports are configured using the ETH1 settings.
- The controller communicates through one port only.
- If the port in use fails, communication is automatically switched over to the backup port.

The feature is OFF by default, and can only be turned ON through the controller's web client. See [step 4](#) on page 14 under [Configure the Controller](#).

Configuring Your GV Matrix



This chapter describes how to configure your GV Matrix using the available user interfaces.

Summary

| | |
|--|----|
| <i>User Interfaces</i> | 19 |
| <i>Configure the CPU-ETH3 Controller</i> | 24 |
| <i>Configure the Frame Reference</i> | 52 |
| <i>Configure the IFM-2T Fabric Module</i> | 59 |
| <i>Configure the XIO-4901 SDI I/O Card</i> | 66 |
| <i>GV Node Manager</i> | 83 |
| <i>Alarm Configuration</i> | 84 |
| <i>Asynchronous Video</i> | 87 |

User Interfaces

The CPU-ETH3 controller is the control point for the GV Matrix frame and the modular cards installed in the frame. There are no separate operating controls on the frame or cards.

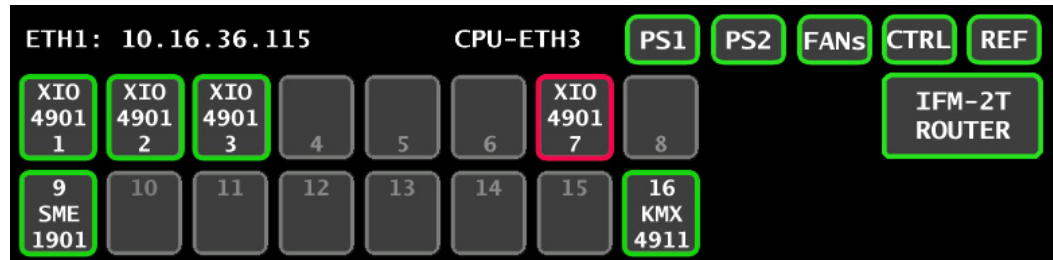
There are three ways to configure the GV Matrix:

| User interface | About... |
|---------------------------------------|---|
| Local control panel | Step through a menu displayed on the touch screen on the front of the frame. No IP connection required, but not all features available. Both the controller itself, and modular cards installed in the frame, can be configured. |
| Controller's web page | A web client served by the controller. IP connection required. Complete functionality of the controller is provided, and help is displayed on the browser page. Does not configure or control other elements of the GV Matrix, i.e. fabric module or modular cards. |
| iControl | Grass Valley's graphic user interface. IP connection required. All elements of the GV Matrix can be configured and controlled with iControl. |

Local control panel

The local control panel is mounted on the front of the CPU-ETH3 controller card, and when installed is located in the upper-right corner of the frame.

The touch screen interface is accessed through an aperture in the frame door.



The IP addresses of control ports ETH1 and ETH2 are displayed alternately in the top left corner of the home screen.

Access buttons with integrated status monitoring are provided for:

- Each of the 16 modular card slots [*SLOT NUMBER, INSTALLED CARD TYPE*].
- The IFM-2T fabric module [*IFM-2T ROUTER*].
- The CPU-ETH3 controller [*CTRL*].
- The controller's integrated reference module [*REF*].

In addition, status monitoring is shown for each of the two power supplies PS1 and PS2, and for the frame's cooling fans.

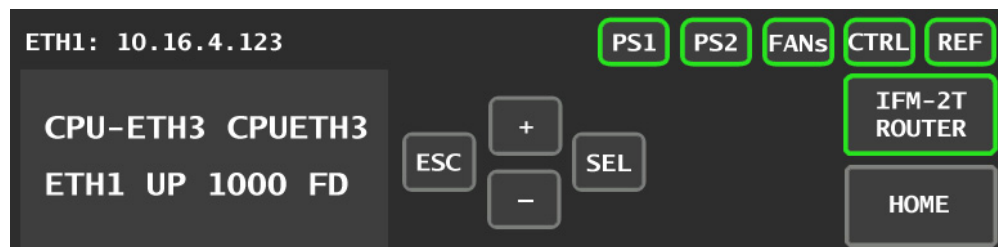
The status of each of these elements is shown by the color of the button outline.

| Color | Meaning |
|--------------|---|
| Green | Status OK |
| Yellow | Warning |
| Red | Error |
| Flashing Red | Critical error |
| Gray | No card in the slot (modular card slots only) |

Status and alarm reporting is configured independently for each module, through its iControl interface. See [Alarm Configuration](#) on page 84 for information about status and alarm reporting and configuration.

Touching an access button brings up the local control menu for the selected module.

Touching the **CTRL** segment displays the local menu for the CPU-ETH3 controller itself.



The full CPU-ETH3 controller menu is shown beginning on [page 50](#).

The functionality of the four virtual pushbuttons is as follows:

- [+] [-] Move up and down the menu when a parameter name is shown

Change to the next or previous value when a variable value is shown and change has been enabled using the [SEL] button

[SEL] Gives access to the next menu level. When a parameter value is shown, pushing this button once enables modification of the value using the [+] and [-] buttons; a second push confirms the new value

[ESC] Cancels the effect of parameter value changes that have not been confirmed; pushing [ESC] causes the parameter to revert to its former value.






Pushing [ESC] moves the user back up to the previous menu level.

[HOME] Exits the current menu and returns the user to the HOME screen.

If no controls are operated for 30 seconds, the controller reverts to its normal operating status, and the status display ceases flashing yellow and reverts to its normal operating mode.

Controller Status Indicator

The controller status is displayed in the upper right side of the control panel, as a colored outline around the CTRL segment. The table shows how the various error conditions are flagged.

| Alarm/Status | Priority | Display | |
|------------------------|----------|-----------------|---|
| Power supply failure | 1 | FLASHING RED |  |
| Fan failure | 1 | FLASHING RED |  |
| Internal error | 2 | RED |  |
| Normal (no errors) | | GREEN |  |
| LOCAL CONTROL SELECTED | | FLASHING YELLOW |  |

The status display can show only one alarm/status, so it displays only the highest priority. For example if there is an internal error, it should display RED. But if at the same time the chassis fan has failed, then the LED will display FLASHING RED.

Be aware that a high priority alarm can mask a lower priority one.

Controller's web page

The controller serves a web page from its ETH1 port. The web page provides complete configuration utilities for the controller itself.

To use this resource, you must be able to connect to the controller. The controller is shipped with these default IP addresses on its ports:

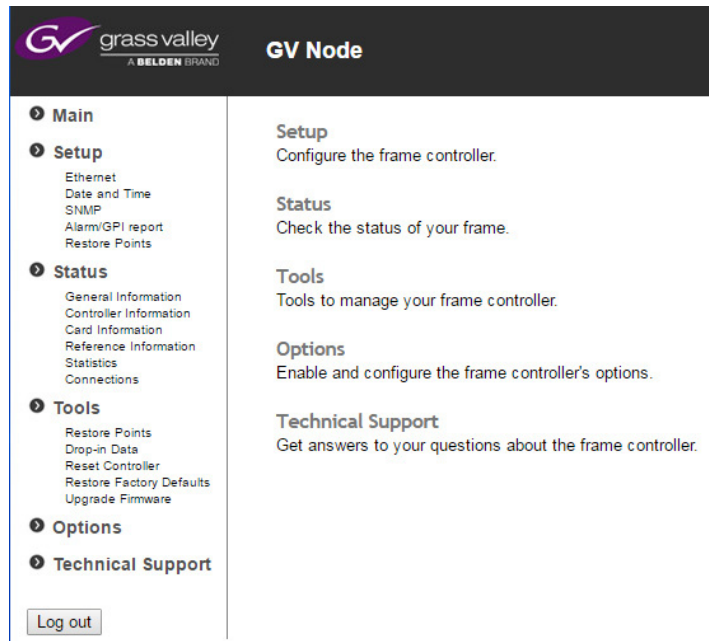
| | ETH1 | ETH2 |
|--------------|---------------|---------------|
| IP address | 192.168.3.3 | 192.168.4.3 |
| Network Mask | 255.255.255.0 | 255.255.255.0 |
| Gateway | 0.0.0.0 | 0.0.0.0 |

You will need to change these to fit your local network.

- You can change them from this web page, or through the local control panel menu, but not through the iControl interface.
- The procedure to change them using the local control panel interface is described in [Setting the GV Matrix's IP Address](#), on page 10.

To access the CPU-ETH3 controller web page

- 1 Open a Web browser window and enter your CPU-ETH3's IP address in the address bar. The home page of the CPU-ETH3 Web client appears.



Select the topic area of interest from the left-hand navigation pane, and click to open the configuration page.

iControl

The CPU-ETH3 controller supports remote operation through two rear-panel 100Mbps / GigE ethernet ports, using Grass Valley's iControl. The command set available for communicating with a Densité frame permits more complex and comprehensive control, parameter storage, and field upgrading than is supported by the local control panel.

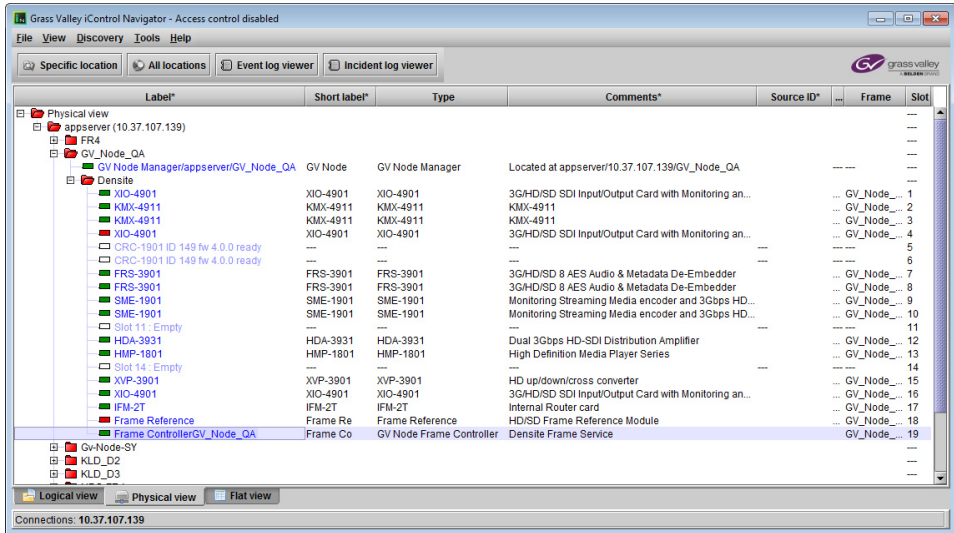
The operation of the CPU-ETH3 card can be controlled using Grass Valley's iControl system. This manual describes the control panels associated with the CPU-ETH3 and their use.

You must install and configure iControl or iControl Solo before you can use it to configure your GV Matrix.

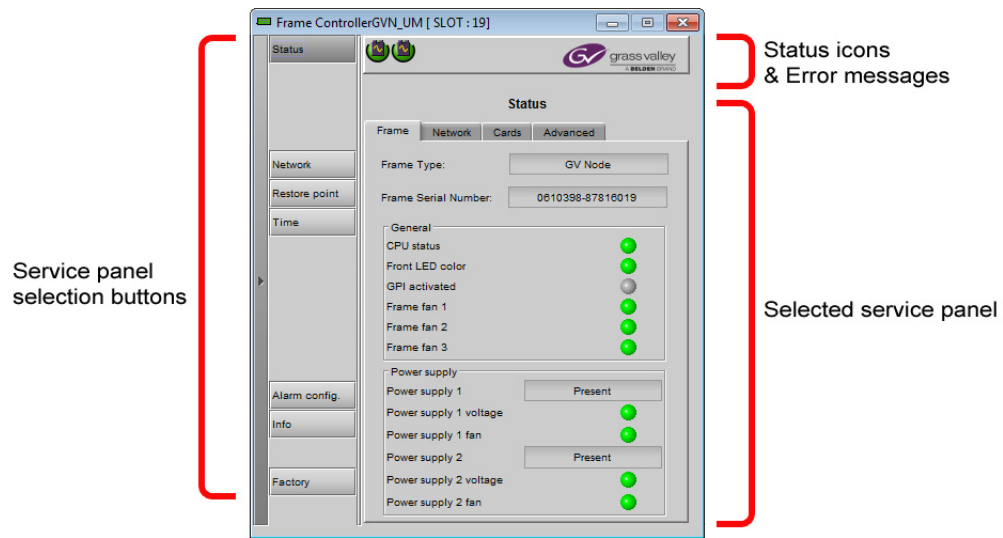
Notes

- For detailed information about iControl , refer to the iControl User Guide, available from the Documentation Library section of Grass Valley’s website.
- For detailed information about iControl Solo, refer to the iControl Solo User Guide, available from the the Documentation Library section of Grass Valley’s website.
iControl Solo is available from the Downloads section of the Grass Valley website.
- The CPU-ETH3 controller is compatible with iControl version 7.20 and later, and iControl Solo version 7.20 build 52 and later.

In iControl Navigator or iControl Websites, double-click on the icon of the controller to open its control panel.



The iControl panel for the CPU-ETH3 controller displays a series of buttons down the left-hand side. Clicking a button changes the contents of the main window to display status reports and controls related to the topic named on the button.



Configure the CPU-ETH3 Controller

This section introduces the operating features of the CPU-ETH3 controller, and describes how to access and control them using:

- The iControl interface
- The controller’s web page
- The local control panel and menu.

Summary

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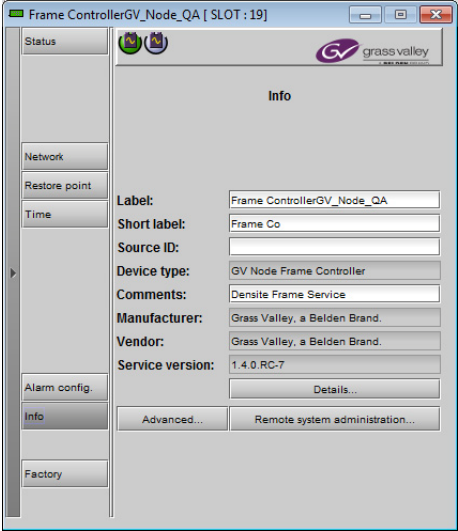
Identification

Configure this feature using...

| iControl | Controller’s web page | Local control panel |
|----------|-----------------------|---------------------|
| ✓ | | |

Identification using iControl

Click the **Info** button in the left-side navigation pane.



The CPU-ETH3 controller is accessible on a network, and must be identifiable in order to function in the iControl environment. The identification data is entered in the iControl Info control panel. This panel also shows other data that is not user-accessible.

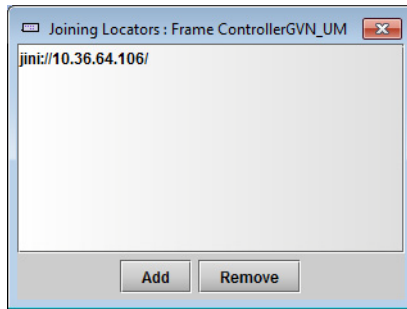
Default information was created when you registered your GV Matrix in iControl. You can modify information appearing in the white-background data boxes by clicking and typing in the data box:

| Data Box | Use | Default |
|-------------|---|-----------------------|
| Label | Identifies this device in iControl applications; usually device type and identification | FrameControllerDNAME |
| Short Label | 8-character short label used in iControl | Frame Co |
| Source ID | Any text | [no text] |
| Comments | Any text | Densite Frame Service |

The remaining data boxes show manufacturing information about this card.

Three buttons in the panel give access to other information:

- **Details:** Reports the Firmware version, service version, and panel version for this card
- **Advanced:** Shows the LongID for this card. The LongID is the address of this CPU-ETH3 controller in the iControl network.
- **Remote system administration:** Opens the Joining Locators data box, which lists remote lookup services to which this CPU-ETH3 is registered.



- **Add:** Force the iControl service for this CPU-ETH3 to register itself on a user-specified Jini lookup service, using the following syntax in the data box:
`jini://<ip_address>`
 where <ip_address> is the ip address of the server running the lookup service.
- **Remove:** select one of the services listed in the window by clicking on it, and then click Remove to open a query box allowing you to delete it from the window.

Status Monitoring

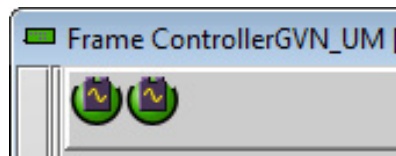
The CPU-ETH3 controller continuously monitors the operating condition and status of the GV Matrix frame's power supplies and ventilating fans. It also monitors the status and usage of its ethernet ports, and the status of its on-board memory, as well as the data throughput of all modular cards installed in the frame.

Monitor status using...

| iControl | Controller's web page | Local control panel |
|----------|-----------------------|---------------------|
| ✓ | ✓ | ✓ |

Status Monitoring using iControl

The iControl interface always displays two icons in the upper left of the window. These report the status of the two power supplies.



| Icon | Messages |
|------|--|
| | Power supply 1 voltage: OK Power supply 2 voltage: OK |
| | Power supply 1 voltage: Absent Power supply 2 voltage: Absent |
| | Power supply 1 voltage: Error Power supply 2 voltage: Error |

The table shows the possible icon displays and the associated messages that appear below them. Error messages are always displayed; other status messages appear only upon mouse-over of the icon.

The **Status panel** shows status information in four categories, each accessed by clicking the appropriate tab.

iControl Status Panel

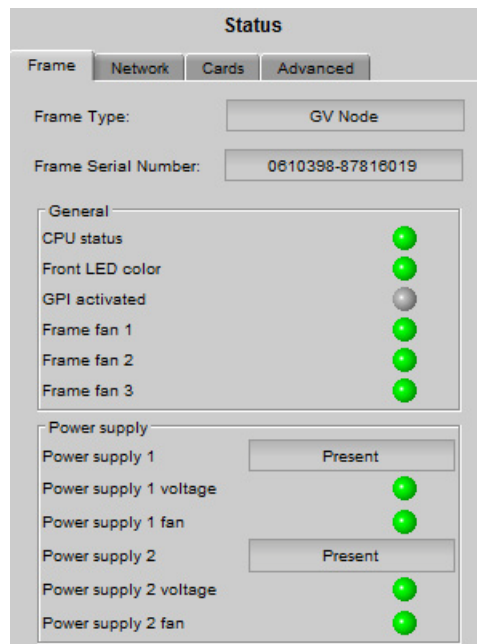
Click the **Status** button in the left-side navigation pane.

Status - Frame

Select the **Frame** tab to see a report on the status of the frame's CPU, fans and power supplies.

These items are displayed:

- CPU status (icon)
- Front LED color (icon)
- GPI activated (icon)
- Frame fan 1 (icon)
- Frame fan 2 (icon)
- Power supply 1 (present/absent)
- Power supply 1 voltage (icon)
- Power supply 1 fan (icon)
- Power supply 2 (present/absent)
- Power supply 2 voltage (icon)
- Power supply 2 fan (icon)

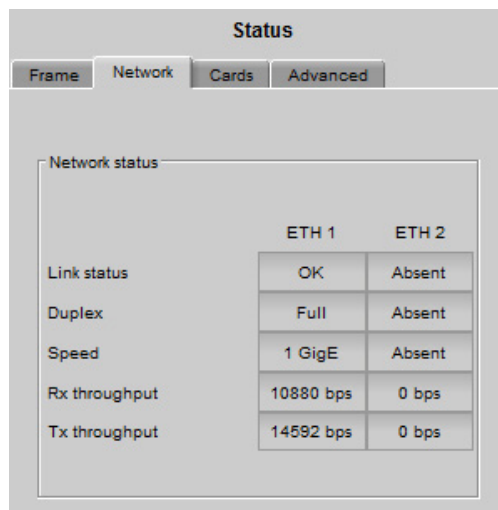


Status - Network

Select the **Network** tab to see a report on the status of the two Ethernet ports on the CPU-ETH3 card.

These items are displayed:

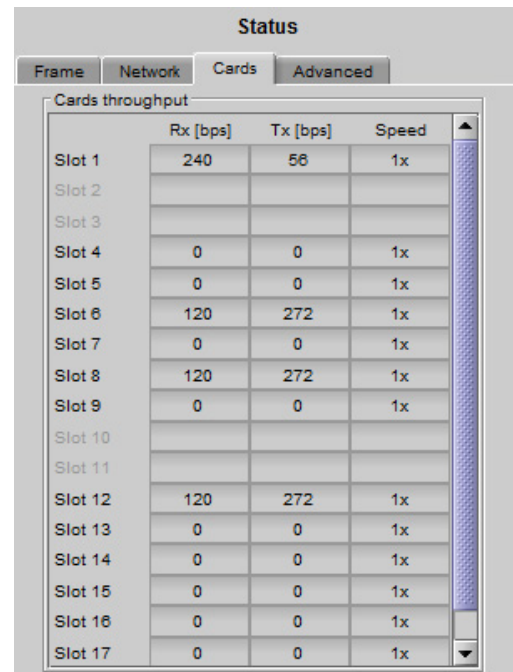
- Link status
- Duplex
- Speed
- Rx throughput
- Tx throughput



Status - Cards

Select the **Cards** tab to see a chart of the current send (Tx) and receive (Rx) data rates, and speed, for all modular cards installed in the GV Matrix frame.

For a more detailed report on the status of a specific card, open that card's control panel in iControl.



The screenshot shows the 'Status' page with the 'Cards' tab selected. The 'Cards throughput' table displays data for 17 slots. The columns are Rx [bps], Tx [bps], and Speed.

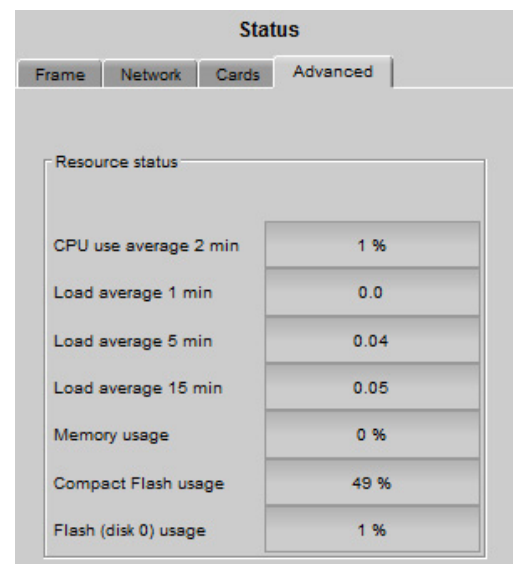
| Slot | Rx [bps] | Tx [bps] | Speed |
|---------|----------|----------|-------|
| Slot 1 | 240 | 56 | 1x |
| Slot 2 | | | |
| Slot 3 | | | |
| Slot 4 | 0 | 0 | 1x |
| Slot 5 | 0 | 0 | 1x |
| Slot 6 | 120 | 272 | 1x |
| Slot 7 | 0 | 0 | 1x |
| Slot 8 | 120 | 272 | 1x |
| Slot 9 | 0 | 0 | 1x |
| Slot 10 | | | |
| Slot 11 | | | |
| Slot 12 | 120 | 272 | 1x |
| Slot 13 | 0 | 0 | 1x |
| Slot 14 | 0 | 0 | 1x |
| Slot 15 | 0 | 0 | 1x |
| Slot 16 | 0 | 0 | 1x |
| Slot 17 | 0 | 0 | 1x |

Status - Advanced

Select the *Advanced* tab to view a report on the usage of the controller's resources.

These items are displayed:

- CPU use average 2 min
- Load average 1 min
- Load average 5 min
- Memory usage
- Compact flash usage
- Flash (disk 0) usage



The screenshot shows the 'Status' page with the 'Advanced' tab selected. The 'Resource status' table displays various usage metrics.

| Resource | Usage |
|-----------------------|-------|
| CPU use average 2 min | 1 % |
| Load average 1 min | 0.0 |
| Load average 5 min | 0.04 |
| Load average 15 min | 0.05 |
| Memory usage | 0 % |
| Compact Flash usage | 49 % |
| Flash (disk 0) usage | 1 % |

Status monitoring using the Controller's web page

The controller's web page offers a very comprehensive view of the status of the entire frame.

Select a page view from the **Status** section of the left-hand navigation pane.

Status | General Information

| Description | GPI Report | LED Report | State |
|------------------------|------------|------------|-------|
| Power Supply 1 | ✓ | ✓ | ● |
| Power Supply 2 | ✓ | ✓ | ● |
| Power Supply 1 Fan | ✓ | ✓ | ● |
| Power Supply 2 Fan | ✓ | ✓ | ● |
| Frame Fan 1 | ✓ | ✓ | ● |
| Frame Fan 2 | ✓ | ✓ | ● |
| Frame Fan 3 | ✓ | ✓ | ● |
| GPI | | | ● |
| Ethernet 1 Link Status | | | ● |
| Ethernet 2 Link Status | | | ● |
| Media Port 1 Status | | | ● |
| Media Port 2 Status | | | ● |
| File System Status | | | ● |

| Slot | Type | GPI | LED |
|------|----------|-----|-----|
| | CPU-ETH3 | Off | ● |
| 1 | XIO-4901 | Off | ● |
| 2 | XIO-4901 | Off | ● |
| 3 | XIO-4901 | Off | ● |
| 4 | XIO-4901 | Off | ● |
| 5 | -<Empty> | Off | ● |
| 6 | CRC-1901 | Off | ● |
| 7 | XIO-4901 | Off | ● |
| 8 | KMX-4911 | Off | ● |
| 9 | HDA-1941 | Off | ● |
| 10 | IPG-3901 | Off | ● |
| 11 | -<Empty> | Off | ● |
| 12 | FRS-3901 | Off | ● |
| 13 | -<Empty> | Off | ● |
| 14 | -<Empty> | Off | ● |
| 15 | HDA-1951 | Off | ● |
| 16 | XIO-4901 | Off | ● |
| | IFM-2T | Off | ● |
| | ETH3-REF | Off | ● |

This page provides status information for the power supplies, the power supply and frame fans, the GPI port, the two ethernet ports, the two media ports, and the controller’s file system.

It also shows the cards occupying the frame’s slots, and the status of each.

Status | Controller information

| | |
|-------------------|------------------|
| Serial Number: | 303401-103267004 |
| Software Version: | 1.3.1 BUILD 0675 |
| PCB Version: | 500 |
| Card Model: | advanced |

| | |
|----------------|----------------------------------|
| Date/Time: | Thursday Mar 9 11:18:36 UTC 2017 |
| Ntp Client: | Disabled |
| NTP Server #1: | 0.0.0.0 |
| NTP Server #2: | 0.0.0.0 |
| NTP Server #3: | 0.0.0.0 |
| NTP Refresh: | 17 min |

| | |
|-------------|---------------|
| SNMP Agent: | Enabled |
| Trap IP #1: | 10.37.106.180 |
| Trap IP #2: | 0.0.0.0 |
| Trap IP #3: | 0.0.0.0 |

| | |
|-------------------------------------|---------|
| Report power supply failure on GPI: | Enabled |
| Report fan failure on GPI: | Enabled |
| Report card alarm on GPI: | Enabled |

| | |
|-----------------|--------------------|
| Default Action: | Keep Card Settings |
| Auto Save: | Disabled |
| Save every: | Sunday at 00:00 |

This page provides detailed information about the controller card:

[Serial number, software version, PCB version, Card model]

It also gives the status of these controller functions:

- Alarm report Configure at
- Restore points Configure at
- Date and Time Configure at
- SNMP Configure at

Status | Network Information

The screenshot shows the 'STATUS | Network Information' page in the GV Node web interface. The page includes a sidebar with navigation options and a main content area with a table of network interface details. A 'Page refresh interval' dropdown is set to 'Never'.

| Network Interface: ETH1 | Network Interface: ETH2 |
|--------------------------------|--------------------------------|
| Link: UP | Link: DOWN |
| Speed: 1 Gbps | Speed: 1 Gbps |
| Duplex: Full | Duplex: Half |
| IP Address: 10.37.106.165 | IP Address: 192.168.0.2 |
| Netmask: 255.255.255.192 | Netmask: 255.255.255.0 |
| Gateway: 10.37.106.129 | Gateway: 0.0.0.0 |
| MAC Address: 00:50:1E:04:E3:14 | MAC Address: 00:50:1E:04:E3:15 |
| MII Status: Autonegotiation | MII Status: Autonegotiation |

| Network Interface: bond0 | |
|---------------------------------------|--|
| Link: DOWN | |
| Mode: fault-tolerance (active-backup) | |

| Network Interface: MEDIA PORT 1 | Network Interface: MEDIA PORT 2 |
|---------------------------------|---------------------------------|
| Type: - | Type: - |
| Link: - | Link: - |
| Speed: - | Speed: - |
| Vendor OUI: - | Vendor OUI: - |
| Vendor Name: - | Vendor Name: - |
| Part Number: - | Part Number: - |
| Serial Number: - | Serial Number: - |
| Date Code: - | Date Code: - |
| Wave Length: - | Wave Length: - |

This page shows the current status of the two ethernet network interfaces on the rear panel (ETH1 and ETH2):

- Link status
- Speed
- Duplex
- IP address / Netmask / Gateway
- MAC address
- MII Status

It also shows the status of the two Media Ports on the rear panel (MEDIA PORT 1 and MEDIA PORT 2), including details of the installed SFP module:

- Type
- Link
- Speed

- Vendor details
- Part Number
- Serial Number
- Date code
- Wave length

Status | Card Information

GV Node

- Main
- Setup
 - Ethernet
 - Date and Time
 - SNMP
 - Alarm/GPI Report
 - Restore Points
- Status
 - General Information
 - Controller Information
 - Network Information
 - >Card Information
 - Reference Information
 - Statistics
 - Connections
- Tools
 - Restore Points
 - Drop-in Data
 - Reset Controller
 - Restore Factory Defaults
 - Upgrade Firmware
- Options
- Technical Support

Page refresh interval: Never ▼

| Cards | | | | | | | |
|-------|----------|---------|------------------|-------|-----------|--------------------------|----------------------------|
| Slot | Type | Label | Firmware Version | Speed | Device ID | Last Saved Restore Point | Restore Point Size (Bytes) |
| 1 | XIO-4901 | SLOT 1 | 1.2.5 | 1x | 178 | 2017-03-09 10:41 | 1648 |
| 2 | XIO-4901 | SLOT 2 | 1.2.5 | 1x | 178 | 2017-03-09 10:41 | 1648 |
| 3 | XIO-4901 | SLOT 3 | 1.2.5 | 1x | 178 | 2017-03-09 10:41 | 1808 |
| 4 | XIO-4901 | SLOT 4 | 1.2.5 | 1x | 178 | 2017-03-09 10:41 | 1760 |
| 5 | <empty> | --- | --- | --- | --- | --- | --- |
| 6 | CRC-1901 | SLOT 6 | 4.0.0 | 1x | 149 | 2017-03-09 10:41 | 37 |
| 7 | XIO-4901 | SLOT 7 | 1.2.5 | 1x | 178 | 2017-03-09 10:41 | 2368 |
| 8 | KMX-4911 | SLOT 8 | 8.5.2 | 1x | 169 | 2017-03-09 10:41 | 142 |
| 9 | HDA-1941 | SLOT 9 | 1.0.2 | 1x | 210 | 2017-03-09 10:41 | 11 |
| 10 | IPG-3901 | SLOT 10 | 1.3.8 | 1x | 168 | 2017-03-09 10:41 | 1496 |
| 11 | <empty> | --- | --- | --- | --- | --- | --- |
| 12 | FRS-3901 | SLOT 12 | 3.1.1 | 8x | 124 | 2017-03-09 10:41 | 25401 |
| 13 | <empty> | --- | --- | --- | --- | --- | --- |
| 14 | <empty> | --- | --- | --- | --- | --- | --- |
| 15 | HDA-1951 | SLOT 15 | 1.0.2 | 1x | 211 | 2017-03-09 10:41 | 11 |
| 16 | XIO-4901 | SLOT 16 | 1.2.5 | 1x | 178 | 2017-03-09 10:41 | 1828 |
| | IFM-2T | SLOT 17 | 2.0.0 | 1x | 177 | 2017-03-09 10:41 | 5016 |
| | ETH3-REF | SLOT 18 | 1.3.0 | 8x | 65530 | 2017-03-09 10:41 | 84 |

This page shows all the slots in the frame, and identifies cards inserted in them, by type, firmware version, speed, device ID, Last saved restore point, and Restore Point size.

Status | Reference Information

This page shows the status of the reference module that generates the frame's internal URS reference. The status of the two REF inputs and the two LTC inputs is shown, as well as the URS generation mode and the selected timecode source.

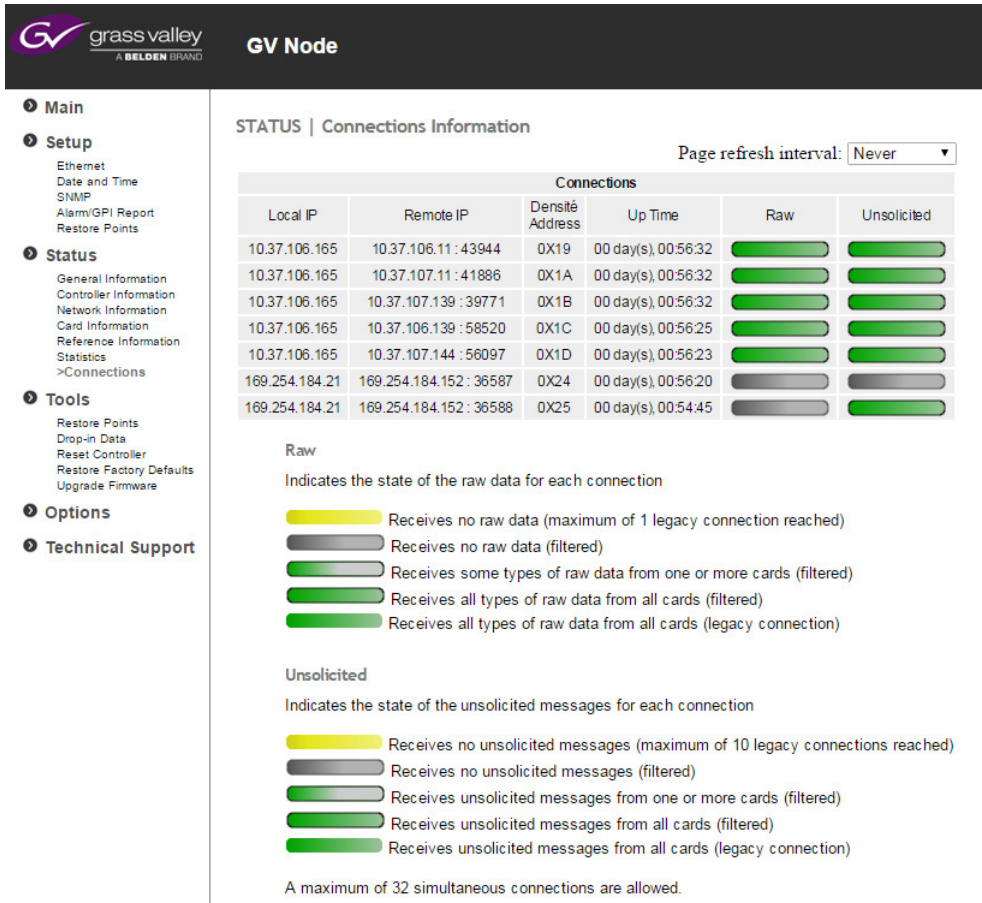
Status | Statistics

| Controller | | Slot | Speed | Rx | Tx |
|--------------------------------|----------------------------------|------|-------|------------|------------|
| CPU Utilization: | 2% | 1 | 1x | 0.00 bps | 0.00 bps |
| Load Average (1 min): | 0.2 | 2 | 1x | 0.00 bps | 0.00 bps |
| Load Average (5 min): | 0.32 | 3 | 1x | 552.00 bps | 112.00 bps |
| Load Average (15 min): | 0.32 | 4 | 1x | 0.00 bps | 0.00 bps |
| Memory utilization: | 0% | 5 | — | — | — |
| Flash Utilization: | 3% | 6 | 1x | 0.00 bps | 0.00 bps |
| Drop-in Data Utilization: | 3% | 7 | 1x | 0.00 bps | 0.00 bps |
| Network Interface: eth1 | | 8 | 1x | 0.00 bps | 0.00 bps |
| Throughput | Rx: 1008.60 Kbps, Tx: 10.20 Mbps | 9 | 1x | 0.00 bps | 0.00 bps |
| Bytes: | 410.28 MB Rx, 123.76 MB Tx | 10 | 1x | 0.00 bps | 0.00 bps |
| Packets: | 4492396 Rx, 4486437 Tx | 11 | — | — | — |
| Errors: | 0 | 12 | 8x | 69.41 Kbps | 1.48 Kbps |
| Dropped: | 0 | 13 | — | — | — |
| Overruns: | 0 | 14 | — | — | — |
| Frame: | 0 | 15 | 1x | 0.00 bps | 0.00 bps |
| Carrier: | — | 16 | 1x | 0.00 bps | 0.00 bps |
| Network Interface: eth2 | | IFM | 1x | 0.00 bps | 0.00 bps |
| Throughput | Rx: 0.00 bps, Tx: 0.00 bps | REF | 8x | 0.00 bps | 0.00 bps |
| Bytes: | 0.00 B Rx, 0.00 B Tx | | | | |
| Packets: | 0 | | | | |
| Errors: | 0 | | | | |
| Dropped: | 0 | | | | |
| Overruns: | 0 | | | | |
| Frame: | 0 | | | | |
| Carrier: | — | | | | |

This page provides a comprehensive overview of resource utilization in the frame:

- The controller card - CPU utilization, load averages, and memory, flash and drop-in data utilization
- The two network interfaces ETH1 and ETH2 - data transfer
- The cards occupying the 16 slots in the frame - data transfer

Status | Connections Information



STATUS | Connections Information Page refresh interval:

| Connections | | | | | |
|----------------|-------------------------|-----------------|---------------------|-----|-------------|
| Local IP | Remote IP | Densité Address | Up Time | Raw | Unsolicited |
| 10.37.106.165 | 10.37.106.11 : 43944 | 0X19 | 00 day(s), 00:56:32 | | |
| 10.37.106.165 | 10.37.107.11 : 41886 | 0X1A | 00 day(s), 00:56:32 | | |
| 10.37.106.165 | 10.37.107.139 : 39771 | 0X1B | 00 day(s), 00:56:32 | | |
| 10.37.106.165 | 10.37.106.139 : 58520 | 0X1C | 00 day(s), 00:56:25 | | |
| 10.37.106.165 | 10.37.107.144 : 56097 | 0X1D | 00 day(s), 00:56:23 | | |
| 169.254.184.21 | 169.254.184.152 : 36587 | 0X24 | 00 day(s), 00:56:20 | | |
| 169.254.184.21 | 169.254.184.152 : 36588 | 0X25 | 00 day(s), 00:54:45 | | |

Raw
Indicates the state of the raw data for each connection

- Receives no raw data (maximum of 1 legacy connection reached)
- Receives no raw data (filtered)
- Receives some types of raw data from one or more cards (filtered)
- Receives all types of raw data from all cards (filtered)
- Receives all types of raw data from all cards (legacy connection)

Unsolicited
Indicates the state of the unsolicited messages for each connection

- Receives no unsolicited messages (maximum of 10 legacy connections reached)
- Receives no unsolicited messages (filtered)
- Receives unsolicited messages from one or more cards (filtered)
- Receives unsolicited messages from all cards (filtered)
- Receives unsolicited messages from all cards (legacy connection)

A maximum of 32 simultaneous connections are allowed.

This page shows the IP address of all connections to this controller, and graphics representing the state of raw data and unsolicited messages for each connection. The page provides help in interpreting the graphics.

Status monitoring using the local control panel

Select STATUS and then [SEL] to cycle through the list of current faults. The amount of status information available through the local menu is very limited.

| Level 1 | Level 2 | Level 3 | |
|---------|------------------|---------|------------------------------------|
| STATUS | PS1 FAILURE | | |
| | PS2 FAILURE | | |
| | PS1 FAN FAILURE | | |
| | PS2 FAN FAILURE | | |
| | FAN1 FAILURE | | |
| | FAN2 FAILURE | | |
| | GPI ACTIVATED | | |
| | INTERNAL FAILURE | | |
| | SD CARD FAILURE | | |
| | RAM FAILURE | | |
| | FPGA LOAD FAIL | | |
| | ETH1 FAILURE | | ETH1 DOWN, ETH1 UP <SPEED><DUPLEX> |
| | ETH2 FAILURE | | ETH2 DOWN, ETH2 UP <SPEED><DUPLEX> |

Network Configuration

The ethernet interface to the CPU-ETH controller can be set up using the local control panel without an existing connection. See [Networking and Control Setup](#) on page 9 for instructions on configuring the IP address of the GV Matrix to enable a connection to your local network, and for instructions on registering your GV Matrix to iControl.

Once an ethernet connection is established, the current values can be modified using the web page or the local controller. Only the hostname can be changed through the iControl interface.

Configure the network interface using...

| iControl | Controller's web page | Local control panel |
|----------|-----------------------|---------------------|
| ✓ | ✓ | ✓ |

Network Configuration using iControl

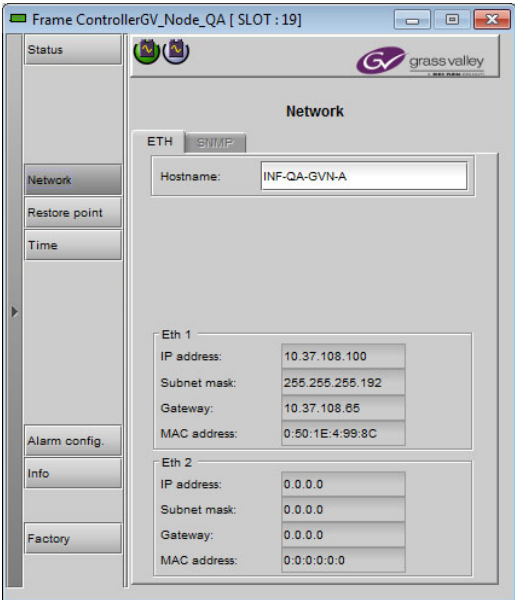
To set the Hostname for this controller

- 1 Click the *Network* button and select the ETH tab

2 Enter the HOSTNAME in the box at the top.

The hostname is the unique name by which this CPU-ETH3 is known on the network. The hostname should be 15 characters or less, and may contain only the ASCII letters 'a' through 'z' (case-insensitive), the digits '0' through '9', and the hyphen.

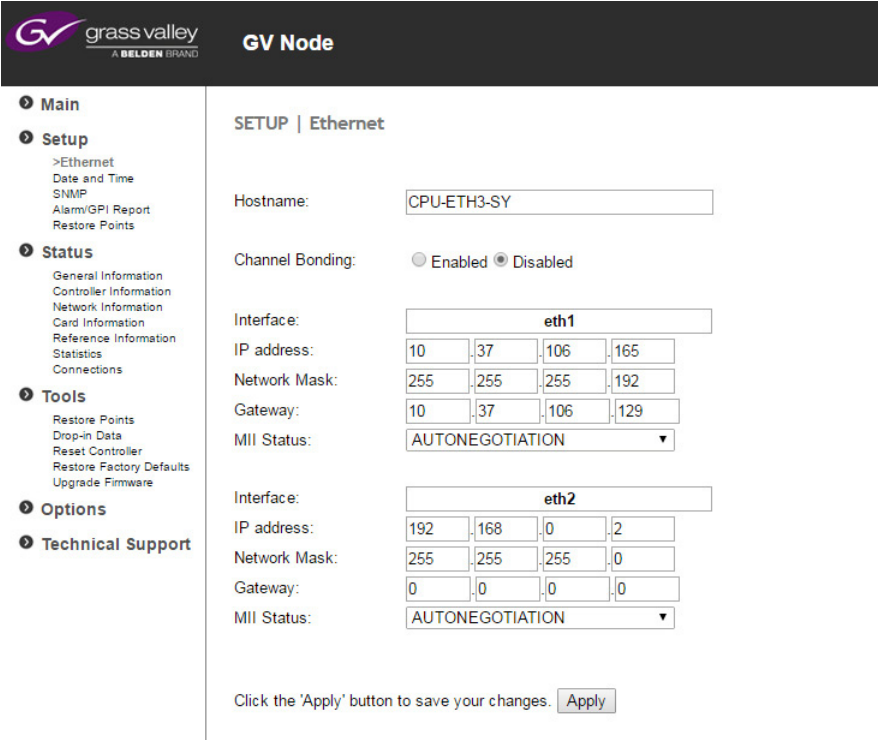
You can see the IP address of the two ethernet ports, but they can only be configured via the menu or the web page.



Network Configuration using the web page

To configure the two Ethernet ports

1 Select Setup-Ethernet from the left-side navigation pane.



- 2 Enter a **Hostname** in the databox.
- 3 If you have activated the **Ethernet Link Redundancy Option**, you can Enable or Disable it here.
See [Link Redundancy](#) on page 36 for detailed information about this option.
- 4 Enter the **IP address**, **Network Mask** and **Gateway** for the two ethernet ports.
- 5 Select **AUTONEGOTIATION** in the MII Status pulldown for each port.
- 6 Click **Apply** to save your changes.

If you have changed the IP address, your browser will no longer have access to the web page, so you will need to reconnect using the new IP address.

Network Configuration using the Menu

To change the IP address

- 1 Scroll down to ETH1 OPTIONS
- 2 Change the IP ADDRESS, NETWORK MASK and GATEWAY addresses as required.
- 3 See [Setting the GV Matrix's IP Address](#) on page 10 for more detailed instructions.

| Level 1 | Level 2 | Level 3 |
|--------------|--------------------|---|
| ETH1 OPTIONS | IP ADDRESS | [[0...255].[0...255].[0...255].[0...255]] |
| | NETWORK MASK | [[0...255].[0...255].[0...255].[0...255]] |
| | GATEWAY | [[0...255].[0...255].[0...255].[0...255]] |
| | MAC ADDRESS | [[0...FFF].[0...FFF].[0...FFF]] |
| | MII STATUS | [AUTONEGOTIATION, 100baseTx-FD, 10baseT-FD, 10baseT-HD] |
| ETH2 OPTIONS | (SAME AS FOR ETH1) | |

Link Redundancy

DENSITE 3+ CPU-ETH3-OPT-LINK is a software option that enables the Ethernet link redundancy function on the GV Matrix's CPU-ETH3.

- Ethernet Link Redundancy is achieved by using channel bonding.
- Channel bonding is an arrangement in which the CPU-ETH3's two network interfaces are combined for redundancy.

The GV Matrix's CPU-ETH3 works in the Active-Backup bonding mode. Active-Backup bonding provides fault tolerance.

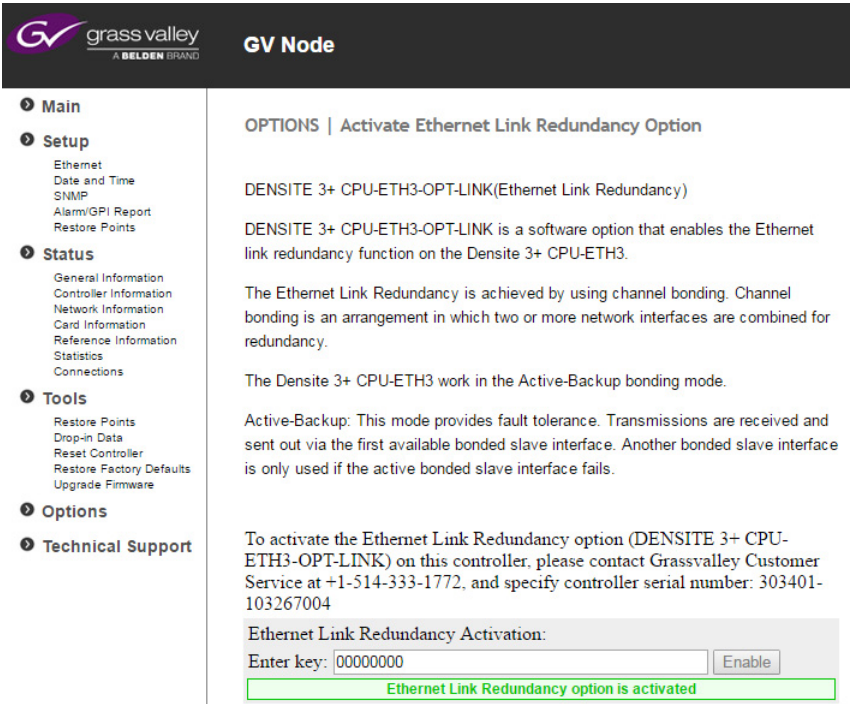
- Only one slave in the bond is active.
- The slave **eth1** is the primary device. The primary device will always be the active slave while it's available. Only when the primary is off-line will the alternate device **eth2** be used.
- The **Link Redundancy Option** can only be activated via the web page.

Activate Link Redundancy using...

| iControl | Controller's web page | Local control panel |
|----------|-----------------------|---------------------|
| | ✓ | |

To activate the Link Redundancy option

- 1 Purchase the option from Grass Valley - you will be given an activation key.
- 2 Click the **Options** heading in the left-side navigation pane.



- 3 Enter the **activation key** into the web page data box.
- 4 Click **Enable**.

SNMP Functionality

The CPU-ETH3 card can function as an SNMP agent, sending SNMP traps to designated targets. SNMP functionality can only be enabled via the web page or the local control panel, but once enabled, the iControl panel can be accessed.

Manage SNMP functionality using...

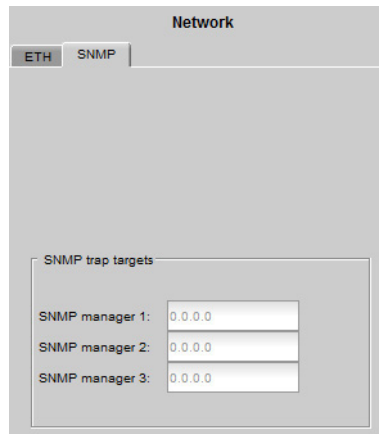
| iControl | Controller's web page | Local control panel |
|----------|-----------------------|---------------------|
| ✓ | ✓ | ✓ |

SNMP functionality using iControl

The iControl panel is only available when SNMP is enabled, either from the web page or from the local control panel.

To specify trap managers once SNMP is enabled

- 1 Click the **Network** button in the left-side navigation pane, and select the **SNMP** tab.



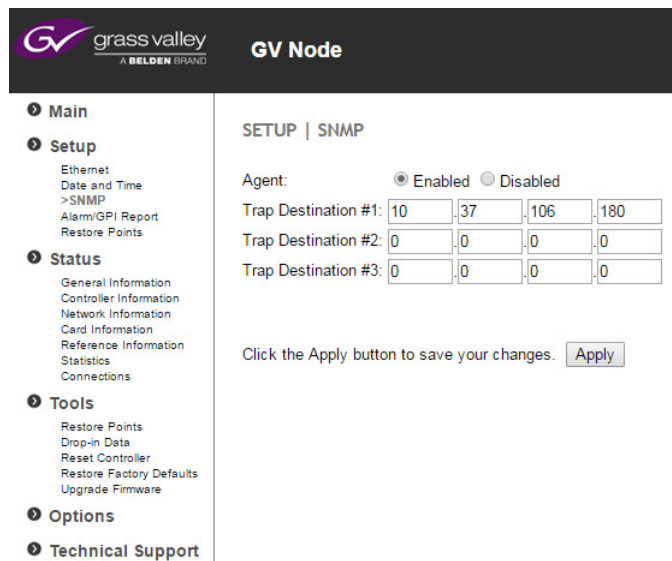
The screenshot shows the 'Network' configuration page with the 'SNMP' tab selected. Under the 'SNMP trap targets' section, there are three input fields for 'SNMP manager 1', 'SNMP manager 2', and 'SNMP manager 3', each containing the IP address '0.0.0.0'.

- 2 Enter the IP addresses of up to three trap managers.
The trap targets are active as soon as the addresses are entered.

SNMP functionality using the web page

To enable and configure SNMP traps

- 1 Select **Setup-SNMP** from the left-side navigation pane.



The screenshot shows the web interface for configuring SNMP traps. The left navigation pane is expanded to 'Setup' > 'SNMP'. The main content area shows the 'SETUP | SNMP' configuration page. The 'Agent' is set to 'Enabled'. There are three 'Trap Destination' rows, each with four input fields for IP addresses. The first row contains '10', '37', '106', and '180'. The other two rows are empty. An 'Apply' button is visible at the bottom.

- 2 Select the **Enabled** radio button.
- 3 Enter the IP addresses of up to three trap managers.
- 4 Click **Apply** to save your changes.

SNMP functionality using the local control panel

| Level 1 | Level 2 | Level 3 | |
|--------------|------------|-------------------|---|
| SNMP OPTIONS | SNMP AGENT | [ENABLE, DISABLE] | |
| | SNMP TRAPS | LIST IP ADDRESS | [[0...255].[0...255].[0...255].[0...255]] |
| | | ADD IP ADDRESS | [[0...255].[0...255].[0...255].[0...255]] |
| | | REMOVE ADDRESS | [[0...255].[0...255].[0...255].[0...255]] |

Data Restoration

Many of the Densité-series cards that can be installed in the GV Matrix frame are complex and have a lot of data stored on-board related to their configuration and parameter values. The CPU-ETH3 controller provides a backup of this data, which can be restored to the card when needed. This is valuable if the card is inadvertently reconfigured, or is replaced after failure with a new card of the same type. The saving of the current data into the controller's memory, and restoring the data onto the Densité-series card, can be done manually or automatically.

Manage data restoration using...

| iControl | Controller's web page | Local control panel |
|----------|-----------------------|---------------------|
| ✓ | ✓ | ✓ |

Data Restoration configuration using iControl

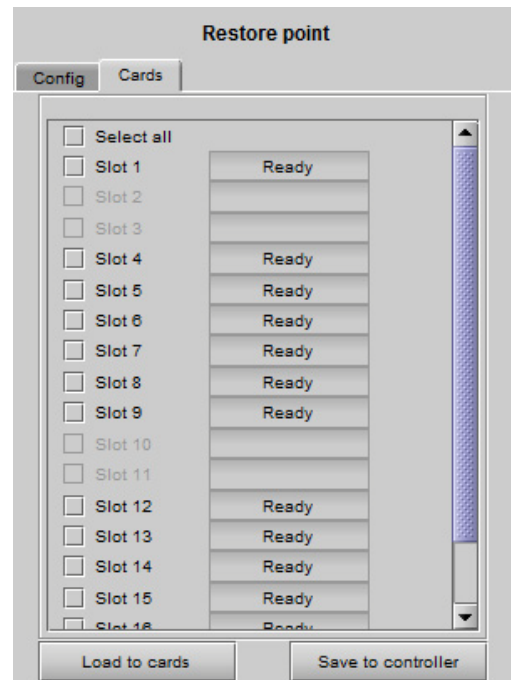
To manually save and apply restore point data

- 1 Click *Restore Point* and view the **Cards** tab.

The tab show a list of the modular card slots available in the GV Matrix frame, with a check box, name, and status box for each. Slots with a card installed are enabled.

- 2 Click the check box to activate the Data Restore feature for the card in that slot, -or-
Click the **Select All** box at the top to activate the feature for all slots in the frame.
- 3 Click **Save to controller** at the bottom to copy all restorable data from the cards in the selected slots into the memory on board the CPU-ETH3 controller.
- 4 Click **Load to cards** to load the cards in the selected slots with data from the controller's memory.

Note that a data restore will only work if the card in the slot is the same type as the card that was there when the data was saved.



To configure automatic data restoration functions

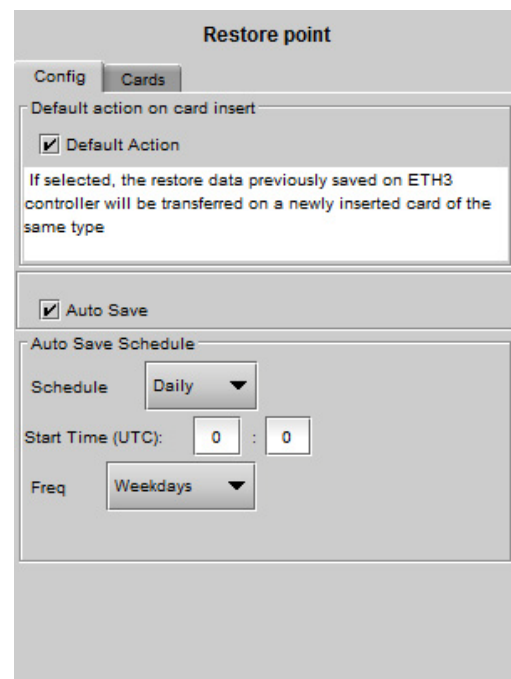
- 1 Click the **Restore Point** button and view the **Config** tab.
- 2 Select the **Default Action** box to enable the auto restore function for all the modular cards in the GV Matrix frame.

Default Action automatically updates a card when it is inserted in a slot previously occupied by a card of the same type whose data was saved. Thus, a new card can be configured automatically to replace the card that was removed, saving a lot of time when cards are swapped.

- 3 Click the **Auto Save** box to enable the automatic save function.

When **Auto Save** is enabled, the CPU-ETH3 card will automatically back up the data on the cards in its slots according to a set schedule.

- 4 Set up the schedule for data backup using the controls provided.
 - Schedule: Daily, Weekly, Monthly
 - Start Time (UTC): Time in hours (24-hour clock) and minutes



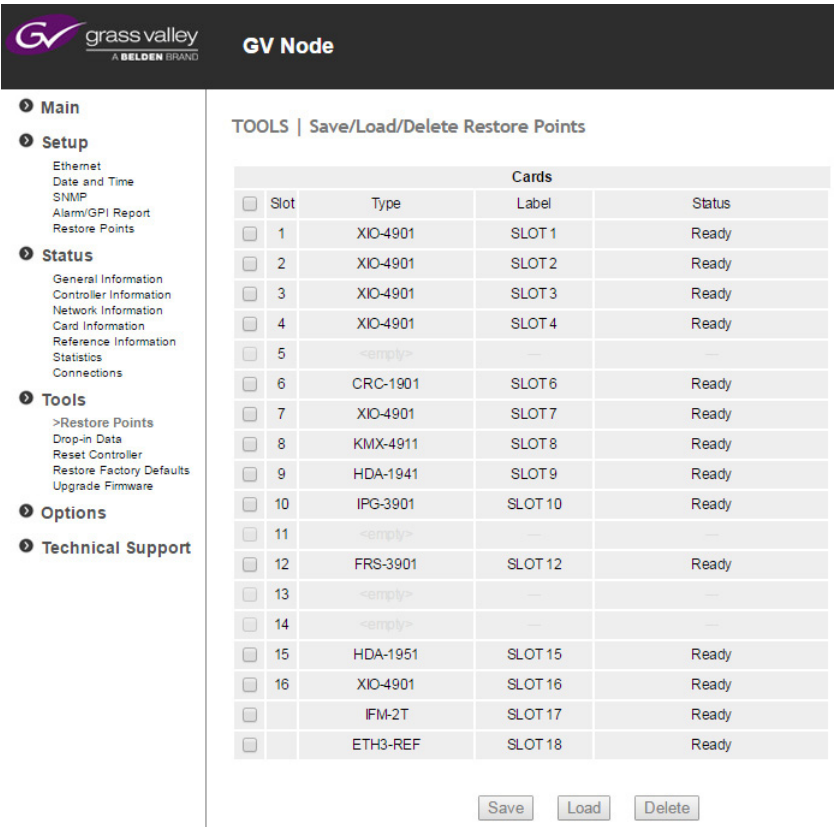
The label and function of the pulldown at the bottom changes to follow the Schedule selection:

| Schedule | Label | Pulldown Options |
|----------|-------|--|
| Daily | Freq | Every day, Weekdays |
| Weekly | Day | Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday |
| Monthly | Week | Week1, Week2, Week3, Week4, Last Week |
| | Day | Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday |

Data Restoration using the Web Page

To manually save and apply restore point data

- 1 Select **Tools - Restore Points** from the left-side navigation pane.



The page shows the card type, label and status for all cards currently installed in the frame.

- 2 Select the **checkboxes** for all the cards for which you want to manually save or restore data.
- 3 Click **Save** at the bottom to copy all restorable data from the cards in the selected slots into the memory on board the CPU-ETH3 controller.
- 4 Click **Load** to load the cards in the selected slots with data from the controller's memory.

- 5 Click **Delete** to delete the restore points of the cards in the selected slots.

To configure automatic data restoration functions

- 1 Select **Setup - Restore Points** from the left-side navigation pane.

The screenshot shows the 'Restore Points' configuration page in the GV Node web interface. The left navigation pane is expanded to 'Setup' > 'Restore Points'. The main content area is titled 'SETUP | Restore Points' and contains the following configuration options:

- Default action for card inserted:** A dropdown menu set to 'Keep card settings'.
- Auto save:** Radio buttons for 'Enabled' (selected) and 'Disabled'.
- Auto save schedule:** Radio buttons for 'Daily', 'Weekly' (selected), and 'Monthly'.
- Daily:** 'Start time (UTC):' is '00 : 00', 'Every:' is 'Every Day'.
- Weekly:** 'Start time (UTC):' is '00 : 00', 'Every:' is 'Sunday'.
- Monthly:** 'Start time (UTC):' is '00 : 00', 'Every:' is 'First' and 'Sunday'.

At the bottom of the configuration area, there is a text prompt: 'Click the Apply button to save your changes.' followed by an 'Apply' button.

- 2 Select the **Default action for card inserted** using the pulldown:
 - **Keep card settings** - leave current card settings unchanged when it is inserted into the frame.
 - **Update card settings** - replace the current card settings with the restore point data stored in the controller when the card is inserted into the frame.
- 3 Select whether **Auto save** is enabled or disabled, using the radio buttons.
- 4 When Auto Save is enabled, you must set up a schedule to save the restore point data. Use the radio buttons to select a daily, weekly or monthly schedule.
- 5 For the selected schedule, set a start time for the auto save action, and select the day and week as needed.
- 6 Click **Apply** to save your changes.

Data Restoration using the local control panel

Configure the data restoration functions, including default action and auto save, from the *Restore Points* menu item.

| Level 1 | Level 2 | Level 3 | |
|----------------|----------------|---------------------------------|--|
| RESTORE POINTS | SAVE ALL CARDS | | |
| | SAVE A CARD | [1...16] (<i>slot number</i>) | |
| | LOAD ALL CARDS | | |
| | LOAD A CARD | [1...16] (<i>slot number</i>) | |
| | DEFAULT ACTION | [<u>CARD</u> , CONTROLLER] | |
| | AUTO SAVE | [<u>ENABLE</u> , DISABLE] | |
| | SAVE EVERY | [DAY, <u>WEEK</u> , MONTH] | |

Factory Alignment

There may be times when the CPU-ETH3 settings have been adjusted and it is useful to restore them to a normalized condition. The CPU-ETH3 controller maintains a “Factory Default” alignment in its memory, to which it can be restored at any time.

Note: Ethernet settings are not included in the Factory data set, and are not changed when the Factory Default alignment is installed.

Reset the card to factory settings using...

| iControl | Controller's web page | Local control panel |
|----------|-----------------------|---------------------|
| ✓ | ✓ | ✓ |

Recall Factory Settings in iControl

To reset the controller to the factory default settings

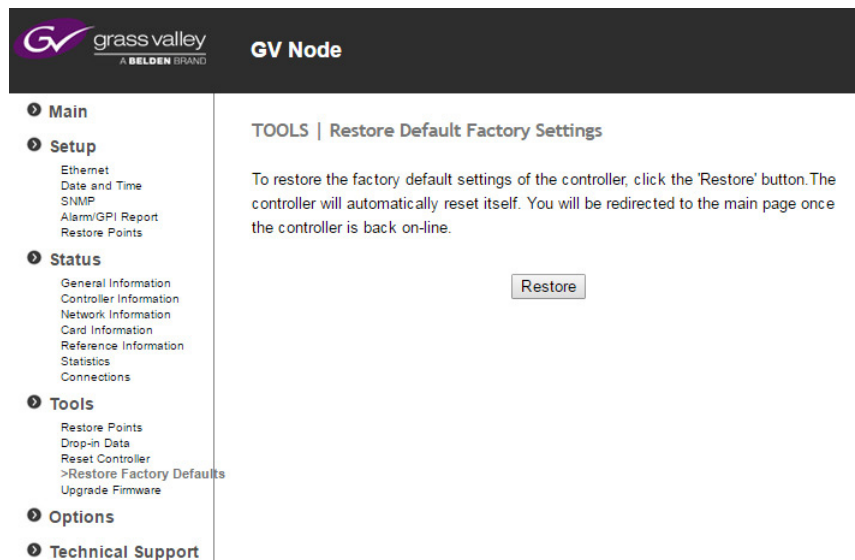
- 1 Click **Factory**
- 2 Click **Load Factory** to restore the card to the Factory default alignment. The controller will automatically **reset** to complete the process.



Recall factory settings using the web page

To reset the controller to the factory default settings

- 1 Select **Tools - Restore Factory Defaults** from the left-side navigation pane.



- 2 Click **Restore**. The controller will automatically **reset**, and you will be returned to the Main page once it is back online.

Recall factory settings using the menu

The factory default values can be loaded from the FACTORY DEFAULT menu item.

| Level 1 | Level 2 | Level 3 | |
|-----------------|--|---------|--|
| FACTORY DEFAULT | [RESTORE] (Sets all parameters shown above to their <u>default</u> values) | | |

The default values are shown underlined in the menu listing beginning on [page 50](#).

Time Management.

The CPU-ETH3 controller is time-aware, and its internal clock can be updated manually or via an NTP (Network Time Protocol) server.

The controller runs on UTC (i.e. universal coordinated time). Note that this does not recognize daylight savings time as implemented in many jurisdictions.

Manage time and date settings using...

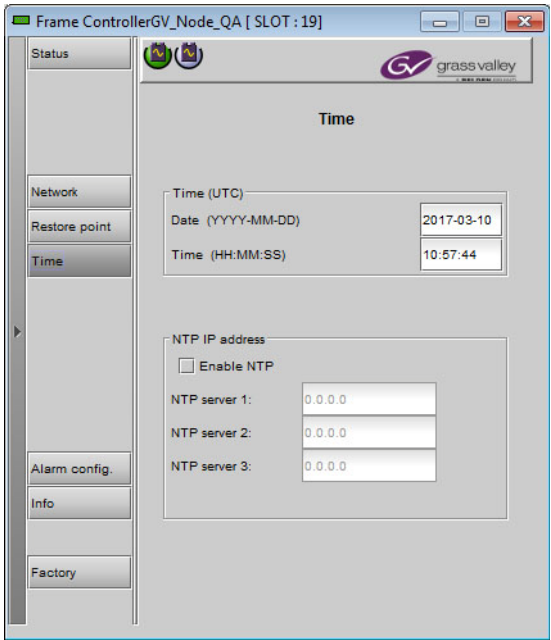
| iControl | Controller's web page | Local control panel |
|----------|-----------------------|---------------------|
| ✓ | ✓ | ✓ |

Time management using iControl

To manage the controller's internal time settings

- 1 Click **Time**.

The data boxes in the **Time (UTC)** section display the time and date currently held in the card.



- 2 If the **Enable NTP** checkbox is **not** selected, you can manually enter new date and time values into the data boxes.
- 3 Select the **Enable NTP** checkbox if you want to use an NTP server as a source of time and date information.
- 4 Enter up to three **IP addresses of NTP servers** in the data boxes.

The CPU-ETH3 card will use the first source of valid time it finds in this list.

Note: You can set a refresh interval for the NTP data using the web page or the menu, but not from this iControl panel.

Time management using the web page

To manage the controller's internal time settings

- 1 Select **Setup - Date and Time** from the left-side navigation pane.

The screenshot shows the 'Date and Time' configuration page in the iControl interface. The left navigation pane is expanded to 'Setup > Date and Time'. The main content area shows the current date and time as 'Thu Mar 9 10:31:34 UTC 2017'. The 'NTP Synchronization' section is currently set to 'Enabled'. Three NTP IP Address fields are visible, all containing '0.0.0.0'. The 'NTP Refresh Rate' is set to '17 min'. The 'Disabled' section shows 'New Time' as '10:31:34 UTC' and 'New Date' as '9 Mar 2017'. An 'Apply' button is located at the bottom right of the configuration area.

The **Current Date/Time** shown at the top is the value at the time this page was opened, and is not dynamically updated.

- 2 Select **Enabled** to activate NTP time synchronization in the controller.
- 3 Enter the IP address of at least one, and up to three running **NTP servers** in the data boxes.

The CPU-ETH3 card will use the first source of valid time it finds in this list.

- 4 From the **NTP refresh rate** pulldown, choose how often the controller will update its internal time from the NTP server.
- 5 Select **Disabled** if you want to enter the time and date manually.
- 6 Enter **New Time** and **New Date** information in the data boxes.
- 7 Click **Apply** to activate your changes.

Time management using the menu

You can enter the current time and date, and activate the NTP time sourcing through the TIME OPTIONS menu item.

| Level 1 | Level 2 | Level 3 | | |
|--------------|-------------------|-------------------|---|--|
| TIME OPTIONS | TIME | [[HH]:[MM]:[SS]] | | |
| | DATE | [DD]:[MMM]:[YY]] | | |
| | NTP CLIENT | [ENABLE, DISABLE] | | |
| | NTP SERVER | LIST IP ADDRESS | [[0...255].[0...255].[0...255].[0...255]] | |
| | | ADD IP ADDRESS | [[0...255].[0...255].[0...255].[0...255]] | |
| | | REMOVE ADDRESS | [[0...255].[0...255].[0...255].[0...255]] | |
| NTP REFRESH | [EVERY [HH] HOUR] | | | |

Note that the NPT REFRESH item, setting the interval at which the local clock is refreshed from the NTP server, is ONLY available from the menu and the web page, and does not appear on the iControl interface.

Alarms

The CPU-ETH3 controller generates alarms for the GV Matrix when error conditions are detected. These alarms are used to set the card status on the local control panel and the status icon in the top left of the iControl window.

The alarms are reported to the iControl network, and can be reported locally on the GV Matrix's GPI port.

- GPI reporting can only be accessed from the web page and the menu, as described at the end of this section (page 32).

Detailed alarm settings are available through the iControl panel. The web page and local control panel are limited to turning GPI reporting ON or OFF.

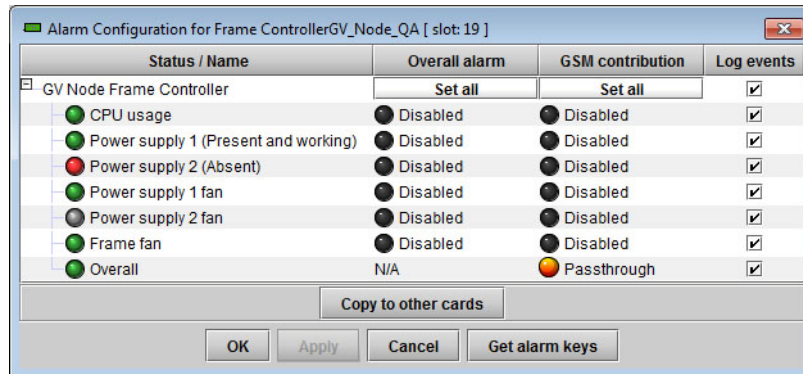
Configure alarm generation and reporting on the CPU-ETH3 using...

| iControl | Controller's web page | Local control panel |
|----------|-----------------------|---------------------|
| ✓ | ✓ | ✓ |

Alarm Configuration using iControl

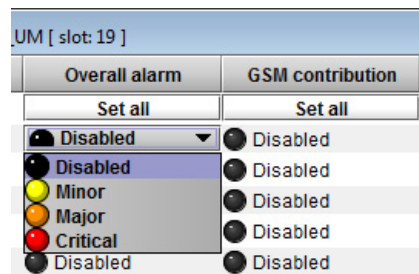
To Configure the alarms

- 1 Click **Alarm Config**.



The iControl Alarm Configuration panel opens in a new window. It can be resized if needed.

- 2 For each line in the Status/Name column:
 - a Click on the icon in the Overall Alarm column.
 - b Click to select the appropriate alarm status from the drop-down list.



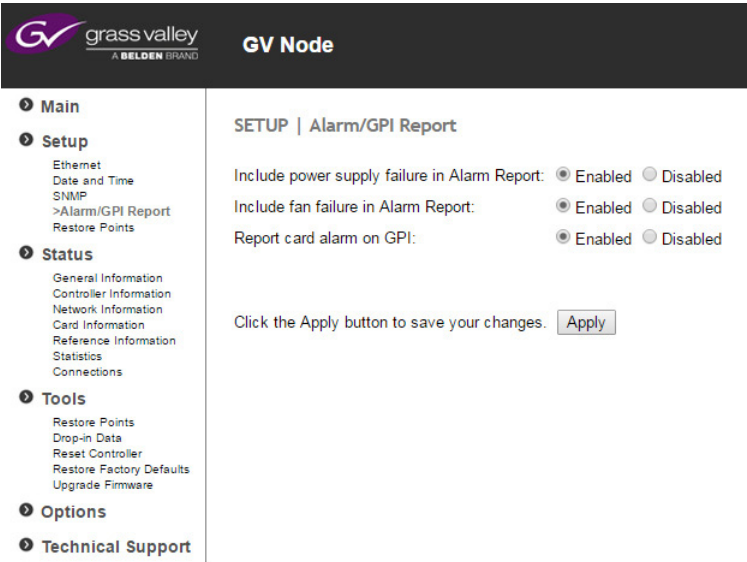
- c Click on the icon in the GSM Contribution column.
 - d Click to select the appropriate alarm status from the drop-down list.
- 3 Click **OK** to accept the settings, or **Cancel** to discard the changes.

See [Alarm Configuration](#), on page 84, for a more detailed description of the contents of this panel.

Alarm Reporting using the Web Page

To configure alarm reporting on the web page

- 1 Select **Setup-Alarm/GPI Report** from the left-side navigation pane.



- 2 Choose whether to enable or disable the inclusion of **Power Supply Failure** in the alarm report, using the radio buttons.
- 3 Choose whether to enable or disable the inclusion of **Fan Failure** in the alarm report, using the radio buttons.
- 4 Choose whether the card alarms will be reported on the rear-panel **GPI interface**, using the radio buttons.
- 5 Click **Apply** to save your changes.

Alarm reporting using the Menu

Access the **Alarm Report** menu item, and scroll through the list of available alarms, setting each to OFF or to report through GPI. Use the **GPI Report** item to turn GPI reporting on or off.

| Level 1 | Level 2 | Level 3 |
|--------------|---------------------------|---------------------|
| ALARM REPORT | PS FAILURE | [NONE, <u>GPI</u>] |
| | FAN FAILURE | [NONE, <u>GPI</u>] |
| GPI REPORT | [ENABLE, <u>DISABLE</u>] | |

Local Control Panel Menu - CPU-ETH3

Here is the complete on-board menu for the GV Matrix's CPU-ETH3 controller, accessed through its local control panel.

| Level 1 | Level 2 | Level 3 | |
|----------------|--------------------|---|---|
| STATUS | PS1 FAILURE | | |
| | PS2 FAILURE | | |
| | PS1 FAN FAILURE | | |
| | PS2 FAN FAILURE | | |
| | FAN1 FAILURE | | |
| | FAN2 FAILURE | | |
| | GPI ACTIVATED | | |
| | INTERNAL FAILURE | | |
| | SD CARD FAILURE | | |
| | RAM FAILURE | | |
| | FPGA LOAD FAIL | | |
| | ETH1 FAILURE | | ETH1 DOWN, ETH1 UP <SPEED><DUPLEX> |
| | ETH2 FAILURE | | ETH2 DOWN, ETH2 UP <SPEED><DUPLEX> |
| HOST NAME | <HOST NAME> | | |
| ETH1 OPTIONS | IP ADDRESS | [[0...255].[0...255].[0...255].[0...255]] | |
| | NETWORK MASK | [[0...255].[0...255].[0...255].[0...255]] | |
| | GATEWAY | [[0...255].[0...255].[0...255].[0...255]] | |
| | MAC ADDRESS | [[0...FFF].[0...FFF].[0...FFF]] | |
| | MII STATUS | [AUTONEGOTIATION, 100baseTx-FD, 10baseT-FD, 10baseT-HD] | |
| ETH2 OPTIONS | (SAME AS FOR ETH1) | | |
| SNMP OPTIONS | SNMP AGENT | [ENABLE, DISABLE] | |
| | SNMP TRAPS | LIST IP ADDRESS | [[0...255].[0...255].[0...255].[0...255]] |
| | | ADD IP ADDRESS | [[0...255].[0...255].[0...255].[0...255]] |
| | | REMOVE ADDRESS | [[0...255].[0...255].[0...255].[0...255]] |
| WEB SERVER | [ENABLE, DISABLE] | | |
| RESTORE POINTS | SAVE ALL CARDS | | |
| | SAVE A CARD | [1...N] (N DEPENDS ON FRAME CAPACITY) | |
| | LOAD ALL CARDS | | |
| | LOAD A CARD | [1...N] (N DEPENDS ON FRAME CAPACITY) | |
| | DEFAULT ACTION | [CARD, CONTROLLER] | |
| | AUTO SAVE | [ENABLE, DISABLE] | |
| | SAVE EVERY | [DAY, WEEK, MONTH] | |

| Level 1 | Level 2 | Level 3 | | |
|-----------------|--|---------------------------|---|--|
| TIME OPTIONS | TIME | [[HH]:[MM]:[SS]] | | |
| | DATE | [DD]:[MMM]:[YY]] | | |
| | NTP CLIENT | [ENABLE, <u>DISABLE</u>] | | |
| | NTP SERVER | LIST IP ADDRESS | [[0...255].[0...255].[0...255].[0...255]] | |
| | | ADD IP ADDRESS | [[0...255].[0...255].[0...255].[0...255]] | |
| | | REMOVE ADDRESS | [[0...255].[0...255].[0...255].[0...255]] | |
| NTP REFRESH | [EVERY [HH] HOUR] | | | |
| ALARM REPORT | PS FAILURE | [NONE, <u>GPI</u>] | | |
| | FAN FAILURE | [NONE, <u>GPI</u>] | | |
| GPI REPORT | [ENABLE, <u>DISABLE</u>] | | | |
| CTRL VERSION | [FIRMWARE V.XXX] | | | |
| BOOT-LOADER VER | [VERSION X.X.X] | | | |
| OPTIONS | [LINK REDUN ON/OFF] | | | |
| FACTORY DEFAULT | [RESTORE] <i>(Sets all parameters shown above to their <u>underlined</u> default values)</i> | | | |
| CTRL EXECUTION | [REBOOT] | | | |

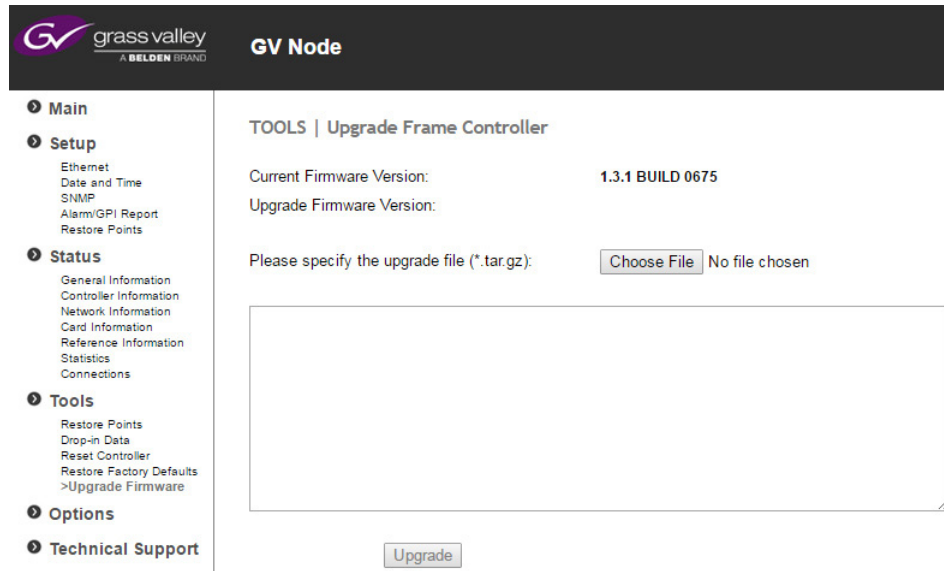
| | | | |
|--|------------------------------------|--|--|
| | Reported value; cannot be changed. | | List of values that can be selected. Default value is <u>underlined</u> . |
|--|------------------------------------|--|--|

Upgrading the CPU-ETH3 Controller

Upgrading the CPU-ETH3 firmware must be accomplished via a web page served by the controller, and accessed through its ethernet port using a browser.

To upgrade the CPU-ETH3 controller

- Obtain an upgrade file from Grass Valley.
The file will be named **3034-01P80-###_CPU-ETH3-BASIC-Firmware_v#.#.#.zip**, where ### is the firmware release version number.
- Unzip the file, and save the expanded file, which will be named **cpueth3-upgrade-#.#.#.bbb.tar.gz**
This file is the file you will need to upgrade the CPU-ETH3 card in step 7 below.
- Using a browser on your network, browse to the IP address of the CPU-ETH3 card.
If you are using iControl, double-click the controller in the iNavigator page, and select **NETWORK | ETH** to see the IP address.
- You will be asked for a username and password - the default values are:
 - "Username = admin
 - "Password = (leave blank)
The CPU-ETH3 web page will open in your browser.
- In the left-side menu, select **Tools | Upgrade Firmware**.



The current firmware version is shown at the top of the window

6 Click **Choose File**.

7 In the **Open** window, browse to the upgrade file you obtained in Step 1, **select** it and click **Open**.

In the Tools | Upgrade Frame Controller window, the upgrade firmware version will be shown at the top of the page, and the Upgrade button will be enabled.

8 Click **Upgrade**.

The window will show the status of the upgrade process.

The CPU-ETH3 card will reboot once the upgrade is complete.

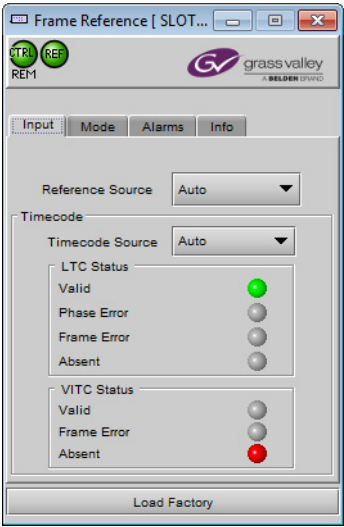
Configure the Frame Reference

Summary

| | |
|-------------------------------|----|
| <i>Reference</i> | 53 |
| <i>URS Generation</i> | 53 |
| <i>Timecode</i> | 54 |
| <i>Alarms</i> | 55 |
| <i>Information</i> | 56 |
| <i>Factory Settings</i> | 58 |

The frame reference module is physically integrated into the CPU-ETH3 module, but it presents its own interface to the user.

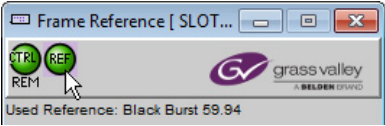
In iControl Navigator, double-click on the Frame Reference icon to open the service panel.



Reference

To see the reference format currently in use

- 1 Mouse-over the **REF** icon in the dashboard area at the top left of the panel.
- 2 The current reference format will be identified in the text area.



To select the reference source

- 1 Select the **Input** tab.
- 2 Click the **Reference Source** pulldown.
- 3 Click to select the reference source:

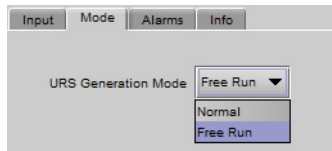
| Selection | Detail |
|-----------|--|
| Auto | Use the External reference; if it's not available, use the Internal reference. |
| External | Use the signal on the REF connector on the controller rear panel. |
| Internal | Use the signal from the internal generator. |

Note: In this release, only **EXTERNAL** is supported, no matter what is selected in the pulldown.

URS Generation

To select the URS generation mode

- 1 Select the **Mode** tab.



- 2 Click the URS Generation Mode pulldown.
- 3 Click to select the URS Generation mode:

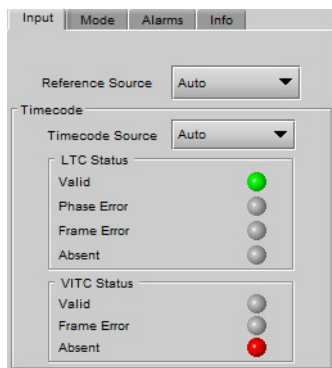
| Mode | Means |
|----------|--|
| Normal | The URS frame rate matches the selected reference input, i.e. only 29.97 or 25 Hz. |
| Free Run | All URS synchronization signals are generated, even the frame-rate-mismatched ones. So, in the same frame, some cards can work in 25Hz frame rate and other cards in 29.97Hz. The phase relation between these two frame rates will be arbitrary, thus the name "free run" |

Note: In this release, only **NORMAL** is supported, no matter what is selected in the pulldown.

Timecode

To select the timecode source

- 1 Select the **Input** tab



- 2 Click the **Timecode Source** pulldown
- 3 Click to select the source of timecode:

| Source | Function |
|--------|--|
| Auto | Use LTC if available, if not, VITC. |
| LTC | Use the timecode connected to the LTC input on the rear panel. |
| VITC | Extract timecode from the reference input. |
| OFF | Do not insert timecode into the URS signal. |

The current status of timecode available to the reference module is shown in the LTC Status and VITC Status areas:

| Status | Icon | Details |
|-------------|-------|---|
| Valid | Green | Valid timecode detected at the input. |
| Phase Error | Red | SMPTE-12 specifies the phase relation between LTC and video. If the LTC received does not match this alignment window, the card will flag this error. |
| Frame Error | Red | The time code must match the input reference frame rate. If not, an error is flagged. |
| Absent | Red | No time code detected at the input. |

Note: The error detection algorithm uses the current reference format. So, when using internal reference, all information extracted from the input is out of phase, and the card may flag errors even if there are none.

To configure timecode logging

- 1 Select the Alarms tab
- 2 Select the checkboxes to send the indicated time codes (LTC, VITC) to the iControl GSM, where it can be used by other network devices.

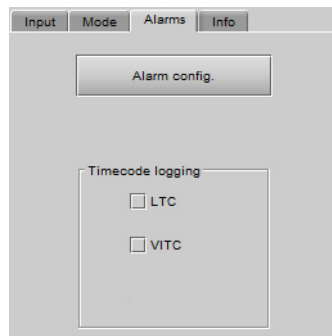
Note: This uses network resources, so you should leave these boxes unchecked if there is no need to use the time code in this way.

Alarms

The Frame Reference generates alarms that are sent to the GV Matrix controller card when error conditions are detected. These alarms are used to set the control panel status display, and the status icon in the top left of the iControl window.

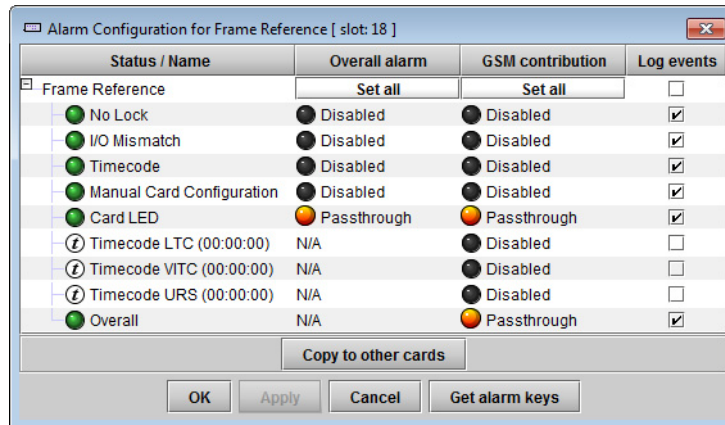
To configure alarms

- 1 Select the **Alarms** tab

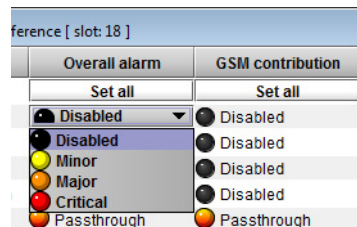


- 2 Click **Alarm Config**

The **Alarm Configuration for Frame Reference** window opens.



- 3 For each line in the Status/Name column:
 - a Click on the icon in the Overall Alarm column.
 - b Click to select the appropriate alarm status from the drop-down list.



- c Click on the icon in the GSM Contribution column.
 - d Click to select the appropriate alarm status from the drop-down list.
- 4 Alternatively:
 - a Click the **Set All** box at the top of the Overall Alarm column.
 - b Click to select the appropriate alarm status from the drop-down list.
All alarms in the column will be set to the selected status.
 - c Repeat steps a and b for the GSM contribution column.
- 5 Click **OK** to accept the settings, or **Cancel** to discard the changes.

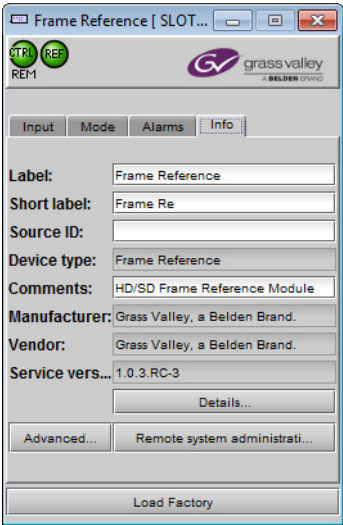
See [Alarm Configuration](#) on page 84 for a more detailed description of the contents of this panel.

Information

The user can enter labels and comments to make this frame reference easy to identify in a complex iControl setup. This information is entered into data boxes in the Info panel.

To enter labels and text descriptions

- 1 Select the **Info** tab.

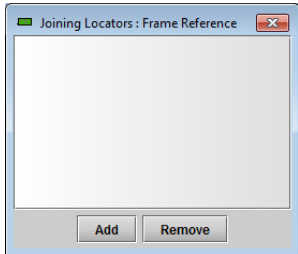
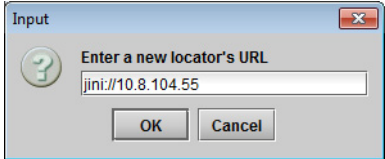


2 Enter appropriate text in the white data boxes (the image shows the default values):

| Data | Usage |
|-------------|---|
| Label | The label that is shown for this card in iControl applications. |
| Short Label | The short-form label that iControl uses in some cases (8 characters). |
| Source ID | A descriptive name for this frame reference. |
| Comments | Any desired text. |

The remaining data boxes show manufacturing information about this device. Three buttons in the panel give access to other information.

| Button | |
|------------|---|
| Details... | Reports the Firmware version, service version, and panel version for this card. |

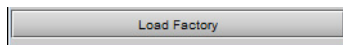
| Button | |
|------------------------------|--|
| Advanced... | Shows the LongID for this device. The LongID is the address of this frame reference in the iControl network. |
| Remote System Administration | <p data-bbox="626 380 1357 443">Opens the Joining Locators window, which lists remote lookup services to which this frame reference is registered.</p> <div data-bbox="626 453 922 705"></div> <p data-bbox="626 726 938 758">To add additional services</p> <ol data-bbox="643 768 1289 915" style="list-style-type: none">1 Click Add2 Enter the IP address of a server running a Jini look-up service, using this syntax: jini://<ip_address> <div data-bbox="675 926 1057 1083"></div> <ol data-bbox="643 1094 1273 1157" style="list-style-type: none">3 Click OK to add the service, or Cancel to discard the information. <p data-bbox="626 1178 980 1209">To remove an existing service</p> <ol data-bbox="643 1220 1357 1367" style="list-style-type: none">1 Click a service in the Joining Locators window to select it.2 Click Remove.3 Click OK in the pop-up confirmation window to remove the service, or Cancel to leave it in place. |

Factory Settings

The frame reference maintains a set of factory-installed settings, to which it can be restored at any time.

To restore the factory default settings

- 1 Click the **Load Factory** button at the bottom of the service panel.



- 2 Click **OK** in the pop-up confirmation window to perform the factory restore, or **Cancel** to leave the settings unchanged.

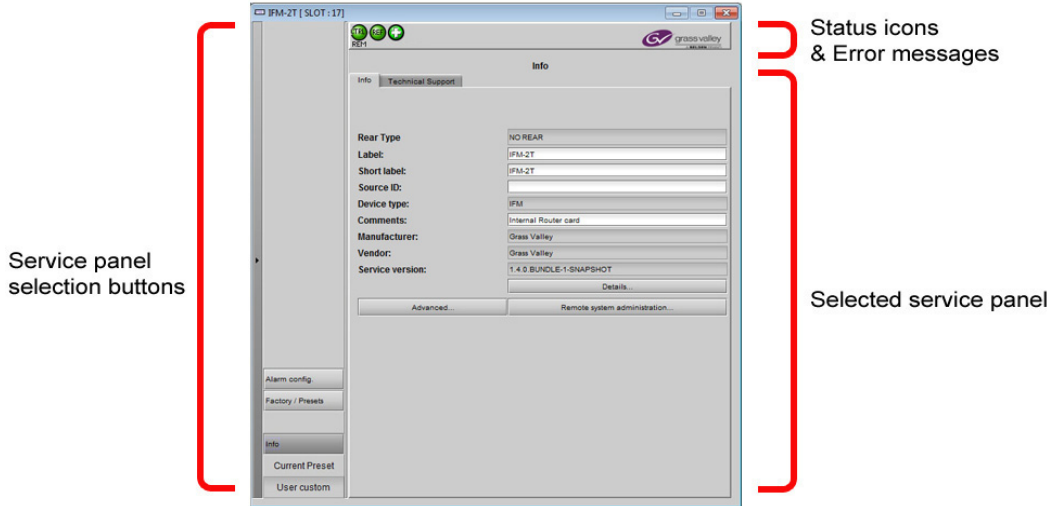
Configure the IFM-2T Fabric Module

The fabric module installed in the GV Matrix is managed and configured through the iControl interface.

Summary

- Identification 59
- Status 61
- Alarms 62
- User Presets 63
- Factory Configuration 64
- Technical Support 65

In iControl Navigator or iControl Websites, double-click on the icon of the fabric module to open its control panel.

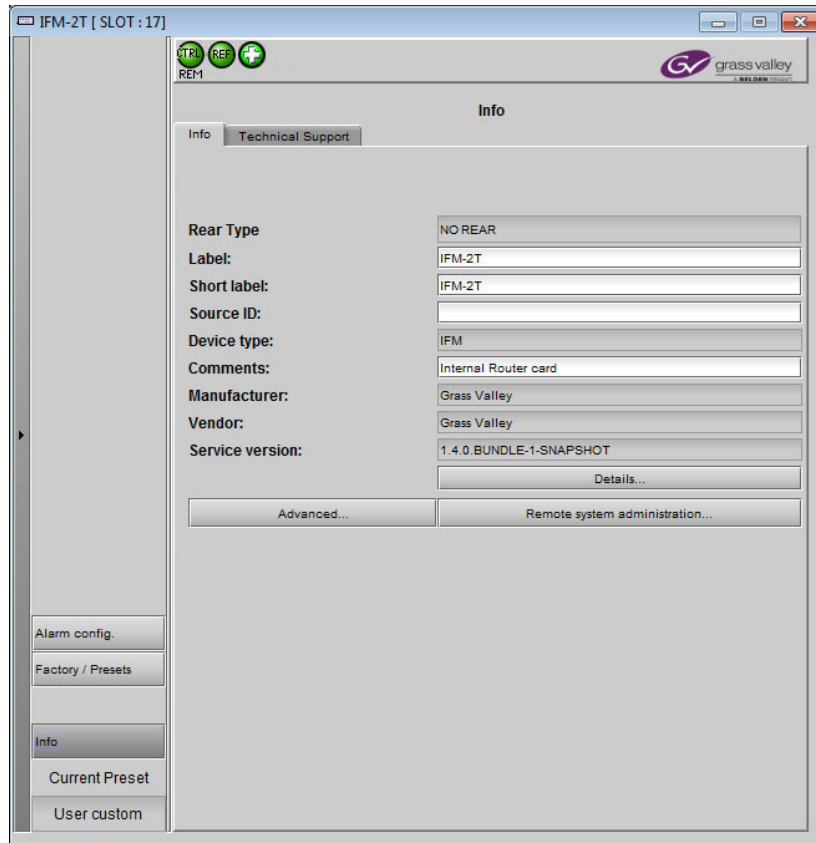


Identification

The user can enter labels and comments to make this fabric module easy to identify in a complex iControl setup. This information is entered into data boxes in the Info panel.

To enter labels and text descriptions

- 1 Click the **Info** button and select the **Info** tab.

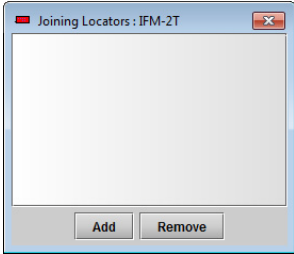
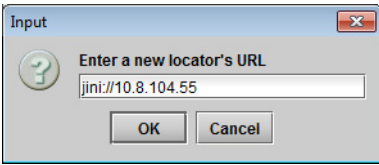


2 Enter appropriate text in the white data boxes (the image shows the default values):

| Data | Usage |
|-------------|---|
| Label | The label that is shown for this module in iControl applications. On initialization, matches the "Device Type", which is "IFM" for GV Matrix, but can be changed by the user. |
| Short Label | The short-form label that iControl uses in some cases (8 characters). |
| Source ID | A descriptive name for this IFM-2T. |
| Comments | Any desired text. |

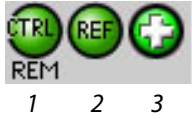
The remaining data boxes show manufacturing information about this device. Three buttons in the panel give access to other information.

| Button | |
|------------|---|
| Details... | Reports the Firmware version, service version, and panel version for this card. |

| Button | |
|------------------------------|--|
| Advanced... | Shows the LongID for this device. The LongID is the address of this IFM-2T in the iControl network. |
| Remote System Administration | <p data-bbox="570 373 1323 451">Opens the Joining Locators window, which lists remote lookup services to which this IFM-2T is registered.</p> <div data-bbox="581 457 873 709" style="border: 1px solid gray; padding: 5px; margin-bottom: 10px;">  </div> <p data-bbox="570 724 893 756">To add additional services</p> <ol data-bbox="592 766 1242 913" style="list-style-type: none"> 1 Click Add 2 Enter the IP address of a server running a Jini look-up service, using this syntax: jini://<ip_address> <div data-bbox="630 924 1006 1087" style="border: 1px solid gray; padding: 5px; margin-bottom: 10px;">  </div> <ol data-bbox="592 1092 1226 1165" style="list-style-type: none"> 3 Click OK to add the service, or Cancel to discard the information. <p data-bbox="570 1176 933 1207">To remove an existing service</p> <ol data-bbox="592 1218 1315 1365" style="list-style-type: none"> 1 Click a service in the Joining Locators window to select it. 2 Click Remove. 3 Click OK in the pop-up confirmation window to remove the service, or Cancel to leave it in place. |

Status

The iControl service panel for the IFM-2T displays four icons in the top left. These icons report the status of card functions.



| Icon # | Significance |
|--------|---|
| 1 | <p>Card control status for this IFM-2T</p> <ul style="list-style-type: none"> • Green (REM): Remote control via this iControl service panel. • Yellow (LOC): Local control of this card from the GV Matrix's local control panel. |
| 2 | <p>Reference status:</p> <ul style="list-style-type: none"> • Green: Reference is OK. • Red: Reference error. • |
| 3 | <p>Card health:</p> <ul style="list-style-type: none"> • Green: Card OK. • Red: Card failure. |

When an error is flagged, an error status message will be shown beneath the dashboard icons. Multiple error messages will cycle in the display.

- You can always check the current status of an icon by mousing over; the status will be shown in the message area.

Alarms

The fabric module generates alarms that are sent to the GV Matrix controller card when error conditions are detected. These alarms are used to set the control panel status display, and the status icon in the top left of the iControl window.

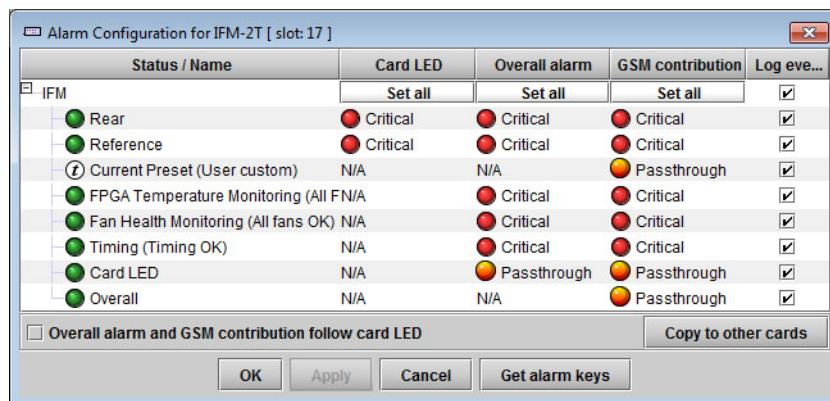
The alarms are reported to the iControl network, and can be reported locally on the frame's GPI port.

GPI reporting can only be accessed from the menu, as described at the end of this section (page 32).

To configure the alarms

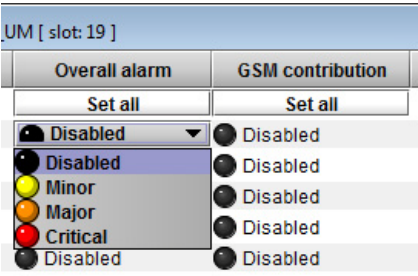
- 1 Click **Alarm Config**.

The Alarm Configuration panel opens in a new window, and can be resized if needed. It allows the alarm reporting of the module to be configured. The panel is organized in columns.



- 2 For each line in the Status/Name column:
 - a Click on the icon in the Overall Alarm column

b Click to select the appropriate alarm status from the drop-down list



c Click on the icon in the GSM Contribution column

d Click to select the appropriate alarm status from the drop-down list

Shortcut: if you click on "Set All" at the top of one of these columns, you will open a pulldown list that lets you assign a level to all alarms in that column simultaneously.

e Click on an icon in the Card LED column

You may find that some of these alarms have been hard-wired to a specific level, or can only be reset using the Set All pulldown

f Click to select the appropriate alarm status from the drop-down list, if available.

3 Click **OK** to accept the settings and close the window, **Apply** to accept the settings and keep the window open, or **Cancel** to discard the changes and close the window.

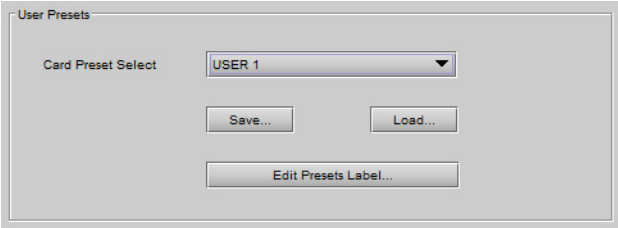
See [Alarm Configuration](#) on page 84 for a more detailed description of the contents of this panel.

User Presets

The IFM-2T has 5 memory registers that can hold user-defined parameter settings. You can save the current settings to a register, or reload the IFM-2T with the contents of a register

To manage User Presets

1 Click **Factory / Presets**.



2 Select a register using the **Card Preset Select** pulldown.

3 Click **Save** to save the card's parameter values in the selected memory register.

A pop-up will allow you to proceed or cancel the action.

Note that this action will overwrite the existing register contents.

4 Click **Load** to load the card with the contents of the selected memory register.

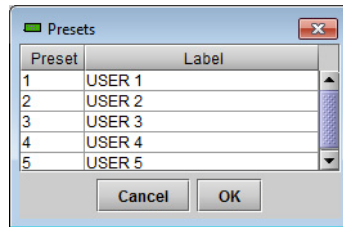
A pop-up will allow you to proceed or cancel the action.

Note that this action will overwrite the card's existing parameter settings and values.

To re-name a user preset

- 1 Click **Edit Presets Label**.

The Presets window opens.



- 2 Double-click on a name in the Label column.
- 3 Type a name in the data box.
- 4 Click **OK**.

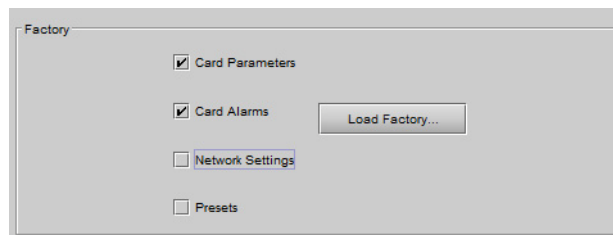
The text you have entered (up to 16 characters) will be appended to the label name in the selection pulldown.

Factory Configuration

The IFM-2T maintains a set of factory-specified settings in memory, and can be restored to that state at any time. You can select which groups of parameters are restored.

To reset the IFM-2T to the factory default status

- 1 Click **Factory / Presets**.



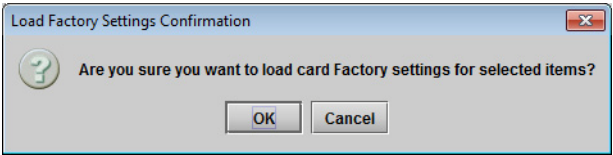
- 2 Click the checkboxes corresponding to the parameters that you want to restore to factory default values:

| Checkbox | Restores (i.e. overwrites current values with factory defaults) |
|------------------|--|
| Card Parameters | All operating parameters you have configured via the user interface. |
| Card Alarms | The alarm settings you have made on the Alarms panel. |
| Network Settings | |
| Presets | The user presets that you have stored on the card. |

If the box is not checked, the current card settings remain unchanged.

- 3 Click **Load Factory**

The Load Factory Settings Confirmation window opens.



4 Click **OK** to restore the factory settings, or **Cancel** to leave the settings unchanged.

Hot Swap to Maintain Routes

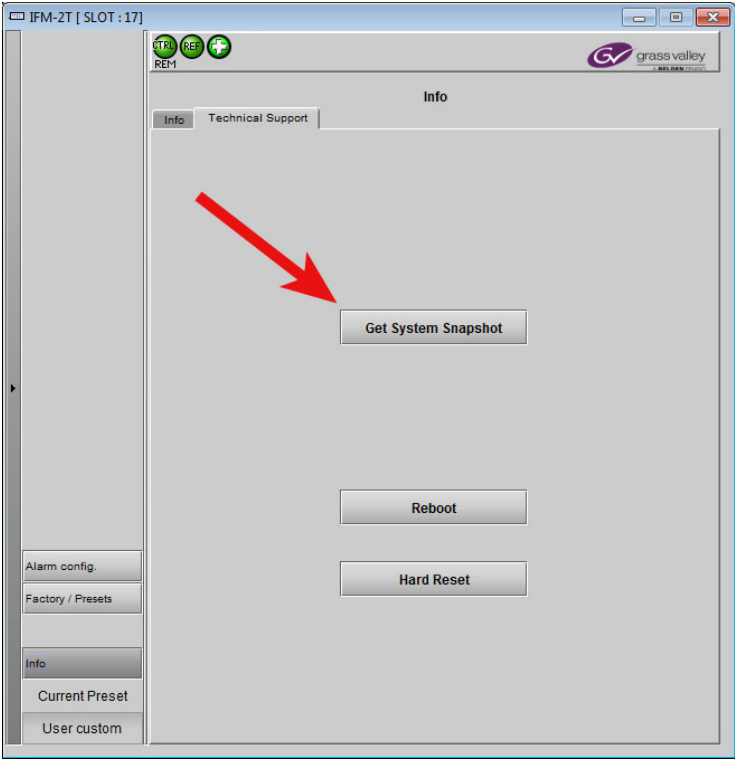
If you need to swap the IFM card for any reason, and want to keep any programmed routes, you should leave the **GV Matrix ON** (specifically, the CPU-ETH3 on and plugged in) while you remove the old IFM-2T and insert a new one.

Technical Support

If you are troubleshooting the IFM-2T with the assistance of Grass Valley's technical support team, they may ask you to supply a system snapshot.

To obtain a system snapshot

1 In iControl, open the IFM-2T service panel and select **Info | Technical Support**



- 2 Click **Get System Snapshot**.
- 3 Technical support will assist you in extracting the file and sending it to Grass Valley.

Emergency Recovery Tools

In some circumstances, e.g. if the IFM-2T card freezes or experiences other unusual symptoms, you may need to reset or restart the card.

To perform an emergency restart or reset

- 1 In iControl, open the IFM-2T service panel and select **Info | Technical Support**
- 2 To restart the card, click **Reboot**.
- 3 To restore the card to a pristine state, click **Hard Reset**.

Configure the XIO-4901 SDI I/O Card

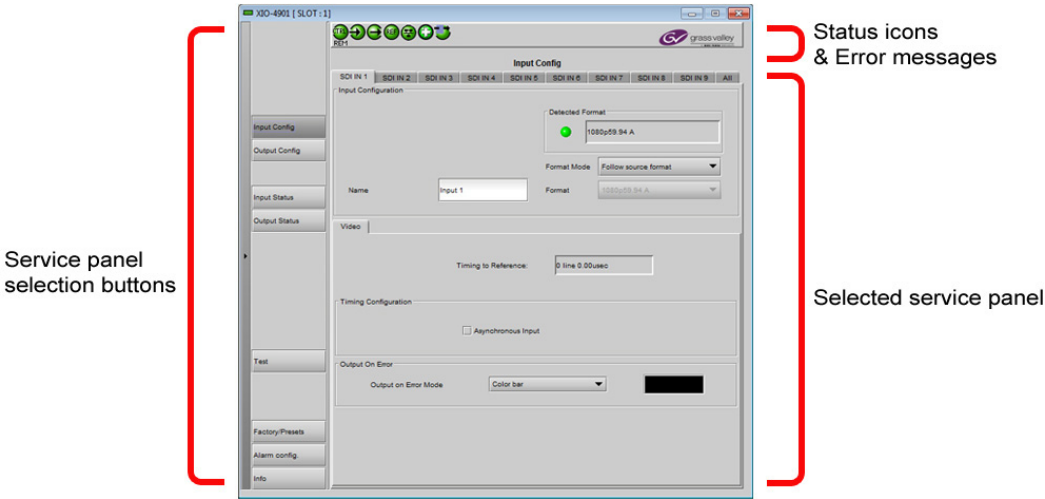
The XIO-4901SDI I/O modular card provides SDI, ASI and MAD1 inputs and outputs on the GV Matrix frame. It can be configured and managed using its iControl interface.

Summary

| | |
|---|----|
| <i>The iControl Service Panel</i> | 66 |
| <i>Identification</i> | 67 |
| <i>Status</i> | 68 |
| <i>Input Configuration - ASI</i> | 69 |
| <i>Input Configuration - SDI</i> | 70 |
| <i>Input Timing - SDI</i> | 72 |
| <i>Input Audio</i> | 73 |
| <i>Output Configuration - ASI</i> | 73 |
| <i>Output Configuration - SDI</i> | 74 |
| <i>Output Timing - SDI</i> | 76 |
| <i>Output Audio</i> | 77 |
| <i>Test</i> | 78 |
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| <i>Factory Configuration</i> | 81 |
| <i>Alarms</i> | 82 |

The iControl Service Panel

Locate your XIO-4901 in iControl Navigator, and double-click its icon to open the service panel.

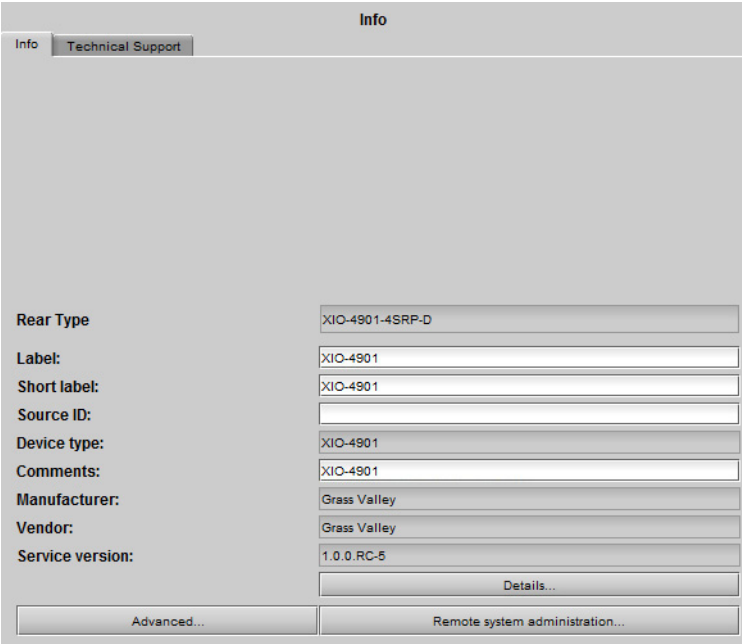


Identification

The user can enter labels and comments to make this XIO-4901 easy to identify in a complex iControl setup. This information is entered into data boxes in the Info panel.

To enter labels and text descriptions

- 1 Click the **Info** button and select the **Info** tab.



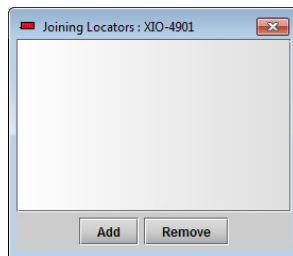
- 2 Enter appropriate text in the white data boxes (the image shows the default values):

| Data | Usage |
|-------------|---|
| Label | The label that is shown for this module in iControl applications. |
| Short Label | The short-form label that iControl uses in some cases (8 characters). |

| Data | Usage |
|-----------|---------------------------------------|
| Source ID | A descriptive name for this XIO-4901. |
| Comments | Any desired text. |

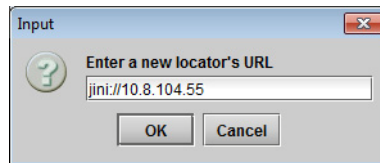
The remaining data boxes show manufacturing information about this device. Three buttons in the panel give access to other information.

| Button | |
|------------------------------|---|
| Details... | Reports the Firmware version, service version, and panel version for this card. |
| Advanced... | Shows the LongID for this device. The LongID is the address of this XIO-4901 in the iControl network. |
| Remote System Administration | Opens the Joining Locators window, which lists remote lookup services to which this XIO-4901 is registered. |



To add additional services

- 1 Click **Add**
- 2 Enter the IP address of a server running a Jini look-up service, using this syntax:
jini://<ip_address>



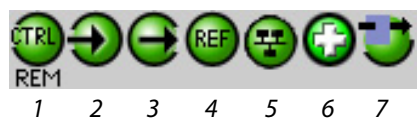
- 3 Click **OK** to add the service, or **Cancel** to discard the information.

To remove an existing service

- 1 Click a service in the Joining Locators window to select it.
- 2 Click **Remove**.
- 3 Click **OK** in the pop-up confirmation window to remove the service, or **Cancel** to leave it in place.

Status

The iControl service panel for the XIO-4901 displays seven icons in the top left. These icons report the status of card functions.



| Icon # | Significance |
|--------|---|
| 1 | Card control status for this XIO-4901: <ul style="list-style-type: none"> Green (REM): Remote control via this iControl service panel. Yellow (LOC): Local control of this card from the GV Matrix's local control panel. |
| 2 | Status of the SDI Inputs: <ul style="list-style-type: none"> Green: Inputs OK. Red: At least one input is in error. |
| 3 | Status of the SDI Outputs: <ul style="list-style-type: none"> Green: Outputs OK. Red: At least one output is in error. |
| 4 | Status of the GV Matrix's frame URS arriving at the XIO-4901: <ul style="list-style-type: none"> Green: URS OK. Red: URS fault. |
| 5 | Status of the Ethernet connection (via the controller rear panel) <ul style="list-style-type: none"> Green: Ethernet OK Red: Ethernet fault. |
| 6 | Card health: <ul style="list-style-type: none"> Green: Card OK. Red: Card failure. |
| 7 | Processing Mode: <ul style="list-style-type: none"> Green: Normal operation. Yellow: Test signal activated on at least one input or output. |

When an error is flagged, an error status message will be shown beneath the dashboard icons. Multiple error messages will cycle in the display.

- You can always check the current status of an icon by mousing over; the status will be shown in the message area.

Input Configuration - ASI

The **Input Config** panel provides resources to configure the processing of the nine rear-panel inputs before they are sent to the IFM-2T fabric module.

If an input has been configured for ASI input using the [GV Node Manager](#), the tab for that input in the Input Config panel will be labeled ASI IN n (n = 1 through 9).

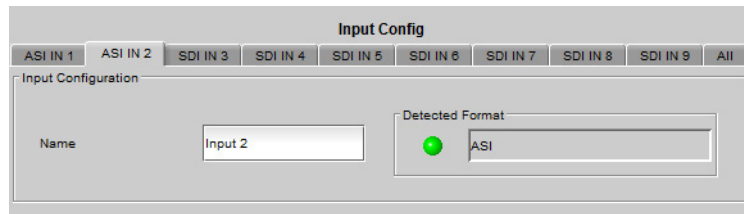
Note: ASI input is **not supported** if the **MDX option is enabled** for the XIO-4901 card.

ASI inputs are passed through without processing, so this tab only allows you to assign a name to the input, and reports the status of the detected format at the input.

To assign a name to an input

- Click **Input Config** and select an **ASI IN** tab.

2 Type a name for this input in the **Name** data box



| Detected Format | Status icon |
|-------------------|-------------|
| ASI | Green |
| All other formats | Red |

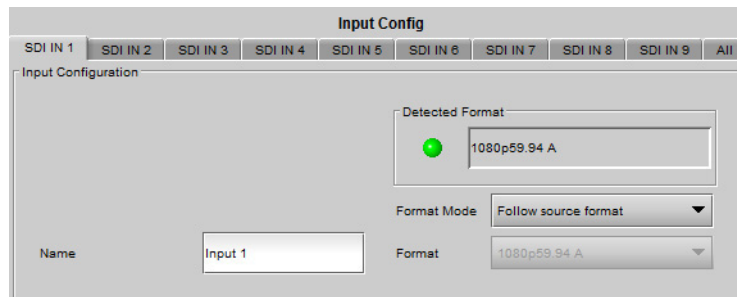
Input Configuration - SDI

The **Input Config** panel provides resources to configure the processing of the nine rear-panel inputs before they are sent to the IFM-2T fabric module.

If an input has been configured for SDI input using the [GV Node Manager](#), the tab for that input in the Input Config panel will be labeled SDI IN n (n = 1 through 9).

To assign a name to an input

- 1 Click **Input Config** and select one of the **SDI IN** tabs.



- 2 Type a name for this input in the **Name** data box.

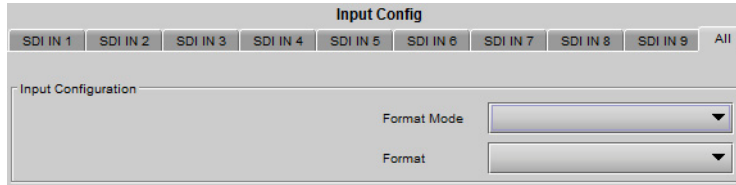
To select the format that the XIO-4901 input will lock to

- 1 Click the **Format Mode** pulldown
- 2 Click to select the desired format mode:

| Selection | Details |
|---------------------------------|--|
| Follow source format | The XIO input format follows the currently-detected input. |
| Lock to initial format detected | The input format locks to the initial format detected, and remains unchanged even if the source format changes. |
| Manual | Forces the input processing to use a specific format. Use the Format pulldown to select one of these supported formats: 525i, 625i, 1080p59.94A, 1080p50A, 1080i59.94, 1080i50, 720p50. |

To select the input format for all nine SDI Inputs at once

- 1 Click **Input Config** and select the **All** tab.



- 2 Click the **Format Mode** pulldown
- 3 Click to select the desired format mode, per [step 2](#) in the previous procedure.

To select the output from the XIO-4901 to the IFM-2T when the input is in error

- 1 Click **Input Config** and select one of the **SDI IN** tabs.
- 2 In the **Video** tab, click the **Output on Error Mode** pulldown.

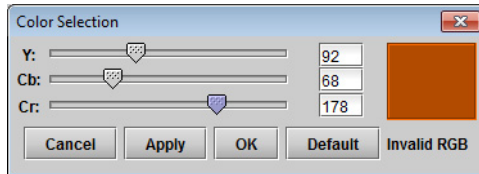


- 3 Click to select the desired output.

| Output | Details |
|-----------|---|
| Color bar | Feed a standard color bar to the fabric module. |
| RGB value | Feed a full-frame color patch to the fabric module. |

To choose the color for the RGB value

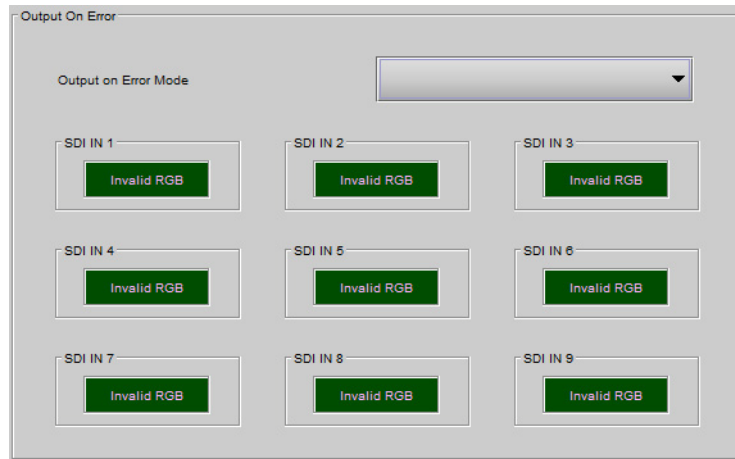
- 1 Click the color patch in the screen beside the Output on Error Mode pulldown.
The Color Selection window opens.



- 2 Click **Default** to select and apply the default color (Black: Y=16; Cb=Cr=128)
- 3 Move the sliders, or type into the data boxes, to adjust the color.
Invalid colors will be flagged as **Invalid RGB** beneath the color patch in this window, and inside the color patch in the SDI IN window.
- 4 Click **Apply** to confirm your changes, or **Cancel** to leave the color unchanged.

To select the Output on Error for all nine SDI Inputs at once

- 1 Click **Input Config** and select the **All** tab.



- 2 Click on the **Output on Error Mode** pulldown.
- 3 Click to select the desired output from the XIO-4901 to the IFM-2T when the SDI input is in error.

| Output | Details |
|-----------|---|
| Blank | Use the selections made on the 9 individual Input tabs. |
| Color bar | Feed a standard color bar signal to the fabric module. |
| RGB value | Feed a full-frame color patch to the fabric module. |

- 4 You must select the color patch individually for each of the nine outputs, as per [To choose the color for the RGB value](#), on page 71. You can use the color patches here instead of returning to the individual tabs - they are interconnected.

Input Timing - SDI

Input Timing to Reference

To see the timing relationship between an input and the GV Matrix's URS signal

- 1 Click **Input Config** and select the **SDI IN** tab for that input.
- 2 Select the **Video** tab and view the **Timing to Reference** data window.

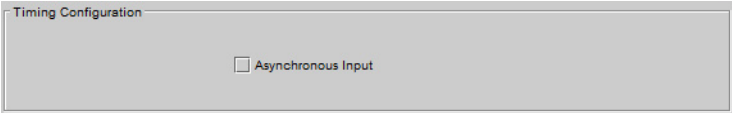
Asynchronous Input Signals

The input detection circuitry in XIO-4901 must be advised when the input signal is asynchronous to the system timing as defined by the GV Matrix's URS signal generated in the CPU-ETH3 controller. This is because an asynchronous signal will occasionally be nearly in phase with the reference, causing the the detection circuitry to lock it, only to have the signal drift away from the reference, unlocking the input circuits. The lock/unlock cycle will raise error messages, and interfere with system operation.

Defining this input as asynchronous allows the system to ignore the occasional in-phase situation. The signal can pass through the system, but of course clean switching will be compromised. See [Asynchronous Video](#) on page 87 for an overview of how GV Matrix handles asynchronous video.

To identify an input signal as asynchronous

- 1 Click **Input Config** and select the **SDI IN** tab for that input
- 2 Select the **Video** tab and view the **Timing Configuration** section.



- 3 Click the **Asynchronous Input** box to select it.
This input will now be considered asynchronous by the system, and processed accordingly. XIO outputs will **not** clean switch to or from this source.

Input Status

You can check the current status of the nine inputs by selecting **Input Status**.

The screenshot shows the "Input Status" window with a table of 9 inputs. The table has columns for Input #, Status, Name, Format, and Physical Address. The status of each input is indicated by a colored circle: green for good, red for error, and yellow for warning.

| Input # | Status | Name | Format | Physical Address |
|---------|--------|-----------|------------|------------------|
| 1 | Green | Input 1hk | ASI | |
| 2 | Red | Input 2 | None | |
| 3 | Yellow | Input 3 | 625i | |
| 4 | Green | Input 4 | 1080i59.94 | |
| 5 | Green | Input 5 | 1080i59.94 | |
| 6 | Green | Input 6 | 1080i59.94 | |
| 7 | Green | Input 7 | 1080i59.94 | |
| 8 | Green | Input 8 | 1080i59.94 | |
| 9 | Red | Input 9 | 625i | |

Input Audio

For a complete discussion of audio (including MADI) in the XIO-4901 and GV Matrix, see [GV Matrix Audio](#), on page 93.

Output Configuration - ASI

The **Output Config** panel provides resources to configure the processing of the nine signals received from the IFM-2T fabric module before they are sent to the rear-panel outputs.

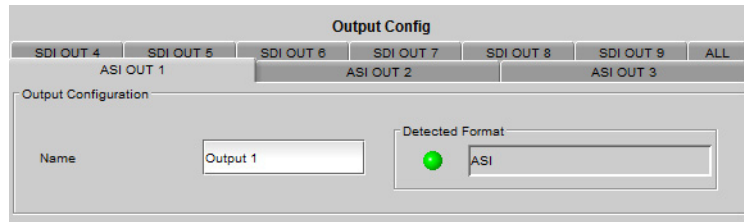
If an output has been configured for ASI output using the GV Node Manager, the tab for that output in the Output Config panel will be labeled ASI OUT n (n = 1 through 9).

Note: ASI output is **not supported** if the **MDX option is enabled** for the XIO-4901 card.

ASI streams are passed through without processing, so this tab only allows you to assign a name to the output, and reports the status of the detected format at the output.

To assign a name to an output

- 1 Click **Output Config** and select an **ASI OUT** tab.
- 2 Type a name for this output in the **Name** data box.



| Detected Format | Status icon |
|-------------------|-------------|
| ASI | Green |
| All other formats | Red |

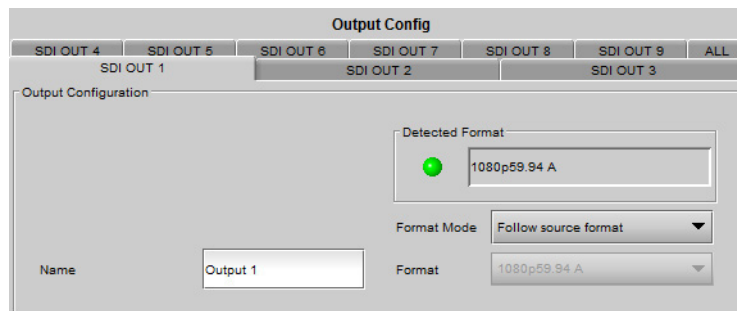
Output Configuration - SDI

The **Output Config** panel provides resources to configure the processing of the nine signals received from the IFM-2T fabric module before they are sent to the rear-panel outputs.

If an output has been configured for SDI output using the GV Node Manager, the tab for that output in the Output Config panel will be labeled SDI OUT n (n = 1 through 9).

To assign a name to an output

- 1 Click **Output Config** and select one of the **SDI OUT** tabs.



- 2 Type a name for this output in the **Name** data box.

To select how the output format of the XIO-4901 is determined

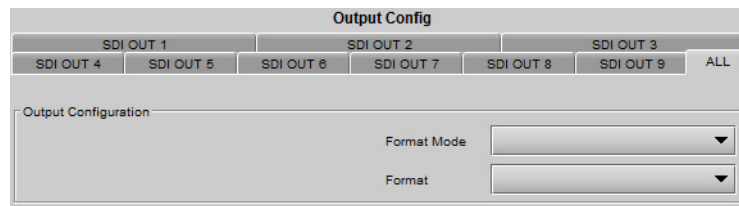
- 1 Click the **Format Mode** pulldown

- 2 Click to select the desired format mode:

| Selection | Details |
|---------------------------------|---|
| Follow source format | The XIO-4901 output format follows the currently-detected input. |
| Lock to initial format detected | The output format locks to the initial format detected, and remains unchanged even if the source format changes. |
| Manual | Forces the output processing to use a specific format. Use the Format pulldown to select one of these supported formats: 525i, 625i, 1080p59.94A, 1080p50A, 1080i59.94, 1080i50, 720p50. |

To select the output format for all nine outputs at once

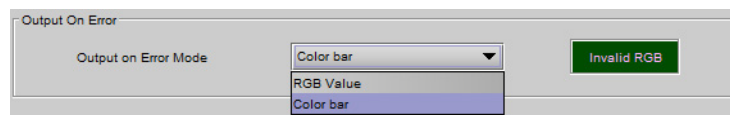
- 1 Click **Output Config** and select the **All** tab.



- 2 Click the **Format Mode** pulldown
- 3 Click to select the desired format mode, per [step 2](#) in the previous procedure.

To select the SDI output from the XIO-4901 when the input from the IFM-2T is in error

- 1 Click **Output Config** and select one of the nine **SDI OUT** tabs.
- 2 In the **Video** tab, click the **Output on Error Mode** pulldown.

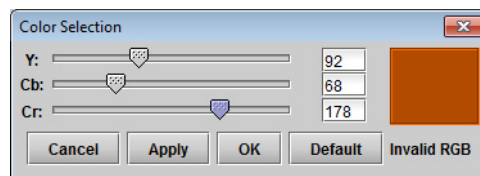


- 3 Click to select the desired output.

| Output | Details |
|-----------|--|
| Color bar | Feed a standard color bar to the SDI output. |
| RGB value | Feed a full-frame color patch to the SDI output. |

To choose the color for the RGB value

- 1 Click the color patch in the screen beside the Output on Error Mode pulldown. The Color Selection window opens.

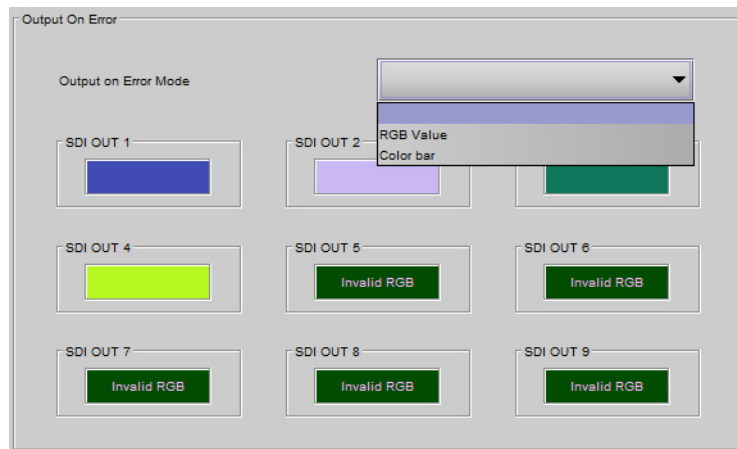


- 2 Click **Default** to select and apply the default color (Black: Y=16; Cb=Cr=128)

- 3 Move the sliders, or type into the data boxes, to adjust the color.
Invalid colors will be flagged as **Invalid RGB** beneath the color patch in this window, and inside the color patch in the SDI IN window.
- 4 Click **Apply** to confirm your changes, or **Cancel** to leave the color unchanged.

To select the Output on Error for all nine SDI Outputs at once

- 1 Click **Output Config** and select the **All** tab.



- 2 Click on the **Output on Error Mode** pulldown.
- 3 Click to select the desired SDI output from the XIO-4901 when the input from the the IFM-2T is in error.

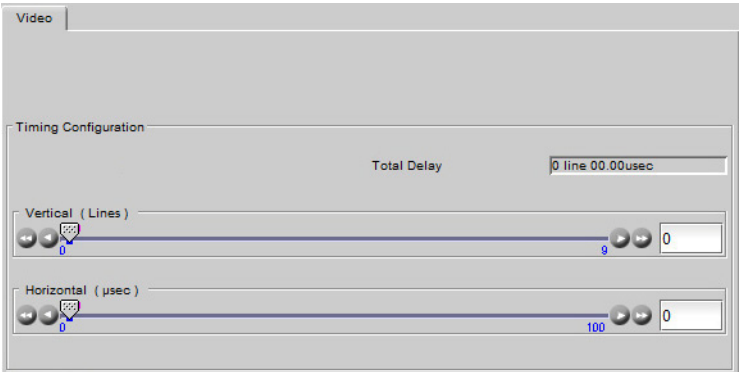
| Output | Details |
|-----------|---|
| Blank | Use the selections made in the 9 individual channel tabs. |
| Color bar | Feed a standard color bar to the SDI output. |
| RGB value | Feed a full-frame color patch to the SDI output. |

- 4 You must select the color patch individually for each of the nine outputs, as per [To choose the color for the RGB value](#), on page 71. You can use the color patches here instead of returning to the individual tabs - they are interconnected.

Output Timing - SDI

Timing Configuration

- 1 Click **Output Config** and select the **SDI OUT** tab for that output.
- 2 Select the **Video** tab and view the **Timing Configuration** section.



Delay (Vertical and Horizontal)

Use the sliders to add delay to the SDI output of the XIO-4901, if required for signal timing at downstream equipment. The total delay added using the two sliders is shown in the **Total Delay** data window.

Output Status

You can check the status of the nine SDI outputs by selecting **Output Status**:

| Input # | Status | Name | Format | Physical Address |
|---------|--------|------|--------------|------------------|
| 1 | ● | | 1080p59.94 A | |
| 2 | ● | | 1080p59.94 A | |
| 3 | ● | | 1080p59.94 A | |
| 4 | ● | | 1080p59.94 A | |
| 5 | ● | | 1080p59.94 A | |
| 6 | ● | | 1080p59.94 A | |
| 7 | ● | | 1080p59.94 A | |
| 8 | ● | | 1080p59.94 A | |
| 9 | ● | | 1080p59.94 A | |

Note: The CRC is recalculated and inserted for all XIO-4901 outputs.

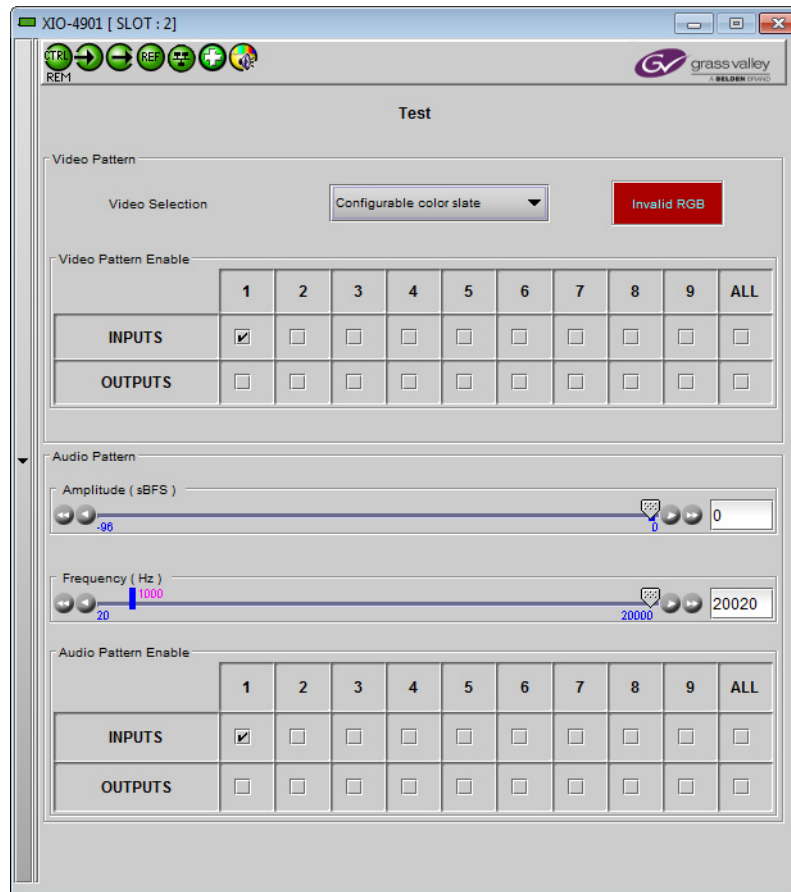
Output Audio

For a complete discussion of audio (including MADI) in the XIO-4901 and GV Matrix, see [GV Matrix Audio](#), on page 93.

Test

The Test panel allows you to place video and audio test signals on selected XIO-4901 inputs and outputs.

Note: The video and audio test patterns are **disabled** (the selection boxes are gray) for all inputs and outputs that are configured for **ASI format**.



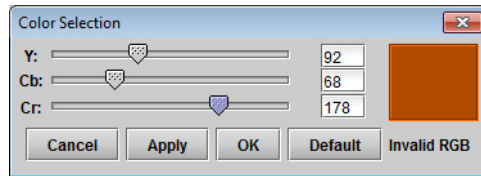
To select the video pattern for the test signal

- 1 In the **Test** panel, click the **Video Selection** pulldown.
- 2 Click to select the desired test signal.

| Output | Details |
|--------------------------|--|
| Color bar | Use a standard color bar as the test signal. |
| Configurable color slate | Use a full-frame color patch as the test signal. |

To choose the color for the full-frame color patch

- 1 Click the color patch in the screen beside the Video Selection pulldown.
The Color Selection window opens.



- 2 Click **Default** to select and apply the default color (Black: Y=16; Cb=Cr=128).
- 3 Move the sliders, or type into the data boxes, to adjust the color.
Invalid colors will be flagged as **Invalid RGB** beneath the color patch in this window, and inside the color patch in the Test panel window.
- 4 Click **Apply** to confirm your changes, or **Cancel** to close the window and leave the color unchanged.
- 5 Click **OK** to close the window after applying your changes.

To enable the video pattern on inputs and outputs

- 1 Click on a checkbox in the **Video Pattern Enable** grid to apply the video test pattern to that input or output.
- 2 Click on the appropriate checkbox in the **ALL** column to apply the pattern to all inputs or all outputs.

To configure the audio pattern for the test signal

- 1 Choose an amplitude by moving the slider or typing in the data box.
Range: -96 sBFS to 0 sBFS
- 2 Choose a frequency by moving the slider or typing in the data box.
Range: 20 Hz to 20000 Hz

To enable the audio pattern on inputs and outputs

- 1 Click on a checkbox in the **Audio Pattern Enable** grid to apply the audio test pattern to that input or output.
- 2 Click on the appropriate checkbox in the **ALL** column to apply the pattern to all inputs or all outputs.

Options

There is one option available for the XIO-4901.

XIO-4901-OPT-MDX is a software option that enables audio embedding / de-embedding on all SDI inputs and outputs on the XIO-4901 module.

To enable this option

- 1 Purchase the option from Grass Valley.
You will be provided with an activation key
- 2 Click **Options**.



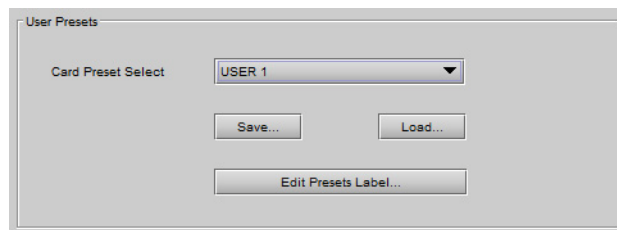
- 3 Enter the activation key in the **Enter Key** data box.
- 4 Click **Enable Option**.
The status window beneath the data box will show that the option is active.

User Presets

The XIO-4901 has 8 memory registers that can hold user-defined parameter settings. You can save the current settings to a register, or reload the XIO-4901 with the contents of a register

To manage User Presets

- 1 Click **Factory / Presets**.



- 2 Select a register using the **Card Preset Select** pulldown.
- 3 Click **Save** to save the card's parameter values in the selected memory register.

A pop-up will allow you to proceed or cancel the action.

Note that this action will overwrite the existing register contents.

- 4 Click **Load** to load the card with the contents of the selected memory register.

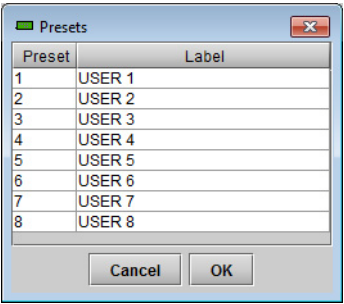
A pop-up will allow you to proceed or cancel the action.

Note that this action will overwrite the card's existing parameter settings and values.

To re-name a user preset

- 1 Click **Edit Presets Label**.

The Presets window opens.



- 2 Double-click on a name in the Label column.
- 3 Type a name in the data box.
- 4 Click **OK**.

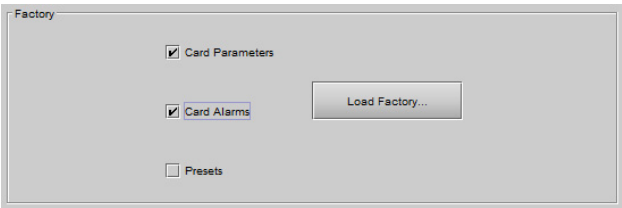
The text you have entered (up to 16 characters) will be appended to the label name in the selection pulldown.

Factory Configuration

The XIO-4901 maintains a set of factory-specified settings in memory, and can be restored to that state at any time. You can select which groups of parameters are restored.

To reset the XIO-4901 to the factory default status

- 1 Click **Factory / Presets**.



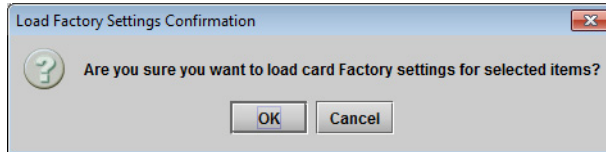
- 2 Click the checkboxes corresponding to the parameters that you want to restore to factory default values:

| Checkbox | Restores (i.e. overwrites current values with factory defaults) |
|-----------------|--|
| Card Parameters | All operating parameters you have configured via the user interface. |
| Card Alarms | The alarm settings you have made on the Alarms panel. |
| Presets | The user presets that you have stored on the card. |

If the box is **not checked**, the current card settings will remain **unchanged**.

3 Click **Load Factory**

The Load Factory Settings Confirmation window opens.



4 Click **OK** to restore the factory settings, or **Cancel** to leave the settings unchanged.

Alarms

The XIO-4901 generates alarms that are sent to the GV Matrix controller card when error conditions are detected. These alarms are used to set the control panel status display, and the status icon in the top left of the iControl window.

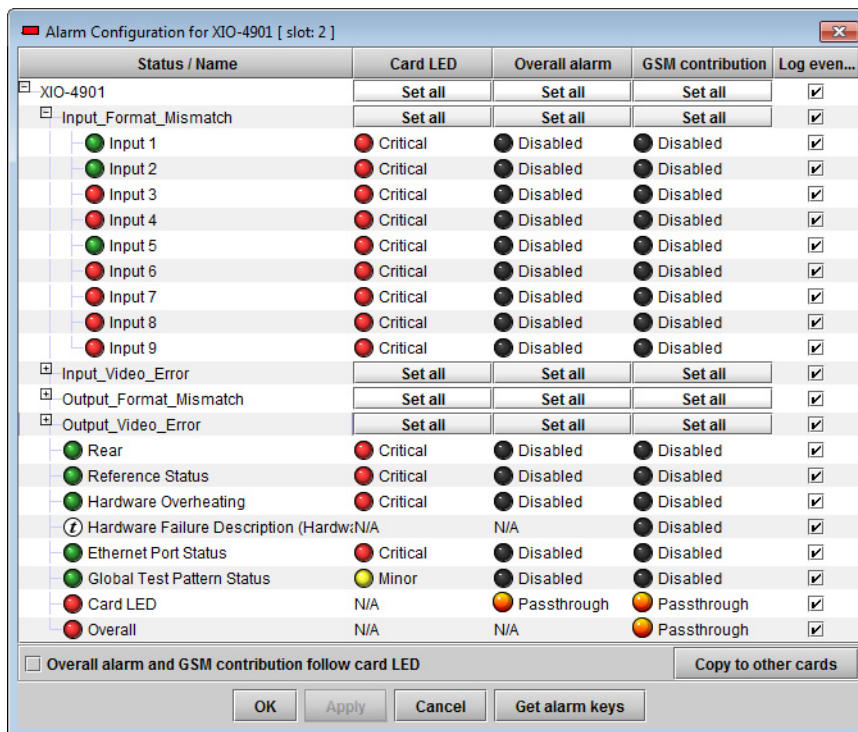
The alarms are reported to the iControl network, and can be reported locally on the frame's GPI port.

GPI reporting can only be accessed from the menu, as described at the end of this section (page 32).

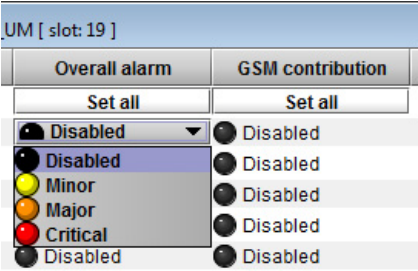
To configure the alarms

1 Click **Alarm Config**.

The Alarm Configuration panel opens in a new window, and can be resized if needed. It allows the alarm reporting of the module to be configured. The panel is organized in columns.



- 2 For each line in the Status/Name column:
 - a Click on the icon in the Overall Alarm column
 - b Click to select the appropriate alarm status from the drop-down list



- c Click on the icon in the GSM Contribution column
 - d Click to select the appropriate alarm status from the drop-down list

Shortcut: if you click on “Set All” at the top of one of these columns, you will open a pulldown list that lets you assign a level to all alarms in that column simultaneously.

- e Click on an icon in the Card LED column

You may find that some of these alarms have been hard-wired to a specific level, or can only be reset using the Set All pulldown
 - f Click to select the appropriate alarm status from the drop-down list, if available.
- 3 Click **OK** to accept the settings and close the window, **Apply** to accept the settings and keep the window open, or **Cancel** to discard the changes and close the window.

See [Alarm Configuration](#) on page 84 for a more detailed description of the contents of this panel.

GV Node Manager

The **GV Node Manager** manages inputs and outputs between the IFM-2T fabric module and the modular cards in the GV Matrix’s 16 slots.

To manage the inputs and outputs between the Fabric Module and the modular cards

- 1 In iControl Navigator, locate the **GV Node Manager** associated with your GV Matrix and double-click its icon.

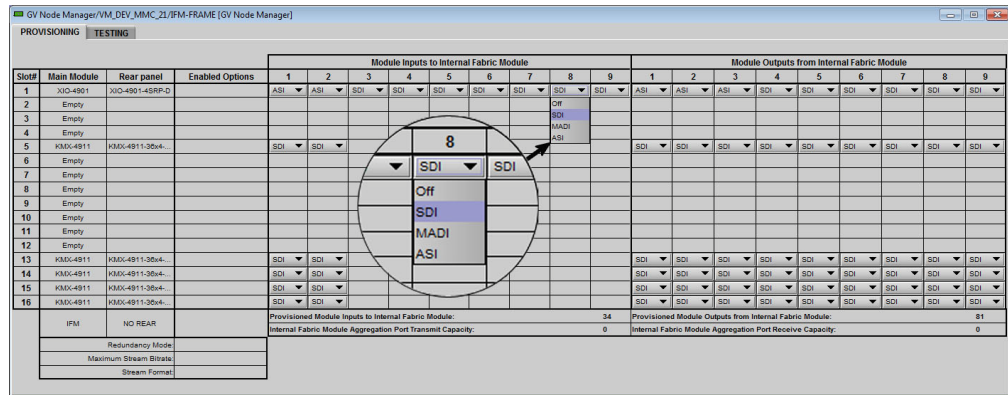
The GV Matrix’s **GV Node Manager** panel opens.

Note: In the presence of multiple GV Node managers, locate yours by checking the Comments column—the DNAME you chose for your GV Matrix will be the last element in the comment. See [step 5](#) on page 12 under Registering your GV Matrix to iControl.

Note: Depending on the version of GV Node Manager that is installed with your GV Matrix, certain elements may or may not be present:

- A **Testing** tab at the top of the table
- References to **Aggregation Ports** and **stream formats** at the bottom of the table

All of these are inactive for GV Matrix, and should be ignored.



- In the row beside each GV Matrix modular card, select the status of each of the 9 inputs to the fabric module and 9 outputs from the fabric module.

XIO-4901: The available choices depend on whether the MDX option is activated on the XIO-4901 card (See [Options](#) on page 79), and whether it is selected under the Options column in the GV Matrix Manager window.

| XIO-4901 Card | GV Node Manager | | |
|---------------|-----------------|-------------------|---------------------------|
| MDX Option | Options | I/O CH 1-7 | I/O CH 8 & 9* |
| Not activated | (blank) | OFF SDI ASI | OFF SDI MADI ASI |
| Activated | None | OFF SDI ASI | OFF SDI MADI ASI |
| Activated | MDX | OFF SDI MDX | OFF SDI MDX |

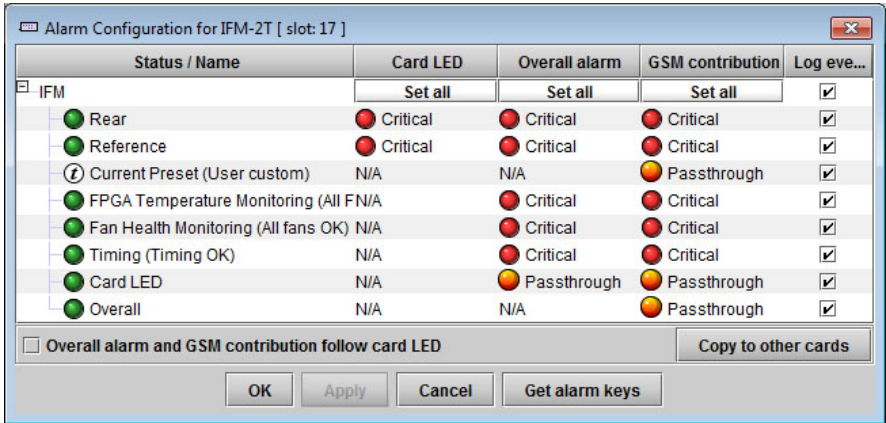
* When using the XIO-4901-4DRP rear panel (BNC connectors), there are only 8 I/O available, and MADI is enabled on I/O CH 7 & 8.

Alarm Configuration

All modules with an iControl interface provide an Alarm Configuration window. The specific display for each module is shown in its own section, but an overview of the elements of the display is given here.

Note: For a more detailed description of alarms in the iControl environment, see the iControl User Manual, available at the Grass Valley website, www.grassvalley.com.

Here is a typical Alarm Configuration panel:



Status/Name

This column contains an expandable tree listing all the alarms reported by this device.

Each alarm name includes an icon that shows its current status

The Card LED, Overall alarm and GSM contribution columns contain pulldown lists that allow the level of contribution of each individual alarm to the alarm named in the column heading to be set. Click on the alarm status in either of these columns to show the status options that are available, then click on one to select it. If no options appear, the alarm is not user-configurable

Card LED

This column allows configuration of the contribution of selected individual alarms to the status displayed on the GV Matrix local control panel. Many cards also have a Status LED located on the front card edge. The Card LED status is shown at the bottom of the alarm tree in the Status/Name column.

This column is not shown in all cases.

Overall Alarm






This column allows configuration of the contribution of each individual alarm to the Overall Alarm associated with this card. The Overall Alarm is shown in the upper left corner of the iControl panel, and also appears at the bottom of the Status/Name column.

GSM Contribution

This column allows configuration of the contribution of each individual alarm to the GSM Alarm Status associated with this card. GSM is a dynamic register of all iControl system alarms, and is also an alarm provider for external applications. The possible values for this contribution are related to the Overall alarm contribution:

- If the Overall alarm contribution is selected as Disabled, the GSM alarm contribution can be set to any available value
- If the Overall alarm contribution is selected as any level other than disabled, the GSM contribution is forced to follow the Overall Alarm.

Levels associated with these alarms:

| Icon & status | Significance |
|---|---|
|  Disabled | The alarm makes no contribution (black icon) |
|  Minor | The alarm is of minor importance (yellow icon) |
|  Major | The alarm is of major importance (orange icon) |
|  Critical | The alarm is of critical importance (red icon) |
|  Passthrough | The alarm exists but has no effect (used for text and composite alarms) |

Shortcut: if you click on **Set All** at the top of one of these columns, you will open a pulldown list that lets you assign a level to all alarms in that column simultaneously.

Once the alarms are configured, you may accept the changes or discard them.

Log Events

iControl maintains a log of alarm events associated with the card. The log is useful for troubleshooting and identifying event sequences.

- Click in the checkboxes to enable logging of alarm events for each alarm individually.
- Click the checkbox at the top of the column beside the card name to select all alarms.

At the bottom of the window are several other controls:

Copy to other cards

- 1 Click this button to open a panel that allows the alarm configuration set for this card to be copied into other cards of the same type.
- 2 Select one or more destination cards from the list in the window by clicking in the checkboxes, or all of them by clicking in the All checkbox.
- 3 Click **Copy** to start the copy process.

The Transfer Status window reports on the status of the data transfer.

Get alarm keys

Click this button to open a save dialog where you can save a file containing a list of all alarms on this card and their current values, along with an Alarm Key for each. The alarm keys are useful for system integration and troubleshooting.

The file is saved in .csv format

OK, Apply, Cancel

- **OK** accepts the settings and closes the window once the controller confirms that there are no errors.
- **Apply** accepts the settings, but leaves the window open
- **Cancel** closes the window without applying any changes, and leaves the previous settings intact.

Asynchronous Video

Sometimes video arriving at the GV Matrix through the XIO-4901 inputs will not be synchronous with the local reference source. Dealing with asynchronous video in a switching/routing environment requires special consideration.

GV Matrix input behavior for asynchronous video

- **SDI inputs:** The user must manually identify asynchronous SDI inputs to the XIO-4901 as asynchronous in the **XIO-4901 Input Config** panel.

See [Asynchronous Input Signals](#) on page 72 for a fuller description and procedure.

| Asynchronous IN checkbox | Behavior |
|--------------------------|--|
| Checked | The signal is considered ASYNC. The incoming SDI can be at a different frame rate than reference, or can be a wild feed. |
| Unchecked | The signal is considered SYNC. The incoming SDI must be genlocked and timed within NTW. |

GV Matrix output behavior for asynchronous video

- **SDI Outputs:** Clean switching at the XIO-4901 output depends on the status of the signals arriving from the fabric module.

| Signal status | Behavior |
|---------------|---|
| SYNC | The deglitcher in the XIO output is active. Switches between synchronous sources will be clean. |
| ASYNC | The deglitcher in the XIO output is disabled. Switches will not be clean. |

3 Router Control Configuration

Introduction

Operating the GV Matrix's internal NV router, the IFM-2T fabric module, requires an external control solution:

- **NV-9000** - Grass Valley's router controller.
- **GV Convergent**
- **NP0017/0017** for third-party control

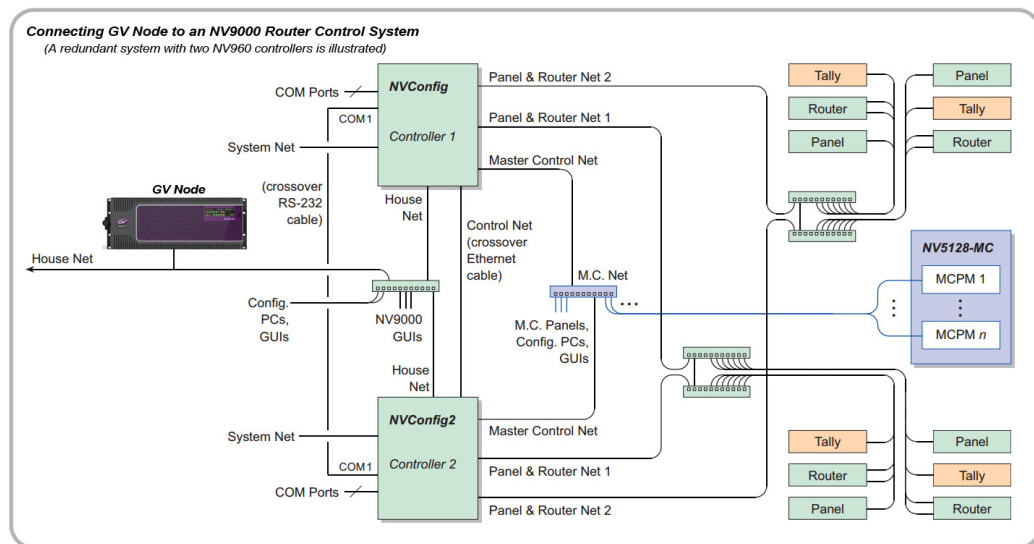
This manual describes an application-specific process for setting up the control interface for GV Matrix using NV-9000. If you need more detailed information, please consult the user documentation for this product, available on the Grass Valley website, www.grassvalley.com.

Summary

| | |
|---|----|
| <i>Introduction</i> | 89 |
| <i>Overview</i> | 89 |
| <i>Step 1: Configure GV Matrix for your operational setup</i> | 90 |
| <i>Step 2: Connect GV Matrix to the NV9000 network</i> | 90 |
| <i>Step 3: Design a configuration using SE Utilities</i> | 90 |

Overview

A typical NV9000 system including a GV Matrix is shown in the diagram below:



The point to note is that, while NV9000 systems are normally operated as an isolated ecosystem (the entire right-hand side of the figure - controllers, routers, panels, tallys, etc.) to prevent breakdowns caused by extra network traffic, the GV Matrix can live outside that closed ecosystem, connected through the House Net that links the NV9000 system to the outside world. The user's PC with iControl Solo can also be connected to that network, allowing the GV Matrix to be configured in situ.

Establishing a router control setup for GV Matrix and NV9000 involves these steps:

[Step 1: Configure GV Matrix for your operational setup](#), on page 90

[Step 2: Connect GV Matrix to the NV9000 network](#), on page 90

[Step 3: Design a configuration using SE Utilities](#), on page 90

Step 1: Configure GV Matrix for your operational setup

Before connecting GV Matrix to an external control solution, you must identify the use requirements and configure the system parameters that affect them. These are found in the earlier chapters of this manual.

Step 2: Connect GV Matrix to the NV9000 network

Because the GV Matrix is connected to the NV9000 House Net, you will need to set the GV Matrix IP address to occupy the same subnet as the NV9000 controller.

- NV9000 default address for the House Net: 192.168.20.1

See [Setting the GV Matrix's IP Address](#), on page 10, for detailed instructions.

Step 3: Design a configuration using SE Utilities

This process is beyond the scope of this manual.

Please consult the **User Manual for NV9000 SE Utilities** configuration software for detailed instructions.

Helpful Information when designing a configuration:

| | |
|-------------------|------------------------------|
| Protocol | NV Ethernet - Compact router |
| Router Size | 288 x 288 |
| Router IP Address | As configured in Step 2 |

The tables below list the port identifications for the various I/O to the fabric card.

Card Slot I/O Numbering

Video Matrix

| Slot No. | First I/O | Last I/O |
|----------|-----------|----------|
| 1 | 1 | 9 |
| 2 | 10 | 18 |
| 3 | 19 | 27 |
| 4 | 28 | 36 |
| 5 | 37 | 45 |
| 6 | 46 | 54 |
| 7 | 55 | 63 |
| 8 | 64 | 72 |
| 9 | 73 | 81 |
| 10 | 82 | 90 |
| 11 | 91 | 99 |
| 12 | 100 | 108 |
| 13 | 109 | 117 |
| 14 | 118 | 126 |
| 15 | 127 | 135 |
| 16 | 136 | 144 |

Audio Matrix (embedded audio)

| Slot No. | I/O 1 | I/O 2 | I/O 3 | I/O 4 | I/O 5 | I/O 6 | I/O 7 | I/O 8 | I/O 9 |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1 | 1 | 17 | 33 | 49 | 65 | 81 | 97 | 113 | 129 |
| 2 | 145 | 161 | 177 | 193 | 209 | 225 | 241 | 257 | 273 |
| 3 | 289 | 305 | 321 | 337 | 353 | 369 | 385 | 401 | 417 |
| 4 | 433 | 449 | 465 | 481 | 497 | 513 | 529 | 545 | 561 |
| 5 | 577 | 593 | 609 | 625 | 641 | 657 | 673 | 689 | 705 |
| 6 | 721 | 737 | 753 | 769 | 785 | 801 | 817 | 833 | 849 |
| 7 | 865 | 881 | 897 | 913 | 929 | 945 | 961 | 977 | 993 |
| 8 | 1009 | 1025 | 1041 | 1057 | 1073 | 1089 | 1105 | 1121 | 1137 |
| 9 | 1153 | 1169 | 1185 | 1201 | 1217 | 1233 | 1249 | 1265 | 1281 |
| 10 | 1297 | 1313 | 1329 | 1345 | 1361 | 1377 | 1393 | 1409 | 1425 |
| 11 | 1441 | 1457 | 1473 | 1489 | 1505 | 1521 | 1537 | 1553 | 1569 |
| 12 | 1585 | 1601 | 1617 | 1633 | 1649 | 1665 | 1681 | 1697 | 1713 |
| 13 | 1729 | 1745 | 1761 | 1777 | 1793 | 1809 | 1825 | 1841 | 1857 |

Audio Matrix (embedded audio)

| Slot No. | I/O 1 | I/O 2 | I/O 3 | I/O 4 | I/O 5 | I/O 6 | I/O 7 | I/O 8 | I/O 9 |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 14 | 1873 | 1889 | 1905 | 1921 | 1937 | 1953 | 1969 | 1986 | 2001 |
| 15 | 2017 | 2033 | 2049 | 2065 | 2081 | 2097 | 2113 | 2129 | 2145 |
| 16 | 2161 | 2177 | 2193 | 2209 | 2225 | 2241 | 2257 | 2273 | 2289 |

Audio Matrix (MADI audio)

| MADI | Groups 1-4 | Groups 5-8 | Groups 9-12 | Groups 13-16 |
|-------|------------|------------|-------------|--------------|
| I/O 8 | 1-16 | 17-32 | 33-48 | 49-64 |
| I/O 9 | 65-80 | 81-96 | 97-112 | 113-128 |

4 GV Matrix Audio

GV Matrix provides audio routing resources in parallel with its video routing resources. This chapter describes the GV Matrix's audio functions.

Summary

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| <i>MADI</i> | 94 |
| <i>SDI Embedded Audio</i> | 95 |

Overview of GV Matrix Audio

GV Matrix supports audio by incorporating an audio router in the IFM-2T fabric module, and by incorporating embedding and de-embedding of audio from SDI streams passing through the XIO-4901 modular card. The XIO-4901 also provides access to the audio router for MADI audio streams. There are no other discreet audio inputs or outputs to the GV Matrix.

Audio functionality is affected by:

- The MDX option (see [Options](#), on page 79) - enables embedding and de-embedding on the XIO-4901.
- The [GV Node Manager](#) - the control point for selecting the status of audio on the XIO-4901 inputs and outputs.

The audio functionality available at each of the XIO-4901 rear panel inputs (9) and outputs (9) is summarized in the table:

| XIO-4901 Card | GV Node Manager | | |
|---------------|-----------------|-------------------|---------------------------|
| MDX Option | Options | I/O CH 1-7 | I/O CH 8 & 9* |
| Not activated | (blank) | OFF SDI ASI | OFF SDI MADI ASI |
| Activated | None | OFF SDI ASI | OFF SDI MADI ASI |
| Activated | MDX | OFF SDI MDX | OFF SDI MDX |

The following summarizes what you can do with audio in the GV Matrix:

- If MDX is OFF (option not activated, or option active but not selected in GV Matrix manager), embedding and de-embedding are not active on the entire XIO-4901 card.
- If MDX is OFF, MADI may be enabled on the last two I/O of an XIO-4901. The MADI audio is directed to the audio matrix. Embedded audio can enter and leave the XIO-4901 through the remaining 7 SDI I/O ports, but remains embedded in the video stream and does not go to the audio matrix. At the outputs, it is passed through and not overwritten.
- If the MDX option is active, and turned ON in GV Matrix manager, the use of MADI is disabled.
- If the MDX option is active, the user may select, through the GV Matrix manager, whether embedding and de-embedding is active on the entire XIO-4901 card using the Options pulldown. If it is active, embedding and de-embedding can be enabled/disabled on individual inputs and outputs. If MDX is active on an output, embedded audio arriving from the video matrix will ALWAYS be overwritten by discrete audio from the audio matrix, or blanked if no audio input is selected by the control system.

Control of the router for audio and video is handled by the NV9000 control system. See [Router Control Configuration](#) on page 89.

MADI

The XIO-4901 supports MADI audio on the last two numbered inputs and outputs. The actual designated inputs and outputs depend on the installed rear panel, because the panel with DIN connectors supports 9 IN and 9 OUT, while the panel with BNC connectors supports 8 IN and 8 OUT.

| Rear Panel | Connectors | MADI I/O Channels |
|-----------------|------------|-------------------|
| XIO-4901-4DRP | BNC | 7 & 8 |
| XIO-4901-4SRP-D | DIN | 8 & 9 |

The XIO-4901 supports MADI at 48 KHz sampling, and the MADI stream can carry 64 channels of audio, in 16 groups of 4 channels each.

Note: When the MDX Option is installed and ON, support for MADI is no longer available.

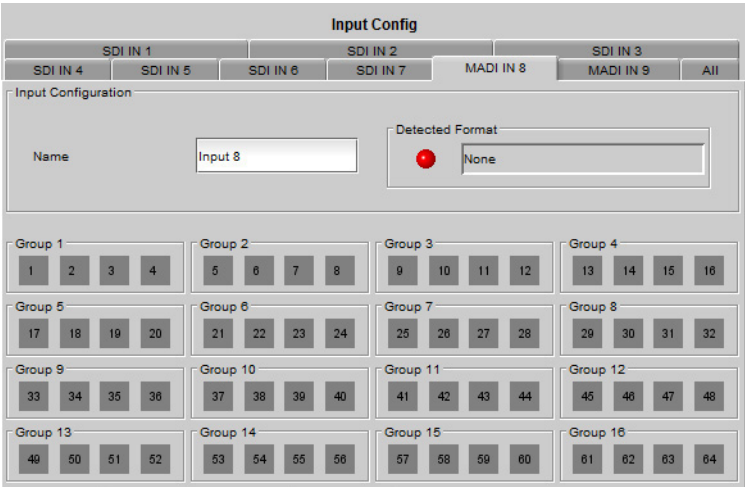
To configure SDI inputs and outputs to carry MADI audio

- 1 Open the **GV Matrix Manager** by double-clicking in the iControl Navigator window.
- 2 In the row for the XIO-4901 you are configuring:
 - a Under **Options**, select **None** from the pulldown if the MDX option is available. Note that this will disable embedding and de-embedding of audio on all 9 inputs and outputs of the XIO-4901.
 - b In the section **Inputs to Internal Fabric Module**, select MADI from the pulldown for any of the last two inputs (see the table above) if you want to activate MADI for that SDI input.

- c In the section **Outputs from Internal Fabric Module**, select MADI from the pulldown for any of the last two outputs (see the table above) if you want to activate MADI on that SDI output.

To configure MADI on an XIO-4901 input

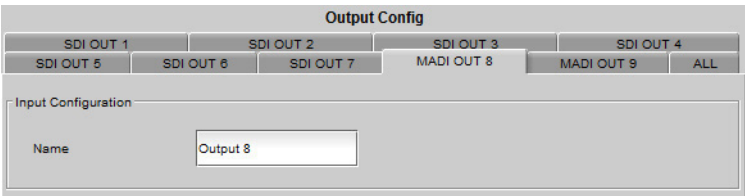
- 1 Click **Input Config** in the XIO-4901 iControl service panel, and select a **MADI IN** tab. Only the last two numbered inputs may be designated as MADI inputs.



The 64 icons in 16 Groups at the center of the panel indicate the status of incoming audio channels in the MADI stream. These audio channels are mapped to the IFM-2T audio matrix as shown in the table [Audio Matrix \(MADI audio\)](#), on page 92.

To configure MADI on an XIO-4901 output

- 1 Click **Output Config** in the XIO-4901 iControl service panel, and select a **MADI OUT** tab. Only the last two numbered inputs may be designated as MADI outputs.



The 64 audio channels in the output MADI stream are mapped from the IFM-2T audio matrix as shown in the table [Audio Matrix \(MADI audio\)](#), on page 92.

SDI Embedded Audio

SDI inputs and outputs on the XIO-4901 can carry up to 32 channels of embedded audio. With the MDX option enabled on the XIO-4901, embedding and de-embedding of 4 groups (16 channels) of audio is activated.

Each XIO-4901 supports 9 inputs and 9 outputs, totaling $(9 \times 16) = 144$ audio IN and 144 audio OUT. Since there are 16 modular card slots, the IFM-2T fabric module provides routing resources for $(16 \times 144) = 2304$ audio IN and 2304 audio OUT at the modular card interface.

These audio channels are mapped to the IFM-2T audio matrix as shown in the table [Audio Matrix \(embedded audio\)](#), on page 91.

To enable audio embedding and de-embedding on the XIO-4901

- 1 Activate the **MDX option** on the XIO-4901.
See [Options](#) on page 79.
- 2 Open the **GV Matrix Manager** by double-clicking in the iControl Navigator window.
- 3 In the row for the XIO-4901 you are configuring:
 - a Under **Options**, select MDX from the pull-down.
 - b In the section **Inputs to Internal Fabric Module**, select MDX from the pull-down for each of the 9 inputs if you want to activate de-embedding for that SDI input.
 - c In the section **Outputs from Internal Fabric Module**, select MDX from the pull-down for each of the 9 outputs if you want to activate embedding on that SDI output.

Note: MDX is the default selection for the Options, Inputs and Outputs columns in GV Matrix Manager when the MDX Option is first enabled. Steps 2 and 3 allow you to verify the default configuration, and let you disable MDX, if you don't need it on a particular input or output, by selecting OFF or SDI in the pull-down.

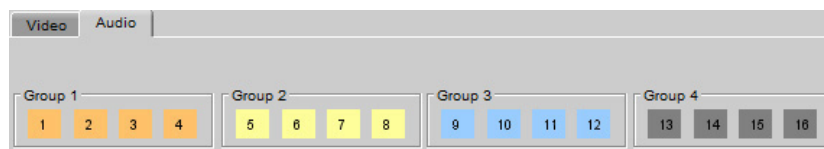
To configure Audio De-embedding on an SDI Input

- 1 Click **Input Config** in the XIO-4901 iControl service panel, and select an **SDI IN** tab.
- 2 Select the **Audio** tab.

The tab will only be shown if the **MDX option** is:

- Installed on this XIO-4901.
- Selected under **Options** in the GV Matrix Manager for this card.
- Selected under **Inputs to Internal Fabric Module** for this input on this card.

The 16 icons in four Groups at the top of the tab indicate the status of incoming audio to the de-embedder:



| Icon color | Audio Type |
|--------------|--------------------|
| Yellow | Non-PCM |
| Orange | PCM |
| Blue | Dolby E |
| Light purple | Dolby Digital |
| Dark purple | Dolby Digital Plus |
| Gray | No Audio |

You can mouse-over a colored icon to see the format.

To configure Audio Embedding on an SDI Output

- 1 Click **Output Config** in the XIO-4901 iControl service panel, and select an **SDI OUT** tab.
- 2 Select the **Audio** tab.

The tab will only be shown if the **MDX option** is:

- Installed on this XIO-4901.
- Selected under **Options** in the GV Node Manager for this card.
- Selected under **Outputs from Internal Fabric Module** for this output on this card.

No information is displayed in this tab in the current release.



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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