DENSITÉ 3+ FR4

HOUSING FRAME

User Manual

M3007-9900-104

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Title	Densité 3+ FR4 User Manual
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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.
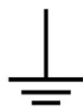
Identifies an external protective grounding terminal which may be connected to earth ground as a supplement to an internal grounding terminal.

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.
- Products that have no on/off switch, and use an external power supply must be installed in proximity to a main power outlet that 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 may have more than one power supply cord. Disconnect all 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.

Mesures de sécurité et avis importants

*Mises en gardeLes mises en garde signalent des conditions ou des pratiques susceptibles d'endommager l'équipement. Veuillez vous familiariser avec les mises en garde ci-dessous : viii*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-CSA-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 nettoyants 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.
- 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 peut comporter plus d'un cordon d'alimentation. Afin de prévenir les chocs électriques, débrancher tous les cordons d'alimentation avant toute opération d'entretien.
- 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.

Recycling

Visit www.grassvalley.com for recycling information.

Certification and Compliance

Safety Compliance

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

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

Environmental Compliance

GVN FR4 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	X	O	O	O	O	O
电路模块 Circuit modules	X	O	X	O	O	O
显示装置 Display Assemblies	X	O	O	O	O	O
组装风扇 Fan Assemblies	X	O	O	O	O	O
金属零件 Metal parts	X	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11364-2014 规定的限量要求以下。

O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T 11364-2014.

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11364-2014 规定的限量要求。

X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T 11364-2014.

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.

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

Table of Contents

Summary

The Densité 3+ FR4 Frame

Overview - Frame

The 4 RU Densite 3+ FR4 Frame from Grass Valley, a Belden Brand, is a modular frame and controller designed to deliver more power per slot and higher speed connectivity needed by the increased feature set of the latest Densité products. The Densité 3+ FR4 frame offers true multiformat operation, with the ability to process simultaneously SDI and IP 4K, 3G, HD, SD, and analog video, as well as AES and analog audio. The frame provides advanced monitoring and back-up capabilities along with a color LCD panel with integrated touchscreen for ease of status and control navigation on the front panel.

The front-opening frame features dual hot-swappable power supplies (PSUs) and fans. The processing modules or cards for the frame are also hot-swappable, and can be configured automatically when a card is replaced. 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. The basic frame configuration includes one PSU and a controller that allows card parameters to be adjusted from the front panel.

Key Product Capabilities

- Fully backwards compatible with Densité 2 and Densité 3 cards.
- 24 slots with a power budget of 25 watts per slots.
- Optional frame reference on controller card.
- Fully modular I/O for the frame controller for "future readiness" of the controller I/O.
- Dual GigE port for system wide redundancy.
- Full touchscreen color LCD panel for module status and control.

Standard Densité capabilities

- Multiple video and audio formats can be fitted in a single frame.
- Densité 3 RU and Densité 2 RU modules can co-exist in the same frame.
- Easy configuration by front panel or remotely via the Ethernet frame controller.
- Choice of control panels, including the PC-based iControl Solo GUI.
- Hot-swappable power supply, with optional redundant power supply.
- Supports full range of Densité Series modules.
- Frame can be stacked without additional cooling spaces.
- Optional redundant Ethernet connection.

Available Options

- Second power supply for redundant power security.
- Full link redundancy using Channel Bonding on the CPU-ETH3 controller.
- Frame reference integrated with controller.
- Densité 3+ FR4 ADV Advanced Controller Platform.

Cards (maximum 24 per frame)

The Densité 3+ FR4 housing frame supports all current Densité 3 series cards directly. Many Densité 2 series cards can also be installed with the use of an adapter that fits on the card, plus an additional adapter to extend the rear panel if a dedicated 3RU rear is not available..

Overview - Controller

The CPU-ETH3 controller installed in the Densité 3+ FR4 frame supports all on-frame communication between cards, and incorporates a touch-screen panel for local control and adjustment of the frame and installed cards. The CPU-ETH3 controller serves as the communications port for control and alarm information entering and leaving the frame. The CPU-ETH3 controller features two Ethernet ports for system-wide monitoring and control of the frame, using Grass Valley's control solutions. This controller card is compatible with the TCP/IP protocol and can support polling or report on error modes (unsolicited messaging). The CPU-ETH3 Advanced controller provides additional features.

Features

- Dual Ethernet RJ-45 ports (100Base-T and Gigabit Ethernet) - the two ports can be configured independently for full network redundancy.

- Provides ultra-robust Ethernet connectivity for LAN/WAN.
- Accelerated data throughput: allows video thumbnail and audio level meter and line scope streaming from all installed modular cards
- Linux-based operating system for robust, mission-critical operations.
- Removable SD memory card for portable and quickly-recoverable device and frame configuration.
- User-configurable GPI alarm port.
- Features front display panel and push-buttons for local configuration of cards and frame.
- Can be remotely configured via iControl.
- Provides card and frame health monitoring and status reporting.
- Provides extensive frame monitoring:
  - Ethernet port monitoring, with communication settings and overall bit rate.
  - detailed bitrate and communication thoughput from individual cards.
  - self-monitoring with CPU load, memory usage.
  - Power Supply and GPI status reporting.
- Individual Card parameter storage for easy card swapping.
- optional integrated frame refrence module.

Functional Block Diagram

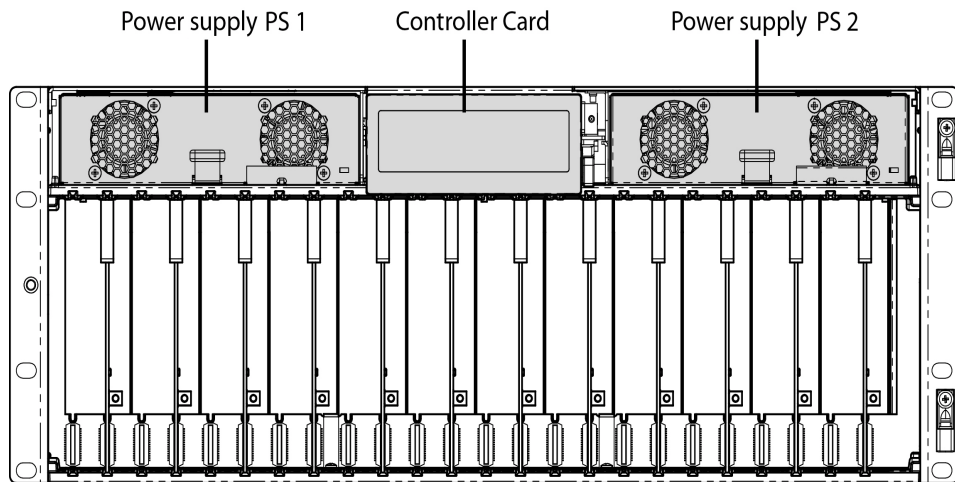DENSITE 3+ FR4 Controller Functionnal Block Diagram
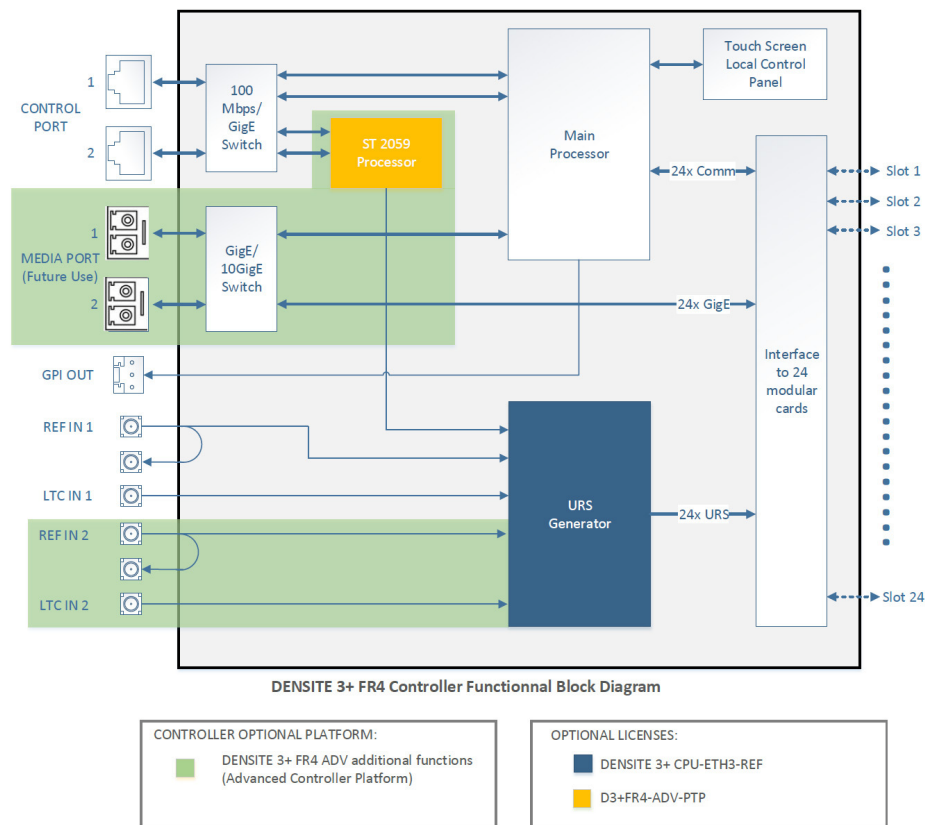
# Description

Mechanical Layout

The Densité 3+ FR4 is a 4 RU frame.

- The upper section contains the power supplies and the controller card.
- The lower portion consists of 24 slots that accept Densité-3 cards.

Front of the frame

Power supply PS 1   Controller Card   Power supply PS 2

When the frame door is closed, the controller card touch screen is exposed through an opening in the top center of the door. All other front elements are concealed by the door.
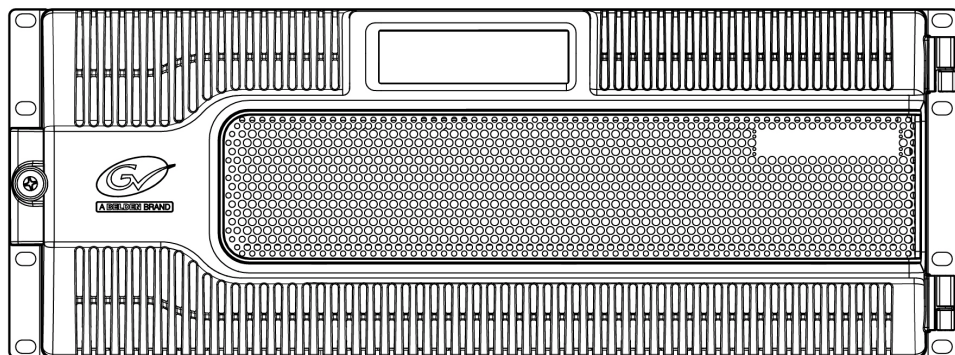
Rear of the Frame

The rear of the Densité 3+ FR4 frame is divided into two sections.

- Upper section contains the controller rear panel in the center, flanked by a fan assembly on each side, and by the power supply AC inputs at each end
- Lower section contains the rear panels for the Densité cards installed in the 24 available slots.

Plug for Power Supply 2   Controller Rear Panel   Plug for Power Supply 1

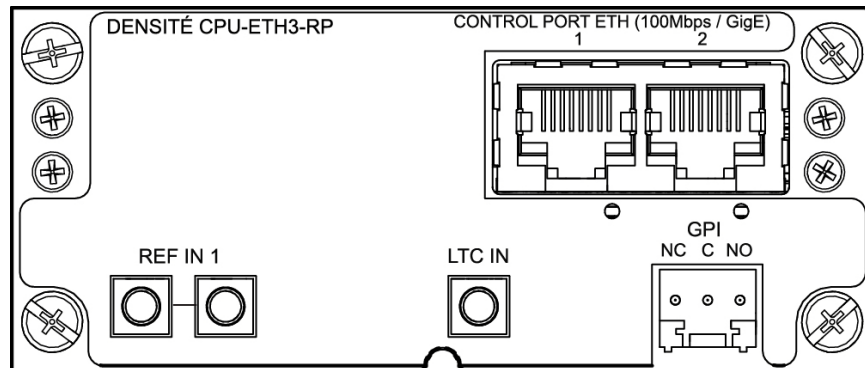Fan Assembly 1   Fan Assembly 2
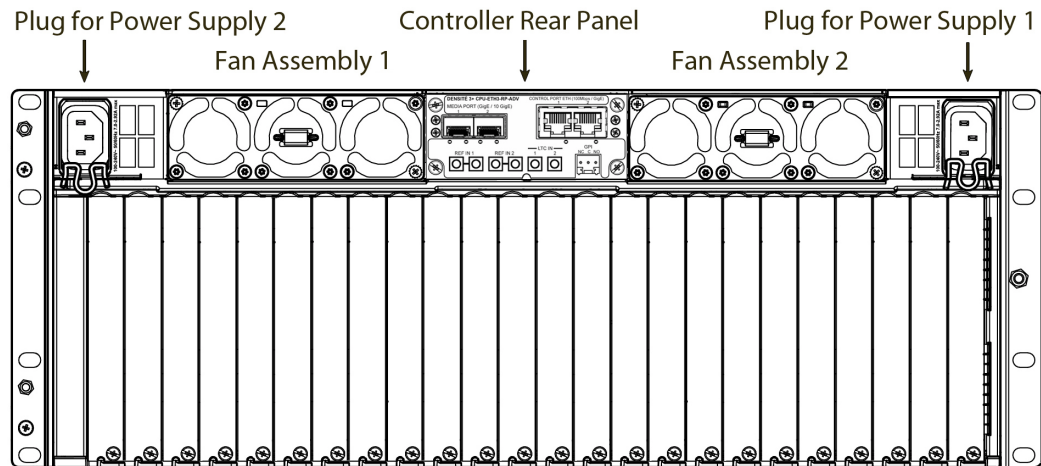
Controller Rear Panel

The rear panel associated with the frame's controller card is located at the top center of the frame. All inputs and outputs to the controller from outside the frame are connected through this panel.

Two versions of the controller are available. The rear panel for the Densité 3+ FR4 Advanced Controller Platform has additional connectors to support its expanded functionality.
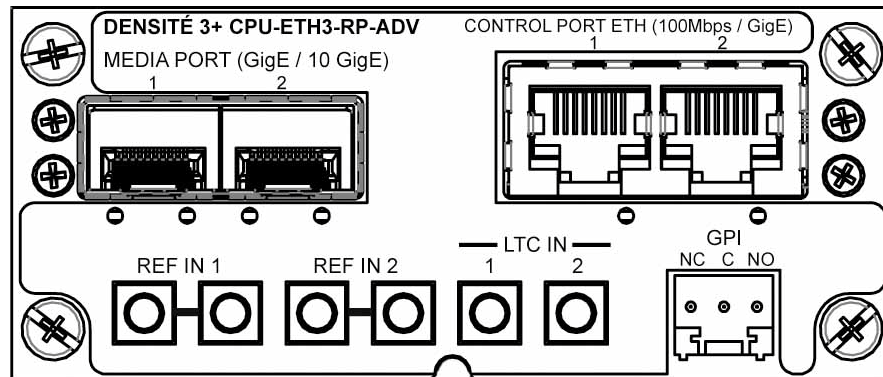
Controller

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. • ETH1 is the primary control port. • ETH2 is used for ethernet link redundancy.
REF IN 1 (2 connectors)	External reference signal for the frame, with a loop-through, on DIN connectors.

| Connector Name	Function
LTC IN	External time code on DIN connector.
GPI	Alarms generated on the controller card may be reported on this GPI connector.

Optional Densité 3+ FR4 Advanced Controller

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. • 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.
REF IN 1 (2 connectors)	External reference signal for the frame, with a loop-through, on DIN connectors.
REF IN 2 (2 connectors)	External reference signal for the frame, with a loop-through, on DIN connectors.
LTC IN 1	External time code on DIN connector.
LTC IN 2	External time code on DIN connector.
GPI	Alarms generated on the controller card may be reported on this GPI connector.

In this release, the additional functionality of the advanced controller is accessed through the optional **Frame Reference** module. See Configuring the Frame Reference, on page 51 for detailed information.

Users who wish to utilize the GPI alarm reporting mechanism should be aware of the circuit driving the GPI connector, in order to correctly interpret its signalling.
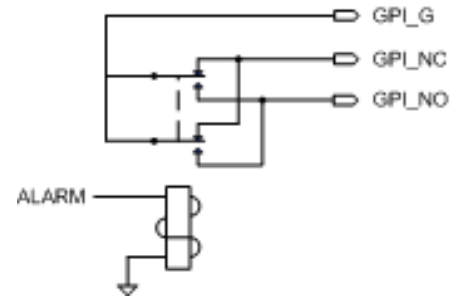
Specifications

MECHANICAL

Dimensions	4RU x 19" W (485 mm) x 11.25" D (286 mm) with connectors
Weight:	7.16 lbs (3,25 kg) with 1 PSU and controller card installed

POWER

Input Range:	AC 100-240V, 50-60 Hz
Frame Rating:	700 W
Operating Temp. Range:	0-40° C

COOLING

Fans:	6 on frame (2 assemblies of 3 fans each), serviceable
	2 on each installed power supply

COMMUNICATION

Connectors:	RJ45 (2)
Compliant to:	Ethernet 100 Mbps / GigE

ALARM

Connectors:	GPI

REFERENCE

REF IN 1 and loop-thru	
REF IN 2 and loop-thru	(Advanced controller only)
Connectors	DIN

TIME CODE

LTC IN 1	
LTC IN 2	(Advanced controller only)
Connectors	DIN

2 Installation

Summary

Installation

Unpacking

Make sure the following items have been shipped with your Densité 3+ FR4 frame:

- Densité 3+ FR4 frame, including 1 Power Supply unit (AC in) with power cord
- Frame controller (Densité 3+ CPU-ETH3 OR Densité 3+ CPU-ETH3 ADV).
- Power cord retaining clips (2)
- A second power supply and AC cord (optional)
- Densité-series cards (per order) with associated rear panels

Opening the Front Door

The front door of the Densité 3+ FR4 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 the door

- Turn the thumbscrew clockwise until it releases, and pull the door open.
- The door can be removed completely after it is open by sliding it vertically off the hinge pins on the right-hand side.

To install and close the door

- Slide the door down onto the hinge pins on the right-hand side
- Push the door into the closed position and turn the thumbscrew on the left-hand side counterclockwise to latch the door in the closed position.
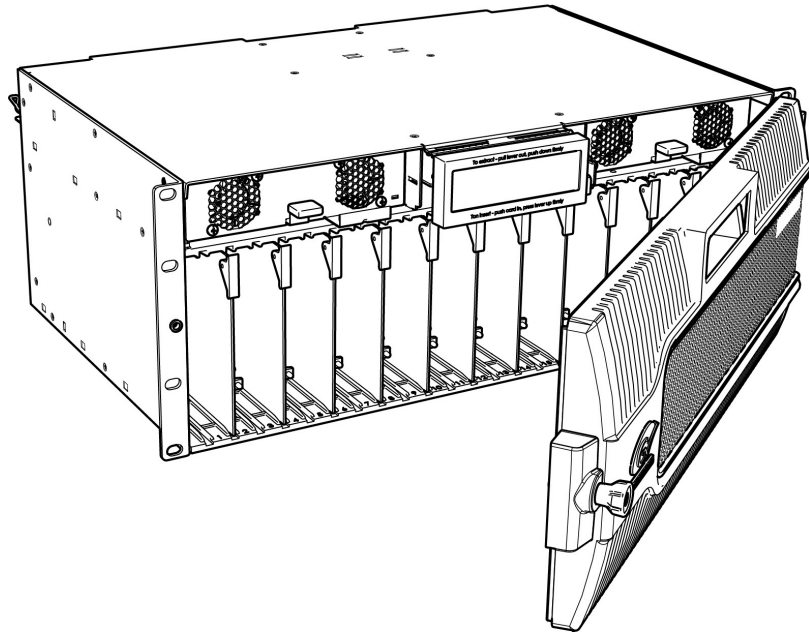
Mounting

The Densité 3+ FR4 housing frame occupies 4RU in a standard 19" rack.

To mount the frame

- Remove the front door to expose the rack mounting flanges at the ends of the chassis.
- Install the frame in the rack using 8 standard rack-mounting screws (not supplied) through the eight holes in the mounting flanges.

Installing Cards in the Densité 3+ FR4 Frame

All Densité-series cards can be installed with the frame power on. Each card has a connector which plugs into the frame's backplane for distribution of power and connection to the controller card, and a second connector that plugs into the associated rear panel for inputs and outputs.

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

NOTE - If you need to install a Densité 2 series card in this frame, which has Densité 3 slots, please see Using Densité 2 cards in the Densité 3+ FR4 Frame, on page 11

To install the rear connector panel

- If a card is installed in the slot whose rear panel is being changed, remove it as described below.
- Remove the existing panel (either blank or belonging to an existing card that is being changed) by releasing the captive screw(s) on the bottom
- Position the new panel and secure it in place with the captive screw(s) on the bottom.
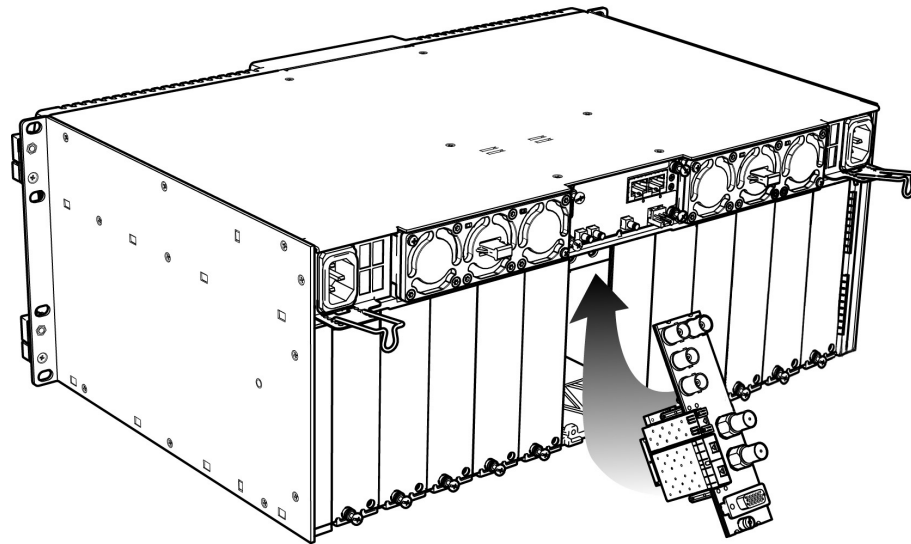
Card Installation and removal

1 Open the front door of the frame

2 To install a card into an empty slot, slide the card into the slot with the swivel handle to the top, and push gently on the handle to seat the connectors. If the card requires a double-width rear panel or larger to accommodate a large number of connectors, it should be inserted into the right-hand slot. Inserting the card into the wrong slot will not damage the card, and will be flagged by the on-card status LED flashing red to indicate that there is no connection to the rear panel.

> N.B. the rear panel must be installed before the card.

3 To remove a card from a slot, tilt the swivel handle on the front of the card to lever the connectors apart, then use the handle to pull the card straight out of the slot.

4 Close the front door of the frame

Note: *Detailed information about the rear panel connections is included in the user manual for the card.*

Using Densité 2 cards in the Densité 3+ FR4 Frame

The Densité 3+ FR4 frame supports Miranda Densité 2 series cards. Should you need to install a Densité 2 card in your Densité 3+ FR4 frame, you will need two adapters – one for the card, and one for the rear panel. These adapters extend the height of the Densité 2 devices so that they will fit into the slots of the Densité 3+ FR4 frame. Note that some Densité 2 cards are available with a 3 RU rear panel, and sold with the card adapter already attached.

Card adapters:

There are 3 different types of adapters
that can be used, depending on the
Densité 2 card geometry:

> DENSITE 3-EXT-A
>
> DENSITE 3-EXT-B
>
> DENSITE 3-EXT-C

To install these on the Densité 2 card

1   Fit the top edge of the card into the
    holding slot along the bottom edge
    of the adapter.

2   Align the holes in the top of the card
    with the holes on the adapter, and
   secure them together with the two provided screws and lock washers, as shown in the
    figure.
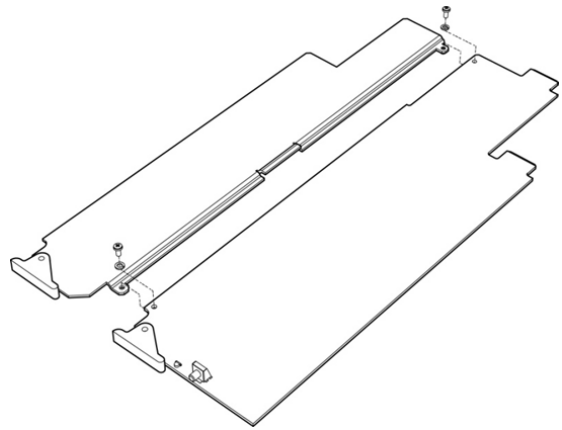
Rear Adapters

3-RU rear panel adapters are available for Single and Double Densité 2 rear panels:

- DENSITE SRP-3RUfor single slot-width rear panels
- DENSITE DRP-3RUfor double slot-width rear panels

To install the adapter and the rear panel

1   Position the adapter at the top of the empty slot(s) on the rear of the frame.

2   Use the captive screw in the adapter to fasten it securely in position.
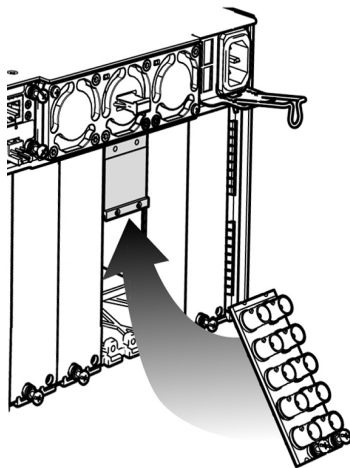
3   Slip the top of the 2RU rear panel into the slot on the bottom of the adapter, and secure
    the panel to the frame using the captive screw at the bottom of the panel.

Installing the Power Cord Retaining Clips

Each power supply is provided with a power cord retaining clip that holds the power cord in place to prevent inadvertent disconnections.

To install the power cord retaining clips

1 With the power cord removed, install the clip into the plate that extends out beneath the power cord socket on the rear of the frame, by slipping the two ends of the clip into a pair of holes in the plate

2 Several pairs of holes are provided to accommodate different sizes of plugs. Use the holes that position the clip closest to the body of the plug.

3 Position the clip horizontally and insert the plug into the socket.

4 Rotate the clip up and press the cord into the gripping loop of the clip.
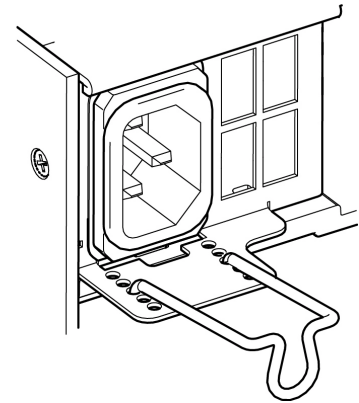
Ventilation

Ventilation for the frame is provided by two fan assemblies, each containing three fans, located on each side in the top section of the rear panel. The fans draw air through the frame from the front and exhaust it to the rear. Ventilation slots are provided in the front door of the frame to allow air to flow into the frame.

An air filter is installed in the front door behind the slots.

• Ensure that the front door ventilation slots are not obstructed.

• Check the air filter regularly to ensure that it is not plugged up with debris.

See Cleaning and replacing the front-door air filter, on page 72 for detailed instructions.

In addition to the main frame cooling fans, each installed power supply has its own fans that pull air into the front of the supply. The fan speed is controlled in response to overall load and frame temperature.

3 Configuration

Summary

Control Interfaces

The CPU-ETH3 controller is the control point for the Densité 3+ FR4 frame and the Densité-series cards installed in the frame. There are no separate operating controls on the frame or cards.

> Note: There are two versions of the controller - CPU-ETH3, and CPU-ETH3-ADV (advanced). The text in this document will make it clear whether descriptions apply to either or both of these versions. In general, CPU-ETH3 will refer to both, and features exclusive to the CPU-ETH3-ADV will be identified as such.

There are three ways to configure the controller:

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.
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 Densité cards installed in the frame.
iControl	Grass Valley's graphic user interface. IP connection required. Nearly complete functionality of the controller is provided. All Densité cards in the frame can be configured and controlled with iControl.

Local control panel

The local control panel is fastened to the front of the CPU-ETH3 controller card, and when installed is located in the top center of the frame.
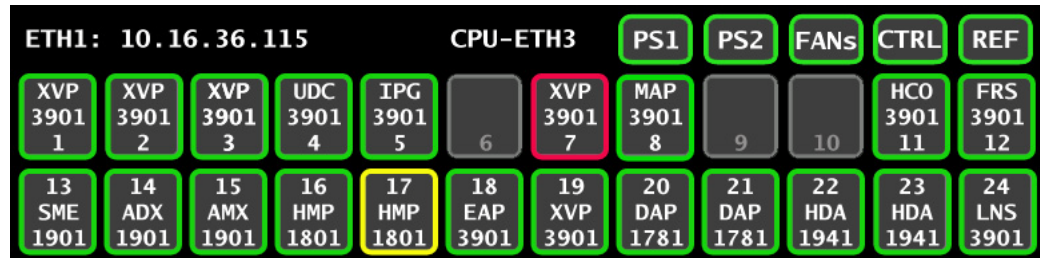
The touch screen interface is accessed through an aperture in the frame door.

In its home state, it shows the contents of all 24 slots in the Densité 3+ FR4 frame:

- Card type (text)
- Card status (colored outline)

The status of the controller itsef is shown in the CTRL segment on the top right.

Touching a "slot" displays the local menu and navigation controls for the card occupying that slot:

- Two lines of text, each 16 characters in length
- Four virtual pushbuttons.

Touching the **CTRL** segment displays the local menu for the CPU-ETH3 controller itself.
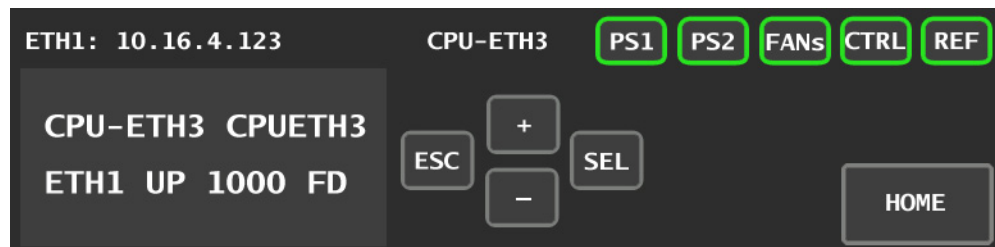
The full CPU-ETH3 and CPU-ETH3-ADV controller menus are shown beginning on .

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 contoller status is displayed in the upper right side of the control panel, as a colored outilne 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 it's 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.

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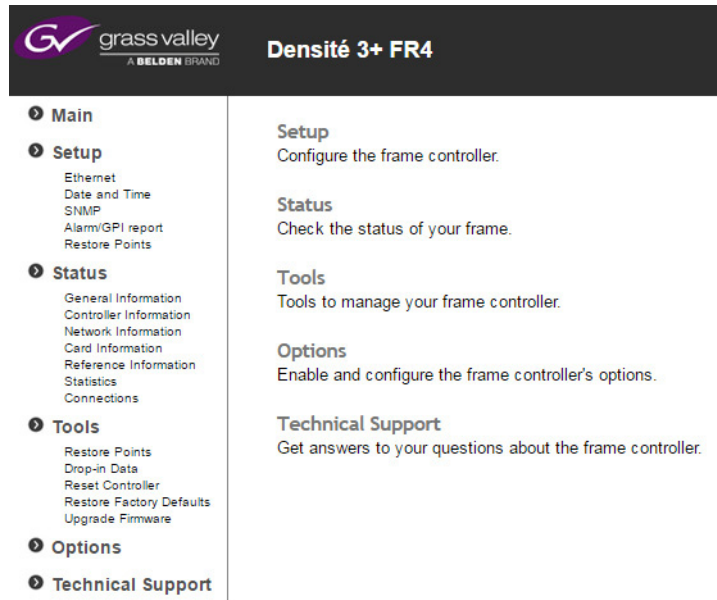
Select the topic area of interest from the left-hand navigation pane, and click to open the configuration page.

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 Node.

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.

- CPU-ETH3 controllers are identified as Controller3 in the Type column of the iControl Navigator window.

- For convenience, enter a descriptive Label in the Info panel of the card, to make it easy to locate this specific frame controller amongst those in the list. See Identification, on page 22 for instructions.
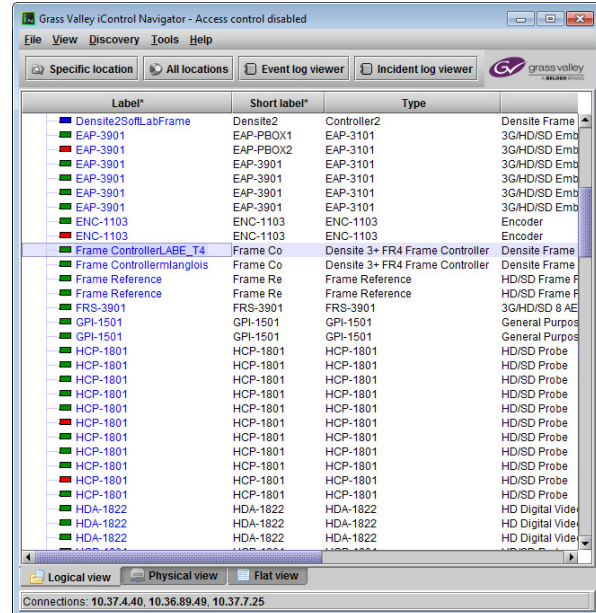
The iControl panel for the CPU-ETH3 controller displays a series of buttons down the left-hand side. Clicking a button changes the contents of the main window to display status reports and controls related to the topic named on the button.

A full description of the use of the iControl interface to configure the CPU-ETH3 card is given below, beginning on page 22.
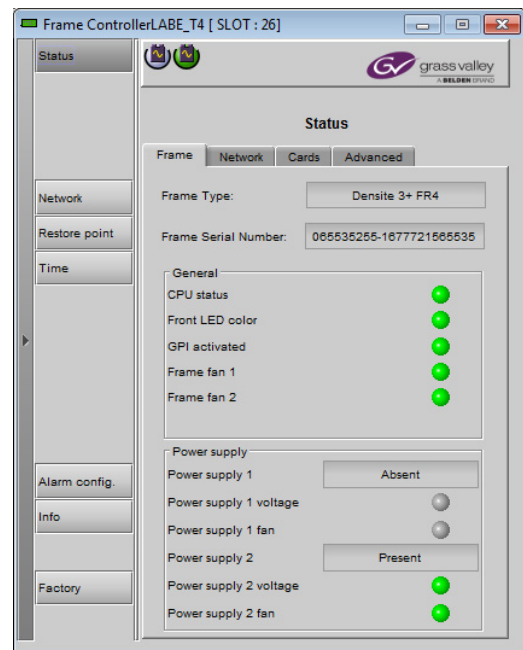
Connect the Densité 3+ FR4 to your network

For the frame to join a TCP/IP network, the controller must be configured with an appropriate IP address, network mask, and gateway.

Use the **local control panel** to configure ethernet port ETH1 so that you can connect to the frame online.

The CPU-ETH3 controller in the Densité 3+ FR4 frame is shipped with the following default settings:

System IP address	192.168.3.1
Network mask	255.255.0.0
Gateway	0.0.0.0

See Setting the controller's IP Address, on page 20, for instructions on replacing these with settings that apply to your local network, so that the frame can be located by control applications such as Grass Valley's iControl or accessed from a browser.

> Note 1: The ETH1 port should be located in the same subnet as the iControl Application Server that will control it.
>
> Note 2: The two ETH ports must be connected to two different subnets to avoid any network bridging loops.

Once the ETH1 port settings have been configured, you can connect your frame to the network via the rear controller connection panel. See Connecting the frame to your Network, on page 21.

Setting the controller's IP Address

To set the controller's IP Address

1 On the control panel, touch **CTRL**.
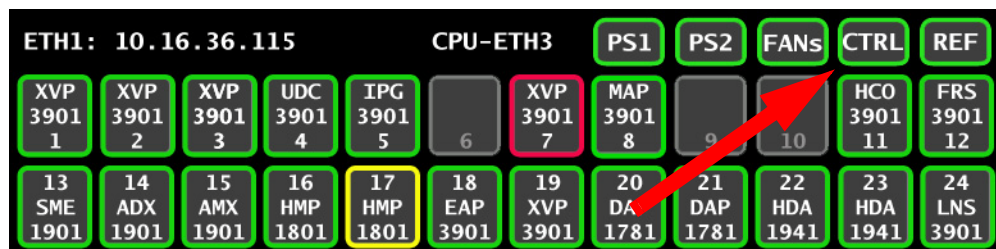
The CPU-ETH3 controller menu appears on the display.
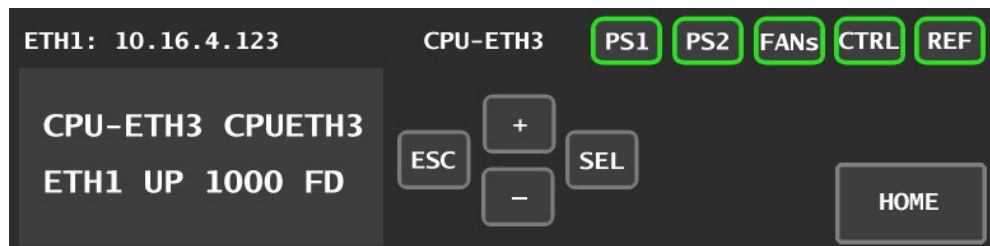
You can navigate the menu by using the four virtual buttons on the touch display:

- Touch the [+] and [–] buttons to navigate between menu options or between parameter values.
- Touch SEL to access the next menu level. When a parametyer 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 postion 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.
>
> • 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 frame to your Network

To connect the Densité 3+ FR4 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.

This is only required if you have purchased the optional frame reference. See Activating the optional frame reference on page 52.

You may use either of the two connectors; the second connector is a loop-through and does not require termination.

Configuring 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

Identification

Configure this feature using...

iControl	Controller's web page	Local control panel
✓		

iControl

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-adjustable.

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

You can enter the following information by clicking and typing in the data box:

Label: allows the user to define the label that identifies this device when it appears in iControl applications

Short Label: allows the user to define the short-form label for iControl (8 characters)

Source ID: type a descriptive name for this CPU-ETH3 controller

Comments: type any desired text

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:
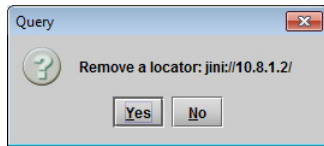>
> jini://<ip_address>
>
> where <ip_address> is the ip address of the server running the lookup service, e.g.:
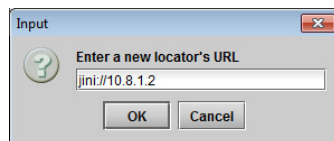
> **Remove:** select one of the services listed in the window by clicking on it, and click *Remove* to open a query box allowing you to delete it from the window.
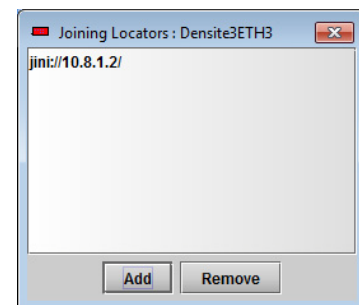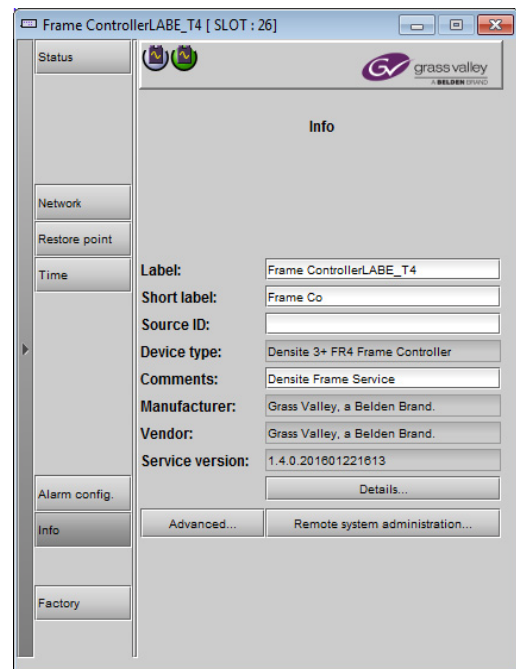
Status Monitoring

The CPU-ETH3 controller continuously monitors the operating condition and status of the housing 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 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.
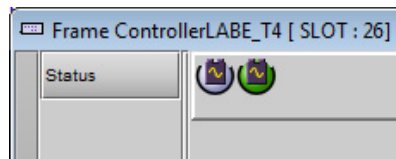
Icon	Messages
	Power supply 1 voltage: OK Power supply 2 voltage: OK
	Power supply 1 voltage: Absent Power supply 2 voltage: Absent
	Power supply 1 voltage: Error Power supply 2 voltage: Error

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.

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)
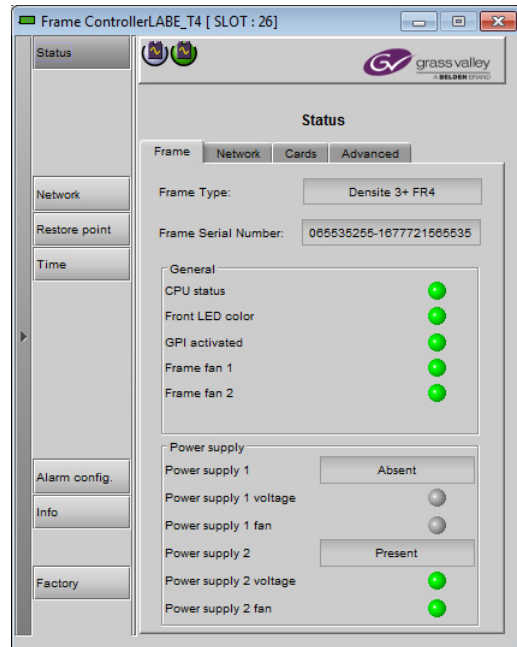
Status - Network

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 cards installed in the Densité frame.

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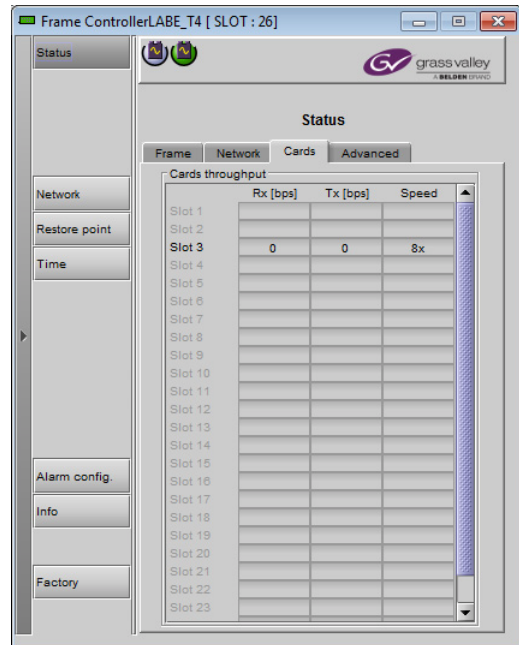
Status - Advanced

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
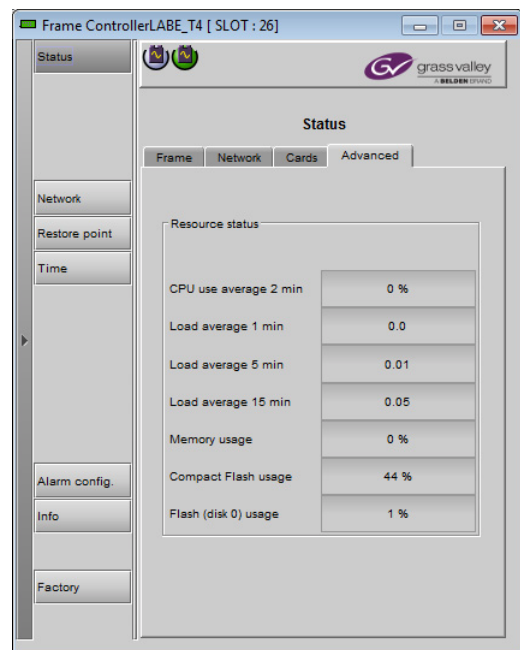
Status monitoring using the Controller's web page

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

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 file system on the card.

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

Status | Controller information

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

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

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 optional 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.

See Activating the optional frame reference on page 52 for instructions on activating the reference option.

Status | Statistics

grass valley A BELDEN BRAND — **Densité 3+ FR4**

- 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

STATUS | Statistics

Page refresh interval: Never

Controller	
CPU Utilization:	8%
Load Average (1 min):	0.11
Load Average (5 min):	0.24
Load Average (15 min):	0.29
Memory utilization:	0%
Flash Utilization:	3%
Drop-in Data Utilization:	3%

Network Interface: eth1

	Rx	Tx
Throughput	136.34 Kbps	108.42 Kbps
Bytes:	1434.15 MB	1355.01 MB
Packets:	14669764	11310392
Errors:	0	0
Dropped:	2768	0
Overruns:	0	0
Frame:	0	---
Carrier:	---	0

Network Interface: eth2

	Rx	Tx
Throughput	0.00 bps	0.00 bps
Bytes:	0.00 B	0.00 B
Packets:	0	0
Errors:	0	0
Dropped:	0	0
Overruns:	0	0
Frame:	0	---
Carrier:	---	0

Cards			
Slot	Speed	Rx	Tx
1	8x	0.00 bps	0.00 bps
2	—		
3	8x	8.06 Kbps	728.00 bps
4	—		
5	8x	16.38 Kbps	280.00 bps
6	8x	0.00 bps	0.00 bps
7	8x	0.00 bps	0.00 bps
8	—		
9	—		
10	—		
11	—		
12	1x	0.00 bps	0.00 bps
13	—		
14	8x	188.88 Kbps	448.00 bps
15	8x	0.00 bps	0.00 bps
16	8x	0.00 bps	0.00 bps
17	8x	0.00 bps	0.00 bps
18	8x	0.00 bps	0.00 bps
19	—		
20	8x	189.28 Kbps	672.00 bps
21	8x	0.00 bps	0.00 bps
22	—		
23	8x	392.00 bps	224.00 bps
24	1x	0.00 bps	0.00 bps
REF	8x	0.00 bps	0.00 bps

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 24 slots in the frame - data transfer

Status | Connections Information

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.

Network Configuration

The ethernet interface to the CPU-ETH controller can be set up using the local control panel without an existing connection. This method was described in detail in Connect the Densité 3+ FR4 to your network, on page 19.

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

Click the *Network* button and select the ETH tab

Enter the HOSTNAME in the box at the top.

- The hostname is the unique name by which this Densité 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.
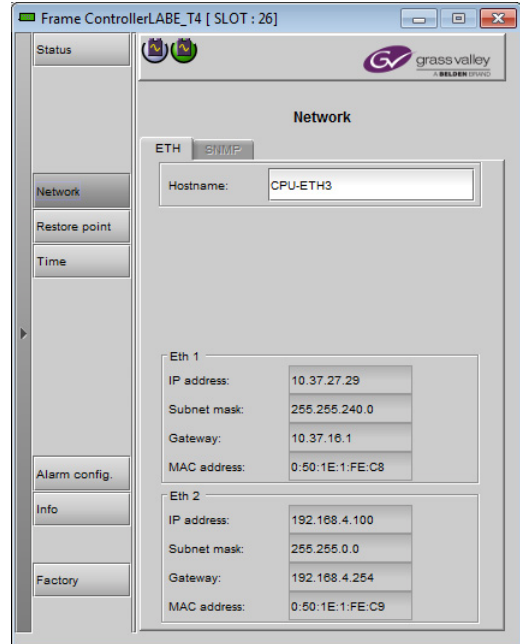
Network Configuration using the web page

To configure the two Ethernet ports

1 Select **Setup-Ethernet** from the left-side navigation pane.
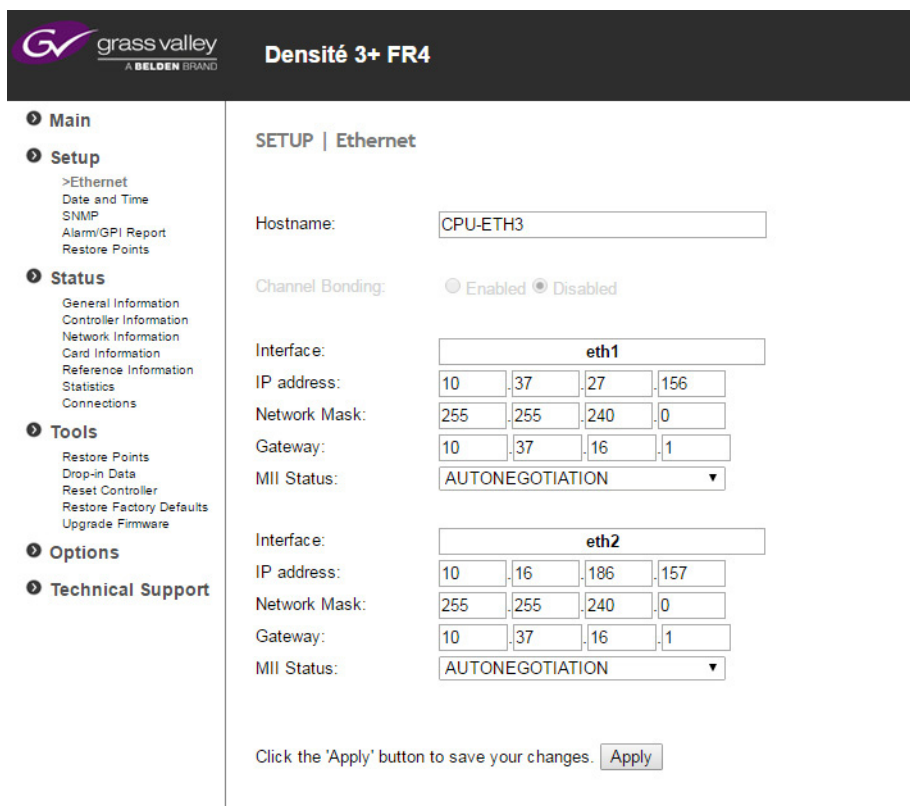
2 Enter a **Hostname** in the databox.

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

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 Densite 3+ 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 Densite 3+ 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**.

Data Restoration

Many of the Densité-series cards that can be installed in the Densité 3+ FR4 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 slots available in the Densité 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.
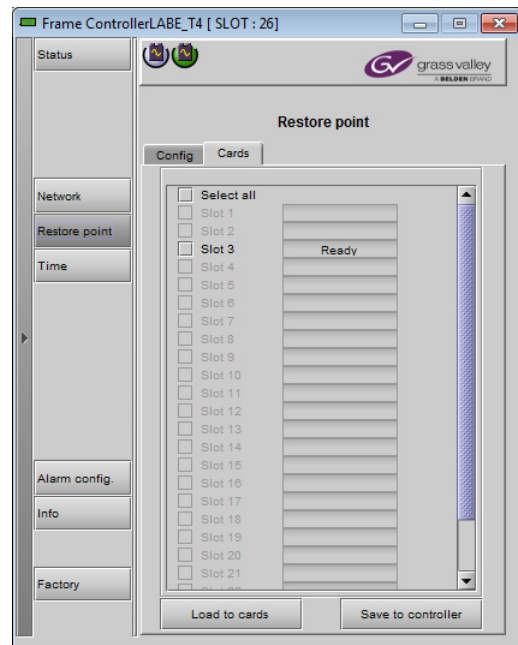
Note that a data restore will only work if the card in the slot is the same type as the card that was there when the data was saved.

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 cards in the 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 Seleautomatic save function.

   When **Auto Save** is enabled, **t**he 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
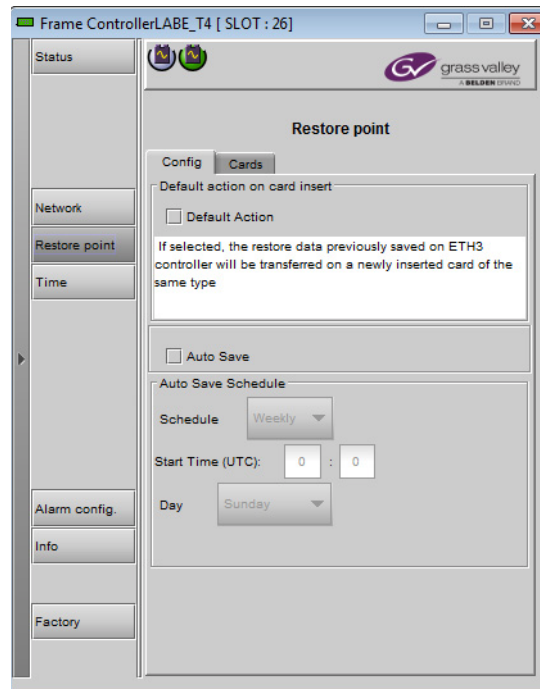
The label and function of the pulldown at the bottom changes to follow the Schedule selection:

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 staus 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.
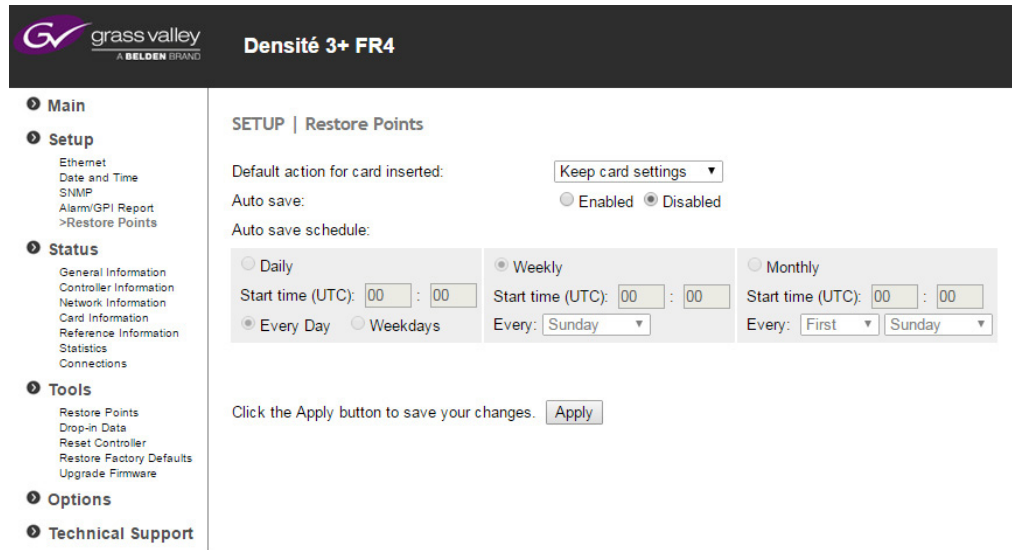
2 Select the **Default action for card inserted** using the pulldown:

- **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] *(slot number)*	
	LOAD ALL CARDS		
	LOAD A CARD	[1...16] *(slot number)*	
	DEFAULT ACTION	[**CARD**, CONTROLLER]	
	AUTO SAVE	[**ENABLE**, DISABLE]	
	SAVE EVERY	[DAY, **WEEK**, 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.
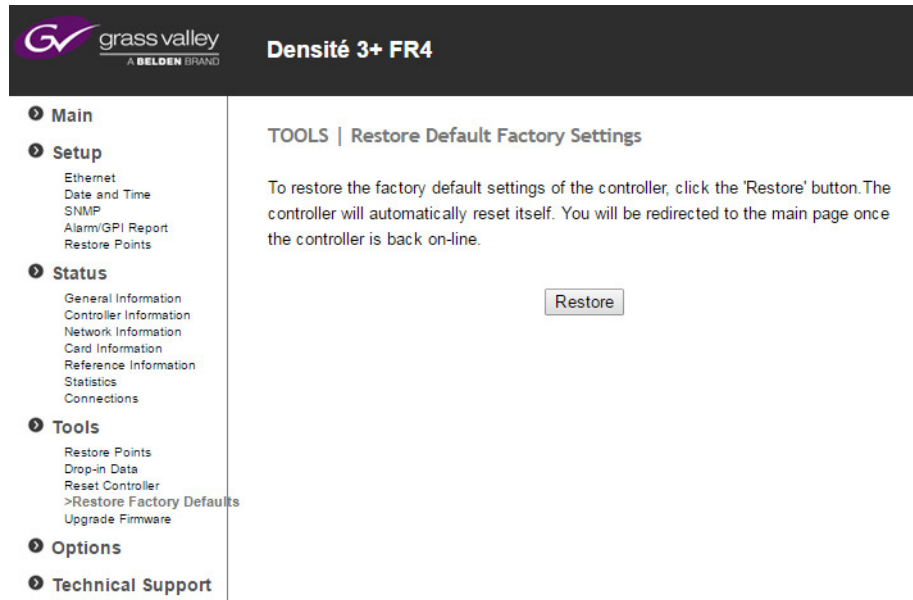
2 Click **Restore**.

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 in the menu to their **bold underlined** default values)*		

The default values are shown underlined in the menu listing beginning on .

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 <u>not</u> 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 these iControl panels.
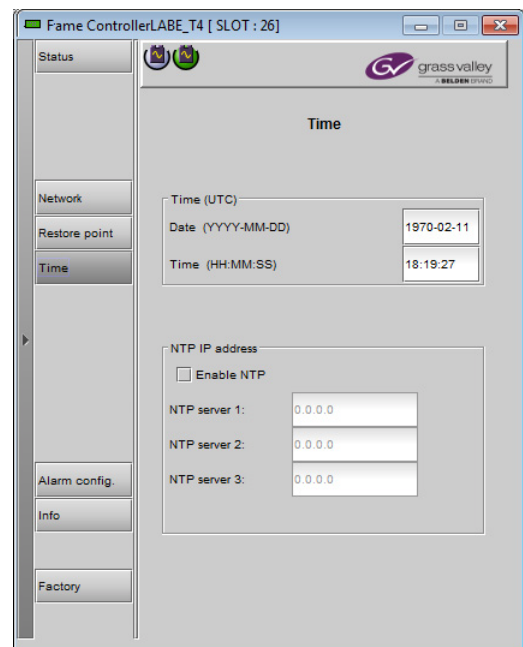
Time management using the web page

To manage the controller's internal time settings

1 Select **Setup - Date and Time** from the left-side navigation pane.
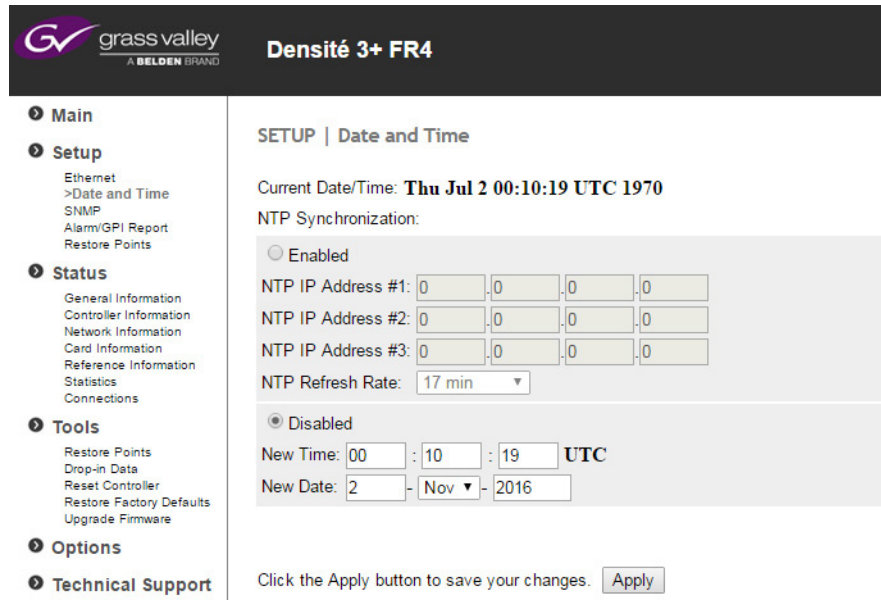
The **Current Date/Time** shown at the top is the value at the time this page was opened, and is not dynamically updated.

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 frame in which it is installed when error conditions are detected. These alarms are used to set the card-front Status LED 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 web page and the menu, as described at the end of this section (page 32).

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

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

Alarm Configuration using iControl

To configure and manage alarm reporting in iControl, select **Alarm Config** in the left-side navigation pane.
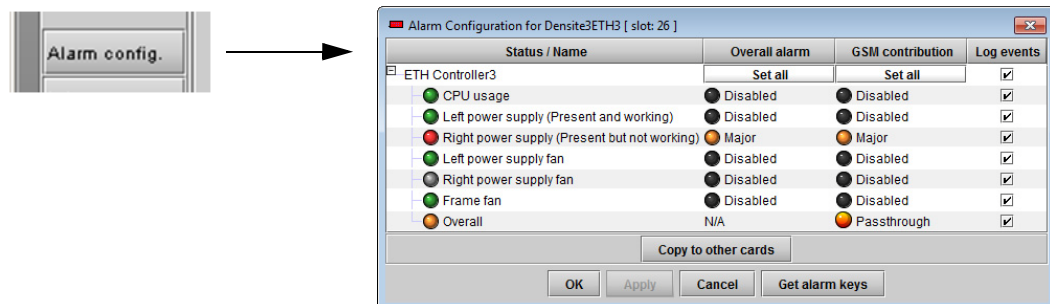
The iControl Alarm Configuration panel opens in a new window, and can be resized if needed. It allows the alarm reporting of the CPU-ETH3 to be configured. The panel is organized in columns.

Status/Name

This contains an expandable tree listing all the alarms reported by this CPU-ETH3 controller.

Each alarm name includes an icon that shows its current status

The **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

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:

The alarm status list may contain some or all of the following options:

Alarm 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 checkbox to enable logging of alarm events for each individual alarm.

At the bottom of the window are several other controls:

Copy to other cards

Click this button to open a panel that allows the alarm configuration set for this card to be copied into other CPU-ETH3 controllers in other frames.

Select one or more destination controllers from the list in the window by clicking in the checkboxes, or all of them by clicking in the *All* checkbox
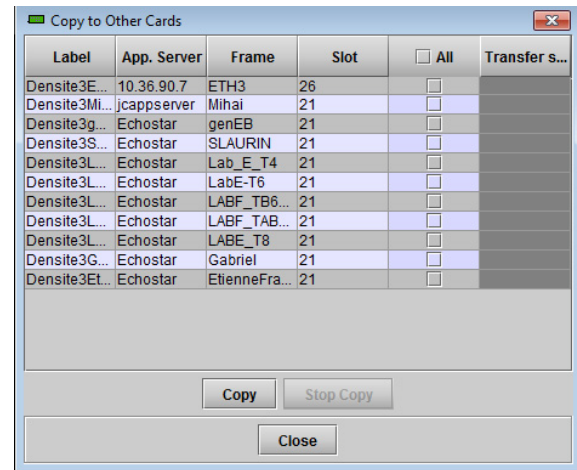
Get alarm keys

Click this button to open a save dialog where you can save a file containing a list of all alarms on this controller 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
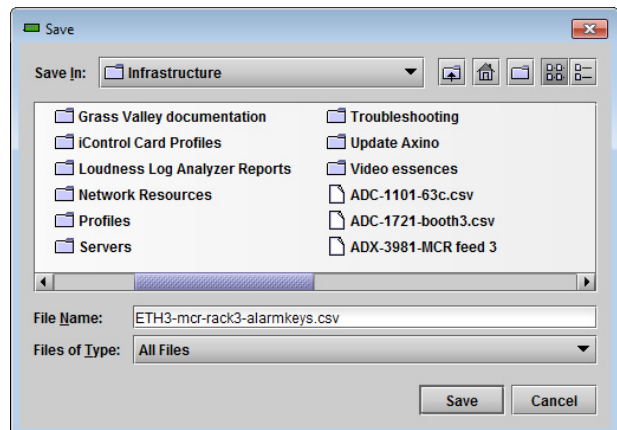
OK, Apply, Cancel

> *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.

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.
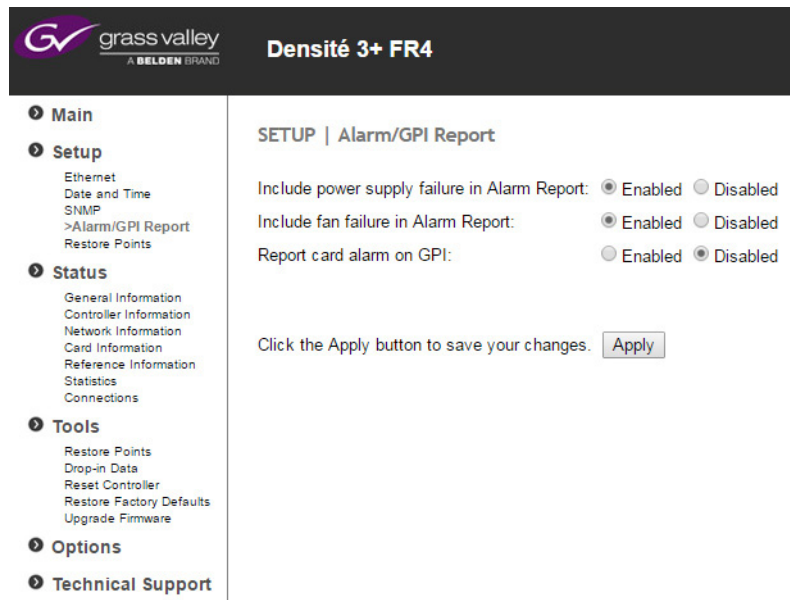
2 Choose whether to enable or disable the inclusion of **Power Supply Failure** in the
alarm report, using the radio buttons.

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, **GPI**]
	FAN FAILURE	[NONE, **GPI**]
GPI REPORT	[ENABLE, **DISABLE**]	

Local Control Panel Menu - CPU-ETH3

Here is the complete on-board menu for the 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, 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]	
ALARM REPORT	PS FAILURE	[NONE, GPI]	
	FAN FAILURE	[NONE, GPI]	
GPI REPORT	[ENABLE, DISABLE]		
CTRL VERSION	[FIRMWARE V.XXX]		
BOOT-LOADER VER	[VERSION X.X.X]		
OPTIONS	[LINK REDUN ON/OFF]		
FACTORY DEFAULT	[RESTORE] *(Sets all parameters shown above to their underlined default values)*		
CTRL EXECUTION	[REBOOT]		

	Reported value; cannot be changed.		List of values that can be selected. Default value is underlined.

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

1 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.

2 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.

3 Using a browser on your network, browse to the IP address of the CPU-ETH3card.

   If you are using iControl, double-click the controller in the iNavigator page, and select **NETWORK | ETH** to see the IP address.

4 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.

5 In the left-side menu, select **Tools | Upgrade Firmware**.
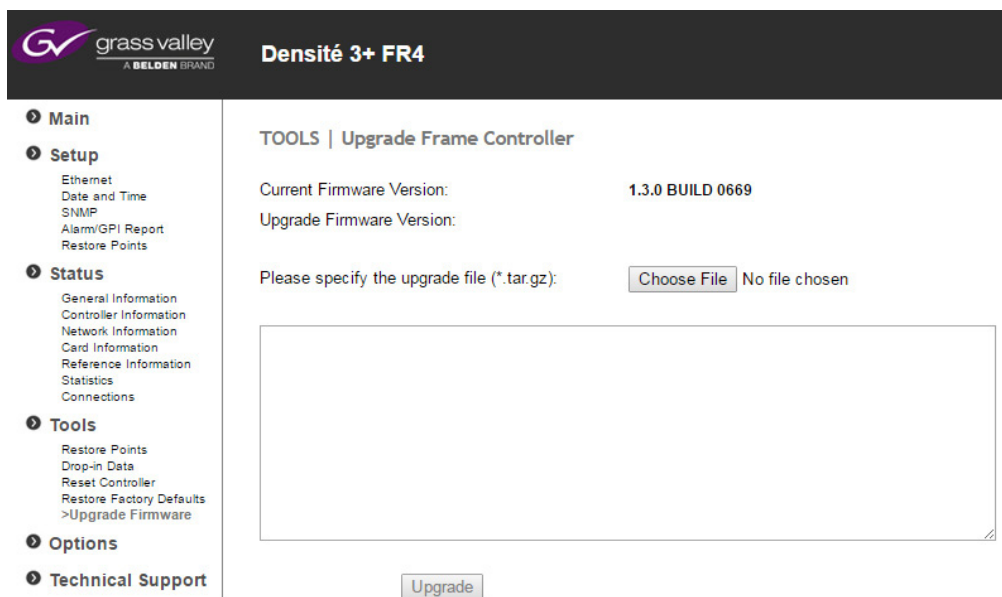
The current firmware version is shown at the top of the window

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.

Configuring the Frame Reference

Summary

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

• The frame reference distributes a Universal Reference Signal (URS) to all modular cards in the frame.

• If the option has not been purchased, individual modular cards in the frame must be connected to their own reference signals via their rear panels.

There are two versions of the frame reference - Basic and Advanced - corresponding to the version of the controller that is installed.

Note: You must use the rear panel corresponding to the controller version that is installed. See Controller Rear Panel, on page 5 for details.

Activating the optional frame reference

The Frame Reference option can be activated only from the local control panel for the basic version of the controller, but can be activated from either the local control panel or the frame reference's iControl service panel for the advanced controller.

To purchase and activate the optional frame reference - Basic and Advanced versions

1 Purchase the option key from Grass Valley.

2 Touch **REF** in the controller home screen.
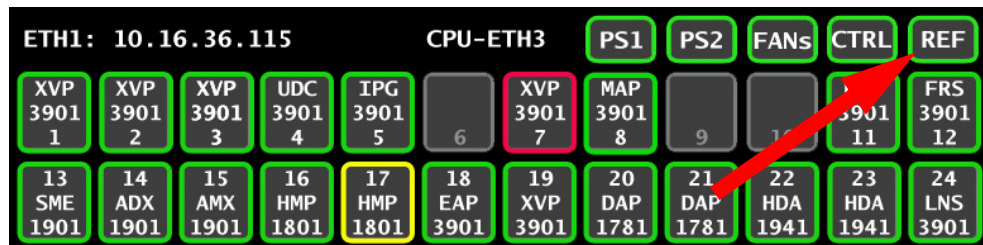
3 Enter the key (xx:xx:xx:xx) in the data window; then touch **[ESC]** to complete the data entry.

You will now have access to the complete frame reference menu when touching the **REF** icon. See Menu for Local Control on page 64 for a complete menu listing.

You will also have full use of the iControl service panel for the frame reference.

To purchase and activate the optional frame reference - Advanced version only

1 Purchase the option key from Grass Valley.

2 Double-click on the **Frame Reference** icon associated with your CPU-ETH3 controller in iControl Navigator to open the service panel.

3 Select the **Options - REF Option** tab.
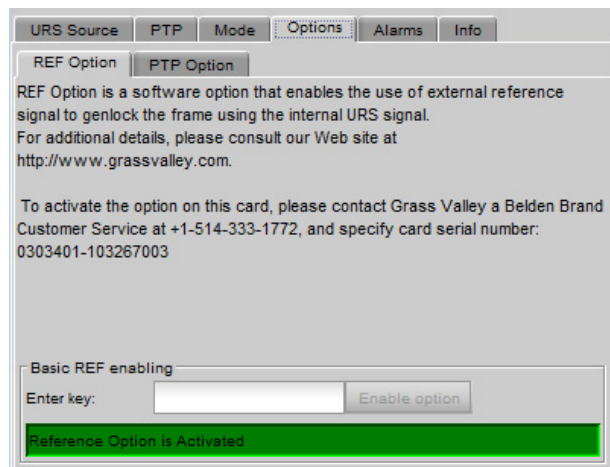
4 Type the key into the **Enter key** data box.

5 Click **Enable Option**.

The activation will be confirmed in the display - text and green background,

To open the Frame Reference control panel

> IMPORTANT
> If you have NOT purchased and activated the Frame Reference Option for the Basic version, you will be able to open a Frame Reference Control Panel in iControl, but this panel will be NON-FUNCTIONAL, and any changes made there will not be applied to the system.

Double-click on the **Frame Reference** icon in iControl Navigator to open the service panel.

• You will see the version of the panel that corresponds to your controller version - Basic or Advanced.

• In the descriptions below, the functionality of both versions is documented.
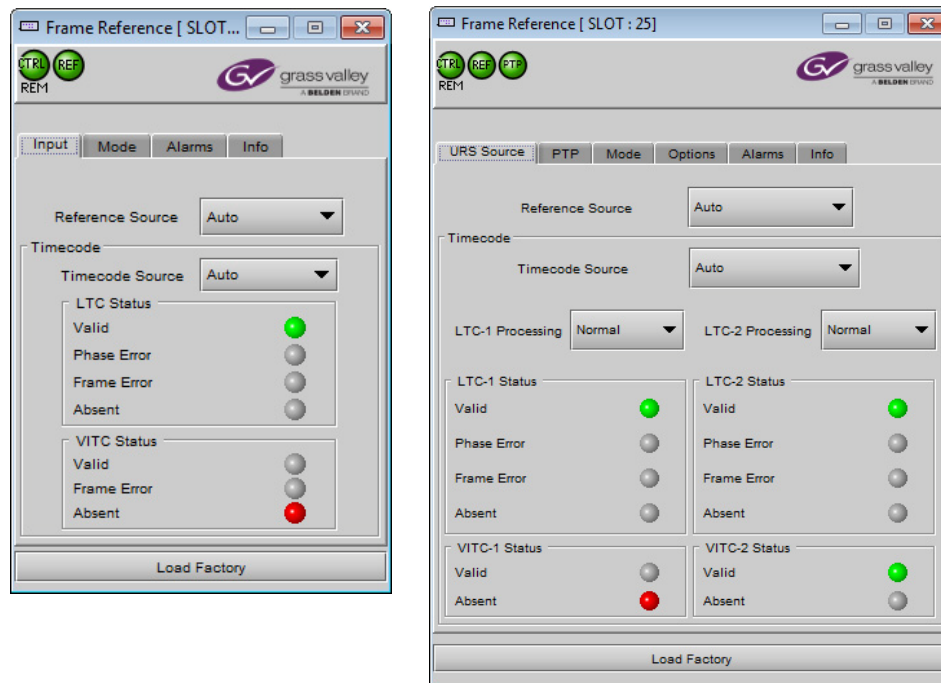
Frame Reference iControl Panels - Basic (left) and Advanced (right)

Reference Source

To select the reference source - Basic version

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 reference connected to the REF input on the rear panel.
Internal	Use the signal from the internal generator.

To select the reference source - Advanced version

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

Selection	Detail
Auto	Select the first valid source from this list, in order: REF-1, REF-2, PTP, Internal
REF-1	Use the reference connected to the REF-1 input on the rear panel.
REF-2	Use the reference connected to the REF-2 input on the rear panel.
REF-1 & REF-2	Useful if REF-1 and REF-2 are different frequencies (i.e. 50 Hz and 59.94 Hz). The URS will carry both timing references, allowing the use of cards operating in both standards within the same frame.
PTP	Use PTP data extracted from the control network. The PTP option must be activated.
Internal	Use the signal from the internal free-running generator.

PTP - Advanced Version only

The Advanced frame reference supports PTP (Precision Time Protocol) fuctionality.

PTP information, when present and valid, is extracted from the incoming data streams on both ETH1 and ETH2 ports. When valid PTP is detected and extracted, it can be selected as the reference source for the URS.

Note: The PTP option must be purchased and activated to enable PTP functionality in the CPU-ETH3 REF.

To configure PTP functionality

1 Select the **PTP** tab.
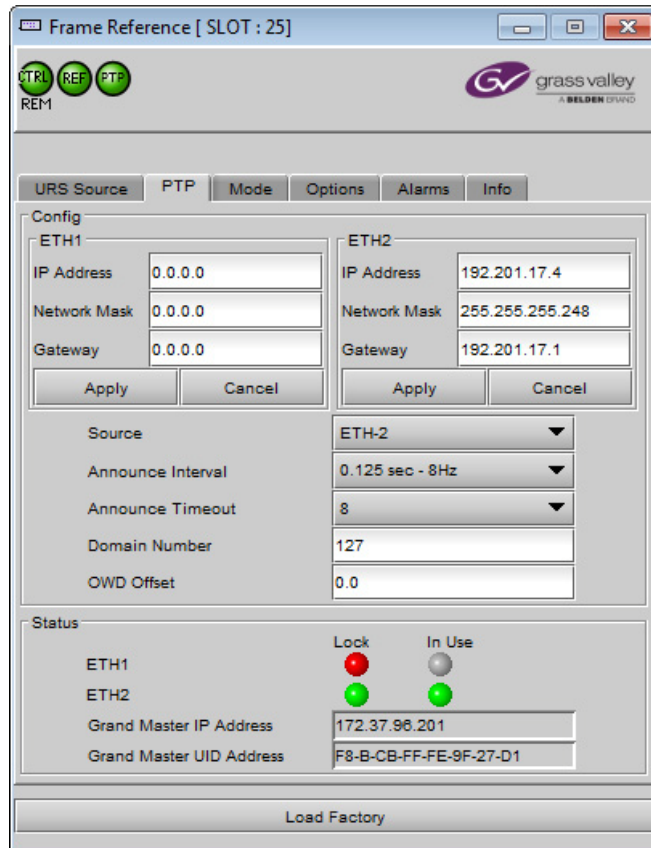
2 Enter the IP address, Network Mask and Gateway for PTP master clock data reception on ETH1.

3 Enter the IP address, Network Mask and Gateway for PTP master clock data reception on ETH2.

4 Click **Apply** to confirm your changes, or **Cancel** to reject the changes and return to the previous values.

5 Click the **Source** pulldown, and select the PTP source.

This is the source that will be used when PTP is the selected URS reference source.

Selection	Details
ETH1	Use the PTP derived from ETH1.
ETH2	Use the PTP derived from ETH2.
BMCA	Selects the clock, from either ETH1 or ETH2, that is determined to be the best clock by the Best Master Clock Algorithm.
Auto	Defaults to ETH1, but switches to ETH2 if ETH1 fails.

6 Click the **Announce Interval** pulldown, and select an appropriate value.

This is the expected time interval between announce messages sent by the master clock.

Announce Interval
0.125 sec - 8 Hz (default)
0.250 sec - 4 Hz
0.5 sec - 2 Hz
1 sec - 1 Hz
2 sec - 0.5 Hz

7 Click the **Announce Timeout** pulldown and select an appropriate value.

This is the number of expected announce messages from the Master Clock that this frame reference will miss before an Announce Timeout is flagged.

Announce Timeout Values
2, **3 (default)**, 4, 5, 6, 7, 8, 9, 10

8 In the **Domain Number** databox, enter the number of the domain you wish to specify for the PTP function.

Domain Number
Range: 0-127 Default: 127

9 In the **OWD Offset** databox, enter a compensation value (in μs) to adjust the OWD (One-Way Delay) setting that comes from the *Network From Master/Boundary Clock* parameter, to compensate for asymmetrical network transit times between the PTP master or boundary clock and the CPU-ETH3-REF.

In the absence of an accurately-measured value, it is recommended to enter 0.0 μs.

PTP Status

At the bottom of the PTP tab, PTP status is reported.

Lock icon - ETH1 and ETH2:

- Green: Valid PTP detected and local reference generator is locked. This PTP may be used as the reference.
- Red: No valid PTP is detected, local reference generator is not locked. This PTP is not available as a reference.

In Use:

- A locked generator may be in use as the PTP reference, if chosen by the Source selection pulldown. Only one generator can be "In Use":.

- This PTP source will be the URS reference if PTP is selected as the URS Reference Source in the URS Source tab.

Timecode

To select the source of timecode for the URS - Basic version

1 Select the **Input** tab.
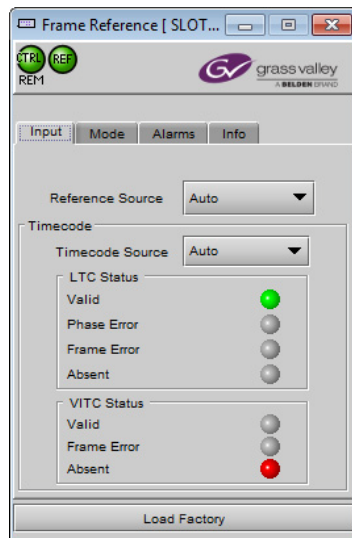
2 Click the **Timecode Source** pulldown

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 REF input on the rear panel.
OFF	Do not insert timecode into the URS signal.

To select the source of timecode for the URS - Advanced version
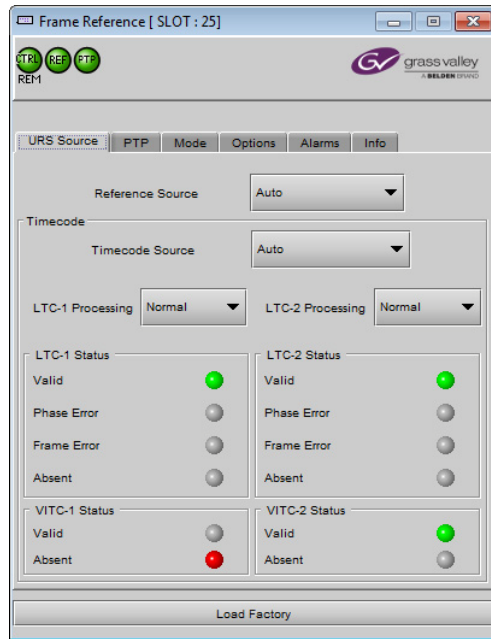
1 Select the **Input** tab.

2 Click the **Timecode Source** pulldown

3 Click to select the source of timecode:

Source	Function
Auto	Select the firstvalid source from the list below, in the order listed.
LTC-1	Use the timecode connected to the LTC-1 input on the rear panel.
VITC-1	Extract timecode from the REF 1 input.
LTC-2	Use the timecode connected to the LTC-2 input on the rear panel.
VITC-2	Extract timecode from the REF 2 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 (LTC 1 & 2)	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 (LTC 1 & 2)	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 - Basic and Advanced versions

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

Basic Version	Advanced Version
LTC	LTC-1
VITC	VITC-1
URS	LTC-2
	VITC-2

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.

URS Generation

To select the URS generation mode - Basic and Advanced versions

1. Select the **Mode** tab.
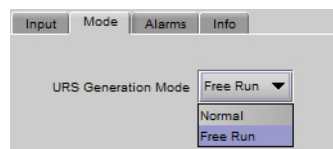
2. Click the **URS Generation Mode** pulldown.

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"

Alarms

To configure alarms

1 Select the **Alarms** tab
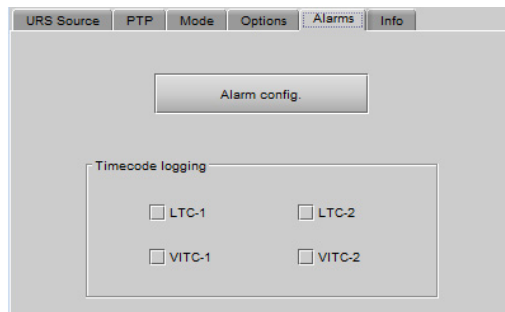
2 Click **Alarm Config**

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.
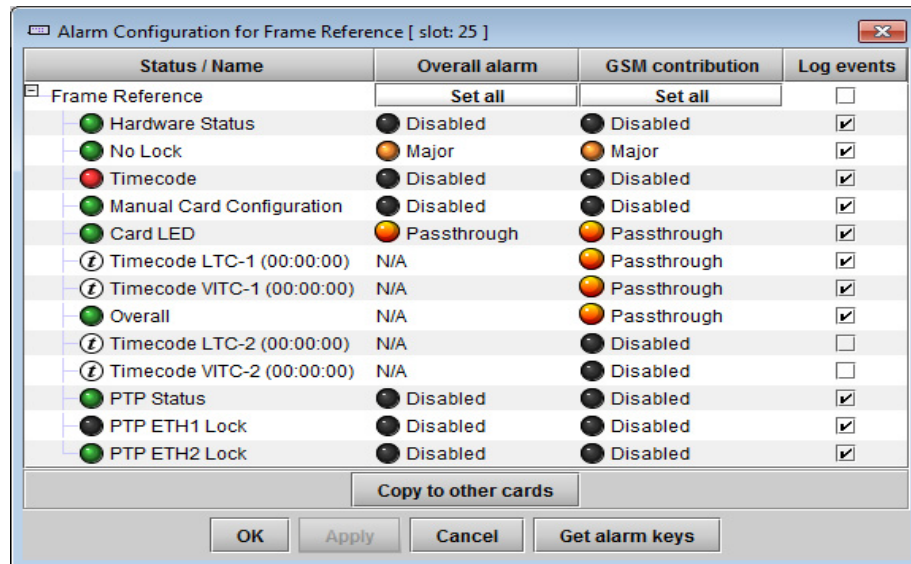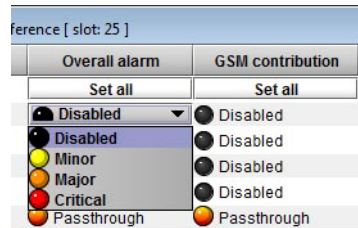
4 Alternatively:

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.

Options - Advanced version only

Two options are available for the advanced version of the frame reference:

- **REF option** - this software option enables the use of external reference signals to genlock the frame using the internal URS signal.

- **PTP option** - this software option enables the use of PTP (IEEE 1588) present on the control network to genlock the frame using the internal URS signal.

Before activating an option, you must purchase the appropriate **key** from Grass Valley. See the option tab for instructions.

To activate the REF option

1 Select the **Options - REF Option** tab.
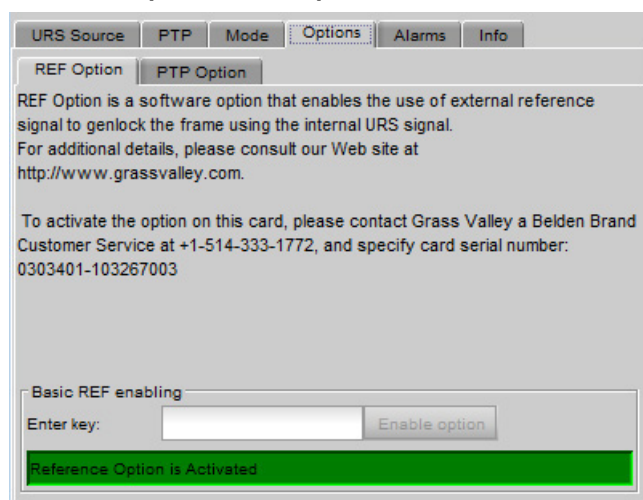
2 Type the key into the **Enter key** data box.

3 Click **Enable Option**.

The activation will be confirmed in the display - text and green background,

To activate the PTP option

1 Select tho Options - PTP Option tab.
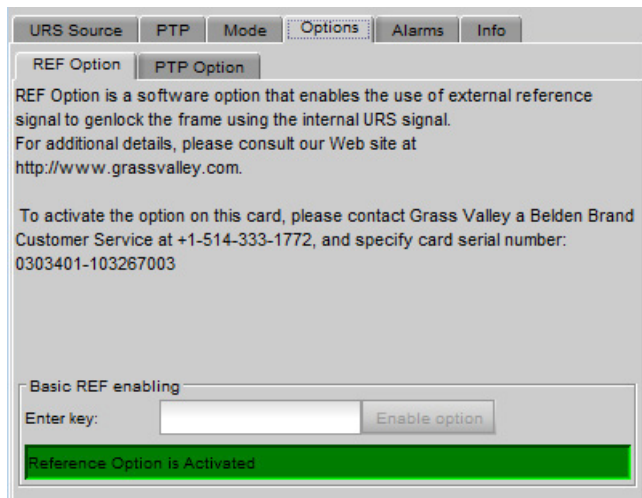
2 Type the key into the **Enter key** data box.

3 Click **Enable Option**.

The activation will be confirmed in the display - text and green background,

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 - Basic and Advanced versions

1 Select the **Info** tab.

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

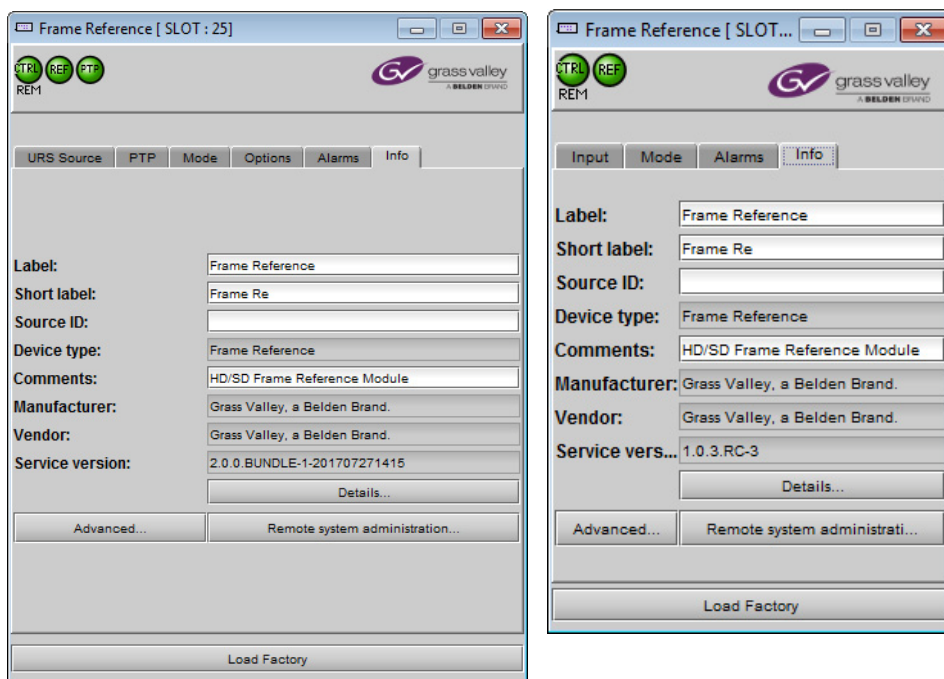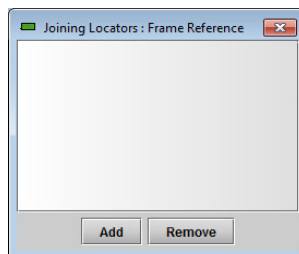| Data	Usage
Label	The label that is shown for this card in iControl applications.
Short Label	The short-form label that iControl uses in some cases (8 characters).
Source ID	A descriptive name for this frame reference.
Comments	Any desired text.

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.
Advanced...	Shows the LongID for this device. The LongID is the address of this frame reference in the iControl network.
Remote System Administration	Opens the Joining Locators window, which lists remote lookup services to which this frame reference 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.
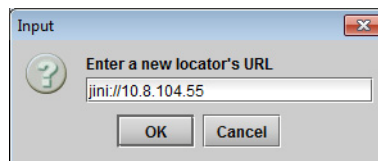
Factory Settings

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.

Upgrading the Frame Reference

The Frame Reference is upgraded using the Densité Upgrade Manager. See your iControl documentation for detailed instructions.

Menu for Local Control

The menu accessed from the touch screen on the frame's front panel is shown below.

- Note that the menu is different for the controller and the optional advanced controller.

Local Control Menu – Base Frame Reference

Level 1	Level 2	Level 3	
STATUS	REF NOT ENABLED		
	HARDWARE FAIL NO		
	INTERNAL REF		
	EXT REF 525-S, etc		
	EXT REF 1 PRESENT / NO EXT REF 1		
	LTC-1 DETECTED / NO LTC-1		
	LTC-1 PHASE ERR		
	VITC-1 DETECTED / NO VITC-1		
	LTC-1 FRAME ERR		
	VITC-1 FRAME ERR		
REFERENCE	SOURCE	[**AUTO**, REFERENCE-1, INTERNAL]	
	URS GEN MODE	[**NORMAL**, FREERUN]	
TIME CODE	SOURCE	[**AUTO**, LTC-1, VITC-1, OFF]	
	PROCESSING MODE	LTC-1	[**NORMAL**, PASS-THROUGH]
	USER BITS	[**ON**, OFF]	
CONFIG ALARMS	NO INPUT SIGNAL	ALARM LEVEL	[GREEN, YELLOW, **RED**, FLASH RED]
		ALARM REPORT	[**NONE**, GPI]
	NO TIME CODE	ALARM LEVEL	[GREEN, YELLOW, **RED**, FLASH RED]
		ALARM REPORT	[**NONE**, GPI]
VERSION	X.X.X.X, FPGA : X.X.X.X, BOOT : X.X.X		
OPTIONS	REF2X ON/OFF		
FACTORY DEFAULT	[RESTORE]		

	Reported value; cannot be changed.		List of values that can be selected. Default value is **bold** underlined.

Local Control Menu – Advanced Frame Reference

Level 1	Level 2	Level 3	
STATUS	GENERAL STATUS	REF NOT ENABLED	
		HARDWARE FAIL NO	
		INTERNAL REF	
		EXT REF 525-S, etc	
		DUAL REF ERR	
		EXT REF 1 PRESENT / NO EXT REF 1	
		EXT REF 2 PRESENT / NO EXT REF 2	
		LTC-1 DETECTED / NO LTC-1	
		LTC-1 PHASE ERR	
		LTC-2 DETECTED / NO LTC-2	
		LTC-2 PHASE ERR	
		VITC-1 DETECTED / NO VITC-1	
		VITC-2 DETECTED / NO VITC-2	
		LTC-1 FRAME ERR	
		LTC-2 FRAME ERR	
		VITC-1 FRAME ERR	
		VITC-2 FRAME ERR	
	PTP STATUS	G-MASTER IP ADDR	
		G-MASTER UID MSB	
		G-MASTER UID LSB	
		ETH-1 IP ADDRESS	
		ETH-1 IP STATUS	
		ETH-2 IP ADDRESS	
		ETH-2 IP STATUS	
REFERENCE	SOURCE	[**AUTO**, REFERENCE-1, REFERENCE-2, PTP, INTERNAL, DUAL_REF]	
	URS GEN MODE	[**NORMAL**, FREERUN]	
TIME CODE	SOURCE	[**AUTO**, LTC-1, LTC-2, VITC-1, VITC-2, OFF]	
	PROCESSING MODE	LTC-1	[**NORMAL**, PASS-THROUGH]
		LTC-2	[**NORMAL**, PASS-THROUGH]
	USER BITS	[**OFF**, ON]	

Level 1	Level 2	Level 3	
PTP CONFIG	ETH1 OPTIONS	IP ADDRESS	[**0.0.0.0**, …, 255.255.255.255]
		NETWORK MASK	[**0.0.0.0**, …, 255.255.255.255]
		GATEWAY	[**0.0.0.0**, …, 255.255.255.255]
	ETH2 OPTIONS	IP ADDRESS	[**0.0.0.0**, …, 255.255.255.255]
		NETWORK MASK	[**0.0.0.0**, …, 255.255.255.255]
		GATEWAY	[**0.0.0.0**, …, 255.255.255.255]
	SOURCE	[ETH1, ETH2, BMCA, **AUTOMATIC**]	
	DOMAIN NUMBER	[0, 1, 2, …, **127**, …, 254, 255]	
	ANNOUNCE INTERVAL	[0.125sec-8Hz, 0.250sec-4Hz, 0.5sec-2Hz, 1sec-1Hz, **2sec-0.5Hz**]	
	ANNOUNCE TIMEOUT	[2, **3**, 4, 5, 6, 7, 8, 9, 10]	
	OWD OFFSET	[**00.000**, 00.001, …, 99.998, 99.999]	
CONFIG ALARMS	NO INPUT SIGNAL	ALARM LEVEL	[GREEN, YELLOW, **RED**, FLASH RED]
		ALARM REPORT	[**NONE**, GPI]
	NO TIME CODE	ALARM LEVEL	[GREEN, YELLOW, **RED**, FLASH RED]
		ALARM REPORT	[**NONE**, GPI]
VERSION	X.X.X.X, FPGA : X.X.X.X, BOOT : X.X.X		
OPTIONS	REF2X ON/OFF		
FACTORY DEFAULT	[RESTORE]		

	Reported value; cannot be changed.		List of values that can be selected. Default value is **bold underlined**.

Service and Maintenance

Summary

Field-Serviceable Items

Field-serviceable items on the Densité 3+ FR4 frame itself include the power supplies, the controller card, the ventilation fan assemblies, and the front-door air filter.

The power supplies and controller card are located behind the door on the front panel. The fan assemblies are mounted on the rear of the frame.

Changing the Power Supply

The Densité 3+ FR4 frame supports dual redundant hot-swappable power supplies. The basic configuration includes a single supply, plus an empty slot for the optional redundant power supply. Installing a second power supply module and applying power to it automatically engages the redundant supply mode. Each power supply has its own power socket on the rear panel, and should be connected to the AC supply using the supplied power cord or other approved cord.

- A single power supply can be installed in either of the two slots.
- Power integrity is enhanced if the two supplies are plugged into different circuits.
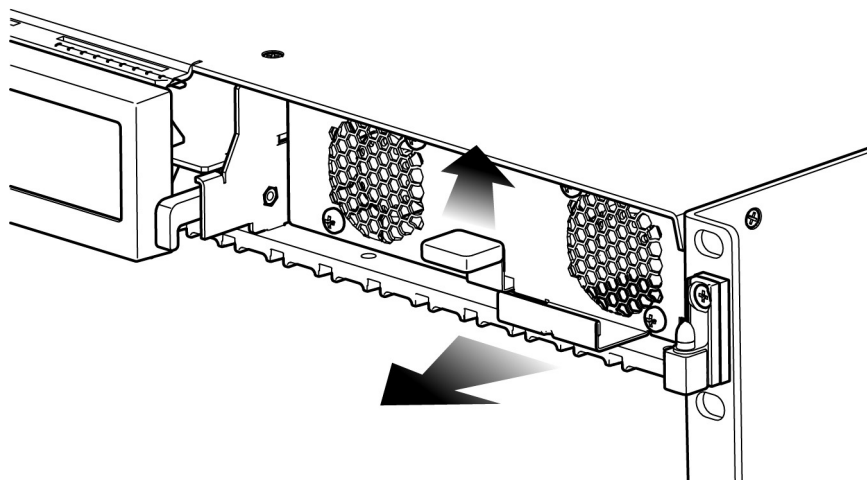
To install or change a power supply module

1 Open the front door of the frame

2 Lift up the latching tab in the front center of the supply.

3 Slide the power supply out of the frame by pulling on the bracket on the bottom right of the supply.

4 Slide the new power supply module into the slot, and push it gently into position to seat the connectors. There is no guiding slot - the supply base sits on the floor of the frame.

5 The latch clicks into position once the supply is properly seated.

6 Close the front door of the frame.

Replacing the Controller

The controller is located at the top center of the frame.

To replace the controller:

1 Open the front door of the frame.

2 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.
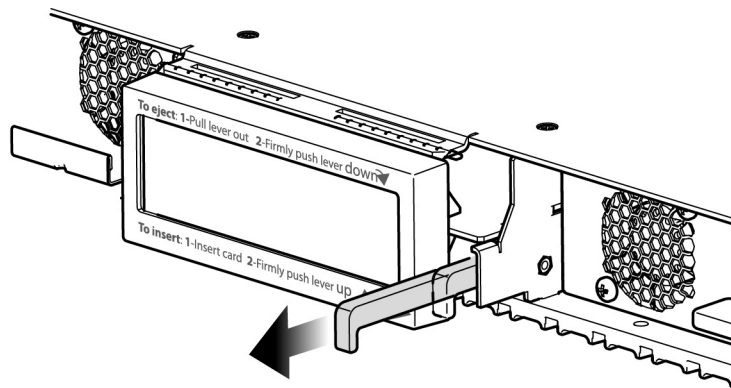

3 Push the lever firmly down to release the controller so that it can slide freely.
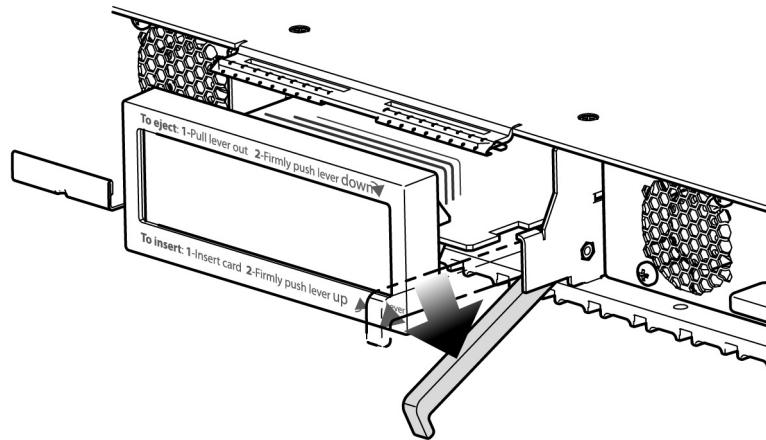
4 Pull gently on the display panel and slide the controller out of the frame.

5 With the lever extended, slide the new controller gently into the controller slot as far as you can until it stops. Do not apply any force, as it may damage the controller/display interface.

6 Firmly push the lever up to seat the card in its connectors.
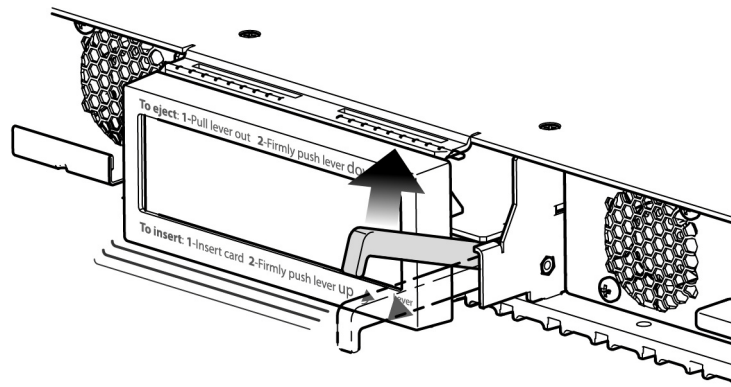
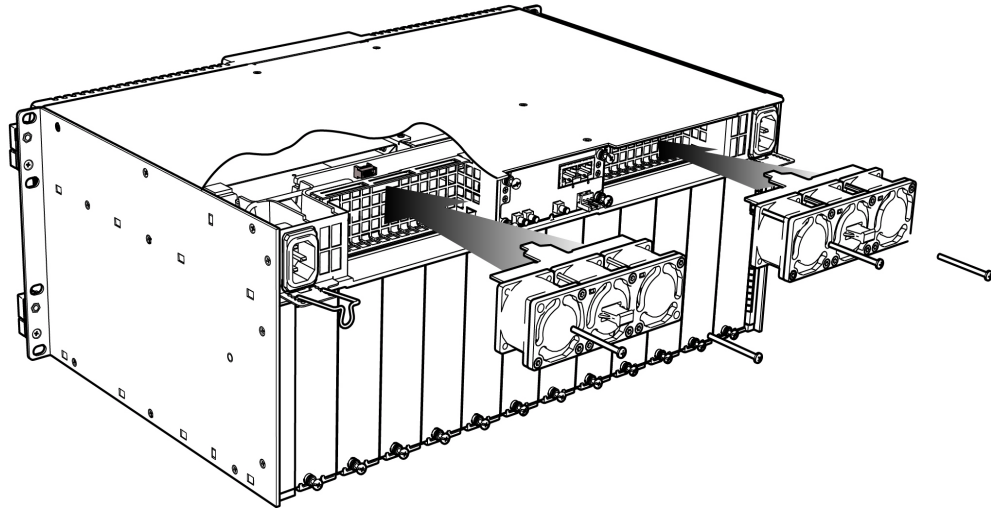7 Close the front door of the frame

Replacing the Frame Ventilation Fans

In case of failure of one of the two cooling fans assemblies on the rear of the frame, replace it according to the following steps.

1 Procure a replacement fan assembly from Grass Valley. It is comprised of a three fans in a housing. It is available from Grass Valley as part #03007-2100-100.
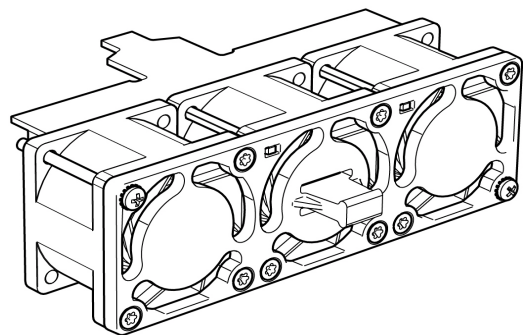
2 Remove the defective fan from the frame:
- Remove the two screws (top left and bottom right corners)that secure the fan assembly to the frame and pull the fan assembly straight out of the frame.
- Retain the screws, as they will be used to install the replacement fan assembly.

3 Install the replacement fan:
- Slide the new fan assembly into the opening on the rear panel, pushing it straight in and ensuring that the connector on the assembly mates with the socket in the frame.

- Use the two screws that were retained when the old fan assembly was removed to secure the new fan assembly to the rear panel.

Cleaning and replacing the front-door air filter

Cooling air pulled into the frame by the rear fan assemblies passes throught an air filter located in the front door of the frame.

- Check the flter regularly to ensure that it is not clogged with debris.
- Remove and clean the filter if it is dirty.
- Replace the filter if it is damaged or cannot be thoroughly cleaned.

To check the filter, open the front door and visually inspect it.

To remove the filter for cleaning or replacement

1. Open the front door and lift it up to slide it off the hinge pins.
2. Lay it face down on a work surface
3. Undo the captive thumbscrew at one end of the filter retaining bar
4. Slip the other end of the retaining bar out of its slot
5. Pull the filter away from the faceplate, by slipping it off the retaing hooks at the four corners.

To clean the filter, either vacuum it or rinse it in water.

⚠️ If you wash it, make sure it is thoroughly dry before replacing it, to prevent moisture from being pulled into the frame by the ventilating fans.

To install the filter in the door

1. Orient the filter so the cutout for the controller display window lines up with the window in the frame door.
2. Slip the holes in the four corners of the filter over the hooks on the door panel.
3. Insert the tip of the retaining bar into the slot on the hinge end of the door

4 Tighten the thumbscrew on the other end of the retaining bar to hold it in place.

5 Install the door onto the frame by sliding it down onto the hinge pins.

A replacement filter is available from Grass Valley.

- Order Part No. 13007-3400-100

Contact Us

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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