



grass valley

A **BELDEN** BRAND

DENSITÉ 3+ FR4

HOUSING FRAME

User Manual

M3007-9900-102

2016-06-22

www.grassvalley.com

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

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| Title | Densité 3+ FR4 User Manual |
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Important Safeguards and Notices

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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.



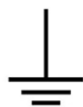
Indicates that the user, operator or service technician should refer to the product manuals for important operating, maintenance, or service instructions.



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

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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 :
 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 nettoyeurs liquides ou en aérosol. Utilisez uniquement un chiffon humide.
- Des tensions dangereuses peuvent exister en plusieurs points dans cet équipement. Pour éviter toute blessure, ne touchez pas aux connexions ou aux composants exposés lorsque l'appareil est sous tension.
- Avant de procéder à toute opération d'entretien ou de dépannage, enlevez tous vos bijoux (notamment vos bagues, votre montre et autres objets métalliques).
- Pour éviter tout risque d'incendie, utilisez uniquement les fusibles du type et du calibre indiqués sur l'équipement ou dans la documentation qui l'accompagne.
- Ne pas utiliser cet appareil dans une atmosphère explosive.
- Présence possible de courants de fuite. Un raccordement à la masse est indispensable avant la mise sous tension.

- Après tout travail d'entretien ou de réparation, faites effectuer des contrôles de sécurité par le personnel technique qualifié.



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

- L'appareil est conçu pour être installé dans un endroit à accès restreint.
- Au moment d'installer l'équipement, ne fixez pas les cordons d'alimentation aux surfaces intérieures de l'édifice.
- 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



c

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

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

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 GB/T 26572-2011 规定的限量要求以下。

O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in GB/T 26572-2011.

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572-2011 规定的限量要求。

X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials for this part is above the limit requirement in GB/T 26572-2011.

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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

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1 Introduction

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The Densité 3+ FR4 Frame

Overview - Frame

The 4 RU Densité 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
- Frame reference integrated with controller

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 Miranda’s control solutions. This controller card is compatible with the TCP/IP protocol and can support polling or report on error modes (unsolicited messaging).

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 throughput 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 reference module

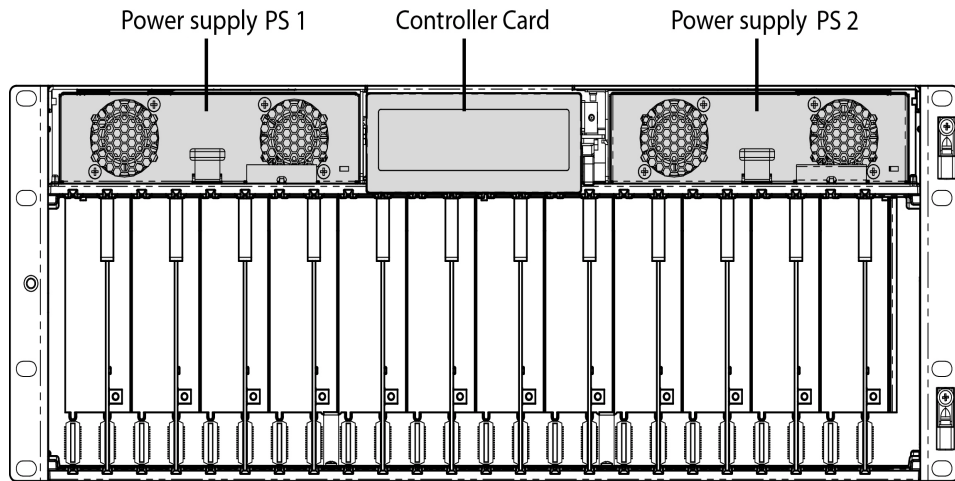
Description

Mechanical Layout

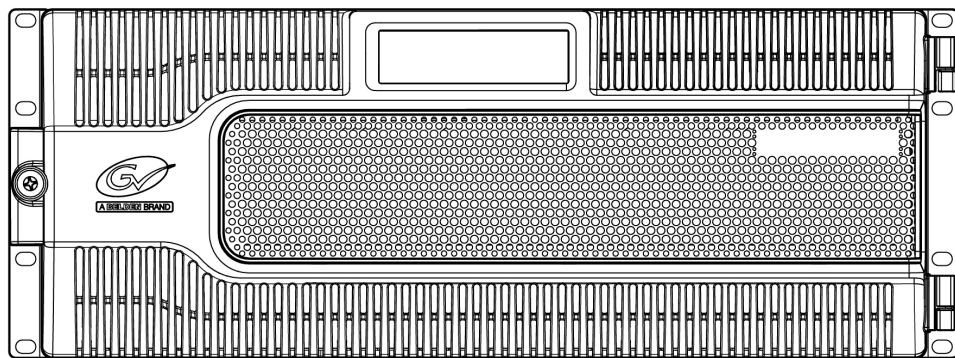
The Densité 3+ FR4 is a 4 RU frame.

- 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



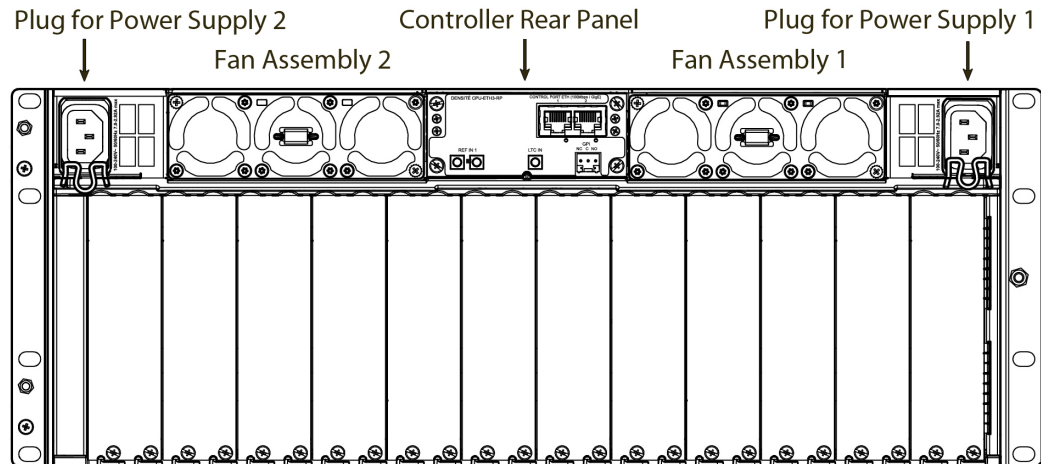
When the frame door is closed, the controller card touch screen is exposed through an opening in the top center of the door. All other front elements are concealed by the door.



Rear of the Frame

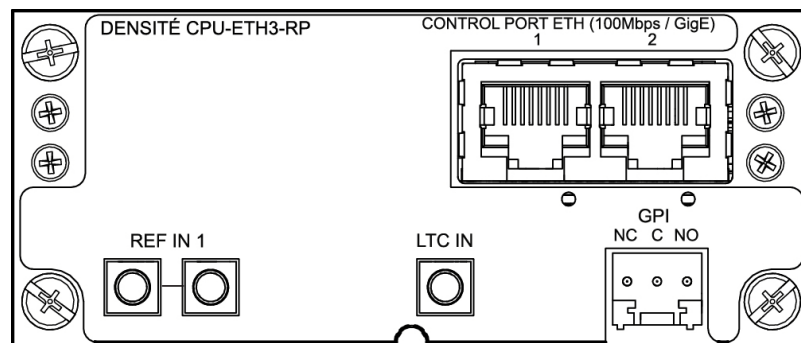
The rear of the Densité 3+ FR4 frame is divided into two sections.

- 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.



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.



CONTROL PORT ETH (100 Mbps / GigE)

The two Ethernet links are connected to these RJ45 connectors.

REF IN 1

External reference signal for the frame, with a loop-through, on DIN connectors.

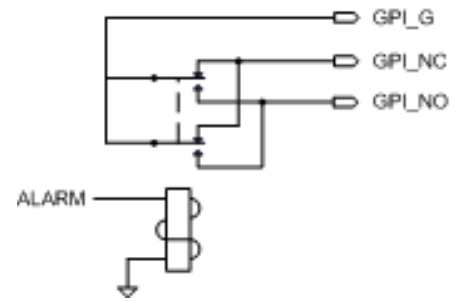
LTC IN

External time code is connected to this DIN connector.

GPI

Alarms generated on the controller card may be reported on the GPI connector on the rear panel.

Users who wish to utilize this 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

IN 1 and loop-thru

Connectors DIN

TIME CODE

LTC IN

Connector DIN

2 Installation

Summary

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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)
- 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

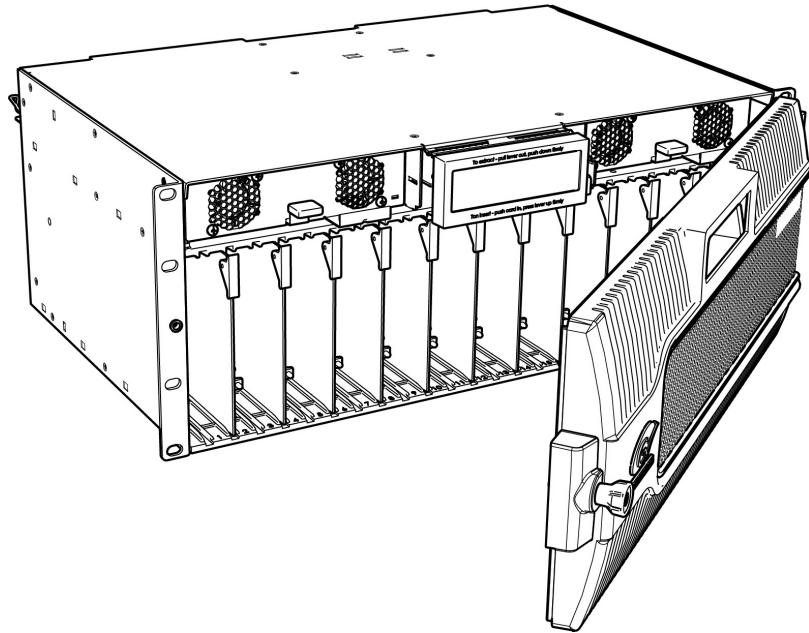
The front door of the Densité 3+ FR4 frame is hinged on the right-hand side, and latched by a captive thumbscrew on the left-hand side. There are no electrical connections to the door.

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

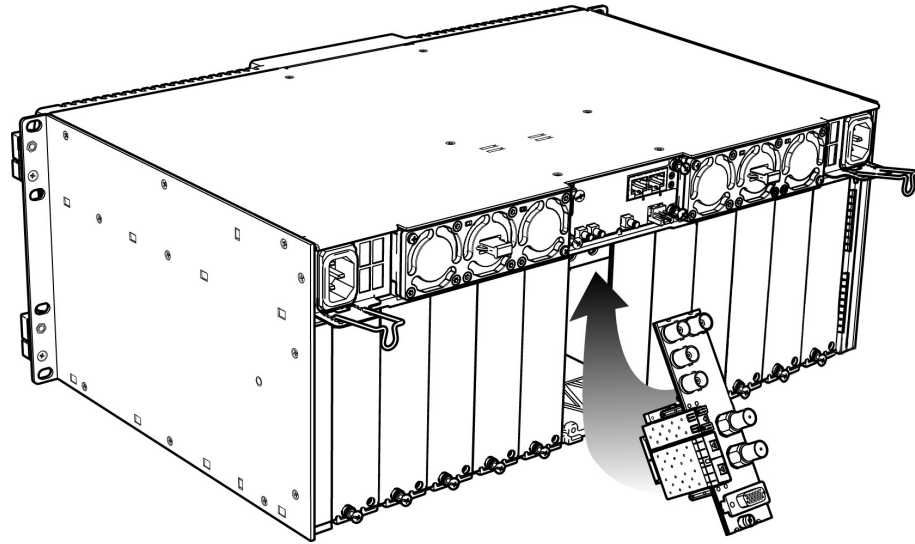
All Densité-series cards can be installed with the frame power on. Each card has a connector which plugs into the frame's backplane for distribution of power and connection to the controller card, and a second connector that plugs into the associated rear panel for inputs and outputs.

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 9

To install the rear connector panel

- 1 If a card is installed in the slot whose rear panel is being changed, remove it as described below.
- 2 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
- 3 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.

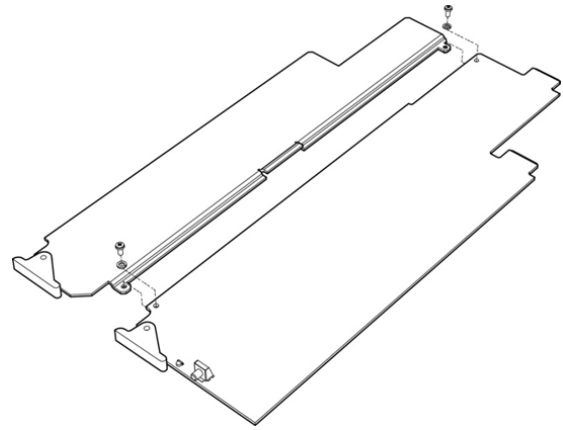
Using Densité 2 cards in the Densité 3+ FR4 Frame

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:

- o DENSITE 3-EXT-A
- o DENSITE 3-EXT-B
- o DENSITE 3-EXT-C



Install these on the Densité 2 card as follows:

- 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.

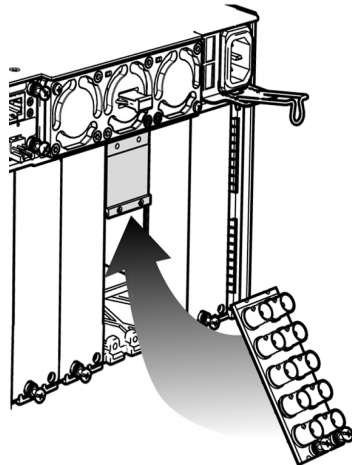
Rear Adapters

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

- DENSITE SRP-3RU for single slot-width rear panels
- DENSITE DRP-3RU for 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.



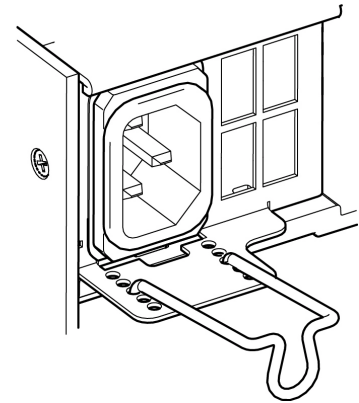
- 3 Slip the top of the 2RU rear panel into the slot on the bottom of the adapter, and secure the panel to the frame using the captive screw at the bottom of the panel.

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
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.
- 2 Position the clip horizontally and insert the plug into the socket.
- 3 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 44 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

| | |
|--|----|
| <i>Using the Ethernet interface</i> | 13 |
| <i>Using the local control interface</i> | 15 |
| <i>Using the Controller's web page</i> | 16 |
| <i>Configuring the CPU-ETH3 Controller</i> | 17 |
| <i>Upgrading the CPU-ETH3 Controller</i> | 32 |
| <i>Configuring the Frame Reference</i> | 33 |

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.

There are three ways to configure the controller, as explained below.

Using the Ethernet interface

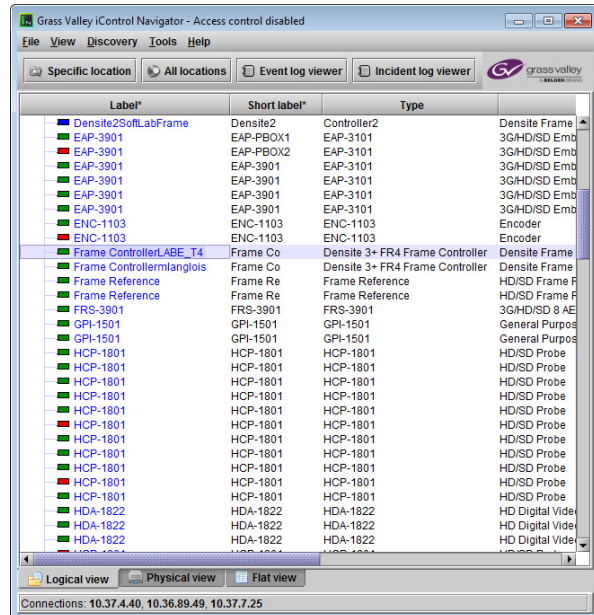
The CPU-ETH3 controller supports remote operation through two rear-panel 100Mbps / GigE ethernet ports, using Grass Valley's iControl. The command set available for communicating with a DENSITÉ frame permits more complex and comprehensive control, parameter storage, and field upgrading than is supported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

Please consult the iControl User's Guide for information about setting up and operating iControl.

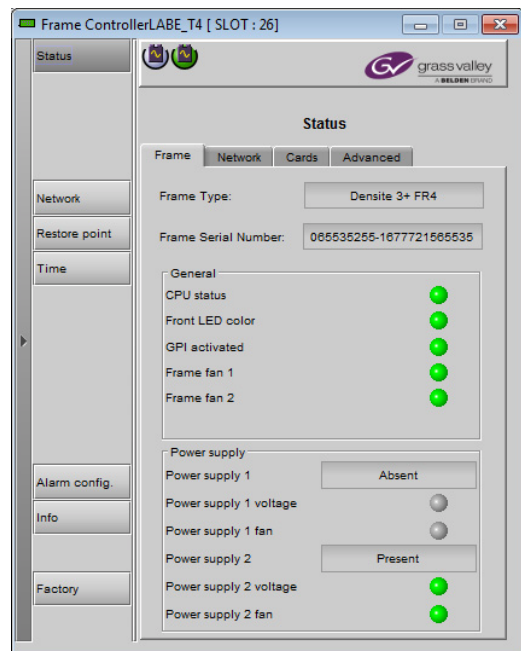
In iControl Navigator or iControl Websites, double-click on the icon of the controller to open its control panel.

- 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 18 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 17](#).



Using the local control interface

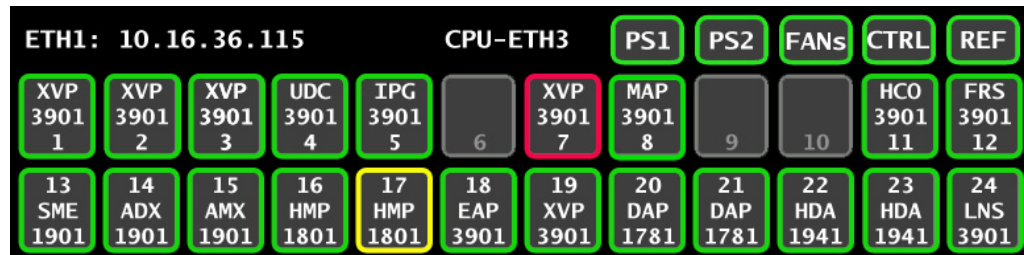
The local control interface is fastened to the front of the CPU-ETH3 controller card, and when installed is located in the top center of the frame.

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)

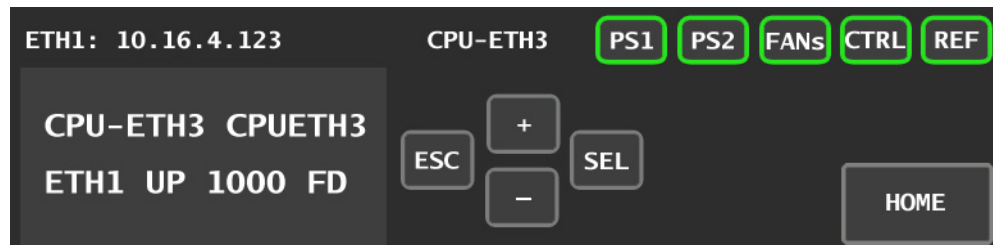
The status of the controller itself is shown in the CTRL segment on the top right.



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 controller menu is shown beginning on [page 31](#).

The functionality of the four virtual pushbuttons is as follows:

- [+] [-] Move up and down the menu when a parameter name is shown
Change to the next or previous value when a variable value is shown and change has been enabled using the [SEL] button
- [SEL] Gives access to the next menu level. When a parameter value is shown, pushing this button once enables modification of the value using the [+] and [-] buttons; a second push confirms the new value
- [ESC] Cancels the effect of parameter value changes that have not been confirmed; pushing [ESC] causes the parameter to revert to its former value.






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

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

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

Controller Status Indicator

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

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

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

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

Using the Controller's web page

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

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

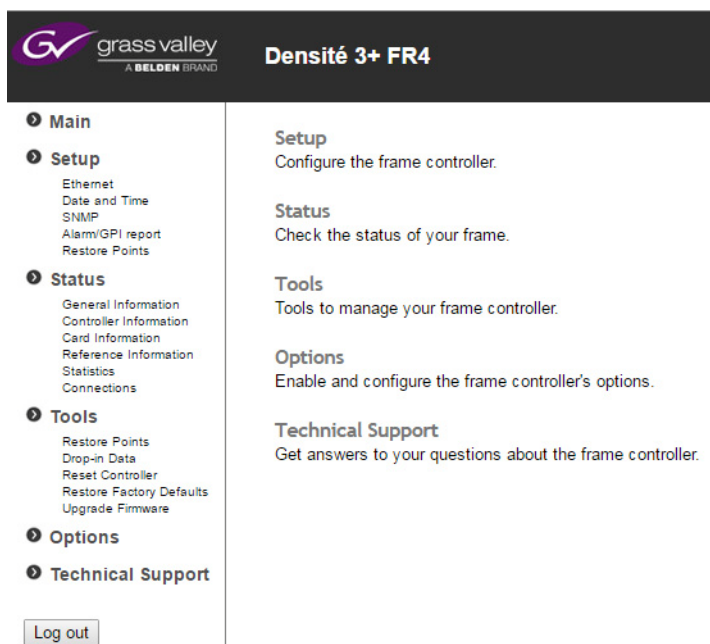
| | ETH1 | ETH2 |
|--------------|---------------|---------------|
| IP address | 192.168.3.3 | 192.168.4.3 |
| Network Mask | 255.255.255.0 | 255.255.255.0 |
| Gateway | 0.0.0.0 | 0.0.0.0 |

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

- You can change them from this web page, or through the local control panel menu, but not through the iControl interface.

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.



- 2 Select the topic area of interest from the index on the left, and click to open the configuration page.

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.

In general, the iControl interface will be used as the primary interface for purposes of describing the configuration process.

The functionality of the web page interface follows the iControl model, and will not be explained separately except as required.

In each case, the menu path which must be navigated on the local control panel to access the configuration item under discussion will also be given.

Summary

| | |
|--------------------------------|----|
| <i>Identification</i> | 18 |
| <i>Status Monitoring</i> | 19 |
| <i>Network</i> | 22 |
| <i>Link Redundancy</i> | 22 |
| <i>Data Restoration</i> | 23 |
| <i>Factory Alignment</i> | 25 |
| <i>Time Management</i> | 26 |
| <i>Alarms</i> | 27 |

Identification

iControl - click the *Info* button

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.

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

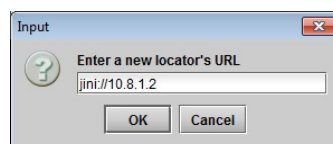
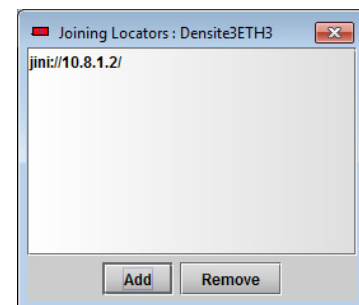
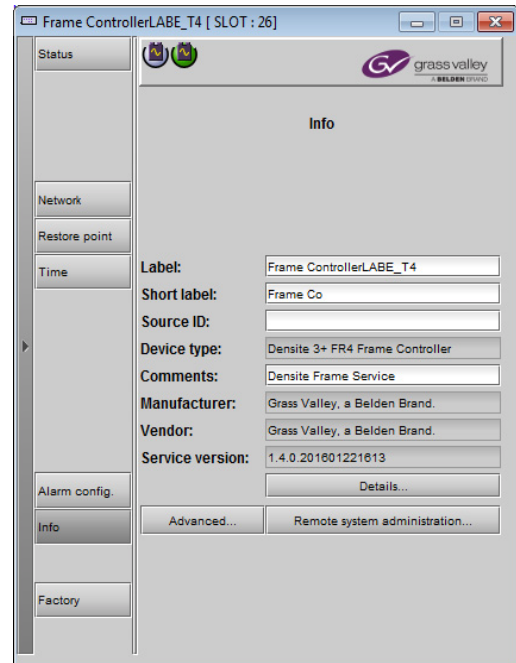
Advanced: Shows the LongID for this card. The LongID is the address of this CPU-ETH3 controller in the iControl network.

Remote System Administration: Opens the Joining Locators data box, which lists remote lookup services to which this CPU-ETH3 is registered.

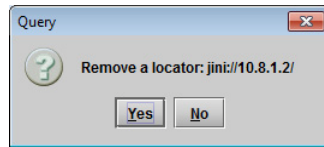
Add: Force the iControl service for this CPU-ETH3 to register itself on a user-specified Jini lookup service, using the following syntax in the data box:

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.



Using the menu

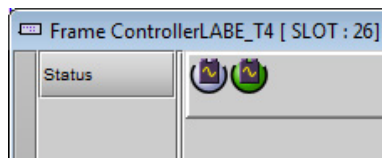
None of this data can be accessed via the local control panel menu, except to read the Firmware version.

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 two ethernet ports, and the status of its on-board memory, as well as the data throughput of all cards installed in the frame.

In addition to the information displayed on the [Controller Status Indicator](#) (see page 16), status information acquired by the controller can be viewed in the iControl interface, and on the local controller display through the menu.

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



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

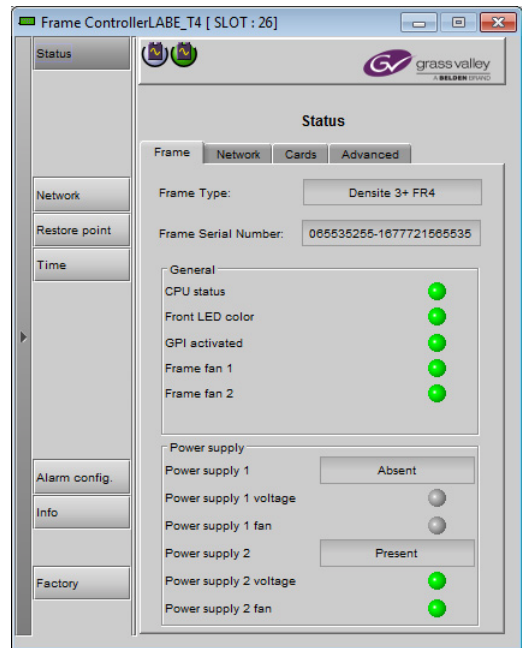
The table shows the possible icon displays and the associated messages that appear below them. Error messages are always displayed; other status messages appear only upon mouse-over of the icon.

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

iControl - click the *Status* button

Status - Frame

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



Status - Network

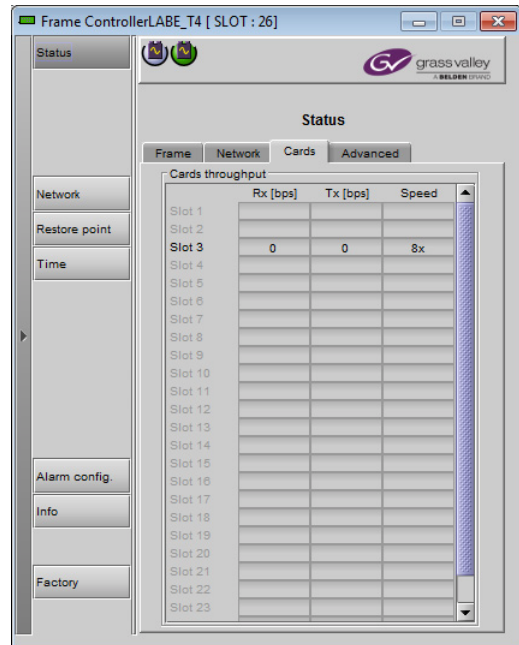
Select the *Network* tab to see a report on the status of the two Ethernet ports on the CPU-ETH3 card.



Status - Cards

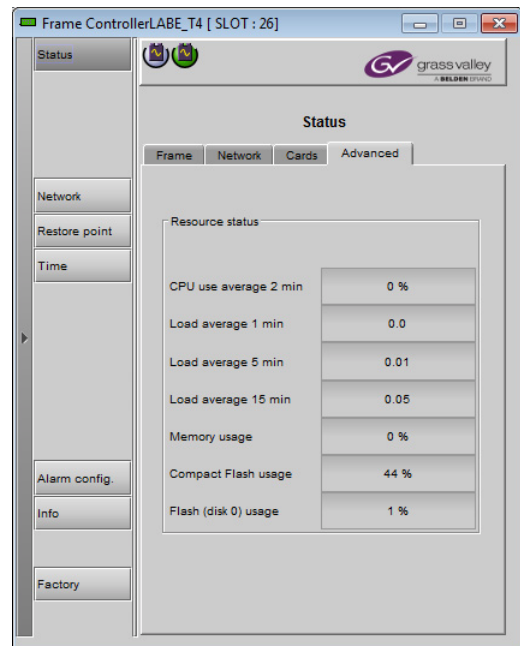
Select the *Cards* tab to see a chart of the current send (Tx) and receive (Rx) data rates, and speed, for all cards installed in the Densité frame.

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 card's resources:



Using the Menu

Select STATUS and then [SEL] to cycle through the list of current faults. The information shown on the *Network*, *Cards* and *Advanced* tabs is not available through the menu.

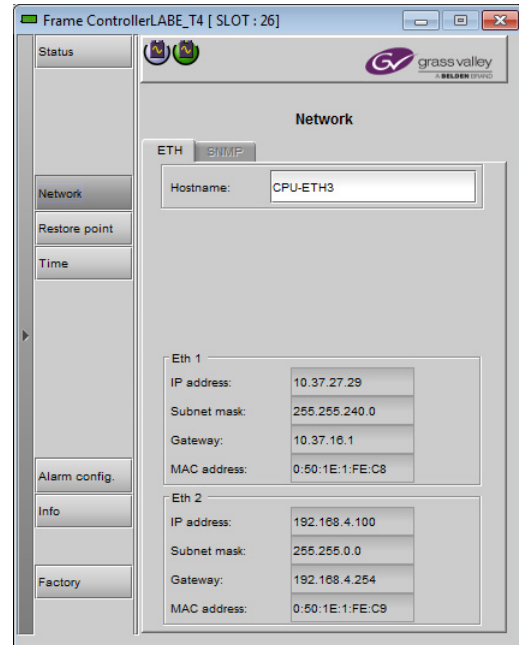
Network

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.

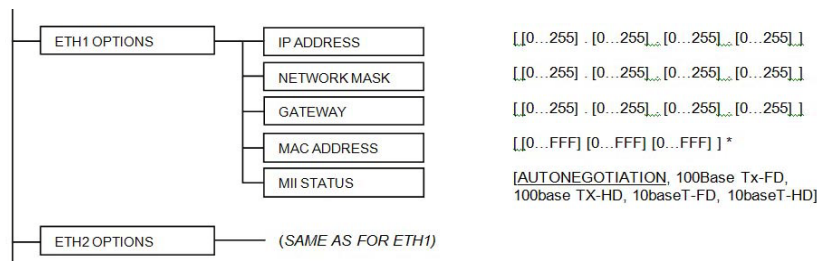


Using the web page:

- 1 Select **Setup-Ethernet** from the index on the left.
- 2 Enter a **Hostname** in the databox
- 3 Enter the **IP address**, **Network Mask** and **Gateway** for the two ethernet ports
- 4 Select **AUTONEGOTIATION** in the MII Status pulldown for each port
- 5 Click **Apply** to save your changes

Using the Menu:

To change the IP address:



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 Densité 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.

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 index of the web page.
- 3 Enter the **activation key** into the web page data box.
- 4 Click **Enable**.
- 5 Click the Ethernet heading under Setup in the left index of the web page.
- 6 Enable the Channel Bonding
- 7 Click Apply
- 8 Click Reset

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.

For manual operation:

iControl - click the *Restore Point* button 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.

Click the check box to activate the Data Restore feature for the card in that slot,

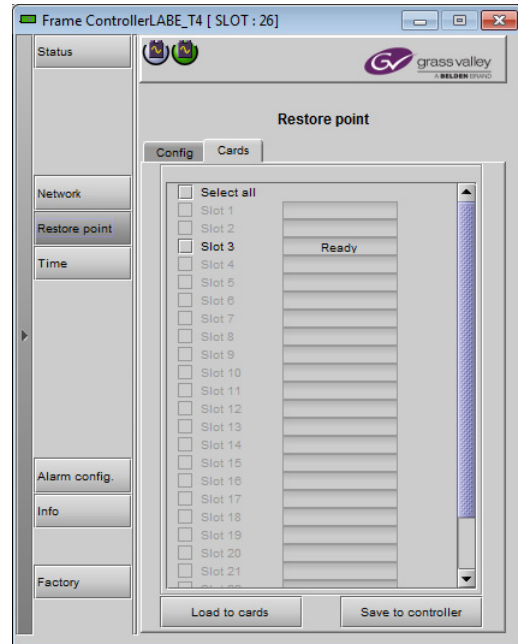
-or-

Click the Select All box at the top to activate the feature for all slots in the frame.

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.

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.



For automatic restore and save:

iControl - click the *Restore Point* button and view the *Config* tab.

Restore: The CPU-ETH3 card can be set up to automatically update 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.

Click the *Default Action* box to enable the auto restore function for all the cards in the frame.

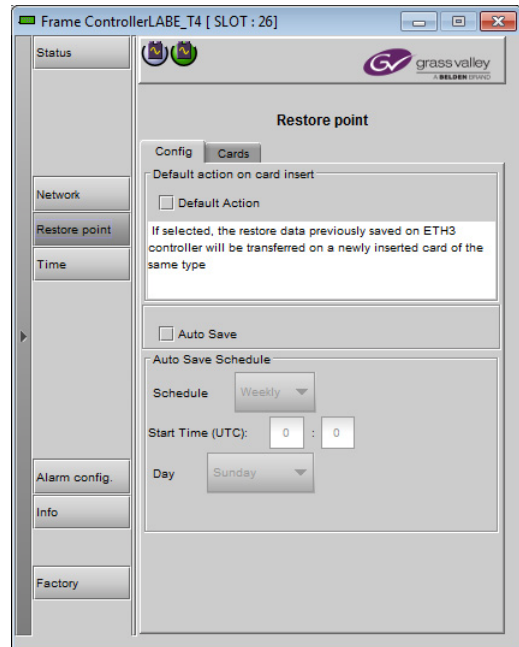
Save: The CPU-ETH3 card can be configured to automatically back up the data on the cards in its slots according to a set schedule.

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

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

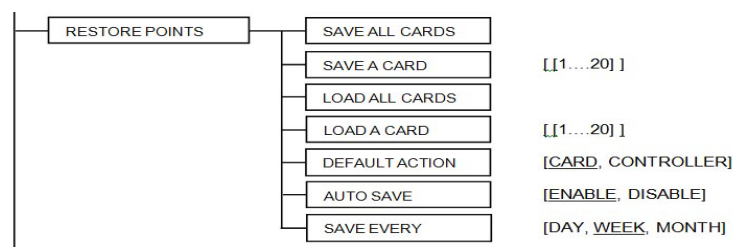


The label and function of the pulldown at the bottom changes to follow the Schedule selection:

| 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 |

Using the menu:

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



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”

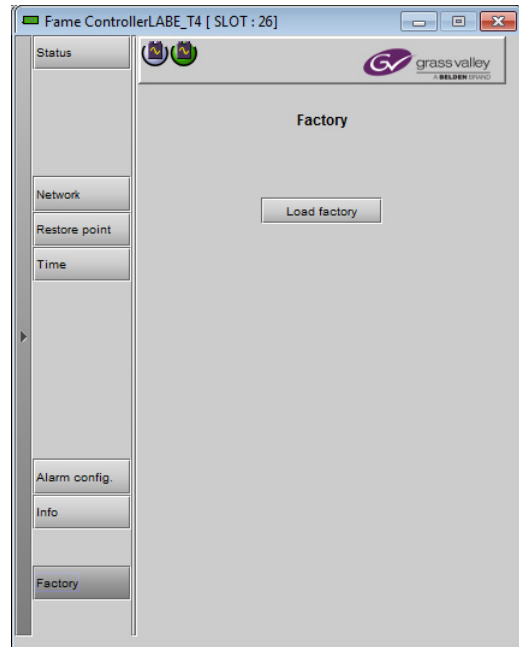
alignment in its memory, to which it can be restored at any time.

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

iControl - click the *Factory Control* button

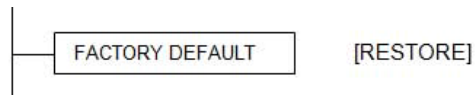
Click the *Load Factory* button to restore the card to the Factory default alignment.

Click the *Load Factory* button to restore the card to the Factory default alignment.



Using the menu

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



The default values are shown underlined in the menu listing beginning on [page 31](#).

Time Management.

The CPU-ETH3 controller is time-aware, and its internal clock can be updated manually or via NTP.

iControl - click the *Time* button

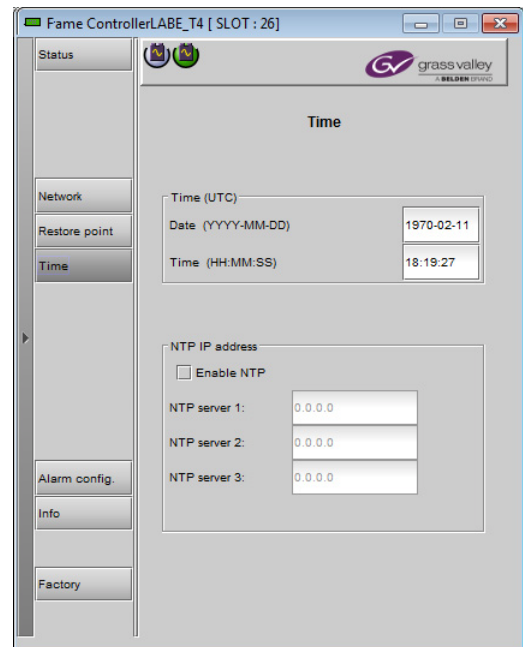
Time (UTC)

The data boxes in this section display the time and date currently held in the card.

Enter new values in these boxes to change the current setting. If an automatic update via NTP is not enabled, the clock will continue to run using an on-board reference, but precision is not guaranteed.

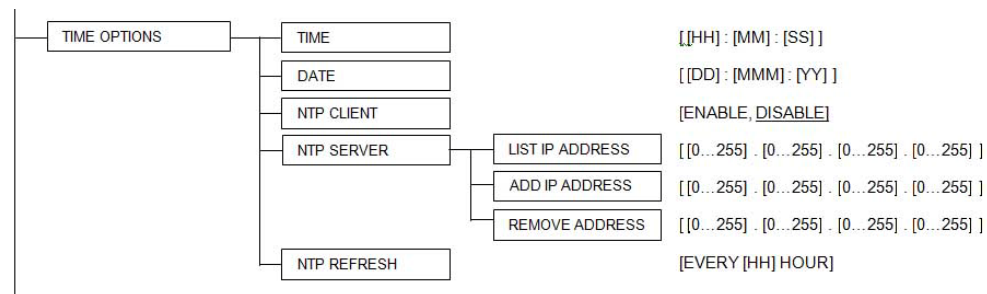
NTP IP address

Click the *Enable NTP* box to use an NTP (Network Time Protocol) source. Enter up to three IP addresses of NTP servers. The CPU-ETH3 card will use the first source of valid time it finds in this list.



Using the menu

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



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.

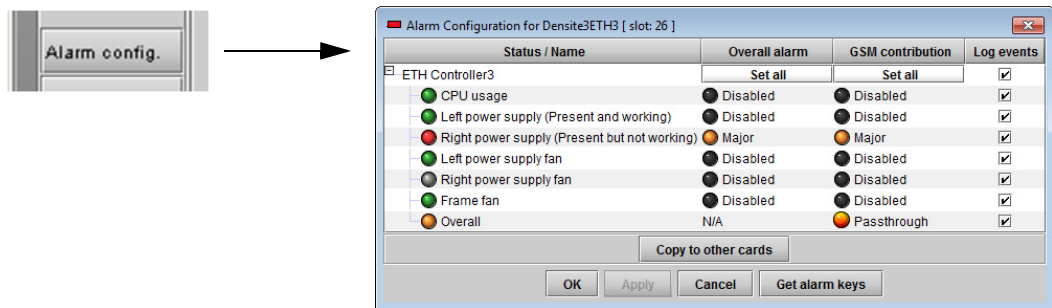
Alarms

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 menu, as described at the end of this section (page 32).

iControl - click the *Alarm Config* button



The iControl Alarm Configuration panel opens in a new window when the *Alarm Config* button is clicked, 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

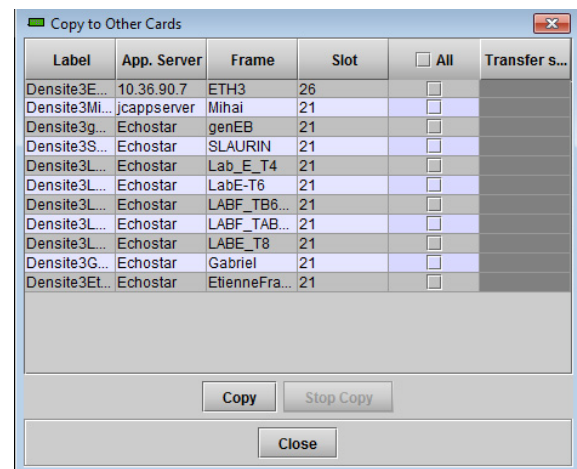
iControl maintains a log of alarm events associated with the card. The log is useful for troubleshooting and identifying event sequences. Click in the checkbox to enable logging of alarm events for each individual alarm.

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.

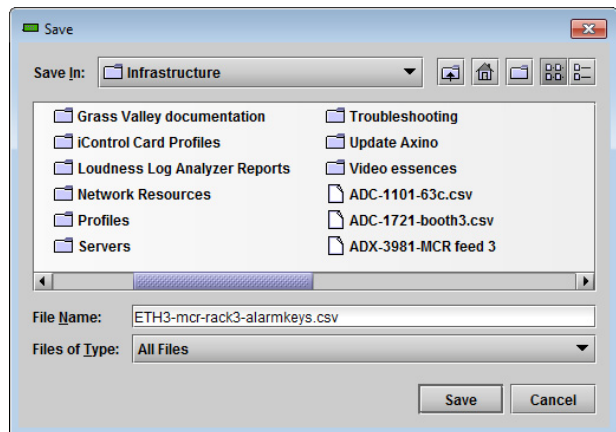
Select one or more destination controllers from the list in the window by clicking in the checkboxes, or all of them by clicking in the *All* checkbox



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

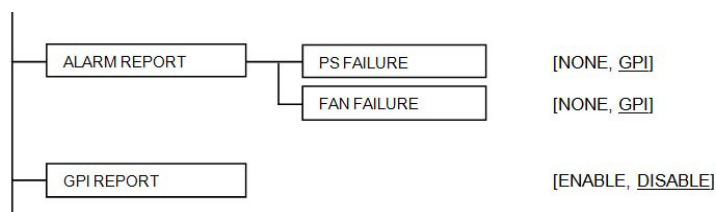


OK, Apply, Cancel

- **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.

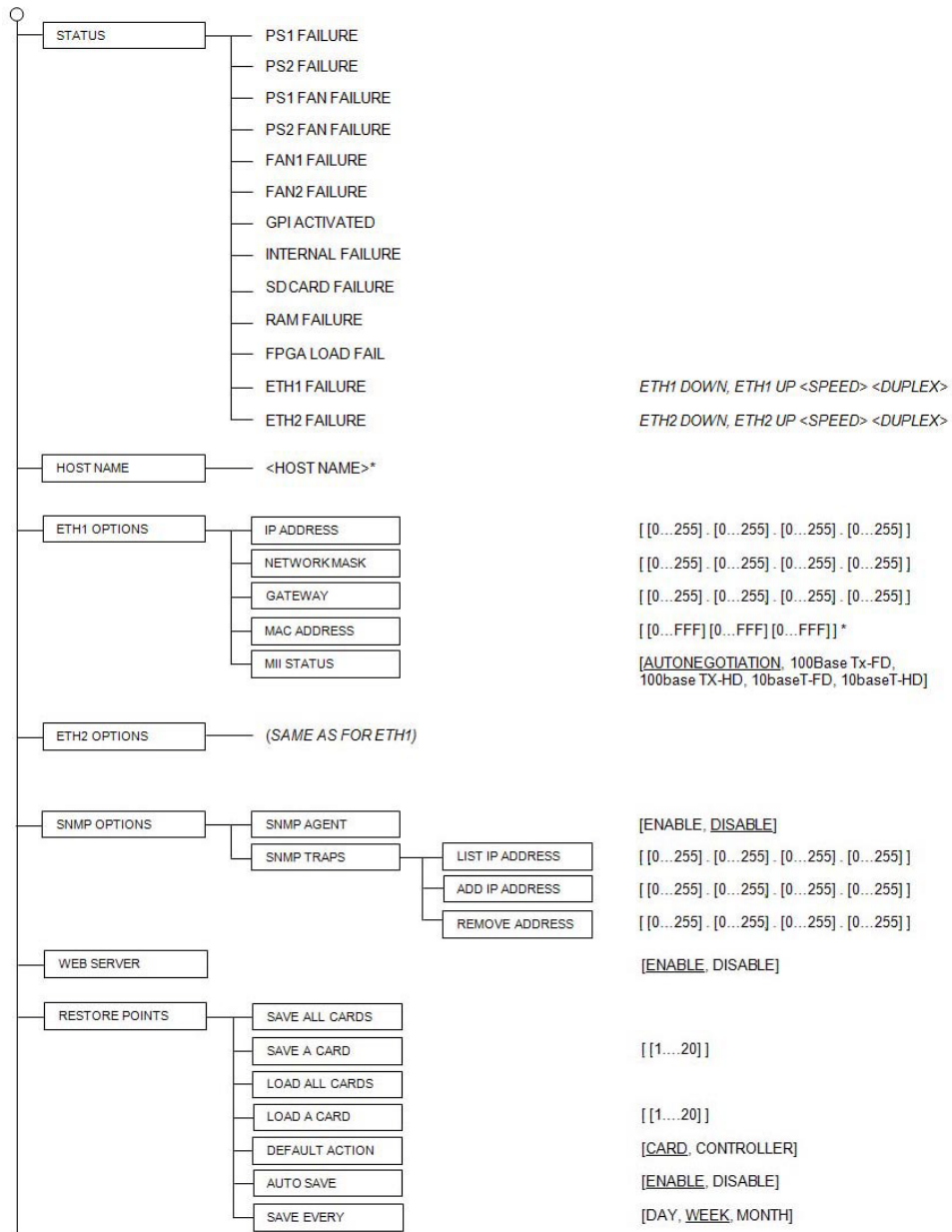
Using the Menu

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.

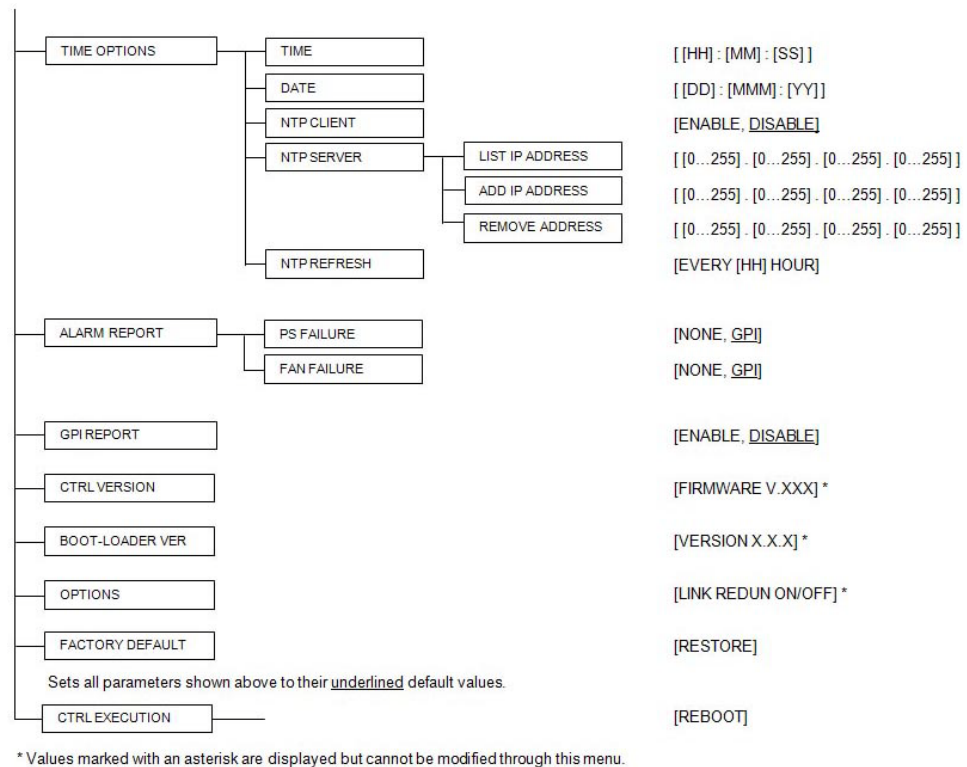


Local Control Panel Menu - CPU-ETH3

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



(continued)

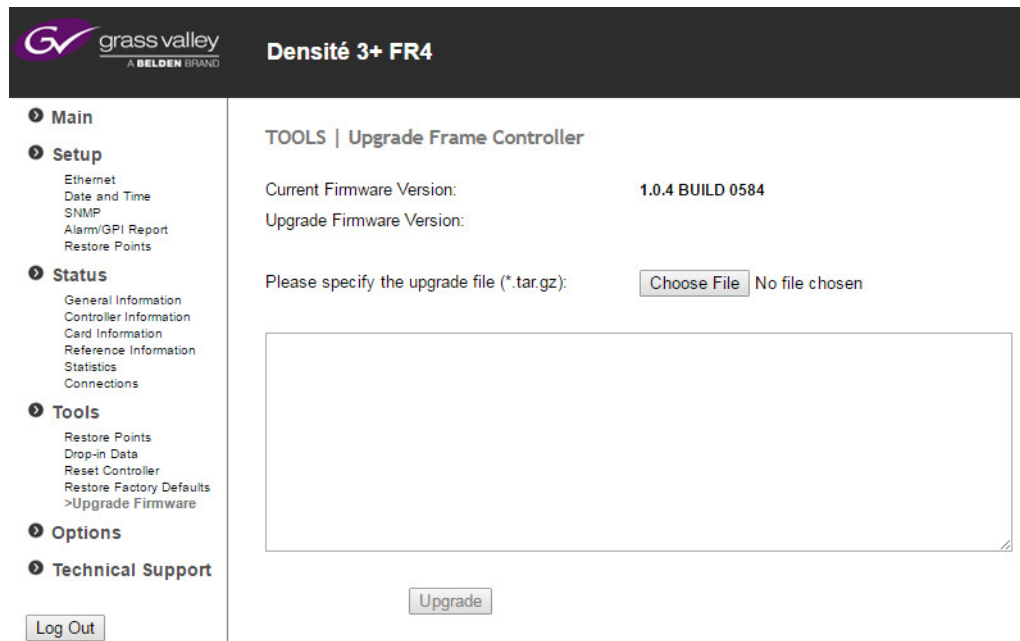


Upgrading the CPU-ETH3 Controller

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.

9 Click **Log Out** at the bottom left of the window to exit the CPU-ETH3 web page.

Configuring the Frame Reference

Summary

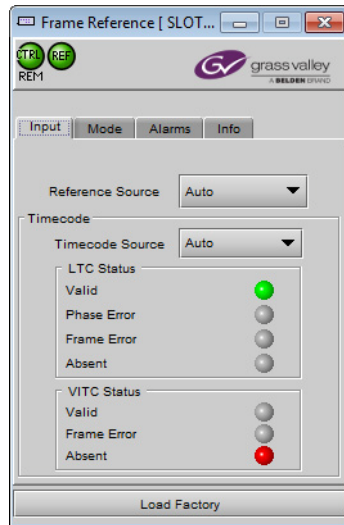
| | |
|-------------------------------|----|
| <i>Reference Source</i> | 34 |
| <i>URS Generation</i> | 34 |
| <i>Timecode</i> | 35 |
| <i>Alarms</i> | 36 |
| <i>Information</i> | 37 |
| <i>Factory Settings</i> | 39 |

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.

To open the Frame Reference control panel

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



Reference Source

To select the reference source

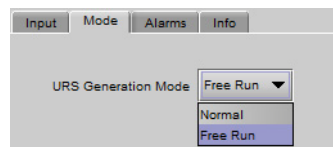
- 1 Select the **Input** tab.
- 2 Click the **Reference Source** pulldown.
- 3 Click to select the reference source:

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

URS Generation

To select the URS generation mode

- 1 Select the **Mode** tab.



- 2 Click the URS Generation Mode pulldown.

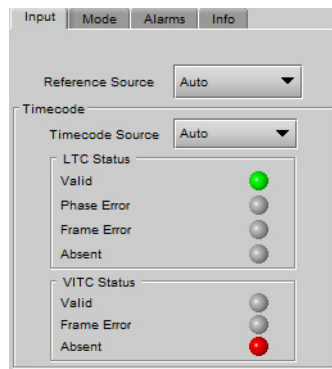
3 Click to select the URS Generation mode:

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

Timecode

To select the timecode source

1 Select the **Input** tab



2 Click the **Timecode Source** pulldown

3 Click to select the source of timecode:

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

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

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

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

To configure timecode logging

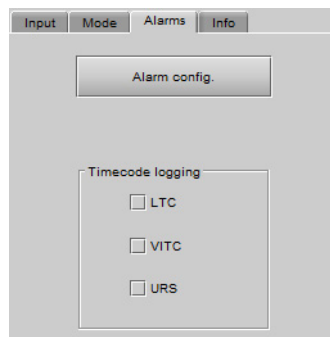
- 1 Select the Alarms tab
- 2 Select the checkboxes to send the indicated time codes (LTC, VITC, URS) to the iControl GSM, where it can be used by other network devices.

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

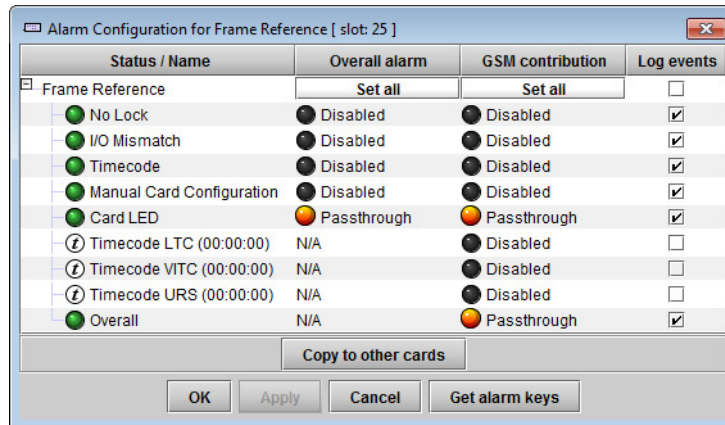
Alarms

To configure alarms

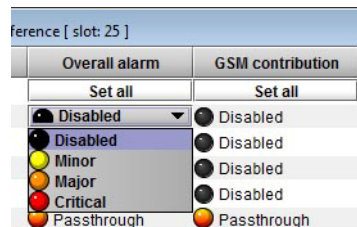
- 1 Select the **Alarms** tab



- 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.



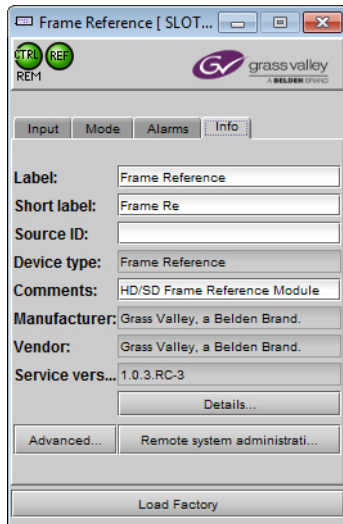
- c Click on the icon in the GSM Contribution column.
 - d Click to select the appropriate alarm status from the drop-down list.
- 4 Alternatively:
 - a Click the **Set All** box at the top of the Overall Alarm column.
 - b Click to select the appropriate alarm status from the drop-down list.
All alarms 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.

Information

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

To enter labels and text descriptions

- 1 Select the **Info** tab.



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

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

The remaining data boxes show manufacturing information about this device.

Three buttons in the panel give access to other information.

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

| Button | |
|------------------------------|---|
| Advanced... | Shows the LongID for this device. The LongID is the address of this frame reference in the iControl network. |
| Remote System Administration | <p data-bbox="626 386 1357 447">Opens the Joining Locators window, which lists remote lookup services to which this frame reference is registered.</p> <div data-bbox="626 457 927 705" data-label="Image"> </div> <p data-bbox="626 726 940 756">To add additional services</p> <ol data-bbox="646 768 1289 915" style="list-style-type: none"> 1 Click Add 2 Enter the IP address of a server running a Jini look-up service, using this syntax: jini://<ip_address> <div data-bbox="675 926 1057 1083" data-label="Image"> </div> <ol data-bbox="646 1098 1273 1161" style="list-style-type: none"> 3 Click OK to add the service, or Cancel to discard the information. <p data-bbox="626 1178 980 1207">To remove an existing service</p> <ol data-bbox="646 1220 1360 1367" style="list-style-type: none"> 1 Click a service in the Joining Locators window to select it. 2 Click Remove. 3 Click OK in the pop-up confirmation window to remove the service, or Cancel to leave it in place. |

Factory Settings

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

To restore the factory default settings

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



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

Upgrading the Frame Reference

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

4 Service and Maintenance

Summary

| | |
|---|----|
| <i>Changing the Power Supply</i> | 41 |
| <i>Replacing the Controller</i> | 42 |
| <i>Replacing the Frame Ventilation Fans</i> | 43 |
| <i>Cleaning and replacing the front-door air filter</i> | 44 |

Field-Serviceable Items

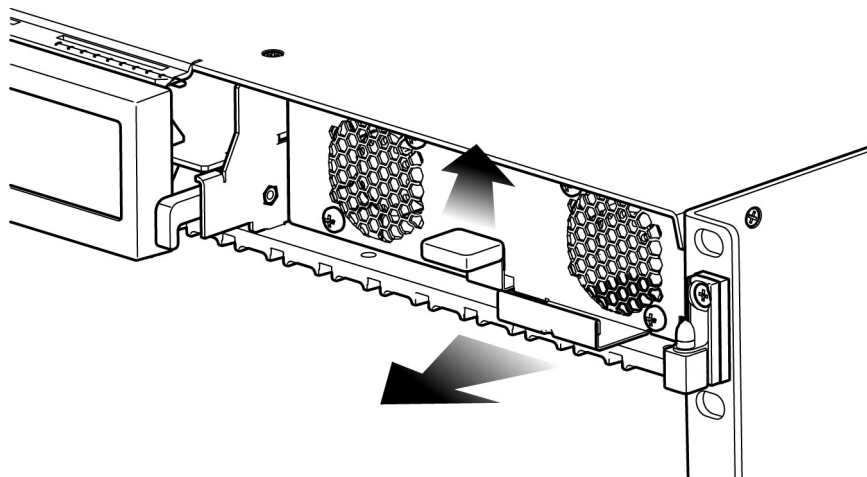
Field-serviceable items on the Densité 3+ FR4 frame itself include the power supplies, the controller card, the ventilation fan assemblies, and the front-door air filter.

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.



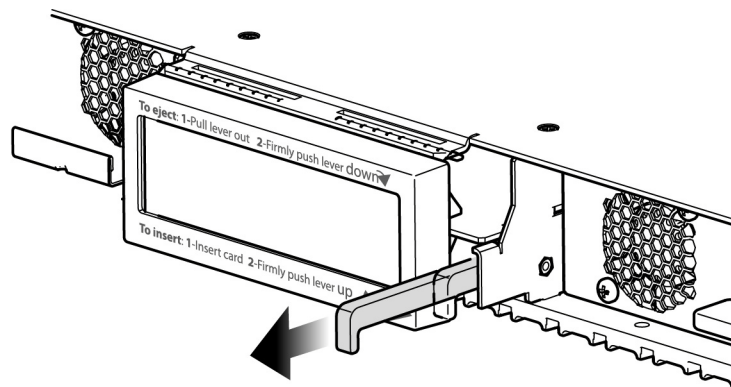
To install or change a power supply module:

- 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.

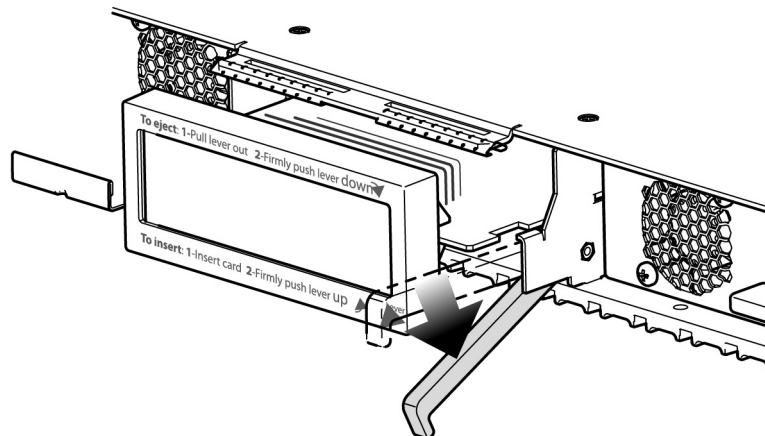
Replacing the Controller

The controller is located at the top center of the frame. To replace the controller, proceed as follows:

- 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.

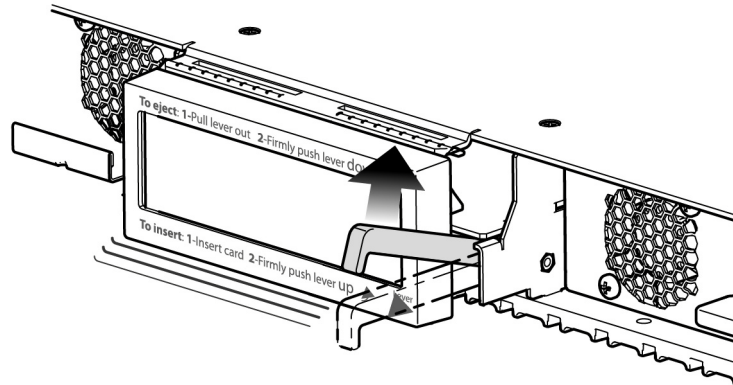


- 3 Push the lever firmly down to release the controller so that it can slide freely.



- 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.

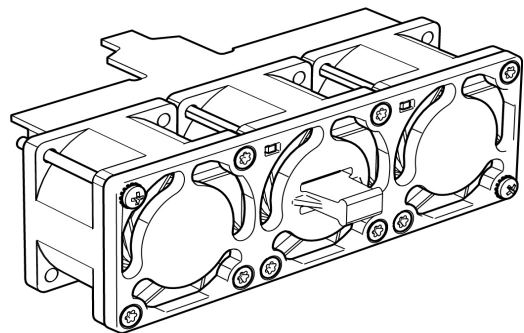


- 7 Close the front door of the frame

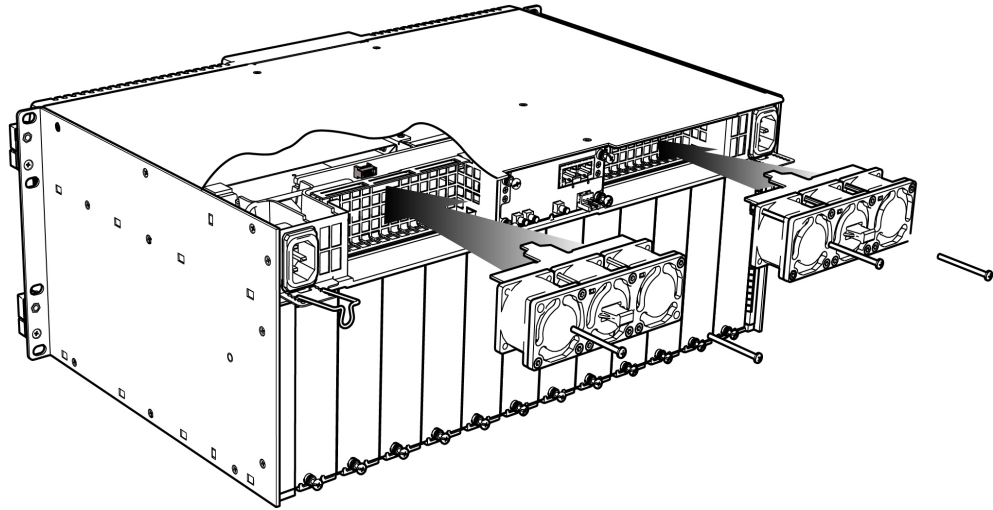
Replacing the Frame Ventilation Fans

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 through an air filter located in the front door of the frame.

- Check the filter 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 retaining 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

Service and Maintenance

Field-Serviceable Items



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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