UCP-3901

UNIFIED COMPUTE PROCESSOR FOR DENSITÉ

User Manual

13-03084-010-M00 AA

2020-07-08

FCC Compliance

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

Patent Information

This product may be protected by one or more patents.

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

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Warranty information is available from the Legal Terms and Conditions section of Grass Valley's website (www.grassvalley.com).

Title	UCP-3901 User Manual
Part Number	13-03084-010-M00 AA
Revision	2020-07-08, 14:28

Important Safety Information

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.
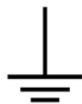
Identifies an external protective grounding terminal which may be connected to earth ground as a supplement to an internal grounding terminal.

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 Underwriters Laboratory (UL) regulations and recommendations for USA.

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 rated mains voltage.
- This product relies on the building's installation for short-circuit (over-current) protection. Ensure that a fuse or circuit breaker for the rated mains voltage 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.
- 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. Servicing should be done in a static-free environment.
- To reduce the risk of electric shock, plug each power supply cord into separate branch circuits employing separate service grounds.

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

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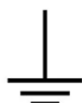
Identifie une borne de mise à la terre externe qui peut être connectée en tant que borne de mise à la terre supplémentaire.

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 UL 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 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.
- Pour réduire le risque de choc électrique, branchez chaque cordon d'alimentation dans des circuits de dérivation distincts utilisant des zones de service distinctes.

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.

Environmental Information

European (CE) WEEE directive.

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

Visit www.grassvalley.com for recycling information.

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

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

Laser Safety - Fiber Output SFP and QSFP Modules Warning

LASER SAFETY

CLASS 1
LASER PRODUCT

The average optical output power does not exceed 0 dBm (1mW) under normal operating conditions. Unused optical outputs should be covered to prevent direct exposure to the laser beam.

Even though the power of these lasers is low, the beam should be treated with caution and common sense because it is intense and concentrated. Laser radiation can cause irreversible and permanent damage of eyesight. Please read the following guidelines carefully:

- Make sure that a fiber is connected to the board's fiber outputs before power is applied. If a fiber cable (e.g. patchcord) is already connected to an output, make sure that the cable's other end is connected, too, before powering up the board.

- **Do not** look in the end of a fiber to see if light is coming out. The laser wavelengths being used are totally invisible to the human eye and can cause permanent damage. Always use optical instrumentation, such as an optical power meter, to verify light output.

Safety and EMC Standards

This equipment complies with the following standards:

Safety Standards

$C\epsilon$

Information Technology Equipment - Safety Part 1

EN60950-1: 2006

Safety of Information Technology Equipment Including Electrical Business Equipment.

UL1419 (4th Edition)

Standard for Safety – Professional Video and Audio equipment (UL file number E193966)

EMC Standards

This unit conforms to the following standards:

EN55032:2015 (Class A)

Electromagnetic Compatibility of multimedia equipment - Emission requirements

EN61000-3-2:2014 (Class A)

Electromagnetic Compatibility - Limits for harmonic current emissions

EN61000-3-3:2013

Electromagnetic Compatibility - Limits of voltage changes, voltage fluctuations and flicker

EN55103-2:2009 (Environment E2)

Electromagnetic Compatibility, Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 2. Immunity

> **WARNING**
> This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.

FCC / CFR 47:Part 15 (Class A)

Federal Communications Commission Rules Part 15, Subpart B

Caution to the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

EMC Performance of Cables and Connectors

Grass Valley products are designed to meet or exceed the requirements of the appropriate European EMC standards. In order to achieve this performance in real installations it is essential to use cables and connectors with good EMC characteristics.

All signal connections (including remote control connections) shall be made with screened cables terminated in connectors having a metal shell. The cable screen shall have a large-area contact with the metal shell.

SIGNAL/DATA PORTS

For unconnected signal/data ports on the unit, fit shielding covers. For example, fit EMI blanking covers to SFP+ type ports; and fit 75 Ω RF terminators to BNC type ports.

COAXIAL CABLES

Coaxial cables connections (particularly serial digital video connections) shall be made with high-quality double-screened coaxial cables such as Belden 8281 or BBC type PSF1/2M, Belden 1694A (for 3Gbps) and Belden 4794A (for 12Gbps).

Table of Contents

Introduction

The UCP-3901 provides a hardware platform which can offer different functionality depending on the software option loaded. These options are known as *Software-Defined Cores* (SDCs), and can be purchased through a licensing mechanism and loaded as operational needs demand.

UCP-3901 modules are also fully compatible with Grass Valley's broadcast-centric IP routing and network management solution, designed to migrate broadcasters from a traditional baseband routing and control environment to new Hybrid SDI and IP work-flows.

The UCP-3901 currently support the Essence Processing (EP) SDC.

Essence Processing (EP) SDC

For SDI to IP gateway type applications. See Essence Processing SDC for UCP-3901 Cards on page 35 for information on how to configure this option.

- SDI IP Encapsulation and De-encapsulation:
  - For 12G.
  - SMPTE ST 2022-6, ST 2022-7, AES67 & ST 2110-20/30/40.
- Frame synchronizer.
- Audio sample rate conversion, shuffling & delay.
- Audio embedding and de-embedding.

Related Documentation

The following related documentation is available. You can obtain the latest product documentation from the Documentation Library section of Grass Valley's website.

Document Number	Title
3084-2927-001 AA	UCP-3901 User Manual (this document)
3084-2928-001 AA	UCP-3901 Release Notes
-	RollCall V4 Suite & RollCall Lite Installation Guide
-	RollCall Control Panel User Manual
-	RollMechanic Operator's Manual

Block Diagram

UCP-3901 with Essence Processing SDC
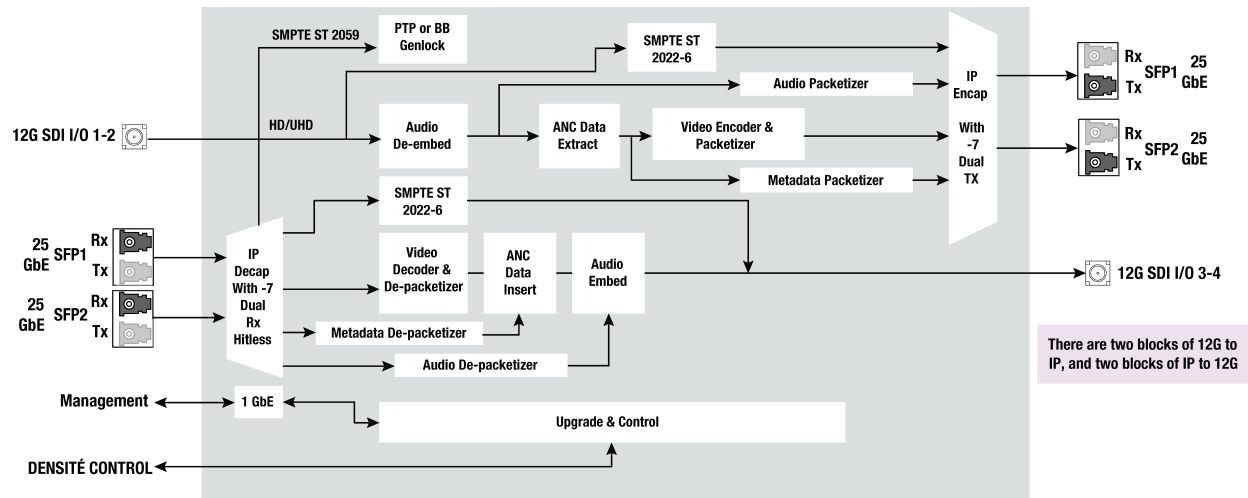
Figure 1 - 1: UCP-3901 Universal Compute Processor Functional Block Diagram

These are the features supported in the initial release and do not necessarily represent all hardware connectors available.

UCP-3901 Ordering Information

Order Code	Description
Cards:	
UCP-3901	Unified Compute Processor with a 25 GB/s network interface.
Rear Panels:	
UCP-3901-3+DRP	Double rear panel for Densité 3+ with HD-BNC. See Rear Panels and Connectors on page 25.

Available Upgrade Licenses

The following Software-Defined Core license is available.

Upgrade	Description
UCP-3901-25G-EP	Essence Processing Software-Defined Core license (for all cards).

See Installing a License into an UCP-3901 on page 110 to install a license.

Supported SFP28 Cartridges

One or two SFP28 cartridges are required (extra). These are shipped as a separate order.

Model	Description
SFP-ETH10G-RT-M85-LC	Short range optical 10GBase Ethernet SFP cartridge with LC/PC fiber connector: • <300m link with OM3 MMF. • <82m link with OM2 MMF. • <33m link with OM1 MMF. 850 nm multi-mode optical transceiver that supports signals up to 10.5 Gb/s for bidirectional serial data communications such as 10GBASE-SR and 10GBASE-SW.
SFP-ETH10G-RT-S13-LC	Long range optical 10GBase Ethernet SFP cartridge with LC/PC fiber connector (<10 000m): 1310 nm single mode optical transceiver that supports signals up to 10.5 Gb/s for bidirectional serial data communications such as 10GBASE-LR and 10GBASE-LW.
SFP-25-SR	Short range SFP28 25GBASE Optical Transceiver MMF cartridge (<300m).
SFP-25-LR	Long range SFP28 25GBASE Optical Transceiver SMF cartridge (<10 000m).

UCP-3901 Installation and Operation

Front Card-edge Interface

STATUS LEDs (left side)
SFP 4
SFP 3
SFP 2
SFP 1

Ident Button
Ejector Tab
STATUS LEDs

SDI IN 9 SDI IN 1
SDI IN 10 SDI IN 2
SDI IN 11 SDI IN 3
SDI IN 12 SDI IN 4
SDI IN 13 SDI IN 5
SDI IN 14 SDI IN 6
SDI IN 15 SDI IN 7
SDI IN 16 SDI IN 8
Densité LED

STATUS LEDs (right)
DIAG
BOARD
PTP
CPU
REF

SELECT Button
USB (unused)

UCP-3901 Left Side
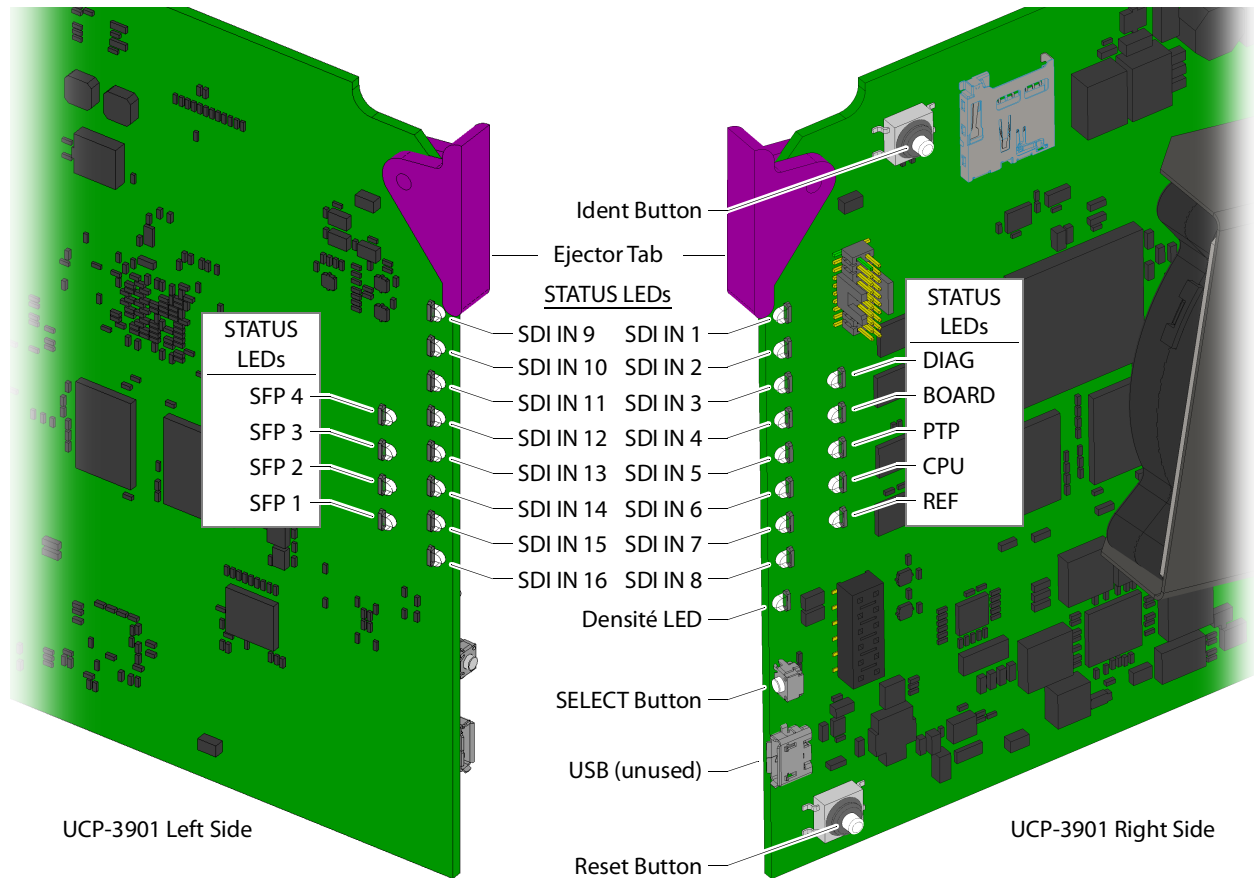UCP-3901 Right Side
Reset Button

Figure 2 - 1: Front card-edge layout

Status LEDs are located on the front card-edge of the UCP-3901. The **Densité LED** is visible through the front access door of the Densité frame. The remaining LEDs are unlit until the **SELECT** button is pressed. These multi-color LEDs indicate the status of the UCP-3901 by color, and by flashing/steady illumination.

Item	Description
Ident Button	Push to (1) make the card's SDI LEDs flash and to (2) activate the **Configuration** > **Location** > **Where Am I** checkbox in RollCall. This works bi-directionally between the card and the RollCall setting. See also Configuration, on page 40 for more information about the **Where Am I** checkbox.
Ejector Tab	Lift the bottom edge of the ejector tab to lever and remove the card out of the frame.
SDI IN 1 to SDI IN 16 status LEDs	As an input, this shows the following port status: • **Green:** Signal is detected. • **Yellow:** Test pattern generator has been activated. • **Red:** Signal loss. As an output, this shows the following port status: • **Green:** Valid flow is detected. • **Yellow:** Test pattern generator has been activated. • **Red:** Flow is not found or invalid. See also Spigot Pages, on page 68 and Logging - SDI Info, on page 75 for more information.
SFP 1 to SFP 4 status LEDs	Shows the SFP link status: • SFP 1 & 2: • **Blue:** Link OK (25G SFP). • **Blue flashing:** SFP detected, link down (fiber not connected, different FEC selection from host. • **Unlit:** SFP not detected. • SFP 3 & 4: Unused. See also Ethernet Pages 1 and 2, on page 50 and Logging - Network, on page 82 for more information.
DIAG status LED	Shows the following states: • **Green:** PTP-LOCK OK. • **Off:** PTP-LOCK Fail. See also Time Sync Configuration, on page 42 and Logging - System, on page 77 for more information.
BOARD status LED	Shows the following states: • **Green:** PTP-SYNC OK. PTP being used and clocks are within the accepted range. • **Off:** PTP-SYNC Fail. PTP being used but clocks haven't synchronized within +/- 1mS.
PTP status LED	Future use.
CPU status LED	Future use.
REF status LED	Shows the following state: • **Flashing Green:** Watchdog timer OK.

Item	Description
Densité status LED	Shows the following states: • **Red:** Card is powering up. If solid red, a hardware failure has been detected; call Technical Support. See Grass Valley Technical Support, on page 129. • **Orange:** Card is booting. • **Green:** Card has finished booting. Normal operation. • **Flashing Orange:** The card has been selected for local control using the Densité frame's control panel by having pressed the card's SELECT button. This returns Green when the card is no longer selected for local control.
SELECT Button	Press to select this card for local control using the Densité frame's control panel. Through the Densité frame's control panel, you can set the card's IP addresses of the Ethernet interfaces. See Local control using the Densité frame control panel to set the Card's IP Addresses, on page 27
USB Socket	Unused.
Reset Button	Performs a hardware reset of the card. Only use this feature during off hours as this will result in an outage until the card has returned to normal operation (Densité status LED becomes green).

For further information about how to troubleshoot an issue, see Troubleshooting, on page 119.

All alarms and operational statuses can also be seen from Rollcall Logging pages. These pages provide the live status of the card. Theses statuses are also logged when using a Log Server. See Logging Pages, on page 103.

Installation

Installation of Rear Connector Panels

Grass Valley Densité series cards are each associated with a rear connector panel, which must be installed in the Densité frame before the card can be inserted.

The UCP-3901 card is designed to fit into Grass Valley's Densité-3 or Densité-3+ frame. See UCP-3901 Ordering Information, on page 18 for details about the cards and rear panels that are available.

See Rear Panels and Connectors, on page 25 for details of the signal connections available on a rear panel.

All cards and rear panels can be installed with the frame power on. The card has connectors which plug into a mid-frame mother board for distribution of power and for connection to the controller card, and a second connector which plugs directly into the rear connector panel for input and output.

The rear connector panel must be installed with the card out of the frame.

- To remove an existing card from the slot, tilt up 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.
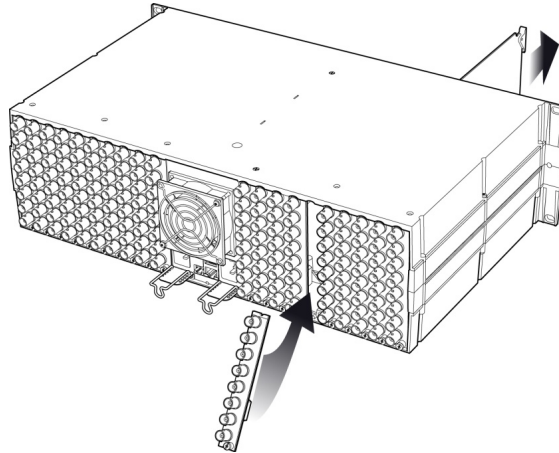

Figure 2 - 2: Densité-3 frame – rear panel installation

Step 1: To install the connector panel:

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

2 Remove the existing panel (either blank or belonging to an existing card that is being changed) by releasing the captive screw(s) at the bottom.

3 Position the new panel and secure it in place with the captive screw(s) at the bottom.

Step 2: To install the UCP-3901 Card:

Once a matching rear connector panel has been installed, install the UCP-3901 card as follows:

1 Open the front panel of the frame.

2 Slide the UCP-3901 card into the slot and push gently on the handle to seat the connectors.

When using a double-slot-width rear panel, the card should be inserted into the right-most of the two slots. 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.

3 Close the front panel of the frame.

Installation of the Optical Interface (option)

See Installing the SFP Ethernet Module, on page 125.

Rear Panels and Connectors

Images of Rear Panel Connectors

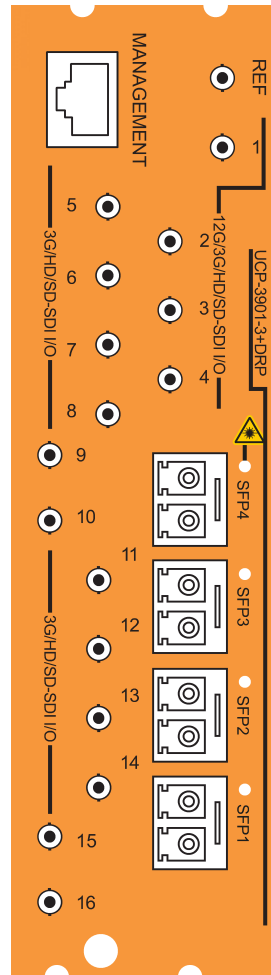The four available rear panels are shown in the figure below, and their various inputs and outputs are described.

Figure 2 - 3: UCP-3901 Rear Panel: UCP-3901-3+DRP

Details of rear panel connections

12G/3G/HD/SD-SDI I/O – Serial digital video inputs / outputs (4)

Connect a serial digital video signal to the BNC or HD-BNC labeled **12G/3G/HD/SD-SDI I/O 1** to **12G/3G/HD/SD-SDI I/O 4** conforming to the:

- SMPTE 2082-10 standard for a 12 G input signal.
- SMPTE 425-1 standard for a 3G input signal.
- SMPTE 292-1 standard for an HD input signal.
- SMPTE 425-5 standard for link #1 to #4 of a quad link 3G HD signals to transmit a 4K UHD signal. For a quad link configuration, see Link Control, on page 59.

In the card's configuration, **12G/3G/HD/SD-SDI I/O 1** to **12G/3G/HD/SD-SDI I/O 4** correspond to Spigots 1 to 4 (see Spigot Pages, on page 68).

3G / HD / SD SDI I/O – Serial digital video inputs / outputs (12)

Connect a serial digital video signal to the BNCs or HD-BNCs labeled **3G/HD/SD-SDI I/O 5** to **3G/HD/SD-SDI I/O 16** conforming to the:

- SMPTE 425-1 standard for a 3G input signal.
- SMPTE 292-1 standard for an HD input signal.
- SMPTE 425-5 standard for link #1 to #4 of a quad link 3G HD signals to transmit a 4K UHD signal. For a quad link configuration, see Link Control, on page 59.

In the card's configuration, **3G/HD/SD-SDI I/O 5** to **3G/HD/SD-SDI I/O 16** correspond to Spigots 5 to 16 (see Spigot Pages, on page 68).

REF – External Analog Reference

For genlock operation. This can be black burst or tri-level sync signal.

In the card's configuration, REF is related to the **Genlock** parameter (see Configuration, on page 40).

MANAGEMENT – GigE RJ-45 Ethernet

The management network is used:

- To configure the UCP-3901 card.
- By management systems to configure and control the UCP-3901 card, such as GV Orbit and RollCall.

This connection is not necessary when the UCP-3901 is used with Densité frames that are equipped with Densité 3+FR4 STD or Densité 3+ FR4 ADV frame controllers that are connected to the management IP network.

In the card's configuration, MANAGEMENT is related to the **Ethernet Gb** configuration page (see Ethernet Gb, on page 98).

SFP1 to SFP4 – Fiber-optic Ethernet input and outputs

These fiber optic interfaces consists of two parts:

- A socket on the rear panel into which an optional SFP interface module is plugged.
- An optional SFP (Small Form-factor Pluggable) module into which the optical fibers are plugged, and which incorporates the optical/electrical interface.

The optical fibers must be terminated in an LC connector.

SFP3 & SFP4 are for future use.

In the card's configuration, SFP1 to SFP4 are related to the **SFP Configuration** page (see SFP Configuration, on page 102).

See Installing the SFP Ethernet Module, on page 125 for instructions on installing and removing the SFP interface module, and for plugging and unplugging the LC-terminated fibers.

See Supported SFP28 Cartridges, on page 18 for the SFP modules supported by the UCP-3901.

User Interface

Control options

The UCP-3901 can be controlled in the following ways:

- The local control panel and its push-buttons can be used to move through a menu of parameters and to adjust parameter values (see section Local control using the Densité frame control panel to set the Card's IP Addresses, on page 27).
- Grass Valley's GV Orbit can be used to access the card's operating parameters from a remote computer, using a convenient graphical user interface (GUI). The initial setup can be made through RollCall; see Remote control using RollCall, on page 29.

Local control using the Densité frame control panel to set the Card's IP Addresses

Push the SELECT button on the UCP-3901 card edge (see Front Card-edge Interface, on page 21) to assign the local control panel to operate the UCP-3901.

- The STATUS LED on the UCP-3901 card edge flashes yellow.

Use the control panel buttons to navigate through the menu. The menu allows you to view and set the UPC-3901 card's current:

- **MANAGEMENT** Ethernet port IP address that you use in RollCall to connect to the card. See also Ethernet Gb, on page 98.
- **SFP1** and **SFP2** Ethernet port IP addresses that you use for media streams. See also Ethernet Pages 1 and 2, on page 50.
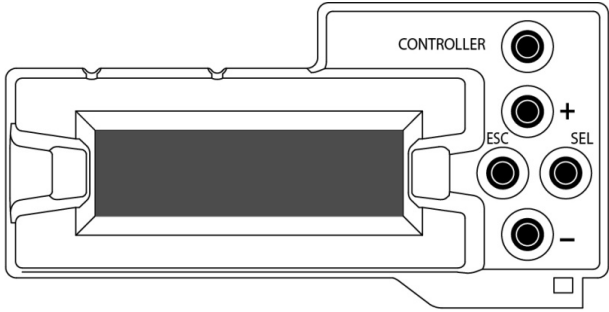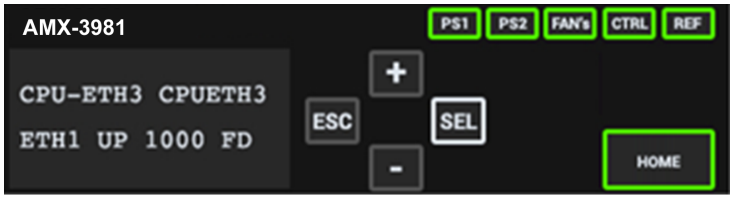
The Ethernet port configuration parameters are:

- The Ethernet port's current operating mode: DHCP or DISABLE.
- The Ethernet port's current IP Address: when mode is set to DISABLE, set the card's IP address.
- The Ethernet port's current subnet Mask: when mode is set to DISABLE, set the subnet mask for your network.
- The Ethernet port's current default Gateway: When mode is set to DISABLE, set the network switch's IP address.

The UCP-3901 card will reboot once you have changed a network parameter when:

- Densité local control is removed from the card or,
- You navigate back to the top level menu. You can change all network parameters in one shot (without the unit rebooting for every parameter change) by staying at a menu level lower than the top level menu (stay within the NETWORK SETTINGS menu level or lower) when changing the network settings.

Two versions of the local control panel exist:

Panel type	Frame models	Appearance
Physical	Densité-3, Densité-3+FR1	
Touch screen	Densité 3+FR4, GV Node	

The local control panel is fastened to the front of the controller card.

- The physical panel is accessed by opening the front door of the frame.
- The touch screen panel is accessed through an aperture in the frame door.

The panel incorporates a display capable of displaying two lines of text, each 16 characters in length, and four pushbuttons. The functionality of the pushbuttons is as follows:

[+] [–]	Used for menu navigation and value modification
[SELECT]	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. At the main menu, [ESC] does *not* exit the menu system. To exit, re-push the [SELECT] button for the card being controlled.

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

Remote control using RollCall

The operation of the UCP-3901 may be controlled using Grass Valley's RollCall.

- This manual describes the control panels associated with the UCP-3901 and their use.
- Please consult the RollCall User's Guide for information about setting up and operating RollCall.

In RollCall, double-click the UCP-3901 in the tree to open the configuration panel. See Essence Processing SDC for UCP-3901 Cards, on page 35.

Connections and Cabling

Cabling Diagrams

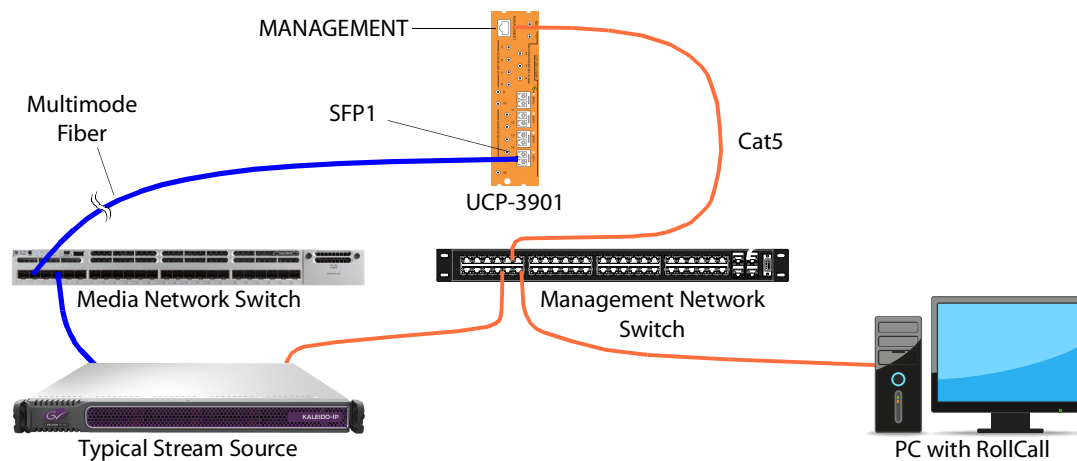The following figure shows the typical connections for an UCP-3901.

Fig. 3-1: Typical UCP-3901 network cabling

The MANAGEMENT connection is not necessary when the UCP-3901 is used with Densité frames that are equipped with Densité 3+FR4 STD or Densité 3+ FR4 ADV frame controllers that are connected to the management IP network.

Cabling to Support SMPTE ST 2022-7 with a UCP-3901

The UCP-3901 supports network redundancy, for use with any SMPTE ST 2022-7 compatible equipment.

To make streaming more reliable over an IP network, the implementation of SMPTE ST 2022-7 seamless protection switching depends on stream redundancy. This protection scheme transmits two identical packet streams over physically separate network routes (shown as Media Red LAN and Media Blue LAN in the figure below), so that if packets from one route are lost, the data can be reconstructed using packets from the second stream. This process is seamless because switching between the streams is instantaneous and does not impact content.

PREREQUISITES:

- At least two DCNM-compliant switches must be used for this application. Contact Grass Valley for more information about switch compatibility. See Grass Valley Technical Support, on page 106.
- For the UCP-3901, in both Rollcall's **Input Spigot** panel and **Output Spigot** panel, make sure to change the **Streaming** type to **Dual**. See Input Spigots, on page 69 and Output Spigots, on page 72.
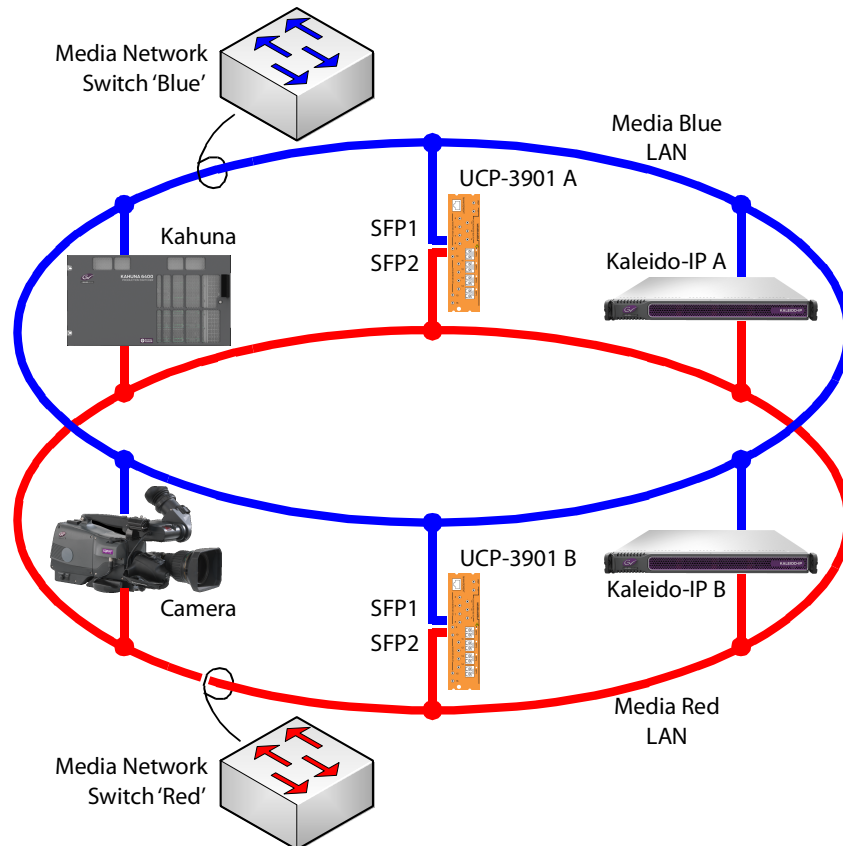

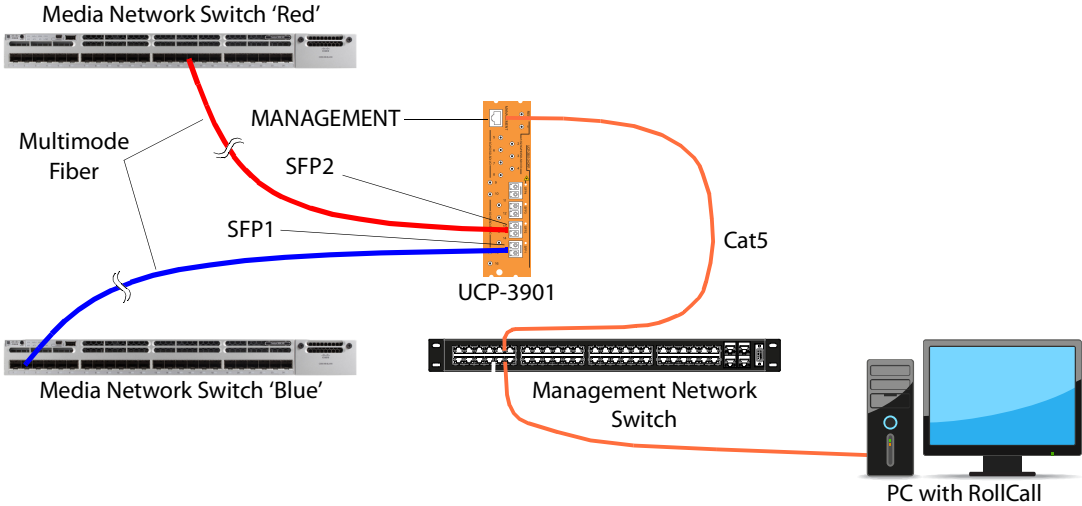*Fig. 3-2: Typical SMPTE ST 2022-7 UCP-3901 Network Overview*

The cabling connections are shown in greater detail below.

Media Network Switch 'Red'

MANAGEMENT

Multimode
Fiber

SFP2

SFP1

Cat5

UCP-3901

Media Network Switch 'Blue'

Management Network
Switch

PC with RollCall

Essence Processing SDC for UCP-3901 Cards

This section contains information on using an UCP-3901 card running the Essence Processing (EP) SDC, through RollCall.

For help with general use of the RollCall application, open the user manual by clicking the ![info] button on the main RollCall toolbar.

Feature Summary - UCP-3901 with Essence Processing SDC

General Features

- Supports configuration of Ethernet links for maximum signal transport using both SFPs, or, for dual link mode, to provide link redundancy as per SMPTE ST 2022-7. When operating as a receiver, the UCP-3901 will dynamically adapt to any stream presented to it.
- Supports unicast as well as IGMPv3 source-specific multicast, allowing point to point operation or transmission in multicast groups, and forward error correction. The UCP-3901 with 25Gb supports clause 74 (Base-R) and clause 108 (RS) FEC.
- Standards supported:
  - 3G-SDI to SMPTE 424M/425M level A compatible
  - HD-SDI to SMPTE292M/274M/296M
  - SD-SDI to SMPTE259M-C
  - 25GbE Ethernet to IEEE 802.3
- RollCall control and monitoring compatible with standard logging and reporting features.

Essence Processing Features

- Handles up to 16 SDI signals over dual 25GbE IP links (dependent on SDI signal format and compressed or uncompressed transport mode).
- Multiple transport types available for each SDI input including:
  - Compressed IP transport using VC2 low latency high quality encoding profile.
  - Uncompressed video transport using either VSF TR-03 and TR-04 RTP or SMPTE-2022-6 encapsulation.
  - PCM audio using TR-03 & AES67.
  - SMPTE-291M metadata support through IETF standard *RTP Payload for Ancillary Data*.
- Supports frame synchronized SDI inputs with audio rate adaption, referenced to IEEE-1588v2 (PTP) network timing (compliant with SMPTE-2059-2).

- Low delay mode and Independent H & V offset available for each channel, along with up to 2 frames of video delay, and up to 255ms of audio delay.

IP Address and Network Port Usage

Use the Densité frame's control panel to view and set the UCP-3901's current IP address that you use in RollCall to connect to it. See Local control using the Densité frame control panel to set the Card's IP Addresses on page 27.

Once you have connected to the card with RollCall, you can change the card's IP configuration through RollCall; see Ethernet Gb on page 98.

Certain ports must be open on the management network. This information can be found under **Port Usage** in the *RollCall V4 Suite & RollCall Lite Installation Guide*. See Related Documentation on page 17.

Installing RollCall

To install RollCall, see the *RollCall V4 Suite & RollCall Lite Installation Guide*. See Related Documentation on page 17.

For help with general use of the RollCall application, open the user manual by clicking the 🛈 button on the main RollCall toolbar.

Firmware Upgrade

The firmware in the UCP-3901 can be upgraded in the field. We strongly recommend to upgrade the UCP-3901 with the latest firmware for the latest feature and stability enhancements. See Upgrading the UCP-3901's SDC Application on page 105.

Terminology Used with RollCall

Term	Description
Essence	A general term used to describe an SDI component; video, audio and data are all essences.
Spigot	Generic term for a source or destination.
Flow	SMPTE ST-2022, 2110-20, 2110-30 and 2110-40 are all flow types. An SDI input can be used to create multiple IP flows.
Source	Originator of one or more flows, i.e. a set of one or more sender spigots.
Destination	Receiver of one or more flows, i.e. a set of one or more receiver spigots.

Navigating Pages in the RollCall Template

The RollCall template has a number of pages, each of which can be selected from the drop-down list at the top left of the display area. Right-clicking anywhere on the pages will also open a page view list, allowing quick access to any of the pages.

Pages List
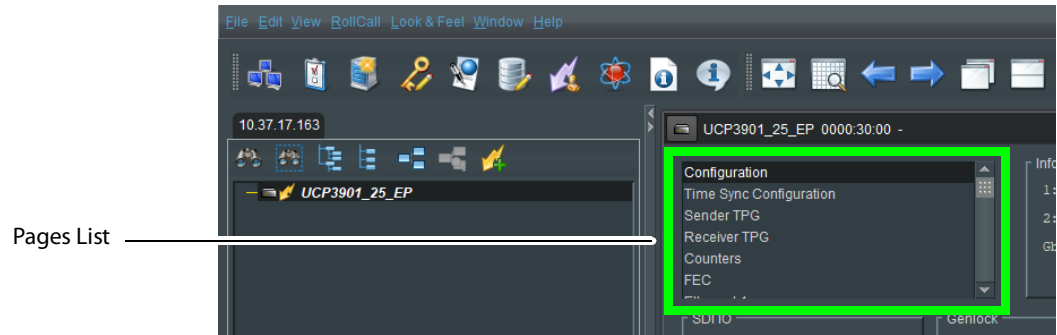
Template Pages

The following pages are available:

- Configuration on page 40.
- Time Sync Configuration on page 42.
- Sender TPG (Test Pattern Generator) on page 45.
- Receiver TPG (Test Pattern Generator) on page 46.
- Counters on page 47.
- FEC on page 48.
- Ethernet Pages 1 and 2 on page 50.
- Ethernet 1 and 2 RTP Sender on page 53.
- Ethernet 1 and 2 RTP Receiver on page 54.
- Ethernet RTP Receiver Video Stats on page 56.
- Ethernet RTP Receiver Audio Stats on page 57.
- Ethernet RTP Receiver Meta Stats on page 58.
- Link Control on page 59.
- HDR Control on page 62.
- Destination Timing on page 64.
- Audio V Fade on page 65.
- Audio Type Control on page 66.
- Input Loss Control on page 67.
- Spigot Pages on page 68.
- Input Spigots on page 69.
- Output Spigots on page 72.
- Logging - SDI Info on page 75.
- Logging - System on page 77.
- Logging - Network on page 82.

Setting Values

Many of the settings within the templates have values, either alpha or numeric.

When setting a value in a field, the value, whether text or a number, must be set by pressing the **Enter** key, or clicking the [S] **Save Value** button.

Clicking an associated [P] **Preset Value** button returns the value to the factory default setting.

Information Display

The **Information** display pane appears at the top of each page, and shows basic information on the input, standard and status of the card. The information to be displayed is defined on the **Video Selection** and **Information Select** panes to the right of the **Information** display.

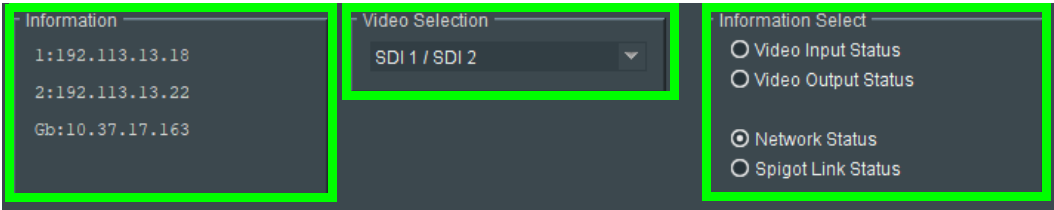*Figure 4 - 1:* Information and Selection Panes

Selecting the Information to Display

- Select the inputs to display data for from the **Video Selection** drop-down list.
- Select **Video Input Status**, **Video Output Status**, **Network Status**, or **Spigot Link Status** from the **Information Select** pane as required.

The selected information type will be displayed on the **Information** display pane.

Configuration

The **Configuration** page allows basic card parameters to be set.

Figure 4 - 2: *Configuration Page*

Note: SDC functionality options are also set here. See Upgrading the UCP-3901's SDC Application on page 105 and Installing a License into an UCP-3901 on page 110 for more information.

Parameter	Description
SDI IO	Displays how input and output spigots are currently configured. See *Card Firmware/Software Version*, below, for information on how to change this.
Where Am I	Causes the front-edge LEDs to flash, allowing the card to be easily identified.
Genlock	Select **Genlock** type: • **Network** - use the network's PTP clock. • **External Reference** - use the reference signal found at the **REF** connector on the card's rear panel. See Rear Panels and Connectors on page 25. • **Freerun** - card is using its own clock with no reference to any other source.
GUID	Displays the absolute unique identifier associated with the card.
Domain	RollCall+ uses domains to partition a network; only nodes on the same domain can communicate with one another. A domain is uniquely identified with a number and a friendly name/alias. Set an ID as required, then press **Take** to confirm the change.
Interface Configuration	Displays the IP address for each of the Ethernet interfaces.
Card Firmware / Software Version	Each software version contains multiple firmware images. These allow different spigot input/output and flow standard combinations to be selected. Select the required software from the **Software Version** pane, then select the firmware which provides the required combination of inputs, outputs and flow standards from the list displayed on the **Firmware** pane. **Note**: **Restore** and **Restart** buttons are displayed only when an item not currently installed is selected. Click **Take** to restart the card and implement any changes made. See Upgrading the UCP-3901's SDC Application on page 105 for how to change the SDC application.
Installed 25G / 50G Licensed Options	Shows the currently installed licensed card options. 50G is for future use. See See Installing a License into an UCP-3901 on page 110 for how to install a license.

Time Sync Configuration

The **Time Sync Configuration** page allows selection of the source to be used for synchronizing flows, and configuration of any properties associated with the relevant source.
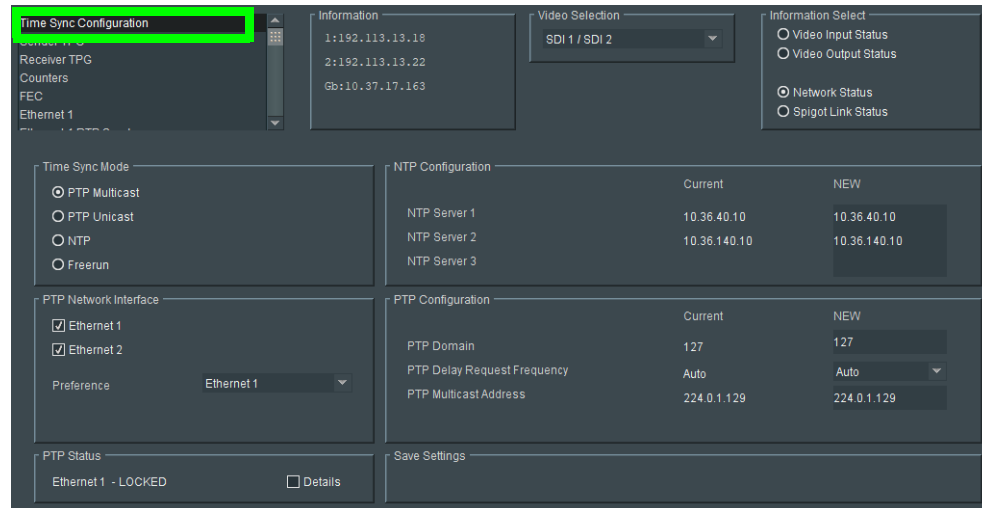
Figure 4 - 3: *Time Sync Configuration Page*

Parameter	Description
Time Sync Mode	Click a radio button to select the required mode. Note that the PTP options require a grandmaster clock to be present in the system.
NTP Configuration	To add an NTP server, enter the server's IP address in to the **New** field.
PTP Network Interface	Click check boxes to enable PTP reception on individual network interfaces. The **Preference** pulldown sets the primary interface to use. If the primary interface fails, the alternate interface (if enabled) will be switched to automatically.
PTP Configuration	Select values from the **PTP Domain** and **PTP Delay Request Frequency** drop-down lists, as required. Type the appropriate IP number into the **PTP Multicast** address field.
PTP Status	Shows the current network port used for the PTP connection and the connection status for that port: • **Free running:** Card is not being synchronized. • **No Lock:** PTP being used but clocks haven't synchronized within +/-1mS. • **Locked:** PTP being used and clocks are within the accepted range. • **NTP:** Card is using NTP to synchronize.

Parameter	Description
Details	Set the **Details** check box to display status information. See Interface Status Panel on page 43, Histogram Panel on page 43, and Visible Clocks Panel on page 44.
Save Settings	Displayed only if settings on this page are changed. • **Restore:** discards any configuration changes made. • **Restart:** implements the configuration changes and reboots the card.

Interface Status Panel

When **Details** has been set, the displays important system status information on a single convenient panel.
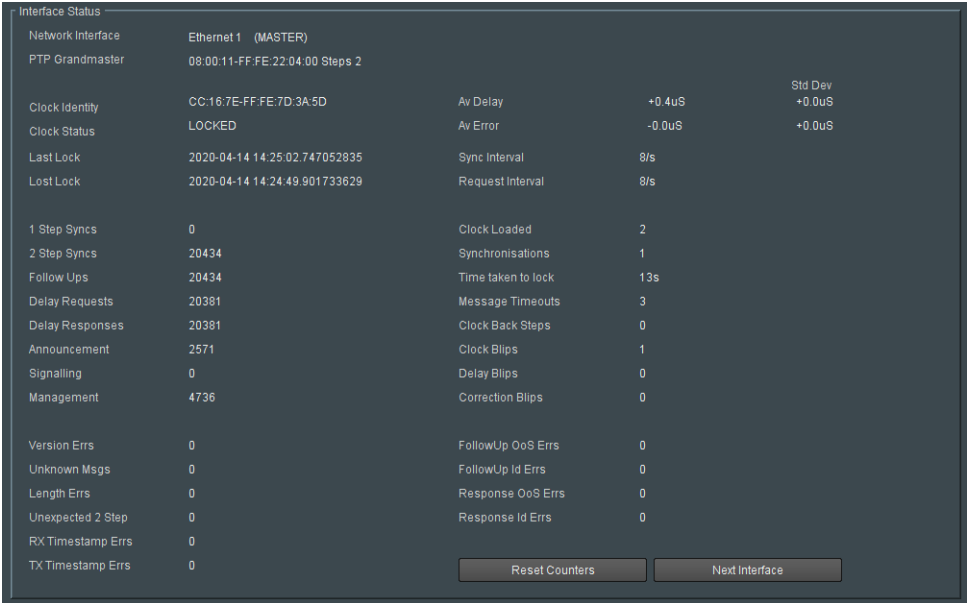
Figure 4 - 4: Time Sync Status

Histogram Panel

When **Details** has been set, the Histogram provides a graphical representation of the distribution of differences between the card's clock and the PTP grandmaster clock. Every time the clock difference is recalculated, the relevant bar is incremented. A correctly

functioning system will show a distinct peak around the 0ns level. The Histogram Panel is located to the below the **Status** panel.
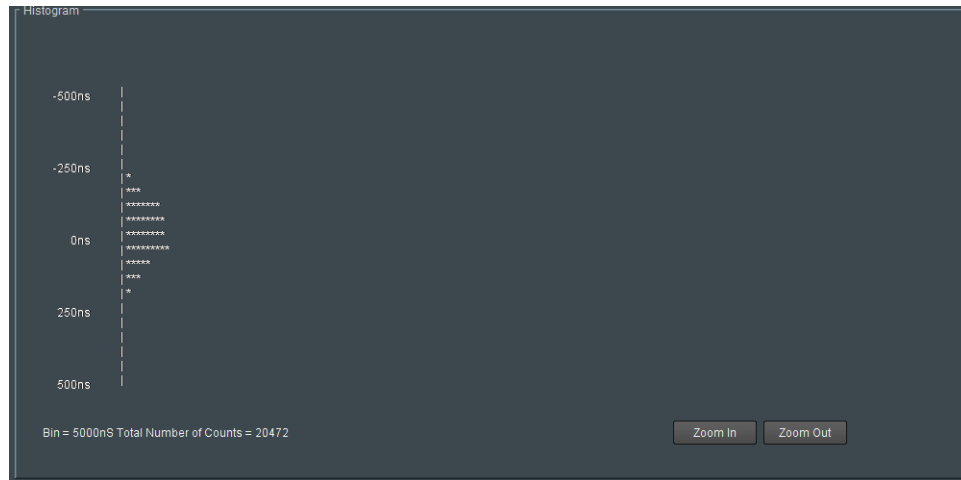
Figure 4 - 5: *Time Sync Status Information - Histogram*

Visible Clocks Panel

Located to the below the **Histogram** panel, this shows a list of available network clocks and the operational parameters for each clock.

Sender TPG (Test Pattern Generator)

The Sender TPG page allows test patterns to be applied to senders on a spigot-by-spigot basis.
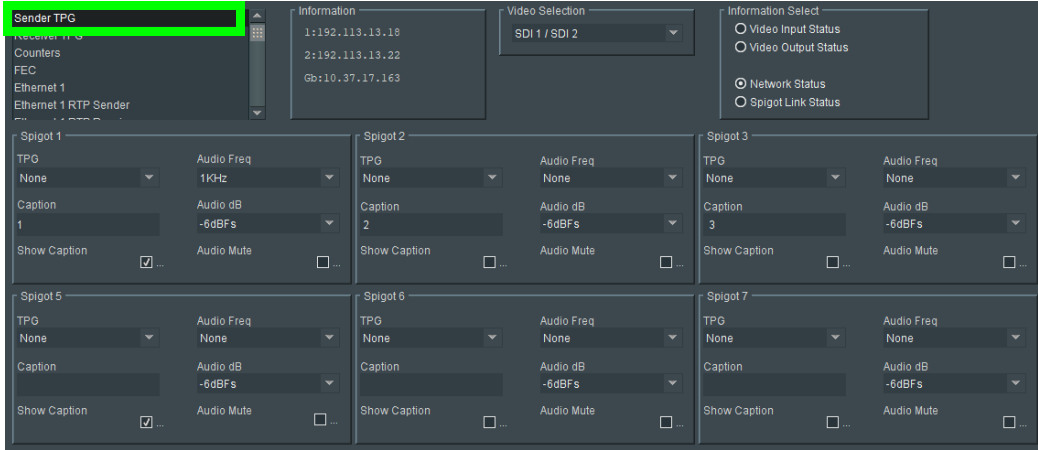
Figure 4 - 6: *Sender TPG Page*

The following options are available for each spigot:

Parameter	Description
TPG	Select the test pattern to apply to the spigot from the drop-down list.
Audio Freq	Select the audio frequency to apply to the spigot from the drop-down list.
Caption	Type a caption (max 19 characters) to optionally be displayed with the test pattern.
Audio dB	Select the dB level to apply to the spigot from the drop-down list.
Show Caption	Set to enable the overlay the caption on the test pattern.
Audio Mute	Set to mute the audio tone.

If a test pattern is applied, either a pattern or a tone, the spigot cannot be used for streaming any other essence.

Receiver TPG (Test Pattern Generator)

The Receiver TPG page allows test patterns to be applied to receivers on a spigot-by-spigot basis.
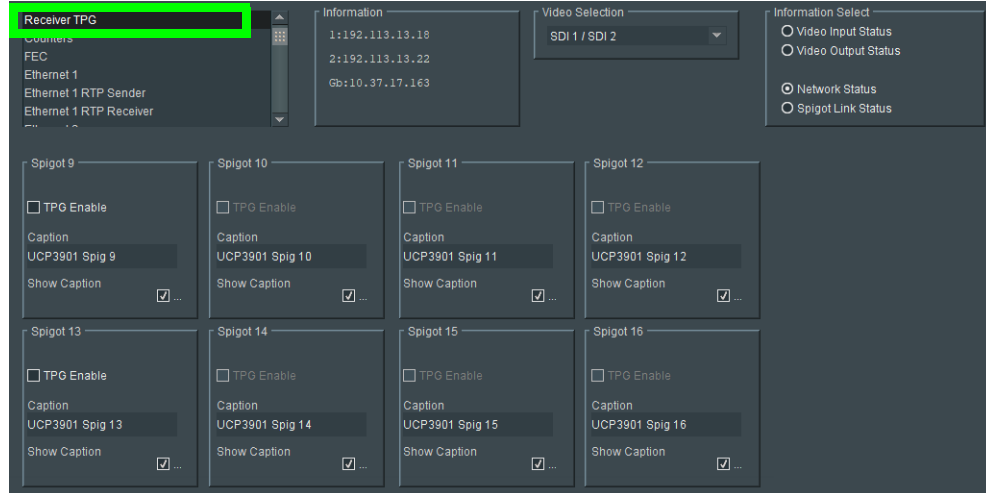
Figure 4 - 7: *Receiver TPG Page*

The following options are available for each spigot:

Parameter	Description
TPG Enable	Set to enable TPG on this spigot.
Caption	Enter a caption for the spigot (optional).
Show Caption	Set to overlay the caption on the video essence.

If a test pattern is applied, the spigot cannot be used for streaming any other essence.

Counters

The **Counters** page allows the various counters provided to be cleared down.
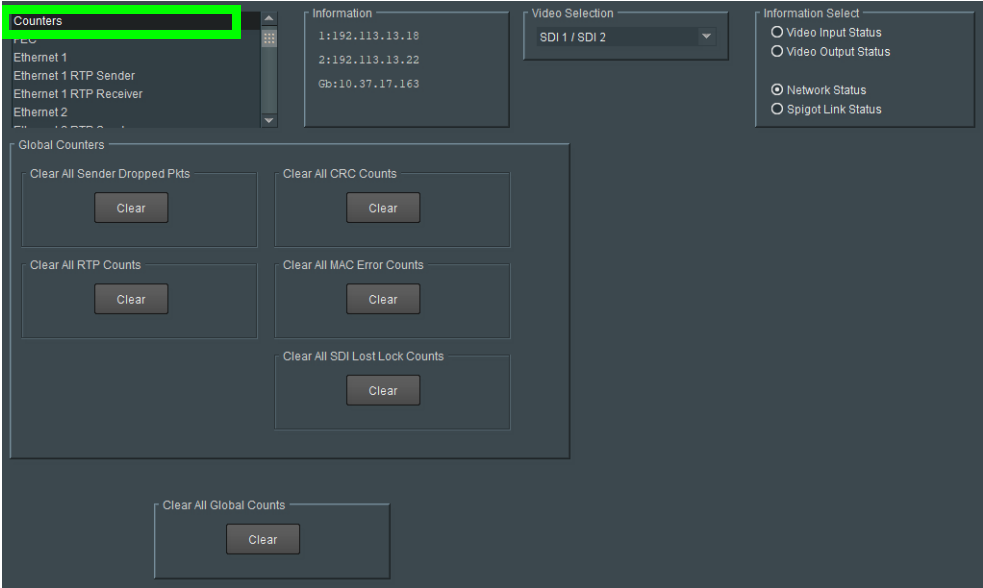
Figure 4 - 8: *Counters Page*

Click **Clear** buttons as required.

FEC

The FEC page allows control of FEC Clause 74 and Clause 108 functionality. The variety of FEC to be used is selected through the Card Firmware/Software Version options on the Configuration page; see Configuration on page 40 for more information.
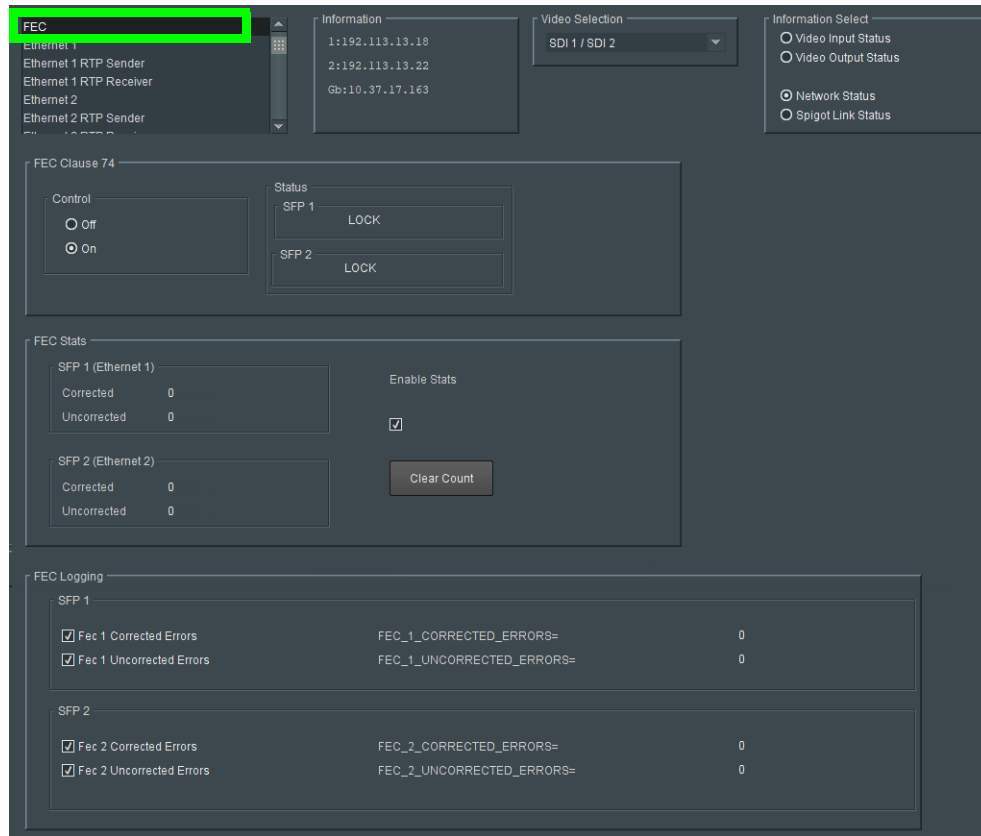
Figure 4 - 9: *FEC Page*

Parameter	Description
FEC Clause 74	Allows low-latency FEC Clause 74 error correction to be used. Options are: • **On** • **Off**
Status	Displays lock status for each SFP.

Parameter	Description
FEC Stats	When **Enable Stats** is set, this displays the number of corrected and uncorrected errors received through the SFPs. Click **Clear Count** to zero the counters.
FEC Logging	Information on several parameters can be made available to a logging device connected to the RollCall network. Individually set the log fields to activate logging as required. **Fec *N* Corrected Errors:** Number of corrected errors for FEC *N*. **Fec *N* Uncorrected Errors:** Number of uncorrected errors for FEC *N*. The available log fields are shown in the table below.

Log Field	Description
FEC_*N*_CORRECTED_ERRORS=	Number of corrected errors for FEC *N*.
FEC_*N*_UNCORRECTED_ERRORS=	Number of uncorrected errors for FEC *N*.

Where N is the SFP number. To identify SFP 1 / 2, see Rear Panels and Connectors *on page 25.*

Ethernet Pages 1 and 2

Ethernet 1 and **Ethernet 2** are the card's high speed media ports. **Ethernet 1** is identified as **SFP1** and **Ethernet 2** is identified as **SFP2** on the card's rear panel. See Rear Panels and Connectors on page 25.

The **Ethernet** pages show details and status for each of the card's high speed media network interfaces. The UCP-3901 defaults to use of DHCP, but this can be overridden and a static IP address defined if required.

The Ethernet configuration for these ports can also be set through the frame's control panel. This is useful when the card is first installed in the frame, to make it quickly operational. See Local control using the Densité frame control panel to set the Card's IP Addresses on page 27.

See Ethernet Gb on page 98 for information on the **MANAGEMENT** Ethernet connector.

Figure 4 - 10: Ethernet 1 Page

Parameter	Description
Ethernet Pane	The Ethernet pane displays details of the currently selected network interface, and allows a static IP address to be defined. **Rear - SFP 1 / 2:** See Rear Panels and Connectors on page 25. **IP Address:** When Mode is set to Static, set the card's IP address. **Default Gateway:** When Mode is set to Static, set the network switch's IP address. **Subnet Mask:** When Mode is set to Static, set the subnet mask for your network. Enter information as required, then click ⬛S to save. New settings are applied when **Restart** is clicked.
New Mode	Set the Ethernet port's connection mode. **DHCP:** The Ethernet port uses automatic configuration obtained from the network's DHCP server. **Static:** The Ethernet port uses a user-specified configuration (**IP Address**, **Default Gateway**, and **Subnet Mask**).
Restart	Click when the New Mode setting is changed for this to take effect. Only make this change during off hours as this can take up to 30 seconds to complete.
MAC Address	Shows the Ethernet port's MAC Address.
Mode	Shows the Ethernet port's current operating mode (**DHCP** or **Static**). See **New Mode** to set the operating mode.
Link Status	Shows the Ethernet port's connections status with the network switch. **UP:** Connection successful **DOWN:** Connection failed
SFP Status	Shows the health status for the SFP cartridge. **OK:** SFP cartridge detected and operational. **NONE:** SFP cartridge unavailable.
SFP Fitted	Shows if an SFP cartridge is present in the rear panel. **OK:** SFP cartridge detected. **NONE:** SFP cartridge unavailable.
Location: Where am I?	When set, the Where Am I function causes the SFP LEDs for the relevant Ethernet connector to flash.
Clear Link Change Count	If the state of the Ethernet link changes, the Link Change Count and Link Change Time fields are updated. Click Clear Link Change Count to reset the Link Change Count to zero.
Switch LLDP Info	Shows the switch's Link Layer Discovery Protocol information received from the switch that the UCP-3901 is connected to.

Parameter	Description
All Traffic	Shows the Ethernet port's bandwidth **Capacity**, current data rate (**Actual** / **Used %**), and the remaining available (**Free**). Click **Enable Stats** to activate.
CPU Traffic	Shows information about traffic going through the card. Click **Enable Stats** to activate.

Ethernet 1 and 2 RTP Sender

The **RTP Sender** page displays the amount of data transmitted, on a spigot-by-spigot basis. Units are megabits per second.
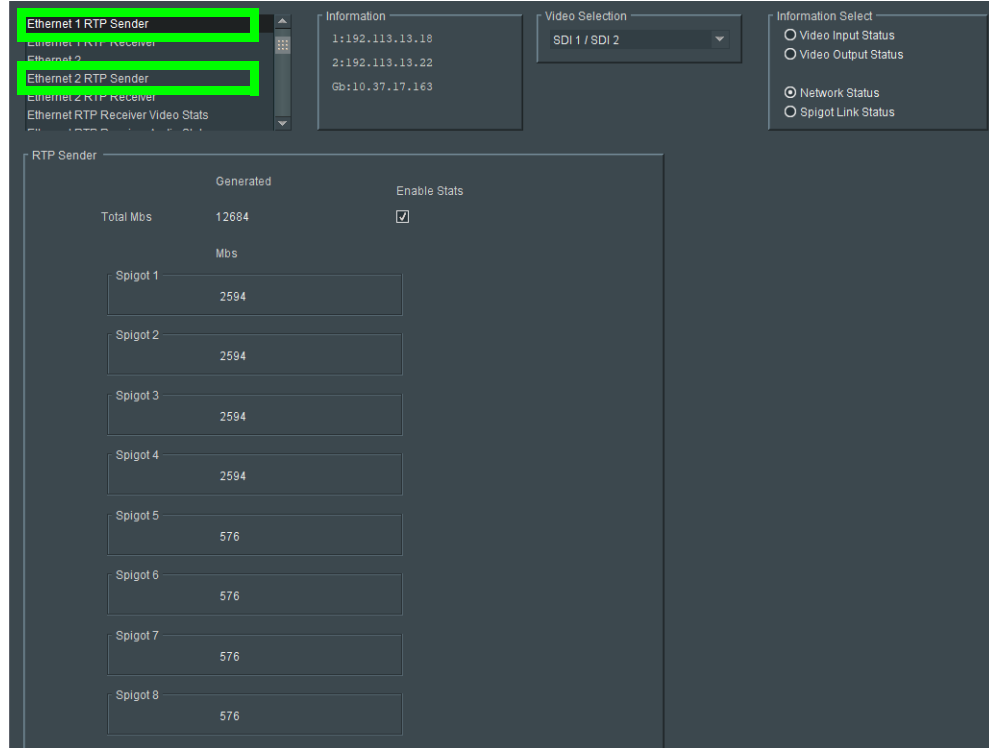
Figure 4 - 11: *Ethernet 1 & 2 RTP Sender Page*

Parameter	Description
Enable Stats	Set to display the amount of data transmitted.

Ethernet 1 and 2 RTP Receiver

The **RTP Receiver** pages display the amount of data received, plus details of packet loss, on a spigot-by-spigot basis. Units are megabits per second.

Click **Enable Stats** to display values; click **Clear RTP Count** or **Clear Error Count** to zero RTP Sequence Discontinuity or Error counters.
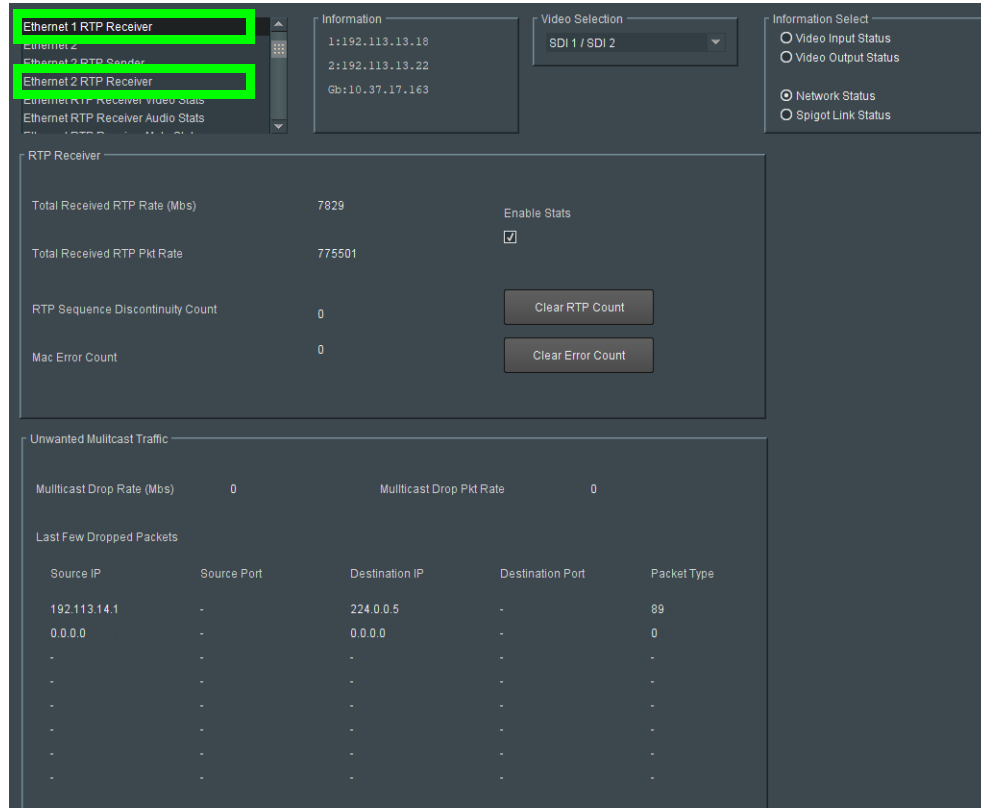
Figure 4 - 12: *Ethernet 1 & 2 RTP Receiver Page*

Parameter	Description
Enable Stats	Set to display the amount of data received.
Clear RTP Count	Click to zero RTP Sequence Discontinuity counters.
Clear Error Count	Click to zero Error counters.

Parameter	Description
Unwanted Multicast Traffic pane	This pane measures of the unexpected multicast packets the card has received. This is an indication that the card is receiving flows that are not configured properly and have been effectively thrown away, thereby wasting network bandwidth.
	For example, say another card's media interfaces were misconfigured by setting them to be within the same vlan (for example, A=172.19.164.21, B=172.19.164.22) but they were supposed to be in separate vlans (or example, A=172.19.164.21, B=172.19.166.22). GV Orbit / RollCall assigns a source address for a flow based on the media interface address and if you tried to route a source from such a misconfigured card, the destination card then complains that the source being on 164 instead of 166. If you see unexpected mutlicast traffic, you need to identify and resolve the offending source flows.
Multicast Drop Rate	The wasted network bandwidth due to dropped multicast packets. See above for more information.
Multicast Drop Pkt Rate	The rate of dropped multicast packets. See above for more information.
Last Few Dropped Packets	Use the information in this table to troubleshoot source flows that result in unwanted multicast traffic.

Ethernet RTP Receiver Video Stats

The **Ethernet RTP Receiver Video Stats** page displays information on the data received through RTP on each Ethernet input. Units are megabits per second.
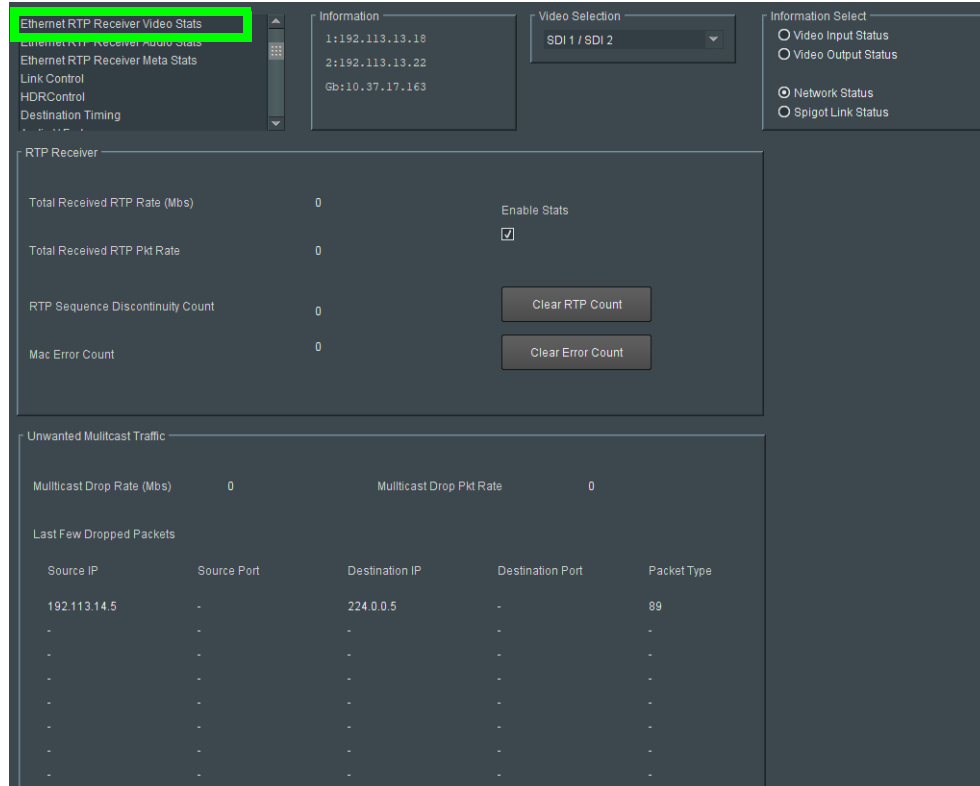
Figure 4 - 13: *Ethernet RTP Receiver Video Stats Page*

Parameter	Description
Enable Stats	Set to display values
Clear All RTP Count	Click to zero RTP Discontinuity counters for each Ethernet input.

Ethernet RTP Receiver Audio Stats

The **Ethernet RTP Receiver Audio Stats** page displays information on the data received through RTP on each Ethernet input. Units are megabits per second.
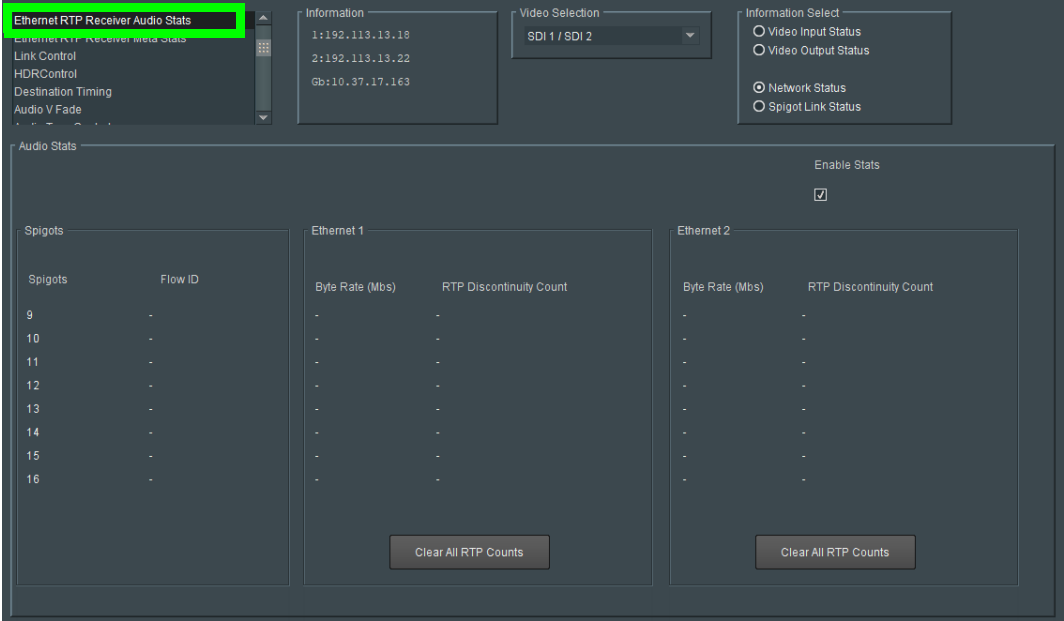
Figure 4 - 14: Ethernet RTP Receiver Audio Stats Page

Parameter	Description
Enable Stats	Set to display values
Clear All RTP Count	Click to zero RTP Discontinuity counters for each Ethernet input.

Ethernet RTP Receiver Meta Stats

The **Ethernet RTP Receiver Meta Stats** page displays information on the metadata received through RTP on each Ethernet input. Units are megabits per second.
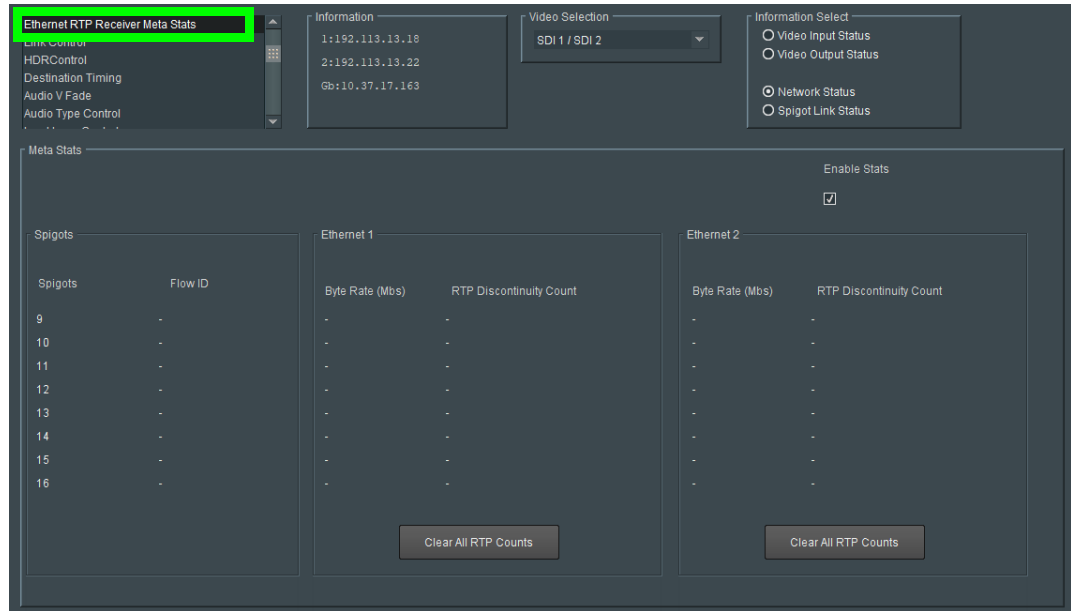
Figure 4 - 15: *Ethernet RTP Receiver Meta Stats Page*

Parameter	Description
Enable Stats	Set to display values
Clear All RTP Count	Click to zero RTP Discontinuity counters for each Ethernet input.

Link Control

The **Link Control** page allows UHD spigots to be configured. Input/output can be through single or quad link. See Configuration on page 40 for information on selecting the required input/output configuration.
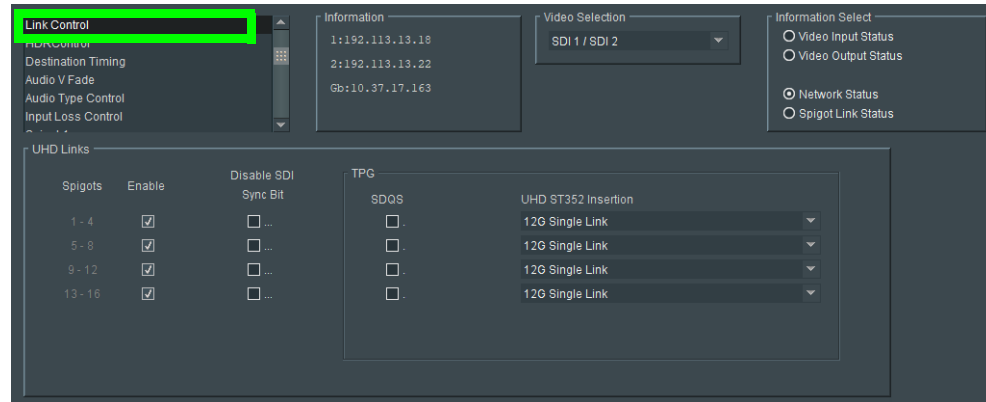
Figure 4 - 16: *Link Control Page*

Parameter	Description
Spigots	When Enable is set, this show the 4 spigots that are to be used for the quad link signals. These spigots must be configured for HD signals. See Input Spigots on page 69 and Output Spigots on page 72. On the rear panel: • Spigots 1 to 4 correspond with **12G/3G/HD/SD-SDI I/O 1** to **12G/3G/HD/SD-SDI I/O 4**. • Spigots 5 to 8 correspond with **3G/HD/SD-SDI I/O 5** to **3G/HD/SD-SDI I/O 8**. • Spigots 9 to 12 correspond with **3G/HD/SD-SDI I/O 9** to **3G/HD/SD-SDI I/O 12**. • Spigots 13 to 16 correspond with **3G/HD/SD-SDI I/O 13** to **3G/HD/SD-SDI I/O 16**. See Rear Panels and Connectors on page 25.
Enable	Enable the spigots to be used for UHD Quad Links as required. Note that these controls are not available when using 12G.
Disable SDI Sync Bit	Some older SDI receiving equipment may not support sync bit insertion. When transmitting signals to these devices, sync bit insertion can be disabled by checking the boxes as required.

Parameter	Description
TPG / SDQS	Set the quad link mode: • Deselect the **SDQS** check boxes as required to use two-sample Interleave (2SI). See Configuring the Streams for use with 4K UHD Two-Sample Interleave Division on page 60. • Set the **SDQS** check boxes as required to use Square Division signals. See Configuring the Streams for use with 4K UHD SQD on page 61.
TPG / UHD ST352 Insertion	Set the ST352 ancillary data type according to how the TPG data is to be output. • For no ancillary data, select **None** from the drop-down list. • For ST425 output over quad links, select **12G Quad Link** from the drop-down list. • For ST2082-10 output over a single link, select **12G Single Link** from the drop-down list. See *SMPTE 2082: 12G-SDI Bit-Serial Interfaces*, *SMPTE 425: Bit-Serial Interfaces at 3 Gb/s* and *SMPTE 352: Payload Identification Codes For Serial Digital Interfaces* for further information.

Configuring the Streams for use with 4K UHD Two-Sample Interleave Division

To support 4K streams, the image is mapped onto four HD sub-images using a Two-Sample Interleave division (2SI), as defined by SMPTE ST 424-5. This means each of the four sub-stream carries a quarter-resolution picture. These four sub-streams must be logically linked together so that they are switched together at once ensuring that there is no switching delay between the four streams that would create visible glitches.

The following shows the typical video stream composition of a two-sample interleave division display.

1: SMPTE ST 424-5 Link 1 pixels
2: SMPTE ST 424-5 Link 2 pixels
3: SMPTE ST 424-5 Link 3 pixels
4: SMPTE ST 424-5 Link 4 pixels
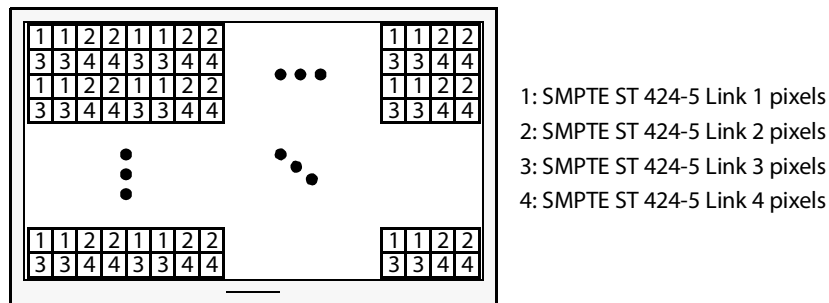
4K UHD Composite Image

To configure a 4K UHD Two-Sample Interleave Division input or output

1 Open the **Link Control** page. See Link Control on page 59.

2 Set **Enable** for the four spigots on which a quad link signal will be used (Spigots 1 to 4, Spigots 5 to 8, Spigots 9 to 12, and Spigots 13 to 16).

3 Deselect the **SDQS** check boxes to use two-sample Interleave (2SI).

4   Configure each of the four UCP-3901 spigots that are to receive / send the four HD sub-images. These links are assigned in groups of 4 as shown by the **Spigots** parameter. For example Spigots 1 to 4, Spigots 5 to 8, Spigots 9 to 12, and Spigots 13 to 16.

5   Connect the quad link signals to the rear panel. See Rear Panels and Connectors on page 25.

Configuring the Streams for use with 4K UHD SQD

To support 4K streams, a quad-link (square division) configuration can be used. That is, the 4K image is divided into four HD quadrants, and each quadrant is sent as four separate streams. These four streams must be logically linked together so that they are switched together at once ensuring that there is no switching delay between the four streams that would create visible glitches between the four quadrants.

The following shows the typical video stream composition of a 4K quad-link display.

| Quadrant 1, Link 1 | Quadrant 2, Link 2 |
| Quadrant 3, Link 3 | Quadrant 4, Link 4 |
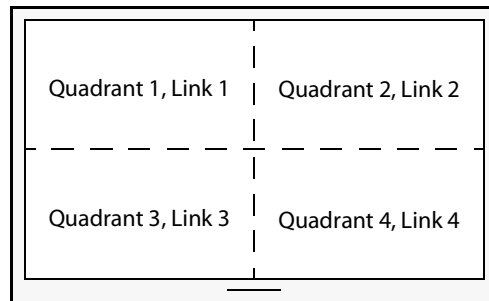
4K UHD Composite Image

PREREQUISITES:

• Configure each of the four UCP-3901 spigots that are to receive / send the four quad-link images. These links are assigned in groups of 4 as shown by the **Spigots** parameter. For example Spigots 1 to 4, Spigots 5 to 8, Spigots 9 to 12, and Spigots 13 to 16.

To configure a 4K UHD Quad Link Square Division input or output

1   Open the **Link Control** page. See Link Control on page 59.

2   Set **Enable** for the four spigots on which a quad link signal will be used (Spigots 1 to 4, Spigots 5 to 8, Spigots 9 to 12, and Spigots 13 to 16).

3   Set the **SDQS** check box to use Square Division signals.

4   Configure each of the four UCP-3901 spigots that are to receive / send the four quad-link images. These links are assigned in groups of 4 as shown by the **Spigots** parameter. For example Spigots 1 to 4, Spigots 5 to 8, Spigots 9 to 12, and Spigots 13 to 16.

5   Connect the quad link signals to the rear panel. See Rear Panels and Connectors on page 25.

HDR Control

The **HDR Control** page allows HDR essences to be configured.

Figure 4 - 17: *HDR Control Pages*

Parameter	Description
Transfer Function	**SDR:** the HD input video signal meets the Rec. 709 standard. **HDR-HLG:** the Hybrid Log-Gamma input video signal meets the BT.2100 standard. **HDR-PQ:** the Perceptual Quantizer input video signal meets the SMPTE ST 2084 standard.
Colorimetry	**BT709:** the input video signal's color gamut meets the Rec. 709 standard. **BT2020:** the input video signal's color gamut meets the Rec. 2020 standard.
Color Space	**YCbCr:** the input video signal's color space uses the YCbCr color model. **ICtCp:** the input video signal's color space uses the ICtCp color model.
Bit depth	**10-bit Full Range:** 0 to 1023 image mapping range according to SMPTE RP. 2077. This is also called *computer RGB*. **10-bit (narrow range):** the standard 64 to 940 image mapping range. This is also called *studio RGB*.
Take	Click to apply new setting. The HDR parameters can be set for receiver spigots only. Sender spigots show the current stream's status.

Destination Timing

The **Destination Timing** page allows genlock timing on each receiver spigot to be adjusted, in order to synchronize the IP signal with the house reference.
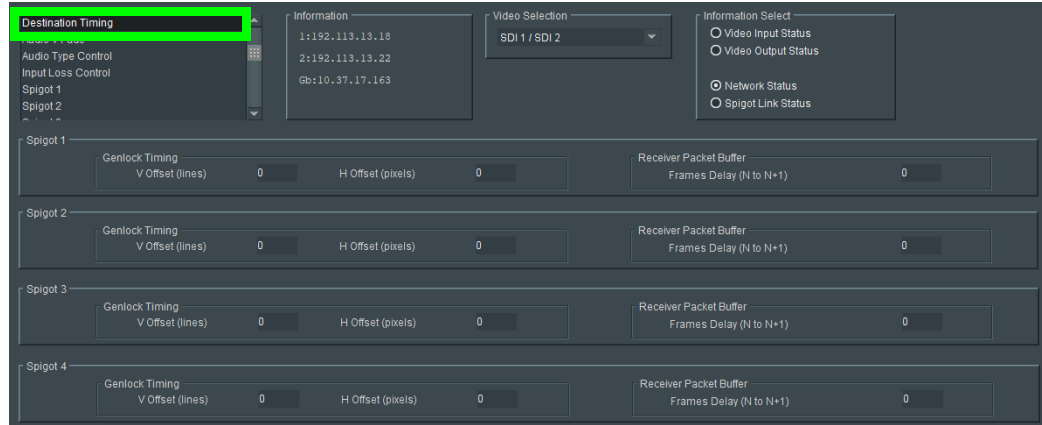
Figure 4 - 18: *Destination Timing Page*

Parameter	Description
Genlock Timing V Offset	Vertical timing offset in lines.
Genlock Timing H Offset	Horizontal timing offset in pixels.
Receiver Packet Buffer Frames Delay	The receiver packet buffer provides additional buffering for a received IP flow. Typically this is required where the IP flow is bursty in nature. However, increasing buffering can affect the time required to switch between IP flows at a spigot, owing to increased switching latency. Adjust as required.

Audio V Fade

This page allows audio fading to be applied on a spigot-by-spigot basis for receivers, in order to minimize audio disruption. When applied, the audio will fade down on input loss and perform an audio V fade (down then up) during input switching.
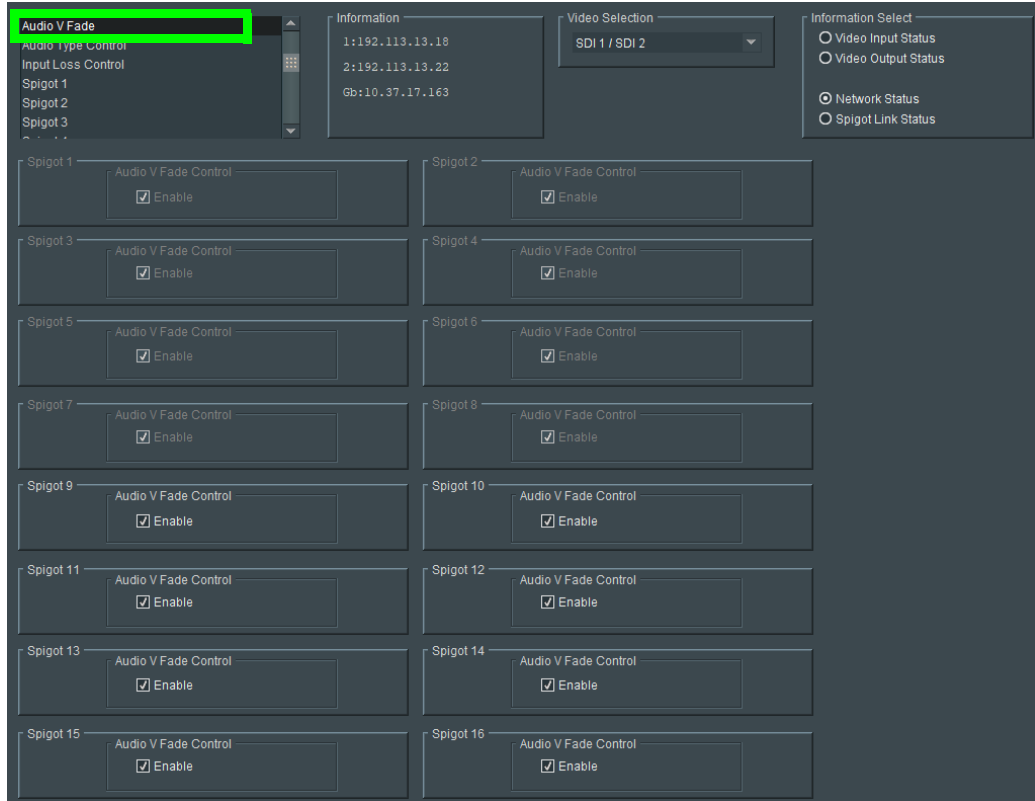
Figure 4 - 19: Audio V Fade Page

Audio Type Control

The **Audio Type Control** page allows you to override the audio type bit within the outgoing SDI to mark it non-PCM. Set the check boxes as required.
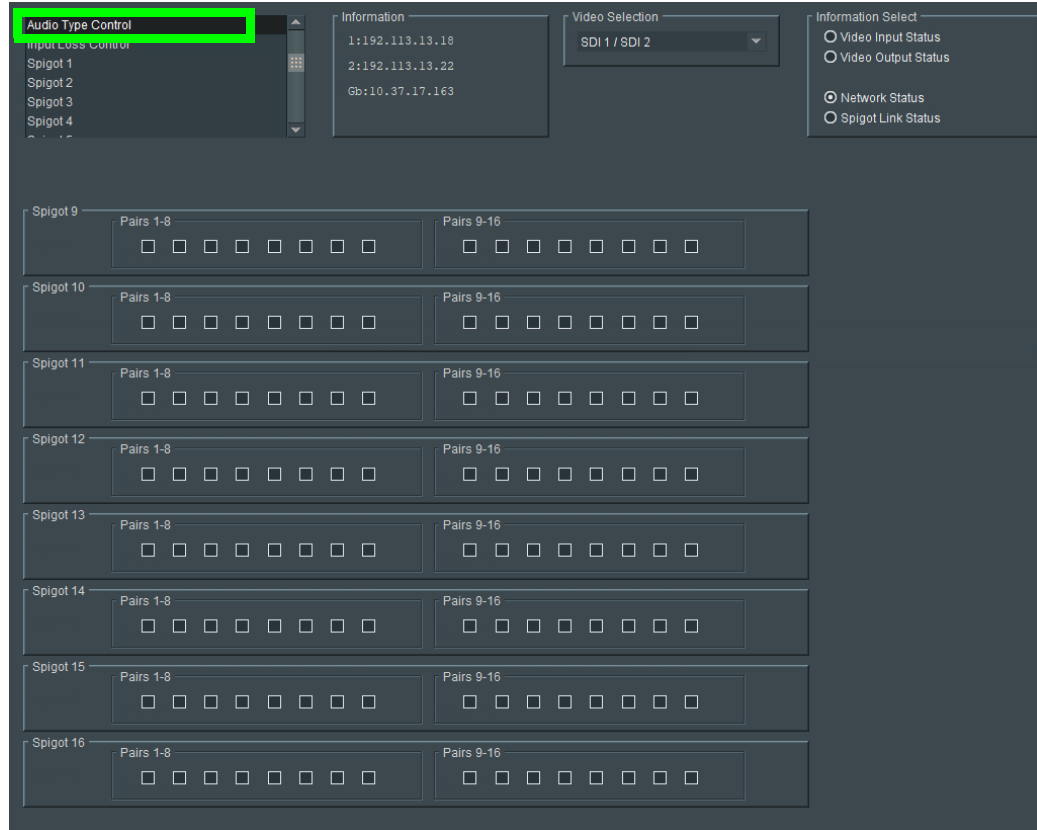
Figure 4 - 20: *Audio Type Control Page*

Input Loss Control

The **Input Loss Control** page allows control of the card's response to signal loss. Select as required.

Figure 4 - 21: *Input Loss Control Page*

Options upon signal loss are:

Option	Operation
Freeze	Picture will freeze.
Black	Picture will cut to black.
TPG	Picture will be replaced by a test pattern output, as set on the **Sender TPG** page. See Sender TPG (Test Pattern Generator) on page 45 for more information.

Spigot Pages

A separate page is provided for each of the active spigots. These pages are dynamically configured by the product, based on the capabilities of the software version/firmware selected.

> **Note:** The pages shown here may differ from those seen on your particular system, depending on the model and configuration of your UCP-3901 card.

On the rear panel:

- Spigots 1 to 4 correspond with **12G/3G/HD/SD-SDI I/O 1** to **12G/3G/HD/SD-SDI I/O 4**.
- Spigots 5 to 16 correspond with **3G/HD/SD-SDI I/O 5** to **3G/HD/SD-SDI I/O 16**.

See

Input Spigots

Input spigots are defined by selecting the appropriate firmware version on the **Configuration** page. See for more information.

Figure 4 - 22: *Typical Input Spigot Page*

Parameter	Description
Spigot pane	The **Spigot** pane provides basic configuration for the selected Spigot. Click **Take** to apply any changes made in this pane.
Direction	Displays spigot direction. **Input:** This spigot is a sender. **Output:** This spigot is a receiver. See Output Spigots on page 72 for this mode of operation.
BNC	Associated BNC connector.
Status	Current spigot's status.
Last Spigot Take	The last **Take** performed on the spigot and how it was made, for example, through RollCall or an external agent such as VSM.
Streaming	Set the redundancy options for this spigot. This will also determine the bandwidth to be used. Options are: • **Dual:** Full redundancy to support SMPTE ST 2022-7, both Primary (**SFP1**) and Secondary (**SFP2**) Ethernet connectors are used. Bandwith is split between the Primary and Secondary. See Cabling to Support SMPTE ST 2022-7 with a UCP-3901 on page 31. • **Single:** Primary Ethernet connector only (**SFP1**), but with all available bandwidth. • **A:** Primary Ethernet connector only (**SFP1**). • **B:** Secondary Ethernet connector only (**SFP2**). See Rear Panels and Connectors on page 25 for SFP / connector locations.
Format	Select the format to be used on this spigot. This will ensure that the appropriate level of bandwidth is allocated for the stream.
Sender / Ext Headers	Extended header operation can be adjusted for TR-03/TR-04 compatibility. Extended headers provide in-band metadata regarding the essence flow and its format, and are applicable to ST-2110 only. If third-party equipment is unable to support this, the functionality can be disabled, or set to On (Legacy), which ensures that the packet format complies with ST2110 but has no video content. Options are: • **Off:** Extended headers are disabled. • **On:** Sends extended headers fully compliant with ST2110-20. • **On (Legacy):** Sends extended headers only, as with previous versions of the card.
Sender / Num Audio Channels	Select the actual number of audio channels present on this spigot.
Sender / Packet Time	Select the amount of time required to complete the transmission of each packet.

Parameter	Description
Sender / SDI Input CRC Errors	Enable the check box to display the number of CRC errors. Click **Clear** to reset the counter to zero.
Spigot Link	When inputs are linked together to support an UHD quad link input, this shows the group of 4 input spigots used for this. See Link Control on page 59 to enable UHD inputs. **Master X-Y:** This is a range of spigots that the above settings apply to. **Slaved to X:** This is the spigot on which the above settings come from.
Take	Click to apply any changes made to the above parameters.
Primary and Secondary Panes	
Flow Panes for Video, Audio and Metadata	Displays Video, Audio, and Metadata status, and allows multicast IP and port details to be defined for the selected spigot. To set multicast details for the spigot: • Enter **Multicast IP** and **Multicast Port** details as required. • Enter the appropriate details in the **Source IP** and **Source Port** fields. Each spigot can support a variety of flows. • Select the required flow type (video standard) from the **Flow Type** drop-down list. • Click ⬛**S** to save the details, or ⬛**P** to return to the preset default value. • Set **Packetizer Stats** to view network statistics for the flow, if required.

Output Spigots

Output spigots are defined by selecting the appropriate firmware version on the **Configuration** page. See Configuration on page 40 for more information.
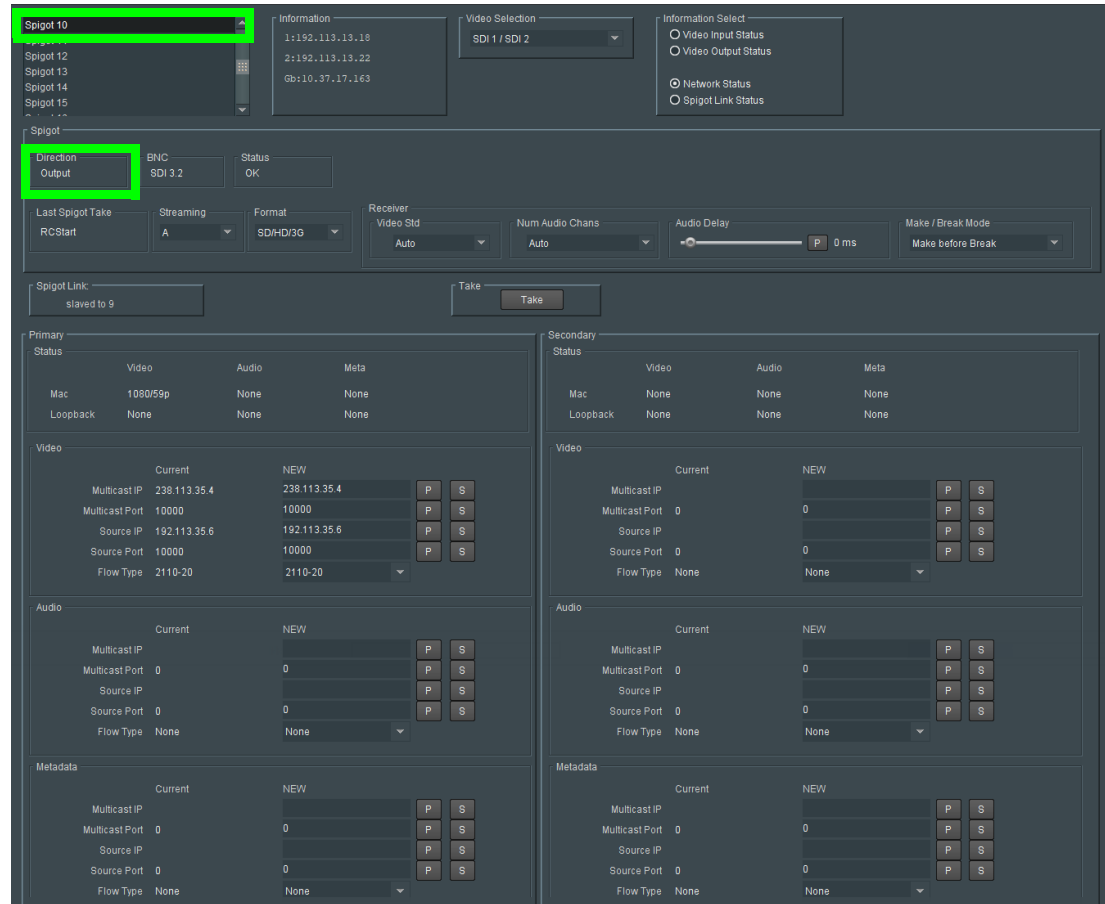
Figure 4 - 23: *Typical Output Spigot Page*

Parameter	Description
Spigot pane	The **Spigot** pane provides basic configuration for the selected Spigot. Click **Take** to apply any changes made in this pane.
Direction	Displays spigot direction. **Input:** This spigot is a sender. See Input Spigots on page 69 for this mode of operation. **Output:** This spigot is a receiver.
BNC	Associated BNC connector.
Status	Current spigot's status.
Last Spigot Take	The last **Take** performed on the spigot and how it was made, for example, through RollCall or an external agent such as VSM.

Parameter	Description
Streaming	Set the Ethernet connectors to use for this spigot. This will also determine the bandwidth to be used. Options are: • **Dual:** Full redundancy to support SMPTE ST 2022-7, both Primary (**SFP1**) and Secondary (**SFP2**) Ethernet connectors are used. All bandwith of both Ethernet connectors are used. See Cabling to Support SMPTE ST 2022-7 with a UCP-3901 on page 31. • **Single:** use either Ethernet connector (**SFP1** & **SFP2**), and so half of the available bandwidth. • **A:** Primary (**SFP1**) Ethernet connector only, and so half of the available bandwidth. • **B:** Secondary (**SFP2**) Ethernet connector only, and so half of the available bandwidth. See Rear Panels and Connectors on page 25 for SFP / connector locations.
Format	Select the format to be used on this spigot. This will ensure that the appropriate level of bandwidth is allocated for the stream.
Receiver / Video Std	Select the standard for the incoming video, or set to **Auto** to detect the standard automatically.
Receiver / Num Audio Chans	Select the number of audio channels present on this spigot. Auto mode only works if the source stream uses an extended header.
Receiver / Audio Delay	Move the slider to set an **Audio Delay** as required. Click $\boxed{P}$ to return to the preset default value.
Receiver / Make/Break Mode	Specifies how changes to an output's destination will be made. **Make before Break** causes the new destination to buffer data before connection to the previous destination is broken; this results in a smoother transition, but requires more bandwidth. **Break before Make** simply swaps the output's destination without buffering. Select the required mode from the drop-down list.
Spigot Link	When inputs are linked together to support an UHD quad link output, this shows the group of 4 output spigots used for this. See Link Control on page 59 to enable UHD inputs. **Master X-Y:** This is a range of spigots that the above settings apply to. **Slaved to X:** This is the spigot on which the above settings come from.
Take	Click to apply any changes made to the above parameters.

Parameter	Description
Primary and Secondary Panes	
Flow Panes for Video, Audio and Metadata	Displays Video, Audio, and Metadata status, and allows multicast IP and port details to be defined for the selected spigot. To set multicast details for the spigot: - Enter **Multicast IP** and **Multicast Port** details as required. - Enter the appropriate details in the **Source IP** and **Source Port** fields. Each spigot can support a variety of flows. - Select the required flow type (video standard) from the **Flow Type** drop-down list. - Click **S** to save the details, or **P** to return to the preset default value. - Set **Packetizer Stats** to view network statistics for the flow, if required.

Logging - SDI Info

Information on various parameters can be made available to a logging device connected to the RollCall network. The information below describes the various parameters available for logging. Logging must be configured and enabled; see Logging - Configuration on page 103.
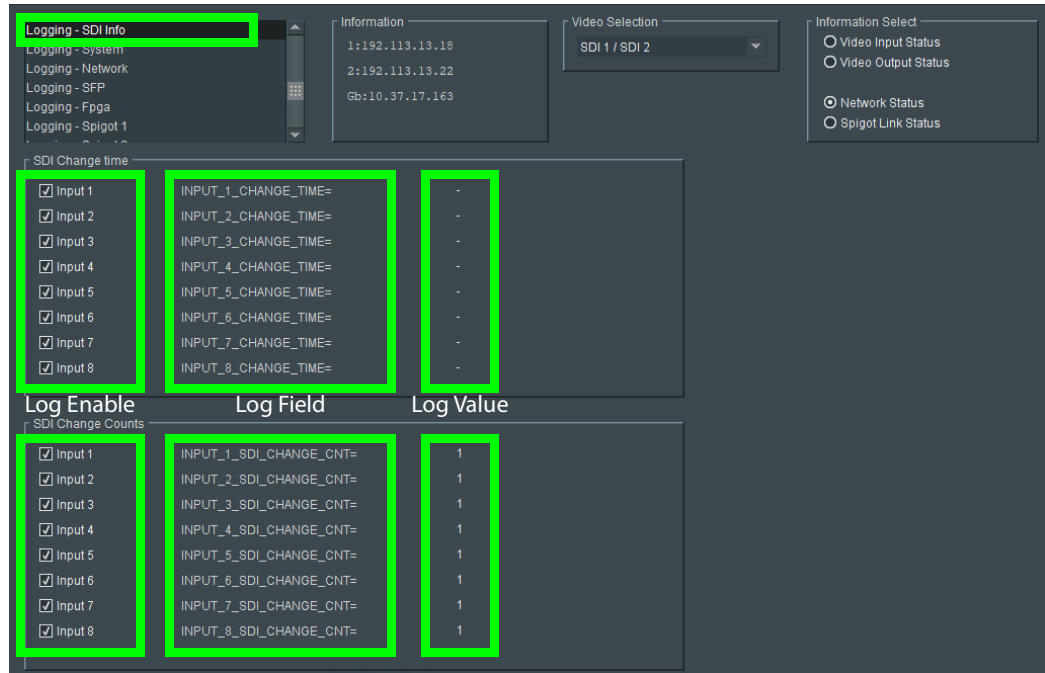
Figure 4 - 24: Logging SDI Info Page

Logging Page Column	Description
SDI Change Time pane	Logs the time at which the SDI input changed.
SDI Change Counts pane	Logs number of times that the SDI input has changed.

The logging page comprises three columns:

Logging Page Column	Description
Log Enable	Select the check boxes that correspond to the parameters for which log information should be collected.
Log Field	Displays the name of the logging field. **INPUT_N_CHANGE_TIME=:** Logs the time at which the SDI input changed. **INPUT_N_SDI_CHANGE_CNT=:** Logs number of times that the SDI input has changed. Where **N** is the input number. To identify SFP 1 / 2, see Rear Panels and Connectors on page 25.
Log Value	Displays the current log value.

Logging - System

Information on several parameters can be made available to a logging device connected to the RollCall network. Logging must be configured and enabled; see Logging - Configuration on page 103.

Figure 4 - 25: Logging - System Page

The logging page comprises three columns:

Logging Page Column	Description
Log Enable	Select the check boxes that correspond to the parameters for which log information should be collected.
Log Field	Displays the name of the logging field.
Log Value	Displays the current log value.

Enable check boxes to activate log fields as required.

Log Field Parameter	Description
SN=	Logs the card serial number, which consists of an *S* followed by eight digits. **Note**: this cannot be deselected.
OS_VERSION=	Logs the operating system name and version.
BUILD_NUMBER=	Logs the build number.
HARDWARE_VERSION=	Logs the hardware version number.
HARDWARE_MOD=	Logs the hardware modification number.
HARDWARE_BUILD=	Logs the hardware build number.
FEATUREBOARD_VERSION=	Not applicable. Logs the rear card daughter board version number.
FEATUREBOARD_MOD=	Not applicable. Logs the rear card daughter board modification number.
FEATUREBOARD_BUILD=	Not applicable. Logs the rear card daughter board build number.
FIRMWARE_VERSION=	Logs the FPGA version number.
UPTIME=	Logs the time since the last restart in the format *ddd:hh:mm:ss*.
RC_UPTIME=	Logs time RollCall has been up in the format *ddd:hh:mm:ss*.
ROL_STATES=	Logs the RollCall status. Valid values are: • **OK** • **FAIL:n** where *n* is the RollTrack index or indexes which are failing • **Disabled**
REAR_ID=	Logs the model number of the currently installed rear panel.
REAR_STATUS=	Logs the status of the rear panel when this can be determined.
SLOT_WIDTH=	Logs the slot width. UCP-3901 cards are available in single and triple width.

Log Field Parameter	Description
SLOT_START=	Logs the slot in the rack where the card is located.
POWER_USAGE=	Logs the power usage in watts and PR Units. **Note**: this cannot be deselected.
TEMP_*N*_CELSIUS=	Logs the temperature status of the FPGA in Celcius. **Note**: this cannot be deselected.
TEMP_*N*_NAME=	Logs the Temperature measurement name.
REFERENCE_*N*_SOURCE=	Logs the time reference source.
REFERENCE_*N*_STATE=	Logs the time reference value. Valid values are: • **OK:Locked** • **OK:Input** • **WARN:Freerun** • **WARN:CrossLock**
TIMESYNC_*N*_MODE=	Logs the time sync mode value. Valid values are: • **Free running**: Card is using its own clock with no reference to any other source. • **PTP Multicast**: Card is synchronizing to a PTP grandmaster clock using multicast network messages. • **PTP Unicast**: As PTP Multicast but using the delay request. Reply messages are unicast to minimize network traffic. • **NTP**: Card clock is synchronized to an NTP clock. Generally less precise than PTP.
TIMESYNC_*N*_NETWORK=	Logs the network port currently being used for synchronization for UCP-3901 cards, dependent on the choice of interfaces made on the Time Configuration page. If PTP and multiple interfaces are enabled, the PTP synchronization will switch ports if it doesn't see regular sync messages on the port.
TIMESYNC_*N*_CLOCK_ID=	Logs the identification number of PTP clock being used for synchronization. This is not necessarily the grandmaster clock identity, as there can be intermediate clocks between the grandmaster and the card, depending on network configuration.
TIMESYNC_*N*_CLOCK_STATE=	Logs the time sync value. Valid values are: • **Free running**: Card is not being synchronized. • **No Lock**: PTP being used but clocks haven't synchronized within +/- 1mS. • **Locked**: PTP being used and clocks are within the accepted range. • **NTP**: Card using NTP to synchronize.

Log Field Parameter	Description
TIMESYNC_*N*_AVG_DELAY=	Logs the current network delay time between the card and the clock sending the synchronization messages. This should be relatively constant and is dependent on network configuration.
TIMESYNC_*N*_STDV_DELAY=	Logs the current standard deviation in the network delay time between the card and the clock sending the synchronization messages. Should be a low number as the network delay is expected to be constant.
TIMESYNC_*N*_AVG_ERROR=	Logs the current difference between the cards time and the grandmaster time. Should be close to zero once card has synchronized.
TIMESYNC_*N*_STDV_ERROR=	Logs the standard deviation in the average error.
TIMESYNC_*N*_GRANDMASTER=	Logs the identity of network clock acting as PTP grandmaster. This is the source of the PTP synchronization messages used by all PTP slave clocks on the network. If there are multiple grandmasters, they should negotiate between themselves to identify the most accurate and then silence the others.
TIMESYNC_*N*_LAST_LOCK=	Logs the time when the card last changed from not locked to locked. Ideally this will be a few seconds after the card has powered up. This allows the user to confirm which clock the card has synchronized to.
TIMESYNC_*N*_SYNCHRONISATIONS=	Logs the number of times the card has synchronized since it was powered up. Ideally this will be a low number, as cards are expected to synchronize and stay synchronized. Large numbers indicate possible problems with the network or grandmaster clock.
TIMESYNC_N_STATE=	When card is synchronized to a network PTP grandmaster clock, this shows the connection state: **OK** or **FAIL**
TIMESYNC_N_CLOCK_ADDRESS=	When card is synchronized to a network PTP grandmaster clock, this shows the PTP grandmaster clock's IP address.
TIMESYNC_N_REQUEST_INTERVAL=	When card is synchronized to a network PTP grandmaster clock, this shows the interval between PTP message.
TIMESYNC_N_REFERENCE=	When card is synchronized to a network PTP grandmaster clock, this shows which Ethernet port is being used to receive the PTP clock source.

Log Field Parameter	Description
FAN_STATUS	Logs the card's cooling fan health. • **OK:** Fan is operating normally. • **FAIL:** Card's fan has failed. The fan must be replaced immediately. If this alarm has been raised, the fan on the UCP-3901 card may have to be replaced. See Cooling Fan Operational Assessment on page 114.
DENSITE_CONTROLLER_STATUS	Reports the connection status of the Densité frame's controller card to the UCP-3901 card. **OK:** The UCP-3901 card has successfully connected to the Densité frame's controller. **Not Connected:** The UCP-3901 card did not connect to the Densité frame's controller or the UCP-3901 card has lost connection to the Densité frame's controller.
DENSITE_CONTROLLER_IP_ADDR	Reports the IP Address of the Densité frame's controller card. If the IP address is 0.0.0.0, then the UCP-3901 card has not yet received the IP address from the frame's controller.
DENSITE_FRAME_SLOT	This is the slot number in which the UCP-3901 card is located within the Densité Frame.

Where N is the input or Ethernet port number. To identify SFP 1 / 2, see Rear Panels and Connectors on page 25.

Logging - Network

Information on several parameters can be made available to a logging device connected to the RollCall network. Logging must be configured and enabled; see Logging - Configuration on page 103.

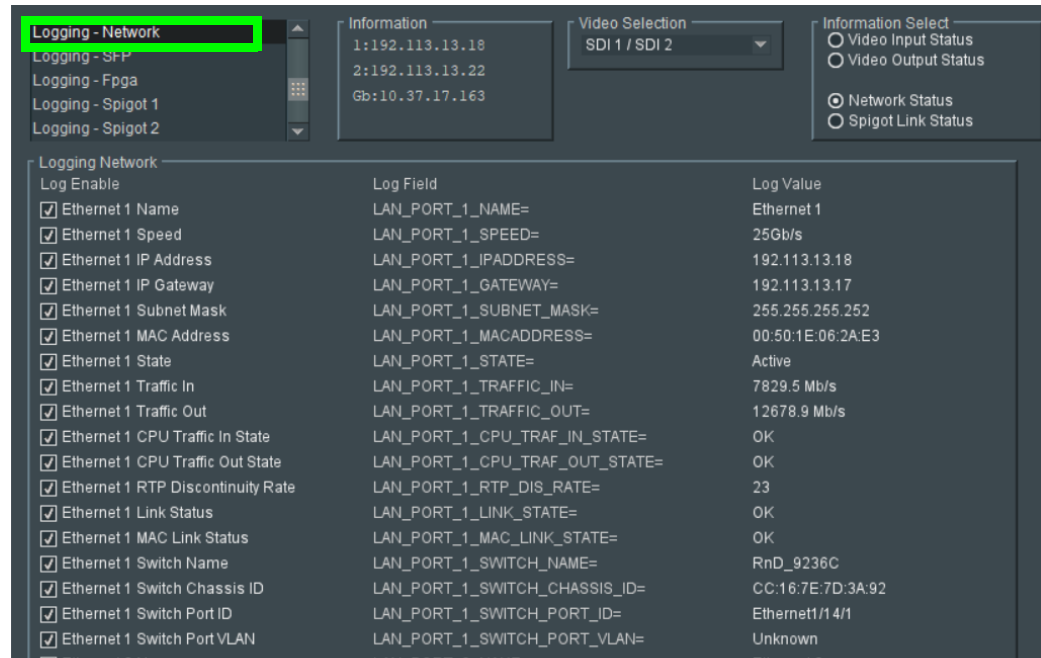**Figure 4 - 26:** *Logging - Network Page*

The logging page comprises three columns:

Logging Page Column	Description
Log Enable	Select the check boxes that correspond to the parameters for which log information should be collected.
Log Field	Displays the name of the logging field.
Log Value	Displays the current log value.

Enable check boxes to activate log fields as required.

Parameter	Description
LAN_PORT_*N*_NAME=	Logs the Ethernet port name.
LAN_PORT_*N*_SPEED=	Logs the Ethernet connection speed. Valid values are: • **10 Mbit/s Full Duplex** • **10 Mbit/s Half Duplex** • **100 Mbit/s Full Duplex** • **100 Mbit/s Half Duplex** • **1 Gbit/s Full Duplex** • **25 Gbit/s** • **No Link**
LAN_PORT_*N*_IPADDRESS=	Logs the Ethernet port IP address.
LAN_PORT_*N*_GATEWAY=	Logs the network gateway IP address.
LAN_PORT_*N*_SUBNET_MASK=	Logs the IP network's subnet mask.
LAN_PORT_*N*_MACADDRESS=	Logs the Ethernet port MAC address.
LAN_PORT_*N*_STATE=	Logs the Ethernet connection state. Valid values are: • **Active** • **WARN:Inactive**
LAN_PORT_*N*_TRAFFIC_IN=	Logs speed of traffic received by the Ethernet port. Values are reported in kbps, Mbps or Gbps, as appropriate.
LAN_PORT_*N*_TRAFFIC_OUT=	Logs speed of traffic transmitted by the Ethernet port. Values are reported in Kbps, Mbps or Gbps, as appropriate.
LAN_PORT_*N*_CPU_TRAF_IN_STATE=	Logs whether the flow of data into the CPU is satisfactory. Valid values are: • **OK** • **WARN:LOW DATA** • **FAIL**
LAN_PORT_*N*_CPU_TRAF_OUT_STATE=	Logs whether the flow of data out of the CPU is satisfactory. Valid values are: • **OK** • **WARN:LOW DATA** • **FAIL**
LAN_PORT_*N*_RTP_DIS_RATE=	Logs RTP discontinuity rate for the Ethernet port.

Parameter	Description
LAN_PORT_*N*_LINK_STATE=	Logs the Ethernet link state. Valid values are: • **OK** • **WARN:DOWN**
LAN_PORT_*N*_MAC_LINK_STATE=	Logs state of the card's FPGA Ethernet link. Valid values are: • **UP** • **DOWN**
LAN_PORT_*N*_SWITCH_NAME=	Logs name of the network switch that the card is connected to.
LAN_PORT_*N*_SWITCH_CHASSIS_ID=	Logs name of the network switch's chassis ID that the card is connected to.
LAN_PORT_*N*_SWITCH_PORT_ID=	Logs Port ID of the network switch the card is connected to.
LAN_PORT_*N*_SWITCH_PORT_VLAN=	Logs name of the VLAN that the card is connected to.

Where N is the input or Ethernet port number. To identify SFP 1 / 2, see Rear Panels and Connectors on page 25.

Logging - SFP

Information on several parameters can be made available to a logging device connected to the RollCall network. Logging must be configured and enabled; see Logging - Configuration on page 103.
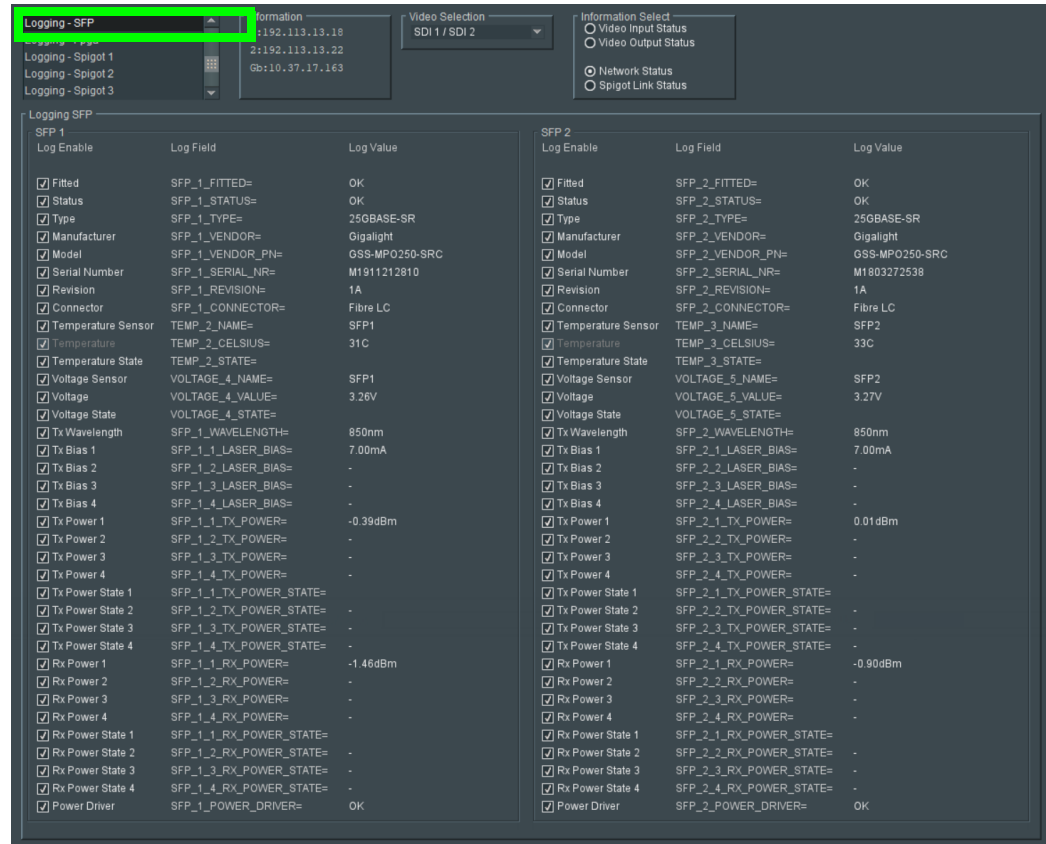
Figure 4 - 27: Logging - SFP Page

The logging page comprises three columns for each SFP:

Logging Page Column	Description
Log Enable	Select the check boxes that correspond to the parameters for which log information should be collected.
Log Field	Displays the name of the logging field.
Log Value	Displays the current log value.

Enable check boxes to activate log fields as required.

Parameter	Description
SFP_*N*_FITTED=	Logs presence of (Q)SFP. Valid values are: • **OK** • **Missing**

Parameter	Description
SFP_*N*_STATUS=	Logs status reported by the (Q)SFP. Valid values are: SFPs • **OK** • **WARN:Temp** • **WARN:VCC** • **WARN:TX BIAS** • **WARN:RX BIAS** • **WARN:Laser** • **WARN:TEC Curr** • **FAIL:SFP Not Ready** • **FAIL:RX LOS - RX Failure** • **FAIL:TX Fault - TX Failure** • **FAIL:RX LOL - RX Loss of Lock** • **FAIL:TX LOL - TX Loss of Lock**
SFP_*N*_TYPE=	Logs (Q)SFP identifier from device.
SFP_*N*_VENDOR=	Logs (Q)SFP manufacturer from device.
SFP_*N*_VENDOR_PN=	Logs (Q)SFP model number from device.
SFP_*N*_SERIAL_NR=	Logs the card serial number, which consists of an S followed by eight digits.
SFP_*N*_REVISION=	Logs manufacturer revision number.
SFP_*N*_CONNECTOR=	Logs connector type.
TEMP_*N*_NAME=	Logs temperature sensor name.
TEMP_*N*_CELSIUS=	Logs current temperature sensor reading.
TEMP_*N*_STATE=	Logs temperature sensor state. Valid values are: • **WARN:Disabled** - Temperature sensor disabled. • **WARN:Low** - Low, but in tolerance. • **WARN:High** - High, but in tolerance. • **OK** • **FAIL:Low** - Low and out of tolerance. • **FAIL:High** - High and out of tolerance.
VOLTAGE_*N*_NAME=	Logs voltage sensor name.
VOLTAGE_*N*_VALUE=	Logs current voltage reading.
VOLTAGE_*N*_STATE=	Logs temperature sensor state. Valid values are: • **OK** • **WARN:Low** - Low, but in tolerance. • **WARN:High** - High, but in tolerance.
SFP_*N*_WAVELENGTH=	Logs transmit wavelength in nm.

Parameter	Description
SFP_*N*_*X*_LASER_BIAS=	Logs bias level in mA.
SFP_*N*_*X*_TX_POWER=	Logs transmit power level in dBm.
SFP_*N*_*X*_TX_POWER_STATE =	Logs transmit power level. Valid values are: • **OK** • **WARN:Low** - Low, but in tolerance. • **WARN:High** - High, but in tolerance. • **FAIL:Low** - Low and out of tolerance. • **FAIL:High** - High and out of tolerance.
SFP_*N*_*X*_RX_POWER=	Logs receive power level in dBm.
SFP_*N*_*X*_RX_POWER_STATE =	Logs receive power level. Valid values are: • **OK** • **WARN:Low** - Low, but in tolerance. • **WARN:High** - High, but in tolerance. • **FAIL:Low** - Low and out of tolerance. • **FAIL:High** - High and out of tolerance.
SFP_N_POWER_DRIVER=	Power supply to the SFP is **OK** or **FAIL**.

Where N is the input/(Q)SFP number and X is the lane. To identify SFP 1 / 2, see Rear Panels and Connectors *on page 25.*

Logging - FPGA

Information on several parameters can be made available to a logging device connected to the RollCall network. Logging must be configured and enabled; see Logging - Configuration on page 103.
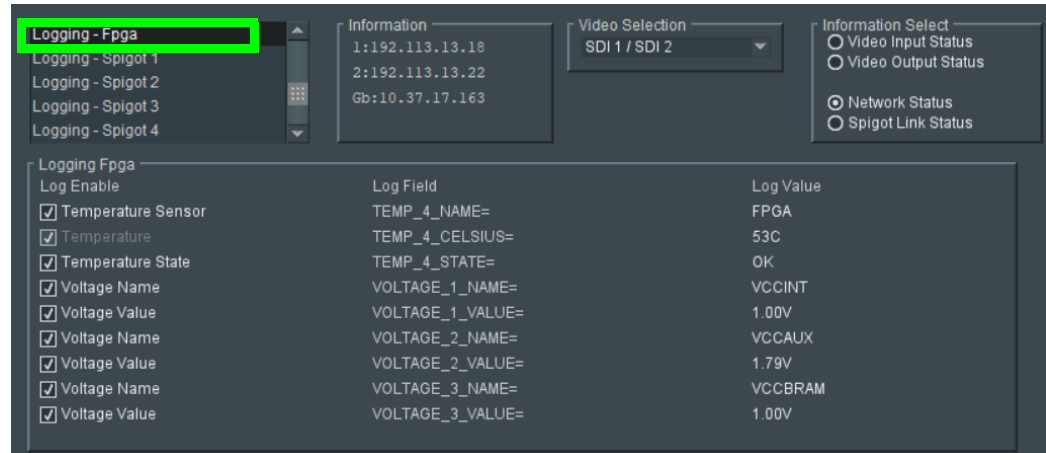

Figure 4 - 28: Logging - FPGA Page

The logging page comprises three columns:

Logging Page Column	Description
Log Enable	Select the check boxes that correspond to the parameters for which log information should be collected.
Log Field	Displays the name of the logging field.
Log Value	Displays the current log value.

Enable check boxes to activate log fields as required.

Parameter	Description
TEMP_N_NAME=	Reports temperature sensor name.
TEMP_N_CELSIUS=	Reports current temperature sensor reading.
TEMP_N_STATE=	FPGA temperature: **OK** or **FAIL**.
VOLTAGE_N_NAME =	Voltage sensor name.
VOLTAGE_N_VALUE =	Reports current voltage reading.

Where N is the input number.

Logging - Spigot 1 to n

The **Logging - Spigot** pages are used to select the fields to be enabled for each available spigot. Depending on whether the spigot is an input or an output, the appropriate log fields are shown. Logging must be configured and enabled; see Logging - Configuration on page 103.

An additional field is provided for the user to optionally specify a name for the input/output.

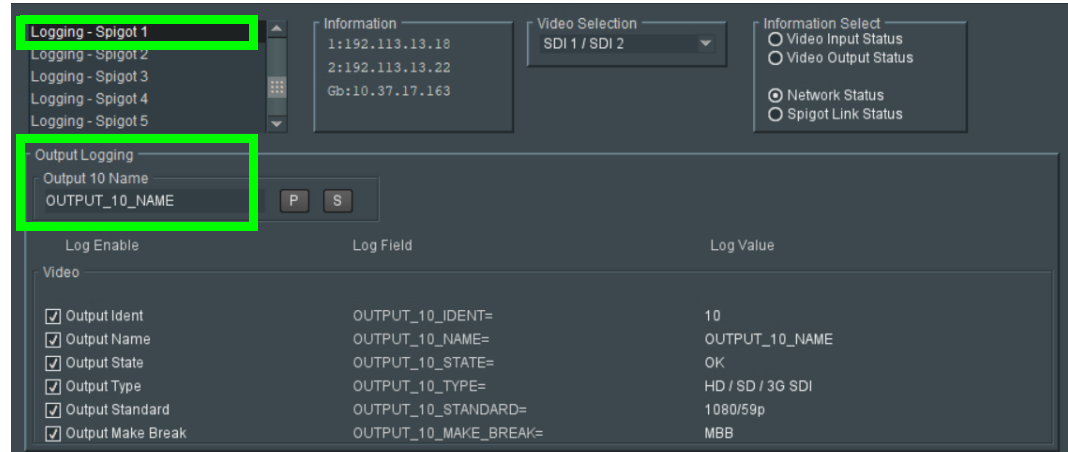***Figure 4 - 29:*** *Input Spigot Logging Page*

Figure 4 - 30: *Output Spigot Logging Page*
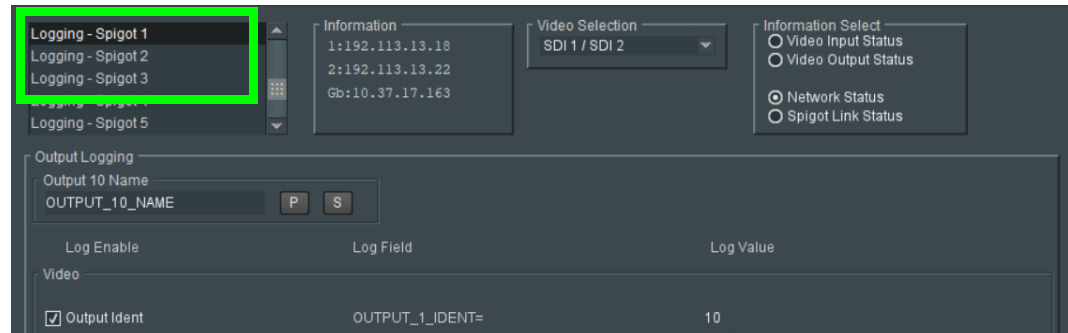
The logging page comprises three columns:

Logging Page Column	Description
Log Enable	Select the check boxes that correspond to the parameters for which log information should be collected.
Log Field	Displays the name of the logging field.
Log Value	Displays the current log value.

Enable check boxes to activate log fields as required.

Parameter	Description
INPUT_*N*_IDENT=	System-defined identifier for the input, based on the rear ID.
INPUT_*N*_NAME=	Name of the input, as defined on the **Setup** page. See Setup on page 96.
INPUT_*N*_STATE=	Valid values are: • **OK**: input signal good. • **FAIL**: input signal not detected.
INPUT_*N*_TYPE=	HD/SD/3G SDI
INPUT_*N*_STANDARD=	PAL/NTSC/625 Mono/525 Mono
INPUT_N_STEAM=	Status of the spigot streaming mode: **DUAL**, **SINGLE**, **A** or **B**. See Input Spigots on page 69 and Output Spigots on page 72.
OUTPUT_*N*_IDENT=	Name of the output as shown on the rear panel.
OUTPUT_*N*_NAME=	Name of the output as defined by the user.
OUTPUT_*N*_STATE=	Valid values are: • **OK**: output signal good. • **FAIL**: output signal not detected. • **WARN:Freeze** • **WARN: Pattern** • **WARN:Black**
OUTPUT_*N*_TYPE=	Valid values are: • **SD SDI** • **HD SDI** • **HD/SD/3G SDI**
OUTPUT_*N*_STANDARD	PAL/NTSC/625 Mono/525 Mono
OUTPUT_*N*_MAKE_BREAK	Logs how changes to an output's destination will be made. • **MBB**: Make before Break causes the new destination to buffer data before connection to the previous destination is broken; this results in a smoother transition, but requires more bandwidth. • **BBM:** Break before Make simply swaps the output's destination without buffering.

Where N is the input/output number.

Logging - Card Diagnostics

Information on several parameters can be made available to a logging device connected to the RollCall network. Logging must be configured and enabled; see Logging - Configuration on page 103.

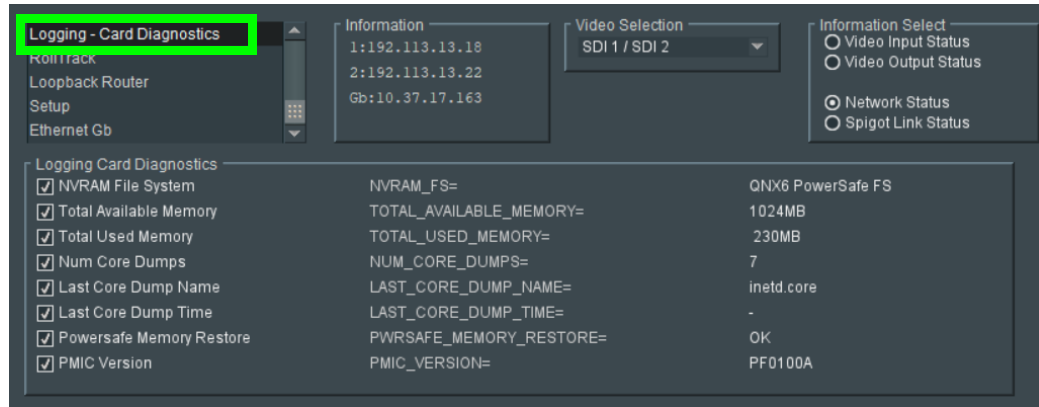**Figure 4 - 31:** *Logging - Card Diagnostics Page*

The logging page comprises three columns:

Logging Page Column	Description
Log Enable	Select the check boxes that correspond to the parameters for which log information should be collected.
Log Field	Displays the name of the logging field.
Log Value	Displays the current log value.

Enable check boxes to activate log fields as required.

Parameter	Description
NVRAM_FS=	Logs whether the installed file system is QNX6 PowerSafe or FAT32.
TOTAL_AVAILABLE_MEMORY =	Logs total amount of CPU memory available to the card, in bytes.
TOTAL_USED_MEMORY=	Logs amount of CPU memory used by the card, in bytes.
NUM_CORE_DUMPS=	Logs number of times a core dump has been performed as a result of an application crash.
LAST_CORE_DUMP_NAME=	Logs name of last application to crash.
LAST_CORE_DUMP_TIME=	Logs time of last core dump performed as a result of an application crash.

Parameter	Description
PWRSAFE_MEMORY_RESTORE =	Logs where system memory was restored from. Valid values are: • **FAT32** - restored from FAT32. • **OK** - restored from QNX6 PowerSafe. • **FAIL** - memory restoration failed.
PMIC_VERSION=	Logs name of the on-board power management chip.

RollTrack

The **RollTrack** page allows information to be sent, through the RollCall network, to other compatible units connected on the same network.

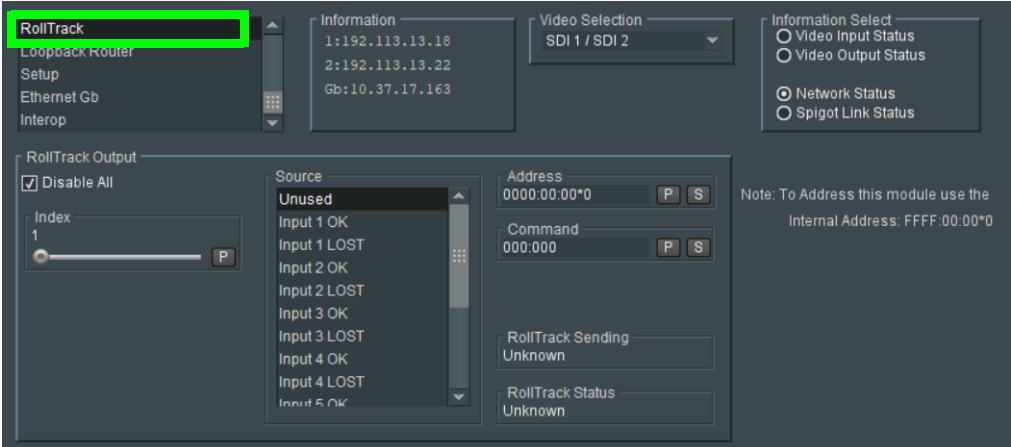The **Source** window lists the RollTrack sources:

Figure 4 - 32: *Source Pane*

Parameter	Description
Disable All	When checked, all RollTrack items are disabled.
RollTrack Index	This slider allows up to 16 distinct RollTrack outputs to be set up. Dragging the slider selects the RollTrack Index number, displayed below the slider. Clicking ⬛P selects the default preset value.
RollTrack Source	The source of information that triggers transmission of data is selected with this control. Dragging the slider selects the RollTrack source, displayed below the slider. Clicking ⬛P selects the default preset value. When no source is selected, **Unused** is displayed. • **Unused:** No RollTracks sent. • **Input N OK:** Input N is good. • **Input N LOST:** Input N is bad. *Where N is the input number.*

Parameter	Description
RollTrack Address	This item enables the address of the selected destination unit to be set. The address may be changed by typing the new destination into the text field, then clicking **S** to save the selection. Clicking **P** returns to the default preset destination. The RollTrack address consists of four sets of numbers, for example, **0000:10:01*99**: • The first set, **0000**, is the network segment code number. • The second set, **10**, is the number identifying the (enclosure/mainframe) unit. • The third set, **01**, is the slot number in the unit. • The fourth set, **99**, is a user-definable number that is a unique identifier for the destination unit in a multi-unit system. This ensures only the correct unit will respond to the command. If left at **00**, an incorrectly fitted unit may respond inappropriately.
RollTrack Command	This item enables a command to be sent to the selected destination unit. The command may be changed by typing a code in to the text field, and then selecting to save the selection. Clicking returns to the default preset command. A RollTrack command consists of two sets of numbers, for example: 84:156: The first number, 84, is the actual RollTrack command. The second number, 156, is the value sent with the RollTrack command.
RollTrack Sending	A message is displayed here when the unit is actively sending a RollTrack command. Possible messages are: • **No:** The message is not being sent. • **Yes:** The message is being sent.
RollTrack Status	A message is displayed here to indicate the status of the currently selected RollTrack index. Possible RollTrack Status messages are: **OK:** RollTrack message was sent and received successfully. **Unknown:** RollTrack message has been sent but transmission has not yet completed. **Timeout:** RollTrack message has been sent but acknowledgment not received. This could be because the destination unit is not at the location specified. **Bad:** RollTrack message has not been correctly acknowledged at the destination unit. This could be because the destination unit is not of the type specified. **Disabled:** RollTrack sending is disabled.

Loopback Router

The **Loopback Router** page provides a basic SDI router as a redundant backup in case of Ethernet failure.
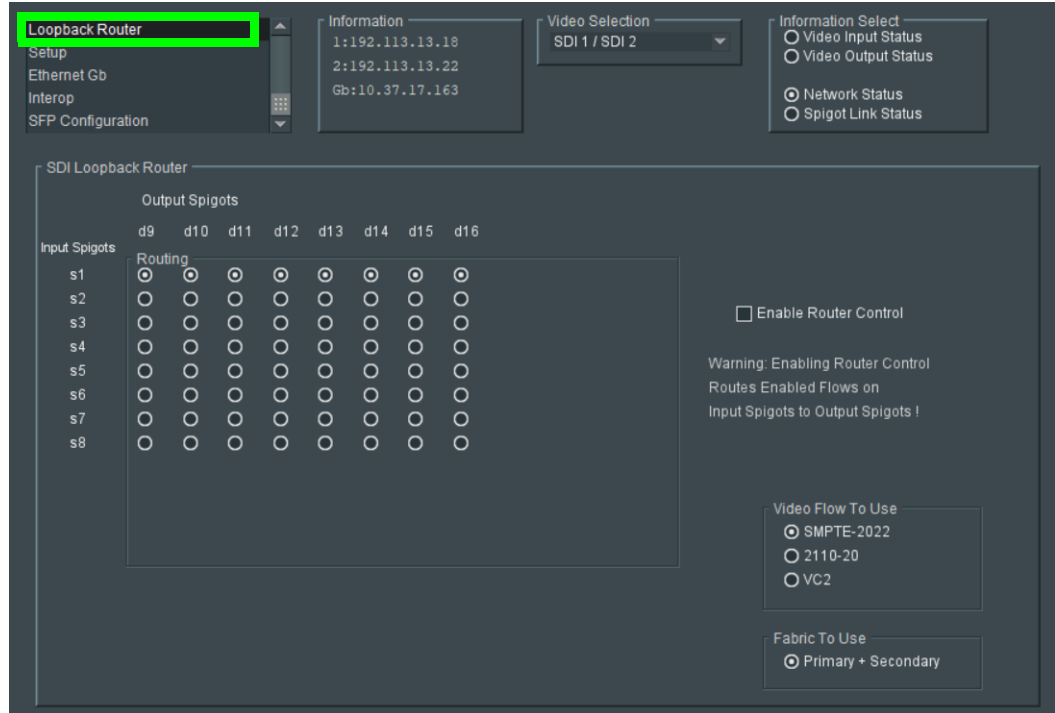

Figure 4 - 33: *Loopback Router Page*

If an Ethernet failure is encountered:

1 Use the matrix radio buttons to specify which inputs should be routed to which outputs.

2 Select the **Video Flow to Use** - SMPTE-2022, 2110-20, or VC2.

3 When set as required, click the **Enable Router Control** check box to activate routing.

Setup

The **Setup** page displays basic information about the card, such as the serial number and software version. Use the functions on the page to restart the card or to return all settings to their factory or default settings.
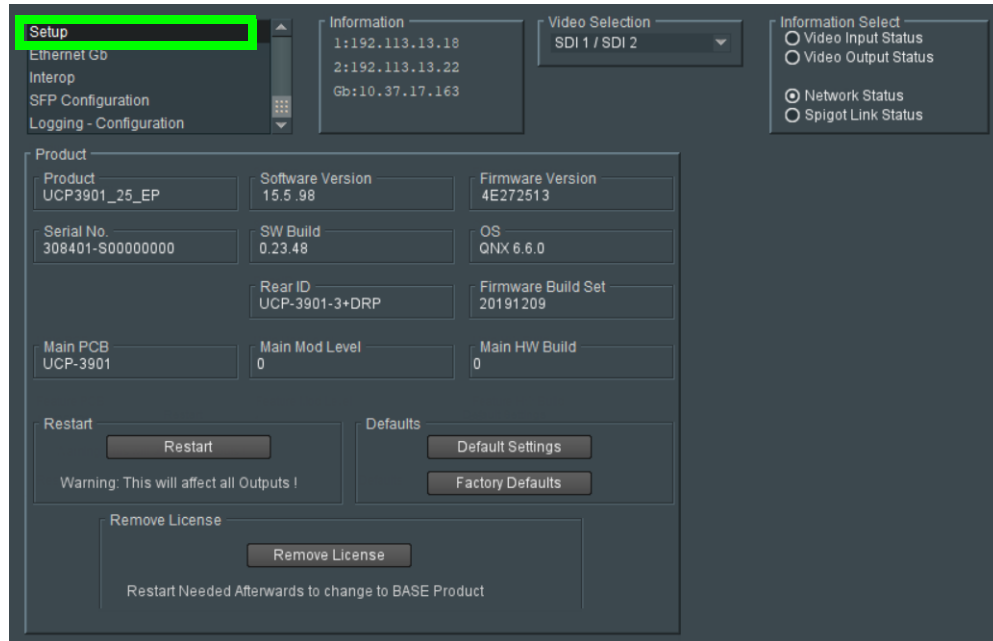

Figure 4 - 34: *Setup Page*

The **Setup** pane displays technical information on the UCP-3901. You may be asked for these details by Grass Valley support if you need technical assistance.

Parameter	Description
Product	Name of the card.
Software Version	Currently installed software version number.
Firmware Version	Currently installed firmware version number.
Serial No.	Card serial number.
SW Build	Factory software build number. This number identifies all parameters of the card.
OS	Operating system version number.
Rear ID	Rear panel type. See also Rear Panels and Connectors on page 25.
Firmware Build Set	FPGA Firmware build date.
Main PCB	Printed Circuit Board version number.
Main Mod Level	Main PCB modification level.
Main HW Build	Factory main hardware build number.

Parameter	Description
Restart	Power-cycles the card. This will produce disturbances on the output picture. **Note:** Restarting the card will affect all outputs.
Defaults	Provides options to reset the card to its defaults. • **Default Settings:** All controls are reset to their default values, except for network configuration and IP addresses. • **Factory Defaults:** All controls are reset to their default values, including network configuration and IP addresses.
Remove Licenses	Click to remove any license currently enabled on the card.

Ethernet Gb

The **Ethernet Gb** is the card's management port. **Ethernet Gb** is identified as **MANAGEMENT** on the card's rear panel. See Rear Panels and Connectors on page 25.

The **Ethernet Gb** page shows details and status for the **MANAGEMENT** Ethernet connector. The UCP-3901 defaults to use of DHCP, but this can be overridden and a static IP address specified if required.

The Ethernet configuration for this port can also be set through the frame's control panel. This is useful when the card is first installed in the frame, to make it quickly operational. See Local control using the Densité frame control panel to set the Card's IP Addresses on page 27.

Ethernet Gb does not need to be configured when the UCP-3901 is used with Densité frames that are equipped with Densité 3+FR4 STD or Densité 3+ FR4 ADV frame controllers that are connected to the management IP network.

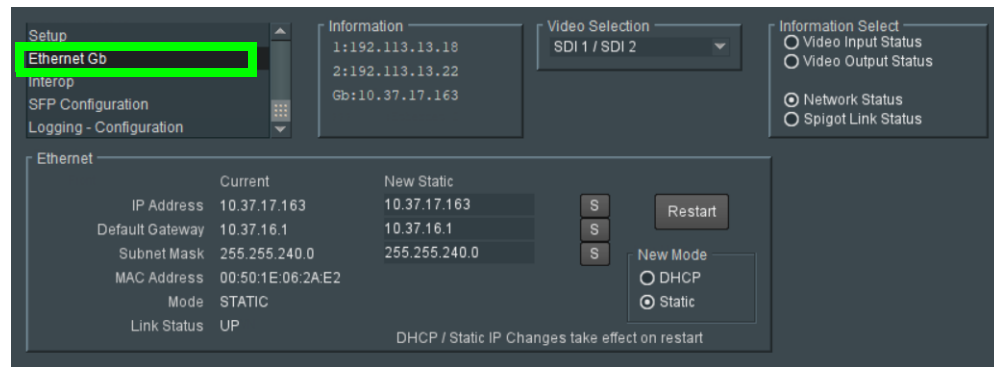See Ethernet Pages 1 and 2 on page 50 to configure the media Ethernet configuration.

Figure 4 - 35: Ethernet Gb Page

Parameter	Description
Ethernet Pane	The Ethernet pane displays details of the Gb network interface, and allows a static IP address to be defined. **IP Address:** When Mode is set to Static, set the card's IP address. **Default Gateway:** When Mode is set to Static, set the network switch's IP address. **Subnet Mask:** When Mode is set to Static, set the subnet mask for your network. Enter information as required, then click ⓢ to save. New settings are applied when **Restart** is clicked.
New Mode	Set the Ethernet port's connection mode. **DHCP:** The Ethernet port uses automatic configuration obtained from the network's DHCP server. **Static:** The Ethernet port uses a user-specified configuration (**IP Address**, **Default Gateway**, and **Subnet Mask**).

Parameter	Description
Restart	Click when the New Mode setting is changed for this to take effect. Only make this change during off hours as this can take up to 30 seconds to complete.
MAC Address	Shows the Ethernet port's MAC Address.
Mode	Shows the Ethernet port's current operating mode (**DHCP** or **Static**). See **New Mode** to set the operating mode.
Link Status	Shows the Ethernet port's connections status with the network switch. **UP:** Connection successful **DOWN:** Connection failed

Interop

The **Interop** page allows certain parameters to be changed in order to improve interoperability with third-party equipment.
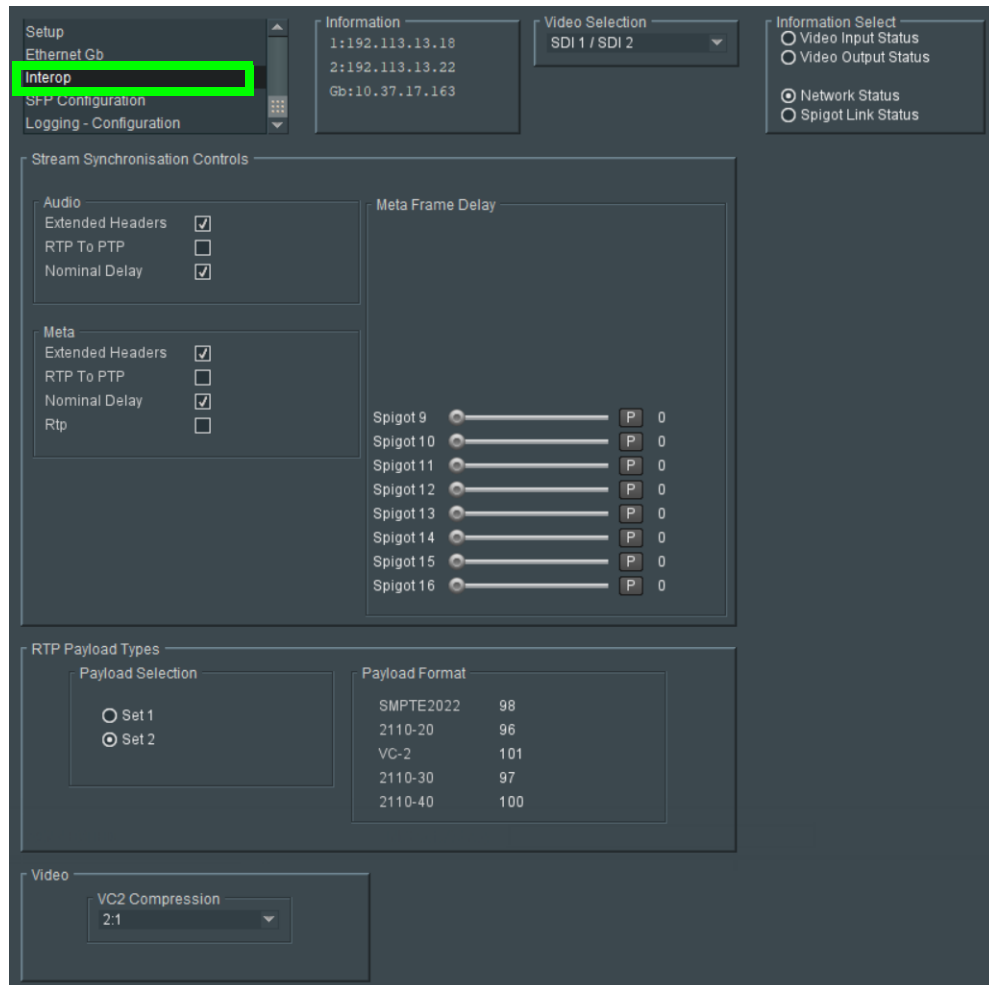

Figure 4 - 36: *Interop Page*

Parameter	Description
Stream Synchronization Controls	**Audio:** • **Extended Headers** - Enable to use extended headers in the RTP audio stream. • **RTP to PTP** - Enable to synchronize RTP to PTP. • **Nominal Delay** - Enable to set nominal delay at the spigot. **Meta:** • **Extended Headers** - Enable to use extended headers in the RTP metadata stream. • **RTP to PTP** - Enable to synchronize RTP to PTP. • **Nominal Delay** - Enable to set nominal delay at the spigot. • **RTP** - Enable to use RTP timestamps only to synchronize metadata to video.
Meta Frame Delay	Allows a frame delay for metadata received on the spigots shown to be set. Use the sliders to adjust as required. Click **P** to use the preset default value.
RTP Payload Types	Payload Selection: • **Set 1/Set 2** - Select the appropriate set of standards to be used. The set contents are displayed on the **Payload Format** pane.
Video	VC2 Compression: • Select the compression ratio to be used from the drop-down list.

SFP Configuration

The **SFP Configuration** page allows various SFP parameters to be adjusted, if required. The page panel has two sections (**SFP 1 Compatibility Control** and **SFP 2 Compatibility Control**); one for each SFP cage. The configuration of the **SFP 1 Compatibility Control** is the same as the **SFP 2 Compatibility Control**. Only the configuration of the **SFP 1 Compatibility Control** is shown below. To identify SFP 1 / 2, see Rear Panels and Connectors on page 25.
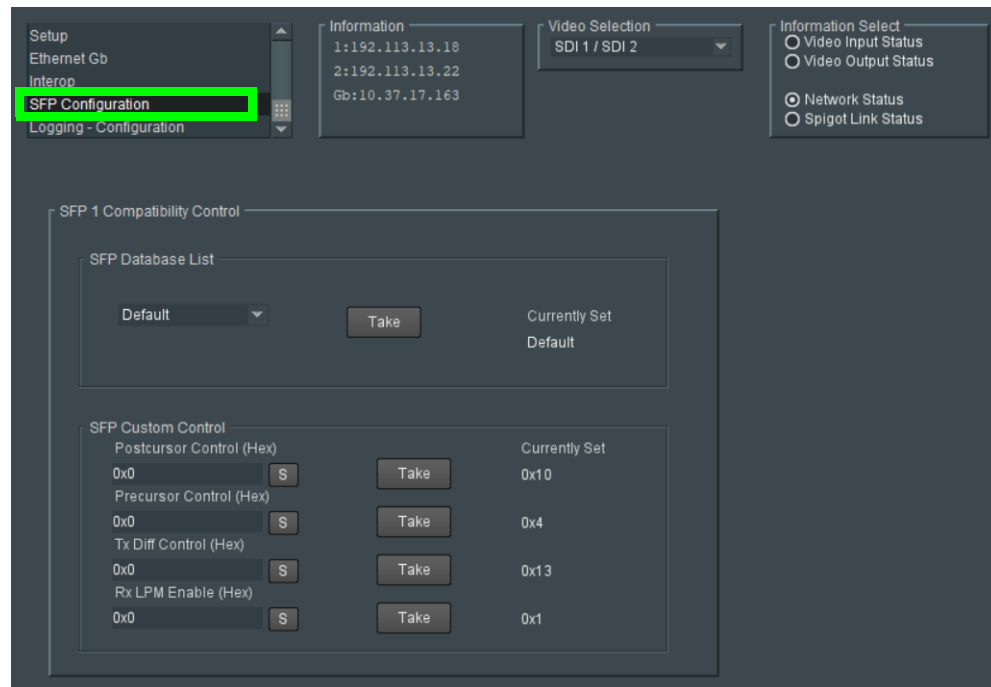

Figure 4 - 37: SFP Configuration Page

The majority of SFPs will operate correctly with UCP-3901 cards without any need for adjustment. Some, however, may need to have card parameters set a little differently.

If difficulties are encountered with an SFP not working as expected, follow these instructions:

1 Select the appropriate SFP type from the **SFP Database List**, and click **Take**. Verify whether the SFP is now working correctly; if so, no further action is required.

2 If the SFP is still not working properly, select **Custom** from the **SFP Database List**. This allows all the parameters shown to be adjusted as required. Make changes and click **Take** to apply them.

3 When a working configuration is found, the parameter values can be saved by clicking [S] beside each field.

Logging - Configuration

The **Logging Configuration** page sets the destination logging server, if required.
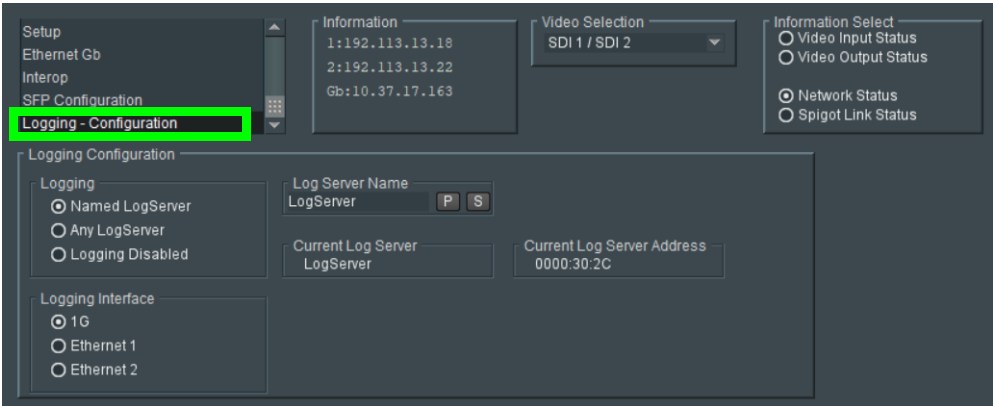

Figure 4 - 38: Logging Configuration Page

Parameter	Description
Logging	Set the connection type to the log server. **Named LogServer:** Specify the specific name of the log server to use for logging. **Any LogServer:** Logging is sent to any LogServer that is discovered on the network. **Logging Disabled:** No logging is generated.
Logging Interface	Set the network interface that has network connectivity to the log server. **1G:** The Gb management Ethernet network. **Ethernet 1:** The Ethernet network connected to SFP 1. **Ethernet 2:** The Ethernet network connected to SFP 2. See Rear Panels and Connectors on page 25 for the location of the card's Ethernet ports.
Log Server Name	When **Logging** is set to **Named LogServer**, this sets the name of the log server to use for logging.
Current Log Server	Shows the name of the current log server being used for logging.
Current Log Server Address	The current Rollcall log server's IP address.

Logging Pages

All alarms and operational statuses can be seen from Rollcall Logging pages. These pages provide the live status of the card. Theses statuses are also logged when using a Log Server. See above.

- Logging - SDI Info on page 75.
- Logging - System on page 77.

- Logging - Network on page 82.
- Logging - SFP on page 85.
- Logging - FPGA on page 88.
- Logging - Spigot 1 to n on page 89.
- Logging - Card Diagnostics on page 91.

Maintenance & Troubleshooting

Maintenance

Saving and Restoring an UCP-3901's Configuration

The UCP-3901's configuration can be saved to your local disk, which is useful in the case you need to return to a previous state. Saving an UCP-3901's configuration is also used as a preventive measure before a firmware upgrade, so that you can downgrade if necessary and quickly restore the configuration.

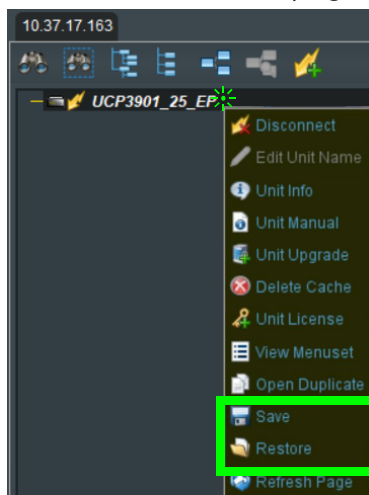Save and restore are found by right-clicking the unit name in the Network Browser.

Fig. 5-1: UCP-3901 Menu

For more information about how to use save and restore, see the *RollCall Control Panel User Manual*, available for download from the Grass Valley website. See Related Documentation, on page 17.

Upgrading the UCP-3901's SDC Application

The following is required to proceed:
- A Microsoft Windows PC that:
    - has Internet connectivity.
    - has network connectivity with the UCP-3901.
    - has RollCall software installed.
- UCP-3901 firmware files.

A SDC Application upgrade package is supplied by Grass Valley Technical Support and comprises a set of data and installer files. The package is associated with an UCP-3901 software version number, for example, 14.35.80

To obtain an upgrade software package, contact Grass Valley Technical Support. See Grass Valley Technical Support, on page 129.

The UCP-3901 card software upgrading process follows the standard process for card upgrades with Grass Valley RollCall Control Panel. For more details, see the:

- RollCall Control Panel User Manual.
- RollMechanic Operator's Manual.

See Related Documentation, on page 17.

A SDC Application upgrade is done in the following stages in RollCall:

- **Stage 1:** To add/import the upgrade package to RollCall Control Panel, on page 106.
- **Stage 2:** To install the upgrade on the UCP-3901, on page 107.
- **Stage 3:** To delete RollCall's cache for the UCP-3901, on page 109.

To add/import the upgrade package to RollCall Control Panel

1 Save the supplied upgrade package(s) to a network location that can be accessed by the Control Panel. Upgrade packages are supplied in a compressed file format (.zip) and they should not be extracted.

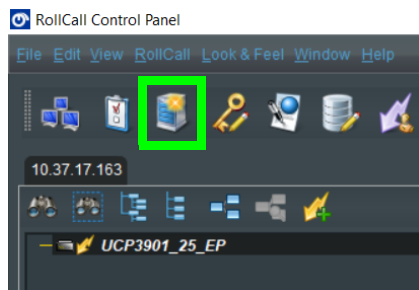2 Click **Import New Upgrades** button in the main toolbar

Fig. 5-2: Import new Upgrades

The RollCall Upgrade Packages dialog displays. The left-hand panel displays all currently available upgrades, grouped by unit type.
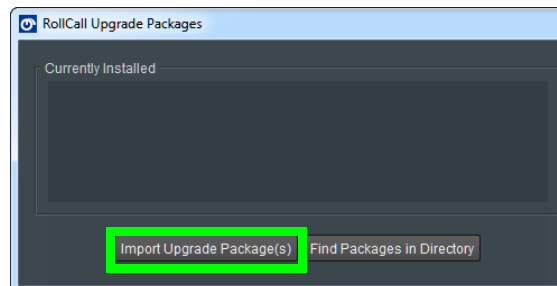

Fig. 5-3: Upgrade Packages
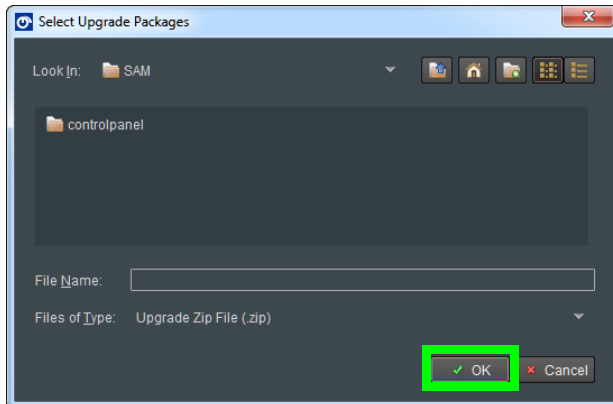
3 Click the **Import Upgrade Package** button.

Fig. 5-4: Select Upgrade Package

4 Browse to the folder containing the upgrade package.

5 Select the upgrade package and click OK.

When the package has been imported, it is added to the list of available upgrades, and units may be upgraded accordingly. See To install the upgrade on the UCP-3901, on page 107.

To install the upgrade on the UCP-3901

A unit can only be upgraded if an appropriate upgrade package is available. See To add/import the upgrade package to RollCall Control Panel, on page 106.

1 Right-click on the unit name in the Network Browser.
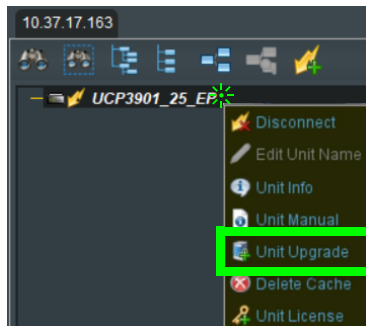
The unit menu displays.

Fig. 5-5: UCP-3901 Menu

2 Click on **Unit Upgrade** from the unit menu.

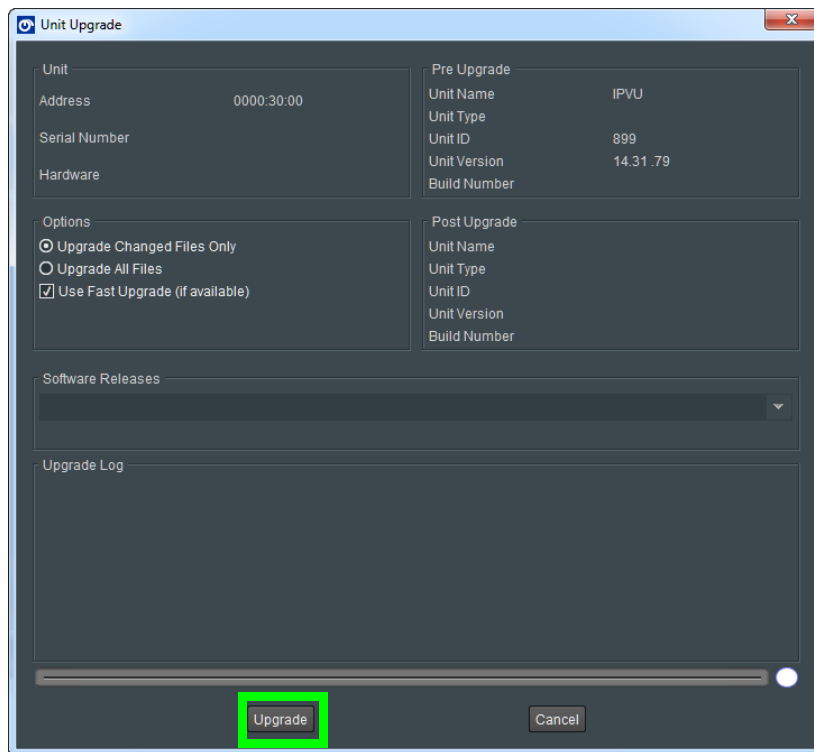The **Unit Upgrade** dialog displays.

Fig. 5-6: Unit Upgrade Dialog

The following elements and options are available:

- **Unit** - This panel displays the unit address, serial number, and hardware version (if available).

- **Pre Upgrade** - This panel displays the unit name, unit type, unit ID, unit version and loader version of the unit before the upgrade.

- **Options** - Choose to either upgrade only the files that have changed or to upgrade all files. It is recommended that the Upgrade Changed Files Only setting is used to ensure a fast upgrade. However, some units may ignore this setting, and always upgrade all files.

- **Post Upgrade** - After completion of the upgrade, this panel displays the new unit name, unit type, unit ID, unit version and loader version.

- **Software Releases** - This drop-down list shows all of the software releases available for the unit type. Note that before any releases can be shown, software releases must be imported using the Import new Upgrades function available from the main toolbar. See To add/import the upgrade package to RollCall Control Panel, on page 106.

- **Release Notes** - If release notes are available, clicking this button displays them. If release notes are not available, this button is not displayed.

- **Upgrade Log** - This displays the progress of the upgrade.

- **Cancel** - This closes the Unit Upgrade dialog. If an upgrade is in progress, confirmation of this action is requested.
- **Upgrade** - see below.
- **Import upgrade from unit** - This creates a software release from the version currently on the unit. Note that this option is only displayed if the unit's version is not already in the list of software releases.

3 Select a software version from the **Software Release** dropdown.

4 Click **Upgrade**.

This starts the upgrade process. Prior to the upgrade process beginning, a check is made to see whether the unit's current version is available in the list of software releases. If not, a dialog displays prompting to save the unit's current software release before upgrading.

> **Note:** The control panel cannot be used while performing an upgrade.

At the end of the upgrade, if the unit does not come back online, a dialog displays.
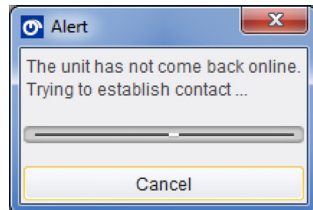
Further attempts are made to establish contact with the unit until it either, comes back online, or the Cancel button is pressed. Cancelling this operation has no effect on the success or otherwise, of the upgrade operation.

To delete RollCall's cache for the UCP-3901

If the upgrade changes any RollCall menu, then these UCP-3901 menus in RollCall may be empty or configuration information is missing or incoherent. Always delete RollCall's cache for the UCP-3901 after an upgrade.

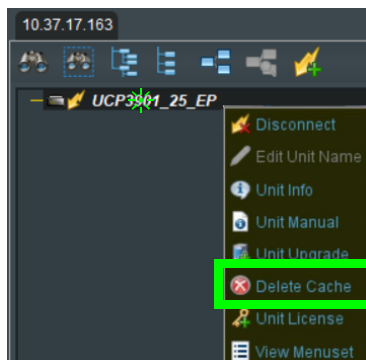1 In RollCall, right-click UCP-3901 and select Delete Cache.

Fig. 5-7: UCP-3901 Menu

2 Close and restart RollCall.

Installing a License into an UCP-3901

A UCP-3901 can have additional features that can only be used if they are licensed; see Available Upgrade Licenses, on page 18. Licenses give access one of the UCP-3901 software-defined core (SDC) functions at a time. Licenses are provided as small zip files; the license key within the file is tied to the serial number of the particular UCP-3901 module for which it has been purchased. Some licenses also use a password. Licenses must be installed to RollCall and then loaded onto the card, which activates the new SDC functionality. Use the License Viewer to manage these licenses. Each platform has a tab at the top of the License Viewer, and the licenses relevant to a platform display in the appropriate tab.

The license files for the UCP-3901 are supplied upon purchasing a license from Grass Valley. They are small .zip files. Store the .zip files in a network location that can be accessed by the Control Panel. To obtain a license, contact Grass Valley Technical Support. See Grass Valley Technical Support, on page 129.

The process of installing a license to an UCP-3901 follows the standard process for a hardware card with licenses administered by Grass Valley's RollCall.

For more details about importing and installing license files, please see the:

- RollCall Control Panel User Manual.
- RollMechanic Operator's Manual.

See Related Documentation, on page 17.

The license key within the file is tied to the Serial Number of a particular UCP-3901 module. Some licenses use a password.

An UCP-3901 is licensed is installed in two stages in RollCall:

- **Stage 1:** To import license files to the RollCall Control Panel, on page 110
- **Stage 2:** To install the License on the UCP-3901, on page 111

To import license files to the RollCall Control Panel

1 Copy the license zip file from Grass Valley to a convenient place, such as the Windows Desktop.

2 Start RollCall, open the **Edit** menu, and select **Licenses**. The License Viewer is displayed.

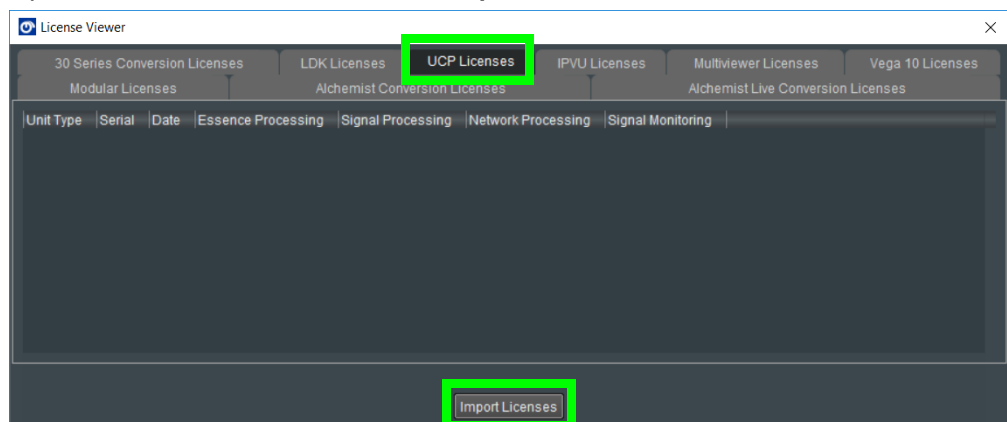3 Open the **UCP Licenses** tab, and click **Import Licenses**.

Fig. 5-8: RollCall License Viewer: Import new License

A Windows Browse dialog is displayed.

4   Browse to the zip file's location, select the file, and click **OK**.

5   The license is imported into RollCall, and the license details are displayed on the License Viewer.

6   Click **OK** to close the summary.

After importing licenses, they can be installed to individual UCP-3901s using the Unit License option. See To install the License on the UCP-3901, on page 111.

To install the License on the UCP-3901

1   Right-click on the unit, and click on Unit License to open the Unit License dialog.
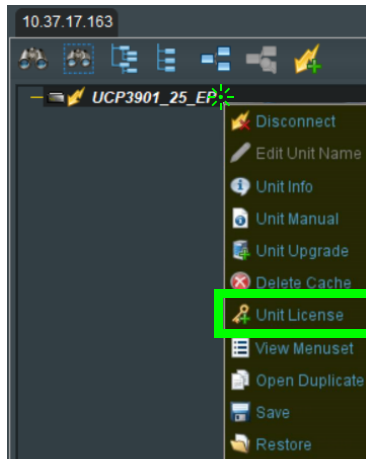

Fig. 5-9: UCP-3901 Menu

The Unit License dialog displays the currently installed licenses for both 3G and Licensed Options as well as any available licenses in the licensing database.

2   Select the licenses to install and click on Install Licenses.

3   In the confirmation dialog that displays, click **Yes** to install the licenses. To cancel the operation, click **No**.

A confirmation dialog displays, prompting for the module to be restarted. The licenses will not be valid until the module is restarted.

4   Click **Yes**.

The Unit License dialog closes. When the unit has restarted the new licenses will be active.

Loading (Selecting) Software Version on the UCP-3901

The UCP-3901 is a generic card and its functionality is set by the licensing that has been enabled on it and by selecting a software version. A UCP-3901 may have more than one license and software version (for example, Essence Processing and another application).

The required functionality is selected by selecting the corresponding licensed software version on the card.

1 Start RollCall, and open the **Configuration** page. See Configuration, on page 40. Scroll down so that the **Card Firmware**, **Software Version**, **Installed 25G Licensed Options**, **Installed 50G Licensed Options** and panes can be seen. 50G is for future use.
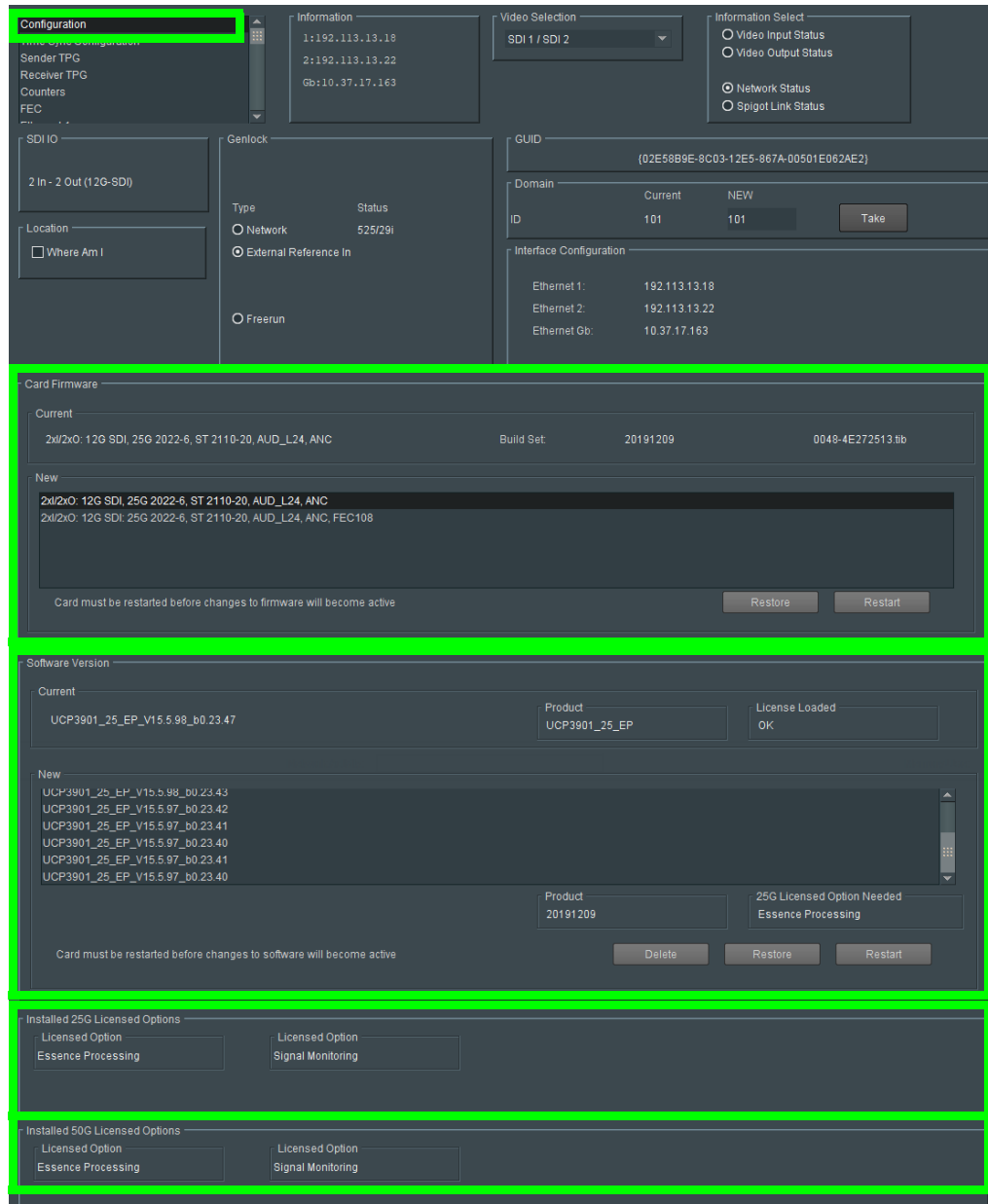
- The **Card Firmware** pane displays the firmware option currently loaded. Other available firmware versions are displayed in the **New** pane.
- The **Software Version** pane displays details of the currently loaded SDC license. Alternative SDCs available for loading are displayed in the **New** pane.
- The **Installed 25G / 50G Licensed Options** panes show all installed licenses.

See Configuration on page 40 for more information.

To change the software version being used

1 Select the required SDC from the **Software Version** > **New** pane

Click **Restore** to return to the current software version in effect.

2 Click **Restart**. The module will reboot, and start with the new SDC functionality.

3 Select any required options from the **Card Firmware** > **New** pane, if available. Click **Restart** once more if any options are selected.

4 In the **Configuration** template, check that the current software version shows as **Licensed OK**.

The module is now ready to use.

Field Repairs

Field Replaceable Units

The following components are Field Replaceable Units (FRUs).

Description	Grass Valley Part Number	See
Cooling fan	UCP-3901-FAN	Cooling Fan Operational Assessment, on page 114
Micro-SD Card	93-03084-010	Replacing the Micro-SD Card, on page 118

Contact Technical Support to order an FRU. See Grass Valley Technical Support, on page 129.

Cooling Fan Operational Assessment

A cooling fan has moving parts that, over time, can wear out. In the final stages of fan wear out, the fan makes a distinctive sound and it rotates at a slower speed, thereby reducing airflow which undermines its ability to remove heat from the UCP-3901. Under this condition, fan replacement is required.

Also, dust contained in the ambient air can accumulate on the fan and on surfaces around the fan and heatsink, thereby reducing airflow, and preventing air from coming into direct contact with the heatsink surfaces which undermines the ability to remove heat from the UCP-3901. Under this condition, cleaning is necessary and fan replacement may be required.

Some diagnostic procedures may interrupt normal system operation. Changing the UCP-3901's cooling fan will interrupt normal system operation. Down time can be minimized by swapping in another known good UCP-3901 to restore system operation quickly. Schedule these maintenance operations during off hours when the system is not in use.

Diagnostics

The UCP-3901's electronic circuitry generates heat that must be shed by forcing air to move across heat-generating components. Reduced air flow or high ambient temperature results in heat build-up within temperature-sensitive components within the UCP-3901. This can cause unexpected behavior such as glitches or even a system freeze or shutdown. The UCP-3901 self-diagnoses high temperature conditions by raising critical temperature and fan alarms.

Critical temperature and fan alarms are reported through the following mechanisms:
- The fan and critical temperature alarms are reported in RollCall in the Alarms Configuration panel. For this, the **Fan Status Check** alarm must be enabled. See Logging - System, on page 77 for more information.
- A UCP-3901's Status LED flashesdue to this condition (note that the Status LED can also flash due to other conditions).

The fan alarm indicates that the fan is not rotating fast enough due to wear and thus it may not provide enough cooling. A fan alarm must be addressed right away. A critical temperature alarm can be ignored if it is accompanied by a fan alarm as the root cause is the fan not rotating fast enough.

Otherwise, if the fan is running properly according to the fan alarm, then the *Critical Temperature Alarm Corrective Actions* steps should be taken.

Critical Temperature Alarm Corrective Actions

If the fan alarm is inactive and the critical temperature alarm is active (see **TEMP_N_STATE=** in Logging - FPGA, on page 88), then undertake the following diagnostic steps in the following order:

1 Confirm that the room temperature is within UCP-3901's operating temperature range specification. If necessary, take corrective actions by, for example, increasing the amount of air conditioning made available to the Densité frame.

2 Confirm that air flow around the Densité frame is not obstructed. If necessary, take corrective actions by, for example, removing obstructions or rerouting cables around and away from the Densité frame.

3 When the previous corrective actions do not eliminate an critical temperature alarm, verify that the UCP-3901's onboard fan is working correctly. See Fan Noise below.

Fan Noise

Over time, a fan's performance (operating speed) can degrade which may raise critical temperature and fan alarms. Under this circumstance, a fan may emit a rough-sounding lower pitched sound as compared to the sound that other healthier fans emit. To confirm that the UCP-3901 has an abnormally-sounding fan, during off hours when the system is not in use, eject the UCP-3901 card from the frame to verify that the distinctive sound stops and take corrective actions (see below).

Fan Alarm and Fan Noise Corrective Actions

When a fan alarm is raised, it must be addressed right away. During off hours when the system is not in use, eject the UCP-3901 card from the frame and inspect the UCP-3901's fan assembly: remove any accumulated dust and dirt from within the UCP-3901 with compressed air and remove any obstruction to the fan's ability to freely rotate.

Re-apply power to the UCP-3901 and restore system operation to see if the fan alarm becomes inactive.

The UCP-3901's onboard circuitry monitors the fan motor's rotational speed to detect that the fan is rotating fast enough to provide sufficient cooling; it raises a fan alarm when the fan's rotational speed has gone below a factory-set threshold.

When the UCP-3901's fan is not rotating fast enough (as detected by a fan alarm), is making abnormal noises, or is not rotating at all, the fan is worn out and it must be replaced with a new one.

Replacing the UCP-3901's Fan

Fan Replacement Kit

The replacement fan kit is available by contacting Technical Support. See Grass Valley Technical Support, on page 129.

Required Tools

The following field-supplied material is required:

- Compressed air to remove dust from the UCP-3901.
- Needle-nose pliers to separate push pins from the PCB.
- Curved tweezers to disconnect the fan's power connector from the UCP-3901's main board.
- Anti-static bag or anti-static work surface to reduce the possibility of electrostatic discharge damage to the UCP-3901's electronics.

Replacing the Cooling Fan

The cooling fan is located on the UCP-3901 PCB card.


Power Connector J14   Cooling Fan Assembly
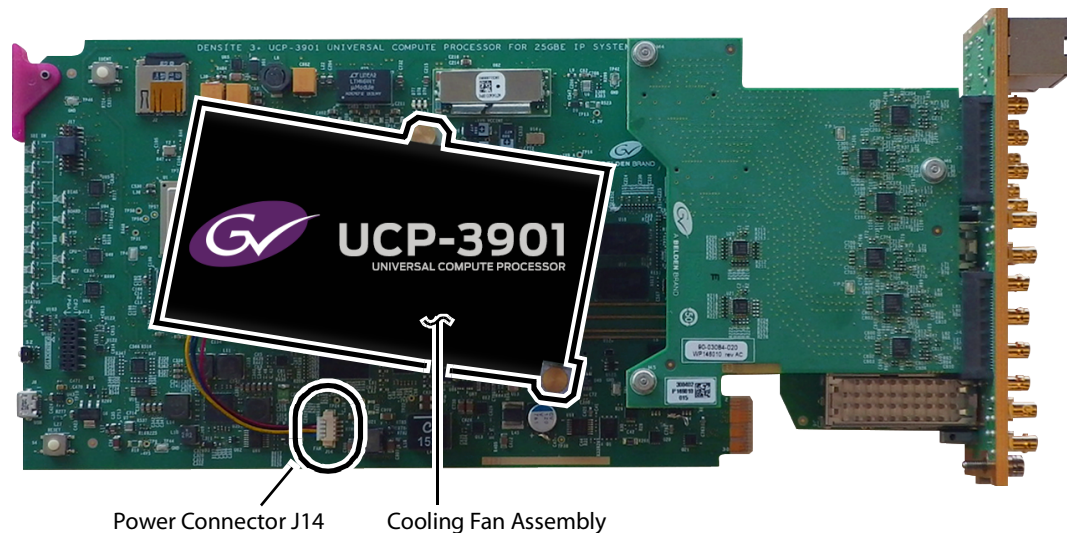
To remove a fan

1 During off hours when the system is not in use, eject the UCP-3901 card from the Densité frame.

2 Flip the UCP-3901 card over to the non-fan side on an anti-static bag or anti-static mat so that you can see the rear (solder side) of the card.

3 Using needle-nose pliers, compress the two pushpins so that they unlatch. Push the pin through the card to release it from the assembly.
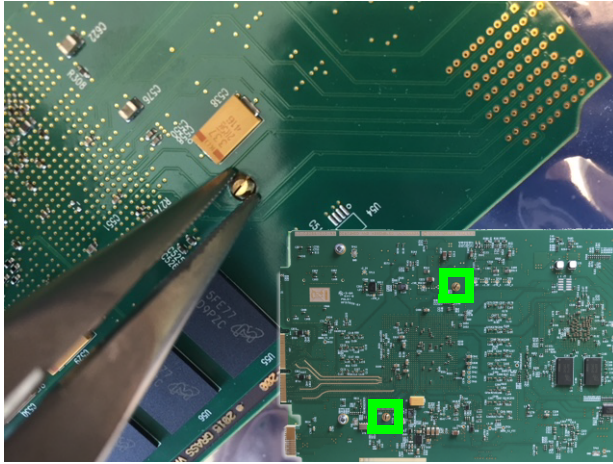

4 Flip the card back to the component (fan) side. Insert the pliers under the one of the pushpin heads. Press down on the center of the fan assembly to prevent it from flipping on its side and gently pry the pin from the heatsink assembly. Repeat for the second pushpin.
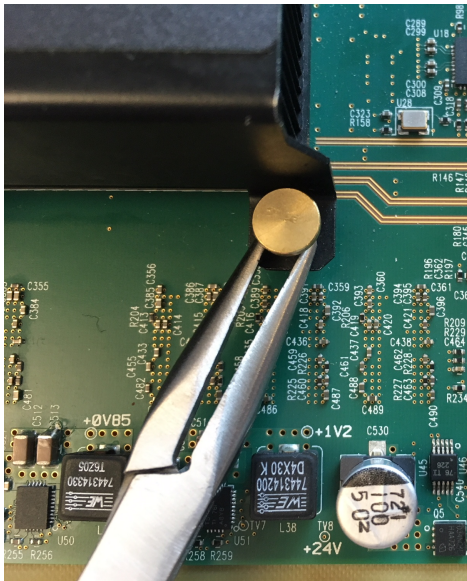
5 Using curved tweezers, disconnect the fan power connector plug, very carefully; gently wiggle the connector plug from the socket (jack). Do not pull on the wires. If the wires

are routed through wire holders, remove the wires from the holders first, before disconnecting.

Fan Power Connector Plug   Fan Power Connector Jack J14
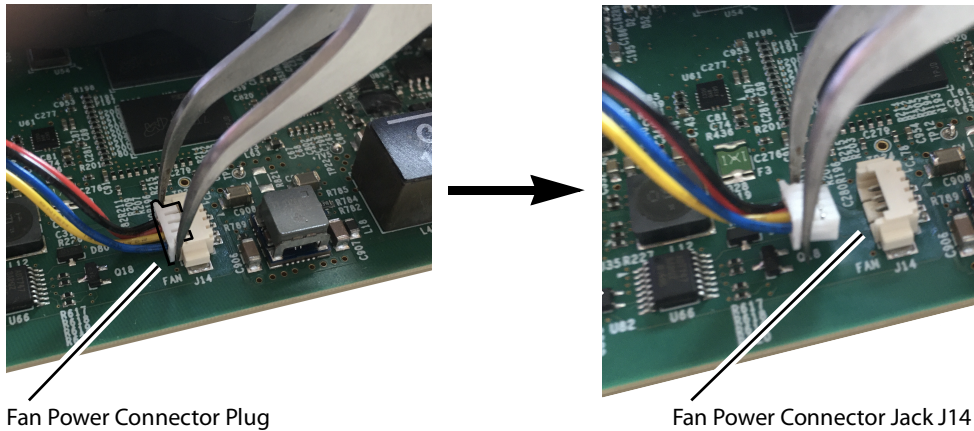
6   Dispose of the failed fan assembly.

7   Remove any accumulated dust from the UCP-3901 card with compressed air.

To install the new fan

1   Place the fan assembly on the heatsink and align the two pushpins with their respective holes on the card.

2   Press down on the fan assembly to hold it in place and press the pushpins into the holes until they lock into place.

3   Connect the power connector for the replacement fan assembly to the **J14** jack on the card.

4   Insert the UCP-3901 card into the Densité frame.

Put the UCP-3901 into operation and confirm that the critical temperature and fan alarms remain inactive.

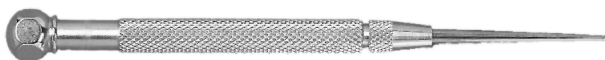## Replacing the Micro-SD Card

When the UCP-3901 does not boot, the Micro-SD card must be replaced.

When replacing a UCP-3901 card for maintenance purposes, you can remove the Micro-SD card from the old UCP-3901 card and then install it on the new UCP-3901 card. This transfers the old card's configuration to the new card so that the replacement UCP-3901 card becomes plug & play with your current installation.

Tools Required

The following tools are required to open and service the UCP-3901.

•   Scribe

Replacing the UCP-3901's Micro-SD Card

1 During off hours when the system is not in use, eject the UCP-3901 card from the Densité frame.

2 Place the UCP-3901 on an anti-static bag or anti-static work surface.

3 Use a scribe to remove the micro-SD card: use the pointed tip to push the card out of the socket. The micro-SD card is located on the UCP-3901 PCB card.
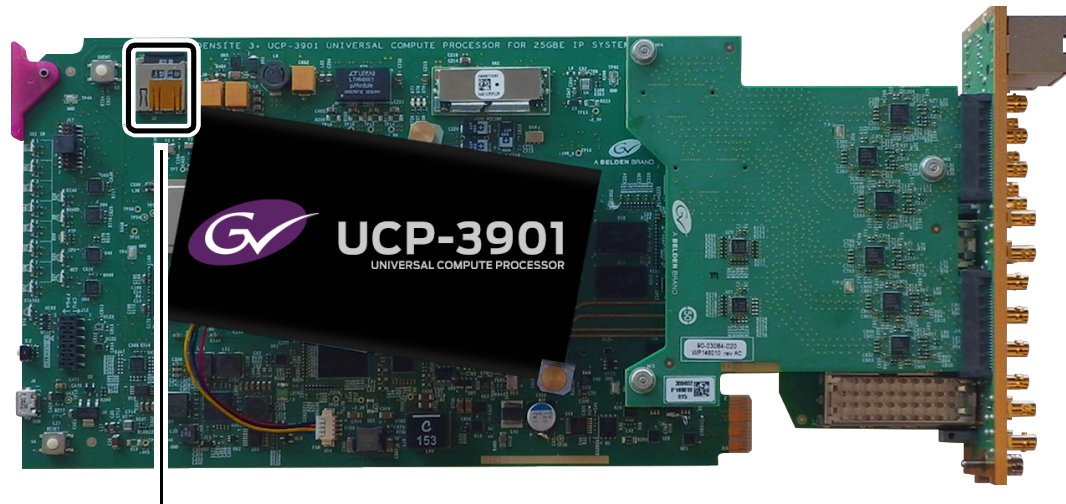
Micro-SD Card and Socket

4 Insert the replacement micro-SD card into the micro-SD card socket.

5 Insert the UCP-3901 card into the Densité frame.

Troubleshooting

Following a methodical process of elimination, try the following steps.

1 Are you using the latest UCP-3901 firmware? To upgrade an UCP-3901's firmware, see Upgrading the UCP-3901's SDC Application, on page 105.

2 The Status Indicators on the UCP-3901 show if it is powered and these indicators provide troubleshooting information. See Front Card-edge Interface, on page 21.

3 All alarms and operational statuses can be seen from Rollcall Logging pages. These pages provide the live status of the card. Theses statuses are also logged when using a Log Server. See Logging Pages, on page 103.

4 Make sure the fiber connectors are clean, as the problem is often related to dust obstructing the light at the fiber connections. See Keep Fiber Connections Clean, on page 120.

5 Use another fiber connection.

6 Swap components of the UCP-3901 with known working components, one component at a time in a systematic fashion to further isolate the issue. For example, swap the SFP transceiver cartridges or use a different port on the network switch.

Further troubleshooting.

Problem	Possible solutions…
SFP n Status LED is blue flashing even with a fiber present	Make sure you are using the right multimode fiber type. By convention, the cable should be orange.
	Make sure the fiber connector is properly seated in the SFP cartridge.
	Make sure the media network switch is a powered-up.
	Make sure the total loss in the optical path is not greater than 2.5 dB, due to any combination of factors mentioned here. Measure the loss if necessary.
	Check the fiber for any damage. The fiber cannot have small circumference loops.
	Check the fiber connectors for dirt and debris. See Keep Fiber Connections Clean, on page 120.
	Make sure your fiber length is within the range of the media network switch and of the SFP cartridge's specification.
	Note: depending on fiber type, and if splices are done on your fiber, the actual maximum usable length will be reduced.
Densité status LED is off	Make sure the card in fully inserted into the frame and that the frame is powered.
After the UCP-3901 has had its firmware upgraded, the menus for UCP-3901 in RollCall are empty or configuration information is missing or incoherent	See To delete RollCall's cache for the UCP-3901, on page 109.
The card does not boot: the Densité status LED stays red	Call Technical Support. See Grass Valley Technical Support, on page 129.
	Technical Support may instruct you to replace the Micro-SD card. For the procedure to do this, see Replacing the Micro-SD Card, on page 118.

When contacting Grass Valley Technical Support, they may ask for product information. This is found in the **Setup** pane. See Setup, on page 96.

Keep Fiber Connections Clean

The physical interface between the optical fiber and the fiber port of the SFP cartridge is the critical point in the system. The fiber and the optical port must be accurately aligned – that's the job of the connector plugs and sockets – and be in intimate contact with no obstructions. That's the job of the user. The small size of the fiber, and the even smaller size of the fiber core, means that even common dust particles can seriously impair the transfer of light from one fiber to another.

There are a variety of cleaning solutions available to help the fiber user maintain good fiber network performance. For best results, it should be possible for the user to perform a visual inspection of the fiber ends to verify cleanliness.

Grass Valley strongly urges all users to select a cleaning method that meets their needs, and to use it rigorously and consistently.

A few tips:

- When an optical fiber is disconnected from the SFP module's optical port, always:
  - Insert a dust plug into the empty SFP module's optical port.
  - Install caps on the open end of the fiber optic cable.

  This keeps airborne particles from settling on the fiber end or in the SFP module's optical port.
- Keep your dust plugs and caps clean – always store them in a sealed container.
- Always follow the instructions carefully when cleaning – abrasions on the fiber ends can degrade system performance significantly.
- A visual inspection will ensure that particles and liquid residue have been removed.
- If it's still dirty, clean it again.

> **Note:** The SFP module's optical ports cannot be cleaned.
> If dust enters the SFP module's optical port to the point where performance degrades, the corrective action is to replace the damaged SFP module with a new one.

Technical Specifications

Inputs/Outputs	Description
Signal Inputs	
Inputs	Up to 16 (0/4/8/12/16)
Connector/Format	HD-BNC/75R panel jack on standard connector panel
Conforms to	3G-SDI to SMPTE 424M/425M level A compatible HD-SDI to SMPTE292M/274M/296M SD-SDI to SMPTE259M-C
Input cable length	Belden 4794A @ UHD / 12G - 60m Belden 1694A @ 2HD / 3G - 120m Belden 1694A @ HD / 1.5G - 165m Belden 1694A @ SD / 270M - 400m
Signal Outputs	
Outputs	Up to 16 (16/12/8/4/0)
Connector/Format	HD-BNC/75R
Conforms to	3G-SDI to SMPTE 424M/425M level A/B compatible HD-SDI to SMPTE292M/274M/296M SD-SDI to SMPTE259M-C
Return loss	• >15 dB up to 1.5 GHz • >10 dB from 1.5 GHz to 3 GHz
Ethernet	
Connector/Format	See Supported SFP28 Cartridges, on page 18.
Conforms to	IEEE 802.3by - 25 Gigabit Ethernet over fiber ST2110-10/20/30 SMPTE-291M/IETF RTP Payload for Ancillary Data AES'67 IEEE-1588v2/SMPTE-2059-2
Video Standards	2160p59.94Hz single raster 2160p50Hz single raster
RollCall Features	
Status	Input and Output status
User memories	None
Communication	
RollCall/RollCall+	Through the gateway or directly through the rear SFP

Status LEDs	
Card edge indicators	See Front Card-edge Interface, on page 21 for more information.
Power Consumption	
Power Consumption	50.0 Watts

Installing the SFP Ethernet Module

Introduction

Installing and removing the SFP output interface cartridge requires special care. This annex describes the process.

Rear panels incorporate one or two SFP interface(s). The interface consists of two parts:

- A socket on the rear panel into which an SFP interface module is plugged
- An SFP (Small Form-factor Pluggable) module that performs output medium translation to which connections are made for optical fibers, coaxial copper, and so on.

> CAUTION
> - SFP fiber Transmitter modules contain a class 1 laser, which emits invisible radiation whenever the module is powered up. Because the SFP is hot-swappable, the module may be powered up as soon as it is installed.
> - DO NOT LOOK INTO AN OPERATING SFP FIBER MODULE'S CONNECTORS, AS EYE DAMAGE MAY RESULT.
> - The SFP module is sensitive to electrostatic discharge (ESD). It is recommended that you use an ESD-preventive wrist strap grounded to the GV Node chassis while handling the SFP module.
> - SFP modules are subject to wear, and their useful lifetime is reduced each time they are inserted or removed. Do not remove them more often than is absolutely necessary.
> - Never remove or install an SFP fiber module with the fiber optic cables connected. Damage to the cables could result.
> - The presence of dust and debris can seriously degrade the performance of an optical interface. It is recommended that you insert a dust plug into the SFP fiber module whenever a fiber optic cable is not connected.

Installing an SFP module
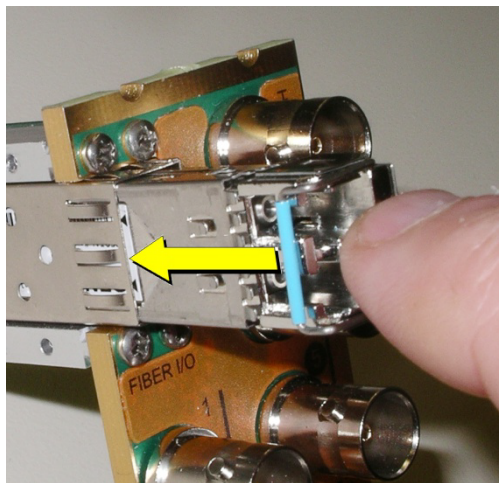
1 Make sure that the bale clasp lever is in the closed position.
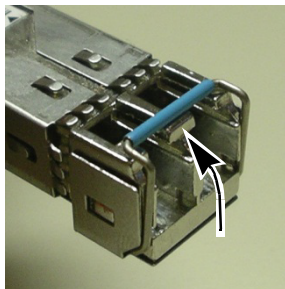
2 Position the SFP module so that the recessed slot is lined up with the tab side of the socket.
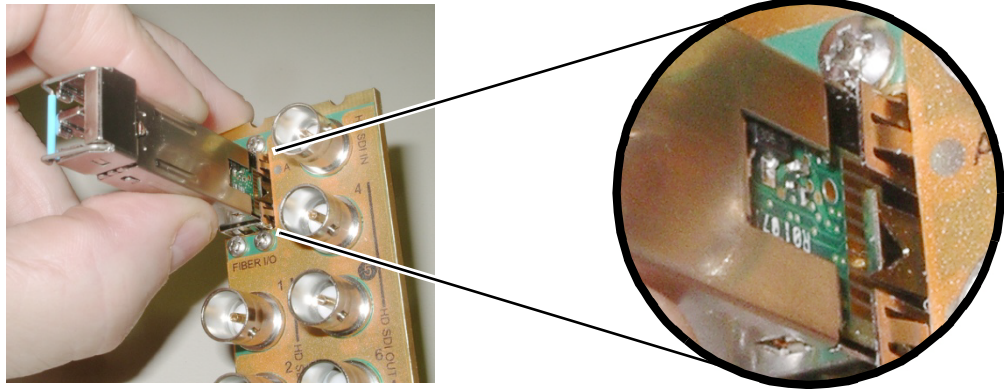
3 Slide the module straight into the socket, and push gently until it clicks into position.


Connecting the fiber optic cables

1 Remove the dust plug from the SFP module if present
2 Verify that the exposed end of the optical fiber in the LC connector is clean
   • Carefully remove any debris if necessary.
3 Plug the LC-terminated fiber optic cable into the SFP module

Removing the fiber optic cables

1 Grasp the LC fiber optic connector that is plugged into the SFP module, and pull it straight out to disengage the optical fiber from the SFP.
   • Never pull the fiber optic cable itself, as irreversible damage may occur.
2 Insert a dust plug into the SFP module.
3 Install caps on the open end of the fiber optic cable.

Removing the SFP module

1 Move the bale clasp lever to the open position.
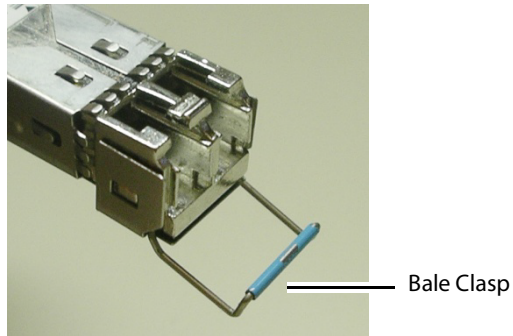
Bale Clasp

2 Grasp the SFP module between your thumb and forefinger, and pull it straight out of the slot.
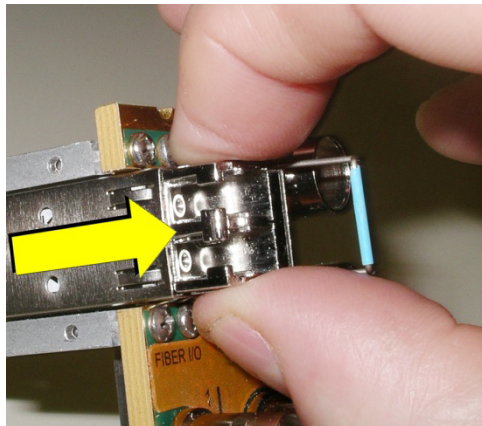
- Do NOT pull on the bale clasp lever to remove the module, as it is easily damaged.
- You may find that you need to wiggle the module, or perhaps push it into the slot a bit, before it will release and slide out.

3 For fiber optic models, insert a dust plug into the SFP module.

Grass Valley Technical Support

For details of our Regional Customer Support Offices, please visit the Grass Valley website and navigate to Support.

www.grassvalley.com/support/

Customers with a support contract should call their personalized number, which can be found in their contract, and be ready to provide their contract number and details.

Corporate Head Office

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