



IQMIX25/40

3G/HD/SD-SDI MULTI-CHANNEL 10/25/40GBE IP
TRANSCEIVERS

User Manual

Issue 2 Revision 1

2020-09-22

www.grassvalley.com

Patent Information

This product may be protected by one or more patents.

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

Copyright and Trademark Notice

Copyright © 2020, Grass Valley Canada. All rights reserved.

Grass Valley®, GV® and the Grass Valley logo are trademarks or registered trademarks of Grass Valley USA, LLC, or its affiliated companies in the United States and other jurisdictions. Grass Valley products listed in this document are trademarks or registered trademarks of Grass Valley USA, LLC or its affiliated companies, and other parties may also have trademark rights in other terms used herein.

Registered trademarks (®) are registered in one or more countries worldwide.

Copyright © 2020 Grass Valley Canada. All rights reserved. Specifications subject to change without notice.

Terms and Conditions

Please read the following terms and conditions carefully. By using IQMIX25/40 documentation, you agree to the following terms and conditions.

Grass Valley hereby grants permission and license to owners of IQMIX25/40 to use their product manuals for their own internal business use. Manuals for Grass Valley products may not be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, for any purpose unless specifically authorized in writing by Grass Valley.

A Grass Valley manual may have been revised to reflect changes made to the product during its manufacturing life. Thus, different versions of a manual may exist for any given product. Care should be taken to ensure that one obtains the proper manual version for a specific product serial number.

Information in this document is subject to change without notice and does not represent a commitment on the part of Grass Valley.

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

Title	IQMIX25/40 User Manual
Part Number	Issue 2 Revision 1
Revision	2020-12-01, 14:27

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.



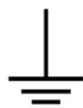
Indicates that the user, operator or service technician should refer to the product manuals for important operating, maintenance, or service instructions.



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.



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

Cautions



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

- This equipment is meant to be installed in a restricted access location.
- When installing this equipment, do not attach the power cord to building surfaces.
- Products that have no on/off switch, and use an external power supply must be installed in proximity to a main power outlet that is easily accessible.
- Use the correct voltage setting. If this product lacks auto-ranging power supplies, before applying power ensure that each power supply is set to match the power source.
- Provide proper ventilation. To prevent product overheating, provide equipment ventilation in accordance with the installation instructions.

- Do not operate with suspected equipment failure. If you suspect product damage or equipment failure, have the equipment inspected by qualified service personnel.
- To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel. Servicing should be done in a static-free environment.
- This unit may have more than one power supply cord. Disconnect all power supply cords before servicing to avoid electric shock.
- Follow static precautions at all times when handling this equipment.

Electrostatic Discharge (ESD) Protection



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

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

Battery Handling



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

http://www.grassvalley.com/assets/media/5692/Take-Back_Instructions.pdf

Cautions for LCD and TFT Displays



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

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

Mesures de sécurité et avis importants

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

Signification des symboles utilisés



Signale la présence d'une tension élevée et dangereuse dans le boîtier de l'équipement ; cette tension peut être suffisante pour constituer un risque de décharge électrique.



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



Invite l'utilisateur, l'opérateur ou le technicien de maintenance à prendre note du calibre du fusible lors du remplacement de ce dernier. Le fusible auquel il est fait référence dans le texte doit être remplacé par un fusible du même calibre.



Identifie une borne de mise à la terre de protection. Il faut relier cette borne à la terre avant d'effectuer toute autre connexion à l'équipement.



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



Signale la présence de composants sensibles à l'électricité statique et qui sont susceptibles d'être endommagés par une décharge électrostatique. Utilisez des procédures, des équipements et des surfaces antistatiques durant les interventions d'entretien.



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



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

Mises en garde



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

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

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

Manipulation de la pile



Ce produit peut inclure une pile de sauvegarde. Il y a un risque d'explosion si la pile est remplacée de manière incorrecte. Remplacez la pile uniquement par un modèle identique ou équivalent recommandé par le fabricant. Disposez des piles usagées conformément aux instructions du fabricant. Avant de vous séparer de votre équipement Grass Valley, veuillez consulter les *informations de mise au rebut et de recyclage* à :

http://www.grassvalley.com/assets/media/5692/Take-Back_Instructions.pdf

Précautions pour les écrans LCD et TFT



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

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

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.

Lithium Batteries

Battery Warning

CAUTION

This equipment contains a lithium battery.
There is a danger of explosion if this is replaced incorrectly.
Replace only with the same or equivalent type.
Dispose of used batteries according to the manufacturer's instructions.
Batteries **shall only** be replaced by trained service technicians.

Your Grass Valley equipment usually comes with at least one button battery located on the main printed circuit board. The batteries are used for backup and should not need to be replaced during the lifetime of the equipment.

Battery Disposal

Before disposing of your Grass Valley equipment, please remove the battery as follows:

- 1 Make sure the AC adapter/power Cord is unplugged from the power outlet.
- 2 Remove the protective cover from your equipment.
- 3 Gently remove the battery from its holder using a blunt instrument for leverage such as a screwdriver if necessary. In some cases the battery will need to be desoldered from the PCB.
- 4 Dispose of the battery and equipment according to your local environmental laws and guidelines.

WARNING

- Be careful not to short-circuit the battery by adhering to the appropriate safe handling practices.
- Do not dispose of batteries in a fire as they may explode.
- Batteries may explode if damaged or overheated.
- Do not dismantle, open or shred batteries.
- In the event of a battery leak, do not allow battery liquid to come in contact with skin or eyes.
- Seek medical help immediately in case of ingestion, inhalation, skin or eye contact, or suspected exposure to the contents of an opened battery.

Laser Safety - Fiber Output SFP and QSFP Modules Warning

LASER SAFETY



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



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 and Belden 1694A (for 3Gbps).

D-TYPE CONNECTORS

D-type connectors shall have metal shells making good RF contact with the cable screen. Connectors having indents which improve the contact between the plug and socket shells are recommended.

toc

Table of Contents

Patent Information	ii
Copyright and Trademark Notice	ii
Important Safety Information.....	iii
Environmental Information.....	x
Lithium Batteries	xi
Battery Disposal	xi
Laser Safety - Fiber Output SFP and QSFP Modules Warning.....	xii
Safety and EMC Standards.....	xii
Safety Standards	xii
EMC Standards.....	xii
1 Introduction	19
Description	19
Block Diagrams	19
IQMIX25	19
IQMIX40	20
Order Codes	20
Rear Panel View	21
Feature Summary	23
IQMIX25 3G/HD/SD-SDI Multi-channel IP Transceiver.....	23
IQMIX40 3G/HD/SD-SDI Multi-channel IP Transceiver.....	23
Enclosures	24
4U B-style Enclosure	24
3U B-style Enclosure	24
IQFAN00 Cooling Fan Module	25
Fitting the Fan Module.....	25
2 Technical Specification	27
3 Connections	29
SDI HD-BNC Inputs/Outputs	29
10/25G Ethernet SFP	29
40G Ethernet QSFP	29
SFP Link LED Indicators.....	29
4 Card Edge LEDs	31
5 RollCall Control Panel	33
Terminology	33
Navigating Pages in the RollCall Template	33
Template Pages.....	33
Setting Values	34
Information Display	34
Selecting the Information to Display.....	35

Configuration	36
Setting Spigot Configuration	37
Time Sync Configuration	38
PTP Status Details	39
Sender TPG (Test Pattern Generator)	43
Receiver TPG (Test Pattern Generator)	44
Counters	45
FEC	46
NMOS	48
Overview	48
Label Patterns	50
Ethernet Pages 1 and 2	53
The Ethernet Pane	53
The Switch LLDP Info Pane	53
The All Traffic/CPU Traffic Panes	53
Ethernet 1 and 2 RTP Sender	54
Ethernet 1 and 2 RTP Receiver	55
Ethernet RTP Receiver Video Stats	56
About Flow IDs	56
Ethernet RTP Receiver Audio Stats	57
About Flow IDs	57
Ethernet RTP Receiver Meta Stats	58
About Flow IDs	58
Link Control	59
UHD Links	59
TPG	59
HDR Control	60
Destination Timing	62
Audio V Fade	63
Audio Type Control	64
Input Loss Control	65
Spigot Pages	66
Input Spigots	66
Output Spigots	69
Spigot Pane	69
Flow Pane	70
Logging - SDI Info	72
Logging - System	73
Logging - Network	77
Logging - SFP	79
Logging - FPGA	82
Logging - Spigot	83
Logging - NMOS	86
Logging - Card Diagnostics	87
RollTrack	88
Disable All	88
RollTrack Index	88
RollTrack Source	88
RollTrack Address	88
RollTrack Command	89
RollTrack Sending	89
RollTrack Status	89
Loopback Router	90
Setup	91
Restart	92
Defaults	92
Ethernet Gb	93
The Ethernet Pane	93

Ethernet Arcnet93
Interop Page94
SFP Configuration Page96

Contact Us..... 97

1 Introduction

Description

The IQMIX series is a range of multi-channel video over IP transceiver modules developed for use within low latency, high bandwidth Ethernet IP networks, capable of encoding/decoding multiple SDI signals. They provide both compressed and uncompressed modes of operation.

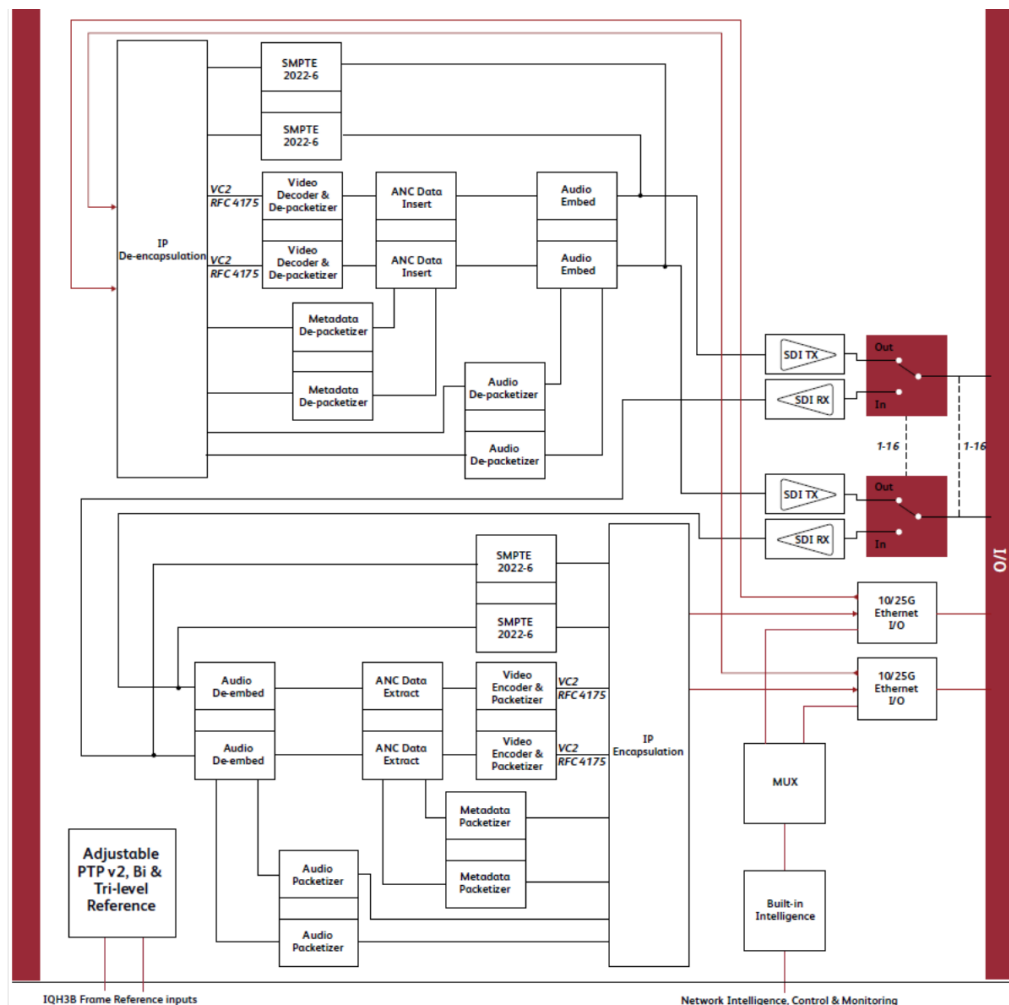
Using SMPTE 2042 (VC2) lightweight compression allows for high quality signal carriage whilst optimizing bandwidth requirements, while sending signals uncompressed provides best quality transport although at the expense of bandwidth.

Encapsulation of signals in a SMPTE 2022-6 transport stream can also be handled to provide compatibility with other video over IP solutions.

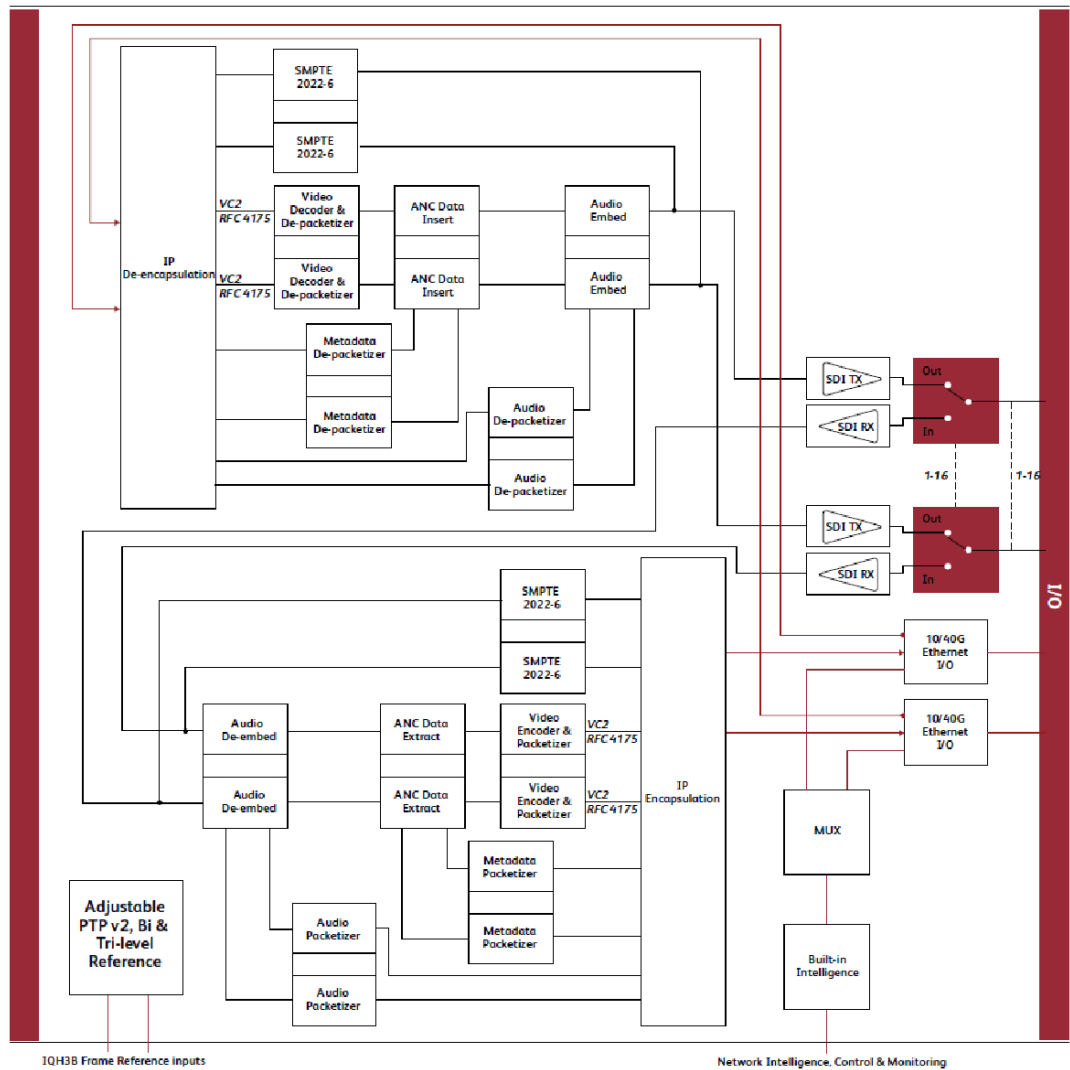
SMPTE 2110 allows each signal component to be separately routable, i.e. video, audio, ANC etc can be part of different streams.

Block Diagrams

IQMIX25



IQMIX40



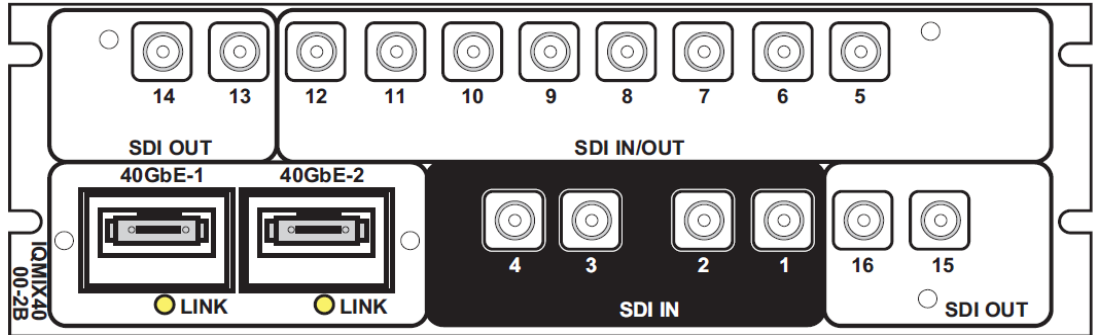
Order Codes

The following product order codes are covered by this manual:

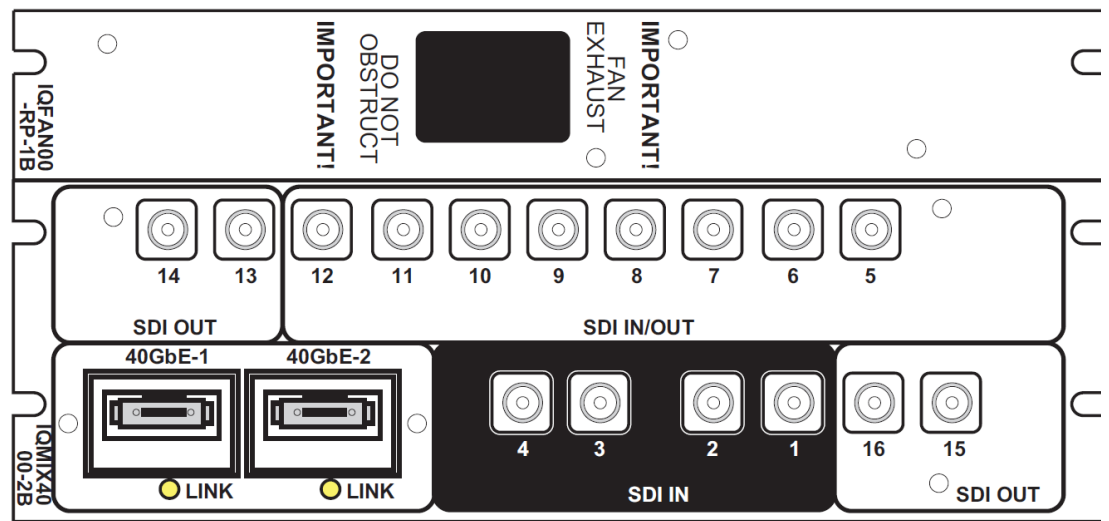
- IQMIX4000-2B3** 16 channel SDI to IP transceiver with 40GbE interface. Up to 16 SDI inputs or outputs, 2 x 40GbE ports.
- IQMIX4001-3B3** 16 channel SDI to IP transceiver with 40GbE interface. Up to 16 SDI inputs or outputs, 2 x 40GbE ports. Includes IQFAN rear panel for additional cooling in IQH3B frame.
- IQMIX4010-2B3** 16 channel SDI to IP transceiver with 10GbE interface. Up to 16 SDI inputs or outputs, 2 x 10GbE ports.
- IQMIX4011-3B3** 16 channel SDI to IP transceiver with 10GbE interface. Up to 16 SDI inputs or outputs, 2 x 10GbE ports. Includes IQFAN rear panel for additional cooling in IQH3B frame.
- IQMIX2500-2B3** 16 channel SDI to IP transceiver with 25GbE interface. Up to 16 SDI inputs or outputs, 2 x 25GbE ports.
- IQMIX2501-3B3** 16 channel SDI to IP transceiver with 25GbE interface. Up to 16 SDI inputs or outputs, 2 x 25GbE ports. Includes IQFAN rear panel for additional cooling in IQH3B frame.

Rear Panel View

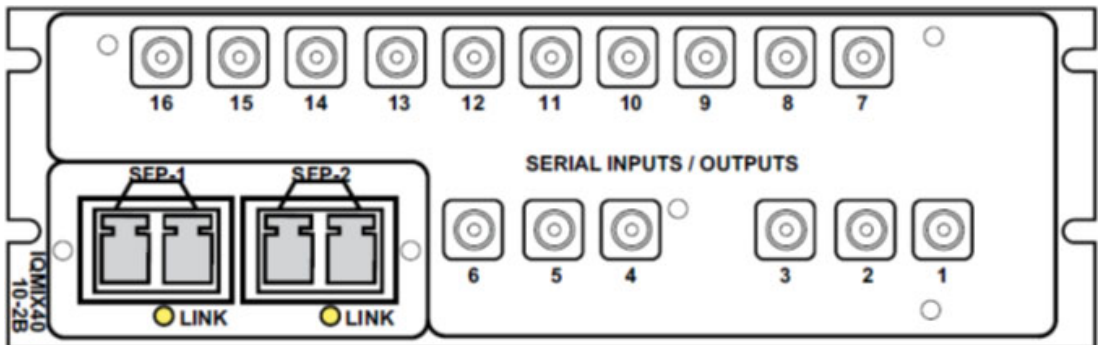
The following rear panel types are available:



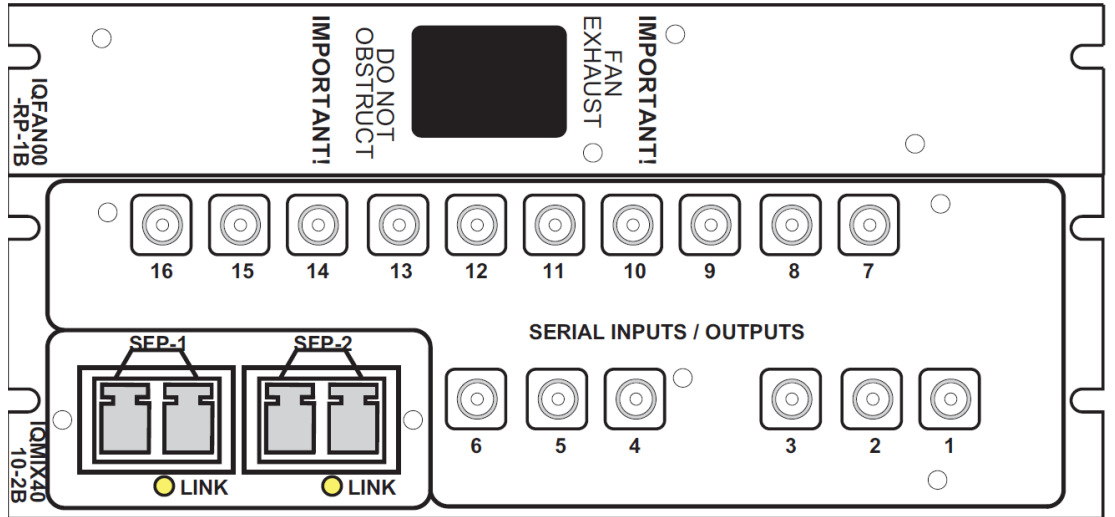
IQMIX4000-2B3



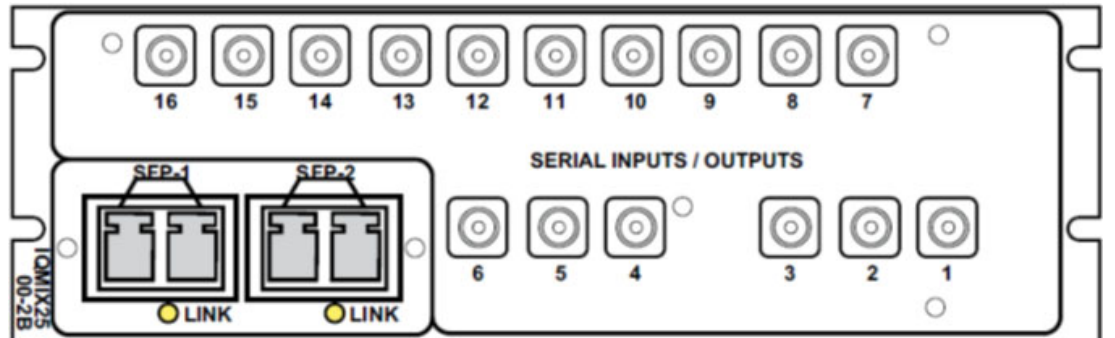
IQMIX4001-3B3



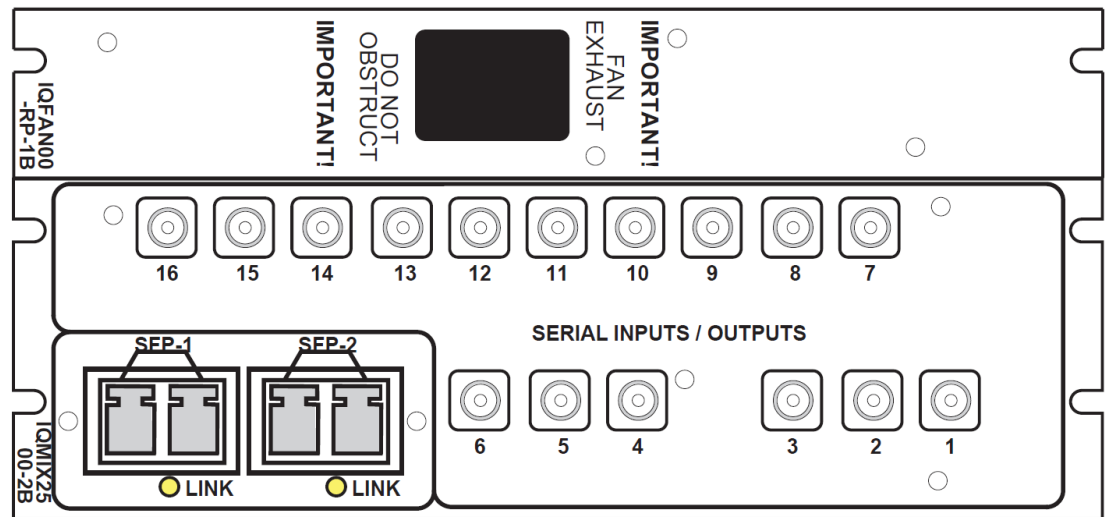
IQMIX4010-2B3



IQMIX4011-3B3



IQMIX2500-2B3



IQMIX2501-3B3

Feature Summary

IQMIX25 3G/HD/SD-SDI Multi-channel IP Transceiver

- Handles up to 16 SDI signals over dual 10GbE or 25GbE IP links (dependent on SDI signal format and compressed/uncompressed transport mode).
- Supports configuration of Ethernet links for maximum signal transport using both SFPs, or for dual link mode to provide link redundancy as per SMPTE 2022-7.
- Multiple transport types available for each SDI input, including:
 - Compressed IP transport using SMPTE-2042 (VC2) low latency high quality encoding profile.
 - Uncompressed video transport using either ST2110-20 or SMPTE-2022-6 encapsulation.
 - PCM audio using ST2110-30.
 - ST2110-40 metadata support.
- Timing and synchronization provided by IEEE-1588v2 (PTP), or via the IQH3B/IQH4B frame analog reference bus.
- Supports unicast as well as IGMPv3 source-specific multicast, allowing point to point operation or transmission in multicast groups.
- 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.

IQMIX40 3G/HD/SD-SDI Multi-channel IP Transceiver

- Handles up to 16 SDI signals over dual 10GbE or dual 40GbE IP links (dependent on Ethernet rate, SDI signal format and compressed/uncompressed transport mode).
- Supports configuration of Ethernet links for maximum signal transport using both SFPs, or for dual link mode to provide link redundancy as per SMPTE 2022-7.
- Multiple transport types available for each SDI input, including:
 - Compressed IP transport using SMPTE-2042 (VC2) low latency high quality encoding profile.
 - Uncompressed video transport using either ST2110-20 or SMPTE-2022-6 encapsulation.
 - PCM audio using ST2110-30.
 - ST2110-40 metadata support.
- Timing and synchronization provided by IEEE-1588v2 (PTP), compliant with SMPTE-2059-2, or via the IQH3B frame analog reference bus.
- Supports unicast as well as IGMPv3 source-specific multicast, allowing point to point operation or transmission in multicast groups.
- Standards supported:
 - UHD-SDI (4x3G-SDI)
 - 3G-SDI to SMPTE 424M/425M level A compatible.
 - HD-SDI to SMPTE292M/274M/296M.
 - SD-SDI to SMPTE259M-C.
 - 40G Ethernet to IEEE 802.3.
- RollCall control and monitoring compatible, with standard logging and reporting features.

Enclosures

The IQMIX modules fit the enclosures shown. Ensure that the supplied cooling fan module is also fitted as described in [IQFAN00 Cooling Fan Module](#), below.

Note: Although IQ modules are interchangeable between enclosures, their rear panels are enclosure-specific. An IQH3B enclosure accepts modules with either "A" or "B" order codes; an IQH3A or IQH1A enclosure accepts modules with "A" order codes only.

4U B-style Enclosure



Enclosure order code: IQH4B-S-P

3U B-style Enclosure



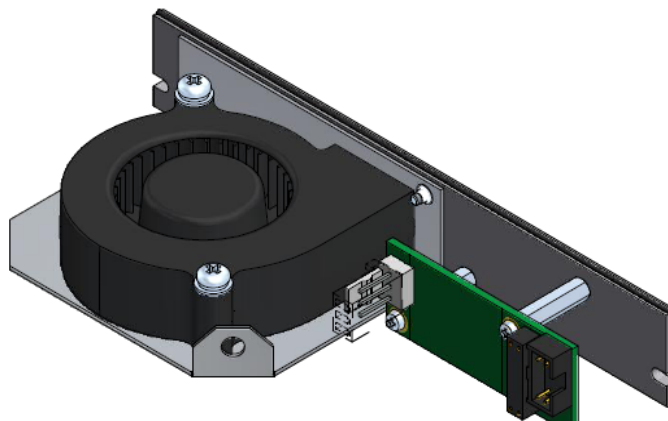
Enclosure order codes: IQH3B-S-0, IQH3B-S-P

Note: The IQH3B enclosure provides two internal analog reference inputs. These inputs are applicable to modules with "B" order codes only.

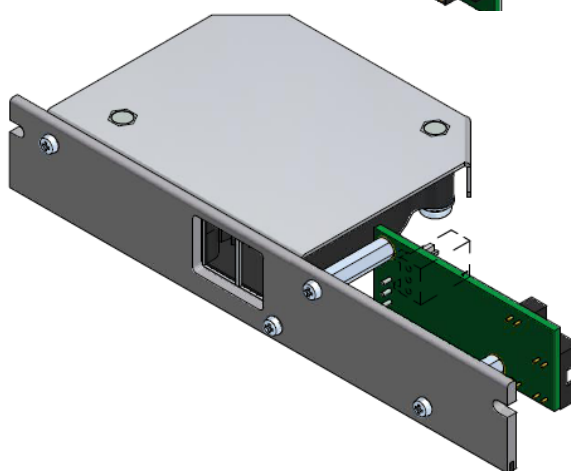
IQFAN00 Cooling Fan Module

IQMIX25/26/40/41 cards are supplied with IQFAN00 cooling modules. Ensure these are fitted according to the instructions below.

Front View



Rear View



IQFAN00 Cooling Module

IMPORTANT
Do not run IQMIX cards without the fan modules. This can cause severe damage to the equipment.

Fitting the Fan Module

A fan module must be fitted immediately to the left of each IQMIX card, as viewed from the rear.

IMPORTANT
Before performing this operation, ensure that the power supply is switched OFF and the mains power connection at the rear of the unit is removed.

- 1 Choose an empty slot position for the module, immediately to the left of the IQMIX as viewed from the rear.
- 2 Remove the screws securing the blanking plate covering the chosen slot position. Remove and store the blanking plate in a safe place for future use.
- 3 Ensuring correct orientation, fit the fan module rear connecting panel to the rear of the enclosure in the vacant aperture, and secure with the fixing screws provided.
- 4 Reattach the power supply and start up the enclosure. The fan should start immediately.

Technical Specification



Inputs/Outputs	
Signal Inputs	
3G/HD/SD-SDI Inputs	Up to 16 (0/4/8/12/16)
Connector/Format	HD-BNC/75R
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 1694A @ 3 Gbit/s - 80m Belden 1694A @ 1.5 Gbit/s - 140m Belden 1694A @ 270 Mbit/s - 350m
Signal Outputs	
3G/HD/SD-SDI 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
Ethernet	
Connector/Format	10GbE = SFP+ 25GbE = SFP+ 40GbE = QSFP
Conforms to	SMPTE 2110-20/30/40 <i>SVIP Timing and Video</i> SMPTE 291M/IETF <i>RTP Payload for Ancillary Data</i> VC-2 AES'67 IEEE-1588v2/SMPTE-2059-2
Video Standards	1080p60, 1080p59, 1080p50 (SMPTE ST274) 1080i30, 1080i29, 1080i25 (SMPTE ST274) 720p60, 720p59, 720p50 (SMPTE ST296) 625i25, 525i29 (SMPTE ST125)

Latency	<p>IP Sender: < 1 line (ignoring compression codec latency) IP Receiver: N->(N+1) frames*</p> <p>*This is dependent on the setting <i>N</i>, currently 0/1/2/3, for the number of frames of delay applied in the packet store buffer. With <i>N</i>=0, the minimum delay is approximately 32 lines by default. VC2 codec latency is approx. 6 lines for both encode and decode.</p>
RollCall Features	
Status	Input and Output status
User memories	None
Communication	
RollCall/RollCall+	Via gateway or directly via rear SFP
Indicators Front Panel and Card Edge	
Front Panel and Card Edge	<p>Green = Power OK Green flashing = CPU OK</p>
16 x Input standard detection LEDs	<p>Off = Input/Spigot not in use Red = No input Yellow = TPG Green = Video flow detected (SDI input for Sender spigot, output IP flow for Receiver spigot)</p>
(Q)SFP LEDs	<p>Red = Fault - rear assembly 3V3 regulator failure. Green = 10G Blue = 25G Cyan = 40G</p>
Logging	<p>Input Status Input Alarms Output Alarms Output Status Misc</p>
RollTrack controls	On/off, Index, Source, Address, Command, Status, Sending
Setup	Versions, reset defaults, restart
Specifications	
Electrical	Transport Stream
Connector/Format	HD-BNC
Power Consumption	
Module Power Consumption	<p>IQMIX25 34.5 PR Max (B frame only) IQMIX40 37.5 PR Max (B frame only)</p>

3 Connections

This section describes the physical input and output connections provided by the IQMIX modules.

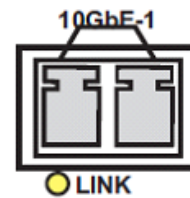
SDI HD-BNC Inputs/Outputs

16 x 3G/HD/SD-SDI interfaces provided with HD-BNC.



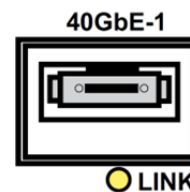
10/25G Ethernet SFP

SFP+ supporting 10/25G Ethernet.



40G Ethernet QSFP

QSFP+ supporting 40G Ethernet.



SFP Link LED Indicators

SFP/QSFP LEDs indicate the following:

SFP:

- **Red** = Fault - 3V3 regulator failure.
- **Green** = OK (10G)
- **Blue** = OK (25G).

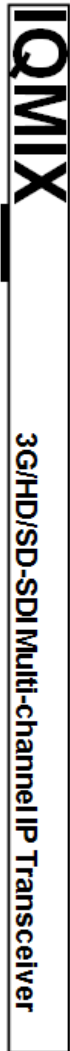
If the LED is flashing, the link is down.

QSFP:

- **Cyan** = OK (40G)


4 Card Edge LEDs

The LEDs on the edge of the module indicate its operating status.

Front Panel			Description
	● STATUS	PB=IDENT	STATUS Green = PTP-LOCK OK Off = PTP-LOCK Fail
	● BOARD	● CPU	BOARD Green = CPU clock running. Off = CPU stopped.
	● PTP	● REF	REF Green flashing = Watchdog timer OK
	● 8	● 16	1 - 16 - Spigot status. Off = Input/Spigot not in use. Red = No input. Yellow = TPG. Green = Video flow detected (SDI input for Sender spigot, output IP flow for Receiver spigot).
	● 7	● 15	
	● 6	● 14	
	● 5	● 13	
	● 4	● 12	
	● 3	● 11	
	● 2	● 10	
	● 1	● 9	
	● SFP 2	● QSFP 2	SFP 1 - 2 = Status/lane. Red = Fault (3V3 regulator failure), Green = OK (10G SFP), Blue = OK (25G SFP). If flashing, link is down.
	● SFP 1	● QSFP 1	
	PB=RESET		

5 RollCall Control Panel

This chapter contains information on using the IQMIX modules with RollCall.

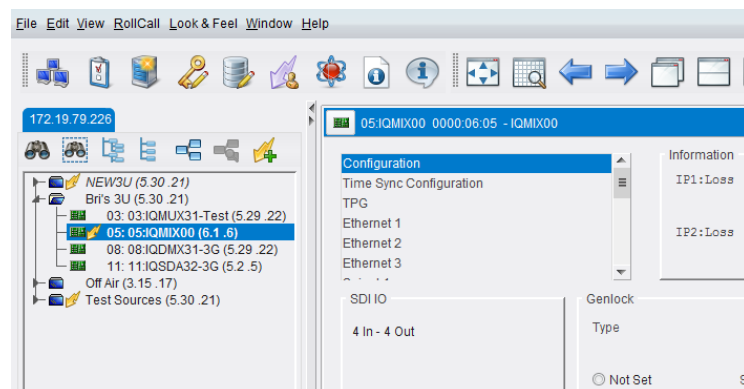
For help with general use of the RollCall application, open the user manual by clicking the  button on the main RollCall toolbar.

Terminology

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	Sequence of RTP packets of a single essence.
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.



Template Pages

Template Pages


The following pages are available:


- **Configuration** - see [page 36](#).
- **Time Sync Configuration** - see [page 38](#).
- **Sender TPG (Test Pattern Generator)** - see [page 43](#).

- **Receiver TPG (Test Pattern Generator)** - see [page 44](#).
- **Counters** - see [page 45](#).
- **FEC (MIX25 only)** - see [page 46](#).
- **NMOS** - see [page 48](#).
- **Ethernet Pages 1 and 2** - see [page 53](#).
- **Ethernet 1 and 2 RTP Sender** - see [page 54](#).
- **Ethernet 1 and 2 RTP Receiver** - see [page 55](#).
- **Ethernet RTP Receiver Video Stats** - see [page 56](#).
- **Ethernet RTP Receiver Audio Stats** - see [page 57](#).
- **Ethernet RTP Receiver Meta Stats** - see [page 58](#).
- **Link Control** - see [page 59](#).
- **HDR Control** - see [page 60](#).
- **Destination Timing** - see [page 62](#).
- **Audio V Fade** - see [page 63](#).
- **Audio Type Control** - see [page 64](#).
- **Input Loss Control** - see [page 65](#).
- **Spigot 1-x** - see [page 66](#).
- **Logging - SDI Info** - see [page 72](#).
- **Logging - System** - see [page 73](#).
- **Logging - Network** - see [page 77](#).
- **Logging SFP** - see [page 79](#).
- **Logging FPGA** - see [page 82](#).
- **Logging Spigot 1-x** - see [page 83](#).
- **Logging - NMOS** - see [page 86](#).
- **Logging - Card Diagnostics** - see [page 87](#).
- **Rolltrack** - see [page 88](#).
- **Loopback Router** - see [page 90](#).
- **Setup** - see [page 91](#).
- **Ethernet Gb** - see [page 93](#).
- **Ethernet Arcnet** - see [page 93](#).
- **Interop** - see [page 94](#).
- **SFP Configuration** - see [page 96](#).

Setting Values

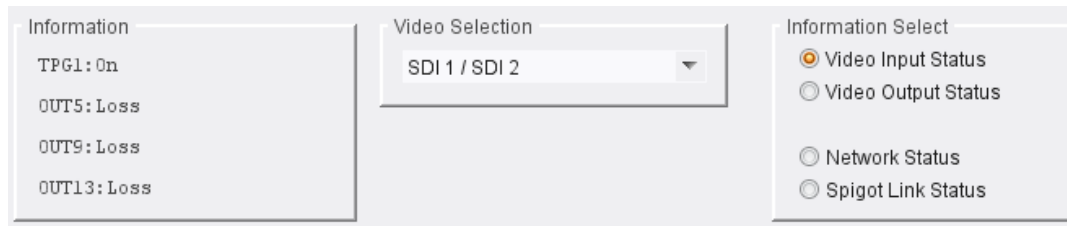
Many of the settings within the templates have values, either alpha or numeric.

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  **Save Value** button.

Clicking an associated  **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 module. The information to be displayed is defined on the **SDI Selection** and **Information Select** panes to the right of the **Information** display.



Information and Selection Panes

Selecting the Information to Display

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

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

Configuration

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

Configuration page 1932

The following facilities are available from this page:

Option	Operation
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 module to be easily identified.
Genlock	Select Genlock type: <ul style="list-style-type: none"> • Network - click to select PTP. See PTP - An Overview, below. • Chassis Reference A/B - click to select an on-chassis reference. • Freerun - click to allow free running.

Option	Operation
GUID	Displays the absolute unique identifier associated with the module.
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 Ethernet interface.
Card Firmware/Software Version	Each software version contains multiple firmware images. These allow different spigot input/output and flow standard combinations to be selected. See Setting Spigot Configuration , below, for more information.
Reset to Defaults on Restart	Enable checkbox to cause any existing details stored on the module, other than network IP settings, to be cleared down prior to restarting the module. See Setting Spigot Configuration , below, and Defaults on page 92 for more information.

PTP - An Overview

PTP provides a mechanism for distributing a common reference clock throughout the system. Each device maintains an internal clock that is synchronized to this common reference clock. RTP timestamps within the RTP packet header (and extended header) are used for synchronization.

Synchronization across multiple essence streams is achieved by comparing the offset between the RTP timestamp and clock.

Setting Spigot Configuration

IMPORTANT!

Existing details must be cleared down before establishing a new configuration. Failure to do this may result in unexpected behavior from the module.

To set a new spigot configuration, follow these steps:

- 1 From the **Configuration** page, 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 **Card Firmware>New** pane.
Note that **Restore** and **Restart** buttons are displayed only when an item not currently installed is selected.
- 2 Enable the **Reset to Defaults on Restart** checkbox. This will cause existing details stored on the module, other than network IP settings, to be cleared down prior to restarting the module. See [Defaults](#) on page 92 for more information.
- 3 Click **Restart** to restart the module and implement any changes made.

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.

Time Sync Configuration Page **1852/1932**

The following facilities are available from this page:

Option	Operation
Time Sync Mode	<p>Click a radio button to select the required mode. Note that the PTP options require a grandmaster clock to be present in the system.</p> <p>Note: Mixing modes within a system is not advisable. For example, PTP uses atomic time (TAI), whereas NTP is UTC, which is leap-second corrected. So, the two systems will not give identical results.</p> <p>Options are:</p> <ul style="list-style-type: none"> • PTP Multicast - this uses multicast for both sync and follow-up messages. • PTP Unicast - this uses multicast for the sync messages and unicast for the follow-up messages. • NTP - uses NTP for local clock correction. NTP can usually maintain time to an accuracy of around 1-10ms, but this value could rise to something on the order of >100ms, depending on network congestion, asymmetry, etc. This potentially means that 1-5 frames of misalignment of the local device clocks may be seen across the network. • Freerun - the local device clock is left to free run, that is it is not corrected with respect to the world clock. This will drift over time. <p>Select as required.</p>
NTP Configuration	<p>Allows an NTP server to be specified. To add an NTP server, enter the server's IP address in to the New field.</p>

Option	Operation
PTP Network Interface	<p>Allows selection of the interface which is to support PTP. Enable check boxes as required.</p> <ul style="list-style-type: none"> The Preference list allows port priority to be set. Select from: <ul style="list-style-type: none"> None - PTP will fail over from one to the next in the absence of sync messages. Once failed over, it shall remain on that port until it fails over again. Ethernet 1 - If Ethernet 1 is available, it has priority. Thus, if we have failed from Ethernet 1 to Ethernet 2, as soon as Ethernet 1 becomes available again we will switch back. Ethernet 2 - as per Ethernet 1 but for Ethernet 2.
PTP Configuration	<p>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.</p>
PTP Status	<p>Displays PTP status information. Enable the Details check box to display detailed interface status information, reset counters, show details for other PTP interfaces etc. See PTP Status Details, below, for more information.</p>
Save Settings	<p>Displayed only if settings on this page are changed. Clicking Restore will discard the changes, while clicking Restart will implement the changes and reboot the module.</p>

PTP Status Details

When the **PTP Status Details** check box is enabled, the following information is displayed:

Interface Status

Displays which port is being used for local clock correction. Click **Next Interface** to move between available PTP Network interfaces.

Interface Status				
Network Interface	Ethernet 2 (BACKUP)			
PTP Grandmaster				
Clock Identity	Free-Running	Avg Delay	+0.0uS	Std Dev +0.0uS
Clock Status	NO LOCK	Avg Error	+0.0uS	+0.0uS
Last Lock		Sync Interval	1s	
Lost Lock		Request Interval	1s	
1 Step Syncs	0	Clock Loaded	0	
2 Step Syncs	0	Synchronisations	0	
Follow Ups	0	Time taken to lock		
Delay Requests	0	Message Timeouts	0	
Delay Responses	0	Clock Back Steps	0	
Announcement	0	Clock Blips	0	
Signalling	0	Delay Blips	0	
Management	0	Correction Blips	0	
Version Errs	0	FollowUp OoS Errs	0	
Unknown Msgs	0	FollowUp Id Errs	0	
Length Errs	0	Response OoS Errs	0	
Unexpected 2 Step	0	Response Id Errs	0	
RX Timestamp Errs	0			
TX Timestamp Errs	0			

Interface Status pane

Interface Status Details

Item	Description
Last Lock	Time when PTP last locked.
Lost Lock	Time when PTP last lost lock.
1 Step syncs	Increments on reception of Sync message that has the twoStepFlag=false.
2 Step Syncs	Increments on reception of Sync message that has the twoStepFlag=true.
Follow Ups	Increments on reception of every follow_up message.
Delay Requests	Increments on reception of every delay_req message.
Delay Responses	Increments on reception of every delay_resp message.
Announcement Messages	Increments on reception of every announce message.
Signaling	Increments on reception of each PTP Signaling message.
Management	Increments on reception of each PTP Management message.
Version Errs	The IQMIX supports PTPv2 only. If a PTPv1 message is received, it is discarded, and this counter incremented. This would be an indication that the grandmaster clock is not configured correctly.
Unknown Msgs	If the product receives messages on the PTP multicast address port 319 or 320 that are not messages defined as PTP ones this counter is incremented.
Length Errs	PTP messages with an invalid length cause this counter to increment.
Unexpected 2 Steps	Increments on the reception of a follow_up message but the sync message is indicating 1 step.
RX Timestamp Errs	Increments for every PTP message where the sequence number is as expected but its timestamp is not valid.
TX Timestamp Errs	Increments for every delay_resp message where its sequence number is as expected but its timestamp is not valid.
Av Delay	This is the average network delay time from the grandmaster to the UCP. This should be stable and in the order of 10-20µs.
Av Error	The average error is the difference between the grandmaster and the UCP local clock. If locked, this number will be small.
Sync Interval	From IEEE1588 7.7.2.1: "For each of the message types Announce, Sync, Delay_Req and Pdelay_Req, the mean time interval between successive messages shall be represented as the logarithm to the base 2 of this time interval measured in seconds on the local clock of the device sending the message. The values of these logarithmic attributes shall be selected from integers in the range 128 to 127 subject to further limits established in an applicable PTP profile. The interpretation of the logMessageInterval depends on the message type; see 13.3.2.11. Except for Delay_Req messages (see 9.5.11.2), a node shall, with 90% confidence, issue messages with intervals within ±30% of the stated value of this attribute."

Item	Description
Request Interval	Return actual minimum interval between delay request messages. This is as set in the PTP Delay Request Frequency control. See Configuration on page 36. Values are, {256/s, 128/s, 64/s, 32/s, 16/s, 8/s, 4/s, 2/s, 1s, 2s, 4s, 8s, 16s}.
Clock Loaded	Increments if the interface was live and the PTP was forced to update (crash lock).
Synchronizations	Increments every time a PTP lock is achieved.
Time Taken to Lock	Length of time it has taken to lock the interface.
Message Timeouts	Increments if none of the following are received within any 2-second period: <ul style="list-style-type: none"> • follow_up • delay_resp • sync • announce
Clock Steps Back	If the IQMIX receives a time earlier than the last, this counter is incremented. This could be because of a fault with the grandmaster, or because there are multiple grandmasters in the system.
Clock Blips	This increments if the local clock offset is >300ns, <-300ns.
Delay Blips	This increments if the network delay is >120%, or <80% of the previous value.
Correction Blips	Uses the <code>correctionField</code> in the header of <code>delay_resp</code> message from the grandmaster. From IEEE1588 13.3.2.7: "The <code>correctionField</code> is the value of the correction measured in nanoseconds and multiplied by 65536. For example, 2.5 ns is represented as 0x28000. Increments if the <code>correctionField</code> is > 40000 (0.61ns).
FollowUp OoS Errs	Increments for every <code>follow_up</code> message that is out of sequence.
FollowUp ID Errs	Increments for every <code>follow_up</code> message that is not from the expected clock.
Response OoS Errs	Increments for every <code>delay_response</code> message that is out of sequence.
Response ID Errs	See Histogram below.

Histogram

The Histogram provides a graphical representation of the distribution of differences between the module'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.



Histogram pane

Visible Clocks

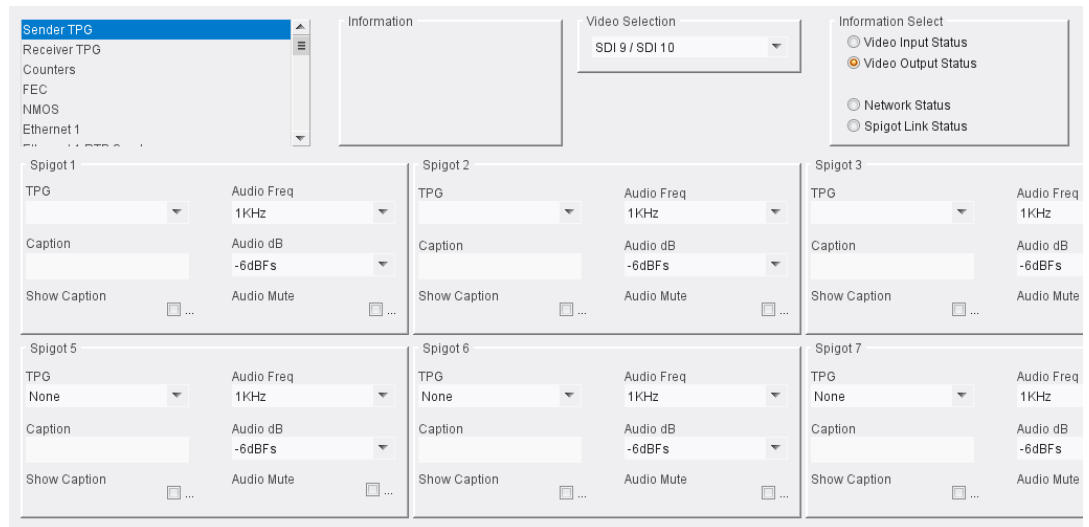
Displays the grandmaster clocks present on the network.

Clock	Domain	Priority1	Quality	Priority2	Steps
00:00:00-00:00:00:00:00	00	00	00-00-0000	00	00

Visible Clocks pane

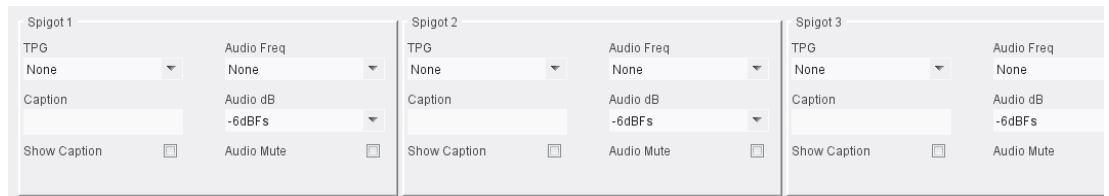
Sender TPG (Test Pattern Generator)

The **Sender TPG** page allows test patterns to be applied to senders on a spigot-by-spigot basis.



Sender TPG Page

The page displays a pane for each spigot in use, as shown above; captions can be defined, TPG enabled or disabled and audio configured for each. However, when spigots are linked, only the Master spigot can be configured; the Slave spigots inherit their configuration from the Master, and have their controls disabled.



Sender TPG page Linked Spigot Display

The following options are available for each spigot:

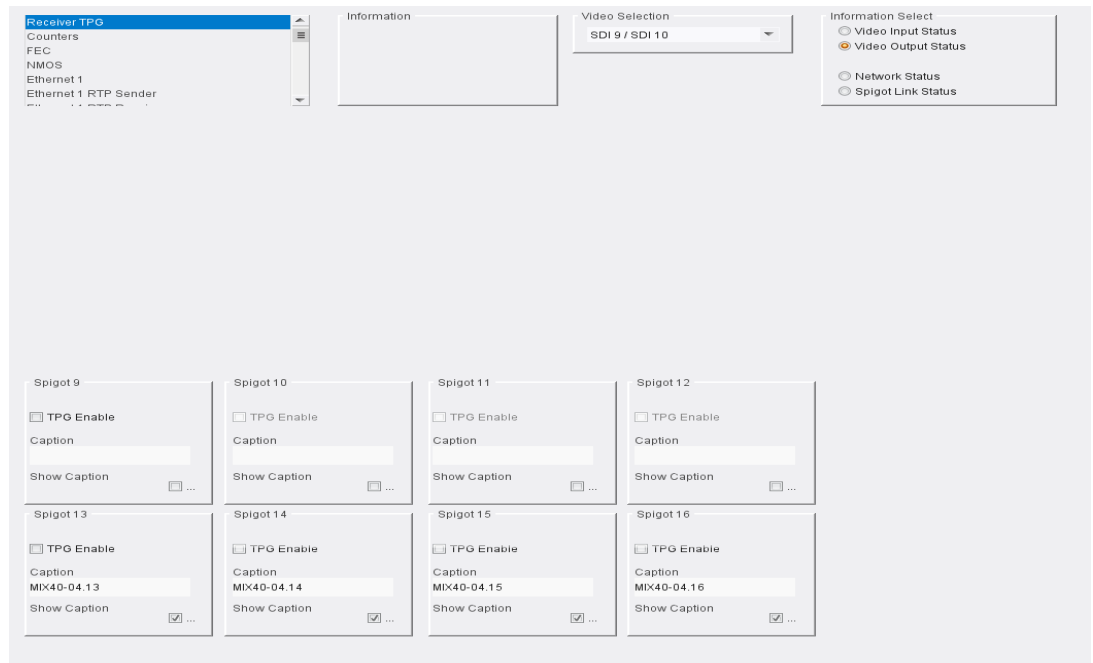
Option	Operation
TPG	Select the test pattern to apply to the spigot from the drop-down list.
Audio Freq	Select the audio frequency to apply to the spigot from the drop-down list.
Caption	Type a caption (max 19 characters) to optionally be displayed with the test pattern.
Audio dB	Select the dB level to apply to the spigot from the drop-down list.
Show Caption	Enable the checkbox to display the caption with the test pattern.
Audio Mute	Enable the checkbox 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.

Click **Show Caption** to overlay a caption on the video essence.

Receiver TPG (Test Pattern Generator)

The **Receiver TPG** page allows test patterns to be applied to receivers on a spigot-by-spigot basis.



Receiver TPG Page

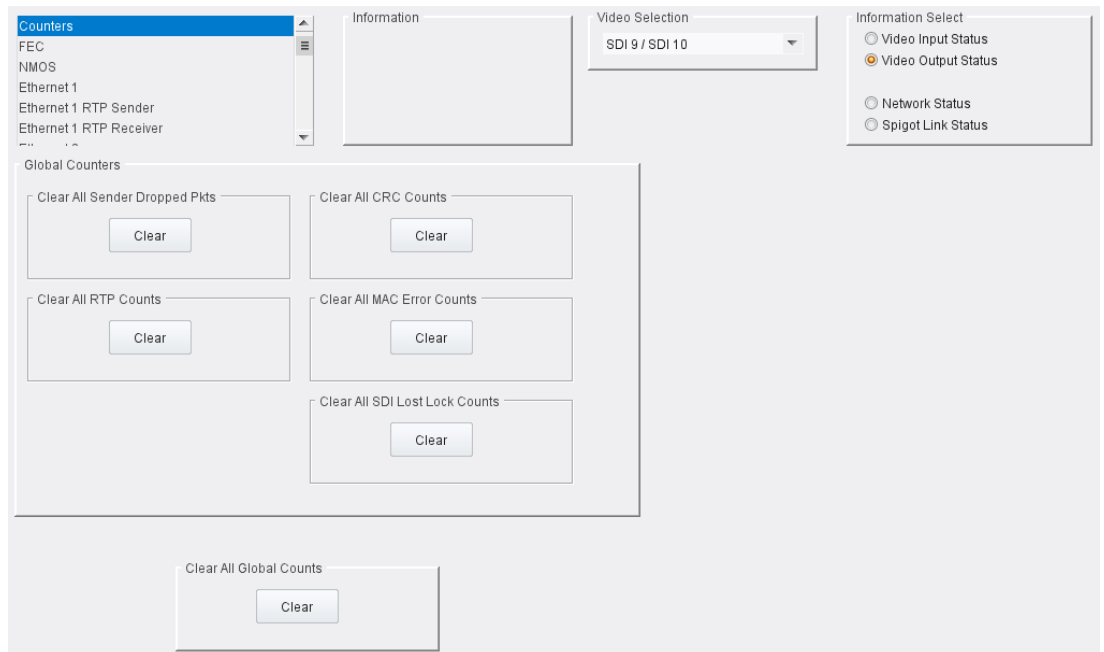
The following options are available for each spigot:

Option	Operation
TPG Enable	Click to enable TPG on this spigot.
Caption	Enter a caption for the spigot (optional).
Show Caption	Click to overlay the caption on the video essence.

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

Counters

The **Counters** page allows the various timers provided by the module to be reset to zero.



Counters Page

Click the appropriate **Clear** button to zero a counter.

FEC

The **FEC** page allows control of FEC functionality. The variety of FEC to be used is selected via the **Card Firmware/Software Version** options on the **Configuration** page; see [Configuration](#) on page 36 for more information.

FEC Page

The following facilities are available from this page:

Option	Operation
FC-FEC (displayed only if a relevant configuration is in use. See Configuration on page 36 for more information).	Allows low-latency FC-FEC error correction to be used. Options are: <ul style="list-style-type: none"> • On • Off • Status - Displays lock status for each SFP.

Option	Operation
RS-FEC (displayed only if a relevant configuration is in use. See Configuration on page 36 for more information).	Allows longer-range RS-FEC error correction to be used. Options are: <ul style="list-style-type: none"> • On • Off • IEEE Clause 108 • 25G Consortium Schedule 3 • Status - Displays lock status for each SFP.
FEC Stats	Displays the number of corrected and uncorrected errors received via the SFPs. Click Enable Stats to activate, and 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. Enable check boxes to activate log fields as required. Available log fields are shown in the table below.

Log Field	Description
FEC_N_CORRECTED_ERRORS=	Number of corrected errors for FEC <i>N</i> .
FEC_N_UNCORRECTED_ERRORS=	Number of uncorrected errors for FEC <i>N</i> .

Where *N* is the SFP number

NMOS

The **NMOS** page allows NMOS functionality to be configured.

NMOS page

Overview

Networked Media Open Specifications, collectively known as *NMOS*, have been developed to provide interoperability between a wide range of products from various manufacturers. NMOS effectively provides a control and management layer in addition to the transport layer provided by SMPTE ST2110. See www.amwa.tv/nmos for further information.

The following facilities are available from this page:

Option	Description
Use Case	<p>Allows Discovery and Connection Management to be disabled. This can be useful if troubleshooting an issue.</p> <p>Options are:</p> <ul style="list-style-type: none"> • Off - IS-04 and IS-05 are both disabled. • IS-04 - IS-05 is disabled. • IS-04 and IS-05 - IS-04 and IS-05 are both active.

Option	Description
IS-04	<p>Controls how the module is to find and use network resources. Set as required.</p> <ul style="list-style-type: none"> • Status - displays registration status of the module. Valid values are: <ul style="list-style-type: none"> • Not Registered • Registering • Registered • Registry Mode - options are: <ul style="list-style-type: none"> • Auto - the module will discover the network and set the IP address of the NMOS registry automatically. • Static - allows IP address details for the NMOS registry to be set manually. • Interface - select the Ethernet interface to be used for NMOS control. • Label - specify a label for the module, and click S to save. This is the identifier by which the module will be known in the NMOS registry. See also Label Patterns, below.
Auto	<p>Displayed if Registry Mode (see above) is set to Auto.</p> <ul style="list-style-type: none"> • DNS IP - displays the current DNS IP address, and allows a new one to be defined. If required, enter a new address in the NEW field, and click S to save. • Search Domain - displays the current search domain, and allows a new one to be defined. If required, enter a new domain in the NEW field, and click S to save.
Static	<p>Displayed if Registry Mode (see above) is set to Static.</p> <ul style="list-style-type: none"> • IP Address - displays the current NMOS registry IP address, and allows a new one to be defined. If required, enter a new address in the NEW field, and click S to save. • Registration Port - displays the port currently used for Registration traffic, and allows a new one to be defined. If required, enter a new port number in the NEW field, and click S to save or P to return to the previous value. • Query Port - displays the port currently used for Query traffic, and allows a new one to be defined. If required, enter a new port number in the NEW field, and click S to save or P to return to the previous value.

Option	Description
Restart	Click to restart the module and apply changes. Initial registration of the module may take a few minutes. Note that restarting the module will result in the loss of any signals currently being processed.
Label Patterns	By default, IP Senders and Receivers will adopt the default Grass Valley label in the NMOS Registry. However, a user-specified label can optionally be generated according to a pattern. This pattern enables the user to specify a label in a generic manner, which will automatically be adopted and applied to all IP Senders and Receivers. This definition is known as a <i>Label Pattern</i> . See Label Patterns , below, for more information.

Label Patterns



Label Patterns pane

Defining a Label Pattern

Label Patterns are defined for both IP Sender and IP Receiver. The basic process for defining a label pattern is:

- 1 Enter at least one **Auto-Generated** variable into the **Sender Pattern** field. The available variables, plus the syntax to be used, are shown in the **Auto-Generated** section below the input fields. It does not matter which variable is used, but at least one must be present.
- 2 Optionally, enter one or more **Optional Variables** into the **Sender/Receiver Variables** fields. These allow a more descriptive label to be generated if required, and do not have to be used. The available variables, plus the syntax to be used, are shown in the **Optional Variables** section below the input fields.
- 3 When all the required values have been entered, click **Restart** to power-cycle the module; IP Senders and Receivers will then automatically generate labels as defined.

The Sender/Receiver Pattern Fields

Leaving the **Sender/Receiver Pattern** fields empty will result in the default Grass Valley text string labels for IP Senders/Receivers being used. If a minimum of one variable is entered, the IP Sender/Receiver will auto-generate labels in accordance with the user-defined label pattern. There is a maximum limit of 63 characters for all text entry boxes.

Preset Values

Preset values are available. Click **P ...**

- ... against **Sender Pattern** to enter `{dev} Sender:{spig}` into the **Sender Pattern** field, or

- ... against **Receiver Pattern** to enter {dev} Receiver:{spig} into the **Receiver Pattern** field.

Where **Sender** and **Receiver** are "static" text.

Saving and Recalling Values

Field values may be saved by clicking **S** next to the appropriate field, and recalled using a Memory or a Saveset. See the *RollCall Control Panel User Manual* for more information on saving and recalling saved values.

Available variables are:

Variable	Description
{dev}	Device label.
{spig}	Spigot number (starting from {s_snum} or {r_snum}).
{flow}	Flow number.
{flowalt}	Flow number with alternate formatting. Restarts at 1 for each flow format type.
{fmt}	Flow format type. Uses one of {sf_v1}, {sf_v2}, {sf_v3}, {sf_a}, {sf_d}, {rf_v1}, {rf_a} or {rf_d}.

Free "static" text can also be added between the variables, as shown in the [Preset Values](#) section above.

Add variables/static text as required.

The Sender/Receiver Variables Field

Sender/Receiver Variables are optional, and allow a more descriptive label to be defined if required. These variables do not have to be used.

Available variables are:

Variable	Description
{sf_v1}	Sender 2022-6 format description. Default = "Video".
{sf_v2}	Sender 2110-20 format description. Default = "VideoAlt".
{sf_v3}	Sender VC2 format description. Default = "VC2".
{sf_a}	Sender 2110-30 format description. Default = "Audio".
{sf_d}	Sender 2110-40 format description. Default = "Data".
{rf_v1}	Receiver video format description. Default = "Video".
{rf_a}	Receiver audio format description. Default = "Audio".
{rf_d}	Receiver data format description. Default = "Data".
{s_snum}	Sender start index number. Default = 1.
{r_snum}	Receiver start index number. Default = 1.
{s_pad}	Sender number padding. Prefixes small numbers with leading zeroes. Default = 2.
{r_pad}	Receiver number padding. Prefixes small numbers with leading zeroes. Default = 2.

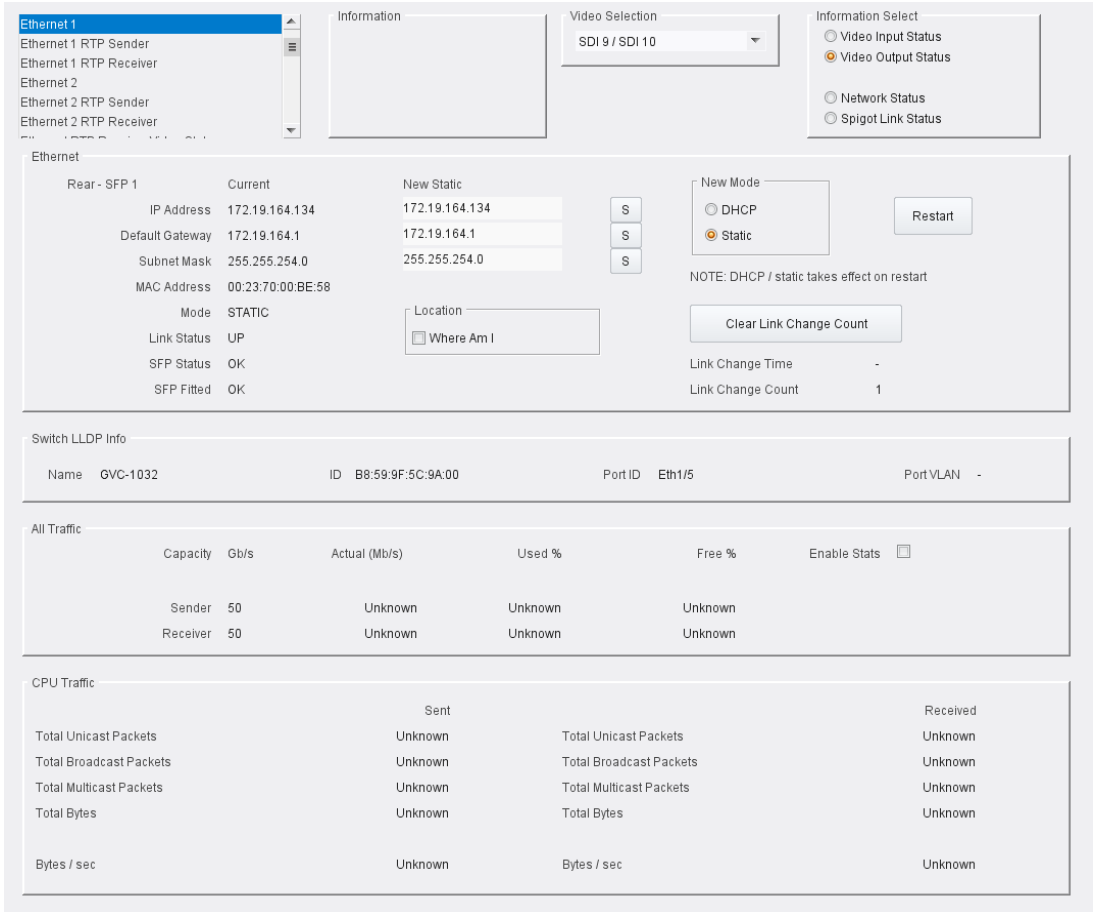
Updating Default Values

The default description values listed above may be updated if required. To do this, simply overwrite the default value as displayed in the Sender/Receiver Variables fields with the required value. This new value will then become the default.

Ethernet Pages 1 and 2

Note: Ethernet pages 1 & 2 refer to the rear-panel Ethernet connectors only. See [Ethernet Gb](#) on page 93 for information on managing the on-module Ethernet connector.

The **Ethernet** pages show details and status for each network interface. The IQMIX defaults to use of DHCP, but this can be overridden and a static IP address defined if required.



Ethernet 1 Page

The Ethernet Pane

The **Ethernet** pane displays details of the currently selected network interface, and allows a static IP address to be defined. Enter information as required, enable the **Static** radio button, then click **S** to save. New settings are applied when **Restart** is clicked.

Where Am I? Checkbox

When enabled, the **Where Am I** function causes the SFP/QSFP LEDs for the relevant Ethernet connector to flash, allowing the module to be physically located.

Clear Link Change Count

Click to reset the **Link Change** counter to zero.

The Switch LLDP Info Pane

This area displays information about the Ethernet switch that the port is connected to.

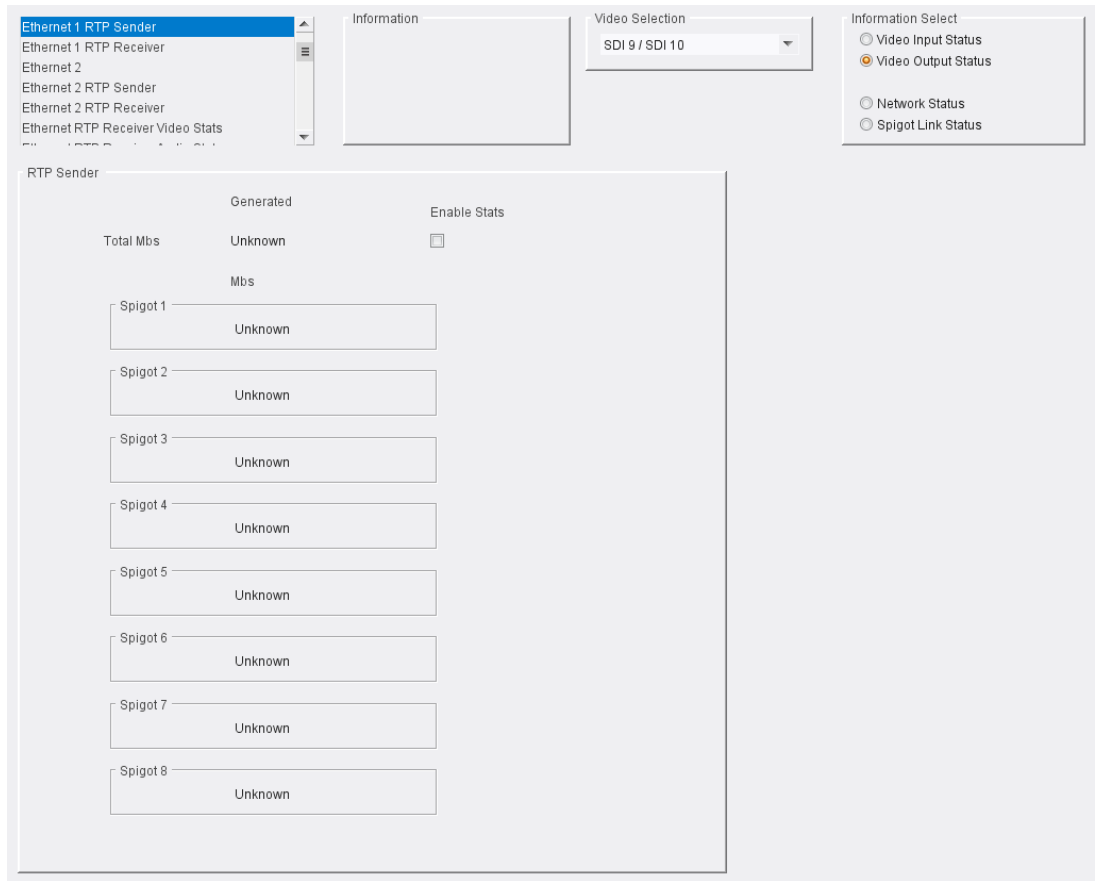
The All Traffic/CPU Traffic Panes

Click the **Enable Stats** check box to display information on traffic through the module.

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.

Click **Enable Stats** to display values.



Ethernet 1 & 2 RTP Sender Page

Ethernet 1 and 2 RTP Receiver

The **RTP Receiver** page displays 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.

The screenshot shows the 'Ethernet 1 RTP Receiver' page. At the top left is a navigation menu with options like 'Ethernet 1 RTP Receiver', 'Ethernet 2', 'Ethernet 2 RTP Sender', etc. The main content area is divided into several sections:

- Information:** A blank box for displaying details.
- Video Selection:** A dropdown menu currently set to 'SDI 9 / SDI 10'.
- Information Select:** Radio buttons for 'Video Input Status', 'Video Output Status' (selected), 'Network Status', and 'Spigot Link Status'.
- RTP Receiver:** A table of statistics:

Total Received RTP Rate (Mbs)	Unknown	Enable Stats <input type="checkbox"/>
Total Received RTP Pkt Rate	Unknown	
RTP Sequence Discontinuity Count	Unknown	Clear RTP Count
Mac Error Count	Unknown	Clear Error Count
- Unwanted Multicast Traffic:**
 - Multicast Drop Rate (Mbs): 1544
 - Multicast Drop Pkt Rate: 134928
 - Last Few Dropped Packets table:

Source IP	Source Port	Destination IP	Destination Port	Packet Type
172.19.164.50	50100	239.20.1.1	50100	17
172.19.164.1	-	239.21.1.13	-	2
172.19.164.1	-	239.21.1.17	-	2
172.19.164.1	-	239.21.1.9	-	2
172.19.164.1	-	239.21.1.1	-	2
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

Ethernet 1 & 2 RTP Receiver Page

Ethernet RTP Receiver Video Stats

The **RTP Receiver Video Stats** page displays information on the data received via RTP on each Ethernet input. Units are megabits per second.

Click **Enable Stats** to display the values; click **Clear All RTP Counts** to zero RTP Discontinuity counters for each Ethernet input.

Ethernet RTP Receiver Video Stats

Ethernet RTP Receiver Audio Stats
Ethernet RTP Receiver Meta Stats
Link Control
HDR Control
Destination Timing

Information

Video Selection
SDI 9 / SDI 10

Information Select
 Video Input Status
 Video Output Status
 Network Status
 Spigot Link Status

Video Stats

Enable Stats

Spigots	Flow ID
9	Unknown
10	Unknown
11	Unknown
12	Unknown
13	Unknown
14	Unknown
15	Unknown
16	Unknown

Byte Rate (Mbs)	RTP Discontinuity Count
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown

Byte Rate (Mbs)	RTP Discontinuity Count
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown

Clear All RTP Counts

Clear All RTP Counts

Ethernet RTP Receiver Video Stats Page

About Flow IDs

In order to maximize media port bandwidth utilization, if spigot addresses match across multiple interfaces then they are allocated to the same Flow ID.

This means that if multiple spigots are assigned to the same Flow ID and the IP addresses are only partially complete, the module will use the shared flow. For example, if two spigots share the same flow, but one of the spigots is missing from the IP addresses for the secondary interface, the module will use all of the information available to it and populate information for the partially completed spigot as if it had a complete flow.

Ethernet RTP Receiver Audio Stats

The **RTP Receiver Audio Stats** page displays information on the data received via RTP on each Ethernet input. Units are megabits per second.

Click **Enable Stats** to display the values; click **Clear All RTP Counts** to zero RTP Discontinuity counters for each Ethernet input.

The screenshot displays the 'Ethernet RTP Receiver Audio Stats' interface. At the top, there is a navigation menu on the left, an 'Information' field, a 'Video Selection' dropdown menu set to 'SDI 9 / SDI 10', and an 'Information Select' panel with radio buttons for 'Video Input Status', 'Video Output Status', 'Network Status', and 'Spigot Link Status'. The main content area is titled 'Audio Stats' and features an 'Enable Stats' checkbox. Below this, there are three data tables: 'Spigots', 'Ethernet 1', and 'Ethernet 2'. The 'Spigots' table lists spigots 9 through 16 with 'Unknown' flow IDs. The 'Ethernet 1' and 'Ethernet 2' tables show 'Unknown' values for both 'Byte Rate (Mbs)' and 'RTP Discontinuity Count'. There are 'Clear All RTP Counts' buttons at the bottom of the Ethernet 1 and Ethernet 2 sections.

Spigots	Flow ID
9	Unknown
10	Unknown
11	Unknown
12	Unknown
13	Unknown
14	Unknown
15	Unknown
16	Unknown

Byte Rate (Mbs)	RTP Discontinuity Count
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown

Byte Rate (Mbs)	RTP Discontinuity Count
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown
Unknown	Unknown

Ethernet RTP Receiver Audio Stats Page

About Flow IDs

In order to maximize media port bandwidth utilization, if spigot addresses match across multiple interfaces then they are allocated to the same Flow ID.

This means that if multiple spigots are assigned to the same Flow ID and the IP addresses are only partially complete, the module will use the shared flow. For example, if two spigots share the same flow, but one of the spigots is missing from the IP addresses for the secondary interface, the module will use all of the information available to it and populate information for the partially completed spigot as if it had a complete flow.

Ethernet RTP Receiver Meta Stats

The **RTP Receiver Meta Stats** page displays information on the metadata received via RTP on each Ethernet input. Units are megabits per second.

Click **Enable Stats** to display the values; click **Clear All RTP Counts** to zero RTP discontinuity counters for each Ethernet input.

The screenshot displays the 'Ethernet RTP Receiver Meta Stats' interface. At the top, there is a navigation menu on the left and a control area with 'Video Selection' set to 'SDI 9 / SDI 10' and 'Information Select' options for Video Input Status, Video Output Status, Network Status, and Spigot Link Status. The main content area is titled 'Meta Stats' and contains three columns: 'Spigots', 'Ethernet 1', and 'Ethernet 2'. Each column has a table with 'Byte Rate (Mbs)' and 'RTP Discontinuity Count' columns. The 'Spigots' table lists spigots 9 through 16 with 'Unknown' flow IDs. The 'Ethernet 1' and 'Ethernet 2' tables also show 'Unknown' values for both metrics. There are 'Clear All RTP Counts' buttons at the bottom of the Ethernet 1 and Ethernet 2 sections. An 'Enable Stats' checkbox is located at the top right of the main content area.

Ethernet RTP Receiver Meta Stats Page

About Flow IDs

In order to maximize media port bandwidth utilization, if spigot addresses match across multiple interfaces then they are allocated to the same Flow ID.

This means that if multiple spigots are assigned to the same Flow ID and the IP addresses are only partially complete, the module will use the shared flow. For example, if two spigots share the same flow, but one of the spigots is missing from the IP addresses for the secondary interface, the module will use all of the information available to it and populate information for the partially completed spigot as if it had a complete flow.

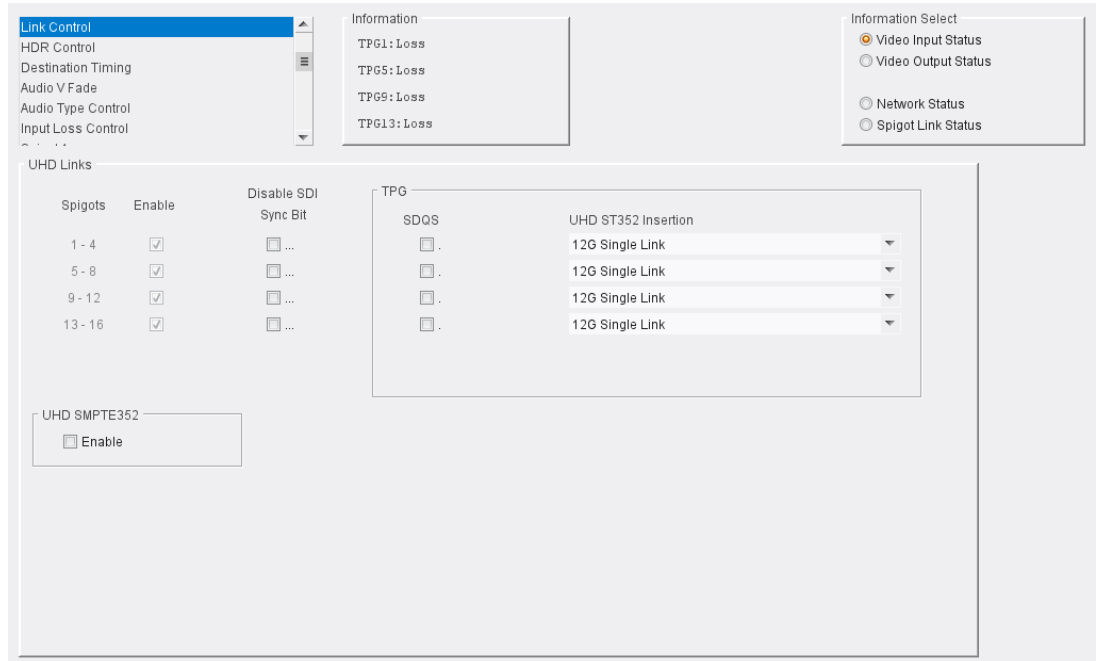
Link Control

The **Link Control** page allows 4K spigots to be configured.

For non-12G configurations, Link Control allows spigots to be combined into groups of 4. Each spigot still has its own set of flows however.

For 4 x 3G-SDI configurations, there is only one resultant 12G ST2110-20 flow. Unchecking the **Enable** check box in this mode allows the card to process SD/HD/3G-SDI.

See also [Configuration](#) on page 36 for information on selecting input/output configurations.



Link Control Page

UHD Links

Enable the spigots to be used as required. These controls are not available when using a single connector to carry 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.

UHD SMPTE352: Click to enable/disable SMPTE352 insertion for UHD.

TPG

These controls are displayed only when using 12G output.

SDQS: If using Square Division signals, enable the **SDQS** check boxes as required. Otherwise, Two-sample Interleave will be used.

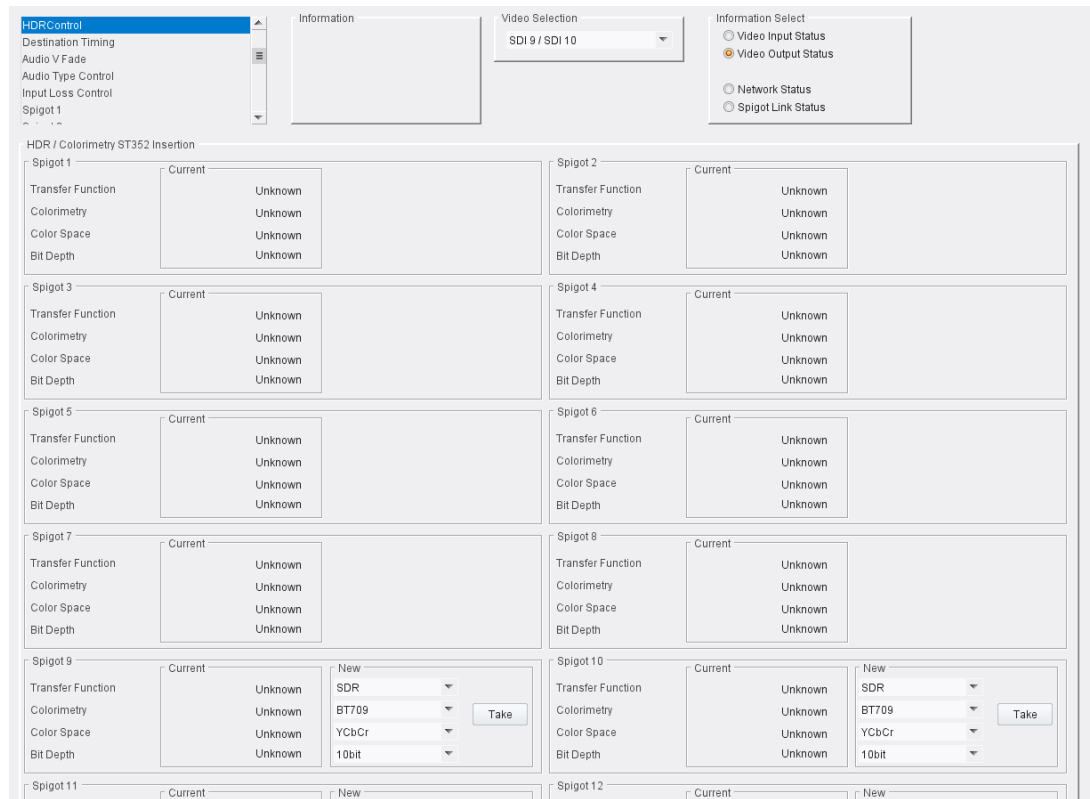
UHD ST352 Insertion: set the ST352 ancillary data type according to how the TPG data is to be output.

- None
- For ST425 output over quad links, select **12G Quad Link** from the drop-down list.

See *SMPTE 425: Bit-Serial Interfaces at 3 Gb/s* and *SMPTE 352: Payload Identification Codes For Serial Digital Interfaces* for further information.

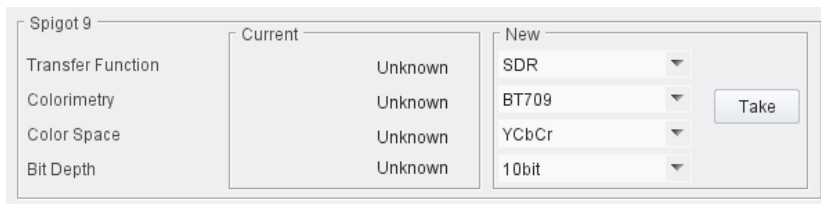
HDR Control

The **HDR Control** page allows outgoing SDI traffic to be modified to indicate that it contains HDR content.



HDR Control page

A **New** pane is displayed against output spigots. Select options from the drop-down menus for each spigot as required, then click **Take** to apply the changes.



Note: When UHD quad-link configurations are used, Slave spigots automatically use the same settings as their associated Master.

The following options are available:

Option	Description
Transfer Function	Available values are: <ul style="list-style-type: none"> • SDR • HDR-HLG • HDR-PQ • Other

Option	Description
Colorimetry	Available values are: <ul style="list-style-type: none"><li data-bbox="772 282 879 315">• BT709<li data-bbox="772 327 895 360">• BT2020<li data-bbox="772 371 874 405">• Other
Color Space	Available values are: <ul style="list-style-type: none"><li data-bbox="772 454 879 488">• YCbCr<li data-bbox="772 499 874 533">• ICtCp
Bit Depth	Available values are: <ul style="list-style-type: none"><li data-bbox="772 582 868 616">• 10bit<li data-bbox="772 627 995 660">• 10bit Full range

Destination Timing

The **Destination Timing** page allows genlock timing on each spigot to be adjusted, in order to synchronize the IP signal with the house reference.

Destination Timing Page

The following options are available.

Option	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.

Where N is the input number

Audio V Fade

This page allows audio fading to be applied on a spigot-by-spigot basis, 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.

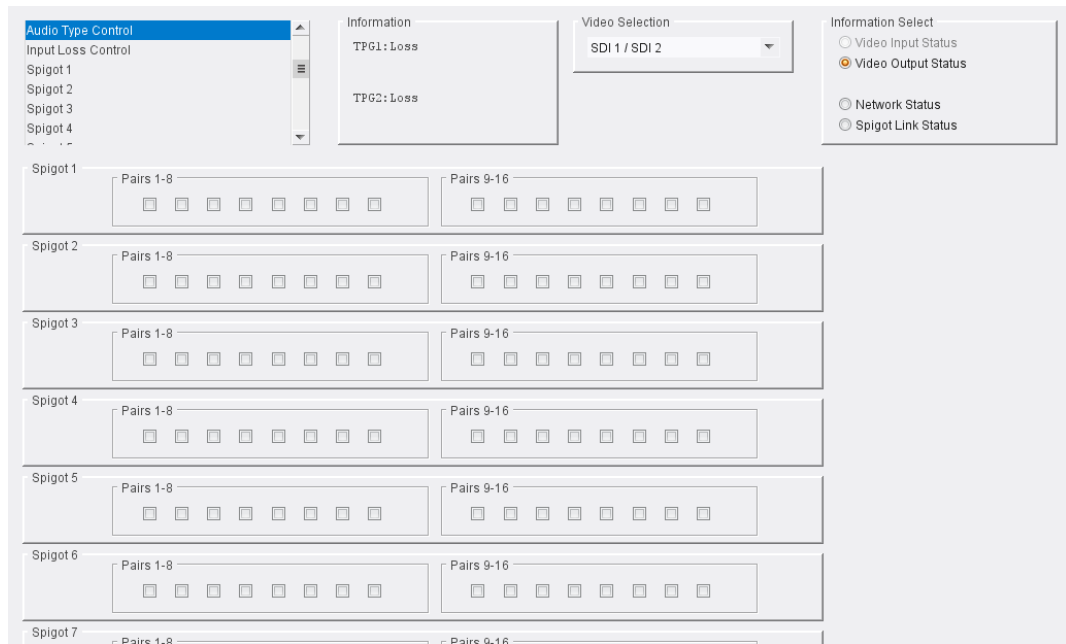
Configure as required.

The screenshot displays the 'Audio V Fade' configuration interface. On the left, a navigation menu lists 'Audio V Fade' (selected), 'Audio Type Control', 'Input Loss Control', and 'Spigot 1' through 'Spigot 3'. The main content area is divided into several sections: 'Information' (empty), 'Video Selection' (dropdown menu showing 'SDI 9 / SDI 10'), and 'Information Select' (radio buttons for 'Video Input Status', 'Video Output Status', 'Network Status', and 'Spigot Link Status'). Below these are 16 individual spigot control panels, labeled 'Spigot 1' through 'Spigot 16'. Each panel contains an 'Audio V Fade Control' section with an 'Enable' checkbox, all of which are checked.

Audio V Fade Page

Audio Type Control

The **Audio Type Control** page allows audio pairs to be marked as carrying PCM or non-PCM. Only pairs on IP receiver spigots are displayed.

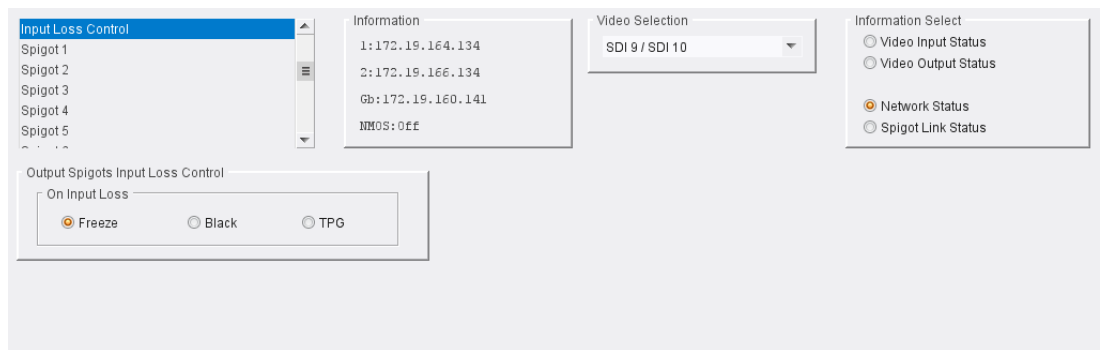


Audio Type Control page

Enable check boxes for pairs carrying PCM.

Input Loss Control

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



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 TPG output, as set on the Sender TPG page. See page 43 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 IQMIX module.

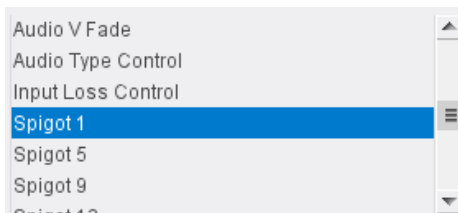
Input Spigots

Input spigots are defined by selecting the appropriate firmware version on the **Configuration** page. See [page 36](#) for more information.

The screenshot displays the configuration interface for Spigot 1. At the top, there is a list of spigots (Spigot 1 to Spigot 6) with Spigot 1 selected. To the right, an 'Information' box shows IP addresses (1: 172.19.164.134, 2: 172.19.166.134, 0: 172.19.160.141) and 'NROS: 0xFF'. A 'Video Selection' dropdown is set to 'SDI 9 / SDI 10'. An 'Information Select' section has radio buttons for 'Video Input Status', 'Video Output Status', 'Network Status' (selected), and 'Spigot Link Status'. Below this, a 'Spigot' section contains 'Direction' (Input), 'BNC' (SDI 1), 'Status' (WARN: TPG), 'Sender' (Ext Headers: On (Legacy)), 'Num Audio Chans' (16), 'Packet Time' (500us), and 'SDI Input CRC Errors' (Unknown, with Enable and Clear buttons). Further down, 'Last Spigot Take' is RCStart, 'Streaming' is Dual, and 'Format' is SDI/HD/3G. A 'Spigot Link' section shows 'Master for 1-4' and a 'Take' button. The main area is split into 'Primary' and 'Secondary' columns. Each column has 'Video', 'Audio', and 'Metadata' sections. Each section has 'Current' and 'NEW' settings for Multicast IP, Multicast Port, Source IP, Source Port, and Flow Type. Below each section are 'Packetizer Stats' for bits/s, packet/s, and packet drop count, all showing 'Unknown'.

Typical Input Spigot Page

Note: If spigots are linked for UHD traffic, only the Master spigots are shown on the main menu. Slave spigots are not shown.



The following facilities are available from this page:

Option	Operation
Spigot Pane	<p>Displays spigot direction, associated BNC connector, current module status, the last Take performed on the spigot and how it was made, e.g. via RollCall or an external agent such as VSM.</p> <p>The following controls are also available:</p> <ul style="list-style-type: none"> • Streaming - set the redundancy options for this spigot. This will also determine the bandwidth to be used. Options are: <ul style="list-style-type: none"> • Dual - full redundancy, both Primary and Secondary available. • Single - Primary only, but with all available bandwidth. • A - Primary only. • B - Secondary only. • Format - select the maximum expected bandwidth requirement for this spigot.
Sender Pane	<ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • Options are: <ul style="list-style-type: none"> • Off - Extended headers are disabled. • On - Sends extended headers fully compliant with ST2110-20. • On (Legacy) - Sends extended headers that are compatible with releases earlier than V11.73D.76. • Num Audio Channels - select the number of audio channels present on this spigot. • Packet Time - select the amount of time required to complete the transmission of each packet. • SDI Input CRC Errors - enable the check box to display the number of CRC errors. Click Clear to reset the counter to zero.

Option	Operation
	<ul style="list-style-type: none">• Spigot Link - indicates the spigot link status for the selected spigot, as set on the Link Control page (see page 59).
Take	Click to apply changes.
Flow Panes (Primary, Secondary, Video, Audio and Metadata)	<p>Displays Video, Audio and Metadata status, and allows multicast IP and port details to be defined for the selected spigot.</p> <p>To set multicast details for the spigot:</p> <ul style="list-style-type: none">• Enter IP and 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 from the Flow Type menu.• Click S to save the details for each item.• Click 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 [page 36](#) for more information.

The screenshot displays the 'Typical Output Spigot Page' for Spigot 9. The interface is organized into several sections:

- Spigot List:** A list on the left shows Spigot 9 selected.
- Information:** Fields for IP1: 1080/291 and IP2: Loss.
- Video Selection:** A dropdown menu set to 'SDI 1 / SDI 2'.
- Information Select:** Radio buttons for Video Input Status (selected), Video Output Status, Network Status, and Spigot Link Status.
- Spigot Controls:** Direction (Output), BNC (SDI 9), and Status (FAIL).
- Streaming Settings:** Last Spigot Take (RCStart), Streaming (Dual), and Format (SDI/HD/3G).
- Receiver Settings:** Video Std (Auto), Num Audio Chans (Auto), Audio Delay (0 ms), and Make / Break Mode (Make before Break).
- Take Button:** A central 'Take' button to apply changes.
- Primary and Secondary Panels:** Each contains:
 - Status:** A table with columns for Mac, Video, Audio, and Meta. All values are 'None'.
 - Video:** Fields for Multicast IP, Multicast Port (0), Source IP, Source Port (0), and Flow Type (None). Includes 'Current' and 'NEW' sections with 'P' and 'S' buttons.
 - Audio:** Similar fields to Video for audio configuration.
 - Metadata:** Similar fields for metadata configuration.

Typical Output Spigot Page

Spigot Pane

The **Spigot** pane provides basic monitoring for the selected Spigot. Click **Take** to apply any changes made.

The screenshot shows the 'Output Spigot Pane' for Spigot 9, which is a simplified version of the main configuration page:

- Spigot:** Direction (Output), BNC (SDI 10), and Status (OK).
- Streaming Settings:** Last Spigot Take (IPCtrl), Streaming (Dual), and Format (SDI/HD/3G).
- Receiver Settings:** Video Std (Auto), Num Audio Chans (Auto), Audio Delay (0 ms), and Make / Break Mode (Make before Break).

Output Spigot Pane

The **Spigot** pane details:

- Spigot direction;
- Associated BNC connector;
- Current status;
- The last **Take** performed on the spigot.

Streaming

Select the Ethernet connectors to use for this spigot. This will also determine the bandwidth to be used. Options are:

- **Dual** - use both Ethernet connectors, and so all available bandwidth.
- **Single** - use either Ethernet connector, and so half of the available bandwidth.
- **A or B** - use one particular Ethernet connector, and so half of the available bandwidth.

Format

Select the format to be used on this spigot. This will ensure that the appropriate level of bandwidth is allocated.

Video Standard

Select the standard for the incoming video, or set to **Auto** to detect the standard automatically.

Num Audio Channels

If the number of audio channels is known, select the number present on this spigot. Otherwise, set to **Auto**.

Note: It is important to use the **Auto** setting unless the actual number of audio channels in the stream is known definitively. Setting an inaccurate number of audio channels may result in unpredictable behavior.

Audio Delay

Move the slider to set an **Audio Delay** as required. Click **P** to return to the preset default value.

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.

Flow Pane

The **Flow** pane provides status information for video, audio and metadata. It also allows the flow type, loopback and multicast IP/port details to be defined for the selected spigot.

The screenshot shows a software interface for configuring the Primary Output Spigot Flow Pane. It is divided into two main sections: Status and Video.

Status Section:

	Video	Audio	Meta
Mac	None	16	None
Loopback	1080/60p	None	None

Video Section:

	Current	NEW		
Multicast IP	239.20.3.164	239.20.3.164	P	S
Multicast Port	50100	50100	P	S
Source IP	172.19.164.161	172.19.164.161	P	S
Source Port	50100	50100	P	S
Flow Type	SMPTE2022	SMPTE2022		

Output Spigot Flow Pane

Loopback

The IQMIX can be put into loopback mode for diagnostic purposes. Select the **Loopback** radio button and click **Take**.

Setting Multicast Details

To set multicast details:

- Select the required video output standard from the drop-down list.
- Enter multicast IP and port details as required.
- Make a selection from the **Flow Type** drop-down menu, if required.
- Click **S** to save the details, or **P** to return to the preset default value.

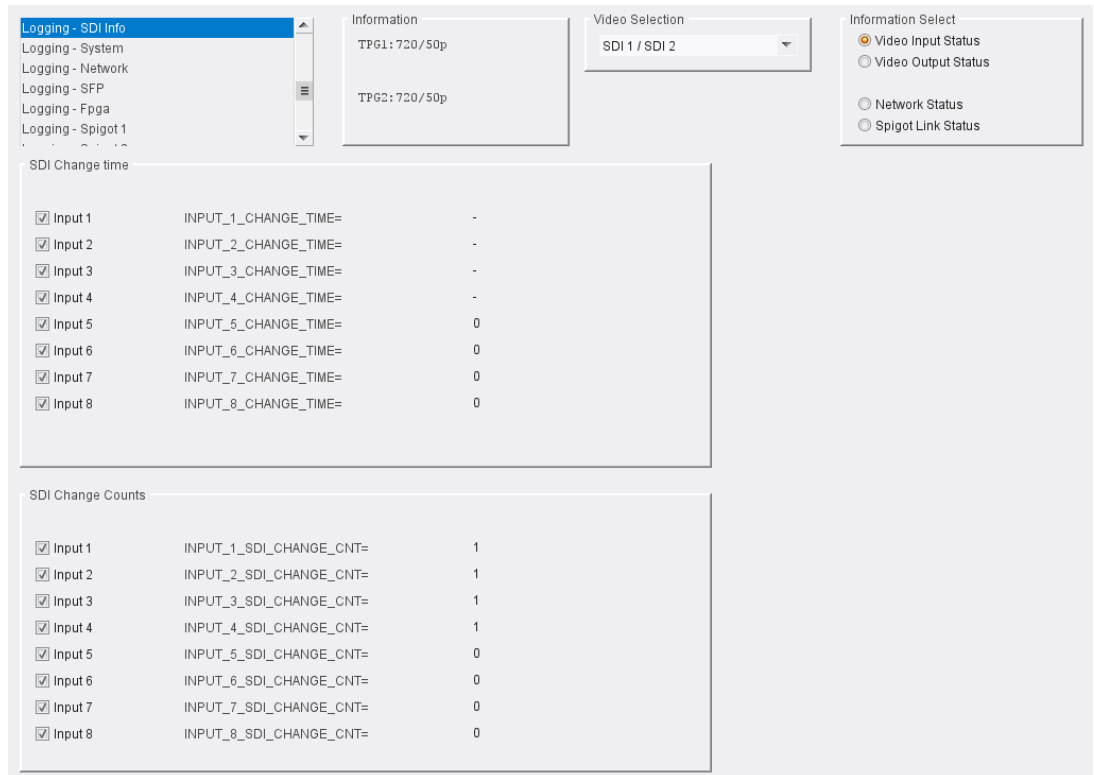
In order to provide redundancy, Primary and Secondary flows are available.

Logging - SDI Info

Information on various parameters can be made available to a logging device connected to the RollCall network. Each logging page comprises three columns:

- **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.

The information below describes the various parameters available for logging.



Logging - SDI Info Page

The following options are available. Enable check boxes to activate log fields as required.

Log Field	Description
INPUT_N_CHANGE_TIME=	Logs time that SDI input changed.
INPUT_N_SDI_CHANGE_CNT=	Logs number of times that the SDI input has changed.

Where N is the input number

Logging - System

Information on several parameters can be made available to a logging device connected to the RollCall network. Each logging page comprises three columns:

- **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.

Log Enable	Log Field	Log Value
<input checked="" type="checkbox"/>	Serial Number	S59062906
<input checked="" type="checkbox"/>	OS Version	QNX 6.6.0
<input checked="" type="checkbox"/>	Build No.	0.24.73
<input checked="" type="checkbox"/>	Hardware Ver.	RUCP251B
<input checked="" type="checkbox"/>	Hardware Mod.	1
<input checked="" type="checkbox"/>	Hardware Build.	0
<input checked="" type="checkbox"/>	Featureboard Ver.	MIX50FB1
<input checked="" type="checkbox"/>	Featureboard Mod.	0
<input checked="" type="checkbox"/>	Featureboard Build.	FB1
<input checked="" type="checkbox"/>	Firmware Version	6626F5BB
<input checked="" type="checkbox"/>	Up Time	000:03:36:00
<input checked="" type="checkbox"/>	RollCall Up Time	000:03:35:00
<input checked="" type="checkbox"/>	RollTracks	Disabled
<input checked="" type="checkbox"/>	Rear ID	5
<input checked="" type="checkbox"/>	Rear Status	OK
<input checked="" type="checkbox"/>	Slot Width	2
<input checked="" type="checkbox"/>	Slot Start	3
<input checked="" type="checkbox"/>	Power Usage	45.5W/45.5LU
<input checked="" type="checkbox"/>	Temperature	30C
<input checked="" type="checkbox"/>	Temperature Sensor	CPU
<input checked="" type="checkbox"/>	Reference Source	Network
<input checked="" type="checkbox"/>	Reference State	OK:LOCKED
<input checked="" type="checkbox"/>	Time Sync Mode	PTP Unicast
<input checked="" type="checkbox"/>	Time Sync Network Interface	Ethernet 1
<input checked="" type="checkbox"/>	Time Sync Clock Identity	08:00:11-FF:FE:21:F6:B2
<input checked="" type="checkbox"/>	Time Sync Clock State	OK:LOCKED
<input checked="" type="checkbox"/>	Time Sync Average Delay	+1.8uS
<input checked="" type="checkbox"/>	Time Sync Std Dev Delay	+0.0uS
<input checked="" type="checkbox"/>	Time Sync Average Error	-0.1uS
<input checked="" type="checkbox"/>	Time Sync Std Dev Error	+0.0uS
<input checked="" type="checkbox"/>	Time Sync Grandmaster	08:00:11-FF:FE:21:F6:B2 Steps 0
<input checked="" type="checkbox"/>	Time Sync Last Lock	2020-05-19 07:32:59.338327208
<input checked="" type="checkbox"/>	Time Sync Synchronisations	1
<input checked="" type="checkbox"/>	Time Sync State Ethernet 0	OK
<input checked="" type="checkbox"/>	Time Sync State Ethernet 1	FAIL
<input checked="" type="checkbox"/>	Time Sync State Ethernet 2	FAIL
<input checked="" type="checkbox"/>	Time Sync Clock Address	172.19.190.3
<input checked="" type="checkbox"/>	Time Sync Request Interval	1s
<input checked="" type="checkbox"/>	Time Sync Network Preference	Ethernet 1

Logging - System Page

The following options are available. Enable check boxes to activate log fields as required.

Log Field	Description
SN=	Reports the module serial number, which consists of an S followed by eight digits. Note: this cannot be deselected.
OS_VERSION=	Reports the operating system name and version.
BUILD_NUMBER=	Reports the build number.
HARDWARE_VERSION=	Reports the hardware version number.
HARDWARE_MOD=	Reports the hardware modification number.

Log Field	Description
HARDWARE_BUILD=	Reports the hardware build number.
FEATUREBOARD_VERSION=	Reports the feature board version number.
FEATUREBOARD_MOD=	Reports the feature board modification number.
FEATUREBOARD_BUILD=	Reports the feature board build number.
FIRMWARE_VERSION=	Reports the firmware version number.
UPTIME=	Reports the time since the module was last restarted, in the format <i>ddd:hh:mm:ss</i> .
RC_UPTIME=	Reports the time since the RollCall process was last restarted, in the format <i>ddd:hh:mm:ss</i> .
ROL_STATES=	Reports the RollCall status. Valid values are: <ul style="list-style-type: none"> • OK • FAIL:n where <i>n</i> is the RollTrack index or indices which are failing • Disabled
REAR_ID=	Reports the code number of the rear fitted.
REAR_STATUS=	Reports the status of the rear where it can be determined.
SLOT_WIDTH=	Reports the slot width. IQMIX modules are available in single and triple width.
SLOT_START=	Reports the slot in the rack where IQMIX is located.
POWER_USAGE=	Reports the power usage in Watts (A-type rack)/PR Units (B-type rack).
TEMP_N_CELSIUS=	Reports the temperature status of the FPGA.
TEMP_N_NAME=	Temperature measurement name.
REFERENCE_N_SOURCE=	Reports time reference source.
REFERENCE_N_STATE=	Valid values are: <ul style="list-style-type: none"> • OK: Locked • OK: Input • WARN: Freerun • WARN: CrossLock
TIMESYNC_N_MODE=	Valid values are: <ul style="list-style-type: none"> • 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: Module clock is synchronized to an NTP clock. Generally less precise than PTP.
TIMESYNC_N_NETWORK=	Network port currently being used for synchronization for IQMIX modules, 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.

Log Field	Description
TIMESYNC_N_CLOCK_ID=	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=	Valid values are: <ul style="list-style-type: none">• 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.• No Sync Messages: Timeout of sync messages.• No Response Messages: Timeout of response messages.• Undefined• NTP: Module using NTP to synchronize.
TIMESYNC_N_AVG_DELAY=	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=	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=	The current difference between the cards time and the grandmaster time. Should be close to zero once card has synchronized.
TIMESYNC_N_STDV_ERROR=	The standard deviation in the average error.
TIMESYNC_N_GRANDMASTER=	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=	Time when the module last changed from not locked to locked. Ideally this will be a few seconds after the module has powered up. This allows the user to confirm which clock the module has synchronized to.
TIMESYNC_N_SYNCHRONISATIONS=	Reports 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=	Logs whether PTP is locked. Valid values are: <ul style="list-style-type: none">• OK:LOCKED• FAIL:NO LOCK
TIMESYNC_N_CLOCK_ADDRESS=	Logs IP address of the currently-selected grandmaster clock.

Log Field	Description
TIMESYNC_N_REQUEST_INTERVAL=	Logs the PTP Delay Request Frequency setting, as set on the Time Sync Configuration page. See page 38 .
TIMESYNC_N_PREFERENCE=	Logs the PTP Network Interface Preference setting, as set on the Time Sync Configuration page. See page 38 .

Where N is the input number

Logging - Network

Information on several parameters can be made available to a logging device connected to the RollCall network. Each logging page comprises three columns:

- **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.

Log Enable	Log Field	Log Value
<input checked="" type="checkbox"/>	LAN_PORT_1_NAME=	Ethernet 1
<input checked="" type="checkbox"/>	LAN_PORT_1_SPEED=	50Gb/s
<input checked="" type="checkbox"/>	LAN_PORT_1_IPADDRESS=	172.19.164.134
<input checked="" type="checkbox"/>	LAN_PORT_1_GATEWAY=	172.19.164.1
<input checked="" type="checkbox"/>	LAN_PORT_1_SUBNET_MASK=	255.255.254.0
<input checked="" type="checkbox"/>	LAN_PORT_1_MACADDRESS=	00:23:70:00:BE:58
<input checked="" type="checkbox"/>	LAN_PORT_1_STATE=	WARN:inactive
<input checked="" type="checkbox"/>	LAN_PORT_1_TRAFFIC_IN=	0.2 Mb/s
<input checked="" type="checkbox"/>	LAN_PORT_1_TRAFFIC_OUT=	0.0 Mb/s
<input checked="" type="checkbox"/>	LAN_PORT_1_CPU_TRAF_IN_STATE=	OK
<input checked="" type="checkbox"/>	LAN_PORT_1_CPU_TRAF_OUT_STATE=	OK
<input checked="" type="checkbox"/>	LAN_PORT_1_RTP_DIS_RATE=	0
<input checked="" type="checkbox"/>	LAN_PORT_1_LINK_STATE=	OK
<input checked="" type="checkbox"/>	LAN_PORT_1_MAC_LINK_STATE=	OK
<input checked="" type="checkbox"/>	LAN_PORT_1_SWITCH_NAME=	GVC-1032
<input checked="" type="checkbox"/>	LAN_PORT_1_SWITCH_CHASSIS_ID=	B8:59:9F:5C:9A:00
<input checked="" type="checkbox"/>	LAN_PORT_1_SWITCH_PORT_ID=	Eth1/5
<input checked="" type="checkbox"/>	LAN_PORT_1_SWITCH_PORT_VLAN=	-
<input checked="" type="checkbox"/>	LAN_PORT_2_NAME=	Ethernet 2
<input checked="" type="checkbox"/>	LAN_PORT_2_SPEED=	50Gb/s
<input checked="" type="checkbox"/>	LAN_PORT_2_IPADDRESS=	172.19.166.134
<input checked="" type="checkbox"/>	LAN_PORT_2_GATEWAY=	172.19.166.1
<input checked="" type="checkbox"/>	LAN_PORT_2_SUBNET_MASK=	255.255.254.0
<input checked="" type="checkbox"/>	LAN_PORT_2_MACADDRESS=	00:23:70:00:BE:5B
<input checked="" type="checkbox"/>	LAN_PORT_2_STATE=	WARN:inactive
<input checked="" type="checkbox"/>	LAN_PORT_2_TRAFFIC_IN=	0.1 Mb/s
<input checked="" type="checkbox"/>	LAN_PORT_2_TRAFFIC_OUT=	0.0 Mb/s
<input checked="" type="checkbox"/>	LAN_PORT_2_CPU_TRAF_IN_STATE=	OK
<input checked="" type="checkbox"/>	LAN_PORT_2_CPU_TRAF_OUT_STATE=	OK
<input checked="" type="checkbox"/>	LAN_PORT_2_RTP_DIS_RATE=	0
<input checked="" type="checkbox"/>	LAN_PORT_2_LINK_STATE=	OK
<input checked="" type="checkbox"/>	LAN_PORT_2_MAC_LINK_STATE=	OK
<input checked="" type="checkbox"/>	LAN_PORT_2_SWITCH_NAME=	GVC-1032
<input checked="" type="checkbox"/>	LAN_PORT_2_SWITCH_CHASSIS_ID=	B8:59:9F:5C:9A:00
<input checked="" type="checkbox"/>	LAN_PORT_2_SWITCH_PORT_ID=	Eth1/27
<input checked="" type="checkbox"/>	LAN_PORT_2_SWITCH_PORT_VLAN=	-

Logging - Network Page

The following options are available. Enable check boxes to activate log fields as required.

Log Field	Description
LAN_PORT_N_NAME=	Ethernet port name as defined by the OS.
LAN_PORT_N_SPEED=	Ethernet connection speed. Valid values are: <ul style="list-style-type: none"> • 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 • No Link

Log Field	Description
LAN_PORT_N_IPADDRESS=	Ethernet port IP address.
LAN_PORT_N_MACADDRESS=	Ethernet port MAC address.
LAN_PORT_N_STATE=	Ethernet connection state. Valid values are: <ul style="list-style-type: none"> • Active • Inactive
LAN_PORT_N_TRAFFIC_IN=	Traffic in. Valid values are: <ul style="list-style-type: none"> • NNN.n Kbps, Mbps, Gbps
LAN_PORT_N_TRAFFIC_OUT=	Traffic out. Valid values are: <ul style="list-style-type: none"> • NNN.n Kbps, Mbps, Gbps
LAN_PORT_N_CPU_TRAF_IN_STA TE=	CPU traffic in state. Valid values are: <ul style="list-style-type: none"> • OK • WARN:LOW DATA • FAIL
LAN_PORT_N_CPU_TRAF_ OUT_STATE=	CPU traffic out state. Valid values are: <ul style="list-style-type: none"> • OK • WARN:LOW DATA • FAIL
LAN_PORT_N_RTP_DIS_ RATE=	RTP Discontinuity state.
LAN_PORT_N_LINK_STATE=	Ethernet link state. Valid values are: <ul style="list-style-type: none"> • OK • WARN:LOW DATA
LAN_PORT_N_MAC_LINK_ STATE=	Reports state of the module's FPGA Ethernet link. Valid values are: <ul style="list-style-type: none"> • UP • DOWN
LAN_PORT_N_SWITCH_ NAME=	Reports name of the network switch that the module is connected to.
LAN_PORT_N_SWITCH_ PORT_ID=	Reports Port ID of the network switch the module is connected to.
LAN_PORT_N_SWITCH_ PORT_VLAN=	Reports name of the VLAN that the module is connected to.

Logging - SFP

Information on several parameters can be made available to a logging device connected to the RollCall network. Each logging page comprises three columns:

- **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.

The screenshot displays the 'Logging - SFP' configuration page. At the top, there is a sidebar menu with 'Logging - SFP' selected. The main content area is divided into three sections: 'Information' (showing TPG1: 720 / 50p and TPG2: 720 / 50p), 'Video Selection' (a dropdown menu set to 'SDI 1 / SDI 2'), and 'Information Select' (radio buttons for Video Input Status, Video Output Status, Network Status, and Spigot Link Status). Below these is the 'Logging SFP' section, which contains a table for 'SFP 1' with columns for 'Log Enable', 'Log Field', and 'Log Value'. All 'Log Enable' checkboxes are checked. The 'Log Field' column lists various SFP parameters, and the 'Log Value' column shows their current values.

Log Enable	Log Field	Log Value	
<input checked="" type="checkbox"/>	Fitted	SFP_1_FITTED=	OK
<input checked="" type="checkbox"/>	Status	SFP_1_STATUS=	OK
<input checked="" type="checkbox"/>	Type	SFP_1_TYPE=	100GBASE-SR4
<input checked="" type="checkbox"/>	Manufacturer	SFP_1_VENDOR=	Mellanox
<input checked="" type="checkbox"/>	Model	SFP_1_VENDOR_PN=	MMA1B00-C100D
<input checked="" type="checkbox"/>	Serial Number	SFP_1_SERIAL_NR=	MT1911FT09907
<input checked="" type="checkbox"/>	Revision	SFP_1_REVISION=	B2
<input checked="" type="checkbox"/>	Connector	SFP_1_CONNECTOR=	MPO 1x12
<input checked="" type="checkbox"/>	Temperature Sensor	TEMP_2_NAME=	QSFP1
<input checked="" type="checkbox"/>	Temperature	TEMP_2_CELSIUS=	43C
<input checked="" type="checkbox"/>	Temperature State	TEMP_2_STATE=	OK
<input checked="" type="checkbox"/>	Voltage Sensor	VOLTAGE_4_NAME=	QSFP1
<input checked="" type="checkbox"/>	Voltage	VOLTAGE_4_VALUE=	3.34V
<input checked="" type="checkbox"/>	Voltage State	VOLTAGE_4_STATE=	OK
<input checked="" type="checkbox"/>	Tx Wavelength	SFP_1_WAVELENGTH=	850.00nm
<input checked="" type="checkbox"/>	Tx Bias 1	SFP_1_1_LASER_BIAS=	6.75mA
<input checked="" type="checkbox"/>	Tx Bias 2	SFP_1_2_LASER_BIAS=	6.75mA
<input checked="" type="checkbox"/>	Tx Bias 3	SFP_1_3_LASER_BIAS=	6.75mA
<input checked="" type="checkbox"/>	Tx Bias 4	SFP_1_4_LASER_BIAS=	6.75mA
<input checked="" type="checkbox"/>	Tx Power 1	SFP_1_1_TX_POWER=	1.38dBm
<input checked="" type="checkbox"/>	Tx Power 2	SFP_1_2_TX_POWER=	1.38dBm
<input checked="" type="checkbox"/>	Tx Power 3	SFP_1_3_TX_POWER=	1.20dBm
<input checked="" type="checkbox"/>	Tx Power 4	SFP_1_4_TX_POWER=	1.22dBm
<input checked="" type="checkbox"/>	Tx Power State 1	SFP_1_1_TX_POWER_STATE=	OK
<input checked="" type="checkbox"/>	Tx Power State 2	SFP_1_2_TX_POWER_STATE=	OK
<input checked="" type="checkbox"/>	Tx Power State 3	SFP_1_3_TX_POWER_STATE=	OK
<input checked="" type="checkbox"/>	Tx Power State 4	SFP_1_4_TX_POWER_STATE=	OK
<input checked="" type="checkbox"/>	Rx Power 1	SFP_1_1_RX_POWER=	1.96dBm
<input checked="" type="checkbox"/>	Rx Power 2	SFP_1_2_RX_POWER=	1.50dBm
<input checked="" type="checkbox"/>	Rx Power 3	SFP_1_3_RX_POWER=	1.90dBm
<input checked="" type="checkbox"/>	Rx Power 4	SFP_1_4_RX_POWER=	1.28dBm
<input checked="" type="checkbox"/>	Rx Power State 1	SFP_1_1_RX_POWER_STATE=	OK
<input checked="" type="checkbox"/>	Rx Power State 2	SFP_1_2_RX_POWER_STATE=	OK
<input checked="" type="checkbox"/>	Rx Power State 3	SFP_1_3_RX_POWER_STATE=	OK
<input checked="" type="checkbox"/>	Rx Power State 4	SFP_1_4_RX_POWER_STATE=	OK

Logging - SFP Page

The following options are available. Enable check boxes to activate log fields as required.

Log Field	Description
SFP_N_FITTED=	Displays presence of (Q)SFP. Valid values are: <ul style="list-style-type: none"> • OK • Missing

Log Field	Description
SFP_N_STATUS=	Logs status reported by the (Q)SFP. Valid values are: <u>SFPs</u> <ul style="list-style-type: none"> • 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 <u>QSFPs</u> <ul style="list-style-type: none"> • OK • WARN:Temp • WARN:VCC • WARN:RX PWR LO • WARN:RX PWR HI • WARN:TX PWR LO • WARN:TX PWR HI • FAIL:SFP Not Ready • FAIL:RX LOS - RX Failure • FAIL:TX LOS - TX Failure • FAIL:EQ Fault - EQ Failure • FAIL:RX LOL - RX Loss of Lock • FAIL:TX LOL - TX Loss of Lock • FAIL:Temp • FAIL:VCC
SFP_N_TYPE=	Displays (Q)SFP identifier from device.
SFP_N_VENDOR=	Displays (Q)SFP manufacturer from device.
SFP_N_VENDOR_PN=	Displays (Q)SFP model number from device.
SFP_N_SERIAL_NR=	Displays the module serial number, which consists of an S followed by eight digits.
SFP_N_REVISION=	Displays manufacturer revision number.
SFP_N_CONNECTOR=	Displays connector type.
TEMP_N_NAME=	Displays temperature sensor name.
TEMP_N_CELSIUS=	Displays current temperature sensor reading.

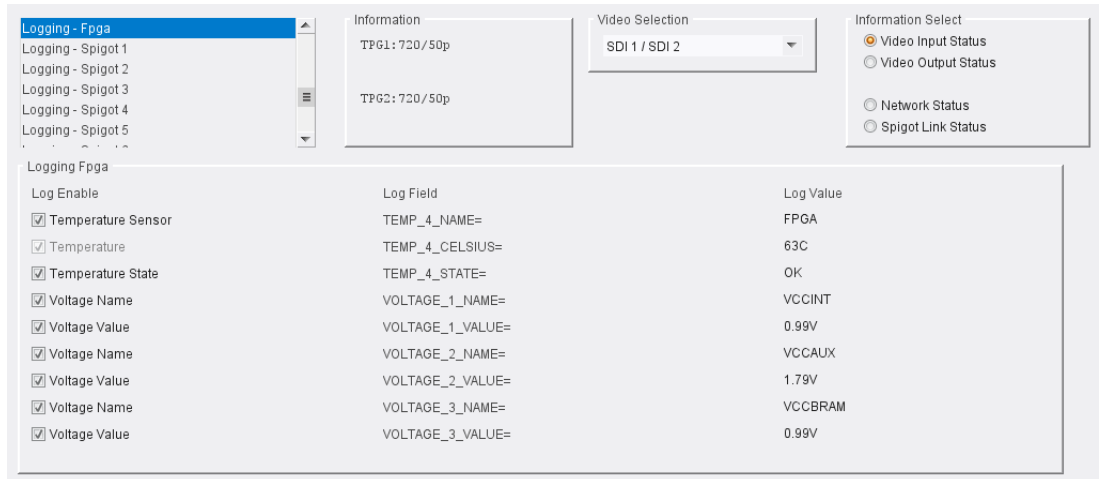
Log Field	Description
TEMP_N_STATE=	Displays temperature sensor state. Valid values are: <ul style="list-style-type: none"> • WARN: Disabled - Temperature sensor disabled. • WARN: Low - Low, but in tolerance. • WARN: High - High, but in tolerance. • OK • FAIL: Low - Low and out of tolerance. • FAIL: High - High and out of tolerance.
VOLTAGE_N_NAME=	Displays voltage sensor name.
VOLTAGE_N_VALUE=	Displays current voltage reading.
VOLTAGE_N_STATE=	Displays temperature sensor state. Valid values are: <ul style="list-style-type: none"> • OK • WARN: Low - Low, but in tolerance. • WARN: High - High, but in tolerance.
SFP_N_WAVELENGTH=	Displays transmit wavelength in nm.
SFP_N_X_LASER_BIAS=	Displays bias level in mA.
SFP_N_X_TX_POWER=	Displays transmit power level in dBm.
SFP_N_X_TX_POWER_STATE=	Displays transmit power level. Valid values are: <ul style="list-style-type: none"> • 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=	Reports receive power level in dBm.
SFP_N_X_RX_POWER_STATE=	Reports receive power level. Valid values are: <ul style="list-style-type: none"> • 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.

Where N is the input/(Q)SFP number and X is the lane

Logging - FPGA

Information on several parameters can be made available to a logging device connected to the RollCall network. Each logging page comprises three columns:

- **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.



Logging - FPGA Page

The following options are available. Enable check boxes to activate log fields as required.

Log Field	Description
TEMP_N_NAME=	Reports temperature sensor name.
TEMP_N_CELSIUS=	Reports current temperature sensor reading.
TEMP_N_STATE=	Reports current temperature state. Valid values are: <ul style="list-style-type: none"> • WARN:Low - temperature is low, but in tolerance. • WARN:High - temperature is high, but in tolerance. • OK • FAIL:Low - temperature is low and out of tolerance. • FAIL:High - temperature is high and out of tolerance. • WARN:Disabled - temperature sensor is disabled.
VOLTAGE_N_NAME=	Voltage sensor name.
VOLTAGE_N_VALUE=	Reports current voltage reading.

Where N is the input number

Logging - Spigot

The **Logging - Spigot** pages are used to select the log 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.

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

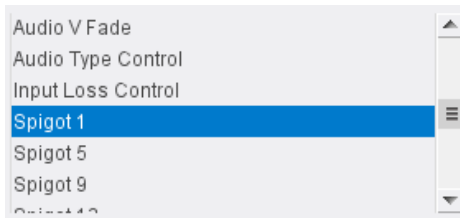
Log Enable	Log Field	Log Value
<input checked="" type="checkbox"/>	Input Ident	INPUT_1_IDENT= 1
<input checked="" type="checkbox"/>	Input Name	INPUT_1_NAME= INPUT_1_NAME
<input checked="" type="checkbox"/>	Input State	INPUT_1_STATE= WARN: TPG
<input checked="" type="checkbox"/>	Input Type	INPUT_1_TYPE= HD / SD / 3G SDI
<input checked="" type="checkbox"/>	Input Standard	INPUT_1_STANDARD= 720/50p
<input checked="" type="checkbox"/>	Input Stream	INPUT_1_STREAM= DUAL

Input Spigot Logging Page

Log Enable	Log Field	Log Value
<input checked="" type="checkbox"/>	Output Ident	OUTPUT_9_IDENT= 9
<input checked="" type="checkbox"/>	Output Name	OUTPUT_9_NAME= OUTPUT_9_NAME
<input checked="" type="checkbox"/>	Output State	OUTPUT_9_STATE= FAIL
<input checked="" type="checkbox"/>	Output Type	OUTPUT_9_TYPE= HD / SD / 3G SDI
<input checked="" type="checkbox"/>	Output Standard	OUTPUT_9_STANDARD= Unknown
<input checked="" type="checkbox"/>	Output Make Break	OUTPUT_9_MAKE_BREAK= MBB

Output Spigot Logging Page

Note: If spigots are linked for UHD traffic, only the Master spigots are shown on the main menu. Slave spigots are not shown.



Brought into line with UCP V16.0

The following options are available. Enable check boxes to activate log fields as required.

Log Field	Description
INPUT_N_IDENT=	System-defined identifier for the input, based on the rear ID.
INPUT_N_NAME=	Name of the input, as defined by the user on the Setup page. See Setup on page 91.
INPUT_N_STATE=	Valid values are: <ul style="list-style-type: none"> • 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_STREAM=	Not to be used if the spigot is part of a UHD Quad-Link configuration. Use INPUT_N_LINK_M_STATUS= in this case (see below). Displays whether an IP sender uses SDI on Primary, Secondary or both. Valid values are: <ul style="list-style-type: none"> • Dual - both used. • A - only Primary used. • B - only Secondary used.
INPUT_N_LINK_M_STATUS=	Reports the status of an input when it is used as a QL UHD link. Valid values are: <ul style="list-style-type: none"> • OK: Linked • OK: Not Linked • FAIL: No Input • FAIL: Wrong Standard
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: <ul style="list-style-type: none"> • OK - output signal good. • FAIL - output signal not detected. • WARN:Freeze • WARN: Pattern • WARN:Black

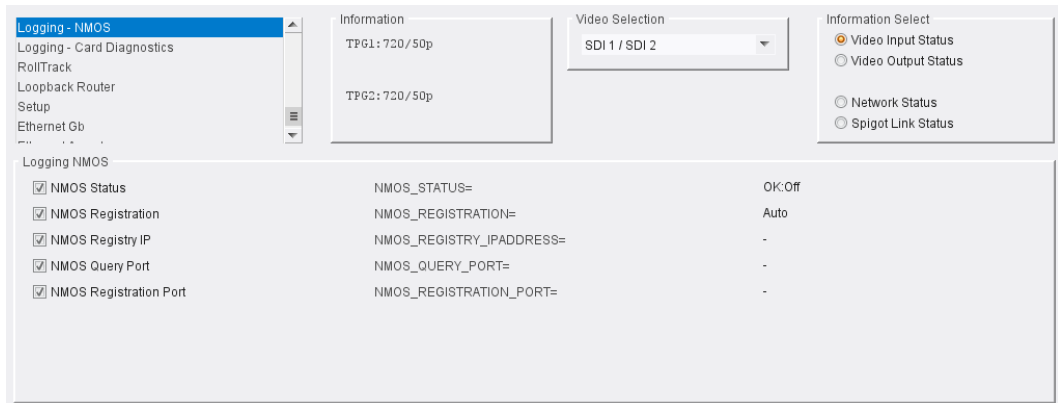
Log Field	Description
OUTPUT_N_TYPE=	Valid values are: <ul style="list-style-type: none">• SD SDI• HD SDI• HD/SD/3G SDI
OUTPUT_N_STANDARD=	Reports the output standard in the format: <Lines>(<Active>)/<Rate><i/p/sf> Where: <ul style="list-style-type: none">• Lines = Total lines• Active = Active lines• Rate = Frame rate• I = interlaced• P = Progressive• SF = Segmented Frame For example: 1080/50p or 1125(1080)/25i
OUTPUT_N_MAKE_BREAK=	Reports Make-before-Break or Break-before-Make setting for the spigot.
OUTPUT_N_LINK_STATUS=	Reports the status of an output when it is used as a QL UHD link. Valid values are: <ul style="list-style-type: none">• OK: Linked• OK: Not Linked• FAIL: No Input• FAIL: Wrong Standard

Where N is the input/output number and M is the QL UHD stream

Logging - NMOS

Information on several NMOS parameters can be made available to a logging device connected to the RollCall network. Each logging page comprises three columns:

- **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.



Logging - NMOS Page

The following options are available. Enable check boxes to activate log fields as required.

Option	Description
NMOS_STATUS=	Displays the current NMOS status. Valid values are: <ul style="list-style-type: none"> • OK:Off - NMOS functionality is disabled. • OK:Registered - the module has been successfully added to the NMOS registry. • WARN:Registering - the module is currently being registered. • FAIL:Unregistered - the registration process has failed.
NMOS_REGISTRATION=	Displays the method used to register the module. Valid values are: <ul style="list-style-type: none"> • Auto • Static See NMOS on page 48 for information on these settings.
NMOS_REGISTRY_IP_ADDRESS=	Displays the IP address of the NMOS registry.
NMOS_QUERY_PORT=	Displays the port currently used for NMOS query traffic.
NMOS_REGISTRATION_PORT=	Displays the port currently used for NMOS registration traffic.

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. Each logging page comprises three columns:

- **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.

Logging Card Diagnostics	Information	Video Selection	Information Select
<input checked="" type="checkbox"/> NVRAM File System	NVRAM_FS=	SDI 1 / SDI 2	<input checked="" type="radio"/> Video Input Status
<input checked="" type="checkbox"/> Total Available Memory	TOTAL_AVAILABLE_MEMORY=		<input type="radio"/> Video Output Status
<input checked="" type="checkbox"/> Total Used Memory	TOTAL_USED_MEMORY=		<input type="radio"/> Network Status
<input checked="" type="checkbox"/> Num Core Dumps	NUM_CORE_DUMPS=		<input type="radio"/> Spigot Link Status
<input checked="" type="checkbox"/> Last Core Dump Name	LAST_CORE_DUMP_NAME=		
<input checked="" type="checkbox"/> Last Core Dump Time	LAST_CORE_DUMP_TIME=		
<input checked="" type="checkbox"/> Powersafe Memory Restore	PWRSAFE_MEMORY_RESTORE=		
<input checked="" type="checkbox"/> PMIC Version	PMIC_VERSION=		

Logging - Card Diagnostics Page

RollTrack Source	Description
NVRAM_FS=	Reports NVRAM file system.
TOTAL_AVAILABLE_MEMORY=	Reports total amount of CPU memory available.
TOTAL_USED_MEMORY=	Reports total amount of CPU memory used.
NUM_CORE_DUMPS=	Reports number of core dumps performed by the module.
LAST_CORE_DUMP_NAME=	Reports name of last core dump performed by the module.
LAST_CORE_DUMP_TIME=	Reports time of last core dump performed by the module.
PWRSAFE_MEMORY_RESTORE=	Reports whether the power-safe memory facility is working correctly. Possible values are: <ul style="list-style-type: none"> • OK • FAIL
PMIC_VERSION=	Reports version of the PMIC chip fitted to the module.

Where N is the input number

RollTrack

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

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

Source Pane

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.

RollTrack Source	Description
Unused	No RollTracks sent.
Input <i>N</i> OK	Input <i>N</i> is good.
Input <i>N</i> LOST	Input <i>N</i> is bad.

Where *N* is the input number

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 that 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 **S** to save the selection. Clicking **P** 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:

Message	Description
No	The message is not being sent.
Yes	The message is being sent.

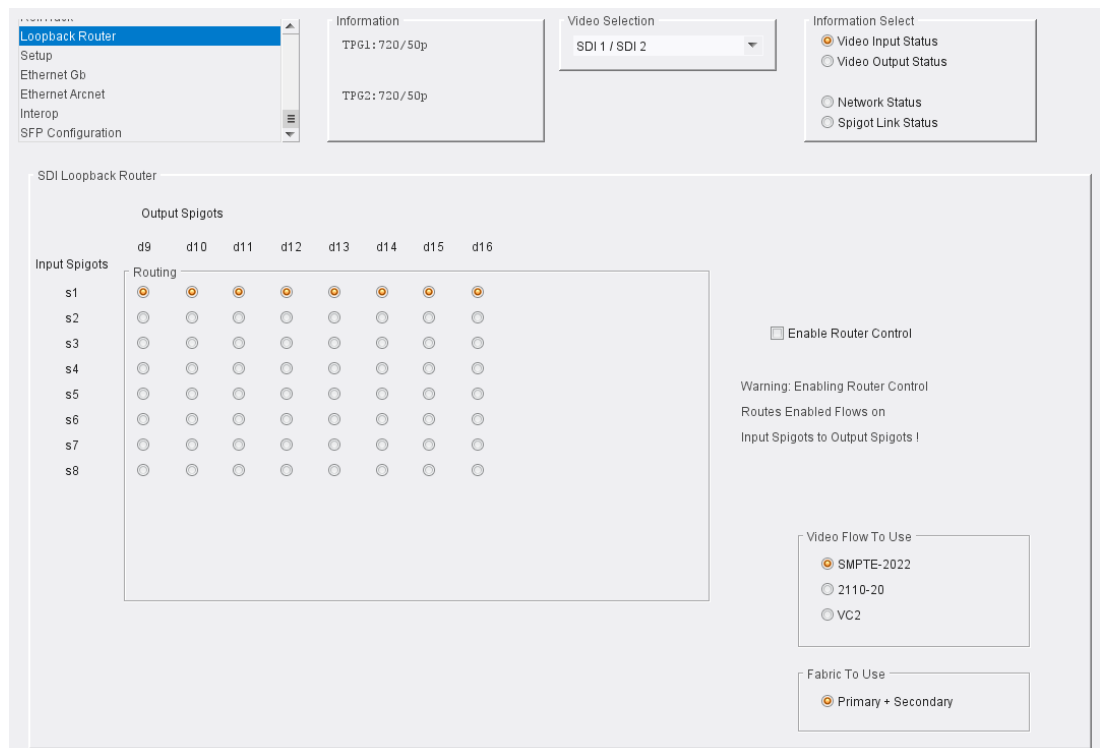
RollTrack Status

A message is displayed here to indicate the status of the currently selected RollTrack index. Possible RollTrack Status messages are:

RollTrack Source	Description
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.



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, RFC4175 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 module, such as the serial number and software version. Use the functions on the page to restart the module or to return all settings to their factory or default settings.

The screenshot shows the 'Setup' page of a web interface. On the left is a navigation menu with 'Setup' highlighted. The main content area is divided into several sections:

- Information:** Displays 'TPG1: 720 / 50p' and 'TPG2: 720 / 50p'.
- Video Selection:** A dropdown menu showing 'SDI 1 / SDI 2'.
- Information Select:** A panel with radio buttons for 'Video Input Status', 'Video Output Status', 'Network Status', and 'Spigot Link Status'.
- Product:** A grid of input fields containing the following data:

Product	Software Version	Firmware Version
IQUCP50_SDI	15.6.107	6626F5BB
Serial No.	SW Build	OS
S59062906	0.24.73	QNIX 6.6.0
	Rear ID	Firmware Build Set
	5	20191219
Main PCB	Main Mod Level	Main HW Build
RUCP251B	1	0
Feature PCB	Feature Mod Level	Feature HW Build
MIX50FB1	0	FB1
- Restart:** A 'Restart' button with a warning: 'Warning: This will affect all Outputs!'.
- Defaults:** 'Default Settings' and 'Factory Defaults' buttons.
- Remove License:** A 'Remove License' button with a note: 'Restart Needed Afterwards to change to BASE Product'.

Setup Page

The **Product** pane displays technical information on the IQMIX module. You may be asked for these details by Grass Valley support if you need technical assistance.

Item	Description
Product	Name of the module.
Software Version	Currently installed software version number.
Firmware Version	Currently installed firmware version number.
Serial No	Module serial number.
SW Build	Factory software build number. This number identifies all parameters of the module.
OS	Operating system version number.
Rear ID	Rear panel type.
Firmware Build Set	Firmware build set ID.
Main PCB	Printed Circuit Board version number.
Main Mod Level	Main PCB modification level.
Main HW Build	Factory main hardware build number.
Feature PCB	Daughterboard PCB revision number.

Item	Description
Feature Mod Level	Daughterboard PCB modification level.
Feature HW Build	Factory Daughterboard hardware build number.

Restart

Power-cycles the module. This will produce disturbances on the output picture on all outputs.

Defaults

Provides options to reset the module to its defaults.

Option	Operation
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.

Ethernet Gb

The **Ethernet Gb** (Gigabit) page shows details and status of the on-module Ethernet connector. The IQMIX defaults to use of DHCP, but this can be overridden and a static IP address specified if required.

The screenshot shows the 'Ethernet Gb' configuration page. On the left, a sidebar lists navigation options: Loopback Router, Setup, **Ethernet Gb**, Ethernet Arcnet, Interop, and SFP Configuration. The main content area is divided into several sections:

- Information:** Displays 'TPG1: 720/50p' and 'TPG2: 720/50p'.
- Video Selection:** A dropdown menu set to 'SDI 1 / SDI 2'.
- Information Select:** Radio buttons for 'Video Input Status' (selected), 'Video Output Status', 'Network Status', and 'Spigot Link Status'.
- Ethernet Configuration Table:**

	Current	New Static
IP Address	172.19.160.141	172.19.160.141
Default Gateway	172.19.160.1	172.19.160.1
Subnet Mask	255.255.254.0	255.255.254.0
MAC Address	00:23:70:00:BE:59	
Mode	STATIC	
Link Status	UP	
- Mode Selection:** Radio buttons for 'DHCP' and 'Static' (selected).
- Buttons:** Three 'S' (Save) buttons and a 'Restart' button.
- Footer:** 'DHCP / Static IP Changes take effect on restart'.

Ethernet Front Page

The Ethernet Pane

The **Ethernet** pane displays details of the currently selected network interface, and allows a static IP address to be defined. Enter information as required, then click **S** to save. New settings are applied when **Restart** is clicked.

Ethernet Arcnet

Not currently used.

The screenshot shows the 'Ethernet Arcnet' configuration page. On the left, a sidebar lists navigation options: RollTrack, Loopback Router, Setup, **Ethernet Arcnet**, Interop, and SFP Configuration. The main content area is divided into several sections:

- Information:** Displays 'IP1: 1080/251' and 'TPG2: 1080/251'.
- SDI Selection:** A dropdown menu set to 'SDI 1 / SDI 2'.
- Information Select:** Radio buttons for 'Video Input Status', 'Video Output Status', and 'Network Status'.
- Ethernet Configuration Table:**

	Current	New Static
IP Address	0.0.0.0	
Default Gateway	Not Found	
Subnet Mask	255.0.0.0	
MAC Address	00:00:00:00:00:00	
Mode	DHCP	
Link Status	DOWN	
- Mode Selection:** Radio buttons for 'DHCP' (selected) and 'Static'.
- Buttons:** Three 'S' (Save) buttons and a 'Restart' button.
- Footer:** 'DHCP / Static IP Changes take effect on restart'.

Ethernet Arcnet Page

Interop Page

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

Interop Page

The following facilities are available from this page:

Option	Operation
Stream Synchronization Controls	<p>Audio:</p> <ul style="list-style-type: none"> • 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.

Option	Operation
	<p>Meta:</p> <ul style="list-style-type: none">• 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 Page

The **SFP Configuration** page allows various SFP parameters to be adjusted, if required.

The screenshot displays the SFP Configuration page interface. At the top left is a navigation menu with options: Loopback Router, Setup, Ethernet Gb, Ethernet Arcnet, Interop, and SFP Configuration (highlighted). To the right of the menu are two boxes: 'Information' showing 'TPG1: 720/50p' and 'TPG2: 720/50p', and 'Video Selection' with a dropdown menu set to 'SDI 1 / SDI 2'. Further right is an 'Information Select' panel with radio buttons for 'Video Input Status' (selected), 'Video Output Status', 'Network Status', and 'Spigot Link Status'. The main content area is divided into two sections: 'SFP 1 Compatibility Control' and 'SFP 2 Compatibility Control'. Each section contains an 'SFP Database List' with a 'Default' dropdown and a 'Take' button, and an 'SFP Custom Control' section with four rows of hex values and 'S' buttons. The 'Currently Set' values are: 0x4, 0x0, 0x12, and 0x1.

SFP Configuration Page

The majority of SFPs will operate correctly with IQMIX modules without any need for adjustment. Some, however, may need to have module 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.



Grass Valley Technical Support

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

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

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

Corporate Head Office

Grass Valley
3499 Douglas-B.-Floreani
St-Laurent, Quebec H4S 2C6
Canada
Telephone: +1 514 333 1772
Fax: +1 514 333 9828

www.grassvalley.com

