grass valley

A **BELDEN** BRAND

IQSDA41/42

SINGLE/DUAL/MULTI-CHANNEL RE-CLOCKING DISTRIBUTION
AMPLIFIERS WITH ROLLCALL

User Manual

Issue 2 Revision 1

2019-04-01

www.grassvalley.com

Patent Information

This product may be protected by one or more patents.

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

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Terms and Conditions

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Important Safety Information

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

Symbols and Their Meanings

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

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

This is a prompt to note the fuse rating when replacing fuses. The fuse referenced in the text must be replaced with one having the ratings indicated.

Identifies a protective grounding terminal which must be connected to earth ground prior to making any other equipment connections.

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

Indicates that static sensitive components are present, which may be damaged by electrostatic discharge. Use anti-static procedures, equipment and surfaces during servicing.

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

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

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

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

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

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

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

Warnings

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

• Appropriately listed/certified mains supply power cords must be used for the connection of the equipment to the rated mains voltage.

• This product relies on the building's installation for short-circuit (over-current) protection. Ensure that a fuse or circuit breaker for the rated mains voltage is used on the phase conductors.

• Any instructions in this manual that require opening the equipment cover or enclosure are for use by qualified service personnel only.

• Do not operate the equipment in wet or damp conditions.

• This equipment is grounded through the grounding conductor of the power cords. To avoid electrical shock, plug the power cords into a properly wired receptacle before connecting the equipment inputs or outputs.

• Route power cords and other cables so they are not likely to be damaged. Properly support heavy cable bundles to avoid connector damage.

• Disconnect power before cleaning the equipment. Do not use liquid or aerosol cleaners; use only a damp cloth.

• Dangerous voltages may exist at several points in this equipment. To avoid injury, do not touch exposed connections and components while power is on.

• High leakage current may be present. Earth connection of product is essential before connecting power.

• Prior to servicing, remove jewelry such as rings, watches, and other metallic objects.

• To avoid fire hazard, use only the fuse type and rating specified in the service instructions for this product, or on the equipment.

• To avoid explosion, do not operate this equipment in an explosive atmosphere.

• Use proper lift points. Do not use door latches to lift or move equipment.

• Avoid mechanical hazards. Allow all rotating devices to come to a stop before servicing.

• Have qualified service personnel perform safety checks after any service.

Cautions

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

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

• When installing this equipment, do not attach the power cord to building surfaces.

• Products that have no on/off switch, and use an external power supply must be installed in proximity to a main power outlet that is easily accessible.

• Use the correct voltage setting. If this product lacks auto-ranging power supplies, before applying power ensure that each power supply is set to match the power source.

• Provide proper ventilation. To prevent product overheating, provide equipment ventilation in accordance with the installation instructions.

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

Electrostatic Discharge (ESD) Protection

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

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

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.

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

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

Avertissements

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

- Un cordon d'alimentation dûment homologué doit être utilisé pour connecter l'appareil à une tension de secteur de 120 V CA ou 240 V CA.
- La protection de ce produit contre les courts-circuits (surintensités) dépend de l'installation électrique du bâtiment. Assurez-vous qu'un fusible ou un disjoncteur pour 120 V CA ou 240 V CA est utilisé sur les conducteurs de phase.
- Dans le présent manuel, toutes les instructions qui nécessitent d'ouvrir le couvercle de l'équipement sont destinées exclusivement au personnel technique qualifié.
- N'utilisez pas cet appareil dans un environnement humide.
- Cet équipement est mis à la terre par le conducteur de mise à la terre des cordons d'alimentation. Pour éviter les chocs électriques, branchez les cordons d'alimentation sur une prise correctement câblée avant de brancher les entrées et sorties de l'équipement.
- Acheminez les cordons d'alimentation et autres câbles de façon à ce qu'ils ne risquent pas d'être endommagés. Supportez correctement les enroulements de câbles afin de ne pas endommager les connecteurs.
- Coupez l'alimentation avant de nettoyer l'équipement. Ne pas utiliser de nettoyants liquides ou en aérosol. Utilisez uniquement un chiffon humide.
- Des tensions dangereuses peuvent exister en plusieurs points dans cet équipement. Pour éviter toute blessure, ne touchez pas aux connexions ou aux composants exposés lorsque l'appareil est sous tension.
- Avant de procéder à toute opération d'entretien ou de dépannage, enlevez tous vos bijoux (notamment vos bagues, votre montre et autres objets métalliques).
- Pour éviter tout risque d'incendie, utilisez uniquement les fusibles du type et du calibre indiqués sur l'équipement ou dans la documentation qui l'accompagne.
- Ne pas utiliser cet appareil dans une atmosphère explosive.
- Présence possible de courants de fuite. Un raccordement à la masse est indispensable avant la mise sous tension.
- Après tout travail d'entretien ou de réparation, faites effectuer des contrôles de sécurité par le personnel technique qualifié.

Mises en garde

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

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

- Les produits qui n'ont pas d'interrupteur marche-arrêt et qui disposent d'une source d'alimentation externe doivent être installés à proximité d'une prise de courant facile d'accès.

- Si l'équipement n'est pas pourvu d'un modules d'alimentation auto-adaptables, vérifiez la configuration de chacun des modules d'alimentation avant de les mettre sous tension.

- Assurez une ventilation adéquate. Pour éviter toute surchauffe du produit, assurez une ventilation de l'équipement conformément aux instructions d'installation.

- N'utilisez pas l'équipement si vous suspectez un dysfonctionnement du produit. Faites-le inspecter par un technicien qualifié.

- Pour réduire le risque de choc électrique, n'effectuez pas de réparations autres que celles qui sont décrites dans le présent manuel, sauf si vous êtes qualifié pour le faire. Confiez les réparations à un technicien qualifié. La maintenance doit se réaliser dans un milieu libre d'électricité statique.

- L'appareil peut comporter plus d'un cordon d'alimentation. Afin de prévenir les chocs électriques, débrancher tous les cordons d'alimentation avant toute opération d'entretien.

- Veillez à toujours prendre les mesures de protection antistatique appropriées quand vous manipulez l'équipement.

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

Protection contre les décharges électrostatiques (DES)

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

- Assurez-vous que le châssis est relié électriquement à la terre par le cordon d'alimentation ou tout autre moyen disponible.

- Portez un bracelet antistatique et assurez-vous qu'il est bien en contact avec la peau. Connectez la pince de masse à une *surface non peinte* du châssis pour détourner à la terre toute tension électrostatique indésirable. En l'absence de bracelet antistatique, déchargez l'électricité statique de votre corps en touchant une surface métallique *non peinte* du châssis.

- Pour plus de sécurité, vérifiez périodiquement la valeur de résistance du bracelet antistatique. Elle doit se situer entre 1 et 10 mégohms.

- Si vous devez mettre une carte de côté, assurez-vous de la ranger dans un sac protecteur antistatique.

- Les cartes qui sont reliées à un châssis ou boîtier métallique mis à la terre ne nécessitent pas de protection antistatique spéciale.

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

<div style="background-color: yellow; border: 1px solid black; padding: 10px;">

<u>CAUTION</u>
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 instructions.
Batteries **<u>shall only</u>** be replaced by trained service technicians.

</div>

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

CLASS 1
LASER PRODUCT

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

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

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

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

Safety and EMC Standards

This equipment complies with the following standards:

Safety Standards

CE

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.

Table of Contents

Introduction

IQSDA41

The IQSDA41 is a single- or dual- channel SDI distribution amplifier for UHD-1 12 Gbit/s, HD 3 Gbit/s, 1.5 Gbit/s or SD 270 Mbit/s signals, providing up to 9 equalized and reclocked outputs in a single-width package. Its 60m 12G, 80m 3G, 180m HD input equalization performance and non-reclocking distribution of wide-band signals make it ideal for all distribution applications.

Variants are available with 10 x BNC I/O (IQSDA4100-1B4), or 8 x BNC I/O + 2 x SFP I/O (IQSDA4101-1B4). See Order Codes on page 20 for more information.
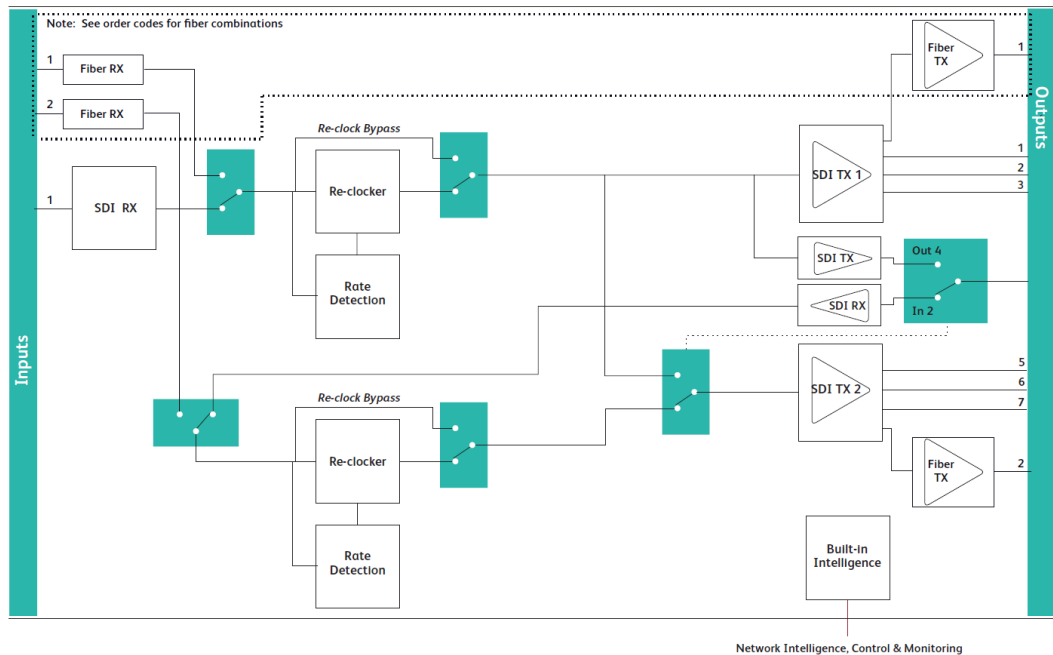
Block Diagram

Block Diagram IQSDA41

Feature Summary

The IQSDA41 provides the following features:

- Intelligent UHD-1 12 Gbit/s, HD 3 Gbit/s or 1.5 Gbit/s and SD-SDI re-clocking distribution amplifier.
- Configurable as 1 input to 9 outputs, or 2 inputs with 4 outputs per input, or 4 inputs with 4 outputs per input.

- Equalizes up to 60m at 12 Gbit/s, 80m at 3 Gbit/s, 180m at 1.5 Gbit/s, and more than 350m at 270 Mbit/s when using Belden 1694A cable.
- Standards supported:
  - 3G-HD to SMPTE 424M
  - HD-SDI to SMPTE 292M
  - SD-SDI to SMPTE 259M-C
  - DVB-ASI
- 1310nm output wavelength.
- RollCall monitoring allows all signal paths to be managed.

IQSDA42

The IQSDA42 is a configurable single, dual or quad-channel SDI distribution amplifier for UHD-1 12 Gbit/s, HD 3 Gbit/s, 1.5 Gbit/s or SD 270 Mbit/s signals, providing up to 19 equalized and re-clocked outputs of the input in a single width-package. Its 60m 12G, 80m 3G, 180m HD input equalization performance coupled with excellent packing density make it ideal for signal-dense distribution applications.

Variants are available with 20 x BNC I/O (IQSDA4201-1B4), or 16 x BNC I/O + 2 x SFP I/O (IQSDA4200-1B4). See Order Codes for more information.

Block Diagram

Block Diagram IQSDA42

Feature Summary

The IQSDA42 provides the following features:

- Intelligent UHD-1 12 Gbit/s, HD 3 Gbit/s or 1.5 Gbit/s and SD-SDI re-clocking distribution amplifier.
- Configurable as 1 input to 9 outputs, or 2 inputs with 4 outputs per input.
- Equalizes up to 60m at 12 Gbit/s, 80m at 3 Gbit/s, 180m at 1.5 Gbit/s and more than 350m at 270 Mbit/s when using Belden 1694A cable.

- Standards supported:
  - 12G UHD-1 to SMPTE 2082
  - 3G-HD to SMPTE424M
  - HD-SDI to SMPTE292M
  - SD-SDI to SMPTE259M-C
  - DVB-ASI
- RollCall monitoring allows all signal paths to be managed.

Order Codes

The following module order codes are covered by this manual:

IQSDA4100-1B4 12G/3G/HD/SD-SDI Re-clocking Distribution Amplifier. 1 input with 7 outputs, or 2 inputs with 3 outputs per input, 2 SFP optical inputs or 2 SFP optical outputs.
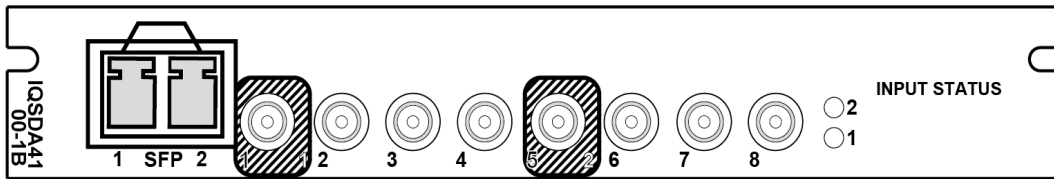
IQSDA4101-1B4 12G/3G/HD/SD-SDI Re-clocking Distribution Amplifier. 1 input with 9 outputs or 2 inputs with 4 outputs per input.
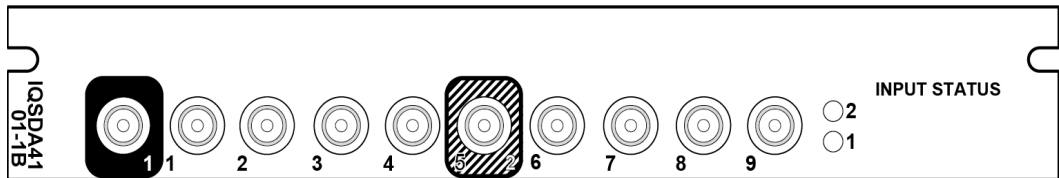
IQSDA4200-1B4 Multi-channel 12G/3G/HD/SD-SDI Re-clocking Distribution Amplifier. 1 input with 15 outputs, 2 inputs with 7 outputs per input, or 4 inputs with 3 outputs per input. 1 SFP optical input and 1 SFP optical output.
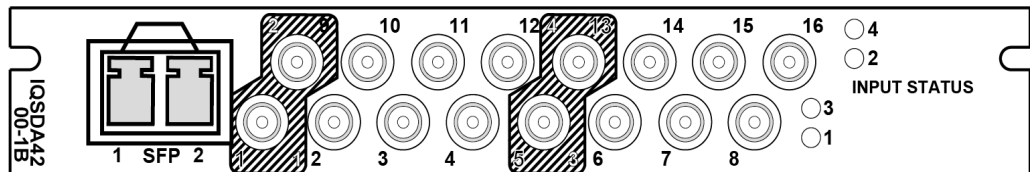
IQSDA4201-1B4 Multi-channel 12G/3G/HD/SD-SDI Re-clocking Distribution Amplifier. 1 input with 19 outputs, 2 inputs with 9 outputs per input, or 4 inputs with 4 outputs per input.
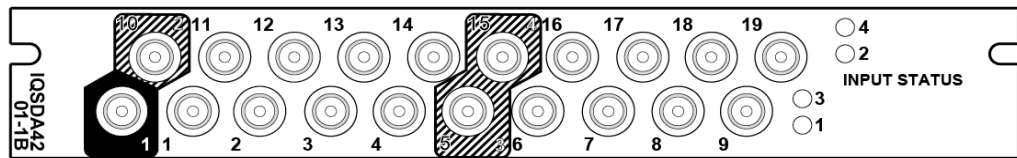
The following SFP modules are available for the IQSDA range:

FGAN FC1-13T1	Fiber SFP module for Cage 1 - 1 x 3G 1310nm Fiber Tx
FGAN FC1-13T2	Fiber SFP module for Cage 1 - 2 x 3G 1310nm Fiber Tx
FGAN FC1-13T2-12G	Fiber SFP module for Cage 1 - 2 x 12G 1310nm Fiber Tx
FGAN FC1-1315T2	Fiber SFP module for Cage 1 - 2 x 3G Fiber Tx 1310/1550nm
FGAN FC1-R1	Fiber SFP module for Cage 1 - 1 x 3G Fiber Rx
FGAN FC1-R2	Fiber SFP module for Cage 1 - 2 x 3G Fiber Rx
FGAN FC1-R2-HS	Fiber SFP module for Cage 1 - 2 x 3G Fiber Rx -9 to-28dBm
FGAN FC1-13R2-12G	Fiber SFP module for Cage 1 - 2 x 12G Fiber Rx
FGAN FC1-13TR	Fiber SFP module for Cage 1 - 3G Fiber Tx/Rx
FGAN FC1-12TR-12G	Fiber SFP module for Cage 1 - 12G Fiber Tx/Rx
FGAN FC1-HDBT2	HD-BNC SFP module for Cage 1 - 2 x 3G Tx HD-BNC
FGAN FC1-HDBR2	HD-BNC SFP module for Cage 1 - 2 x 3G Rx HD-BNC
FGAN FC1-HDMIR	Fiber SFP module for Cage 1 - HDMI Rx with 2m cable

Enclosures

The IQSDA41 and IQSDA42 modules can be fitted into the enclosure types below.

> Note: Although IQ modules are interchangeable between enclosures, their rear panels are enclosure-specific. IQH1A (post-2015), IQH3B and IQH4B enclosures accept modules with either **A** or **B** order codes. IQH3A or IQH1A enclosures accept modules with **A** order codes only.

B-style Enclosures

IQH3B-S-0, IQH3B-S-P
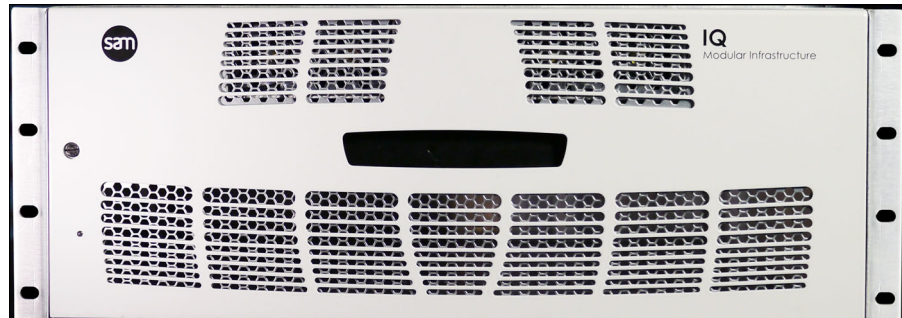
IQH4B-S-P

Note: The IQH3B and IQH4B enclosures provide two internal analog reference inputs. These inputs are applicable to modules with **B** order codes only.

Technical Specifications

Inputs and Outputs	
Signal Inputs	
SDI Inputs	1 or 2 (configurable) x 12G/3G/HD/SD-SD (IQSDA41) 1, 2 or 4 (configurable) x 12G/3G/HD/SD-SD (IQSDA42)
Connector/Format	HD-BNC/75 Ohm panel jack on standard Grass Valley connector panel.
Input Cable Length	Up to 60 m Belden 1694A @ 12 Gbit/s Up to 80 m Belden 1694A @ 3 Gbit/s Up to 180 m Belden 1694A @ 1.5 Gbit/s 350+ m Belden 1694A @ 270 Mbit/s **Note**: When using mixed HD and SD inputs, it is recommended that cable lengths do not exceed the HD specification of 180 m.
Fiber Signal Input*	
Inputs	2
Optical	12 Gbit/s UHD-1 3 Gbit/s HD-SDI 1.485 Gbit/s HD-SDI 270 Mbit/s SD-SDI
Connector/Format	LC single mode
Conforms to	SMPTE 2082 SMPTE 297-2006 SMPTE 424M (HD level A/B) SMPTE 292M (HD) SMPTE 259M-C (SD)
Signal Outputs	
Outputs	Up to 19, group selectable
Connector/Format	HD-BNC/75 Ohm panel jack on standard Grass Valley connector panel
Conforms to video standards	SMPTE 297-2006 SMPTE 424M (HD level A/B) SMPTE 292M (HD) SMPTE 259M-C (SD)
Fiber Signal Output*	
Outputs	Up to 2, selectable per channel

Optical	12 Gbit/s UHD-1 3 Gbit/s HD-SDI 1.485 Gbit/s HD-SDI 270 Mbit/s SD-SDI
Connector/Format	LC single mode
Conforms to	SMPTE 297-2006 SMPTE 424M (HD level A/B) SMPTE 292M (HD) SMPTE 259M-C (SD)

Dependant on SFP fitted

Controls	
Indicators:	
Power	OK (Green)
CPU	OK (Green flashing)
Input 1	OK (Green), Bypass (Orange), Loss (Red)
Input 2	OK (Green), Bypass (Orange), Loss (Red)
Input 3 (IQSDA42 only)	OK (Green), Bypass (Orange), Loss (Red)
Input 4 (IQSDA42 only)	OK (Green), Bypass (Orange), Loss (Red)
SFP A	OK (Green), Bypass (Orange), Loss (Red)
SFP B	OK (Green), Bypass (Orange), Loss (Red)
Other Controls	
User Memories	Name, save, and recall 16 user memories
Memory Naming	User configurable naming of memories 1–16
Information Window	Unit Status, SFP Status
Logging	Input 1-4 Type Input 1-4 Data Rate Input 1-4 Present Input 1-4 Error Input 1-4 Loss
Optical Logging	Tx Laser Bias High Warning Tx Power Low Warning Tx Power High Warning
Laser Wavelength	Input 1 (2) Rx Power High Warning Input 1 (2) Rx Power Low Warning Input 1 (2) Rx Power Measurement
RollTrack Index	Up to 16 RollTrack destinations
RollTrack Controls	On/Off, Index, Source, Address, Command, Status, Sending
Roll Track Sources	Unused, Input Present (1-4, Fiber 1 & 2), Input Loss (1-4, Fiber 1 & 2), Output Rate/Std (1 -4), Out 1 Selects (In 1-4 & Rx 1 & Rx 2), Fiber Rx Power OK (1 & 2), Fiber Rx Power Fail (1 & 2), Fiber Tx Bias OK (1 & 2), Fiber Tx Bias High (1 & 2), Fiber Tx Bias Low (1 & 2)

Factory Default	Resets all module settings to factory specified default values and clears memories
Default Settings	Resets all module settings to factory specified default values but does not clear memories
Restart	Software restart of the module
Module Information	Reports the following module information: Software Version, Serial Number, Build Number, KOS Version, Firmware Version, PCB Version
Specifications	
Electrical	3 Gbit/s SDI, SMPTE 424M 1.5 Gbit/s HD-SDI, SMPTE 292M 270 Mbit/s SDI, SMPTE 259M-C/DVB-ASI
Connector/Format	HD-BNC 75 Ohm LC singlemode SFP
Return Loss	>-15 dB (270 Mbit/s, 1.5 Gbit/s) >-10 dB (3 Gbit/s)
Output Jitter	SD-SDI 0.2 UI (10 Hz)/0.2 UI (1 kHz) 3G/HD-SDI 1.0 UI (10 Hz)/0.2 UI (100 kHz)
Optical 1310 nm Tx	
Wavelength	1310 nm
Spectral Width (FWHM)	>1.5 nm (typical)
Output Power	0 to -5 dBm (-2 dBm typical)
Rise and Fall Time	45 ps @ 12 Gbit/s 135 ps @ 3 Gbit/s 270 ps @ 1.5 Gbit/s 1.5 ns @ 270 Mbit/s
Extinction Ratio	>7.5:1 (typical)
Optical Return Loss	-27 dB
Link Distance	Up to 10 Km @ 12 Gbit/s
Optical Rx	
Input Wavelength Range	1260 nm (min.), 1620 nm (max.)
Input Sensitivity	-21 dBm
Optical Power Input Range	>0 dBm, <-20 dBm
Link Distance	Up to 10 Km @ 12 Gbit/s
Power Consumption	
Module Power Consumption	IQSDA41:5PR IQSDA42: 8PR

Connections

This section describes the physical input and output connections provided by the IQSDA41/42.

SDI Input/Output

Serial digital inputs and outputs are via HD-BNC connectors which terminate in 75 Ohms. The number of connectors varies according to the actual module variant in use.
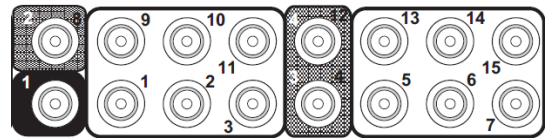
Connectors are color-coded for easy identification:
Black shading indicates an input;
**Gray** shading indicates a bi-directional connector (see below);
No shading indicates an output.

Bi-directional Connectors

Bi-directional connectors can be used as either an input or an output. They can be identified by the gray shading and the twin ID numbers; the number in white is the input number, and the number in black is the output number.

SDI SFP

SFP supporting 12G/3G/HD/SD-SDI.
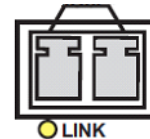
Rear Panel LEDs

The LEDs on the rear panel of the module indicate input status. There is one LED per input.
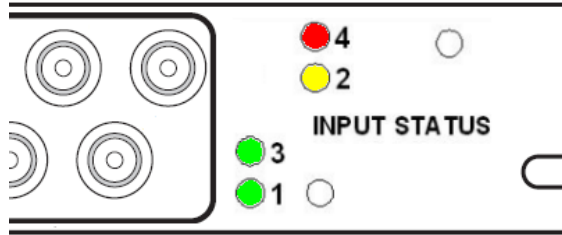
- **When Green**: Input enabled, signal valid.
- **When Yellow**: Input disabled or Reclocker Bypass active.
- **When Red**: No signal on input or signal not valid.

See Input Output/Input Output (SFP) on page 35 for information on enabling/disabling inputs.

Operation Using the RollCall Control Panel

This section contains information on using IQSDA41/42 modules with RollCall.

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

> Note: The IQSDA41/42 will dynamically configure itself depending on user configuration and SFP options fitted. The RollCall control panel will change to reflect the current product configuration.
> The pages shown in this section are for guidance and reference only, and may be slightly different to those on your module.

Navigating Pages in the RollCall Template

The RollCall template has a number of pages, each of which can be selected from the scrolling list as shown. Right-clicking anywhere on the pages will also open a page view list, allowing quick access to any of the pages.
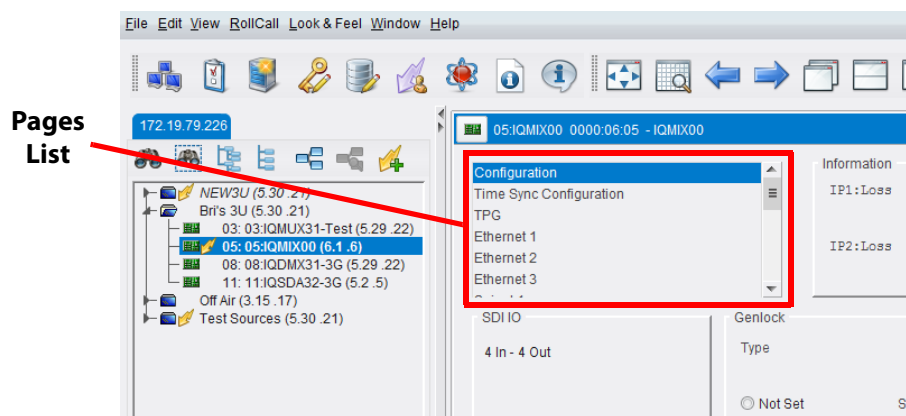
Setting Values

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 saved by pressing the ENTER key, or clicking the ⎡S⎤ **Save Value** button.

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

Template Pages

The following templates are available:

- **Setup/Setup (SFP)** - see .
- **Input Output/Input Output (SFP)** - see .
- **Logging - Misc** - see .
- **Logging - Input** - see .
- **Logging - Output 1-*n*** - see .
- **RollTrack** - see .
- **Memory 1-16** - see .

Information Window

The Information window is displayed at the top of each page, next to the pages list. It can displays basic information about the input and output status of the module; select a radio button as required.
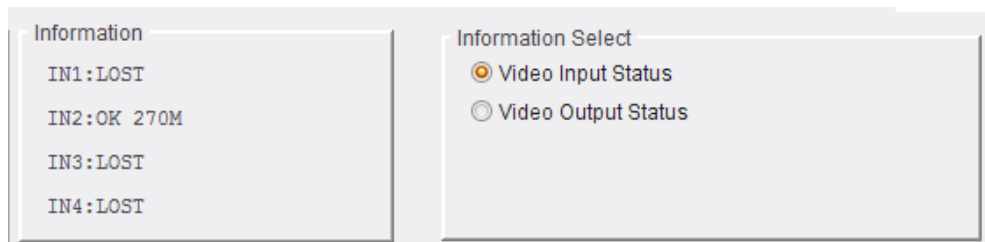
Setup/Setup (SFP)

> **Note:** If SFPs are fitted, the page is named **Setup (SFP)**.

The **Setup/Setup (SFP)** page displays basic information about the module, such as the serial number and software versions. Use the functions on the page to restart the module, return all settings to their factory or default settings, and apply names to inputs and outputs.

The following information is displayed:

- **Product:** Name of the module.
- **Software Version:** Currently installed software version number.
- **Serial No:** Module serial number.
- **Build:** Factory build number. This number identifies all parameters of the module.
- **OS:** Operating system version number.
- **PCB:** Printed Circuit Board revision number.
- **PCB Mods:** PCB modification level.

These controls are also available:

Restart

Click **Restart** to power cycle the module.

Default Settings

The **Default Settings** button enables module settings to be reset to their factory defaults, leaving user memories intact.

Factory Defaults

The **Factory Defaults** button enables the module settings to be reset to their factory defaults.

> Note: Resetting the module to its factory defaults also clears all the saved memory settings.

Input Names

These are the input names displayed in logs.

To change the name of an input, type the name in the appropriate text field and click **S**. To return the name to its factory default, click **P**.

Output Names

These are the output names displayed in logs.

To change the name of an output, type the name in the appropriate text field and click **S**. To return the name to its factory default, click **P**.

Input Output/Input Output (SFP)

> **Note:** If SFPs are fitted, the page is named **Input Output (SFP)**.

The **Input Output/Input Output (SFP)** page enables inputs and outputs to be configured, and determines how output ports are to behave in the event of an input error.
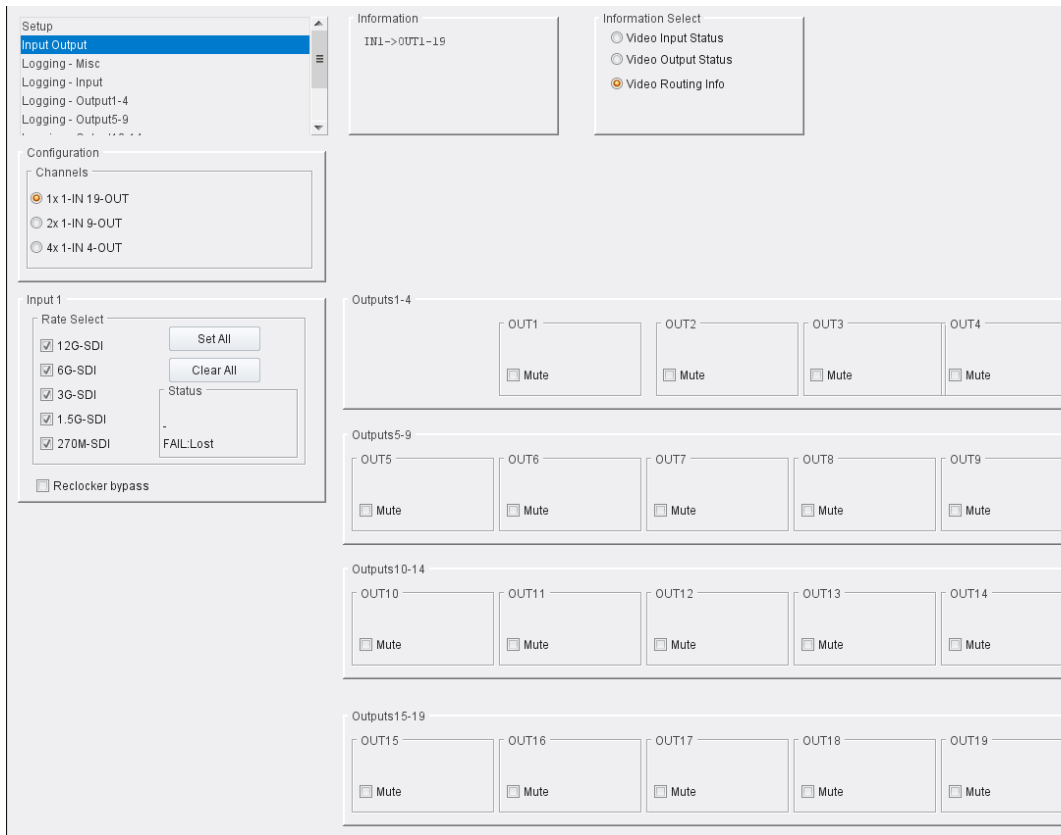
Configuration

This allows the input configuration to be selected; use the radio buttons to select the required input/output configuration.

> Note: The options available are dependent on the number and type of input connectors on the module. The other controls displayed on the page may also vary depending on the option selected.

Inputs

These controls allow selection of the incoming signal rates which are to be reclocked and sent onwards. Enable check boxes as appropriate; all check boxes can be set or cleared simultaneously using the **Set All** and **Clear All** buttons.

Incoming signals at rates not selected here will be muted.

Reclocker Bypass

Enabling **Reclocker Bypass** will prevent any incoming signal from being re-clocked, regardless of other settings. The signal will be passed onwards without modification.

Outputs

Each output can be muted individually. Select **Mute** to manually apply mute as required.

SFP

The **SFP** page displays information on any SFPs connected to the module.

SFP Details

Displays technical details read from the SFP fitted to the module.

Configure Types

When set to **Auto**, the module interrogates the SFP and automatically selects the correct TxRx and Media types. Alternatively, settings may be selected manually if required.

SFP Output *n*

Displays transmission statistics read from the SFP fitted to the module.

SFP Input *n*

Displays power statistics read from the SFP fitted to the module.

Restart

Click **Restart** to power cycle the module. This is required if the SFP type is changed.

Logging - Misc

The **Logging - Misc** page displays current log information regarding the unit's basic parameters.

The following options are available. Enable check boxes to activate logging.

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.
ROL_STATES=	Reports the RollCall status. Valid values are: • **OK** • **FAIL:*n*** where *n* is the RollTrack index or indices which are failing. • **Disabled**
LAST_RECALLED_MEMORY=	Reports the last memory to be recalled.
SLOT_WIDTH=	Reports the slot width.
SLOT_START=	Reports the slot start number.

Log Field	Description
UPTIME=	Reports the time since the last restart in the format *ddd:hh:mm:ss*.
POWER_USAGE=	Displays the power rating for the module. This is not a live power reading, but rather a maximum rating. **Note**: this cannot be deselected.

Logging - Input

The **Logging - Input** page displays current input logging information.

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

Log Field	Description
INPUT_N_STATE=	Reports current state of the input signal. Valid values are: • **OK**: input signal good. • **FAIL**: input signal not detected.
INPUT_N_SDIRATE=	Reports current bit rate for the input.

Log Field	Description
INPUT_N_TYPE=	Reports current input type. Valid values are: • **HD** • **SD** • **3G** • **6G** • **12G** • **SDI**
INPUT_N_IDENT=	Reports system-defined identifier for the input, based on the rear ID.
INPUT_N_NAME=	Reports name of the input, as defined on the **Setup** page. See page 33.

Where N is the input number.

Logging - Output 1-*n* SFP

The **Logging - Output 1-*n* SFP** pages display current logging information for each output.

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

Log Field	Description
OUTPUT_N_STATE=	Valid values are: • **OK**: output signal good. • **FAIL**: output signal not detected. • **WARN:Freeze** • **WARN:Pattern** • **WARN:Black**
OUTPUT_N_SDIRATE=	Reports current bit rate for the output.

Log Field	Description
OUTPUT_N_TYPE=	Valid values are: • **HD** • **SD** • **3G** • **6G** • **12G** • **SDI**
OUTPUT_N_IDENT=	Name of the output as shown on the rear panel.
OUTPUT_N_NAME=	Reports name of the output, as defined on the **Setup** page; see page 33.

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.
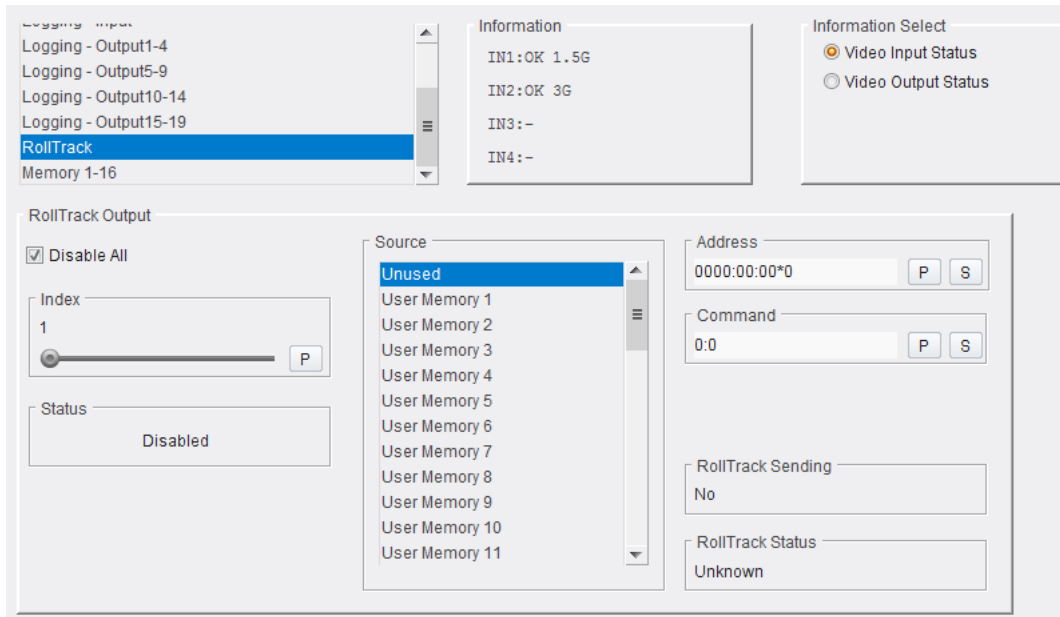
Disable All

When checked, all RollTrack items are disabled.

Index

This slider enables up to 16 RollTrack outputs to be set up. Dragging the slider selects the RollTrack Index number, displayed below the slider. Clicking the **P** button selects the default preset value.

Source

This enables selection of the source of information which is to trigger the transmission of data. Clicking the **P** button selects the default preset value. When no source is selected, **Unused** is displayed.

Log Field	Description
User Memory 1-16	User-defined.
Unused	No RollTracks sent.
Input N OK	Input N is good.
Input N LOST	Input N is bad.
Input N Bitrate 12G	Received bit rate is 12 Gbit/s.
Input N Bitrate 6G	Received bit rate is 6 Gbit/s.
Input N Bitrate 3G	Received bit rate is 3 Gbit/s.

Log Field	Description
Input N Bitrate 1.5	Received bit rate is 1.5 Gbit/s.
Input N Bitrate 270	Received bit rate is 270 Mbit/s.
Input N Bitrate Un.	Received bit rate is unknown.
TX N Bias OK	LASER Bias currently within limits.
TX N Bias High	LASER Bias currently above limits.
TX N Bias Low	LASER Bias currently below limits.
RX N Power OK	Receive power is within limits.
RX N Power High	Receive power is above limits.
RX N Power Low	Receive power is below limits.

Where N is the input number.

Address

This item enables the address of the selected destination unit to be set.

The address may be changed by typing the new destination in the text area and then selecting the **S** button to save the selection. Clicking the **P** button 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-defined unique identification number 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 unexpectedly.

Command

This item enables a command to be sent to the selected destination unit.

The command may be changed by typing a code in the text area and then selecting the **S** button to save the selection. Clicking the **P** button returns to the default preset command.

The RollTrack command consists of two sets of numbers, for example: **84:156**.

- The first number (**84**) is the actual RollTrack command.

RollTrack Sending

A message is displayed here when the unit is actively sending a RollTrack command. Possible RollTrack Sending messages are:

Message	Description
String	A string value is always being sent.
Number	A number value is always being sent.

| Message	Description
No	The message is not being sent.
Yes	The message is being sent.
Internal Type Error	Inconsistent behavior. Please contact your local Grass Valley agent.

RollTrack Status

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

Log Field	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 no acknowledgment 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.

Memory 1-16

The **Memory 1-16** page enables up to 16 configurations to be saved and recalled later. Default memory names can be changed to provide more meaningful descriptions.
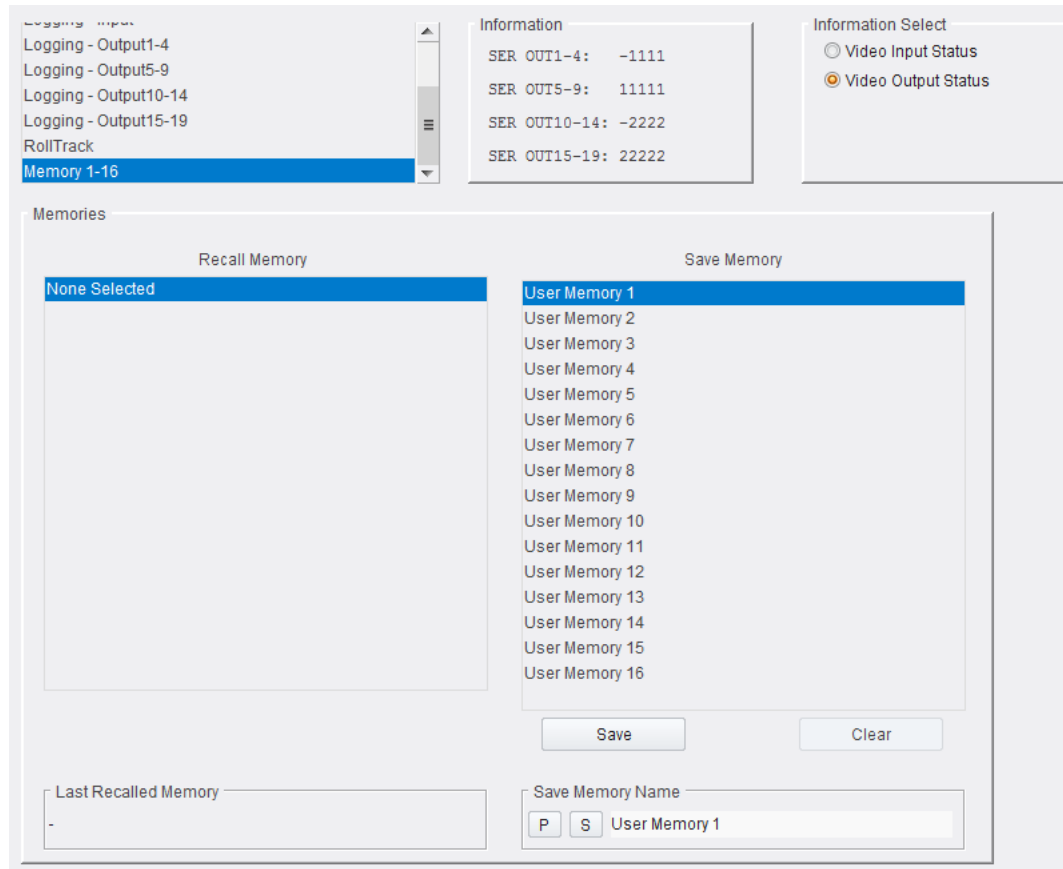
Recall Memory

This column lists the settings that have been previously saved. If no settings have been saved, **None Selected** is displayed.

To recall the settings saved in a memory:

- In the **Recall Memory** column, select the memory to recall by clicking on it. The recalled settings will be applied and the memory name will appear in the **Last Recalled Memory** section.

Note: User memories do not recall log field states – that is, whether a log value has been enabled or disabled.

Save Memory

This column lists the 16 pre-set memory names that are available for use.

To save settings:

- In the **Save Memory** column, select a memory location, and then click **Save**. The current settings are saved and the memory appears in the **Recall Memory** column.

To clear a memory location:

- In the **Save Memory** column, select a memory location, and then click **Clear**. The current settings stored for that memory are cleared. After you clear a memory location, it disappears from the **Recall Memory** list.

Last Recalled Memory

The **Last Recalled Memory** pane displays the most recently recalled memory. If any of the settings have been changed since it was recalled, an asterisk will be displayed after the memory name.

Save Memory Name

This option enables the preset memory names to be changed to something more memorable or meaningful, if required.

To change a memory name:

- In the **Save Memory Name** field, type the new memory name, and then click the **S** button. To return the memory to its default preset value, click **P** button.

Contact Us

Grass Valley Technical Support

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

www.grassvalley.com/support/

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

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