IQAMD40 User Manual

Multi-Channel MADI to10GbE IP Transceiver

Information and Notices

Copyright and Disclaimer

Contact Details

Customer Support

For details of our **Regional Customer Support Offices** please visit the SAM website and navigate to Support/24/7-Support.

www.s-a-m.com/support/247-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.

Safety Information

Explanation of Safety Symbols (GB)

This symbol refers the user to important information contained in the accompanying literature. Refer to manual.

This symbol indicates that hazardous voltages are present inside.
No user serviceable parts inside.
This unit should only be serviced by trained personnel.

Safety Warnings

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT REMOVE COVERS
NO USER SERVICEABLE PARTS
REFER SERVICING TO QUALIFIED PERSONNEL ONLY

Servicing instructions where given, are for use by qualified service personnel only.
To reduce 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 personnel.

- **To reduce the risk of electric shock, do not expose this appliance to rain or moisture.**
- **Always ensure that the unit is properly earthed and power connections correctly made.**
- **This equipment must be supplied from a power system providing a PROTECTIVE EARTH ⏚ connection and having a neutral connection which can be reliably identified.**
- **The power outlet supplying power to the unit should be close to the unit and easily accessible**

Power connection in countries other than the USA

The equipment is normally shipped with a power cable with a standard IEC moulded free socket on one end and a standard IEC moulded plug on the other. If you are required to remove the moulded mains supply plug, dispose of the plug immediately in a safe manner.

The colour code for the lead is as follows:

GREEN/YELLOW lead connected to E (Protective Earth Conductor)
BLUE lead connected to N (Neutral Conductor)
BROWN lead connected to L (Live Conductor)

Caution If the unit has two mains supply inputs ensure that both power cords are plugged into mains outlets operating from the same phase.

Légende : (F)

Ce symbole indique qu'il faut prêter attention et se référer au manuel.

Ce symbole indique qu'il peut y avoir des tensions électriques à l'intérieur de l'appareil. Ne pas intervenir sans l'agrément du service qualifié.

Précaution d'emploi :

ATTENTION
RISQUE DE CHOC ELECTRIQUE
NE PAS RETIRER LE COUVERCLE
NE PAS INTERVENIR SANS L'AGREMENT DU SERVICE QUALIFIE

Les procédures de maintenance ne concernent que le service agréé. Afin de réduire le risque de choc électrique, il est recommandé de se limiter aux procédures d'utilisation, à moins d'en être qualifié. Pour toute maintenance, contacter le service compétent.

- **Pour réduire le risque de choc électrique, ne pas exposer l'appareil dans un milieu humide.**
- **Toujours s'assurer que l'unité est correctement alimentée, en particuliers à la liaison à la terre.**
- **La source électrique de cet équipement doit posséder une connexion à la terre ⏚, ainsi qu'une liaison « neutre » identifiable.**
- **La prise électrique qui alimente l'appareil doit être proche de celle-ci et accessible.**

Câble secteur de pays autres que les Etats-Unis

L'équipement est livré avec un câble secteur au standard IEC, moulé mâle/femelle.
Si vous souhaitez changr la prise mâle de votre cordon, voici les codes couleurs des fils :

Le fil VERT/JAUNE est connecté à T (Terre)
Le fil BLEU est connecté à N (Neutre)
Le fil MARRON est connecté à P (Phase)

Attention si l'appareil a 2 alimentations, s'assurer que les cordons soient branchés sur la même phase.

Erklärung der Sicherheitssymbole (D)

Dieses Symbol weist den Benutzer auf wichtige Informationen hin, die in der begleitenden Dokumentation enthalten sind.

Dieses Symbol zeigt an, dass gefährliche Spannung vorhanden ist.
Es befinden sich keine vom Benutzer zu wartenden Teile im Geräteinneren.
Dieses Gerät sollte nur von geschultem Personal gewartet werden

Sicherheits-Warnhinweise

ACHTUNG
Gefahr von Elektroschocks.
Abdeckungen nicht entfernen
Keine vom Benutzer zu wartende Teile
Wenden Sie sich ausschließlich
an qualifiziertes Personal

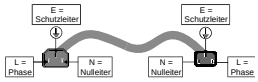
Die angeführten Service-/Reparatur-Anweisungen sind ausschließlich von qualifiziertem Service-Personal auszuführen. Um das Risiko eines lektroschocks zu reduzieren, führen Sie ausschließlich die im Benutzerhandbuch eschriebenen Anweisungen aus, es sei denn, Sie haben die entsprechende Qualifikation. Wenden Sie sich in allen Service-Fragen an qualifiziertes Personal.

- **Um das Risiko eines Elektroschocks zu reduzieren, setzen Sie das Gerät weder Regen noch Feuchtigkeit aus.**
- **Stellen Sie immer sicher, dass das Gerät ordnungsgemäß geerdet und verkabelt ist.**
- **Dieses Equipment muss an eine Netzsteckdose mit ⏚ Schutzleiter angeschlossen werden und einen zuverlässig identifizierbaren Nullleiter haben.**
- **Die Netzsteckdose sollte nahe beim Gerät und einfach zugänglich sein.**

Netzanschluss in anderen Ländern als der USA

Das Equipment wird im Normalfall mit einem Netzkabel mit Standard IEC Anschlussbuchse und einem Standard IEC Anschlussstecker geliefert. Sollten Sie den angeschweißten Stecker auswechseln müssen, entsorgen Sie diesen bitte umgehend. Die farbliche Belegung des Netzkabels ist wie folgt:

GRÜN GELB E = Schutzleiter ⏚
BLAU N = Nulleiter
BRAUN L = P = Phase



Achtung: Wenn das Gerät zwei Anschlussbuchsen hat, stellen Sie bitte sicher, dass beide Netzkabel mit der selben Phase in die Netzsteckdose gesteckt werden.

Explicación de los Símbolos de Seguridad (ESP)

Éste símbolo refiere al usuario información importante contenida en la literatura incluida. Referirse al manual.

Éste símbolo indica que voltajes peligrosos están presentes en el interior.
No hay elementos accesibles al usuario dentro.
Esta unidad sólo debería ser tratada por personal cualificado.

Advertencias de Seguridad

ADVERTENCIA
RIESGO DE CHOQUE ELECTRICO
NO QUITAR LAS PROTECCIONNES
ELEMENTOS NO ACCESIBLES AL USUARIO.
SERVICIO SOLAMENTE A PERSONAL CUALIFICADO

Las instrucciones de servicio cuando sean dadas, son sólo para uso de personal cualificado. Para reducir el riesgo de choque eléctrico no llevar a cabo ninguna operación de servicio aparte de las contenidas en las instrucciones de operación, a menos que se esté cualificado para realizarlas.
Referir todo el trabajo de servicio a personal cualificado.

- **Para reducir el riesgo de choque eléctrico, no exponer este equipo a la lluvia o humedad.**
- **Siempre asegurarse de que la unidad está propiamente conectada a tierra y que las conexiones de alimentación están hechas correctamente.**
- **Este equipo debe ser alimentado desde un sistema de alimentación con conexión a TIERRA ⏚ y teniendo una conexión neutra fácilmente identificable.**
- **La toma de alimentación para la unidad debe ser cercana y fácilmente accesible.**

Conexión de alimentación en otros países que no sean USA

El equipo es normalmente entregado con un cable de alimentación con un enchufe hembra estándar IEC en un extremo y con una clavija estándar IEC en el otro. Si se requiere eliminar la clavija para sustituirla por otra, disponer dicha clavija de una forma segura.
El código de color a emplear es como sigue:

VERDE/ AMARILLO conectado a E (Conductor de protección a Tierra -Earth en el original-)
AZUL conectado a N (Conductor Neutro -Neutral en el original-)
MARRÓN conectado a L (Conductor Fase -Live en el original-)

Advertencia Si la unidad tuviera dos tomas de alimentación, asegurarse de que ambos cables de alimentación están conectados a la misma fase.

Simboli di sicurezza: (I)

Questo simbolo indica l'informazione importante contenuta nei manuali appartenenti all'apparecchiatura. Consultare il manuale.

Questo simbolo indica che all'interno dell'apparato sono presenti tensioni pericolose. Non cercare di smontare l'unità.
Per qualsiasi tipo di intervento rivolgersi al personale qualificato.

Attenzione:

ATTENZIONE
RISCHIO DI SHOCK ELETTRICO NON CERCARE DI SMONTARE L'UNITÀ PER QUALSIASI TIPO DI INTERVENTO RIVOLGERSI AL PERSONALE QUALIFICATO

Le istruzioni relative alla manutenzione sono ad uso esclusivo del personale qualificato. E' proibito all'utente eseguire qualsiasi operazione non esplicitamente consentita nelle istruzioni. Per qualsiasi informazione rivolgersi al personale qualificato.

- **Per prevenire il pericolo di scosse elettriche è necessario non esporre mai l'apparecchiatura alla pioggia o a qualsiasi tipo di umidità.**
- **Assicurarsi sempre, che l'unità sia propriamente messa a terra e che le connessioni elettriche siano eseguite correttamente.**
- **Questo dispositivo deve essere collegato ad un impianto elettrico dotato di un sistema di messa a terra efficace.**
- **La presa di corrente deve essere vicina all'apparecchio e facilmente accessibile.**

Connessione elettrica nei paesi diversi dagli Stati Uniti

L'apparecchiatura normalmente è spedita con cavo pressofuso con la presa e spina standard IEC. Nel caso della rimozione della spina elettrica, gettarla via immediatamente osservando tutte le precauzioni del caso.
La leggenda dei cavi è la seguente:

VERDE/GIALLO cavo connesso ad "E" (terra)
BLU cavo connesso ad "N" (neutro)
MARRONE cavo connesso ad "L" (fase)

Attenzione! Nel caso in cui l'apparecchio abbia due prese di corrente, assicurarsi che i cavi non siano collegati a fasi diverse della rete elettrica.

Forklaring på sikkerhedssymboler (DK)

Dette symbol gør brugeren opmærksom på vigtig information i den medfølgende manual.

Dette symbol indikerer farlig spænding inden i apparatet. Ingen bruger servicerbare dele i apparatet på brugerniveau.
Dette apparat må kun serviceres af faglærte personer..

Sikkerhedsadvarsler

FORSIGTIG
RISIKO FOR ELEKTRISK STØD DÆKPLADER MÅ IKKE FJERNES INGEN BRUGER SERVICERBARE DELE SERVICE MÅ KUN UDFØRES AF FAGLÆRTE PERSONER

Serviceinstruktioner er kun til brug for faglærte servicefolk. For at reducere risikoen for elektrisk stød må bruger kun udføre anvisninger i betjeningsmanualen.
Al service skal udføres af faglærte personer.

- **For at reducere risikoen for elektrisk stød må apparatet ikke udsættes for regn eller fugt.**
- **Sørg altid for at apparatet er korrekt tilsluttet og jordet.**
- **Dette apparat skal forbindes til en nettilslutning, der yder BESKYTTENDE JORD ⏚ og 0 forbindelse skal være tydeligt markeret.**
- **Stikkontakten, som forsyner apparatet, skal være tæt på apparatet og let tilgængelig**.

Nettilslutning i andre lande end USA

Udstyret leveres normalt med et strømkabel med et standard IEC støbt løst hunstik i den ene ende og et standard IEC støbt hanstik i den anden ende. Hvis et af de støbte stik på strømkablet er defekt, skal det straks kasseres på forsvarlig vis. Farvekoden for lederen er som følger:

GRØN/GUL leder forbundet til J (Jord)
BLÅ leder forbundet til 0
BRUN leder forbundet til F(Fase)

Forsigtig Hvis enheden har to lysnetindgange, skal der sørges for at begge ledninger tilsluttes lystnetudgange fra den samme fase.

Förklaring av Säkerhetssymboler (S)

Denna symbol hänvisar användaren till viktig information som återfinns i litteraturen som medföljer. Se manualen.

Denna symbol indikerar att livsfarlig spänning finns på insidan.
Det finns inga servicevänliga delar inne i apparaten.
Denna apparat få endast repareras av utbildad personal.

Säkerhetsvarningar

CAUTION
RISK OF ELECTRIC SHOCK DO NOT REMOVE COVERS NO USER SERVICEABLE PARTS REFER SERVICING TO QUALIFIED PERSONNEL ONLY

Serviceinstruktioner som anges avser endast kvalificerad och utbildad servicepersonal. För att minska risken för elektrisk stöt, utför ingen annan service än den som återfinns i medföljande driftinstruktionerna, om du ej är behörig. Överlåt all service till kvalificerad personal.

- **För att reducera risken för elektrisk stöt, utsätt inte apparaten för regn eller fukt.**
- **Se alltid till att apparaten är ordentligt jordad samt att strömtillförseln är korrekt utförd.**
- **Denna apparat måste bli försörjd från ett strömsystem som är försedd med jordadanslutning ⏚ samt ha en neutral anslutning som lätt identifierbar.**
- **Vägguttaget som strömförsörjer apparaten bör finnas i närheten samt vara lätttillgänglig.**

Strömkontakter i länder utanför USA

Apparaten utrustas normalt med en strömkabel med standard IEC gjuten honkontakt på ena änden samt en standard IEC gjuten hankontakt på den andra änden. Om man måste avlägsna den gjutna hankontakten, avyttra denna kontakt omedelbart på ett säkert sätt. Färgkoden för ledningen är följande:

GRÖN/GUL ledning ansluten till E (Skyddsjordad ledare)

BLÅ ledning ansluten till N (Neutral ledare)
BRUN ledning ansluten till L (Fas ledare)

Varning! Om enheten har två huvudsakliga elförsörjningar, säkerställ att båda strömkablarna som är inkopplade i enheten arbetar från samma fas.

Turvamerkkien selitys (FI)

Tämä merkki tarkoittaa, että laitteen mukana toimitettu kirjallinen materiaali sisältää tärkeitä tietoja. Lue käyttöohje.

Tämä merkki ilmoittaa, että laitteen sisällä on vaarallisen voimakas jännite. Sisäpuolella ei ole mitään osia, joita käyttäjä voisi itse huoltaa. Huollon saa suorittaa vain alan ammattilainen.

Turvaohjeita

VAROITUS
SÄHKÖISKUN VAARA ÄLÄ AVAA LAITTEEN KANSIA EI SISÄLLÄ KÄYTTÄJÄLLE HUOLLETTAVIA OSIA HUOLTO AINOASTAAN AMMATTILAISEN SUORITTAMANA

Huolto-ohjeet on tarkoitettu ainoastaan alan ammattilaisille. Älä suorita laitteelle muita toimenpiteitä, kuin mitä käyttöohjeissa on neuvottu, ellet ole asiantuntija. Voit saada sähköiskun. Jätä kaikki huoltotoimet ammattilaiselle.

- **Sähköiskujen välttämiseksi suojaa laite sateelta ja kosteudelta.**
- **Varmistu, että laite on asianmukaisesti maadoitettu ja että sähkökytkennät on tehty oikein.**
- **Laitteelle tehoa syöttävässä järjestelmässä tulee olla SUOJAMAALIITÄNTÄ ⏚ ja nollaliitännän on oltava luotettavasti tunnistettavissa.**
- **Sähköpistorasian tulee olla laitteen lähellä ja helposti tavoitettavissa.**

Sähkökytkentä

Laitteen vakiovarusteena on sähköjohto, jonka toisessa päässä on muottiin valettu, IEC-standardin mukainen liitäntärasia ja toisessa päässä muottiin valettu, IEC-standardin mukainen pistoliitin. Jos pistoliitin tarvitsee poistaa, se tulee hävittää heti turvallisella tavalla. Johtimet kytketään seuraavasti:

KELTA-VIHREÄ suojamaajohdin E-napaan
SININEN nollajohdin N-napaan
RUSKEA vaihejohdin L-napaan

Huom! Jos laitteessa on kaksi verkkojännitteen tuloliitäntää, niiden johdot on liitettävä verkkopistorasioihin, joissa on sama vaiheistus.

Símbolos de Segurança

P

O símbolo triangular adverte para a necessidade de consultar o manual antes de utilizar o equipamento ou efectuar qualquer ajuste.

Este símbolo indica a presença de voltagens perigosas no interior do equipamento. As peças ou partes existentes no interior do equipamento não necessitam de intervenção, manutenção ou manuseamento por parte do utilizador. Reparações ou outras intervenções devem ser efectuadas apenas por técnicos devidamente habilitados.

Avisos de Segurança

As instruções de manutenção fornecidas são para utilização de técnicos qualificados. Para reduzir o risco de choque eléctrico, não devem ser realizadas intervenções no equipamento não especificadas no manual de instalações a menos que seja efectuadas por técnicos habilitados.

- **Para reduzir o risco de choque eléctrico, não expor este equipamento à chuva ou humidade.**
- **Assegurar que a unidade está sempre devidamente ligada à terra e que as ligações à alimentação estão correctas.**
- **O sistema de alimentação do equipamento deve, por razões de segurança, possuir ligação a terra de protecção (⏚) e ligação ao NEUTRO devidamente identificada.**
- **A tomada de energia à qual a unidade está ligada deve situar-se na sua proximidade e facilmente acessível.**

Ligação da alimentação noutros países que não os EUA

O equipamento é, normalmente, enviado com cabo de alimentação com ficha IEC fêmea standard num extremo e uma ficha IEC macho standard no extremo oposto. Se for necessário substituir ou alterar alguma destas fichas, deverá remove-la e elimina-la imediatamente de maneira segura.
O código de cor para os condutores é o seguinte:

Condutor VERDE/AMARELO ligado a E (Terra)
Condutor AZUL ligado a N (Neutro)
Condutor CASTANHO ligado a L (Vivo).

Atenção: Se a unidade tem duas fontes de alimentação assegurar que os dois cabos de alimentação estão ligados a tomadas pertencentes à mesma fase.

Επεξήγηση των Συμβόλων Ασφαλείας

Αυτό το σύμβολο παραπέμπει το χρήστη σε σημαντικές πληροφορίες που συμπεριλαμβάνονται στο συνοδευτικό εγχειρίδιο.

Αυτό το σύμβολο υποδεικνύει ότι στο εσωτερικό υφίστανται επικίνδυνες ηλεκτρικές τάσεις. Στο εσωτερικό δεν υπάρχουν επισκευάσιμα μέρη. Αυτή η μονάδα πρέπει να επισκευάζεται μόνο από ειδικά εκπαιδευμένο προσωπικό.

Προειδοποίηση Ασφαλείας

Οδηγίες επισκευής, όπου παρέχονται, αναφέρονται αποκλειστικά και μόνο σε εξειδικευμένο προσωπικό. Για να μειωθεί ο κίνδυνος ηλεκτροπληξίας, μην εκτελείτε επισκευές παρά μόνο τις συμπεριλαμβανόμενες στο εγχειρίδιο των οδηγιών, εκτός και αν έχετε τα απαραίτητα προσόντα για να το κάνετε. Όλες οι επισκευές να εκτελούνται από ειδικά εκπαιδευμένο προσωπικό.

- **Για να μειώσετε τον κίνδυνο ηλεκτροπληξίας μην εκθέτετε τη συσκευή σε βροχή ή υγρασία.**
- **Πάντα να εξασφαλίζετε τη σωστή γείωση της συσκευής και τη σωστή σύνδεση των συνδέσμων τροφοδοσίας.**
- **Ο εξοπλισμός πρέπει να τροφοδοτείται από ένα σύστημα τροφοδοσίας που να εξασφαλίζει ΠΡΟΣΤΑΤΕΥΤΙΚΗ ΓΕΙΩΣΗ (⏚) και να έχει καθορισμένες θέσεις ουδέτερου και φάσης.**
- **Ο εξοπλισμός που τροφοδοτεί τη συσκευή θα πρέπει να βρίσκεται κοντά στη συσκευή και να είναι εύκολα προσβάσιμος.**

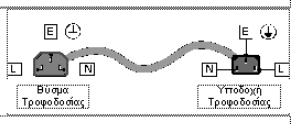
Σύνδεση τροφοδοσίας σε χώρες εκτός των ΗΠΑ

Ο εξοπλισμός συνοδευέται συνήθως από ένα καλώδιο τροφοδοσίας με ένα σταθερό βύσμα τροφοδοσίας ρεύματος τύπου πυραμίδας στη μια άκρη του και μια σταθερή υποδοχή τροφοδοσίας ρεύματος τύπου πυραμίδας στην άλλη άκρη του. Εάν χρειαστεί να αφαιρέσετε το σταθερό βύσμα τροφοδοσίας μην το επαναχρησιμοποιείτε, θεωρείται άχρηστο. Ο χρωματικός οδηγός για το καλώδιο τροφοδοσίας είναι ο παρακάτω:

ΠΡΑΣΙΝΟ/ΚΙΤΡΙΝΟ καλώδιο συνδέεται στο E (Προστατευτικός Αγωγός Γείωσης)

ΜΠΛΕ καλώδιο συνδέεται στο N (Ουδέτερο Αγωγό)

ΚΑΦΕ καλώδιο συνδέεται στο L (Αγωγό Φάσης)



ΠΡΟΣΟΧΗ! Αν η μονάδα έχει δύο τροφοδοτικά βεβαιωθείτε ότι και τα δύο καλώδια τροφοδοσίας είναι συνδεδεμένα σε εξόδους τροφοδοσίας που βρίσκονται στην ίδια φάση.

Laser Safety

This product operates with Class 1 laser products.

Caution: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Ventilation

Although the unit is constructed to meet normal environmental requirements, ensure that there is a free flow of air at the front, rear, and sides of the unit to dissipate the heat produced during operation. Installations should be designed to allow for this.

Do not obstruct the ventilation holes on the right-side of the unit. Damage to the equipment may result.

Safety Standards

This equipment conforms to the following standards:

EN60950-1 2006 + A11: 2009

Safety of Information Technology Equipment Including Electrical Business Equipment.

UL1419 (3rd Edition) - UL File E193966

Standard for Safety – Professional Video and Audio equipment.

EMC Standards

This equipment conforms to the following standards:

EN 55103-1: 1996 (Environment E4)

Electromagnetic Compatibility, Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 1. Emission.

EN 55103-2: 1996 (Environment E2)

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

FCC/CFR 47:Part 15, Class A

Federal Communications Commission Rules Part 15, Subpart B, Class A.

EMC Environment

The product(s) described in this manual conform to the EMC requirements for, and are intended for use in, the controlled EMC environment (for example, purpose-built broadcasting or recording studios), and the rural outdoor environment (far away from railways, transmitters, overhead power lines, etc.) E4.

EMC Performance of Cables and Connectors

Snell 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.

Coaxial Cables

Coaxial cables connections (particularly serial digital video connections) shall be made with high-quality double-screened coaxial cables such as Belden 1694 or BBC type PSF1/2M.

D-type Connectors

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

Contents

1. Introduction

1.1 Description

The IQAMD40 provides multi-channel MADI to IP interfacing, and has been developed to allow high density audio integration into Ethernet IP networks. Industry-standard AES67 encapsulation and a 10GbE interface enables the IQAMD40 to interface directly with many common audio desks and systems.

IQAMD40 fully integrates with SAM's RollCall control and monitoring system, including the IP Routing System Controller, to migrate broadcasters from a traditional baseband routing and control environment to new Hybrid SDI/IP work flows.

1.2 Block Diagram

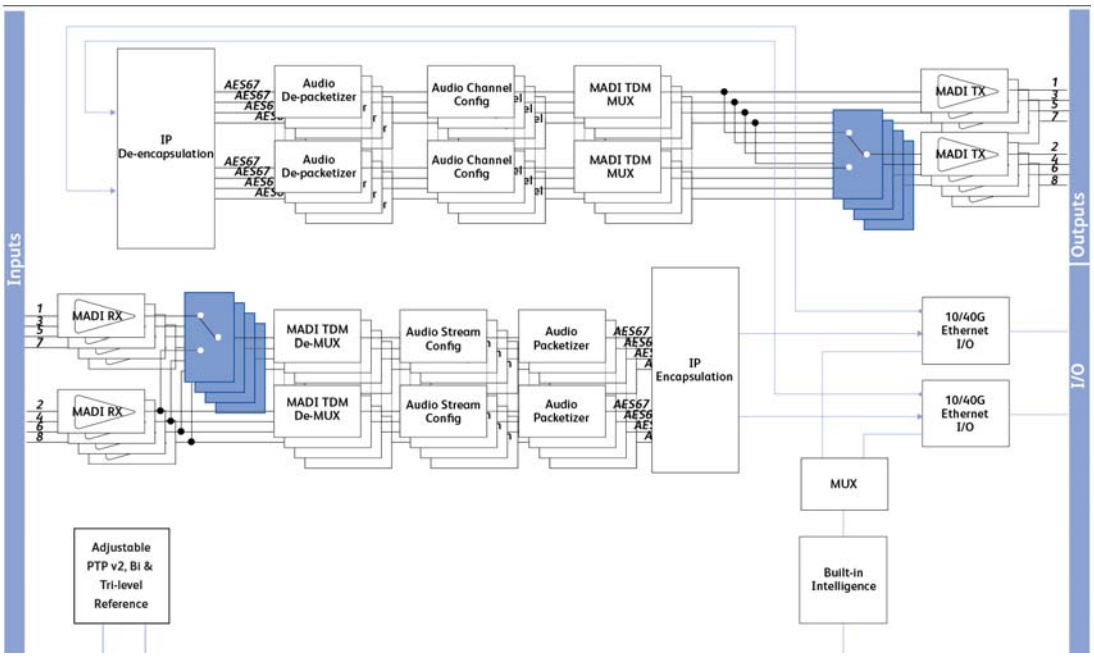


Figure 1 Block Diagram for IQAMD40

1.3 Feature Summary

- Handles up to 16 MADI signals (8 in, 8 out) over dual 10GbE IP links, with the option to provide MADI link redundancy.
- Audio delay per IP stream of up to 255ms.
- Dual SFP to provide link redundancy.
- Uncompressed PCM audio transport using ST2110-30.
- Timing and synchronization provided by IEEE-1588v2 (PTP), compliant with SMPTE-2059-2 and AES67 profiles.
- Supports unicast as well as IGMPv3 source-specific multicast, allowing point to point operation or transmission in multicast groups.
- Two audio tone generators available for MADI channels, with selectable tone frequencies of 500Hz, 1kHz, 2kHz and 4kHz.
- Standards supported:
  - MADI to AES10-2003
  - 10G Ethernet to IEEE 802.3

- Audio channel selection per IP stream from 1-64 channels, plus packet time selection of 125us, 250us, 500us, 1ms and 4ms.
- RollCall control and monitoring compatible with standard logging and reporting features.

1.4 Rear Panel

Note: IQAMD units must be used in conjunction with an IQFAN00-RP-1B cooling fan module. The fan must be positioned in the slot to the left of the IQAMD module when viewed from the rear. See section 1.5 for more information.

Do not run IQAMD cards without a fan module. This can result in severe damage to the equipment.

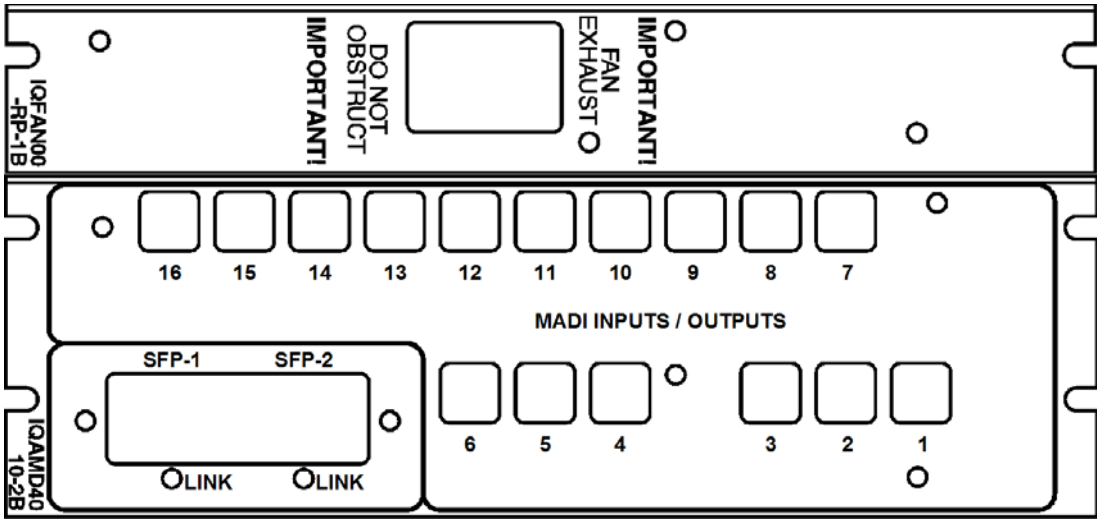


Figure 2 IQAMD4010-2B3 Rear

1.5 IQFAN00 Cooling Fan Module

The IQAMD40 is supplied with an IQFAN00 cooling module. Ensure this is fitted according to the instructions below.

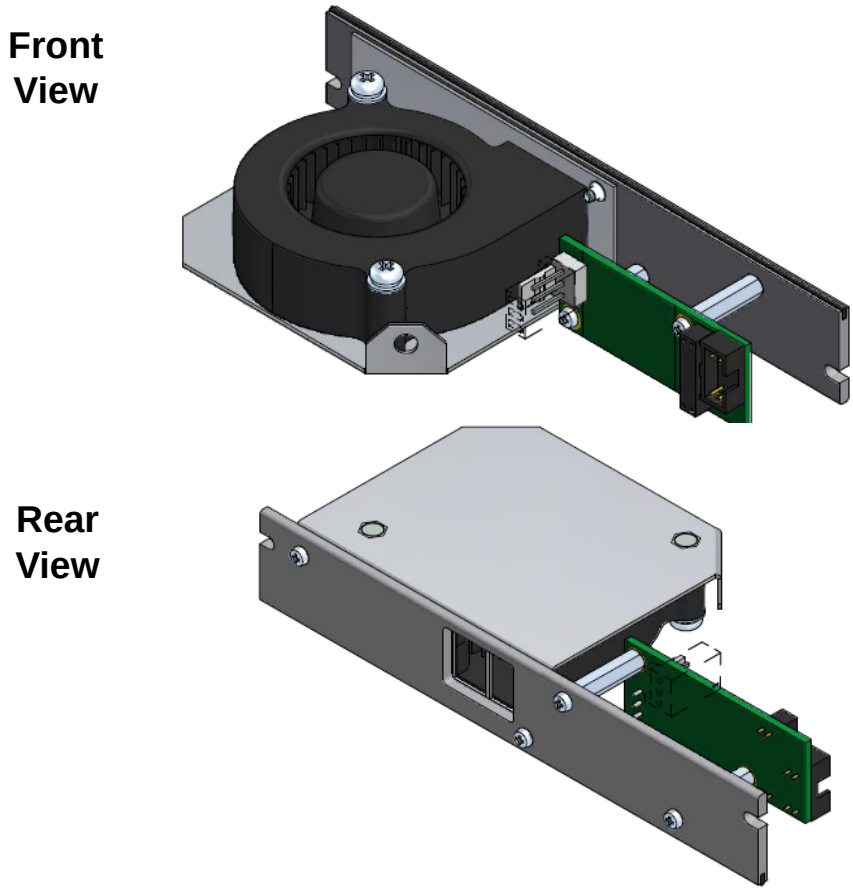


Figure 3 IQFAN00 Cooling Module

Do not run IQAMD cards without a fan module. This can cause severe damage to the equipment.

1.5.1 Fitting the Fan Module

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

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 IQAMD40 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. Reconnect the power supply and start up the enclosure. The fan should start immediately.

1.6 Order Codes

Note: Modules with "B" order codes (for example, IQAMD4010-2**B**3) can be fitted into B-type enclosures only. See section 1.7 for information on enclosures.

The following product order codes are covered by this manual:

IQAMD4010-2B3 MADI to IP transceiver with 10GbE interface. Up to 4 SDI inputs or outputs, 2 x 10GbE ports.

1.7 Enclosures

The IQAMD40 module fits the IQH3B enclosure shown below. Ensure that the supplied cooling fan module is also fitted as described in section 1.5.1.

1.7.1 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.

1.8 Power Ratings

SAM IQ modules are assigned a *Power Rating* (PR). This figure represents the relative power consumption of a module.

SAM modular enclosures are also assigned PR values. This figure represents the maximum power available from the enclosure.

The combined total of all modules’ PR values must not exceed the enclosure’s PR value.

Note: If a module’s PR value is not known, use the module’s power consumption figure in watts as the PR value.

1.8.1 Power Ratings and Card Widths

Product	Width	PR
IQAMD40	1	18.5

2. Technical Specification

Inputs/Outputs	
Signal Inputs	
Inputs	4
Connector/Format	BNC 75ohm panel jack
Conforms to	MADA
Input Cable Length	N/A
Signal Outputs	
Outputs	4
Connector/Format	BNC 75ohm panel jack
Conforms to	MADI
Ethernet	
Connector/Format	10GbE = SFP+
Conforms To	ST2110-30 AES'67 IEEE-1588v2/SMPTE-2059-2
Indicators	**Front Panel and Card Edge**
Power	OK (Green)
CPU	OK (Green flashing)
1-16 Input Standard Detection LEDs	Green = Signal present Yellow = TPG active Red = Signal expected but missing Off - No signal
Content Status Summary	OK (Green) Warning (Yellow) Error (Red)
RollCall Features	
Status	Input & Output
User Memories	None
Logging	Input status Input alarms Output alarms Output status
RollTrack Controls	On/off Index Source Address Command Status Sending

Setup	Versions Reset defaults Restart
Electrical	
Data Format	MADI transport stream
Sample Rate	48kHz
Connector/Format	HD-BNC SFP
Power Consumption	
Module power consumption	18.5 PR Max (B enclosure only)

Note: For information on IQH3B enclosures, see the relevant user manual.

3. Connections

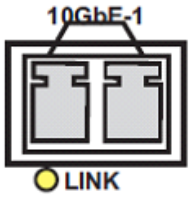
This section describes the physical input and output connections provided by the IQAMD modules.

3.1 I/O

16 x MADI via HD-BNC.

3.2 10G Ethernet SFP

SFP+ supporting 10G Ethernet.



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 flashing= PTP-SYNC OK Off = PTP-SYNC Fail
	PTP	REF	**REF** Green flashing = Watchdog timer OK
	8	16	**1 - 8** = Input port status **9 - 16** = Output port status Green = Signal present Yellow = TPG active Red = Signal expected but missing Off - No signal
	7	15	
	6	14	
	5	13	
	4	12	
	3	11	
	2	10	
	1	9	
	SFP 2		**SFP 1 - 2** = Status/lane. Green = OK. If flashing, link is down.
	SFP 1		
		PB=RESET	

5. RollCall Control Panel

This section contains information on using IQAMD with RollCall.

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

5.1 Terminology

The following terms are used in this document:

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, ie. a set of one or more sender spigots.
Destination	Receiver of one or more flows, ie. a set of one or more receiver spigots.

5.2 Navigating Pages in the RollCall Template

The RollCall template has a number of pages, each of which can be selected from the 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.

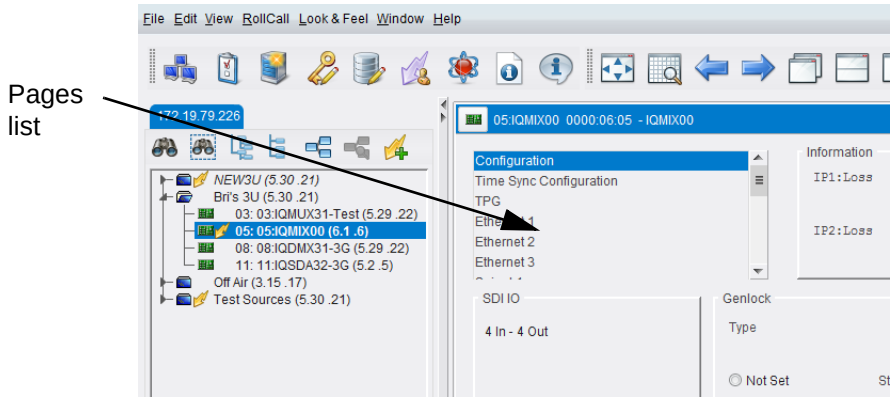


Figure 4 Template Pages

5.2.1 Template Pages

The following pages are available for the IQAMD module. Please note that what is displayed on these pages is dependant on the module's capabilities and the privileges assigned to the user. So, the illustrations in this manual may differ somewhat from what is seen in your environment.

- **Spigots** - See section 5.4
- **Configuration** - See section 5.5.
- **Time Sync Configuration** - See section 5.6.
- **Ethernet 1, 2** - See section 5.7.
- **Ethernet 1, 2 RTP Sender** - See section 5.8.

- **Ethernet 1, 2 RTP Receiver** - See section 5.9.
- **Logging Misc** - See section 5.10.
- **Logging SFP** - See section 5.11.
- **Logging FPGA** - See section 5.12.
- **Logging - Spigots** - See section 5.13.
- **RollTrack** - See section 5.14.
- **Setup** - See section 5.15.

5.2.2 Setting Values

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

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

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

5.3 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.

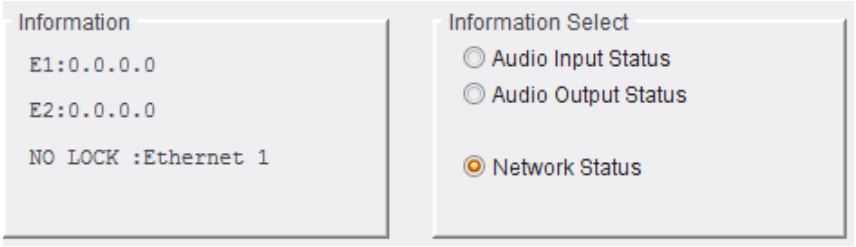


Figure 5 Information and Selection Panes

5.3.1 Selecting the Information to Display

- Select the spigots to display data for from the **Spigot** drop-down list.

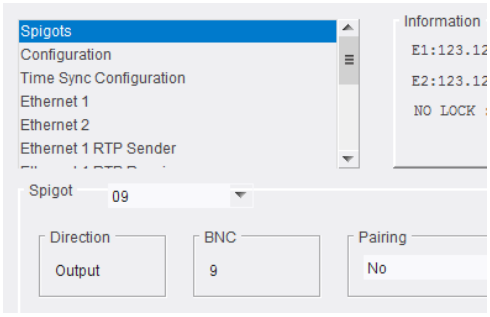


Figure 6 Spigot Selection

- Select **Audio Input Status**, **Audio Output Status** or **Network Status** from the **Information Select** pane as required.

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

5.4 Spigots

The **Spigots** page displays information for each active spigot. This is presented on a series of dynamically-generated panes, one for each spigot.

Note: The pages shown here may differ from those seen on your particular system, depending on the model and configuration of your IQAMD module.

5.4.1 Selecting a Spigot

Note: Connectors are configured as being either input or output spigots by selecting the appropriate firmware version on the **Configuration** page. See section 5.5 for more information.

Click the **Spigots** page to display the Spigots list, and select the spigot to work with.

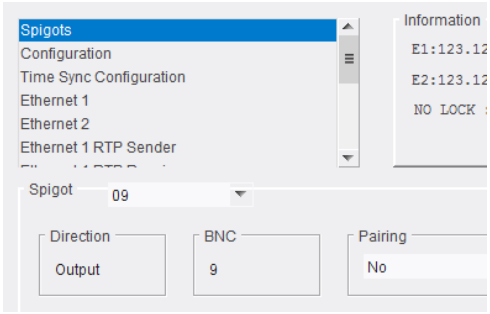


Figure 7 Spigot Selection

5.4.2 Input Spigots

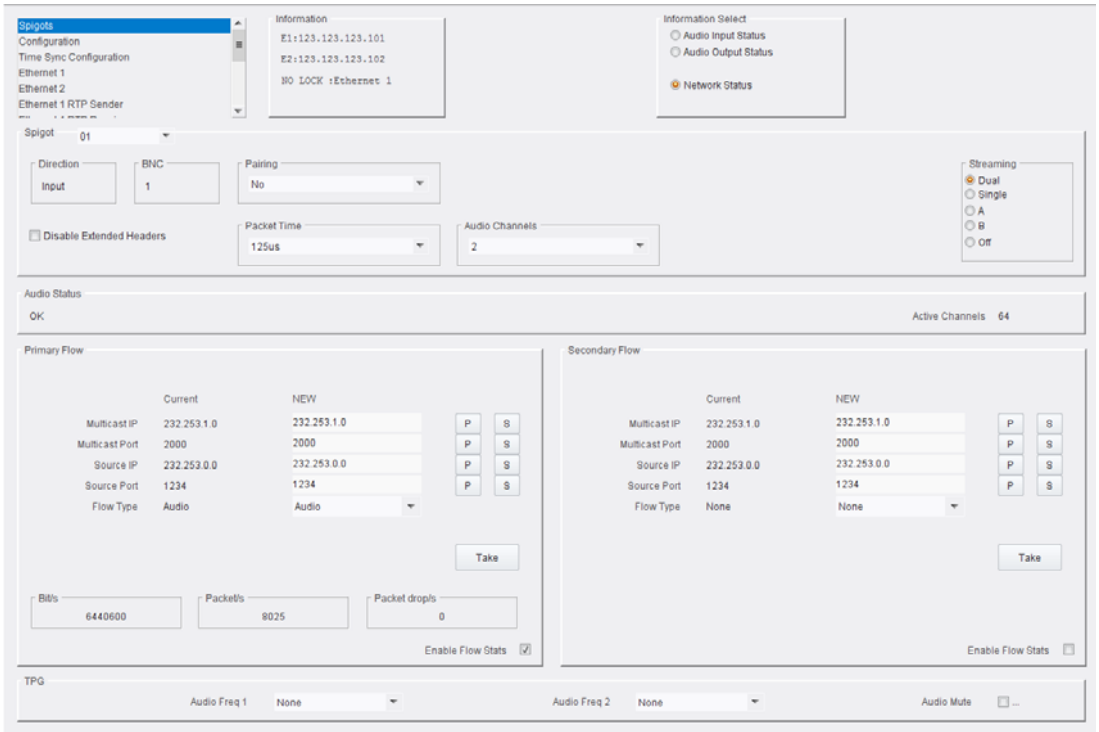


Figure 8 Typical Input Spigot Page

5.4.2.1 Spigot Pane (Input)

The **Spigot** pane provides basic information for the selected spigot, and allows certain parameters to be set.

Figure 9 Input Spigot Pane

The following facilities are available from this pane:

Option	Operation
Spigot drop-down list	Select a spigot to work with.
Direction	Displays whether spigot is input or output.
BNC	Displays the associated BNC connector.
Pairing	Spigots may be paired to provide redundancy. When in use, spigots 1 & 2, 3 & 4, 5 & 6 etc are paired. Options available are: • **No** - do not pair spigots. • **Auto *n*** - if one spigot fails, traffic will be automatically switched to the other. • **Main *n*** - use the Main spigot. If it fails, traffic will not be switched. • **Redundant *n*** - use the Redundant spigot. If it fails, traffic will not be switched. Where *n* is the even spigot number.
Disable Extended Headers	Extended header operation can be disabled for TR-03/TR-04 compatibility. Enable the **Disable Extended Headers** checkbox to disable the extended headers.
Packet Time	Select the packet time appropriate for your system. See *AES67-2015: Standard for Audio Applications of Networks - High-Performance Streaming Audio-Over-IP Interoperability* for more information.
Audio Channels	Select the number of channels to be contained within each AES67 packet. See *AES67-2015: Standard for Audio Applications of Networks - High-Performance Streaming Audio-Over-IP Interoperability* for more information.
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. • **Off** - do not use an Ethernet connector for this spigot.

5.4.2.2 Flow Pane (Input)

The **Flow** pane allows multicast IP and port details to be defined for the selected spigot. Stats for the spigot can also be enabled from here.

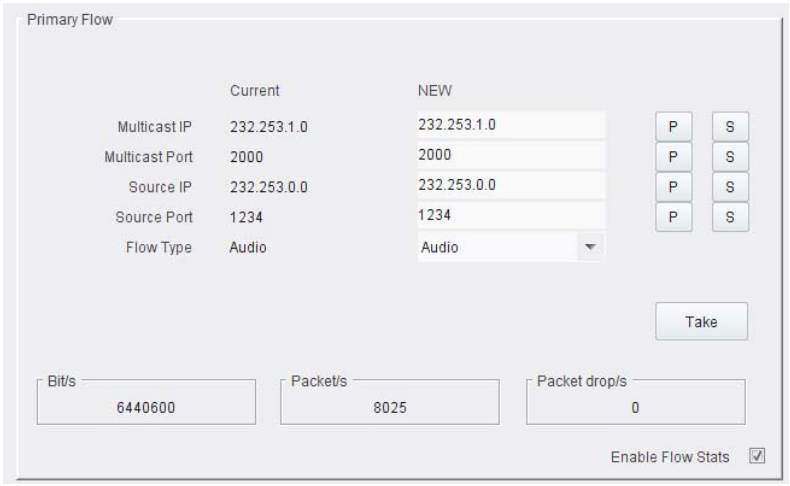


Figure 10 Input Flow Pane

Setting Multicast Details

To set multicast details:

- Enter IP and port details as required.
- Select **Audio** from the **Flow Type** drop-down menu.
- Click **Packetizer Stats** to view network statistics for an outgoing flow, if required.
- Click **S** to save the details.
- Click **Take** to implement the changes.

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

Flow Type

Allows traffic through the spigot to be suspended. Select **None** to stop the flow of data, and **Audio** to start it again.

5.4.2.3 The TPG Pane

The **TPG** pane provides controls for the audio test tone generator.

Select an audio frequency for each TPG from the drop-down lists.

Note: The TPGs can either be both on or both off. Selecting **None** from either list will silence both TPGs.

Figure 11 TPG Pane

5.4.3 Output Spigots

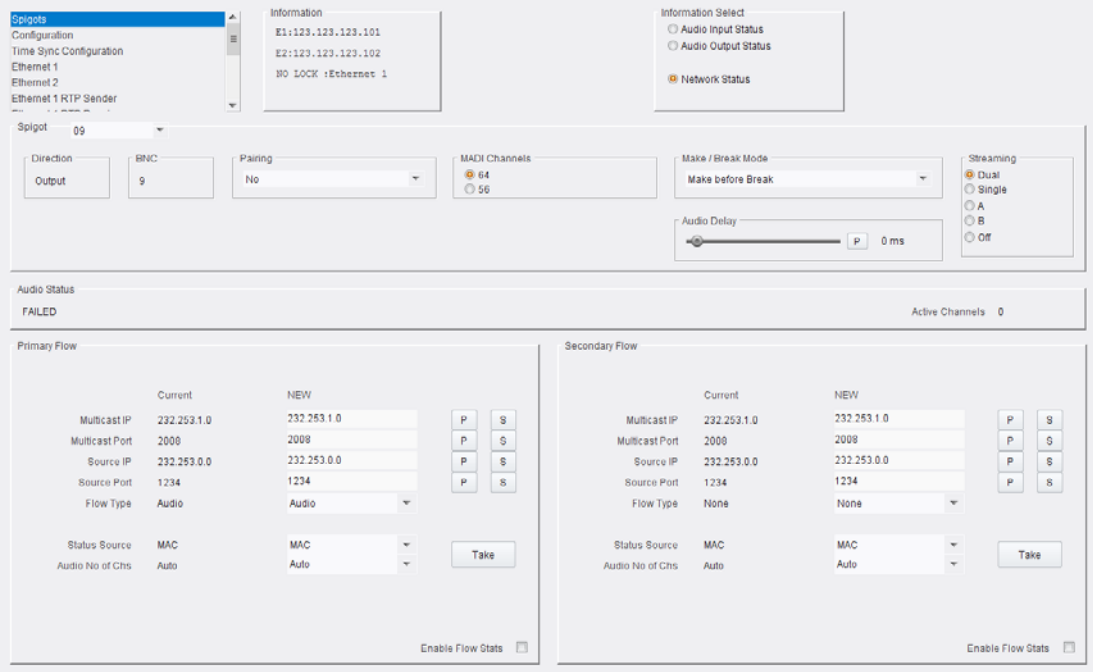


Figure 12 Typical Output Spigot Page

5.4.3.1 Spigot Pane (Output)

The **Spigot** pane provides basic information for the selected spigot, and allows certain parameters to be set.

Figure 13 Output Spigot Pane

The following facilities are available from this pane:

Option	Operation
Spigot drop-down list	Select a spigot to work with.
Direction	Displays whether spigot is input or output.
BNC	Displays the associated BNC connector.
Pairing	Select whether or not channels should be paired to provide redundancy.
MADI Channels	Select the number of MADI channels to use. See *AES67-2015: Standard for Audio Applications of Networks - High-Performance Streaming Audio-Over-IP Interoperability* for more information.

Option	Operation
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.
Audio Delay	Move the slider to set an **Audio Delay** as required. Click **P** to return to the preset default value.
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. • **Off** - do not use an Ethernet connector for this spigot.

5.4.3.2 Flow Pane (Output)

The **Flow** pane allows multicast IP/port details to be defined for the selected spigot. Status source and the number of audio channels can also be set here.

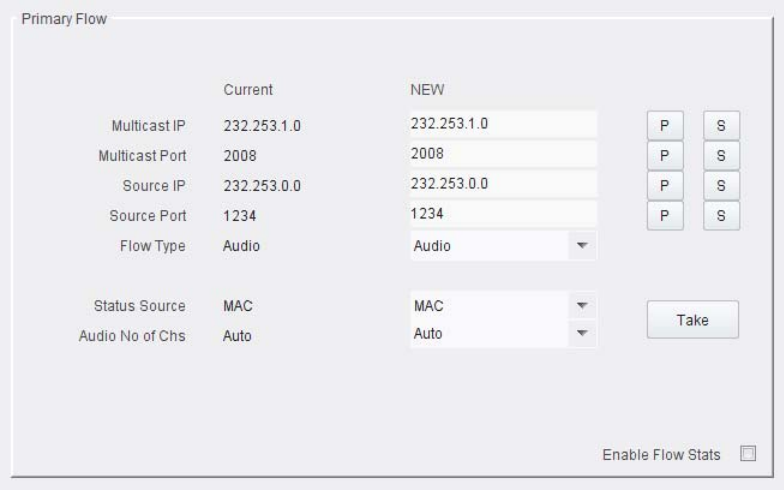


Figure 14 Output Spigot Flow Pane

Setting Multicast Details

To set multicast details:

- Enter Multicast IP and port details as required.
- Make a selection from the **Flow Type** drop-down menu, if required.
- **Status Source** will generally be set to **MAC**, meaning that the data flowing through the spigot will be sent onwards over IP. Setting this option to **Loopback** will prevent

the data from reaching the IP network. This can be useful when performing diagnostic tests etc.

- If using extended headers, select **Auto** from the **Audio No of Chs** drop-down list. If the **Disable Extended Headers** feature is in use (see section 5.4.2.1), set the number of audio channels to match the source audio.
- Click **Enable Flow Stats** to display bits per second, packets per second, and the number of packets dropped per second.
- Click **S** to save the details, or **P** to return to the preset default value.
- Click **Take** to implement the changes.

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

5.5 Configuration

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

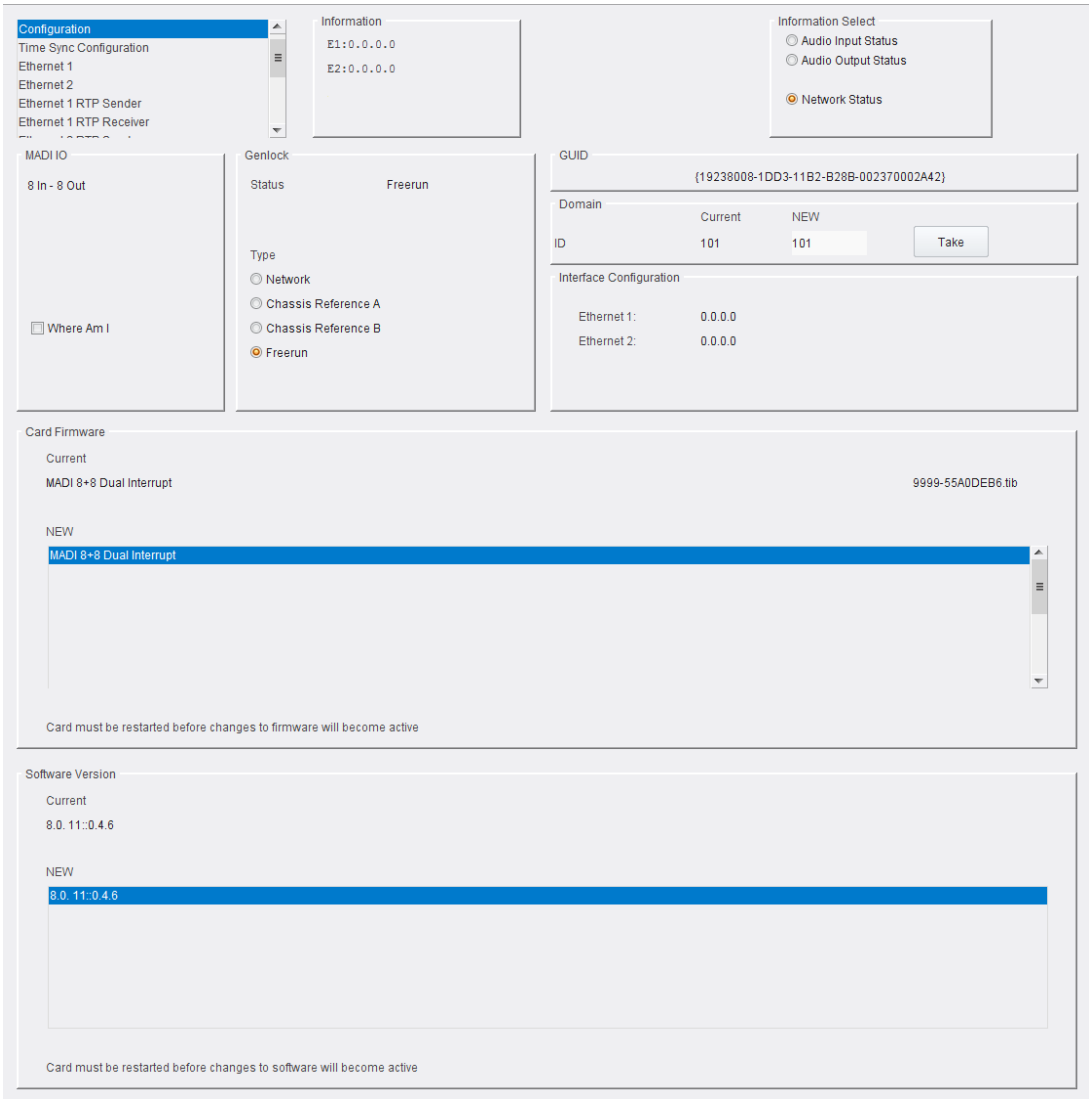


Figure 15 Configuration Page

The following facilities are available from this page:

Option	Operation
MADI 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 located.
Genlock	Select Genlock type: • **Network** - click to select PTP. • **Chassis Reference A/B** - click to select an on-chassis reference. • **Freerun** - click to allow free running.
GUID	Displays the absolute unique identifier associated with the IQAMD module.

Option	Operation
Domain	RollCall+ uses domains to partition a network; only nodes on the same domain can communicate with one another. A domain is uniquely identified with a number and a friendly name/alias. Set an ID as required, then press **Take** to confirm the change.
Interface Configuration	Displays the IP address for each of the Ethernet interfaces.
Card Firmware/Software Version	Each software version contains multiple firmware images. These provide different spigot input/output and flow standard combinations. Select the firmware which provides the required combination of inputs, outputs and flow standards from the list displayed on the **Firmware** pane. **Note**: **Restore** and **Restart** buttons are displayed only when an item not currently installed is selected. The **Software Version** pane displays the last few software releases, allowing you to roll back to a previous version if required. After making changes, click **Take** to restart the module and implement the changes.

5.6 Time Sync Configuration

The **Time Sync Configuration** page provides the necessary controls to select the source used for synchronizing the flows and configure any properties associated with the associated source.

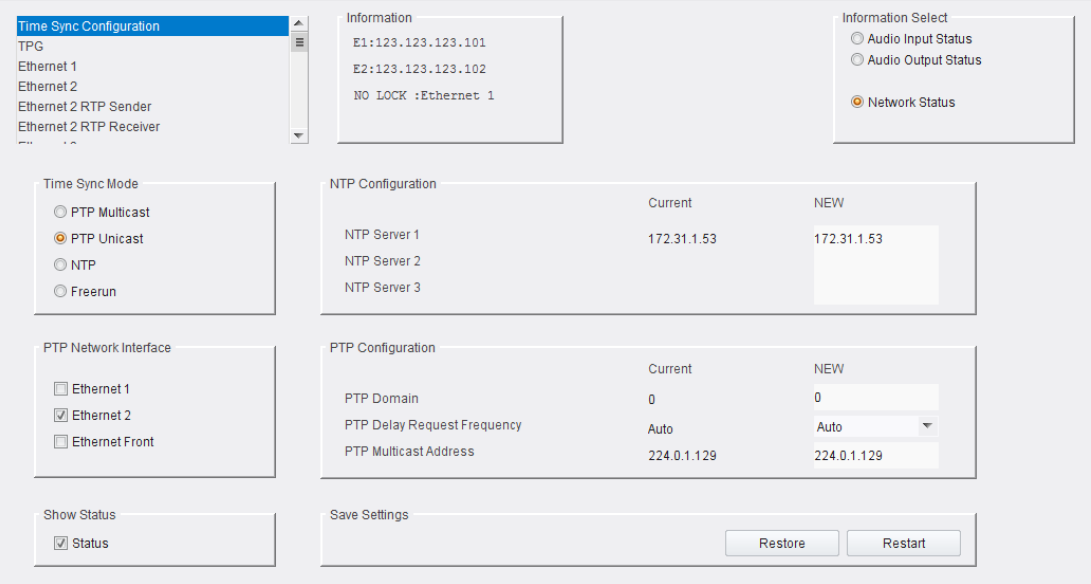


Figure 16 Time Sync Configuration Page

The following facilities are available from this page:

Option	Operation
Time Sync Mode	Click a radio button to select the required mode. Note that the PTP options require a grandmaster clock to be present in the system.
NTP Configuration	To add an NTP server, enter the server's IP address in to the **New** field.
PTP Network Interface	Click check boxes to select the required network interface.
PTP Configuration	Select values from the **PTP Domain** and **PTP Delay Request Frequency** drop-down lists, as required. Type the appropriate IP number into the **PTP Multicast** address field.
Show Status	Check the **Show Status** checkbox to display status information. See section 5.6.1.
Save Settings	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.

5.6.1 Status

Displays important system status information on a single convenient panel.

Figure 17 Time Sync Status

The following information is available from this panel:

Field	Description
Network Interface	Name of interface currently being monitored for PTP sync messages. If no sync messages are found, the interface will switch to the next available until messages are found. Interfaces are checked as per the PTP Network Interface settings. Valid values are: • **Ethernet 1** • **Ethernet 2** • **Ethernet Front**:
PTP Grandmaster	Grandmaster ID number.

Field	Description
Clock Identity	ID number of PTP clock being used for synchronization. This is not necessarily the grandmaster clock, as there can be intermediate clocks between the grandmaster and the card, depending on network configuration. Valid values are: • **Waiting for Announce Message**: No announce messages have been received since booting the card. • **NTP**: PTP time sync mode is set to NTP, i.e. the card clock is synchronized to an NTP clock (generally less precise than PTP). • **Free Running**: PTP time sync mode is set to free-run, i.e. the card is using its own clock with no reference to any other source.
Clock Status	Valid values are: • **LOCK**: Difference between grandmaster and Local clocks is> 1ms. • **NO LOCK**: Difference between grandmaster and Local clocks < 1ms. • **???** or **Unknown**: Status is indeterminate as no recent sync message has been received.
Last Lock	Time when card last entered **LOCKED** state, in the format *yyyy-mm-dd hh:mm:ss.*
Lost Lock	Time when card last exited **LOCKED** state, in the format *yyyy-mm-dd hh:mm:ss*.
Av Delay	Average network delay time between the card and the clock sending the synchronization messages. This should be relatively constant, and is dependant on network configuration. Valid values are: • **xxxx.x ns**: Average network delay. • **++++++++**: Average network delay between card and GM is > +9s. • **----------**: Average network delay between card and GM is > -9s. The standard deviation for this should be a low number, as the network delay is expected to be constant.

Field	Description
Av Error	The current difference between the card's time and the grandmaster time. This should be close to zero once the card has synchronized. Valid values are: • **xxxx.x ns**: Current difference between the card's time and the grandmaster time. • **++++++++**: Time difference between the card and the grandmaster is > +9s. • **----------**: Time difference between the card and the grandmaster is > -9s. The standard deviation for this should be close to zero once synchronized.
Sync Interval	Expected interval between sync messages as set by the grandmaster.
Request Interval	Minimum interval between delay request messages. If the **PTP Delay Request** setting is set to **AUTO**, the request interval will be set by the grandmaster. If the **PTP Delay Request** is not set to **AUTO**, then the request interval will be as the **PTP Delay Request** setting.
1 Step Syncs	Number of single-step sync messages received. Depending on grandmaster configuration, this could be zero or the count could increase steadily. It should be zero if the grandmaster is set to two step.
2 Step Syncs	Number of two-step sync messages received. Depending on grandmaster configuration, this could be zero or the count could increase steadily. It should be zero if the grandmaster is set to one step.
Follow Ups	Number of follow up messages. Should keep in step with the two-step count.
Delay Requests	Number of network delay requests sent to the grandmaster.
Delay Responses	Number of network delay responses received from the grandmaster. Should keep in step with the delay request count.
Announcements	Number of announcement messages received.
Synchronizations	Number of times card has entered **LOCK** since booting.
Message Timeouts	Number of times the card has not received any messages during the 2-second time-out period. If this number counts up, it suggests a failed network or PTP clock.
Clock Blips	Number of times the clock has been out by more than +/- 300ns while locked, or the clock has appeared to run backwards
Delay Blips	Number of times the network delay has varied by more than +/- 20% of the previous value.

Field	Description
Version Errors	Message version number doesn't match a supported version. Currently, only PTP V2 is supported.
Unknown Msgs	Messages received correctly, but whose content is not supported
Length Errs	Message received but message length is incorrect.
Unexpected 2 Step	Counts number of follow up messages received when sync messages indicate one-step mode is being used. If this is non-zero, check for multiple grandmasters on the network.
RX Timestamp Errors	Counts the number of messages received where the software sequence ident does not match that reported by the hardware. Should be zero.
TX Timestamp Errors	Counts the number of delay responses received where the software sequence ident does not match that reported by the hardware. Should be zero.
FollowUp OoS Errs	Counts the number of follow ups where the software sequence ident does not match that reported by the hardware. Should be zero.
FollowUp ID Errs	Counts the number of follow up messages received from a different clock to the one sending the sync messages. If this is non-zero, check for multiple grandmasters on the network.
Response OoS Errs	Counts the number of responses where the software sequence ident does not match that reported by the hardware. Should be zero.

5.6.2 Histogram

Located to the right of the **Status** panel, the Histogram provides a graphical representation of the distribution of differences between the card's clock and the PTP grandmaster clock. Every time the clock difference is recalculated, the relevant bar is incremented. A correctly functioning system will show a distinct peak around the 0ns level.

Figure 18 Time Sync Status Information - Histogram

5.7 Ethernet 1, 2

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

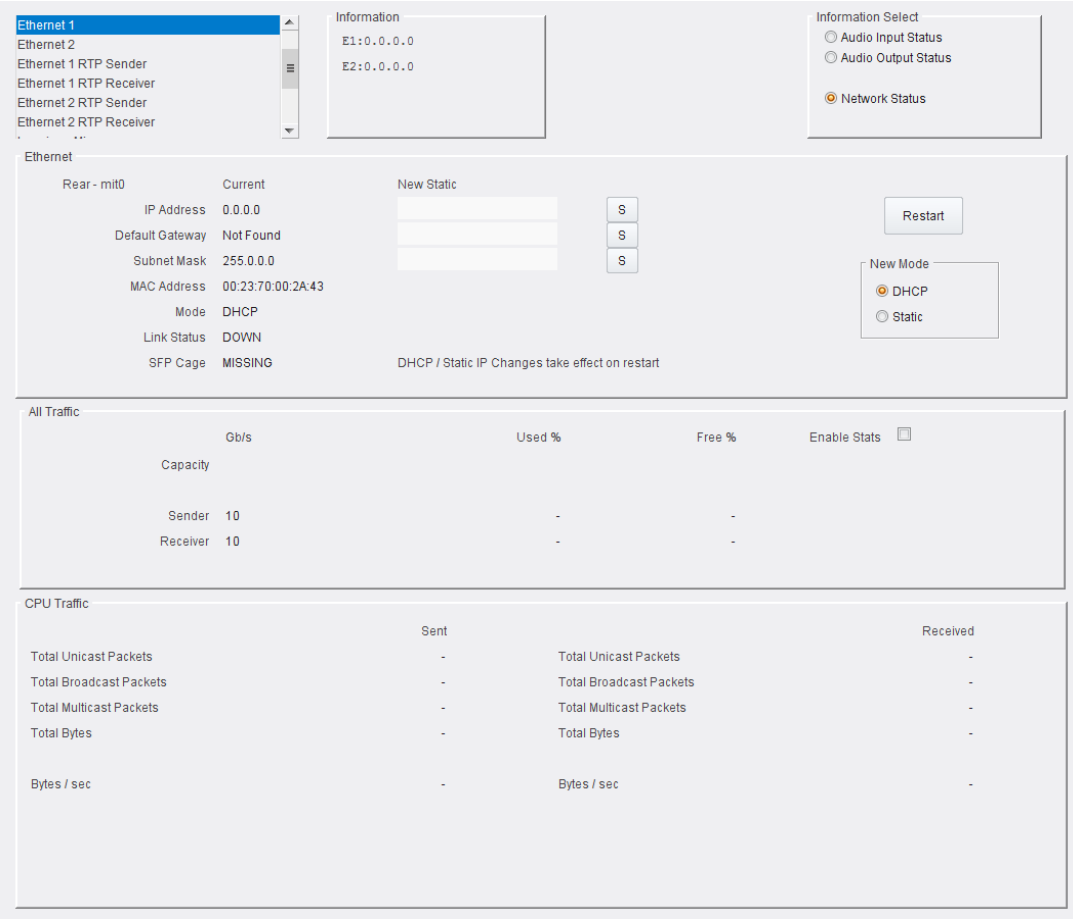


Figure 19 Ethernet Page

5.7.1 The Ethernet Pane

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

5.7.2 The All Traffic/CPU Traffic Panes

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

5.8 Ethernet 1, 2 RTP Sender

The **Ethernet RTP Sender** page display the amount of data required and the amount actually transmitted, on a spigot-by-spigot basis. Units are megabits per second. Click **Enable Stats** to display the values.

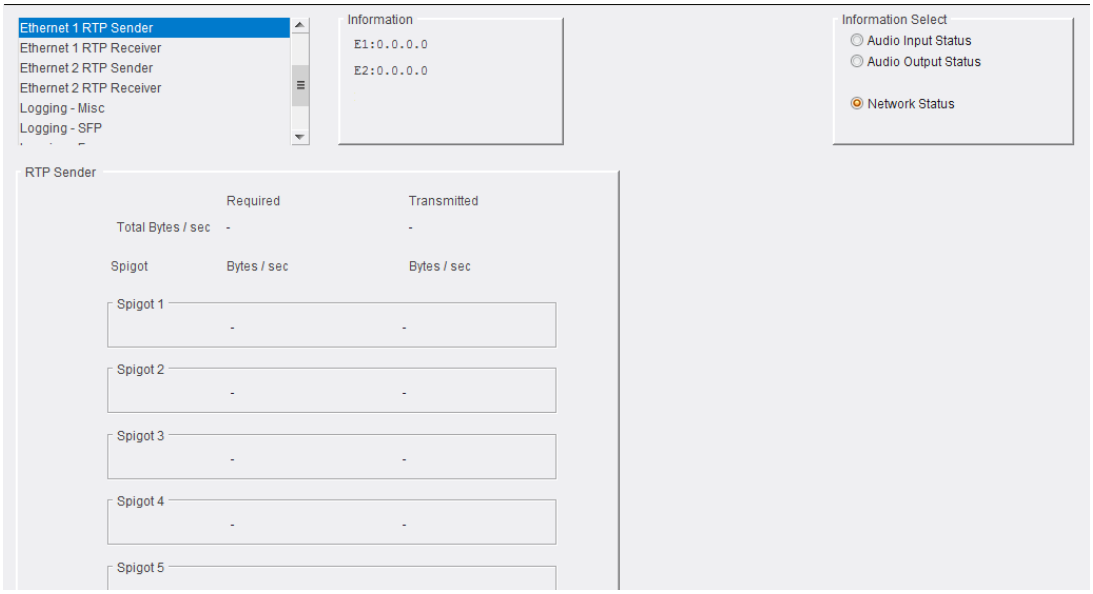


Figure 20 Ethernet RTP Sender Page

5.9 Ethernet 1, 2 RTP Receiver

The **Ethernet RTP Receiver** pages display the amount of data required and the amount actually received, plus details of packet loss, on a spigot-by-spigot basis. Units are megabits per second. Click **Enable Stats** to display the values.

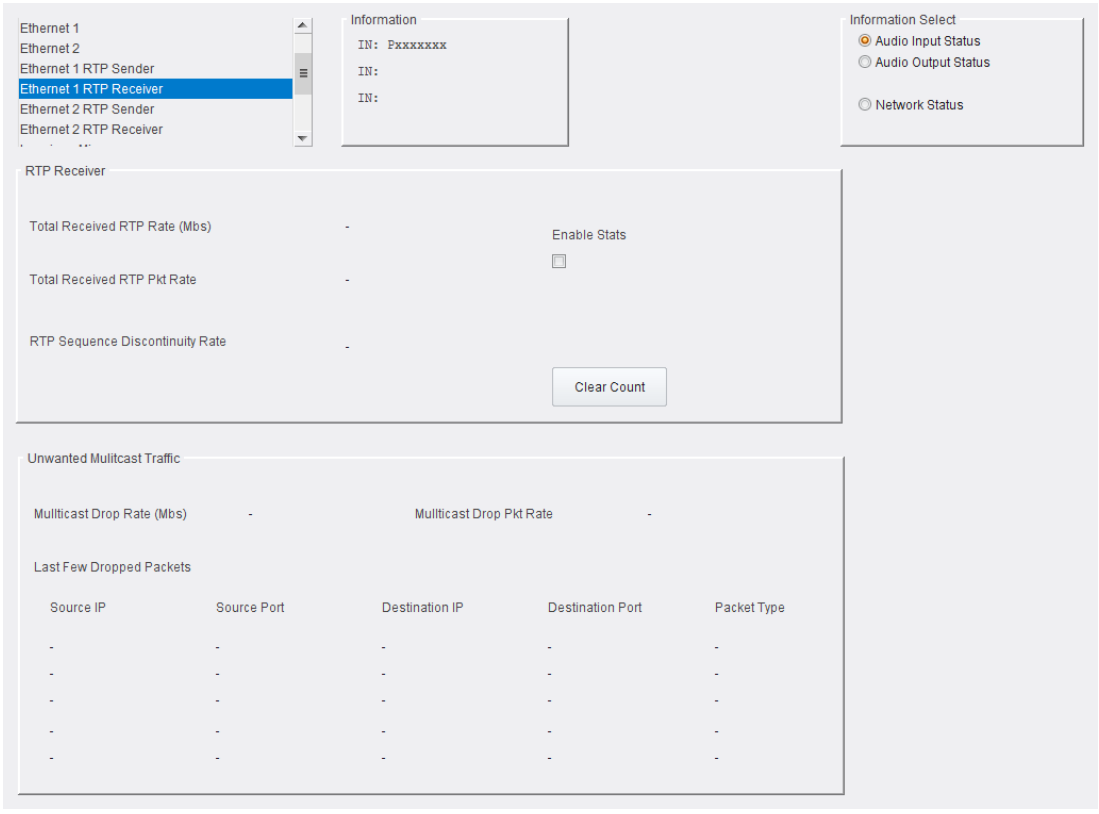


Figure 21 Ethernet RTP Receiver Page

5.10 Logging - Misc

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.

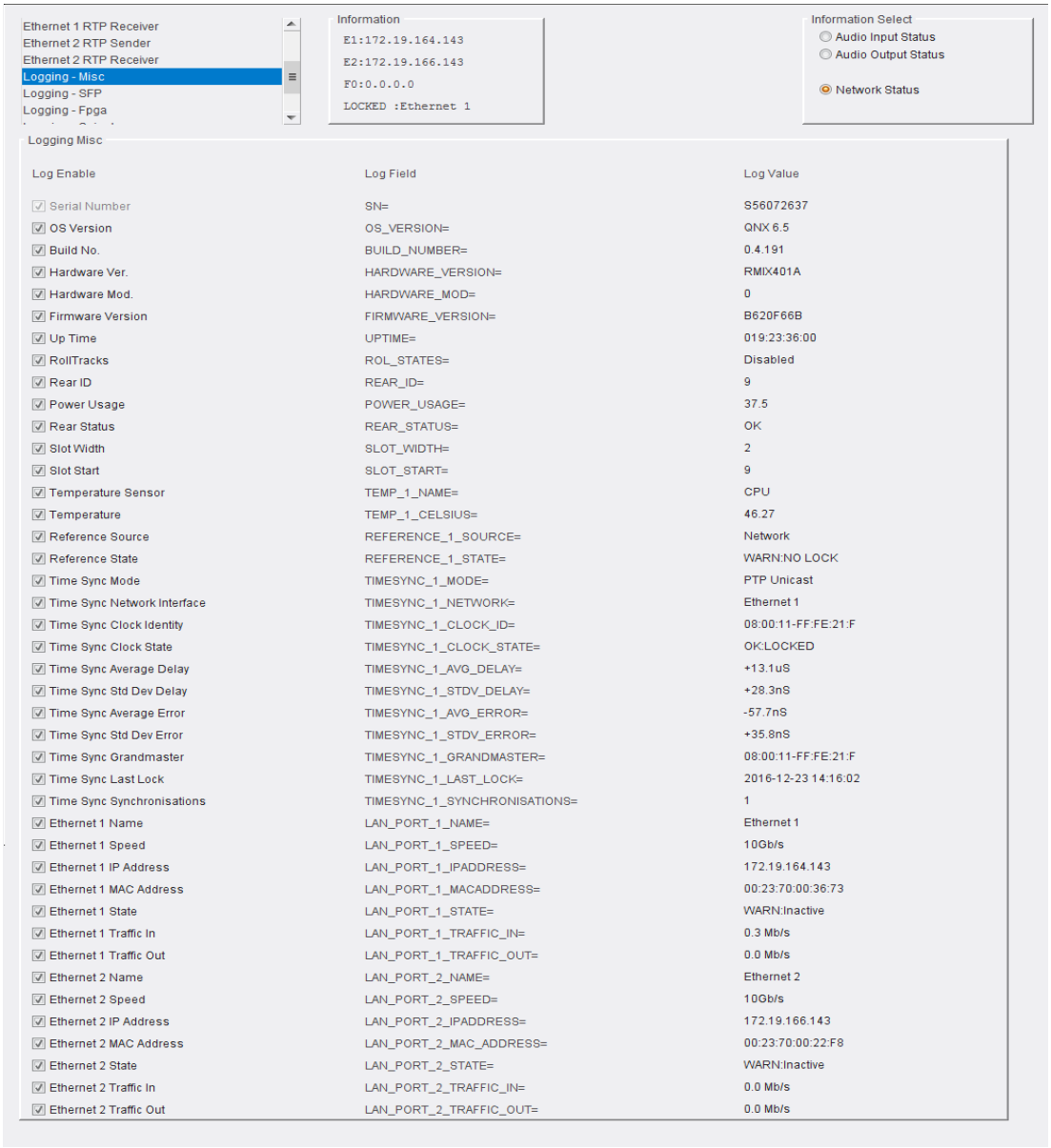


Figure 22 Logging Misc Page

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.

Log Field	Description
BUILD_NUMBER=	Reports the build number.
HARDWARE_VERSION=	Reports the hardware version number.
HARDWARE_MOD=	Reports the hardware modification number.
FIRMWARE_VERSION=	Reports the firmware version number.
UPTIME=	Reports the time since the last restart in the format *ddd:hh:mm:ss*.
ROL_STATES=	Reports the RollCall status. Valid values are: • **OK** • **FAIL:*n*** where *n* is the RollTrack index or indices which are failing • **Disabled**
REAR_ID=	Reports the code number of the rear fitted.
POWER_USAGE=	Reports the power usage in Watts (A-type rack)/PR Units (B-type rack).
REAR_STATUS=	Reports the status of the rear, where it can be determined.
SLOT_WIDTH=	Reports the slot width. IQAMD modules are available in single and triple width.
SLOT_START=	Reports the slot in the rack where IQAMD is located.
TEMP_N_NAME=	Temperature measurement name.
TEMP_N_CELSIUS=	Reports the temperature status of the FPGA.
REFERENCE_N_SOURCE=	Reports time reference source.
REFERENCE_N_STATE=	Valid values are: • **OK: Locked** • **OK: Input** • **WARN: Freerun** • **WARN: CrossLock**
TIMESYNC_N_MODE=	Valid values are: • **Free running:** Card is using its own clock with no reference to any other source**.** • **PTP Multicast:** Card is synchronizing to a PTP grandmaster clock using multicast network messages. • **PTP Unicast:** As PTP Multicast but using the delay request. Reply messages are unicast to minimize network traffic**.** • **NTP**: Module clock is synchronized to an NTP clock. Generally less precise than PTP.
TIMESYNC_N_NETWORK=	Network port currently being used for synchronization for IQAMD modules, dependant on the choice of interfaces made on the Time Sync Configuration page (See section 5.6). 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: • **Free running**: Card is not being synchronized. • **No Lock**: PTP being used but clocks haven't synchronized within +/- 1mS. • **Locked**: PTP being used and clocks are within the accepted range. • **NTP**: 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 dependant 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.
LAN_PORT_N_NAME=	Reports the Ethernet port name as defined by the OS.
LAN_PORT_N_SPEED=	Reports the Ethernet connection speed.
LAN_PORT_N_IPADDRESS=	Reports the IP address of LAN port *N*.
LAN_PORT_N_MACADDRESS=	Reports the MAC address of LAN port *N*.
LAN_PORT_N_STATE=	Ethernet connection state. Valid values are: • **Active** • **Inactive**
LAN_PORT_N_TRAFFIC_IN=	Traffic in. Valid values are: • **NNN.n Kbps, Mbps, Gbps**

Log Field	Description
LAN_PORT_N_TRAFFIC_OUT=	Traffic out. Valid values are: • **NNN.n Kbps, Mbps, Gbps**

Where N is the input number

5.11 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.

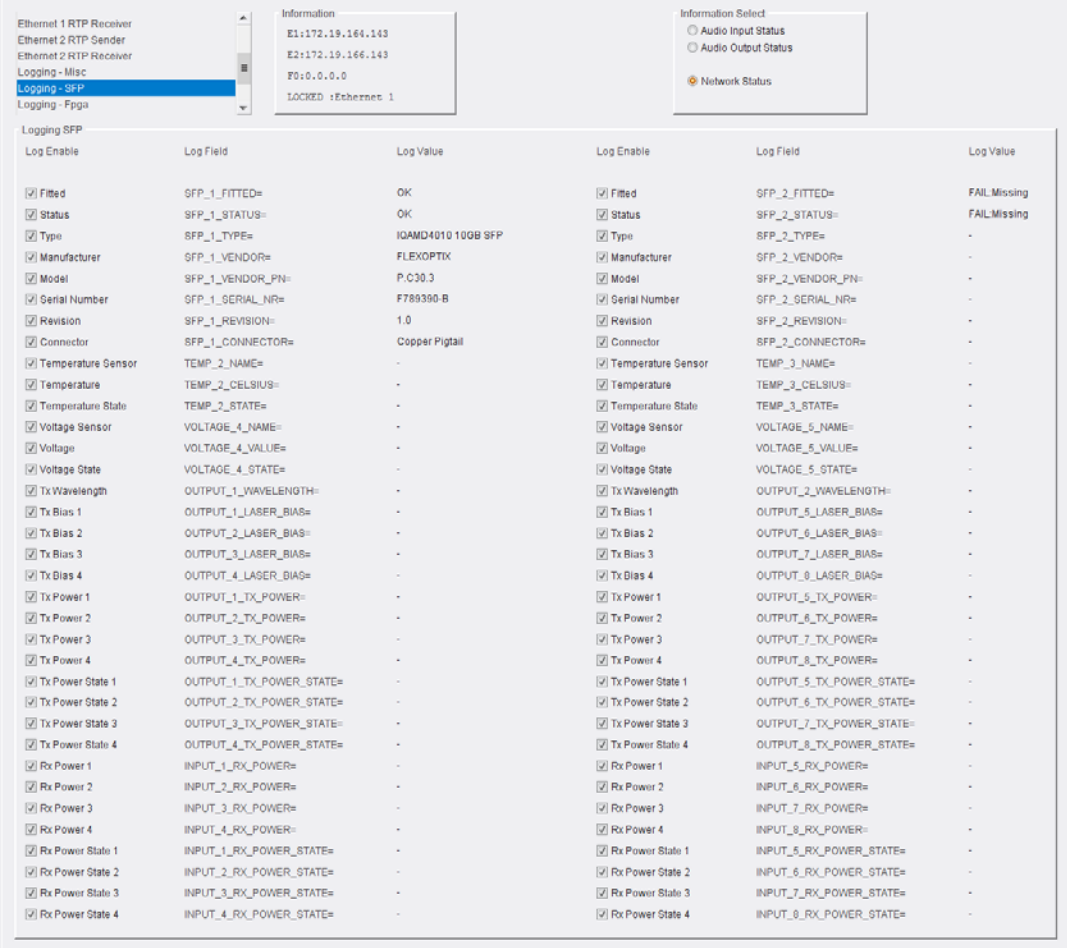


Figure 23 Logging - SFP Page

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

Log Field	Description
SFP_N_FITTED=	Reports presence of SFP. Valid values are: • **OK** • **FAIL: Missing**
SFP_N_STATUS=	Reports status from the SFP, defined by INF-8074, SFF-8436. Valid values are: • **OK** • **WARN** - Temp VCC Bias Tx (SFP warning) Rx Laser TEC (SFP warning)
SFP_N_TYPE=	Reports SFP identifier from device.
SFP_N_VENDOR=	Reports SFP manufacturer from device.

Log Field	Description
SFP_N_VENDOR_PN=	Reports SFP model number from device.
SFP_N_SERIAL_NR=	Reports the module serial number, which consists of an S followed by eight digits.
SFP_N_REVISION=	Reports manufacturer revision number.
SFP_N_CONNECTOR=	Reports connector type.
TEMP_N_NAME=	Reports temperature sensor name.
TEMP_N_CELSIUS=	Reports current temperature sensor reading.
TEMP_N_STATE=	Reports temperature sensor state. Valid values are: • **WARN: Disabled** - Temperature sensor disabled. • **WARN: Low** - Low, but in tolerance. • **WARN: High** - High, but in tolerance. • **OK** • **FAIL: Low** - Low and out of tolerance. • **FAIL: High** - High and out of tolerance.
VOLTAGE_N_NAME=	Reports voltage sensor name.
VOLTAGE_N_VALUE=	Reports current voltage reading.
VOLTAGE_N_STATE=	Reports temperature sensor state. Valid values are: • **OK** • **WARN: Low** - Low, but in tolerance. • **WARN: High** - High, but in tolerance.
OUTPUT_N_WAVELENGTH=	Reports transmit wavelength in nm.
OUTPUT_N_LASER_BIAS=	Reports bias level in mA.
OUTPUT_N_TX_POWER=	Reports transmit power level in dBm.
OUTPUT_N_TX_POWER_ STATE=	Reports transmit power level. Valid values are: • **OK** • **WARN: Low** - Low, but in tolerance. • **WARN: High** - High, but in tolerance. • **FAIL: Low** - Low and out of tolerance. • **FAIL: High** - High and out of tolerance.
INPUT_N_RX_POWER=	Reports receive power level in dBm.
INPUT_N_RX_POWER_ STATE=	Reports receive power level. Valid values are: • **OK** • **WARN: Low** - Low, but in tolerance. • **WARN: High** - High, but in tolerance. • **FAIL: Low** - Low and out of tolerance. • **FAIL: High** - High and out of tolerance.

5.12 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.

Figure 24 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.
VOLTAGE_N_NAME=	Voltage sensor name.
VOLTAGE_N_VALUE=	Reports current voltage reading.

Where N is the input number

5.13 Logging - Spigots

The **Logging - Spigot** pages are used to select the fields to be enabled for each available spigot. Depending on whether the spigot is an input or an output, the appropriate log fields are shown.

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

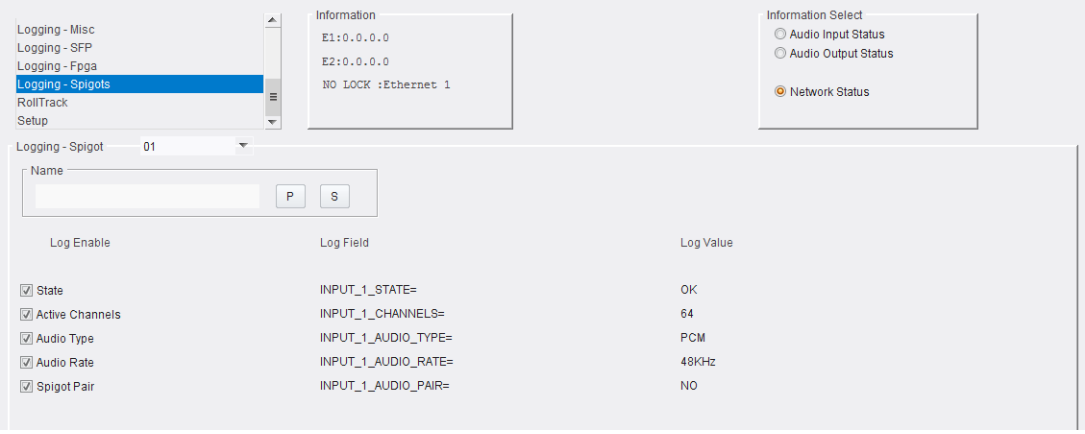


Figure 25 Input Spigot Logging Page

Figure 26 Output Spigot Logging Page

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 section 5.15.
INPUT_N_STATE=	Valid values are: • **OK**: input signal good. • **FAIL**: input signal not detected.
INPUT_N_TYPE=	HD/SD/3G SDI
INPUT_N_STANDARD=	PAL/NTSC/625 Mono/525 Mono
OUTPUT_N_IDENT=	Name of the output as shown on the rear panel.

Log Field	Description
OUTPUT_N_NAME=	Name of the output as defined by the user.
OUTPUT_N_STATE=	Valid values are: • **OK**: output signal good. • **FAIL**: output signal not detected. • **WARN:Freeze** • **WARN: Pattern** • **WARN:Black**
OUTPUT_N_TYPE=	Valid values are: • **SD SDI** • **HD SDI** • **HD/SD/3G SDI**
OUTPUT_N_STANDARD=	Reports the output standard in the format **<Lines>(<Active>)/<Rate><i/p/sf>** Where: • **Lines** = Total lines • **Active** = Active lines • **Rate** = Frame rate • **I** = interlaced • **P** = Progressive • **SF** = Segmented Frame For example: **1080/50p** or **1125(1080)/25i**

Where N is the input/output number

5.14 RollTrack

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

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

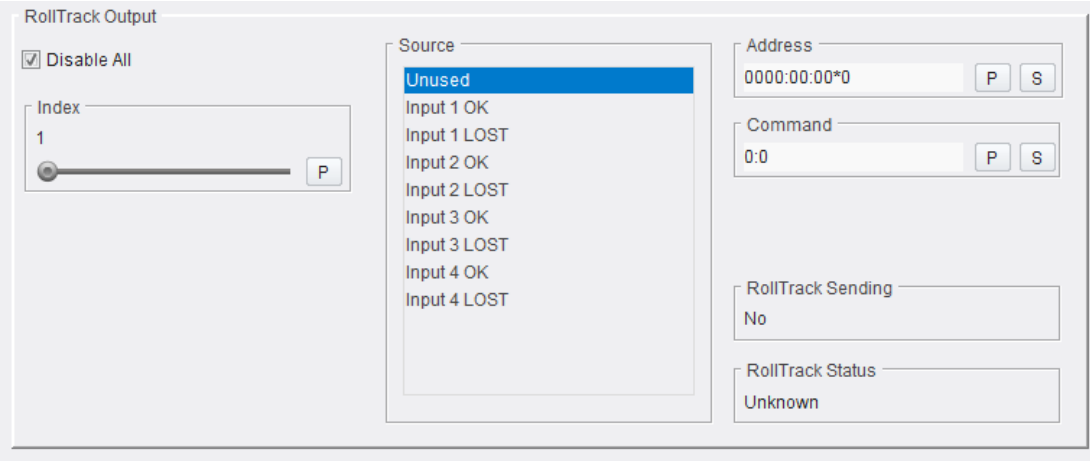


Figure 27 Source Pane

5.14.1 Disable All

When checked, all RollTrack items are disabled.

5.14.2 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.

5.14.3 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 *N* OK	Input *N* is good.
Input *N* LOST	Input *N* is bad.

Where N is the input number

5.14.4 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.

5.14.5 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.

5.14.6 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.

5.14.7 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 acknowledgement 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.

5.15 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.

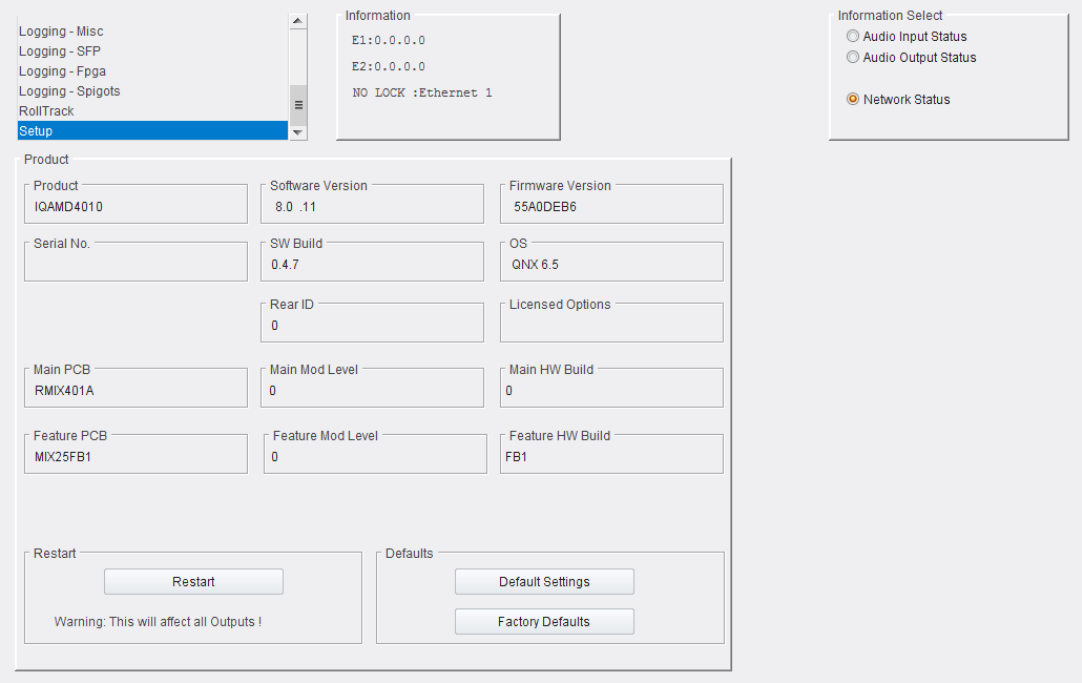


Figure 28 Setup Page

The **Product** pane displays technical information on the IQAMD module. You may be asked for these details by SAM 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.
Licensed Options	Additional options.
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.
Feature Mod Level	Daughterboard PCB modification level.
Feature HW Build	Factory Daughterboard hardware build number.

5.15.1 Restart

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

Important: Restarting the module will affect all outputs.

5.15.2 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.

