



Snell  
Advanced  
Media

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# User Instruction Manual

## **IQSAM00**

3G/HD/SD-SDI Signal Assurance Module

## Information and Notices

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# 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:** These servicing instructions are for use by qualified 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.

## 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



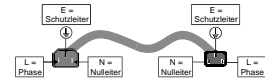
Die angeführten Service-/Reparatur-Anweisungen sind ausschließlich von qualifiziertem Service-Personal auszuführen. Um das Risiko eines lektroschocks zu reduzieren, führen Sie ausschließlich die im Benutzerhandbuch eschriebenen Anweisungen aus, es sei denn, Sie haben die entsprechende Qualifikation.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

## 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:** 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 changer 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.

## 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



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:



- ⚠ 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:



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.

## Förklaring av Säkerhetssymboler



- ⚠ 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 får endast repareras av utbildad personal.

## Säkerhetsvarningar



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 försörd från ett strömsystem som är försedd med jordanslutning (⊕) samt ha en neutral anslutning som lätt identifieras.
- Väggtuttaget som strömförsörjer apparaten bör finnas i närheten samt vara lättillgänglig.

## 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.

## Forklaring på sikkerhedssymboler



- ⚠ Dette symbol gør brugeren opmærksom på vigtig information i den medfølgende manual.
- ⚠ Dette symbol indikerer farlig spænding inden i apparatet. Ingen bruger servicebare dele i apparatet på brugerniveau. Dette apparat må kun serviceres af faglærte personer..

## Sikkerhedsadvarsler



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 jordat.
- 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 lysnetudgange fra den samme fase.

## Turvamerkkien selitys



- ⚠ 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



Huolto-ohjeet on tarkoitettu ainoastaan alan ammattilaisille. Älä suorita laitteelle muita toimenpiteitä, kuin mitä käyttöohjeissa on neuvottu, ellei 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 nolaliitännän on oltava luotettavasti tunnistettavissa.
- Sähköpistorasian tulee olla laitteen lähellä ja helposti tavoitettavissa.

## Sähkökytkentä

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

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



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

### Σύμβολα de Segurança



- 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

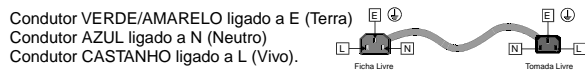


As instruções de manutenção fornecidas são para utilização de técnicos qualificados. Para reduzir o risco de choque eléctrico, não devem ser realizadas intervenções no equipamento não especificadas no manual de instalações a menos que seja efectuadas por técnicos habilitados.

- 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:



- 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.

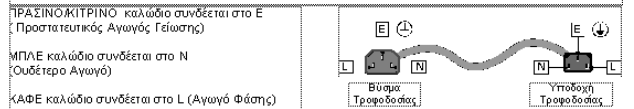
### Προειδοποίηση Ασφαλείας

- Οδηγίες επισκευής, όπου παρέχονται, αναφέρονται απακλειστικά 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 συνοδεύεται συνήθως από ένα καλώδιο τροφοδοσίας με ένα σταθερό βύσμα τροφοδοσίας ρευματός τύπου πυραμίδας στη μία άκρη του και μια σταθερή υποδοχή τροφοδοσίας ρευματός 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:



- 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.

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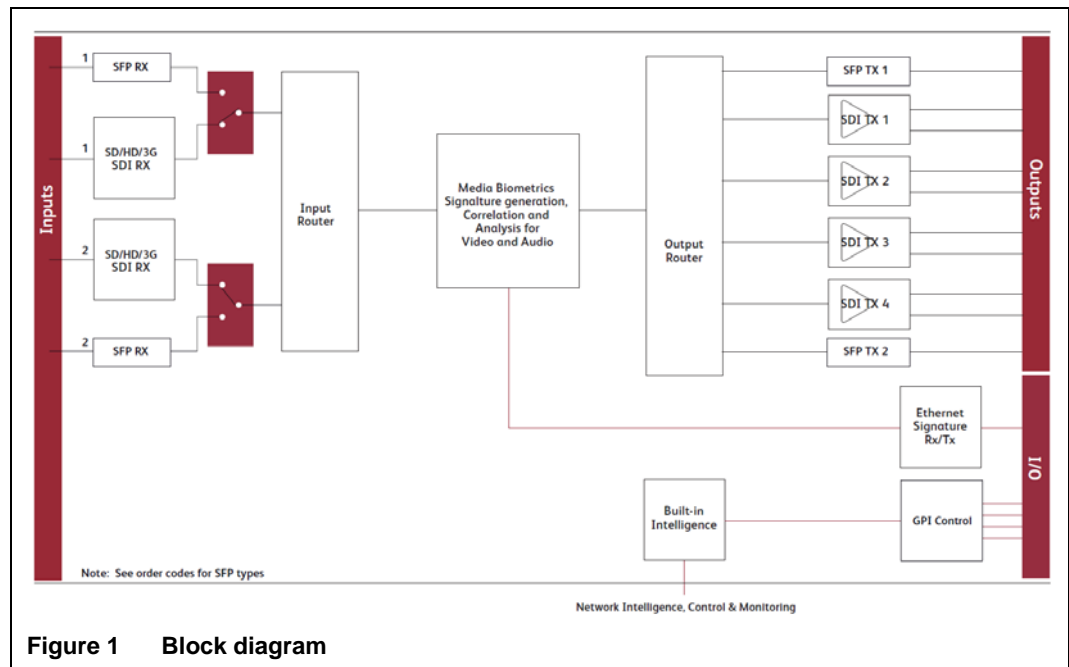
# 1 Introduction

## 1.1 Description

The IQSAM00 provides a fast and efficient way to monitor video and audio confidence and timing at various points within an SDI system. In broadcast systems maintaining the association and timing between video and audio signals to avoid an objectionable viewer experience has always involved a lot of time consuming set up, testing and monitoring by broadcast engineers and staff, but now IQSAM00 can provide the monitoring confidence that everything is correct and remains correct during live operation. It does this by generating and comparing video and audio signatures from the SDI stream and reporting back the delay value and an accuracy confidence, all without the need for potentially intrusive metadata insertion, or watermarking.

IQSAM00 can operate as a purely SDI-based module to compare two SDI streams (one 'known good' and one 'measured') in a 'probe' -type application, or can transmit and receive signatures over IP for comparison with units at different locations within the facility or at a remote site. IQSAM00 can compare the signals quickly and reliably with typical confidence times of sub 5 seconds achieved for common applications and material types.

Being fully compatible with SAM's RollMap graphical monitoring software means that signal confidence and delay values from across the system can be shown in a single display graphic providing system timing confidence 'at a glance'. Alternatively native SNMP support enables the IQSAM00 to be integrated with other network management systems used for 'in house' monitoring operations.



## 1.2 Order Codes

The following order codes are available.

### 1.2.1 IQH3B

Order codes for the IQH3B enclosure:

<b>IQSAM0000-1B3</b>	3G/HD/SD-SDI Signal Assurance Module. 2 SDI inputs, 2 SDI outputs, 1 SFP interface, 2 GPIs, Ethernet I/O
<b>IQSAM0002-2B3</b>	3G/HD/SD-SDI Signal Assurance Module. 2 SDI inputs, 8 SDI outputs (group selectable), 1 SFP interface, 4 GPIs, Ethernet I/O.
<b>IQSAM0003-2B3</b>	3G/HD/SD-SDI Signal Assurance Module with dual relay input bypass. 2 SDI inputs, 5 SDI outputs (group selectable), 1 SFP interface, 4 GPIs, Ethernet I/O

### 1.2.2 IQH3A/1A

Order codes for the IQH3A and IQH1A enclosures:

<b>IQSAM0000-1A3</b>	3G/HD/SD-SDI Signal Assurance Module. 2 SDI inputs, 2 SDI outputs, 1 SFP interface, 2 GPIs, Ethernet I/O
<b>IQSAM0002-2A3</b>	3G/HD/SD-SDI Signal Assurance Module. 2 SDI inputs, 8 SDI outputs (group selectable), 1 SFP interface, 4 GPIs, Ethernet I/O
<b>IQSAM0003-2A3</b>	3G/HD/SD-SDI Signal Assurance Module with dual relay input bypass. 2 SDI inputs, 5 SDI outputs (group selectable), 1 SFP interface, 4 GPIs, Ethernet I/O

### 1.2.3 SFP Options

Order codes for the SFP options:

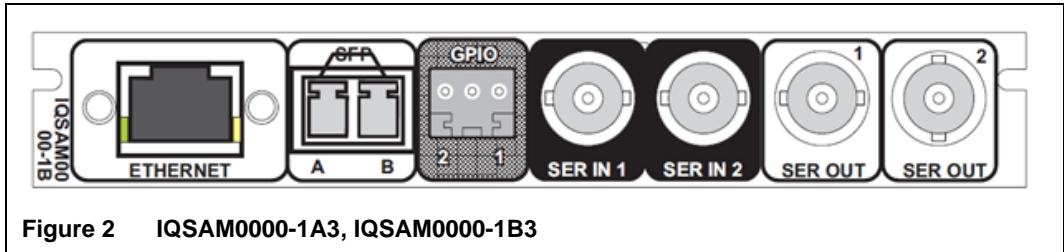
<b>FC1-13T1</b>	Single 1310nm fiber Tx
<b>FC1-13T2</b>	Dual 1310nm fiber Tx
<b>FC1-15T1</b>	Single 1550nm fiber Tx
<b>FC1-15T2</b>	Dual 1550nm fiber Tx
<b>FC1-R1</b>	Single fiber Rx
<b>FC1-R2</b>	Dual fiber Rx
<b>FC1-13TR</b>	Fiber transceiver 1310nmTx/Rx
<b>FC1-HDBT2</b>	HD-BNC Dual Tx
<b>FC1-HDBR2</b>	HD-BNC Dual Rx
<b>Fiber CWDM Tx</b>	Wavelengths available on request

**Note:** SFP type must be ordered in addition to the module.

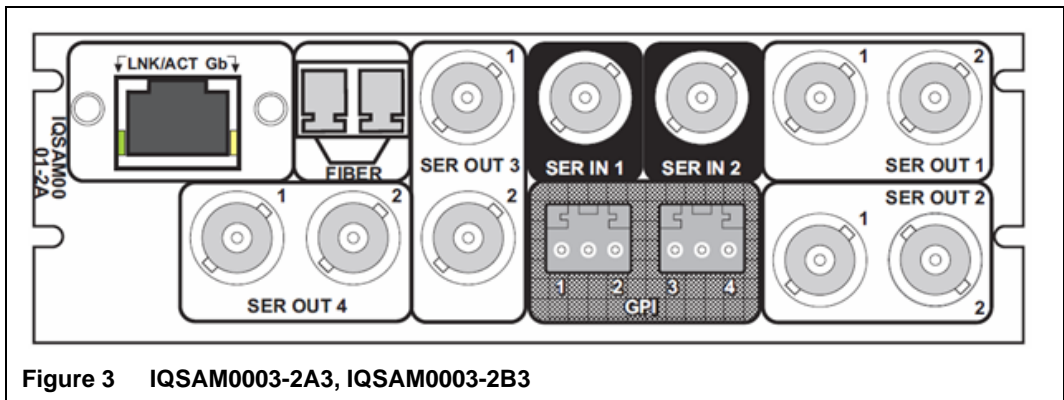
### 1.3 Rear Panel View

This section contains the available rear panels.

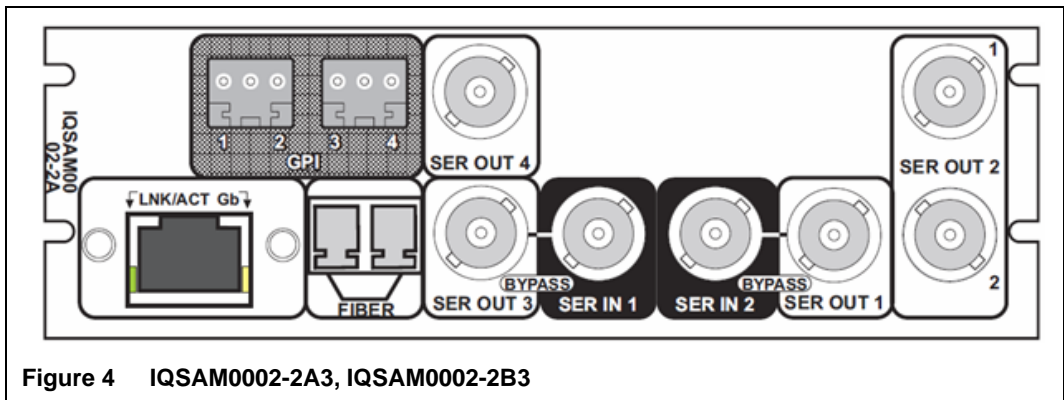
#### 1.3.1 IQSAM0000-1A3, IQSAM0000-1B3



#### 1.3.2 IQSAM0002-2A3, IQSAM0002-2B3



#### 1.3.3 IQSAM0003-2A3, IQSAM0003-2B3



### 1.4 Enclosures

IQSAM00 can only be fitted in the following enclosures, shown below:

**Important:**

Although IQ modules are interchangeable between enclosures, their rear panels are enclosure specific. An IQH3B enclosure accepts modules with either “A” or “B” order codes. An IQH3A or IQH1A enclosure accepts modules with “A” order codes only. See page 10.

#### IQH3B-S-0, IQH3B-S-P



Figure 5 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.

#### IQH1A-S-P



Figure 6 IQH1A-S-P

#### IQH3A-S-0, IQH3A-S-P



Figure 7 IQH3A-S-0, IQH1A-S-P

#### IQH3A-E-0, IQH3A-E-P, IQH3A-0-P

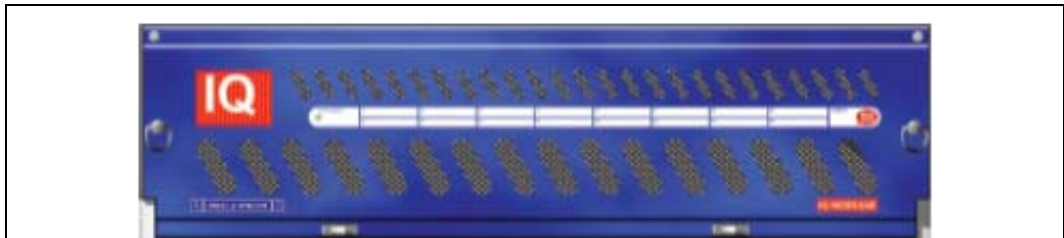


Figure 8 IQH3A-E-0, IQH3A-E-P, IQH3A-0-P

#### IQH1A-S-P



Figure 9 IQH1A-S-P

## 1.5 Feature Summary

This module provides the following features:

- Compares SDI signals for video and audio timing differences with accuracy to 1ms. Handles and can compare up to 16 channels of embedded audio present on the incoming SDI stream.
- Full RollCall and SNMP compatibility allows easy integration with SAM or third party network management systems providing an all-inclusive monitoring and control solution.
- Has the flexibility to operate as a local signal probe comparing 2 SDI inputs.
- Standards supported:
  - 3G-SDI to SMPTE 424M/425M level A
  - HD-SDI to SMPTE292M/274M/296M
  - SD-SDI to SMPTE259M-C
  - Fiber to SMPTE 297-2006

**Note:** Input signals should be of the same frame/field rate for accurate comparison.

- SFP cage enables I/O over fiber or additional SDI via HD-BNC
- 16 x user memories, save/recall/rename
- RollTrack delay values created to enable delay correction by other RollTrack enabled units

## 1.6 Applications

This module quickly and reliably detects any video or audio routing and lipsync errors in the system and provides measurements and alerts to work in harmony with Network management systems.

It is designed to be used for measurement of signals that have undergone format or ARC conversion, or for remote 'off-air' applications where the signal will have been compressed and decoded. It can provide delay values via SAM's RollTrack low level control system allows connected units to automatically adjust any unwanted audio delay errors, ideal for use in remote locations or low-staffing situations.

Full RollCall and SNMP compatibility allows easy integration with SAM, or third party, network management systems providing an all-inclusive monitoring and control solution.

## 2 Technical Specification

This section contains technical information for the IQSAM00 module.

<b>Inputs and Outputs</b>	
<b>Signal Inputs</b>	
SDI Inputs	2x 3G/HD/SD-SDI
Electrical	3 Gbit/s SDI (Level A only), SMPTE 424M 1.5 Gbit/s HD-SDI, SMPTE 292M 270 Mbit/s SDDSI, SMPTE 259M-C
Connector/Format	BNC/75 Ohm panel jack on standard SAM connector panel
Input Cable Length	Up to 80m Belden 1694A @ 3Gbps Up to 150m Belden 1694A @ 1.5 Gbps Up to 250m Belden 1694A @ 270 Mbps
<b>Fiber Signal Input</b>	
Inputs	2 x <b>Note:</b> Optical I/O and control dependant on type of SFP module fitted
Optical	3 GBit/s HD-SDI 1.5 GBit/s HD-SDI 270 Mbit/s SD-SDI
Connector/Format	LC singlemode
Standard	SMPTE 297-2006
<b>Signal Outputs</b>	
SDI Outputs	Up to 8 pair selectable from input 1, 2
Electrical	3 Gbit/s SDI, SMPTE 424M 1.5 Gbit/s HD-SDI, SMPTE 292M 270 Mbit/s SDI, SMPTE 259M-C
Connector/Format	BNC/75 Ohm
<b>Fiber Signal Output</b>	
Optical	3 GBit/s HD-SDI 1.5 Gbit/s HD-SDI 270 Mbit/s SD-SDI
Connector/Format	LC singlemode
Conforms to	SMPTE 297-2006
Outputs	Up to 2 <b>Note:</b> Optical I/O and control dependant on type of SFP module fitted
Conforms to	3 Gbit/s SDI, SMPTE 424M (Level A only) 1.5 Gbit/s HD-SDI, SMPTE 292M 270 Mbit/s SDI, SMPTE 259M-C
Video Standards	1080/50p, 1080/59p, 1080/60p 750(720)/60p, 1125(1080)/30 750(720)/59p, 750(720)/50p 1125(1080)/29i, 1125(1080)/30p 1125(1080)/29p, 1125(1080)/25i 1125(1080)/25p, 1125(1080)/24p 1125(1080)/23p, 525(480)/29i 625(576)/25i

**Table 1 Inputs and Outputs**

**Inputs and Outputs****Control Interface**

GPI	Up to 4 IO configurable
Electrical	TTL-compatible, active-low driven
Connector / Format	Standard SAM screw terminal

**Table 1 Inputs and Outputs**

### 3 Connections

This section contains information on the module connectors.

#### 3.1 SDI Output



Figure 1 SDI Output

#### 3.2 SDI Input



Figure 2 SDI Input

#### 3.3 GPIO



Figure 3 GPIO

#### 3.4 SFP

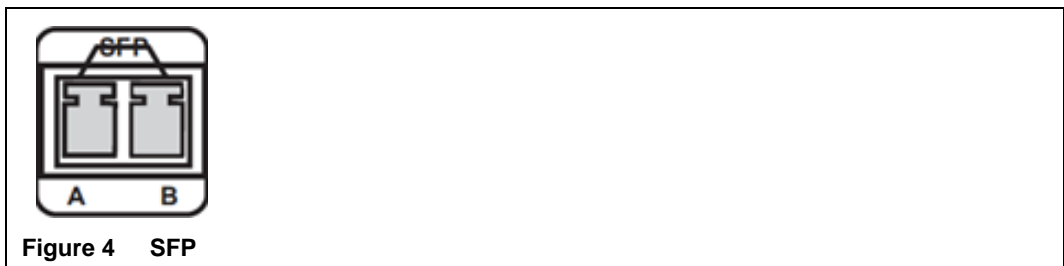


Figure 4 SFP

#### 3.5 Ethernet Input



Figure 5 Ethernet Input



## 4 Card Edge LEDs

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

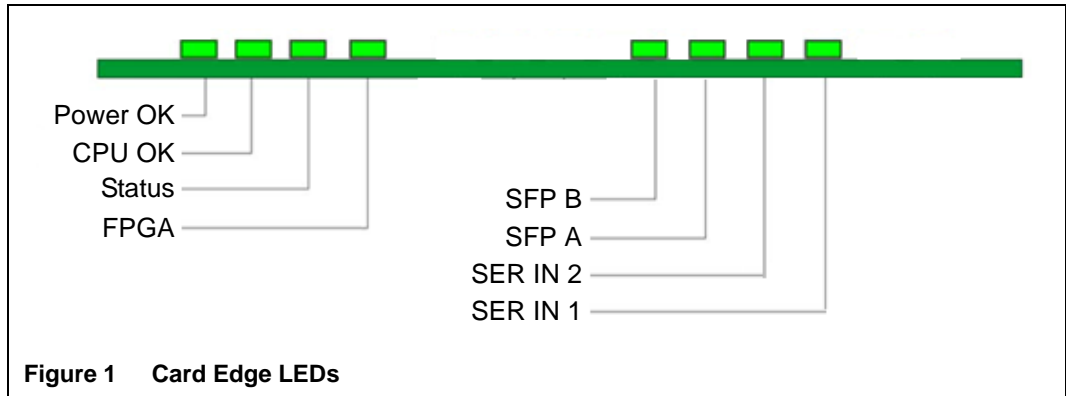


Figure 1 Card Edge LEDs

LED	Color	Description
Power OK	Green	OK when on
CPU OK	Green flashing	
CPU Status		Not in use on IQSAM00
FPGA		Not in use on IQSAM00
SER IN 1	Red Green Blue	Input selected: No input/error Input selected: Input OK Input available but not selected
SER IN 2	Red Green Blue	Input selected: No input/error Input selected: Input OK Input available but not selected
SFP A	Red Green Blue Off	Input selected: No input/error Input selected: Input OK Input available but not selected Input not available
SFP B	Red Green Blue Off	Input selected: No input/error Input selected: Input OK Input available but not selected Input not available

Table 1 Card Edge LEDs

## 5 RollCall Control Panel

This section contains information on using the IQSAM00 module with RollCall.

### 5.1 Information Window

The information window appears in the upper-right corner of each screen and displays basic information about the input, standard and status of the module. When Video Status is selected, the status of the video input and reference is displayed as shown in the example below:



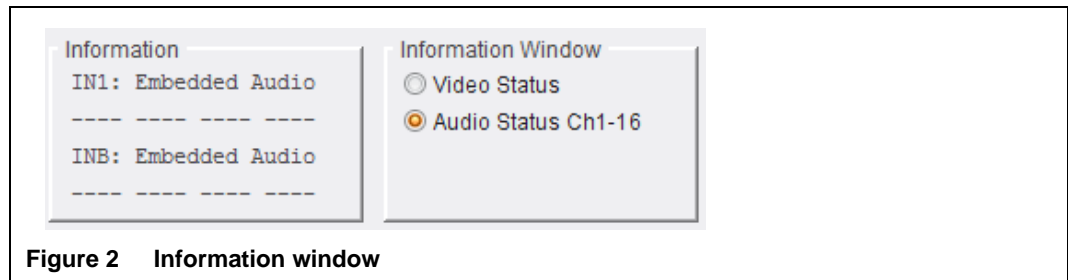
Figure 1 Video input and reference status

Name	Status	Description
IN1:		Displays the status of the video input 1, followed by the standard of the input
	<b>OK 1080/29i</b>	Valid input signal received. Detected standard of input signal.
IN2: (Line 2)	<b>LOST</b>	No input signal received.
	<b>OK 1080/29i</b>	Valid input signal received. Detected standard of input signal.
OUT: (Lines 3 and 4)	<b>LOST</b>	No input signal received.
		Line 3 lists the available outputs and line 4 shows the assigned input to each output.

Table 1 Video input and reference status

## 5.2 Information Window - Audio Status Ch1-16

RollCall displays the Audio information window when the relevant radio button is selected. 16 Audio channels appear for each input.



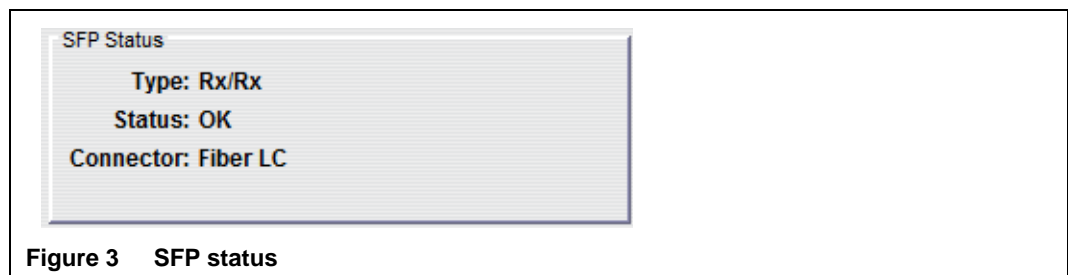
**Figure 2** Information window

The audio status can be one of the following:

- P** The channel is a PCM audio input
- No audio input is detected
- D** The signal is data, for example, non-PCM or DolbyDigital
- E** The signal is Dolby E

## 5.3 SFP Status

The SFP Status window displays detected information about any module inserted. If no SFP is fitted, the information fields contain the '-' symbol.



**Figure 3** SFP status

## 5.4 Inputs/Outputs

The Input/Output screen configures the outputs to display any of the available inputs, outputs or mute status.

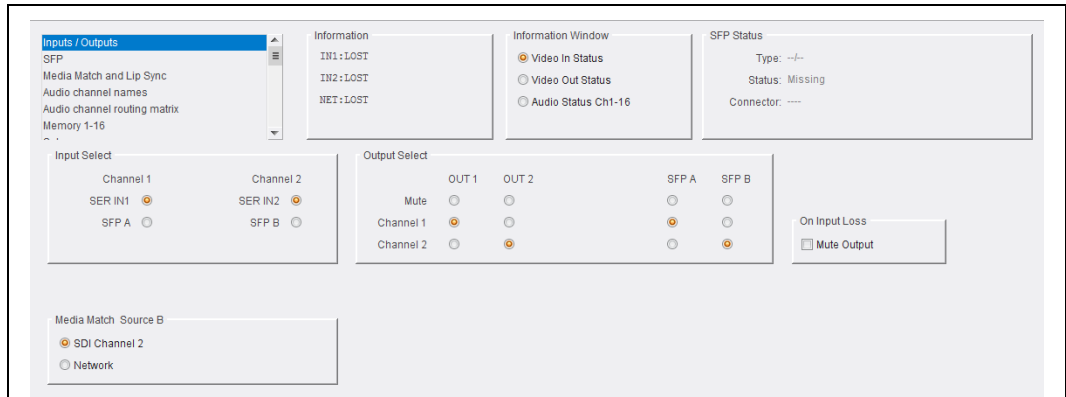


Figure 4 Inputs/Outputs

### 5.4.1 Input Select

This panel allows the selection of input source for each input. The SFP option is still visible even if no SFP is fitted or an output SFP is fitted to the rear panel.

### 5.4.2 Output Select

This panel allows the user to select which input channel is routed to each available output. If the rear has fewer than 4 output groups, then the unavailable groups are not shown. Even if the SFP is not fitted, or is an input type, then the SFP columns in this panel are still available but not active.

### 5.4.3 On Input Loss

If the Mute Output box is ticked, then outputs are muted when the selected input source is not valid.

#### 5.4.4 Media Match Source B

Select the correlator input to be used using the radio buttons.

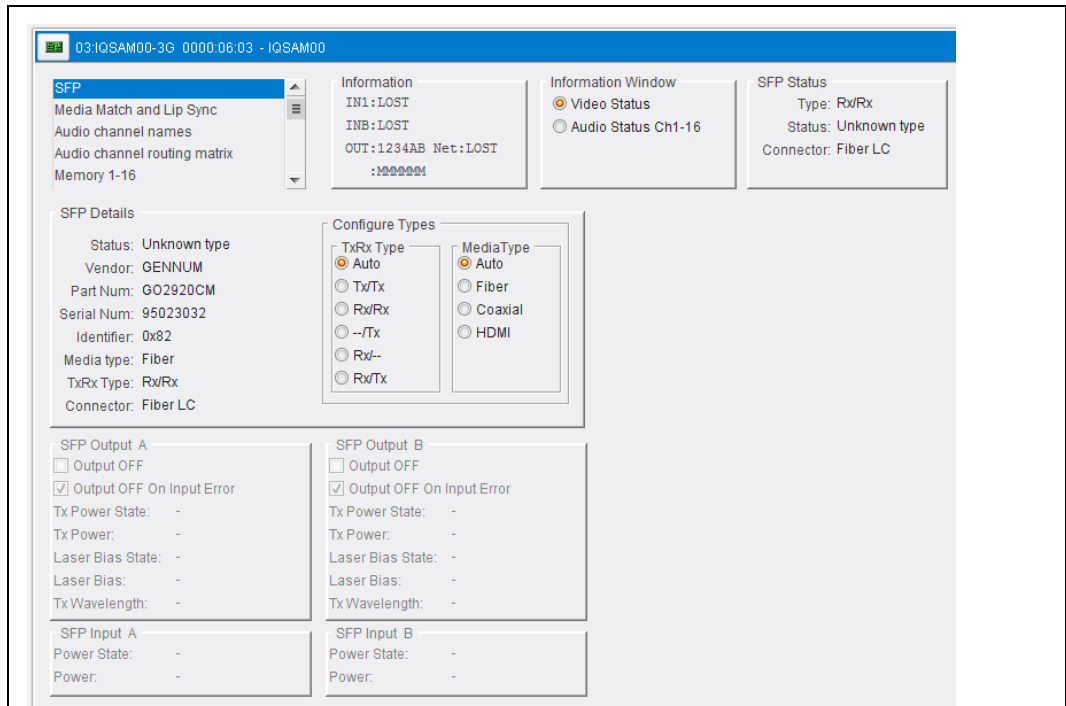
- **SDI Channel 2:** The delay measurements are relative to the channel 1 input. This gives absolute and relative delays between the video and audio (see section 9.6).

**Note:**

When SDI channel 2 is selected, the channel 1 signature is the reference and channel 2 is the measured channel.

### 5.5 SFP Info

The SFP Info screen appears as shown in the example below:



**Figure 5 SFP Info**

The SFP details are recovered from the SFP module inserted into the IQSAM00 rear panel. The type of SFP module inserted affects the capabilities of the IQSAM00 input/ output.

In the event of the module not recognizing the SFP, the Configure Type controls become available for manual selection.

If a dual receiver is inserted, as shown above, then the option to source the inputs is available on the Inputs/ Outputs RollCall panel. If a dual transmitter is inserted, then the option to select reclocked input sources to be sent out using fiber, is made available.

If an HDMI module is inserted, then the option to select reclocked input sources to be sent out through this output, is made available.

**Note:** A restart of the unit can be required to register the change of an SFP and re-configuration of the RollCall panels.

## 5.6 Media Match and Lip Sync

The Media Match and Lip Sync screen allows the control and monitoring of the Lip Sync functionality as shown in the example below:

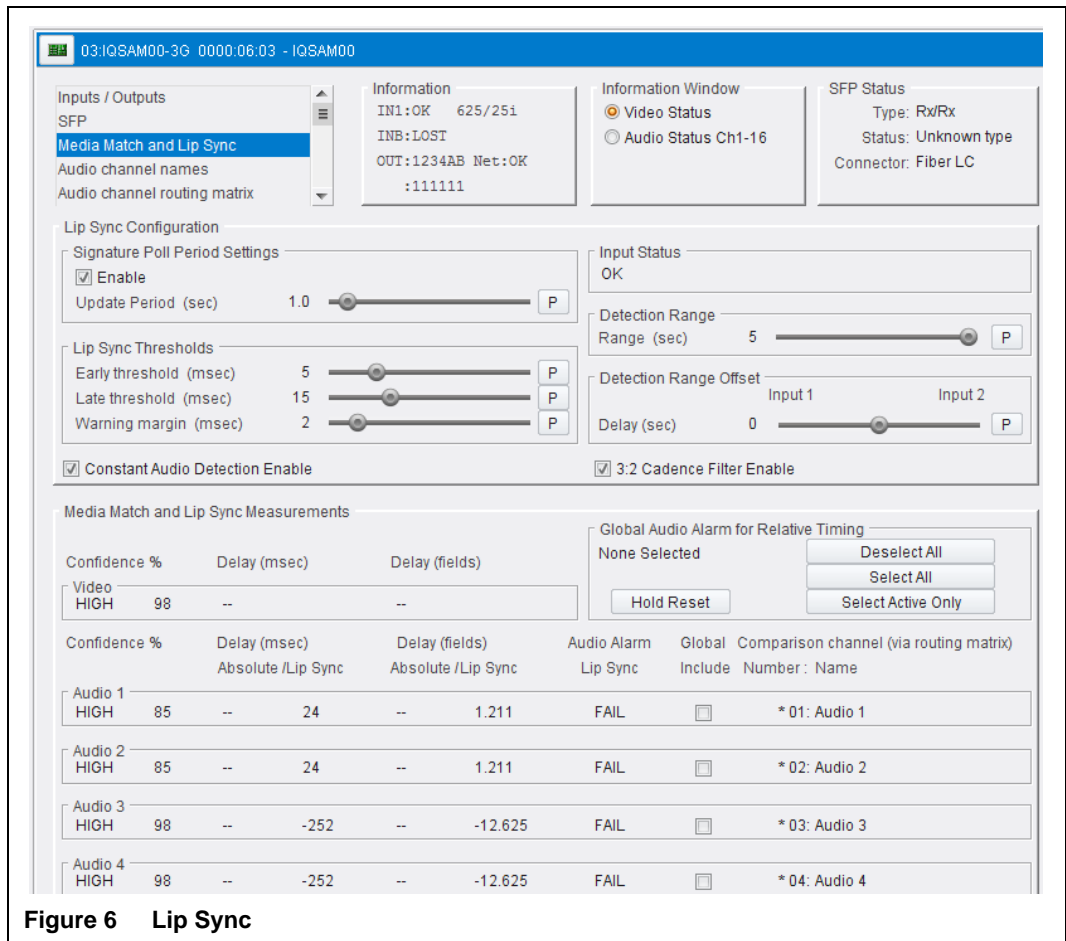


Figure 6 Lip Sync

### 5.6.1 Lip Sync Configuration

The panel contains the following sections.

#### 5.6.1.1 Signature Poll Period Settings

This sub-panel allows adjustment of the lip sync measurement update rate. The faster the update, the more communication traffic is required. If the **Enable** box is not selected, then updates are disabled and the lip sync values are blank.

#### 5.6.1.2 Lip Sync Threshold

This sub-panel has three sliders that set the audio warning and alarm thresholds. Each slider has a P button that resets the slider value to a preset value.

- The **Early threshold** sets the limit of audio time difference when audio arrives on input channel 2 before input channel 1.
- The **Late threshold** sets the limit of audio time difference when audio arrives on input channel 2 after input channel 1.
- The **Warning margin** slider sets the level of audio delay (positive or negative) that is tolerated before asserting a warning. This is subtracted from the Alarm value to obtain the OK / WARN threshold. For example, if the warning margin is set to 2ms and the Alarm Late threshold is set to 24ms, the Audio alarm state will change to WARN from OK when the relative audio delay is 22ms.

### 5.6.1.3 Detection Range

This sub-panel allows adjustment of the lip sync detection range. The detection range affects the time taken to detect video and audio delays. The larger the detection range, the longer it takes to initially detect the delay.

### 5.6.1.4 Detection Range Offset

This sub-panel allows adjustment of the lip sync detection range offset. Some systems may insert a long fixed delay in the signal to one or other input. By adjusting this slider, a fixed delay can be allowed for in the calculations.

Moving the detection range offset control to the left, delays input 1. Moving the control to the right, delays input 2.

**Note:**

Combining the Detection range with Detection range offset controls increases the flexibility of the correlation system. The user can decide to have narrow detection range with fixed offset. For example, if the Detection range is set to 1 and the Detection range offset is set to input 1 delayed by 5, then the correlator looks in the range of Input 1 being between 4 and 6 seconds delayed with respect to Input 2.

The delay measurements are affected by the delay offset. For example, if the measured video delay is 6 seconds and the delay offset is 5 seconds, the actual measured delay is 1 second.

### 5.6.1.5 Constant Audio Detection Enable

When enabled the confidence level is maintained when comparing silence or tones.

### 5.6.1.6 3:2 Cadence Filter Enable

Select to enable enhanced 3:2 cadence handling.

## 5.6.2 Media Match and Lip Sync Measurements

This panel is divided into Video and Audio correlation sections.

### 5.6.2.1 Video Correlation

This section provides the following information:

- **“Quick” confidence indication.** - This either is HIGH or LOW. If HIGH is displayed, the following delay numbers are likely to be accurate. If LOW the following delay numbers may be less accurate.

**Note:**

If LOW is displayed and the % confidence is also very low then the displayed delay value is the last valid output or 0 if no valid output has been calculated.

- **% confidence.** - This number gives an indication of how confident the correlator is about the calculated the delay value.
- **Delay (msec)** - This number is the calculated absolute delay value. The number is positive if input channel 2 is delayed with respect to input channel 1. If input channel 1 is delayed with respect to input channel 2, then the number is negative.
- **Delay (fields)** - This number represents the absolute delay between the two input channels in the form of video fields.



### 5.6.2.2 Audio Correlation

This section provides the following information for each audio channel:

- **“Quick” confidence indication** - This either is HIGH or LOW. If HIGH is displayed, the following delay numbers are likely to be accurate. If LOW the following delay numbers may be less accurate.

**Note:**

If LOW is displayed and the % **confidence** is also very low, then the displayed delay value is the last valid output or 0 if no valid output has been calculated.

- **% confidence** - This number gives an indication of how confident the correlator is about the calculated the delay values.
- **Delay (msec) absolute** - This number is the calculated absolute delay value. The number is positive if input channel 2 is delayed with respect to input channel 1. If input channel 1 is delayed with respect to input channel 2, then the number is negative.
- **Delay (msec) Lip Sync**  
Operation depends on **Correlator Input 2** configuration, see section 9.4.4).
  - **SDI Channel 2:** This number is the calculated relative audio delay value. The number is positive if the selected audio input to the comparison channel is delayed with respect to the audio on channel 1, otherwise it is negative.
  - **Network:** This number is the calculated relative audio delay value. The number is positive if the selected audio input to the comparison channel is delayed with respect to the audio on **Network**, otherwise it is negative.

**Note:**

The relative audio delay value is calculated by determining the time between a particular piece of video and audio for each channel. These delay values are then subtracted to obtain the lip sync delay.

- **Delay (fields) absolute** - This number represents the absolute audio delay between the two compared channels in the form of video fields.
- **Delay (fields) Lip Sync** - This number represents the audio delay between the two compared channels in the form of video fields.
- **Audio Alarm Lip Sync** - This field indicates the alarm state for the particular audio channel comparison.
- **Comparison channel (through routing matrix)** - These two fields indicate the dis-embedded audio channel from Input two that is currently being compared with the input 1 audio channel (indicated in sub panel border on left hand side).

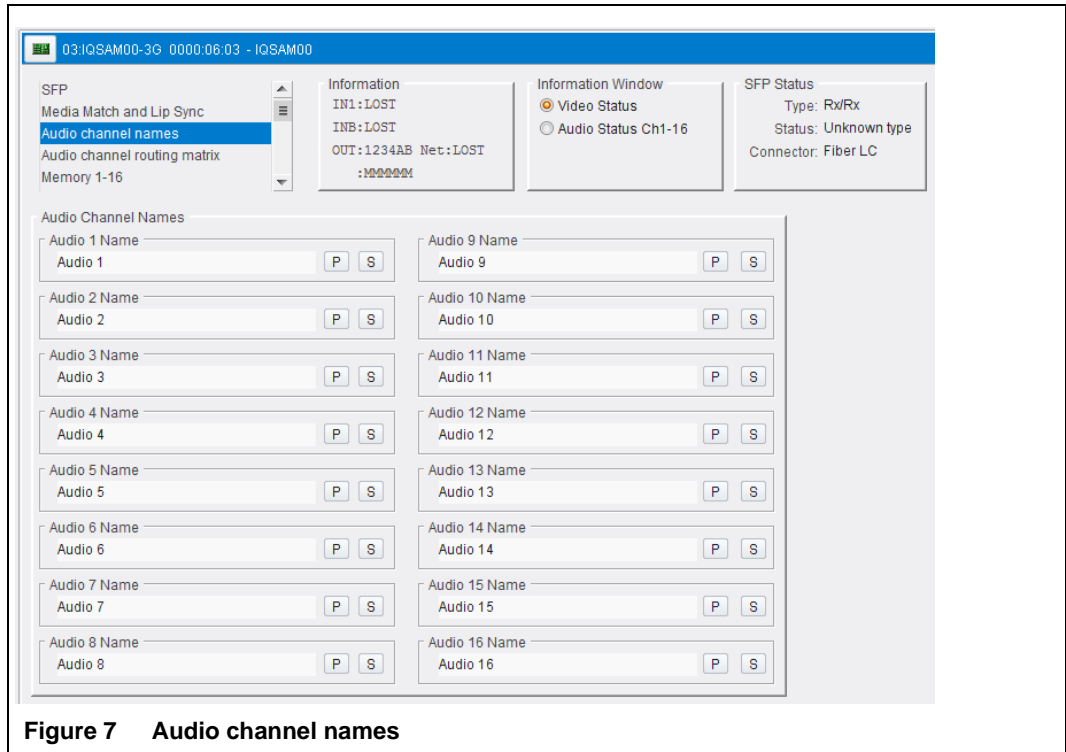
### 5.6.2.3 Global Audio alarm for Relative Timing

This sub-panel allows the user to select which audio channels are included in the global relative timing alarm:

- **Deselect All** - All Audio channels are removed from the global alarm.
- **Select All** - All Audio channels are included in the global alarm.
- **Select Active Only** - All Audio channels detected as active are included in the global alarm.
- **Hold Reset** - Audio channels that were in the Hold state are reset.

### 5.7 Audio channel names

The Audio channel names screen enables the allocation of a name to each audio channel in input channel 2 as shown in the example below:



**Figure 7 Audio channel names**

It is possible to change the default name for each audio channel and then set the name by clicking the **S** button. The names can be reset to the default value by clicking the **P** button.

### 5.8 Audio channel routing matrix

The Audio channel routing matrix screen enables the selection of any dis-embedded audio channel to be correlated against each audio channel from correlator input 1 as shown in the example below:

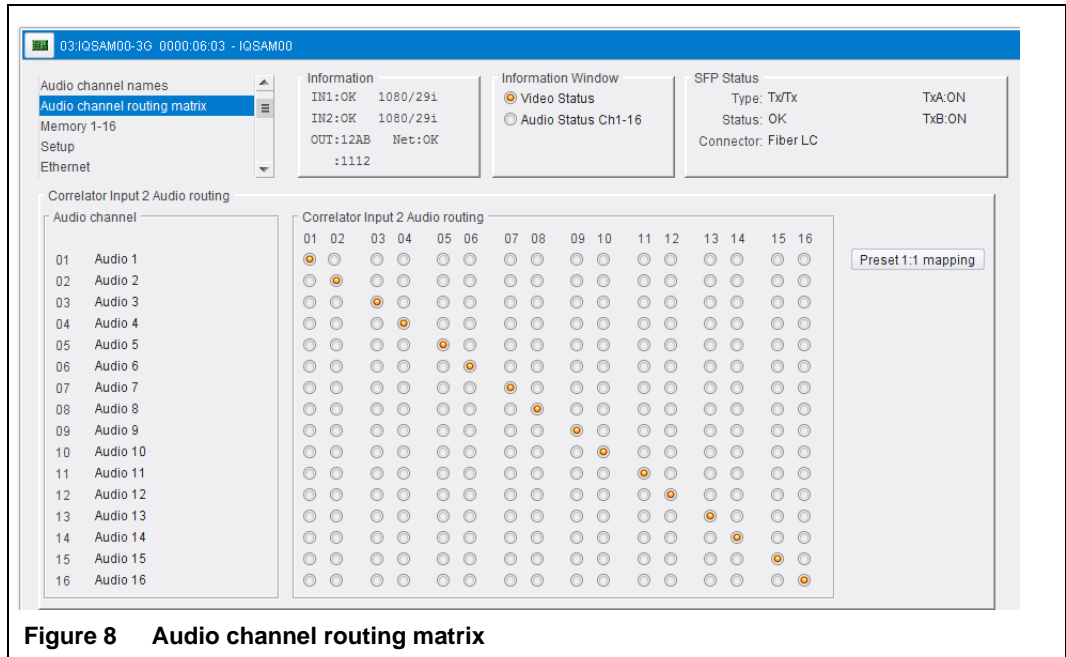


Figure 8 Audio channel routing matrix

In Figure 23, each audio channel from input 2 is compared against the equivalent audio channel from input 1.

In Figure 24 below, input 1 audio channel 1, is correlated against input 2 channel 2 and Input 1 audio channel 2, is correlated against input 2 channel 1.

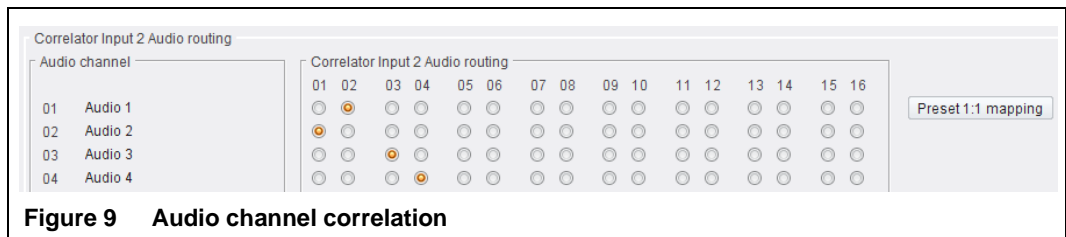


Figure 9 Audio channel correlation

Clicking the **Preset 1:1 mapping** button reverts the mapping to the settings shown in Figure 23.

### 5.9 Memory

The Memory screen enables up to 16 setups to be saved and recalled later. Default memory names can be changed to provide more meaningful descriptions.

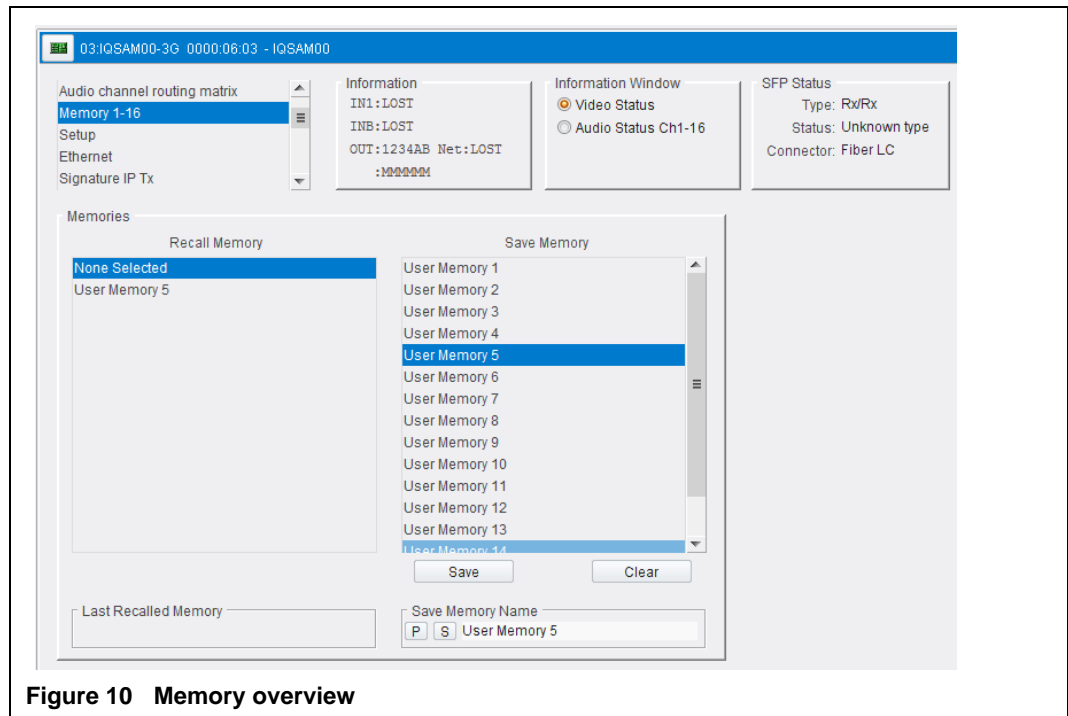
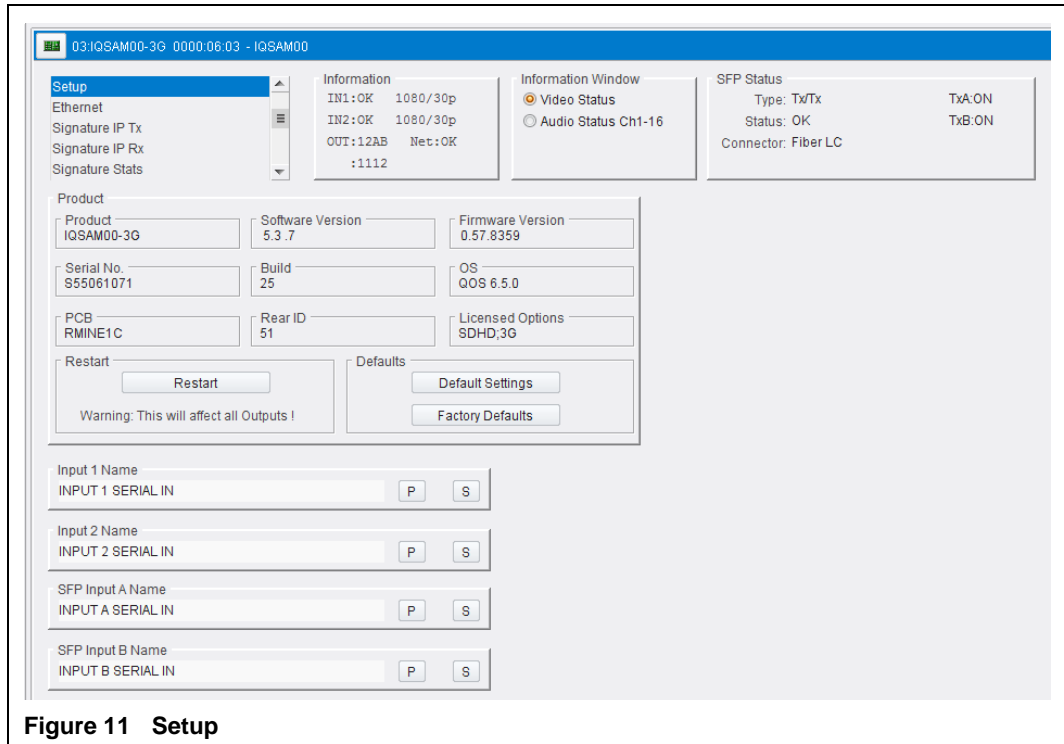


Figure 10 Memory overview

## 5.10 Setup

The Setup screen display basic information about the module, for example, the serial number and software versions. Use the functions on the screen to restart the module or return all settings to their factory or default settings.



**Figure 11 Setup**

The available settings are:

- **Product** - The name of the module.
- **Software Version** - The currently installed software version number.
- **Firmware Version** - The currently installed firmware version number.
- **Serial No** - The module serial number.
- **Build** - The factory build number. This number identifies all parameters of the module.
- **OS** - The operating system version number.
- **PCB** - The Printed Circuit Board revision number.
- **Rear ID** - The type identification number of the rear panel that has been detected by the IQSAM00.
- **Licensed Options** - The currently installed licensed options detected by the IQSAM00.

### 5.10.1 Default Settings

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

### 5.10.2 Factory Defaults

The Factory Defaults button enables the module settings to be reset to their factory defaults. This operation can take a few seconds to implement.

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

### 5.10.3 Restart Unit

This setting reboots the unit by powering it down and then powering it up. This restores the power-up settings and will produce disturbances on the output picture.

**Important:** Restarting the module will affect all outputs.

### 5.10.4 Input 'X' Name

These four panels enable the user to change the name allocated to each input, to a value that is more meaningful for the system where the IQSAM00 card is installed.

## 5.11 Ethernet

The Ethernet screen enables networking functions to be configured.

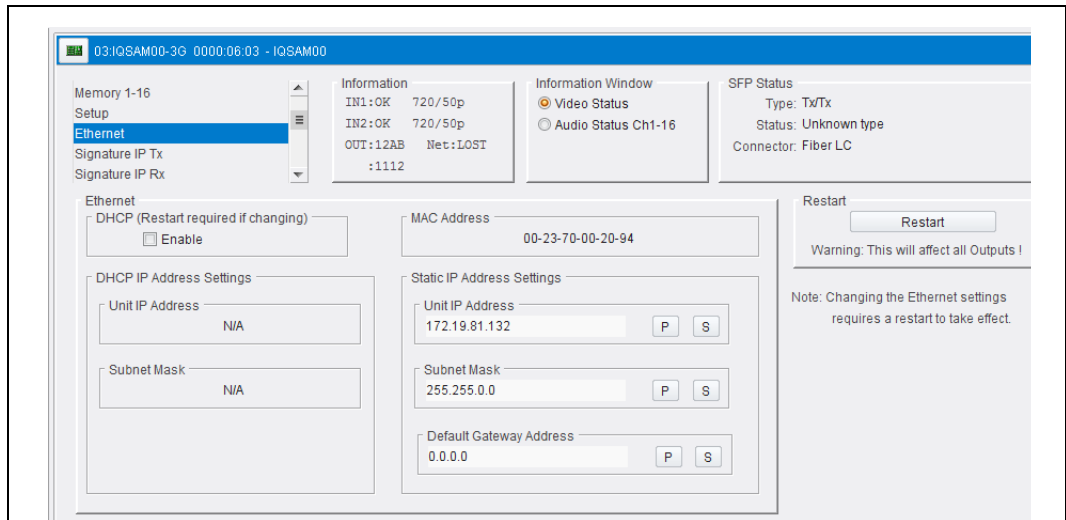


Figure 12 Ethernet

**Note:**

- The network administrator should be able to give the correct setting for these controls.
- The IQSAM00 module must be restarted for the IP settings to take effect, see section 9.11.2.

### 5.11.1 Ethernet Settings

#### 5.11.1.1 DHCP Tick Box

Tick the **Enable** tick box to automatically set the IP address details from the network DHCP server.

**Note:**

The IQSAM00 module must be restarted for the IP settings to take effect, see section 9.11.2.

#### 5.11.1.2 DHCP IP Address Settings

Displays the DHCP **Unit IP Address** and **Subnet Mask** if the DHCP **Enable** checkbox is ticked.

#### 5.11.1.3 Static IP Address Settings

The IQSAM00 ships with the following default IP address settings:

- **Unit IP address:** 192.168.1.100
- **Subnet Mask:** 255.255.0.0
- **Default Gateway Address:** 0.0.0.0.

The IP address details are only used when the DHCP **Enable** box is unticked.

Enter the Unit IP address details in the text box and click on the **S** button to save the new setting. Clicking on the **P** button will return the setting to its default value.

**Note:**

The IQSAM00 module must be restarted for the IP settings to take effect, see section 9.11.2.

#### 5.11.1.4 MAC Address

Displays the IQSAM00 module MAC address.

#### 5.11.2 Restart

The IQSAM00 module must be restarted for the IP settings to take effect.

Click on the **Restart** button to restart the IQSAM00 module.

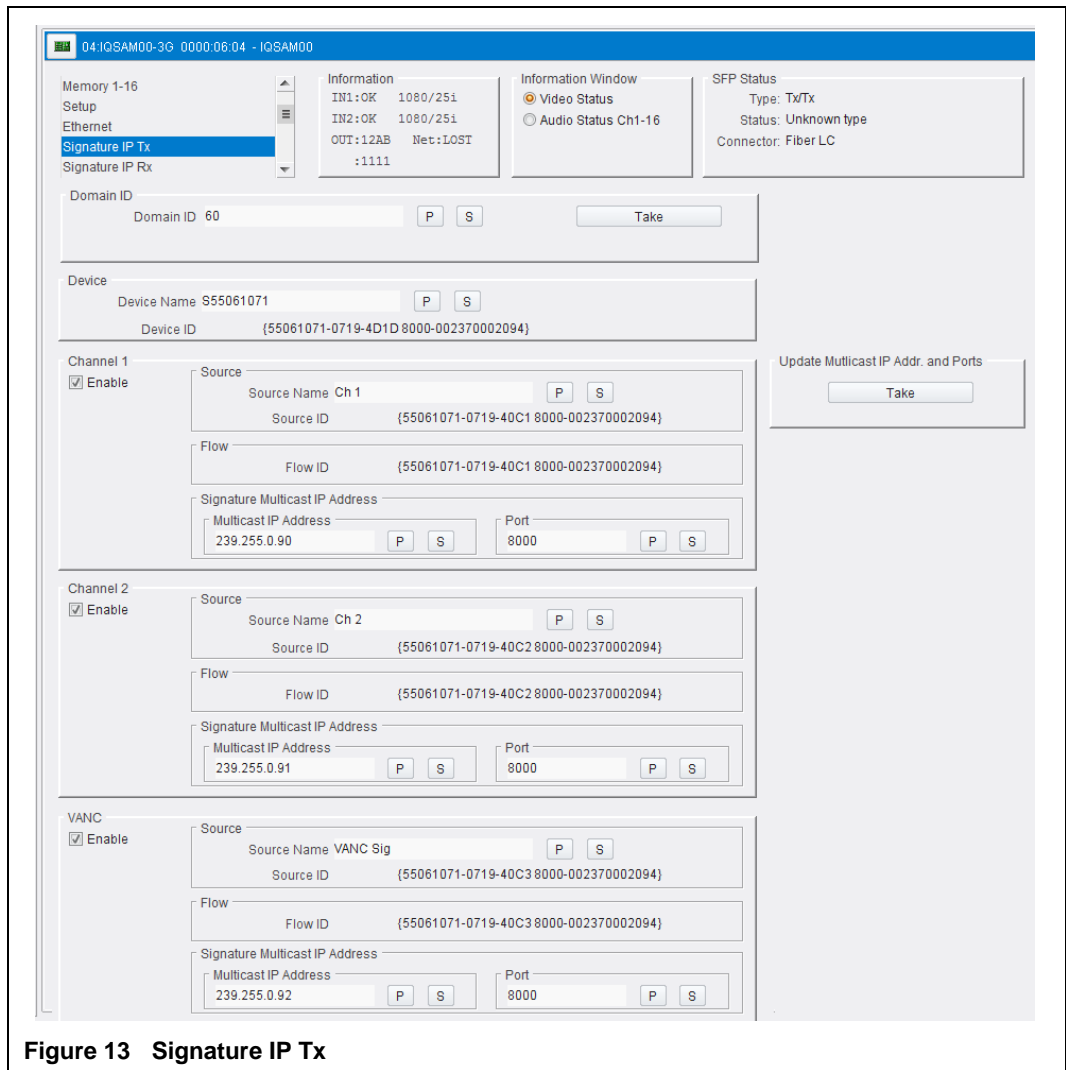
**Important:**

Restarting the module will affect all outputs.



## 5.12 Signature IP Tx

The **Signature IP Tx** screen is used to configure the sources generating signatures for use by IQSAM00 modules.



**Figure 13 Signature IP Tx**

### 5.12.1 Domain ID

Enter the Domain ID number in the text box and click the **S** button to save the new setting.

To reset the Domain ID to the default value of **201** click on the **P** button.

**Note:** A Domain ID setting change will not take effect until the user clicks on the Domain ID **Take** button, see section 9.12.1.1.

#### 5.12.1.1 Take Button

The Take button is used to make the IQSAM00 module use a modified Domain ID.

Click on the **Take** button to use the modified Domain ID.

### 5.12.2 Device

Enter the Device Name in the text box and click the **S** button to save the new name.

To reset the Device Name to the default of **SAM XXXXXX** (where **XXXXXX** is the module serial number) click on the **P** button.

### 5.12.3 Channel “X”

The two Channel panels allow the user to enable the channels as sources for IQSAM00 modules.

#### 5.12.3.1 Signature Multicast IP Address

Sets the Multicast IP address and Port number that the Signature data is broadcast on.

If any of them are changed the user must click the **Take** button in the **Update Multicast IP Addr and Ports** panel to use the modified Multicast IP address and/or Port.

Note:

A Multicast IP address and Port number change will not take effect until the user clicks on the **Take** button in the **Update Multicast IP Addr and Ports** panel, see section 9.12.4.1.

### 5.12.4 Update Multicast IP Addr and Ports Panel

#### 5.12.4.1 Take Button

The Take button is used to make the IQSAM00 module use modified Multicast IP address and port numbers.

Click on the **Take** button to use a new Multicast IP address or port number change.

### 5.13 Signature IP Rx

The **Signature IP Rx** screen is used to select the device and source supplying the signature.

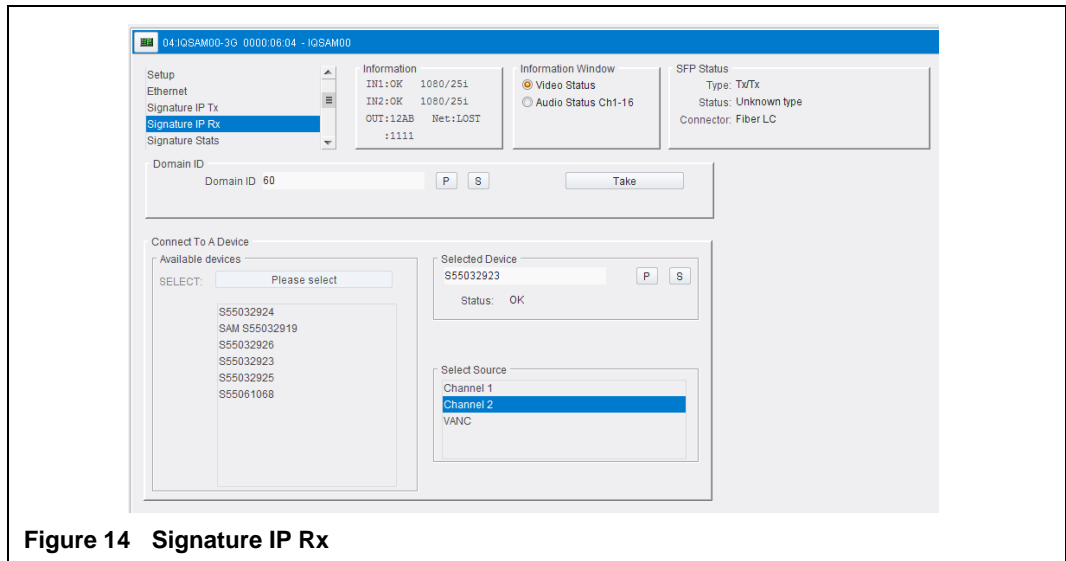


Figure 14 Signature IP Rx

#### 5.13.1 Domain ID

Enter the **Domain ID** number in the text box and click the **S** button to save the new setting. To reset the **Domain ID** to the default value of **201** click on the **P** button.

**Note:** A Domain ID setting change will not take effect until the user clicks on the Domain ID **Take** button, see section 9.13.1.1.

##### 5.13.1.1 Take Button

The Take button is used to make the IQSAM00 module use a modified Domain ID. Click on the **Take** button to use the modified Domain ID.

#### 5.13.2 Connect To a Device

This section is used to connect to a device supplying a signature.

##### 5.13.2.1 Available Devices

Displays devices available to connect to.

Select a signature device from the list and then select it by clicking on the **Please Select** button.

##### 5.13.2.2 Selected Device

Displays the currently selected device and its status.

##### 5.13.2.3 Select Source

Lists the available sources for the connected device. The selected source is highlighted. Select a source by clicking on it from the list.

**Note:** Some sources in the list may not be enabled. If one of these sources is selected **NET: Lost** is displayed in the Information window.

## 5.14 Signature Stats

The **Signature Stats** screen displays the audio/video/processed signature statistics.

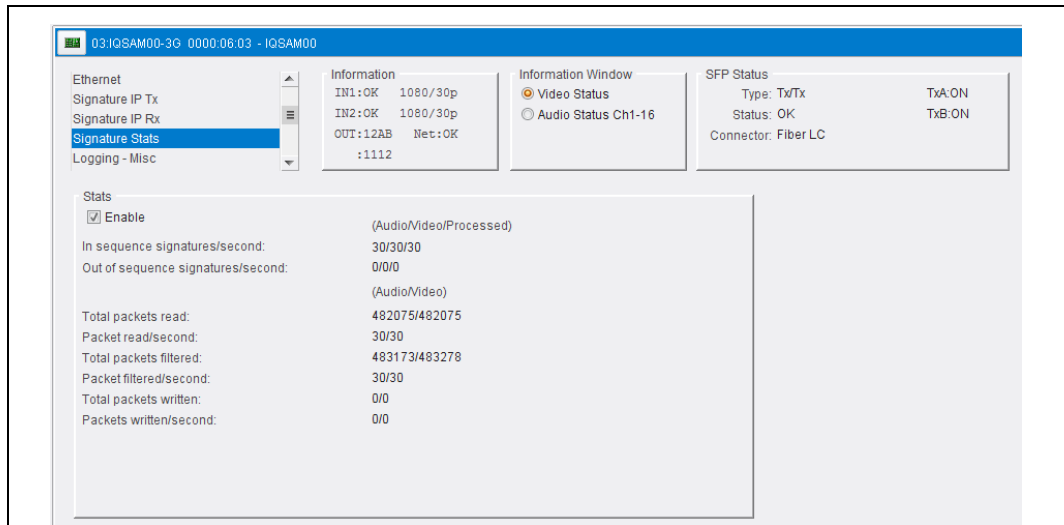


Figure 15 Signature Stats

### 5.14.1 Stats

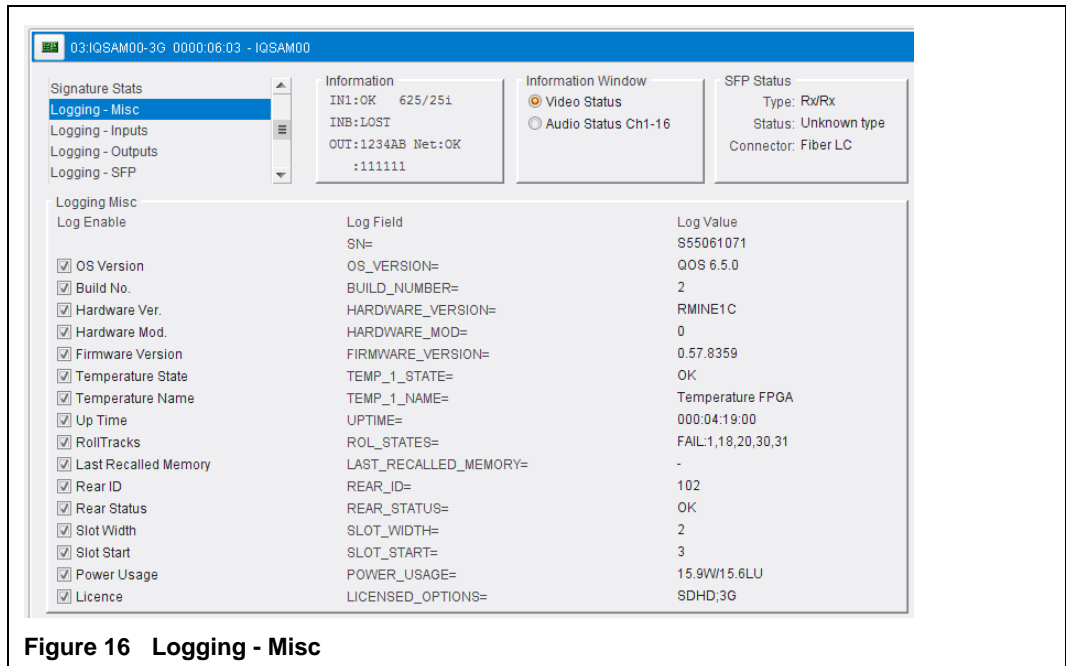
Tick the Enable box to display the Signature statistics.

Statistics	Description
<b>Audio/Video/Processed Stats</b>	
In sequence signatures/second:	Displays the number of “in sequence” audio/video/processed signatures per second.
Out of sequence signatures/second:	Displays the number of “out of sequence” audio/video/processed signatures per second.
<b>Audio/Video Stats</b>	
Total packets read:	Displays the total number of audio/video packets read since the Enable box was ticked.
Packets read/second:	Displays the number of audio/video packets being read per second.
Total packets filtered:	Displays the total number of filtered audio/video packets since the Enable box was ticked.
Packets filtered/second:	Displays the number of filtered audio/video packets being read per second.
Total packets written:	Displays the total number of audio/video packets written since the Enable box was ticked.
Packets written/second:	Displays the number of audio/video packets being written per second.

## 5.15 Logging

### 5.15.1 Logging - Misc

The **Logging - Misc** screen displays current unit and status information. The checkboxes are used to disable or enable logging of the individual parameters.



**Figure 16 Logging - Misc**

The following options are available:

Log field	Description
SN=	Displays the module serial number, which consists of an S followed by eight digits.
OS_VERSION=	Displays the operating system name and version. For example, V115.
BUILD_NUMBER=	Displays the build number.
HARDWARE_VERSION=	Displays the hardware version number.
HARDWARE_MOD=	Displays the hardware modification number.
FIRMWARE_VERSION=	Displays the firmware version number.
TEMP_1_STATE=	Displays the temperature status of the FPGA.
TEMP_1_NAME=	Temperature measurement name
UPTIME=	Displays the time since the last restart in the format ddd:hh:mm:ss.
ROL_STATES=	Displays the RollCall status. Valid values are: <ul style="list-style-type: none"> <li>OK</li> <li>FAIL:n where n is the RollTrack index (or indices) which are failing</li> <li>Disabled</li> </ul>
LAST_RECALLED_MEMORY=	Displays the last recalled memory.
REAR_ID=	Displays the code number of the rear fitted

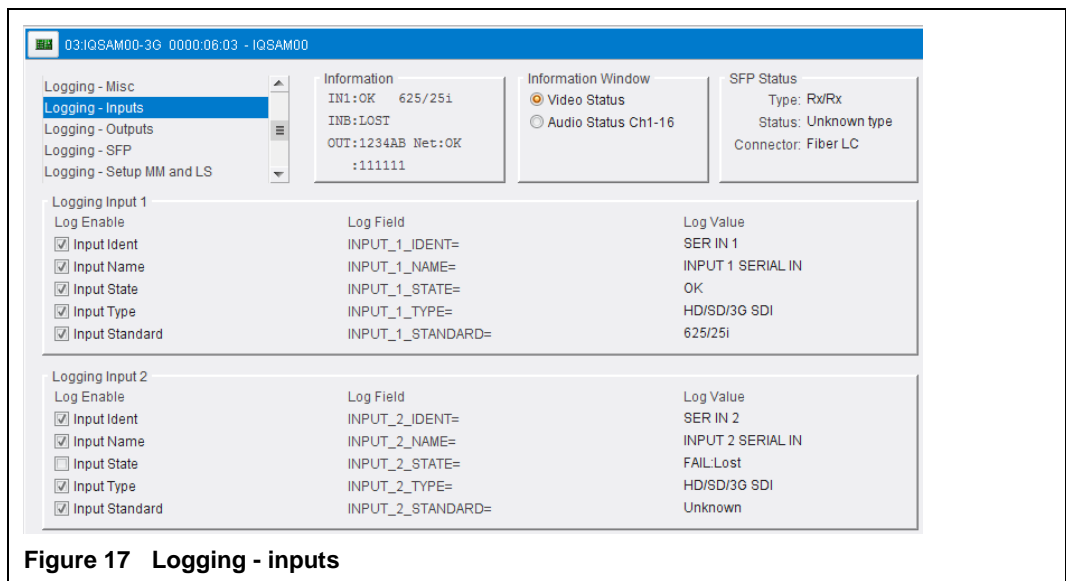
**Table 2 Logging - Misc**

Log field	Description
REAR_STATUS=	Displays the status of the rear where it can be determined
SLOT_WIDTH=	Displays the slot width. IQSAM00 units are available in single and double width
SLOT_START=	Displays the slot in the rack where IQSAM00 is located
POWER_USAGE=	Displays the power usage in Watts (A type rack) / Load Units (B type rack)
LICENCED_OPTIONS=	Displays the state of any licence file

**Table 2 Logging - Misc**

### 5.15.2 Logging - Inputs

The **Logging - Inputs** screen displays current input information. The checkboxes are used to disable or enable logging of the individual parameters.



**Figure 17 Logging - inputs**

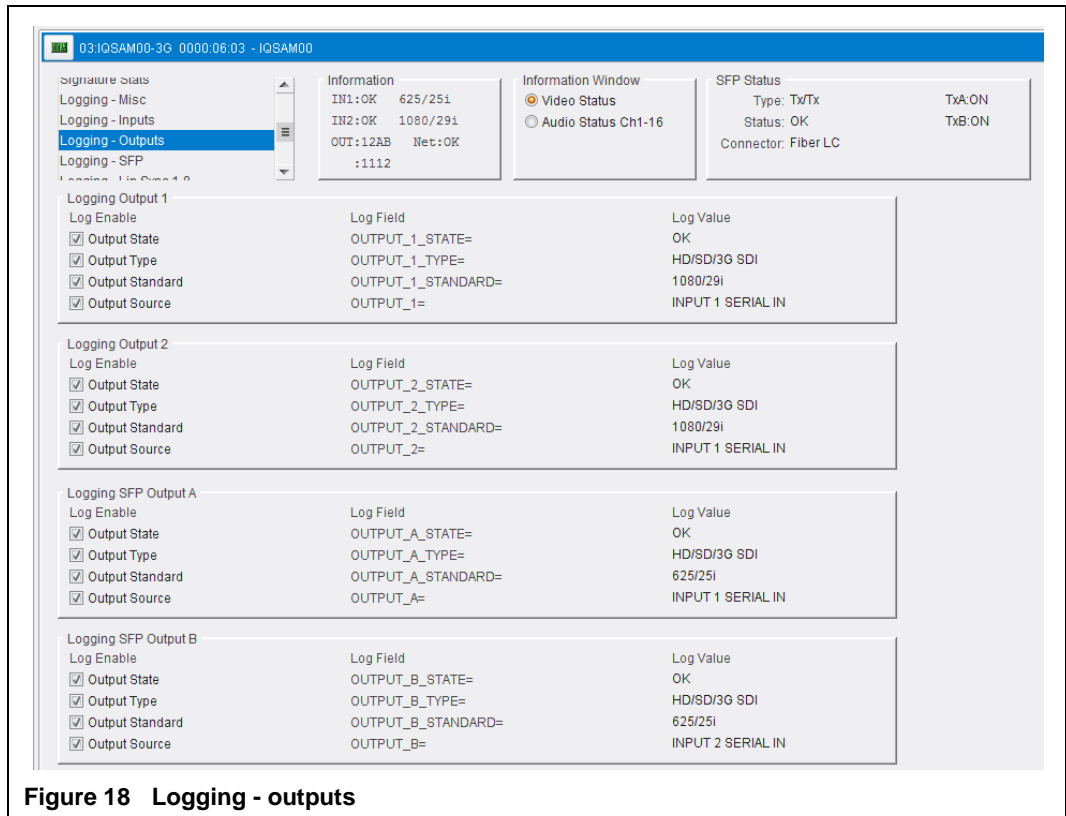
The following options are available:

Log field	Description
INPUT_n_IDENT=	Displays the identifier of the input.
INPUT_n_NAME=	Displays the name of the input.
INPUT_n_STATE=	Displays the status of the input. Valid values are: <ul style="list-style-type: none"> <li>• FAIL:Lost</li> <li>• OK</li> </ul>
INPUT_n_TYPE=	Displays the type for the input. (HD/SD/3G SDI).
INPUT_n_STANDAR=	Displays the standard for the input. Valid values are: <ul style="list-style-type: none"> <li>• UNKNOWN</li> <li>• Standard (525/29I, 625/25I, 1125/29I, 750/59P etc...)</li> </ul>

**Table 3 Logging - inputs**

### 5.15.3 Logging - Outputs

The **Logging - Outputs** screen displays current output information. The checkboxes are used to disable or enable logging of the individual parameters.



**Figure 18 Logging - outputs**

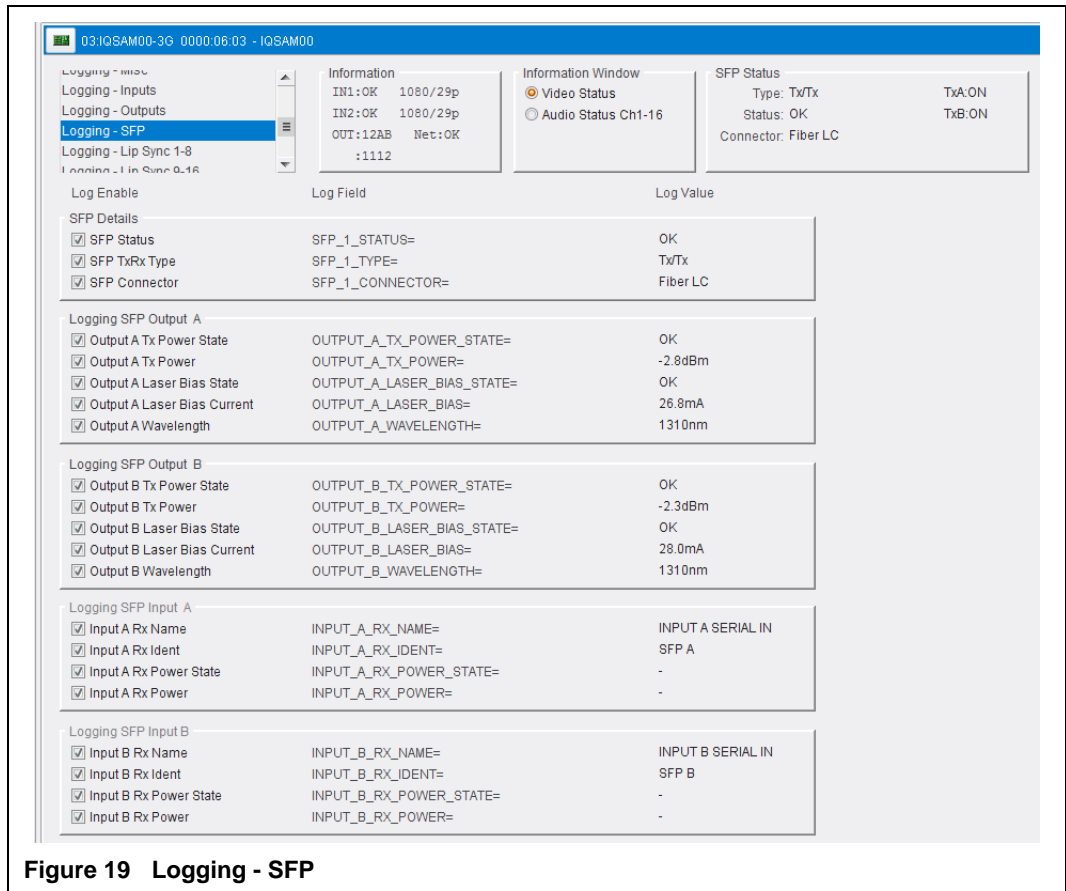
Each output contains the following information:

Log field	Description
OUTPUT_n_STATE=	Displays the status of the output. Valid values are: <ul style="list-style-type: none"> <li>• FAIL:Lost</li> <li>• OK</li> </ul>
OUTPUT_n_TYPE=	Displays the type for the output. (HD/SD/3G SD1).
OUTPUT_n_STANDAR=	Displays the standard for the output. Valid values are: <ul style="list-style-type: none"> <li>• UNKNOWN</li> <li>• Standard (525/29i, 625/25i, 1125/29i, 750/59P etc...)</li> </ul>
OUTPUT_n=	Displays the input source that is feeding the output.

Logging - outputs

### 5.15.4 Logging - SFP

The **Logging - SFP** screen displays current SFP information. The checkboxes are used to disable or enable logging of the individual parameters.



**Figure 19 Logging - SFP**

The following fields are available:

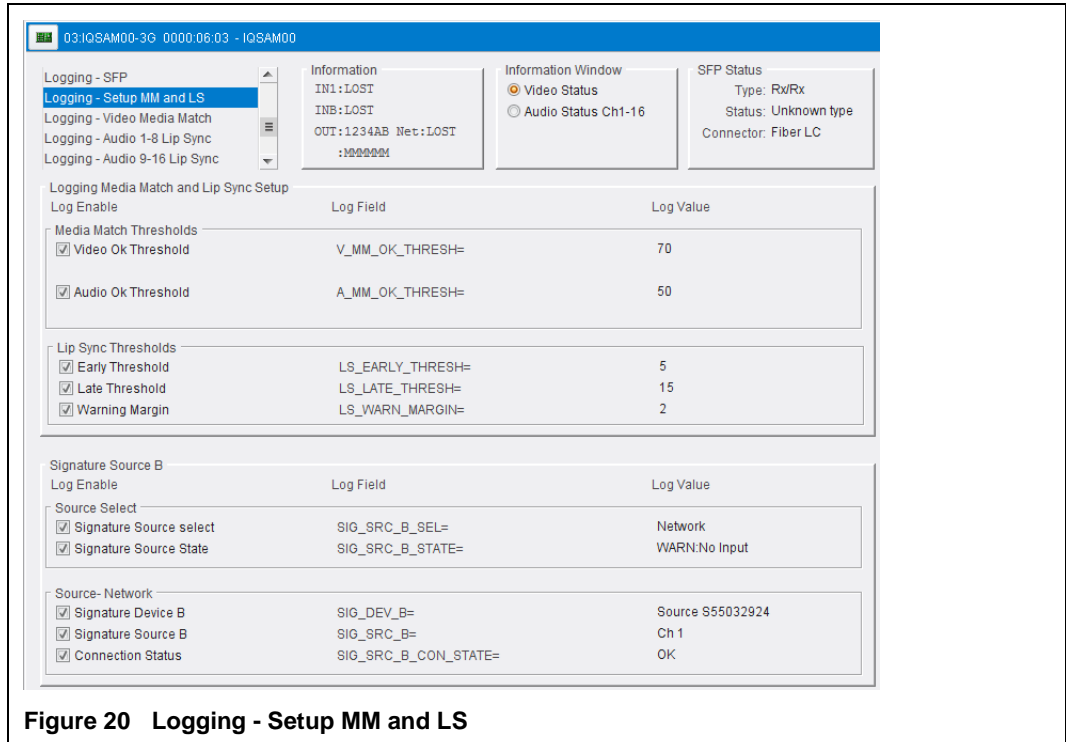
Log field	Description
SFP_1_STATUS=	Displays the status of SFP 1. Valid values are: <ul style="list-style-type: none"> <li>• FAIL:Lost</li> <li>• OK</li> </ul>
SFP_1_TYPE=	Displays type of the SFP fitted. In the example, the SFP is a dual receiver.
SFP_1_CONNECTOR=	Displays the type of connector on the SFP
OUTPUT_n_TX_POWER_STATE=	Displays the reported TX power status
OUTPUT_n_TX_POWER=	Displays the reported TX power
OUTPUT_n_LASER_BIAS_STATE=	Displays the reported laser bias state
OUTPUT_n_LASER_BIAS=	Displays the reported laser bias
OUTPUT_n_WAVELENGTH=	Displays the reported wavelength of the transmitter
INPUT_n_RX_NAME=	Displays the input name (set on the Setup page)
INPUT_n_RX_IDENT=	Displays the input identification
INPUT_n_RX_POWER_STATE=	Displays the power status based on the reported power
INPUT_n_RX_POWER=	Displays the reported input power

**Table 4 Logging - SFP**



### 5.15.5 Logging - Setup MM and LS

The **Logging - Setup MM and LS** screen displays video, audio and signature threshold values and states. The checkboxes are used to disable or enable logging of the individual parameters.



**Figure 20 Logging - Setup MM and LS**

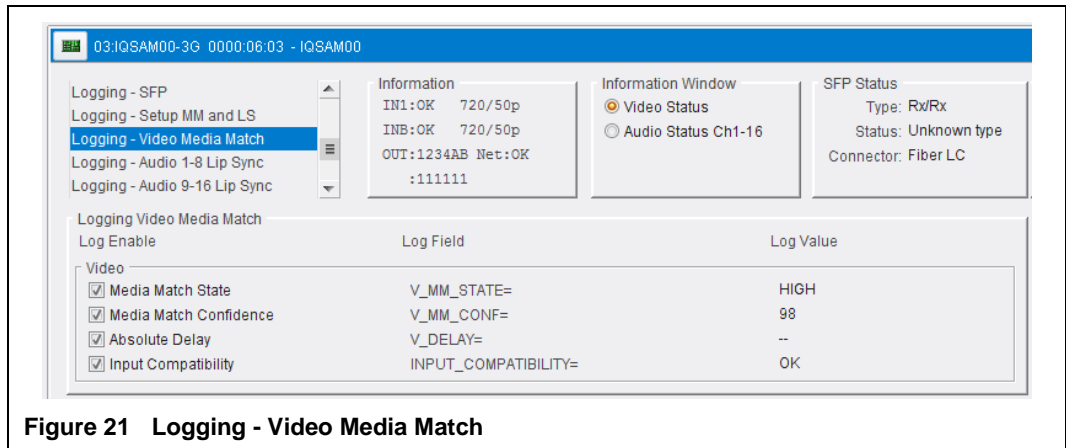
The following fields are available:

Log field	Description
V_MM_OK_THRESH=	Displays the Video OK threshold value.
A_MM_OK_THRESH=	Displays the Audio OK threshold value.
LS_EARLY_THRESH=	Displays the lip sync early threshold value.
LS_LATE_THRESH=	Displays the lip sync late threshold value.
LS_WARN_MARGIN=	Displays the lip sync warning margin value.
SIG_SRC_B_SEL=	Displays the selected signature source.
SIG_SRC_B_STATE=	Displays the selected signature source state. Valid values are: <ul style="list-style-type: none"> <li>• OK</li> <li>• WARN:No Input</li> </ul>
SIG_DEV_B=	Displays the selected signature device.
SIG_SRC_B=	Displays the selected signature source.
SIG_SRC_B_CON_STATE=	Displays the selected signature connection state. Valid values are: <ul style="list-style-type: none"> <li>• OK</li> <li>• FAIL:Not Found</li> <li>• WARN:Not Selected</li> </ul>

**Table 5 Logging - Setup MM and LS**

### 5.15.6 Logging - Video Media Match

The **Logging - Video Media Match** screen displays media match state and values. The checkboxes are used to disable or enable logging of the individual parameters.



**Figure 21 Logging - Video Media Match**

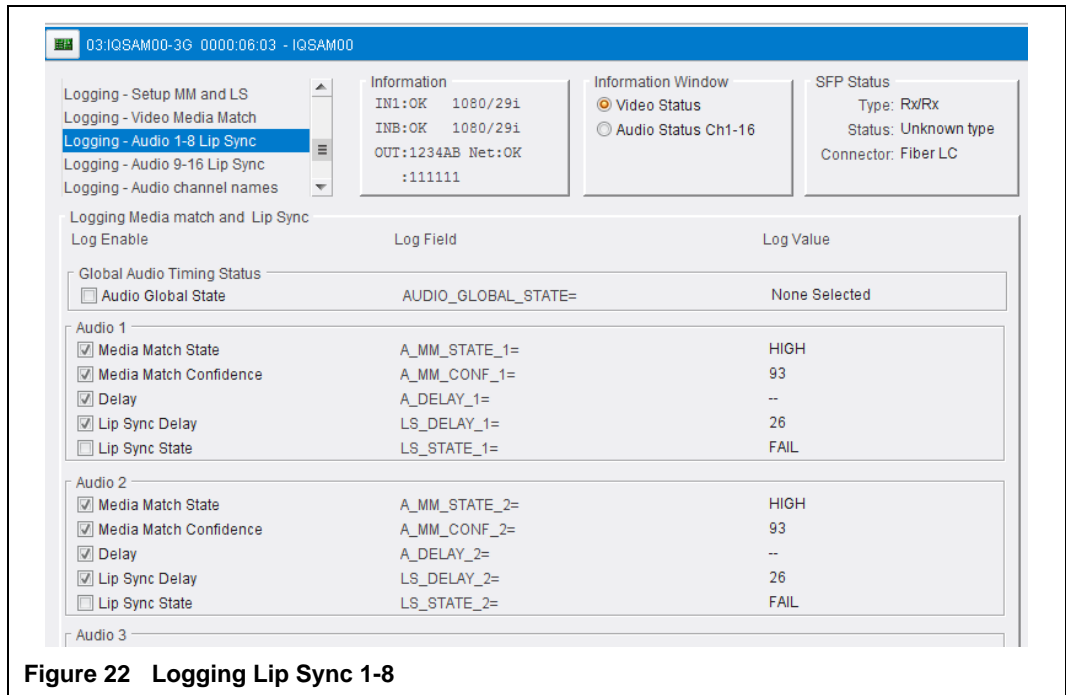
The following fields are available:

Log field	Description
V_MM_STATE=	Displays the video media match state. Valid values are: <ul style="list-style-type: none"> <li>• HIGH</li> <li>• LOW</li> <li>• WARN:No Input</li> </ul>
VMM_CONF=	Displays the video media match confidence level.
V_DELAY=	Displays the absolute video delay value.
INPUT_COMPATIBILITY=	Displays the selected signature source state. Valid values are: <ul style="list-style-type: none"> <li>• OK</li> <li>• WARN:No IN1</li> <li>• WARN:No IN2</li> <li>• WARN:No INA</li> <li>• WARN:No INB</li> <li>• WARN:No Net</li> <li>• WARN:Unsup Inp Comb</li> </ul>

**Table 6 Logging - Video Media Match**

### 5.15.7 Logging - Lip Sync 1-8

The **Logging - Lip Sync 1-8** screen displays current Lip Sync information for audio channels 1 to 8. The checkboxes are used to disable or enable logging of the individual parameters.



**Figure 22 Logging Lip Sync 1-8**

The following options are available:

Log field	Description
AUDIO_GLOBAL_STATE=	Indicates the status of the Global Audio Alarm. Valid values are: <ul style="list-style-type: none"> <li>None Selected</li> <li>OK</li> <li>WARN:No Input</li> <li>WARN: Timing</li> <li>FAIL:Timing</li> </ul>
A_MM_STATE_n=	Displays the audio media match state for the audio channel. Valid values are: <ul style="list-style-type: none"> <li>HIGH</li> <li>LOW</li> <li>WARN:No INPUT</li> </ul>
A_MM_CONF_n=	Displays the audio media match confidence for the audio channel.
A_DELAY_n=	Displays the audio media match delay for the audio channel.
LS_DELAY_n=	Displays the lipsync delay for the audio channel.

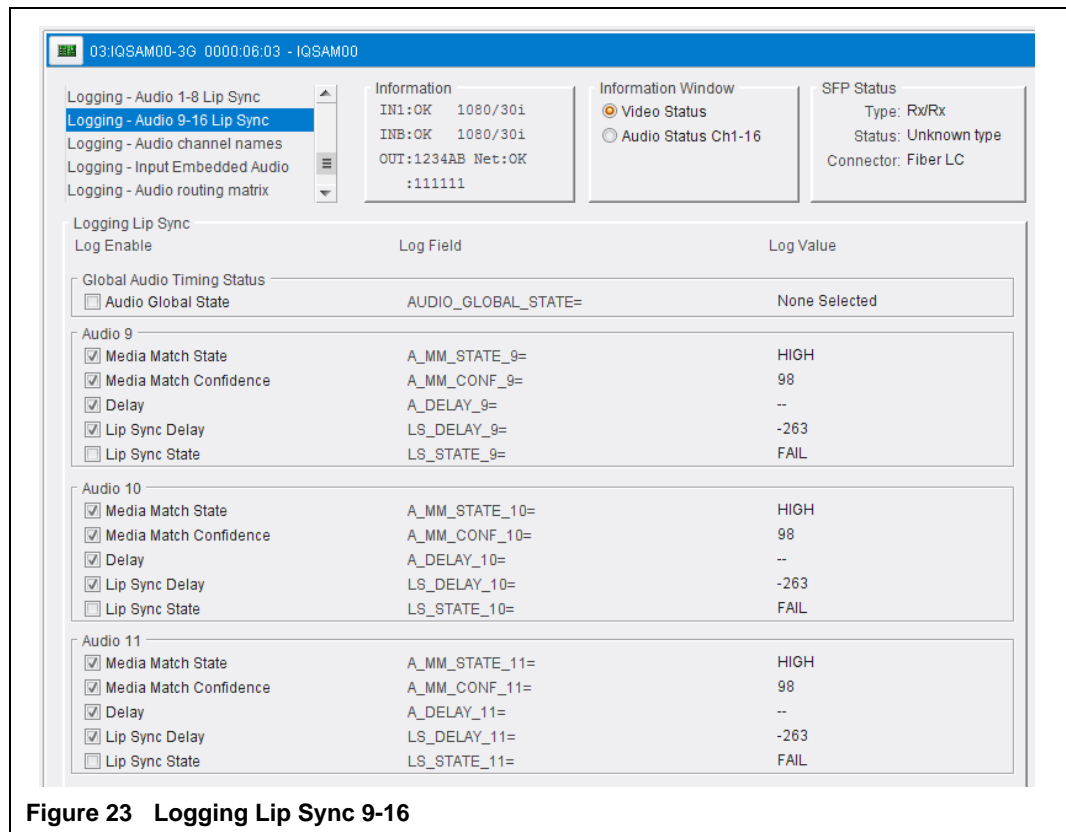
**Table 7 Logging -Lip Sync 1-8**

Log field	Description
LS_STATE_n=	<p>Displays the lipsync state for the audio channel. Valid values are:</p> <ul style="list-style-type: none"> <li>• OK</li> <li>• HELD</li> <li>• FAIL</li> <li>• WARN</li> <li>• **</li> </ul>

**Table 7 Logging -Lip Sync 1-8**

### 5.15.8 Logging - Lip Sync 9-16

The **Logging - Lip Sync 9-16** screen displays current Lip Sync information for audio channels 9 to 16. The checkboxes are used to disable or enable logging of the individual parameters.



**Figure 23 Logging Lip Sync 9-16**

The following options are available:

Log field	Description
AUDIO_GLOBAL_STATE=	<p>Indicates the status of the Global Audio Alarm. Valid values are:</p> <ul style="list-style-type: none"> <li>• None Selected</li> <li>• OK</li> <li>• WARN:No Input</li> <li>• WARN: Timing</li> <li>• FAIL:Timing</li> </ul>

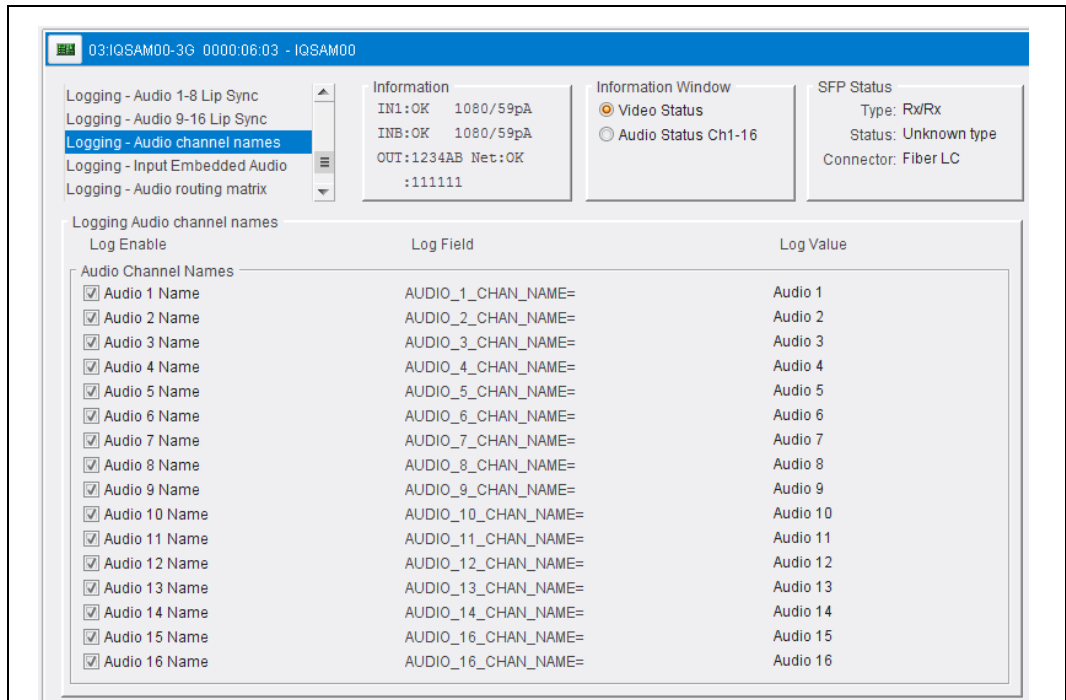
**Table 8 Logging -Lip Sync 9-16**

Log field	Description
A_MM_STATE_n=	Displays the audio media match state for the audio channel. Valid values are: <ul style="list-style-type: none"> <li>• HIGH</li> <li>• LOW</li> <li>• WARN:No INPUT</li> </ul>
A_MM_CONF_n=	Displays the audio media match confidence for the audio channel.
A_DELAY_n=	Displays the audio media match delay for the audio channel.
LS_DELAY_n=	Displays the lipsync delay for the audio channel.
LS_STATE_n=	Displays the lipsync state for the audio channel. Valid values are: <ul style="list-style-type: none"> <li>• OK</li> <li>• HELD</li> <li>• FAIL</li> <li>• WARN</li> <li>• **</li> </ul>

**Table 8** Logging -Lip Sync 9-16

### 5.15.9 Logging - Audio Channel Names

The **Logging - Audio Channel Names** screen displays the current allocated audio channel names. The checkboxes are used to disable or enable logging of the individual parameters.



**Figure 24 Logging - Audio Channel Names**

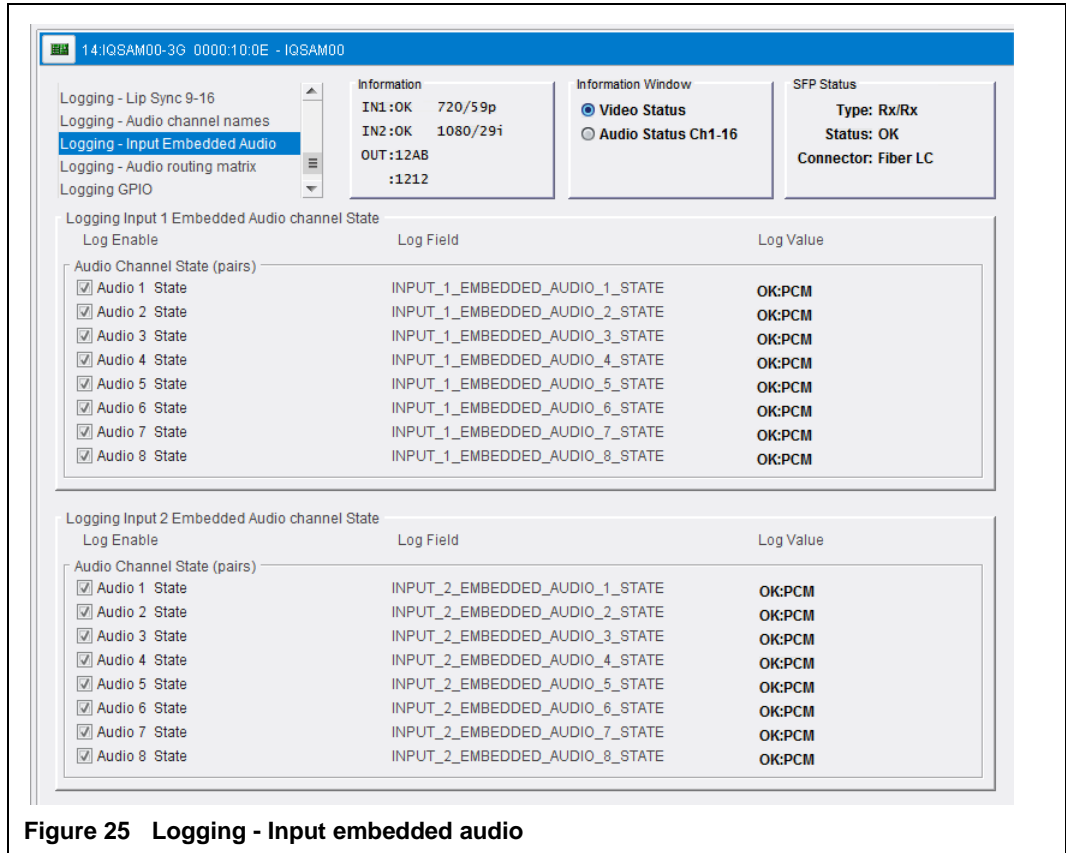
The following option is available:

Log field	Description
AUDIO_n_CHAN_NAME=	Displays the allocated name for audio channel n. This relates to the name assigned on the Audio channel names panel.

**Table 9 Logging - Audio Channel Names**

### 5.15.10 Logging - Input Embedded Audio

The **Logging - Input Embedded Audio** screen displays the current embedded audio status of the inputs. The checkboxes are used to disable or enable logging of the individual parameters.



**Figure 25** Logging - Input embedded audio

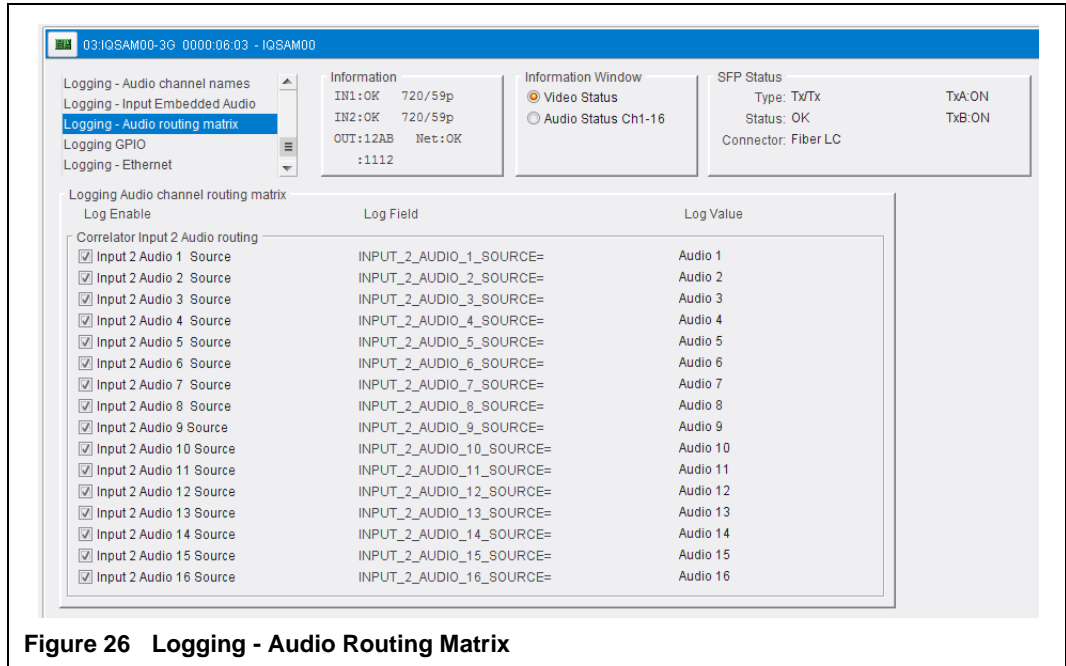
The following option is available:

Log field	Description
INPUT_n_EMBEDDED_AUDIO_m_STATE=	Displays the type of audio content for each channel.

**Table 10** Logging - Input embedded audio

### 5.15.11 Logging - Audio Routing Matrix

The **Logging - Audio Routing Matrix** screen displays current audio routing matrix configuration information. The checkboxes are used to disable or enable logging of the individual parameters.



**Figure 26 Logging - Audio Routing Matrix**

The following option is available:

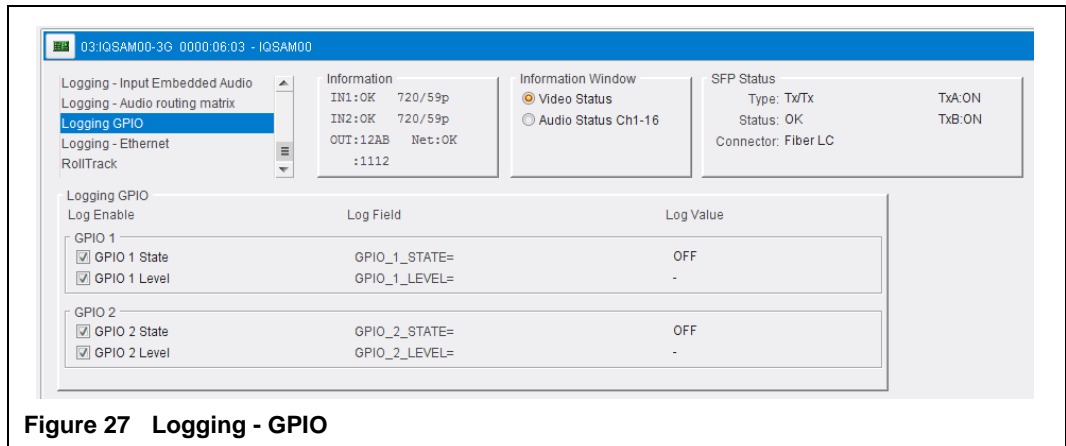
Log field	Description
INPUT_2_AUDIO_n_SOURCE=	Displays the allocated audio channel from input 2 that is mapped to audio correlator n. This relates to the value assigned on the Audio routing matrix panel.

**Table 11 Logging - Audio Routing Matrix**



### 5.15.12 Logging - GPIO

The **Logging - GPIO** screen displays current GPIO information. The checkboxes are used to disable or enable logging of the individual parameters.



**Figure 27 Logging - GPIO**

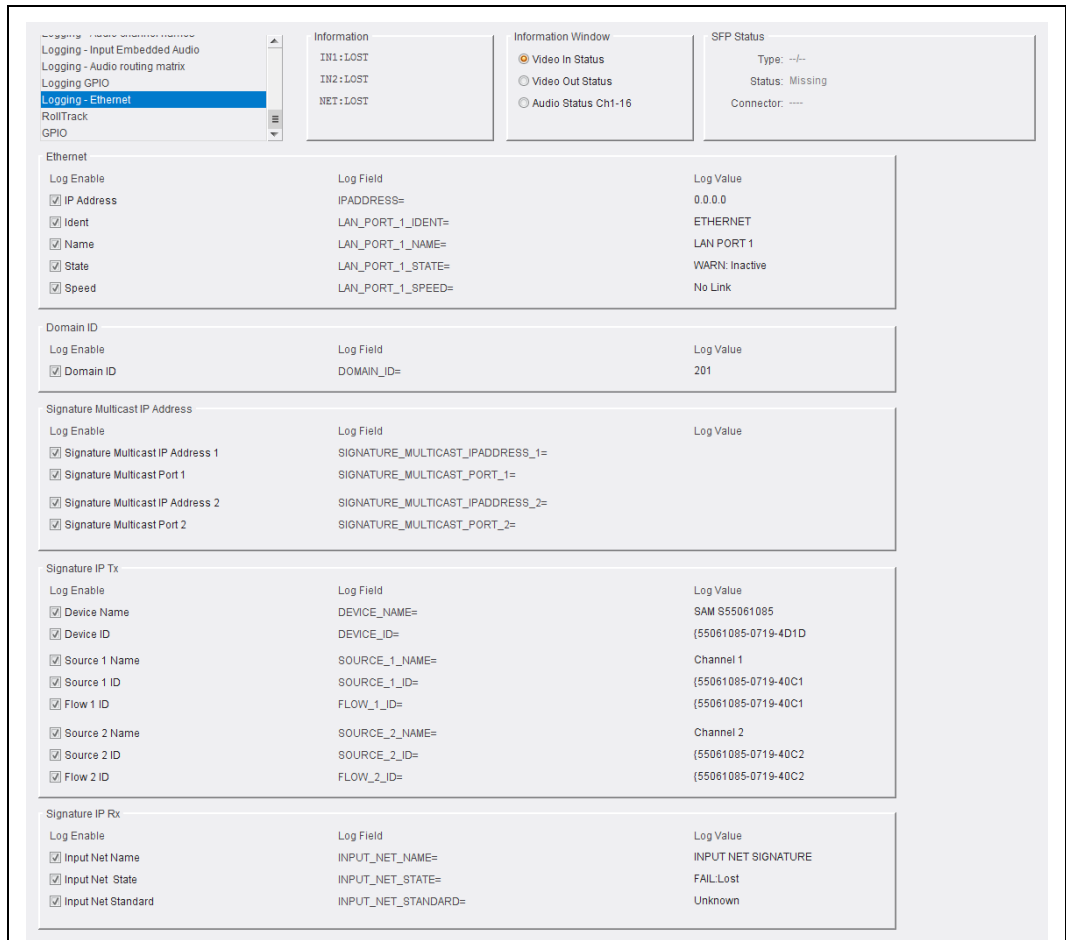
The following options are available:

Log field	Description
GPIO_n_STATE=	Displays the state of the GPIO
GPIO_n_LEVEL=	Displays the Input/Output level of the GPIO

**Table 12 Logging - GPIO**

### 5.15.13 Logging - Ethernet

The **Logging - Ethernet** screen displays current IP and signature information. The checkboxes are used to disable or enable logging of the individual parameters.



**Figure 28 Logging - Ethernet**

The following options are available:

Log field	Description
<b>Ethernet</b>	
IPADDRESS=	Displays the unit IP address.
<b>Domain ID</b>	
DOMAIN_ID=	Displays the unit domain ID.
<b>Signature Multicast IP Address</b>	
SIGNATURE_MULTICAST_IPADDRESS_1=	Displays the channel 1 signature multicast IP address.
SIGNATURE_MULTICAST_PORT_1=	Displays the channel 1 signature multicast port.
SIGNATURE_MULTICAST_IPADDRESS_2=	Displays the channel 2 signature multicast IP address.
SIGNATURE_MULTICAST_PORT_2=	Displays the channel 2 signature multicast port.
<b>Signature IP Tx</b>	

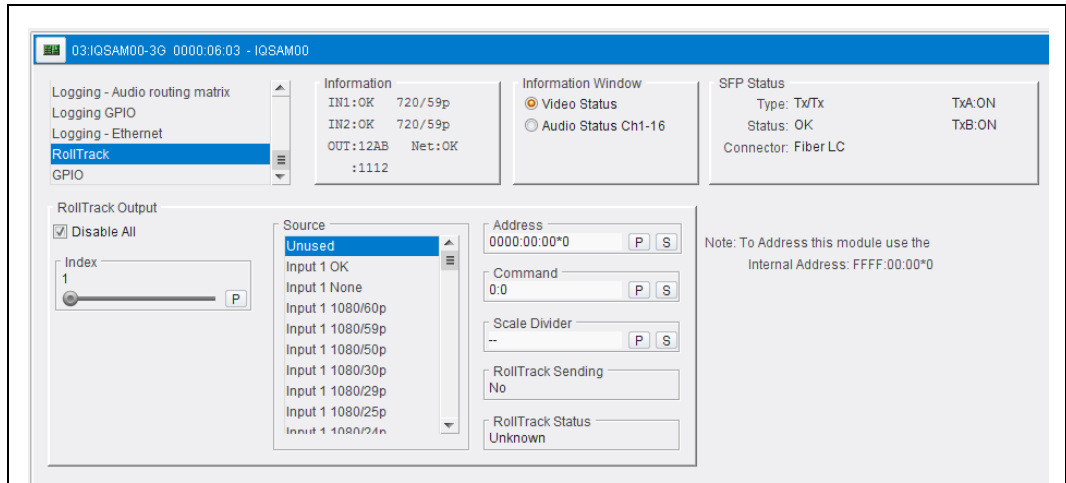
**Table 13 Logging - Ethernet**

Log field	Description
DEVICE_NAME=	Displays the signature IP Tx device name.
DEVICE_ID=	Displays the signature IP Tx device ID.
SOURCE_1_NAME=	Displays the signature IP Tx source 1 name.
SOURCE_1_ID=	Displays the signature IP Tx source 1 ID.
FLOW_1_ID=	Displays the signature IP Tx flow 1 ID.
SOURCE_2_NAME=	Displays the signature IP Tx source 2 name.
SOURCE_2_ID=	Displays the signature IP Tx source 2 ID.
FLOW_2_ID=	Displays the signature IP Tx flow 2 ID.
<b>Signature IP Rx</b>	
DEVICE_CONNECTED=	Displays the signature IP Rx device connected.
DEVICE_SOURCE=	Displays the signature IP Rx device source.
CONNECTION_STATUS=	Displays the signature IP Rx device connection status.

**Table 13** Logging - Ethernet

## 5.16 RollTrack

This enables information to be sent, through the RollCall™ network, to other compatible units connected on the same network.



**Figure 29 RollTrack**

The following options are available.

### 5.16.1 Disable All

When checked, RollTrack messages are disabled from the unit however the unit stills reflects the message states in this mode.

### 5.16.2 RollTrack Index

The slider allows all of the available RollTrack triggers to be browsed. Click on a relevant source of information to be used as the trigger for the transmission of data via the rolltrack mechanism. The **P** button selects the default preset value. When no source is selected, it displays **Unused**.

### 5.16.3 RollTrack Source

This slider selects the source of information that triggers the transmission of data. Dragging the slider selects the RollTrack source, displayed below the slider. Clicking the **P** button selects the default preset value. When no source is selected, it displays **Unused**.

### 5.16.4 RollTrack Address

This item sets the address of the selected destination unit.

To change the address, type the new destination into the text area and then select 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-configurable number that is a unique identification number for the destination unit in a multi-unit system. This ensures that only the correct unit responds to the command. If left at 00, an incorrectly fitted unit can respond inappropriately.

**Note:** A segment address of FFFF is the module itself. For example, FFFF:00:00 addresses the RollTrack to itself.

### 5.16.5 RollTrack Command

This item sends a command to the selected destination unit.

It is possible to change this command 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.
- The second number (156) is the value sent with the RollTrack command.

### 5.16.6 RollTrack Sending

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

String	A string value is always being sent.
Number	A number value is always being sent.
No	The message is not being sent
Yes	The message is being sent.
Internal Type Error	Inconsistent behavior. Please contact your local SAM agent.

### 5.16.7 RollTrack Status

A message appears here to indicate the status of the currently selected RollTrack index. Available RollTrack Status messages are:

OK	RollTrack message sent and received OK
Unknown	RollTrack message has been sent but it has not yet completed
Tijmeout	RollTrack message 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.

## 5.17 GPIO n

This enables configuration of the two GPIO ports.

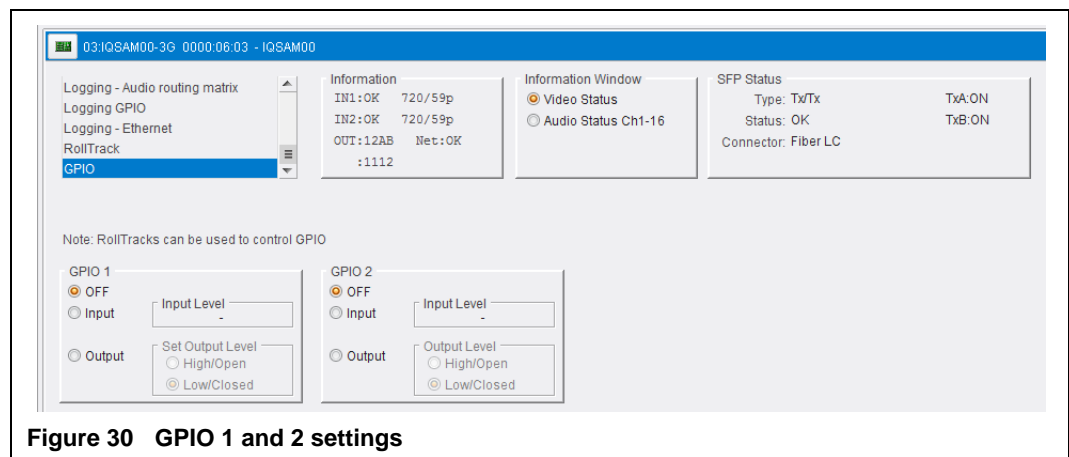


Figure 30 GPIO 1 and 2 settings

Each GPIO can be configured as an Input, Output or set to Off. When set as an input, the input level is monitored. When set as an output, the output level is controllable.

## Appendix A Lip Sync Troubleshooting

### A.1 Supported correlation of differing input standards

The following table summarizes the supported correlation between differing input standards.

Input 1 \ Input 2	1080 50p	1080 59p	1080 60p	1080 25i	1080 29i	1080 30i	720 50p	720 59p	720 60p	1080 25p	1080 29p	1080 30p	1080 24p	1080 23p	525 29i	625 25i
1080 50p	■			■			■									■
1080 59p		■			■			■								■
1080 60p			■			■			■							
1080 25i	■			■			■									■
1080 29i		■			■			■								■
1080 30i			■			■			■							
720 50p	■			■			■									■
720 59p		■			■			■								■
720 60p			■			■			■							
1080 25p										■						
1080 29p											■					
1080 30p												■				
1080 24p													■			
1080 23p														■		
525 29i		■			■			■								■
625 25i	■			■			■									■

Table 16 Input standards

## Appendix B Application Examples

### B.1 Summary

The IQSAM00 provides a fast and efficient way to monitor video and audio confidence and timing at various points within an SDI system. In broadcast systems maintaining the association and timing between video and audio signals to avoid an objectionable viewer experience has always involved a lot of time consuming set up, testing and monitoring by broadcast engineers and staff, but now IQSAM00 can provide the monitoring confidence that everything is correct and remains correct during live operation. It does this by generating and comparing video and audio signatures from the SDI stream and reporting back the delay value and an accuracy confidence, all without the need for potentially intrusive metadata insertion, or watermarking.

The IQSAM00 can operate as a purely SDI-based module to compare two SDI streams (one 'known good' and one 'measured') in a 'probe' -type application, or can transmit and receive signatures over IP for comparison with units at different locations within the facility or at a remote site. IQSAM00 can compare the signals quickly and reliably with typical confidence times of sub 5 seconds achieved for common applications and material types.

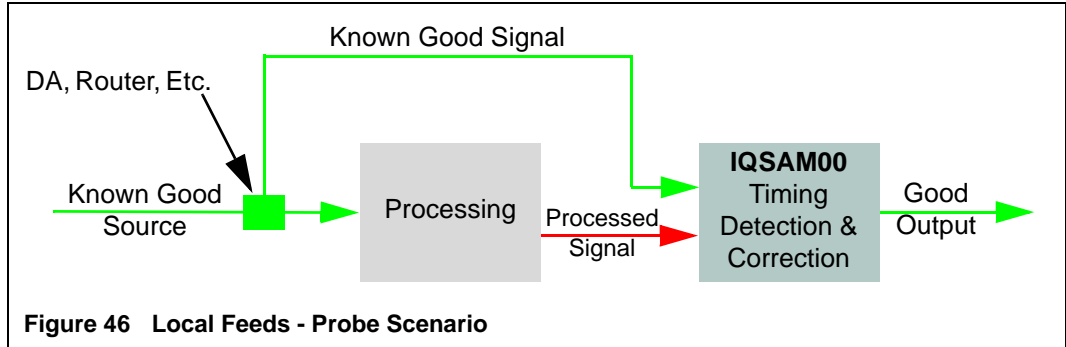
Being fully compatible with SAM's RollMap graphical monitoring software means that signal confidence and delay values from across the system can be shown in a single display graphic providing system timing confidence 'at a glance'. Alternatively native SNMP support enables the IQSAM00 to be integrated with other network management systems used for 'in house' monitoring operations.

## B.2 Signature Transport Scenarios

Video and audio signatures are transported through the signal chain in one of a number of ways depending on the required system workflow. See sections B.2.1 to B.2.2.

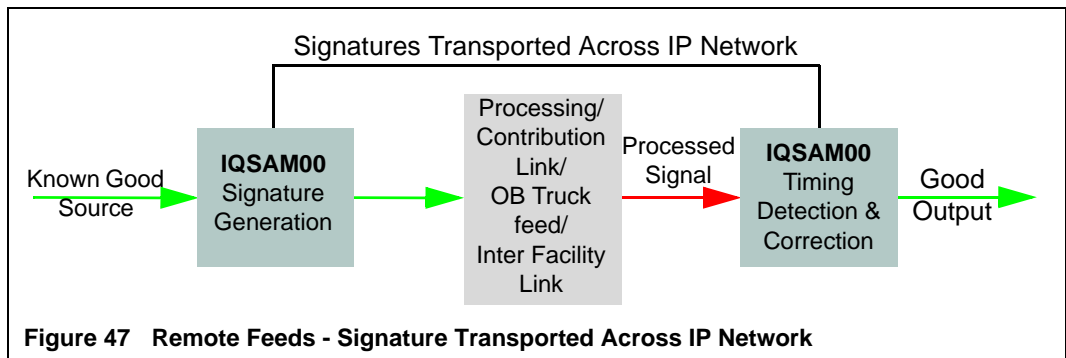
### B.2.1 Local Feeds - Probe Scenario

An IQSAM00 card can be added at any point of interest within an existing workflow to allow for a processed SDI signal to be compared to a known good source SDI signal.



### B.2.2 Remote Feeds - Signature Transported Across IP Network Scenario

The signature is generated by an IQSAM00 from a known good source and transported across the IP network to a remote IQSAM00 module where it is compared to the processed signal.

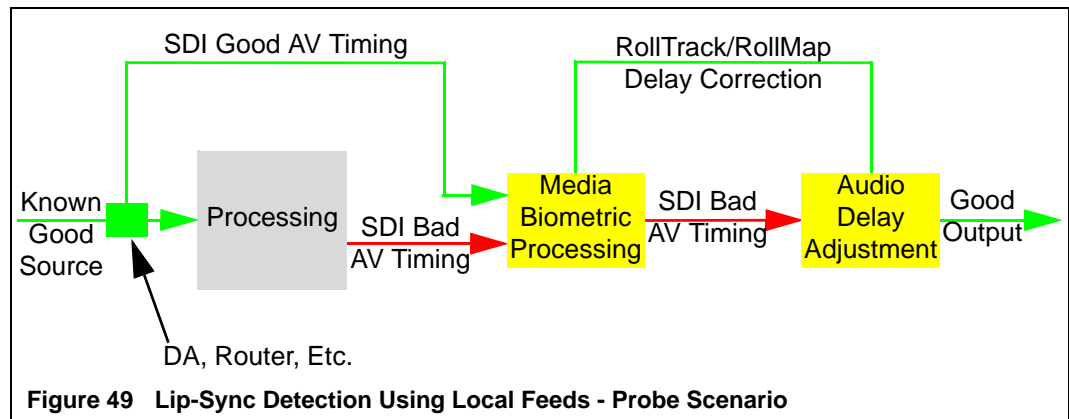
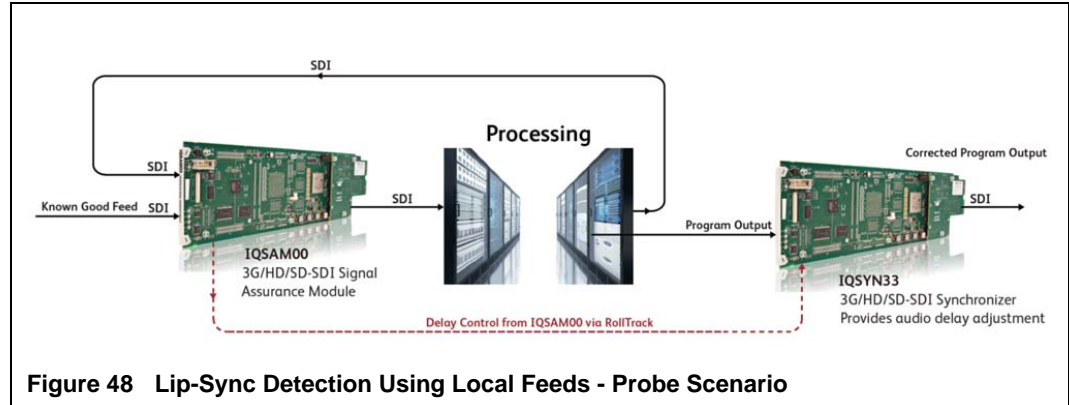




### B.3 Example Application: Lip-Sync Detection A/V Timing

Maintaining lipsync through complex broadcast systems can be difficult to achieve and even more difficult to prove. Media Biometrics can ensure your lipsync keeps on track, and provide traceability.

In its simplest implementation an IQSAM00 Biometric assurance module takes an SDI feed from the incoming content where the AV timing is “known good” and a second SDI feed from the end of the existing broadcast chain.



In the above example (Figure 48 & Figure 49) signatures are generated at a known good point in the workflow by the IQSAM00 module. Downstream processing may have introduced a video/audio offset and any timing difference is measured using Biometrics on the IQSAM00 module.

The value of the delay measured can be optionally passed using RollTrack to a delay adjustment product, in this case a downstream Synchronizer such as the IQSYN33, which will automatically correct the offset as can be seen in Figure 48 & Figure 49 or If an error is detected an alarm can be triggered to alert an existing management system via SNMP as can be seen in the following RollMap example monitoring screens (Figure 50 and Figure 51).

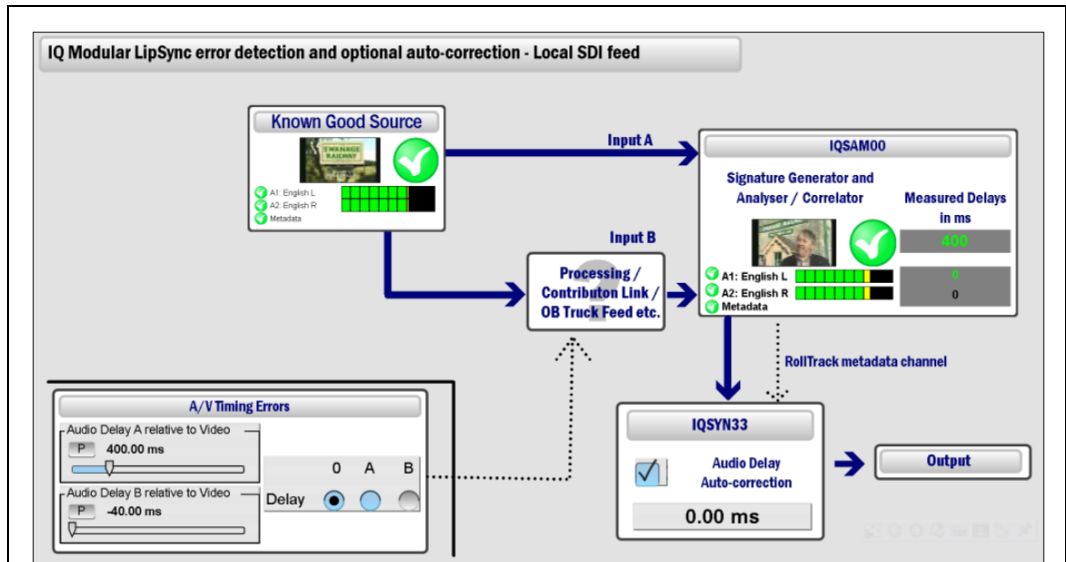


Figure 50 Example RollMap Lip-Sync Detection Using Local Feeds - OK State

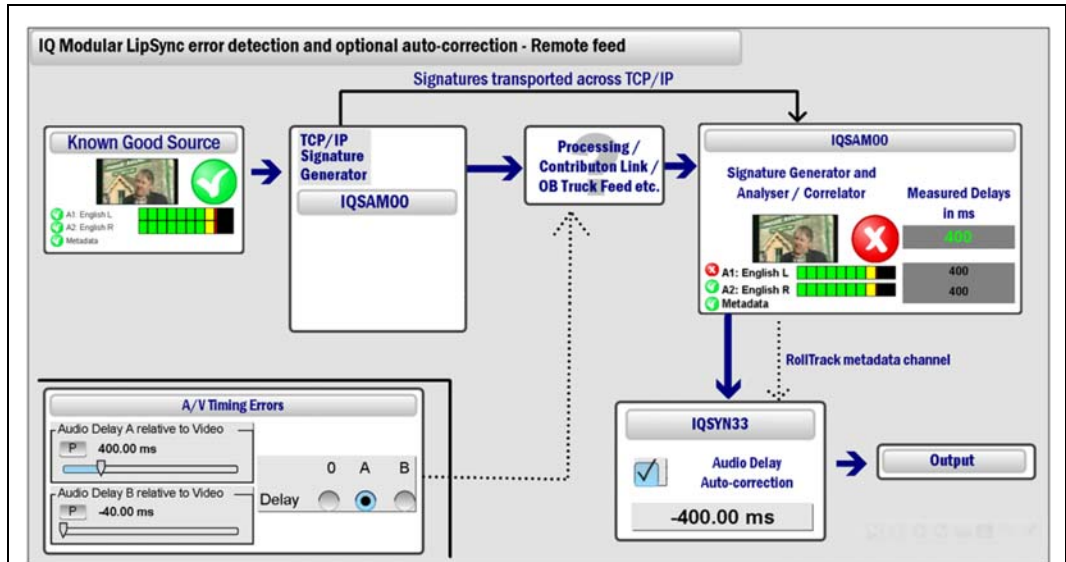


Figure 51 Example RollMap Lip-Sync Detection Using Local Feeds - Error State with Correction Added

Where the source of the content and the point at which lipsync is known to be good is remote, a Biometric Signature can be generated at the remote site by the IQSAM00 module and transported independently via IP.

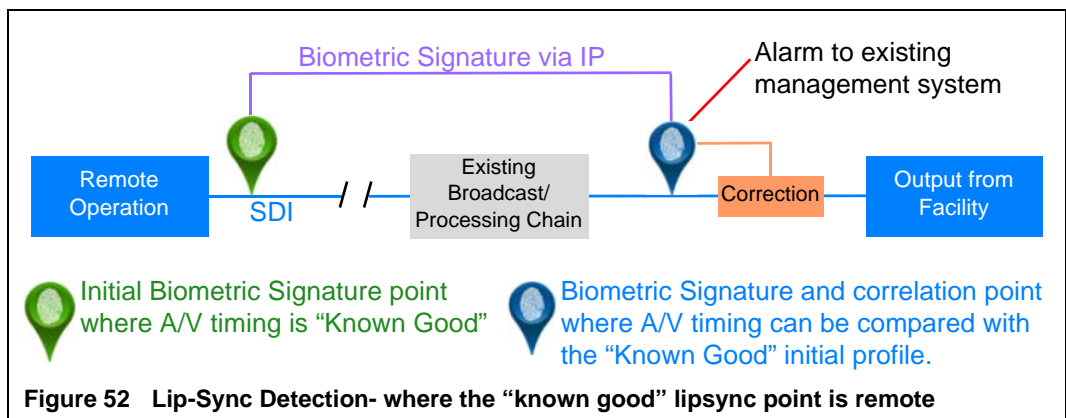


Figure 52 Lip-Sync Detection- where the "known good" lipsync point is remote

The value of the delay measured can be optionally passed using RollTrack to a delay adjustment product such as a downstream Synchronizer e.g IQSYN33 which will automatically correct the offset or If an error is detected an alarm can be triggered to alert an existing management system via SNMP as can be seen in the following RollMap example monitoring screens (Figure 53 and Figure 54).

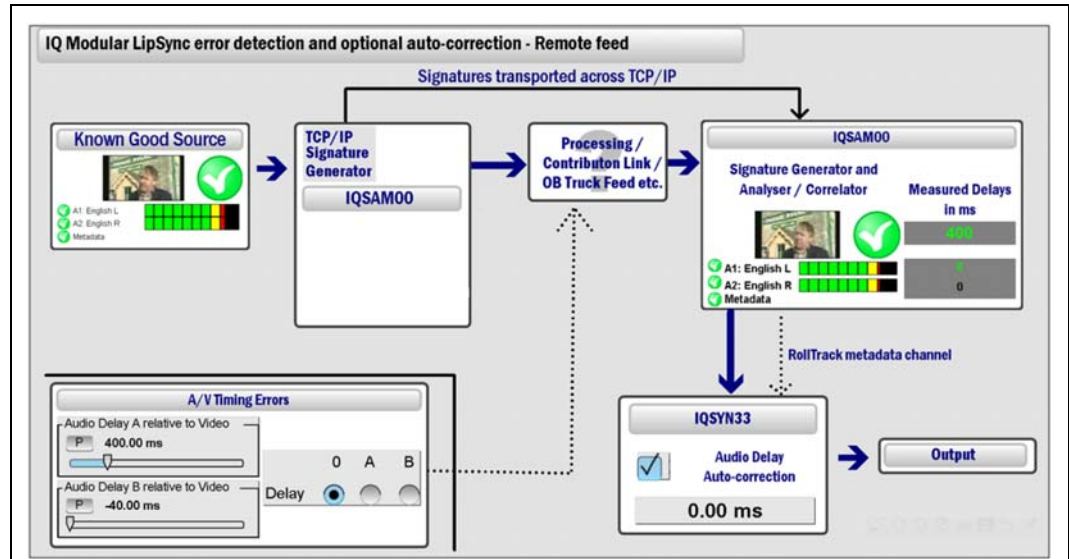


Figure 53 Example RollMap Lip-Sync Detection Using Remote Feeds - OK State

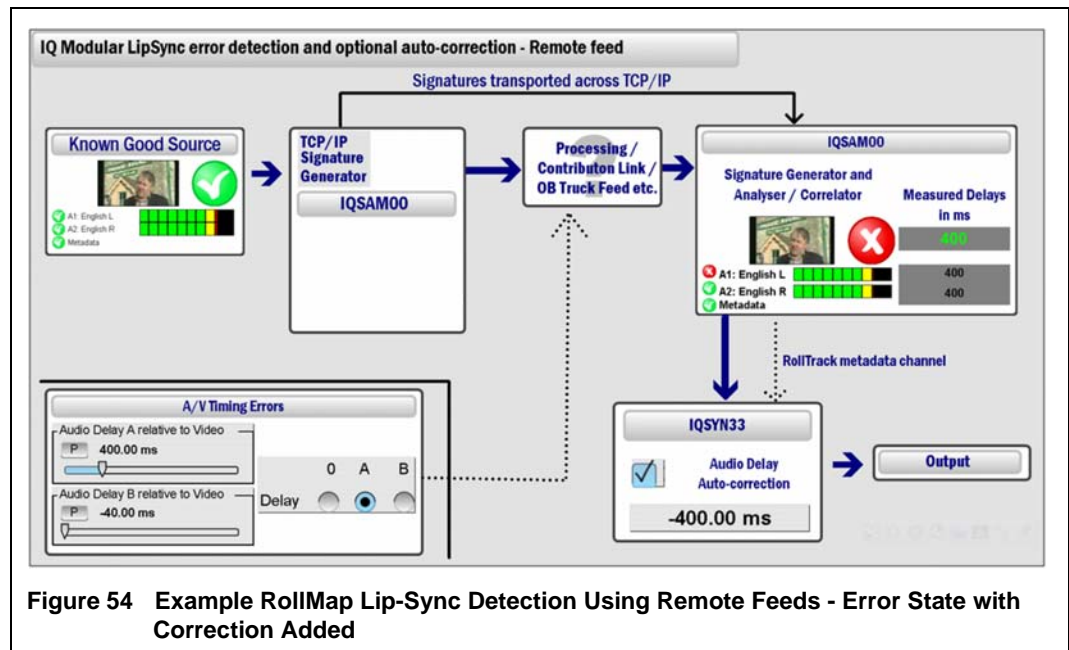


Figure 54 Example RollMap Lip-Sync Detection Using Remote Feeds - Error State with Correction Added

Media Biometrics differ from other ‘fingerprinting’ technologies in two ways. Firstly the identification of a signature can be achieved in 2-3 seconds allowing short duration media to be identified. Secondly the signatures are resilient to image processing, including aspect ratio conversion, cropping, format conversion, and even compression.

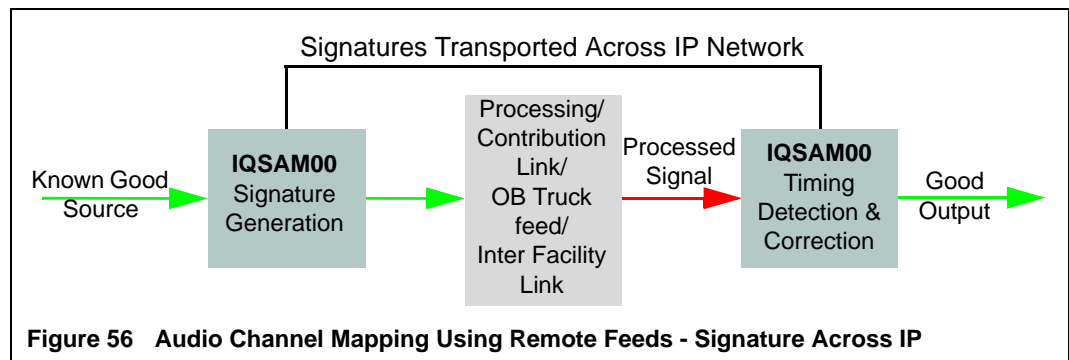
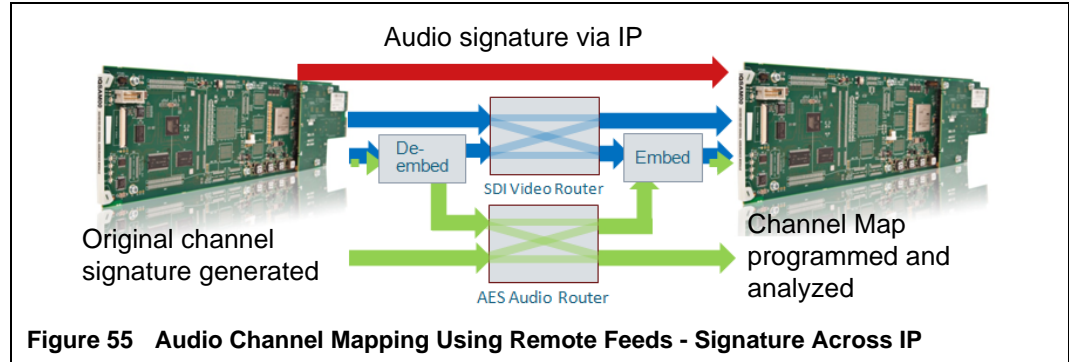
Through detection and correlation of these signatures at various points in the transmission chain, it is possible to identify if there have been any changes in the video and audio, including their relative timings.

An implementation like this requires no existing SAM equipment or infrastructure. This example is shown using a local feed but can also be achieved with remote feeds by using the transport methods described in sections B.2.1 or B.2.2 depending on the workflow required.

### B.4 Example Application: Audio Channel Mapping

It is common for media to have many audio channels associated with it – multiple languages, separate commentary and Dolby Surround are just some examples. Media Biometrics makes sure you are delivering the right audio on the right channel.

A unique biometric signature is generated for each audio track by the IQSAM00 module. The detection IQSAM00 module is programmed with the audio channel map and analyses the signal to check the channel mapping is correct.



This example is shown using a remote feed with the signature transported across an IP network. It could also be configured with a local feed as described in section B.2.1.

Figure 57 Example RollMap Audio Channel Mapping Using Remote Feeds - Signature across IP - OK State

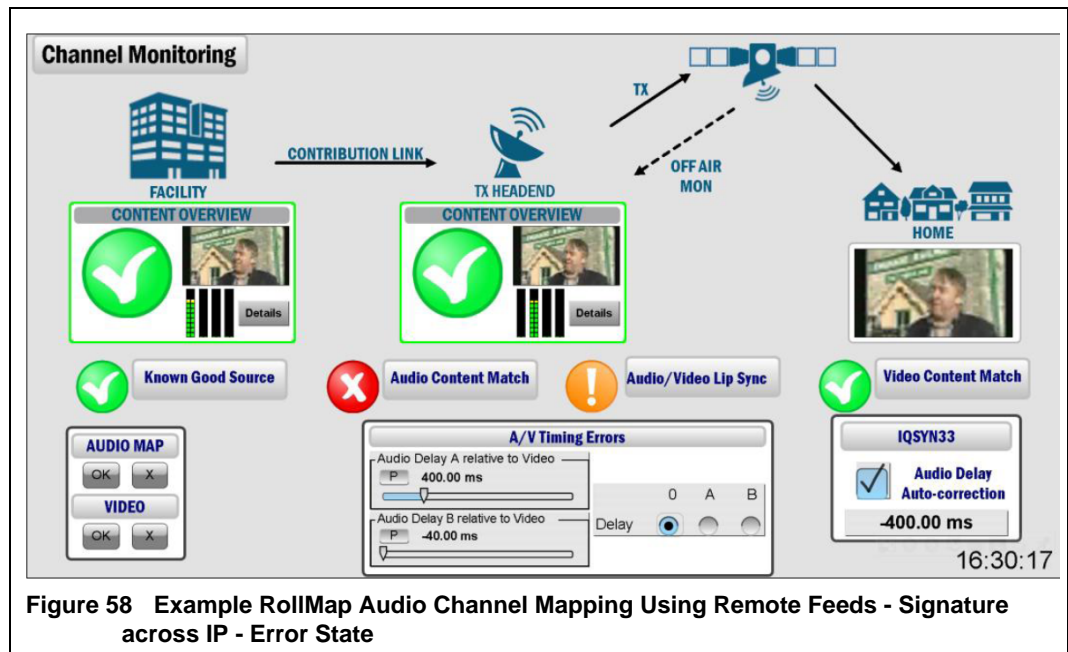


Figure 58 Example RollMap Audio Channel Mapping Using Remote Feeds - Signature across IP - Error State

### B.5 Example Application: Video Content Match

Within complex, multi-channel broadcast facilities, how do you know you are playing the right content, on the right channel, at the right time? Media Biometrics can track media throughout and confirm that the content being played out on a channel is the right content.

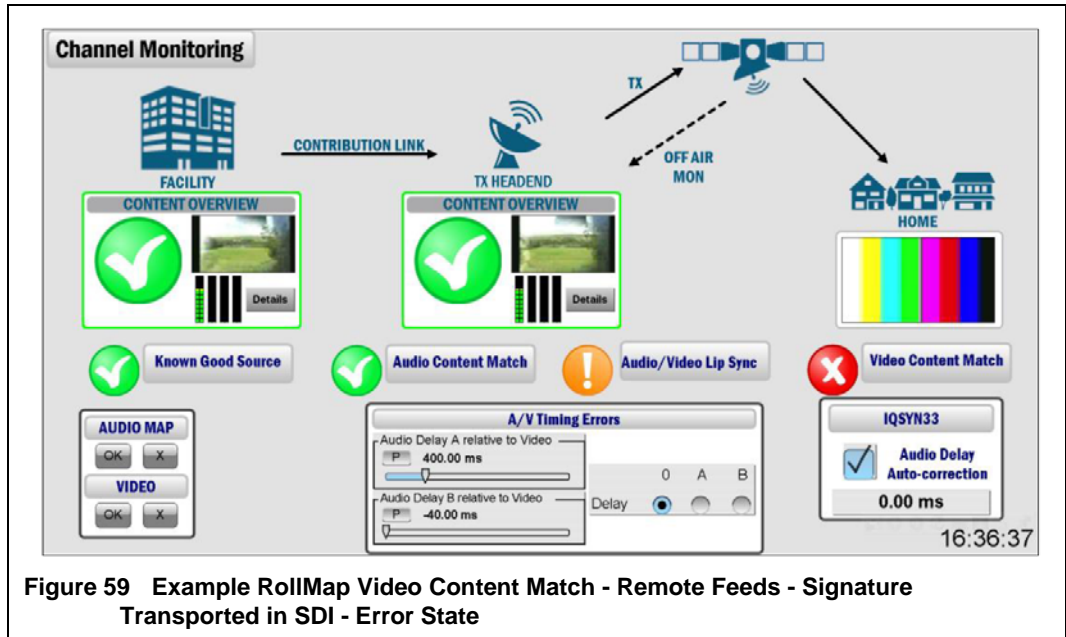


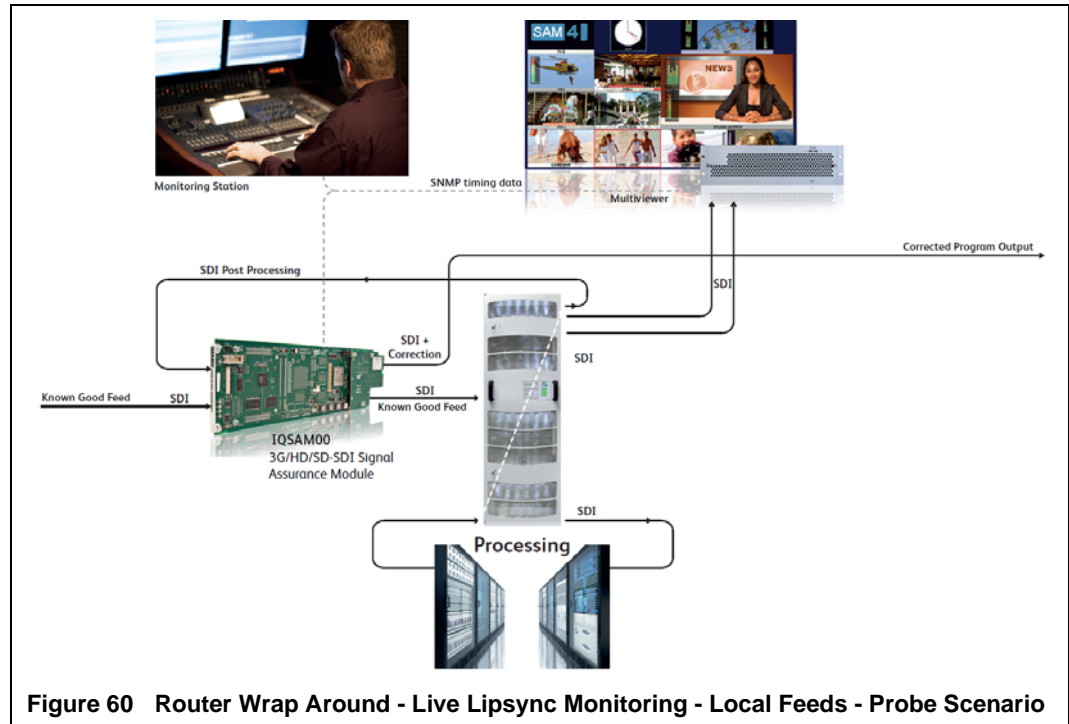
Figure 59 Example RollMap Video Content Match - Remote Feeds - Signature Transported in SDI - Error State

This example is shown using a remote feed with the signature transported in the SDI. This example can also be configured with a local feed (section B.2.1) or a remote feed transported across an IP network (section B.2.2) depending on the workflow required.



### B.6 Example Application: Router Wrap Around - Live Lipsync Monitoring

This example shows an efficient way to monitor and correct video and audio timing where a known good signal is being wrapped around a router for additional processing such as down conversion or logo insertion.



**Figure 60 Router Wrap Around - Live Lipsync Monitoring - Local Feeds - Probe Scenario**

Accurate to 1ms and a less than 5 second timing detection window enables IQSAM00 to send timing and confidence values to any network management or monitoring system via SNMP, or direct to any RollCall enabled products to provide delay adjustments. Any timing issues can also be corrected by the IQSAM00 via it's built in audio correction option to provide delay adjustment.

This example is shown using a local feed but can also be achieved with remote feeds by using the transport methods described in sections B.2.1 or B.2.2 depending on the workflow required.