

# IQOYA X/LINK range

# IP audio codecs



# User manual for: IQOYA X/LINK-LE, X/LINK-ST, X/LINK-DUAL, X/LINK-AES67

Applies from firmware version 3.01 January 2020

| Date          | Changes  |
|---------------|--|
| June, 4, 2020 | Appendix C,GPIO description: N.C and N.O pins were inverted. |



## Note regarding the presentation of this document:

IQOYA X/LINK devices feature two modes of use :

- The 'Program Distribution' mode of use
- And the 'Remote Broadcasting' mode of use

These two modes are described in the WORKING PRINCIPLES chapter.

In this document, the chapters specific to the "Program Distribution" mode of use are presented on a green background and the chapters specific to the "Remote Broadcasting" mode of use are presented on a blue background. The chapters which are relevant for both modes of use are presented on a white background.

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#### Important Safety Information: read carefully before using this equipment!

Follow these instructions and keep them in a safe place! Keep in mind that damages due to failure to observe the instructions contained in this manual are not covered by warranty.

Instructions importantes de sécurité: lire soigneusement avant d'utiliser l'équipement! Lisez et suivez ces instructions. Conservez les pour consultation ultérieure! Les dommages dus au non-respect des instructions contenues dans ce manuel ne sont pas couverts par la garantie.

#### Wichtige Sicherheitshinweise: vor Inbetriebnahme des Gerätes sorgfältig lesen!

Befolgen Sie die Anweisungen und bewahren Sie sie für spätere Fragen auf! Bei Schäden, die durch Nichtbeachten dieser Bedienungsanleitung verursacht werden, erlischt der Garantieanspruch!



#### Do Not Open the Cabinet

There are no user-serviceable components inside this product. Opening the cabinet may present a shock hazard, and any modification to the product will void your warranty. If it is necessary to open the device for maintenance or advanced configuration purposes, this is to be done by qualified personnel only after disconnecting the power cord and network cables!



The device is to be connected only to a power supply as specified in this manual and marked on the equipment.

This equipment must be earthed!

Do not block any of the ventilation openings!

#### Humidity

To reduce the risk of fire or shock, do not expose this device to rain or moisture. Do not place objects filled with liquid on this device.

#### Installation Location

To ensure proper operation and to avoid safety hazards, the device must be installed in a 19" rack mount chassis. The electrical installation of the building should dispose of easily accessible disconnecting means in the immediate vicinity of the device. If rack installation is not possible, place it on a firm and level surface. The use of a supply lead with a power plug respecting the legal standards in the country of use is obligatory. The plug shall be easily accessible in case of a problem.

Avoid installation in extremely hot or cold locations, or in an area that is exposed to direct sunlight or heating equipment. Avoid moist or humid locations. Connection of this product to an IT power supply system is only in Norway.

#### Cleaning

Clean only with a soft, dry cloth. If necessary, after disconnecting the unit's cables, wipe it with a soft cloth dampened with mild soapy water, then with a fresh cloth with clean water. Wipe dry immediately with a dry cloth. NEVER use benzene, aerosol cleaners, thinner, alcohol or any other volatile cleaning agent. Do not use abrasive cleaners, which may damage the finish of metal or other parts.

#### Refer all servicing to qualified service personnel.

Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

#### Moving the device

Before moving the unit, be certain to disconnect any



#### Ne pas ouvrir l'appareil

L'ouverture du coffret peut produire un risque de choc électrique, et toute modification du produit annule votre garantie. S'il est nécessaire d'ouvrir l'appareil pour l'entretien ou la configuration avancée, cela doit être fait par du personnel qualifié, après avoir débranché le cordon d'alimentation et les câbles réseaux !



Il est primordial de connecter l'appareil à une alimentation électrique telle que spécifiée dans ce manuel d'utilisateur et sur le matériel même. Cet équipement doit être raccordé à la terre ! N'obstruer aucune ouverture de ventilation !

#### Humidité

Afin de réduire les risques de feu ou de choc, n'exposez pas cet appareil à la pluie ou l'humidité. Ne placez pas d'objet contenant un liquide sur l'appareil.

#### Installation, mise en place

Afin d'assurer le fonctionnement correct et de minimiser les risques potentiels liés à la sécurité. l'appareil doit être installé dans un châssis 19 pouces. Si cela ne vous est pas possible, placez-le sur une surface solide et plane. Prévoir dans l'installation électrique du bâtiment un dispositif de sectionnement aisément accessible et à proximité immédiate de l'appareil. L'utilisation d'un câble d'alimentation avec une fiche de prise de courant respectant les normes en viqueur dans le pays d'utilisation est obligatoire. De plus la fiche de prise de courant doit être aisément accessible en cas de problème.

Évitez une installation dans des endroits très chauds ou très froids ainsi que dans des lieux exposés directement au soleil. Évitez les lieux présentant un excès d'humidité.

Le raccordement de ce produit à un régime d'alimentation IT n'est possible qu'en Norvège.

#### Nettoyage

Nettoyez uniquement avec un chiffon doux et sec. Si nécessaire, après avoir débranché le cordon d'alimentation, essuyez-le avec un chiffon doux humidifié avec de l'eau savonneuse puis rincez le á l'aide d un chiffon propre et d'eau claire. Séchez-le immédiatement avec un chiffon sec. N'utilisez JAMAIS d'essence, de nettovants en aérosols, d'alcool ou tout autre agent nettoyant volatile. N'utilisez pas de produits nettoyants abrasifs qui pourraient endommager les finitions métalliques ou d'autres pièces.

#### Réparation

Lorsque l'appareil a été endommagé quelle qu'en soit la cause ou qu'il ne fonctionne pas normalement, toute réparation doit être effectuée par du personnel qualifié. Avant de transporter l'unité, assurez-vous d'avoir bien déconnecté le cordon d'alimentation ainsi que tous les



Throughout this manual, the lightning bolt triangle is used to alert the user to the risk of electric shock.

The exclamation point triangle is used to alert the user to important operating or maintenance instructions.



#### Gerät nicht öffnen

Öffnen des Geräts kann eine Gefährdung durch Stromschlag und Erlöschen der Garantie zur Folge haben. Reparaturarbeiten und Änderungen der Hardwarekonfiguration dürfen nur von qualifiziertem Personal nach entfernen der Strom- und Netzwerkkabel durchgeführt werden.



# Stromversorgung

Das Gerät darf nur mit der in dieser Bedienungsanleitung und auf dem Gerät angegebenen Stromversorgung betrieben werden. Erdung ist zu gewährleisten! Belüftungsschlitze nicht verdecken! Wasser und Feuchtigkeit

Um Brand- oder Stromschlagrisiken zu vermeiden, darf das Gerät nicht mit Feuchtigkeit in Berührung kommen.

#### Aufbau des Geräts

Um den einwandfreien Betrieb zu gewährleisten und Sicherheitsrisiken zu vermeiden, sollte das Gerät in einem 19-Zoll Baugruppenrahmen montiert werden. Die elektrische Installation des Gebäudes sollte über einen leicht zugänglichen Trennschalter in unmittelbarer Nähe des Geräts verfügen Nur wenn die Installation im Rack nicht möglich ist, stellen Sie das Gerät auf einen festen, waagerechten Untergrund.

Die Verwendung eines Anschlußkabels und eines Steckers, die die im Benutzungsland gültigen Normen erfüllen, ist obligatorisch. Des weiteren muß die Steckdose für einen eventuellen Problemfall leicht zugänglich sein.

Meiden Sie Standorte in der Nähe von Wärme- oder Feuchtigkeitsquellen sowie direkte Sonneneinstrahlung. Anschluß dieses Produktes an eine spezielle IT-Stromversorgung ist nur in Norwegen genehmigt.

#### Reinigen des Geräts

Säubern Sie das Gerät nur mit einem weichen, trockenen Tuch. Bei Bedarf verwenden Sie ein mit mildem Seifenwasser befeuchtetes Tuch, nachdem Sie die Netzanschlusskabel aus der Steckdose gezogen haben, anschließend ein weiches, mit klarem Wasser befeuchtetes Tuch. Trocken Sie das Gerät sofort im Anschluß. Keinesfalls Benzol, Verdünner oder sonstige starke Lösungsmittel oder Scheuerreiniger verwenden, da hierdurch das Gehäuse beschädigt werden könnte.

#### Lassen Sie etwaige Reparaturen nur von qualifizierten Fachleuten durchführen!

Sollten das Netzkabel oder der Netzstecker beschädigt sein, oder sollte das Gerät selbst beschädigt worden sein (z. B. durch Eindringen von Feuchtigkeit durch Fall auf den Boden), oder sollte es nicht ordnungsgemäß funktionieren oder eine deutliche Funktionsabweichung aufweisen, so ist es von qualifizierten Fachleuten zu reparieren.



cables that connect with other components.

câbles la reliant à d'autres appareils.

# **INFORMATION FOR THE USER**

"This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense."

Warning

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

### CAN ICES-3 (A) / NMB-3 (A)

| User safety  | EMC   |
|--|---|
| European Directive 2006/95/EC "Low Voltage Directive       | European Directive: EMC 2004/108/EC   |
| Europe: EN60950-1 (2006+A11/2009+A1/2010+A12/2011+A2/2013) | Radio disturbance :   |
| International: IEC 60950-1 (2005+A1/2009+A2/2013)          | International: CISPR22 (2008) Class A   |
|  | IEC 61000-6-3 (2006+A1/2010)  |
|  | European : EN55022 Class A (2010) Requirements for<br>Information Technology Equipment (ITE)                        |
|  | EN 61000-6-3 (2007+A1/2011)   |
|  | Immunity: International : CISPR24 (2010)  |
|  | IEC 61000-6-2 (2005)  |
|  | European : EN55024 (2010) (ITE)   |
|  | EN 61000-6-2 (2005)   |
|  | Harmonics: International : IEC 61000-3-2 (2005 + A1/2008 + A2/2009)   |
|  | European : EN61000-3-2 (2006 + A1/2009 + A2/2009)   |
|  | Voltage changes : International : IEC 61000-3-3 (2013)  |
|  | European  :EN 61000-3-3 (2013)  |
|  | United States: CFR 47, FCC Part 15, Subpart A (Class A Digital Device)<br>& Industry Canada ICES-003 (Issue 5/2012) |
| RoHS<br>European directive 2011/65/EU aka "RoHS"           | Note: to comply with standard EN55024, use shielded network cables!   |

In order to guarantee compliance with the above standards in an installation, the following must be done:

- the provided cables must not be modified.
- additional cables used must have their respective shield connected to each extremity.



Attach a ground wire to the chassis (ideally the ground wire has a ring terminal). Connect the other end of the ground wire to a good electrical
ground point.

The limits specified in the standards are designed to provide reasonable protection against harmful interference in an industrial installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- reorient or relocate the receiving antenna.
- increase the separation between the equipment and the receiver.
- connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- consult the dealer or an experienced audio/television technician for help.

#### Note:

Connecting this device to peripheral devices that do not comply with CLASS A requirements or using an unshielded peripheral data cable could also result in harmful interference to radio or television reception. The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. To ensure that the use of this product does not contribute to interference, it is necessary to use shielded I/O cables.

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You have just acquired a Digigram IQOYA X/LINK and we congratulate you!

The manual at hand will guide through installation, configuration, and operation. For any software related issue, please refer to the specific documentation provided in its online help.



# **1 KEY HARDWARE FEATURES**

## 1.1 IQOYA X/LINK-LE

- 1U rack
- Two internal redundant power supply units (2x220 VAC, optionally 220VDC / -48VDC)
- 4 Ethernet ports via RJ-45 connectors. 1 x 100 Mbits/s, and 3 x 100/1000 Mbits/s ports
- 2 balanced analog line inputs and outputs
- 1 AES/EBU input and output
- Switchable hardware by-pass on inputs to outputs in case of power supply failure
- 1 RS232 port for auxiliary data tunneling
- 8 GPIO's, or 4 GPIO's if the 10 MHz / 1 PPS external synchro input(s) are used (optional)
- External synchronization: AES/EBU input, 10 MHz (Optional), PTP clock, Livewire clock
- Status LEDs
- SDHC card reader
- 6.35mm headphones jack with volume knob and codec input/output selection

### 1.2 IQOYA X/LINK-ST

- 1U rack
- Two internal redundant power supply units (2x220 VAC, optionally 220VDC / -48VDC)
- 4 Ethernet ports via RJ-45 connectors. 1 x 100 Mbits/s, and 3 x 100/1000 Mbits/s ports
- 2 balanced analog line inputs and outputs
- 1 AES/EBU input and output
- Switchable hardware by-pass on inputs to outputs in case of power supply failure
- 1 RS232 port for auxiliary data tunneling
- 8 GPIO's, or 4 GPIO's if the 10 MHz / 1 PPS external synchro input(s) are used (optional)
- External synchronization: AES/EBU input, 10 MHz (optional), PTP clock, Livewire clock
- Front panel LCD display and keypad
- Status LEDs
- SDHC card reader
- 6.35mm headphones jack with volume knob and codec input/output selection

### 1.3 IQOYA X/LINK-DUAL

- 1U rack
- Two internal redundant power supply units (2x220 VAC, optionally 220VDC / -48VDC)
- 4 Ethernet ports via RJ-45 connectors. 1 x 100 Mbits/s, and 3 x 100/1000 Mbits/s ports
- 4 balanced analog line inputs and outputs
- 2 AES/EBU input and output
- Switchable hardware by-pass on the first stereo inputs to outputs in case of power supply failure
- 1 RS232 port for auxiliary data tunneling
- 4 GPIO's if the 10 MHz / 1 PPS external synchro input(s) are used (optional)
- External synchronization: AES/EBU input, 10 MHz (optional), PTP clock, Livewire clock
- Front panel LCD display and keypad
- Status LEDs
- SDHC card reader



• 6.35mm headphones jack with volume knob and codec input/output selection

### 1.4 IQOYA X/LINK-AES67

- 1U rack
- Two internal redundant power supply units (2x220 VAC, optionally 220VDC / -48VDC)
- 4 Ethernet ports via RJ-45 connectors. 1 x 100 Mbits/s, and 3 x 100/1000 Mbits/s ports
- 1 RS232 port for auxiliary data tunneling
- 8 GPIO's, or 4 GPIO's if the 10 MHz / 1 PPS external synchro input(s) are used (optional)
- External synchronization: 10 MHz (optional), PTP clock, Livewire clock
- Front panel LCD display and keypad
- Status LEDs
- SDHC card reader
- 6.35mm headphones jack with volume knob and codec input/output selection

# 2 KEY SOFTWARE FEATURES

#### 2.1 Supported I/O channels

|                          | Number of mono input / output<br>channels of the codec | Type of audio I/Os  |
|--------------------------|--|---|
| X/LINK-ST &<br>X/LINK-LE | 2/2  | Analog, AES/EBU, AES67, Ravenna, Livewire (standard mode) |
| X/LINK-DUAL              | 4/4  | Analog, AES/EBU, AES67, Ravenna, Livewire (standard mode) |
| X/LINK-AES67             | From 2 / 2 to 16 / 16                                  | AES67, Ravenna, Livewire (standard mode)                  |

#### 2.2 Standard features

- Two modes of use: "Program Distribution" mode and "Remote Broadcasting" mode
- Simultaneous encoding, decoding
- Multi-format encoding and multi-protocol streaming of each input.
- Support for SIP signaling protocol including SIP presence information
- Support for symmetric RTP
- Contact list management
- Call profile management
- Possibility to place calls choosing the correspondent in an address book and the call profile in a call profile list and to accept or deny incoming calls.
- Support of unicast, multi-unicast, multicast, multi-multicast addressing
- Support of IGMPv3
- MPEG-TS/IP streaming



- VLAN Tagging + DSCP
- Support of DHCP
- Asymmetric algorithmic encoding/decoding
- 3 decoding priorities per output program, with choice of the audio source on each priority: IP service (RTP, UDP, HTTP), file, playlist and audio input
- Automatic switching to a lower decoding priority in case of upper priority failure
- Possibility to disable/enable any defined priority
- Possibility to stop streaming upon input silence detection with adjustable silence threshold and duration.
- Decoding of a stereo source to a mono output, with possibility to mix left and right channels
- Dual port redundant streaming with optional time diversity up to 3 second
- Selectable FECs for ACIP RTP streams (from +10% to +100% IP bandwidth)
- Pro MPEG Cop#3 FEC for MPEG-TS streams (line, columns)
- Automatic audio format detection on the decoder
- Real-time metrics on network path quality (jitter, lost packets, duplicated packets, disordered packets) for the primary stream as well as for the FEC stream.
- Adjustable jitter buffer
- Management of lost packets, disordered packets, duplicated packets, and AAC error concealment
- In-band auxiliary data tunneling: serial and status (serial via RS232 or UDP, Status via GPIOs or UDP)
- WEB user rights management
- NTP synchronization (date and time)
- Save / load full codec configuration
- Save / load audio configuration
- Remote firmware update
- Audio still active during firmware upload
- Firmware version N and N-1 locally stored
- SNMPv2c SET, GET, Traps

#### 2.3 Optional software features

- IP streams transcoding. X/LINK, X/LINK-DUAL, X/LINK-AES67
- Multi-protocol streaming: X/LINK-LE
- NTP based audio synchronization
- 1+1 redundancy

### 2.4 Supported audio algorithms

| Included   | Otional |
|--|---------|
| <ul> <li>linear 16/20/24-bit PCM</li> <li>ITU G.711/722</li> <li>ISO MPEG-1/2 Layer I, Layer II, Layer III</li> <li>AAC-LC, HE-AACv1 (LC+SBR), HE-AACv2(LC+SBR+PS),<br/>AAC-LD, AAC-ELD</li> </ul> |         |



# **3 PHYSICAL INTERFACES**

## 3.1 IQOYA X/LINK-ST, X/LINK-DUAL and X/LINK-AES67 front Panel



#### 3.1.1 LEDs

| PSU1      | Status of the first internal power supply unit. Blue if PSU is ok. Off for PSU failure.  |
|-----------|--|
| PSU2      | Status of the second internal power supply unit. Blue if PSU is ok. Off for PSU failure.   |
| Network   | Green: all the enabled network interfaces are up.<br>Orange: at least one of the enabled network interface is down<br>Red: no network connection on all the network interfaces |
| Send      | Green: "Send" activity is normal.<br>Red: Failure on a sender.   |
| Receive   | Green: "Receive" activity is normal<br>Red: at least one active receiver has no audio source   |
| System    | Green flashing if unit is ok.  |
| Fail-over | Green in case at least one output program has switched to a backup audio source  |
| SD        | Flashes when SDHC card is accessed   |

### 3.1.2 LCD display and keypad

- - Next menu or sub-menu
- Previous menu or sub-menu
  - Previous item in the menu, or increase the selected value
- Next item in the menu, or decrease the selected value



Validate the selected action

#### 3.1.3 SDHC card reader

Supports SDHC cards, used for:

- saving/loading of the codec configuration
- Storing backup playlists and sound files

#### 3.1.4 Headphones output

Allows audio monitoring.

The push button allows the selection of the audio source to be monitored.

For IQOYA X/LINK-ST and X/LINK-LE: encoder input, decoder output

For X/LINK-DUAL and X/LINK-AES67, it selects the audio that is assign to vu-meter A or vu-meter B. This assignment is made from the LCD front panel and keypad.

#### 3.1.5 Navigating menus on LCD display

#### Use the arrow keys to navigate in the menus, and the Ok key to confirm a choice.

| System<br>(Home page)         | Eth1           | Eth2           | Eth3            | Eth3           | Monitoring<br>A(*)         | Monitoring<br>B(*)           | Status   | (**) |
|-------------------------------|----------------|----------------|-----------------|----------------|----------------------------|------------------------------|--|------|
| Host Name                     | Enable         | Enable         | Enable<br>'yes) | Enable         | Ana IN1 L<br>Ana IN1 R     | Ana OUT1 L<br>Ana OUT1 R     | Clock source: internal,<br>AES IN1, AES IN2,<br>PTP, 10 mHz<br>Valeur (ex: 48000 Hz) |      |
| Device Name                   | IPv4 @         | IPv4 @         | IPv4 @          | IPv4 @         | AES IN1 L<br>AES IN1 R     | AES OUT1 L<br>AES OUT1 R     | PTP<br>OFF, Sync, Eth, source<br>IP@   |      |
| System Time                   | Speed<br>Mode  | Speed<br>Mode  | Speed<br>Mode   | Speed<br>Mode  | Ana IN2 L<br>Ana IN2 R     | Ana OUT2 L<br>Ana OUT2 R     | SNMP: On / Off   |      |
| System Date                   | Link Status    | Status         | Status          | Status         | AES IN2 L<br>AES IN2 R     | AES OUT2 L<br>AES OUT2 R     | FTP: On/Off  |      |
| NTP Server URL1               | Mac @          | Mac @          | Mac @           | Mac @          | AES67 IN1 L<br>AES67 IN1 R | AES67 OUT1 L<br>AES67 OUT1 R | NTP date and time<br>On/Off  |      |
| NTP Server URL2               | DHCP           | DHCP           | DHCP            | DHCP           | AES67 IN2 L<br>AES67 IN2 R | AES67 OUT2 L<br>AES67 OUT2 R | Audio Synchro on NTP<br>On / Off - Sync / Not<br>sync                                |      |
| Serial Number                 | Subnet<br>mask | Subnet<br>mask | Subnet<br>mask  | Subnet<br>mask | AudioBus1 L<br>AudioBus1 R | AudioBus1 L<br>AudioBus1 R   | Audio synchro on PTP<br>On / Off - Sync / Not<br>sync                                |      |
| Firmware version              | Gateway        | Gateway        | Gateway         | Gateway        | AudioBus2 L<br>AudioBus2 R | AudioBus2 L<br>AudioBus2 R   | Clock source: internal,<br>AES IN1, AES IN2,<br>PTP, 10 mHz<br>Valeur (ex: 48000 Hz) |      |
| Analog bypass /<br>AES bypass | Primary<br>DNS | Primary<br>DNS | Primary<br>DNS  | Primary<br>DNS |                            | 1                            |  |      |
| Apply factory                 | Alternate      | Alternate      | Alternate       | Alternate      |                            |                              |  |      |



| settings                  | DNS | DNS | DNS | DNS |
|---------------------------|-----|-----|-----|-----|
| Restart                   |     |     |     |     |
| Halt                      |     |     |     |     |
| Remount SD card           |     |     |     |     |
| Unmount SD card           |     |     |     |     |
| Copy config to SD         |     |     |     |     |
| Restore config<br>from SD |     |     |     |     |
| Firmware update           |     |     |     |     |
| Screen Dimmer             |     |     |     |     |

#### (\*) Note about Monitoring.

The name of the inputs and outputs displayed on the LCD screen are the names configured from the inputs and outputs settings WEB pages.

#### (\*\*) The following menus are only available in "Remote Broadcasting" mode of use:

| Select codec   | <sup>(1)</sup> Call C<#N>   | <sup>(2)</sup> Contacts<br>C<#N>  | <sup>(3)</sup> Recent calls<br>C<#N>   | <sup>(4)</sup> Profiles<br>C<#N>                     |
|--|---|---|--|--|
| Codec instance #1:<br><i channels="" o="">: <contact name=""><br/><sip address="" listening="" or="" port="" rtp=""><br/>Ok key leads to submenu (1)</sip></contact></i> | CALL/ HANGUP<br><contact be="" called="" to=""></contact>                                     | Contact entry #1:<br><contact name=""><br/><sip address="" or<br="">IP address (****)&gt;</sip></contact> | Recent call #1:<br><name of="" remote="" the=""><br/><sip address="" or<br="">IP address (****)&gt;</sip></name> | Call profile #1:<br><call name="" profile=""></call> |
| Codec instance #2:<br><i channels="" o="">: <contact name=""><br/><sip address="" listening="" or="" port="" rtp=""><br/>Ok key leads to submenu (1)</sip></contact></i> | SELECT CONTACT (***)<br><selected contact=""><br/>Ok key leads to submenu (2)</selected>      | Contact entry #2:<br><contact name=""><br/><sip address="" or<br="">IP address (****)&gt;</sip></contact> | Recent call #2:<br><name of="" remote="" the=""><br/><sip address="" or<br="">IP address (****)&gt;</sip></name> | Call profile #2:<br><call name="" profile=""></call> |
| <br>!  | RECENT CALLS (***)<br><selected call="" recent=""><br/>Ok key leads to submenu (3)</selected> | <u>i</u>  | Ē  | I  |
| Codec instance #N:<br><i channels="" o="">: <contact name=""><br/><sip address="" listening="" or="" port="" rtp=""><br/>Ok key leads to submenu (1)</sip></contact></i> | SELECT PROFILE (***)<br><selected profile=""><br/>Ok key leads to submenu (4)</selected>      | Contact entry #N:<br><contact name=""><br/><sip address="" or<br="">IP address (****)&gt;</sip></contact> | Recent call #N:<br><name of="" remote="" the=""><br/><sip address="" or<br="">IP address (****)&gt;</sip></name> | Call profile #N:<br><call name="" profile=""></call> |
|  | LAST MESSAGE<br><message a="" call<br="" following="">failure&gt;</message>                   |   |  |  |
|  | CONTACT NAME<br><contact name="" of="" this<br="">codec&gt;</contact>                         |   |  |  |
|  | REGISTRATION NAME<br><sip address="" codec="" of="" this=""></sip>                            |   |  |  |

(\*\*\*) Items not available during a communication.

(\*\*\*\*) Depending on whether the contact is accessible via SIP or Symmetric RTP



## 3.2 IQOYA X/LINK/LE front Panel



#### 3.2.1 LEDs

| PSU1      | Status of the first internal power supply unit. Blue if PSU is ok. Off for PSU failure.    |
|-----------|--|
| PSU2      | Status of the second internal power supply unit. Blue if PSU is ok. Off for PSU failure.   |
| Power     | Green if internal power is ok  |
| Send      | Green: Send activity is normal.<br>Red: at least one active sender has a failure           |
| Receive   | Green: Receive activity is normal<br>Red: at least one active receiver has no audio source |
| System    | Green flashing if unit is ok.  |
| Fail-over | Green in case at least one output program has switched to a backup audio source            |
| SD        | Flashes when SDHC card is accessed   |

### 3.3 IQOYA X/LINK-ST, X/LINK-LE, X/LINK-DUAL back Panel





# 3.4 IQOYA X/LINK-AES67 back Panel





### **4 WORKING PRINCIPLES**

IQOYA X/LINK features two modes of use :

- The 'Program Distribution' mode of use: In this mode, the available functions and the graphical user interfaces are suitable for the needs of fixed installations like STL and SSL links, delivery of WEB radios to CDNs, program delivery to DVB/cable operators, IP audio transcoding, etc ...
- The 'Remote Broadcasting' mode of use: In this mode, the available functions and the graphical user interfaces are suitable for the needs of temporary audio over IP connections like live remote broadcasts, intercom, etc ...

At first power up, the user is prompted to choose the mode of use either from the front panel (except IQOYA X/LINK-LE) or from the configuration web interface. Later it is possible to switch from one mode to another from the configuration web pages.

## 4.1 Working principles in "Program Distribution" mode of use

#### 4.1.1 IQOYA X/LINK-ST & X/LINK-LE

IQOYA X/LINK allows at the same time:

- Encoding two audio channels in multiple audio formats, and streaming over IP
- Decoding IP audio streams to two output channels
- Transcoding IP audio streams (optional)





### 4.1.2 IQOYA X/LINK-DUAL

IQOYA X/LINK-DUAL allows at the same time:

- Encoding four audio channels in multiple audio formats, and streaming over IP
- Decoding IP audio streams to four output channels
- Transcoding IP audio streams (optional)



Schematic diagram of IQOYA X/LINK-DUAL

### 4.1.3 IQOYA X/LINK-AES67

IQOYA X/LINK-AES67 allows at the same time:

- Encoding 16 audio channels in multiple audio formats, and streaming over IP
- Decoding IP audio streams to 16 output channels
- Or transcoding IP audio streams (optional)





Schematic diagram of IQOYA X/LINK-AES67

#### 4.1.4 Audio inputs and outputs

The audio inputs receive the audio signals to be encoded. They can be analog, or AES/EBU, or LAN audio (RAVENNA or AES67 or Livewire). Each source can be encoded several times at different formats, and streamed to several destinations.

Audio samples decoded by X/LINK are played to the selected audio output. An audio output can be analog, or AES/EBU, or LAN audio (AES67 or RAVENNA or Livewire).

Note that decoded audio samples can also be sent to internal audio buses, and audio buses can also be sources to be encoded. This optional feature is used for transcoding IP audio streams.

#### 4.1.5 Programs

On the encoding section of IQOYA X/LINK, a program is the encoding of one or several audio inputs. A program is then defined by the following parameters:

- the audio mode: mono, stereo, multi-channel.
- the audio inputs that receive the signal to be encoded. The number of inputs is given by the audio mode. Stereo and multi-channel modes refer to consecutive inputs.
- the audio format: algorithm, bitrate, sampling frequency.

On the decoding part of IQOYA X/LINK, a program is the decoding of an audio source to the audio output. A program can be composed of three decoding priorities, with automatic switching from a priority to another in case the audio source is lost. Audio sources of the decoding priorities can be:

• an RTP stream (raw RTP),



- a HTTP stream (Icecast/Shoutcast),
- audio inputs,
- sound files or playlists stored locally.

#### 4.1.6 IP services

IP services are the way programs are streamed over the IP network. An IP service can include one audio program, or several multiplexed audio programs (case of MPEG-TS MPTS encapsulation). When IQOYA streams, an IP service can be sent to one IP destination (unicast or multicast), or several IP

destinations (multi-unicast or multi-multicast). The main parameters that define an IP service are:

- the streaming protocol: RTP, UDP, HTTP
- the encapsulation: raw (no encapsulation), MPEG-TS
- the audio program(s) included in the service: one program in case of raw or MPEG-TS SPTS transport; several programs in case of MPEG-TS MPTS transport
- the FEC scheme (IP data redundancy)
- the destination IP address and port. Several destination IP addresses and ports can be declared (multi-unicast / multi-multicast).

When IQOYA decodes, it listens to IP services and unpacks the IP frames in order to extract and decode the audio contents.

#### 4.1.7 Audio buses

The audio buses serve for transcoding IP audio streams. An audio bus can be selected as the output of one or several output programs. In case several output programs are connected to the same internal bus, the bus mixes the audio from the different programs. Note that an output program can be simultaneously connected to an audio output and an internal bus.

An audio bus can also be selected as the audio source of an input program (like an audio input), so that it can be streamed as an IP Service.

## 4.2 Working principles in "Remote Broadcasting" mode of use

#### 4.2.1 IQOYA X/LINK-ST & X/LINK-LE

IQOYA X/LINK-ST and IQOYA X/LINK-LE can run one stereo IP codec instance or two mono IP codec instances. Each instance of an IP codec allows to receive, establish or terminate one Symmetric RTP ou SIP IP audio connection. Before establishing a connection, the user chooses the recipient in the address book or enter the recipient address manually and choose the call profile in the call profile list.



Schematic diagram of IQOYA X/LINK-ST & X/LINK-LE

### 4.2.2 IQOYA X/LINK-DUAL

IQOYA X/LINK-DUAL can run two stereo IP codec instances or one stereo and two mono IP codec instances or four mono IP codec instances. Each instance of an IP codec allows to receive, establish or terminate one Symmetric RTP ou SIP IP audio connection. Before establishing a connection, the user chooses the recipient in the address book or enter the recipient address manually and choose the call profile in the call profile list.



Schematic diagram of IQOYA X/LINK-DUAL

### 4.2.3 IQOYA X/LINK-AES67

IQOYA X/LINK-AES67 can run 8 stereo IP codec instances or 16 mono IP codec instances or any combination of mono and stereo IP codec instances which total number of audio channels is less than 16. Each instance of an IP codec allows to receive, establish or terminate one Symmetric RTP ou SIP IP audio connection. Before establishing a connection, the user chooses the recipient in the address book or enter the recipient address manually and choose the call profile in the call profile list.



Schematic diagram of IQOYA X/LINK-AES67

### 4.2.4 Audio inputs and outputs

The audio inputs receive the audio signals to be encoded by the IP codec instance(s). They can be analog, or AES/EBU, or LAN audio (AES67 or RAVENNA or Livewire).

Audio samples decoded by the IP codec instance(s) are played to the audio outputs. An audio output can be analog, or AES/EBU, or LAN audio (AES67 or RAVENNA or Livewire).

### 4.2.5 IP codec instances

A codec instance can establish a connection with a remote IP codec, accept or refuse a connection request from a remote IP codec, or terminate an established connection. The connections can be SIP, direct SIP or symmetrical RTP.

A stereo (resp. mono) codec instance is associated with a stereo (resp. mono) audio input and a stereo (resp. mono) audio output by configuration. Once a connection has been established, the IP codec instance encodes, packetizes and sends over IP to the remote IP codec the audio samples received from the audio input and, at the same time, it depacketizes and decodes the IP audio stream received from the remote IP codec then push the audio samples to the audio output.

#### 4.2.6 Contacts and Address book

A contact is a SIP address (for SIP connections) and/or an IP address (for Symmetrical RTP connections) that has been named. The address book is the list of all the contacts defined on the equipment. Usually the address book of the studio codecs are populated with the addresses of the field codecs and vice versa.

#### 4.2.6 Call profiles and Call profile list

A call profile is a named set of audio and network parameters used to define the characteristics of a connection and applied at connection establishment. The call profile list is the list of all the call profiles defined on the equipment. The parameters of a call profile are:

- The audio encoding format of the sent stream
- The payload type of the outgoing audio stream
- The packet size of the outgoing audio stream
- The FEC (Forward Error Correction) scheme or dual streaming scheme of the outgoing audio stream
- The outgoing stream QoS (Quality of Service)
- The size of the jitter buffer recommended by the caller to the callee
- The jitter buffer size of the caller
- The audio encoding format expected for the stream sent by the remote
- The payload type expected for the stream sent by the remote
- The FEC (Forward Error Correction) scheme or dual streaming scheme expected for the stream sent by the remote

# **5 INSTALLATION**

### 5.1 Grounding the IQOYA X/LINK

Attach a ground wire to the chassis (ideally the ground wire has a ring terminal).

Connect the other end of the ground wire to a good electrical ground point.

Once IQOYA is installed and properly grounded, you can connect the Eth ports and audio I/Os as required for your installation.

### 5.2 Connecting IQOYA X/LINK to the network

We recommend that the first connection to the IQOYA codec is done on a LAN. The default IP addresses of IQOYA X/LINK Eth ports are:

- Eth1: 192.168.0.100
- Eth2: 192.168.1.100
- Eth3: 192.168.2.100
- Eth4: 192.168.3.100

In case you do not know the IP addresses of the IQOYA X/LINK unit you want to connect to, you can read its IP addresses from the front panel (see paragraph "LCD display and keypad"), except for IQOYA X/LINK-LE where the IP addresses are written on the inserted SDHC card at startup (the SD card is not delivered by Digigram).



Make sure all other devices connected to this LAN are in the same subnet and have different IP addresses (this includes the PC from which you will connect to the IQOYA codec to configure).

WARNING:

- Eth1, Eth2, Eth3 and Eth4 must belong to different subnetworks.
- Eth1, Eth3 and Eth4 are Gbits interfaces.
- Eth2 is a 100 Mbits/s interface. It is recommended to use one of the other interfaces for LAN audio connectivity (AES67, RAVENNA, Livewire).

## 5.3 Enabling / disabling the hardware bypass function

IQOYA X/LINK, X/LINK-LE and X/LINK-DUAL allow for the hardware bypass of audio inputs to audio outputs in case of power supply failure. This concerns analog inputs & outputs 1&2, and AES/EBU input & output 1.



# 5.4 Powering up IQOYA X/LINK

It is recommended to establish all connections before powering up the device.

IQOYA X/LINK features two internal hot swappable redundant power supply units. It is recommended to connect the two power cords. However, only one cord may be used.

IQOYA X/LINK starts as soon as it is connected to the mains.

# 5.5 Steps to follow to configure IQOYA X/LINK in "Program Distribution" mode of use

Set the global parameters of your IQOYA X/LINK If IQOYA is used for encoding:

- Adjust the parameters of the audio inputs: type (analog, AES3, AES67, RAVENNA, Livewire), and gain.
- Declare the programs (encodings)
- Declare the IP services to be streamed over IP (IP audio streams)

If IQOYA is used for decoding:

 Adjust the parameters of the audio outputs: type (analog, AES3, AES67, RAVENNA, Livewire), and gain.



- Declare the IP services to be received from the network (IP audio stream)
- Declare the output program(s)
- Check the status and metrics on the output programs.

If IQOYA is used for transcoding:

- Declare the IP services to be received from the network
- Declare the programs to be decoded from the received IP services, and assign them to internal audio buses.
- Declare the input programs (select audio buses as the sources of these input programs)
- Declare the IP services to be streamed over IP
- Check the status and metrics on the output programs.

5.6 Steps to follow to configure IQOYA X/LINK in "Remote Broadcasting" mode of use

- Set the network parameters of your IQOYA X/LINK
- Adjust the parameters of the audio inputs: name, type (analog, AES3, AES67, RAVENNA, Livewire), and gain.
- Adjust the parameters of the audio outputs: name, type (analog, AES3, AES67, RAVENNA, Livewire), and gain.
- Declare the SIP accounts
- Declare the IP codec instances



# 6 Accessing IQOYA X/LINK WEB pages

From a WEB browser, connect to the IQOYA X/LINK WEB pages:

- for a network connection through Eth1 port, enter https://192.168.0.100 (this is the default IP address of Eth1).
- for a network connection through Eth2 port, enter https://192.168.1.100 (this is the default IP address of Eth2).
- for a network connection through Eth3 port, enter https://192.168.2.100 (this is the default IP address of Eth3).
- for a network connection through Eth4 port, enter https://192.168.3.100 (this is the default IP address of Eth4).

The WEB browser displays a message about security certificate. Select the option that allows to continue with this WEB server.

Enter the requested username and password. The default administrator login is:

username = iqoya

password = iqoya

IQOYA X/LINK supports three categories of users: Administrator, User, Read only

#### • "Administrator" category

A user from the "Administrator" category has all the access rights on the WEB pages.

The login to the embedded WEB server as "Administrator" is:

- username: iqoya

- default password: iqoya

Username and password can only be modified when logged as Administrator. See <u>Preferences -></u> <u>System -> Password.</u>

### • "User" category

A user from the "User" category has limited access rights. "Write" access is limited to the audio parameters (audio format, source/target IP address and UDP port).

The login to the embedded WEB server as "User" is:

- username: user

- default password: user

Username and password can only be modified when logged as Administrator. See <u>Preferences -></u> <u>System -> Password.</u>

### • "Read-only" category

A user from the Read-only category only has "Read" access rights. He cannot modify a single parameter of the codec.

The login to the embedded WEB server as "Read-only" is:

- username: guest

- default password: guest

Username and password can only be modified when logged as Administrator. See <u>Preferences -></u> <u>System -> Password.</u>



### Once the login has passed:

• In "Program Distribution" mode of use the "Properties" WEB page is displayed. This is the home page.

|          | Preferences - System                       | - Properties (home page) | Apply | Cancel |
|----------|--|--------------------------|-------|--------|
|          | Hostname                                   | iqoya                    |       |        |
|          | Device name                                | XLINK                    |       |        |
| <b>O</b> | Localization                               | English                  |       |        |
|          | Serial number                              | 2457.00020000            |       |        |
|          | Firmware version                           | 01.02b066                |       |        |
|          | Date                                       | 25/07/2018 15:25:51      |       |        |
|          | Plateform ID                               | 3F32-C7BF-77F3-3299-A030 |       |        |
| <i>:</i> |  |                          |       |        |
|          | Supported options                          |                          |       |        |
| 3        | Number of mono channels for<br>transcoding | 0                        |       |        |
|          | Number of AES67 mono channels              | 2                        |       |        |
|          | Number of aptX mono channels               | 0                        |       |        |
|          | Audio synchronization pack                 | Available                |       |        |
|          | AES/EBU transparency                       | Available                |       |        |
|          | Multi-protocol streaming                   | Available                |       |        |
|          | Latest firmware version                    | v00.00a999               |       |        |
|          | Support contract validity date             | 2018-01-01               |       |        |



• In "Remote Broadcasting" mode of use the "Operations" WEB page is displayed. This is the home page.



# 7 Configuration from the WEB pages

Click on the "value" field of a parameter to enter the edit mode. The background colour of all the parameters that can be modified becomes white.

Select/Enter the appropriate values for the parameters of the page, and click on "Apply" on the top right of the page to confirm the settings, or "Cancel to ignore the changes.

# 8 WEB pages organization

# 8.1 WEB pages organization in "Program Distribution" mode of use

The WEB pages are organized in categories which are always accessible from the left side of the WEB pages.

| Icon     | Category    | Description  |
|----------|-------------|--|
|          | Home page   | Displays the properties of the unit as well as its software options                                  |
| 00       | Preferences | Global parameters of the unit.   |
| Ģ        | Audio I/Os  | Audio inputs and outputs parameter settings: name, type selection, audio level adjustment, vu-meters |
| <u>2</u> | Encoders    | Settings of programs (encodings of audio inputs) and IP services (streaming of programs).            |
| *        | Decoders    | Settings of IP services to be received, and associated audio programs to be decoded to the outputs.  |
| 22       | Status      | Display the status of all the encoders and decoders, as well as the alarms.                          |
| ?        | Help        | About IQOYA X/LINK and this user manual.   |



# 8.1.1 "Preferences" category of menus

| Preference  | s                                     |  | Click on to display all the availables menus.  |
|---|---------------------------------------|--|--|
| 08  | Preferences                           | ed program(s)  | Move the mouse pointer above the menus to display the submenus. Click on a sub-menu to display the |
|   | System                                | > System   | corresponding page.  |
| <ul> <li>○</li> <li>★</li> <li>★</li> <li>★</li> <li>₹</li> <li>₹</li></ul> | Services<br>Network<br>Auxillary data | Properties (home page)<br>Audio clock<br>Audio setup<br>Alarm setup<br>Logs<br>Download / Upload<br>SD card<br>SD card backup<br>Firmware update<br>Password<br>Shutdown / restart |  |



### 8.1.1.1 Preferences -> System

# 8.1.1.1.1 Preferences -> System -> Properties

|          | Preferences - System - Properties (home page) Apply Cancel |                          |  | Cancel |
|----------|--|--------------------------|--|--------|
|          | Hostname   | iqoya                    |  |        |
|          | Device name  | XLINK                    |  |        |
| ନ        | Localization   | English                  |  |        |
|          | Serial number  | 2457.00020000            |  |        |
| <u> </u> | Firmware version   | 01.02b066                |  |        |
|          | Date   | 25/07/2018 15:25:51      |  |        |
|          | Plateform ID   | 3F32-C7BF-77F3-3299-A030 |  |        |
|          |  |                          |  |        |
|          | Supported options  |                          |  |        |
| ?        | Number of mono channels for<br>transcoding                 | 0                        |  |        |
|          | Number of AES67 mono channels                              | 2                        |  |        |
|          | Number of aptX mono channels                               | 0                        |  |        |
|          | Audio synchronization pack                                 | Available                |  |        |
|          | AES/EBU transparency                                       | Available                |  |        |
|          | Multi-protocol streaming                                   | Available                |  |        |
|          | Latest firmware version                                    | v00.00a999               |  |        |
|          | Support contract validity date                             | 2018-01-01               |  |        |

| Parameter                                     | Read/Write | Meaning  |  |  |
|---|------------|--|--|--|
| Hostname                                      | R/W        | Logical name given to the device on the network.                               |  |  |
| Device Name                                   | R/W        | Name given to the equipment  |  |  |
| Localization                                  | R/W        | Language   |  |  |
| Serial number                                 | R          | Serial number of the unit. This number is set in factory and cannot be changed |  |  |
| Firmware version                              | R          | Version of the firmware running on the unit. The firmware can be update.       |  |  |
| Date  | R/W        | Date and time of the unit.   |  |  |
| Platform ID                                   | R          | Identifier of the unit. this number is required for applying firmware options. |  |  |
| Supported Options                             |            |  |  |  |
| Number of mono<br>channels for<br>transcoding | R          | Number of mono channels supported for transcoding through internal buses.      |  |  |



| Number of AES67<br>mono channels | R | Number of mono input and output channels on AES67 or Ravenna, or Livewire                                     |
|----------------------------------|---|---|
| Number of aptX<br>mono channels  | R | Number of mono channels to be processed in aptX   |
| Audio synchronous<br>pack        | R | Value 1: the codec features the audio synchronization via NTP<br>Value 0 : the option is not installed.       |
| AES/EBU<br>transparency          | R | Value 1: the codec allows for AES transparency transport.<br>Value 0; the option is not installed.            |
| Multiprotocol<br>streaming       | R | Value 1: the codec features the multiprotocol streaming.<br>Value 0: the option is not installed              |
| Latest firmware version          | R | Maximum firmware version number authorized by the ongoing support contract.                                   |
| Support contract validity date   | R | Defines the date until when the firmware can be updated/upgraded according to the purchased support contract. |

#### 8.1.1.1.2 Preferences -> System -> Audio Clock

This page allows defining the X/LINK sampling clock source .

| Preferences - System - Audio clock |          |   | Apply | Cancel |
|------------------------------------|----------|---|-------|--------|
| Device clock                       | Internal | • |       |        |
| Master clock                       | None     | • |       |        |

#### **Device clock**

The clock source can be:

- Internal: on-board clock
- Extracted from an AES/EBU input (not available on X/LINK-AES67)
- A PTP clock (AES67, RAVENNA)
- A Livewire clock

The clock sampling frequency value is set from Preferences->Audio setup.

#### Master clock

Allows defining if the codec generates a PTP clock.



#### 8.1.1.1.2.1 PTP clock source

The following parameters appear when the mode "PTP AES67 Slave" is selected:

| 00 |                             | Device clock            | PTP AES67 (slave)         |  |
|----|-----------------------------|-------------------------|---------------------------|--|
|    |                             | PTP configuration       |                           |  |
| 9  |                             | Transport               | Multicast                 |  |
| 1  |                             | Domain number 7         |                           |  |
|    |                             | Mechanism               | Syntonized only           |  |
|    |                             | Network interface       | lan1 🔻                    |  |
|    |                             | IGMPv3 filtering mode   | Include v                 |  |
|    | IGMPv3 IP source addresses: |                         |                           |  |
|    |                             | IP address 1            | 192.168.1.20              |  |
| ?  |                             |                         |                           |  |
|    |                             | DSCP                    | Expedited Forwarding (EF) |  |
|    |                             | PTP advanced settings   |                           |  |
|    |                             | Clock offset threshold  | 0.5 sample 🔹              |  |
|    |                             | Slave clock sensitivity | 500                       |  |

| Transport         | R/W | Allows specifying if the PTP clock is unicast or multicast.   |
|-------------------|-----|---|
| Domain number     | R/W | PTP clock domain number (from 0 to 128)   |
| Mechanism         | R/W | <ul> <li>Syntonized: means that IQOYA's clock is the same as the Grandmaster PTP, but they are not synchronous (delay between the two clocks).</li> <li>Synchronous clock is obtained thanks to E2E or P2P modes, which serve to compensate the delay between Grandmaster PTP clock and IQOYA.</li> <li>E2E is a more universal setting (it consists of requests and answers between the node (IQOYA) and the Grandmaster PTP clock unit).</li> <li>P2P provides higher clock sync precision but requires full PTP support from all participating switches (between IQOYA and related clock master.)</li> <li>In case the PTP clock is generated by an IQOYA, the PTP mechanism must be the same as in the IQOYA master: syntonized.</li> </ul> |
| Network interface | R/W | Select the network interface that receives the PTP  |



| IGMPv3 filtering mode       | R/W              | Off: X/LINK subscribes to the multicast PTP clock which can be generated by any source IP address.<br>Include: X/LINK subscribes to the multicast PTP clock which is generated only by the listed source IP addresses.<br>Exclude: X/LINK subscribes to the multicast PTP clock which is generated by any source IP address, with exception of the listed IP addresses. |  |
|-----------------------------|------------------|---|--|
| IGMPv3 IP source addresse   | es               |   |  |
| IP address x                | R/W              | Allows declaring the source IP addresses to be included or excluded. Click on to add an IP@ to the list.  |  |
| DSCP                        | <sup>"</sup> R/W | QoS assigned to the PTP frames. Select the value from the drop down list. For optimal QoS on PTP, "Expedited forwarding (EF)" value is recommended.   |  |
| PTP advanced settings       |                  |   |  |
| Clock offset threshold R/W  |                  | This parameter defines the condition for being synchronized to the PTP clock. The lower the value, the better the phase with the PTP clock. Lower values require a deterministic network. For networks that introduce an erratic jitter to the PTP frames, the value must be increased. Default value is 0.5 sample. It can be increased up to 64 samples.              |  |
| Slave clock sensitivity R/W |                  | It defines the sensibility of the slave clock to the PTP packet jitter. Enter a value between 500 (for a high sensitivity) and 100 (for a low sensitivity). Default value is 500  |  |

The *clock offset distribution* section displays information about the received PTP clock.
| Clock offset distribution  |   |                     |
|----------------------------|---|---------------------|
| Current offset             | -1070423 ns                                 |                     |
| Status / Master clock info | Not sync / 00-00-00-00-00-00-00:0 / 0.0.0.0 |                     |
| Reset metrics              | Reset                                       |                     |
| [0 - 2604 ns [             | 4.02  | 529/13175 measures  |
| [2604 - 5208 ns [          | 0%  | 0/13175 measures    |
| [5208 - 7813 ns [          | 0%  | 0/13175 measures    |
| [7813 - 10417 ns [         | 0%  | 0/13175 measures    |
| [10417 - 15625 ns [        | 0%  | 0/13175 measures    |
| [15625 - 20833 ns [        | 0%  | 0/13175 measures    |
| [20833 - 41667 ns [        | 0%  | 0/13175 measures    |
| [41667 - 62500 ns [        | 0.105                                       | 17/13175 measures   |
| [62500 - 83333 ns [        | dans -                                      | 103/13175 measures  |
| [83333 - 166667 ns [       | 3.2   | 432/13175 measures  |
| [166667 - 333333 ns [      | 7.64%                                       | 1007/13175 measures |
| [333333 - 666667 ns [      | 12.01%                                      | 1582/13175 measures |
| [666667 - 1333333 ns [     | 28.38%                                      | 3476/13175 measures |
| [1333333+ ns [             | 45.78%                                      | 6029/13175 measures |
| Min Offset                 | -2535582 ns                                 |                     |
| Max Offset                 | 0 ns  |                     |
| Max Jitter                 | 109 µs                                      |                     |
| Path delay                 | 0 µs  |                     |
| Errors                     | 0   |                     |

# 8.1.1.1.2.2 Livewire (Slave)

# The following parameters appear when the mode "Livewire Slave" is selected:

| O.       | Device clock           | Livewire (slave) | • |
|----------|------------------------|------------------|---|
|          | Livewire configuration |                  |   |
| ନ        |                        |                  |   |
|          | Network interface      | lan4             | • |
| <u>1</u> | IGMPv3 filtering mode  | Off              | ٠ |

| Network interface     | R/W | Select the network interface that receives the livewire clock.  |
|-----------------------|-----|---|
| IGMPv3 filtering mode | R/W | Off: X/LINK subscribes to the Livewire clock which can be generated by any source<br>IP address.<br>Include: X/LINK subscribes to the Livewire clock which is generated only by the<br>listed source IP addresses.<br>Exclude: X/LINK subscribes to the Livewire clock which is generated by any<br>source IP address, with exception of the listed IP addresses. |



| IGMPv3 IP source addresse | es  |   |
|---------------------------|-----|---|
| IP address x              | R/W | Displayed if IGMPv3 filtering mode is set to "Exclude" or "Include". Allows declaring the source IP addresses to be included or excluded. Click on to add an IP@ to the list. |

#### The *clock offset distribution* section displays information about the received Livewire clock.

| lock offset distribution   |               |       |  |                  |
|----------------------------|---------------|-------|--|------------------|
| Current offset             | 0             | ns    |  |                  |
| Status / Master clock info | Not sync / 0. | 0.0.0 |  |                  |
| Reset metrics              | Reset         |       |  |                  |
| [0 - 2604 ns [             | 0%            |       |  | 0/0 measures     |
| [2604 - 5208 ns [          | 0%            |       |  | 0/0 measures     |
| [5208 - 7813 ns [          | 0%            |       |  | 0/0 measures     |
| [7813 - 10417 ns [         | 0%            |       |  | 0/0 measures     |
| [10417 - 15625 ns [        | 0%            |       |  | 0/0 measures     |
| [15625 - 20833 ns [        | 0%            |       |  | 0/0 measures     |
| [20833 - 41667 ns [        | 0%            |       |  | <br>0/0 measures |
| [41667 - 62500 ns [        | 0%            |       |  | 0/0 measures     |
| [62500 - 83333 ns [        | 0%            |       |  | 0/0 measures     |
| [83333 - 166667 ns [       | 0%            |       |  | 0/0 measures     |
| [166667 - 333333 ns [      | 0%            |       |  | 0/0 measures     |
| [333333 - 666667 ns [      | 0%            |       |  | 0/0 measures     |
| [666667 - 1333333 ns [     | 0%            |       |  | 0/0 measures     |
| [1333333+ ns [             | 0%            |       |  | 0/0 measures     |
| Min Offset                 | 0             | ns    |  |                  |
| Max Offset                 | 0             | ns    |  |                  |

Click on "Apply" to confirm your choice.

# 8.1.1.1.3 Preferences -> System -> Audio setup

This page allows setting the processing granularity and the working sampling frequency value IQOYA X/LINK

|     | Preferences - System - Audio | setup    | Apply Cancel |
|-----|------------------------------|----------|--------------|
| 102 | Processing granularity       | 1 ms     |              |
|     | Sampling frequency           | 48000 Hz |              |

Click on a parameter field to be able to change the values.

| Parameter              | Description  |
|------------------------|--|
| Processing granularity | This is the smallest amount of data processed at a time by IQOYA. The lower the processing granularity, the lower the latency. Possible values are 1ms, 2ms, 3 ms, 4 ms. |



.

|                    | However, a value of 1ms may lead to audio underruns, depending on the features enabled on IQOYA. In case this happens, it is necessary to increase the processing granularity value.<br>Note: the payload size of an IP frame is adjustable via parameter Payload size, from the Send page (see paragraph Encoder parameters configuration).   |
|--------------------|--|
| Sampling frequency | It defines the working sampling frequency of IQOYA. Note that received and generated IP streams can carry audio at a different sampling frequencies (in which case a high quality frequency change is applied).<br>When sampling frequency is set to 48 kHz, IP streams can be at 48 kHz, 32 kHz, 16 kHz (G722), and 8 kHz (G711). Note that 44.1 kHz is allowed for a HTTP stream.<br>When sampling frequency is set to 44.1 kHz, IP streams must be at 44.1 kHz. |

Click on "Apply" to confirm your changes.

#### 8.1.1.1.4 Preferences -> System -> Alarms setup

Each alarm occurring on IQOYA can be written in a log file, or/and sent to a GPO, or/and signalled as an SNMP trap (not available in the first firmware version).

The "Alarms setup" page allows enabling/disabling each alarm notifications

|      | Alarm Name                          | Log Trace | SNMP Trap | GPO |
|------|-------------------------------------|-----------|-----------|-----|
| Sys  | lem log cleared                     | Yes       | Yes       | No  |
| Eth  | ) cable unplugged                   | Yes       | Yes       | No  |
| Eth  | I cable unplugged                   | Yes       | Yes       | No  |
| Clo  | k sync failed                       | Yes       | Yes       | No  |
| Aud  | io clock failed                     | Yes       | Yes       | No  |
| Rec  | undant power supply failed          | Yes       | Yes       | No  |
| Ten  | perature failed                     | Yes       | Yes       | No  |
| Fan  | failed                              | Yes       | Yes       | No  |
| Ser  | al input silent                     | Yes       | Yes       | No  |
| Sen  | d serial overflow                   | Yes       | Yes       | No  |
| Rec  | eive serial overflow                | Yes       | Yes       | No  |
| Ana  | log audio input silent              | No        | No        | No  |
| Digi | tal audio input silent              | No        | No        | No  |
| Rec  | eive failed                         | Yes       | Yes       | No  |
| Rec  | eive main source failed             | Yes       | Yes       | No  |
| Rec  | eive backup source failed           | Yes       | Yes       | No  |
| Rec  | elve secondary backup source failed | Yes       | Yes       | No  |

Click on a parameter field to be able to change the values.

Click on "Apply" to confirm your changes.

## Available alarms



| System log cleared            | Log file has been<br>cleared   |
|-------------------------------|--|
| Eth0 cable unplugged          | No connection of Eth0  |
| Eth1 cable unplugged          | No connection of Eth1  |
| Clock sync failed             | External synchro failure<br>(PTP, NTP)                                 |
| Audio clock failed            | Audio sampling clock<br>failure  |
| Redundant power supply failed | PSU failure  |
| Temperature failed            | Temperature too high   |
| Fan failed                    | Internal fan failure   |
| Serial input silent           |  |
| Send serial overflow          |  |
| Receive serial overflow       |  |
| Analog audio input<br>silent  | Silence detected on the analog input according the criteria of silence |
| Digital audio input silent    | Silence detected on the analog input according the criteria of silence |

| Receive failed  | No available defined IP<br>stream on the output<br>program   |
|---|--|
| Receive main source failed                            | Priority 1 of the output program is not available  |
| Receive backup source failed                          | Priority 2 of the output program is not available  |
| Receive secondary backup source failed                | Priority 3 of the output program is not available  |
| Receive sync failed                                   |  |
| Receive main source disabled                          | Priority 1 on the output program is disabled   |
| Receive backup source disabled                        | Priority 2 on the output program is disabled   |
| Receive secondary backup source disabled              | Priority 3 on the output program is disabled   |
| Receive main source primary stream failed             | In case of streaming with<br>FEC on priority 1, this<br>means that the primary<br>stream is lost on priority 1 |
| Receive backup source primary<br>stream failed        | In case of streaming with<br>FEC on priority 2, this<br>means that the primary<br>stream is lost on priority 2 |
| Receive secondary backup source primary stream failed | In case of streaming with<br>FEC on priority 3, this<br>means that the primary<br>stream is lost.              |
| Receive main source<br>redundancy stream failed       | In case of streaming with<br>FEC on priority 1, this<br>means that the FEC is lost.                            |
| Receive backup source<br>redundancy stream failed     | In case of streaming with<br>FEC on priority 2, this<br>means that the FEC is lost.                            |
| Receive silent  | Audio in the IP stream is silent according to the silence criteria.  |



#### 8.1.1.1.5 Preferences -> System -> Logs

| Preferences - Sys               | stem -  | Logs                            | Download logs  | R   | eset logs |
|---------------------------------|---------|---------------------------------|----------------|-----|-----------|
| Event Type : A<br>Codec : A     |         | <b>v</b>                        | Auto refresh : | Yes | •         |
| Date & Time ↓ = EventType       | e Codec | Message                         |                |     |           |
| 2018/11/16 14:13:19.362 INFO    |         | Temperature failed alarm is OFF |                |     |           |
| 2018/11/16 14:13:18.052 WARNING |         | Temperature failed alarm is ON  |                |     |           |
| 2018/11/16 10:29:23.470 INFO    | Codec 4 | Receive silent alarm is OFF     |                |     |           |
| 2018/11/16 10:29:23.467 INFO    | Codec 3 | Receive silent alarm is OFF     |                |     |           |
| 2018/11/16 10:29:23.463 INFO    | Codec 2 | Receive silent alarm is OFF     |                |     |           |
| 2018/11/16 10:29:23.461 INFO    | Codec 1 | Receive silent alarm is OFF     |                |     |           |
| 2018/11/16 10:29:19.530 WARNING | Codec 4 | Receive silent alarm is ON      |                |     |           |
| 2018/11/16 10:29:19.526 WARNING | Codec 3 | Receive silent alarm is ON      |                |     |           |

This page allows viewing and downloading the log file of IQOYA X/LINK. This log file gives information about the internal behaviour of IQOYA, and is useful for advanced diagnostics. Traces of enabled alarms are written into this log file (alarm ON, alarm OFF). This log file is stored internally and is persistent to a power cycle, a restart or reboot.

**Event Type**: allows selecting the category of traces to be displayed: Infos, Warnings, Errors, Errors & Warnings. **Codec**: allows selecting one of the coedcs so that only log traces related to this codec are displayed. The number of the codec can be seen from the Send/IP Services page, and from the Receive/ Programs page. **Auto refresh:** The page content is refreshed automatically if this parameter is set to "Yes".

**Date & Time:** clicking on this icon allows to sort out the traces by date and time, starting by most recent traces or starting by oldest traces.

**Reset logs**: resets all the traces.

**Download logs:** allows remotely downloading the log traces.

## 8.1.1.1.6 Preferences -> System -> Download / Upload

This page allows downloading the IQOYA configuration to a remote PC, or uploading a configuration from a remote PC to IQOYA.

| -           | Upload   |   |
|-------------|----------|---|
| <b>19</b> 6 | Action   | Upload audio configuration file from local disk 🔹 |
| 0           | File     | Browse  |
|             | Download |   |
|             | Action   | Audio configuration                               |
|             |          | Download  |

To save the current configuration of IQOYA to a remote PC, click on "Download".

To apply a configuration to IQOYA, click on "Browse" to select the configuration file, and click on "Apply".

The configuration that can be uploaded/downloaded can be:



- The audio configuration only (includes the programs and IP services)
- The full codec configuration

In addition, the html file which allows to view all the parameters of the codec can be downloaded. From the download section, select " Device Information", and download.

#### 8.1.1.1.7 Preferences -> System -> SD card

This page allows:

- mounting an SDHC card if it is inserted while the unit is running,
- unmounting it before removing it from the front panel.
- Viewing the SDHC card status: mounted/unmounted



#### 8.1.1.1.8 Preferences -> System -> SD card backup

The codec configuration can be saved to SDHC card or loaded from it.

| 88 | Copy configuration | •  |
|----|--------------------|--|
|    |                    | From SD Card to device<br>From device to SD Card |
|    |                    |  |

• From the "Copy configuration" field, select whether the configuration has to be copied from the SDHC card to IQOYA's internal memory or from the internal memory to the SDHC card.

Notes:

- Audio activity is stopped when the configuration is loaded from the SDHC card.
- The unit is restarted to apply the new configuration.
- On the SDHC card, the configuration file "IQOYA\_Configuration\_save.tar" is stored in folder \IQOYA\_LINK\Config.
- The current configuration of the IQOYA codec can also be displayed from a WEB browser by selecting the file \IQOYA\_LINK\ Config.html, accessible via FTP.
- The configuration saved on the SDHC card can be loaded from the IQOYA X/LINK front panel LCD display and keyboard (menu System)
- This configuration on SDHC card can also be loaded when starting IQOYA with the SD card inserted. The file "/SDCARD/iqoya\_link/run\_once/ boot\_commands.txt" must contain the following line: RESTORE\_FULLCONFIG\_FROMSD=Yes

#### 8.1.1.1.9 Preferences -> System -> Firmware update

IQOYA can be updated with a new firmware, a patch, or an optional license. The first phase of the update consists in uploading and checking the software package; during this phase, the audio activity is not stopped. The second phase consists in applying the uploaded package; audio activity is stopped during this phase. Two firmware versions are stored locally: the currently running version, and the previous version. This allows to go back to the previous firmware version if an issue is experienced with the more recent version, without having to go through an upload.



| Preferences - System - Firmw        | vare update Apply Cancel                             |
|-------------------------------------|--|
| Action                              | Upload a package (firmware, patch or licence update) |
| Package filename                    | Browse   |
|                                     |  |
| Versions                            |  |
| Last uploaded package               | none   |
| Current running firmware            | 01.02c015  |
| Previous firmware                   | none   |
|                                     |  |
| Options                             |  |
| Copy firmware to SD card on install | No ve  |
|                                     | No   |

Click on the "Action" field, and click on the arrow to display the list of possible actions.

|            | Preferences - System - Firmware update |  |  |
|------------|--|--|--|
|            | Action                                 | ×  |  |
|            |  | Upload a package (firmware, patch or licence update)   |  |
| $\bigcirc$ | Versions                               | Check last uploaded package<br>Check previous firmware package<br>Install last uploaded package (commit) |  |
|            | Last uploaded package                  | Install previous firmware package (rollback)<br>Remove last uploaded package                             |  |
| <u> </u>   | Current running firmware               | Remove previous firmware package   |  |

Select the appropriate action through the list.

For a firmware update, select "Upload a package", and click on "Browse" to select the file to be uploaded. Click on "Apply" to start the upload. Audio activity is not stopped during the upload.

Once the package upload is completed, select the action "Install last uploaded firmware", and click on "Apply". Applying the firmware stops the audio activity. The equipment restarts automatically.

The following operations are also possible from the "Action" drop-down menu:

- Check previous firmware package: this allows checking that the previous firmware version that is stored locally is correct.
- **Check last uploaded package**: this allows checking that the last uploaded firmware version is correct. This operation is done automatically during the upload phase.
- **Install previous firmware package** (rollback): this allows installing a previous version of the firmware that is stored locally. This is a firmware downgrade.
- **Remove last uploaded package**: this allows deleting the last uploaded package. This means that this package will not be installed.



• **Remove previous uploaded package**: this allows deleting the previous uploaded package. This means that an upload is necessary for a firmware downgrade.

#### Copy firmware to SD card on install

Set to Yes, this parameter allows copying to the SD card the firmware to be installed to facilitate a future possible firmware rollback. Exemple:

- Firmware to be upload and applied: version A
- Copy to SD card set to Yes
- Firmware to upload and applied: version B
- Copy to SD card set to Yes
   => Current firmware = version B / Previous firmware = version A
   At this point version A can be re-installed without the upload phase.

#### 8.1.1.1.10 Preferences -> System -> Password

This page allows changing the username and password for a given user category. This can be done when logged to the IQOYA as Administrator.

| Preferences - System - Password |                 |  |  |
|---------------------------------|-----------------|--|--|
| Profile                         | Administrator 🔹 |  |  |
| Login                           | iqoya           |  |  |
| Old password                    |                 |  |  |
| New password                    |                 |  |  |
| New password again              |                 |  |  |

First select the profile for which credentials have to be changed.

| Preferences - System - Password |                 |  |  |
|---------------------------------|-----------------|--|--|
| Profile                         | Administrator 🔹 |  |  |
| Login                           | Administrator   |  |  |
| Old password                    | User            |  |  |
| New password                    | Guest           |  |  |
| New password again              |                 |  |  |

Login: allows configuring the username to be used in order to log to the WEB GUI with the selected profile.

**Old password**: Type the current password **New password**: Type the new password



# **New password again**: confirm the new password Click on "Apply" to confirm the changes.

8.1.1.1.11 Preferences -> System -> Shutdown / Restart This page allow to restart or shutdown IQOYA.

|  | Preferences - System - Shutdown / Restart             |   | Click on the appropriate action.      |  |
|--|---|---|---------------------------------------|--|
| <b>\$</b>                                |   | A Confirm to restart the                      |                                       |  |
| Shutdown the machine Restart the machine |   | Restart the machine                           | machine                               |  |
|  | Click on the following button to shutdown the machine | Click the button below to restart the machine | Are you sure to restart the machine ? |  |
|  | O Shutdown  | C Restart                                     | ✓ Confirm ★ Cancel                    |  |
|  |   |   |                                       |  |

Confirm or cancel your choice through the displayed confirmation window.

#### 8.2.3.1.11 Preferences -> System -> Switch mode of use

This page allows switching from "Program Distribution" mode of use to "Remote Broadcasting" mode of use and vise versa:





| To switch to "Remote Broadcasting" mode of use, click through the displayed confirmation window: |                              |  | For remote<br>broadcasting | button then confirm your choice |
|--|------------------------------|--|----------------------------|---------------------------------|
|  | A Confirm mode of use change |  |                            |                                 |



#### 8.1.1.2 Preferences -> Services

This menu allows configuring the "network" services of IQOYA.



## 8.1.1.2.1 Preferences -> Services -> NTP

This page allows:

- configuring the date and time synchronization to an NTP server.
- enabling the optional feature "audio synchronization on NTP clock".

NTP service is disabled by default.

|    | Preferences - Service | s - NTP Apply Cance |  |
|----|-----------------------|---------------------|--|
| 08 | Service activation    | No                  |  |
|    | Service status        | Stopped             |  |
| 0  | Server IP address     | 192.168.0.200       |  |

Click on the **"service activation"** field to activate/deactivate the NTP service. Select "Yes" to activate it. Enter then the IP address of the NTP server.

In case you just need to activate the date and time NTP synchronization, click on "Apply". The status of the service is displayed in the field "Service status".

| Service activation        | Yes                    |                    |
|---------------------------|------------------------|--------------------|
| Service status            | Running, synchronized  |                    |
| Server IP address         | fr.pool.ntp.org        |                    |
| Audio synchronization     |                        |                    |
| Sync audio on NTP clock   | Yes                    |                    |
| Clock offset distribution |                        |                    |
| Current offset            | 0 US Reset NTP metrics | Reset              |
| [0 ; 250 µs[              | 100%                   | 8593/8593 measures |
| [250 ; 500 µs[            | 0%                     | 0/8593 measures    |
| [500 ; 750 µs[            | 0%                     | 0/8593 measures    |
| [750 ; 1000 µs[           | 0%                     | 0/8593 measures    |
| [1000 ; 2500 µs[          | 0%                     | 0/8593 measures    |
| [2500 ; 5000 µs[          | 0%                     | 0/8593 measures    |
| [5000 ; 7500 µs[          | 0%                     | 0/8593 measures    |
| [7500 ; 10000 µs[         | 0%                     | 0/8593 measures    |
| [10000 ; 15000 µs[        | 0%                     | 0/8593 measures    |
| [15000 ; 20000 µs[        | 0%                     | 0/8593 measures    |
| [20000 ; 50000 µs[        | 0%                     | 0/8593 measures    |
| [50000 ; 75000 µs[        | 0%                     | 0/8593 measures    |
| [75000 ; 100000 µs[       | 0%                     | 0/8593 measures    |
| [100000 ; + µs[           | 0%                     | 0/8593 measures    |

For activation of the NTP based audio synchronization, select "Yes" for parameter "Sync audio on NTP clock".

Once IQOYA is synchronized on the NTP server, the field "Service status" displays "Running, synchronized". This requires that the software option is installed on the IQOYA X/LINK, as well as on the associated IQOYA decoders.

## 8.1.1.2.2 Preferences -> Services -> FTP

FTP is useful typically for managing the backup playlists and sound files on IQOYA's internal storage (uploading/deleting).

FTP service is disabled by default.

|              | Preferences - Service  | s - FTP                        | Apply Cancel | Click on the "Service activation" field.<br>Select "Yes" to enable the FTP   |  |
|--------------|--|--------------------------------|--------------|--|--|
| <b>*</b> C ( | Service activation<br>Service status<br>Port<br>Bandwidth limitation | Yes<br>Running<br>21<br>0 kb/s |              | service, "No" to disable it.<br>If necessary, you may change the<br>port used for FTP (default value is<br>21).<br>Parameter "Bandwidth limitation"<br>allows limiting the network<br>bandwidth of the FTP traffic.<br>Click on "Apply" to confirm the |  |
|              |  |                                |              |  |  |



Note that backup playlists and sound files have to be stored in folder DEVICE\_STORAGE.

#### 8.1.1.2.3 Preferences -> Services -> SSH

This page allows enabling/disabling the SSH service on IQOYA. SSH is mainly to be used by Digigram technical support for advanced diagnostics.

|    | Preferences - Services - SSH |         |  |  |  |  |
|----|------------------------------|---------|--|--|--|--|
| 0Ê | Service activation           | Yes     |  |  |  |  |
|    | Service status               | Running |  |  |  |  |

# 8.1.1.2.4 Preferences -> Services -> SNMP

This page allows setting the SNMP parameters. It also displays the System group MIB-II information.

|   | Preferences - Service    | s - SNMP             | Apply Cancel |
|---|--------------------------|----------------------|--------------|
|   | Service activation       | No                   |              |
|   | Service status           | Stopped              |              |
| ନ | Trap Address 1           | 127.0.0.1            |              |
|   | Trap Address 2           |                      |              |
|   | Trap Address 3           |                      |              |
|   | Trap Address 4           |                      |              |
| 3 | Trap Address 5           |                      |              |
|   |                          |                      |              |
|   | System group MIB-II info | ormation             |              |
|   | Name                     | IQOYA *SERV/LINK     |              |
|   | Contact                  | support@digigram.com |              |
|   | Location                 | DIGIGRAM             |              |

IQOYA can be controlled and monitored via SNMP (SET, GET, Traps) provided that the SNMP service is activated.

IQOYA can send the SNMP traps to up to 5 SNMP supervisors (Trap addresses 1 to 5). Click on "Apply" to confirm the settings.



#### 8.1.1.2.5 Preferences -> Services -> HTTPS

This page allows setting a bandwidth limitation to the HTTP traffic.

In case the IP audio stream takes almost all the available network bandwidth, the HTTP traffic generated when accessing the WEB pages may disturb the IP audio frames transmission, because the total bandwidth necessary for the IP audio stream plus HTTP traffic may exceed the available network bandwidth.

To avoid this problem, IQOYA offers the possibility to set a bandwidth limitation for the HTTPS traffic.

| ŝ | Preferences - Service | s - HTTPS |      | Apply Cancel |
|---|-----------------------|-----------|------|--------------|
| 0 | Maximum bit rate      | 0         | kb/s |              |
|   |                       |           |      |              |

Click on the "Maximum bit rate" field, and enter the maximum bit rate allowed for HTTPS traffic. Default value is 0, which means no limitation on HTTPS traffic. The smaller the value, the longer it takes to load the WEB page!

Click on "Apply" to confirm the settings.

#### 8.1.1.2.6 Preferences -> Services -> Publish / Discover

This page allows enabling the automatic discovery and publishing of AES67 or RAVENNA streams.

| Preferences - Services - Publish / Discover |         |  | Cancel |
|---|---------|--|--------|
| Service activation                          | Yes     |  |        |
| Service status                              | Running |  |        |

In case you do not use AES67 or RAVENNA audio I/Os, there is no need to activate this service.

| 08           | Preferences    | ervice activation Ye | This menu allows accessing the network configuration of IQOYA |
|--------------|----------------|----------------------|---|
|              | System         | Service status       |   |
| $\mathbf{O}$ | Services       | Port 21              |   |
|              | Network        | Network              |   |
| Ì.           | Auxillary data | LAN1                 |   |
|              |                | LAN2                 |   |
| <b>1</b>     |                | LAN3                 |   |
|              |                | LAN4                 |   |
| <u>_</u>     |                | VLAN                 |   |
| •••          |                | IP routing           |   |
|              |                | HTTP stream provv    |   |

#### 8.1.1.3 Preferences -> Network

## 8.1.1.3.1 Preferences -> Network -> LANx

These pages allow configuring the four network ports of IQOYA X/LINK.



|    | Preferences - Network - lan1   |                         |  |  |  |
|----|--------------------------------|-------------------------|--|--|--|
| O. | Name                           | lan8                    |  |  |  |
|    | Ethernet interface name        | lan1                    |  |  |  |
| ନ  | Status                         | Running v               |  |  |  |
|    | Speed and duplex mode obtained | 1000 Mbit/s full duplex |  |  |  |
|    | Speed and duplex mode asked    | Autonegotiation 🔻       |  |  |  |
| 4  | DHCP                           | On Off                  |  |  |  |
|    | IPv4 address                   | 192.168.1.23            |  |  |  |
|    | Subnet mask                    | 255.255.255.0           |  |  |  |
|    | Gateway                        |                         |  |  |  |
| ?  | Primary DNS                    |                         |  |  |  |
|    | Secondary DNS                  |                         |  |  |  |

Click on a parameter field ("Status" for instance) to enter the editing mode.

| Parameter                      | Туре       | Description  |  |  |
|--------------------------------|------------|--|--|--|
| Name                           | R/W        | Allows giving a name to the interface. This is the name displayed the WEB pages typically for selecting the ethernet interface.  |  |  |
| Ethernet interface name        | Read       | Displays the "real low level" name of the ethernet ports, as they ca<br>be read from the IQOYA back panel. This parameter can't be<br>changed.   |  |  |
| Status                         | Read/Write | This parameter allows enabling/disabling the interface<br>Default value=Running<br>Possible values:<br>Running: ethernet port is enabled.<br>Stopped: ethernet port is disabled  |  |  |
| Speed and duplex mode obtained | Read       | Displays the current speed and mode of the ethernet interface.   |  |  |
| Speed and duplex mode asked    | Read/Write | Allows selecting the working mode of the ethernet interface.<br>Possible values are as follows:<br>Autonegotiation<br>Autonegotiation<br>1000 Mbit/s full duplex<br>100 Mbit/s full duplex<br>100 Mbit/s full duplex<br>10 Mbit/s full duplex<br>10 Mbit/s full duplex<br>10 Mbit/s half duplex<br>10 M |  |  |



| DHCP            | Read/Write                                 | Allows enabling/disabling DHCP (Dynamic Host Configuration<br>Protocol). Default value is OFF (disabled).<br>Click on "On" to enable DHCP. This mode disables the following<br>parameters.   |
|-----------------|--|--|
| IPv4 address    | Read if DHCP is On<br>Write if DHCP is Off | DHCP Off<br>Default value is:192.168.0.100 for Eth1, 192.168.1.100 for Eth2,<br>192.168.2.100 for Eth3, 192.168.3.100 for Eth4<br>Enter the IP address of this ethernet interface.<br>DHCP On<br>Displays the IP address automatically set by DHCP.  |
| Subnet mask     | Read if DHCP is On<br>Write if DHCP is Off | DHCP Off<br>Enter the mask of the subneworkt this ethernet port belongs to.<br>DHCP On<br>Displays the subnetwork mask automatically set by DHCP.  |
| Default gateway | Read if DHCP is On<br>Write if DHCP is Off | <ul> <li>DHCP Off         Enter the default gateway IP address. Streams sent beyond the subnets configured on LAN1 to 4 will pass through this gateway except if specific routing rules has been defined in the IP routing page.         Only one default gateway must be configured for all the ethernet interfaces. If several gateways has to be used, one can be set as default gateway, the others must be the subject of routing rules in the IP routing page.         DHCP On         Displays the default gateway IP address automatically set by DHCI     </li> </ul> |
| Primary DNS     | Read if DHCP is On<br>Write if DHCP is Off | DHCP Off<br>Enter the IP address of the primary DNS (if any).<br>DHCP On<br>Displays the IP address of the DNS automatically set by DHCP.  |
| Secondary DNS   | Read if DHCP is On<br>Write if DHCP is Off | DHCP Off<br>Enter the IP address of the secondary DNS (if any).<br>DHCP On<br>Displays the IP address of the secondary DNS automatically set by<br>DHCP (may be empty).  |

# 8.1.1.3.2 Preferences -> Network -> VLAN

This page allows declaring VLANs on the ethernet interfaces. No VLAN is declared by default. Multiple VLANs can be declared for each ethernet interface.



| A Preference      | es - Network -  | VLAN      |   | For selected VLAN(s) - | + Add VLAN |
|-------------------|-----------------|-----------|---|------------------------|------------|
| <b>c</b>          |                 |           |   |                        |            |
| lick on "+Add VLA | N" to declare a | new VLAN. |   |                        |            |
| Add VLAN          |                 |           | × |                        |            |
| Network interface | eth0 🔻          | 0         |   |                        |            |
| VLAN ID           |                 | 0         |   |                        |            |
| Name              |                 | 0         |   |                        |            |
| Status            | Running         | 0         |   |                        |            |
|                   |                 |           |   |                        |            |

| Parameter         | Туре       | Description  |  |
|-------------------|------------|--|--|
| Network interface | Read/Write | Select the network interface that will support the VLAN (ETH1 to ETH4)   |  |
| VLAN ID           | Read/Write | Enter the VLAN ID in the range 14094. Avoid ids 1002 to 1005 which are reserved.   |  |
| Name              | Read/Write | Enter a logical name for this VLAN   |  |
| Status            | Read/Write | Allows enabling/disabling this VLAN.<br>Select "Running" to enable this VLAN.<br>Select "Stopped" to disable this VLAN.  |  |
| Priority          | Read/Write | Enter the VLAN priority in the range [0-7].  |  |
| IPv4 address      | Read/Write | Enter the IP address of the selected ethernet port within this VLAN.<br>If no value is entered, the IP address is the IP address of the selected<br>ethernet port. |  |
| Netmask           | Read/Write | Enter the netmask for this VLAN interface.<br>If no value is entered, the netmask is the same as the selected<br>ethernet port netmask.                            |  |

8.1.1.3.3 Preferences -> Network -> IP routing

This page allows viewing the current IP routing table, downloading it, and uploading a modified IP routing table.



|          | Preferences - Network - IP r | outing          |                 |           |
|----------|------------------------------|-----------------|-----------------|-----------|
| ¢8       | Upload IP Table              | Browse          |                 |           |
| 0        | Download IP Table            | Download        |                 |           |
|          | Destination                  | Gateway         | Netmask         | Interface |
|          | default                      | 192.168.254.252 | 0.0.0.0         | eth1      |
| 9        | 127.0.0.0                    | *               | 255.0.0.0       | ю         |
| <b>_</b> | 192.168.1.0                  | *               | 255.255.255.0   | eth0      |
|          | 192.168.254.0                | *               | 255.255.255.0   | eth1      |
|          | 255.255.255.255              | *               | 255.255.255.255 | eth0      |

In case the routing table has to be modified, click on "Download".

The routing table can be edited with a standard text editor (such as notepad). You may add IP routes, as described in the downloaded file. Only the additional routes must appear in this file. Routes to directly accessible subnets are not present in this file and need not be added to this file.

**Note**: In case you use more than one ethernet interface, do not declare several gateways. Declare instead one default gateway, for instance on Eth0, and declare routes on other ethernet interfaces through this routing table.

#### 8.1.1.3.4 Preferences -> Network -> HTTP stream proxy

This page allows declaring a proxy used for HTTP streaming.

|          | Preferences - Network - HTT | Apply Cancel |  |
|----------|-----------------------------|--------------|--|
|          | IP address                  |              |  |
|          | Port                        | 80           |  |
| <b>O</b> | Exceptions                  | None         |  |

| Parameter  | Туре       | Description  |
|------------|------------|--|
| IP address | Read/Write | IP address (or domain name) of the HTTP proxy.   |
| Port       | Read/Write | TCP Port for the HTTP proxy (80 by default)  |
| Exceptions | Read/Write | Default is None.<br>Select "Locals" to bypass the HTTP stream proxy for local IP<br>addresses. |

#### 8.1.1.4 Preferences -> Auxiliary data

Ths section allows configuring the tunneling of serial data and status data.

8.1.1.4.1 Preferences -> Auxiliary data -> Serial port

This pages allows enabling/disabling the RS232 port, and set its configuration.



| og Pr     | eferences        | evice name  | Data tra |          |          |         |
|-----------|------------------|-------------|----------|----------|----------|---------|
| Sy:       | stem 🕨           |             |          |          |          |         |
| Sei<br>Ne | rvices           |             |          |          |          |         |
| Au        | xillary data 🔹 🕨 | Auxillary o | data     |          |          |         |
|           |                  | Serial port |          |          |          |         |
| modif     | w the nara       | meters of   |          | ort clic | on ite 🔽 | icon on |
| -dit Seri | ial Port         |             |          |          |          | ×       |
|           |                  |             |          |          |          |         |
|           | Device nam       | e COM1      |          |          |          |         |
| Data tr   | ansmission mod   | le Gener    | ic       | • 0      |          |         |
|           | Baud rat         | te 11520    | 0        | * 0      |          |         |
|           | Data bit         | s 8         |          | . 0      |          |         |
|           | Stop bit         | ts 1        |          | • 0      |          |         |
|           | Parit            | ty None     |          | • 0      |          |         |
|           | Statu            | Enable      | 9        | . 0      |          |         |
|           |                  |             |          |          |          |         |
|           |                  |             |          |          |          |         |

| Parameter                         | Туре       | Description   |  |  |  |  |
|-----------------------------------|------------|---|--|--|--|--|
| Device name                       | Read       | Name of the RS232 port  |  |  |  |  |
| Data transmission mode Read/Write |            | Defines the way serial data are inserted into the IP audio stream.<br>Generic: serial data are inserted as they arrive.<br>UECP: serial data are inserted each time a complete RDS UECP<br>frame is fully received from the RS232 port.   |  |  |  |  |
| Baud rate                         | Read/Write | Serial port baud rate in bits/s, from 1200 bps to 40 Kbits/s  |  |  |  |  |
| Data bits                         | Read/Write | Select the number of bits for each character (6, 7 or 7)  |  |  |  |  |
| Stop bits                         | Read/Write | Enter the number of bits used to signal the end of a character: 1 or 2.   |  |  |  |  |
| Parity                            | Read/Write | <ul> <li>Select the method used for detecting errors on the RS232 port transmission:</li> <li>None: No</li> <li>Odd: number of bits of each character (including the parity bit) is always odd.</li> <li>Even: number of bits of each character (including the parity bit) is always even.</li> </ul> |  |  |  |  |
| Status                            | Read/Write | Enable: the COM port is enabled.<br>Disable: the COM port is disabled.  |  |  |  |  |

Click on "Save" to confirm the changes.



#### 8.1.1.4.2 Preferences -> Auxiliary data -> GPIO

X/LINK offers the possibility to use physical GPIOs, or virtual GPIOs through UDP ports. The status of the physical or virtual GPI's is tunneled in-band so that the decoder can output the status information on physical or virtual GPO's.

Virtual GPIO's allow third party applications to send/receive status information via IP to/from IQOYA.32 virtual GPI status can be tunneled.

#### Structure of a virtual status information frame over UDP

|                | 0 1 2 3 4 5 6 7 8 9 10 11 12 13 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 31 |  |  |  |  |
|----------------|---|--|--|--|--|
| 32-bit word 1: | Version number (4 bits) = 0000 User ID (24 bits)                                |  |  |  |  |
| 32-bit word 2: | 32 bits. Bit 0 = Status GPI0 -> Bit 31 = Status GPI31                           |  |  |  |  |
| 32-bit word 3  | Validation mask (32 bits)   |  |  |  |  |

The validation mask validates the GPI statuses to be taken into account.

The page <u>Preferences -> Auxiliary data -> GPIO</u> allows enabling/disabling the in-band tunneling of GPI status information to GPO.

|              | Prefere        | nce           | es - Auxillary o |
|--------------|----------------|---------------|------------------|
|              |                |               |                  |
|              | Preferences    | _             | :                |
|              | System         | $\rightarrow$ |                  |
| $\mathbf{O}$ | Services       | $\rightarrow$ |                  |
|              | Network        | - × .         |                  |
| ÷.           | Auxillary data | •             | Auxillary data   |
|              | obi tumelet    | 1011          | Serial port      |
| <b>.</b>     |                |               | GPIO             |
|              |                | User          | UDP              |
|              | Preferenc      | es -          | Auxillary data   |
| 6            |                |               |                  |
| 68           |                |               | Status           |
|              | Virtual CDIOs  |               |                  |
| 9            | Viituai GPIOS  |               |                  |
|              |                |               | Mode             |

Status: Select enable to activate the status tunneling.

To declare virtual GPI's to be tunneled, select "In" from parameter "Mode". To declare virtual GPO's, select "Out" from parameter "Mode". To declare both virtual GPI's and GPO's, select "In & Out".

| Virtual GPIOs |                               |
|---------------|-------------------------------|
|               |                               |
| Mode          | None                          |
|               | None<br>In<br>Out<br>In & Out |

The following screen capture corresponds to the mode "In & Out".

| Virtual GPIOs                              |                                 |                                       |                              |         |           |      |      |   |
|--|---------------------------------|---------------------------------------|------------------------------|---------|-----------|------|------|---|
|  |                                 | Mode                                  | In & Out                     |         |           |      |      | Ŧ |
| UDP tunneled GPIs                          |                                 |                                       |                              |         |           |      |      |   |
| IP add                                     | ress                            | 127.0.0.1                             |                              | _       |           | Port | 2000 |   |
| User ID 1                                  |                                 |                                       |                              |         |           |      |      |   |
|  |                                 | User ID                               |                              |         |           |      |      |   |
|  | Use                             | erTGPI                                | GPI [X-Y]                    |         | Invertion |      |      |   |
|  | U                               | IDP GPI 1                             |                              |         |           |      |      |   |
|  |                                 |                                       |                              |         | •         |      |      |   |
|  |                                 |                                       |                              |         |           |      |      |   |
| UDP tunneled GPOs                          |                                 |                                       |                              |         |           |      |      |   |
| Lis  | ar ID                           |                                       |                              |         |           |      |      |   |
| Us<br>Repetition freque                    | er ID                           | 100                                   |                              | ms      |           |      |      |   |
| Us<br>Repetition freque                    | er ID<br>ency                   | 100                                   |                              | ms      |           |      |      |   |
| Usi<br>Repetition freque<br>IP destination | er ID<br>ency<br>IP             | 100<br>Paddress                       | 127.0.0.1                    | ms      |           | Port | 2000 |   |
| Use<br>Repetition freque<br>IP destination | er ID<br>ency<br>IP<br>Local so | 100<br>P address<br>urce port         | 127.0.0.1<br>2000            | ms      |           | Port | 2000 |   |
| Usi<br>Repetition freque<br>IP destination | er ID<br>ency<br>IP<br>Local so | 100<br>P address<br>urce port<br>DSCP | 127.0.0.1<br>2000<br>Default | ms      |           | Port | 2000 |   |
| Usi<br>Repetition freque<br>IP destination | er ID<br>ency<br>IP<br>Local so | 100<br>P address<br>urce port<br>DSCP | 127.0.0.1<br>2000<br>Default | ms<br>• |           | Port | 2000 |   |

| Parameter         | Туре       | Description  |  |  |  |
|-------------------|------------|--|--|--|--|
| UDP Tunneled GPIs |            |  |  |  |  |
| User ID           | Read/Write | Allows defining a group of Virtual GPIs (among 32 possible<br>tunneled GPIs) sent by an application. The 32 virtual GPIs can be<br>shared between several applications. The User ID identifies one<br>given application. |  |  |  |



| UDP GPI1             | Read/Write | Click on to declare an additional input status.<br>Enter for each input status (UDP GPIn) its rank among the 32<br>transported status. |
|----------------------|------------|--|
| UDP Tunneled GPOs    |            |  |
| User ID              | Read/Write | Identifies the IQOYA that sends the Virtual GPOs frame.  |
| Repetition frequency | Read/Write | Defines how often the GPO values have to be repeated so that the decoder does not miss a status change.                                |
| IP Destination:Port  | Read/Write | IP@and UDP port the UDP frames of virtual GPOs are sent to.  |
| DSCP                 | Read/Write | Quality of service giver to the virtual GPOs UDP frames.   |

## 8.1.1.4.3 Preferences -> Auxiliary data -> UDP

This page allows defining the UDP ports used for receiving and /or sending serial data over IP.

| $ 0_0^\circ $ | Preferences    |            | JDP socket(s) 🗸     |                      |       |   |   |                    |      |
|---------------|----------------|------------|---------------------|----------------------|-------|---|---|--------------------|------|
|               | System         | •          |                     | UDP - Add UDP socket |       |   |   |                    | ×    |
| 42            | Network        | - P<br>- F | ld ‡≟ Mode          | Socket name          |       |   | 0 |                    |      |
|               | Auxillary data | •          | Auxillary data      | Enable               | No    | ۳ | 0 |                    |      |
| <u> </u>      |                |            |                     | Mode                 | Input | ¥ | 0 |                    |      |
|               |                |            | Serial port<br>GPIO | Port                 | 9000  |   | 0 |                    |      |
|               |                |            | UDP                 |                      |       |   |   | Close Save & New S | Save |

| Parameter   | Туре       | Description  |
|-------------|------------|--|
| Socket name | Read/Write | Name given to the UDP socket. This name allows selecting the socket for tunneling data, in the Send->IPService and Receive->Program pages. |
| Enable      | Read/Write | Yes: socket is enabled. No, socket is disabled.  |
| Mode        | Read/Write | Input: IQOYA reads the data to be tunneled from the socket.<br>Output: IQOYA sends data through this socket.                               |
| Port        | Read/Write | UDP port of the socket   |

Serial data received via a UDP port are inserted in the IP audio stream, provided that this UDP port has been selected as the source of auxiliary data to be tunneled.

For an Icecast/Shoutcast, serial data have to conform to the standard ICY-metadata syntax.



## 8.1.2 Audio I/Os category of menus

This category gathers all the menus allowing for the configuration of the inputs that can be encoded, and the outputs that play decoded audio.



#### 8.1.2.1 Audio I/O -> Input

## 8.1.2.1.1 Audio I/O -> Input -> VU meters

This page displays the level of the signals incoming on the inputs (Line analog, AES/EBU, or MADI depending on the X/LINK configuration).



#### Displayed VU-meters unit is dBfs.

For a X/LINK with more than 8 mono channels (X/LINK-AES67 with additional optional I/O channels), the group of channels to be displayed is selectable from the top right menu.



Select "Unlock faders" to change the input gains.

If the X/LINK features analog inputs, it is possible to adjust both the analog input gain and the digital input gain.

Selection of analog or digital gain is done thanks to the selector below the fader.



| Digital<br>dBFS<br>Input 1             | When Digital is selected, a digital gain/attenuation is applied to the input signal.  |
|--|---|
| Analog<br>dbu > 0 dbrs dbrs<br>Input 1 | When Analog is selected an analog gain/attenuation is<br>applied to the input signal. The value displayed below<br>the fader corresponds to the input signal level which<br>gives 0 dBfs after analog to digital conversion |

#### Vu-meters settings

Click on the "Settings" button to adjust the bargraph display and the front panel LED vu-meters display (red zone, orange zone, and green zones).

| Vumeters - Settings  |     |      | ×          | Peak duration window: duration of the display of the   |
|----------------------|-----|------|------------|--|
| Peak duration window | 100 | ms   | 8          | peak levels (from 20ms to 10000ms)   |
| Peakmeters zones     |     |      |            | reak. Level value in dbis above which the vu-meter is red  |
| Peak                 | -3  | dBFS | 0          | <b>Headroom</b> : Level value in dBfs above which the vu-meter   |
| Headroom             | -12 | dBFS | 0          | is orange.   |
| Nominal 1            | -24 | dBFS | 0          | <b>Nominal 1</b> : Level value in dBfs above which the LED right                                       |
| Nominal 2            | -36 | dBFS | 0          | below the headroom LED is highlighted in green   |
| Nominal 3            | -48 | dBFS | 0          | Nominal 2: Level value in dBfs above which the 3rd LED   |
| Nominal 4            | -60 | dBFS | •          | from the bettern is bighted in green   |
|                      |     |      |            | nom the bottom is highlighted in green.  |
|                      |     |      | Close Save | <b>Nominal 3</b> : Level value in dBfs above which the 2nd LED from the bottom is highlighted in green |
|                      |     |      |            | nom the bottom is highlighted in green.  |
|                      |     |      |            | Nominal 4 :Level value in dBfs above which the 1rst LED  |
|                      |     |      |            | from the bottom is highlighted in green.   |

#### 8.1.2.1.2 Audio I/O -> Input -> settings

This page allows the following:

- Selection of the input signals to be allocated to the encoder inputs
- naming of the encoder inputs
- Configuration of the input AES67, or RAVENNA, or Livewire AoIP streams



# IQOYA X/LINK range user manual

| 08       | For selected input | (S) <b>*</b>   |                |                |                      |                      |
|----------|--------------------|----------------|----------------|----------------|----------------------|----------------------|
| ନ        | ° Input 1 °        | ° Input 2 °    | ° Input 3 °    | ° Input 4 °    | ° Input 5 °          | ° Input 6 °          |
| <u>2</u> | o o                | o o<br>Input 2 | o o<br>Input 3 | o o<br>Input 4 | o o                  | o o<br>Input 6       |
| *        | Line               | Line           | AES+SRC        | AES+SRC        | AolP<br>Edit Metrics | AolP<br>Edit Metrics |

This page displays all the inputs proposed by your IQOYA.

The audio sources to be encoded (input Programs) are selected among these inputs.

|                          | Displayed mono inputs             | Number of mono inputs that can be selected for encoding                  |
|--------------------------|-----------------------------------|--|
| X/LINK-ST &<br>X/LINK-LE | 2 analog, 2 on AES/EBU, 2 AoIP(*) | 2  |
| X/LINK-DUAL              | 4 analog, 4 on AES/EBU, 4 AoIP(*) | 4  |
| X/LINK-AES67             | AoIP(*)                           | 2 (basic version<br>Up to 16 depending the software option<br>installed. |

(\*) AES67, RAVENNA, Livewire

# Analog line input settings

| <sup>o</sup> Input 1 <sup>o</sup><br>o o | Click on the "Input" field to rename the input. The new<br>name will appear in other WEB pages (Input<br>Program). Audio levels are adjustable from the<br>VU-Meters page. |
|--|--|
| Input 1<br>Line                          |  |

# AES/EBU input settings



| <ul> <li>Input 3</li> <li>Input 3</li> <li>Input 3</li> </ul> |   | Click on the "Input" field to rename the input. The new<br>name will appear in other WEB pages (Input<br>Program). Audio levels are adjustable from the<br>VU-Meters page. |
|---|---|--|
| Input 3   |   | The AES/EBU input features a hardware sample rate converter, which is useful when the AES/EBU input is   |
| AES+SRC 🔻   |   | not synchronous of the selettect sampling clock source.  |
| AES   |   | To enable the hardware SRC, select AES+SRC.  |
| AES+SRC   |   | To disable the hardware SRC, select AES.   |
| AES+TUN   | 1 | For AES transparent transport, select AES+TUN  |

# AoIP input settings

| Input 9<br>Input 9<br>AoIP<br>Edit Metrics |              | <ul> <li>Click on the "Input" field to rename the input. The new name will appear in other WEB pages (Input Program). Audio levels are adjustable from the VU-Meters page.</li> <li>Click on"<i>Edit</i>" to be able to configure the input AoIP stream, as described below.</li> <li>Click on "Metrics" to display the metrics on the configured AoIP stream. This is useful to get the minimum jitter value to be entered in the parameters. LED: if an AoIP stream is configured and it is well received the LED is green; The LED is red if the stream is not received, and grey if the stream reception is disabled.</li> </ul> |
|--|--------------|--|
| Audio AoIP Input                           |              | Input Name: the same as described above.   |
| Input name                                 | Input 9      | Input Status: Enable/disable.  |
| Input Status                               | Enabled v 🖓  |  |
| Input AoIP type                            | AES67 V      | Input AOIP type: AESO7, RAVEININA, or LIVEWIRE   |
| Number of channel                          | 2 🔹          | Number of channels: defines the number of audio  |
| Discovery                                  | Browse       |  |
| Audio stream                               |              | channels to be extracted from this AoIP stream   |
| Port                                       | 5010         | When AES67 or RAVENNA type is selected the   |
| IP address                                 | 239.1.1.20   |  |
| Network interface                          | lan1 🔻 📀     | Browse button allows discovering the available   |
| IGMPv3 filtering mode                      | Off v        | AES67 or RAVENNA streams on all the networks. The  |
| Jitter                                     | 48 ms 🕜      |  |
| Synchro clock                              | PTP • 0      | list of parameters below is then filled in according to  |
| In-band format signalling                  | No V 3       | the selected AoIP stream   |
| Payload                                    | Storen       |  |
| Mode<br>Sample rate                        | 48000Hz V    |  |
| Encoding format                            | PCM_24bits v |  |
| Bit rate                                   | 2304kb/s • 0 |  |
|  |              |  |
|  | Close        | Save   |
|  |              |  |



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| Livewire channel      | 0          |    | Settings for a Livewire stream<br>Livewire channel:  |
|-----------------------|------------|----|--|
| Port                  | 5010       |    | <i>Port</i> : UDP port number for receiving the stream   |
| IP address            | 239.1.1.20 |    | <i>IP address</i> : multicast or unicast IP@<br><i>Network interface</i> : network interface (LAN or VLAN)   |
| Network interface     | lan1       |    | used for receiving the stream.   |
| IGMPv3 filtering mode | Off        | ٣  | <i>IGMPv3 filtering</i> : Allows including or excluding source IP addresses of the multicast stream.   |
| Jitter                | 48         | ms | If Include or Exclude value is selected, the list of IP  |
| Pavload               | 98         |    | addresses can be entered via the following interface:  |
|                       |            |    | IP address 1   |
|                       |            |    | <i>Jitter</i> : enter the jitter value. This value must be at least equal to the jitter value reported from the Metrics on the stream. <i>Payload</i> : Set to 98. |

It is possible to enable or disable the reception of one or several declared AoIP input streams.

• Select the declared input streams though the check box on the left of "Edit"



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• Select Enable or Disable from the "For selected input(s)" list box on the top left.



Click on "Apply" to confirm the changes.

8.1.2.2 Audio I/O -> Output

8.1.2.2.1 Audio I/O -> Output -> VU meters

This page displays the level of the output signals.



| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | Settings Unlock faders Output 1 to Output 8   | ut - VU meters | Audio I/O - Output -           |
|--|---|----------------|--------------------------------|
| Analog   | 12       10 <td< th=""><th></th><th>Analog<br/>Output 1<br/>Cutout 1</th></td<> |                | Analog<br>Output 1<br>Cutout 1 |

## Displayed VU-meters unit is dBfs.

For a X/LINK with more than 8 mono channels (X/LINK-AES67 with additional optional I/Os), the group of channels to be displayed is selectable from the top right menu.

| Unlock faders                           | Output 1 to Output 8  | ٠ |
|---|-----------------------|---|
| Concession of the local division of the | Output 1 to Output 8  | - |
| -0                                      | Output 9 to Output 16 |   |

Select "Unlock faders" to change the output gains.

If the X/LINK features analog outputs, it is possible to adjust both the analog output gain and the digital output gain.

Selection of analog or digital gain is done thanks to the selector below the fader.

| Digital<br>dB<br>Input 1  | When Digital is selected, a digital gain/attenuation is applied to the output signal.  |
|---|--|
| Image: Control of the second secon | When Analog is selected, an analog gain/attenuation<br>is applied to the output signal. The value displayed<br>below the fader corresponds to the level of the output<br>signal for a 0 dBfs digital signal. |

#### Vu-meters settings

Click on the "Settings" button to adjust the bargraph display and the front panel LED vu-meters display (red zone, orange zone, and green zones).

| Vumeters - Settings       ×         Peak duration window: duration of the display of the peak levels (from 20ms to 10000ms)         Peakmeters zones   | the                                     |
|--|---|
| Peak       -3       dBFS       Image: Constraint of the state of | er is red<br>u-meter<br>ED right        |
| Nominal 2       -36       dBFS       0         Nominal 3       -48       dBFS       0         Nominal 4       -60       dBFS       0         Close       Save       Save       Nominal 1: Level value in dBfs above which the 3r from the bottom is highlighted in green.         Nominal 4       -60       dBFS       0         Nominal 5: Level value in dBfs above which the 3r       1         from the bottom is highlighted in green.       Nominal 4: Level value in dBfs above which the 1r         from the bottom is highlighted in green.       Nominal 4: Level value in dBfs above which the 1r   | ED right<br>rd LED<br>nd LED<br>rst LED |

## 8.1.2.2.2 Audio I/O -> Output -> settings

This page allows the following:

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- assign a physical output or AoIP output to a decoder output signal
- naming of the encoder outputs
- Configure the AoIP output(s)



This page displays all the inputs proposed by your IQOYA.

The audio sources to be encoded (input Programs) are selected among these inputs.

|                          | Displayed mono outputs            | Number of mono outputs that can be selected for output programs destinations |
|--------------------------|-----------------------------------|--|
| X/LINK-ST &<br>X/LINK-LE | 2 analog, 2 on AES/EBU, 2 AoIP(*) | 2  |
| X/LINK-DUAL              | 4 analog, 4 on AES/EBU, 4 AoIP(*) | 4  |
| X/LINK-AES67             | AoIP(*)                           | From 2 to 16 depending the software option installed.                        |
| (*) AES67, RAVENNA, L    | ivewire                           | ·  |



# Analog line output settings

| Output 1 0<br>Output 1<br>Line | Click on the "output" field to rename the output. The<br>new name will appear in other WEB pages (output<br>Program). Audio levels are adjustable from the<br>VU-Meters page. |
|--------------------------------|---|
|                                |   |

# AES/EBU output settings

| Output 3 | Click on the "output" field to rename the output. The<br>new name will appear in other WEB pages (Output<br>Program). Audio levels are adjustable from the<br>VU-Meters page. |
|----------|---|
| Output 3 | For AES transparent transport, select AES+TUN by  |
| AES      | clicking on the AES field   |
|          |   |

# AoIP output settings

| Output 5 °<br>Output 5<br>Output 5<br>AoIP |  |                                 |     | Click on the "output" field to rename the output. The<br>new name will appear in other WEB pages (Output<br>Program). Audio levels are adjustable from the<br>VU-Meters page.<br>Click on" <i>Edit</i> " to be able to configure the output AoIP<br>stream, as described below. |
|--|--|---------------------------------|-----|---|
| Audio AoIP Ou                              | utput                                  |                                 |     | Output Name: the same as described above.   |
|  | Output name                            | Output 5                        |     | Output Status. Enable/disable.  |
|  | Output Status                          | Enabled                         | • 6 | Audio Format Tab<br>Sample rate: 32 kHz, 44,1 kHz, or 48 kHz  |
|  | Output AoIP type                       | AES67                           | • 6 |   |
| Audio Format                               | IP Stream                              |                                 |     | <i>Audio Format</i> : PCM 12, 16, 20 or 24 bits   |
|  |  |                                 |     |   |
|  | Mode                                   | Stereo                          | •   |   |
|  | Mode<br>Sample rate                    | Stereo<br>48000Hz               | •   |   |
|  | Mode<br>Sample rate<br>Encoding format | Stereo<br>48000Hz<br>PCM_12bits | · · |   |

| Audio Format IP Stream<br>Audio Stream<br>IP address<br>Network Interface / VLAN<br>Local source port<br>DSCP<br>Payload type<br>Payload type<br>Synchro clock<br>In-band format signalling<br>Advanced mode | Any    Any                                    | Port         5004           Port         5004           Port         5004           Port         5004           Port         5004 | 0 | Settings for an AES67/RAVENNA output stream<br><i>IP address</i> : multicast or unicast destination IP@<br><i>Port</i> : destination UDP port number<br>Local Source Port<br><i>Network interface</i> : network interface (LAN or VLAN)<br>used for sending the stream.<br><i>DSCP</i> : Value for the QoS of the stream.<br><i>Payload type</i> : Set to 98 for PCM.<br><i>Payload size</i> : When set to 0, the payload size is<br>equal to the processing granularity (Preferences/Audio<br>setup). Set 1 ms for 48 samples at 48 kHz<br>(interoperable AES67 profile). |
|--|---|---|---|--|
| IP Stream<br>Program<br>Livewire channel<br>Audio Stream<br>IP address<br>Network interface / VLAM<br>Local source port<br>DSCP<br>Payload size  | 0<br>Any •<br>7004<br>Default •<br>96<br>0 ms | Port         5004           O         0           O         0           O         0           O         0           O         0   | 0 | Settings for a Livewire output stream<br>Livewire channel: number of the Livewire channel<br><i>IP address</i> : multicast or unicast IP@<br><i>Port</i> : UDP port number for receiving the stream<br><i>Network interface</i> : network interface (LAN or VLAN)<br>used for receiving the stream.<br><i>Local source port</i> : Local UDP port used to send the<br>stream<br><i>DSCP:</i> Value for the QoS of the stream.<br><i>Payload type</i> : Set to 98 for PCM.   |
|  |   |   |   |  |

It is possible to enable or disable the sending of one or several declared AoIP output streams.

• Select the declared output streams though the check box on the left of "Edit"



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• Select Enable or Disable from the "For selected input(s)" list box on the top left.



Click on "Apply" to confirm the changes.



#### 8.1.2.3 Audio I/O -> Audio Bus

Audio buses are useful for the transcoding of IP streams, or for mixing several decoded IP streams. An audio bus can be the destination of one or several output programs, and the source of input programs. The number of available audio buses is defined by the license. Audio buses are optional.



#### 8.1.2.3.1 Audio I/O -> Audio Bus -> Vu meters



Audio buses are displayed in groups of 8 channels. For a X/LINK offering more than 8 mono channels for the buses, the group of channels to be displayed is selectable from the top right menu.

| Unlock fa | ders | Bus 1 to Bus 8   | • |
|-----------|------|------------------|---|
|           |      | Bus 1 to Bus 8   |   |
|           | - 0  | Bus 9 to Bus 16  |   |
| 15        | -    | Bus 17 to Bus 24 |   |
|           |      | Bus 25 to Bus 32 |   |
|           | -    | Bus 33 to Bus 40 |   |
|           |      | Bus 41 to Bus 48 |   |
|           |      | Bus 49 to Bus 56 |   |
|           |      | Bus 57 to Bus 64 |   |

#### 8.1.2.3.2 Audio I/O -> Audio Bus -> Settings



Click on the "name" field to rename the audio bus. The new name will appear in other WEB pages. Right below the name of the bus, its type can be selected:

- AudioBus + Tun: select this option in case AES transparency is needed (transport of samples and user bits)
- AudioBus: default value. Only audio samples are transported.

#### 8.1.3 "Send" category of menus

This category allows defining the programs and the IP services to be streamed, but also getting the status of the IP services.

The principle consists in first declaring the programs, and then declaring the IP services that carry the programs.



#### 8.1.3.1 Send -> Programs

This page allows viewing and declaring the audio encoding instances: the programs.



It can be accessed either from the left column, or from the icon "Go to programs" on the top right of the IP





| S | Send -   | Pro    | ograr    | ms           |        |             |             |            |          | Go to IP Service 🎓 |
|---|----------|--------|----------|--------------|--------|-------------|-------------|------------|----------|--------------------|
|   | 団 Delete | select | ed progr | am(s)        |        |             |             |            |          | + Add Program      |
|   |          |        | Id JE    | Program Name | Mode   | First Input | Sample rate | Format     | Bitrate  | IP Service         |
|   | 1        | S      | 1        | Prog 1       | 7.1    | Input 1     | 48000Hz     | PCM_12bits | 4608kb/s | Used               |
|   | 1        |        | 2        | Prog 2       | Stereo | Input 1     | 48000Hz     | AAC-LC     | 288kb/s  | Unused             |
|   | 1        |        | 3        | Prog3        | Stereo | Input 1     | 48000Hz     | AAC-LC     | 288kb/s  | Unused             |

In case some programs are already created, they are listed in the Programs page, with their characteristics: name, mode, first audio input, sample rate, audio format, bitrate, IP Service using this Program.

If a Program is used in at least one IP Service, the icon *signal states is displayed on the left of its name, and "Used"* appears in the column "IP Service". The IP services that use this program are listed when moving the mouse above "Used".

|   |   | ld ‡≟ | Program Name | Mode   | First Input | Sample rate | Format     | Bitrate  | IP Service             |
|---|---|-------|--------------|--------|-------------|-------------|------------|----------|------------------------|
| 1 | S | 1     | Prog 1       | 7.1    | Input 1     | 48000Hz     | PCM_12bits | 4608kb/s | Used Send 1,<br>gdfhsh |
| 1 |   | 2     | Prog 2       | Stereo | Input 1     | 48000Hz     | AAC-LC     | 288kb/s  | Unused                 |

If a Program is not used by any IP Service, the selection button 🦳 is displayed on the left of its name. A Program can be associated to one IP Service. Only unused Programs can be selected in an IP Service.

+ Add Program To declare a new Program, click on the icon Give a unique name to the program. Send - Edit Program Click on "Save" to confirm the parameters. Program Silence detection Click on "Close" to discard the changes. Click on "Save & New" to confirm the settings, and Prog 1 0 Name duplicate Audio IO 0 Input type Input 1 Ψ. 0 them so that to create a new program with similar First channel 7.1 Ψ. 0 Mode settings, except the name. 48000Hz Ψ. 0 Sample rate PCM\_12bits ۳ 0 Encoding format Ŧ 0 4608kb/s Bit rate Close



To edit an existing Program, click on the icon *in the left side of the Program line*.

A new program can be created by duplicating one of the displayed programs; click on the icon in front of the program to be duplicated.

| Parameter       | Туре       | Description   |
|-----------------|------------|---|
| Name            | Read/Write | Name given to the encoding instance. This name will be selected when declaring an IP service.                               |
| Input type      | Read/Write | Audio source of the program: it can be an audio input, or an audio bus, or an AoIP input                                    |
| First channel   | Read/Write | First input channel of the audio signal to be encoded, to be selected among the list of input channels.                     |
| Mode            | Read/Write | Mono, Stereo, Multi-channel 5.1   |
| Sample rate     | Read/Write | Frequency of the encoded audio, to be selected from the list box.<br>It may be different from the IQOYA sampling frequency) |
| Encoding format | Read/Write | Audio format of the encoding, to be selected from the list box.   |
| Bit rate        | Read/Write | Bit rate of the encoded audio.  |

#### Silence detection parameters

Click on the "Silence detection" tab to set the criteria for silence detection on this program. An alarm is signalled when silence is detected, and it is reset when signal is detected again.

It is also possible to automatically stop/start the streaming upon silence/signal detection. This can be configured from the IP Service page (see next paragraph **Send -> IP services**).

| Program       Silence detection         Input signal for silence detection       At least one channel v ?         Silence threshold       -43.00 dB ?         Silence duration       1000 ms ?  |
|---|
| Input signal for silence detection     At least one channel     Image: Comparison of the second seco |
| Silence threshold -43.00 dB (?)   |
| Silence duration 1000 ms  |
|   |
| Signal threshold -43.00 dB  |
| Signal duration 2000 ms ?   |
| Signal drop duration 1000 ms  |
| Close Save  |



| Input signal for silence<br>detection                       | <ul> <li>In case IQOYA is used as an encoder, it can generate an alarm when silent audio is detected on the audio inputs, and set this alarm off when audio signal is detected again. (Note that all the alarms handled by IQOYA can be enabled/disabled from the "Alarms setup" menu).</li> <li>The parameter "Input signal for silence detection" allows defining on which input signal the silence detection is applied. Possible choices are:</li> <li>Mean of left + right channels: compares the mean value of a left and right sample to the threshold. In case the calculated values are always lower to the silence threshold during the defined silence duration, silence condition is reached.</li> <li>Left channel only: compares the left channel samples to the silence threshold. In case the sample values are always lower to the silence threshold. In case the sample values are always lower to the silence threshold. In case the sample values are always lower to the silence threshold. In case the sample values are always lower to the silence threshold during the defined silence duration, silence condition is reached.</li> <li>Left channel only: compares the right channel samples to the silence threshold. In case the sample values are always lower to the silence threshold during the defined silence duration, silence condition is reached.</li> <li>Left and right channels: compares both the left and right channel samples to the silence threshold. In case the sample values on both channels are always lower to the silence threshold. In case the silence threshold. In case the sample values on both channels are always lower to the silence threshold. In case the silence threshold. In case the sample values on both channels are always lower to the silence threshold. In case the sample values on both channels are always lower to the silence threshold. In case the sample values on at least one on the two channels are always lower to the silence threshold. In case the sample values on at least one on the two channels are always lower to the sile</li></ul> |
|---|--|
| Silence threshold & Silence duration                        | Silent audio is defined through these two parameters, expressed in dBfs.<br>When audio level is below the threshold value during at least the defined duration, the alarm<br>"Analog audio in silent" or "Digital audio in silent" is set (if it is enabled from the "Alarms setup"<br>menu).  |
| Signal threshold<br>Signal duration<br>Signal drop duration | <ul> <li>Audio signal is defined through the three parameters. Audio signal is considered as recovered if all the following conditions are true: <ul> <li>Audio level exceeds the Signal threshold (dBfs) within the "Signal duration" analysis window (ms).</li> <li>Audio level does not stay below the Signal threshold during the "Signal drop duration", within the "Signal duration" analysis window.</li> </ul> </li> <li>Note the following rule: Signal drop duration &lt;= (Signal duration / 2).</li> <li>Once signal is recovered, the alarm "Analog audio in silent" or "Digital audio in silent" is reset (if it is enabled from the "Alarms setup" menu).</li> </ul>  |

Click on Save button to confirm the new Program.

To delete one or several unused programs, select them by clicking on the icon on the left of their names, and click on the button Delete selected program(s) on the top of the Programs list.


•

| If all Programs are unused and you wa   | ant to delet              | e them all, clic           | k on the ico                | on 🗆 or            | the lef   | ft of the c      | olumn title   |
|---|---------------------------|----------------------------|-----------------------------|--------------------|-----------|------------------|---------------|
| "Program Name" (this selects all the Pr<br>the Programs list.<br>Confirm or cancel your choice in the dis | rograms), a<br>splayed co | and click on the           | e button <sup>in</sup> dow. | Delete sele        | ected pro | ogram(s)         | on the top of |
| 8.1.3.2 Send -> IP services<br>This page allows viewing and declaring                                     | g the IP Se               | rvices to be str           | reamed ove                  | er IP.             |           |                  |               |
| It can be accessed either from the left<br>on the top right of the Programs page                          | Column Go to IP Se        | Programs IP Services Ivice | , or dir                    | ectly fron         | n the ic  | on "Go tơ        | o IP Service" |
| Send - IP Services  |                           |                            |                             |                    | t Add     | Go to programs A |               |
| IP Service  | Program                   | Tunneled<br>serial ports   | Tunneled<br>GPIs            | Service<br>Bitrate | FEC       | Status           |               |
|   |                           |                            |                             | -<br>836 kb/s      | Yes       | •                |               |
|   | 1                         |                            |                             |                    |           | •                |               |

In case some IP Services are already created, they are listed in the IP Services page, with their characteristics: Name, Program, Tunneled ports, Tunneled GPIs, bitrate, FEC, Status.

The program(s) carried by an IP service can be displayed by clicking on the icon  $\textcircled$  right on the left of the IP service name (an IP service can contain several programs in case of MPEG-TS MPTS encapsulation).

To declare a new IP Service, click on the icon

2

+ Add IP Service

A new IP service can also be created by duplicating an existing one. Click on the icon on the left of the IP service to be duplicated.



| To start, stop, or delete an IP se<br>the appropriate action: | ervice, check t                         | the box on   | the left of its name | 1 | Send 1 | , and select |
|---|---|--------------|----------------------|---|--------|--------------|
|   | For selected service(s) or program(s) - |              |                      |   |        |              |
|   | ► Start                                 |              |                      |   |        |              |
|   | Stop                                    | L IP Service |                      |   |        |              |
| For selected service(s) or program(s) -                       | Delete                                  | 1 Send 1     |                      |   |        |              |

Note that a list of consecutive service can be selected by clicking on the first service check box, and shift clicking on the check box of the last service of the list.

Non consecutive services can be selected by CTRL clicking on their check boxes.

To edit an existing IP Service, click on the icon in right end of the IP Service line. The following window is displayed.

| Send - Add IP Service   |  |   |           | ×              |
|---|--|---|-----------|----------------|
| Name<br>Encapsulation   | None T   | 0   |           |                |
| Transport protocol  | RTP •  | 0   |           |                |
| Program   |  |   |           |                |
| Name  | program 01 ¥                                       | 0   |           |                |
| Audio Stream  |  |   |           |                |
| IP address<br>Network Interface / VLAN<br>Local source port<br>DSCP<br>Payload type<br>Payload size<br>Stop streaming on silence detection<br>Synchroletisch<br>Prosentation detay<br>In-band format signalling | Any * 7004 Default * 14 0 ms No * N1P* 9 U U Ves * | 0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0 | Port 5004 | 0              |
| FEC Stream (Forward error correc  | tion)  |   |           | M              |
| Туре  | No redundancy •                                    | 0   |           |                |
|   |  |   | Close     | ave & New Save |
|   |  |   |           |                |

| Parameter | Туре       | Description                   |
|-----------|------------|-------------------------------|
| Name      | Read/Write | Name given to this IP service |



| Encapsulation | Read/Write | None: The IP Service includes one Program, and audio data are not<br>encapsulated (raw mode).<br>MPEG-TS MPTS: The IP Service includes several Programs which are<br>multiplexed in a single MPEG-TS stream |
|---------------|------------|---|
|               |            | multiplexed in a single MPEG-TS stream  |

### Encapsulation = None

| Program : Name  | Read/Write | Select the Program to be streamed from the list of Programs. A Program can be used by several IP services.   |
|---|------------|--|
| Program: Tunneled serial port                               | Read/Write | If there is a serial port hardware option installed, select the serial port that provides the serial data to be tunnelled in-band.   |
| Program: Tunneled GPIs                                      | Read/Write | If there is a GPIO hardware option installed, enter a list of GPI numbers<br>which status is to be tunnelled in-band. Numbers start from 1 and must<br>be separated by commas  |
| Program: Transport<br>protocol                              | Read/Write | Select RTP, UDP, or HTTP protocol.<br>HTTP is to be used for streaming to an Icecast/Shoutcast server.<br>For other applications, we recommend to select RTP.<br>UDP is to be used only if the equipment that receives the stream does<br>not support standard ACIP RTP streams.                                 |
| Audio stream: IP address                                    | Read/Write | Destination IP address or domain name.   |
| Audio stream: Port  | Read/Write | Enter the destination UDP port for RTP or UDP protocols, or the destination TCP port for HTTP streaming.   |
| Audio stream:File path or mount point                       | Read/Write | Valid if Transport protocol = HTTP<br>Example: server URL= http://streamer.myorgnization.com:6400/M1<br>Mount point is to be set to: /M1   |
| Audio stream: Username                                      | Read/Write | Valid if Transport protocol = HTTP. Username to access the server  |
| Audio stream: password                                      | Read/Write | Valid if Transport protocol = HTTP. Password to access the server  |
| Audio stream: Network<br>interface/VLAN<br>(for RTP or UDP) | Read/Write | Select the network interface or VLAN for this stream.<br>In case the target address is unicast, select "Any" so that the Eth<br>interface is determined automatically according to this IP address, or<br>select a VLAN.<br>In case the target IP address is multicast, select the Eth interface or the<br>VLAN. |
| Audio stream: Local source port (for RTP or UDP)            | Read/Write | Local UDP port number of IQOYA X/LINK  |
| Audio stream: DSCP<br>(for RTP or UDP)                      | Read/Write | Select the quality of service (QoS) class of the stream.   |
| Audio stream: Payload type<br>(For RTP)                     | Read/Write | <ul> <li>RTP payload value that defines the audio profile. Standard values are:</li> <li>0 for G711</li> <li>9 for G722; 14 for MPEG</li> </ul>  |



|   |            | 96 for AAC, Opus  |
|---|------------|---|
| Audio stream: Payload size<br>(for RTP and UDP)         | Read/Write | Size (in ms) of the audio transported by an RTP frame.<br>For unframed formats (like PCM, G7xx), payload size value is rounded to<br>the nearest multiple value that is equal or higher than the processing<br>granularity value.<br>For framed formats (like MPEG, AAC), payload size value is rounded to<br>the nearest multiple value equal or higher than the frame size.   |
| Audio stream: Stop<br>streaming on silence<br>detection | Read/Write | IQOYA can automatically stop streaming and restart streaming upon<br>silence/signal detection on the audio source. This feature can be<br>enabled by setting this option to "Yes".<br>As a consequence, a decoder receiving the stream will switch to a<br>backup when silence is detected on the input of the encoder that<br>generates the stream.<br>Set this option to "No" if you want the encoder to stream even when the<br>audio source is silent.  |
| Audio stream:Synchro<br>Clock<br>(for RTP and UDP)      | Read/Write | None, or NTP.<br>NTP can be selected if the option "NTP based audio synchro" is installed.  |
| Audio stream:Presentation<br>delay                      | Read/Write | Valid if Synchro Clock is set to NTP.<br>Offset of time added to the current NTP time for time-stamping the IP<br>packets so that several decoders play the packets at the same time.<br>This value, expressed in microseconds, must be at least equal to the<br>maximum network transport time for an IP packet to reach the target<br>decoders.<br>Once the encoder and the decoders are configured, this value can be<br>tuned by checking the IP metrics. The maximum value is 2 000 000<br>microseconds (2 seconds) for unframed audio formats (PCM, Opus<br>G7xx), and 256 frames for framed audio formats (MPEG, AAC). In<br>MPEG Layer 2 48 kHz, this corresponds to 6 seconds (6 000 000<br>microseconds). |
| In-band format signalling                               | Yes/No     | <ul> <li>Yes: the description of the audio format is inserted in the IP audio stream so that the decoder can automatically adapt to the received format. This works only with IQOYA encoders and decoders.</li> <li>In this mode, FEC stream is sent to the same destination IP address as the IP audio stream, on UDP port +2.</li> <li>No: the decoder must be configured to receive the appropriate audio format.</li> <li>In this mode, FEC stream destination IP address and UDP port can be configured.</li> </ul>  |

Click on the icon 😐 on the bottom right of the page to add an IP destination.

#### IQOYA X/LINK range user manual

| - IP address             |       | 0 | Port | 5008 | 0 |   |
|--------------------------|-------|---|------|------|---|---|
| Network interface / VLAN | Any 🔻 | 0 |      |      |   | _ |
|                          |       |   |      |      |   | + |

Enter the new target IP address, UDP port, and the network interface through which the stream is sent.

Click on the icon **b** to remove a destination.

An FEC can be selected. FEC consists in sending additional data so that the decoder can recover lost packets. The amount of additional frames defines the recovery performance.

| FEC Stream (Forward error correction)  |  |
|--|--|
| Type No redundancy   | • 😯  |
|  | Close Save   |
|  |  |
| No redundancy "+50% bandwidth, recovery 2, 1 stream (FEC)" "+100% bandwidth, recovery 3, 2 streams (audio+FEC)" "+100% bandwidth, recovery 4, 2 streams (audio+FEC)" "+50% bandwidth, recovery 1/2, 2 streams (audio+FEC)" "+33% bandwidth, recovery 1/3, 2 streams (audio+FEC)" "+25% bandwidth, recovery 1/4, 2 streams (audio+FEC)" "+20% bandwidth, recovery 1/5, 2 streams (audio+FEC)" "+10% bandwidth, recovery 1/10, 2 streams (audio+FEC)" "+100% bandwidth, dual stream with no delay" "+100% bandwidth, dual stream with 100 ms delay" "+100% bandwidth, dual stream with 200 ms delay" "+100% bandwidth, dual stream with 400 ms delay" "+100% bandwidth, dual stream with 500 ms delay" "+100% bandwidth, dual stream with 600 ms delay" "+100% bandwidth, dual stream with 600 ms delay" "+100% bandwidth, dual stream with 900 ms delay" | <ul> <li>FEC on 1 stream means that additional data are see in the IP audio stream (in-band).</li> <li>FEC on 2 streams means additional data are sent a a second IP stream.</li> <li>Dual stream FEC mean that the IP steam is duplicated. When no delay is selected, primary stre and redundant stream are sent at the same time. When a delay is selected, redundant stream is delayed compared to the primary stream.</li> </ul> |

In case parameter "In-band format signalling" is set to "Yes", the destination IP address and UDP port of the FEC stream cannot be configured. The destination IP address is the same as for the primary stream, and the destination UDP port is equal to "primary stream destination UDP port + 2".



| FEC Stream (Forward error correc | ction)                             |        |            |
|----------------------------------|------------------------------------|--------|------------|
| Type<br>Payload type             | "+100% bandwidth, dual stı ▼<br>98 | 6<br>6 |            |
|                                  |                                    |        | Close Save |

In case parameter "In-band format signalling" is set to "No", the destination IP address and UDP port of the FEC stream can be configured.

| FEC Stream (Forward error corre | ction)                       |   |      |      |            |
|---------------------------------|------------------------------|---|------|------|------------|
| Туре                            | "+100% bandwidth, dual sti 🔻 | 8 |      |      |            |
| IP address                      |                              | 0 | Port | 5006 | •          |
| Network interface / VLAN        | Any 🔻                        | 0 |      |      |            |
| Local source port               | 7006                         | 0 |      |      |            |
| DSCP                            | Default 🔹                    | 8 |      |      |            |
| Payload type                    | 98                           | 0 |      |      |            |
|                                 |                              |   |      |      | Close Save |

| FEC stream: IP address                | Read/Write | Enter the destination IP address (unicast or multicast) of the FEC stream.   |
|---------------------------------------|------------|--|
| FEC stream: Port                      | Read/Write | Enter the destination UDP port of the FEC stream.  |
| FEC stream: Network<br>interface/VLAN | Read/Write | Select the network interface or VLAN for this FEC stream.<br>In case the target address is unicast, select "Any" so that the Eth<br>interface is determined automatically according to this IP address, or<br>select a VLAN.<br>In case the target IP address is multicast, select the Eth interface or the<br>VLAN. |
| FEC stream: Local source port         | Read/Write | Local UDP port number of IQOYA X/LINK  |
| FEC stream: DSCP                      | Read/Write | Select the quality of service (QoS) class of the FEC stream.   |
| FEC stream: Payload type              | Read/Write | RTP payload of the FEC stream. Value 98 is recommended.  |

Click on "Save" to confirm the settings. Click on "Save & New" to confirm the settings an create a new IP service with the same parameters.

Click on "Close" to discard the settings.

### Static metadata for Icecast/Shoutcast streaming

Metadata can be added by selecting "Yes" for the "Yellow Pages" parameter (YP Settings).



| Yellow Pages                              |  |     |             |       |            |      |
|---|--|-----|-------------|-------|------------|------|
| YP Settings                               | Yes <b>v</b><br>Public Server <b>v</b> | 8   | No <b>v</b> | 6     |            | ÷    |
|   |  |     |             | Close | Save & New | Save |
| Each new metadata field o<br>Yellow Pages | an be displayed by clic                | kin | g on 💶 .    |       |            |      |
| VD Softings                               | Vec                                    | 6   | <b>`</b>    |       |            |      |
| -   | Public Server                          |     | No          | Ø     |            |      |
|   | Stream Name 🔻                          | 1   |             | •     |            |      |
|   | Stream Description 🔹                   | 1   |             |       |            |      |
|   | Stream URL 🔻                           | 1   |             |       |            |      |
|   | Stream Genre 🔹                         | 1   |             |       |            |      |
| -   | ICQ #                                  | 1   |             |       |            |      |
| -   | AIM                                    | 1   |             |       |            |      |
| -   | IRC                                    | ]   |             |       |            |      |
|   | Other •                                |     |             |       |            |      |
|   |  |     |             |       |            | +    |
|   |  |     |             | Close | Save & New | Save |

#### Available Yellow Pages settings:

| Dublic Occord      | Konsentalite to make use a dia station (second   |
|--------------------|--|
| Public Server.     | if you would like to make your radio station (server)<br>public.   |
| Stream Name:       | Generally used to specify the name of the radio station<br>or broadcast.   |
| Stream Description | on: Generally used to specify the description (or title) of<br>the radio station or broadcast.   |
| Stream URL:        | Generally used to specify the internet address of the<br>radio website.  |
| Stream Genre:      | Generally used to specify the genre of music or<br>content stream by the radio station.  |
| ICQ#, AIM:         | ICQ and AIM labels. The purpose of these fields is to<br>allow your listeners to make instant music requests or<br>leave feedbacks on your stream. If you do not have an<br>AIM or ICQ username, or do not wish to include it<br>along with your stream, you should leave these fields<br>blank. |
| IRC:               | The field labeled 'IRC' is for those who wish to link<br>their stream to an Internet Relay Chat server. If you do<br>not have a chat room on an IRC server, or do not wish<br>to include it with your stream, you should leave this<br>field blank.  |
| Other:             | Use this type of field to send specific metadata to your<br>server.  |
|                    | No formatting added : your data will be inserted<br>without processing   |

### Dynamic metadata for Icecast/Shoutcast streaming

Dynamic metadata area also supported for Icecast/Shoutcast streams. These metadata have to be sent through a UDP port (one UDP port per metadata flow associated to an HTTP stream). UDP ports used for auxiliary data tunneling have to be declared from Preferences -> Auxiliary Data -> UDP (they must be set as input ports). For a given IP service, the source of auxiliary data can then be selected as shown in the screen capture below:



| Send - Add IP Service |                              | ×                     |
|-----------------------|------------------------------|-----------------------|
| Name<br>Encapsulation | None v                       | 0<br>0                |
| Transport protocol    | HTTP v                       | 0                     |
| Program               |                              |                       |
| Name                  | program 01 🔻                 | 0                     |
| Auxiliary data        | none 🔻                       | 0                     |
| Audio Stream          | UDP serial 1<br>UDP serial 2 |                       |
| IP address            |                              | 0                     |
| Port                  | 8000                         | 0                     |
| Username              |                              | 0                     |
| Password              |                              | 0                     |
| Buffer                | 2 s                          | 0                     |
| Yellow Pages          |                              |                       |
| YP Settings           | No                           | 0                     |
|                       |                              | Close Save & New Save |

### Log traces associated to an IP service

To view the log traces associated to an IP service, click on its status LED on the right, as shown on the screen capture below.

|          | Send - IP Services |             |           | rvices            |         |                          |                  |                    |       | Go to programs 🄿 |
|----------|--------------------|-------------|-----------|-------------------|---------|--------------------------|------------------|--------------------|-------|------------------|
| 00       |                    | For selecte | d service | (s) or program(s) | •       |                          |                  |                    | + Add | d IP Service     |
| 0        |                    |             |           | IP Service        | Program | Tunneled<br>serial ports | Tunneled<br>GPIs | Service<br>Bitrate | FEC   | Status           |
| <b>£</b> |                    | 10          |           |                   | 04      |                          |                  | -                  | Yes   | •                |
|          |                    | 15          |           | testMPTS          |         |                          |                  | 836 kb/s           | No    | •                |
|          |                    |             |           |                   | 1       |                          |                  |                    |       | •                |
|          |                    |             |           |                   | 2       |                          |                  |                    |       | •                |



## Encapsulation = MPEG-TS SPTS

| Send - Add IP Service             |                  | ×                           |
|-----------------------------------|------------------|-----------------------------|
| Name                              |                  | 0                           |
| Synchronous AoIP                  | None 🔻           | 0                           |
| Encapsulation                     | MPEG-TS SPTS V   | 0                           |
| Program                           |                  |                             |
| Name                              | test 🔻           | 0                           |
| Number                            |                  | 0                           |
| Program PID (PMT)                 |                  | 0                           |
| Stream PID                        |                  | 0                           |
| PTS announcement period           | 100 ms           | 0                           |
| Language                          | ENG              | 0                           |
|                                   |                  |                             |
| Transport Stream ID               | 1                | 0                           |
| PCR PID                           |                  | 0                           |
| PSI announcement period           | 100 ms           | 0                           |
| Delay for PTS calculation         | 500 ms           | 0                           |
| Overall bitrate                   | kbps             | 0                           |
| Transport protocol                | RTP •            | 0                           |
| Number of TS packet per IP packet | 7 *              | 0                           |
| Audio Stream                      |                  |                             |
| IP address                        |                  | <b>?</b> Port 5004 <b>?</b> |
| Network interface / VLAN          | Any 🔻            | 0                           |
| Local source port                 | 7004             | 0                           |
| DSCP                              | Default 🔻        | 0                           |
| FEC Stream MPEG (Forward error    | or correction)   | •                           |
| Туре                              | Column and row 🔻 | 0                           |
| Number of columns (L)             | 6                | 0                           |
| Number of rows (D)                | 4                | 0                           |
|                                   |                  | Close Save & New Save       |

| Program : Name                      | Read/Write | Select the Program to be streamed from the list of unused Programs.  |
|-------------------------------------|------------|--|
| Program: Number                     | Read/Write | Enter the program number (1 to 65535)  |
| Program: PID (PMT)                  | Read/Write | Enter the Program Map Table PID (16 to 8190)   |
| Program: Stream PID                 | Read/Write | Enter the PID of the elementary stream (16 to 8190)  |
| Program: PTS<br>announcement period | Read/Write | Enter the Program Time Stamps announcement period (from 100 to 700 ms)   |
| Program: Language                   | Read/Write | Enter the language descriptor, according to ISO 639-2  |
| Program: PCR ID                     | Read/Write | Program Clock Reference<br>Select this option in case the PCR is sent as an elementary stream, and<br>enter its packet ID (16 to 8190) |



| Program: PSI<br>announcement period     | Read/Write | Program Specific Information<br>Enter the announcement period (from 100 to 5000 ms)  |
|---|------------|--|
| Program: Delay for PTS calculation      | Read/Write | Enter the relative delay to be used to calculate the Presentation Time Stamp (100 to 2000ms)   |
| Program: Overall bit rate               | Read/Write | Enter the overall bit rate of the MPEG-TS stream.<br>When set to 0, the bit rate is set automatically.   |
| Program: Transport<br>Protocol          | Read/Write | Streaming protocol of the MPEG-TS stream: RTP or UDP.  |
| Audio stream: IP address                | Read/Write | Enter the destination IP address (unicast or multicast)  |
| Audio stream: Port                      | Read/Write | Enter the destination UDP port.  |
| Audio stream: Network<br>interface/VLAN | Read/Write | Select the network interface or VLAN for this stream.<br>In case the target address is unicast, select "Any" so that the Eth<br>interface is determined automatically according to this IP address, or<br>select a VLAN.<br>In case the target IP address is multicast, select the Eth interface or the<br>VLAN. |
| Audio stream: Local source port         | Read/Write | Local UDP port number of IQOYA X/LINK  |
| Audio stream: DSCP                      | Read/Write | Select the quality of service (QoS) class of the stream.   |
| FEC stream MPEG                         | Read/Write | See description hereafter "FEC Pro MPEG COP#3 for MPEG-TS streams"   |

Click on the icon • on the bottom right of the page to add IP destinations.

### Encapsulation = MPEG-TS MPTS

| Send - Add IP Service             |                |   |      |      |            |         | ×    |
|-----------------------------------|----------------|---|------|------|------------|---------|------|
| Name                              |                | 0 |      |      |            |         |      |
| Synchronous AoIP                  | None           | 0 |      |      |            |         |      |
| Encapsulation                     | MPEG-TS MPTS   | 0 |      |      |            |         |      |
| Programs                          |                |   |      |      |            |         |      |
| Name                              | test           | 0 |      |      |            |         |      |
| Number                            |                | 0 |      |      |            |         |      |
| Program PID (PMT)                 |                | 0 |      |      |            |         |      |
| Stream PID                        |                | 0 |      |      |            |         |      |
| PTS announcement period           | 100 ms         | 0 |      |      |            |         |      |
| Language                          | ENG            | 0 |      |      |            |         |      |
| Transport Stream ID               | 1              | 0 |      |      |            |         | +    |
| PCR PID                           |                | 0 |      |      |            |         |      |
| PSI announcement period           | 100 ms         | 0 |      |      |            |         |      |
| Delay for PTS calculation         | 500 ms         | 0 |      |      |            |         |      |
| Overall bitrate                   | kbps           | 0 |      |      |            |         |      |
| Transport protocol                | RTP            | 0 |      |      |            |         |      |
| Number of TS packet per IP packet | 7              | 0 |      |      |            |         |      |
| Audio Stream                      |                |   |      |      |            |         |      |
| IP address                        |                | 0 | Port | 5004 |            | 0       |      |
| Network interface / VLAN          | Any 🔻          | 0 |      |      |            |         |      |
| Local source port                 | 7004           | 8 |      |      |            |         |      |
| DSCP                              | Default        | 0 |      |      |            |         | _    |
|                                   |                |   |      |      |            |         | +    |
| FEC Stream MPEG (Forward erro     | or correction) |   |      |      |            |         |      |
| Туре                              | Column and row | 0 |      |      |            |         |      |
| Number of columns (L)             | 6              | 0 |      |      |            |         |      |
| Number of rows (D)                | 4              | 0 |      |      |            |         |      |
|                                   |                |   |      |      | Close Save | e & New | Save |

| Programs : Name                      | Read/Write | Select the Program to be streamed from the list of unused Programs.    |
|--------------------------------------|------------|--|
| Programs: Number                     | Read/Write | Enter the program number (1 to 65535)                                  |
| Programs: PID (PMT)                  | Read/Write | Enter the Program Map Table PID (16 to 8190)                           |
| Programs: Stream PID                 | Read/Write | Enter the PID of the elementary stream (16 to 8190)                    |
| Programs: PTS<br>announcement period | Read/Write | Enter the Program Time Stamps announcement period (from 100 to 700 ms) |
| Programs: Language                   | Read/Write | Enter the language descriptor, according to ISO 639-2                  |



An additional program to be transported in the MPTS stream can be declared by clicking on the button after the declared programs.

A declared program can be removed by clicking on the button 🗖 on the left of the program.

| Programs: PCR ID                        | Read/Write | Program Clock Reference<br>Select this option in case the PCR is sent as an elementary stream, and<br>enter its packet ID (16 to 8190)   |
|---|------------|--|
| Programs: PSI<br>announcement period    | Read/Write | Program Specific Information<br>Enter the announcement period (from 100 to 5000 ms)  |
| Programs: Delay for PTS calculation     | Read/Write | Enter the relative delay to be used to calculate the Presentation Time Stamp (100 to 2000ms)   |
| Programs: Overall bit rate              | Read/Write | Enter the overall bit rate of the MPEG-TS stream.<br>When set to 0, the bit rate is set automatically.   |
| Programs: Transport<br>Protocol         | Read/Write | Streaming protocol of the MPEG-TS stream: RTP or UDP.  |
| Audio stream: IP address                | Read/Write | Enter the destination IP address (unicast or multicast)  |
| Audio stream: Port                      | Read/Write | Enter the destination UDP port.  |
| Audio stream: Network<br>interface/VLAN | Read/Write | Select the network interface or VLAN for this stream.<br>In case the target address is unicast, select "Any" so that the Eth<br>interface is determined automatically according to this IP address, or<br>select a VLAN.<br>In case the target IP address is multicast, select the Eth interface or the<br>VLAN. |
| Audio stream: Local source port         | Read/Write | Local UDP port number of IQOYA X/LINK  |
| Audio stream: DSCP                      | Read/Write | Select the quality of service (QoS) class of the stream.   |
| FEC stream MPEG                         | Read/Write | See description hereafter "FEC Pro MPEG COP#3 for MPEG-TS streams"   |

Click on the icon 🔝 on the bottom right of the page to add an IP destination.

### FEC stream MPEG

This section allows configuring a Pro MPEG COP#3.2 FEC for the MPEG-TS stream.

| No Redundancy: No FEC is generated.  |
|--|
| <b>Column</b> : 1 dimension FEC scheme. Only FEC frames generated from columns are |
| streamed. Number of columns can be set from 1 to 20. This FEC is ideal for         |
|  |



|                       | <ul> <li>correcting packet burst errors and random errors. The column FEC frames are sent to UDP port = MPEG-TS stream UDP port + 2.</li> <li>Column and row: 2 dimensions FEC scheme. Provides correction for non-consecutive lost frames, and can correct any single packet loss within a row of media packets. <ul> <li>4 &lt;= Number of Columns (L) &lt;= 20.</li> <li>4 &lt;= Number of rows (D) &lt;= 20</li> <li>L x D &lt;= 100</li> </ul> </li> <li>The column FEC frames are sent to UDP port = MPEG-TS stream UDP port + 2. The row FEC frames are sent to UDP port = MPEG-TS stream UDP port + 4.</li> </ul> |
|-----------------------|---|
| Number of columns (L) | Column depth<br>Column scheme: value from 1 to 20<br>Column and row scheme: 4 <= L <= 20  |
| Number of rows (D)    | Row depth: 4 <= Number of rows (D) <= 20  |

Click on "Save" to confirm the settings. Click on "Save & New" to confirm the settings and create a new IP service with the same parameters.

Click on "Close" to discard the settings.

### 8.1.4 "Receive" category of menus

This category allows defining the IP services to be received by IQOYA, and the audio programs to be played to the outputs of IQOYA; three decoding priorities can be defined per audio program.

#### 8.1.4.1 Receive -> IP services



This page allows declaring and viewing the IP services to be received by IQOYA.

| <b>^</b> | 1 | Receive     | Go      | Go to programs 🏞 |   |               |                      |
|----------|---|-------------|---------|------------------|---|---------------|----------------------|
| 00       |   | i Delete se | elected | IP service(s)    |   | + Add IF      | <sup>D</sup> Service |
| <b>•</b> | 1 |             |         | Name             | URL   | Encapsulation | FEC                  |
|          |   | 10          | S       | 5004             | rtp://127.0.0.1:5004  | None          | No                   |
|          |   | 1           | S       | shoutcast        | http://tonicradiobourgoin.ice.infomaniak.ch:80/tonicradiobourgoin.mp3 | None          | No                   |



| In case some IP Services are already created, they are listed in the IP Services paname, URL, encapsulation (MPEG-TS or not), FEC. | ge, with their characteristics: : |
|--|-----------------------------------|
| To edit an existing IP service, click on the icon 🔽 on the right end of its line.  |                                   |
| To remove an IP service, click on the icon on the left end of its line, and select   | 面 Delete selected IP service(s)   |
| To delete all the IP services, click on the icon on the left of "Name", and select   | l Delete selected IP service(s)   |
| To declare a new IP service, click on the button + Add IP Service.   |                                   |
| An IP service can also be created by duplicating an existing one. Click on the icon service to be duplicated.                      | on the left on the IP             |
| When declaring or editing an IP service the following page is displayed.   |                                   |
| Receive - Add IP Service   | ×                                 |
| IP Service name  |                                   |

| IP Service name           |               |    | Ø                     |
|---------------------------|---------------|----|-----------------------|
| Synchronous AolP          | None          | •  | 0                     |
| Transport protocol        | RTP           | ٣  | 0                     |
| Encapsulation             | None          | ٣  | ]                     |
| Audio stream              |               |    |                       |
| IP address                | 127.0.0.1     |    | 0                     |
| Listening port            | 5004          |    | 0                     |
| Jitter                    | 200           | ms | 0                     |
| Loss                      | 150           | ms | 0                     |
| Synchro clock             | None          | ٣  | 0                     |
| In-band format signalling | No            | ٣  | 0                     |
| Payload type              | 96            |    | 0                     |
| FEC stream                |               |    |                       |
| Туре                      | No redundancy | ٣  | 0                     |
|                           |               |    | Close Save & New Save |

In case Icecast/Shoutcast is selected for the transport protocol (for WEB radio), the following parameters are displayed.



| Receive - Add IP Service                                    |                     |   |      |  |  |  |  |
|---|---------------------|---|------|--|--|--|--|
| IP Service name<br>Transport protocol                       | ShoutCast/Icecast v | 0<br>7<br>0                                       |      |  |  |  |  |
| Audio stream  |                     |   |      |  |  |  |  |
| URL<br>Listening port<br>File path or mount point<br>Buffer | 80<br>10 s          | 0           0           0           0           0 |      |  |  |  |  |
|   |                     | Close Save & New                                  | Save |  |  |  |  |

| Parameter  | Туре       | Description  |
|--|------------|--|
| IP service name                                      | Read/Write | Name given to this IP service. This is the name that can be selected in the source of a decoding priority of an output program.  |
| Transport protocol                                   | Read/Write | Values: RTP, UDP, Icecast/Shoutcast  |
| Encapsulation  | Read/Write | Only displayed if selected transport protocol is different from Icecast/Shoutcast.<br>Values are: None, MPEG-TS SPTS or MPEG-TS MPTS.  |
| Audio stream: IP address<br>(for RTP and UDP)        | Read/Write | In unicast, set this parameter to 127.0.0.1, otherwise enter the multicast IP address to listen to.  |
| Audio stream: listening port<br>(for RTP and UDP)    | Read/Write | For RTP and UDP protocols, value of the UDP port to listen to.<br>For Icecast/Shoutcast, value of the TCP port to listen to.   |
| Audio stream: Jitter<br>(for RTP and UDP)            | Read/Write | Enter the input buffering size to compensate the jitter of the network. This value, expressed in ms, must be at least equal to the measured jitter. In case there is FEC, it is necessary to consider the measured jitter for "primary and FEC stream".  |
| Audio stream: Loss<br>(only for RTP)                 | Read/Write | Defines the duration of consecutive lost packets until which IQOYA<br>replaces lost frames by silence, without flushing the buffer of jitter.<br>If the absence of received consecutive packets exceeds this duration,<br>the buffer of jitter is then flushed, and filled gain with received packets;<br>this allows resynchronization on the incoming IP audio stream, but this<br>generates a silence longer than the consecutive packet lossed.<br>To avoid long audio silences when only a few consecutive packets are<br>lost (especially for high jitter values), it is recommended to set the Loss<br>value to approximately 3/4 of the jitter buffer. |
| Audio stream: Synchro<br>clock (for RTP)             | Read/Write | Select NTP in case the audio synchronization on NTP is used for decoding this stream (optional feature).   |
| Audio stream: In-band<br>format signalling (for RTP) | Read/Write | Set this parameter to "Yes" if it is also set to "Yes" on the IQOYA encoder.   |

|   |            | Set this parameter to "No" if it is not configured on the IQOYA encoder, or if the encoder is another brand.  |
|---|------------|---|
| Audio stream: payload type<br>(for RTP)                 | Read/Write | Only displayed if "In-band format signalling" is set to "No".<br>Enter the payload value of the audio stream (same payload value as<br>configured on the stream encoder).                                 |
| Audio stream: URL<br>(for HTTP)                         | Read/Write | Only displayed when Transport Protocol is set to Icecast/Shoutcast URL of the Icecast/Shoutcast server. Example: streamer.mysite.com.   |
| Audio stream: File path or<br>mount point<br>(for HTTP) | Read/Write | File path of the source of a Shoutcast server.<br>File path of the source or mount point of an Icecast server.  |
| Audio stream: Buffer<br>(for HTTP)                      | Read/Write | Buffer value in seconds necessary to decode correctly the HTTP stream.<br>This value may depend on the HTTP server. In case the decoding is<br>producing audio breaks, this value has to be be increased. |

In case the audio format of the IP stream is not signalled in-band, it is necessary to declare if the received IP service includes an FEC.

Select the appropriate FEC for the Type field as shown below. The payload type is set automatically.

| 1 LO Stickin  |                             |   |            |
|---------------|-----------------------------|---|------------|
| Туре          | "+50% bandwidth, recovery 🔹 | 0 |            |
| Payload type  | 98                          | 0 |            |
| Advanced mode | No v                        | 0 |            |
|               |                             |   | Close Save |

In case FEC is not sent on the default UDP port and IP address, select "Yes" in the "Advanced mode" field, to be able to enter the IP address and UDP port.

| FEC stream     |                           |   |   |            |
|----------------|---------------------------|---|---|------------|
| Туре           | "+50% bandwidth, recovery | Ŧ | 0 |            |
| Payload type   | 98                        |   | 0 |            |
| Advanced mode  | Yes                       | • | 0 |            |
| IP address     |                           |   | 0 |            |
| Listening port | 5004                      |   | 0 |            |
|                |                           |   |   | Close Save |

| FEC stream parameters | Туре       | Description  |
|-----------------------|------------|--|
| Туре                  | Read/Write | Select the FEC that is configured on the encoder of the received IP stream.                  |
| Payload type          | Read/Write | Enter the same FEC payload type that is configured on the encoder of the received IP stream. |



| Advanced mode  | Read/Write | Select "Yes" if the FEC destination IP address is not the same as the IP stream destination IP address, or of it is to be received on a UDP port different from "IP stream UDP port +2" |
|----------------|------------|---|
| IP address     | Read/Write | Displayed if Advanced mode is set to "Yes".<br>In unicast, set the IP address to 127.0.0.1.<br>In multicast, enter the multicast IP address.  |
| Listening port | Read/Write | Displayed if Advanced mode is set to "Yes".<br>Enter the UDP port for receiving the FEC.  |

Click on "Save" to confirm the settings.

#### 8.1.4.2 Receive -> Programs

Output programs are composed of a list of audio sources organized in priorities. Up to 3 decoding priorities can be defined. The highest priority is priority 1. If the audio source of priority 1 is lost, IQOYA switches to priority 2 if the corresponding audio source is available, or to priority 3 if the corresponding audio source is available. If no declared audio source is available, the program output is silent.

|   | 1    | Receive     | ]                      |
|---|------|-------------|------------------------|
|   |      | IP Services |                        |
| Output programs configuration is accessible either from the left column |      | Programs    | , or directly from the |
| icon "Go to IP Service" on the top right of the IP Services             | ns 产 |             |                        |

|    | ļ | Receive     | ) - Pr   | ograms            |            |        |         |              |              | Go t      | o IP Service 🆈 |
|----|---|-------------|----------|-------------------|------------|--------|---------|--------------|--------------|-----------|----------------|
| 00 |   | For selecte | d progra | m(s) and/or prior | ity(ies) ◄ |        |         |              |              | + Add     | Program        |
| 9  |   |             |          | Name              | Priority   | Source | Status  | Audio format | First output | Audio bus | Metrics        |
|    |   | 1           |          | ⊕ pcm             |            |        | •       |              | Output 1     |           |                |
|    |   | 1           |          | radio one         |            |        | •       |              | Output 4     |           |                |
| 2  |   |             | (        |                   | 1          | test   | Playing |              |              |           | View           |

The "Programs" page displays the declared output programs.

To declare a new output program, click on

, or create it from an existing one by selecting the

icon **b** on the left of this latter.

| Receive -  | Edit Program   |  |             |                                     |      |       | ×    |
|------------|--|--|-------------|-------------------------------------|------|-------|------|
| Program    | Backup switching   |  |             |                                     |      |       |      |
|            | Program name<br>Disabled   | From Cancun No   | 6<br>6      |                                     |      |       |      |
| Audio out  | puts   |  |             |                                     |      |       |      |
|            | Primary output<br>First output type<br>First output<br>Number of outputs | Audio IO <b>v</b><br>None <b>v</b><br>1 <b>v</b>   | 6<br>6      | Secondary output<br>First audio bus | None | <br>v | 0    |
| Priority 1 |  |  |             |                                     |      |       |      |
| Source     | Silence detection  |  |             |                                     |      |       |      |
|            | Type<br>First input<br>Disabled<br>Digital level (dB)                    | Audio input  Input 1 I | 6<br>6<br>6 |                                     |      |       | ÷    |
|            |  |  |             |                                     |      | Close | Save |

| Program Parameter                   | Туре       | Description  |
|-------------------------------------|------------|--|
| Program name                        | Read/Write | Name given to this output Program.   |
| Disabled                            | Read/Write | Set this parameter to "Yes" if you want to disable the program. This<br>means that IQOYA does not process it.<br>Set this parameter to "No" so that IQOYA processes this program and<br>decodes audio. |
| Audio outputs: first output<br>type | Read/Write | Audio I/O: to select a physical output (not available on X/LINK-AES67)<br>AoIP: to select a declared output stream (AES67/RAVENNA/Livewire)<br>Audio Bus: to select an audio bus (optional)            |
| Audio outputs: first output         | Read/Write | Select the first audio output associated to this program.<br>Note that it is necessary to select an audio output that is not assigned to<br>another program (an error is displayed)                    |
| Audio outputs: First audio bus      | Read/Write | Select the first audio bus channel associated to this program.<br>Audio bus is useful for IP stream transcoding.   |
| Number of outputs                   | Read/Write | Set this parameter to 1 for mono, 2 for stereo, 6 for 5.1, 8 for 7.1.  |

## Backup switching criteria



| Receive - Edit Program      |      |    |   |  | × |            |
|-----------------------------|------|----|---|--|---|------------|
| Program Backup switching    |      |    |   |  |   |            |
| IP stream loss duration     | 1000 | ms | 0 |  |   |            |
| IP stream recovery duration | 1000 | ms | 8 |  |   |            |
| IP stream absence duration  | 500  | ms | 8 |  |   |            |
|                             |      |    |   |  |   | Close Save |

| Program Parameter              | Description   |
|--------------------------------|---|
| IP stream loss<br>duration     | In case the codec is configured to decode an IP audio stream and at least one backup is defined, you can configure the backup switching criteria.<br>IP stream loss duration , expressed in ms, is the duration of absence of the stream. When this condition is encountered on priority 1 or priority 2, IQOYA automatically switches to the lower priority.<br>The minimum value for this duration is the jitter value set from the Receive page. |
| IP stream recovery<br>duration | This value, expressed in ms, is the duration of presence of the stream after it has been lost.<br>When this condition is encountered, IQOYA automatically switches to the higher priority where<br>the stream is recovered.<br>These two criteria apply to the main received IP stream as well as to the backup IP stream.  |
| IP stream absence<br>duration  | During the stream recovery process, if a received packet is followed by a packets absence duration larger than this "IP stream absence duration", the stream is considered as absent. This value (in ms) should be lower than half the "IP stream recovery duration". If the value is set to 0, this parameter is ignored   |

The following parameter define the audio source associated to priority 1. It is possible to declare two additional

priorities by clicking on the button 🕒 on the right below the decoding priority.

The parameters listed for a decoding priority depend on the selected source "Type": IP service, File, Playlist, Audio input.

| Priority 1                         | 1                       |                  |        |    |   |           |   |
|------------------------------------|-------------------------|------------------|--------|----|---|-----------|---|
| Source                             | Silence detection       |                  |        |    |   |           |   |
|                                    | Туре                    | IP Service       |        | •  | 8 |           |   |
|                                    | Service                 | FLUX02           |        | •  | ? |           |   |
| Receive                            | d format auto-detection | Yes              |        | Ŧ  |   |           |   |
|                                    | Disabled                | No               |        | •  | 0 |           |   |
|                                    | Digital level (dB)      | 0                |        | -) | 8 |           |   |
|                                    | Input channel mapping   |                  |        | •  | 8 |           |   |
|                                    | PLL                     | Yes              |        | •  | 8 |           |   |
| Data tunnel                        | ing:                    |                  |        |    |   |           |   |
|                                    | Auxiliary data          | None             |        | ۳  | 0 |           |   |
| Routing of t                       | unneled GPIs:           |                  |        |    |   |           |   |
|                                    |                         | [1-4] : Physical | I GPIs |    |   |           |   |
| GPI index                          |                         |                  | GPO    |    |   | Invertion | 0 |
| <ul> <li>Tunneled GPI 1</li> </ul> |                         |                  | 1      |    |   |           |   |
| - Tunneled GPI 2                   |                         |                  | 2      |    |   |           |   |

### Source Type = IP service, and IP service is RTP

| Priority Source Parameter         | Туре       | Description  |
|-----------------------------------|------------|--|
| Туре                              | Read/Write | Select the audio source for this priority.<br><b>IP Service</b> : audio will be extracted from a declared IP service.<br>File: audio source is a local file<br>Playlist: audio source is a local "m3u" playlist<br>Audio input: audio source is an audio input.  |
| Service                           | Read/Write | Select the IP service from the list of declared IP services.<br>(IP services must have been declared first from the IP Services page).   |
| Received format<br>auto-detection | Read       | This parameter is set automatically according to the selected IP service.<br>If the IP service has been declared with in-band format signalling,<br>auto-detection is set to "Yes".  |
| Disabled                          | Read/Write | Set this parameter to "Yes" to disable this decoding priority. Disabling a define priority is useful when some servicing is in progress on it (network servicing, servicing on the source of the IP stream). The priority can then be enabled when servicing operations are finished.  |
| Digital Level (dB)                | Read/Write | Digital gain applied to the audio samples on this priority.  |
| Input channel mapping             | Read/Write | <ul> <li>Displayed when the audio source includes more audio channels than the output. Select how the channels of the selected source are to be processed:</li> <li>No: each input channel is assigned to an output channel.</li> <li>Mix: the input channels are mixed to a single output channel. An attenuation of -6 dB is applied to each channel before they are mixed. The gain/attenuation set through "Digital level" comes in addition to this attenuation.</li> </ul> |



|   |            | <ul><li>First channel only: only the first channel is processed.</li><li>Second channel only: only the second channel is processed.</li></ul>   |  |  |  |  |
|---|------------|---|--|--|--|--|
| PLL   | Read/Write | To be set to "Yes" in most of the use cases. It allows synchronisation of the incoming stream to the internal clock, thus guaranteeing a constant latency with the encoder.<br>Has to be set to "No" typically when AES transparency is required between the encoder and the decoder (this requires also that the encoder and the decoder use clocks that have the same frequency). |  |  |  |  |
| Data tunneling: Auxiliary<br>data                       | Read/Write | In case serial data are tunneled in-band, select the output port. It can be the RS232 COM port, or a UDP port if it has been declared from menu "Preferences/Auxiliary data/UDP".   |  |  |  |  |
| Routing of tunneled status<br>data: Status data indexes | Read/Write | Routing of tunneled GPIs:<br>[1-4]: Physical GPIs<br>GPI index GPO Invertion<br>Tunneled GPI 1 1<br>Tunneled GPI 2 2<br>GUIDED TUNNELED GPI 3<br>Tunneled GPI 3<br>Characteristic constraints from 1) that will reflect the tunneled GPI status.<br>Click on "Add tunneled GPI" to route another tunneled status.   |  |  |  |  |
| Routing of tunneled status<br>data: GPO inversion mask  | Read/Write | Check the box under a GPO so that it reflects the inverted status of the tunneled GPI.  |  |  |  |  |

# Silence detection parameters for the decoding priority

| Priority 1                        |                             |       |   |  |       |
|-----------------------------------|-----------------------------|-------|---|--|-------|
| Source Silence detection          |                             |       |   |  |       |
| Disable upon silence detection    | Yes No                      |       | 0 |  |       |
| nput signal for silence detection | Mean of left + right channe | els 🔻 | 0 |  |       |
| Silence threshold                 | -43.00                      | dB    | 8 |  |       |
| Silence duration                  | 1000                        | ms    | 8 |  |       |
| Signal threshold                  | -43.00                      | dB    | 0 |  |       |
| Signal duration                   | 2000                        | ms    | 8 |  |       |
| Signal drop duration              | 1000                        | ms    | 0 |  |       |
|                                   |                             |       |   |  |       |
|                                   |                             |       |   |  | Close |
|                                   |                             |       |   |  |       |



| Priority Source Parameter                                   |            | Туре   |
|---|------------|--|
| Disable upon silence<br>detection                           | Read/Write | IQOYA can also automatically disable the decoding priority in case of silence detection in the audio source. The priority can then be enabled again via the WEB site, or via SNMP.   |
| Input signal for silence<br>detection                       | Read/Write | The parameter "Input signal for silence detection" allows defining on which source signal the silence detection is applied. Possible choices are:     - Mean of left + right channels: compares the mean value of a left and right sample to the threshold. In case the calculated values are always lower to the silence threshold during the defined silence duration, silence condition is reached.     - Left channel only: compares the left channel samples to the silence threshold during the defined silence duration is reached.     - Right channel only: compares the left channel samples to the silence threshold during the defined silence duration, silence condition is reached.     - Right channel only: compares the right channel samples to the silence threshold during the defined silence duration, silence condition is reached.     - Right channel only: compares the right channel samples to the silence threshold during the defined silence duration, silence condition is reached.     - Left and right channels: compares both the left and right channel samples to the silence threshold. In case the sample values are always lower to the silence duration, silence condition is reached.     - Left and right channels: compares both the left and right channel samples to the silence threshold. In case the sample values on both channels are always lower to the silence threshold during the defined silence threshold. In case the sample values on at least one on the two channels are always lower to the silence threshold during the defined silence duration, silence condition is reached. |
| Silence threshold &<br>Silence duration                     | Read/Write | Silent audio is defined through these two parameters, expressed in dBfs.<br>When audio level is below the threshold value during at least the defined duration, the alarm "Analog audio in silent" or "Digital audio in silent" is set (if it is enabled from the "Alarms setup" menu).  |
| Signal threshold<br>Signal duration<br>Signal drop duration | Read/Write | <ul> <li>Audio signal is defined through the three parameters. Audio signal is considered as recovered if all the following conditions are true: <ul> <li>Audio level exceeds the Signal threshold (dBfs) within the "Signal duration" analysis window (ms).</li> <li>Audio level does not stay below the Signal threshold during the "Signal drop duration", within the "Signal duration" analysis window.</li> </ul> </li> <li>Note the following rule: Signal drop duration &lt;= (Signal duration / 2). Once signal is recovered, the alarm "Analog audio in silent" or "Digital audio in silent" is reset (if it is enabled from the "Alarms setup" menu).</li> </ul>   |



# Source Type = IP service, and IP service is UDP

| Source       | Silence detection    |              |   |
|--------------|----------------------|--------------|---|
|              | Туре                 | IP Service v | · • • • • • • • • • • • • • • • • • • • |
|              | Service              | test5 v      | · • •                                   |
|              | Mode                 | Stereo 🔻     | · • • • • • • • • • • • • • • • • • • • |
|              | Sample rate          | 48000Hz 🔻    | · • • • • • • • • • • • • • • • • • • • |
|              | Encoding format      | AAC-LC 🔻     |   |
|              | Bit rate             | 288kb/s 🔻    |   |
|              | Disabled             | No 🔻         |   |
|              | Digital level (dB)   |              | 0                                       |
| 1            | nput channel mapping | No 🔻         |   |
|              | PLL                  | Yes 🔻        |   |
| Data tunneli | ng:                  |              | _                                       |
|              |                      |              | *                                       |
|              |                      |              | Close Save & New Save                   |
|              |                      |              | Close Save & New Sat                    |

In UDP mode, the audio format has to be declared.

### Source Type = IP service, and IP is a WEB radio

| Priority 1               |              |   |       |            |      |
|--------------------------|--------------|---|-------|------------|------|
| Source Silence detection |              |   |       |            |      |
| Туре                     | IP Service v | 0 |       |            |      |
| Service                  | WEB radio 🔻  | 0 |       |            |      |
| Disabled                 | No 🔻         | 0 |       |            |      |
| Digital level (dB)       |              | 0 |       |            |      |
| Input channel mapping    | No 🔻         | 0 |       |            |      |
| PLL                      | Yes 🔻        | 0 |       |            |      |
| Data tunneling:          |              |   |       |            |      |
| Auxiliary data           | None 🔻       | 0 |       |            |      |
|                          |              |   |       |            | +    |
|                          |              |   | Close | Save & New | Save |
|                          |              |   |       |            |      |



| Parameter                         | Туре       | Description  |
|-----------------------------------|------------|--|
| Туре                              | Read/Write | IP Service   |
| Service                           | Read/Write | Select the IP service from the list of declared IP services.<br>(IP services must have been declared first from the IP Services page).   |
| Disabled                          | Read/Write | Set this parameter to "Yes" to disable this decoding priority.   |
| Digital Level (dB)                | Read/Write | Digital gain applied to the audio samples on this priority.  |
| Input channel mapping             | Read/Write | <ul> <li>Select how the channels of the selected source are processed:</li> <li>No: each input channel is assigned to an output channel.</li> <li>Mix: the input channels are mixed to a single output channel. An attenuation of -6 dB is applied to each channel before they are mixed. The gain/attenuation set through "Digital level" comes in addition to this attenuation.</li> <li>First channel only: only the first channel is processed.</li> <li>Second channel only: only the second channel is processed.</li> </ul> |
| PLL                               | Read/Write | Set to Yes in most of the cases. It allows synchronization of the incoming IP audio to the sampling clock, thus guaranteeing a constant delay. It has to be set to No when samples must ne be modified between the encoder and the decoder (this required that the encoder and the decoder have clock sources having the exact same sampling frequency)  |
| Data tunneling: Auxiliary<br>data | Read/Write | In case serial data are tunneled in-band, select the output port. It can be<br>the RS232 COM port, or a UDP port if it has been declared from menu<br>"Preferences/Auxiliary data/UDP".  |

# Source Type = File or Playlist

| Source | Silence detection    |                |   |            |
|--------|----------------------|----------------|---|------------|
|        | Туре                 | Playlist 🔻     | 0 |            |
|        | Playlist file        | playlist.m3u 🔻 | • |            |
|        | Disabled             | No 🔻           | 0 |            |
|        | Digital level (dB)   |                | • |            |
| h      | nput channel mapping | No 🔻           | • |            |
|        |                      |                |   | E          |
|        |                      |                |   | Close Save |

| Parameter | Туре       | Description   |
|-----------|------------|---|
| Туре      | Read/Write | File or Playlist.<br>These files are stored locally on the internal DOM (disk on module). |



| Audio File            | Read/Write | Select the an audio file or playlist from the list.  |  |
|-----------------------|------------|--|--|
| Disabled              | Read/Write | Set this parameter to "Yes" to disable this decoding priority.   |  |
| Digital Level (dB)    | Read/Write | Digital gain applied to the audio samples on this priority.  |  |
| Input channel mapping | Read/Write | <ul> <li>Select how the channels of the selected source are processed:</li> <li>No: each input channel is assigned to an output channel.</li> <li>Mix: the input channels are mixed to a single output channel. An attenuation of -6 dB is applied to each channel before they are mixed. The gain/attenuation set through "Digital level" comes in addition to this attenuation.</li> <li>First channel only: only the first channel is processed.</li> <li>Second channel only: only the second channel is processed.</li> </ul> |  |

### Source Type = Audio input

| Priority 1 |                      |             |     |            |
|------------|----------------------|-------------|-----|------------|
| Source     | Silence detection    |             |     |            |
|            | Туре                 | Audio input | . 0 | •          |
|            | First input          | Input 1     | ,   |            |
|            | Disabled             | No          | •   |            |
|            | Digital level (dB)   | •           | 0   |            |
| 1          | nput channel mapping | No          | 0   |            |
|            |                      |             |     |            |
|            |                      |             |     | Close Save |

Parameters are the same as above, except the audio input that must be selected instead of a sound file or playlist.

Once output programs have been defined, they are listed in the "Programs" page.

To view the content of a program, click on 1 on the left of its name.

| F | Receive     | ) - Pro    | ograms        |                |                  |           |              |              | Go to II  | P Service 🏞 |
|---|-------------|------------|---------------|----------------|------------------|-----------|--------------|--------------|-----------|-------------|
|   | For selecte | ed prograr | n(s) and/or p | riority(ies) 🗸 |                  |           |              |              | + Add Pro | ogram       |
|   |             |            | Name          | Priority       | Source           | Status    | Audio format | First output | Audio bus | Metrics     |
|   | 1           |            | pcm           |                |                  | •         |              | Output 1     |           |             |
|   | 1           | • •        | radio one     |                |                  | ٠         |              | Output 4     |           |             |
|   |             |            |               | 1              | test             | Playing   |              |              |           | View        |
|   |             |            |               | 2              | File Contigo.wav | Available |              |              |           |             |

The decoding priorities of the program are displayed as well as some associated information:

- Name: program name
- Priority: 1, 2, or 3 priorities are displayed, depending on what has been defined.
- Source: displays the name of the audio source defined for the priority
- Program status: Displays the status of the program, and the status of each priority. Possible program statuses are:
  - Green LED => the first enabled priority is decoded.
  - Orange LED => the source of a priority is missing
  - Red LED => all the defined sources are missing.

Possible priority statuses are:

- Playing: IQOYA is playing this priority
- Missing: the audio source of the priority is missing
- Disable: the decoding priority is disabled
- Available: means that the source of this priority is detected, but a higher priority source is being played.
- Audio format: display the audio format of the decoded IP service.
- First output: displays the first output used for the program
- Serial: displays the serial port that outputs tunneled serial data.
- GPOs: displays the GPO that reflect the tunneled statuses



| Reset IP metric       Reset         Max geting       4         Primary Steff       5         Primary Steff       5         Messured jitter       3         Acceived packets       3         Jouplicate packets       3         Duplicate packets       3         Recovered packets       3         Recovered packets       3         Messured jitter       3         Recovered packets       3         Steadered packets       3         Messured jitter       1         Recovered packets       3         Steadered packets       3         Steadered packets       3         Guptacet packets       3         Steadered packets       3   | rogram's Metrics                       |                     | 2                 |
|---|--|---------------------|-------------------|
| Max measured jitter<br>(Primary & FEC)       46 ms         Primary stream (127.0.11502)       370         Measured jitter<br>(Beasured jitter)       3970         Received packets       0         Late packets       0         Duplicated packets       0         Received packets       0         Received packets       0         Proward encorrection structures       0         Measured jitter       1ms         Received packets       0         Measured jitter       1ms         Late packets       0         Duplicated packets       0         Measured jitter       1ms         Received packets       0         Late packets       0         Duplicated packets       0         Juplicated packets <td>Reset IP metrics</td> <td>Reset</td> <td></td>  | Reset IP metrics                       | Reset               |                   |
| Primary stream (127.0.0.1:5012)           Measured jitter         3 ms           Received packets         13970           Lost packets         0           Duplicated packets         0           Recordered packets         0           Recordered packets         0           Recordered packets         0           Forward error correction str=         127.0.0.1:5014           Measured jitter         1 ms           Received packets         0           Lost packets         0           Lost packets         0           Received packets         0           Lost packets         0           Lost packets         0           Lost packets         0           Duplicated packets         0           Late packets         0           Itate packets         0           Jitter distribution         Primary stream           [0.0 - 6.0]         99.98%           19967/19370 pac         0/19370 pac           [12.0 - 18.0]         0%           [12.0 - 18.0]         0%           [12.0 - 18.0]         0%           [12.0 - 18.0]         0%           [12.0 - 18.0]         0%  | Max measured jitter<br>(Primary & FEC) | 46 ms               |                   |
| Measured jitterSmReceived packets3970Late packets0Duplicated packets0Recorder packets0Recorder packets0Secover d packets0Measured jitter1mReceived packets6Objicated packets0Secover d pa   | Primary stream (127.0.0.1:5012)        |                     |                   |
| Received packets       13870         Lost packets       0         Late packets       0         Duplicated packets       0         Recordered packets       0         Recordered packets       0         Forward error correction struturuturuturuturuturuturuturuturuturu   | Measured jitter                        | 3 ms                |                   |
| Lost packets       0         Duplicated packets       0         Recordered packets       0         Recordered packets       0         Forward error correction st====================================   | Received packets                       | 13970               |                   |
| Late packets         0           Duplicated packets         0           Recorder dpackets         0           Forward error correction struture         0           Measured jitter         1ms           Received packets         0           Duplicated packets         0           Lost packets         0           Duplicated packets         0           List packets         0           Duplicated packets         0           Duplicated packets         0           Jitter distribution         Primary stream            Image structure         13367/13970 packet         13367/13970 packet           Image structure         99.98%         13367/13970 packet           Image structure  | Lost packets                           | 0                   |                   |
| Duplicated packets         9           Recorder packets         9           Forward error correction structuruturuturuturuturuturuturuturuturu  | Late packets                           | 0                   |                   |
| Reordered packets         0           Recovered packets         0           Forward error correction stre=tro.ts:out         Immandiane           Measured jitter         1 ms           Received packets         4656           Lost packets         0           Duplicated packets         0           Received packets         0           Lost packets         0           Duplicated packets         0           Jitter distribution         Primary stream            Immandiant         99.98%         13967/13970 packets           Immandiant         99.98%         13967/13970 packets           Immandiant         90.98%         13967/13970 packets   | Duplicated packets                     | 0                   |                   |
| Recovered packets         0           Forward error correction stream (127.0.0.1:5014)         Image: Contract Contrect Contrect Contract Contrect Contract Contrect Contract Conte | Reordered packets                      | 0                   |                   |
| Forward error correction streaw (127.0.0.1:5014)         Measured jitter       1 ms         Received packets       4656         Lost packets       0         Late packets       0         Duplicated packets       0         Received packets       0         Itter distribution       Primary stream         (0.0 - 6.0[       99.98%         13967/13970 packets       0/13970 packets         [6.0 - 12.0[       0%         (12.0 - 18.0[       0%         (13.0 - 36.0[       0%         (13.0 - 36.0[       0%         (13.0 - 36.0[       0%         (13.0 - 36.0[       0%         (13.0 - 48.0[       0%         (13.0 - 48.0[       0%   | Recovered packets                      | 0                   |                   |
| Measured jitter       1 ms         Received packets       4656         Lost packets       0         Late packets       0         Duplicated packets       0         Jitter distribution       Primary stream       ▼         Jitter distribution       Primary stream       ▼         Image: Stream (12.0 - 18.0)       0%       0%         Image: Stream (12.0 - 18.0)       0%       0%       0%       0%         Image: Stream (12.0 - 18.0)       0%       0%       0%       0%         Image: Stream (12.0 - 18.0)       0%       0%       0%       0%       0%         Image: Stream (12.0 - 18.0)       0%       0%       0%       0%       0%       0%       0%       0%       0%   | Forward error correction stream        | am (127.0.0.1:5014) |                   |
| Received packets         4656           Lost packets         0           Late packets         0           Duplicated packets         0           Reordered packets         0           Jitter distribution         Primary stream         ▼           Image: Primary stream         ▼         13967/13970 packets           Image: Primary stream         13967/13970 packets <th< td=""><td>Measured jitter</td><td>1 ms</td><td></td></th<>   | Measured jitter                        | 1 ms                |                   |
| Lost packets         0           Late packets         0           Duplicated packets         0           Reordered packets         0           Jitter distribution         Primary stream         ▼           [0.0 - 6.0[         99.98%         13967/13970 pact           [6.0 - 12.0[         0%         0/13970 pact           [12.0 - 18.0[         0%         0/13970 pact           [13.0 - 24.0[         0%         0/13970 pact           [13.0 - 36.0[         0%         0/13970 pact           [13.0 - 36.0[         0%         0/13970 pact           [14.0 - 14.0[]         0%         0/13970 pact           [13.0 - 24.0[]         0%         0/13970 pact           [13.0 - 36.0[]         0%         0/13970 pact           [13.0 - 36.0[]         0%         0/13970 pact           [13.0 - 42.0[]         0%         0/13970 pact   | Received packets                       | 4656                |                   |
| Late packets         0           Duplicated packets         0           Reordered packets         0           Jitter distribution         Primary stream         •           [0.0 - 6.0[         99.98%         13967/13970 packets           [0.0 - 6.0[         99.98%         13967/13970 packets           [1.2.0 - 18.0[         0%         0/13970 packets           [1.2.0 - 18.0[         0%         0/13970 packets           [1.2.0 - 18.0[]         0%         0/13970 packets   | Lost packets                           | 0                   |                   |
| Duplicated packets         0           Reordered packets         0           Jitter distribution         Primary stream         •           [0.0 - 6.0[         99.98%         13967/13970 pact           [0.0 - 6.0[         99.98%         0           [1.0 - 6.0[         99.98%         0           [1.0 - 6.0[         99.98%         0/13970 pact           [1.0 - 6.0[         99.98%         0/13970 pact           [1.0 - 12.0[         0%         0/13970 pact           [1.2 - 18.0[         0%         0/13970 pact           [1.2 - 18.0[         0%         0/13970 pact           [1.3 - 24.0[         0%         0/13970 pact  | Late packets                           | 0                   |                   |
| Reordered packets         0           Jitter distribution         Primary stream         •           [0.0 - 6.0[         99.98%         13967/13970 pact           [6.0 - 12.0[         0%         0/13970 pact           [12.0 - 18.0[         0%         0/13970 pact           [18.0 - 24.0[         0%         0/13970 pact           [12.0 - 30.0[         0%         0/13970 pact           [30.0 - 36.0[         0%         0/13970 pact           [36.0 - 42.0[         0%         0/13970 pact           [42.0 - 48.0[         0%         0/13970 pact   | Duplicated packets                     | 0                   |                   |
| Jitter distribution         Primary stream           [0.0 - 6.0[         99.98%         13967/13970 pace           [6.0 - 12.0[         0%         0/13970 pace           [12.0 - 18.0[         0%         0/13970 pace           [18.0 - 24.0[         0%         0/13970 pace           [24.0 - 30.0[         0%         0/13970 pace           [30.0 - 36.0[         0%         0/13970 pace           [36.0 - 42.0[         0%         0/13970 pace           [42.0 - 48.0[         0%         0/13970 pace   | Reordered packets                      | 0                   |                   |
| [0.0 - 6.0[         99.98%         13967/13970 pac           [6.0 - 12.0[         0%         0/13970 pac           [12.0 - 18.0[         0%         0/13970 pac           [18.0 - 24.0[         0%         0/13970 pac           [18.0 - 24.0[         0%         0/13970 pac           [13.0 - 36.0[         0%         0/13970 pac           [36.0 - 42.0[         0%         0/13970 pac           [42.0 - 48.0[         0%         0/13970 pac  | Jitter distribution                    | Primary stream 🔻    | ]                 |
| [6.0 - 12.0]       0%       0/13970 pac         [12.0 - 18.0]       0%       0/13970 pac         [18.0 - 24.0]       0%       0/13970 pac         [24.0 - 30.0]       0%       0/13970 pac         [30.0 - 36.0]       0%       0/13970 pac         [36.0 - 42.0]       0%       0/13970 pac         [42.0 - 48.0]       0%       0/13970 pac   | [0.0 - 6.0[                            | 99.98%              | 13967/13970 packe |
| [12.0 - 18.0[       0%       0/13970 pac         [18.0 - 24.0[       0%       0/13970 pac         [24.0 - 30.0[       0%       0/13970 pac         [30.0 - 36.0[       0%       0/13970 pac         [36.0 - 42.0[       0%       0/13970 pac         [42.0 - 48.0[       0%       0/13970 pac   | [6.0 - 12.0[                           | 0%                  | 0/13970 packet    |
| [18.0 - 24.0]       0%       0/13970 pac         [24.0 - 30.0]       0%       0/13970 pac         [30.0 - 36.0]       0%       0/13970 pac         [36.0 - 42.0]       0%       0/13970 pac         [42.0 - 48.0]       0%       0/13970 pac  | [12.0 - 18.0[                          | 0%                  | 0/13970 packet    |
| [24.0 - 30.0[       0%       0/13970 pac         [30.0 - 36.0[       0%       0/13970 pac         [36.0 - 42.0[       0%       0/13970 pac         [42.0 - 48.0[       0%       0/13970 pac   | [18.0 - 24.0[                          | 0%                  | 0/13970 packet    |
| [30.0 - 36.0]         0%         0/13970 pac           [36.0 - 42.0]         0%         0/13970 pac           [42.0 - 48.0]         0%         0/13970 pac  | [24.0 - 30.0[                          | 0%                  | 0/13970 packet    |
| [36.0 - 42.0]         0%         0/13970 pace           [42.0 - 48.0]         0%         0/13970 pace   | [30.0 - 36.0[                          | 0%                  | 0/13970 packe     |
| [42.0 - 48.0[ 0% 0/13970 pac  | [36.0 - 42.0[                          | 0%                  | 0/13970 packe     |
|   | [42.0 - 48.0[                          | 0%                  | 0/13970 packet    |

• Metrics/view: Click on view to display the metrics of the IP service.

These metrics are important characteristics of the network path. In case an FEC is used, metrics are available for both the primary stream and the FEC stream. Note that the measured jitter (Primary + FEC streams)

| Variable            | Meaning   |
|---------------------|---|
| Max Measured jitter | Displayed only if an FEC stream is received.<br>Defines the minimum jitter to be configured in Receive->IP Services (it includes the<br>primary stream and the FEC stream).<br>On unmanaged networks, we recommend to configure a higher value as the jitter<br>may evolve and reach higher values. |
| Measured jitter     | Jitter measured for the considered stream (primary or FEC).<br>If no FEC stream is received, this value defines the minimum jitter to be configured   |



|                    | in Receive->IP Services (it includes the primary stream and the FEC stream).<br>On unmanaged networks, we recommend to configure a higher value as the jitter<br>may evolve and reach higher values.  |
|--------------------|---|
| Receive packets    | Number of IP frames received for the considered stream (primary or FEC). If this value does not increase regularly, the IP stream is not received.  |
| Lost packets       | Number of IP frames that have not been received.  |
| Late packets       | Number of IP frames that have been received late.   |
| Duplicated packets | Number of IP frames that are received more than once. IQOYA automatically removes duplicated frames.  |
| Reordered packets  | Number of IP frames that have been reordered after being received disordered.   |
| Recovered packets  | Number of IP frames that are recovered thanks to the FEC.<br>If "Lost packets - Recovered packets" equals 0, the FEC is adapted to the network<br>path.<br>If "Lost packets > Recovered packets", the selected FEC does not allow to recover<br>all the lost packets. It is then necessary to select another FEC.<br>Make also sure that the jitter value set in Receive-> IP services is higher than the<br>max measured jitter. |

### 8.1.5 Status

The status page displays a synthesis of the statuses of sent IP Services and output programs, and gives access to all the alarms of each IP service and output program.

| -    |  |
|------|--|
| A12. |  |
|      |  |
|      |  |

This page is accessible by clicking on the icon

| Status |      |        |            |           |   |  |
|--------|------|--------|------------|-----------|---|--|
|        |      | Status | filter All | T         |   |  |
|        | Ser  | nd     |            | Receive   | e |  |
|        | udp  | •      |            | pcm       | • |  |
|        | test | •      |            | radio one | • |  |

All sent IP services are listed on the left under "Send".

All output programs are listed on the right under "Receive".

The parameter "Status filter" allows filtering on the type of alarms to take into account for the display. Possible values are:



- All: all alarms are taken into account. Green LED means no alarm is ON. Orange LED means there are warnings ON. Red LED means there are alarms and the stream is stopped.
- Warnings: only the warnings are taken into account. They concern the receivers.
- Failures: only failures are taken into account; this is typically when there is a streaming failure (no stream received, ne stream sent).

A list of all the alarms can be displayed by click on the IP Service name (Send), and on the output program name (Receive).

### 8.2 WEB pages organization in "Remote Broadcasting" mode of use

The WEB pages are organized in categories which are always accessible from the left side of the WEB pages.

| lcon | Category                  | Description   |
|------|---------------------------|---|
| S.   | Operations<br>(Home page) | Displays the mosaic of call pages of the different active codec instances.  |
| 0°   | Connections               | Connection parameters of the unit and of the codec instances:<br>- at network level - ethernet and IP<br>- at audio and SIP level<br>- at user level - contacts and call profiles.  |
| 00   | Advanced<br>Settings      | System parameters (System properties, clock settings, audio advanced<br>settings, alarm settings, logs, configuration up- and download, firmware<br>and license update, password change, shutdown/restart, mode of use<br>switch).<br>Secondary network service settings (NTP, FTP, SSH).<br>Auxiliary data settings (from/to serial ports, GPIO or UDP sockets). |
| •    | Audio I/Os                | Audio input and audio output settings: name, type selection, audio level adjustment, vu-meters  |
| ?    | Help                      | About IQOYA X/LINK and this user manual.  |

All the web pages has the same header showing the following information:

- On the left, the status of the redundant power supply unit:

Power redundancy



The led is green when the two redundant power supplies work correctly,
The led is red when one of the two redundant power supplies is out of order.
The redundant power supplies are hot swappable.
On the right, the device model and the current mode of use:

IQOYA X/LINK-DUAL for remote broadcasting

#### 8.2.1 "Operations" page

This page presents the call windows of the codec instances currently configured and enabled. Each call window

can be expanded clicking on

or collapsed clicking on

In the example below, the call window of the first IP codec instance is expanded while the call window of the second codec instance is collapsed:

| 0 | PERATIONS  |  |
|---|--|--|
|   | AUDIO I/O: AesIn3 - AesIn4 / LineOut1 - LineOut2  igx-program + RTP  | AUDIO I/O: AoipIn3 - AoipIn4 / AoipOut1 - AoipOut2 TV Skyline Ü + RTP                |
|   | LEMO27-SERV-PGM <sip:iqs-madi-20007-27-program< th=""><th>LEM027-SERV-TB <sip:iqs-madi-20007-27-talkba< th=""></sip:iqs-madi-20007-27-talkba<></th></sip:iqs-madi-20007-27-program<> | LEM027-SERV-TB <sip:iqs-madi-20007-27-talkba< th=""></sip:iqs-madi-20007-27-talkba<> |
|   | վիվի High Quality with 100-percent FEC 🗾 🗸   | վիփ OPUS 48kHz mono 48kbps 🔽 🚺   |
|   | -1.0 dB<br>-1.9 dB<br>0.0 dB   |  |
|   | 3 % < ★ < <  |  |
|   | ⊘DEMO02-SERV-PGM ▼   |  |
|   | ⊘DEM003-SERV-PGM ▼   |  |
|   | DEMO27-SERV-PGM sip:iqs-madi-20007-27-program@sip.digidemo.iqoya.c   |  |
|   | ⊘DEM027-SERV-TB ▼  |  |
|   | DEV01-JPB-SIP-SO   |  |
|   | DEV01-JPB-SIPDIRECT-SO   |  |
|   | JPB-DEV-01-1   |  |
|   | JPB-DEV-01-2   |  |
|   | JPB-DEV-01-3   |  |
|   | SIP DIRECT SENDONLY  |  |
|   |  |  |



Each call window can be reopened in an independent window by double clicking on its title bar. 8.2.1.1 Call window when no communication is in progress Call window (expanded version): Name of the audio inputs and Name and address of the remote party who will be called outputs allocated to the IP codec instance 0 when clicking "CALL" button. It can be selected from the contact list/call history or entered manually (address only) Display name of the SIP account used for the primary SIP registration Add the remote party appearing in the adjacent field to the local contact list Primary SIP registration status NJDIO I/O: Input 1 - Input 2 / Output 1 - Output 2 DEMO02-SERV-PGM Open a window with the details of the Secondary SIP registration status DEMO43-SERV-PGM call profile selected in the adjacent field DEMO27-SERV-PGM <sip:iqs-madi-20007-27-program Display name of the SIP account used for the secondary SIP registration փոխ High Quality Open a dropdown list allowing to choose the call profile Name of the call profile which will -11.6 dB U -12.1 dB be used to establish the connection 2 0.0 dB Digital input level adjustment fader when clicking "CALL" button Display the outgoing call history below Vumeters of the audio input ODEMO03-SERV-PGN allocated to the IP codec instance Display the incoming call history below DEMO03-SERV-TB DEMO27-SERV-PGM Display the list of favorite contacts below Sip:iqs-madi-20007-27-program@sip. Display the list of all tagged contacts below OEM027-SERV-TB List of contacts/call history Display the list of local contacts below DEMO44-SERV-PGM depending on the icon selected above DEMO44-SERV-TB Display the list of all contacts (imported DEMO45-SERV-PGM global contacts and local contacts) DEMO45-SERV-TB -DEMO46-SERV-PGM \* DEMO46-SERV-TR -Enable/disable auto-redial (auto-redial is enabled when the icon is blue) Collapse the list of contacts/call history Enable/disable auto-reply (auto-reply is enabled when the icon is blue) Call the remote party selected in 1 using the call profile selected in 2



#### IQOYA X/LINK range user manual



#### 8.2.1.2 Place a call

Please refer to the image of the previous paragraph for references to the graphical interface.

To place a call the user (1) select a remote party in the contact list/call history or enter the remote party address, (2) select a call profile and (3) press the CALL button. The CALL button is grayed out until the remote party and the profiles have been specified.

#### Format of the remote party address

• For a SIP connection, the address is:

sip:sip\_account\_name@sip\_server\_domain:sip\_server\_port

(the *sip\_server\_port* is optional, 5060 is used as default).

The "sip:" prefix must not be forgotten when the SIP address is entered manually.

• For a direct SIP connection, the address is:

sip:@remote\_party\_IP\_address:remote\_party\_SIP\_listening\_port

(the remote\_party\_SIP\_listening\_port is optional, 5060 is used as default)

• For a symmetric RTP connection, the address is:

remote\_party\_IP\_address:remote\_party\_audio\_listening\_port



#### 8.2.1.3 Accept or reject a call



Click ACCEPT button to accept an incoming call or DECLINE button to reject it:

#### 8.2.1.5 Call window when a communication is in progress

#### Call window (expanded version with network quality selector in QUALITY position):







Call window (expanded version with network quality selector in METRICS position):

8.2.1.6 Hang up a call

Click HANGUP button to terminate the communication.

![](_page_107_Picture_0.jpeg)

When auto-redial is activated on the caller's side, only the caller can terminate the communication. If the callee hangs up, the communication is automatically re-established by the caller device.

### 8.2.2 "Connections" category of menus

| 00                   | CONNECTIONS | AUDIO I/O:        | Click on   |
|----------------------|-------------|-------------------|------------|
|                      | Network 🕨 🕨 | Network           | Move the n |
| $\mathbf{Q}_{0}^{0}$ | IP codecs   | ETH1              | correspond |
|                      | Profiles    | ETH2              | /          |
| $\mathbf{O}$         |             | ETH3              |            |
|                      |             | ETH4              |            |
| ?                    |             | VLAN              |            |
|                      | 1           | IP routing        |            |
|                      |             | HTTP stream proxy |            |
|                      | ×           |                   |            |

![](_page_107_Picture_5.jpeg)

Click on to display all the availables menus. Nove the mouse pointer above the menus to display the ubmenus. Click on a sub-menu to display the porresponding page.

### 8.2.2.1 Connections -> Network

![](_page_107_Picture_8.jpeg)

This menu allows accessing the network configuration of IQOYA X/LINK.


## 8.2.2.1.1 Connections -> Network -> ETHx

These pages allow configuring the four network ports of IQOYA X/LINK.

| C.       | CONNECTIONS - Network - eth1 Apply Cancel  |                         |  |  |  |
|----------|--|-------------------------|--|--|--|
| <b>Q</b> | Name   | eth1                    |  |  |  |
| Ľ        | Ethernet interface name  | lan1                    |  |  |  |
| 00       | Status   | Running                 |  |  |  |
|          | Speed and duplex mode obtained   | 1000 Mbit/s full duplex |  |  |  |
|          | Speed and duplex mode asked  | Autonegotiation         |  |  |  |
|          | DHCP   | Off                     |  |  |  |
| 2        | IPv4 address   | 192.168.0.211           |  |  |  |
|          | Subnet mask  | 255.255.255.0           |  |  |  |
|          | Gateway  |                         |  |  |  |
|          | Primary DNS  |                         |  |  |  |
|          | Secondary DNS  |                         |  |  |  |
|          | Help -   |                         |  |  |  |
|          | Click on a text line to modify setup details   |                         |  |  |  |
|          | eth1 /P: 192.168.0.211 • eth2 /P: - • eth3 /P: - • eth4 /P: 192.168.255.112 • logged as: iqoya |                         |  |  |  |

### Click on a parameter field ("Status" for instance) to enter the editing mode.

| Parameter                      | Туре       | Description  |
|--------------------------------|------------|--|
| Name                           | R/W        | This is the logical name of the ethernet interface which will be used<br>in all the graphic user interfaces and in particular in the web pages<br>The names in the factory configuration are ETH1 to ETH4. |
| Ethernet interface name        | Read       | Displays the physical name of the ethernet ports. This parameter can't be changed.   |
| Status                         | Read/Write | This parameter allows enabling/disabling the interface<br>Default value=Running<br>Possible values:<br>Running: ethernet port is enabled.<br>Stopped: ethernet port is disabled                            |
| Speed and duplex mode obtained | Read       | Displays the current speed and mode of the ethernet interface.   |
| Speed and duplex mode asked    | Read/Write | Allows selecting the working mode of the ethernet interface.   |



|                 |  | Possible values are as follows:<br>Autonegotiation<br>Autonegotiation<br>1000 Mbit/s full duplex<br>100 Mbit/s full duplex<br>100 Mbit/s full duplex<br>10 Mbit/s full duplex<br>10 Mbit/s full duplex<br>10 Mbit/s half duplex<br>We recommended to avoid the "Auto-negotiation" mode. Select the<br>mode supported by the network node connected to the IQOYA<br>X/LINK.  |
|-----------------|--|---|
| DHCP            | Read/Write   | Allows enabling/disabling DHCP (Dynamic Host Configuration<br>Protocol). Default value is OFF (disabled).<br>Click on "On" to enable DHCP. This mode disables the 5 following<br>parameters.  |
| IPv4 address    | Read only if DHCP<br>is On<br>Read/Write if DHCP<br>is Off | DHCP Off<br>Default value is:<br>192.168.0.100 for Eth1,<br>192.168.1.100 for Eth2,<br>192.168.2.100 for Eth3,<br>192.168.3.100 for Eth4<br>Enter the IP address of this ethernet interface.<br>DHCP On<br>Displays the IP address automatically set by DHCP.   |
| Subnet mask     | Read only if DHCP<br>is On<br>Read/Write if DHCP<br>is Off | DHCP Off<br>Enter the mask of the subnetwork this ethernet port belongs to.<br>DHCP On<br>Displays the subnetwork mask automatically set by DHCP.   |
| Default Gateway | Read only if DHCP<br>is On<br>Read/Write if DHCP<br>is Off | <ul> <li>DHCP Off</li> <li>Enter the default gateway IP address. Streams sent beyond the subnets configured on LAN1 to 4 will pass through this gateway except if specific routing rules has been defined in the IP routing page.</li> <li>Only one default gateway must be configured for all the ethernet interfaces. If several gateways has to be used, one can b set as default gateway, the others must be the subject of routing rules in the IP routing page.</li> <li>DHCP On</li> <li>Displays the gateway IP address automatically set by DHCP.</li> </ul> |
| Primary DNS     | Read only if DHCP<br>is On<br>Read/Write if DHCP<br>is Off | DHCP Off<br>Enter the IP address of the primary DNS (if any).<br>DHCP On<br>Displays the IP address of the DNS automatically set by DHCP.   |
| Secondary DNS   | Read only if DHCP  | DHCP Off  |



|  | is On<br>Read/Write if DHCP<br>is Off | Enter the IP address of the secondary DNS (if any).<br><b>DHCP On</b><br>Displays the IP address of the secondary DNS automatically set b<br>DHCP (may be empty). |
|--|---------------------------------------|---|
|--|---------------------------------------|---|

## 8.2.2.1.2 Connections -> Network -> VLAN

This page allows declaring VLANs on the ethernet interfaces. No VLAN is declared by default. Multiple VLANs can be declared for each ethernet interface.

| C.         | CONNECTIONS - Network - VLAN | For selected VLAN(s) - | + Add VLAN |
|------------|------------------------------|------------------------|------------|
| 60         |                              |                        |            |
| <b>*</b> * |                              |                        |            |

## Click on "+Add VLAN" button to declare a new VLAN.

| Add VLAN          |            | ×    |
|-------------------|------------|------|
| Network interface | eth0 V     |      |
| VLAN ID           | 0          |      |
| Name              | 0          |      |
| Status            | Running (? |      |
| Priority          | 0 ?        |      |
| IPv4 address      | 0          |      |
| Netmask           | •          |      |
|                   | Close      | Save |

| Parameter         | Туре       | Description   |
|-------------------|------------|---|
| Network interface | Read/Write | Select the network interface that will support the VLAN (ETH1 to ETH4)  |
| VLAN ID           | Read/Write | Enter the VLAN ID in the ranges 1-4094. Avoid using ids 1002 to 1005 which are reserved.                                |
| Name              | Read/Write | Enter a logical name for this VLAN  |
| Status            | Read/Write | Allows enabling/disabling this VLAN.<br>Select "Running" to enable this VLAN.<br>Select "Stopped" to disable this VLAN. |
| Priority          | Read/Write | Enter the VLAN priority in the range 0-7.   |



| IPv4 address | Read/Write | Enter the IP address of the selected ethernet port in this VLAN.<br>If no value is entered, the IP address is the IP address of the selected<br>ethernet port. |
|--------------|------------|--|
| Netmask      | Read/Write | Enter the netmask for this VLAN interface.<br>If no value is entered, the netmask is the same as the selected<br>ethernet port netmask.                        |

#### 8.2.2.1.3 Connections -> Network -> IP routing

This page allows viewing the current IP routing table, downloading it, and uploading a modified IP routing table.

| C        | CONNECTIONS - Network - | IP routing |               |           |
|----------|-------------------------|------------|---------------|-----------|
| <b>9</b> | Upload IP Table         | Browse     |               |           |
|          | Download IP Table       | Download   |               |           |
| 6        | Destination Gat         | teway      | Netmask       | Interface |
|          | default 192             |            | 0.0.0.0       | lan3      |
| 2        | 127.0.0.0 *             |            | 255.0.0.0     | lo        |
|          | 192.168.0.0 *           |            | 255.255.255.0 | lan1      |
|          | 192.168.224.0 *         |            | 255.255.240.0 | lan3      |
|          |                         |            |               |           |

In case the routing table has to be modified, click on "Download".

The routing table can be edited with a standard text editor (such as notepad). You may add IP routes, as described in the downloaded file. Only the additional routes must appear in this file. Routes to directly accessible subnets are not present in this file and need not be added to this file.

**Note**: In case you use more than one ethernet interface, do not declare several gateways. Declare instead one default gateway, for instance on Eth0, and declare routes on other ethernet interfaces through this routing table.

#### 8.2.2.2 Connections -> IP codecs



This menu allows accessing the configuration of the IP codec instances.

## 8.2.2.2.1 Connections -> IP codecs -> SIP accounts

This page shows the declared SIP accounts and allows declaring new SIP accounts or editing/deleting existing ones. The SIP accounts declared in this page can be used by IP codec instances to register on SIP servers.

| J  | C | CONNECTIONS - IP codecs - SIP accounts |                 |  | n 🔿 |
|----|---|--|-----------------|--|-----|
| 60 |   |  |                 | + Add SIP account                                      |     |
| 00 |   |  | Display name    | SIP address  | Â   |
|    |   | 🖊 🖪 🔒                                  | DEMO02-SERV-PGM | iqs-madi-20007-02-program@sip.digidemo.iqoya.com:5060  |     |
|    |   | / 🖪 🖹                                  | DEMO02-SERV-TB  | iqs-madi-20007-02-talkback@sip.digidemo.iqoya.com:5060 |     |
|    |   | / 🖪 🔒                                  | DEMO03-SERV-PGM | iqs-madi-20007-03-program@sip.digidemo.iqoya.com:5060  |     |
| 2  |   | / 🕓 🔒                                  | DEMO03-SERV-TB  | iqs-madi-20007-03-talkback@sip.digidemo.iqoya.com:5060 |     |
|    |   | 1 🖸 🔒                                  | DEMO27-SERV-PGM | iqs-madi-20007-27-program@sip.digidemo.iqoya.com:5060  |     |
|    |   | / 🖸 🔒                                  | DEMO27-SERV-TB  | iqs-madi-20007-27-talkback@sip.digidemo.iqoya.com:5060 |     |

The shortcut below.

Go to IP codec configuration

allows to quickly jump to the IP codec configuration page described

8.2.2.2.1.1 Declare a new SIP account

To declare a new SIP account, click on

+ Add SIP account , or create it from an existing one by clicking the icon

on the left of this latter. Then provide the requested parameters and click on the "Save" button. To cancel the declaration of a new SIP account, you can click on the "Close" button at any time. The requested parameters are described below:

| Add SIP account   |             | ×                                 |  |
|---|-------------|-----------------------------------|--|
| Display name<br>SIP account name<br>SIP server domain<br>Authentication password<br>Advanced parameters | <pre></pre> | 0       0       0       0       0 |  |
|   |             | Close Save                        |  |
|   |             |                                   |  |
| SIP account parameter   | Туре        | Description                       |  |

| Display name            | Read/Write | Name given to this SIP account. This name will be presented to the remote party at call time by the codec instance registered with this SIP account. |
|-------------------------|------------|--|
| SIP account name        | Read/Write | Name that will be used to register with the SIP server (also called SIP registrar).  |
| SIP server domain       | Read/Write | Domain name or the IP address of the SIP server (also called SIP registrar) providing the SIP account.   |
| Authentication password | Read/Write | The access to the SIP server is usually protected by an authentication name and password. This is the password of the SIP account on the SIP server. |

With some SIP infrastructures you might have to adjust advanced parameters. Click on the chevron to access to the advanced parameters:

| Add SIP account         |                                |   |      | ×      |  |
|-------------------------|--------------------------------|---|------|--------|--|
| Display name            |                                | 0 |      |        |  |
| SIP account name        |                                | 0 |      |        |  |
| SIP server domain       |                                | 0 |      |        |  |
| Authentication password |                                | 0 |      |        |  |
| Advanced parameters     | ^                              |   |      |        |  |
| Authentication name     | SIP account name used if empty | 0 |      |        |  |
| SIP server port         | 5060                           | 0 |      |        |  |
|                         |                                |   | Clos | e Save |  |

| SIP account advanced<br>parameter | Туре       | Description  |
|-----------------------------------|------------|--|
| Authentication name               | Read/Write | The access to the SIP server is usually protected by an authentication<br>name and password. This is the authentication name of the SIP account<br>on the SIP server. This parameter is optional, if no authentication name<br>is provided, the SIP account name will be used. |
| SIP server port                   | Read/Write | Listening port of the SIP server providing the SIP account. This parameter is optional, if no listening port is provided 5060 the default SIP listening port is used.  |

## 8.2.2.2.1.2 Edit a SIP account

To edit an existing SIP account, click the icon on the left of this latter. The edit page is identical to the add page described in the previous paragraph.



#### 8.2.2.2.1.3 Delete a SIP account

To delete a SIP account, click the icon in on the left of this latter. Only SIP accounts that are not currently used to register IP codec instances can be deleted.

#### 8.2.2.2.2 Connections -> IP codecs -> IP codec configuration

This page shows the IP codec instances and allows creating new IP codec instances or editing/deleting existing ones. The IP codec instances created on this page must be activated to be operational and to appear in the codec mosaic of the "Operations" page.

| <u>ک</u> | ( | CONNECTIONS - IP codecs - IP codec configuration |            |           |          |                 |   |                |  |  |
|----------|---|--|------------|-----------|----------|-----------------|---|----------------|--|--|
| 00       |   | For selected IP of                               | codec(s) 🔻 |           |          |                 |   | + Add IP codec |  |  |
| 00       |   |  |            | Audio I/O | RTP port | Contact name    | SIP address   | Status         |  |  |
| <b>•</b> |   | * 🗸 🖪  |            | 1 - 2     | 15004    | DEMO02-SERV-PGM | iqs-madi-20007-02-<br>program@sip.digidemo.iqoya.com:5060   | Registered     |  |  |
|          |   |  |            |           |          | DEMO43-SERV-PGM | iqs-madi-20007-43-<br>program@sip.digidemo2.iqoya.com:5060  | Registered     |  |  |
| ?        |   | * 🖊 🖪  |            | 2 - 3     | 15008    | DEMO02-SERV-TB  | iqs-madi-20007-02-<br>talkback@sip.digidemo.iqoya.com:5060  | Registered     |  |  |
|          |   |  |            |           |          | DEMO43-SERV-TB  | iqs-madi-20007-43-<br>talkback@sip.digidemo2.iqoya.com:5060 | Registered     |  |  |

This page shows the following parameters for each IP codec instance:

- Audio I/O: The audio I/Os associated with the IP codec instance.
- **RTP port**: The port used by the the IP codec instance to listen to the IP audio stream coming from the remote party.
- **Contact name**: The display names of the SIP accounts used to register the IP codec instance with SIP servers (only SIP is activated for this instance). There can be up to 2 registrations per IP codec instance.
- SIP address: The SIP addresses of the IP codec instance, one per registration.
- **Status**: The status of the IP codec instance is empty when the IP codec instance is disabled else the possible statuses are:
  - "Registered": SIP is activated and the IP codec instance is successfully registered with the SIP server.
  - An error message in red: SIP is activated and the IP codec instance fails to register with the SIP server. The possible error messages are:
    - "Invalid address, check DNS": the SIP domain is wrong,
    - **"Unknown name or user"**: the SIP account name, the SIP authentication name or the SIP authentication password is wrong.
    - "No remote response": The SIP server is unreachable.
  - "Not registered": The user has manually unregistered the IP codec instance.
  - "Ready": SIP is not activated and the IP codec instance is ready for a symmetric RTP connection.



• "Failed": SIP is not activated and the IP codec instance is not ready for a symmetric RTP connection probably because the audio listening port is not available. 8.2.2.2.1 Create a new IP codec instance + Add IP codec To create a new IP codec instance, click on button, or create it from an existing one by clicking the icon on the left of this latter. Then provide the requested parameters and click on the Save button. To Save Save & New create several instances successively, click on rather than on . To cancel the creation of a Close new IP codec instance, you can click on the button at any time. The requested parameters are described below: Parameters related to the audio I/Os Add IP codec × Audio I/Os IP audio stream SIP Audio Stereo ۳ 0 Number of channels Audio IO . 0 Audio I/O type AesOut1 0 First mono output channel v First mono input channel AesIn1 v 0 Close Save & New Save

| IP codec parameter        | Туре       | Description   |
|---------------------------|------------|---|
| Number of channels        | Read/Write | Number of audio channels managed by the IP codec instance. It can be Mono or Stereo.  |
| Audio I/O type            | Read/Write | Type of the audio I/Os allocated to the IP codec instance. It can be<br>"Audio IO" for Analog or AES/EBU I/Os or "AoIP" for AES67 audio<br>channels.  |
| First mono output channel | Read/Write | First mono audio output allocated to the IP codec instance. If the IP codec instance is stereo, the next mono audio output is also allocated to the instance. Audio outputs already allocated are greyed out in the drop-down menu. |
| First mono input channel  | Read/Write | First mono audio input allocated to the IP codec instance. If the IP codec instance is stereo, the next mono audio input is also allocated to the instance. By default, the input with the same number as the output is allocated.  |



## • Parameters related to the IP audio stream received from the remote party

| Add IP codec                       |         |   | ×                     |
|------------------------------------|---------|---|-----------------------|
| Audio I/Os IP audio stream         | SIP     |   |                       |
| IP audio stream                    |         |   |                       |
| Use SIP signaling                  |         | 0 |                       |
| Jitter buffer size(ms)             | 200 ms  | 0 |                       |
| Audio stream listening port        | 15012   | 0 |                       |
| FEC stream listening port          | 15014   | 0 |                       |
| Advanced parameters                | ^       |   |                       |
| RTCP listening port                | 15013   | 0 |                       |
| RTCP listening port related to FEC | 15015   | 0 |                       |
| Audio stream loss duration (ms)    | 1000 ms | 0 |                       |
|                                    |         |   | Close Save & New Save |

| IP codec parameter                 | Туре              | Description  |  |  |  |  |
|------------------------------------|-------------------|--|--|--|--|--|
| Use SIP signaling                  | Read/Write        | Check this box if you want to establish connections via SIP (through a SIP infrastructure or directly). Checking this box brings up the SIP configuration tab.   |  |  |  |  |
| Jitter buffer size(ms)             | Read/Write        | Size of the jitter buffer for the IP audio stream received from the remote party in milliseconds. The larger the buffer, the more the IP codec instance is immune to the network jitter but the higher the latency.  |  |  |  |  |
| Audio stream listening port        | Read/Write        | Number of the UDP port used by the IP codec instance to listen to the IP audio stream coming from the remote party.  |  |  |  |  |
| FEC stream listening port          | Read/Write        | Number of the UDP port used by the IP codec instance to listen to the FEC stream coming from the remote party if there is one.   |  |  |  |  |
| Click on the chevron to acc        | cess to these adv | anced parameters:  |  |  |  |  |
| RTCP listening port                | Read/Write        | Number of the UDP port used to listen to the RTCP traffic related to the audio stream coming from the remote party.  |  |  |  |  |
| RTCP listening port related to FEC | Read/Write        | Number of the UDP port used to listen to the RTCP traffic related to the FEC stream coming from the remote party.  |  |  |  |  |
| Audio stream loss duration<br>(ms) | Read/Write        | When the IP codec instance no longer receives the IP audio stream free the remote party for a duration equal to this parameter value, a hang-<br>is triggered as if the hang-up button has been pressed. The value is<br>expressed in milliseconds and must be greater than 100ms. |  |  |  |  |



• Parameters related to SIP

| dd IP codec                                  |  |        |        |   |                    | ×   |
|--|--|--------|--------|---|--------------------|-----|
| Audio I/Os IP audio stream                   | SIP  |        |        |   |                    |     |
| SIP  |  |        |        |   |                    |     |
| Primary SIP account                          | Test mqx2 <test_mqx2@sip.< td=""><td>iqoya.</td><th>i.com&gt;</th><td>0</td><td></td><td></td></test_mqx2@sip.<> | iqoya. | i.com> | 0 |                    |     |
| Secondary SIP account                        | None   |        | Ŧ      | 0 |                    |     |
| Advanced parameters                          | ^  |        |        |   |                    |     |
| Transport protocol                           | SIP over UDP   | •      | 0      |   |                    |     |
| Listening network interface                  | Any  | •      | 0      |   |                    |     |
| Listening port                               | 7004   |        | 0      |   |                    |     |
| Auto registration                            | Yes  | ۳      | 0      |   |                    |     |
| Registration every (secondes)                | 120  | S      | 0      |   |                    |     |
| Outbound proxy activation                    | No   | ۳      | 0      |   |                    |     |
| Allows symmetric RTP connections without SIP | No   | •      | 0      |   |                    |     |
| Presence                                     |  |        |        |   |                    |     |
| Presence activation                          | Yes  | •      | 0      |   |                    |     |
| Notification lease (seconds)                 | 3600   | S      | 0      |   |                    |     |
| Net topology-related settings                |  |        |        |   |                    |     |
| Connection to public internet                | Direct   |        | Ŧ      | 0 |                    |     |
| Others                                       |  |        |        |   |                    |     |
| Fallback FEC scheme                          | No redundancy  |        | Ŧ      | 0 |                    |     |
|  |  |        |        |   | Close Save & New S | ave |

| IP codec parameter   | Туре       | Description   |  |  |  |  |  |  |
|--|------------|---|--|--|--|--|--|--|
| SIP section  |            |   |  |  |  |  |  |  |
| Primary SIP account  | Read/Write | Primary SIP account to be used by the codec instance to register with a SIP server  |  |  |  |  |  |  |
| Secondary SIP account Read/Write                             |            | The codec instance can register on 2 SIP servers at the same time. So if<br>one SIP infrastructure breaks down, the codec remains accessible<br>through the other infrastructure. This is useful for example to implement a<br>disaster recovery plan.<br>This is the SIP account to be used by the codec instance to register with<br>a secondary SIP server |  |  |  |  |  |  |
| Click on the chevron to access to these advanced parameters: |            |   |  |  |  |  |  |  |



| Transport protocol                           | Read/Write | The protocol to be used to transport SIP signaling. It can be UDP or TCP.<br>The choice depends on your SIP infrastructure. IQOYA CONNECT,<br>Digigram's SIP infrastructure, supports both but UDP is preferable.   |
|--|------------|---|
| Listening network interface                  | Read/Write | The network interface to be used by the IP codec instance to listen to the SIP signaling. Use "Any" if you do not have instructions from your IT team on this.  |
| Listening port                               | Read/Write | Port to be used by the IP codec instance to listen to the SIP signaling.<br>The web interface proposes you a free port. Keep the proposed value to<br>avoid port conflicts.   |
| Auto registration                            | Read/Write | <ul> <li>'Yes' enables automatic and periodic SIP registration(s) of the IP codec instance with the SIP server(s). The refresh period of the SIP registration is defined below.</li> <li>'No' disables the automatic and periodic SIP registration(s) of the IP codec instance with the SIP server(s). Note that manual registration is possible in the call window.</li> </ul> |
| Registration every<br>(secondes)             | Read/Write | This is the refresh period of the SIP registration in seconds. It is not recommended to enter a value below 30s. The default value is 120.  |
| Outbound proxy activation                    | Read/Write | Enable/disable the use of an outbound SIP proxy.  |
| Outbound proxy domain                        | Read/Write | Visible only if "Outbound proxy activation" is yes.<br>This is the IP address or the domain name of the outbound SIP proxy.   |
| Outbound proxy port                          | Read/Write | Visible only if "Outbound proxy activation" is yes.<br>This is the listening port of the outbound SIP proxy.  |
| Allows symmetric RTP connections without SIP | Read/Write | Enables/disables the possibility of also establishing or accepting symmetric RTP connections.   |
| Presence                                     |            |   |
| Presence activation                          | Read/Write | Enable/disable the SIP presence service. Do not disable the SIP presence service if you use Digigram's SIP infrastructure IQOYA CONNECT.  |
| Notification lease (seconds)                 | Read/Write | This is the refresh period of the subscription to the presence service. The lease value must be greater than the field 'Registration every (seconds)'. The default value is 3600.   |
| Net topology-related settings                |            |   |
| Connection to public internet                | Read/Write | Select the proposition that best matches with your internet connection topology. Ask you IT team if you don't know.<br>If you are using IQOYA CONNECT, Digigram's SIP infrastructure, choose "Direct" because IQOYA CONNECT integrates a NAT traversal solution.  |
| Public IP address                            | Read/Write | Visible only if "Connection to public internet" is "From behind NAT specifying public address".<br>Enter the public IP address or domain name of the device.  |



| STUN server address | Read/Write | Visible only if "Connection to public internet" is "From behind NAT using STUN".<br>This is the IP address or domain name of a STUN server.  |
|---------------------|------------|--|
| STUN server port    | Read/Write | Visible only if "Connection to public internet" is "From behind NAT using STUN".<br>This is the listening port of the STUN server.   |
| Others              |            |  |
| Fallback FEC scheme | Read/Write | The IP codec instance enables the FEC scheme given here when the SIP signaling coming from a third party codec requires a FEC stream without specifying any FEC scheme. In this case, the FEC scheme used by the third party codec needs to match this fallback FEC scheme. Note that this field is only relevant with SIP and has no use for a communication between two Digigram's codecs. |

## 8.2.2.2.2 Enable IP codec instances

After creation, the IP codec instances must be enabled to appear in the "Operations" page.

| J  | CONNECTIONS - IP codecs - IP codec configuration |             |          |              |                              |                |  |  |  |  |  |
|----|--|-------------|----------|--------------|------------------------------|----------------|--|--|--|--|--|
| 0  | For selected IP codec(s)                         | •           |          |              |                              | + Add IP codec |  |  |  |  |  |
|    | ► Enable   |             |          |              |                              |                |  |  |  |  |  |
| 00 | Disable  | Audio I/O 🗄 | RTP port | Contact name | SIP address                  | Status         |  |  |  |  |  |
|    | l Delete   | 1 - 2       | 15004    |              |                              | Ready          |  |  |  |  |  |
|    | * 🗾 🖻 💌  | 3 - 4       | 15008    | Test mqx2    | test_mqx2@sip.iqoya.com:5060 |                |  |  |  |  |  |

To enable IP codec instances, select them checking the box on the corresponding lines of the list, then open "For selected IP codec(s)" menu at the top of the list and click "Enable" item. Once enabled, the codec is added to the "Operations" page.

The enabled IP codec instances appear on the "Operations" page in the same order as they appear in the list. It is possible to reorder the list clicking the "up" icon present at the beginning of each line:



To test an enabled IP codec instance, it is possible to access its call page clicking the call icon at the beginning of the line:



### IQOYA X/LINK range user manual

| Power      | redu | undancy         |              | /                    |                         |         | C MI  |  | 2         | ~                   | liarom             |
|------------|------|-----------------|--------------|----------------------|-------------------------|---------|-------|--|-----------|---------------------|--------------------|
|            |      |                 |              |                      |                         |         |       | NK-JPB - Google Chrome                   | - Ll      | -1                  | iyrani             |
|            | i I  |                 |              |                      |                         |         |       | IO I/O: Appin2 - Appin4 / LincOut1 - Lin |           |                     | broadcasting       |
| R.         |      | CONNEC          | TIONS        | - IP code            | <mark>cs -</mark> IP co | odec d  | i 🕑   | px-program + RTP                         | leouiz    |                     | P accounts 🏳       |
|            |      |                 |              |                      |                         |         |       | sip:igx-1-talkback@sip.igova.com:5060    |           |                     |                    |
| <b>Q</b>   |      | For selected IP | codec(s) -   |                      |                         |         |       | (  |           |                     | <sup>o</sup> codec |
|            |      |                 |              |                      |                         |         | diale | Low Delay                                | •         | $\lfloor i \rfloor$ |                    |
| 00         |      |                 |              | Audio I/O            | RTP port                | Conta   |       | L  | -4.6 dB   |                     |                    |
|            |      | * Z IN V        | Call from 'i | qx-program' (active  | 15004                   | iax-pro | Y     |  | 0.0 dB    |                     | red                |
| $\bigcirc$ |      |                 |              | codec #1)            |                         |         |       | 🔞 🛪 💊 ★ 🤆                                | <b>(+</b> |                     |                    |
|            |      |                 |              | AoipOut1<br>AoipOut2 | 15008                   | TV Sky  | DE    | MO02-SERV-PGM                            |           | -                   | red                |
|            |      | 1.0             | _            | AcipOut5             | 15016                   | -       | OD    | MO03-SERV-PGM                            |           |                     |                    |
| 4          |      |                 |              | AoipOut6             | 15016                   |         | ODE   | MO27-SERV-PGM                            |           | v                   |                    |
|            |      | 1 Z B           |              | AoipOut3             | 15012                   | -       | ØDE   | MO27-SERV-TB                             |           | v                   |                    |
|            |      |                 |              | AoipOut4             |                         |         | DE    | V01-JPB-SIP-SO                           |           | Ŧ                   |                    |
|            |      |                 |              |                      |                         |         | DE    | V01-JPB-SIPDIRECT-SO                     |           | •                   |                    |
|            |      |                 |              |                      |                         |         | JF    | B-DEV-01-1                               |           | •                   |                    |
|            |      |                 |              |                      |                         |         | JF    | B-DEV-01-2                               |           | •                   |                    |
|            |      |                 |              |                      |                         |         | JF    | B-DEV-01-3                               |           | •                   |                    |
|            |      |                 |              |                      |                         |         | bli   |  |           | *                   |                    |
|            |      |                 |              |                      |                         |         |       | CALL                                     | AUTC      | AUTO                |                    |
|            |      |                 |              |                      |                         |         |       |  |           | -                   |                    |
|            |      |                 |              |                      |                         |         |       |  |           | _                   |                    |

## 8.2.2.2.3 Edit an IP codec instance

It is possible to edit for modification an existing IP codec instance.

Click the pencil icon on the line of the IP codec instance you want to modify to start editing. The edition gives access to the same settings pages as the creation:

• Parameters related to the audio I/Os



| Edit IP codec configuration   | RTP 15004 / in Input 1+Input 2 / o  | ut Output 1+Output 2                                | ×        |
|---|---|---|----------|
| Audio I/Os IP audio stream  |   |   |          |
| Audio   |   |   |          |
| Number of channels  | Stereo  | 7 😧   |          |
| Audio I/O type  | Audio IO  | . 6   |          |
| First mono output channel   | Output 1  | · 0   |          |
| First mono input channel  | Input 1   | • •   |          |
|   |   | Ci  | ose Save |
| Refer to the paragraph "Create  | e a new IP codec instan   | ce" to know the meaning of the each parameter.      |          |
|   |   |   |          |
| <ul> <li>Decomptors related to f</li> </ul>   | the ID evidie streem read   | wind tram the remate nerty                          |          |
| Parameters related to t   | the IP audio stream rece  | eived from the remote party                         |          |
| Parameters related to t Edit IP codec configuration   | RTP 15004 / in Input 1+Input 2 / or   | at Output 1+Output 2                                | ×        |
| Parameters related to t Edit IP codec configuration Audio I/Os IP audio stream  | RTP 15004 / in Input 1+Input 2 / ou   | arved from the remote party<br>at Output 1+Output 2 | ×        |
| Parameters related to t Edit IP codec configuration Audio I/Os IP audio stream IP audio stream  | TP 15004 / in Input 1+Input 2 / ou  | aved from the remote party<br>at Output 1+Output 2  | ×        |
| Parameters related to t Edit IP codec configuration Audio I/Os IP audio stream IP audio stream Use SIP signaling  | TP 15004 / in Input 1+Input 2 / ou  | erved from the remote party<br>at Output 1+Output 2 | ×        |
| Parameters related to t Edit IP codec configuration Audio I/Os IP audio stream IP audio stream Use SIP signaling Jitter buffer size(ms)   | TP 15004 / in Input 1+Input 2 / ou<br>SIP<br>200 ms   | erved from the remote party<br>at Output 1+Output 2 | ×        |
| Parameters related to t Edit IP codec configuration Audio I/Os IP audio stream IP audio stream Use SIP signaling Jitter buffer size(ms) Audio stream listening port   | TP 15004 / in Input 1+Input 2 / ou<br>SIP<br>200 ms<br>15004  | erved from the remote party<br>at Output 1+Output 2 | ×        |
| Parameters related to t Edit IP codec configuration Audio I/Os IP audio stream IP audio stream Use SIP signaling Jitter buffer size(ms) Audio stream listening port FEC stream listening port                     | TP 15004 / in Input 1+Input 2 / ou<br>SIP<br>200 ms<br>15004<br>15006   | erved from the remote party<br>at Output 1+Output 2 | ×        |
| Parameters related to t Edit IP codec configuration Audio I/Os IP audio stream IP audio stream Use SIP signaling Jitter buffer size(ms) Audio stream listening port FEC stream listening port Advanced parameters | Image: style="text-align: center;">Image: style="text-align: center;"/>Image: style="text-align: center;"//// Image: style="text-align: center;"/// Image: style="text-align: center;"// Image: style="text-align: center;"// Image: style="text-align: center;"// Image: style="text-align: style="text-align: center;"// Image: style= | erved from the remote party<br>at Output 1+Output 2 | ×        |
| Parameters related to t Edit IP codec configuration Audio I/Os IP audio stream IP audio stream Use SIP signaling Jitter buffer size(ms) Audio stream listening port FEC stream listening port Advanced parameters | RTP 15004 / in Input 1+Input 2 / ou         SIP         200       ms         15004         15006  | erved from the remote party<br>at Output 1+Output 2 | Se Save  |

• Parameters related to SIP



| Edit IP codec configuration                  | RTP 15004 / in Input 1+Input 2 / out | Output 1+Output 2  |                        | ×          |
|--|--------------------------------------|--------------------|------------------------|------------|
| Audio I/Os IP audio stream                   | SIP                                  |                    |                        |            |
| SIP  |                                      |                    |                        |            |
| Primary SIP account                          | None                                 | Ŧ                  | 0                      |            |
| Secondary SIP account                        | None                                 | Ŧ                  | 0                      |            |
| Advanced parameters                          | ^                                    |                    |                        |            |
| Transport protocol                           | SIP over UDP 🔹                       | 0                  |                        |            |
| Listening network interface                  | Any 🔻                                | 0                  |                        |            |
| Listening port                               | 7002                                 | 0                  |                        |            |
| Auto registration                            | Yes 🔻                                | 0                  |                        |            |
| Registration every (secondes)                | 120 s                                | 0                  |                        |            |
| Outbound proxy activation                    | No 🔻                                 | 0                  |                        |            |
| Allows symmetric RTP connections without SIP | No v                                 | 0                  |                        |            |
| Presence                                     |                                      |                    |                        |            |
| Presence activation                          | Yes 🔻                                | 0                  |                        |            |
| Notification lease (seconds)                 | 3600 s                               | 0                  |                        |            |
| Net topology-related settings                |                                      |                    |                        |            |
| Connection to public internet                | Direct                               | Ŧ                  | 0                      |            |
| Others                                       |                                      |                    |                        |            |
| Fallback FEC scheme                          | No redundancy                        | Ŧ                  | 0                      |            |
|  |                                      |                    |                        | Close Save |
| Refer to the paragraph "Create               | e a new IP codec instance            | e" to know the mea | ning of the each paran | neter.     |

#### 8.2.2.2.2.4 Disable IP codec instances

To disable IP codec instances, select them checking the box on the corresponding lines of the list, then open "For selected IP codec(s)" menu at the top of the list and click "Disable" item. Once disabled, the IP codec instance disappeared from the "Operations" page.



| L.  | ( | CONNECTIONS                | - IP codeo  | c <mark>s</mark> - IP co | dec configu  | iration                      | Go to SIP accounts 🏓 |
|-----|---|----------------------------|-------------|--------------------------|--------------|------------------------------|----------------------|
| 00  |   | For selected IP codec(s) - |             |                          |              |                              | + Add IP codec       |
|     |   | ► Enable                   |             |                          |              |                              |                      |
| 108 |   | Disable                    | Audio I/O 🛓 | RTP port                 | Contact name | SIP address                  | Status               |
|     |   | 逾 Delete                   | 1 - 2       | 15004                    |              |                              | Ready                |
|     |   | * Z 🖸 V 🖉                  | 3 - 4       | 15008                    | Test mqx2    | test_mqx2@sip.iqoya.com:5060 | Registered           |

### 8.2.2.2.5 Delete IP codec instances

To delete IP codec instances, select them checking the box on the corresponding lines of the list, then open "For selected IP codec(s)" menu at the top of the list and click "Delete" item.

| ٩ <u></u> | CONNECTIONS - IP codecs - IP codec configuration |   |                      |          |              | Go to SIP accounts 🏓         |                |
|-----------|--|---|----------------------|----------|--------------|------------------------------|----------------|
| 60        |  | For selected IP codec(s)                    | •                    |          |              |                              | + Add IP codec |
| 00        |  | <ul> <li>Enable</li> <li>Disable</li> </ul> | Audio I/O <u>  =</u> | RTP port | Contact name | SIP address                  | Status         |
|           |  | ា Delete                                    | 1 - 2                | 15004    |              |                              | Ready          |
|           |  | * 🗸 💽                                       | 3 - 4                | 15008    | Test mqx2    | test_mqx2@sip.iqoya.com:5060 |                |

An IP codec instance must be disabled before it can be deleted.

#### 8.2.2.3 Connections -> Profiles



This menu gives access to the call profile management page. This page allows you to add, modify or delete call profiles stored only locally on the device.

The profile management page shows the list of local call profiles currently defined:



| S.       | CC | CONNECTIONS - Profiles - Profiles management |  |                             |                                   |  |  |  |  |
|----------|----|--|--|-----------------------------|-----------------------------------|--|--|--|--|
| 90       |    | For selected Profile(s) -                    |  |                             | + Add Profile                     |  |  |  |  |
| 00       |    |  |  | Profile Nameļ <u>i</u>      | Description                       |  |  |  |  |
| <b>•</b> |    | 1 🗈 🖻  |  | High quality audio          | HE-AACv2 stereo 56 kbps           |  |  |  |  |
|          |    | 1 🖪  |  | High quality audio with FEC | HE-AACv2 stereo 56kbps + FEC 100% |  |  |  |  |
| ?        |    | 1 🗈 🖻  |  | High quality voice          | OPUS mono 48kbps                  |  |  |  |  |
|          |    | 1 🗈  |  | High quality voice + FEC    | OPUS mono 48kbps + FEC 50%        |  |  |  |  |

## 8.2.2.3.1 Add a call profile

To create a new call profile, click on + Add Profile, or create it from an existing one by clicking the icon the left of this latter. Then provide the requested parameters and click on the "Save" button. To cancel the



| Add profile                         | ×  |
|-------------------------------------|--|
| Name                                | 0  |
| Description                         | 0  |
| Use a specific jitter buffer size   | ✓  |
| Jitter buffer size (ms)             | ms 😯                                     |
| Sent stream settings                |  |
| Audio encoding format               | MPEG_L2 V 48000Hz V Stereo V 256kb/s V ? |
| Forward error correction            | No FEC V                                 |
| Advanced parameters                 | ^  |
| Audio stream payload type           | Auto 😯                                   |
| Packet size (ms)                    | Auto ms 😯                                |
| FEC stream payload type             | Auto                                     |
| DSCP                                | Default 🔻 😯                              |
| Advise jitter buffer size to callee | ✓  |
| Jitter buffer size to advise (ms)   | ms 😮                                     |
| Received stream settings            |  |
| Asymmetric settings                 | ☑ 0                                      |
| Audio encoding format               | MPEG_L2 V 48000Hz V Stereo V 256kb/s V   |
| Forward error correction            | No FEC 🔻 😯                               |
| Advanced parameters                 | ^  |
| Audio stream payload type           | Auto                                     |
| Packet size (ms)                    | Auto ms 🝞                                |
| FEC stream payload type             | Auto                                     |
|                                     | Close Save & New Save                    |

## creation of a new call profile, you can click on the "Close" button at any time.

## The parameters requested at creation are described below:

| SIP account parameter             | Туре       | Description  |
|-----------------------------------|------------|--|
| Name                              | Read/Write | Name of the call profile   |
| Description                       | Read/Write | Call profile description   |
| Use a specific jitter buffer size | Read/Write | This parameter defines the jitter buffer size to be used when the user<br>selects the profile at call time:<br>- Checked: the specific jitter buffer size specified below will be used,<br>- Unchecked: the default jitter buffer size defined at IP codec instance<br>level will be used. |
| Jitter buffer size (ms)           | Read/Write | Visible only if "Use a specific jitter buffer size" is checked.  |



|                              |            | Size of the jitter buffer to be allocated by the IP codec instance when<br>the user selects this profile at call time.  |
|------------------------------|------------|---|
| Sent stream settings section |            |   |
| Audio encoding format        | Read/Write | Audio encoding format of the stream sent to the remote party.   |
| Forward error correction     | Read/Write | Forward Error Correction (FEC) is a technique used to reduce data<br>transmission errors on unreliable networks by sending additional<br>information allowing to correct them.<br>This parameter allows to select the FEC scheme for the FEC stream<br>sent to the remote party. Possible values are:<br>• No FEC stream<br>• +50% bandwidth, recovery 2, 1 stream (audio)<br>• +100% bandwidth, recovery 3, 2 streams (audio + FEC)<br>• +100% bandwidth, recovery 4, 2 streams (audio + FEC)<br>• +50% bandwidth, recovery 1/2, 2 streams (audio + FEC)<br>• +50% bandwidth, recovery 1/3, 2 streams (audio + FEC)<br>• +25% bandwidth, recovery 1/4, 2 streams (audio + FEC)<br>• +20% bandwidth, recovery 1/5, 2 streams (audio + FEC)<br>• +10% bandwidth, recovery 1/10, 2 streams (audio + FEC)<br>• +10% bandwidth, recovery 1/10, 2 streams (audio + FEC)<br>• +10% bandwidth, recovery 1/10, 2 streams (audio + FEC)<br>• the state of the the the terms of terms of the terms of the terms of terms of the terms of terms of terms of the terms of the terms of terms of terms of the terms of the terms of the terms of terms |

# Advanced parameters:

| Audio stream payload type | Read/Write | Payload type of the audio stream sent to the remote party. It's an integer between 0 and 127.   |
|---------------------------|------------|---|
| Packet size (ms)          | Read/Write | Defines the size in ms of the audio packets sent to the remote party or<br>0 to use the default value.<br>The packet size is the amount of audio data to be put in the network<br>packets, expressed in ms.<br>For PCM, G711, G722, and aptX formats: The entered value is<br>adjusted to the nearest greater or equal multiple of the processing<br>granularity. It is the amount of audio samples processed by the audio<br>engine at each cycle.<br>For MPEG formats: The entered value is adjusted to the nearest<br>greater or equal multiple of the MPEG frame.<br>For AAC formats: The entered value is adjusted to the nearest greater<br>or equal multiple of the AAC frame. |
| FEC stream payload type   | Read/Write | Payload type of the FEC stream sent to the remote party. It's an integer between 0 and 127.   |
| DSCP                      | Read/Write | Defines the Quality of Service (QoS) class for the audio stream as<br>defined in the Differentiated Services Code Point (DSCP) standard.<br>Possible values are:  |



|                                     |            | <ul> <li>Class 2</li> <li>Class 3</li> <li>Class 4</li> <li>Class 5</li> <li>Class 6</li> <li>Class 7</li> <li>Assured Forwarding 11 (AF 11)</li> <li>Assured Forwarding 12 (AF 12)</li> <li>Assured Forwarding 13 (AF 13)</li> <li>Assured Forwarding 21 (AF 21)</li> <li>Assured Forwarding 22 (AF 22)</li> <li>Assured Forwarding 31 (AF 31)</li> <li>Assured Forwarding 32 (AF 32)</li> <li>Assured Forwarding 33 (AF 33)</li> <li>Assured Forwarding 41 (AF 41)</li> <li>Assured Forwarding 42 (AF 42)</li> <li>Assured Forwarding 43 (AF 43)</li> <li>Expedited Forwarding (EF)</li> </ul>   |
|-------------------------------------|------------|--|
| Advise jitter buffer size to callee | Read/Write | This parameter can be checked to recommend a size for the receiving jitter buffer of the remote party's device.  |
| Jitter buffer size to advise (ms)   | Read/Write | Visible only if "Advise jitter buffer size to callee" is checked.<br>This parameter is the recommended size for the receiving jitter buffer<br>of the remote party's device. The size is in milliseconds.  |
| Receive stream settings section     |            |  |
| Asymmetric settings                 | Read/Write | <ul> <li>This parameters allows to negotiate different settings for the audio stream sent by the remote party than for the audio stream sent to the remote party.</li> <li>Checked: The settings for the audio streams sent by the remote party and to the remote party are different.</li> <li>Unchecked: The settings for the audio streams sent by the remote party and to the remote party are the same.</li> </ul>  |
| Audio encoding format               | Read/Write | Visible only if "Asymmetric settings" is checked.<br>Audio encoding format of the stream sent by the remote party.   |
| Forward error correction            | Read/Write | <ul> <li>Visible only if "Asymmetric settings" is checked.</li> <li>Forward Error Correction (FEC) is a technique used to reduce data transmission errors on unreliable networks by sending additional information allowing to correct them.</li> <li>This parameter allows to select the FEC scheme for the FEC stream sent by the remote party. Possible values are: <ul> <li>No FEC stream</li> <li>+50% bandwidth, recovery 2, 1 stream (audio)</li> <li>+100% bandwidth, recovery 3, 2 streams (audio + FEC)</li> <li>+100% bandwidth, recovery 4, 2 streams (audio + FEC)</li> <li>+50% bandwidth, recovery 1/2, 2 streams (audio + FEC)</li> <li>+33% bandwidth, recovery 1/3, 2 streams (audio + FEC)</li> </ul> </li> </ul> |



|                           |            | <ul> <li>+25% bandwidth, recovery 1/4, 2 streams (audio + FEC)</li> <li>+20% bandwidth, recovery 1/5, 2 streams (audio + FEC)</li> <li>+10% bandwidth, recovery 1/10, 2 streams (audio + FEC)</li> <li>'recovery N' means that up to N consecutive lost IP packets can be reconstructed thanks to the FEC scheme, 'recovery 1/N' means one lost IP packet out of N consecutive packets can be reconstructed thanks to the FEC scheme.</li> </ul> |
|---------------------------|------------|--|
| Advanced parameters:      |            |  |
| Audio stream payload type | Read/Write | Visible only if "Asymmetric settings" is checked.<br>Payload type of the audio stream sent by the remote party. It's an<br>integer between 0 and 127.  |
| Packet size (ms)          | Read/Write | Visible only if "Asymmetric settings" is checked.<br>Defines the size in ms of the audio packets sent by the remote party or<br>0 not to negotiate the packet size.  |
| FEC stream payload type   | Read/Write | Visible only if "Asymmetric settings" is checked.<br>Payload type of the FEC stream sent by the remote party. It's an<br>integer between 0 and 127.  |

## 8.2.2.3.2 Edit a call profile

To edit an existing call profile, click the icon on the left of this latter. The edit page is identical to the add page described in the previous paragraph.

## 8.2.2.3.2 Delete call profiles

To delete a call profile, click the icon i on the left of this latter.

To delete several call profiles at the same time, check the box of the call profiles you want to delete then click "Delete" item in the "For selected Profiles(s)" menu at the top of the page:

| S.       | CONNECTIONS - Profiles - Profiles management |                                  |   |                             |                                   |  |  |  |  |
|----------|--|----------------------------------|---|-----------------------------|-----------------------------------|--|--|--|--|
| 00       |  | For selected Profile(s) -        |   |                             | + Add Profile                     |  |  |  |  |
| 100 C    |  | l Delete                         | _ |                             |                                   |  |  |  |  |
|          |  |                                  |   | Profile Name                | Description                       |  |  |  |  |
| <b>•</b> |  | / 🗈 🗎                            | • | High quality audio          | HE-AACv2 stereo 56 kbps           |  |  |  |  |
|          |  | <ul> <li>N</li> <li>B</li> </ul> | • | High quality audio with FEC | HE-AACv2 stereo 56kbps + FEC 100% |  |  |  |  |
| ?        |  | <ul> <li>N</li> <li>B</li> </ul> |   | High quality voice          | OPUS mono 48kbps                  |  |  |  |  |
|          |  | / 🖪 🗎                            |   | High quality voice + FEC    | OPUS mono 48kbps + FEC 50%        |  |  |  |  |
|          |  |                                  |   |                             |                                   |  |  |  |  |

## 8.2.3 "Advanced settings" category of menus



## 8.2.3.1 Advanced settings -> System

8.2.3.1.1 Advanced settings -> System -> Properties

## This page displays the system properties:

| S.         | ADVANCED SETTINGS - System - Properties |                          |  |   |   |
|------------|---|--------------------------|--|---|---|
| 0          | Hostname                                | iqoya-xiink-20025        |  | ŕ |   |
|            | Device name                             | XLINK-JPB                |  |   |   |
| 05         | Localization                            | English                  |  |   |   |
|            | Serial number                           | 2654.00020025            |  |   |   |
| $\bigcirc$ | Firmware version                        | 03.01b007                |  |   |   |
|            | Date                                    | 23/12/2019 08:19:39      |  |   |   |
| 2          | Platform ID                             | 341C-CAD0-FDCE-074A-A030 |  |   |   |
|            |   |                          |  |   |   |
|            | Supported options                       |                          |  |   |   |
|            | Number of mono channels for             | 0                        |  |   |   |
|            | transcoding                             | 14                       |  |   |   |
|            | Number of AES67 mono channels           | 0                        |  |   |   |
|            |   | unavailable              |  |   |   |
|            |   | unavailable              |  |   |   |
|            | AES/EBO transparency                    |                          |  |   |   |
|            |   | 4                        |  |   |   |
|            | General purpose l/o                     | *<br>vn1 022000          |  |   |   |
|            | Latest firmware version                 | 101.02233                |  | - | r |

### Description of the parameters:

| Parameter    | Read/Write | Meaning  |
|--------------|------------|--|
| Hostname     | R/W        | Logical name given to the device on the network. |
| Device Name  | R/W        | Name given to the equipment                      |
| Localization | R/W        | Language   |



| Serial number                                 | R   | Serial number of the unit. This number is set in factory and cannot be changed.   |
|---|-----|---|
| Firmware<br>version                           | R   | Version of the firmware running on the unit. The firmware can be update.  |
| Date  | R/W | Date and time of the unit.  |
| Platform ID                                   | R   | Identifier of the unit. this number is required for applying firmware options.  |
| Supported Option                              | S   |   |
| Number of<br>mono channels<br>for transcoding | R   | Number of mono channels supported for transcoding through internal buses.   |
| Number of<br>AES67 mono<br>channels           | R   | Number of mono input and output channels on AES67 or Ravenna, or Livewire   |
| Number of<br>aptX mono<br>channels            | R   | Number of mono channels to be processed in aptX   |
| Audio<br>synchronous<br>pack                  | R   | Value 1: the codec features the audio synchronization via NTP, PTP, or 10 MHz / 1PPS, and the clock synchro on 10 MHz. Value 0 : the option is not installed. |
| AES/EBU<br>transparency                       | R   | Value 1: the codec allows for AES transparency transport.<br>Value 0; the option is not installed.  |
| Multiprotocol<br>streaming                    | R   | Value 1: the codec features the multiprotocol streaming.<br>Value 0: the option is not installed  |
| Latest firmware version                       | R   | Maximum firmware version number authorized by the ongoing support contract.   |
| Support<br>contract validity<br>date          | R   | Defines the date until when the firmware can be updated/upgraded according to the purchased support contract.   |



#### 8.2.3.1.2 Advanced settings -> System -> Audio Clock

This page allows defining the X/LINK sampling clock source:

| L  | ADVANCED SETTINGS - Syste | m - Audio clock   | Apply Cancel |
|----|---------------------------|-------------------|--------------|
| 0  | Device clock              | Internal <b>v</b> | ]            |
|    | Master clock              | None 🔻            |              |
| 00 |                           |                   |              |

#### **Device clock**

The clock source can be:

- Internal: on-board clock
- Extracted from an AES/EBU input (not available on X/LINK-AES67)
- A PTP clock (AES67, RAVENNA)
- A Livewire clock

The clock sampling frequency value is set from Preferences->Audio setup.

#### Master clock

Allows defining if the codec generates a PTP clock.

## 8.2.3.1.2.1 PTP clock source

The following parameters appear when the mode "PTP AES67 Slave" is selected:

| S          |   | ADVANCED SETTINGS - System - Audio clock Apply |                           |  |  |   |  |  |
|------------|---|--|---------------------------|--|--|---|--|--|
| 0          |   | Device clock                                   | PTP AES67 (slave)         |  |  | * |  |  |
| 68         |   | PTP configuration                              |                           |  |  |   |  |  |
| 440        | 1 | Transport                                      | Multicast 🔻               |  |  |   |  |  |
| $\bigcirc$ |   | Domain number                                  | 73                        |  |  |   |  |  |
|            | L | Mechanism                                      | Syntonized only 🔻         |  |  |   |  |  |
| 2          | L | Network interface                              | eth1 🔻                    |  |  |   |  |  |
|            | L | IGMPv3 filtering mode                          | Include 🔻                 |  |  |   |  |  |
|            |   | IGMPv3 IP source addresses:<br>IP address 1    | 192.168.1.20              |  |  |   |  |  |
|            |   |  | •                         |  |  |   |  |  |
|            | I | DSCP   | Expedited Forwarding (EF) |  |  |   |  |  |
|            |   | PTP advanced settings                          |                           |  |  |   |  |  |
|            |   | Clock offset threshold                         | 0.5 sample 🔻              |  |  |   |  |  |
|            |   | Slave clock sensitivity                        | 500                       |  |  |   |  |  |



| Description | of the p | parameters: |
|-------------|----------|-------------|
|-------------|----------|-------------|

| Parameter               | Read/<br>Write  | Meaning   |  |  |
|-------------------------|-----------------|---|--|--|
| Transport               | R/W             | Allows specifying if the PTP clock is unicast or multicast.   |  |  |
| Domain number           | R/W             | PTP clock domain number (from 0 to 128)   |  |  |
| Mechanism               | R/W             | <ul> <li>Syntonized: means that IQOYA's clock is the same as the Grandmaster PTP, but they are not synchronous (delay between the two clocks).</li> <li>Synchronous clock is obtained thanks to E2E or P2P modes, which serve to compensate the delay between Grandmaster PTP clock and IQOYA.</li> <li>E2E is a more universal setting (it consists of requests and answers between the node (IQOYA) and the Grandmaster PTP clock unit).</li> <li>P2P provides higher clock sync precision but requires full PTP support from all participating switches (between IQOYA and related clock master.)</li> <li>In case the PTP clock is generated by an IQOYA, the PTP mechanism must be the same as in the IQOYA master: syntonized.</li> </ul> |  |  |
| Network interface       | R/W             | Select the network interface that receives the PTP  |  |  |
| IGMPv3 filtering mode   | R/W             | Off: X/LINK subscribes to the multicast PTP clock which can be generated by any source IP address.<br>Include: X/LINK subscribes to the multicast PTP clock which is generated only by the listed source IP addresses.<br>Exclude: X/LINK subscribes to the multicast PTP clock which is generated by any source IP address, with exception of the listed IP addresses.   |  |  |
| IGMPv3 IP source addres | sses            |   |  |  |
| IP address x            | R/W             | Allows declaring the source IP addresses to be included or excluded. Click on to add an IP@ to the list.  |  |  |
| DSCP                    | <sup></sup> R/W | QoS assigned to the PTP frames. Select the value from the drop down list.<br>For optimal QoS on PTP, "Expedited forwarding (EF)" value is<br>recommended.   |  |  |
| PTP advanced settings   |                 |   |  |  |
| Clock offset threshold  | R/W             | This parameter defines the condition for being synchronized to the PTP clock. The lower the value, the better the phase with the PTP clock. Lower values require a deterministic network. For networks that introduce an erratic jitter to the PTP frames, the value must be increased. Default value is 0.5 sample. It can be increased up to 64 samples.  |  |  |



| Slave clock sensitivity | R/W | It defines the sensibility of the slave clock to the PTP packet jitter. Enter a value between 500 (for a high sensitivity) and 100 (for a low sensitivity). Default value is 500 |
|-------------------------|-----|--|
|-------------------------|-----|--|

### The *clock offset distribution* section displays information about the received PTP clock.

| Clock offset distribution  |                           |                       |                     |
|----------------------------|---------------------------|-----------------------|---------------------|
| Current offset             | -1070423 ns               |                       |                     |
| Status / Master clock info | Not sync / 00-00-00-00-00 | -00-00-00:0 / 0.0.0.0 |                     |
| Reset metrics              | Reset                     |                       |                     |
| [0 - 2604 ns [             | 4.02                      |                       | 529/13175 measures  |
| [2604 - 5208 ns [          | 0%                        |                       | 0/13175 measures    |
| [5208 - 7813 ns [          | 0%                        |                       | 0/13175 measures    |
| [7813 - 10417 ns [         | 0%                        |                       | 0/13175 measures    |
| [10417 - 15625 ns [        | 0%                        |                       | 0/13175 measures    |
| [15625 - 20833 ns [        | 0%                        |                       | 0/13175 measures    |
| [20833 - 41667 ns [        | 0%                        |                       | 0/13175 measures    |
| [41667 - 62500 ns [        | 0.000                     |                       | 17/13175 measures   |
| [62500 - 83333 ns [        | (1995)                    | 103/13175 measures    |                     |
| [83333 - 166667 ns [       | 3.2                       | 432/13175 measures    |                     |
| [166667 - 333333 ns [      | 7.64%                     |                       | 1007/13175 measures |
| [333333 - 666667 ns [      | 12.01%                    |                       | 1582/13175 measures |
| [6666667 - 1333333 ns [    | 26.38%                    |                       | 3476/13175 measures |
| [1333333+ ns [             | 45.76%                    |                       | 6029/13175 measures |
| Min Offset                 | -2535582 ns               |                       |                     |
| Max Offset                 | 0 ns                      |                       |                     |
| Max Jitter                 | 109 µs                    |                       |                     |
| Path delay                 | 0 µs                      |                       |                     |
| Errors                     | 0                         |                       |                     |

## 8.2.3.1.2.2 Livewire (Slave)

The following parameters appear when the mode "Livewire Slave" is selected:

| C. | ADVANCED SETTINGS - System | Apply Cancel     |   |
|----|----------------------------|------------------|---|
| 69 | Device clock               | Livewire (slave) | × |
|    | Livewire configuration     |                  |   |
|    | Network interface          | eth3             | · |
| G  | IGMPv3 filtering mode      | Off              | · |

## Description of the parameters:

| Parameter F | Read/<br>Write | Meaning |
|-------------|----------------|---------|
|-------------|----------------|---------|



| Network interface       | R/W | Select the network interface that receives the livewire clock.  |
|-------------------------|-----|---|
| IGMPv3 filtering mode   | R/W | Off: X/LINK subscribes to the Livewire clock which can be generated by any source<br>IP address.<br>Include: X/LINK subscribes to the Livewire clock which is generated only by the<br>listed source IP addresses.<br>Exclude: X/LINK subscribes to the Livewire clock which is generated by any<br>source IP address, with exception of the listed IP addresses. |
| IGMPv3 IP source addres | ses |   |
| IP address x            | R/W | Displayed if IGMPv3 filtering mode is set to "Exclude" or "Include". Allows declaring the source IP addresses to be included or excluded. Click on to add an IP@ to the list.   |

## The clock offset distribution section displays information about the received Livewire clock.

| Clock offset distribution  |                    |              |
|----------------------------|--------------------|--------------|
|                            |                    |              |
| Current offset             | 0 ns               |              |
| Status / Master clock info | Not sync / 0.0.0.0 |              |
| Reset metrics              | Reset              |              |
| [0 - 2604 ns [             | 0%                 | 0/0 measures |
| [2604 - 5208 ns [          | 0%                 | 0/0 measures |
| [5208 - 7813 ns [          | 0%                 | 0/0 measures |
| [7813 - 10417 ns [         | 0%                 | 0/0 measures |
| [10417 - 15625 ns [        | 0%                 | 0/0 measures |
| [15625 - 20833 ns [        | 0%                 | 0/0 measures |
| [20833 - 41667 ns [        | 0%                 | 0/0 measures |
| [41667 - 62500 ns [        | 0%                 | 0/0 measures |
| [62500 - 83333 ns [        | 0%                 | 0/0 measures |
| [83333 - 166667 ns [       | 0%                 | 0/0 measures |
| [166667 - 333333 ns [      | 0%                 | 0/0 measures |
| [333333 - 666667 ns [      | 0%                 | 0/0 measures |
| [666667 - 1333333 ns [     | 0%                 | 0/0 measures |
| [1333333+ ns [             | 0%                 | 0/0 measures |
| Min Offset                 | 0 ns               |              |
| Max Offset                 | 0 ns               |              |

## Click on "Apply" to confirm your choice.

## 8.2.3.1.3 Advanced settings -> System -> Audio setup

This page allows setting the processing granularity and the working sampling frequency:

| S. | ADVANCED SETTINGS - Syste | <b>m</b> - Audio setup | Apply Cancel |
|----|---------------------------|------------------------|--------------|
| 0  | Processing granularity    | 1 ms                   |              |
|    | Sampling frequency        | 48000 Hz               |              |
| 00 |                           |                        |              |



Click on a parameter field to be able to change the values.

| Parameter              | Description  |
|------------------------|--|
| Processing granularity | This is the smallest amount of data processed at a time by IQOYA. The lower the processing granularity, the lower the latency. Possible values are 1ms, 2ms, 3 ms, 4 ms.<br>However, a value of 1ms may lead to audio underruns, depending on the features enabled on IQOYA. In case this happens, it is necessary to increase the processing granularity value.<br>Note: the payload size of an IP frame is adjustable via parameter Payload size, from the Send page (see paragraph Encoder parameters configuration). |
| Sampling frequency     | It defines the working sampling frequency of IQOYA. Note that received and generated IP streams can carry audio at a different sampling frequencies (in which case a high quality frequency change is applied).<br>When sampling frequency is set to 48 kHz, IP streams can be at 48 kHz, 32 kHz, 16 kHz (G722), and 8 kHz (G711). Note that 44.1 kHz is allowed for a HTTP stream.<br>When sampling frequency is set to 44.1 kHz, IP streams must be at 44.1 kHz.   |

Click on "Apply" to confirm your changes.

#### 8.2.3.1.4 Advanced settings -> System -> Logs

| C.       | ADVANCED SET                    | TINGS    | S - System - Logs Download logs Reset lo  | ogs |
|----------|---------------------------------|----------|---|-----|
|          | 2019/12/23 08:31:08.990 WARNING | Codec 16 | Receive main source failed alarm is ON  |     |
|          | 2019/12/23 08:31:08.993 WARNING | Codec 16 | Receive failed alarm is ON  |     |
| <b>N</b> | 2019/12/23 08:31:08.995 INFO    | Codec 16 | Receiver no source elected  |     |
|          | 2019/12/23 08:31:08.998 INFO    | Codec 5  | Sender is stopped   |     |
| 08       | 2019/12/23 08:31:13.916 INFO    |          | 2002 Codec 16 OutgoingCall - name: sip:iqs-madi-20007-27-program@sip.digidemo.iqoya.com:5060, ur<br>sip:iqs-madi-20007-27-program@sip.digidemo.iqoya.com:5060 | ri: |
|          | 2019/12/23 08:31:13.920 INFO    |          | 2002 v=0  |     |
| Q        | 2019/12/23 08:31:13.923 INFO    |          | 2002 o=DIGIGRAM_iqoyaservlink-aes3_03.01b007 1577089873916 1577089873916 IN IP4 37.71.132.157   |     |
|          | 2019/12/23 08:31:13.926 INFO    |          | 2002 s=iqoyaservlink-aes3 call request  |     |
|          | 2019/12/23 08:31:13.929 INFO    |          | 2002 t=0 0  |     |
|          |                                 |          |   |     |

This page allows viewing and downloading the log file of IQOYA X/LINK. This log file gives information about the internal behaviour of IQOYA, and is useful for advanced diagnostics. Traces of enabled alarms are written into this log file (alarm ON, alarm OFF). This log file is stored internally and is persistent to a power cycle, a restart or reboot.

**Event Type**: allows selecting the category of traces to be displayed: Infos, Warnings, Errors, Errors & Warnings. **Codec**: allows selecting one of the coedcs so that only log traces related to this codec are displayed. The number of the codec can be seen from the Send/IP Services page, and from the Receive/ Programs page. **Auto refresh:** The page content is refreshed automatically if this parameter is set to "Yes".

**Date & Time:** clicking on this icon allows to sort out the traces by date and time, starting by most recent traces or starting by oldest traces.

**Reset logs**: resets all the traces.

**Download logs:** allows remotely downloading the log traces.

### 8.2.3.1.5 Advanced settings -> System -> Download / Upload

This page allows downloading the IQOYA configuration to a remote PC, or uploading a configuration from a remote PC to IQOYA.

| ٩ <u></u> | ADVANCED SETTINGS - System - Download / Upload |   |  |
|-----------|--|---|--|
|           | Upload   |   |  |
| <b>(</b>  | Action   | Upload audio configuration file from local disk |  |
| 88        | File   | Browse  |  |
|           | Download                                       |   |  |
| 6         | Action   | Audio configuration                             |  |
|           |  | Download  |  |

To save the current configuration of IQOYA to a remote PC, click on "Download".

To apply a configuration to IQOYA, click on "Browse" to select the configuration file, and click on "Apply".

The configuration that can be uploaded/downloaded can be:

- The audio configuration only (includes the programs and IP services)
- The full codec configuration
- The connection book: The connection book is the concatenation of the contact list and the call profile list.

In addition, the html file which allows to view all the parameters of the codec can be downloaded. From the download section, select " Device Information", and download.

#### 8.2.3.1.6 Advanced settings -> System -> SD card

This page allows:

- mounting an SDHC card if it is inserted while the unit is running,
- unmounting it before removing it from the front panel.
- Viewing the SDHC card status: mounted/unmounted

| 0å | Γ | Action         | · · · · · · · · · · · · · · · · · · · |
|----|---|----------------|---------------------------------------|
|    |   | SD card status | Inserted. Mounted.                    |
|    |   |                |                                       |

8.2.3.1.7 Advanced settings -> System -> SD card backup

The codec configuration can be saved to SDHC card or loaded from it.

| 30 | Copy configuration | <b>*</b>   |
|----|--------------------|--|
|    |                    | From SD Card to device<br>From device to SD Card |



• From the "Copy configuration" field, select whether the configuration has to be copied from the SDHC card to IQOYA's internal memory or from the internal memory to the SDHC card.

#### Notes:

- Audio activity is stopped when the configuration is loaded from the SDHC card.
- The unit is restarted to apply the new configuration.
- On the SDHC card, the configuration file "IQOYA\_Configuration\_save.tar" is stored in folder \IQOYA\_LINK\Config.
- The current configuration of the IQOYA codec can also be displayed from a WEB browser by selecting the file \IQOYA\_LINK\ Config.html, accessible via FTP.
- The configuration saved on the SDHC card can be loaded from the IQOYA X/LINK front panel LCD display and keyboard (menu System)
- This configuration on SDHC card can also be loaded when starting IQOYA with the SD card inserted. The file "/SDCARD/iqoya\_link/run\_once/ boot\_commands.txt" must contain the following line: RESTORE FULLCONFIG FROMSD=Yes

#### 8.2.3.1.8 Advanced settings -> System -> Firmware & License update

IQOYA can be updated with a new firmware, a patch, or an optional license. The first phase of the update consists in uploading and checking the software package; during this phase, the audio activity is not stopped. The second phase consists in applying the uploaded package; audio activity is stopped during this phase. Two firmware versions are stored locally: the currently running version, and the previous version. This allows to go back to the previous firmware version if an issue is experienced with the more recent version, without having to go through an upload.

| S | ADVANCED SETTINGS - Syste           | Apply Cancel |  |
|---|-------------------------------------|--------------|--|
| 0 | Action                              |              |  |
|   | Versions                            |              |  |
|   | Last uploaded package               | none         |  |
| 9 | Current running firmware            | 03.01b007    |  |
|   | Previous firmware                   | none         |  |
| ? |                                     |              |  |
|   | Options                             |              |  |
|   | Copy firmware to SD card on install | No           |  |
|   |                                     |              |  |





Click on the "Action" field, and click on the arrow to display the list of possible actions.

Select the appropriate action through the list.

For a firmware update, select "Upload a package", and click on "Browse" to select the file to be uploaded. Click on "Apply" to start the upload. Audio activity is not stopped during the upload.

Once the package upload is completed, select the action "Install last uploaded firmware", and click on "Apply". Applying the firmware stops the audio activity. The equipment restarts automatically.

The following operations are also possible from the "Action" drop-down menu:

- Check previous firmware package: this allows checking that the previous firmware version that is stored locally is correct.
- Check last uploaded package: this allows checking that the last uploaded firmware version is correct. This operation is done automatically during the upload phase.
- Install previous firmware package (rollback): this allows installing a previous version of the firmware that is stored locally. This is a firmware downgrade.
- Remove last uploaded package: this allows deleting the last uploaded package. This means that this package will not be installed.
- Remove previous uploaded package: this allows deleting the previous uploaded package. This means that an upload is necessary for a firmware downgrade.

## Copy firmware to SD card on install

Set to Yes, this parameter allows copying to the SD card the firmware to be installed to facilitate a future possible firmware rollback. Exemple:

- Firmware to be upload and applied: version A
- Copy to SD card set to Yes
- Firmware to upload and applied: version B



#### Copy to SD card set to Yes

- => Current firmware = version B / Previous firmware = version A
- At this point version A can be re-installed without the upload phase.

#### 8.2.3.1.9 Advanced settings -> System -> Password

This page allows changing the username and password for a given user category. This can be done when logged to the IQOYA as Administrator.

| S  | ADVANCED SETTINGS - System - Password |               | Apply Cancel |
|----|---------------------------------------|---------------|--------------|
| 0  | Profile                               | Administrator |              |
| ľ  | Login                                 | iqoya         |              |
| 06 | Old password                          |               |              |
|    | New password                          |               |              |
| 52 | New password again                    |               |              |
|    |                                       |               |              |

First select the profile for which credentials have to be changed.

## ADVANCED SETTINGS - System - Password

| Profile            | Administrator 🔹 |
|--------------------|-----------------|
| Login              | Administrator   |
| Old password       | User            |
| New password       | Guest           |
| New password again |                 |

Login: allows configuring the username to be used in order to log to the WEB GUI with the selected profile.

**Old password**: Type the current password **New password**: Type the new password **New password again**: confirm the new password Click on "Apply" to confirm the changes.

8.2.3.1.10 Advanced settings -> System -> Shutdown / Restart This page allow to restart or shutdown IQOYA.





displayed confirmation window.

#### 8.2.3.1.11 Advanced settings -> System -> Switch mode of use

This page allows switching from "Remote Broadcasting" mode of use to "Program Distribution" mode of use and vise versa:



distribution

To switch to "Program Distribution" mode of use, click through the displayed confirmation window:

button then confirm your choice



#### 8.2.3.2 Advanced settings -> services

#### 8.2.3.2.1 Advanced settings -> services-> NTP

This page allows:

- configuring the date and time synchronization to an NTP server.
- enabling the optional feature "audio synchronization on NTP clock".

#### NTP service is disabled by default.

| L  | ADVANCED SETTINGS  | S - Services - NTP    | Apply Cancel |
|----|--------------------|-----------------------|--------------|
| 0. | Service activation | Yes                   |              |
|    | Service status     | Running, synchronized |              |
| 06 | Server IP address  | 192.168.0.200         |              |
|    |                    |                       |              |

Click on the **"service activation"** field to activate/deactivate the NTP service. Select "Yes" to activate it. Enter then the IP address of the NTP server.

In case you just need to activate the date and time NTP synchronization, click on "Apply". The status of the service is displayed in the field "Service status".

For activation of the NTP based audio synchronization, select "Yes" for parameter "Sync audio on NTP clock".

| Service activation        | Yes                    |                    |
|---------------------------|------------------------|--------------------|
| Service status            | Running, synchronized  |                    |
| Server IP address         | fr.pool.ntp.org        |                    |
| Audio synchronization     |                        |                    |
| Sync audio on NTP clock   | Yes                    |                    |
| Clock offset distribution |                        |                    |
| Current offset            | 0 US Reset NTP metrics | Reset              |
| [0 ; 250 µs[              | 100%                   | 8593/8593 measures |
| [250 ; 500 µs[            | 0%                     | 0/8593 measures    |
| [500 ; 750 µs[            | 0%                     | 0/8593 measures    |
| [750 ; 1000 µs[           | 0%                     | 0/8593 measures    |
| [1000 ; 2500 µs[          | 0%                     | 0/8593 measures    |
| [2500 ; 5000 µs[          | 0%                     | 0/8593 measures    |
| [5000 ; 7500 µs[          | 0%                     | 0/8593 measures    |
| [7500 ; 10000 µs[         | 0%                     | 0/8593 measures    |
| [10000 ; 15000 µs[        | 0%                     | 0/8593 measures    |
| [15000 ; 20000 µs[        | 0%                     | 0/8593 measures    |
| [20000 ; 50000 µs[        | 0%                     | 0/8593 measures    |
| [50000 ; 75000 µs[        | 0%                     | 0/8593 measures    |
| [75000 ; 100000 µs[       | 0%                     | 0/8593 measures    |
| [100000 ; + µs[           | 0%                     | 0/8593 measures    |



Once IQOYA is synchronized on the NTP server, the field "Service status" displays "Running, synchronized". This requires that the software option is installed on the IQOYA X/LINK, as well as on the associated IQOYA decoders.

#### 8.2.3.2.2 Advanced settings -> services-> FTP

FTP is useful typically for managing the backup playlists and sound files on IQOYA's internal storage (uploading/deleting).

FTP service is disabled by default.

| ADVANCED SETTINGS - Services - FTP     Apply |                      |                                      | Apply Cancel | Click on the "Service activation" field.<br>Select "Yes" to enable the FTP  |  |  |
|--|----------------------|--------------------------------------|--------------|---|--|--|
| 0  | Service activation   | Yes                                  |              | service. "No" to disable it.  |  |  |
| <u> </u>                                     | Service status       | Running, download configuration only |              | If necessary, you may change the  |  |  |
| 06   | Port                 | 21                                   |              | port used for FTP (default value is   |  |  |
|  | Bandwidth limitation | 0 kb/s                               |              | 21)   |  |  |
|  |                      |                                      |              | Parameter "Bandwidth limitation"<br>allows limiting the network<br>bandwidth of the FTP traffic.<br>Click on "Apply" to confirm the<br>changes.<br>Note that a username and password<br>are required to establish an FTP<br>connection to IQOYA X/LINK.<br>Username is: ftp. Password is the<br>administrator password, by default: |  |  |
|  |                      |                                      |              |   |  |  |

Note that backup playlists and sound files have to be stored in folder DEVICE\_STORAGE.

#### 8.2.3.2.3 Advanced settings -> services-> SSH

This page allows enabling/disabling the SSH service on IQOYA.

SSH is mainly to be used by Digigram technical support for advanced diagnostics.

| S. | ADVANCED SETTINGS  | Apply Cancel |  |
|----|--------------------|--------------|--|
| 0  | Service activation | Yes          |  |
|    | Service status     | Running      |  |
| 00 |                    |              |  |

#### 8.2.3.2.4 Advanced settings -> services-> HTTPS

This page allows setting a bandwidth limitation to the HTTP traffic.



In case the IP audio stream takes almost all the available network bandwidth, the HTTP traffic generated when accessing the WEB pages may disturb the IP audio frames transmission, because the total bandwidth necessary for the IP audio stream plus HTTP traffic may exceed the available network bandwidth.

To avoid this problem, IQOYA offers the possibility to set a bandwidth limitation for the HTTPS traffic.

| C. | ADVANCED SETTINGS - Services - HTTPS |   |      | Apply Cancel |
|----|--------------------------------------|---|------|--------------|
| 60 | Maximum bit rate                     | 0 | kb/s |              |
| H  |                                      |   |      |              |

Click on the "Maximum bit rate" field, and enter the maximum bit rate allowed for HTTPS traffic. Default value is 0, which means no limitation on HTTPS traffic. The smaller the value, the longer it takes to load the WEB page!

Click on "Apply" to confirm the settings.

#### 8.2.3.2.5 Advanced settings -> services-> Publish / Discover

This page allows enabling the automatic discovery and publishing of AES67 or RAVENNA streams.

| C  | ADVANCED SETTINGS  | Apply Cancel |  |
|----|--------------------|--------------|--|
| 0  | Service activation | Yes          |  |
|    | Service status     | Running      |  |
| 06 |                    |              |  |
|    |                    |              |  |

In case you do not use AES67 or RAVENNA audio I/Os, there is no need to activate this service.

## 8.2.4 Audio I/Os category of menus

This category of menus and the pages they allow to reach are identical in "Remote Broadcasting" mode of use and in "Program Distribution" mode of use. Please refer to their descriptions in the "Program Distribution" section of this manual, paragraph <u>8.1.2 Audio I/Os category of menus</u>.

# 9 Managing sound files and playlists via FTP

Available in "Program Distribution" mode of use only.

Local sound files and playlists on the SDHC card can be uploaded and removed via FTP. Connect to IQOYA X/LINK via an FTP software application. Login is as follows:

- username: ftp
- password: iqoya These are default username and passwords. Note that the username and password may be changed.

Playlists (.m3u) and sound files must be stored in folder "SDCARD".


# 10 Specifications

## 10.1 IQOYA X/LINK-LE and X/LINK-ST

## **10.1.1 CONFIGURATION**

| Dimensions                            | 19", 1RU  |
|---------------------------------------|---|
| Weight                                | ~ 3.1 kg (~6.85 lbs)  |
| Power supply                          | 2 internal redundant PSU 100-250VAC,<br>Optional: 100-250VAC / -48VDC |
| Temperature / Humidity non-condensing | Operating: 0°C – 50°C / 0% – 95%<br>Storage: -5°C – 70°C / 0% – 95%   |
| Power consumption                     | Max 21W   |

## 10.1.2 CONNECTIVITY

|                                    | X/LINK-ST<br>X/LINK-LE   | X/LINK-DUAL  | X/LINK-AES67  |
|------------------------------------|--|--|---|
| WAN / LAN Ethernet<br>ports        | 1 x 100 Mbps   | (Eth2) + 3 x 10/100/1000 Mbps  | RJ-45 (Eth1, 3,4)   |
| Analog and AES/EBU<br>audio inputs | Female XLR on  | breakout cables  |   |
| Analog and AES/EBU audio outputs   | Male XLR on b  | reakout cables   |   |
| Serial data                        |  | 1 x RS232 port SubD-D 9  |   |
| GPIO's                             | 8 Opto-Isolated GPIs (4 with<br>factory option "Sync option<br>for X/LINK")<br>8 relay GPOs (4 with factory<br>option "Sync option for<br>X/LINK"):<br>: - 3 SPDT outputs:<br>common, norm. open, .norm.<br>closed<br>- max 220 VDC/250<br>VAC,<br>- max 60 W, 62.5 VA<br>- max.<br>continuous/switching current:<br>2 A/3 A | 4 Opto-Isolated GPIs<br>4 relay GPOs:<br>: - 3 SPDT outputs:<br>common, norm. open,<br>.norm. closed<br>- max 220 VDC/250<br>VAC,<br>- max 60 W, 62.5 VA<br>- max.<br>continuous/switching<br>current: 2 A/3 A | 8 Opto-Isolated GPIs (4 with<br>factory option "Sync option for<br>X/LINK")<br>8 relay GPOs (4 with factory<br>option "Sync option for<br>X/LINK"):<br>: - 3 SPDT outputs: common,<br>norm. open, .norm. closed<br>- max 220 VDC/250<br>VAC,<br>- max 60 W, 62.5 VA<br>- max.<br>continuous/switching current: 2<br>A/3 A |



## **10.1.3 ANALOG INPUTS**

|                             | X/LINK<br>X/LINK-LE   | X/LINK-DUAL | X/LINK-AES67 |
|-----------------------------|---|-------------|--------------|
| Туре                        | 2 balanced  | 4 balanced  | -            |
| A/D converter resolution    | 24 bits   |             | -            |
| Maximum level/<br>impedance | +24 dBu/ >10 kΩ   |             | -            |
| Adjustable gain             | From –94.5dB to +24 dB; 0.5 dB steps<br>Maximum sensitivity: 0 dBU input signal -> 0 dBfs |             | -            |
| Adjustable digital gain     | From –15 dB to +15 dB; 0.1 dB steps   |             | -            |

## **10.1.4 ANALOG LINE OUTPUTS**

|                                   | X/LINK<br>X/LINK-LE                  | X/LINK-DUAL     | X/LINK-AES67 |
|-----------------------------------|--------------------------------------|-----------------|--------------|
| Туре                              | 2 Line balanced                      | 4 Line balanced | -            |
| D/A converter resolution          | 24                                   | 24 bits         |              |
| Maximum input level/<br>impedance | +24 dBu/ <100 Ω                      |                 | -            |
| Adjustable analog gain            | From –94.5dB to +24 dB; 0.5 dB steps |                 | -            |
| Adjustable digital gain           | From –15 dB to +15 dB; 0.1 dB steps  |                 | -            |

## 10.1.5 AES/EBU INPUTS

|                                 | X/LINK<br>X/LINK-LE                                  | X/LINK-DUAL               | X/LINK-AES67 |
|---------------------------------|--|---------------------------|--------------|
| Туре                            | 1 balanced. Zin = 110 Ohms                           | 2 balanced. Zin = 110 Ohm | -            |
| Hardware sample rate converters | Sample rate conversion = 7.5:1 to 1:8, up to 192 kHz |                           | -            |
| Adjustable digital gain         | from –15 dB to +15 dB                                |                           | -            |



## 10.1.6 AES/EBU OUTPUTS

|             | X/LINK<br>X/LINK-LE            | X/LINK-DUAL                 | X/LINK-AES67 |
|-------------|--------------------------------|-----------------------------|--------------|
| Туре        | 1 balanced. Zout = 110<br>Ohms | 2 balanced. Zout = 110 Ohms | -            |
| Sample rate | 32 kHz, 4                      | 4.1 kHz, or 48 kHz          | -            |

## 10.1.7 AES67/RAVENNA

|                       | X/LINK<br>X/LINK-LE   | X/LINK-DUAL                | X/LINK-AES67                                |
|-----------------------|---|----------------------------|---|
| Inputs / outputs      | 2 mono channels (1<br>stereo)   | 4 mono channels (2 stereo) | 2 mono to 16 mono<br>(1 stereo to 8 stereo) |
| Sample rate           | 44.1 kHz, or 48 kHz   |                            |   |
| PTP slave             | Yes   |                            |   |
| PTP Master            | Yes   |                            |   |
| Clock source          | PTPv2 (IEEE1588-2008) from network<br>or internal clock or Word Clock<br>or local clock eligible as GrandMaster PTP |                            |   |
| Samples per packet    | 48 / 192  |                            |   |
| Audio payload formats | PCM16 / PCM24 / PCM32 / AM824 (PCM24+AES3 channel status)   |                            |   |

## 10.1.8 Livewire

|                  | X/LINK<br>X/LINK-LE           | X/LINK-DUAL                | X/LINK-AES67                             |
|------------------|-------------------------------|----------------------------|--|
| Inputs / outputs | 2 mono channels (1<br>stereo) | 4 mono channels (2 stereo) | 2 to 16 mono channels<br>(1 to 8 stereo) |
| Sample rate      | 48 kHz                        |                            |  |
| Mode             | Standard (240 samples)        | Standard (240 samples)     | Standard (240 samples)                   |

## **10.1.9 HEADPHONES OUTPUT**

| X/LINK    | X/LINK-DUAL | X/LINK-AES67 |
|-----------|-------------|--------------|
| X/LINK-LE |             |              |



| Туре  | 1 balanced (6.35mm jack)     |
|-------|------------------------------|
| Power | max 2x50 mW / 2x32 ohms load |

## **10.1.10 OTIONAL SYNCHRONIZATION INPUTS**

|                | X/LINK<br>X/LINK-LE | X/LINK-DUAL                      | X/LINK-AES67 |
|----------------|---------------------|----------------------------------|--------------|
| 10 MHz / 1 PPS |                     | BNC connectors on breakout cable |              |

## **10.1.11 ANALOG AUDIO PERFORMANCES**

| Frequency response                           | 20 Hz-20 kHz +/- 0,1 dB at 48 kHz                        |
|--|--|
| Signal to Noise                              | >108 dBA   |
| Dynamic range (A-weighted)                   | Analog In: >104 dB / Analog Out: >106 dB                 |
| THD + noise 20-20kHz at –1 dBfs              | <-90 dB  |
| Channel phase difference: 20/20kHz           | 0.1° / 0.27°   |
| Crosstalk (Analog in or out) 1 kHz at 22 dBu | 1 kHz: < -120 dB<br>10 kHz: <-110 dB<br>20 kHz: <-107 dB |
| Internal clock precision                     | Better than 10 PPM                                       |



# **11 APPENDIX C: GPIO's CONNECTORS**



## GPIO pinout Upper Sub-D 25

| Pin   | 13     | 12  | 11  | 10    | 9     | 8     | 7     | 6      | 5     | 4     | 3     | 2     | 1      |
|-------|--------|-----|-----|-------|-------|-------|-------|--------|-------|-------|-------|-------|--------|
| GPIO  | -      | -   | -   | GPO_4 | GPI_4 | GPO_3 | GPO_3 | -      | GPO_2 | GPI_2 | GPO_1 | GPO_1 | -      |
| Label | unused | GND | GND | N.C.  | к     | N.O.  | COM   | unused | N.C.  | к     | N.O.  | COM   | unused |

| Pin   | 25     | 24  | 23    | 22    | 21     | 20    | 19    | 18    | 17    | 16     | 15    | 14    |
|-------|--------|-----|-------|-------|--------|-------|-------|-------|-------|--------|-------|-------|
| GPIO  | -      | -   | GPO_4 | GPO_4 | -      | GPO_3 | GPI_3 | GPO_2 | GPO_2 | -      | GPO_1 | GPI_1 |
| Label | unused | GND | N.O.  | COM   | unused | N.C.  | К     | N.O.  | COM   | unused | N.C.  | К     |

#### Lower Sub-D 25

| Pin   | 13     | 12  | 11  | 10    | 9     | 8     | 7     | 6      | 5     | 4     | 3     | 2     | 1      |
|-------|--------|-----|-----|-------|-------|-------|-------|--------|-------|-------|-------|-------|--------|
| GPIO  | -      | -   | -   | GPO_8 | GPI_8 | GPO_7 | GPO_7 | -      | GPO_6 | GPI_6 | GPO_5 | GPO_5 | -      |
| Label | unused | GND | GND | N.C.  | К     | N.O.  | COM   | unused | N.C.  | К     | N.O.  | COM   | unused |

| Pin   | 25     | 24  | 23    | 22    | 21     | 20    | 19    | 18    | 17    | 16     | 15    | 14    |
|-------|--------|-----|-------|-------|--------|-------|-------|-------|-------|--------|-------|-------|
| GPIO  | -      | -   | GPO_8 | GPO_8 | -      | GPO_7 | GPI_7 | GPO_6 | GPO_6 | -      | GPO_5 | GPI_5 |
| Label | unused | GND | N.O.  | COM   | unused | N.C.  | К     | N.O.  | COM   | unused | N.C.  | К     |

- **GND**: connected to ground
- N.C.: contact normally closed
- N.O.: contact normally open
- **COM**: common contact
- unused: not used, DO NOT CONNECT!
- **K**: optocoupler cathode



## General Purpose Inputs (GPIs)



The IQOYA X/LINK GPI's are compatible TTL 5 V.

They do not require any external power.

GPI status is "open" (1) when pin K is not connected to the ground for at least 20ms.

GPI status is "closed" (0) when pin K is connected to the ground for at least 20ms. (ground is on pins 11-12-24 on the upper Sub-D connector, and pins 10-12-24 on the lower Sub-D

connector).

## **GPI** optocoupler specifications

| Minimum current imin to switch GPI         | 1 mA               |
|--|--------------------|
| Maximum current i <sub>max</sub> supported | 60 mA              |
| Maximum voltage $V_{\kappa}$ supported     | 11 V <sub>DC</sub> |

## **General Purpose Outputs (GPOs)**

The IQOYA X/LINK GPO's are opto-isolated SPDT type relays (Single Pole, Double Throw).

Each GPO features 3 pins:

- COM : Common
- N.C. : normally closed
- N.O. : normally open

According to the status applied to the GPO, pin N.C. is connected to pin COM, or pin N.O. is connected to pin COM.

GPIO tunneling in direct mode (status not inverted)

When GPI tunneling is enabled, an open GPI (pin K not connected to the ground) is reflected on the distant GPO by pin N.O connected to pin COM.

GPIO tunneling in inverted mode (status inverted)



An "open" GPI (pin K not connected to the ground) is reflected on the distant GPO by pin N.O connected to pin COM. Pin N.C is left unconnected.

A "closed" GPI (pin K connected to the ground) is reflected on the distant GPO by pin N.C. connected to pin COM. Pin N.O is left unconnected.

#### Alarms notification

Alarms can also be notified on GPOs. See chapter "Alarms management".

## **GPO relay specifications**

| Maximum power switching capability            | 60 W/62.5 VA  |
|---|---|
| Maximum switching current                     | 5 A <sub>DC</sub>   |
| Maximum carrying current                      | 2 A <sub>DC</sub>   |
| Maximum switching voltage <sup>*</sup>        | 220 V <sub>DC</sub> /0.24A-60 W<br>250 V <sub>AC</sub> /0.25-62.5 V <sub>AC</sub><br>125 V <sub>AC</sub> /0.5A-62.5 V <sub>AC</sub><br>30 V <sub>DC</sub> /2 A-60 W |
| Typical life expectancy (switching max power) | 10 <sup>6</sup> operations  |

<sup>\*</sup>Note: The maximum voltage makes it possible to control devices (up to 60 W. max) directly through the power outlet.



## 12 APPENDIX D: SERIAL PORT (RS232 ON DB9)

| Pin | Description            |
|-----|------------------------|
| 1   | Not connected          |
| 2   | RxD (received data)    |
| 3   | TxD (transmitted data) |
| 4   | Not connected          |
| 5   | Signal ground          |
| 6   | Not connected          |
| 7   | RTS (request to send)  |
| 8   | CTS (clear to send)    |
| 9   | Not connected          |



IQOYA X/LINK codecs provide an RS232 serial port on a male DB-9 connector on the back panel. Use this port to connect any compatible device. For pinout allocation details, please refer to the figure and table above.

The port may be used for tunneling serial data between encoder and decoder (RDS data, commands). Set-up is done through a web browser .

## **13 APPENDIX E: TYPICAL LATENCY VALUES**

The back to back latency between two IQOYA X/LINK devices depends on the selected audio format, the network quality, and the enabled functionalities (backup, half/full duplex, FEC).

See the table underneath for maximum latency values in half-duplex, using neither failover configurations nor FEC, with the jitter buffer size set to 0, and with an optimized network.

| Audio Type      | Audio format | Latency<br>(processing<br>granularity set to<br>1ms) | Description |
|-----------------|--------------|--|-------------|
| PCM             | 24 bit       | 9ms  |             |
| MPEG Layer II   | 256 kbps     | 90ms   |             |
| MPEG Layer III  | 128 kbps     | 152ms  |             |
| AAC-4 LC        | 256 kbps     | 105ms  |             |
| AAC-4 LC+SBR    | 96 kbps      | 210ms  | aka HEv1    |
| AAC-4 LC+SBR+PS | 56 kbps      | 251ms  | aka HEv2    |
| AAC-4 LD        | 160 kbps     | 51ms   |             |
| AAC-4 ELD       | 160 kbps     | 45ms   |             |
| Opus            | 256 kbps     | 73ms   |             |

All measurements taken on stereo samples at 48 kHz

## Impact of the processing granularity

Add about 4 ms to the latency each time the processing granularity is increased of 1ms.

## Impact of the network on latency

Latency highly depends on the quality of the network. Network jitter and packets loss typically have a direct impact on latency.

- Network jitter compensation is achieved by buffering audio data on the decoder. A good quality network
  generally offers a low jitter, then requiring low buffering on the decoder, which means a low increase of
  latency. But a network with a high jitter requires increasing the decoder buffering accordingly, leading to a
  significant increase of latency.
- In case of packets loss on the network, it is necessary to enable an FEC, which allows recovering lost packets thanks to redundant frames. FEC increases the latency.

## Impact of features on the latency

The amount of features used in IQOYA directly impacts the latency. For a given audio format, the lowest latency is obtained in half duplex mode, with no backup defined and no FEC. As soon as one of these features is used, the latency increases a bit.

# APPENDIX F: AAC SETTINGS FOR STEREO SAMPLES

| AAC type | Sampling frequency<br>(Hz) | Audio bit rate<br>(bit/s) | IP stream bit rate<br>(bit/s) |
|----------|----------------------------|---------------------------|-------------------------------|
| AAC-LC   | 16000                      | 32000 – 39999             | 8250+ Audio bit rate          |
| AAC-LC   | 22050                      | 32000 – 39999             | 11369+ Audio bit rate         |
| AAC-LC   | 24000                      | 32000 – 39999             | 12375+ Audio bit rate         |
| AAC-LC   | 32000                      | 40000 – 320000            | 16500+ Audio bit rate         |
| AAC-LC   | 44100                      | 40000 - 320000            | 22739+ Audio bit rate         |
| AAC-LC   | 48000                      | 40000 – 320000            | 24750+ Audio bit rate         |

| HE-AACv1 (SBR) | 16000 |               |                       |
|----------------|-------|---------------|-----------------------|
| HE-AACv1 (SBR) | 22050 |               |                       |
| HE-AACv1 (SBR) | 24000 |               |                       |
| HE-AACv1 (SBR) | 32000 | 24000 – 96000 | 8250+ Audio bit rate  |
| HE-AACv1 (SBR) | 44100 | 24000 – 96000 | 11369+ Audio bit rate |
| HE-AACv1 (SBR) | 48000 | 24000 – 96000 | 12375+ Audio bit rate |

| HE-AACv2 (SBR+PS) | 16000 |               |                       |
|-------------------|-------|---------------|-----------------------|
| HE-AACv2 (SBR+PS) | 22050 |               |                       |
| HE-AACv2 (SBR+PS) | 24000 |               |                       |
| HE-AACv2 (SBR+PS) | 32000 | 14000 – 56000 | 8250+ Audio bit rate  |
| HE-AACv2 (SBR+PS) | 44100 | 18000 – 56000 | 11369+ Audio bit rate |
| HE-AACv2 (SBR+PS) | 48000 | 18000 – 56000 | 12375+ Audio bit rate |



| AAC type | Sampling frequency<br>(Hz) | Audio bit rate<br>(bit/s) | IP stream bit rate<br>(bit/s) |
|----------|----------------------------|---------------------------|-------------------------------|
| AAC-LD   | 16000                      |                           |                               |
| AAC-LD   | 22050                      |                           |                               |
| AAC-LD   | 24000                      | 80000 – 111999            | 24750 + Audio bit<br>rate     |
| AAC-LD   | 32000                      | 112000 – 320000           | 33000 + Audio bit<br>rate     |
| AAC-LD   | 44100                      |                           | 45478 + Audio bit<br>rate     |
| AAC-LD   | 48000                      |                           | 49500 + Audio bit<br>rate     |

| AAC-ELD | 16000 |                |                           |
|---------|-------|----------------|---------------------------|
| AAC-ELD | 22050 |                |                           |
| AAC-ELD | 24000 | 64000 – 97999  | 24750 + Audio bit<br>rate |
| AAC-ELD | 32000 | 64000 – 135999 | 33000 + Audio bit<br>rate |
| AAC-ELD | 44100 | 76000 – 256000 | 45478 + Audio bit<br>rate |
| AAC-ELD | 48000 | 98000 – 256000 | 49500 + Audio bit<br>rate |

| AAC-ELD + SBR | 16000 |               |                           |
|---------------|-------|---------------|---------------------------|
| AAC-ELD + SBR | 22050 |               |                           |
| AAC-ELD + SBR | 24000 |               |                           |
| AAC-ELD + SBR | 32000 |               |                           |
| AAC-ELD + SBR | 44100 | 48000 – 96000 | 45478 + Audio bit<br>rate |
| AAC-ELD + SBR | 48000 | 48000 – 96000 | 49500 + Audio bit<br>rate |



## **14 APPENDIX H: AVAILABLE FEC**

FEC (Forward Error Correction) is a mechanism which consists in sending redundant information (redundant frames) to the decoder so that it can compensate packet transmission errors on unreliable networks.

An FEC can be selected when defining the parameters of the stream to be generated (Send page) and/or to be received (Receive page).

## FEC requiring no additional stream

Redundant frames are sent in the same stream as the IP audio stream.

The FEC to be selected is "+50% bandwidth, recovery 2, 1 stream (audio)".

Its characteristics are: +50% bandwidth, additional delay of 2 frames, recovers 1 lost packet at 100%, recovers 2 consecutive lost packets at 75%.

## FEC requiring an additional stream

#### Standard FECs

Redundant frames are sent as a second stream of data. The used UDP port is: port of the IP audio stream + 2. Selectable FECs are:

- +100% bandwidth, recovery 3, 2 streams (audio + FEC)
   +100% bandwidth, additional delay of 1 frame, recovers 2 consecutive lost packet at 100%, recovers 3 consecutive lost packet at 75%
- +100% bandwidth, recovery 4, 2 streams (audio + FEC)
   +100% bandwidth, additional delay of 3 frames, recovers 3 lost packet at 100%, recovers 4 consecutive lost packet at 80%
- +50% bandwidth, recovery 1/2, 2 streams (audio + FEC)
   +50% bandwidth, additional delay of 1 frame, recovers 1 lost packet over 2 consecutive packets.
- +33% bandwidth, recovery 1/3, 2 streams (audio + FEC)
   +33% bandwidth, additional delay of 2 frames, recovers 1 lost packet over 3 consecutive packets.
- +25% bandwidth, recovery 1/4, 2 streams (audio + FEC)
   +25% bandwidth, additional delay of 3 frames, recovers 1 lost packet over 4 consecutive packets.
- +20% bandwidth, recovery 1/5, 2 streams (audio + FEC)
   +20% bandwidth, additional delay of 4 frames, recovers 1 lost packet over 5 consecutive packets.
- +10% bandwidth, recovery 1/10, 2 streams (audio + FEC) From firmware 2.31
   +10% bandwidth, additional delay of 9 frames, recovers 1 lost packet over 10 consecutive packets.

## Redundant dual streaming

Redundant dual streaming is activated by selecting an appropriate "Dual stream" FEC. A dual stream FEC consists in considering the redundant stream as an FEC.

In addition, the duplicated stream can be delayed to offer time diversity, thus avoiding that a network disturbance affects the same frames on the primary stream and on the FEC stream. Selectable delay is from 0 to 3000 ms, by steps of 100 ms.

Notes:



- When in-band audio format signaling is enabled, FEC stream is sent to the same IP address as the primary stream, and on UDP port + 2.
- When in-band audio format signaling is disabled, it is possible to define the destination address and port of the FEC stream.



## **15 APPENDIX I: REDUNDANT DUAL STREAMING**

## **Spatial diversity**

IQOYA X/LINK can be configured to send the same AoIP stream on two distinct networks, typically through Eth0 and Eth1 interfaces. On the decoding side, IQOYA automatically synchronizes both received streams. Using separate network paths ensures that potential network failures are statistically uncorrelated, enabling the reconstruction of a unique unperturbed stream.

Terminology used for the two redundant streams is: primary stream, and FEC "dual" stream for the duplicate stream.



## **Time diversity**

IQOYA doesn't only propose passive duplication as on most codecs. It also allows delaying the duplicate stream compared to the primary stream. Although the primary stream and the FEC stream are configured to use different networks, it is quite common that some network components are common to both networks (last mile router for instance). The selected delay avoids that temporary failures occurring on common network components impact both a primary frame and its duplicate frame.



Multicast and unicast can be used for redundant dual streaming, and different UDP ports can also be used for the primary stream and the FEC stream.

A typical redundant dual streaming configuration is as follows:

- Enter the destination IP address and UDP port of the primary stream. The IP address can be the public IP address of the Eth interface of the IQOYA that decodes the stream, or a multicast address. Select the IP interface used to send the stream in case of multicast.
- Select a "Dual stream" FEC, with or without time delay. Enter if necessary the destination IP address and UDP port of the FEC stream. The IP address can be the public IP address of another Eth interface of the



IQOYA that decodes the stream, or a multicast address. Select the IP interface used to send the FEC stream.

Notes:

- When in-band audio format signaling is enabled, FEC stream is sent to the same IP address as the primary stream, and on UDP port + 2.
- When in-band audio format signaling is disabled, it is possible to define the destination address and port of the FEC stream.