

# Audio over IP - Receivers

## Receivers

The **Receivers (RX)** section under **AoIP** contains the receive streams configured on the flexAI system.

Use **ADD** to create a new receiver. Existing receivers are listed below **Receivers (RX)** and can be selected individually for configuration. Use **DEL** to remove selected receivers.

Some receiver parameters are only visible when **Show Expert Settings** is enabled.

The screenshot shows the 'Receivers (RX)' configuration page in the flexAI system. The left sidebar lists various interfaces: AoIP, NDI, and tieLight / MADI. Under AoIP, the 'Receivers (RX)' section is expanded, showing a list of receivers. The selected receiver is '01: Stream 01 flexAIs...'. The main configuration area is divided into several sections: 'Protocol' (ST 2110), 'Status' (OK), 'RTP Status' (Receiving), 'Provisional Stream Status' (a list of parameters like active, rx\_reset\_underflow, etc.), and 'Settings' (Enable, Stream Name, Channel Count, Seamless Protection Switching, SDP, Codec, Auto Link Offset, Link Offset, Ignore RTP Payload Type, RTP Payload Type). A 'RESET' button is visible at the bottom left of the main area.

## Protocol

| Parameter | Values | Default | Description |
|-----------|--------|---------|-------------|
|-----------|--------|---------|-------------|

|                    |                          |   |                                                                                                                  |
|--------------------|--------------------------|---|------------------------------------------------------------------------------------------------------------------|
| Protocol Selection | Available AoIP protocols | - | Selects the protocol used by the receiver. The available settings may change depending on the selected protocol. |
|--------------------|--------------------------|---|------------------------------------------------------------------------------------------------------------------|

# Status

The **Status** section shows the current operating state of the receiver and its stream legs.

| Parameter                 | Values                 | Default | Description                                                                                     |
|---------------------------|------------------------|---------|-------------------------------------------------------------------------------------------------|
| Session Status            | Status                 | -       | Shows the overall status of the receive session.                                                |
| RTP Status                | Status                 | -       | Shows whether RTP packets are currently being received.                                         |
| Provisional Stream Status | Diagnostic information | -       | Provides detailed receiver statistics and diagnostic information about the incoming RTP stream. |
| Reset Receiver Status     | Button                 | -       | Resets the displayed receiver status and diagnostic counters.                                   |
| RTP Status – Leg 1        | Status                 | -       | Shows the receive status of both stream legs combined.                                          |
| RTP Status – Leg 2        | Status                 | -       | Currently not used                                                                              |

The **Provisional Stream Status** is primarily intended for diagnostics and troubleshooting. For normal operation, the Session and RTP status indicators provide the most relevant overview.

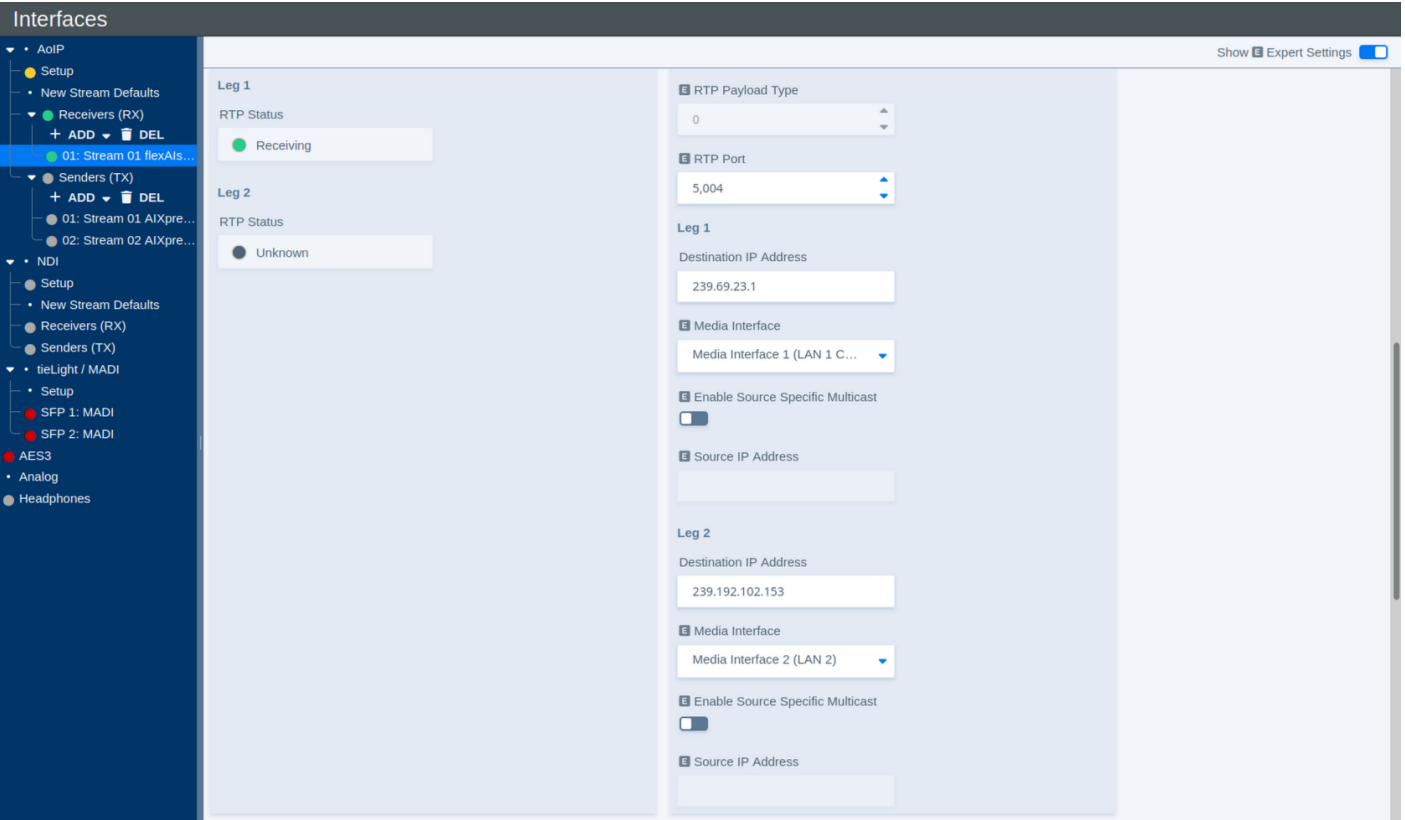
# Settings

| Parameter     | Values                   | Default | Description                                                              |
|---------------|--------------------------|---------|--------------------------------------------------------------------------|
| Enable        | On / Off                 | -       | Enables or disables the receiver.                                        |
| Stream Name   | Text                     | -       | Defines the name used to identify the receiver within the flexAI system. |
| Channel Count | Supported channel counts | -       | Defines the number of audio channels carried by the receive stream.      |

| Parameter                                 | Values           | Default | Description                                                                                                                                                                                                                            |
|-------------------------------------------|------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seamless Protection Switching (ST 2022-7) | On / Off         | -       | Enables SMPTE ST 2022-7 seamless protection switching. When enabled, two redundant stream legs can be received over separate network paths.                                                                                            |
| SDP                                       | SDP data         | -       | Defines the Session Description Protocol information for the incoming stream. The original SDP provided by the sender can be pasted directly into this field. Alternatively, SDP information can be obtained from a discovered stream. |
| Codec                                     | Available codecs | -       | Defines the expected audio codec or sample format of the incoming stream.                                                                                                                                                              |
| Auto Link Offset                          | On / Off         | -       | Automatically applies the Link Offset configured for the corresponding stream type and packet time on the AoIP Setup page.                                                                                                             |
| Link Offset                               | Delay in samples | -       | Defines the fixed receive/playout delay when <b>Auto Link Offset</b> is disabled. The delay remains constant for the stream, providing deterministic latency.                                                                          |
| Ignore RTP Payload Type                   | On / Off         | -       | Defines whether the configured RTP Payload Type is ignored when receiving the stream.                                                                                                                                                  |
| RTP Payload Type                          | RTP payload type | -       | Defines the expected RTP payload type when payload-type checking is used.                                                                                                                                                              |
| RTP Port                                  | Port number      | -       | Defines the UDP port on which the RTP stream is received.                                                                                                                                                                              |

Pasting the sender's original SDP is often the simplest way to configure a receiver manually, as it transfers the relevant stream parameters in a single step.

# Stream Legs



Each receiver can use up to two stream legs. **Leg 1** carries the primary stream. **Leg 2** is used for redundant reception when **ST 2022-7** is enabled.

The following parameters are available for each leg:

| Parameter                        | Values                     | Default | Description                                                                         |
|----------------------------------|----------------------------|---------|-------------------------------------------------------------------------------------|
| Destination IP Address           | Multicast IP address       | -       | Defines the multicast destination address from which the receiver joins the stream. |
| Media Interface                  | Available Media Interfaces | -       | Selects the Media Interface used to receive this stream leg.                        |
| Enable Source Specific Multicast | On / Off                   | -       | Enables Source-Specific Multicast (SSM) for this stream leg.                        |
| Source IP Address                | IP address                 | -       | Defines the expected source address when Source-Specific Multicast is enabled.      |

Each receiver can be assigned individually to one of the available **Media Interfaces**. This allows different receivers, and, with ST 2022-7, individual stream legs, to use separate physical AoIP networks.

In combination with the internal audio routing, flexAI can also transfer audio between otherwise independent AoIP networks: audio received through one Media Interface can be routed internally and transmitted again through a sender assigned to another Media Interface. This operates at the audio level rather than as a network bridge.

With **Source-Specific Multicast (SSM)** enabled, the receiver joins the multicast stream from the specified source address rather than accepting traffic for the multicast group from any source.

## Stream Discovery

The **Discovery** section can be used to find available AoIP streams on the network and apply their parameters to the selected receiver.

## Interfaces

- AoIP
  - Setup
  - New Stream Defaults
  - Receivers (RX)
    - + ADD ▾ DEL
  - 01: Stream 01 flexAIs...
  - Senders (TX)
    - + ADD ▾ DEL
    - 01: Stream 01 AIXpre...
    - 02: Stream 02 AIXpre...
- NDI
  - Setup
  - New Stream Defaults
  - Receivers (RX)
  - Senders (TX)
- tieLight / MADI
  - Setup
  - SFP 1: MADI
  - SFP 2: MADI
- AES3
  - Analog
  - Headphones

Source IP Address

Discovery

AES67 / ST 2110

LIVEWIRE
SAP
NMOS
Filter by name

| NAME                         | ADDRESS       |
|------------------------------|---------------|
| Stream 02 flexAlserver-00023 | 239.69.23.2   |
| Stream 02 flexAlserver-00023 | 239.69.23.2   |
| Stream 02 flexAlserver-00023 | 239.69.23.2   |
| Stream 02 flexAlserver-00023 | 239.69.23.2   |
| Stream 02 flexAlserver-00023 | 239.69.23.2   |
| Stream 02 flexAlserver-00023 | 239.69.23.2   |
| Stream 03 AIXpressor-00094   | 239.69.94.3   |
| Stream 04 AIXpressor-00094   | 239.69.94.1   |
| Stream 05 AIXpressor-00094   | 239.69.94.4   |
| Xnode_Mic                    | 239.192.0.205 |
| servxnode_a                  | 239.192.0.201 |
| servxnode_b                  | 239.192.0.202 |

Name

Stream 02 flexAlserver-00023

Channel Count

33

Address

239.69.23.2

Port

5004

Codec

AM824

Packet Time

125

Rate

48000

Timestamp Reference Clock

ptp=IEEE1588-2008:traceable

Media Clock

direct=0

APPLY

Available discovery methods include:

- **Livewire**
- **SAP** for AES67 / ST 2110
- **NMOS**

Use the protocol buttons to select the desired discovery method. The **Filter by name** field can be used to narrow the list of discovered streams.

Select a stream to display the information advertised by the sender. Depending on the protocol, this may include information such as:

- Name
- Channel Count
- Destination Address

- RTP Port
- Codec
- Packet Time
- Sample Rate
- Timestamp Reference Clock
- Media Clock

Click **Apply** to connect the selected stream with the current receiver.

This provides a convenient alternative to entering the receiver parameters manually and helps ensure that the receiver settings match those advertised by the sender.

## Livewire Receiver Settings

When **Livewire** is selected under **Protocol Selection**, some receiver parameters differ from those used for ST 2110.

Interfaces

- AoIP
  - Setup
  - New Stream Defaults
  - Receivers (RX)
    - + ADD ▾ DEL
    - 01: Stream 01 flexAls...
  - Senders (TX)
    - + ADD ▾ DEL
    - 01: Stream 01 AIXpre...
    - 02: Stream 02 AIXpre...
- NDI
  - Setup
  - New Stream Defaults
  - Receivers (RX)
  - Senders (TX)
- tieLight / MADI
  - Setup
  - SFP 1: MADI
  - SFP 2: MADI
- AES3
  - Analog
  - Headphones

active : 1

rx\_reset\_underflow : 0

rx\_reset\_overflow : 1

rx\_count : 15002

rx\_srst : 1

rx\_seqe : 0

rx\_drop : 0

rx\_dupl : 0

rx\_good : 15001

rx\_defects : 0

rx\_malformed : 0

rx\_ssrc\_id\_changes : 0

buffer\_margin\_current : 72

buffer\_margin\_min : 0

buffer\_margin\_max : 96

rtp\_ts\_pos\_current : -72

rtp\_ts\_pos\_min : -72

rtp\_ts\_pos\_max : 0

rtp\_ts\_pos\_ema : -51.21

rtp\_ts\_pos\_variance : 744.228

rx\_48kFrames : 32557776

request\_nsec : 1788514748673000000

Reset Receiver Status

RESET

Leg 1

RTP Status

Receiving

Leg 2

RTP Status

Unknown

Seamless Protection Switching (ST 2022-7)

Auto Delay

Delay

96 samples

Livewire Type

From Source

Leg 1

Destination IP Address

239.69.23.1

Livewire Channel

0

Media Interface

Media Interface 1 (LAN 1 C...

Leg 2

Destination IP Address

239.192.102.153

Livewire Channel

26,265

Media Interface

Media Interface 2 (LAN 2)

| Parameter  | Values           | Default | Description                                                                                                                                         |
|------------|------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Auto Delay | On / Off         | -       | Automatically applies the receive delay configured for the corresponding Livewire stream type on the AoIP Setup page.                               |
| Delay      | Delay in samples | -       | Defines the fixed receive/playout delay when <b>Auto Delay</b> is disabled. The configured delay remains constant, providing deterministic latency. |

| Parameter                      | Values                     | Default | Description                                                                                                                                       |
|--------------------------------|----------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Livewire Type                  | Available Livewire types   | -       | Defines how the Livewire stream is addressed. <b>To Source</b> uses the Livewire channel information associated with the source stream.           |
| Destination IP Address – Leg 1 | Multicast IP address       | -       | Shows or defines the multicast destination address used for the first Livewire stream leg.                                                        |
| Livewire Channel – Leg 1       | Livewire channel number    | -       | Defines the Livewire Channel used for the first stream leg. The Livewire Channel identifies the corresponding stream within the Livewire network. |
| Media Interface – Leg 1        | Available Media Interfaces | -       | Selects the Media Interface used to receive the first stream leg.                                                                                 |
| Destination IP Address – Leg 2 | Multicast IP address       | -       | Shows or defines the multicast destination address used for the redundant second stream leg.                                                      |
| Livewire Channel – Leg 2       | Livewire channel number    | -       | Defines the Livewire Channel used for the redundant second stream leg.                                                                            |
| Media Interface – Leg 2        | Available Media Interfaces | -       | Selects the Media Interface used to receive the redundant second stream leg when ST 2022-7 is enabled.                                            |

As with other receiver types, **Leg 2** is used for redundant reception when **Seamless Protection Switching (ST 2022-7)** is enabled.

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