ASI2816

AM/FM/HD/WB 4-16 Channel Streaming Tuner

1 DESCRIPTION

The ASI2816 is a multi-channel streaming radio tuner packaged in a 1U form factor. It can be configured with up to four modules. Each module contains four radio tuners for a total of up to 16 tuners per ASI2816. The ASI1471 module contains four AM/FM/WeatherBand (WB) tuners. The ASI1472 module contains four AM/AM-HD/FM/FM-HD tuners.

Up to sixteen ICY encoded audio streams can be sent from the ASI2816. The format of the streams is mono 44.1kHz AAC-LC.

The ASI2816 contains an OLED front panel display showing current configuration and status of all tuners including band, frequency, signal strength and HD status.

Each tuner module also includes balanced stereo audio outputs on a StudioHub compatible RJ-45 connector with a software adjustable level of 0 to +24dBu

2 MODULES

ASI2816	Base streaming tuner unit
ASI1471	4 tuner AM/FM/WB module
ASI1472	4 tuner AM/FM/AMHD/FMHD module

3 FEATURES

- Up to 16 channels of AM/FM HD Radio audio capture
- Up to 16 channels of analog AM/FM audio capture
- Up to 16 channels of Weather Band capture
- Antenna connector on each module or chainable across multiple modules
- Audio monitoring of all tuners simultaneously using RJ-45 StudioHub analog outputs
- Gb Ethernet interface
- 100 to 240VAC universal power supply with IEC-320 receptacle
- Internet streaming: One ICY encoded, mono, 48kbps, AAC-LC stream @ 44.1kHz per tuner
- HTML based web UI for configuring tuners and streaming parameters
- Front panel display shows tuner status and audio metering

4 SPECIFICATIONS

ASI1471 AM/FM/WB TUNER MODULE	
Connector	Dual F type 75 ohms, on module bracket
AM	
Frequency range	520kHz-1720kHz, 1kHz channel spacing
Sensitivity	30dBuV for -30dB THD+N
Input Level	90 dBuV Maximum
THD+N	-50dB @ 60dBuV RF Level, 1kHz sinewave, 75% modulation, A-weighting, 2kHz bandwidth
De-emphasis	None or 50us (software selectable)
Audio bandwidth	100Hz - 2kHz (+/-3dB)
FM	
Modes	Mono or Stereo
Frequency range	64MHz - 108MHz, 50kHz channel spacing
Sensitivity	15dBuV for -30dB THD+N
Input Level	90 dBuV Maximum
THD+N	-55dB @ 60dBuV RF Level, 1kHz sinewave, mono, 75kHz deviation, A-weighting
De-emphasis	50us or 75us (software selectable)
Audio bandwidth	30Hz-15kHz (+/-3dB)
WB	
Frequency range	162.400 – 162.550MHz, 25kHz channel spacing
Sensitivity	0dBuV for 12dB S/N
THD+N	-40dB @ 60dBuV RF Level, 1kHz sinewave
Audio bandwidth	300Hz - 2kHz (+/-3dB)
ASI1472 AM/AM-HD/FM/FM-HD TUNER MODULE	
Connector	Dual F type 75 ohms, on module bracket
AM	
Frequency range	520kHz-1720kHz, 1kHz channel spacing
Sensitivity	30dBuV for -30dB THD+N
Input Level	90 dBuV Maximum
THD+N	-50dB @ 60dBuV RF Level, 1kHz sinewave, 75% modulation, A-weighting, 2kHz bandwidth
De-emphasis	None or 50us (software selectable)
Audio bandwidth	100Hz - 2kHz (+/-3dB)
AM-HD	
Modes	Auto or Analog only
Frequency Range	520kHz-1720kHz, 1kHz channel spacing
Sensitivity	TBD
Input Level	90 dBuV Maximum
FM	
Modes	Auto or Mono
Frequency range	76MHz - 108MHz, 50kHz channel spacing
Sensitivity	15dBuV for -30dB THD+N
Input Level	90 dBuV Maximum
THD+N	-55dB @ 60dBuV RF Level, 1kHz sinewave, mono, 75kHz deviation, A-weighting
De-emphasis	50us or 75us (software selectable)
Audio bandwidth	30Hz-15kHz (+/-3dB)
FM-HD	
Modes	Auto or Analog only
Frequency Range	76MHz – 108MHz
Sensitivity	TBD
Input Level	90 dBuV Maximum

LINE OUTPUT	
Connector	RJ-45 using StudioHub standard
Audio Level	0 – 24dBu in 3dB steps (software selectable)
STREAMING	
Audio Formats	One ICY encoded, mono[1], 48kbps, MPEG AAC-LC[2] stream @ 44.1kHz per tuner [1] FM Stereo signals are downmixed to mono [2] MPEG Layer-3 audio coding technology licensed from Fraunhofer IIS and THOMSON multimedia
GENERAL	
Dimensions	1 RU, 19”(482mm) W x 8”(203mm) L x 1.75”(44mm)
Weight	7 lb (3.2kg) max
Operating Temperature	0C to 60C
Power Requirements	100-240VAC, 47-63Hz, 25W max.

5 REVISIONS

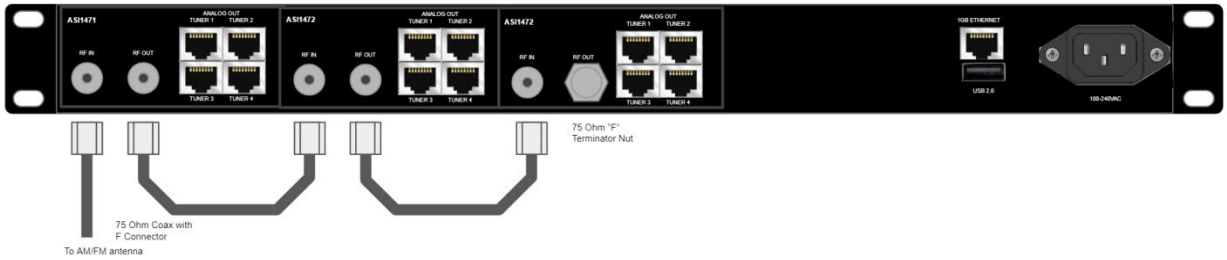
Date	Description
Sept 2021	Preliminary
Jan 2022	Added web interface section/front and rear panel sections
Jan 25 2022	Added “Analog Only” info for HD tuners
Aug 16 2022	Updated to include meters and silence detection
Aug 30 2022	Added Specifications page

6 CONTENTS

7 INSTALLATION

7.1 Before Power Up

1. Install the RG-6 jumper cables so that each tuner module has an RF signal feed. I.e



2. Connect the unit to your Ethernet network using the RJ45 connector.
3. Connect power.

7.2 Power Up

The unit may be powered up by plugging AC power into the back of it. The POWER LED on the front panel will initially light up as Orange and then change to Green as the unit boots.

If in standby mode (POWER LED is Orange) the unit may also be powered up by pressing the recessed power button using a paper-clip.

7.3 Power Down

Once powered up, the unit may be powered down by pressing the recessed power button using a paper-clip. The POWER LED will change from Green to Orange indicating the unit is in Standby mode.

7.4 Using the web interface

By default, the ASI2816 will obtain an IP address using DHCP. You can also assign a static IP address if needed (see Web Interface ->IPv4 section below). You can find its IP address looking on the front panel display or by using an IP scanner (such as Angry IP Scanner) to look for devices on the network with port 80 open. The POCs will show up as so:

IP	Hostname	Ports
192.168.4.204	ASI2801-A0-120374.local	22

8 OPERATION

8.1 Front Panel Display

Hardware revision / Serial #

Model number
Firmware version

Temperature
IP address
(Static or DHCP)

Module 1 model Station tuning	Module 2 model Station tuning	Module 3 and 4 empty

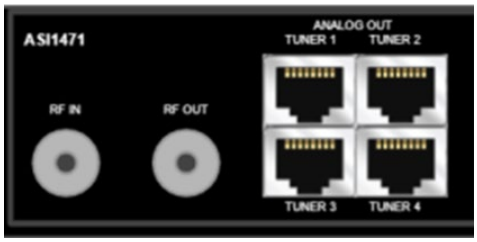
9 REAR PANEL

The rear panel will show each of the installed modules starting with module 1 on the left. Each module will have a similar layout. The right side of the rear panel contains the network Ethernet connection and power.

9.1 Modules

Module model #

RF connectors



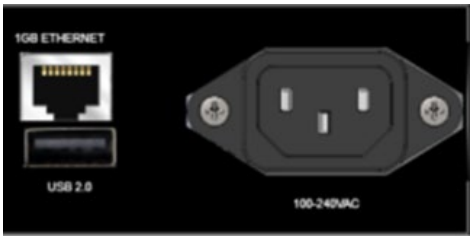
Analog outputs

StudioHub RJ-45
compatible
(local monitoring)

9.2 Power and Ethernet

1GB Ethernet

USB 2.0
(future use)



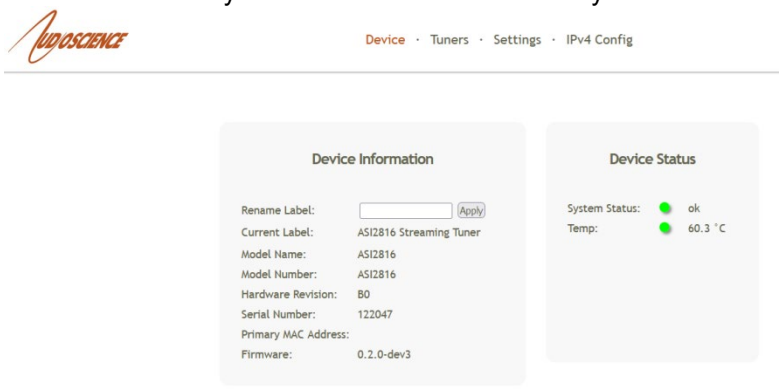
Power connector

10 WEB INTERFACE

To access the unit's web interface, enter its IP address in your web browser of choice (Chrome, Firefox, Edge, etc.) and you should see the page below.

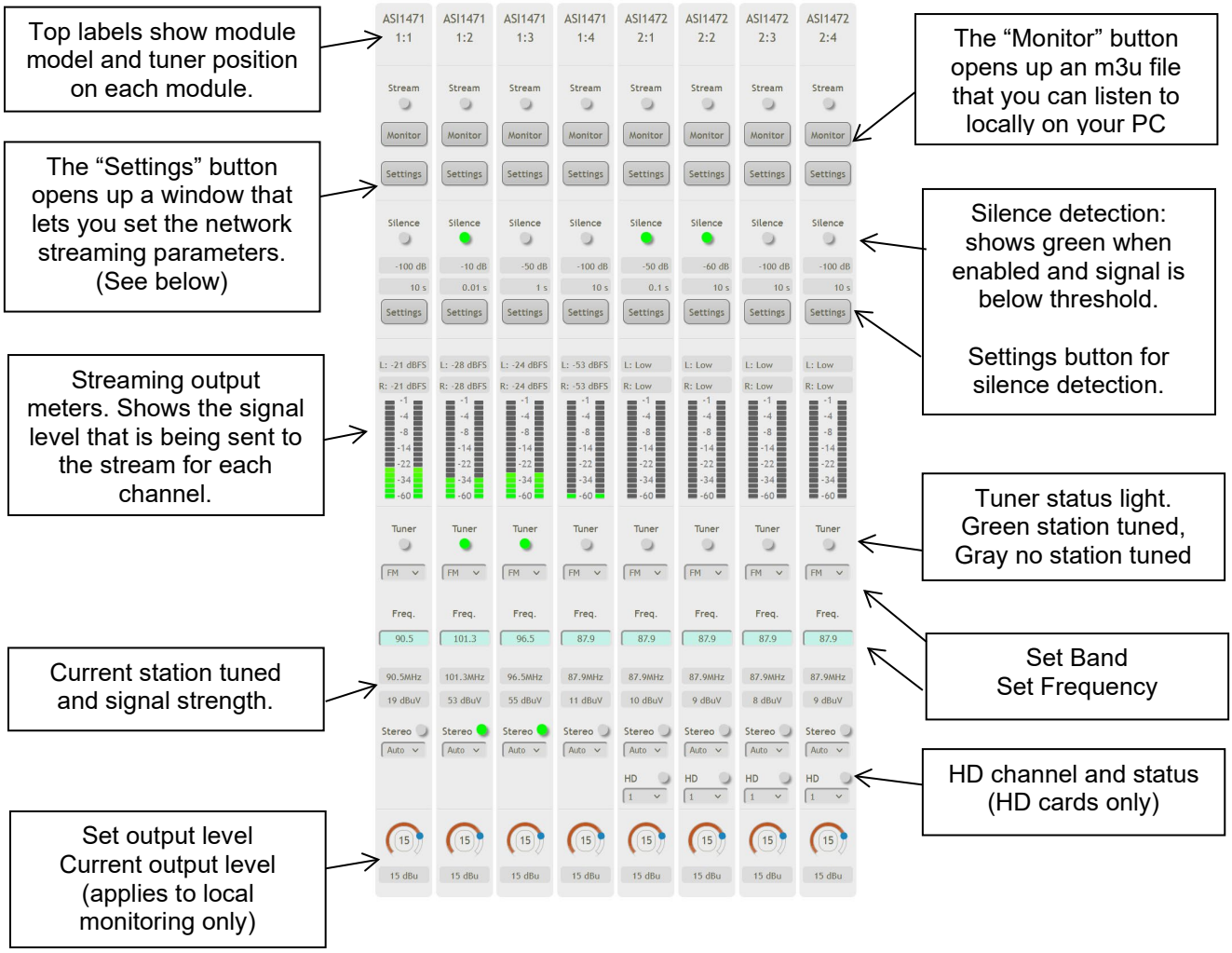
10.1 Device tab

The Device tab displays information about your hardware and also allows you to customize its name.



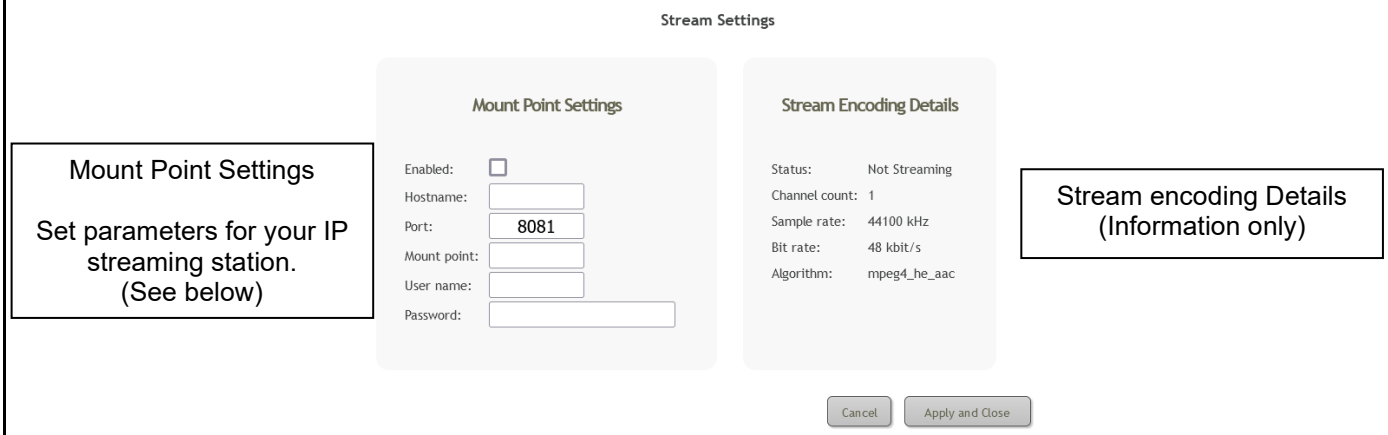
10.2 Tuners tab

The Tuners tab is where you set the band, station, levels and streaming options for each tuner.



10.2.1 Streaming settings

Clicking the “Settings” button allows you to enter the parameters you will use to be able to stream your tuners to external devices over the network/IP port.



Mount Point Settings

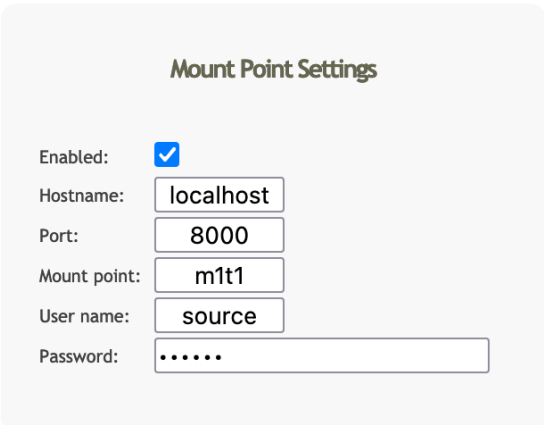
Set parameters for your IP streaming station. (See below)

Stream encoding Details (Information only)

To enable IP streaming over the network:

1. Click “Enabled” a check mark appears.
2. Enter the “Hostname” for your website.
3. Enter the network port you want to use (8081 is default)
4. Enter a unique name for your station
5. Enter a User name and Password (if needed)
6. Click “Apply and Close”

You can also use this page to set a local only stream if you just need to monitor multiple streams using audio software on your system (and don’t need to send it to a remote location). Use these settings to set up a local only stream using icecast:



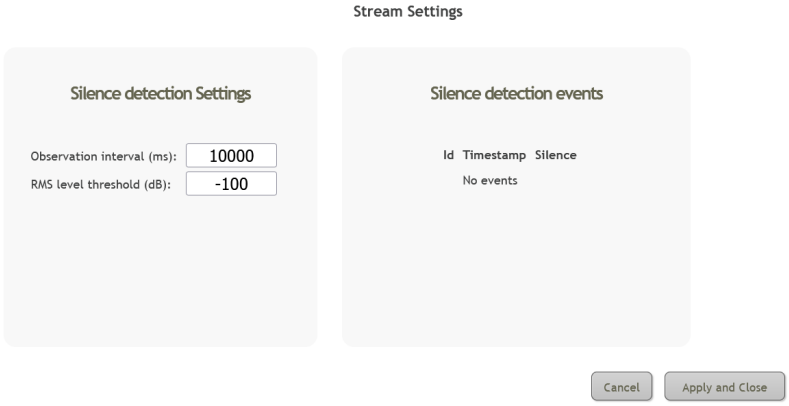
Set Hostname to “localhost”
Set unique name for each
Default pw is “hackme”

You can then use the following URL in your software http://unit IP address:8000/m1t1.m3u

10.2.2 Silence detection settings

Silence detection can be used to show an alert when a tuner is offline or no sound is being detected. Click the "Settings" button in the Silence section to customize this for each channel.

1. Observation interval (ms). This is the "how often do you want to check for silence?" setting. Higher numbers mean we check less often, lower numbers we check more often.
2. RMS level threshold (dB). This is the level that will trigger a positive "Silence". In other words, the level has to dip below this number to trigger a silence alert. In this case lower numbers (since they are negative) will mean less sensitive detection. You can estimate the best numbers to use by watching the meters and the dBFS numbers on the main tuner screen. Observe what a normal signal looks like and then set your RMS level threshold below that to trigger an alert when the signal drops.



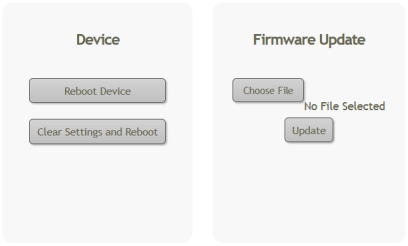
10.2.3 Analog only option

You can set tuners on HD modules to use ONLY analog signals if you need. In the HD Prog section, click the down arrow to open up the drop box. From here you can set the HD program you want to tune or set it to Analog Only to prevent it from detecting any HD signals on this particular tuner. The status circle will turn black when set to Analog Only.

10.3 Settings tab

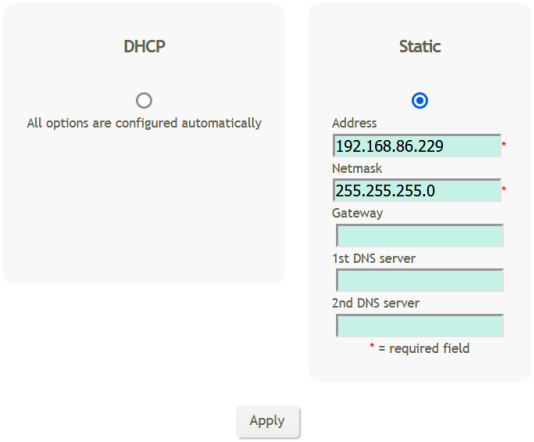
From the Settings tab you can reboot the unit or clear the settings and reboot. Clear settings will reset all tuners to factory defaults and remove any streaming settings.

You can also update the unit's firmware on this tab.



10.4 IPv4 Config tab

The IPv4 Config tab is where you set you IP address, you can either use DHCP if your network provides that service or enter a Static IP address, Netmask and Gateway DNS if needed.



11 RECOVERY MODE

Recovery Mode is used to get the unit back to a known version of its OS and to default settings. These are:

- OS Ver - TBD
- IP Address - DHCP
- Tuner settings: FM - 87.9MHz

1. To enter Recovery Mode do the following:
2. Unplug power cord
3. Press the SELECT button on the front panel and keep it pressed throughout the following steps.
4. Plug in the power cord
5. Wait until the display shows the recovery has started. This should be less than a minute.
6. Release the SELECT button.
7. The unit will load the Recovery OS, clear its tuner settings and reset it's IP back to DHCP

<end>