Axis Series – RX User Guide

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Contents

0. Systems Description

The subject equipment of this User Guide is:

Equipment Title	Part Number
AXRX1- Axis Series Diversity Receiver	(AXRX2 2-Way, AXRX4 4-Way, AXRX6 6-Way, AXRX8 8-Way)

Figure 0-1 – AXRX1 Broadcast Receiver

0.1   What is the AXRX1 Broadcast Receiver?

The AXRX1 is a feature rich multi-way diversity COFDM receiver designed to work with the next generation of H.264 wireless camera systems.

Designed specifically for the demanding broadcast market, it is supplied in a 1/2 19″ 2U high rack receiver chassis, where two units can be mounted together to occupy a 19″ slot and uses standard broadcast connectors for signal interfaces.

It is available with 2-way, 4-way, 6-way and 8-way maximum ratio combining RF inputs; ensuring video is recovered free from the distortions typically associated with fading and multipath. All DVB-T 6/7/8MHz modes are supported. Designed to work with external down-converters, the receiver can be located up to 100m from the antennas using standard Belden 1694A 75? co-axial cables.

The AXRX1 incorporates an extremely flexible decoding platform, with low-delay H.264 decoding capability plus an SD MPEG2 decoder for compatibility with existing RF systems. Multiple video output formats are offered with composite and SDI outputs in SD mode and HD-SDI and in HD mode. SDI/HD-SDI both feature embedded audio and a HDMI output is provided for use with HDMI equipped monitors.

The AXRX1 can be genlocked with either SD or HD sync signals. When in HD mode, a downconverted SD composite video monitoring output is also offered. When enabled, the downconverted SD is also available on the SDI2 output.

The AXRX1 can be controlled through its OLED front panel display, as well as on its RS232 or IP Ethernet browser control interfaces.

For customers wanting to distribute received video to remote locations, the AXRX1 is supplied with ASI and optional IP streaming outputs.

A comprehensive On-Screen Graphical display is available for monitoring and diagnostics, which can be enabled or disabled separately on the composite and SDI outputs.

0.2   What are the Features and Benefits of AXRX1?

It can be very useful to understand how the features of the unit yield tangible benefits to you. This table summarizes these features and, more importantly, the benefits.

0.2.1   Features and Benefits Table

Key Features	Key Benefits
Digital COFDM Modulation	Excellent performance - Resistant to multipath interference, delivers high quality video and audio, even in non-line of sight operation.
Receivers with 2, 4, 6 or 8-way COFDM maximum ratio combining antenna diversity.	Excellent performance and reliability - Enables fade and multipath elimination delivering reliable reception.
Compliant DVB-T Modulator and comprehensive demodulation at 6, 7, and 8MHz.	True multi-mode operation - Simple integration with your current equipment.
H.264 SD & HD decoding.	Highly flexible – Configure the unit to suit your operational needs.
Low Delay, high quality H.264 SD/HD and fully MPEG-2 compliant SD decoding	Robust transmission and minimal latency, switches easily with wired cameras.
HD-SDI/SDI with embedded audio out	Simple connection to your current equipment.
HDMI Output	For interfacing with "prosumer" equipment.

Key Features	Key Benefits
ASI input and output	Low cost of ownership - Easy connection to your current devices.
IP control and optional IP streaming video	Easy to use - Operations staff can make quick changes to reconfigure the receiver. More flexibility – IP streaming enables ingress to internet based broadcast systems.
Genlock input	Easy synchronization eliminates the need for external "frame shaker" or frame sync.
Comprehensive On-Screen display (OSD)	Software Driven - Simple and fast to deploy and operate – saves you time and cost with diagnostics for link analysis, including spectrum analyzer.
External Downconverters provide remote antenna mounting capability.	Improved operational efficiency - Efficient use of limited radio spectrum. Enables convenient remote antenna placement away from the receiver and closer to where the transmitter is operating.

Table 0-1 – Features and Benefits of AXRX1

0.3 Getting an Overview of the AXRX1

Diagram: AXRX1 Main System
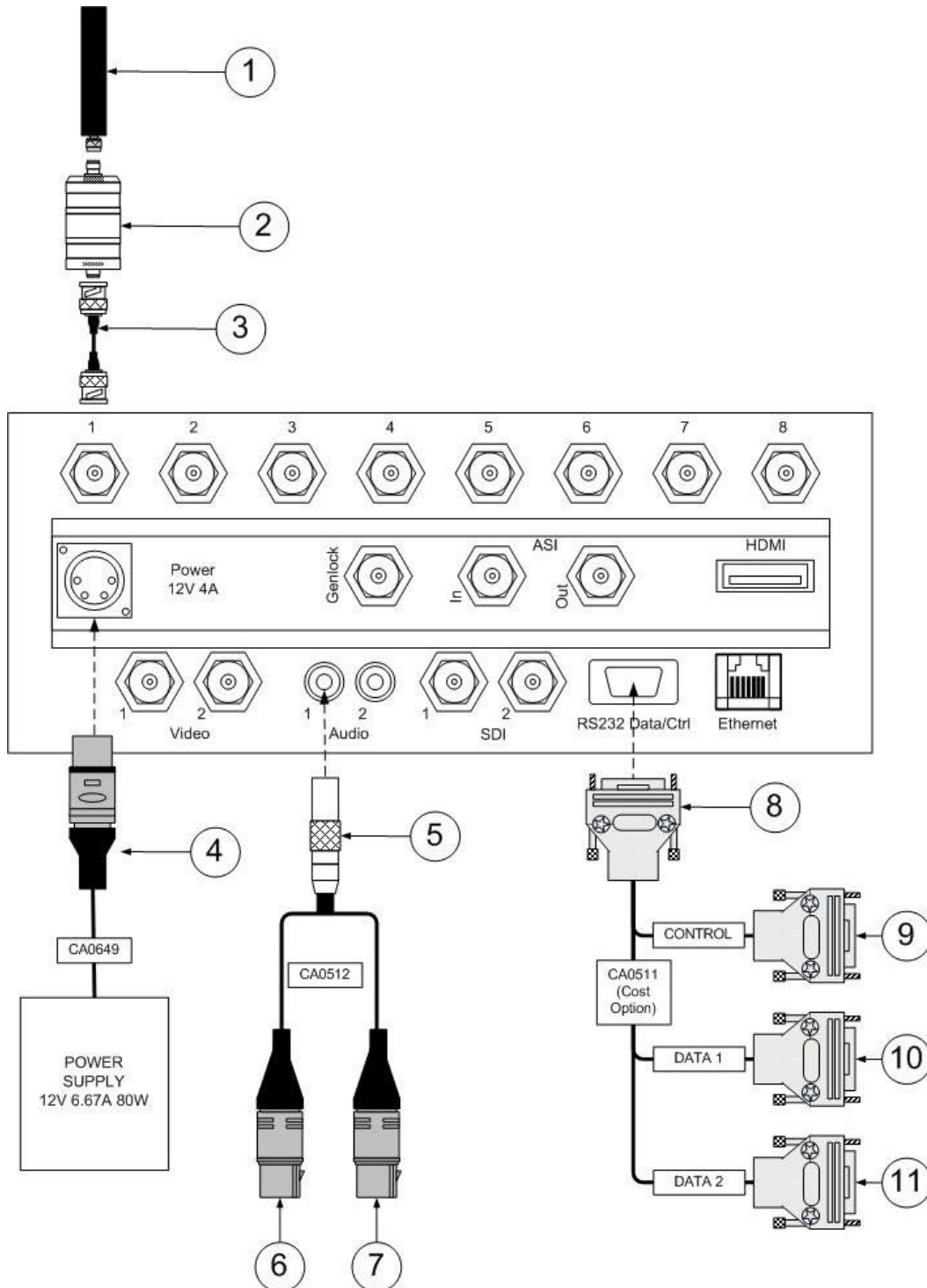
Figure 0-2 Main System Diagram

No	Item	Function
1	Antenna.	Matched to band of the downconverter. Do not over tighten – hand tight only.
2	Downconverter.	Enables the AXRX1 to be used in various RF bands.
3	IF cable, TNC 2-way plug, (pins) to BNC 2-way plug, (pins).	Downconverter to AXRX1 connection. IF – Intermediate Frequency.
4	XLR 4-way plug (sockets).	Power connection to the AXRX1 from the CA649 power supply unit.
5	LEMO OB 5-way plug (pins) twin key.	For Audio output. CA512 AXRX1 External XLR Audio Cable Assembly 2 Metres.
6	XLR 3-way plug (pins)	For left audio output.
7	XLR 3-way plug (pins)	For right audio output.

Table 0-2 – Main System Diagram Key

1. Getting Started

1.1   Identifying your Device

The <u>6-way</u> version of the AXRX1 will be described in this User Guide.

This is an **AXRX1 Receiver.**

Its type designation is: **AXRX1-**

Size: 358mm (L) x 220mm (W) x 87.5 (H).

Weight: 2.8kg.

Operating Temperature: -20 deg C to +60 deg C.

DC Input 9 to 16VDC Reverse Polarity Protected

Power Consumption:

27W (Two Way Diversity Inc. D/C)
35W (Four Way Diversity Inc. D/C)
43W (Six Way Diversity Inc. D/C)
51W (Eight Way Diversity Inc. D/C)

Figure 1-1 – AXRX1 Receiver

1.2   Unpacking your AXRX1

Carefully open the packaging and remove the device. Verify that all the components have been included in the package as shown in the packing list. Inspect the unit for shipping damage.

Retain the packing list and all the packing materials for storage.

The codes on the picture mean:

- CA – Cable Assembly
- SA – Sub Assembly
- AP – Assembly Part.

The codes are useful to you if you need to order a new cable at some point.

Diagram: Unpacking your AXRX1
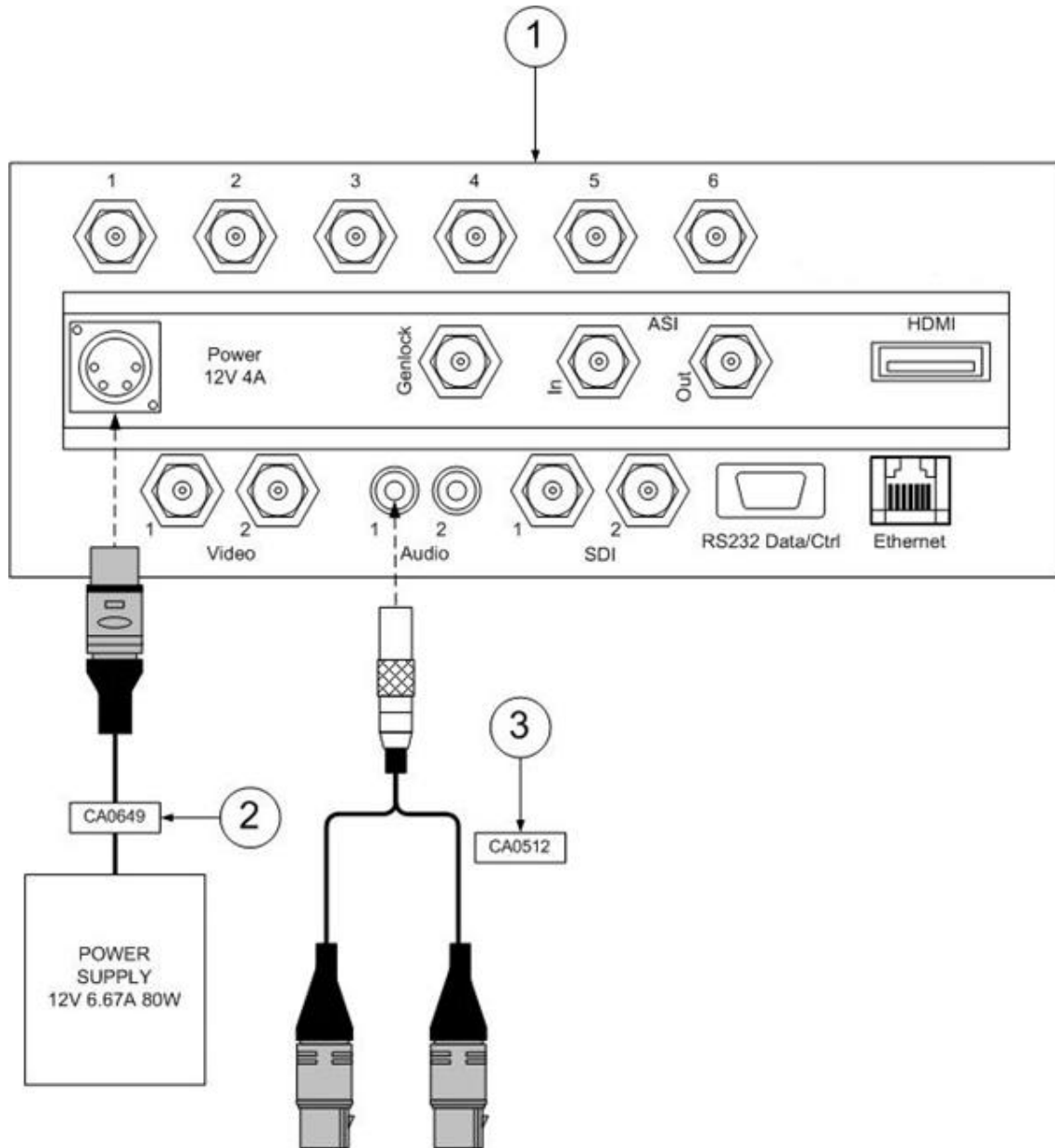
Figure 1-2 – AXRX1 Packing Diagram

No	Item	Notes
1	Main Unit.	AXRX2 for example, 2-way diversity, DVBT demodulation, includes MPEG2 and H.264 SD decoder, Composite and SDI out, Genlock, Web-browser interface, with BNC connectors, excludes antennas and down converters.
2	AXRX1 External 12V 6.67A 80W Desktop Power Supply Unit.	CA0649 Power Cable Assembly (3 metres) PSU Block to XLR 4-way plug (sockets) 12VDC.
3	AXRX1 External XLR Audio Cable Assembly.	CA0512 LEMO OB 5-way plug (pins) to XLR 3-way plug, sockets (left audio) XLR 3-way plug, sockets (right audio).

Table 1-1 – Parts in the AXRX1 Package

1.3   Planning the Hardware Installation

During the design and layout of the system, you should give careful consideration of the location of this and all other associated equipment. Some of the items to consider include:

- Space - Leave at least 100mm clearance left and right to allow for cable bending.
- Proximity to other devices (proper spacing to allow good ventilation).
- Length of cable runs.
- Environmental conditions (temperature, humidity, etc.)
- Access for service repair.

1.4   Identifying the Variants of AXRX1

Step 1: Identify the Variants

Equipment Title	Part Number
8-way diversity, DVBT demodulation, includes MPEG2 and H.264 SD decoder, Composite and SDI out, Genlock, Web-browser interface, with BNC connectors, excludes antennas and down converters.	PRORXB-8 and PRORXB-8NA
Equipment Title	**Part Number**
2-way diversity, DVBT demodulation, includes MPEG2 and H.264 SD decoder, Composite and SDI out, Genlock, Web-browser interface, with BNC connectors, excludes antennas and down converters.	AXRX2 (2-Way Input)
4-way diversity, DVBT demodulation, includes MPEG2 and H.264 SD decoder, Composite and SDI out, Genlock, Web-browser interface, with BNC connectors, excludes antennas and down converters.	AXRX4 (4-Way Input)
6-way diversity, DVBT demodulation, includes MPEG2 and H.264 SD decoder, Composite and SDI out, Genlock, Web-browser interface, with BNC connectors, excludes antennas and down converters.	AXRX6 (6-Way Input)

1.5   Identifying the Options on AXRX1

The AXRX1 has **two** types of options:

- ■ Accessory Options
- ■ Licensing Options

Step 1: Identify the Accessory Options

Equipment Title	Part Number
Professional Receiver Broadcast 42HP Single Rack Front Panel.	AXRX1SRFP

Equipment Title	Part Number
Upgrade with extra 2-way diversity including additional licensing.	AXRX1-UP
Enable HDMI output on AXRX1 receiver	AXRX1-HDMIUP

Step 2: Identify the Licensing Options

Equipment Title	Part Number
License for Receiver Streaming Upgrade (Professional Receiver Broadcast).	NETAXRX1IPUP

1.6   About the Software with your AXRX1

The AXRX1 has **two** software elements:

- **Firmware** that runs inside the device on the boards.
- **Control Pages** that you access using your web browser on your Windows PC.

About the Firmware

Although much of the unit is built up of hardware components, many of the sophisticated features are implemented in firmware running on a Field Programmable Gate Array (FPGA) inside the device.

When you need to perform an internal software upgrade we will provide an installer pack which contains all the code you'll need to do this easily.

About the Control Pages

The software tools provide users a convenient access to the most common features and functions of the device. All software tools are implemented as a web interface. The advantage of a web interface is that it is independent from the user's operating system and doesn't require any specific software on the host PC.

The Control Panel on the front of the unit gives access to many of the features of the radio but for more sophisticated operations and configuration tasks you'll connect up a PC running a web browser to access the Control Pages on your AXRX1.

The Control Pages enables you to set up sixteen presets in the radio and have control over many parameters of the unit.

Here's what one of the AXRX1 Control Pages look like:

Screenshot: AXRX1 Control Page
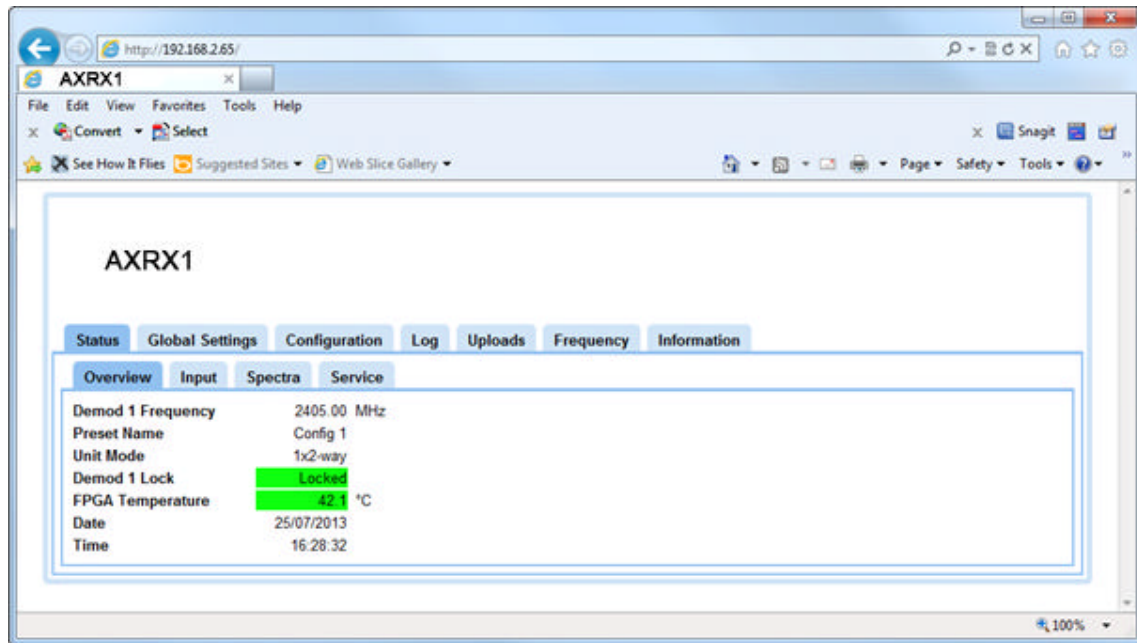
Figure 1-3 – AXRX1 Control Page

2. Controls, Connections and Indicators

2.1 About Controls, Connections and Indicators

You'll need to be able to identify all the **controls** and **connections** on the unit. You'll also need to be able to identify and interpret any **alarms** or **indicators**. The following topics will help you identify all these features.

Each AXRX1 has **front** and **rear** panels which contain all the interface connections for the units and the controls and indicators. There is an operational control panel on the front of the unit.

2.2 Exploring the Front Panel

Diagram: Front Panel

Figure 2-1 AXRX1 Front Panel

No	Item	Used for...
1	Rack Mounting Ears.	Removable metalwork to enable the AXRX1 to be fitted in a half of a 19" rack.
		Two AXRX1s can be joined together to fit a full 19" rack space using the Professional Receiver Coupler Kit, part code AXRX1CPLKT.
2	Display Screen.	This two line OLED display screen forms part of the Control Panel where you can quickly set up many of the features of the AXRX1.

No	Item	Used for...
3	Cancel / Back Button.	Press to cancel action or go back one level.
4	Joystick / Confirm Button	Move the joystick for UP, DOWN, LEFT and RIGHT. Press the joystick for ENTER.
5	Power Button.	Toggles the power on or off.
6	USB Jack.	Supplies USB Power.
7	BNC Jack.	For video output.

Table 2-1 – AXRX1 Front Panel Key

2.3   Exploring the Rear Panel

Diagram: Rear Panel
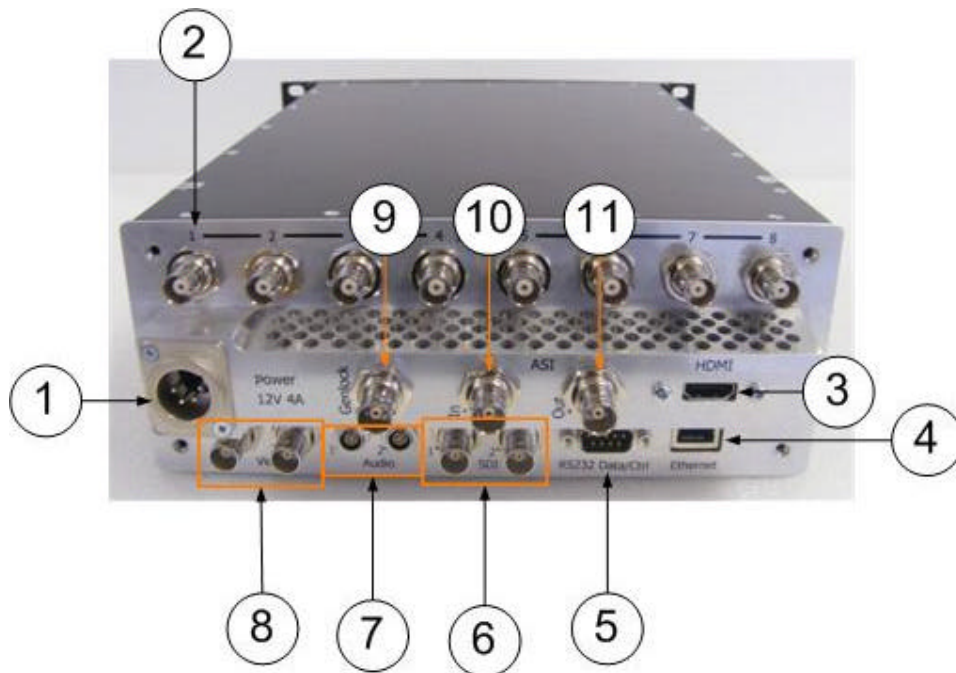
Figure 2-2 AXRX1 Rear Panel

No	Item	Used for...
1	XLR 4-way jack, (pins) marked POWER 12V 4A.	Power input to the AXRX1.
2	BNC 2-way jack (sockets) x 8 marked 1 to 8.	Connect your IF cables from the downconverter / antenna assembly here. Do not over tighten. Hand-tight only.
3	HDMI Type-A 19-way jack, sockets.	HDMI (High Definition Multimedia Interface) output.
4	RJ45 8-way jack, (sockets) marked ETHERNET.	Ethernet input / output. You'll use this port to control your AXRX1 using a web browser on your PC. It is also used for streaming video if your unit is licenced for that.
5	D-Type 9-way jack, (pins) marked RS232 Data/Ctrl.	RS232 Data/Control port. Data output and enables you to control the AXRX1 serially if required.
6	BNC 2-way jacks, (sockets) marked SDI 1 and SDI 2.	SDI video outputs, decoder 1 and 2.
7	LEMO OB 5-way jacks, (sockets) marked AUDIO 1 and AUDIO 2.	Audio outputs, decoder 1 and 2.
8	BNC 2-way jacks, (sockets) marked VIDEO 1 and VIDEO 2.	Composite video outputs, decoder 1 and 2.

Table 2-2 – Rear Panel Key

3. Setting up your AXRX1

3.1 Connecting the Antennas

This topic describes connecting systems designed mainly for transporting the RF signals. Of all the variables affecting single-channel radio communications, the one factor that an operator has the most control over is the antenna. With the right antenna, an operator can change marginal RF signal reception into a very reliable RF signal.

There are **six** antenna interfaces located on the rear panel of the AXRX1 receiver.

> **Note**: If you have four-way diversity AXRX1 then you **must** connect **four** antennas to achieve best performance from the four-way diversity receiver system.
>
> If you have six-way diversity AXRX1 then you **must** connect **six** antennas to achieve best performance from the six-way diversity receiver system.

Before you Begin

You'll need:

- 2, 4 or 6 down converters that match the frequency range of the AXTX1 transmitter.
- 2, 4 or 6 antennas that match the operating frequency range of your down converters.

Step 1: Select your Down converters

All AXRX1 receivers use down converters to lower the frequency from the main carrier microwave frequency to an intermediate frequency (IF) between 51 and 858MHz that the on-board tuners in the receivers use.

It is important to select the correct down converter for the microwave transmission frequency you are planning to receive. Down converters have a label to help you select the correct unit.

If you are using long cable runs from the base of the down converter to the rear panel of the AXRX1, you may need to select the high gain switch position of the down converter to deal with RF/DC Power losses due to the long cable length.

Step 2: Attach the Antennas to the Down converters

1. Connect each antenna directly to the "N" Connector (labelled RF IN) on the top of each down converter.

Step 3: Set Antenna Polarization

1. COFDM links are very robust and are tolerant to changes in antenna position, however, it is important to try and keep the antennas in the **same plane** if possible.
2. The antennas used with the COFDM links are normally vertical polarized.

Step 4: Attach IF Cable to the Down converter

1. Connect the "N" to BNC adapter "N" connector on the bottom panel of each down converter and connect the IF cable to the BNC connector.

Step 5: Attach IF Cable to the AXRX1

Connect the BNC plug on the IF Cable to the BNC jack on the rear panel of the AXRX1.

Next Steps

Connect AC Power.

3.2   Connecting AC Power

Before you Begin

You'll need:

- A CA0649 AXRX1 External 12V 6.67A 80W Desktop Power Supply
- AXRX1.

Step 1: Connect the AC Power

1. Connect the **XLR 4-way plug** (sockets) from the AC adaptor to the **XLR 4-way jack** (pins) on the AXRX1 Receiver which is located on the left side of the rear panel.

2. Now connect the **IEC mains 3-way plug** (sockets) to the **IEC mains 3-way jack** (pins) on the AC adaptor.

3. Connect IEC mains plug to your **local AC supply** and switch on.

4. Basic Operation

4.1 Starting and Stopping the AXRX1

AXRX1 units have a power switch on the right side of the front panel.

Before you Begin

You'll need:

- An AXRX1 connected to a source of power.

Step 1: Powering Up

1. Press the Power Switch on the front panel.
2. You'll see the Splash display appear.
3. Let the unit Initialize.

Step 2: Shutting Down

It is important to shut down the system carefully. This ensures that all processes are terminated correctly and no data or settings are lost.

1. Press the Power Switch on the front panel.
2. The display will go blank.
3. The system is shut down safely.

Next Steps

Exploring the Control Panel.

4.2 Exploring the Control Panel

When you have powered up the AXRX1 you'll see the control panel located on the front panel.

Before you Begin

You'll need:

- A fully powered AXRX1

Diagram: Control Panel

Figure 4-1 AXRX1 Control Panel

No	Item	Used for...
1	Display Screen.	This two line OLED display screen forms part of the Control Panel where you can quickly set up many of the features of the AXRX1.
2	Cancel / Back Button.	Press to cancel action or go back one level.
	Joystick / Confirm Button	Move the joystick for UP, DOWN, LEFT and RIGHT. Press the joystick for ENTER.

Table 4-1 – Control Panel Key

Next Steps

Navigating the Menu Pages.

4.3 Navigating the Menu Pages on the Control Panel

The AXRX1 has a Control Panel which uses a system of **menu pages** which enable you to change **modes**, **configurations** and to control the **RF** settings.

Those menu pages are:

■ Status

■ Config

Before you Begin

You'll need:

- A fully powered AXRX1.

Step 1: Select the Status or Configuration Menu

1. On the front panel, press the **Cancel/Back** Button.
2. You'll see PRO-RX, **Status** on the display screen.
3. Pull the **Joystick/Confirm** Button down.
4. You'll see PRO RX, **Config** on the display screen.
5. You can cycle between **Status** and **Config** by moving the **Joystick/Confirm** button up and down.
6. Choose **Status**.
7. **Press** the center of the **Joystick/Confirm** button to **select** the **Status** Menu.
8. **Press** the **Cancel/Back** button to **go back up a menu level.**
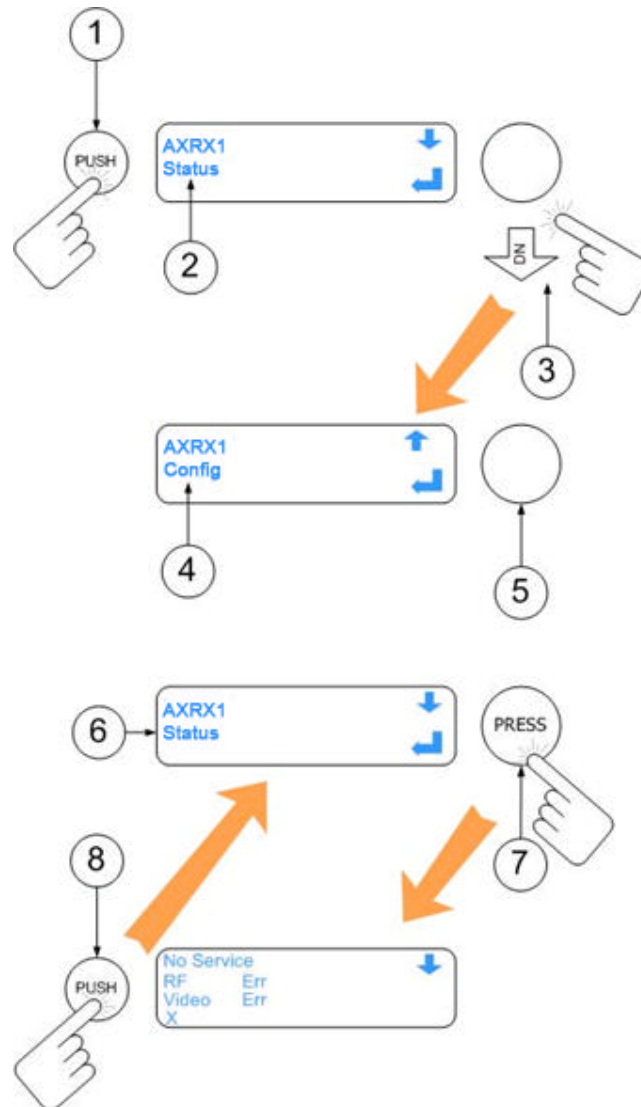
Figure 4-2 Select the Status or Configuration Menu

Next Steps

Explore the Status Menu.

4.4   Exploring the Status Menu

Before you Begin

You'll need:

- A fully powered AXRX1

Step 1: Select Status Menu

1. From the menu, choose **Status**.

2. **Press** the center of the **Joystick/Confirm** button to **select** the **Status** menu.

3. Use the **Joystick/Confirm** button to move up and down the status menu

Menu	Sub-Menu	Notes
Status	No Service or Unit 1 RF Err or OK Video Err or OK	The Service status The RF lock status The Video lock status
	Config 1 Freq 2415.00 LO 1880.00 Low	The configuration in use The frequency in this configuration Local oscillator **frequency** and **side**
	BW 8MHz Const 16QAM FEC 1/2	The bandwidth in use Constellation in use FEC rate in use
	Input A to F No Lock SNR 0.0 Level -83.3	Input A to F Lock status The signal to noise ratio The received signal strength
	192.168.2.65 255.255.255.0 192.168.2.254	The IP Address of the unit The Subnet Mask of the unit The Gateway of the unit
	Software Version 2.0 HD Dec 1.3	Software versions: Firmware in the unit itself Firmware for the HD decoder in the unit
	Clock 13/04/2013 19:15:13	Date / Time: Date Time

Menu	Sub-Menu	Notes
	TX Status Video Lock: ____ Battery: _____	If the transmitter has been configured to send its status information then it will be displayed here. Video lock status – reports if the input to the transmitter has a video lock. Battery status – Reports the voltage of the transmitters battery

Table 4-2 – Status Menu

Note: Don't worry if you accidentally press the **Joystick/Confirm** button when you are moving about the status menu. It really just shows you the current settings and will not allow you to change them.

Next Steps

Exploring the Config Menu.

4.5   Exploring the Config Menu

Before you Begin

You'll need:

■   A fully powered AXRX1

Step 1: Select Config Menu

1. From the menu, choose **Config**.
2. **Press** the center of the **Joystick/Confirm** button to **select** the **Config** menu.
3. Use the **Joystick/Confirm** button to move up and down the Config menu

Menu	First Sub-Menu	Second Sub-Menu	Notes
Config	**Global Setup**	Preset Config 1	
		DHCP Disabled	

Menu	First Sub-Menu	Second Sub-Menu	Notes
		IP Address 192.168.2.65	
		IP Netmask 255.255.255.0	
		IP Gateway 192.168.2.254	
		Rest. Defaults Off	
	RF Setup	RF Frequency 2405.00	
		LO Preset DCBGS-200250	
		LO Frequency 1880.00	
		LO Side Low	
		Receiver Mode DVB-T	
		Bandwidth 8 MHz	
		Guard Interval 1/8	
		Polarity Normal	
		LNB Power On	
	Decoder Setup	Decoder Input Demod 1	

Menu	First Sub-Menu	Second Sub-Menu	Notes
		Service Mode Defaults	
		Prog. List (0) No Service	
		Default Service Unit 1	
		Default ID 1	
		Man. Video PID1 0300	
		Man. Audio PID1 0200	
		Man. PCR PID1 8190	
		Man. Data PID1 100	
	Video Setup	OSD Mode Off	
		OSD Eng. Mode Spectra	
		OSD Spectrum Input A	
		Genlock Mode Off	
		Lines Offset 0	
		Pixels Offset 0	

Menu	First Sub-Menu	Second Sub-Menu	Notes
		Freeze Frame Off	

Table 4-3 – Config Menu

4.6 Changing Numbers in the Config Menu

Sometimes you'll need to change numbers in the Config menu, like frequencies for example. This technique will apply to all numbers you change in the Config menu.

Before you Begin

You'll need:

■ A fully powered AXRX1

Step 1: Select Config Menu

1. From the menu, choose **Config**.
2. **Press** the center of the **Joystick/Confirm** button to **select** the **Config** menu.

Step 2: Select Config Sub-Menu

3. Use the **Joystick/Confirm** button to move up and down the Config menu and choose **RF Setup** (a sub-menu) from the choices: **Global Setup**, **RF Setup**, **Decoder Setup** or **Video Setup**.
4. **Press** the center of the **Joystick/Confirm** button to **select** the **RF Setup** sub-menu.

Step 3: Select Config you want to Change

5. Use the **Joystick/Confirm** button to move up and down the RF Setup sub-menu.
6. When you find a config with numbers you want to change, **press** the **Joystick/Confirm** button to select that config for editing. (RF Frequency as an example).

Step 4: Change the Numbers in the Config

7. Move the **Joystick/Confirm** button left and right to move the **cursor** underneath each digit.
8. Move the **Joystick/Confirm** button up and down to increase and decrease the value of the digit.
9. Press the **Joystick/Confirm** button to **save** the new setting.
10. Press the **Joystick/Confirm** button again to **confirm** the new setting.
11. When done, press the **Cancel/Back** button to return to the top menu.

Note: If you do not understand any of the parameters mentioned above, they are all fully covered in the chapter about the control pages.
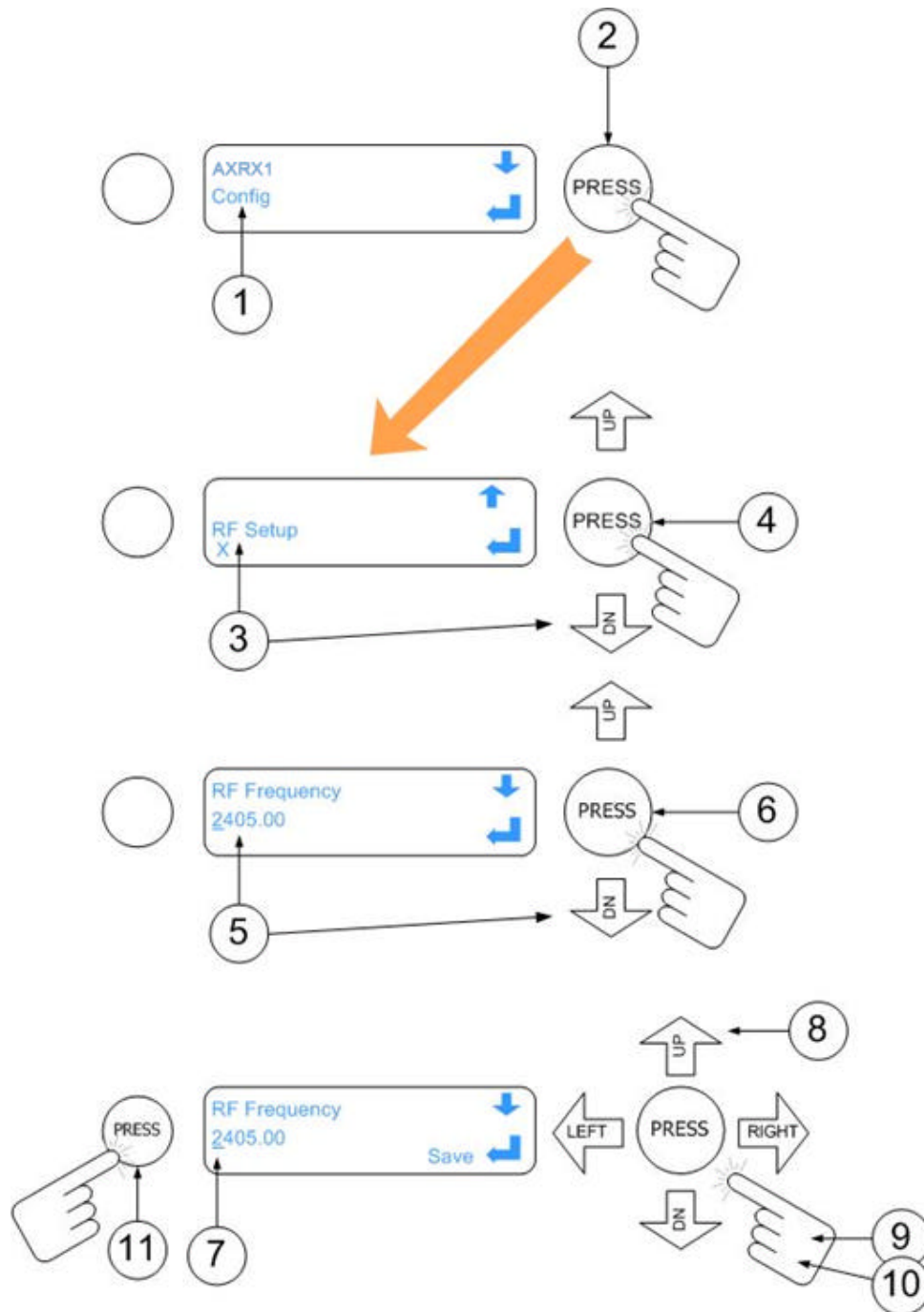
Figure 4-3 Changing Numbers in the Configuration Menu

4.7 Toggling DHCP On or Off

When shipped, the AXRX1 is set to be given an IP address by an external DHCP server.

You may need to switch this DHCP facility off.

Before you Begin

You'll need:

- A fully powered AXRX1

Step 1: Select Config Menu

1. From the menu, choose **Config**.
2. **Press** the center of the **Joystick/Confirm** button to **select** the **Config** menu.

Step 2: Select Global Setup Sub-Menu

1. Use the **Joystick/Confirm** button to move up and down the Config menu and choose **Global Setup**.
2. **Press** the center of the **Joystick/Confirm** button to **select** the **Global Setup** sub-menu.

Step 3: Select DHCP

1. Use the **Joystick/Confirm** button to move up and down the Global Setup sub-menu.
2. When you find **DHCP**, press the **Joystick/Confirm** button to select it for editing.

Step 4: Change the DHCP Mode

1. Move the **Joystick/Confirm** button up and down to toggle between enabled and disabled.
2. Press the **Joystick/Confirm** button to **save** the new setting.
3. Press the **Joystick/Confirm** button again to **confirm** the new setting.
4. When done, press the **Cancel/Back** button to return to the top menu.

4.8 Setting a Fixed IP Address

One of the very early things you'll want to do is be able to set up your fixed IP address on the unit.

Before you Begin

You'll need:

- A fully powered AXRX1.
- Ensure you have disabled DHCP.

Step 1: Select Config Menu

1. From the menu, choose **Config**.
2. **Press** the center of the **Joystick/Confirm** button to **select** the **Config** menu.

Step 2: Select Global Setup Sub-Menu

1. Use the **Joystick/Confirm** button to move up and down the Config menu and choose **Global Setup**.
2. **Press** the center of the **Joystick/Confirm** button to **select** the **Global Setup** sub-menu.

Step 3: Select IP Address

1. Use the **Joystick/Confirm** button to move up and down the Global Setup sub-menu.
2. When you find **IP Address**, press the **Joystick/Confirm** button to select it for editing.

Step 4: Change the IP Address

1. Move the **Joystick/Confirm** button left and right to move the **cursor** underneath each digit.
2. Move the **Joystick/Confirm** button up and down to increase and decrease the value of the digit.
3. Press the **Joystick/Confirm** button to **save** the new setting.
4. Press the **Joystick/Confirm** button again to **confirm** the new setting.
5. When done, press the **Cancel/Back** button to return to the top menu.

> **Note**: You can also use this procedure to configure the **IP Netmask** and **IP Gateway** settings.

4.9   Setting the Receiver Configuration

A common operational requirement is to be able to change preset configurations quickly.

Before you Begin

You'll need:

- A fully powered AXRX1

Step 1: Select Config Menu

1. From the menu, choose **Config**.
2. **Press** the center of the **Joystick/Confirm** button to **select** the **Config** menu.

Step 2: Select Global Setup Sub-Menu

1. Use the **Joystick/Confirm** button to move up and down the Config menu and choose **Global Setup**.

2. **Press** the center of the **Joystick/Confirm** button to **select** the **Global Setup** sub-menu.

Step 3: Select Preset

1. Use the **Joystick/Confirm** button to move up and down the Global Setup sub-menu.

2. When you find **Preset**, press the **Joystick/Confirm** button to select it for editing.

Step 4: Change the Preset

1. Move the **Joystick/Confirm** button up and down to increase and decrease the value of the digit.

2. Press the **Joystick/Confirm** button to **save** the new setting.

3. Press the **Joystick/Confirm** button again to **confirm** the new setting.

4. When done, press the **Cancel/Back** button to return to the top menu.

5. Advanced Operation

5.1 About Streaming Over IP

Note: This section is relevant only to customers that have the Streaming licence loaded onto their AXRX1 unit.

Streaming is the transmission of digital audio or video or the listening and viewing of such data without first storing it.

The AXRX1 supports:

■ Raw Multicast streaming

■ RTSP/RTP streaming.

5.2 Configuring UDP Multicast Streaming

When you have got a Video or Audio service into the AXRX1, you may want to stream that information down a fixed IP link.

For multicast streaming the transport stream video data is transmitted over the Ethernet network by means of multicasting i.e. continuous real-time streaming of packets accessible to any PC connected to the network.

It is therefore possible for more than one connected PC to view the streamed data simultaneously.

Before you Begin

You'll need:

■ To have connected your PC to the AXRX1 using IP.

■ To be logged on to the AXRX1 unit.

■ The AXRX1 must have a Streaming licence installed.

■ Have a video transmission being received on Demod 1 of your AXRX1.

Step 1: Open the Global Settings Tab

1. Click on the **Global Settings** tab.

2. Find the **Streaming Settings** Pane.

Step 2: Configure the IP Settings Pane - Gateway

For multicast operations it is very important that you configure the **gateway** in the IP settings pane even though we might not have a gateway in our network.

1. You must use an IP address in the same network range as the AXRX1 and for simplicity; we recommend you use the actual AXRX1 IP Address for your Gateway too.
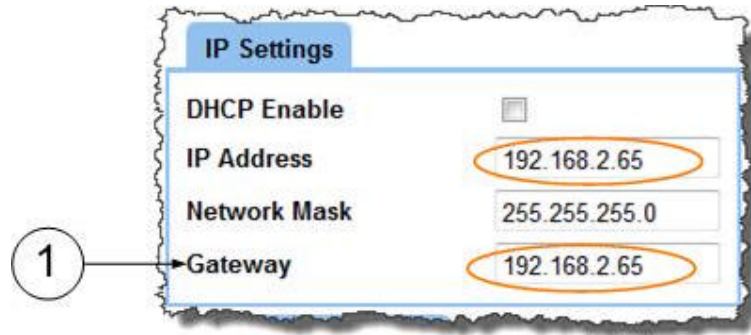
Figure 5-1 Configure the Gateway in the IP Settings Pane

Step 3: Configure the Streaming Settings

1. Check the **Streaming Enable** checkbox.

2. In the **Streaming Mode** box select **UDP Multicast**.

3. In the **Streamer Select** box choose the source you want to stream (**Demod 1** in my example).

4. In the **Multicast Address** box set **239.16.33.254**.

5. In the **Multicast TTL** box set 10.

6. In the **Multicast Port** box set 10000.

7. In the **Multicast Service Name** box set 10000.

8. In the **Multicast ToS** box set Routine (0).

9. Click the **Apply** button.

10. The **Configured Successfully** message opens.

11. Click the **OK** button.
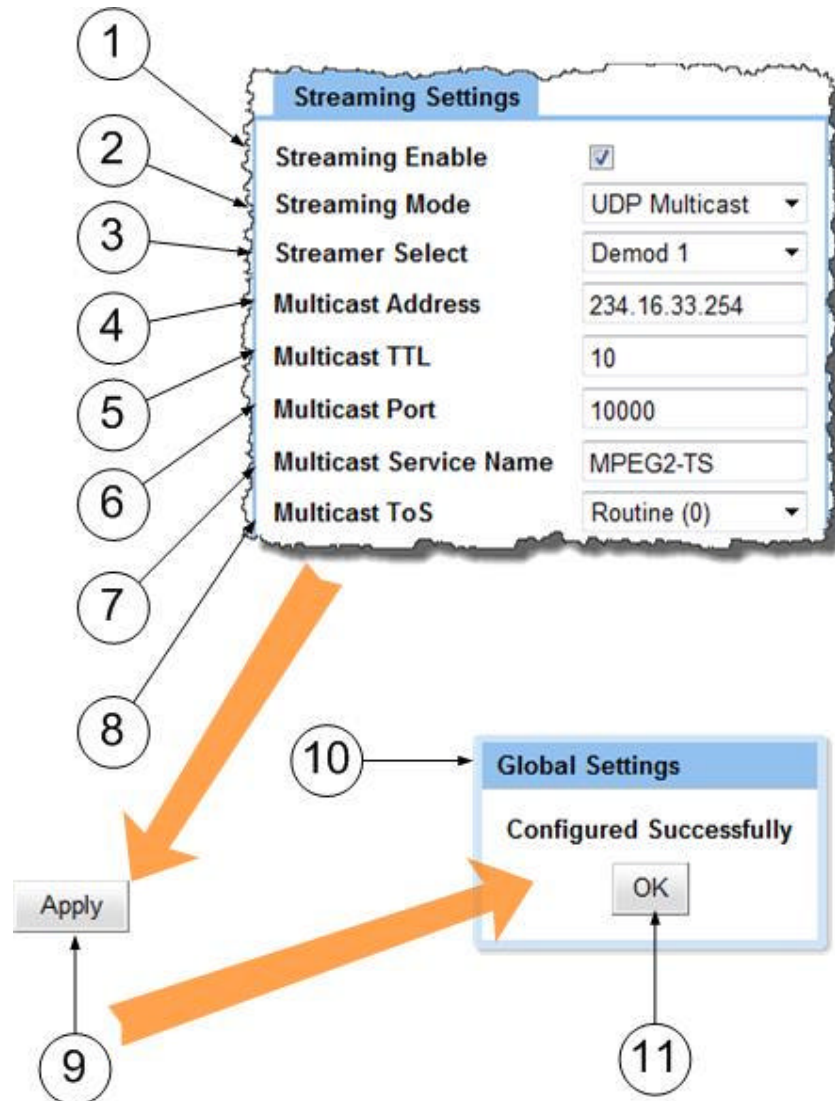
Figure 5-2 Configure the Streaming Settings Pane

5.3   Recovering a UDP Multicast Stream - VLC

Now you have configured your multicast stream at the AXRX1, you'll want to recover that stream on you PC. We'll use VLC Media Player for this example as it is free to download from the internet.

Before you Begin

You'll need:

■   To have connected your PC to the AXRX1 using IP.

■   To be logged on to the AXRX1 unit.

■   The AXRX1 must have a UDP Multicast Stream Configured.

■ Your PC must have VLC loaded.

Step 1: Open VLC

1. On your desktop, double-click the **VLC Media Player** Icon.

2. The **VLC Media Player** window opens.

Step 2: Configure the Playback

3. From the **Media** menu, select **Open Network Stream**.

4. The **Open Media** window opens.

5. Type the Network URL in this format: udp://@234.16.33.254:10000

6. Click the **Play** button.

7. Your **stream** will start playing in a new window.

Screenshot: Recovering a UDP Multicast Stream
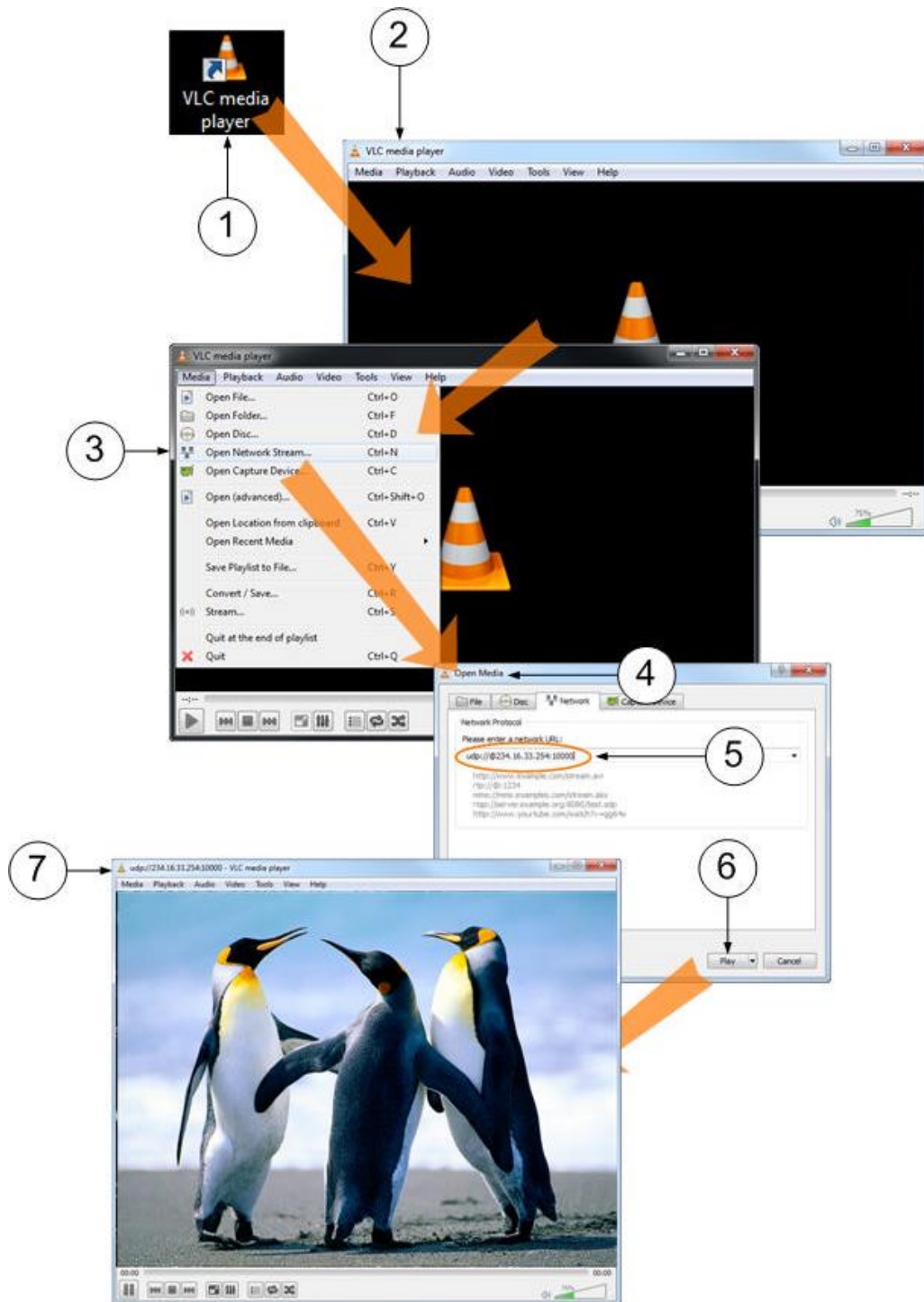
Figure 5-3 Recovering a UDP Multicast Stream - VLC

5.4 About RTSP Multicast and Unicast

If you set the streaming mode on the AXRX1 to be RTSP Multicast or RTSP Unicast then the Network URL you'll need in VLC or Mission Commander will be:

rtsp://192.168.2.65/stream1.sdp

The IP address here is that of the AXRX1 you are streaming from.

If you were using the second streamer on the AXRX1 then the last part of the URL would be stream2.sdp.

6. Advanced Setup

6.1 About Advanced Setup

To get the best performance from your radio system you should customize the programming of the Advanced Setup menu features.

> **CAUTION**: Before you start programming your radio make sure the batteries are fresh and fully charged. If the radio loses power while you are programming it, its memory might become corrupted which will require you to reset defaults. All information programmed in the radio might be lost. Alternatively, you should use an AC adapter to power your radio before attempting to program the unit.

The **Control Application** or **Control Pages** enable you to control the communication system, to keep it functioning in proper and stable order. It enables you to change many of the settings of the unit such as frequency or bandwidth.

The control system may be in the form of a **Control Application** that runs on your computer connected to the device using serial communication.

Alternatively, it may be in the form of **Control Pages** that are viewed on your PC's browser when connected to the device using IP communication.

The AXRX1 Receiver uses **Control Pages** accessed from your web browser which enables you to perform many configuration tasks quickly and easily. The following will tell you how to connect your computer to the receiver and use your browser to configure the unit.

6.2 Installing a compatible browser on your computer

> **Note**: Most PCs will have a browser already installed. You'll only need to follow these instructions if you wish to use a different type browser.

Before you Begin

You'll need:

- A computer running Windows version XP or later.
- Have the computer's network card configured for a fixed IP Address.
- A copy of the Browser Application you want to use. (Such as Internet Explorer or Firefox).

Step 1: Install the Browser Application on your PC

1. Install Browser on your desktop or other convenient location on your computer.
2. Ensure you have a Browser start-up icon on your desktop to start the program.

Next Steps

Connect the AXRX1 to your computer using the IP interface.

6.3   Connecting your computer to the AXRX1 using IP

You'll want to configure your AXRX1 to accept IP control.

The AXRX1 has **Control Pages** accessed from your web browser which enables you to perform many configuration tasks quickly and easily.

Before you Begin

You'll need:

- A computer with a web browser.
- An Ethernet cable.
- A powered AXRX1 unit.
- The IP Address of the AXRX1 unit.

Step 1 - Install the Web Browser Application on your computer

Ensure you have installed a **browser** (Internet Explorer, Firefox or Chrome for example) onto your computer.

Step 2: Establish an IP Connection between AXRX1 and the computer

1. Connect the RJ45 8-way plug (pins) on the Ethernet Cable to the RJ45 8-way jack (sockets) on the AXRX1 receiver.

2. Connect the RJ45 8-way plug (pins) on the Ethernet Cable to the RJ45 8-way jack (sockets) of your computer.

Diagram: AXRX1 IP Connection
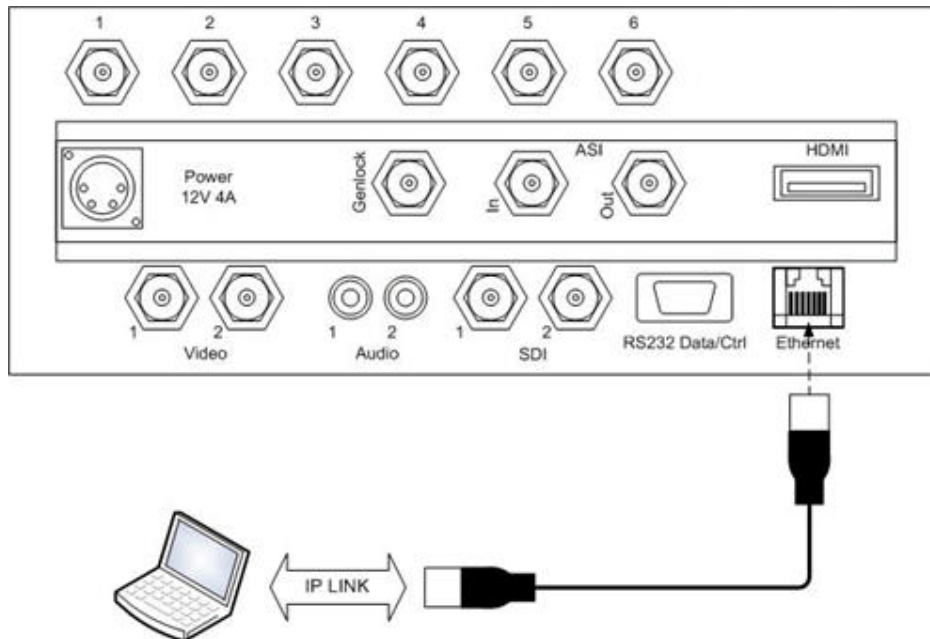
Figure 6-1 AXRX1 IP Connection

Step 3 - Open your Web Browser and Log on

1. Double-click your **Internet Browser** icon.

2. The Web browser **Home Page** window **opens**.

3. In the **Address bar**, type the **IP Address** of the AXRX1 you want to configure like this example: http://192.168.2.65/

4. Your AXRX1 **Control Page** opens in your Web Browser.

Screenshot: Open Web Browser and Log on
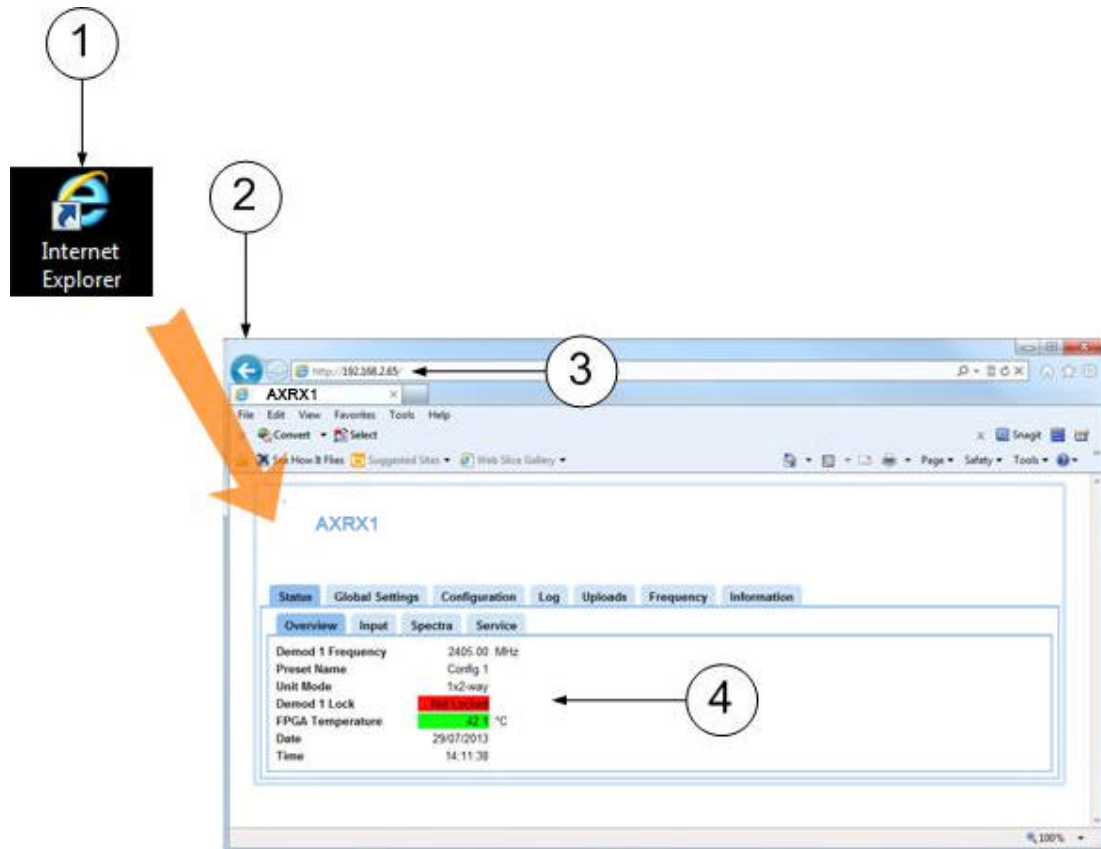
Figure 6-2 Open Web Browser and Log on

Troubleshooting

Problem: I don't know the IP address of the unit.

Solution: You'll find the IP Address on the front panel **Config**>**Global Setup**>**IP Address** page.

Problem: I just received the unit, new out of the box and it's in DHCP mode.

Solution: You can toggle DHCP to OFF on the front panel **Config**>**Global Setup**>**DHCP** page.

Next Steps

Exploring the Browser's Main Window.

6.4   Exploring the Browser's Main Window

Before you Begin

You'll need:

- To have connected your computer to the AXRX1 using IP.
- To be logged on to the AXRX1 unit.

Screenshot: Exploring the Control Pages
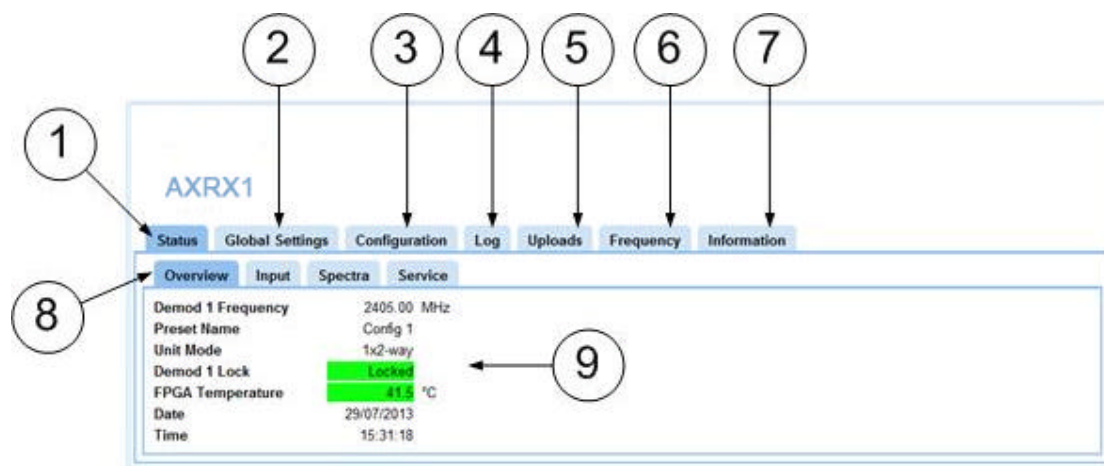
Figure 6-3 Explore the Control Pages

| No	Name	Notes
1	Status tab	Divided into Overview, Input, Spectra and Service sub-tabs. This displays detailed status information of received signal quality and decoded video and audio services.
2	Global Settings tab	Divided into General Settings, Down converter Settings, IP Settings, Streaming Settings, OSD Settings and Genlock Settings panes.
3	Configuration tab	Divided into Basic Configuration, Demod 1 Configuration, Decoder 1 Configuration, Demod 2 Configuration and Decoder 2 Configuration panes. The Configuration tab contains the list of 16 presets. Each preset the user can specify demodulation parameters, and decoding modes.
4	Log tab	The AXRX1 receiver has the facility for generating log files of receiver status information.

No	Name	Notes
5	Uploads tab	Enables you to upload a license file to enable licensable features, and send software upgrade files to the AXRX1.
6	Frequency tab	The AXRX1 is able to scan frequencies and find active channels for you for quick tuning.
7	Information tab	Contains information including software versions and unit specific data. You'll need this information during a service support call for example.
8	Overview sub-tab	Some of the tabs have sub-tabs to further divide the information or they will use panes to divide information.
9	Information Fields	The sub-tabs or panes are divided into fields of information that you'll work with.

Table 6-1 – Control Pages Key

Next Steps

Configure the Basic Settings.

6.5   Configuring the Basic Settings

When shipped, the AXRX1 is set to be given an IP address by an external DHCP server.

In managed networks which use DHCP address allocation this option should be selected. In networks that are manually managed (or do not feature a DHCP server), users may prefer to assign an IP address manually.

When you start-up the AXRX1 for the first time you'll need to set up a couple of things.

■   You need to turn off DHCP.

■   You need to assign a fixed IP address to the AXRX1.

Before you Begin

You'll need:

■   A fully powered AXRX1.

Step 1: Switch DHCP to OFF

Use the topic: **Toggling DHCP On or Off** in *Basic Operation*.

Step 2: Set a Fixed IP Address

Use the topic: **Setting a Fixed IP Address** in *Basic Operation*.

6.6 Working with the Status Tab

The **Status Tab** displays detailed status information of received signal quality and decoded video and audio services.

The Status Tab is divided into four sub-tabs:

- Overview
- Input
- Spectra
- Service

Before you Begin

You'll need:

- To have connected your computer to the AXRX1 using the IP interface.
- To be logged on to the AXRX1 unit.

Step 1: Open the Overview Sub-Tab

Click on **Status** > **Overview** tab.
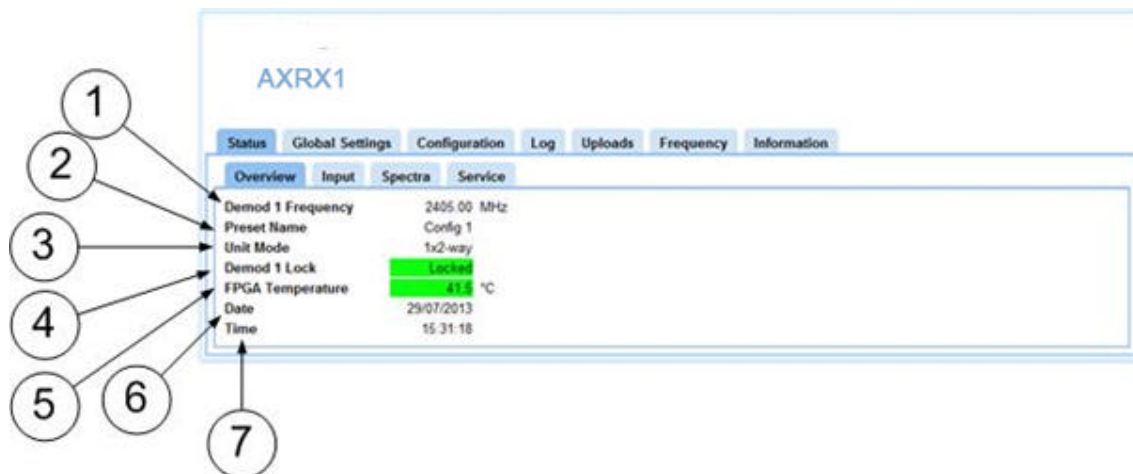
Screenshot: Overview Sub-Tab

Figure 6-4 Status Tab showing Overview Sub-Tab

Step 2: Interpret the Overview Sub-Tab

No	Name	Options	Notes
1	Input frequency (MHz)	Different Frequency bands	The **frequency** in megahertz (MHz) to which the receiver is tuned.

No	Name	Options	Notes
2	Preset Name	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	This is the preset configuration choices you have to choose from. Only 1 thru 16.
3	Unit Mode	1x2-way 1x4-way 2x3-way etc.	The configuration of the diversity and channel arrangement of the receiver.
4	Demod 1 Lock Status	Locked or Not Locked	Tells you if the unit has successfully demodulated the incoming RF.
5	FPGA Temperature	Any temperature on a green or red field background.	This field reports the current temperature of the FPGA in degrees Celsius. If the field background is green, the temperature is within limits. If the background shows red, then the FPGA is overheating and the unit should be switched off immediately and allowed to cool.
6	Date	Any valid date.	
7	Time	Any valid time.	

Table 6-2 – Overview Sub-Tab Key

Step 3: Open the Input Sub-Tab

Click on, **Status** > **Input** tab.
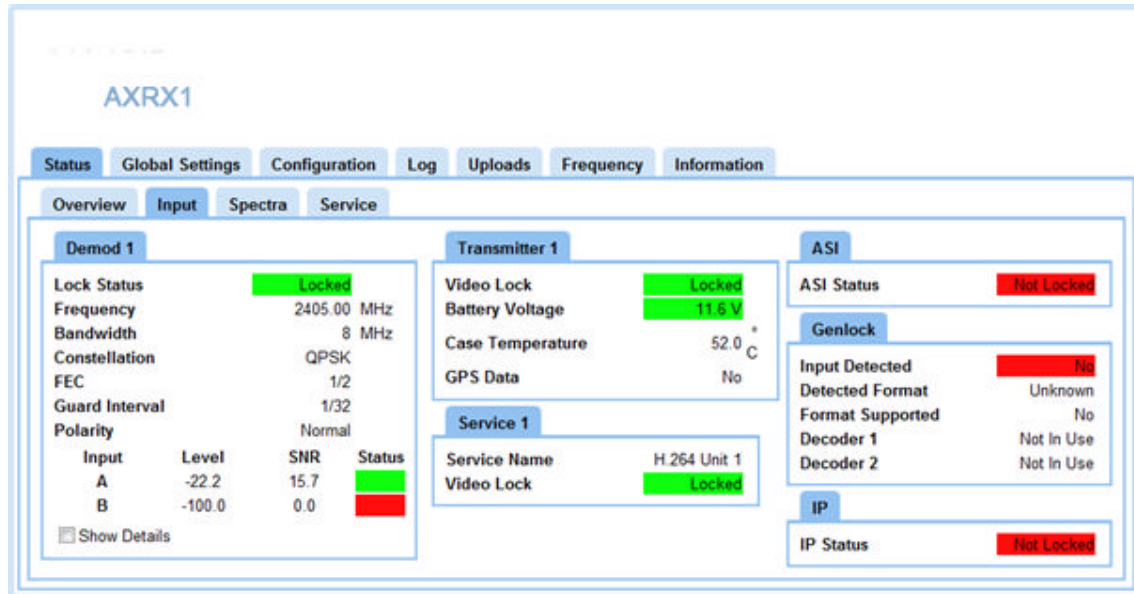
Screenshot: Input Sub-Tab

Figure 6-5 Status Tab showing Input Sub-Tab

Step 4: Interpret the Demod 1 Pane
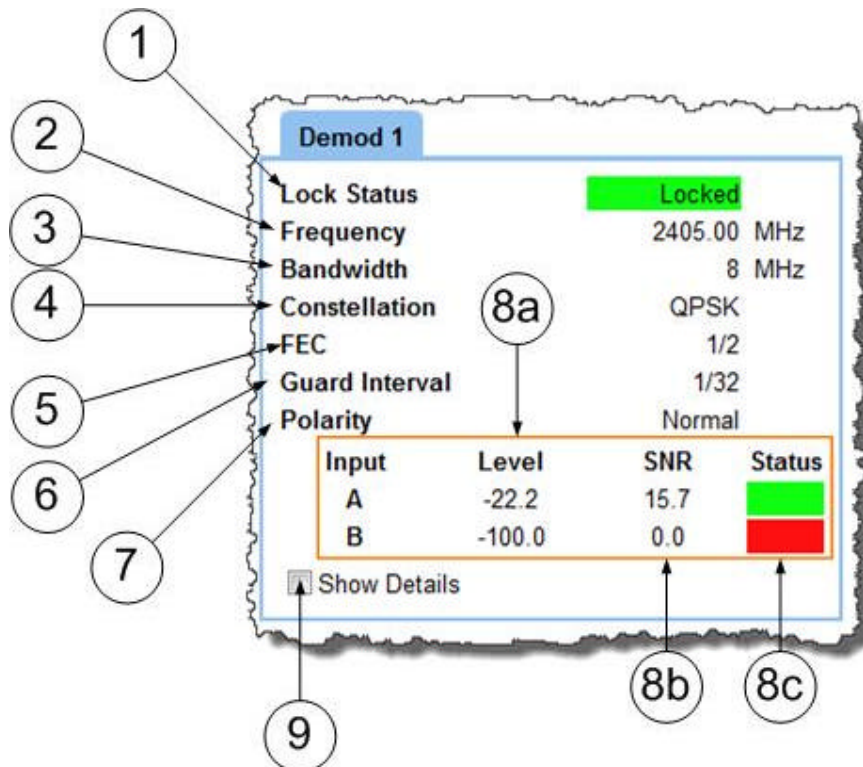
Screenshot: Demod 1 Pane

Figure 6-6 Input Sub-Tab showing Demod 1 Pane

No	Name	Options	Notes
1	Lock Status	Locked (steady green background) or Not Locked (steady red background.	Tells you if the unit has successfully locked to the incoming bit stream.
2	Frequency (MHz)	RF Channel Selections	The frequency in megahertz (MHz) to which the receiver is tuned.
3	Bandwidth	DVBT: 6, 7 and 8MHz	DVB-T bandwidths (normally used for broadcast).
4	Constellation	DVBT: QPSK, 16QAM, 64QAM	This field indicates the COFDM constellation being received. QPSK-less data bandwidth, Most sensitivity. 16QAM-more data bandwidth, -6dB less sensitivity than QPSK. 64QAM-Most data bandwidth, -6dB less sensitivity than 16QAM.
5	FEC (Forward Error Correction)	DVBT: 1/2, 2/3, 3/4, 5/6, 7/8	This field indicates the forward error correction (FEC) rate which is being applied. Think 'data bits/all bits' 1/2 means 1 bit out of 2 bits is data and therefore half the data bits are used for error correction. Less data bandwidth means less picture quality, but with more error correction which means a more robust signal and therefore less susceptible to picture break up. 7/8 means 1bit out of 8 bits of data is used for error correction. More data bandwidth means much better picture quality, but with less error correction which means less robust signal and therefore more susceptible to picture break up. The mode is automatically detected and is simply displayed here; the actual settings are made on the AXTX1 transmitter.

No	Name	Options	Notes
6	Guard interval	DVBT: 1/32, 1/16, 1/8, 1/4	The guard interval is a deliberate extension of the RF symbol period to give increased immunity to multipath reflections. 1/32, short extensions, deals with fast reflections, more data, less range. 1/8, long extensions, deals with slower reflections, less data, more range. Always use the 1/8 setting with more than 2 antennas.
7	Polarity	Normal or Inverted	The receivers can be used with other manufacturer's products and sometimes this requires us to change the polarity to inverted to match this third party equipment.
8a	Input Level A		The level in dBm of the signal being received on antenna A. There are readings for both antennas.
8b	Input A SNR	Could be any number.	The signal to noise ratio of the signal being received on antenna A. There are readings for both antennas.
8c	Status	Green or Red	A visual indication of signal strength.
9	Show Detail Check Box	Checked or Unchecked	When checked, the extra details about the error corrector on this page are displayed.

Table 6-3 – Demod 1 Pane Key

Step 5: Check the Show Details Checkbox

When checked, the extra details about the error corrector on this page are displayed.

Screenshot: Demod 1 Pane, Show Details Checked
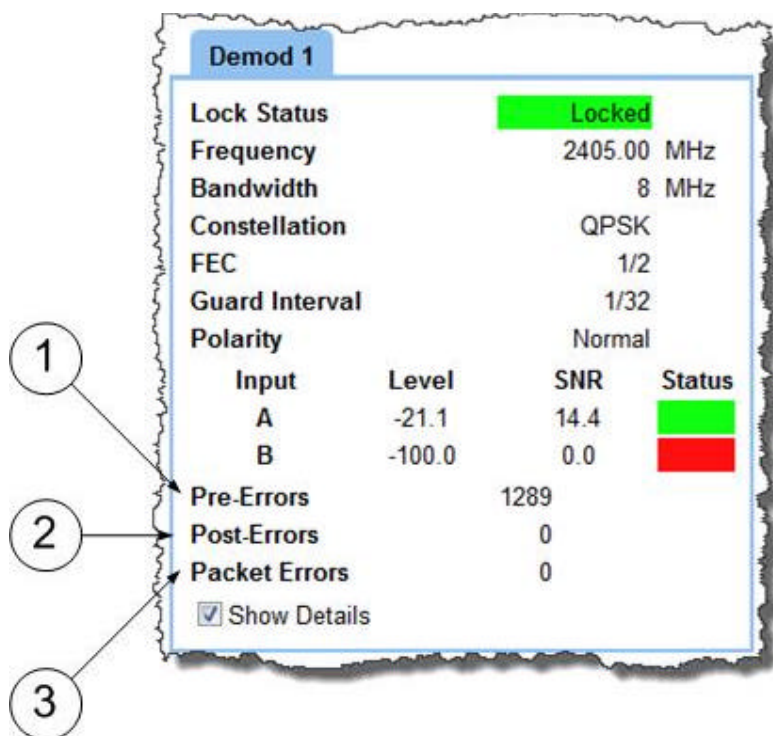
Figure 6-7 Demod 1 Pane with Show Details Checked

No	Name	Options	Notes
1	Pre-Errors	0 is ideal. Could be any number.	The bit error rate for pre-errors.
2	Post-Errors	0 is ideal. Could be any number.	The bit error rate for post-errors.
3	Packet Errors	0 is ideal. Could be any number.	The number of packet errors coming out of the error correction system. Any error here will corrupt the video, audio or data signals coming through the receiver.

Table 6-4 – Demod 1 Pane with Show Details Key

Step 6: Interpreting the Transmitter 1 Pane

Some transmitters are capable of sending telemetry data within with the RF signal. This telemetry data has to be switched on at the transmitter before it can provide useful information at the receiver.

Screenshot: Transmitter 1 Pane

Figure 6-8 Input Sub-Tab showing Transmitter 1 Pane

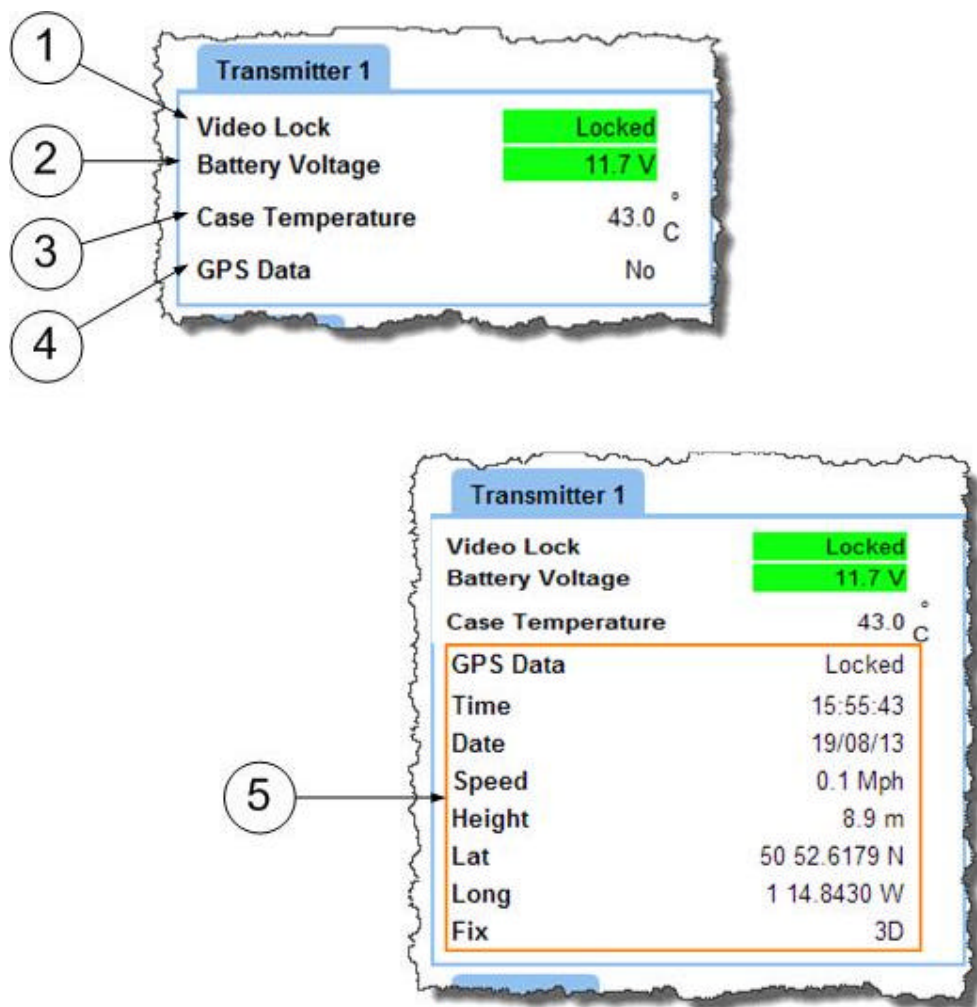| No	Name	Options	Notes
1	Video Lock	Locked (steady green background) or Not Locked (steady red background.	Tells you if the transmitter has successfully locked to its incoming video signal. *(Make sure the camera and transmitter are set to the same video format AND frame rate)*

No	Name	Options	Notes
2	Battery Voltage	Any voltage on a green or red field background.	This indicator shows the current voltage of the transmitter's battery in VDC. If the indicator's background is green, the voltage is greater than the TX Battery Alarm voltage parameter specified in the Global Settings pane. If the indicator's background is red, then the voltage is below the alarm limit, too low and the unit will fail to operate correctly.
3	Case Temperature	Any temperature on a green or red field background.	This indicator reports the current temperature of the transmitter's case in degrees Celsius.
4	GPS Data	Locked or No	Indicates if GPS Data is being sent from the transmitter. If GPS NMEA data is present, the receiver will extract and display it.
5	GPS Data	Locked in this case	This shows the Transmitter 1 Pane with GPS data being received.

Table 6-5 – Transmitter 1 Pane Key

Step 7: Interpreting the Service 1 Pane

Screenshot: Service 1 Pane

Figure 6-9 Input Sub-Tab showing Service 1 Pane

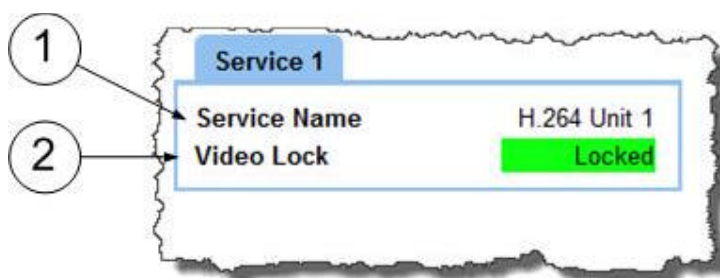| No	Name	Options	Notes
1	Service Name	H.264 Unit 1 is default but could be anything.	This text box lets you name the multicast stream as delivered in the SAP/SDP packets from the unit. Default is **H.264 Unit 1.** The Service Name on the receiver should match the transmitter's service name.

No	Name	Options	Notes
2	Video Lock	Locked (steady green background) or Not Locked (steady red background.	Tells you if the unit has successfully locked to the incoming decoded video signal.

Table 6-6 – Service 1 Pane Key

Step 8: Interpreting the ASI Pane

Screenshot: ASI Pane

Figure 6-10 Input Sub-Tab showing ASI Pane

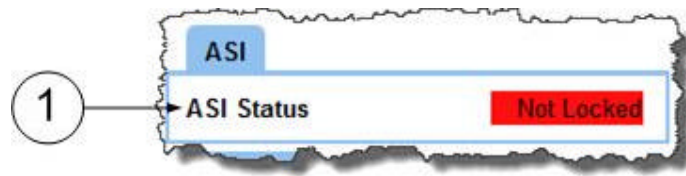| No	Name	Options	Notes
1	ASI Status	Locked (steady green background) or Not Locked (steady red background.	Tells you if the unit has successfully locked to the incoming ASI signal.

Table 6-7 – ASI Pane Key

Step 9: Interpreting the Genlock Pane

Screenshot: Genlock Pane
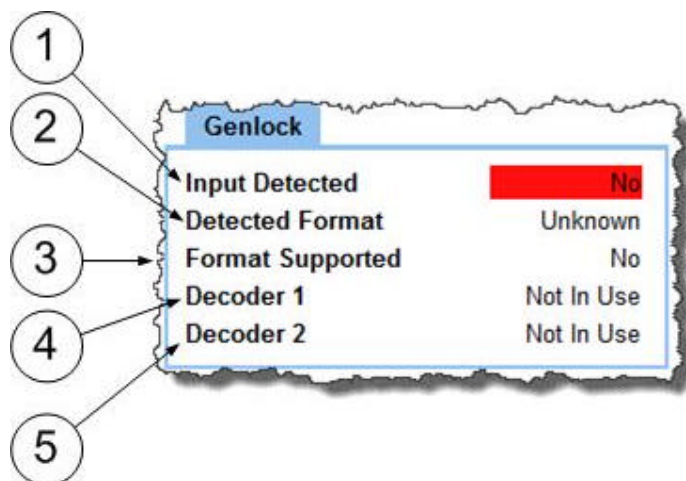
Figure 6-11 Input Sub-Tab showing Genlock Pane

No	Name	Options	Notes
1	Input Detected	Yes (steady green background) or No (steady red background.	Tells you if the unit has successfully locked an incoming Genlock signal.
2	Detected Format	Unknown PALNTSC HD standards	Reports the format of the Genlock signal. If the unit features the tri-level sync upgrade, HD standards are also detected.
3	Format Supported	Yes or No.	Informs you if the currently received Genlock format is suitable for use with this receiver.
4	Decoder 1	Not in Use Using	External Genlock has been selected and is supported. Not in use – External Genlock not selected or not supported.
5	Decoder 2	Not in Use Using	External Genlock has been selected and is supported. Not in use – External Genlock not selected or not supported.

Table 6-8 – Genlock Pane Key

## Step 10: Interpreting the IP Pane

Screenshot: IP Pane
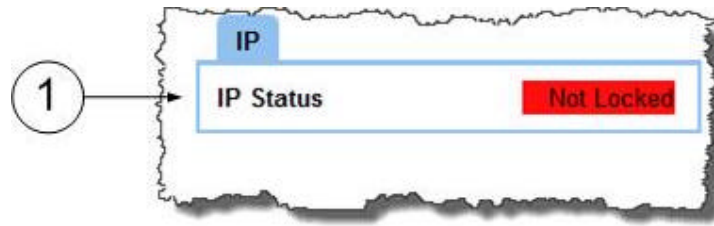
Figure 6-12 Input Sub-Tab showing IP Pane

No	Name	Options	Notes
1	IP Status	Locked (steady green background) or Not Locked (steady red background.	Tells you if the unit has successfully locked to an IP signal. Not Locked – IP Input not selected or not being received.

Table 6-9 – IP Pane Key

Step 11: Open the Spectra Sub-Tab

Click on, **Status** > **Spectra** tab.

Screenshot: Spectra Sub-Tab
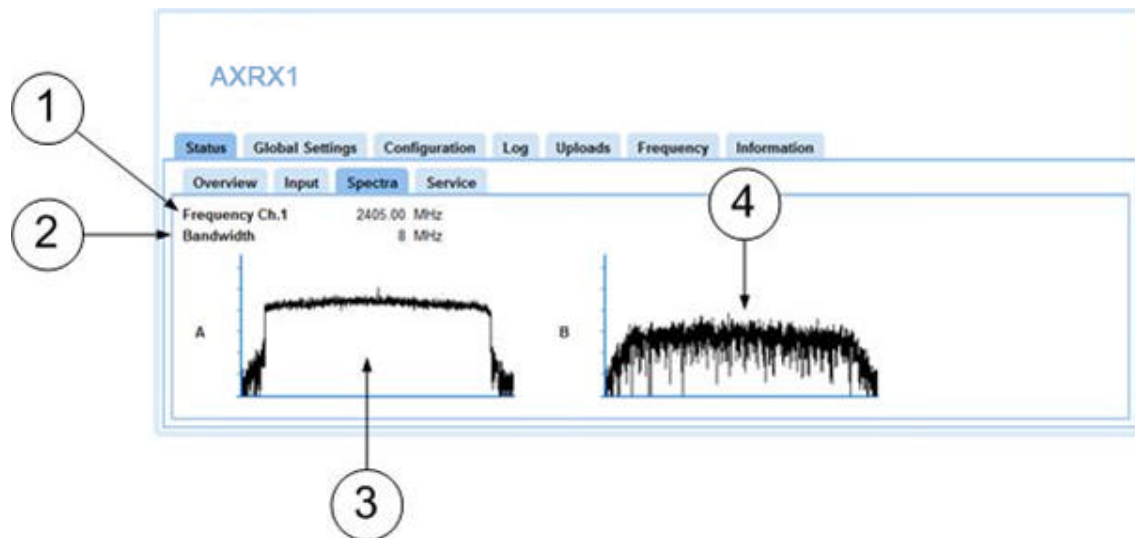
Figure 6-13 Status Tab showing Spectra Sub-Tab

No	Name	Options	Notes
1	Frequency (MHz).	2, 5.8, 6.4, 7.1GHz	The frequency in megahertz (MHz) to which the receiver is currently tuned.
2	Bandwidth.	DVBT:\n\n6, 7 and 8MHz	DVB-T bandwidths (normally used for broadcast).
3	Spectrum Display for channel A.	Displays for the A and B antennas are shown in my example, but there may be up to six displays here, A to G.	When tuned in correctly you'll expect to see the classic 'Top Hat' or "Bart Simpson" display of a COFDM waveform as shown.
4	Spectrum for channel B.		Channel B has been disconnected here to show you what a noisy channel looks like. Compare this to the COFDM waveform in channel A.

Table 6-10 – Spectra Sub-tab Key

Step 12: Open the Service Sub-Tab

Click on, **Status** > **Service** tab.

Screenshot: Service Sub-Tab

Figure 6-14 Status Tab showing Service Sub-Tab
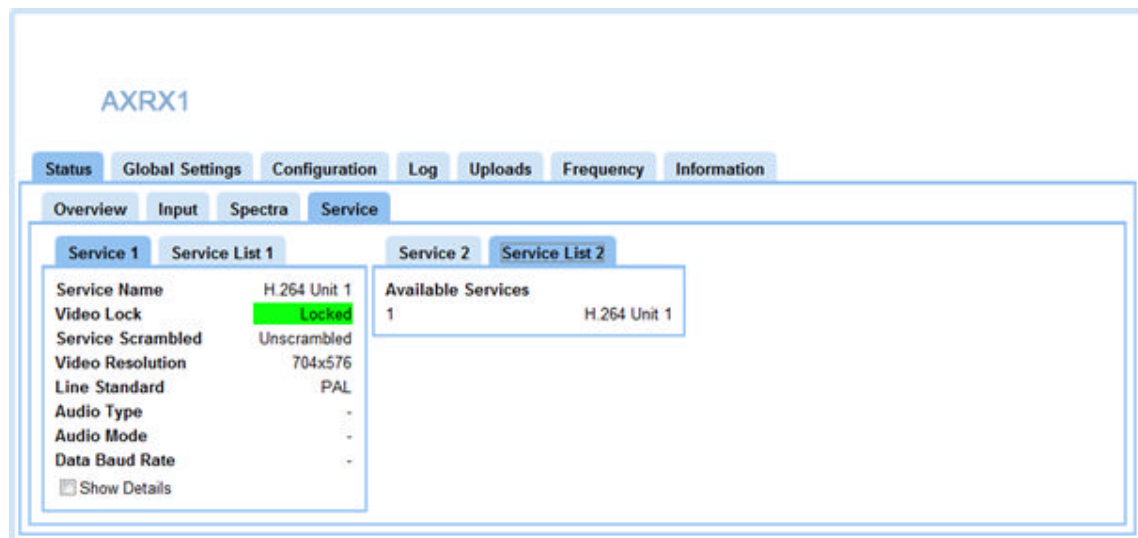
Step 13: Interpreting the Service 1 Pane

Screenshot: Service 1 Pane
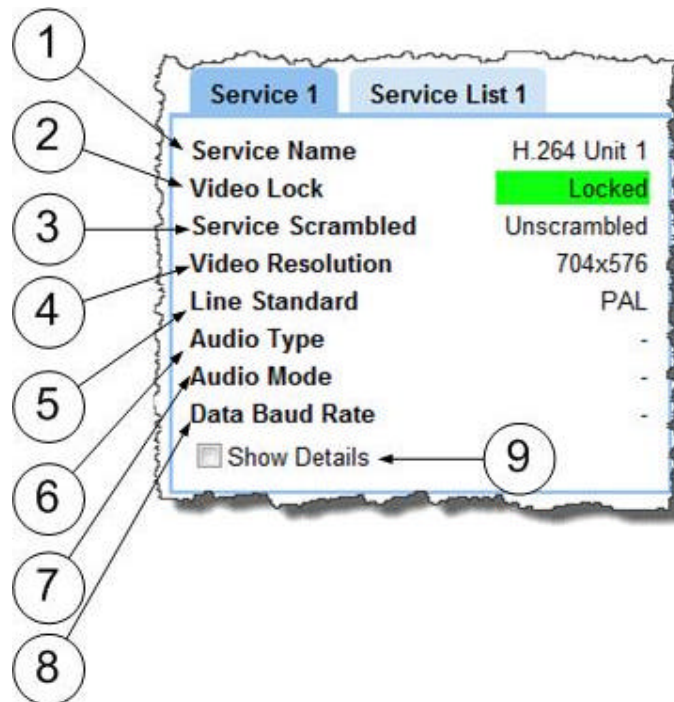
Figure 6-15 Service Sub-Tab showing Service 1 Pane

No	Name	Options	Notes
1	Service Name	H.264 Unit 1 is default but could be anything.	Displays the current received and decoded service name from the incoming service.
2	Video Lock	Locked (steady green background) or Not Locked (steady red background.	Tells you if the unit is successfully decoding the incoming video signal.
3	Service Scrambled	Scrambled or Unscrambled	Not Applicable
4	Video Resolution	704x576 or any valid video resolution.	Reports the video resolution of the video that was set at the transmitter.

No	Name	Options	Notes
5	Line Standard	SD: PAL or NTSC HD: 720p50, 720p59, 720p60, 1080i50, 1080i59, 1080i60, 1080p23, 1080p24, 1080p25, 1080p29, 1080p30, 1080psf23, 1080psf24, 1080psf25, 1080psf29, 1080psf30	Reports the video format that was set at the transmitter. (*Please insure that the camera and the transmitter are both set to the same video format*)
6	Audio Type	MPEG Layer 1, MPEG Layer 2	Reports the type of the audio that was set at the transmitter.
7	Audio Mode	Stereo or Mono	Reports the mode of the audio that was set at the transmitter.
8	Data Baud Rate	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200	Reports the baud rate of the date that was set at the transmitter.
9	Show Details Checkbox	Checked or Unchecked.	When checked, you'll see a lot more detail in the Service 1 Pane. You may want to leave this unchecked to reduce clutter on the screen.

Table 6-11 – Service 1 Sub-tab Key

Step 14: Check the Show Details Checkbox

When checked, the extra details about the Service 1 Pane on this page are displayed.

Screenshot: Service 1 Pane, Show Details Checked
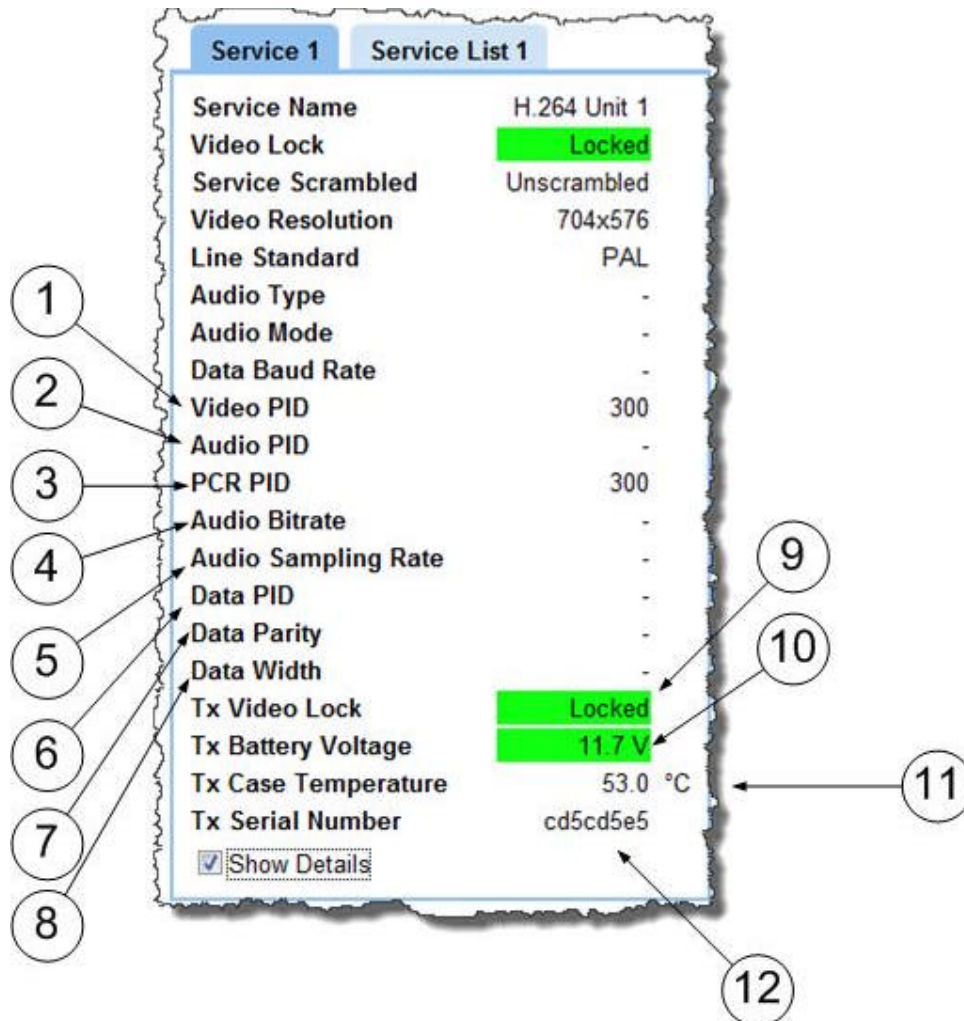
Figure 6-16 Service 1 Pane with Show Details Checked

No	Name	Options	Notes
1	Video PID	Default or 0x0020 to 0x1FFE	Each table or elementary stream in a transport stream is identified by a 13-bit packet ID (PID). This is set at the transmitter.
2	Audio PID	Default or 0x0020 to 0x1FFE	Each table or elementary stream in a transport stream is identified by a 13-bit packet ID (PID). This is set at the transmitter.

No	Name	Options	Notes
3	PCR PID PCR=Program Clock Reference	Default or 0x0020 to 0x1FFE	Each table or elementary stream in a transport stream is identified by a 13-bit packet ID (PID). This is set at the transmitter. Used to sync the audio and video. The PCR keeps the system clock synced. If the clock starts to drift, it is rectified using the PCR value.
4	Audio Bitrate	64, 96, 128, 160, 192, 224, 256, 288, 320, 352, 384, 416 and 448kbits/s are examples of MPEG L1 bit-rates.	Reports the audio bitrate that has been set at the transmitter. This is the MPEG audio encoding bit-rate. Generally the higher the number the better the quality.
5	Audio Sampling Rate	44.1kHz, 48kHz or 32kHz	Reports the audio sampling rate that has been set at the transmitter.
6	Data PID	Default or 0x0020 to 0x1FFE	Each table or elementary stream in a transport stream is identified by a 13-bit packet ID (PID). This is set at the transmitter.
7	Data Parity	None, Even, Odd	This is the parity of serial data running through the unit. This normally must match the data device you are planning to use. Reports the Data parity that has been set at the transmitter.
8	Data Width	7 or 8 bit	8 bit is standard and 7 bit is available to allow interoperability with third party equipment. Reports the Data Width that has been set at the transmitter.
9	TX Video Lock	Locked (steady green background) or Not Locked (steady red background.	Tells you if the **transmitter** has successfully locked to an incoming video signal. This does not mean this receiver necessarily has video lock.

No	Name	Options	Notes
10	Battery Voltage	Any voltage on a green or red field background.	This indicator reports the current voltage of the **transmitter's** battery in VDC. If the indicator's background is green, the voltage is within limits. If the background shows red, then the voltage is too low and the unit will fail to operate correctly. The voltage alarm threshold is set in **Global Settings**>**General Settings**>**TX Battery Alarm(v)**
11	TX Case Temperature	Any temperature	This indicator reports the current temperature of the **transmitter** case in degrees Celsius.
12	TX Serial Number	Any valid electronic serial number (ESN).	The ESN is used for licencing. We may ask you for this number during a support call or for a feature upgrade.

Table 6-12 – Service 1 Pane with Show Details Key

Step 15: Configuring the Service List 1 Pane

Screenshot: Service List 1 Pane

Figure 6-17 Service Sub-Tab showing Service List 1 Pane

No	Name	Options	Notes
1	Available Services	Any Valid Service	Provides a list of services which have been recovered from the transport stream and are available for decoding.

Table 6-13 – Service List 1 Pane Key

> **Note**: Service 2 and Service List 2 work in exactly the same way as Service 1 and Service List 1.

6.7   Working with the Global Settings Tab

The Global Settings tab contains parameters that control global unit features common to all presets, including down converter settings, IP settings, streaming settings and OSD configuration for example.

The Global Settings tab is divided into six panes:

- General Settings
- Down converter Settings
- IP Settings
- Streaming Settings
- OSD Settings
- Genlock Settings

Before you Begin

You'll need:

- To have connected your computer to the AXRX1 using the IP interface.
- To be logged on to the AXRX1 unit.

Step 1: Open the Global Settings Tab

Click on the **Global Settings** tab.

Screenshot: Global Settings Tab
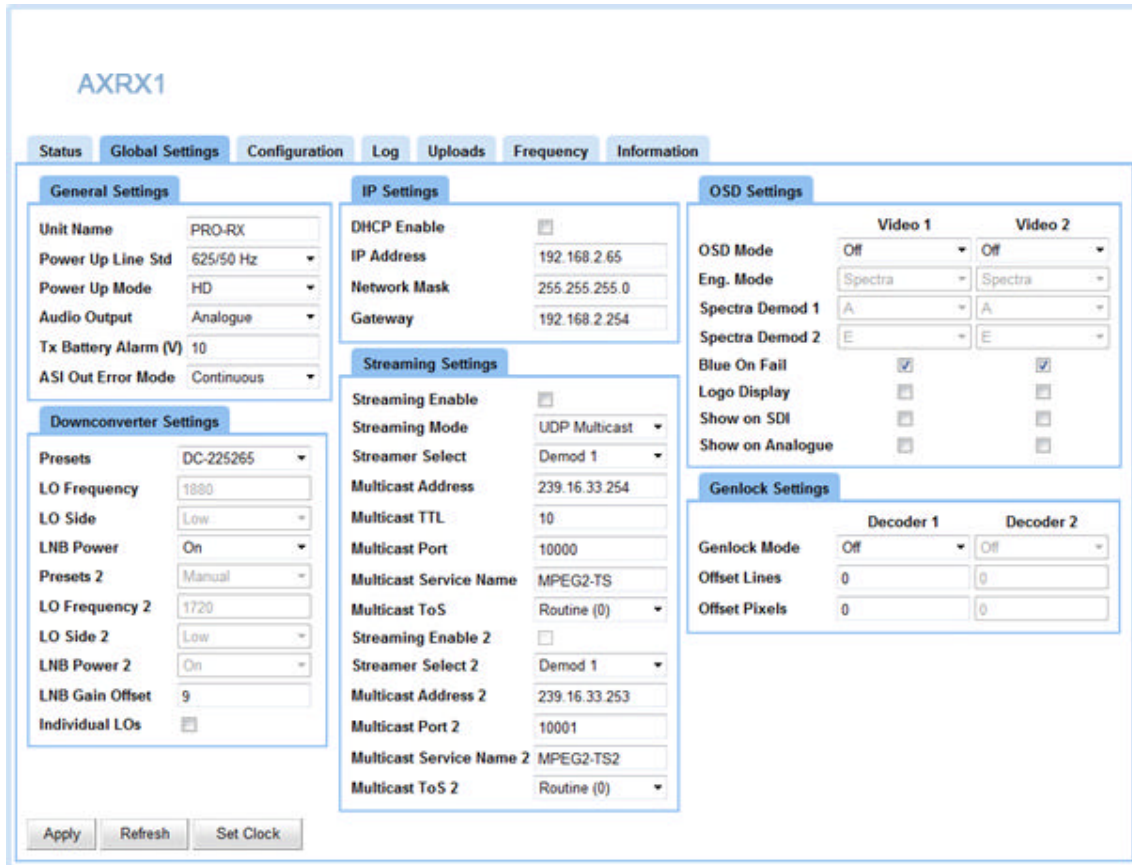
Figure 6-18 Global Settings Tab

Step 2: Configuring the General Settings Pane

Screenshot: General Settings Pane
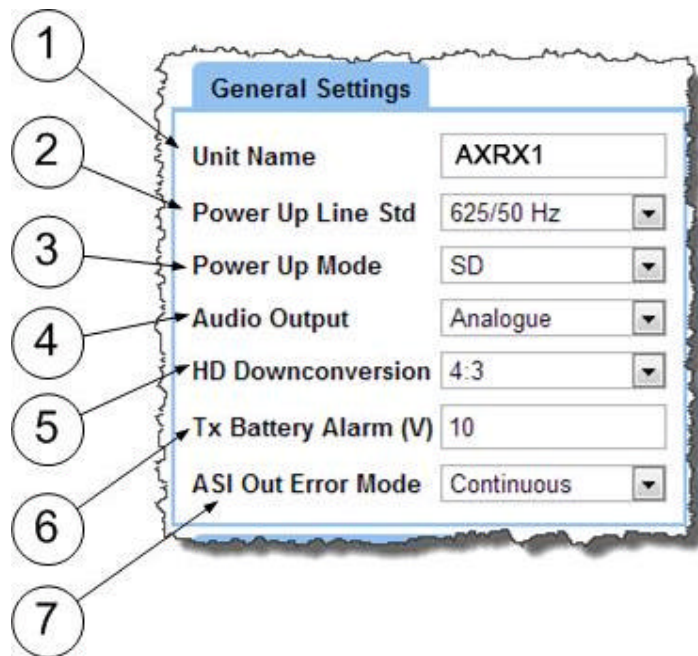
Figure 6-19 General Settings Pane

No	Name	Options	Notes
1	Unit Name	AXRX1 or any combination of characters.	The name for the receiver. Used when the AXRX1 is streaming to identify the source.
2	Power Up Line Std.	625/50 Hz or 525/59 Hz.	The television line standard that the receiver will start up with when first powered on. 625/50 Hz is PAL. 525/59 Hz is NTSC.
3	Power Up Mode	HD or SD.	The mode that the receiver will start up with when first powered on. HD is High Definition. SD is Standard Definition.
4	Audio Output	Analog or Digital	Select the audio mode to suit your operation.

No	Name	Options	Notes
5	HD Down Conversion	Off, 4:3 or 16:9	When licensed for HD down conversion, offers the option to enable and select the video output aspect ratio.
6	TX Battery Alarm (V)	Any value from 0 to 20V.	This number is the voltage at which the TX Battery Voltage caption turns red.
7	ASI Out Error Mode.	Continuous or Gapped.	Continuous – ASI data is always passed but if in error it is flagged. Gapped – ASI output only passes valid data.

Table 6-14 – General Settings Pane Key

Step 2: Configuring the Down converter Settings Pane

Screenshot: Down converter Settings Pane
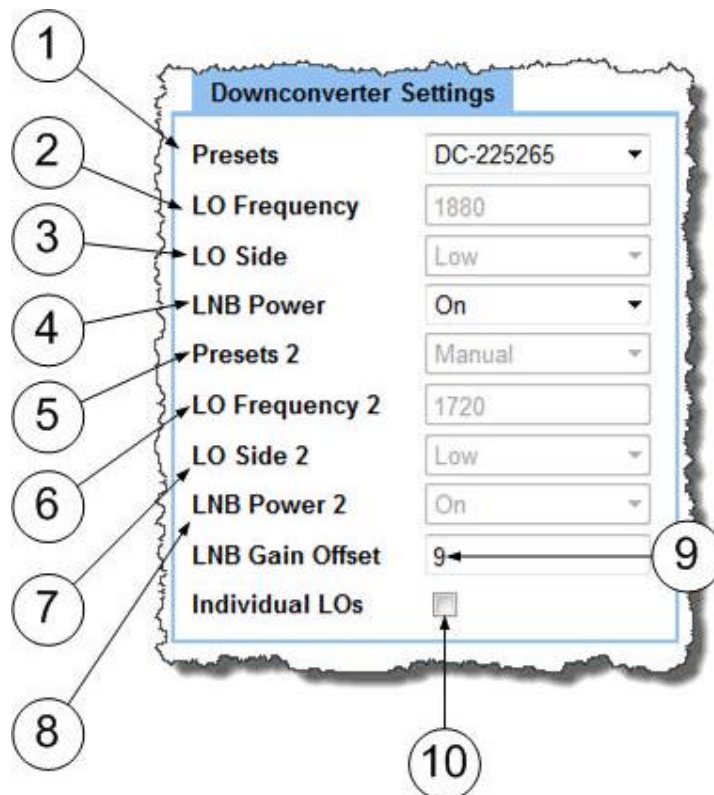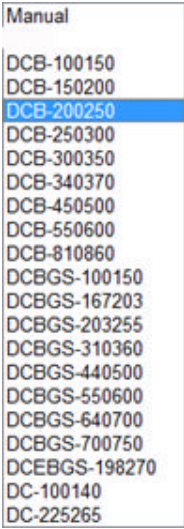

Figure 6-20 Down converter Settings Pane

No	Name	Options	Notes
1+6	Presets	Manual DCB-100150 DCB-150200 **DCB-200250** DCB-250300 DCB-300350 DCB-340370 DCB-450500 DCB-550600 DCB-810860 DCBGS-100150 DCBGS-167203 DCBGS-203255 DCBGS-310360 DCBGS-440500 DCBGS-550600 DCBGS-640700 DCBGS-700750 DCEBGS-198270 DC-100140 DC-225265	If you select **Manual** it means you will have to type in the LO Frequency and LO Side in the next two fields yourself. You might do this for an unusual frequency that requires an odd down converter. The easiest thing to do is select your down converter from the list. Then the LO Frequency and LO Side will be automatically selected for you. Check the label on your down converter to see which model you have.
2+7	LO Frequency (MHz)	1880 or any valid down converter frequency.	All our receiver units use **down converters** to lower the frequency from microwave to an intermediate frequency (IF) between 51 and 858MHz that the on-board tuners in the receivers can demodulate the converted RF signals. We get this information from the down converter frequency and side table in Appendix D – Reference Material.
3+8	LO Side	Low or High	We need to set which side (of the expected incoming frequency) the LO frequency will be. In my example the incoming frequency I want to receive is 2.25GHz to 2.65 GHz. I've selected a DC-225265 down converter whose LO Frequency is 1880MHz. Now, 1880MHz is *lower* than 2.25GHz, so I set the LO side to be **Low**. We get this information from the down converter frequency and side table in Appendix D – Reference Material.

No	Name	Options	Notes
4+9	BDC Power	On or Off	The down converters up on the mast need power. We send this up the IF line. We call it LNB power and here is where you turn it on. BDC= Block Down Converter. You may want to turn BDC power off if you are using a third party down converter that has its own power supply for example.
5+10	BDC Voltage	9V or 12V	When unit is fitted with latest tuner PCBs, the BDC voltage is selectable.
11	BDC Gain Offset	9 typically, but any value to suit the down converter you are using.	Most down converters introduce gain to the RF path. A DCB-200250 for example introduces 9dB in its standard gain version and 19dB in the high gain version. The signal strength gain will depend on how long the IF cable is.
12	Individual LOs	Checked or Unchecked	When unchecked the LO Frequency and LO Side apply globally to all down converters attached to the receiver. When checked, new fields open up to enable you to set individual LO Frequencies and LO Sides for each down converter. This means you could have one half of the antennas set up for one frequency band and the other antennas, set for another frequency band.

Table 6-15 – Down converter Settings Pane Key

Step 3: Checking the Individual LOs Checkbox

When checked, the extra fields which enable individual LO Frequencies are displayed. In addition, you'll find a checkbox which enables you to invert the COFDM spectrum.

Screenshot: Down converter Settings Pane, Individual LOs Checked
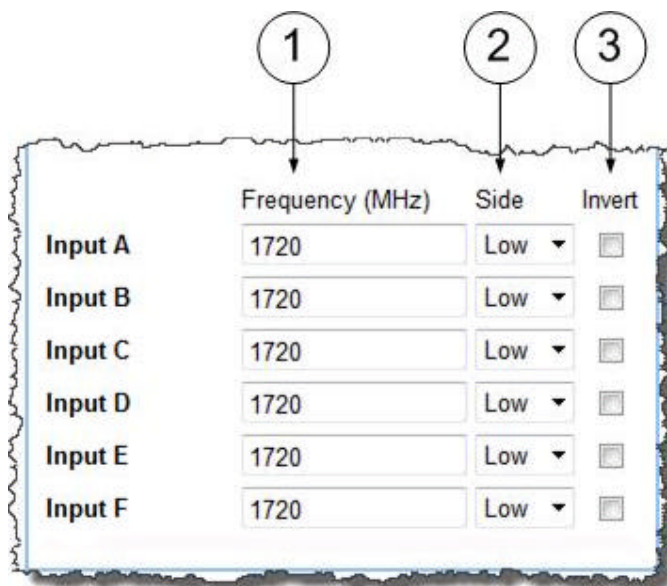
Figure 6-21 Down converter Settings Pane with Individual LOs Checked

No	Name	Options	Notes
1	LO Frequency (MHz)	1720 or any valid down converter frequency.	All our receiver units use **down converters** to lower the frequency from microwave (L, S and C-Band) to an Intermediate Frequency (IF) between 51 and 858MHz that the on-board tuners in the receivers can use. We get this information from the down converter frequency and side table in Appendix D – Reference Material.
2	LO Side	Low or High	We need to set which side (of the expected incoming frequency) the LO frequency will be. We get this information from the down converter frequency and side table in Appendix D – Reference Material.

No	Name	Options	Notes
3	Invert	Checked or Unchecked	Checked=Inverted Unchecked=Normal The receivers can be used with other manufacturer's products and sometimes this requires us to change the polarity to inverted to match this third party equipment.

Table 6-16 – Individual LO Settings Key

Step 4: Configuring the IP Settings Pane

Screenshot: IP Settings Pane
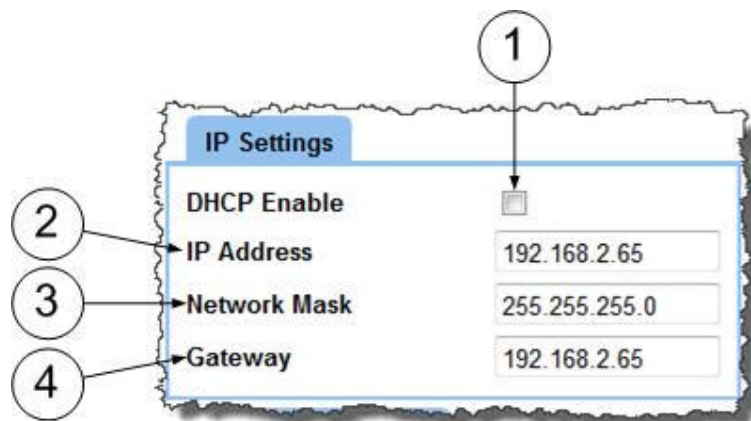
Figure 6-22 IP Settings Pane

No	Name	Options	Notes
1	DHCP Enable (Dynamic host configuration protocol)	Checked or Unchecked	When checked the AXRX1 is given an IP address by an external DHCP server. In managed networks which use DHCP address allocation this option should be selected. In networks that are manually managed (or do not feature a DHCP server), users may prefer to assign an IP address manually.

No	Name	Options	Notes
	IP Address	Example: 192.168.2.65	If the AXRX1 is not automatically acquiring its IP address via a DHCP server then a fixed IP address needs to be assigned to the unit Enter an **IP address** for this AXRX1 in the IP address text box. It can be any class of network you choose.
	Network Mask	Example: 255.255.255.0	The network mask allows a network administrator to break a network into smaller more efficient subnets to prevent excessive numbers of IP packets being routed through the network. This is normally defined by the network administrator Enter a **subnet mask** in the Network mask text box.
	Gateway	Example: 192.168.2.254	A default gateway is used by a host when an IP packet's destination address belongs to someplace outside the local subnet. The default gateway address is usually an interface belonging to the LAN's border router. We recommend you leave the gateway at the same setting as the IP Address. Note, for correct streaming operation, a valid Gateway address within the IP subnet range must be set, either manually or via DHCP.

Table 6-17 – IP Settings Pane Key

Step 5: Configuring the IP Streaming Settings Pane

Screenshot: IP Streaming Settings Pane
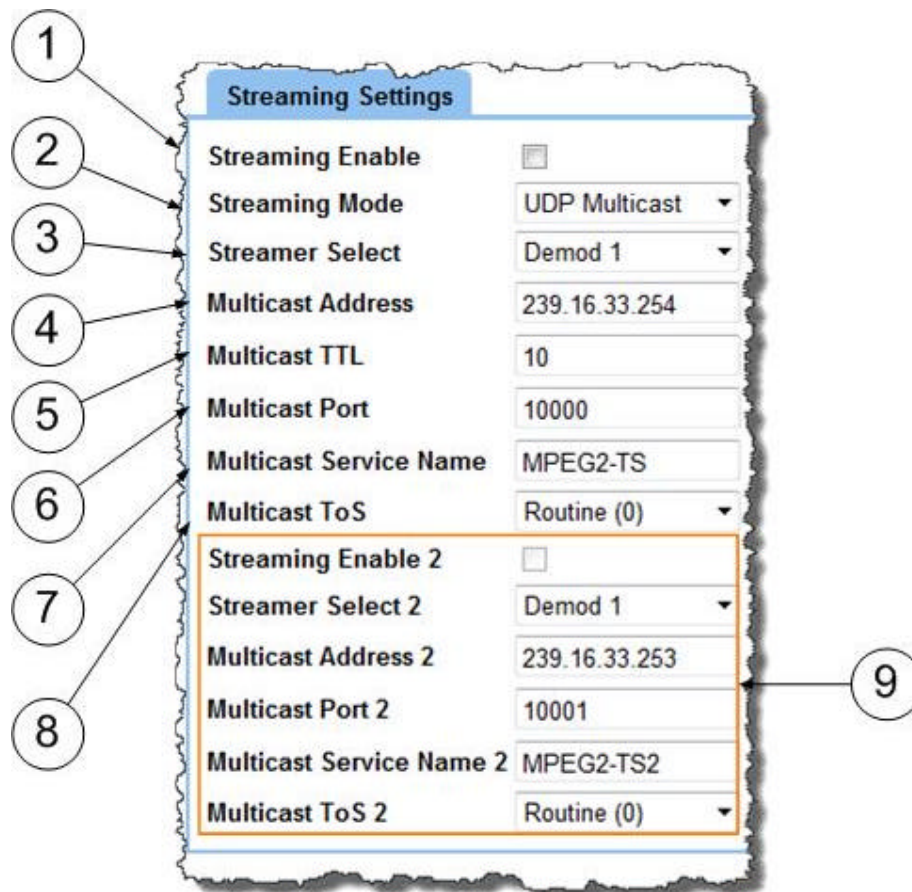
Figure 6-23 Streaming Settings Pane

No	Name	Options	Notes
1	Streaming Enable	Checked or Unchecked	Switches the streaming feature on or off.
			Note: The AXRX1 must be licensed for Streaming. If it is not, you won't be able to enable Streaming. In addition, for correct streaming operation, a valid Gateway address within the IP subnet range must be set, either manually or via DHCP.
2	Stream Mode	UDP Multicast or RTSP Multicast or RTSP Unicast	Select the streaming mode you want to use.

No	Name	Options	Notes
3	Streaming Select	Demod 1 ASI Input Descrambler 1 Remux Remux Decrypted	You choose the source that will provide the stream from this box. Demod 1 for example means the stream will come from the first receiver channel.
4	Multicast Address	239.16.33.254	This text box enables you to change the multicast address used by the unit. The default value is 239.16.33.254. It is also possible to Unicast by specifying a valid destination IP address within the local subnet range.
5	Multicast TTL	1 to 255 Default is 10	This is the multicast time to live value. Default 127.
6	Multicast Port	10000 Range available is 1-65535	Protocols like TCP or UDP use port numbers in the header to direct traffic around the network. Low port numbers are used by computer systems for predefined tasks. For example SMPT (for your email service) uses port 25. A good rule is to use numbers above 10,000 to avoid conflict with existing services. When you set up a port number on several computers on a network they will all listen for packets directed to that port. The default values are 10000 and 10001.
7	Multicast Service Name	Up to 20 ASCII characters.	The defaults are MPEG2-TS and MPEG2-TS2. This is an identifier for the service.
8	Multicast ToS	Routine (0) Priority (1) Immediate (2) Flash (3) Flash Override (4) Critical (5) Internetwork Control (6) Network Control (7)	The priority for the Multicast can be set here.

No	Name	Options	Notes
9	Channel 2		All the controls are exactly the same for the second channel.

Table 6-18 – Streaming Settings Pane Key

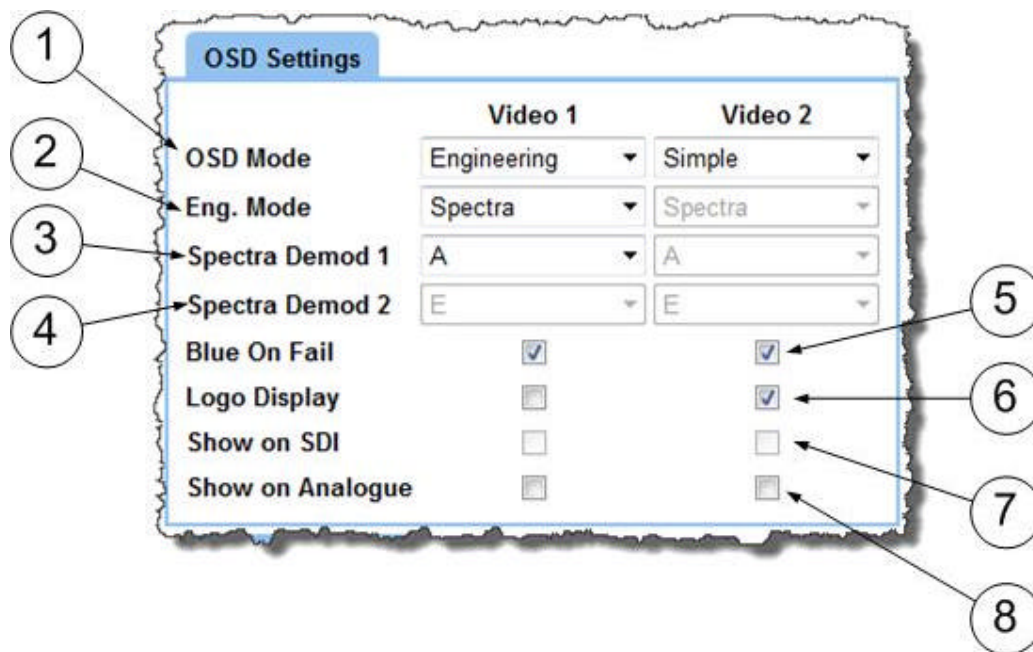## Step 6: Configuring the OSD Settings Pane

Screenshot: OSD Settings Pane

Figure 6-24 OSD Settings Pane

No	Name	Options	Notes
1	Mode	Off Simple Detailed Engineering	You can choose how much detail is displayed on the On Screen Display (OSD). You can also switch the OSD off.

No	Name	Options	Notes
2	Eng. Mode	Spectra Scan GPS/TX Data	If you selected **Engineering** in **Mode** earlier, these fields become active. Spectra – Displays a graph on the OSD of the spectra being received for the antenna selected. Scan – Displays the frequency scanner on the OSD similar to the display under the frequency tab. GPS/TX Data – Displays metadata and GPS data from the transmitter on the OSD. The TX must be configured to send metadata and data must be in valid NMEA format.
3	Spectra Demod 1	A to F	The Demodulator 1 OSD Spectrum display can be set to show antenna A to F.
4	Spectra Demod 2	A to F	The Demodulator 2 OSD Spectrum display can be set to show antenna A to F.
5	Blue On Fail	Checked or Unchecked	If the link is lost, a blue screen appears to alert you. Some broadcasters prefer not to have blue on fail set.
6	Logo Display	Checked or Unchecked	When checked, the Logo will be displayed in the OSD.
7	Show on SDI	Checked or Unchecked	When checked the OSD is displayed on the SDI output. You may want to turn this off if you are transmitting from this port. The OSD is only available if an SD video service is decoded. If the video is HD, the OSD can only be displayed on SDI Output 2 and HD Down conversion is enabled and selected.
8	Show on Analog	Checked or Unchecked	When checked the OSD is displayed on the Analog output. You may want to turn this off if you are transmitting from this port.

Table 6-19 – OSD Settings Pane Key

Step 7: Configuring the Genlock Settings Pane
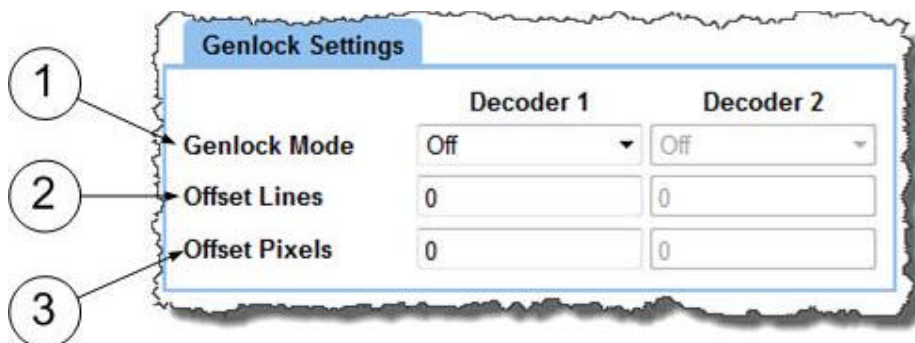
Screenshot: Genlock Settings Pane

Figure 6-25 Genlock Settings Pane

No	Name	Options	Notes
1	Genlock Mode	Off External Internal	Off=Genlock switched off and systems is not locked. External=Using the Genlock source connected to the external port on the back of the receiver. This is normally your house reference signal. Internal=Using the receiver's own Genlock source built into the unit.
2	Offset Lines	0	Standard dependant. Enables you to make timing adjustments.
3	Offset Pixels	0	Standard dependant. Enables you to make timing adjustments.

Table 6-20 – Genlock Settings Pane Key

Step 8: Use the Apply Button Consistently

Each time you change any parameter on the Control Application it is **very important** to click the **Apply** button and wait for a moment for the changes to be sent to the device.

Many times people change a parameter and then wonder why the device has not changed behavior. **Always** click the **Apply** button.

Step 9 – About the Refresh Button

The browser software will check with the device every few seconds so it can update the Control Pages with the latest changes.
To force a refresh of the control pages you'll need to click the **Refresh Button.**

6.8   Setting the Clock

Before you Begin

You'll need:

- To have connected your computer to the AXRX1 using the IP interface.
- To be logged on to the AXRX1 unit.

Step 1: Open the Global Settings Tab

Click on the **Global Settings** tab.

Step 2: Setting the Clock

1. Click the **Set Clock** button.
2. The **Set Clock** dialog opens.
3. Click the **Date** box.
4. The **Calendar** opens.
5. Select the date you require.
6. In the **Time** box, enter the current time.
7. Ensure you use the correct time format! (hh:mm:ss).
8. In the **Time Zone** drop-down box, select the time zone you require.
9. In the Daylight Savings drop-down box, select the setting you require. (Off, 1 hour or 2 hours).
10. Click the **Set** button.
11. The **Clock Set Successfully** message opens.
12. Click the **OK** button.

Screenshot: Setting the Clock
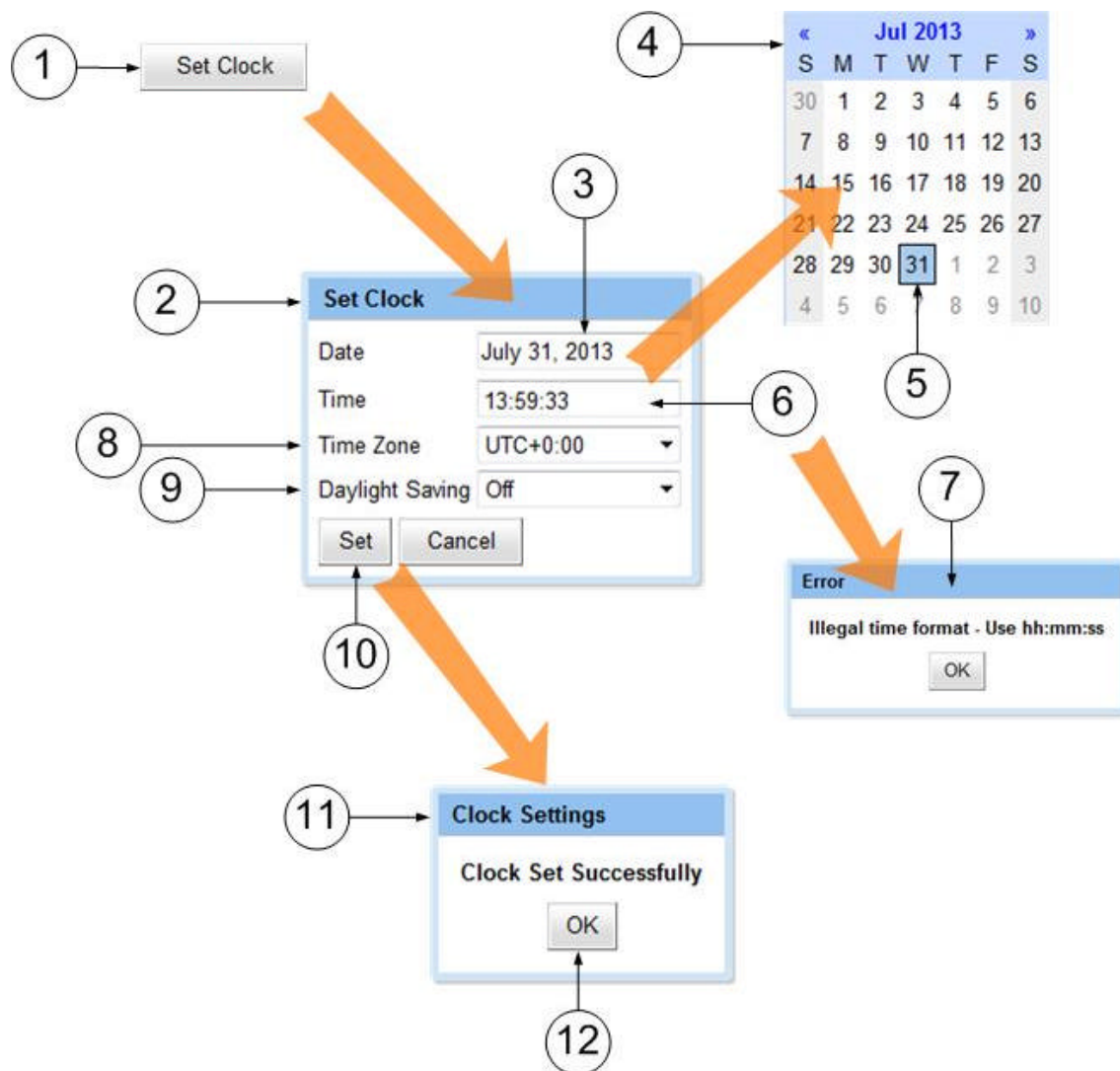
Figure 6-26 Set the Clock

6.9 Working with the Configuration Tab

The Configuration tab contains the list of 16 presets. Each preset enables you to specify demodulation parameters, decoding modes, and descrambling configuration.

You can easily load a different preset by selecting one of the 16 configuration tabs and clicking the **Apply** button.

The **Live** preset is indicated by a **green box** around the preset number.

Changes to the live preset are automatically applied with the **Apply** button. Changes made to all other non-live presets can be saved by clicking on **Save**.

The Configuration tab is divided into five panes:

- Basic Configuration

- Demod 1 Configuration

- Decoder 1 Configuration

- Demod 2 Configuration

- Decoder 2 Configuration

Before you Begin

You'll need:

- To have connected your computer to the AXRX1 using the IP interface.

- To be logged on to the AXRX1 unit.

Step 1: Open the Configuration Tab

Click on the **Configuration** tab.

Screenshot: Configuration Tab

Figure 6-27 Configuration Tab

Step 2: Understanding the Preset Tab Colors

1. The **green box** shows which preset is currently **active** in the receiver.

2. The **light blue** tab shows presets available for you to use (There are 16).

3. The **dark blue** tab shows the preset you are currently **editing**.
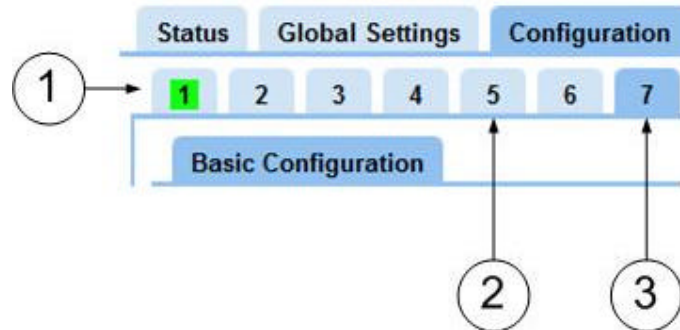
Figure 6-28 Preset Tab Colors

Step 3: Making a Different Preset Available for Editing

1. Click on any **light blue** tab

2. The tab turns **dark blue** and you are now **editing** that preset

Step 4: Making a Different Preset Active on the Receiver

1. Click on **any tab** other than the green one.

2. Click the **Apply** button

3. The tab turns **green** and that preset is now **active** on the receiver.

Step 5: Configuring the Basic Configuration Pane

Screenshot: Basic Configuration Pane
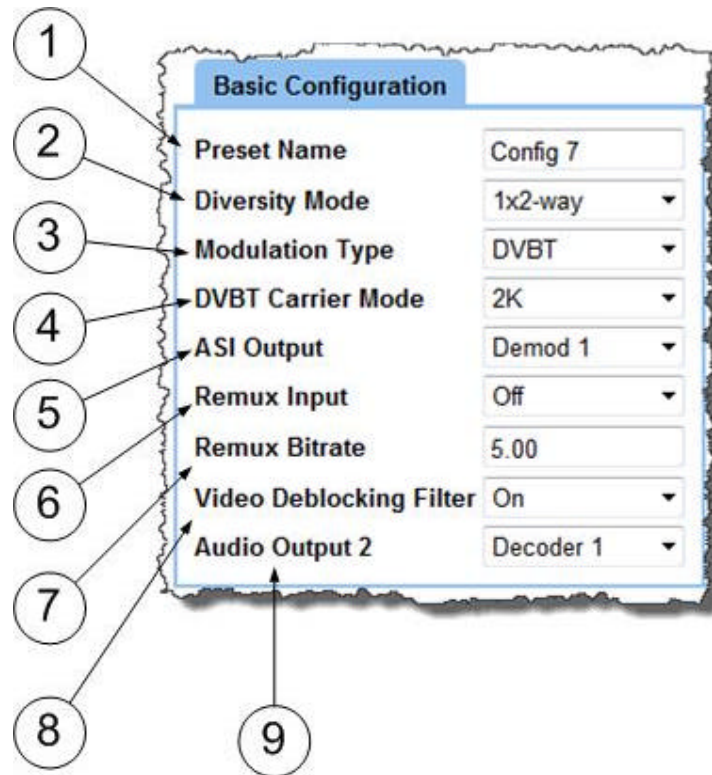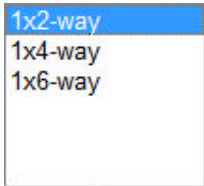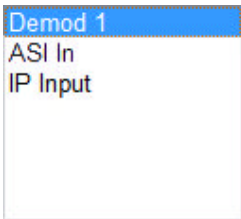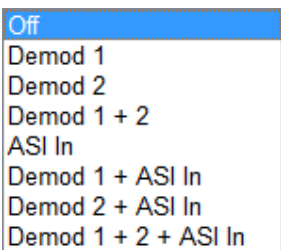
Figure 6-29 Basic Configuration Pane

No	Name	Options	Notes
1	Preset Name	Config 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	This is where you **set** the current configuration.
2	Diversity Mode	1x2-way 1x4-way 1x6-way	The configuration of the diversity and channel arrangement of the receiver.
3	Modulation type	DVBT	Choose the modulation bandwidth you want to use.

No	Name	Options	Notes
4	DVBT Carrier Mode	2K or 4K	If you selected DVBT as your Modulation Type earlier, you can now select how many carriers will be used. 2K=About 2000 4K=About 4000 (dual pedestal mode)
5	ASI Output	Demod 1 / ASI In / IP Input	The source for the ASI output is selected here. For example if you choose Demod 1, then this will provide an ASI signal to the ASI Out port. If you choose Remux, the ASI Output will be made up of whatever you configure in the next field, Remux Input.
6	Remux Input	Off / Demod 1 / Demod 2 / Demod 1 + 2 / ASI In / Demod 1 + ASI In / Demod 2 + ASI In / Demod 1 + 2 + ASI In	This field enables you to select what you want to go into the Remux. You can combine sources to be remuxed into a single ASI stream. For example, **Demod 1+ASI** in would enable you to have received pictures being combined with a signal from the ASI input port, all being sent to the ASI Output port. For correct operation all PIDs present in the input streams must be unique.
7	Remux Bitrate	5.00	If you have selected **Remux** in **ASI Output** (item 5 in this table) earlier, then this field will become active and will enable you to set the bitrate for the Remux stream leaving the ASI Output port. You may have remuxed two video signals together which you are then planning to transmit forwards. You could configure the Remux Bitrate to suit your transmitter bandwidth then ensure the two signals you are going to Remux will fit into that space. For correct operation, the bitrate must be equal or higher than the combined bitrate of all input streams.

No	Name	Options	Notes
8	Video De-blocking Filter	Off or On.	MPEG ASP mode only. Filter which by default is on, helps provide a softening effect on sharp edged boundaries.
9	Audio Output 2	Decoder 2 or Decoder 1	Mapping the second audio physical output to an audio stream source. Also selects which audio service is embedded on SDI channels 3 and 4. If service contains two audio streams, select Decoder 1.

Table 6-21 – Basic Configuration Pane Key

Step 6: Configuring the Demod 1 Configuration Pane

Screenshot: Demod 1 Configuration Pane in each Possible Configuration
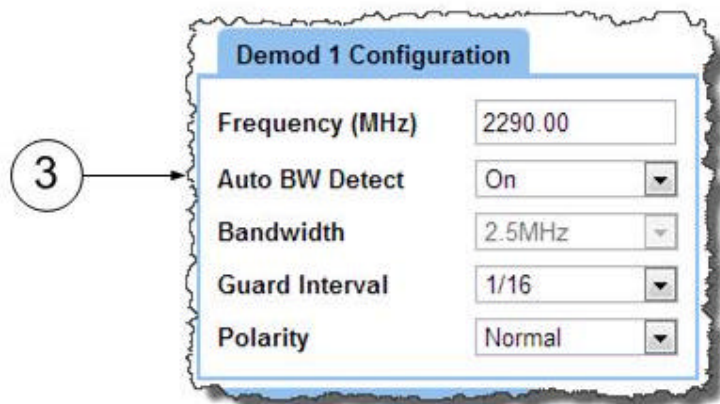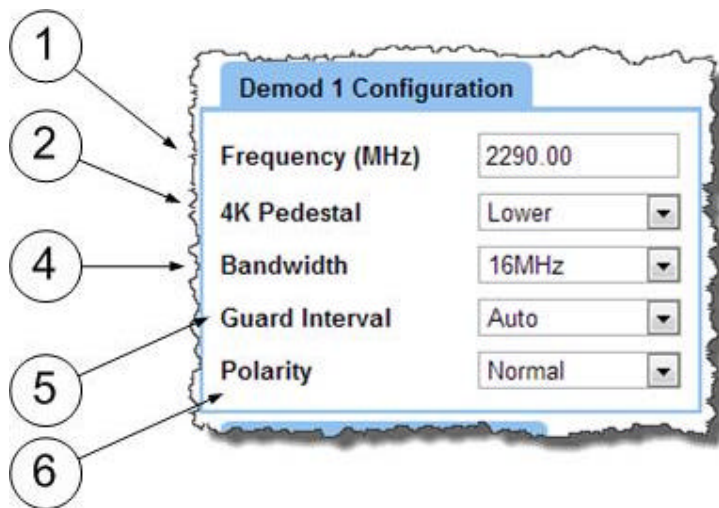
Figure 6-30 Demod 1 Configuration Panes

No	Name	Options	Notes
1	Frequency (MHz)	2, 5.8, 6.4, 7.1GHz	The frequency in megahertz (MHz) that you want to use for this preset.
			If you try to input a frequency that is out of range, the radio will tune the nearest available frequency automatically.
2	4K Pedestal	Lower or Upper	DVBT only and if licensed for dual pedestal mode. Selects which pedestal is demodulated wrt the center frequency.
3	Auto BW Detect	Off or On	When on, the receiver will attempt to automatically detect the bandwidth.
4	Bandwidth	DVBT:6, 7 & 8MHz	DVB-T bandwidths (normally used for broadcast)
5	Guard Interval	DVBT: 1/32, 1/16, 1/8, 1/4	The guard interval is a deliberate extension of the RF symbol period to give increased immunity to multipath reflections.
			1/32, short extensions, deals with fast reflections, more data, less range.
			1/8, long extensions, deals with slower reflections, less data, more range.
			Always use the 1/8 setting with more than 2 antennas.
6	Polarity	Normal Inverted Auto	The receivers can be used with other manufacturer's products and sometimes this requires us to change the polarity to inverted to match this third party equipment.
			If you select Auto the receiver will attempt to automatically select the correct format for you.

Table 6-22 – Demod 1 Configuration Pane Key

Step 7: Configure the Decoder 1 Configuration Pane

Screenshot: Decoder 1 Configuration Pane
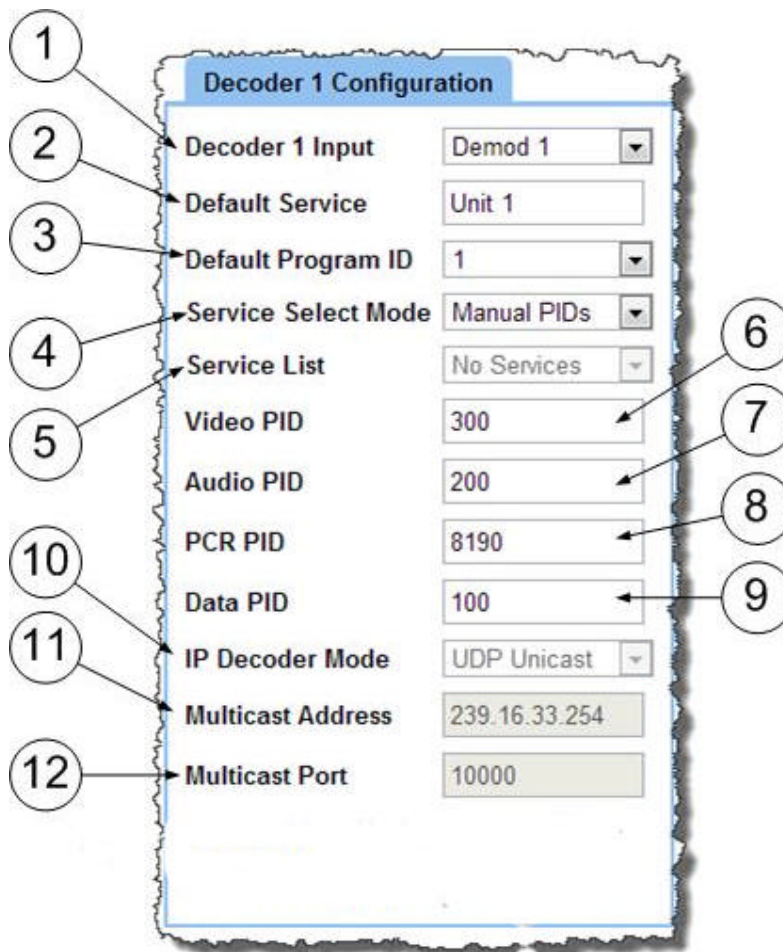
Figure 6-31 Decoder 1 Configuration Pane

No	Name	Options	Notes
1	Decoder 1 Input	Demod 1 Demod 2 ASI In IP In	Source feeding the decoder. Licence dependant.

No	Name	Options	Notes
2	Default Service	Up to 20 ASCII characters.	The default is Unit 1. If the received stream contains multiple services, this service name will be checked for a match and used as preference.
3	Default Program ID	1 to 10	This sets which program number in the transport stream will be used on initial power up. If the received stream contains multiple services, this program ID will be checked for a match and used in preference.
4	Service Select Mode	Defaults List Manual PIDs	This selects how services in the transport stream will be selected. Defaults – Uses Default Service name and Program ID as set earlier. List – Will show a list of available services in **Status** > **Service** > **Service List 1** or **2**. Manual PIDs - Enables you to select particular elements from the transport stream like alternate language audio.
5	Service List	H.264 Unit 1 for example.	If you have selected List in Service Select Mode earlier then this field will show a list of available services on the current Transport stream. The selected service from the list will be decoded.
6	Video PID	0x0020 to 0x1FFE	Set the manual Video service PID for decoding
7	Audio PID	0x0020 to 0x1FFE	Set the manual Audio service PID for decoding
8	PCR PID	0x0020 to 0x1FFE	Set the manual PCR PID for clock reference
9	Data PID	0x0020 to 0x1FFE	Set the manual Data service PID for decoding
10	IP Decoder Mode	UDP Unicast UDP Multicast	Only available if you have selected IP In under Decoder 1 input.

No	Name	Options	Notes
11	Multicast Address	239.16.33.254	This text box enables you to change the multicast address to be received by the unit. The default value is 239.16.33.254.
12	Multicast Port	10000 Range available is 1024-65535	Protocols like TCP or UDP use port numbers in the header to direct traffic around the network. Low port numbers are used by computer systems for predefined tasks. For example SMPT (for your email service) uses port 25. A good rule is to use numbers above 10,000 to avoid conflict with existing services. When you set up a port number on several computers on a network they will all listen for packets directed to that port. The default value is 10333.

Table 6-23 – Decoder 1 Configuration Pane Key

Note: Demod 2 and Decoder 2 Configuration are set up exactly the same as Demod 1 and Decoder 1.

6.10 Working with the Copy from Config Button

Sometimes you want to create a new configuration from one that already exists. For example, you may have a complex configuration you like to use but just need to change the frequency. The **Copy from Configuration** button makes this very simple.

Before you Begin

You'll need:

- To have connected your computer to the AXRX1 using the IP interface.
- To be logged on to the AXRX1 unit.

Step 1: Open the Configuration Tab

1. Click on the **Configuration** tab.
2. The Configuration Page opens
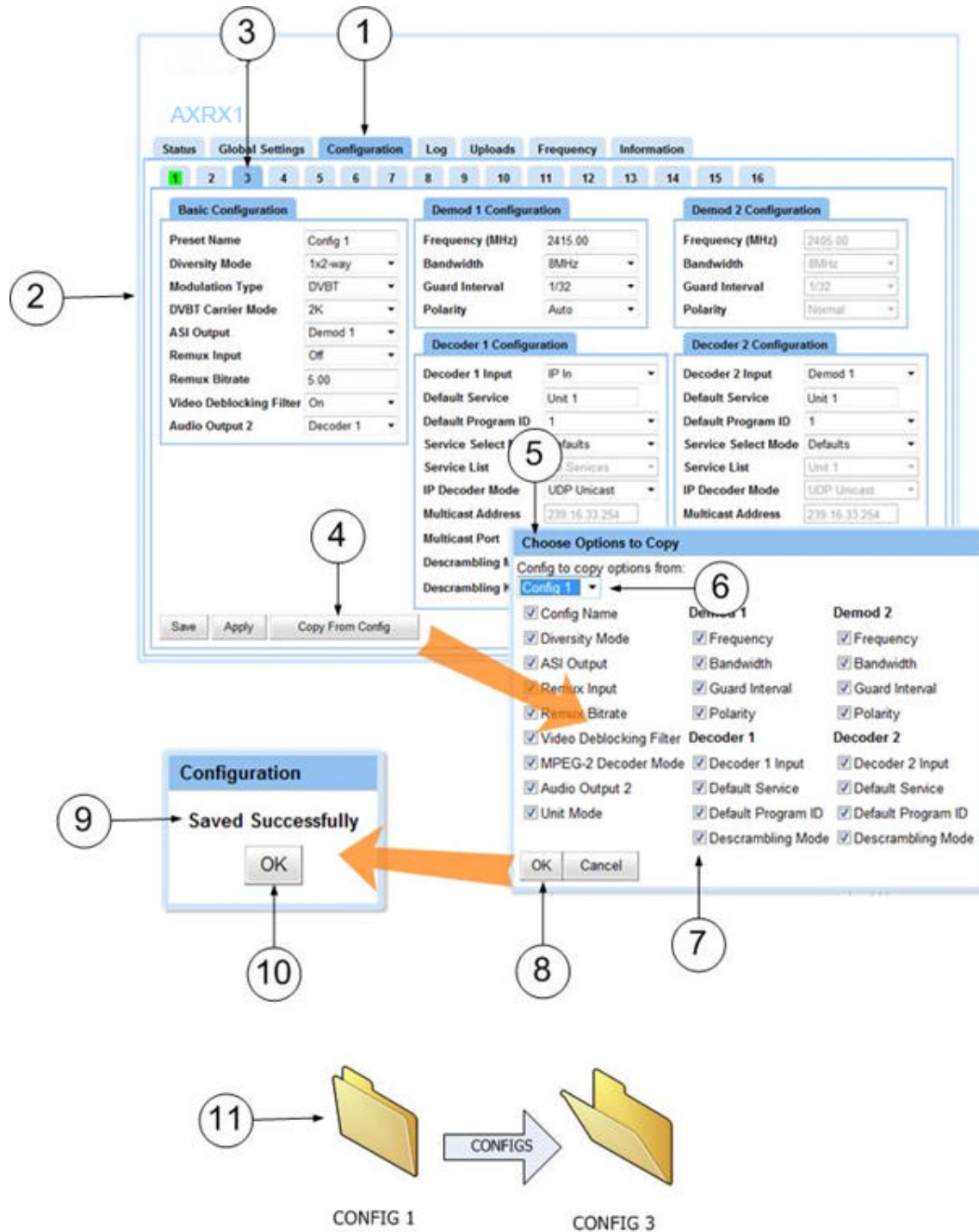
Figure 6-32 Working with the Copy from Config Button

Step 2: Select the Preset you want to Setup

3. Click on a **Config** tab. I've chosen config 3 in my example. It turns **dark blue** which means you are **editing** that configuration file.

Step 3: Open the Choose Options to Copy Window

4. Click the **Copy from Config** button.

5. The **Choose Options to Copy** window opens.

6. Choose a **Config** to copy options **from**. I've chosen Config 1 in my example.

7. **Check** any items you want to be copied **to** your new preset.

8. Click the **OK** button.

9. You'll see the **Saved Successfully** message box.

10. Click the **OK** button.

11. All the configs you selected from Config 1 are now pasted into config 3.

6.11 Working with the Log Tab

The AXRX1 receiver has the facility for generating log files of receiver status information.

Before you Begin

You'll need:

- To have connected your computer to the AXRX1 using the IP interface.
- To be logged on to the AXRX1 unit.

Step 1: Open the Log Tab

Click on **Log** tab.

Screenshot: Log Tab
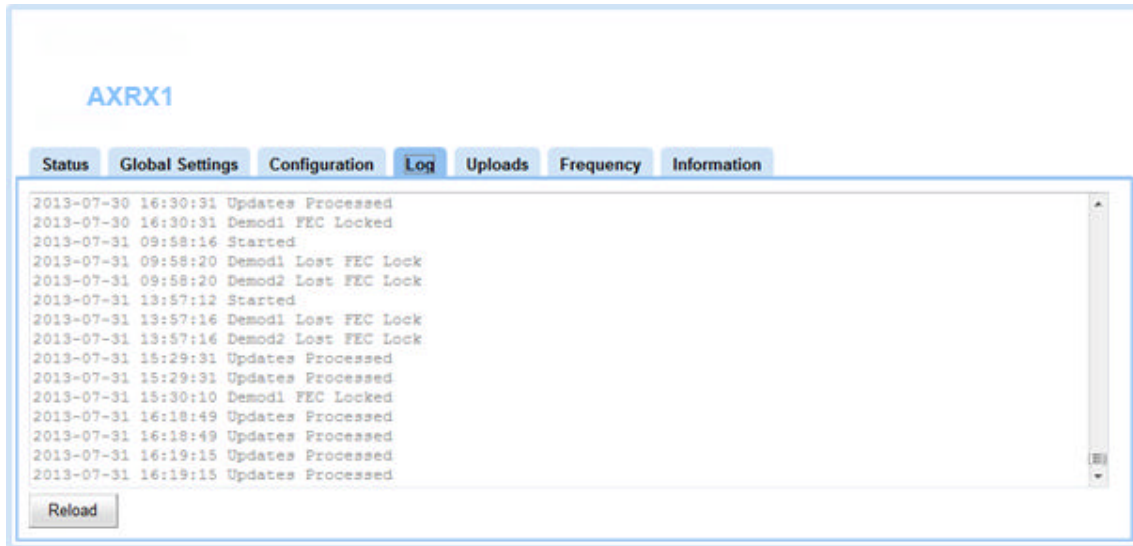
Figure 6-33 Log Tab

Step 2: Interpreting the Information displayed in the Log Tab

The log tab gives you a textual display of events with time information. The events logged include stream errors and software updates processed.

Step 3: Reload Button

Click the **Reload** button to force a reload of the page data.

6.12 Working with the Upload Tab

This page enables you to upload a license file, enable licensable features, or send software upgrade files to the AXRX1.

Before you Begin

You'll need:

- To have connected your computer to the AXRX1 using the IP interface.
- To be logged on to the AXRX1 unit.

Step 1: Open the Uploads Tab

Click on **Uploads** tab.

Screenshot: Uploads Tab
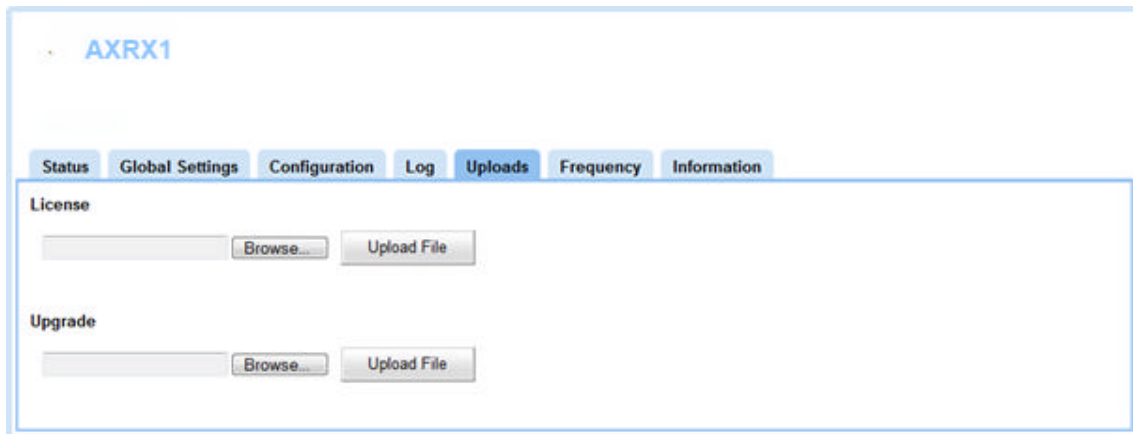
Figure 6-34 Uploads Tab

Step 2: Upload a New License File

If a new licensable feature is purchased for a unit then a new license code has to be programmed into the AXRX1 to enable the function.

We can generate a new license file (with the file extension .lic) which we will email to you.

1. Open the **Uploads** Tab.

2. Click the **Browse** button next to the **Licence** text box.

3. The **Choose File to Upload** window opens.

4. Navigate to the .lic file we emailed you.

5. Click **Open.**

6. Check the **correct file** is shown in the **Licence** text box.

7. Click **Upload File.**

8. The licence is written to the unit, you'll see a **message.**

9. After rebooting the unit, the new features will be enabled.

Step 3: Upgrade your AXRX1

When a new software release is available for the AXRX1, we can supply customers with a software upgrade.

We can generate a new upgrade file (with the file extension .upg) we will email to you.

1. Open the **Uploads** Tab.

2. Click the **Browse** button next to the **Upgrade** text box.

3. The **Choose File to Upload** window opens.

4. Navigate to the .upg file we emailed you.

5. Click **Open.**

6. Click **Upload File –** it will take about five minutes.

7. The upgrade is applied to the unit, you'll see a **message**.

8. After rebooting the unit, the new features will be enabled.

6.1   Working with the Frequency Tab

The **Frequency** tab enables you to scan the spectrum around you within a **bandwidth** and **resolution** of your choice.

You can use the **Find** function which will tag the strongest signals and report their frequencies to you.

You can use the **Cycle** button to select found frequencies in turn and if you wish you can press the **Select** button which will make that frequency currently active in your AXRX1.

Before you Begin

You'll need:

■   To have connected your computer to the AXRX1 using the IP interface.

■   To be logged on to the AXRX1 unit.

## Step 1: Open the Frequency Tab

Click on **Frequency** tab.

Screenshot: Frequency Tab
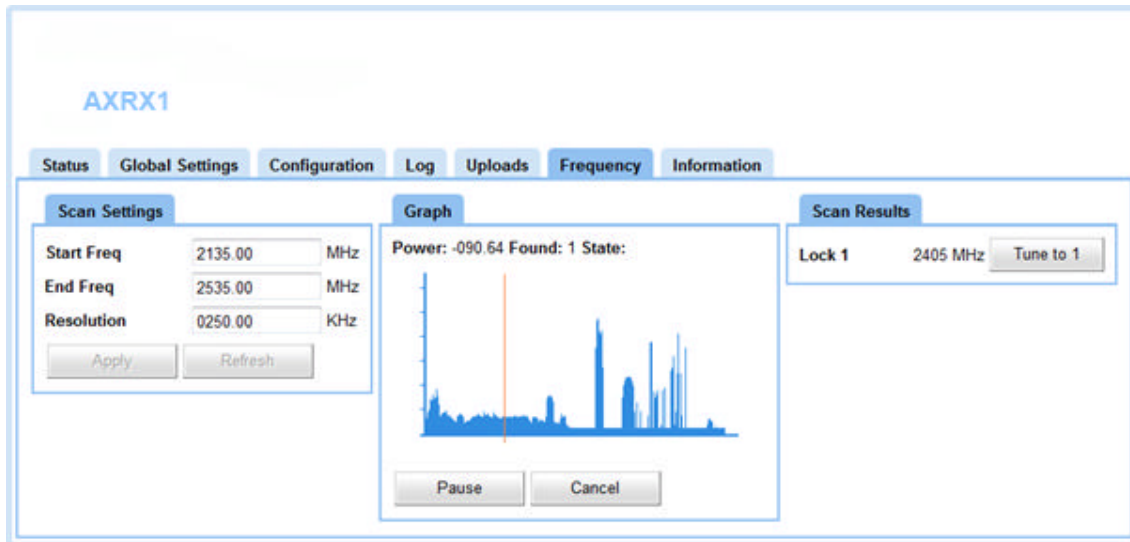
Figure 6-35 Frequency Tab

Step 2: Configuring the Scan Settings Pane

1. Click the **Refresh** button – this resets any previous scans in the frequency scanner.

2. Type in the **Start** frequency in MHz you want to use for your Frequency scan. If you enter a frequency that is too low the Start frequency will set itself to the lowest frequency within the band the AXRX1 is tuned for.

3. Type in the **End** frequency in MHz you want to use for your Frequency scan. If you enter a frequency that is too high the End frequency will set itself to the highest frequency within the band the AXRX1 is tuned for.

4. **Note**: The wider the band you want to scan using the Start and Stop setting, the longer the scan will take.

5. Type in the **Resolution** frequency in MHz you want to use for your Frequency scan. If you enter a very small resolution like 0.5 MHz the scan will find many more discrete frequencies but the scan will take longer. Using a larger resolution will speed up the scan but may miss very fine frequency steps.

6. Click the **Apply** button.

7. The **Scan Settings** message window opens.

8. Click the **OK** button.

Screenshot: Scan Settings Pane
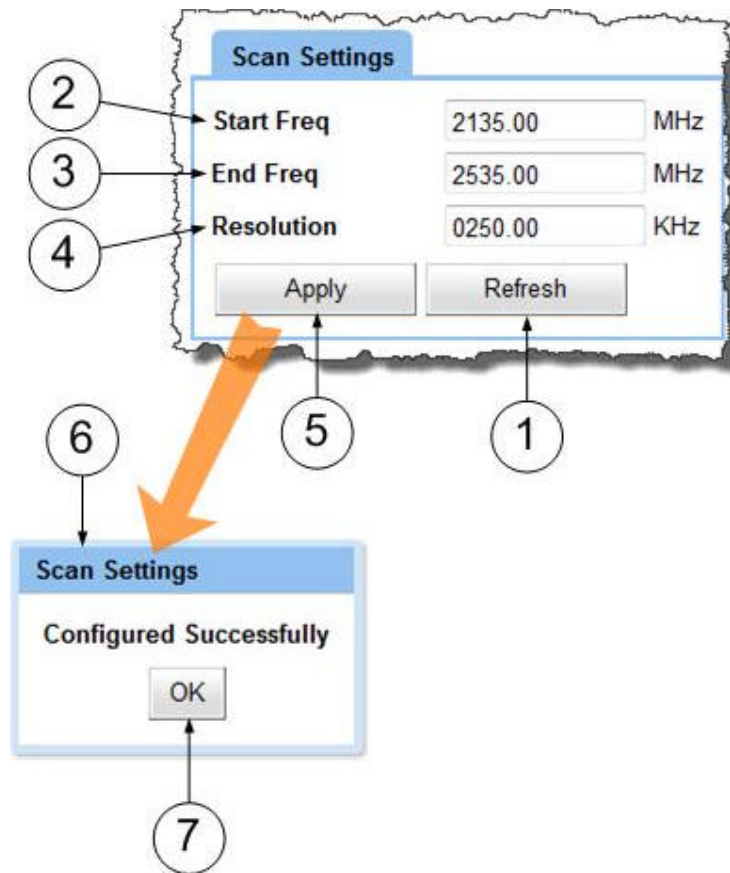
Figure 6-36 Scan Settings Pane

Step 3: Start the Scan

1. Click the **Start** button.

2. The **Confirm Scan** message window opens. This reminds you normal operations will stop.

CAUTION: This means the receiver will drop any channel it is receiving. Don't run a scan if the receiver is on air!

3. Click the **OK** button.

4. Observe the **graphical display** of the scan. The orange line will track across the graph drawing a graph of RF power levels. The state indicator shows **scanning**.

5. You can click the **Pause** button at any time. Click **Continue** button to carry on with the scan.

6. After the scan, there is a **testing** phase – please wait until this is complete.

Screenshot: Graph Pane
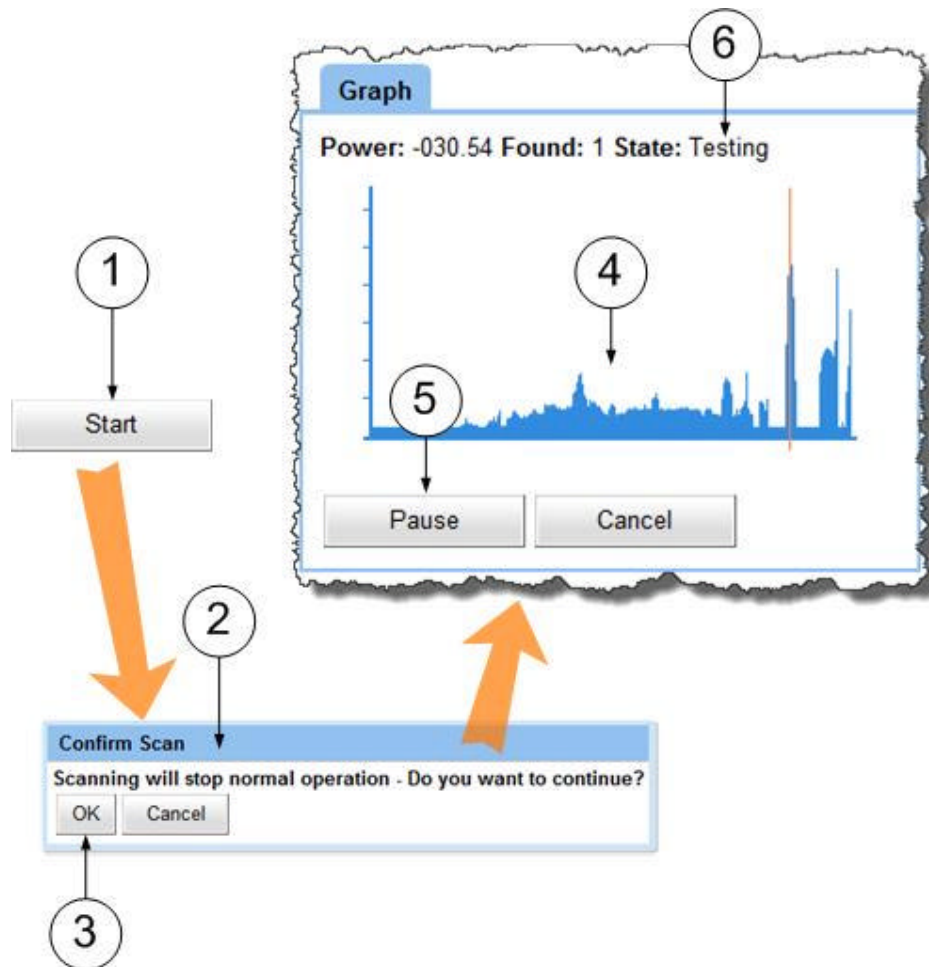
Figure 6-37 Graph Pane

Step 4: Checking the Scan Results

1. Look at the **Scan Results** pane – It will list any frequencies it has found that it is able to tune for you.

2. Click the **Tune to** button for your required channel.

3. The **Channel Details** window opens. It tells you some things about the channel like its frequency and bandwidth for example.

4. If you want the AXRX1 to tune to this channel, press the **Yes** button. This will save the channel configuration parameters on the currently active configuration preset.

5. If you want the AXRX1 to remain on its current channel, then press the **No** button.

Screenshot: Scan Results Pane
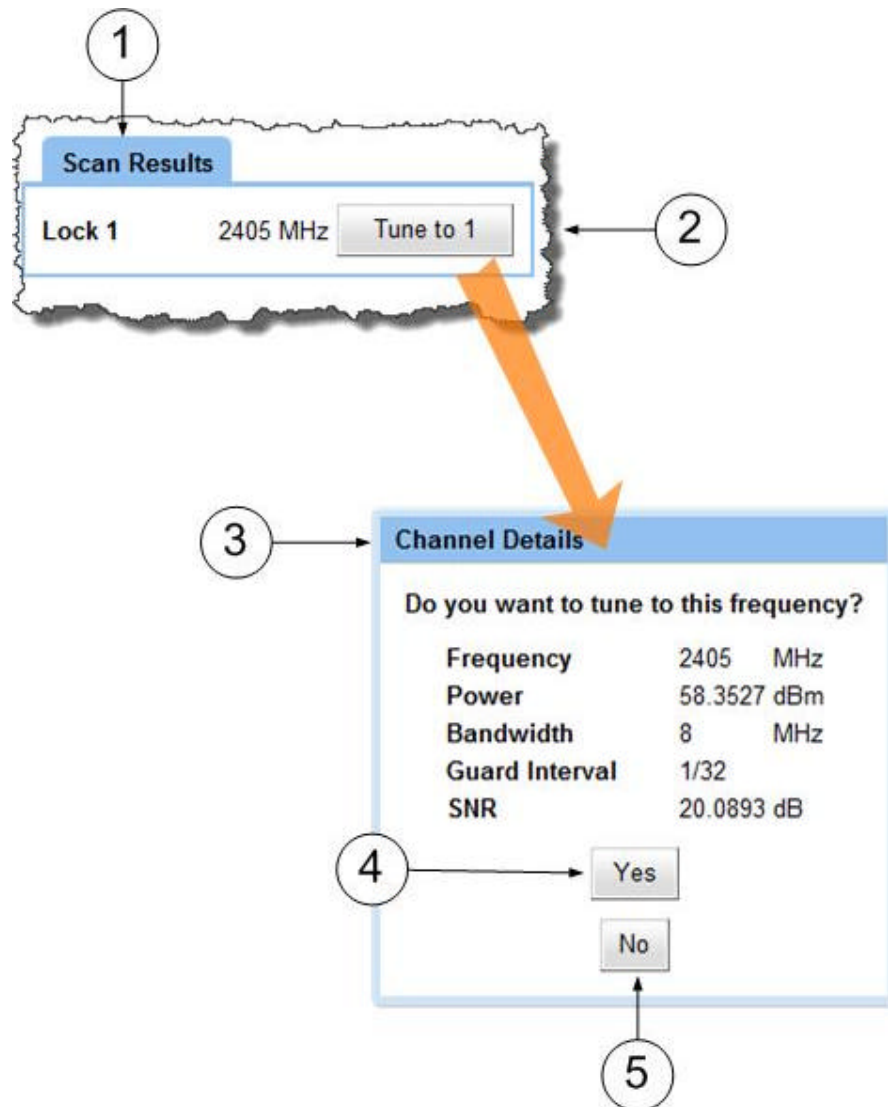
Figure 6-38 Scan Results Pane

6.2 Working with the Information Tab

The Information tab contains generic information including software versions and unit specific data. You may need this information during a support call for example.

Before you Begin

You'll need:

■ To have connected your computer to the AXRX1 using the IP interface.

■ To be logged on to the AXRX1 unit.

Step 1: Open the Information Tab

Click on **Information** tab.

Screenshot: Information Tab
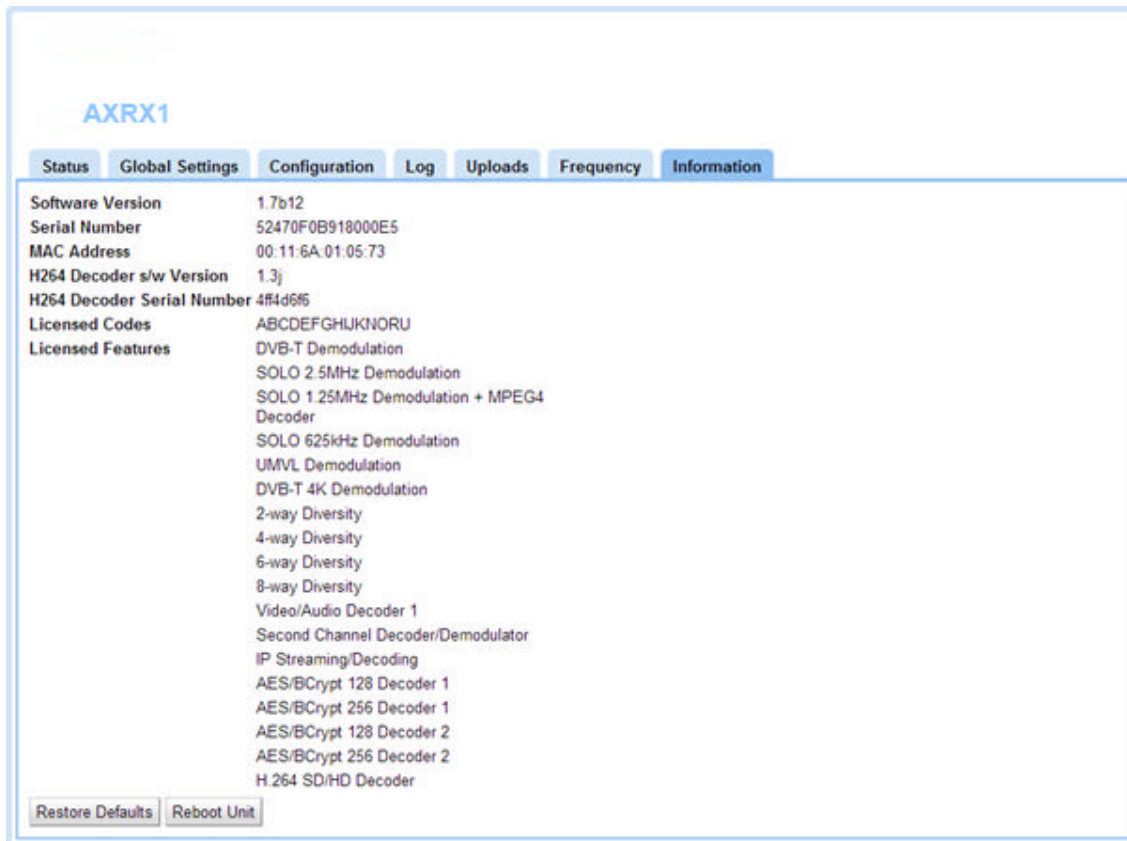
Figure 6-39 Information Tab

Step 2: Checking the Software Version

This field returns the current version of software loaded onto the AXRX1 unit. When you do an upgrade, you'll probably want to check here to see that the upgrade went well.

Step 3: Checking the Serial Number

During a support call we'll often ask you for the Serial Number of your AXRX1. This is where you find it.

Step 4: Checking the MAC Address

Media Access Control Address (MAC) is reported by this field. You may need this if you are involved in network operations with your AXRX1.

Step 5: Checking the H264 Decoder Software Version

This field returns the current version of software loaded onto the H264 Decoder unit. When you do an upgrade, you'll probably want to check here to see that the upgrade went well.

Step 6: Checking the H264 Decoder Serial Number

During a support call we'll often ask you for the Serial Number of your H264 Decoder unit. This is where you find it.

Step 7: Checking the Licenced Codes

Our products use licence codes to switch features on and off in your product. Each feature has a letter and your licence is made up of several of these letters.

Step 5: Check the Licensed Features

The **Licensed Features Pane** is a list of all the licensed features on this device.

7. Appendix A – Cautions and Warnings

7.1 Cautions and Warnings

Serial	Area	Note
1	Enclosures	Do not remove any factory installed screws or fastenings. Damage to the units may result and void any warranties.
		Only authorized, trained personnel should open the product. There are no functions that required the user to gain access to the interior of the product. There are no user serviceable parts inside.
2	Maintenance	Other than cleaning, no scheduled maintenance is required to ensure proper function of the unit.
3	Environment	The equipment should not be used in hazardous or corrosive atmospheres. Users are reminded of the necessity of complying with restrictions regarding the use of radio devices in fuel depots, chemical plants and other hazardous locations.
4	Power Supply	Ensure that the power supply arrangements are adequate to meet the stated requirements of each product. Observe all electrical safety precautions.
5	Electro Static Discharge (ESD) Precautions	ESD guidelines must be followed for this electrostatic sensitive device.
6	Lightning Strike	There is a risk of lightning strike to antennas. The equipment should not be assembled in an area at the time of lightning activity. Antennas should be adequately ground protected from lightning strikes.
7	Working at Height	Observe caution when locating the device at height, for example on a mast. Ensure the unit is well secured to prevent it falling and injuring personnel.
8	Risk of Eye Injury	Care should be taken to avoid eye contact with the antennas.
9	Cables	Connecting cables should not be positioned where they are likely to become damaged or where they may present a trip hazard.

Serial	Area	Note
10	Thermal Control System	Any powered device will always produce heat as a by-product of its operation. If you operate this device in an enclosed space you must ensure it has adequate airflow to keep it cool.
		Also, if worn close to the body, care must be taken to protect the operator from excessive temperatures.
11	RF Emission System	When using this device please ensure a distance of 20cm is maintained between your device and your body while the device is transmitting.

8. Appendix B - Care and Maintenance

8.1 Caring for your Equipment

- Do not subject the radio to physical abuse, excessive shock or vibration

- Do not carry the radio by the antenna

- Avoid exposure to excessive moisture or liquids

- Do not submerse the radio underwater

- Do not expose the radio to corrosives, solvents, cleaners or mineral spirits

- Avoid exposure to excessive cold and heat

- Avoid prolonged exposure to direct sunlight

- Do not place or leave radios on surfaces that are wet or unstable

- Always turn the radio off before installing optional accessories

- Only use accessories intended for the specific make and model of your radio, especially batteries, chargers and power adapters

8.2 Cleaning

- Turn off the radio and remove batteries (if applicable) before maintenance

- Use a clean, soft, damp cloth to clean the radio. A microfiber cloth is recommended

- Do not use alcohol or cleaning solutions to clean the radio

- Do not immerse the radio in water to clean it

- If the radio becomes wet, immediately dry it with a microfiber or other lint-free cloth.

8.3 Storage

- Turn off the radio and remove batteries before storage

- Store radios and battery packs in a cool, dry area at room temperature (72 degrees F).

- Do not store radios and/or batteries in active chargers

8.4 Repairs

Do not attempt any repair. The radio contains no user serviceable parts. Contact the Customer Service Center or take it to a qualified repair technician.

9. Appendix C-Glossary

9.1 Glossary

0-9	Definition
16QAM	16-state Quadrature Amplitude Modulation.
64QAM	64-state Quadrature Amplitude Modulation.

A	Definition
AC	**Alternating Current.** Current that is continually changing in magnitude and periodically in direction from a zero reference level.
A/V	Audio/Video.
ASI	**Asynchronous Serial Interface**. A streaming data interface which often carries an MPEG Transport Stream. An ASI signal can carry one or multiple SD, HD or audio programs that are already compressed, not like an uncompressed SD-SDI (270Mbs) or HD-SDI (1.45Gbs). An ASI signal can carry varying amounts of data but is always padded to run at a fixed line rate of 270 Mb/s.
Amplification	The process of increasing the strength (current, voltage or power) of a signal.
Amplitude	The level of an audio or other signal in voltage or current. The magnitude of variation in a changing quantity from its zero value.
Amplitude Modulation	Modulation in which the amplitude of the carrier wave is varied above and below its normal value in accordance with the intelligence of the signal being transmitted. Also called AM.
Analog	**Analog transmission** is a transmission method of conveying voice, data, image, signal or video information using a continuous signal which varies in amplitude, phase, or some other property in proportion to that of a variable.
Antenna	An **antenna** is a transducer designed to radiate or receive electromagnetic energy (generally RF).

A	Definition
Antenna Bandwidth	The frequency range over which a given antenna will accept signals.
Antenna Gain	The effectiveness of a directional antenna as compared to a standard non-directional antenna. It is usually expressed as the ratio in decibels of standard antenna input power to directional antenna input power that will produce the same field strength in the desired direction. For a receiving antenna, the ratio of signal power values produced at the receiver input terminals is used. The more directional an antenna is, the higher is its gain.
Attenuation	Power loss resulting from conductor resistance and dielectric loss within the insulating material used to separate the conductors.

B	Definition
BNC	A very common type of connector used for terminating coaxial cable.
Bandwidth	The width of a band of frequencies used for a particular purpose.
BDC	Block Down Converter. A device which converts microwave frequencies to UHF frequencies to compensate for cable loss between the antenna and the receiver.

C	Definition
COFDM	**Coded Orthogonal Frequency Division Multiplexing** is a frequency-division multiplexing (FDM) scheme utilized as a digital multi-carrier modulation method. A large number of closely-spaced orthogonal sub-carriers are used to carry data.

D	Definition
Digital	A **digital signal** is a discontinuous signal that changes from one state to another in discrete steps.
Decibel	The standard unit used to express transmission gain or loss and relative power levels. Also written as dB.
Decoder	A processor in a video receiver that converts the demodulated video and audio signals extracted from the carrier, to be used as a source signal for a monitor, switcher or router input
Demodulate	To recover the information signal (usually audio & video) originally sent in the modulated RF carrier frequency.

E	Definition
Electromagnetic field	The field of force that an electrical current produces around the conductor through which it flows.
Electromagnetic Waves	A wave propagating as a periodic disturbance of the electric and magnetic fields and having frequency in the electromagnetic spectrum; the means by which energy is transmitted from one place to another.
Elementary IP Stream (ES)	Elementary IP streams: These streams contain only one MPEG-2 video channel and no audio. Elementary streams are required if you intend to use **Milestone** or any player that cannot operate with Transport streams. You must be in RTSP mode to use Elementary streams.
Encoder	A processor in a video transmitter which converts audio & video from the source (usually a camera) into an information signal that can be modulated into an RF carrier signal.

F	Definition
FEC	**Forward Error Correction** is a system of error control for data transmission, whereby the sender adds redundant data within the data transmission, also known as an **error-correction code**. This allows the receiver to detect and correct errors (within certain limits) to conceal corrupted data and reproduce a useable, stable picture. The advantage of forward error correction is that a back-channel is not required, or that retransmission of data can often be avoided, at the cost of higher bandwidth requirements on average. FEC is therefore applied in situations where retransmissions are relatively costly or impossible.
Firmware	Software which is installed directly on a device and is intended specifically for that device and is used to control it.
FOV	**Field of View -** The field of view (also field of vision) is the angular extent of the observable world that is seen at any given moment.
Fading	A periodic decrease in received signal strength
Frequency	The rate at which a process repeats itself. In radio communications, frequency is expressed in cycles per second. $f = \frac{1}{T}$ Signals also have a property called wavelength, which is inversely proportional to the frequency.

F	Definition
Frequency Modulation	The process of varying the frequency of a carrier wave, usually with an audio frequency, in order to convey intelligence. Also called **FM**.
FPGA	**Field-Programmable Gate Array -** an integrated circuit designed to be configured by the customer or designer after manufacturing, hence "field-programmable".

G	Definition
GUI	**Graphical User Interface.**
GHz	**Gigahertz** - One gigahertz is equal to 1,000 megahertz (MHz) or 1,000,000,000 Hz.
Gain	The increase in signal strength that is produced by an amplifier.

H	Definition
Hertz	One cycle per second = 1Hz.

I	Definition
IP Address	**Internet Protocol Address** – A unique numeric ID for a device within a network.
IR	**Infra Red** - Infrared (IR) radiation is electromagnetic radiation whose wavelength is longer than that of visible light to humans.
Impedance	The total opposition offered by a circuit or component to the flow of alternating current.

L	Definition
LOS and NLOS	**Line-of-sight** propagation refers to electro-magnetic radiation including light emissions travelling in a straight line. The rays or waves are diffracted, refracted, reflected, or absorbed by atmosphere and obstructions with material and generally cannot travel over the horizon or behind obstacles. **NLOS is Non Line-of-sight**.

L	Definition
Load	A device that consumes electrical power.
Lux	The **lux** (symbol: **lx**) is the SI unit of illuminance and luminous emittance. It is used in photometry as a measure of the *apparent* intensity of light hitting or passing through a surface.

M	Definition
MHz	**Megahertz** is equal to 1,000,000 Hz
mW	**Milliwatt** - The milliwatt (symbol: mW) is equal to one thousandth (10^{-3}) of a watt.
MPEG	Moving Pictures Experts Group.
Modulation	To change the output of a transmitter in amplitude, phase or frequency in accordance with the information to be transmitted. Data is superimposed to a carrier current or wave by means of a process called modulation. Signal modulation can be done in either of two main ways: Analog and digital. In recent years, digital modulation has been getting more common, while Analog modulation methods have been used less and less. There are still plenty of Analog signals around, however, and they will probably never become totally extinct.
Multicast	Multicasting is sending data from a sender to multiple receivers where each receiver signals that they *want* to receive the data.

N	Definition
nm	A **nanometer**; symbol **nm**) is a unit of length in the metric system, equal to one billionth of a meter (i.e., 10^{-9} m or one millionth of a millimeter).
NMEA 0183	**NMEA 0183** is a combined electrical and data specification for communication between marine electronic devices such as echo sounder, sonar, anemometer, gyrocompass, autopilot, GPS receivers and many other types of instruments. It has been defined by, and is controlled by, the U.S.-based National Marine Electronics Association.
NTSC	National Television Systems Committee.
Noise	Random pulses of electromagnetic energy generated by lightening or electrical equipment.

O	Definition
Omni directional antenna	An antenna whose radiation pattern shows equal radiation in all horizontal directions.
Oscillation	A periodic, repetitive motion or set of values (voltage, current, velocity).

P	Definition
PAL	Phase Alternate Line.
PIR	**Passive Infra Red** sensor (PIR sensor) is an electronic device that measures infrared (IR) light radiating from objects in its field of view.
PTZ	**Pan, Tilt and Zoom** – PTZ is a common way of referring to controllable cameras.
Propagation	A phenomenon by which any wave moves from one point to another; the travel of electromagnetic waves through space or along a transmission line.

Q	Definition
QPSK	Quadrature Phase Shift Keying.

R	Definition
RF	**Radio Frequency.**
RTSP	**Real Time Streaming Protocol** (RTSP) is a network control protocol designed for use in entertainment and communications systems to control streaming media servers. The protocol is used for establishing and controlling media sessions between end points. Clients of media servers issue VCR-like commands, such as play and pause, to facilitate real-time control of playback of media files from the server.
RX	**Receiver**, an electronic device that changes a radio signal from a transmitter into useful information.
Radiate	To transmit RF energy.
Radio Frequency	Any frequency of electrical energy capable of propagation into space (usually above 20kHz). Also called RF.

S	Definition
SNR	**Signal to Noise Ratio** is an electrical engineering measurement defined as the ratio of a signal power to the noise power corrupting the signal. Signal-to-noise ratio compares the level of a desired signal (such as music) to the level of background noise. The higher the ratio, the less obtrusive the background noise is.
Signal	In electronics, a signal is an electric current or electromagnetic field used to convey data from one place to another. The simplest form of signal is a direct current (DC) that is switched on and off; this is the principle by which the early telegraph worked. More complex signals consist of an alternating-current (AC) or electromagnetic carrier that contains one or more data streams.
Streaming	**Streaming** is the transmission of digital audio or video or the listening and viewing of such data without first storing it.

T	Definition
TX	A **transmitter** is an electronic device which, usually with the aid of an antenna, propagates an electromagnetic signal such as radio, television, or other telecommunications.
TNC	The **TNC connector** is a threaded version of the BNC connector. The connector has a 50 O impedance and operates best in the 0–11 GHz frequency spectrum.
Transport Stream (TS)	Transport streams: These streams can contain several MPEG-2 content channels and associated audio. All the channels are multiplexed together, allowing the receiver to choose which to play back.

U	Definition
USB	Universal Serial Bus
Unicast	Unicast is simply sending packets from one source to one destination. For example, from one web server to one (or each) person viewing a page on a web browser.

V	Definition
VHF	**Very High Frequency** – 30 MHz to 300 MHz
V	Volt.

V	Definition
Viterbi Decoder	A Viterbi decoder uses the Viterbi algorithm for decoding a bit stream that has been encoded using forward error correction based on a Convolutional code.

W	Definition
Watt	The **watt** (symbol: **W**) is a derived unit of power in the International System of Units (SI). It measures rate of energy conversion. One watt is equivalent to 1 joule (J) of energy per second.
Waveform	Signal shape.
Waveguide	A specially formed hollow metal tube, usually rectangular in shape in cross section, used to connect a High Power amplifier to the antenna.