Resource Identifier: 100321

Revision 1.4

For the moments that matter

Sapphire-RXD4 Setup Guide

Commercial in Confidence

0. Preface

0.1 About this Document

This document contains relevant information required to identify and install the equipment or system. Basic configuration settings are provided for typical operation.

The actual presentation may differ from those in this document due to hardware or software changes.

0.2 Notice about this Publication

While DTC makes every attempt to maintain the accuracy of the information contained in its product manuals, the information is subject to change without notice.

Performance specifications included in this manual are included for guidance. All particulars are given in good faith, actual performance may vary.

0.3 Copyright

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0.4 Related Documents

All DTC documents can be downloaded from WatchDox. See *Section 9.1*.

Document	Description
MASH Serial Guide	Describes the serial control protocol
MASH REST API Guide	Describes the REST API control over IP
MASH Schemas Guide	Explains the contents of schemas from the unit. Schemas are used to generate all the status/config/command web pages, options, help text etc.

0.5 Document History

This is a controlled document, written and produced by the DTC Technical Publications team. Changes are recorded in the table below.

Revision	Date	Author	Summary of Changes
1.0	08/09/2022	IR	First release
1.1	17/10/2022	IR	Corrected multicast streaming end address. Corrected PKT IN note.
1.2	28/03/2023	IR	Corrected power cable. Updated for RXD4.
1.3	26/06/2023	IR	Firmware upgrade details.
1.4	30/11/2023	IR	Touchscreen bar graph colour-coded thresholds.

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1. Product Overview

1.1 Description

Sapphire-RXD4 is a Broadcast quality HEVC receiver decoding system, combining class-leading RF technology with Ultra-Low Latency HEVC decoding, presented in a compact ½ 19'' chassis.

The Sapphire-RXD4 cleverly combines an 8-way diversity COFDM receiver and DBS' Sapphire Ultra-Low Latency HEVC decoder in a single 2RU ½ 19'' package, offering end to end latency of less than 40ms which makes it ideal for live action scenarios. Operators requiring legacy support for H.264 decoding can add this via an optional licence.

Eight-way Maximum Ratio Combining diversity inputs ensure reception in the most difficult RF environments whilst configurable LO frequencies and variable power ensures support for a variety of external downconverters.

The Ultra-Low Latency H.265 decoder supports resolutions up to 4K in 10 bit 4:2:2 format and with full support for HDR reinsertion, video interfaces are 12G capable. A monitoring port can be provided on SFP which can be down sampled to HD in the case of a 4K signal.

Sapphire-RXD4 will decode up to 8 stereo audio pairs and output them embedded on SDI, 1 pair of analogue audio outputs are also provided on XLR.

The Sapphire-RXD4 has a unified web-browser control interface for remote control.

Local control is achieved with a single touch screen interface offering immediate status on transmitter performance and receiver status. The display can be set to operate in day or night modes, with intuitive configuration entry.

The Sapphire-RXD4 enables onward streaming of video and audio and supports multiple streaming formats including SRT. Timecode and HDR signalling are also fully supported. The Sapphire-RXD4 can support ST2110 interfaces for users requiring high-rate video over IP solutions using the SFP interface provided.

1.2 Basic Specifications

DC Input	12VDC nominal
Power consumption	50-80W depending on number of downconverters
Dimensions	½ 19" rack 2RU
Weight	4kg

Note: Detailed technical specifications are given in the product datasheet. Please see https://www.domobroadcast.com.

1.3 Approval Notices

The equipment has been designed to meet and has been tested against harmonized EMC and safety standards. The CE Declaration of Conformity as well as the technical file are available on request.

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2. Product Package

2.1 Overview

Carefully open the packaging and verify that all the parts have been included, as ordered. Retain the packing materials for storage.

Note: If you do not have all the parts or are not happy with the condition of your delivered product, please contact DTC. See *Section 9.2*.

2.2 Variants

This part number will identify the product; it is also on the label.

Part Number	Description
SAPPH-RXD4-2	Sapphire RX HEVC decoder 2-way diversity
SAPPH-RXD4-4	Sapphire RX HEVC decoder 4-way diversity
SAPPH-RXD4-6	Sapphire RX HEVC decoder 6-way diversity
SAPPH-RXD4-8	Sapphire RX HEVC decoder 8-way diversity

2.3 Parts List

These items will be in the package.

Part Number	Description
Primary unit	Sapphire-RXD4 Receiver (see variants above)
CA4065	120W 12VDC PSU to XLR

2.4 Licensing

Some product functions are enabled by licenses. The license for your product can be viewed in the control software.

Product Code	Description
LIC-4K-RX	4K Decoding
LIC-ASIPS	ASI Packet Switching
LIC-DPED-RX	Dual Pedestal Demodulation
LIC-H264-HD	H.264 HD Decoding
LIC-IP	IP Streaming

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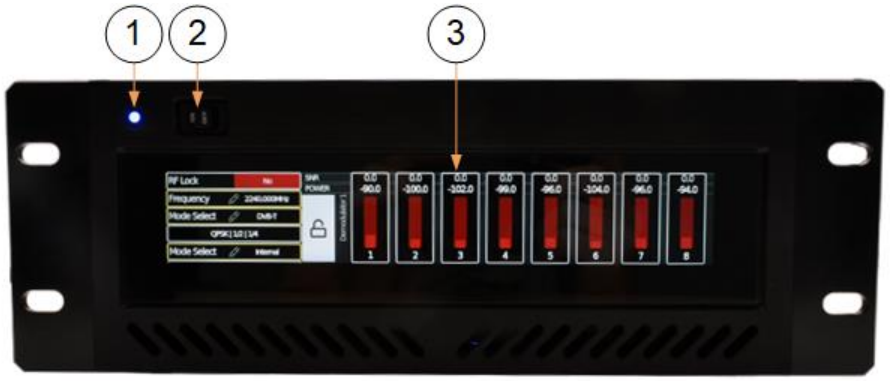
3. Connections, Controls, and Indicators

3.1 Introduction

This chapter will help identify all the connections and interfaces of the product needed to install, control, and monitor the device.

3.2 Front Panel



No.	Item	Notes
1	Power LED	The power LED will illuminate when power is on.
2	Power on/off switch	It is recommended to use the switch to power the device On or Off.
3	Touchscreen display	When fully booted (approx. 90s), the touchscreen display can be used to monitor and configure some of the most used features. See *Section 4* for a description of operation. **Note**: The web user interface can be used for more detailed configuration.

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3.3 Rear Panel

No.	Item	Notes
1	XLR 4-way (male)	Connect the supplied PSU (CA4065) for 12V power. See *Section 3.4.1* for pinout. **CAUTION**: To prevent damage to internal regulators, ensure the supply can provide a minimum 10A. **IMPORTANT**: Please ensure the power switch on the front panel is set to Off when connecting the power source. The power switch should be used to control power to the device.
2	SFP+ cage	SFP provides a video output for monitoring. Supports 12G-SDI, 6G-SDI, or 3G-SDI video formats.
3	HD-BNC socket	SDI output 1. Supports 12G-SDI, 6G-SDI, or 3G-SDI video formats.
4	HD-BNC socket	SDI output 2. Supports 12G-SDI, 6G-SDI, or 3G-SDI video formats.
5	HD-BNC socket	SDI output 3. Supports 3G-SDI video formats.
6	HD-BNC socket	SDI output 4. Supports 3G-SDI video formats.
7/8	RJ45 jack	Gigabit Ethernet connection for web user interface control or IP streaming. **Note**: The CTRL and STREAM labels are notional and are used to differentiate the connections.
9	BNC socket (50Ω)	RF input from a downconverter/antenna assembly. Up to eight antennas can be fitted for maximum receive diversity depending on variant.
10	BNC socket (75Ω)	Connect a Genlock device to this port to keep the receiver synchronised with all the other equipment in your facility.

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No.	Item	Notes
11	BNC socket (75Ω)	ASI output.
12	BNC socket (75Ω)	The packet diversity input (PKT IN) allows you to double the diversity of the system by linking a remote receiver via ASI. Each unit will provide coverage in a different area but will act like a single receiver.
13	XLR 3-way (male)	Audio stereo line level audio output left. See *Section 3.4.3* for pinout.
14	XLR 3-way (male)	Audio stereo line level audio output right. See *Section 3.4.3* for pinout.
15	Hirose 4-way (male)	RS-232 data port. See *Section 3.4.2* for pinout.

3.4 Pinout

3.4.1 Power

Mating part: Neutrik NC4FX

Pin	Function
1	0V
2	N/C
3	N/C
4	VIN (12VDC nominal)

3.4.2 Data

Mating part: Hirose HR10-7P-4S(73)

Pin	Function
1	GND
2	RX
3	TX
4	N/C

3.4.3 Audio

Mating part: Neutrik NC3FX

Pin	Function
1	0V
2	AUD OUT+ (L/R)
3	AUD OUT- (L/R)

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4. Front Panel Touchscreen Control

4.1 Power

The Sapphire-RXD4 requires 12VDC power which can be supplied via the supplied mains PSU. There is a switch on the front panel which can be used to power the unit On or Off.

When the unit has been switched on, it will take approximately 90s to boot-up.

4.2 Introduction

The Sapphire-RXD4 has a front panel touchscreen which can be used to monitor and control the device without the need to connect to a PC device.

When the unit has fully booted, the front panel touchscreen will display the home screen and the power LED will be illuminated.

Press the lock symbol, indicated below, for 5 seconds to lock the screen, if required.

The home screen will show colour-coded information and is divided into two zones, **Left** and **Right**.

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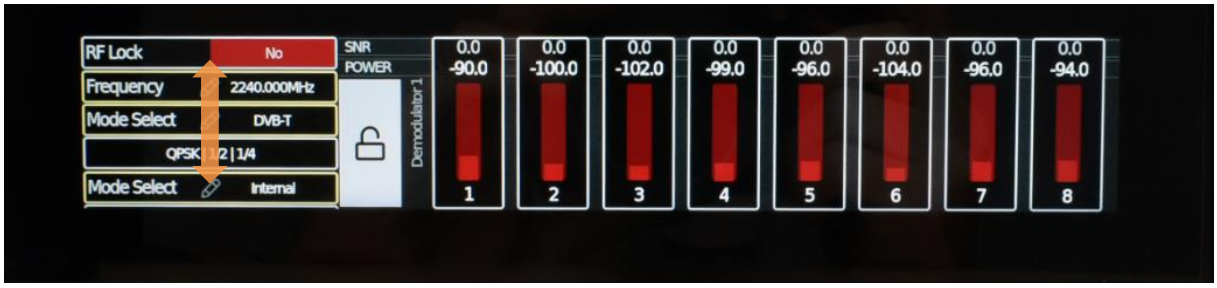
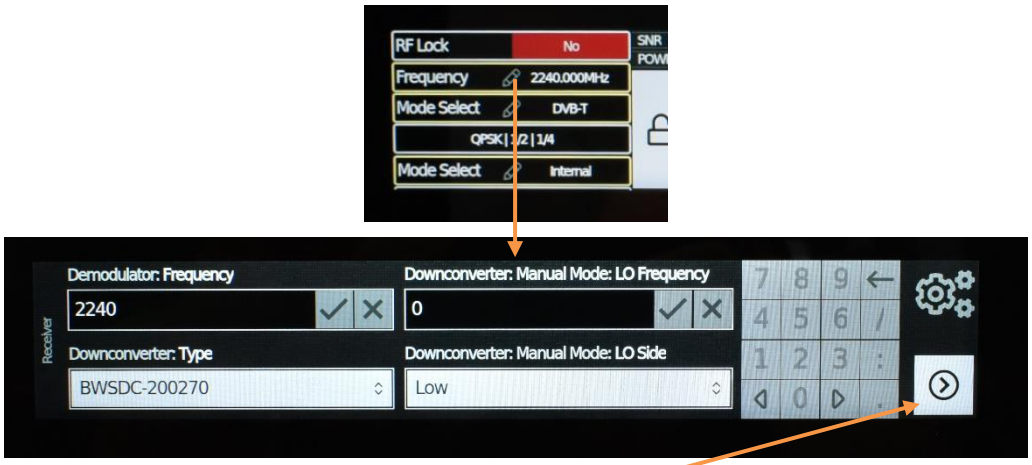
4.3 Touchscreen Left Zone

The left zone holds key information about the RF and genlock settings and can be navigated by swiping up/down.



Parameters which are detailed with the pencil icon can be edited, press the parameter to open the settings.



To return to the home screen, select the right arrow icon.

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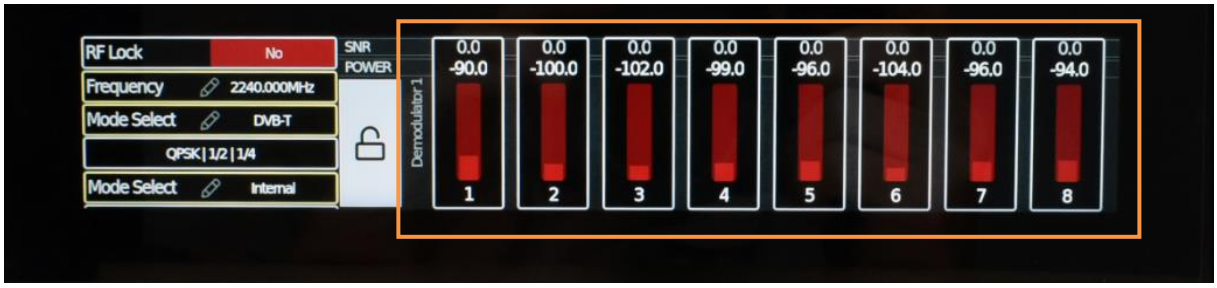
4.4 Touchscreen Right Zone

The default right zone view displays the SNRs and levels for the received signals with a colour-coded bar graph.



The colour will indicate the received signal quality needed to achieve the transmitted constellation and FEC. The minimum will be indicated by an amber bar but for optimum performance, a green bar is desired.

For example, a 16QAM signal with 3/4 FEC requires SNRs greater than 12.6dB but preferably greater than 16.1dB. To achieve improved SNRs the system setup and configuration may need to be reconsidered, e.g., increase receive diversity or introduce dual pedestal operation.

Constellation	FEC	SNR red threshold (dB)	SNR amber threshold (dB)	SNR green threshold (dB)
QPSK	1/2	3.5	7	>7
QPSK	2/3	5.3	8.8	>8.8
QPSK	3/4	6.3	9.8	>9.3
QPSK	5/6	7.3	10.8	>10.8
QPSK	7/8	7.9	11.4	>11.4
16QAM	1/2	9.3	12.8	>12.8
16QAM	2/3	11.4	14.9	>14.9
16QAM	3/4	12.6	16.1	>16.1
16QAM	5/6	13.8	17.3	>17.3
16QAM	7/8	14.4	17.9	>17.9
16QAM	1/2	13.8	17.3	>17.3
16QAM	2/3	16.7	20.2	>20.2
16QAM	3/4	18.2	21.7	>21.7
16QAM	5/6	19.4	22.9	>22.9
16QAM	7/8	20.2	23.7	>23.7

Table 4-1: Receiver Thresholds DVB-T

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Constellation	FEC	SNR red threshold (dB)	SNR amber threshold (dB)	SNR green threshold (dB)
BPSK	1/2	2	5	>5
BPSK	2/3	3.5	6.5	>6.5
QPSK	1/2	3.5	6.5	>6.5
QPSK	2/3	5	8	>8
8PSK	1/2	6	9	>9
8PSK	2/3	7.5	10.5	>10.5
16QAM	1/2	8.5	11.5	>11.5
16QAM	2/3	10	13	>13
64QAM	1/2	13	16	>16
64QAM	2/3	14.5	17.5	>17.5

Table 4-2: Receiver Thresholds UMVL/Narrowband

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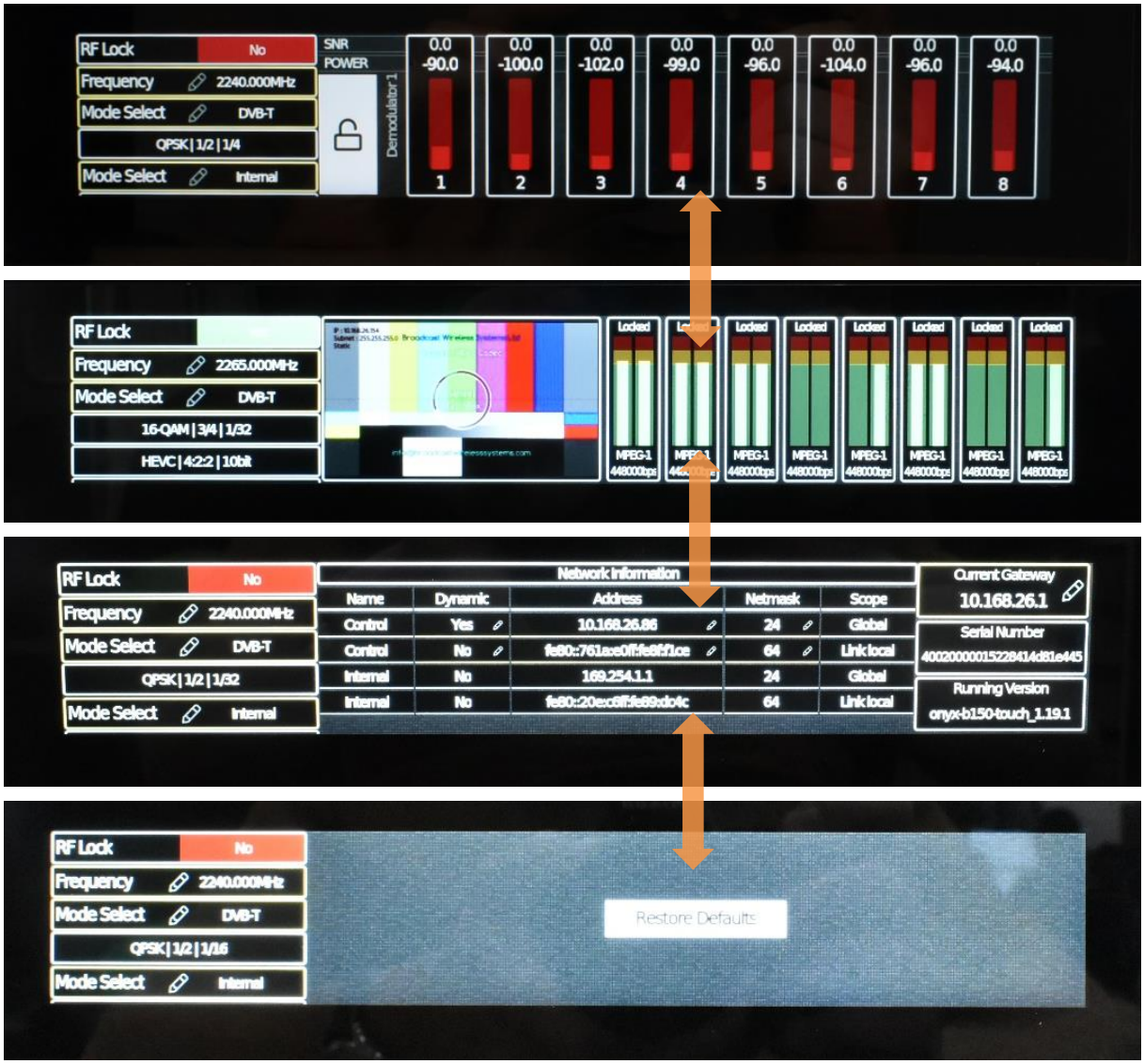
Further information from the right zone can be viewed by swiping up/down to view video/audio and network information. The bottom page will allow you to restore defaults, this will return the Sapphire-RXD4 to factory settings.

Parameters which are detailed with the pencil icon can be edited, press the parameter to open the settings.



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5. Initial Communications

5.1 Introduction

The Sapphire-RXD4 has a comprehensive web user interface (WUI) for detailed monitoring and control. The WUI is accessed via a web browser using the IP address of the Sapphire, so an Ethernet connection from the **CTRL** or **STREAM** port to a PC device is required.

Our devices are shipped to you with the IP DHCP setting enabled. This means that if the Sapphire-RXD4 is connected to a network which is administered by a DHCP server, the IP address will be automatically assigned. If the device is connected to a network which does **not** have a DHCP server, contact your Network Administrator for an IP address you can use.

Re-configuration of the IP settings can be achieved via the web interface (see *Section 5.5*), or via the touchscreen (see *Section 5.3.2*).

Note: If you are using a standalone PC or laptop, you will need to set the IP address of the PC to match the IP address range of the device. Refer to *Section 8.1* to find out how to do this.

5.2 Power

The Sapphire-RXD4 requires 12VDC power which can be supplied via the supplied mains PSU. There is a switch on the front panel which can be used to power the unit On or Off.

When the unit has been switched on, it will take approximately 90s to boot-up.

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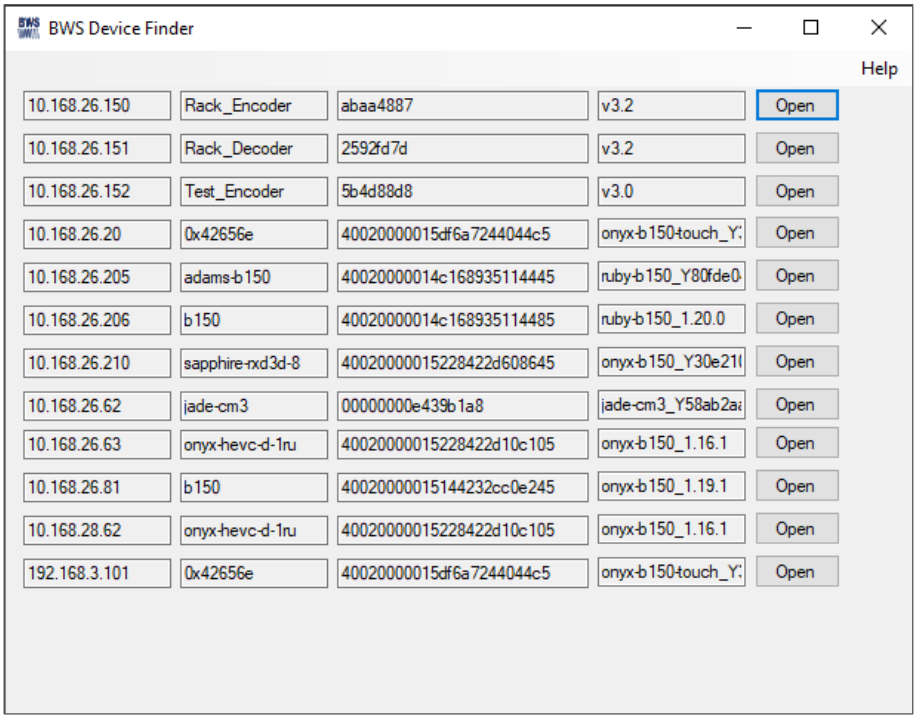
5.3 IP Address Identification

5.3.1 Device Finder

DBS' **Device Finder** application can be used to identify DBS product IP addresses on a network.

Device Finder comes as a simple executable file which can be downloaded from DTC's WatchDox facility, see *Section 9.1*. This can be saved to the PC desktop.

Double-click the Device Finder executable to open the application. All DBS devices attached to the network will be detected. Click **Open** to initialise communications with your PC's default web browser.



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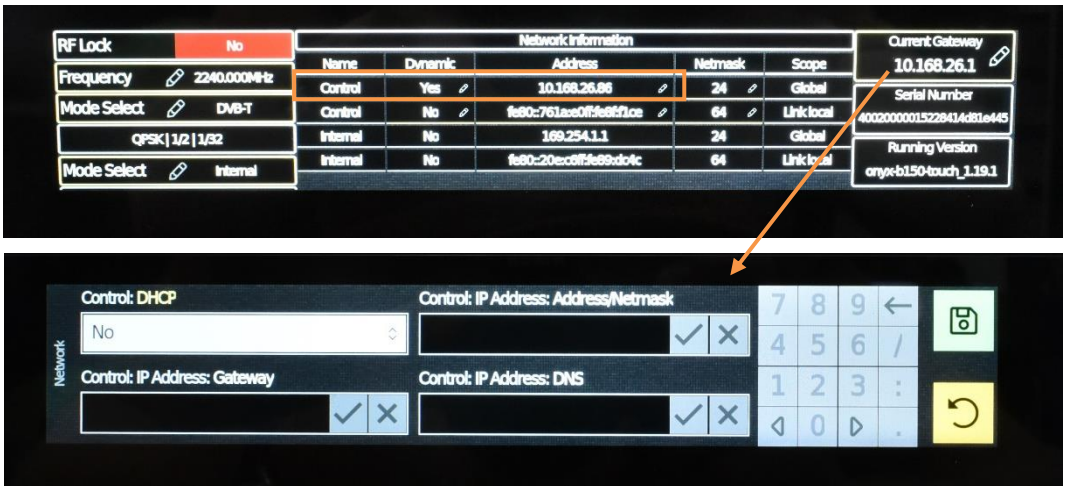
5.3.2 Front Panel Touchscreen

The IP address of the Sapphire can be found and edited, if required from the front panel touchscreen. This can be useful if the device is not connected via a DHCP server, or the IP address does not match the subnet of the PC and the IP address settings need to be changed.

The IP address can be discovered by swiping up on the touchscreen right zone to find the **Network Information** page. If the Ethernet cable is attached to the CTRL port, the IP address will appear adjacent to the **Control** parameter (highlighted below). If the Ethernet cable is attached to the Stream port, the IP address will appear adjacent to the **Stream** parameter.

The IP settings can be edited by pressing the **Current Gateway** parameter.

Note: Some IP parameters indicated with the pencil are not currently active and are for future development.



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5.3.3 IPv6 Address

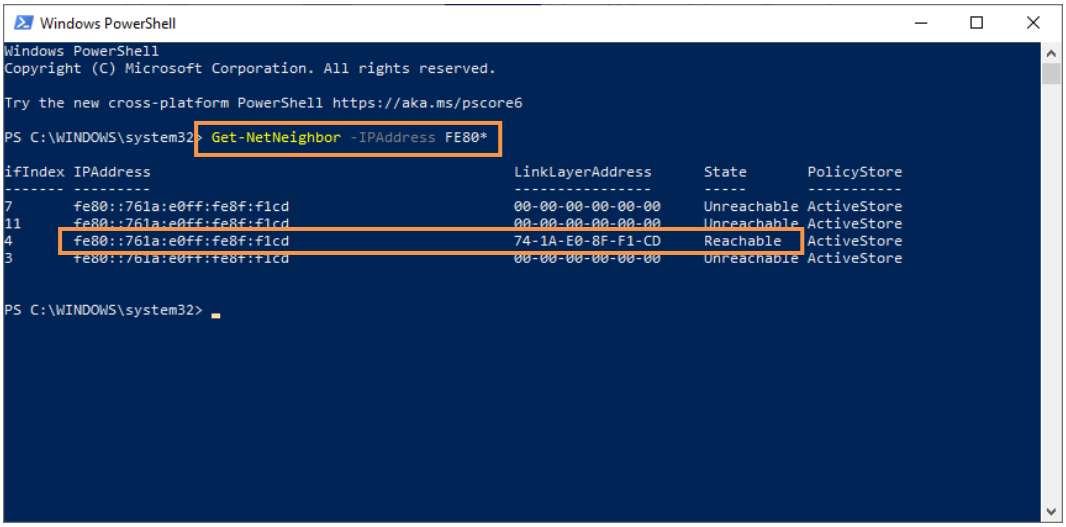
DBS products support link-local IPv6 addressing. This will allow web browser control if the device is not connected via a DHCP server, or the IP address does not match the subnet of the PC and the IP address settings need to be changed.

The IPv6 address of the Sapphire-RXD4 can be discovered from the front panel touchscreen, see *Section 5.3.2* above.

Alternatively, the IPv6 address can be discovered from Windows Powershell by entering the command:

*Get-NetNeighbor -IPAddress FE80**

The IP address for the Sapphire-RXD4 must have a **Reachable** state.



Note: If using the IPv6 address, enter the IP address into your web browser using square brackets around the address, e.g., https://[fe80::761a:e0ff:fe8f:f1cd].

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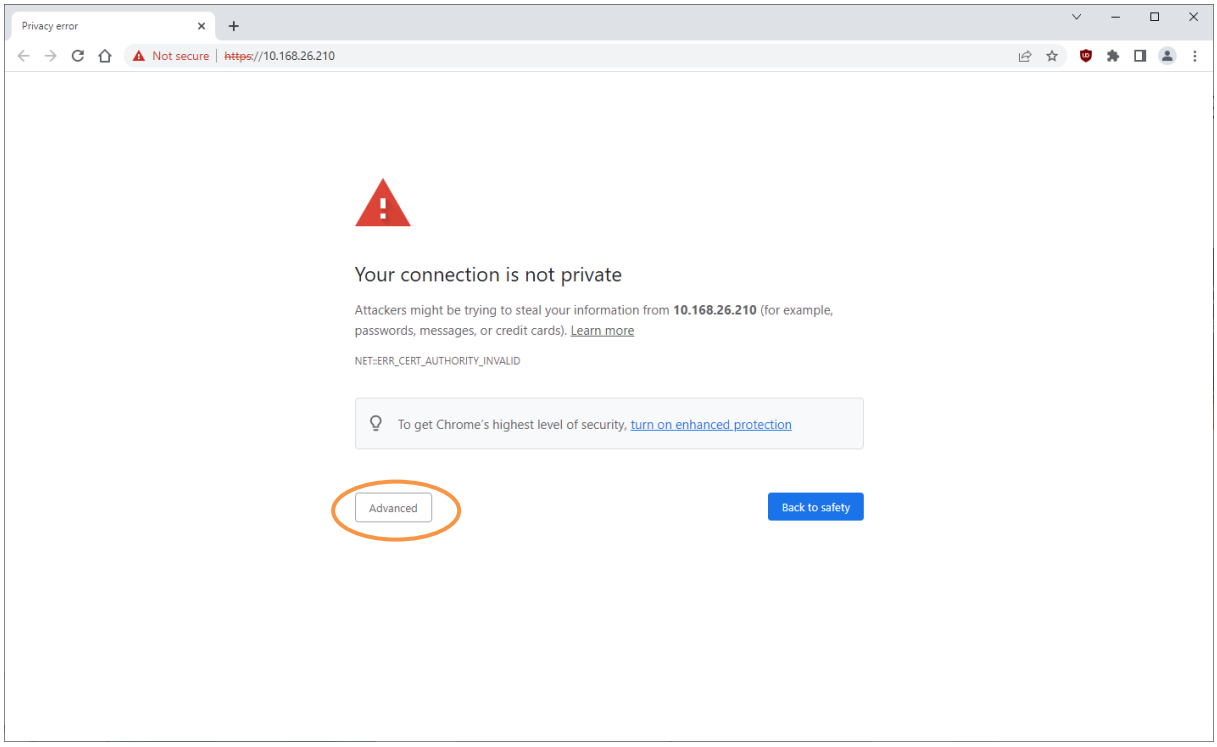
5.4 Open Web Interface

Once the IP address has been confirmed, open a web browser on a PC device and enter the IP address of the Sapphire-RXD4 in the address bar.

Note: If using the IPv6 address, enter the IP address into your web browser using square brackets around the address, e.g., https://[fe80::761a:e0ff:fe8f:f1cd].

Alternatively, if running Device Finder, click **Open** on the line of the device address.

DBS devices have a pre-installed self-signed HTTPS certificate, the first time web communications are established, it will be necessary to trust the address. The presentation of the web page will differ depending on the browser application; the following example is Google Chrome. Click on **Advanced** to proceed.



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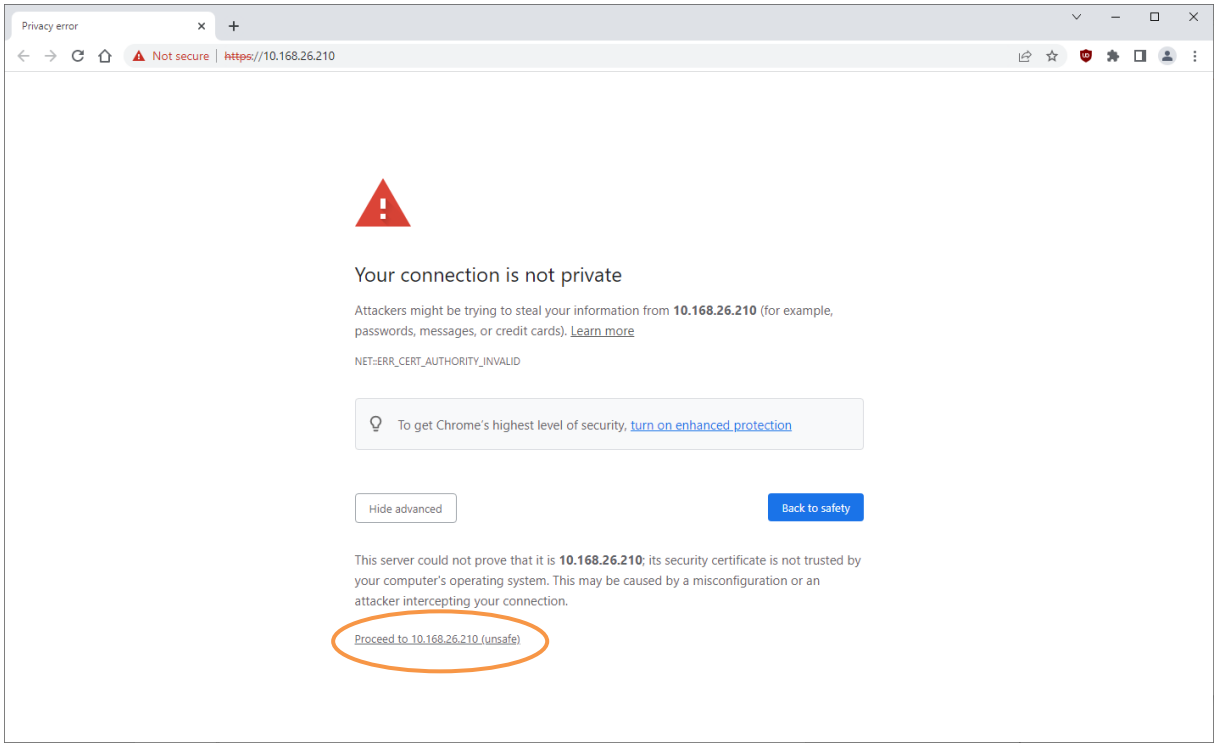
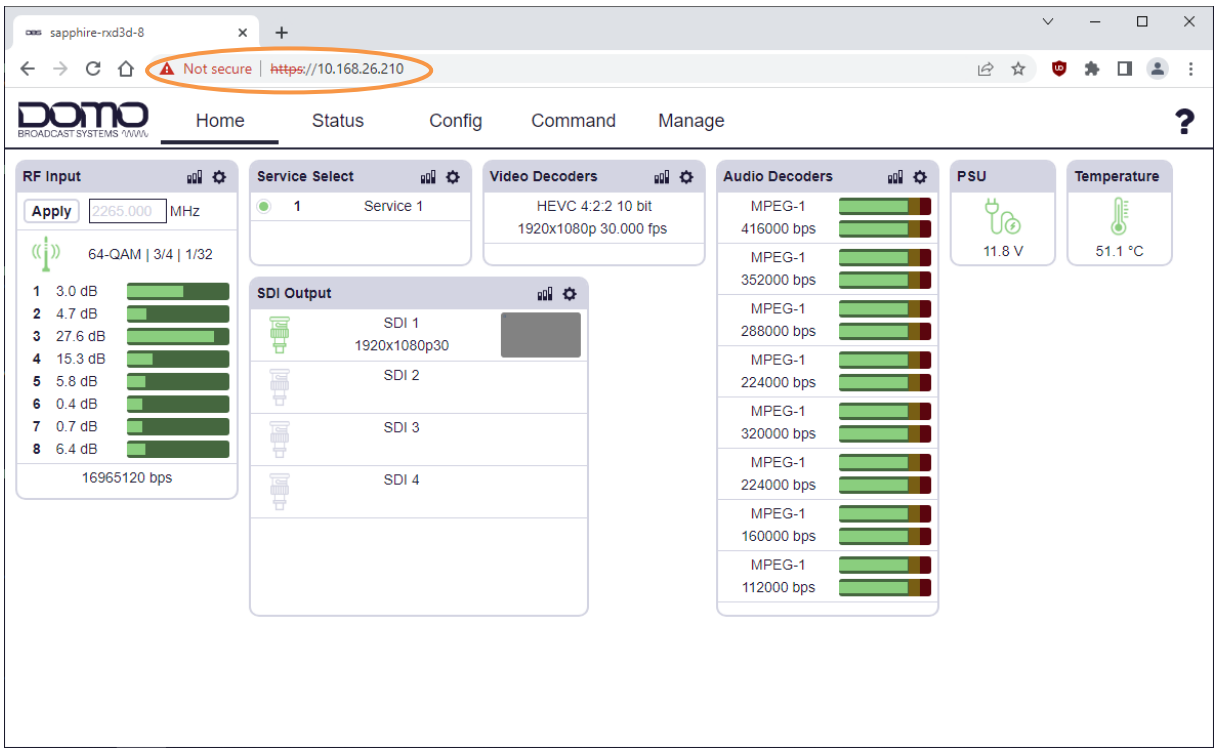
Click **Proceed to <*ip_address*> (unsafe)** to open the web user interface.



The browser will indicate that the site is connected by HTTPS but is not secure.



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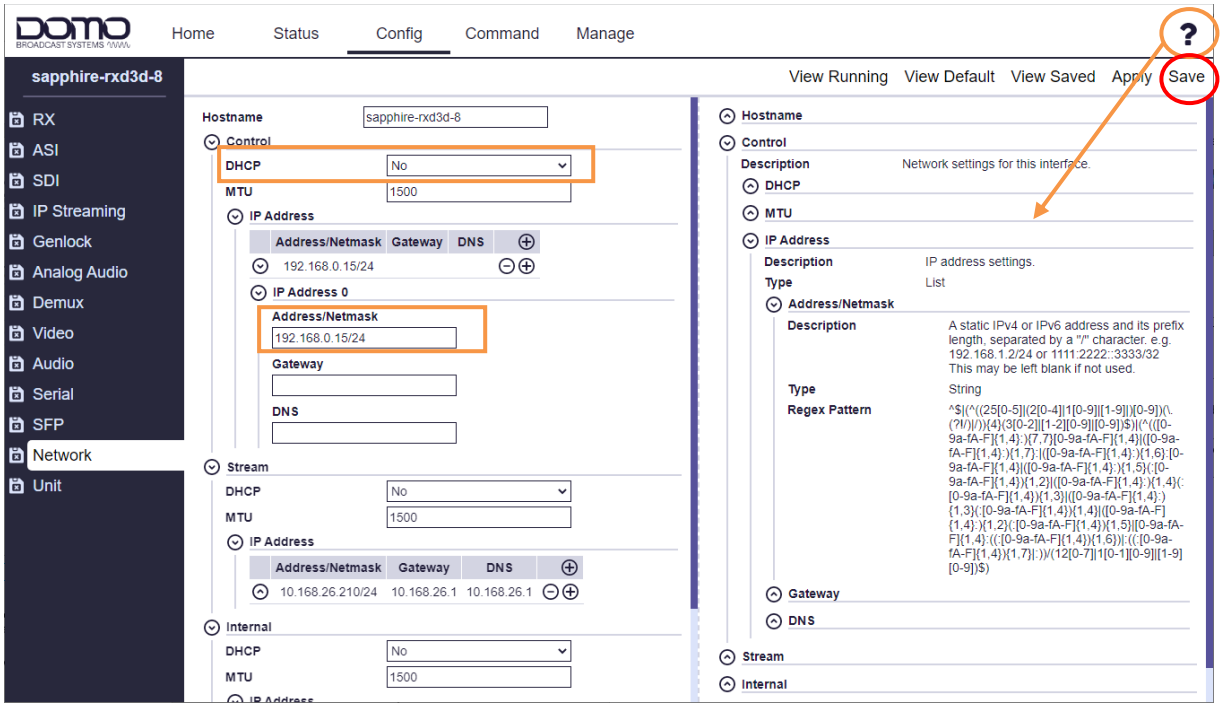
5.5 IP Address Configuration

The IP address can be configured via the front panel, explained in *Section 5.3.2*, or via the web interface.

To re-configure the IP address via the web interface, go to the **Config>Network** page.

Note: It may be useful to open the **Help** (?) menu for descriptions of settings.



Change the **DHCP** setting to **No** if you do not want the unit to try and get an IP Address, Gateway or DNS from a DHCP server.

The **IP Address/Netmask** parameter is written in CIDR notation. This is a compact representation where the IP address is followed by a slash (/) and then a decimal number which indicates the count of leading 1-bits in the network mask.

For example, an IP address 192.168.0.15 with a netmask of 255.255.255.0 would be written in CIDR notation as 192.168.0.15/24, where the first 24-bits of the IP address are masked. See *Section 8.2* for a table of subnets mapped to CIDR values.

Click **Apply** to activate a running config and **Save** to retain.

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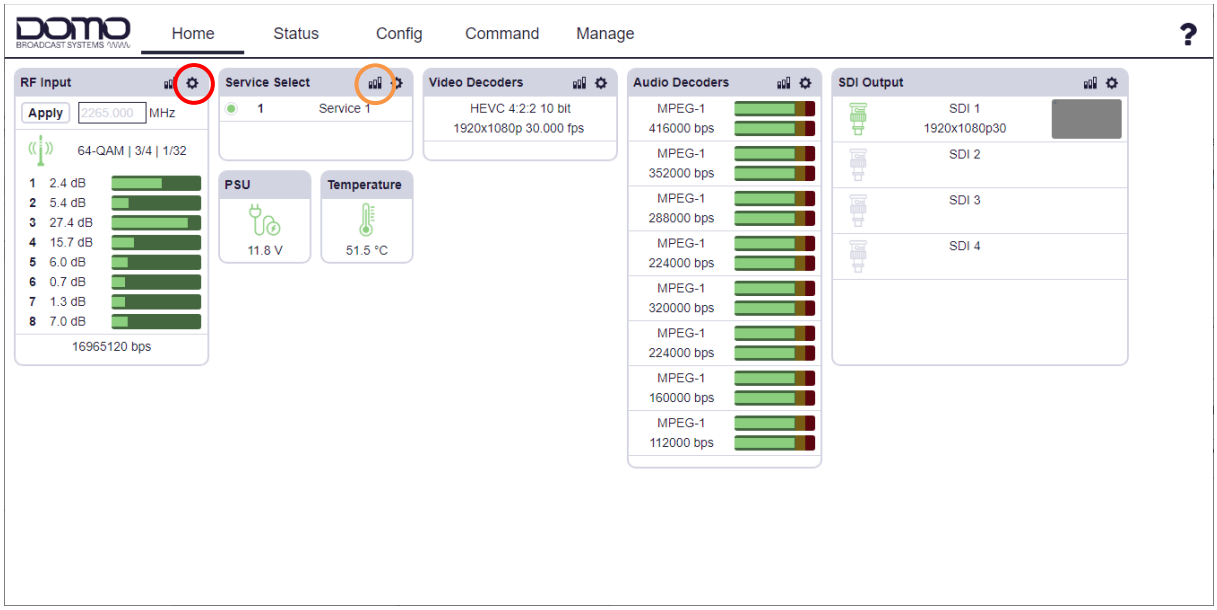
6. Web User Interface Overview

6.1 Home Page

The Home page is a dashboard of information relating to currently active configurations. There are shortcuts to Config pages (red circle) or Status pages (orange circle).

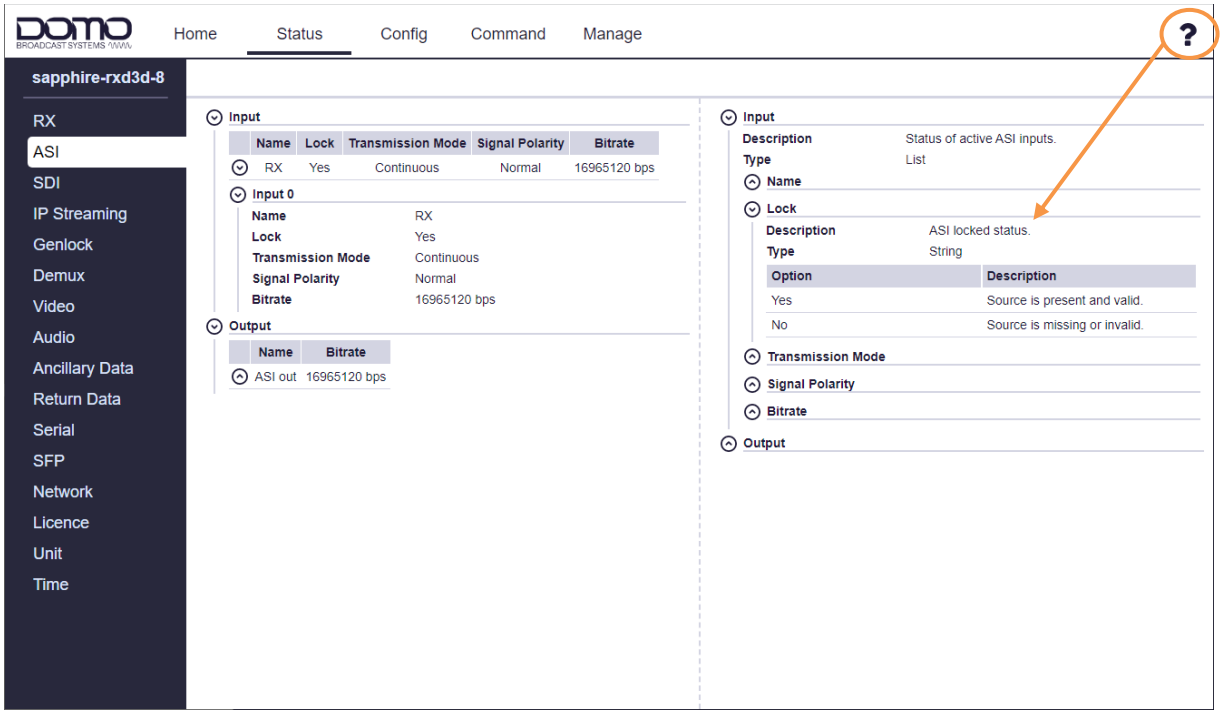


6.2 Status Pages

The Status pages are provided giving detailed information for the Sapphire-RXD4. Select the category you want to view from the list on the left panel.

Menus can be expanded or collapsed using the arrows adjacent to the header of each parameter.

Note: It may be useful to open the **Help** (?) menu for descriptions of settings.



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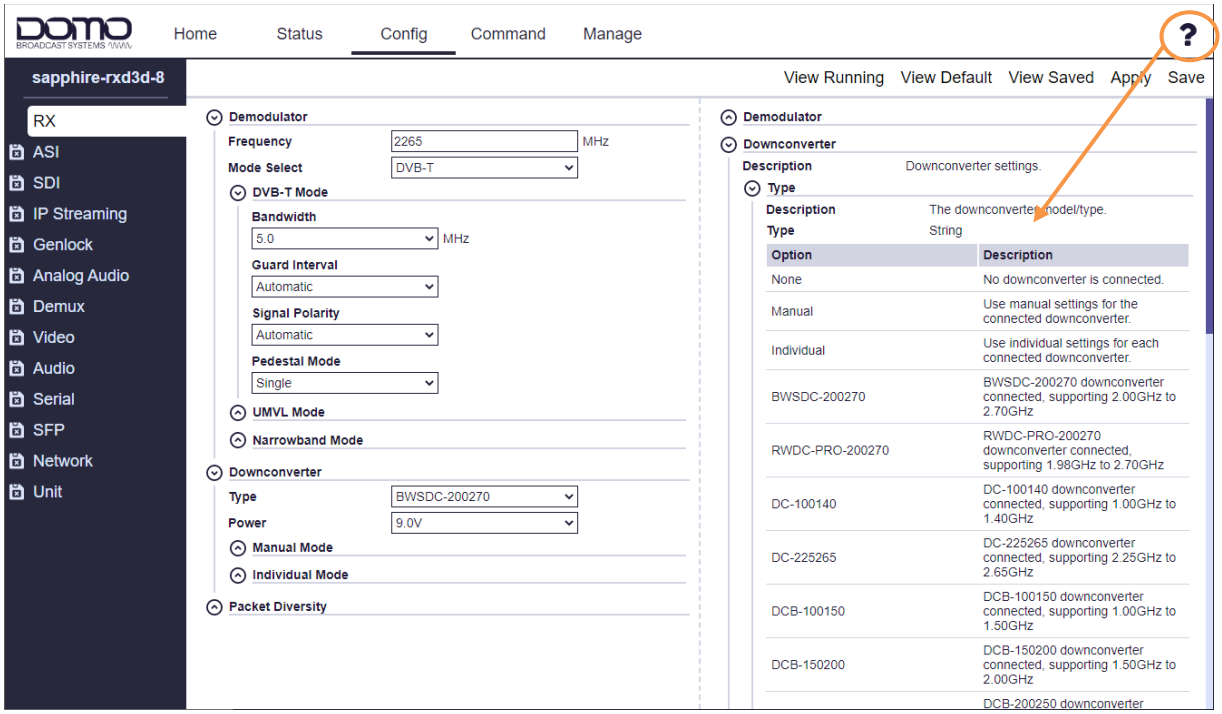
6.3 Config Pages

The Config pages are used to make changes to configuration settings. Select the category you want to edit from the list on the left panel.

Menus can be expanded or collapsed using the arrows adjacent to the header of each parameter.

Note: It may be useful to open the **Help** (?) menu for descriptions of settings.



Changes to settings can be applied or saved. It is important to understand the differences:

- **Apply** – applies the setting to the running config, this does not save the setting. On reboot the unit will return to the saved settings.
- **Save** – saves the settings in the running config, this will restore these settings on reboot. To save a change, it must be applied first.

Note: Categories on the left panel marked with a save icon , indicate that they have been applied but not saved. To carry out a global save, go to the **Manage>Config** page.

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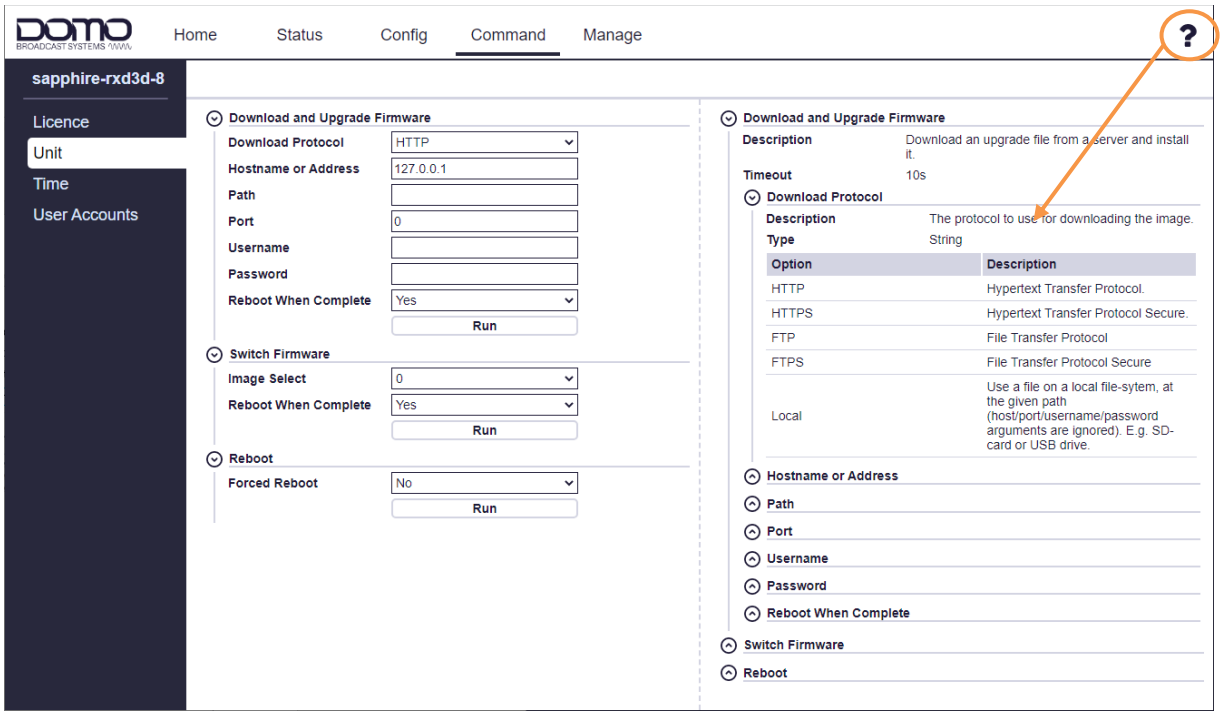
6.4 Command Pages

The Command pages are used to send commands to the device, or upgrades via external servers.

Select the category you want to send commands to from the list on the left panel.

Menus can be expanded or collapsed using the arrows adjacent to the header of each parameter.

Note: It may be useful to open the **Help** (?) menu for descriptions of settings.



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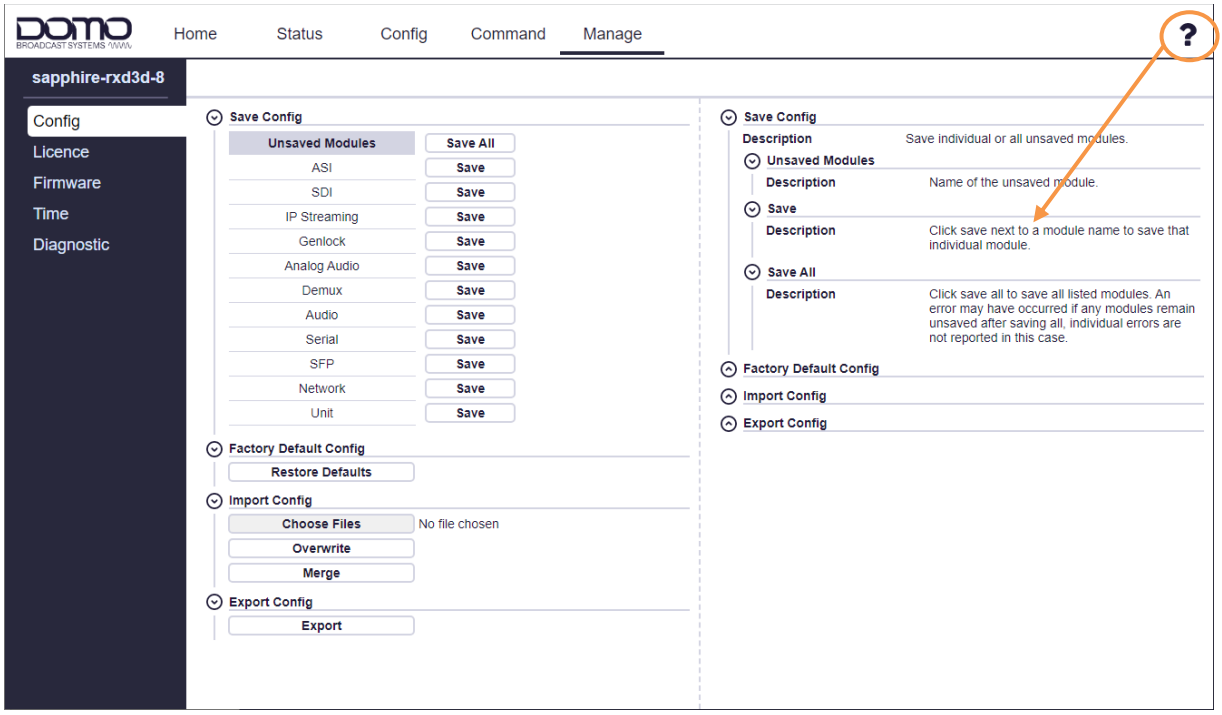
6.5 Manage Pages

The Manage pages are used for maintenance of the Sapphire-RXD4 internal software and settings. See *Section 7.5* for a firmware upgrade example.

Select the category you want to manage from the list on the left panel.

Menus can be expanded or collapsed using the arrows adjacent to the header of each parameter.

Note: It may be useful to open the **Help** (?) menu for descriptions of settings.



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7. Basic Operation

7.1 Introduction

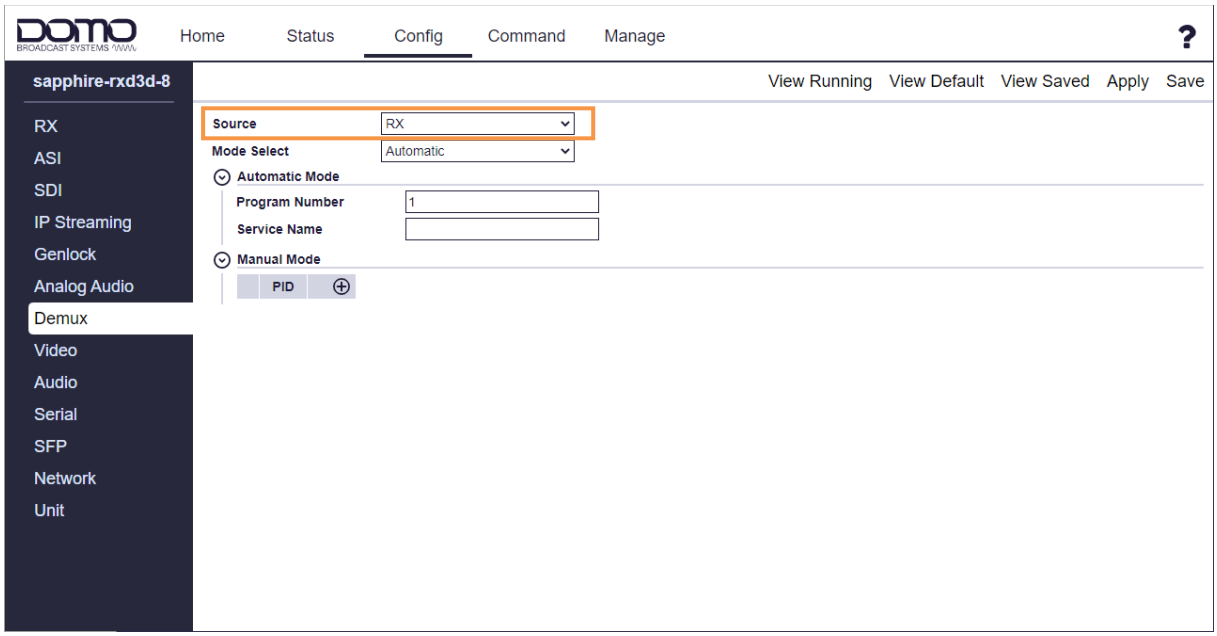
The sections in this chapter can be used in conjunction as a workflow to complete a system configuration.

Currently only limited RF setup can be achieved via the front panel touchscreen, therefore, only web interface configuration is covered.

Only settings for the Sapphire-RXD4 are explained, it is assumed that the inputs to the system are provided.

7.2 Receiver Setup

Sapphire-RXD4 can be configured as an RF receiver (RX) which can be used as a source for the ASI output, the IP streaming output or the Demux service. Setting the Demux to RX will allow you to decode from the receiver.



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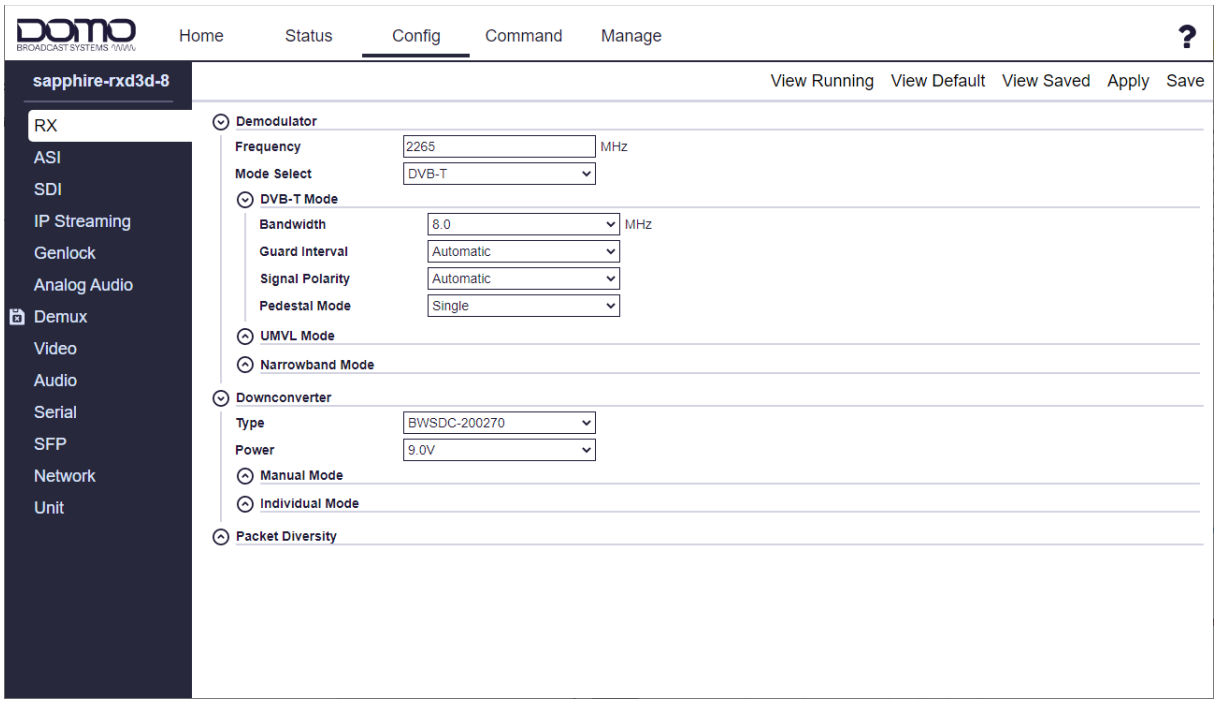
Go to the **Config>RX** page and configure the **Demodulator** settings to match the transmitter.

Downconverter presets are available for standard downconverters. If a different manufacturer is used, then manual settings can be applied.

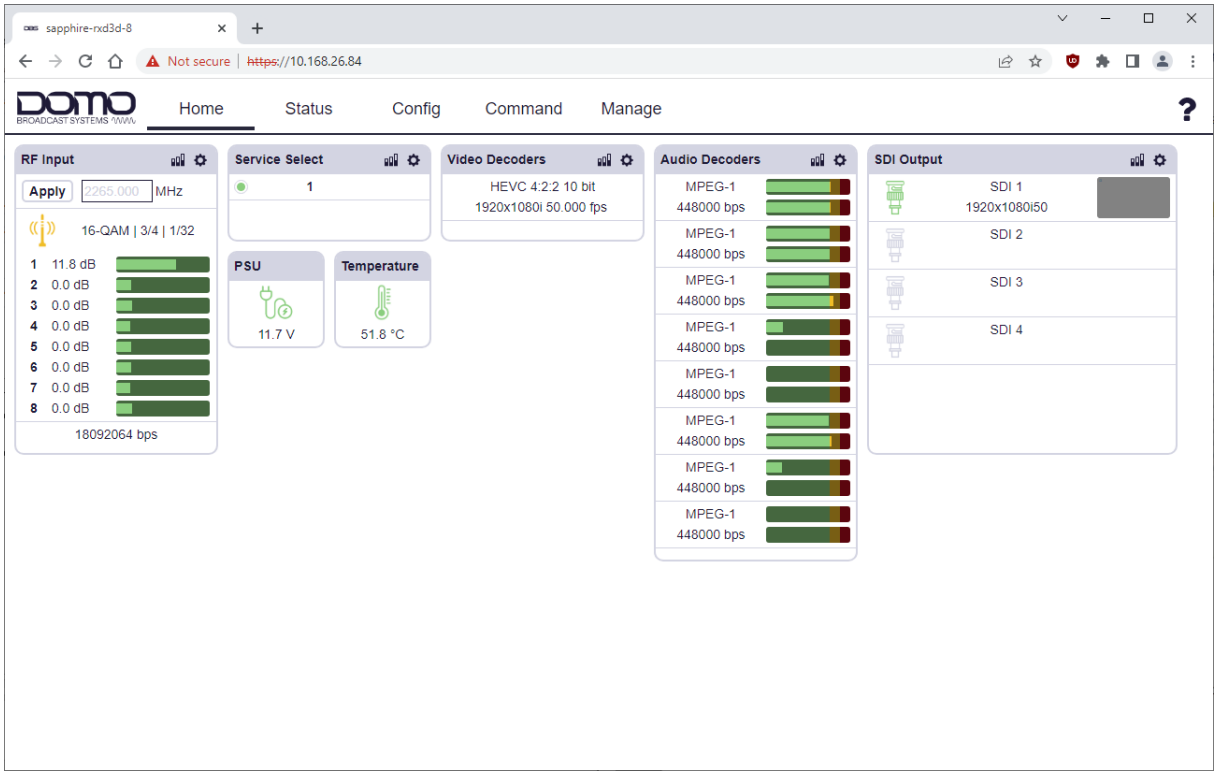
Click **Apply** to activate a running config and **Save** to retain.



RF Input can be verified on the front panel touchscreen, and on the WUI **Status** and **Home** page.

Note: The Home page will only display used parameters. The **RF Input** will not be displayed if RX has not been selected as a source for the ASI output, the IP streaming output or the Demux service.

Note: The example below is for a receiver with only one RF input for illustration.



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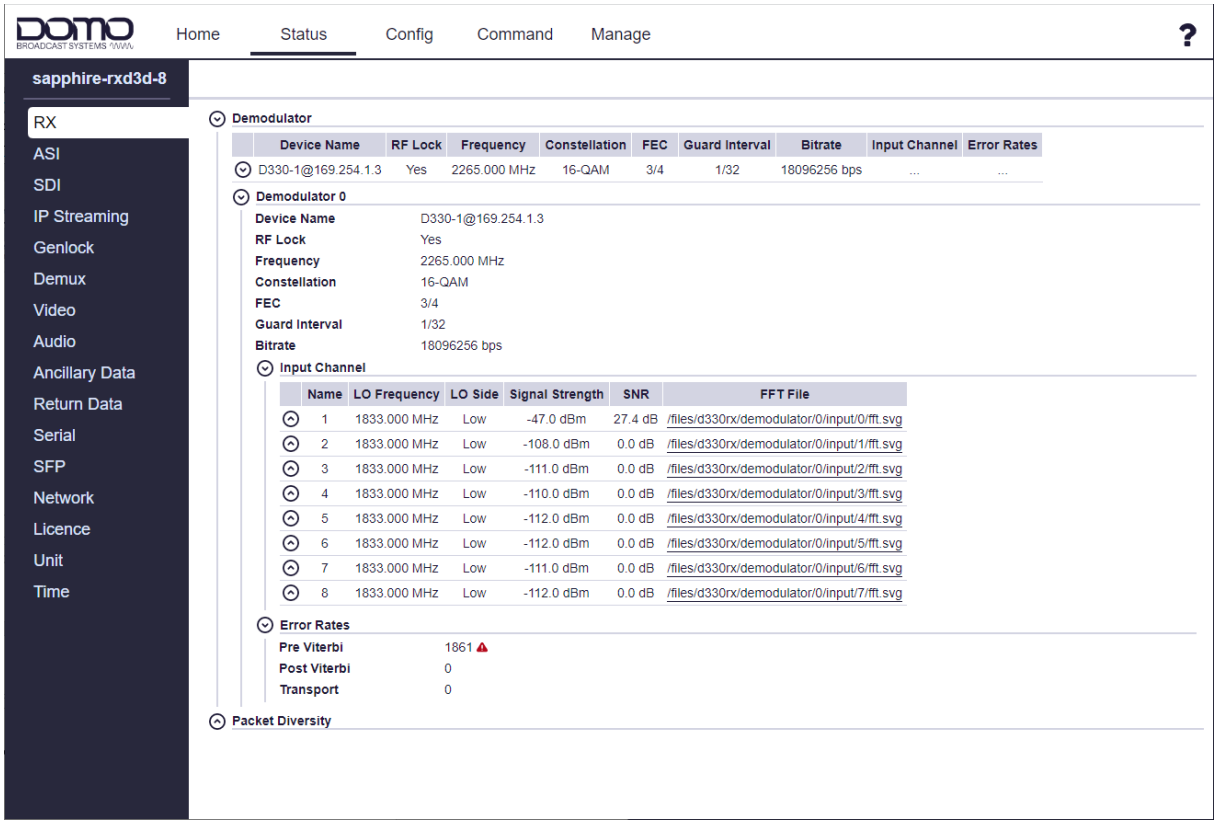
Diagnostics

Achieving a good receive signal is key to RF performance. The **RX>Status** page is a good place to monitor critical RF performance indicators.



With no RF lock, the Signal Strength should have a value of around -110dBm which indicates a low noise floor at the input. If this level is raised significantly, it could indicate that noise will adversely affect the SNR (signal-to-noise) level when a RF signal is received which will need to be investigated.

The RF noise floor can also be monitored by clicking the FFT File for the input. This will open a spectrum analysis if the received COFDM signal. An ideal receive signal should have a uniform shape with strong shoulder height. Example below.

Another key indicator of RF performance is the Post Viterbi errors, these are errors that cannot be corrected by the receiver's signal processor. Pre Viterbi can be monitored to ensure Post Viterbi errors do not occur.

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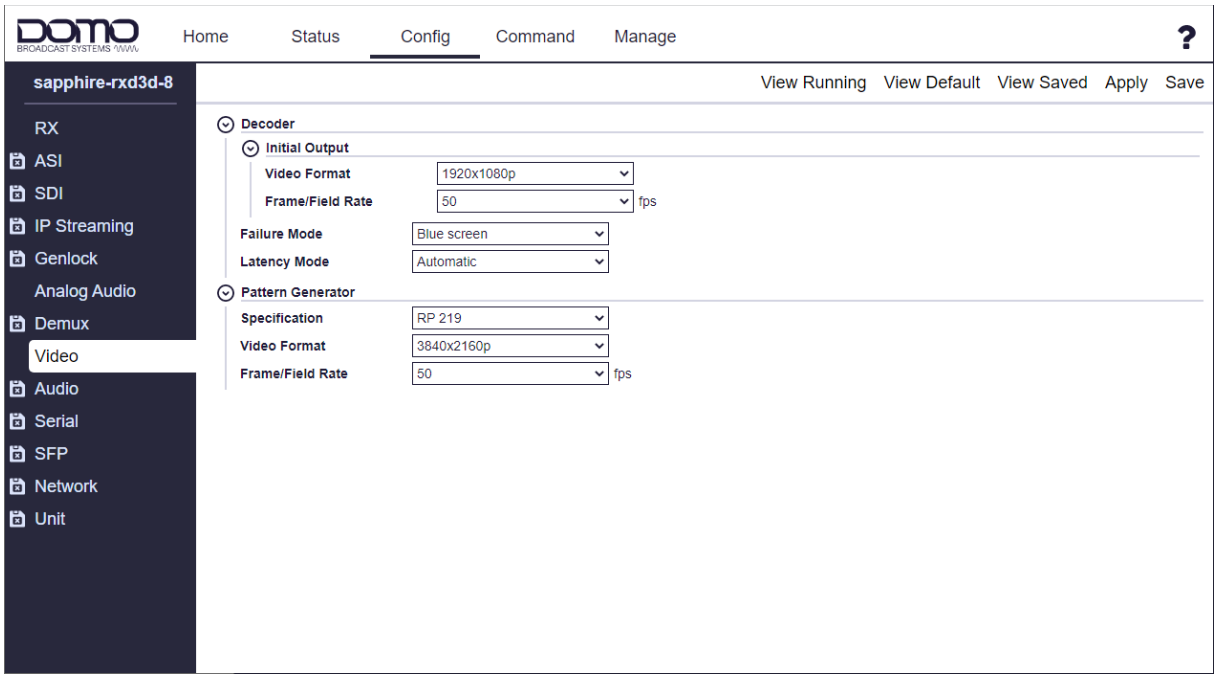
7.3 SDI Video

The SDI video outputs on the rear panel can be configured for 12G/6G/3G-SDI signals.

Go to the **Config>Video** page to configure the **Decoder**.

The **Pattern Generator** can be used to test the video through to the output stage of the system prior to receiving a live transmission.

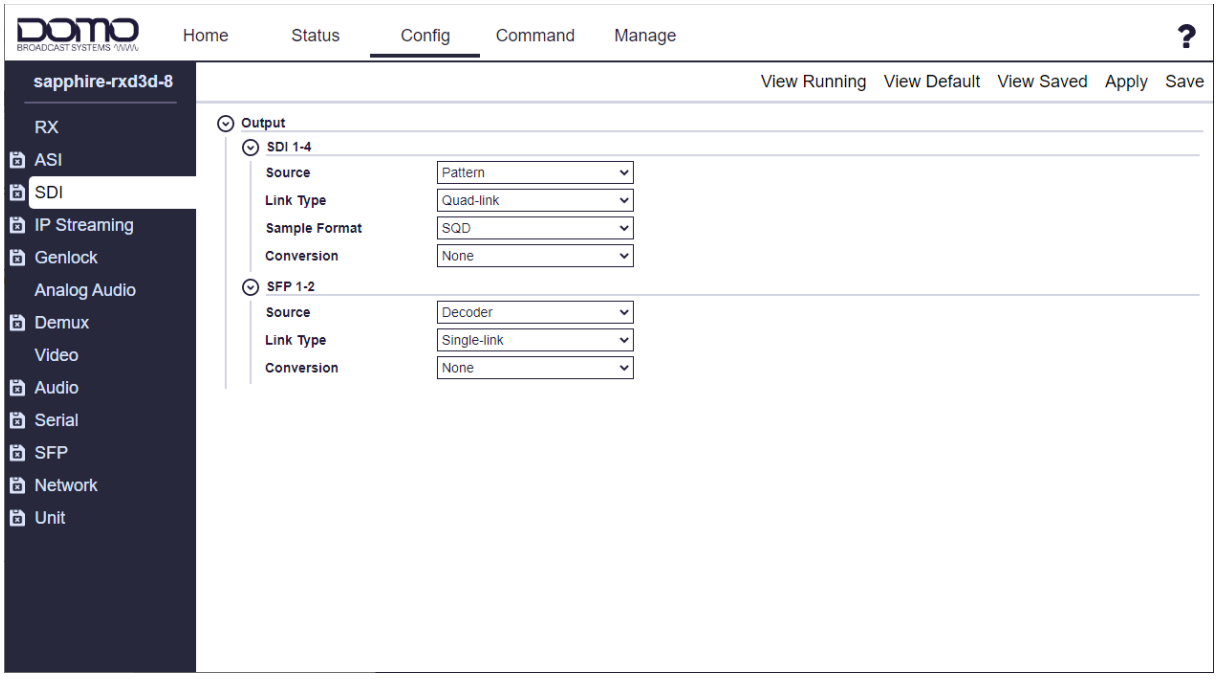
Click **Apply** to activate a running config and **Save** to retain.



Go to the **Config>SDI** page and configure the SDI output, these settings will depend on how the outputs will be viewed. If using the SFP port, an SFP adaptor must be fitted.

Set the **Source** to **Pattern** if testing the received video, or **Decoder** to view live video.

Click **Apply** to activate a running config and **Save** to retain.



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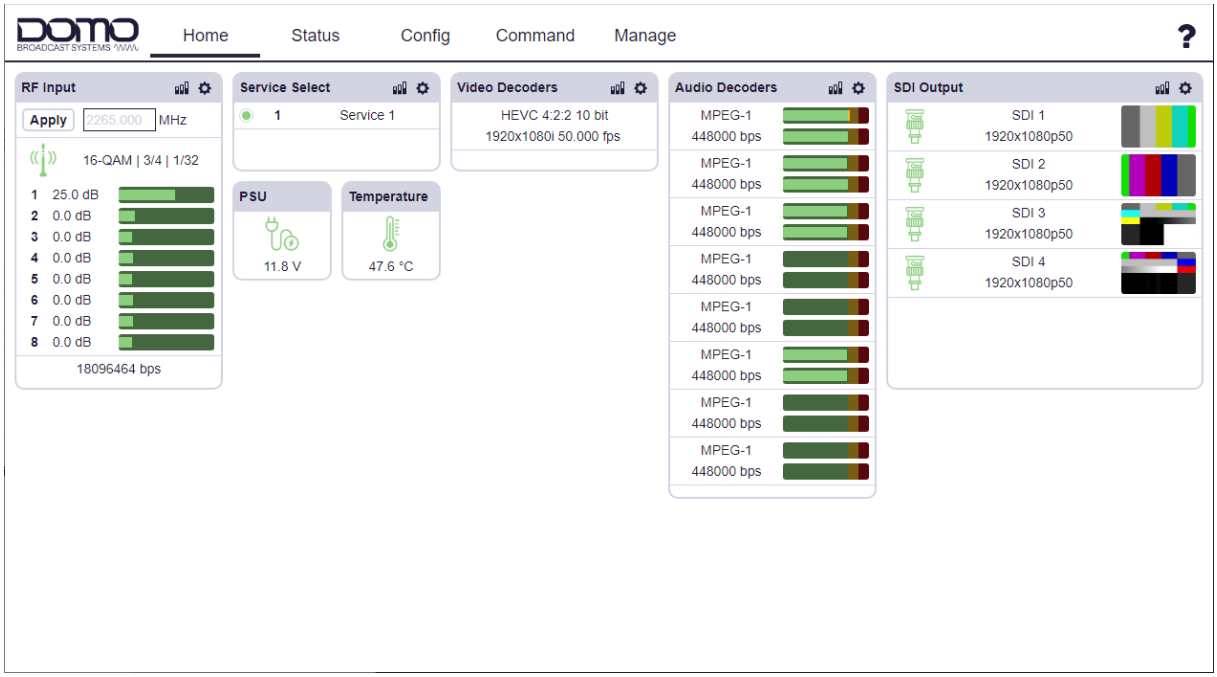
SDI Output can be verified on the front panel touchscreen, and on the WUI **Status** and **Home** page.



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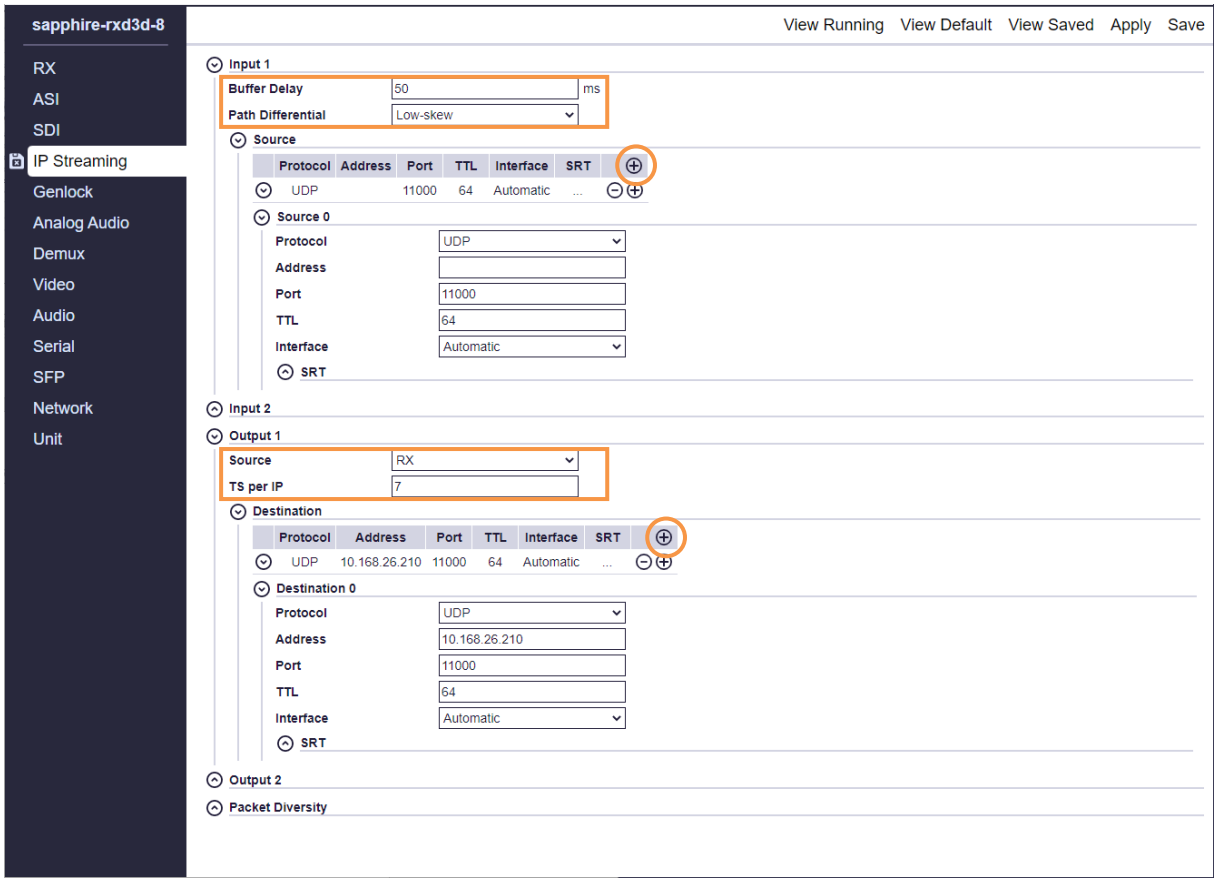
7.4 IP Streaming

7.4.1 IP Streaming Overview

Sapphire-RXD4 can be configured as an IP streaming input (IP1/IP2) which can be used as a source for the ASI output, the IP streaming output or the Demux service. Setting the Demux to IP1/IP2 will allow you to decode from the IP input.

Go to the **Config>IP Streaming** page, click the **+** button (orange circle) to create new input/output settings. Up to two streams per input/output can be applied for redundancy or in SMPTE 2022-7 networks, see *Section 7.4.4*.

Once settings have been entered, click **Apply** to activate a running config and **Save** to retain.



Note: Streaming status can be monitored in the **Status>IP Streaming** page, see *Section 7.4.5*.

Global Input/Output Settings

Item	Notes
Buffer Delay	IP packets can be received unevenly which causes jitter. This setting will make the flow of data smoother by adding a delay to the input stream.
Path Differential	The path differential is a delay difference between sources when there are different routes to the destination, for example in SMPTE 2022-7 systems, see *Section 7.4.4*.
Source	Set the source of the output stream. If using IP1 or IP2, ensure the input settings are configured.
TS per IP	The number of transport stream packets in each IP packet. Leave this at the default value of 7 unless an advanced user.

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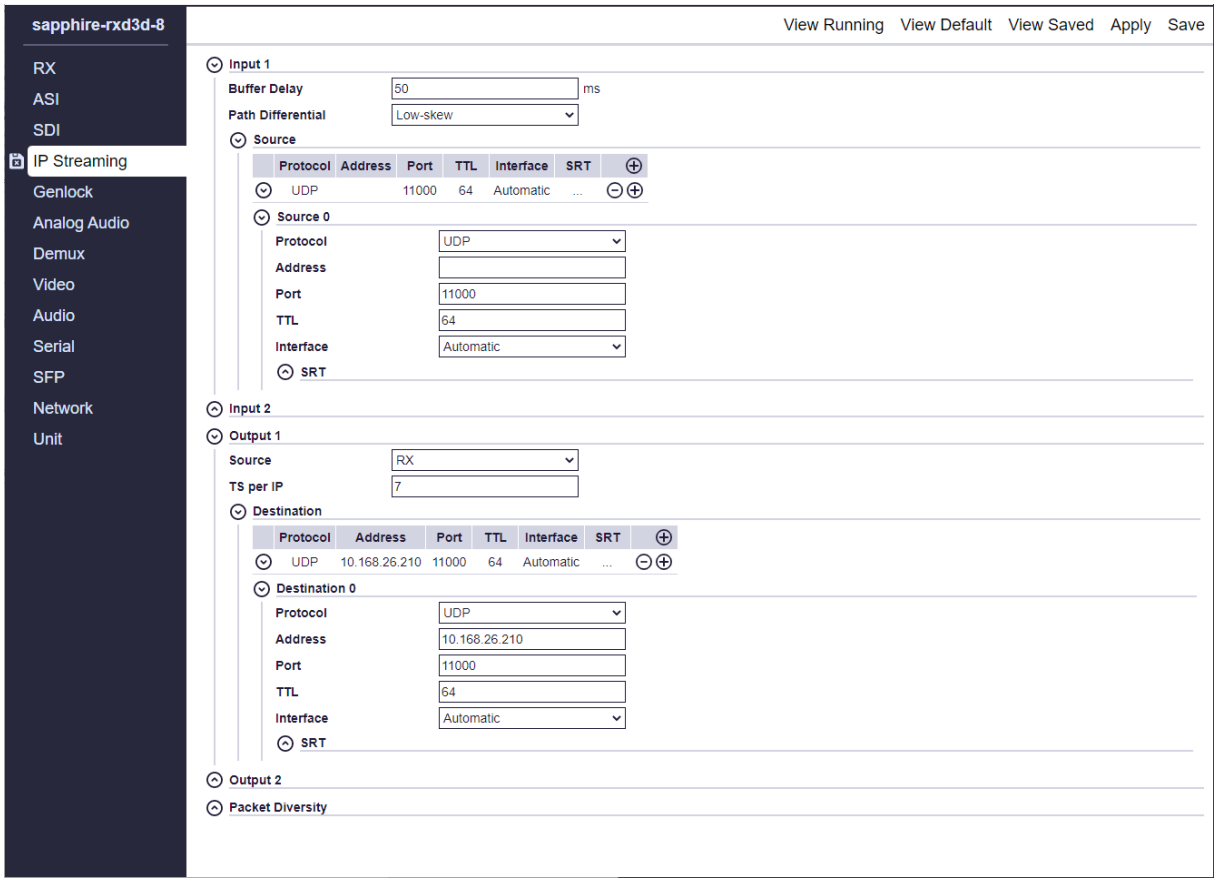
7.4.2 UDP/RTP IP Streaming

Unicast Streaming

Unicasting is one-to-one streaming between a sender and receiver. The Sapphire can be configured as an input, output or both.



Item	Notes
Protocol	UDP, RTP or SRT. **Note**: When using SRT, the SRT settings will need to be configured, see *Section 7.4.3*.
Address	When configuring an **Input**, it is not necessary to enter an address. When configuring an **Output**, enter the IP address of the destination device.
Port	Port numbers are used to identify IP address connections.
TTL	The time to live value limits how long data circulates in a system.
Interface	This will set the physical interface that the unicast is received on.

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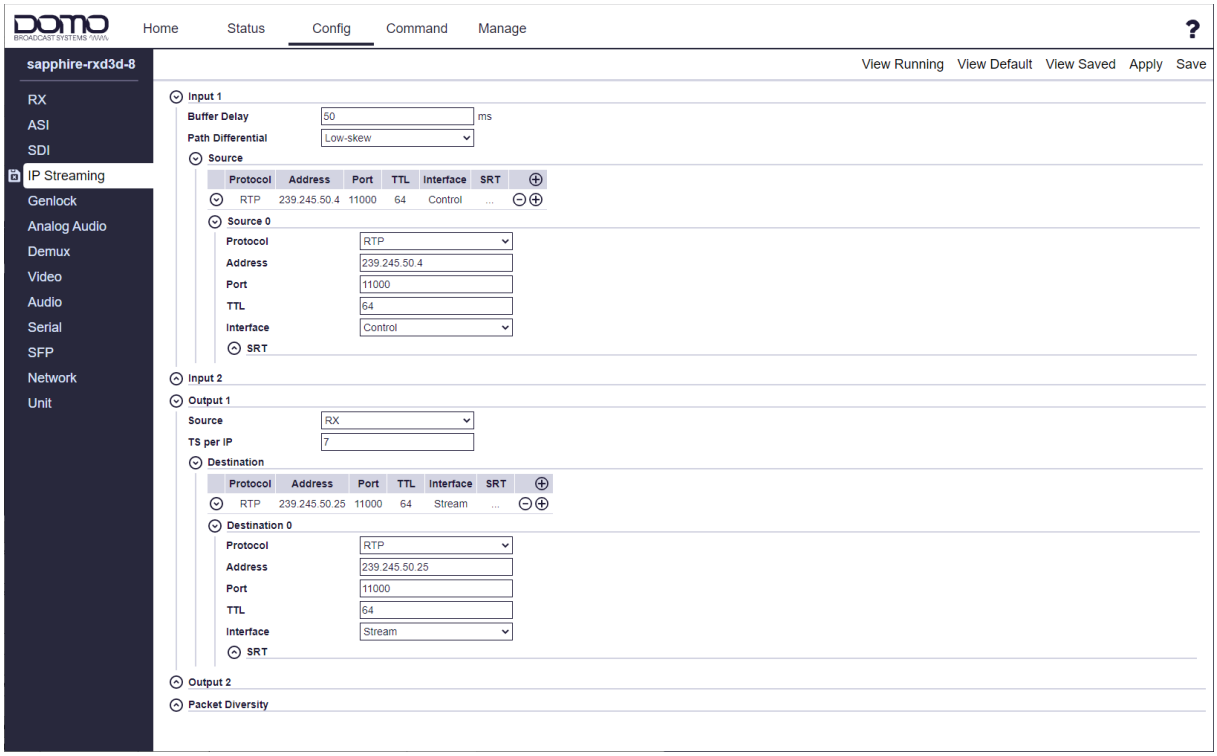
Multicast Streaming

Multicasting is one-to-many streaming between a sender and multiple receivers. The Sapphire can be configured as an input, output or both.



Item	Notes
Protocol	UDP or RTP.
Address	Enter the multicast stream address that is being received or sent. The multicast address range is 224.0.0.0 to 239.255.255.255. For more guidance on multicast addressing, see *Table 7-1*.
Port	Port numbers are used to identify IP address connections.
TTL	The time to live value limits how long data circulates in a system.
Interface	This will set the physical interface that the multicast is expected on. When multicast streaming, it is particularly important to select the actual interface being used.

Start Address	End Address	Description
224.0.0.0	224.0.0.255	Reserved for special well-known multicast addresses
224.0.1.0	238.255.255.255	Globally scoped (Internet-wide) multicast addresses
239.0.0.0	239.255.255.255	Administratively scoped (local) multicast addresses

Table 7-1: Multicast Address Uses

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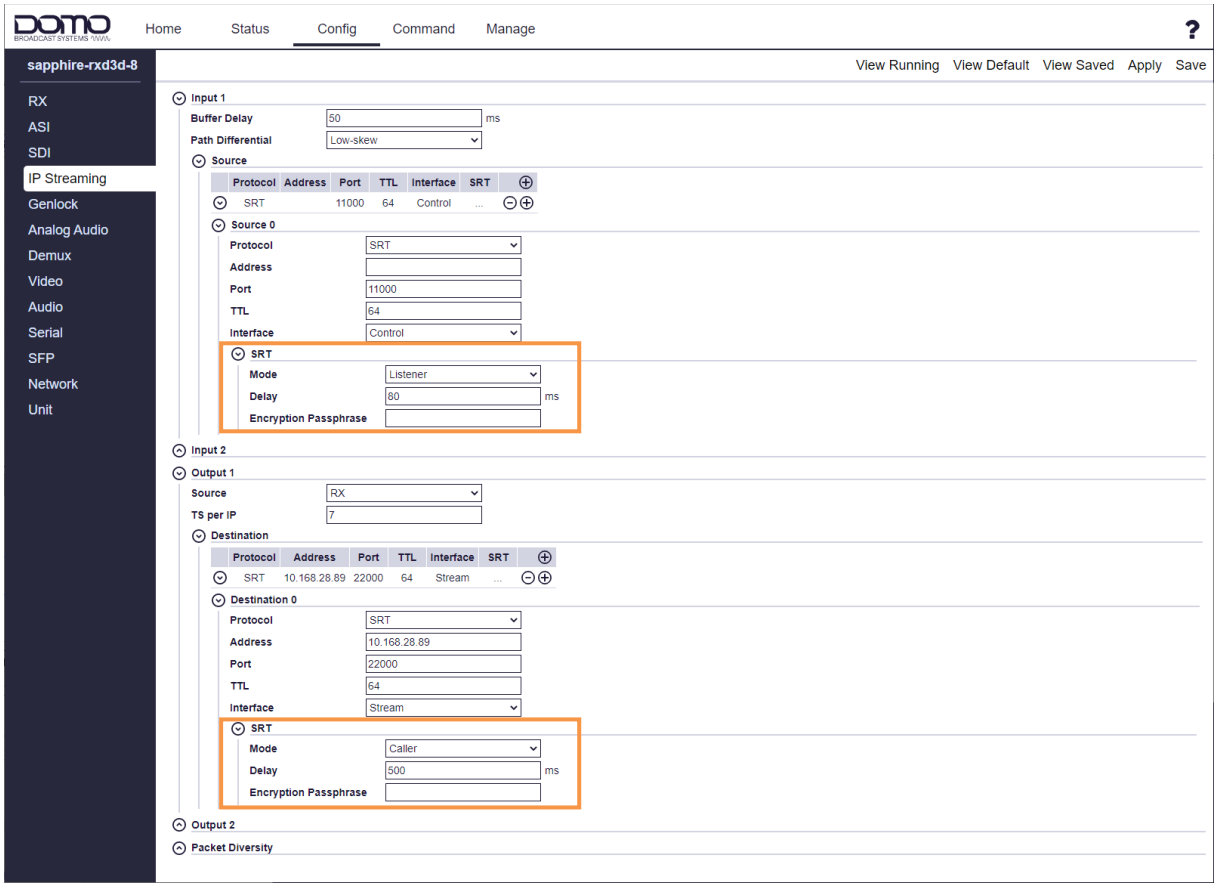
7.4.3 SRT (Secure Reliable Transport) Protocol

SRT is a video streaming transport protocol that delivers secure low latency streaming over noisy or unpredictable (lossy) networks such as the public internet. SRT utilises the UDP transport protocol but adds error checking for reliability.

If SRT streaming is required, the settings for unicast streaming will also need to be configured, see *Section 7.4.2*.



Item	Notes
Mode	The **Caller** initiates the outbound call to the Listener. The Caller can be an input (receiver) or output (sender). The **Listener** waits for an inbound connection from the Caller. The Listener can be an input (receiver) or output (sender). **Note**: In a one-to-one setup, it is arbitrary whether the Caller and Listener device is the input or output. However, the input or output must be set to Listener if it is ingesting multiple Callers. A **Rendezvous** server will allow the delivery of messages from one source to another. This can be used to avoid port forwarding via a router.
Delay	The delay ca be adjusted to account for dropped packets. The delay will depend on the round-trip time (RTT) and the packet loss. This is advised in the web page help guide.
Encryption Passphrase	SRT includes an AES128 encrypted passphrase. This must be matched in the input and output device. If this is left blank, no encryption will be applied.

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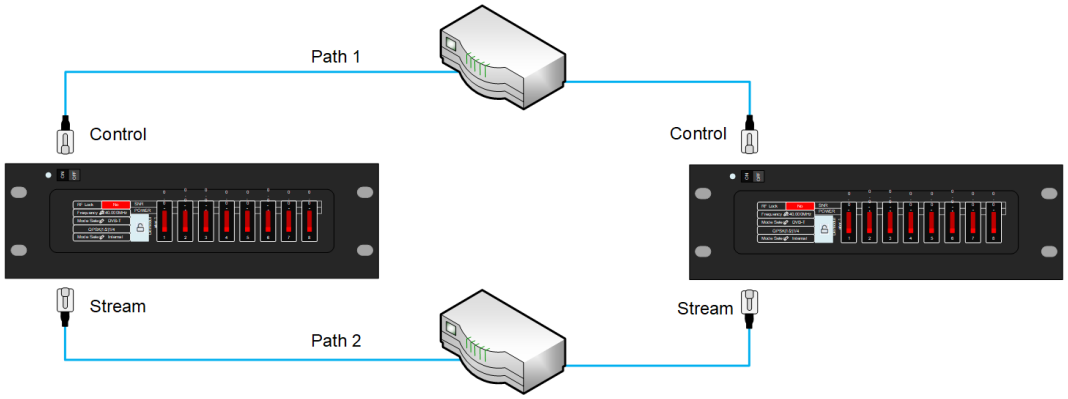
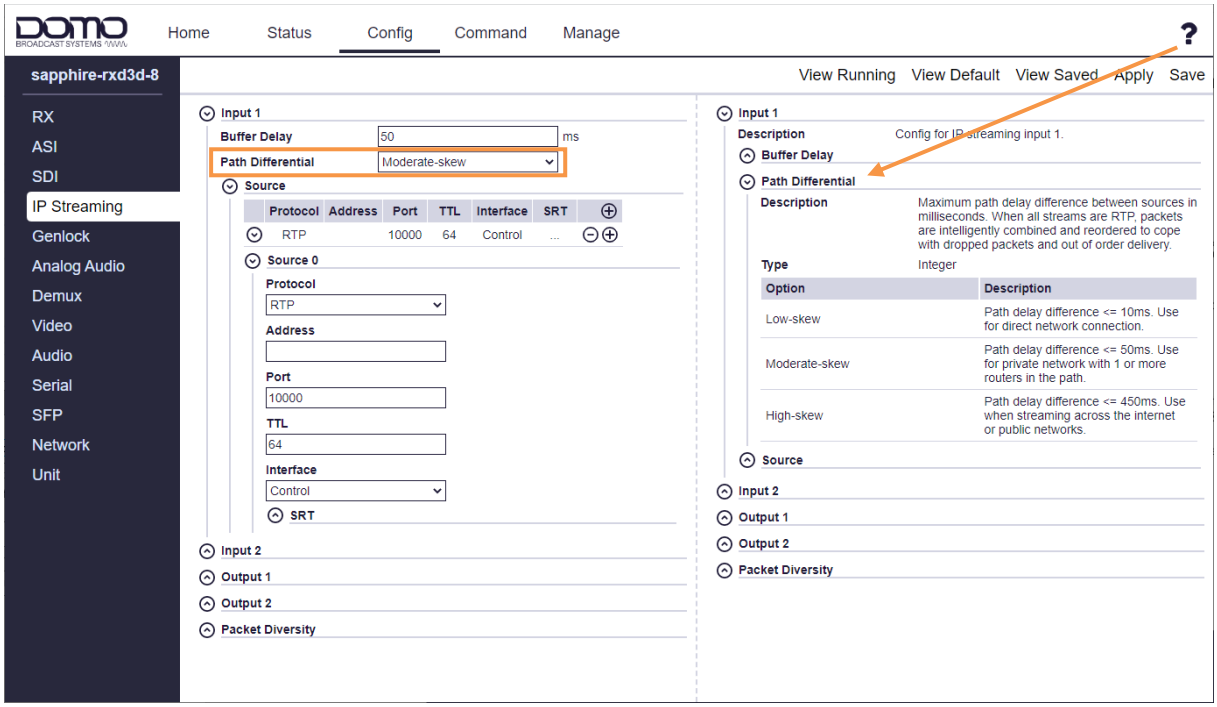
7.4.4 SMPTE-2022-7 Networks

The Sapphire-RXD4 receiver is SMPTE-2022-7 compliant. SMPTE 2022-7 IP networks allow for the recovery of lost packets by generating two streams with the same data using different routes to the destination. If a packet was lost at the receiver on path 1, the packet is taken from path 2 and vice versa. To be able to switch between path 1 and path 2 packets seamlessly, some buffering is needed to deal with the delay difference or jitter (can be observed in the **Status>IP Streaming** page).



Adjust the **Path Differential** setting depending on the distance between the sources, the path delay options are explained in the Sapphire web page help guide.

UDP/RTP settings for unicast or multicast will also need to be configured, see *Section 7.4.2*.



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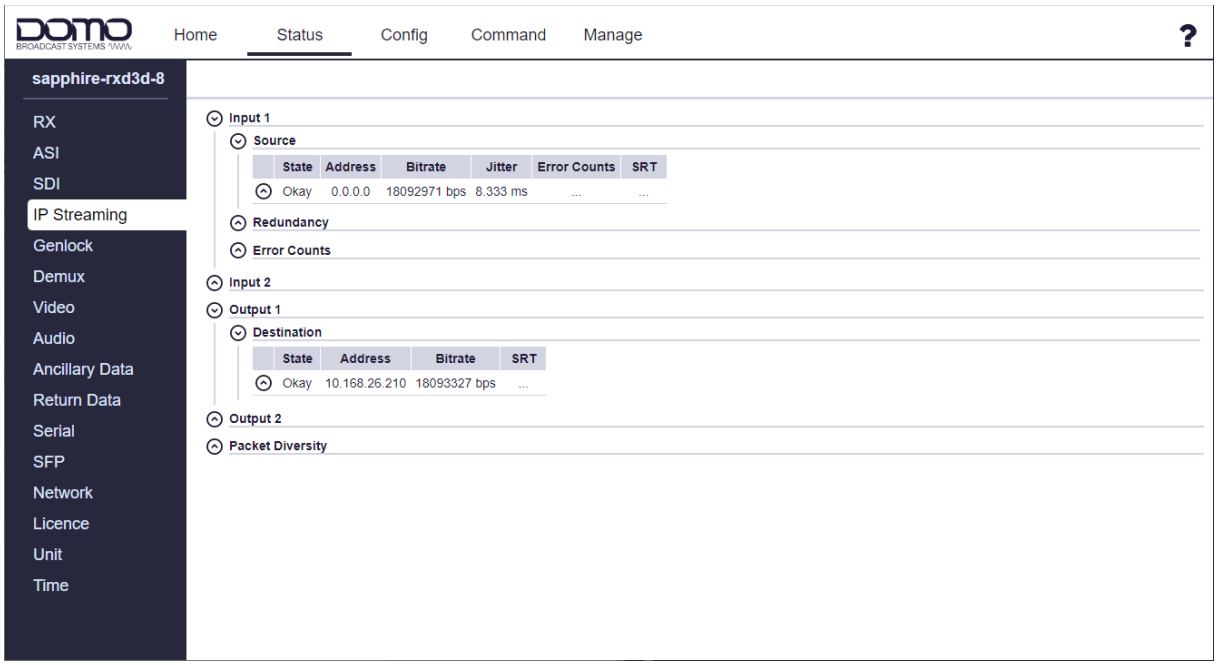
7.4.5 IP Streaming Status

The streaming input and output status can be monitored in the **Status>IP Streaming** page.

Jitter and error count measurements are key performance indicators which can be corrected by adjusting buffer delay parameters in the setup.



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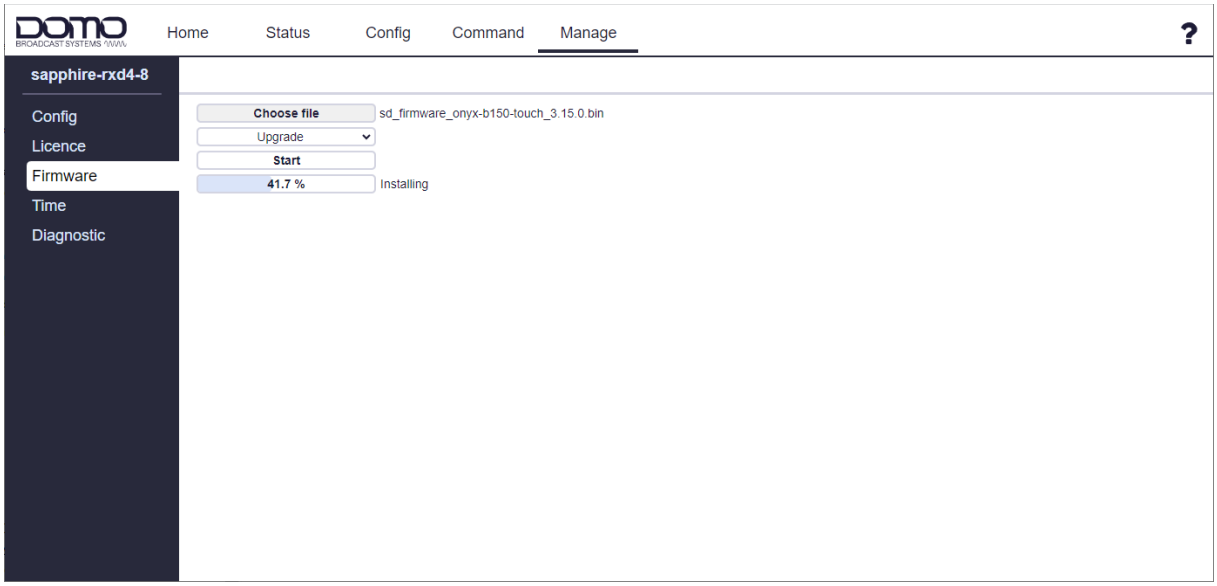
7.5 Firmware Upgrade

When firmware updates are required, DBS will make them available on WatchDox, see *Section 9.1*. Upgrades may be required for the codec (**b150**) and the demod (**d330**). If both files require upgrade, the codec must be uploaded first. A reboot is required on completion of the upgrade.

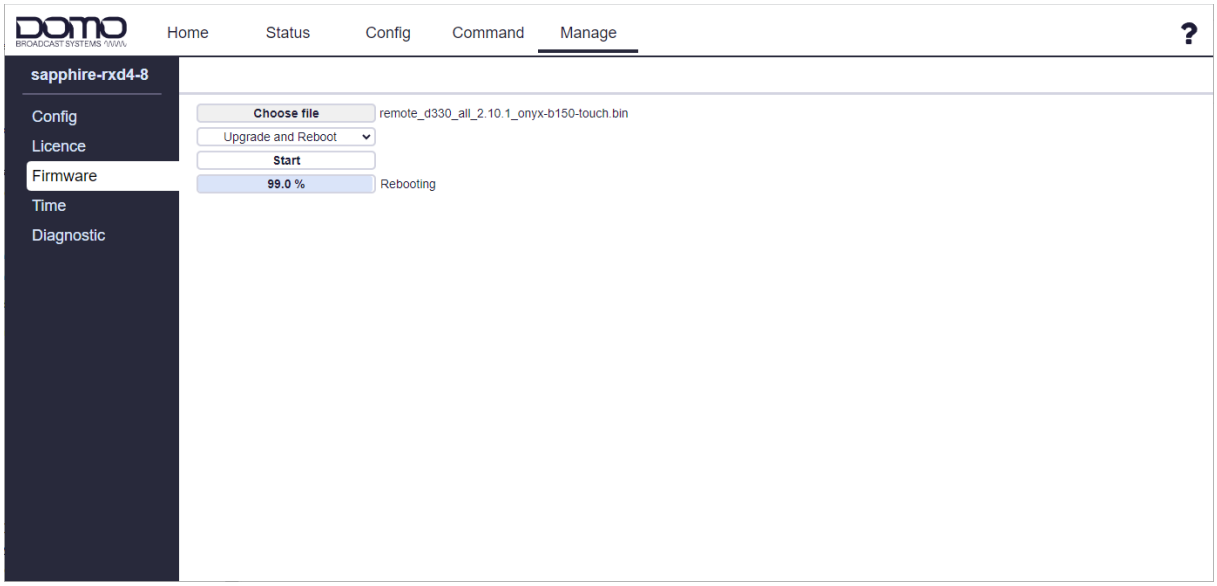
Go to the **Manage>Firmware** page. Select **Choose File** and browse to the *sd_firmware_onyx-b150-touch_x.x.x.bin* file. Set to **Upgrade** and click **Start**. The upgrade status will display accordingly.

Note: If only the codec upgrade is needed, this can be set to **Upgrade and Reboot**.



When the upgrade has completed, the status will read **100% Ready** or will reboot if Upgrade and Reboot was selected.

If the demod requires upgrade, select **Choose File** again and browse to the *remote_d330_all_x.x.x_onyx-b150-touch.bin* file. Set to **Upgrade and Reboot** and click **Start**.



When the upgrade has completed, the unit will reboot. Firmware versions can be verified in the **Status>Unit** page.

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8. Appendix A – Reference Material

8.1 How to Configure a PC IP Address

The following guide will tell you how to configure a PC or laptop IP address so that it matches the IP address range of the unit you are connected to. This is important because if they do not match, you will not be able to communicate with your device.

The IP address range given in this example is a good one to use if you are unsure.

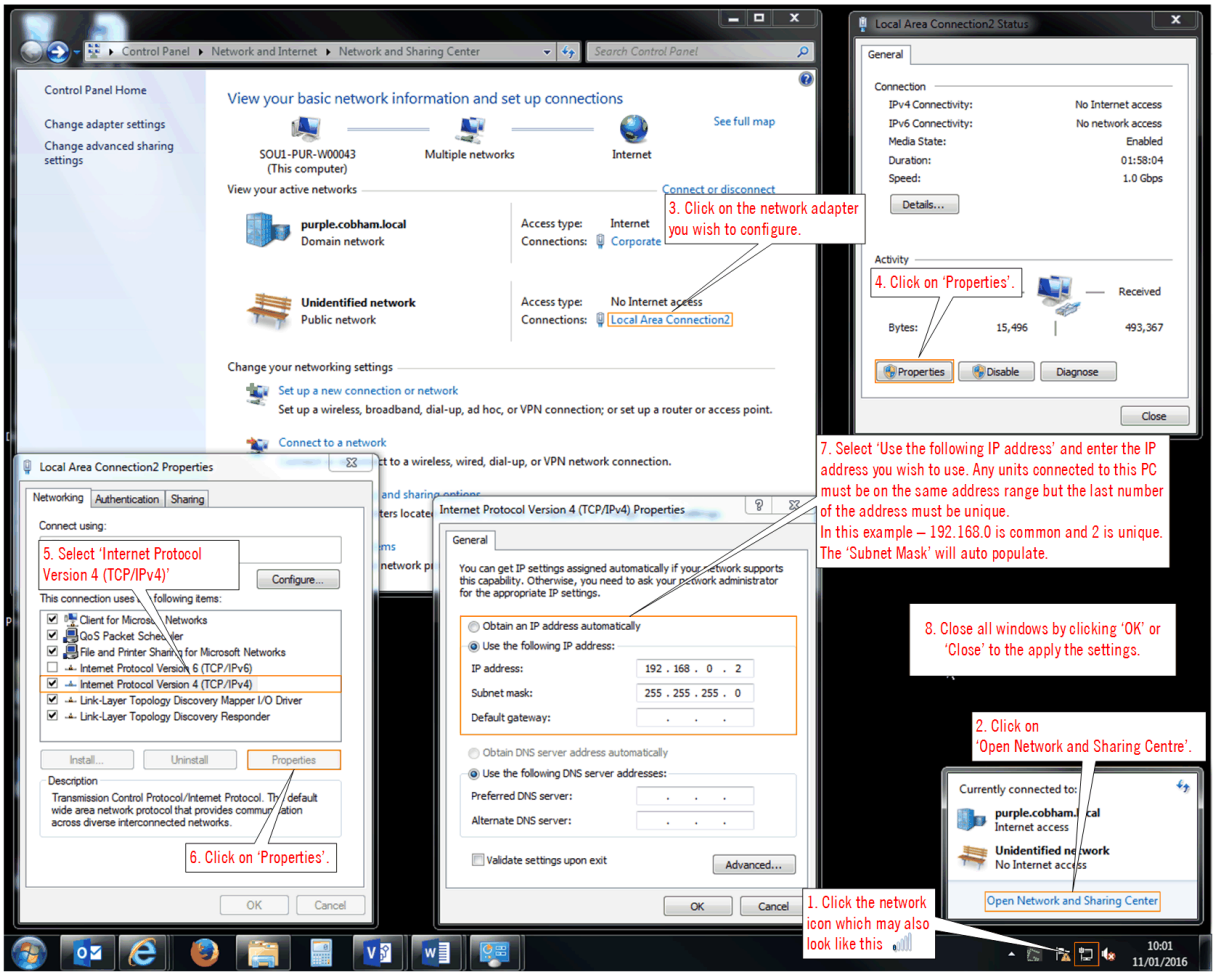

Figure 8-1 How to configure a PC IP address

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8.2 CIDR with Subnet Mask

CIDR	Subnet Mask
/32	255.255.255.255
/31	255.255.255.254
/30	255.255.255.252
/29	255.255.255.248
/28	255.255.255.240
/27	255.255.255.224
/26	255.255.255.192
/25	255.255.255.128
/24	255.255.255.0
/23	255.255.254.0
/22	255.255.252.0
/21	255.255.248.0
/20	255.255.240.0
/19	255.255.224.0
/18	255.255.192.0
/17	255.255.128.0
/16	255.255.0.0

CIDR	Subnet Mask
/15	255.254.0.0
/14	255.252.0.0
/13	255.248.0.0
/12	255.240.0.0
/11	255.224.0.0
/10	255.192.0.0
/9	255.128.0.0
/8	255.0.0.0
/7	254.0.0.0
/6	252.0.0.0
/5	248.0.0.0
/4	240.0.0.0
/3	224.0.0.0
/2	192.0.0.0
/1	128.0.0.0
/0	0.0.0.0

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9. Appendix B – After Sales Support

9.1 Documentation and Software

It is DTC's practise to make the majority of our latest user guides and software available to customers online, by using our WatchDox facility. To access this site, please contact your Account Manager or send a request to uk.technical.support@domotactical.com.

You will be sent a link where you can log in and create your own password followed by a confirmation email. Once you have done this, you can then log in to your account.

9.2 Contact Technical Support

The Technical Support team can be accessed by one of the following:

- **Phone**: +44 1489 884 550
- **Email**: support@domobroadcast.com (no restricted content)

9.3 Using the DTC RMA Service

9.3.1 Contact DTC

If there is a problem and our technical support team have been unable to resolve the issue, email dtc.rma@domotactical.com (US) or solent.customerhub@domotactical.com (UK/ROW) to request a Return Material Authorisation (RMA) form.

Note: Alternatively, use the online form at https://www.domotactical.com/support/.

9.3.2 Complete and Return the RMA Form

Complete the RMA form with the following information and return to the customer hub:

- Name
- Address
- Unit serial number
- Date of purchase or the original invoice number
- Date of failure
- A detailed description of the problems you have encountered
- A list of the hardware/software configuration if applicable

When the hub receives the completed form, an RMA number and shipping instructions will be sent.

9.3.3 Pack the Device

Note: Before packing, remove all personal non-DTC kit or media from the device.

Use the original shipping container and packing materials, if possible.

If the original packing materials are not available, wrap the equipment with soft material (e.g., PU/PE form) then put the wrapped equipment into a hard cardboard shipping box.

9.3.4 Put the RMA Number on the Box

Clearly mark the outside of the shipping box with the RMA number. If an RMA number is not present on the shipping box, receiving will be unable to identify it and it might be returned.

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9.3.5 Send the Box to DTC

Send the box using your normal shipping process.

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10. Appendix C – Safety and Maintenance

Note: The following guidelines may or may not be applicable to your product. However, we would ask that you read them to assess their relevance.

10.1 Cautions and Warnings

Area	Note
Aircraft safety	Use of this equipment on board aircraft is strictly forbidden without the required testing and qualification for aircraft type. Use of radio transmitter equipment in an aircraft can endanger navigation and other systems without appropriate testing, or carry-on certification by a competent certified body.
Cables	Connecting cables should not be positioned where they are likely to become damaged or where they may present a trip hazard.
Electrostatic discharge	ESD guidelines must be followed for this electrostatic sensitive device.
Enclosures	Do not remove any factory installed screws or fastenings as this may void any warranties. There are no functions that require the user to gain access to the interior of the product. There are no user serviceable parts inside.
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 locations where explosives are stored and/or used.
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 protected from lightning strikes.
Power supply	Ensure that the power supply arrangements are adequate to meet the stated requirements of each product. Observe all electrical safety precautions.
Risk of eye injury	Care should be taken to avoid eye contact with the antennas.
RF emissions	When using this device please ensure 20cm is maintained between your device and your body while the device is transmitting.
Thermal control system	If you operate this device in an enclosed space, you must ensure it has adequate airflow to keep it cool. If worn close to the body, care must be taken to protect the operator from excessive temperatures.
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.

10.2 Repairs and Alterations

Attempted repairs, alterations, improper installations or connections may invalidate the warranty.

Please contact Technical Support if you suspect a faulty or defective component. See *Section 9.2*.

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10.3 Caring for your Equipment

- Do not subject the unit to physical abuse, excessive shock or vibration
- Do not drop, jar or throw the unit
- Do not carry the unit by the antenna
- Avoid exposure to excessive moisture or liquids
- Do not submerse the unit unless it is designed to be submersible
- Do not expose the unit 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 units on surfaces that are unstable
- Only use accessories intended for the specific make and model of your unit, especially batteries, chargers and power adapters.

10.4 Charging

- Use approved batteries, chargers and adapters designed specifically for your make and model unit
- Do not attempt to charge a wet unit or battery pack
- Do not charge the unit or battery pack near anything flammable
- Stabilize the battery pack to room temperature (22°C) before charging
- Do not charge units and/or battery packs on wet or unstable surfaces
- Do not leave units and/or batteries in chargers for excessive periods

10.5 Working with Lithium Batteries

- Charge only with the approved charging cable
- Batteries are to be used only for the specified purpose. Incorrect use will invalidate the warranty and may make the battery become dangerous.
- Charge in a clean, dry environment ideally at 10°C (0 to 45°C is permissible).
- Do not store or operate in direct sunlight for extended periods. Battery can be damaged by over-heating, for example if placed on the rear parcel shelf of a motor vehicle.
- Store in a cool dry environment. Storage at elevated temperatures can cause permanent loss of capacity.
- For short term storage (less than six months), store in a fully charged state.
- For extended periods of storage (more than one year), charge before storage and recharge every six to nine months.
- Always fully recharge the battery after any storage period greater than one month before use.
- Do not store the battery with the charge depleted as this can cause failure of the battery and invalidate warranty.
- Do not short circuit
- Do not immerse in water
- Do not incinerate. Cells are likely to explode if placed in a fire.

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- Dispose of batteries in accordance with the regulations in place for the country of use. Batteries are normally considered separate waste and should not be allowed to enter the normal waste stream. Either return to the seller or deliver to an approved re-cycling facility.

10.6 Cleaning

- Turn off the unit and remove batteries (if applicable) before maintenance
- Use a clean, soft, damp cloth to clean the unit. A microfiber cloth is recommended.
- Do not use alcohol or cleaning solutions to clean the unit
- Do not immerse the unit in water to clean it
- If the unit becomes wet, immediately dry it with a microfiber or other lint-free cloth

10.7 Storage

- Turn off the unit and remove batteries before storage
- Store units and battery packs in a cool, dry area at room temperature (22°C)
- Do not store units and/or batteries in active chargers

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