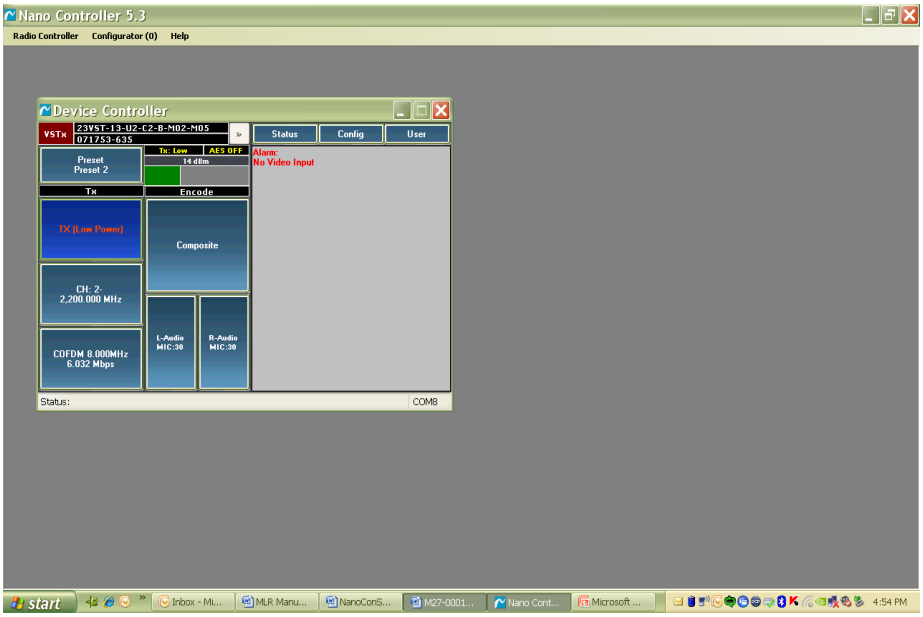
NANOCONTROLLER™

Radio Remote Control Software
Version 5.3



Software User Guide

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NANOCONTROLLER
Users Manual

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NANOCONTROLLER
Software User Manual

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1 Introduction

This document is a user manual for the NanoController Software. NanoController is a Remote Control Windows PC GUI (graphical user interface) used to control certain IMT and Nucomm products via their built-in RS-232 Serial or Ethernet interfaces.

The NanoController GUI may be referred to as the "NanoController," the "PC GUI," or just the "GUI" throughout this document. Due to the variety of controllable devices (transmitters, receivers, repeaters, encoders, decoders, etc), these units will be referred to either directly by product name or by using term such as "unit," "radio," or "product" as applicable.

The NanoController PC GUI remotely controls and configures modes of operation on various IMT and Nucomm devices. The GUI contains user-friendly screens with pushbuttons and menus for selecting features you wish to setup or program. The GUI also uses dialog boxes for selecting configurable options.

1.1 Manual Overview -The contents of this manual are as follows:

1.1.1 Chapter 2

Chapter 2 contains the NanoController connection and installation information.

1.1.2 Chapter 3

Chapter 3 describes Unit Interface operating instructions for Transmitters.

1.1.3 Chapter 4

Chapter 4 describes Unit Interface operating instructions for Receivers.

1.1.4 Chapter 5

Chapter 5 describes instructions for editing preset and frequency plan configuration files.

1.1.5 Chapter 6

Chapter 6 of this manual contains warranty and support information.

1.2 Glossary - The following terminology will be used throughout this document.

1.2.1 Preset

A standalone group of settings used to define the state of the entire unit. This includes RF, Audio and video settings. Presets are numbered and can be recalled by the user from the front panel (if unit is so equipped). NanoController has the ability to modify presets and choose the settings for each preset. Presets are not channels but can reference a channel in the frequency plan.

1.2.2 Frequency Plan

This defines the radio parameters and capabilities. The allowable tuning range of the unit along with discrete channels are defined here. This will allow the user to separate the band into logical channels and reference them in the presets. Customers can use the IMT default or order a unit with a predefined plan (at extra cost).

1.2.3 Default Frequency Plan

IMT chooses a default frequency plan for each unit model. If the customer does not define or purchase another custom plan the default plan is installed.

1.3 Compatibility

The NanoController GUI controls the following products:

- NANOTX
- NANOTX
- STX
- SRX
- VSTX
- VSRX
- X-TENDER
- MICROLITE
- MOBILE TACTICAL RECEIVER
- SKYMASTER
- MOBILCMDR
- DIRECT VU
- MOBILE VIEWER
- NEWSCODER 4

1.4 PC Minimum Requirements

The Windows PC GUI runs on a Windows PC. It connects to the product via the transmitter's RS-232 serial or Ethernet interface. The Windows PC minimum requirements are:

- Windows XP SP2, Vista SP1 32 bit, Windows 7 32Bit operating systems
- 512 MB RAM
- 1GHz Pentium or better
- RS-232 Serial Port Interface, USB Serial Port Converter, or Ethernet interface.

2 NanoController Connection

2.1 Connecting to the NanoController

2.1.1 Starting NanoController

On the PC, choose "IMT Software" in the Start > IMT software folder to open the "IMT NanoController" Remote Control PC GUI software. The Nano Controller Icon is placed on the desktop upon installation. Upon opening, the main window is displayed. The main window as shown below includes three menus:

- **Radio Controller** Used to select which type of product you wish to control.
- **Configurator** Used to edit Preset programming windows.
- **Help** Displays the GUI version.

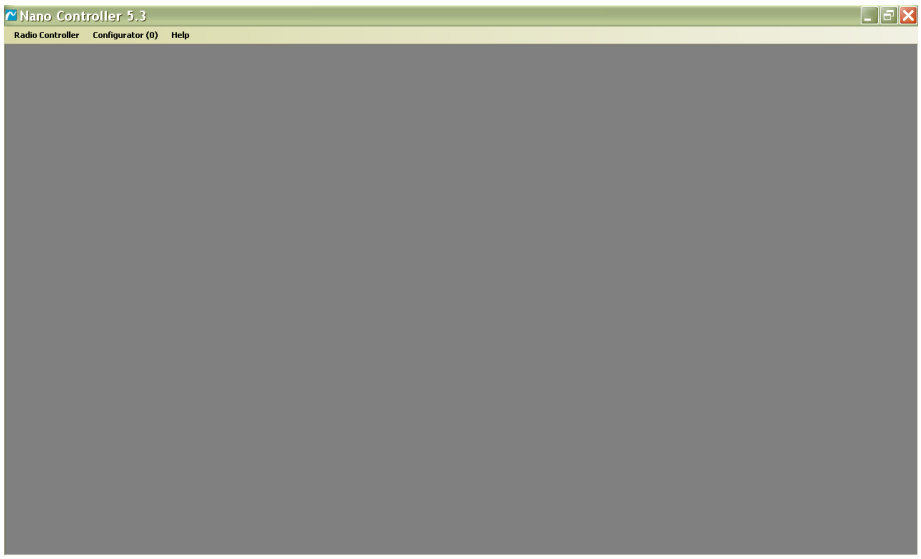

Figure 2-1: GUI main window

2.1.2 Connecting to the Unit

2.1.2.1 Transmitter/Newscoder

Use the 7 pin Lemo (Power Cable) to DB-9 cable. If the computer does not have RS-232 use a USB to RS-232 adaptor.

2.1.2.2 Receiver Products

Connect the receiver to the computer using either a null modem cable with USB to RS 232 adaptor via the receiver's DB-9 connector or an Ethernet cable via the receivers Ethernet port. To use the Ethernet port the computer IP address has to be on the same subnet. The default unit IP address is ***192.168.010.035***. When you pick the Ethernet COM, the NanoController will automatically find the receiver.

2.1.2.3 Radio Controller connection

Open the drop down port menu window as shown in Figure 3-2. Select the port needed to connect to the device. All transmitter products will connect a COM

port. All receiver products may be connected to a COM port or Network via the Ethernet port.

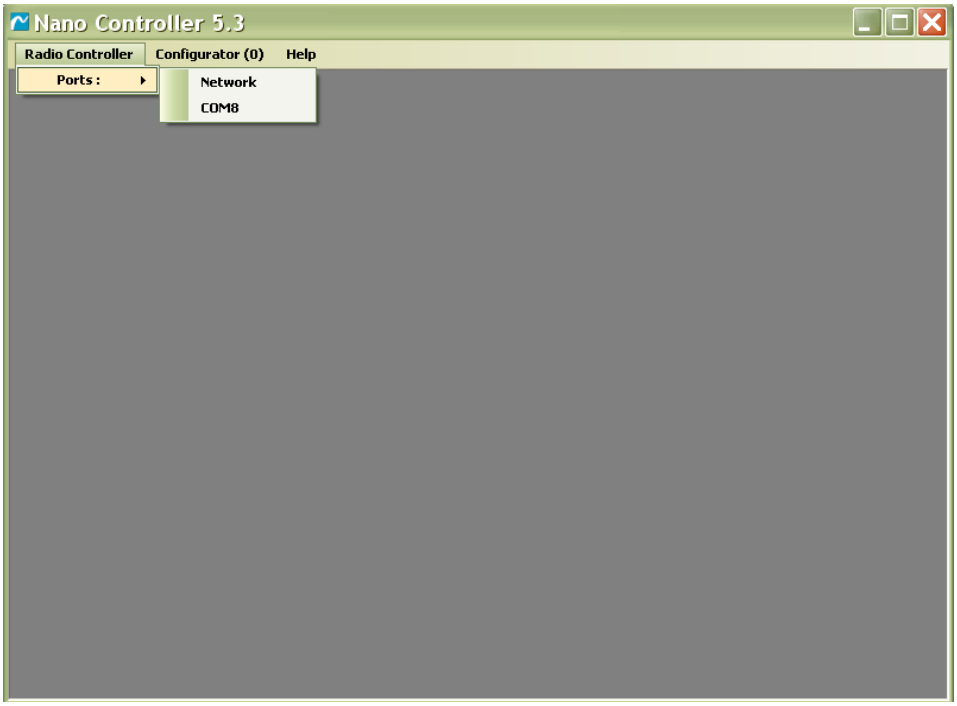

Figure 2-2: COM menu

2.1.2.4 Start Search Menu

Selecting either a COM port or Network will bring up the Start Search menu. Select the baud rate, UserName, Password, and check the Store this setting and/or Keep Config in Sync if desired from the menu window. Refer to Figure 2-3.

- **Keep Config. in Sync** check box will automatically download the preset and frequency plan files. This is only necessary if you wish to reconfigure the presets or the frequency plan.
- **Store this setting** button will populate this menu the same way every time you boot up the NanoController until the inputs are manually changed.

Figure 2-3: COM port detection

2.1.2.5 Connection

Click “Search” and the program will automatically detect the connected unit and display the unit interface GUI (Device Controller).

3 Transmitter Device Controller

The following describes the unit interface in detail.

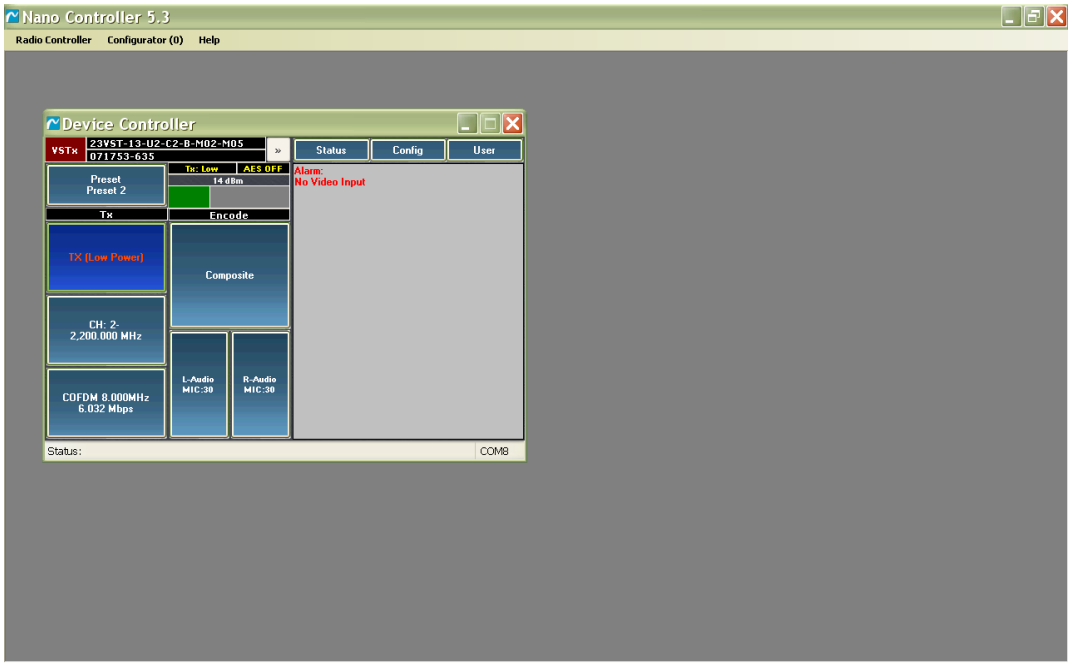

Figure 3-1: Unit Device Controller

Figure 3-2: Unit Description Block

3.1 Device Controller Unit Description Block

The Unit Description window contains the following information:

- Unit family (VSTX shown)
- Model number
- Serial number

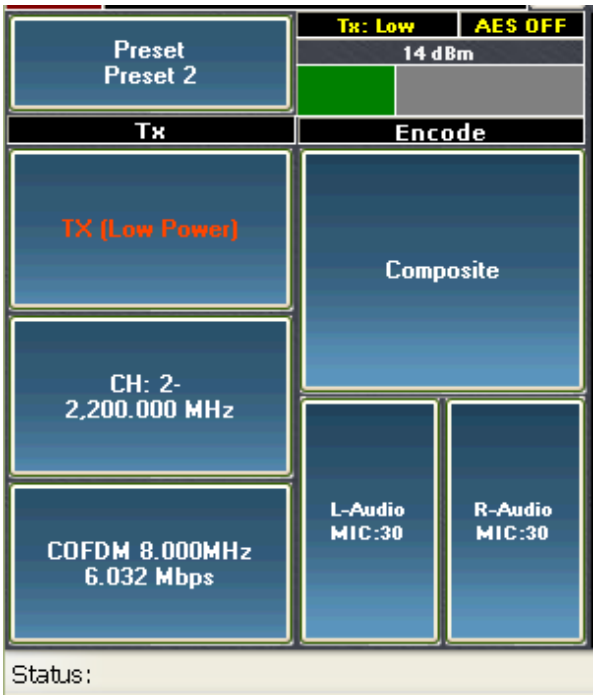

Figure 3-3: Unit Interface Control Block

3.2 The User Interface Control Block

The User Interface control block is located on left side of the Device Control window. It is broken into three distinct sections:

- The Transmitter
- The Encoder parameters
- Transmitter statistics

3.3 The Transmitter Block

The transmitter block includes the following controls:

- **Preset button** – allows user to select Preset. Indicates the frequency and preset selected.
- **RF Power button** – allows user to select high or low power output levels. ("Standby" shown)
- **Channel button** – Selects the channel and displays frequency set to (CH:2 – 2,200.000 MHz shown)
- **Modulation button** – allows users to specify and monitors both modulation parameters and bit rates ("COFDM 8.000MHz 6.032Mbps" shown)

3.4 The Encode Block

The Encode block includes the following controls:

- **Input Source button** – used to select type of video input used ("Composite" shown).
- **Left and Right Audio control**

3.5 Status Indicators

- **TX Power** - power output displayed by combination bar graph and numerical readout.
- **AES Encryption** - the AES block will display the encryption status as on or off.

3.6 Unit Status and Configuration Block

The Status and Configuration block is located on the right side of the Device Control window. The block contains three control buttons and one text block as shown below.

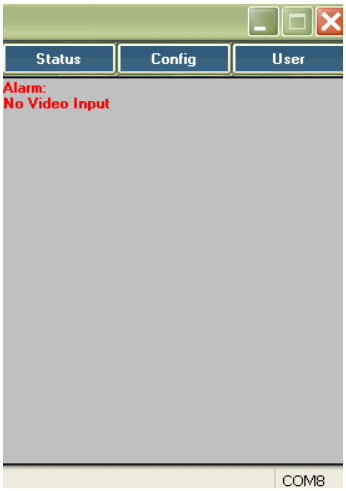

Figure 3-4: Unit Status and Configuration Block

3.6.1 Text Block

The text box will display live unit alarms. The potential alarms are as follows:

- "No Video Input"
- "Vin High Voltage"
- "Low Battery"
- "RF Unlocked"
- "Over Temperature"
- "Video Format Error"

3.6.2 Status Button

When pressed will display unit information including but not limited to the following:

- Model number
- Serial number

- Software version

3.6.3 Configuration Button

This allows the user to upload or download radio configurations and to access the preset and frequency plan files. A detailed explanation is given below.

3.6.4 Login Button

When pressed, the Login NanoController widow is opened. This window is used to log-on at different access levels. There are two access levels:

- User – Lets the user control the basic unit parameters on both the Unit Interface and the Configuration files.
- Administration – Gives the user greater access to the Unit Interface and Configuration files.

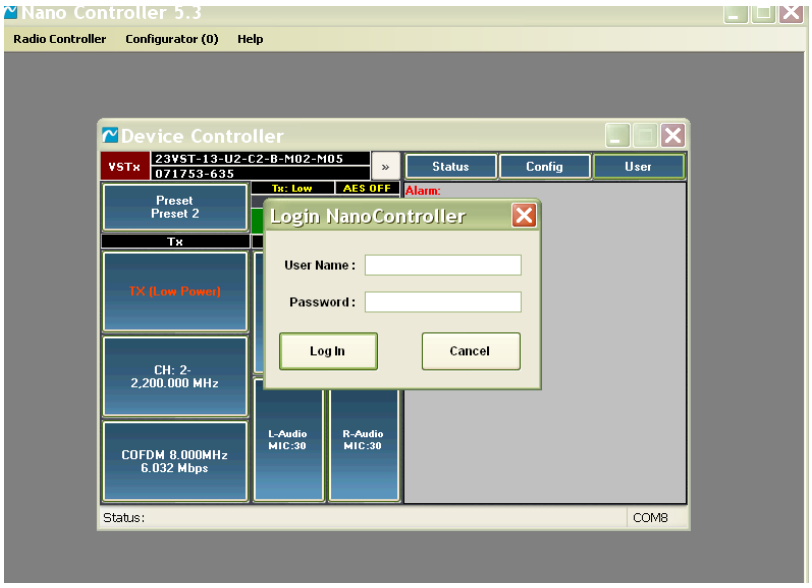

Figure 3-5: NanoController Login Window

3.7 Transmitter User Interface controls

3.7.1 Preset Control

Pressing the preset control will produce a simple drop down menu as shown below.

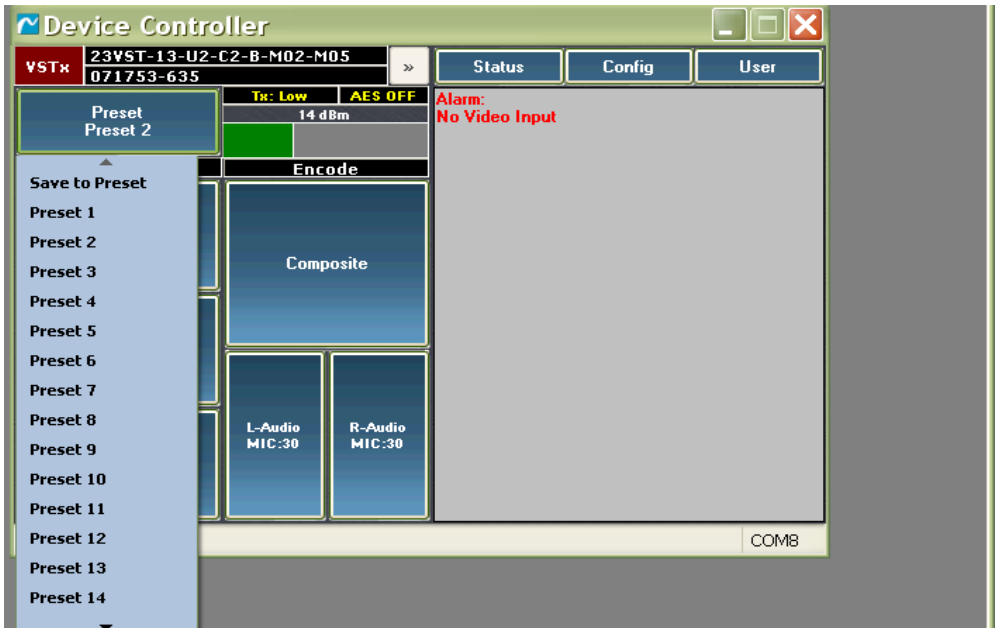

Figure 3-6: Preset drop down menu

Select the desired preset needed. The 'Save to preset' option will automatically save the current parameter changes to the unit without having to download the configuration files. The NanoController will prompt you with the option of which preset to save to.

3.7.2 Transmitter Power Control

Simply click on one of the three desired RF Transmit power options from the drop down menu:

- **Standby** – The RF output power is turned off in this mode. The unit can optionally be set within a preset to enter the Standby mode with the loss of video input.
- **TX (High)** – Full output power
- **TX (Low)** – Typically set to 6dB below full output power.

The RF Power Status block will indicate the power level out.

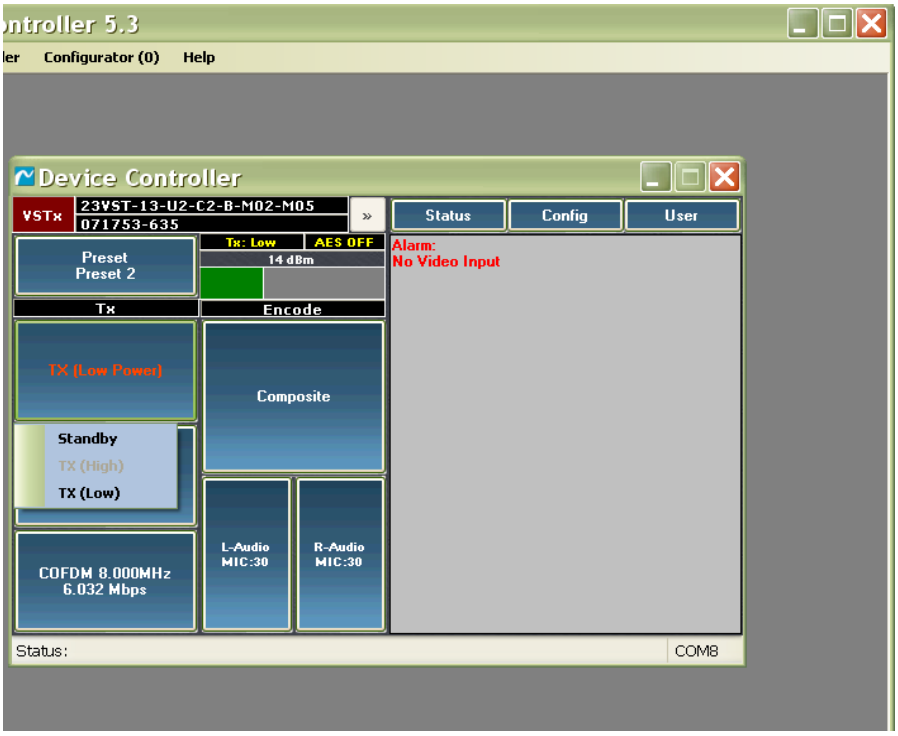

Figure 3-7: RF Power drop down menu

3.7.3 RF Channel

The RF Channel area displays what frequency and channel are in use. Click the button and the Band/Channel Selection window will appear. The drop down menu is populated with the channels supplied in the frequency plan. Use the drop down menu to make any changes.

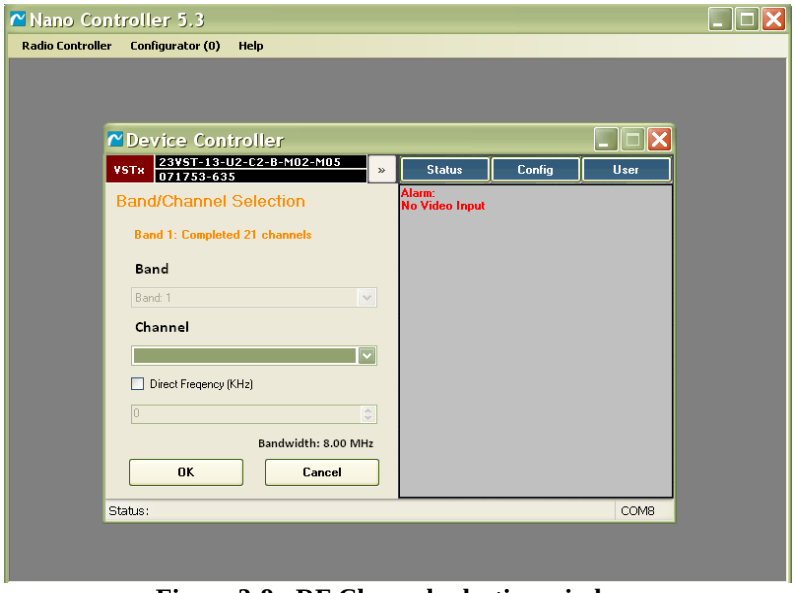

Figure 3-8: RF Channel selection window

3.7.4 Modulation Control

"COFDM" - The COFDM modulation control has two options on the drop down menu:

3.7.4.1 COFDM

Choosing the COFDM will open a menu as shown below:

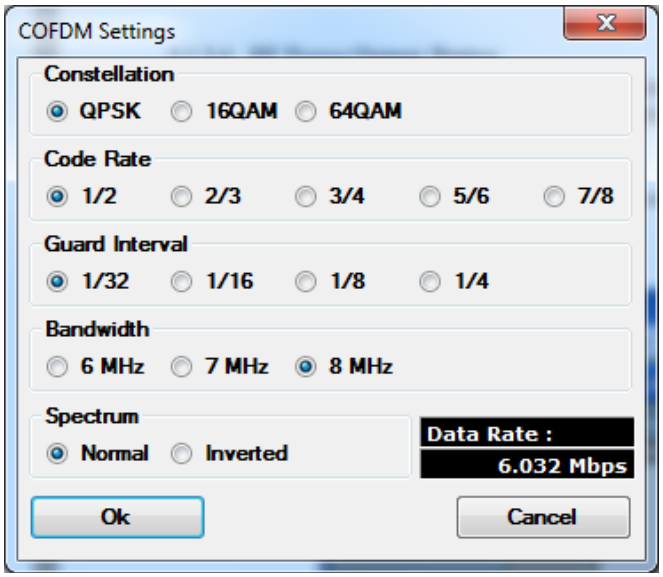

Figure 3-9: COFDM settings

The COFDM Modulation settings affect the data rate and error rates. Data rate requirements vary depending upon video applications. Follow the instructions in the section, "COFDM Modulation Settings – Reference Information" found later in this chapter to select which parameters to use in the COFDM Settings dialog box.

3.7.4.2 NB-COFDM

It chooses narrow band COFDM at either 1.25 or 2.5MHz. Choosing the NB-COFDM will open a menu as shown below:

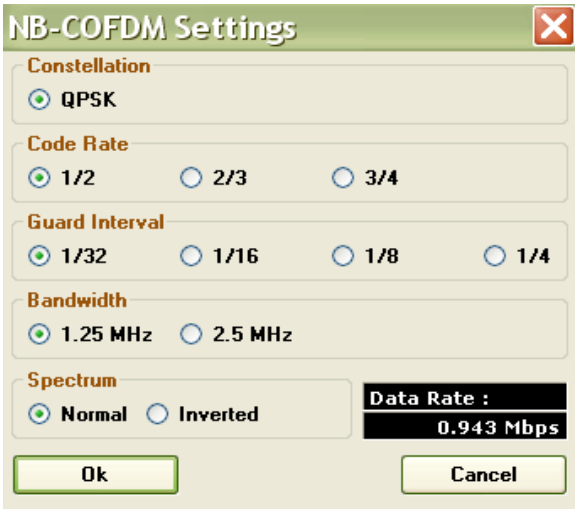

Figure 3-10: NB-COFDM settings window

3.7.5 Video Input Source

The Video Input has between one and four choices depending on product type. Simply select the desired video input source as shown below.

Note: The transmitter will automatically detect between composite and SDI.

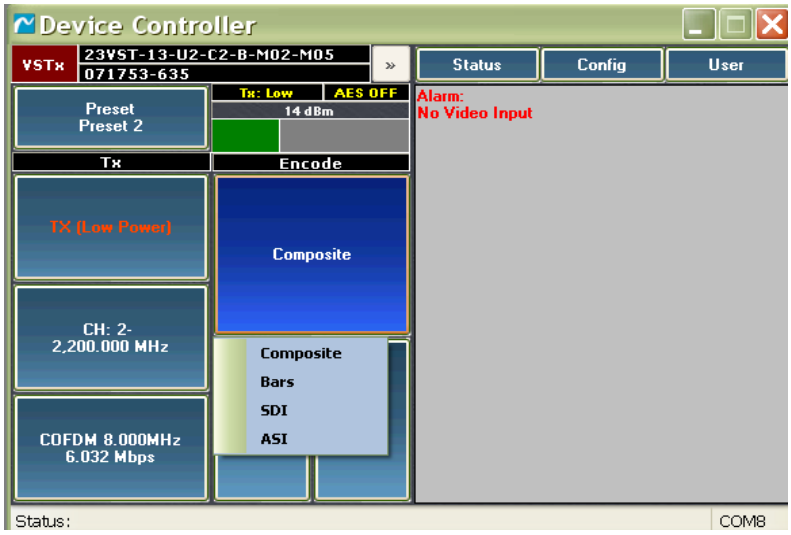

Figure 3-11: Video Input drop down window

3.7.6 Left and Right Audio Control

The Audio Control window has the following parameters from which to choose:

- Audio Input
- Gain Level

3.7.6.1 Audio Level

The drop down menu allows you to select the following audio options:

- **OFF** – Audio OFF
- **Line** – Sets to line level audio
- **Tone** – selects internal tone (1kHz)
- **Embedded –** Sets audios to embedded
- **MIC** – Sets to mic level audio
- **MIC_PP** – Sets to mic level audio with microphone bias (5VDC)

3.7.6.2 Gain Level

The gain level is adjustable from -12 to + 50dBs in 1dB steps.

4 Receiver Unit Interface

Figure 4-1: Receive Device Controller window

4.1 Device Controller Unit Information Block

The same as the Transmitter (2.3.1)

4.2 The Receiver Unit Interface Block

The Receiver Unit Interface includes the following elements:

- **Preset Menu button** – allows user to select Preset configurations.
- **RF Channel button** –Used to change channel and frequency.
- **Modulation button** – allows user to select modulation modes.

The Unit Interface control buttons work in the exact same fashion as the transmitter.

4.3 The Receiver Statistic Window

The Receiver Statistics are displayed two distinct blocks.

4.3.1 Modulation/Decode

The Modulation and Decoder statistics are shown in the figure below:

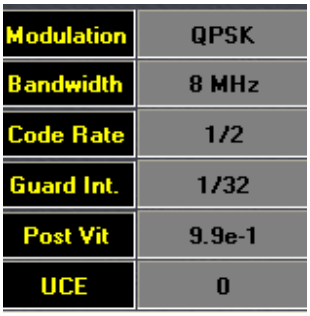

Figure 4-2: Modulation/decoder Statistics

Note: The Transmitter and Receiver must be set to the same bandwidth to decode video.

4.3.2 RF Link Quality Statistics

RF Link Quality statistics are located to the right of the column of the control buttons and displays three bar graphs and the corresponding numerical values. The three statistics displayed are as follows:

- RSL (Received Signal Level)
- MER
- Link Q (link quality is an IMT metric for determining quality of received signal)

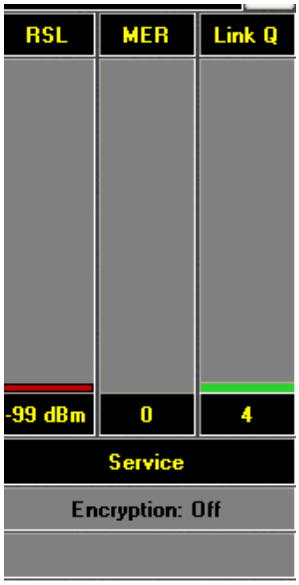

Figure 4-3: RF Link Quality window

4.3.3 Unit Information and Configuration Window

The right half of the RX Controller window displays Alarms, Unit Information or Configuration Data (i.e. hardware and software version information). The block contains three control buttons and one text block as shown below.

Figure 4-4: Unit Information and Configuration Block

4.3.4 Text Box

The text box will display live unit alarms. The potential alarms are as follows:

- "Demod unlocked"
- "Vin High Voltage"
- "Low Battery"
- "RF Unlocked"
- "Over Temperature"
- "Video Format Error"

4.3.5 Status Button

When pressed will display unit information including but not limited to the following:

- Model number
- Serial number
- Software version

4.3.6 Configuration Button

The Config button allows the user to upload or download radio configurations and to access the preset and frequency plan files. Refer to chapter 5for unit configuration in details.

4.3.6.1 Login Button

The Login button displays the current access level. Selecting the login button activates the login window. There are two access levels:

- User – Lets the user control the basic unit parameters on both the Unit Interface and the Configuration files.
- Administration – Gives the user greater access to the unit's Unit Interface and Configuration files.

4.4 COFDM Modulation Settings – Reference Information

4.4.1 COFDM Guidelines

The COFDM Data Rate is determined by manipulating Guard Interval, Code Rate, Bandwidth and Constellation, per the COFDM Data Rate tables in the following section.

As a rule of thumb, select the COFDM parameters in this order:

- Use the lowest data rate required to pass the necessary data.
- Use the maximum Bandwidth allowed by your spectrum manager(s).
- Choose the minimum Constellation (i.e. Modulation System) setting that will allow the data rate required. For example, do not use 16QAM if enough data can be transmitted using QPSK.
- Adjust the GI (Guard Interval) and CR (Code Rate).

The GI, or "safety bits", enhances the ability to operate in multipath environments (around buildings, across water, etc.) by increasing the time delay between data segments. Increasing the GI (1/4 is the maximum setting) increases link robustness but reduces the overall data rate, as less time is made available for payload transmission. Conversely, moving the GI towards 1/32 (the minimum) decreases link robustness but allocates more bits to payload.

The CR controls how much error correction overhead is included in the data stream. To compensate for a poor link, moving the CR towards 1/2 (maximum error correction) increases link robustness as bits are re-allocated from payload to error correction. Moving the CR towards 7/8 (minimum error correction) allocates bits from error correction to payload.

4.4.2 COFDM Data Rate Tables

The tables in this section show the data rates available by modifying the COFDM parameters.

Note: When inputting ASI signals, the data rate should be set to approximately 1-2 Mbps above the ASI input rate.

Modulation System	Code Rate	Guard Interval			
		1/32	1/16	1/8	1/4
				BW = 7 MHz	
			Data Rate (Mbps)		
	1/2	5.27807525	5.12283713	4.8382355	4.35441213
	2/3	7.037433375	6.8304495	6.45098038	5.80588225
QPSK	3/4	7.917112	7.68425613	7.25735325	6.53161775
	5/6	8.7967915	8.53806188	8.06372525	7.25735325
	7/8	9.23663125	8.96496563	8.46691213	7.620221
	1/2	10.5561505	10.2456743	9.676471	8.70882425
	2/3	14.07486675	13.660899	12.9019608	11.6117645
16-QAM	3/4	15.834224	15.3685123	14.5147065	13.0632355
	5/6	17.593583	17.0761238	16.1274505	14.5147065

	7/8	18.4732625	17.9299313	16.9338243	15.240442
	1/2	15.83422575	15.3685114	14.5147065	13.0632364
	2/3	21.11230013	20.4913485	19.3529411	17.4176468
64-QAM	3/4	23.751336	23.0527684	21.7720598	19.5948533
	5/6	26.3903745	25.6141856	24.1911758	21.7720598
	7/8	27.70989375	26.8948969	25.4007364	22.860663

Table 4-1: 7MHz Bandwidth Data Rates

Modulation System	Code Rate	Guard Interval			
		1/32	1/16	1/8	1/4
					BW = 6 MHz
			Data Rate (Mbps)		
	1/2	4.5240645	4.48248248	4.2334561	3.81011061
	2/3	6.03208575	5.854671	5.5294118	4.9764705
QPSK	3/4	6.786096	6.58650525	6.2205885	5.5985295
	5/6	7.540107	7.31833875	6.9117645	6.2205885
	7/8	7.9171125	7.68425625	7.2573533	6.531618
	1/2	9.048129	8.7820065	8.294118	7.4647065
	2/3	12.0641715	11.709342	11.058824	9.952941
16-QAM	3/4	13.572192	13.1730105	12.441177	11.197059
	5/6	15.080214	14.6366775	13.823529	12.441177
	7/8	15.834225	15.3685125	14.514707	13.063236
	1/2	13.5721935	13.1730098	12.441177	11.1970598
	2/3	18.0962573	17.564013	16.588235	14.9294115
64-QAM	3/4	20.358288	19.7595158	18.661766	16.7955885
	5/6	22.620321	21.9550163	20.735294	18.6617655
	7/8	23.7513375	23.0527688	21.77206	19.594854

Table 4-2: 6 MHz Bandwidth Data Rates

Modulation System	Code Rate	Guard Interval			
		1/32	1/16	1/8	1/4
					BW = 2.5 MHz
			Data Rate (Mbps)		
	1/2	1.88503			
QPSK					
	3/4	2.82754			

Table 4-3: 2.5 MHz Data Rates

Modulation System	Code Rate	Guard Interval
		1/32

			BW =1.25 MHz
			Data Rate (Mbps)
QPSK	1/2	0.94251	
	3/4	1.41377	

Table 4-4: 1.25 MHz Bandwidth Data Rates

5 Preset and Frequency Plan Configuration

5.1 Using the GUI Preset Configuration Window

5.1.1 Login

Login from the third tab in the Unit Information and Configuration block (shows "USER" in **Figure 5-1**). The tab will display the current login state. Pressing the login tab will activate the login unit. Enter the User and Password. Two levels are available:

- User – Lets the user control the basic unit parameters on both the Unit Interface and the Configuration files.
- Administration – Gives the user greater access to the Unit Interface and Configuration files. The Administrator can turn "on" or "off" the ability to program all available files.

5.1.2 Downloading Configuration Files

Choose Download Configuration from the drop down menu from the Config tab. The unit will now down load the Preset and Frequency Plan configuration files from the unit. The Config button will be olive green when the files have completed downloading or if the files have been downloaded previously.

Note: Skipped this step if the "Keep Config in Sync" box was checked when first booting up the NanoController.

Once the configuration files are downloaded, choose the desired file to upload to the NanoController as shown below.

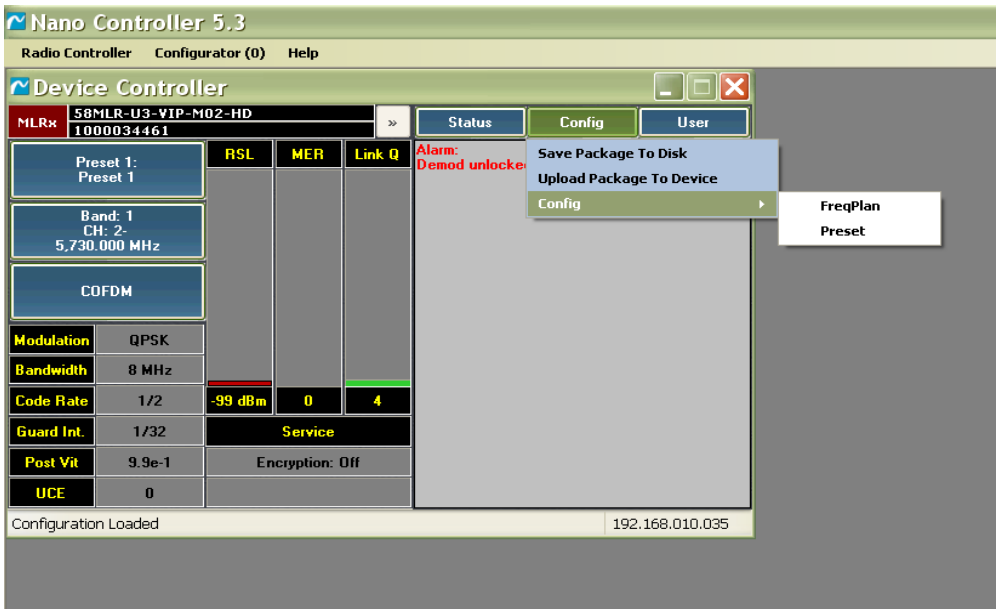

Figure 5-1: Config File Menu

- Preset settings include all programmable options, including modulation parameters, frequencies and channels, and streaming video over Ethernet options, if available.
- Frequency plan includes the frequency plan and the channels.

5.2 Editing Transmitter Presets

5.2.1 Preset Tabs

Choose the set of fields you wish to edit. The Preset Tab number will correspond to the faceplate Preset button number, if present on your product. You can select multiple presets by using the following steps:

- Hold down the "control" key and click each tab to select multiple presets.
- Hold down the "shift" and click a tab to select a range of presets
- The fields that are not universally the same through all presets will be highlighted in green. A change to the field will transfer to all the selected presets.

5.2.2 Administrator control

The drop down menus to the right of each field allows the administrator to control the access of the field. Control of the inner fields is nested by the parent controls in the upper right corner of each section.

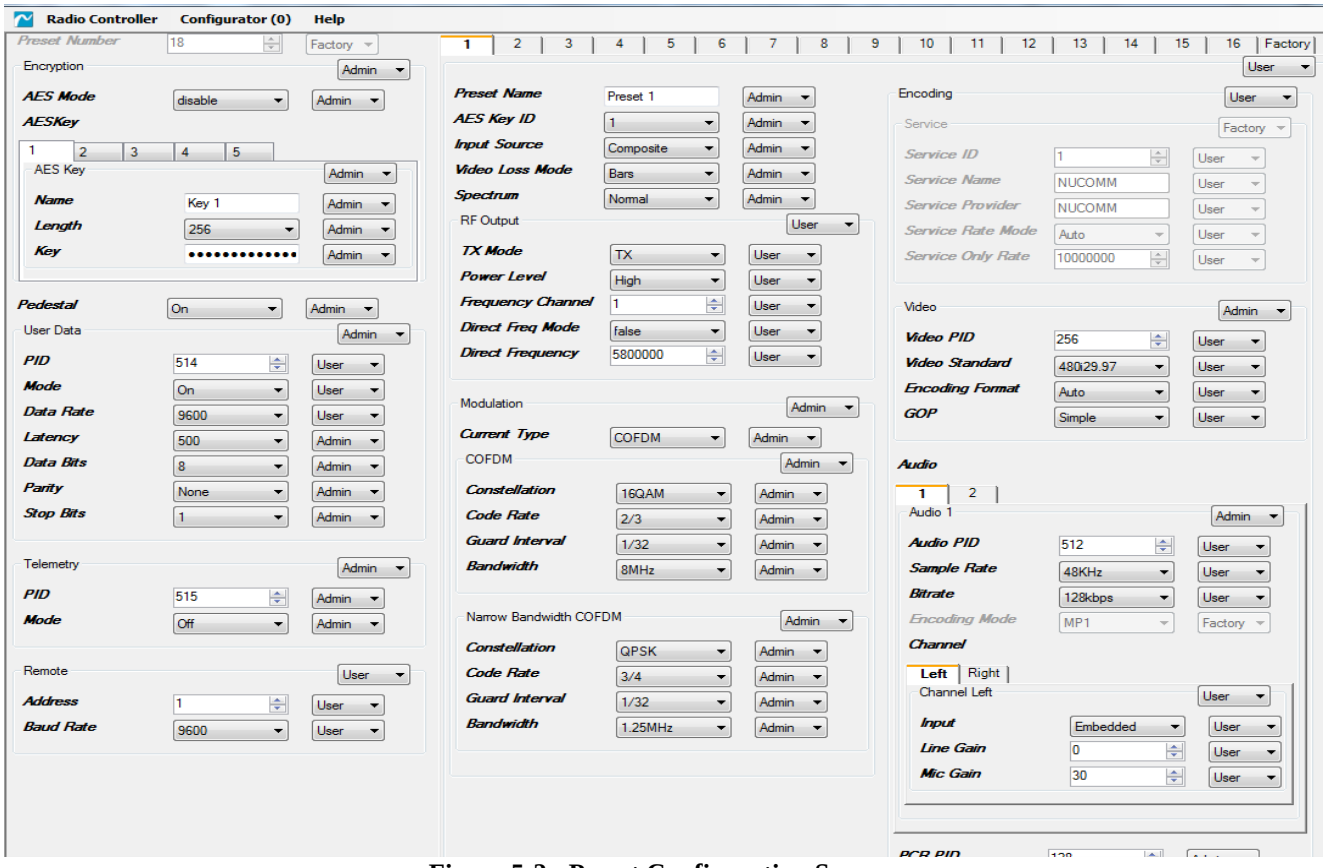

Figure 5-2: Preset Configuration Screen

5.2.3 Global Settings

These are setting that will affect every preset selection. The global settings are located on the right side of the preset menu. See the figure and tables below.

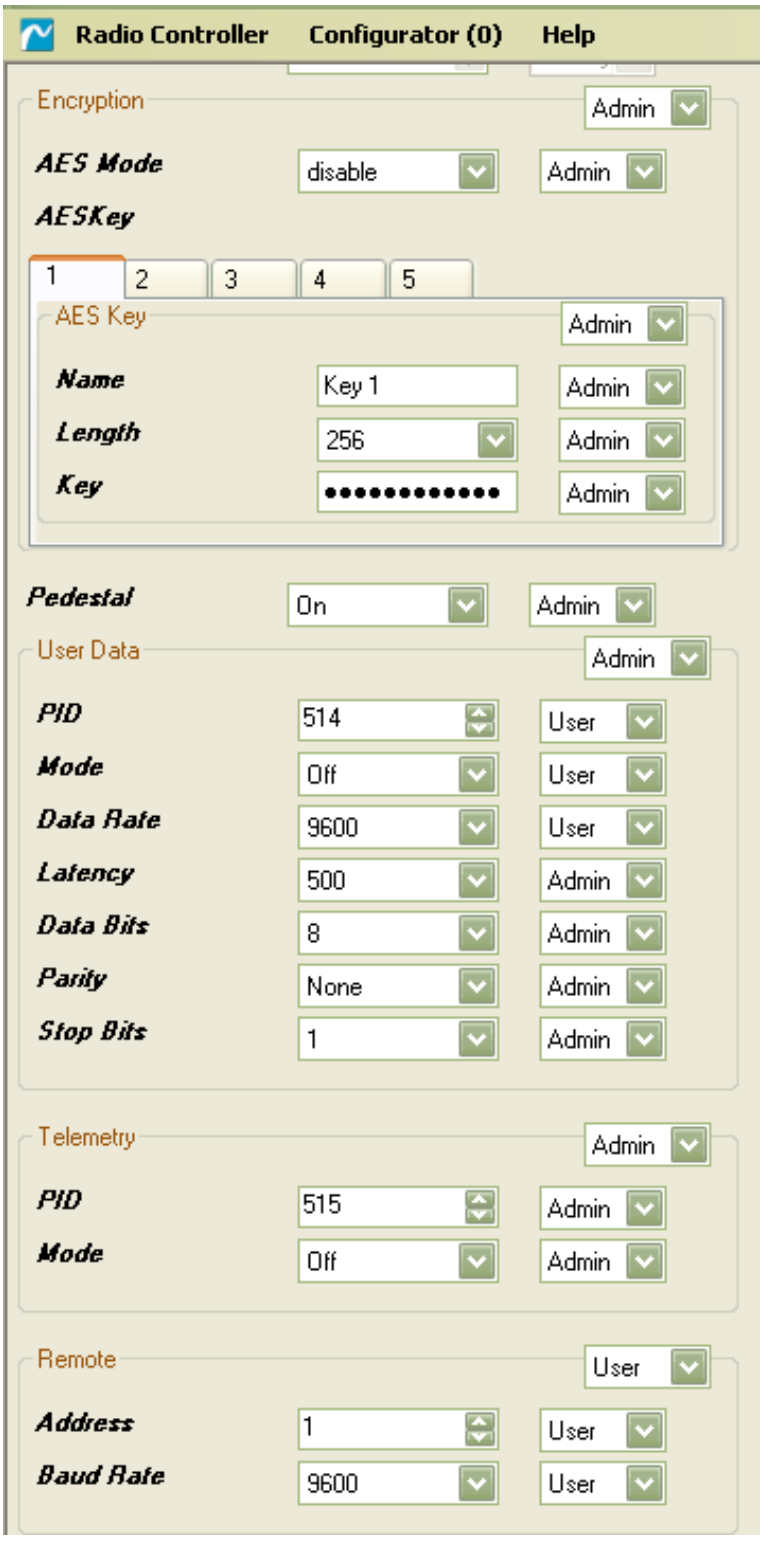

Figure 5-3: Global Preset Settings

Field	Setting	Range
Encryption	AES Mode	Disable, bcrypt1, or bcrypt2
	AES Key Name	User selectable
	Length	128 or 256 bit
Encryption	AES Key	User selectable
Pedestal	On/Off	On/Off – Used for troubleshooting
User Data	PID	32 to 8190
	Mode	On, off, or data trigger
	Data Rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200
	Latency	0 to 1000mS (100mS increments)
	Data Bits	7 or 8
	Parity	Even, odd, or none
	Stop Bits	1 or 2

Table 5-1: Transmitter and User Data Settings

Field	Setting	Range
Telemetry	PID	32 to 8190
	Mode	On or Off
Remote	Address	Factory Set
	Baud Rate	1200, 2400, 9600, 19200, 38400, 57600, 115200

Table 5-2: Transmitter Telemetry, Remote and Ethernet Settings

5.2.4 Preset and RF Settings

See figure and table below.

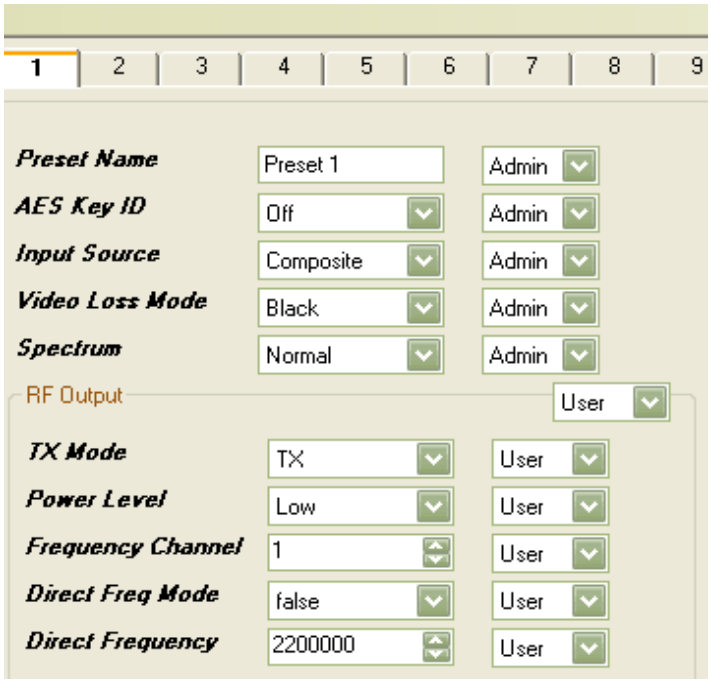

Figure 5-4: Transmitter Preset and RF Output Settings

Field	Setting	Range
Preset Information	Preset Name	Text
	AES Key	On/Off
	Input Source	Composite, Bars, or ASI
	Video Loss Mode	Black, Bars, or Standby
	Spectrum	Normal or Inverted
RF Output	TX Mode	TX or Standby
	Power Level	High or Low
	Frequency Channel	1 to 255
	Direct Freq Mode	true (on) or false (off)
	Direct Frequency	RF Frequency

Table 5-3: Transmit Preset and RF Output Settings

Note: This is the admin screen. In the user screen, the user will have access to only the settings tagged "User"

5.2.5 Modulation Settings

See figure and tables below.

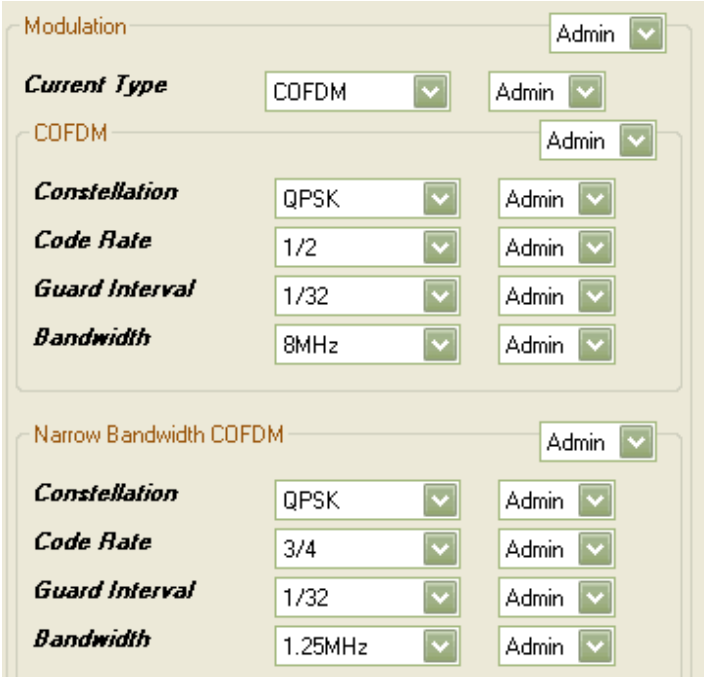

Figure 5-5: Transmitter and Bandwidth Settings

Field	Setting	Range
COFDM	Constellation	QPSK, 16QAM, or 64QAM
	Code Rate	1/2, 2/3, 3/4, 5/6, or 7/8
	Guard Interval	1/4, 1/8, 1/16, or 1/32
	Bandwidth	6, 7, or 8 MHz
NB-COFDM	Constellation	QPSK, 16QAM, or 64QAM
	Code Rate	1/2, 2/3,3/4, 5/6, or 7/8
	Guard Interval	1/4, 1/8, 1/16, or 1/32
	Bandwidth	1.25Mhz or 2.5MHz

Table 5-4: Transmitter Modulation and Bandwidth Settings

5.2.6 TX Encoding Settings

See figure and table below.

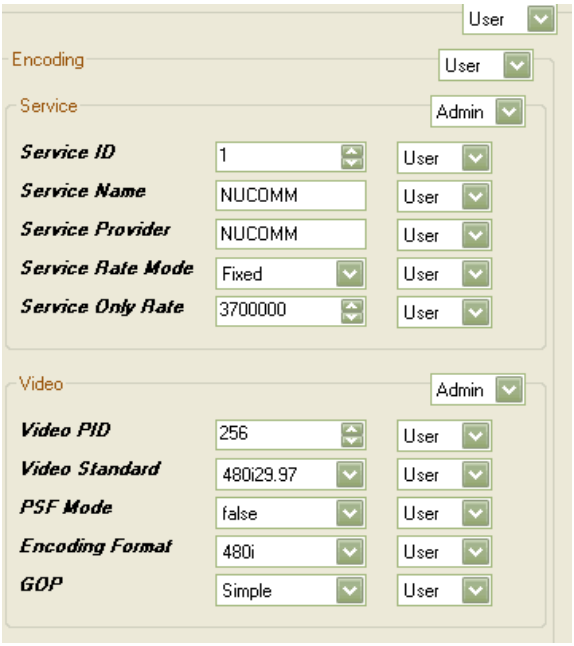

Figure 5-6: Transmitter Encoding and Video Settings

Field	Setting	Range
Encoding	Service ID	User selectable
	Service Name	User selectable
	Service Provider	User selectable
	Service Rate Mode	Fixed or Auto
	Service Only Rate	3.8Mbps to 10Mbps
Video	Video PID	1 to 8190
	Video Standard	Unit dependant
	PSF Mode	False (Off) or True (On)
	Encoding Format	Auto
	GOP	Low Latency, Simple, Long, Advanced

Table 5-5: Transmitter Encoding and Video Settings

5.2.7 Audio Settings

See figure and table below.

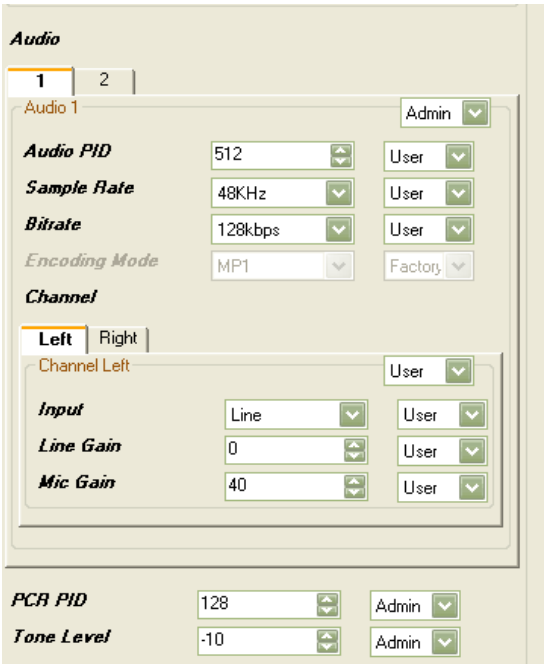

Figure 5-7: Transmitter Audio Settings

Field	Setting	Range
Audio	Audio PID	1 to 8190
	Sample Rate	32khz, 44.1khz, or 48khz
	Bitrate	64khz, 128khz, or 256khz
	Encoding Mode	MP1 or AC3
Channel Left	Input	Off, Line, Tone, MIC, or MIC+PP
	Line Gain	0 to 50dB
	Mic Gain	0 to 50dB
	PCR PID	1 to 8190
	Tone Level	-12dB to 50ddB
Channel Right	Input	Off, Line, Tone, MIC, or MIC+PP
	Line Gain	0 to 50dB
	Mic Gain	0 to 50dB
	PCR PID	1 to 8190
	Tone Level	-12dB to 50ddB

Table 5-6: Transmitter Audio Settings

Note: Audio 2 tab not used

5.2.8 Uploading Preset Configuration Files

To upload the new preset configuration files to the unit follow the steps below:

- Click on the Config Tab and choose the "Save Package to Disk". This will send both the FreqPlan and Preset files as a package with an .imt file extension to a directory chosen by the user. This step does not have to be done to upload files to the unit.
- Click on the "Upload Package to Device" to send the FreqPlan and/or Preset files as a package to the unit. The NanoController will automatically load the files and reboot the unit. Follow all NanoController prompting during upload.

5.3 Editing Receiver Presets

The Preset screens for the RX are essentially the same as the TX with some minor differences. The screens that follow show the available settings.

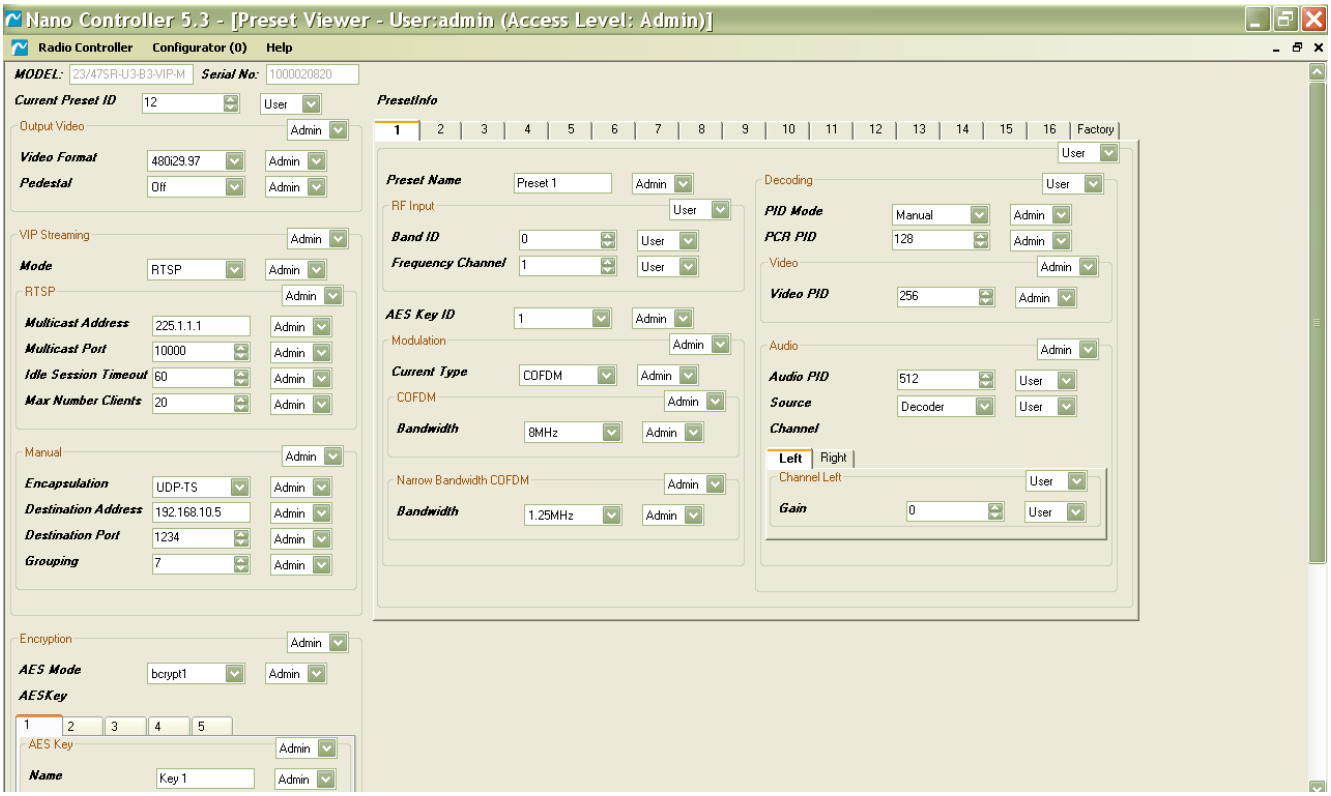

Figure 5-8: Receiver Preset Settings Window

5.3.1 Receiver Global Settings

5.3.1.1 Video Out and Video over IP Settings

See figure and table below.

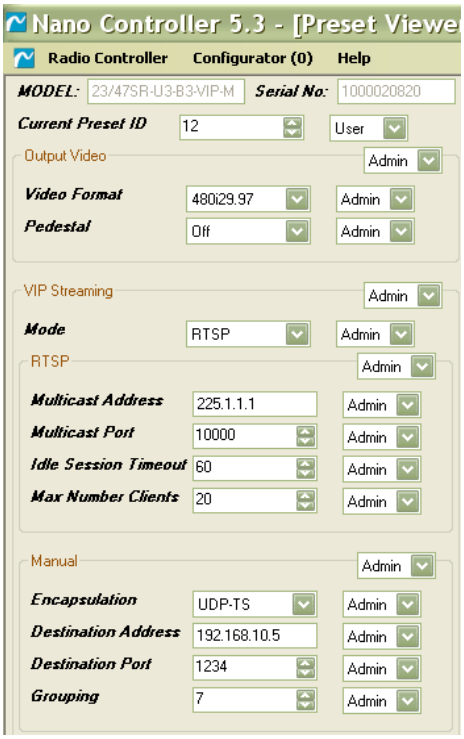

Figure 5-9: Receiver Factory, Output Video and VIP Streaming

Field	Setting	Range
Factory Information	Model and Serial	Factory set
	CurPresetID	Preset selected at bootup
Output Video	Video Format	*Enter format to scan first
	Pedestal	On/Off
VIP Streaming	Mode	Off/RTSP/Manual
RTSP	Multicast	Multicast address
	Multicast Port	
	Idle Sesion Timeout	Entered in seconds
	Max Number of clients	Enter Max of clients
Manual	Encapsulation	UDP-TS or RTP-TS
	Destination Address	Enter address
	Destination Port	
	Grouping	

Table 5-7: Receiver Factory, Output Video and VIP Streaming Settingg Settings

NOTE: The decoder will auto detect the format. The user has the ablity to enter a format to scan first for faster decoding.

5.3.2 Encryption Settings

See figure and table below.

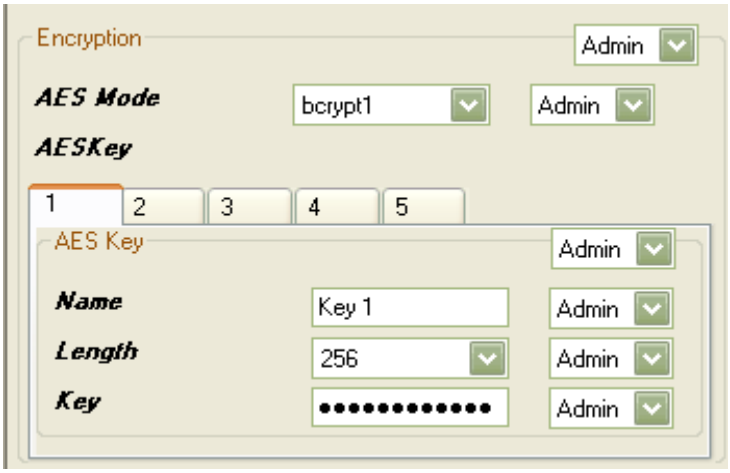

Figure 5-10: Receiver Encryption Settings

Field	Setting	Range
Encryption	AES Mode	Disable/bcrypt 1/bcrypt 2
AES Key	Name	Name of Key in 16 characters
	Length	128 or 256
	Key	1 to 5

Table 5-8: Receiver Encryption Settings

Note: Up to 5 encryption keys may be entered

5.3.3 Remote and Ethernet settings

See figure and table below.

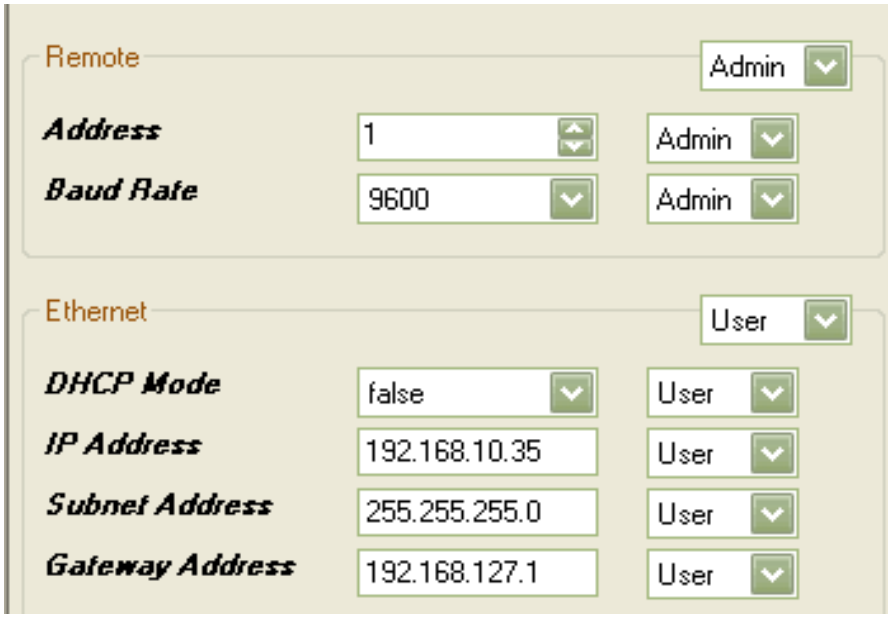

Figure 5-11: Receiver Remote and Ethernet Settings

Field	Setting	Range
Remote	Address	Factory selectable
	BaudRate	300, 600, 1200, 2400, 9600, 38400, 57600, and 115200 kbps
Ethernet	DHCPMode	True (on) or false (off)
	IP Address	User selectable
	Subnet Address	User selectable
	Gateway Address	User selectable

Table 5-9: Receiver Remote and Ethernet Settings

5.3.4 Receiver Preset Editing

5.3.4.1 RF, AES Encryption and Modulation Settings

See figure and table below.

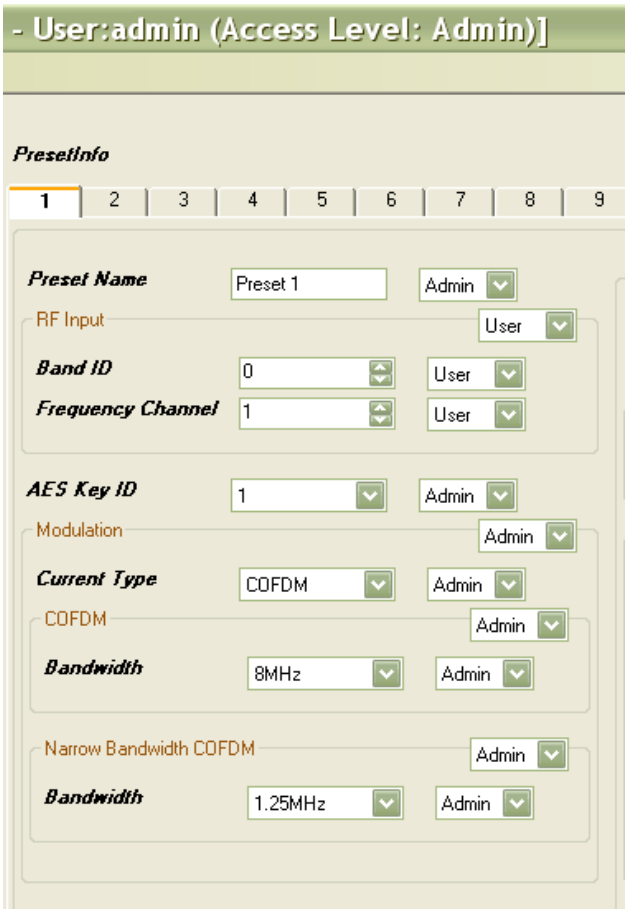

Figure 5-10: Receiver Preset Info, RF Input, Decryption and Modulation Settings

Field	Setting	Range
Preset Info	Preset Name	Name of preset in 16 characters
RF Input	Band ID	0 to 1
	FreqPreset	1 to maximum channel in freq plan
Decryption	AES Key ID	Keys 1 to 5 selectable
Modulation	Current ModulationType	COFDM or NB-COFDM
COFDM	Bandwidth	6, 7, or 8MHz
NBCOFDM	Bandwidth	1.25MHz or 2.5MHz

Table 5-11: Receiver Preset Info, RF Input, Decryption and Modulation Settings

5.3.4.2 Decoding Settings

See figure and table below.

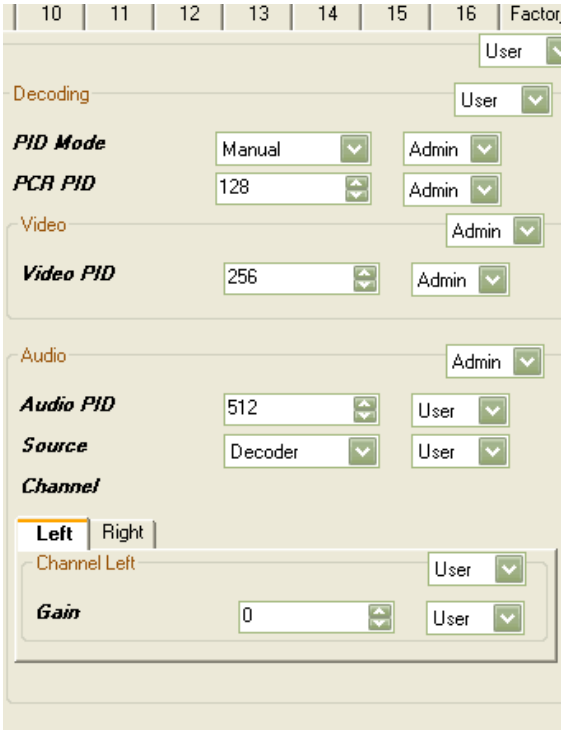

Figure 5-12: Receiver Video and Audio Decoding Settings

Field	Setting	Range
Decoding	PID Mode	Auto or Manual
	PCR_PID	32 to 8190
Video	Video PID	32 to 8190
Audio	Audio PID	32 to 8190
	Gain	0 to 50
	Low Delay Mode	1 (on) or 0 (off)

Figure 5-13: Receiver Video and Audio Decoding Settings

5.4 TX/RX Frequency Plan Editing Procedures

5.4.1 Band (Factory Set Only)

Band 0 refers to the lower frequency band and Band 1 refers to the higher frequency Band. Dual band is a receiver only option. All band parameters are factory level settings

5.4.2 Channel Tabs

Choose the set of fields you wish to edit. The Channel Tab number will correspond to the channel number in the frequency plan.

5.4.2.1 Field Options

- Use the up/down arrow button to the right of fields or input a value to enter your choice.
- The drop down menus on the right are used to control user access.

Figure 5-14: Frequency Plan Window

Field	Setting	Range
Band	MaxNrBands	The number of bands available
	BandName	Name of band in 16 characters
	LowLimit	Factory set
	HighLimit	Factory set
	StartChnl	Factory set
	StopChnl	Factory set
	OffsetOption	Factory set
	OffsetFreq	Factory set
	Direct Freq	Band range in 1Mhz steps
	Inverted Flag	Factory Set
	CurrentPresetID	Preset value at bootup
Channel 1-16	Name	Name of Channel in 16 characters
	Freq	Channel Frequency (in kHz)

Table 5-12: Frequency Plan Settings

Note: Channel 0 is not used.

6 Proprietary Information and Disclaimer Notice

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