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The most important thing we build is trust.

Very Efficient Transmission Apparatus Transmitters

(VETA TX)

SOFTWARE MANUAL

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Table of Contents

List of Tables

List of Figures

Revision History

Revision	Date	Main Changes from Previous version	Edited by	Checked
X1	26 Apr 2010	Initial Release – Extracted detailed software operation for VETA Transmitters into single manual to support VTx GUI	DRF	
1	19 Apr 2011	Transferred from 100-M0143X1	OdM	OdM
A	14 Jul 2011	Production Release	DM	
X2	9 Jan 2012	Added Admin Password	DRF	
X3	31 Aug 2012	Added 625KHz BW, 8PSK and BPSK Modulation Modes. Updated screen shots and modified styles to current manual format.	NM/DRF	

1. Acronyms

This section lists and describes the various acronyms used in this document.

Name	Meaning
16 QAM	16-state Quadrature Amplitude Modulation
64 QAM	64-state Quadrature Amplitude Modulation
8PSK	8-State Phase-Shift Keying
A/V	Audio/Video
AES	Advanced Encryption System (32 bit)
ASI	Asynchronous Serial Interface
BDC or BDCC	Block down converter
BER	Bit Error Rate
BPSK	Binary Phase-Shift Keying
COFDM	Coded Orthogonal Frequency Division Multiplexing
CVBS/Y	Composite video/Luminance with S-video
C	Chroma video
D/C	Down-Converter
DVBT	Digital Video Broadcasting Terrestrial
FEC	Forward Error Correction
GUI	Graphical User Interface
HD	High Definition
I/O	Input/ Output
Kbaud	Kilobaud per second
Kbps	Kilobits per second
Mbps	Megabits per second
MER	Modulation Error Rate
MPEG	Moving Picture Experts Group
MSR	Messenger Smart Receiver
M2D	Messenger Two Decoder
M2T	Messenger Two Transmitter
M2L	Messenger Two Link
NTSC	National Television System Committee
PAL	Phase Alternation Line
QPSK	Quadrature Phase Shift Keying
QAM	Quadrature Amplitude Modulation
RF	Radio Frequency
RX	Receiver
S/N	Signal-to-Noise Ratio
SD	Standard Definition
SDI	Serial Digital Interface
THD	Total Harmonic Distortion
TS	Transport Stream

Name	Meaning
TX	Transmitter
VDC	Volts (Direct Current)
VDL	VETA Digital Link
VETA	Very Efficient Transmission Apparatus
VR	VETA Receiver
VT	VETA Transmitter
VMT	VETA Miniature Transmitter
VNA	VETA Network Adapter

2. Introduction

2.1 About the Manual

This manual describes how to use the software application to interact with VETA family transmitters. All the transmitters in the family have the same basic functions. The manual is divided into the following main sections:

- Software Control Overview
- Drop-Down Menu Definitions
- Status Elements Details
- Tab Definitions
- Default
- Configurations

2.2 Warranty

Cobham offers a 12 month standard product warranty. During this period, should the customer encounter a fault with the equipment we recommend the following course of action:

Check the support section of the website for information on that product and any software/firmware upgrades.

If fault persists call our support line and report the fault. If fault persists and you are informed to return the product, please obtain an RMA number from the Cobham support department or website and ship the equipment with the RMA number displayed and a description of the fault. Please email the support section the airway bill/consignment number for tracking purposes.

Depending on the nature of the fault, Cobham endeavor to repair the equipment and return it to the customer within 14 days of the item arriving at our workshops. Obviously it is impossible to cater for all types of faults and to manage 100% replacement part availability, and delays are sometimes inevitable.

Please contact Cobham for details of packages that can be tailored to meet your individual needs, whether they are service availability, technical training, local geographic support or dedicated spares holdings.

2.3 Safe Operating Procedures

Ensure that the power supply arrangements are adequate to meet the requirements of VETA product.

Operate within the environmental limits specified for the product. The transmitter will generate considerable heat and it is the responsibility of the end user to properly heat sink the device before using.

Electro-Static Discharge (ESD) precautions should be observed as a safe practice.

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.

3. Software Control Overview

This software is used for all Cobham products based on Very Efficient Transmission Apparatus (VETA) transmitters, including all variations of the VETA Transmitter (VT) and the VETA Miniature Transmitter (VMT). However, each product uses a unique control cable. Control cables, as well as connector pin outs, are described in detail in corresponding product manual.

Configuration, control and monitoring of the VETA Series transmitters are accomplished using Cobham's Microsoft Windows-based VETA Tx configurator software program (Cobham's Part Number 630-SW0070). This Graphical User Interface (GUI) style program provides the end user with an easy way to interface with the VETA Transmitter units. During normal operation, once a VETA Digital Link (VDL) is established, the GUI does not need to be active and can be disconnected from the VETA Tx unit after the link is established.

3.1 System Requirements

The VETA Tx Configurator program has been developed and tested on Windows XP (service pack 3), Vista (32-bit) (Service Pack 2) and Windows 7 (both 32-bit and 64 bit). Although the program may work properly on other operating systems, no Cobham support or assistance can be provided concerning other operating systems.

3.2 Software Installation

3.2.1 Download Method – Setup Utility

Cobham customer service will provide a link to the folder containing the VTx Setup package.

NOTE: Screens displayed by different computer operating systems may differ slightly from those shown.

When you click the link, your default browser will start the file download. Depending on your computer's security settings, you may see a security-warning screen shown in Figure 1

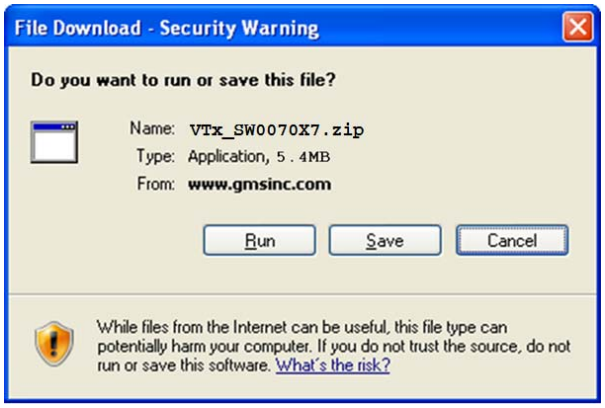


Figure 1 – File Download Security Screen

If so, click on the Save button to proceed. The Save As screen should appear (Figure 2). The file can be saved at any convenient location. Accept the default file name. Remember the location where the file is stored.

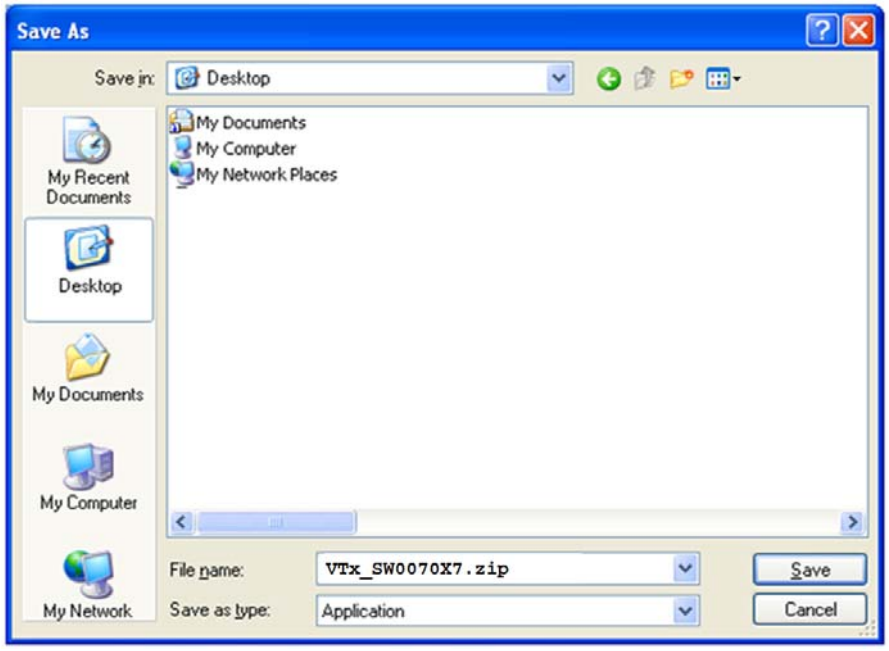


Figure 2 – Save As Screen

The file should complete downloading (Figure 3).

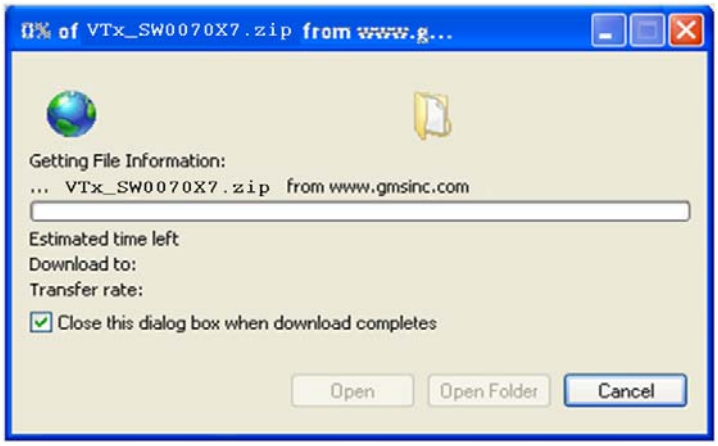


Figure 3 – Download Progress Screen

The file must be 'unzipped' (decompressed) to be used.

Windows has numerous options to extract zip files. One option is to use Windows Explorer. Locate the file in Windows Explorer and right mouse click on the file name. An option menu for the file, similar to Figure 4, will appear. Any of the 'Extract' options will uncompress the file(s).

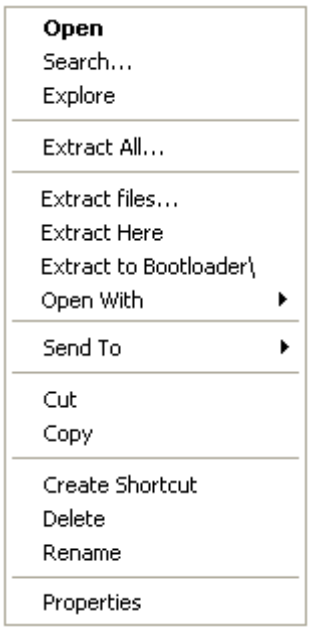


Figure 4 – Option Menu

The setup package will contain the files listed in Figure 5.

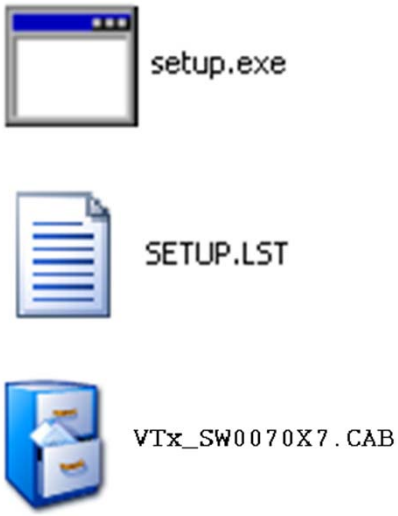


Figure 5 – Files in Setup Package

Run the setup.exe program. The program will initially copy files and display the screen shown in Figure 6.

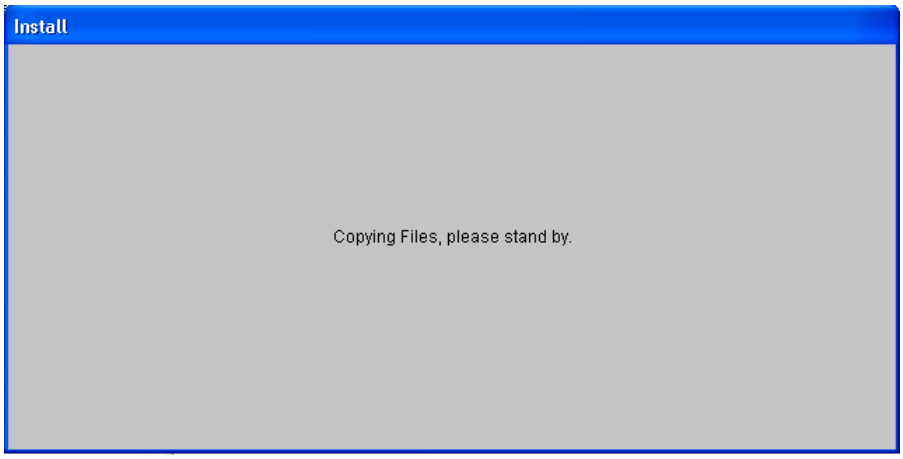


Figure 6 – Setup Copying Files

The introduction screen shown in Figure 7 will be displayed when the setup application is ready to start.

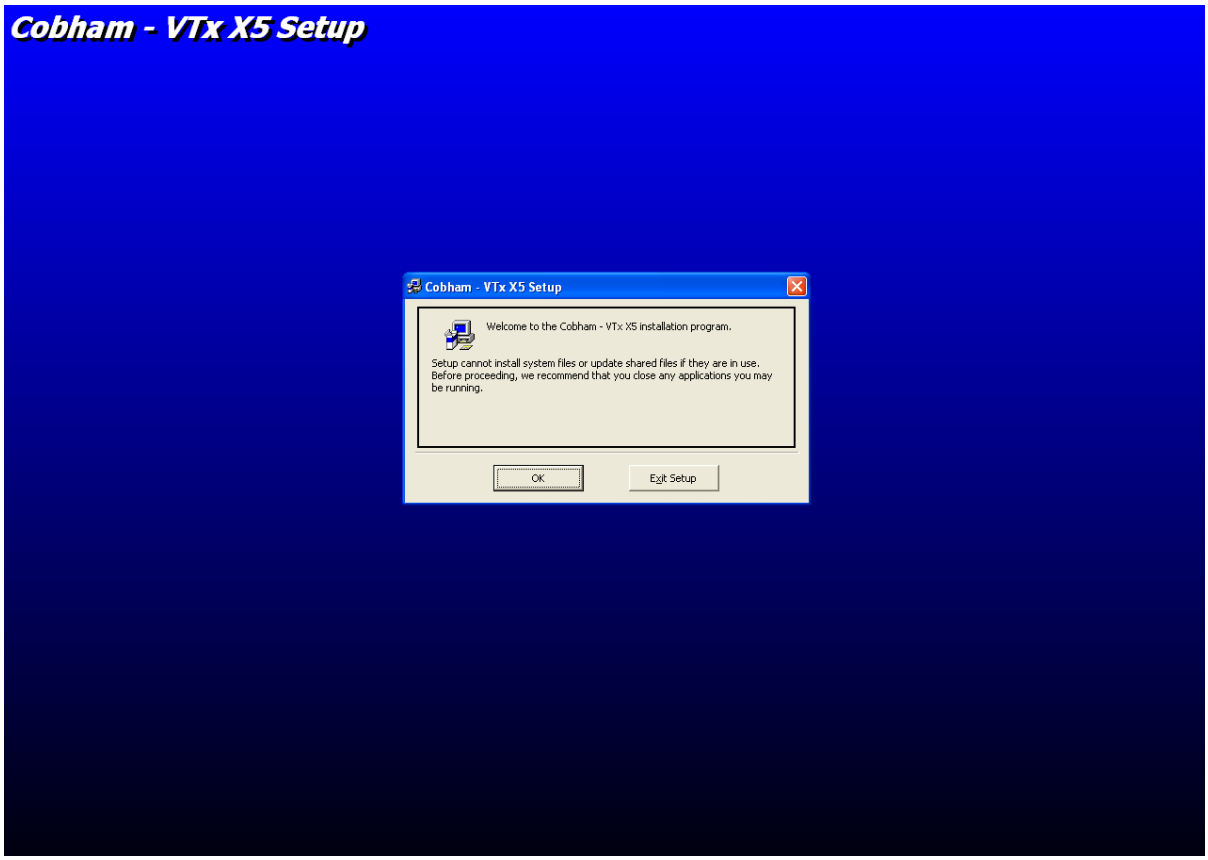


Figure 7 – VTx Setup Introduction Screen

Continue with the installation by clicking the OK button. The next screen, Figure 8, allows you to change the installation directory. A new location can be selected by clicking the Change Directory button. It is recommended that the default directory be used.

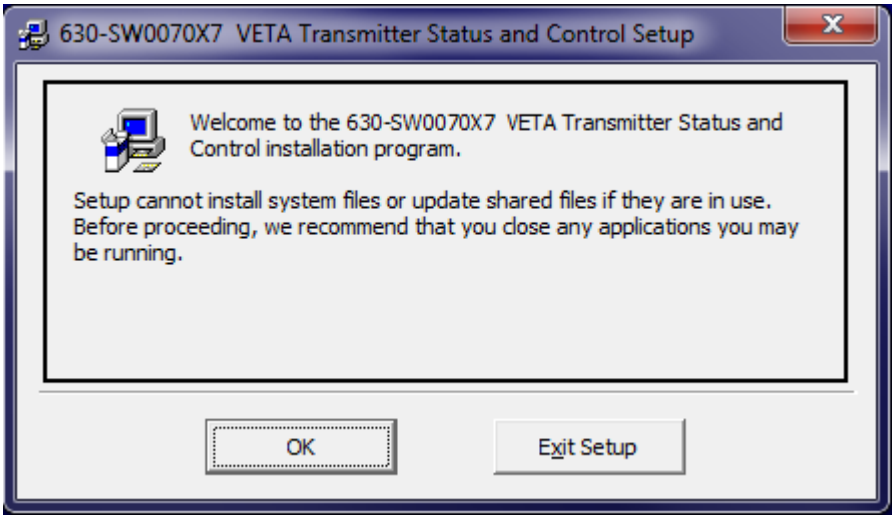


Figure 8 – Installation Directory Selection

Click the  button to begin the installation.

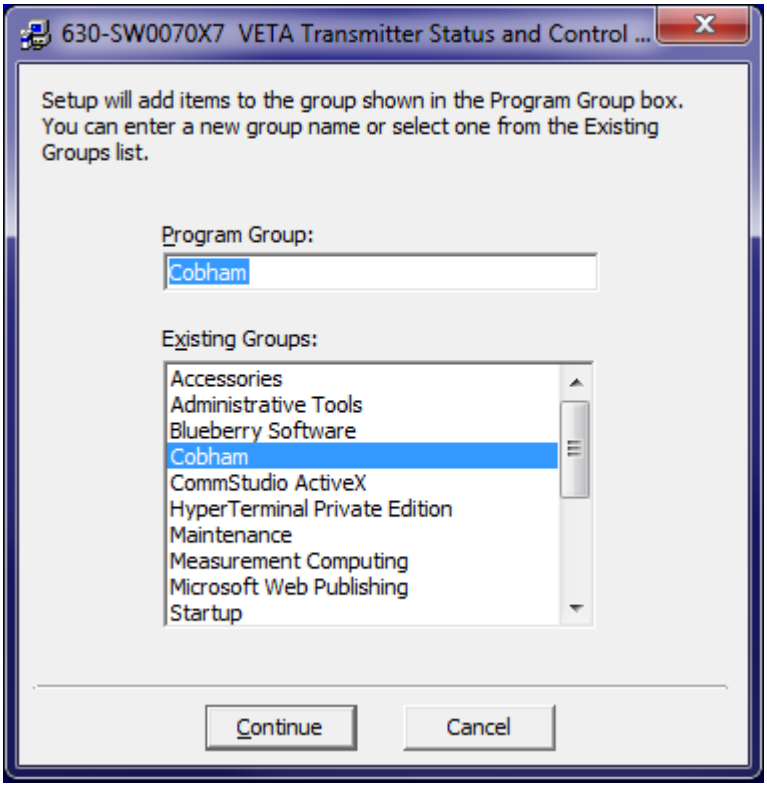


Figure 9 – Choose Program Group

Figure 9 shows the next screen. This allows you to modify the program group that windows creates to launch the program from the All Programs section of the windows Start menu. It is again recommended that the default be used.

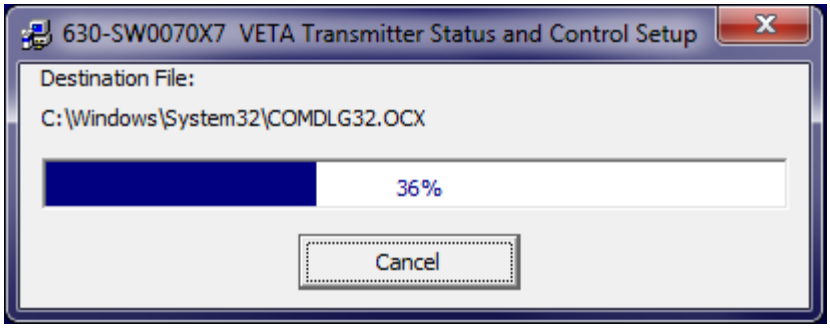


Figure 10 – File Installation

The application will load and register the Configurator and support files (Figure 10).

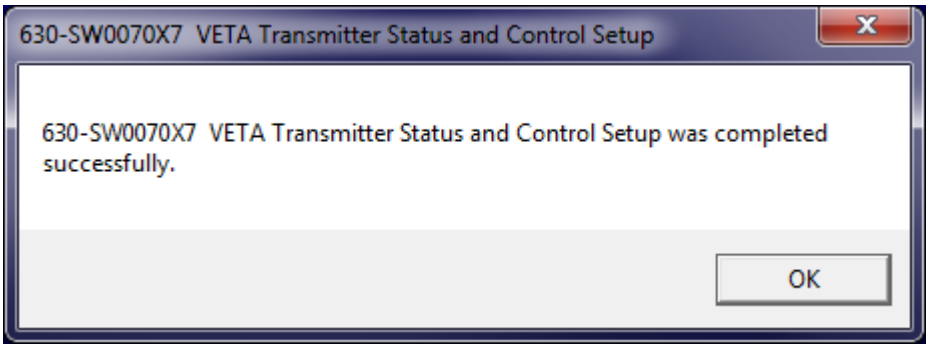


Figure 11 – Setup Successfully Completed

The screen shown in Figure 11 is displayed when the installation has been successfully completed.

3.2.2 CD Method – Setup Utility

The application is also available on the CD delivered with the product. The installation follows the same screens that were shown in 3.2.1. The following instructions outline the installation process for the VETA Tx Configurator program:

- Insert provided CD-ROM into computer.
- Click on 'setup.exe' file. This will launch the VR Setup program. Several initial setup files will begin to be copied onto the computer.
- The VTx Setup program will prompt the user to click on the 'computer icon' button to begin installation. If desired, the user can change the destination directory from the default. Click on the 'computer icon' button.
- The VTx Setup program will then prompt the user to 'Choose Program Group'. If desired, the user can change the program group from the default. Click on the 'Continue' button.
- After installing the VETA Tx Configurator program, the VTx Setup program will put up a window indicating that setup was completed successfully. Click 'OK'.

3.3 Product Control & Status Monitoring Approach

Advanced control of VETA transmitters is available by using the configurator program. Typically, users may want to customize the factory provided default configuration based control settings (such as frequency, modulation parameters or scrambling keys).

Cobham transmitters and receivers provide programmable presets or configurations that can be set up through special programming software by Administrators. The user selects configurations though an application program. The VMT allow 16 configurations and the VT allows 8 configurations.

Administrators define the configurations for specific applications. Each configuration completely defines all of the unit parameters including center frequency, modulation parameters, video and audio parameters, user data and encryption. Field personnel will select specific configuration via pre-determined guidance from the Administrators. Matching the transmitter operation to the receiver operation is as simple as selecting the same configuration for both. For example: If the transmitter is set to configuration #3, then the receiver needs to be set to configuration #3 for them to operate together.

3.4 VETA Tx Configurator Functions

The VETA Tx Configurator program provides the user access to different configuration, control and monitoring options. Up to 32 VETA VTx units can be connected to the GUI.

When the VETA Tx Configurator program is launched, it will detect all the VETA Tx units connected to the computer. However, it will not detect units connected to the computer after the program is launched. In this case, the user should close the program and open it again. If the program cannot find any valid devices connected, the screen shown in Figure 12 will be displayed. The user can exit the program or check the connection and then try again.

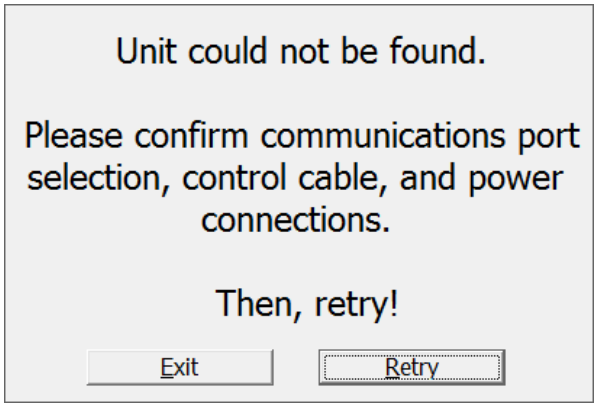


Figure 12 – VETA Tx Configurator

If the program finds valid devices on any com ports, it opens up the main control window. The program generates a message while collecting unit information. The main window is shown in Figure 13.

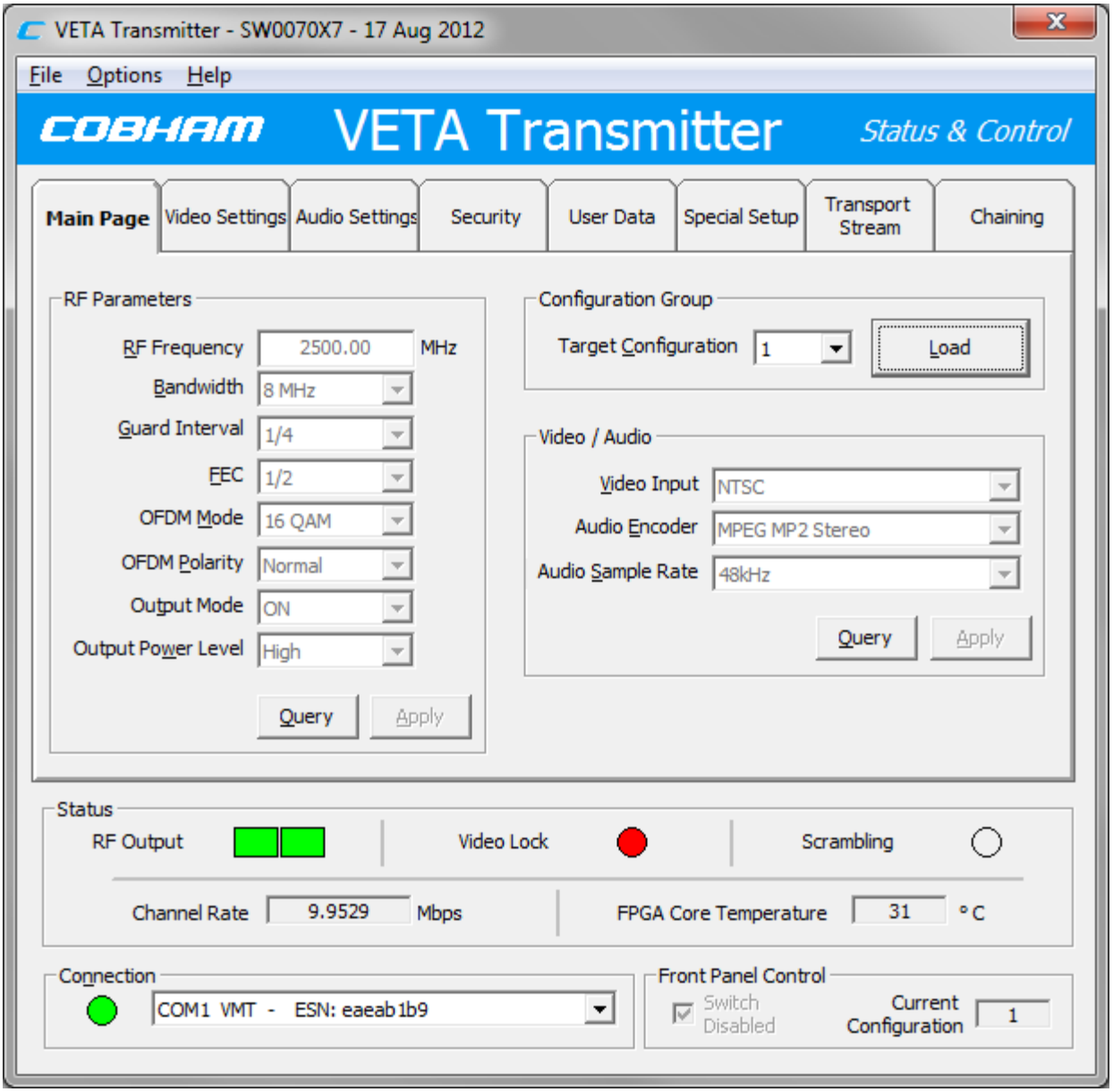


Figure 13 – VETA Tx GUI Main Screen

As the figure shows, the application window consists of tab groups of associated functions and a status / connection area at the bottom of the window. The status / connection area remains visible apart from which tab is active.

3.5 Access levels

As was described previously, the VETA Control software has two levels of access – a User level and an Administrator level. To have full access to the controls, it is necessary to enter the password provided by Cobham into the Administrator Login window. The Options pull-down menu provides access to this window. The password can only be changed by the factory.

User level access only allows changing the predefined configuration groups.

3.6 Transmitter Differences

The two basic transmitter types (VT and VMT) have different feature sets. Table 1 details these differences.

Table 1 – Transmitter Differences

Function	VMT	VT
Output High Low Switch	0 = low level 1 = high level (default)	0 = Low Power 1 = Medium Low Power 2 = Medium High Power 3 = Full Power
Output Attenuation -Med-Low Power	NOT AVAILABLE	Used
Video Profile	Used	NOT AVAILABLE
Audio PID	NOT AVAILABLE	Used
Audio PID 1	Used	NOT AVAILABLE
Audio PID 2	Used	NOT AVAILABLE
Audio 2 Enable	Used	NOT AVAILABLE
Core Temperature	Used	NOT AVAILABLE
Video Stream ID	Used	NOT AVAILABLE
Audio Stream ID	Used	NOT AVAILABLE
Transport Stream Version	Used	NOT AVAILABLE
Provider Name	Used	NOT AVAILABLE
Transport Stream Switch	Used	NOT AVAILABLE
Available Configurations	16	8

4. Pull-Down Menu Definitions

This section discusses the Pull-Down Menus that include File, Options and Help.

4.1 File

This menu contains only one selection - *Exit*. The *Exit* selection closes and exits the PC control software. Alternatively, the *X* box in the upper right hand corner of the window can be used to exit the program.

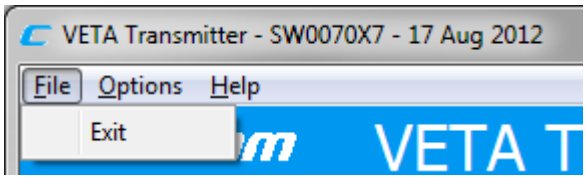


Figure 14 – File Pull-Down Menu

4.2 Options

The number of selections in this menu depends on login level.

For user level, this menu contains only one menu – Administrative Login (Figure 15), which allows the user to access more selections and widen the control by entering password (Figure 16) that can be obtained from Cobham. Contact the factory for the password.

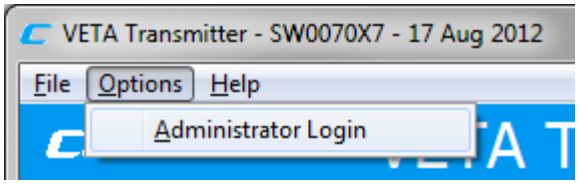


Figure 15 – Options Initial Pull-Down Menu

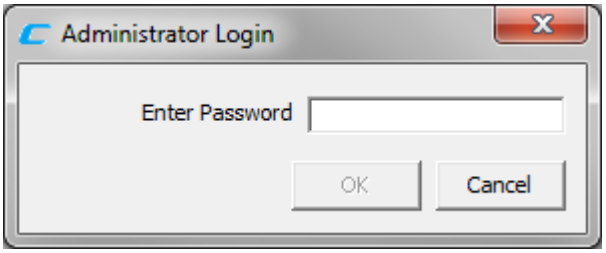


Figure 16 – Administrator Login

Administrator login (see Figure 17) adds the following selections:

- Log Off
- Load Configuration File
- Write License Code
- Write License File
- Create Log File

- Change Administrator Password
- Disable Login Requirement

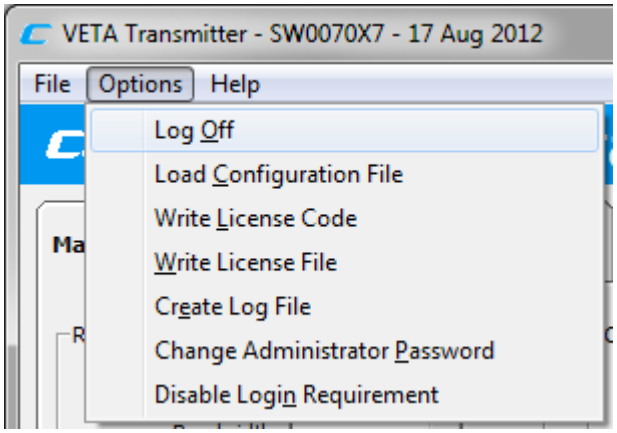


Figure 17 – Options Full Pull-Down Menu

4.2.1 Load Configuration File

This is a special feature that allows the Administrator to change all the parameters of the unit at once. Cobham can provide Configuration Files that can be modified before loading into the unit. Examples of Default Configurations Files are shown in Table 12 and Table 13 ,

Configuration Files are based on a Microsoft Excel® spreadsheet. To use this feature, Microsoft Excel® must be installed on the computer.

After the desired changes are made in the file, save and close it. Ensure that no other Excel file is open during loading. Click *Load Configuration File* and select file from desired location.

4.2.2 Write License Code/File

This option allows the user to enable features that are optional (e.g. advanced encryption) when new licensing option is purchased, without sending the unit back to factory. Depending on the version of the unit, the user will need to load Code or File. Contact Cobham for details.

4.2.3 Restore Default Configuration

This option should be selected only after new Firmware was loaded into the unit.

4.2.4 Log Off

Clicking *Log Off* will restrict access to User Parameters only.

4.2.5 Create Log File

Clicking on this selection will create a log file in the same directory as the application. E.g. if the program is on the desktop, then a *Logfiles* subfolder will be created automatically for the desktop. This folder will contain a text file with the time stamp in the file name. The log file lists all the commands that were executed. Logging can be disabled by clicking the Disable Logging menu selection (see Figure 18).

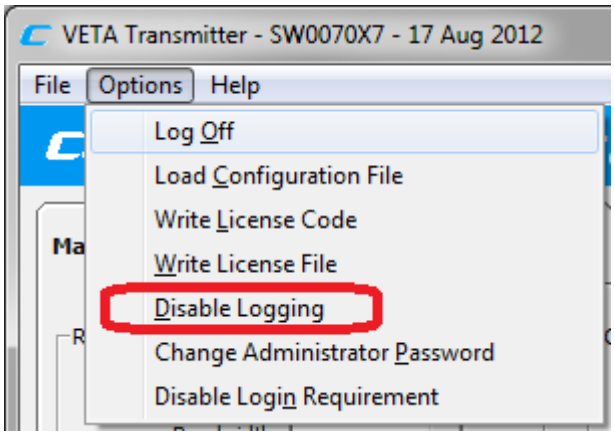


Figure 18 – Options Pull-Down Menu – Disable Logging

4.2.6 Change Administrator Password

User's that have the administrator password can change that password. Clicking on Change Administrator Password brings up the window shown in Figure 19.

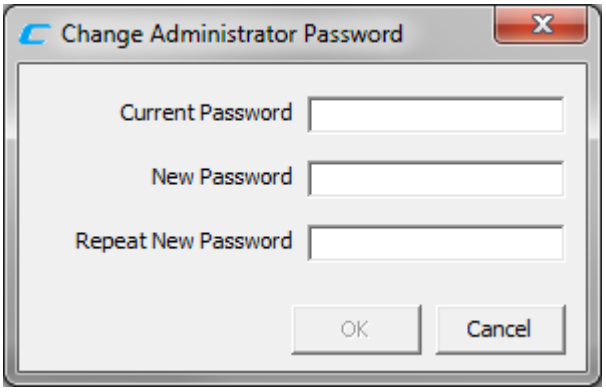


Figure 19 – Change Administrator Password

Enter the current password and the new password in the appropriate fields. Reenter the new password in the last field. If the current password entered is authenticated, and the two entries of the new password are the same; the administrator password is changed (Figure 20).

The administrative password has no restricting characteristics.

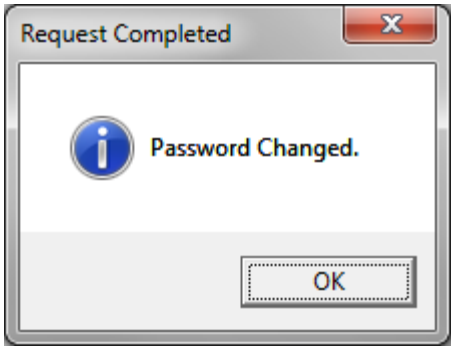


Figure 20 – Password Changed

4.2.7 Disable Login Requirement

The need for an administrative password can be eliminated by this menu as well. This means that the menus that were previously password restricted are available to anyone using the application.

When the Disable Login Requirement is clicked, the application responds with the window shown in Figure 21. The application also shows a check mark (Figure 22) next to the menu selection indicating that the option is active.

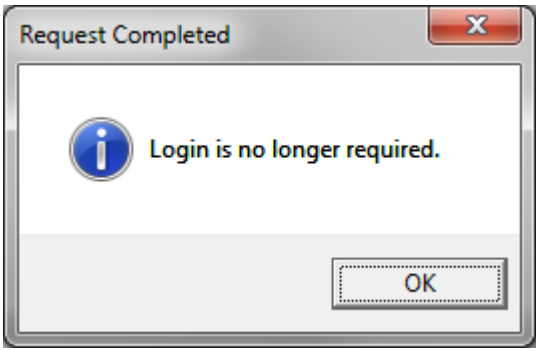


Figure 21 – Login Is No Longer Required

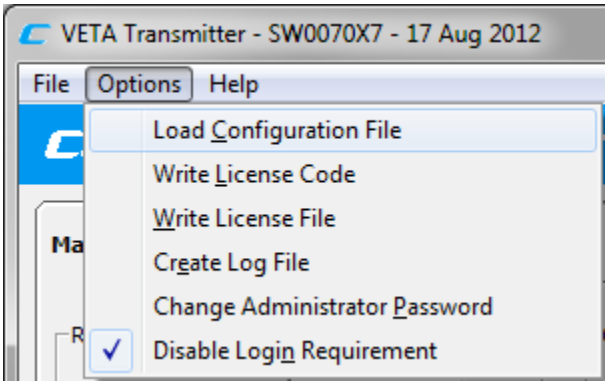


Figure 22 – Re-enable Login Requirement

The login requirement can be re-enabled by clicking the Disable Login Requirement to toggle the option. The application responds with the window shown in Figure 23.

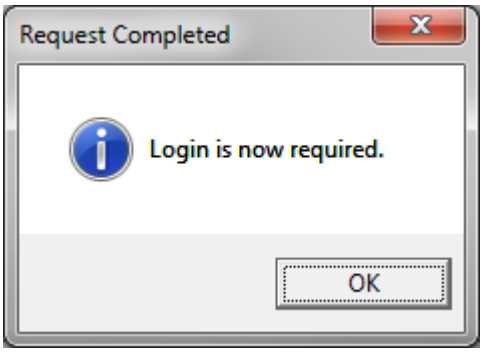


Figure 23 – Login Is Now Required

4.3 Help

Help menu has three selections: *Manuals*, *FW Version* and *About*.

4.3.1 Manuals

This manual is attached to the Control Software. Clicking this selection will launch this manual as a PDF file. See Figure 24 and Figure 25.

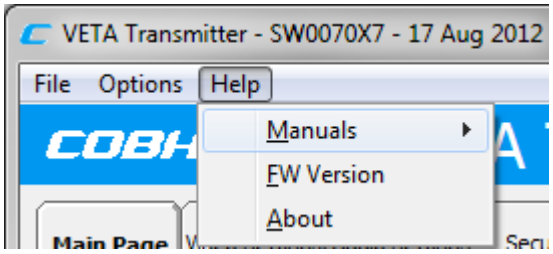


Figure 24 – Help Pull-Down Menu

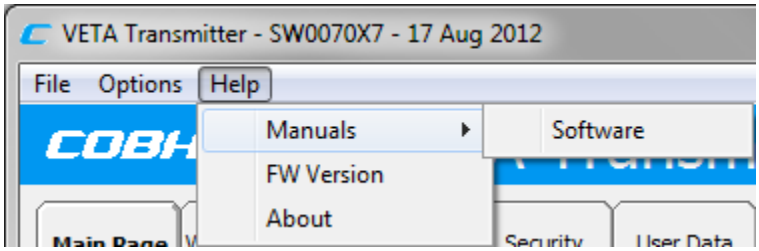


Figure 25 – Help Pull-Down Menu - Manuals

4.3.2 FW Version

This menu contains the Firmware Version of the unit, FPGA Version number of the firmware and the Serial number of the unit. See Figure 26.

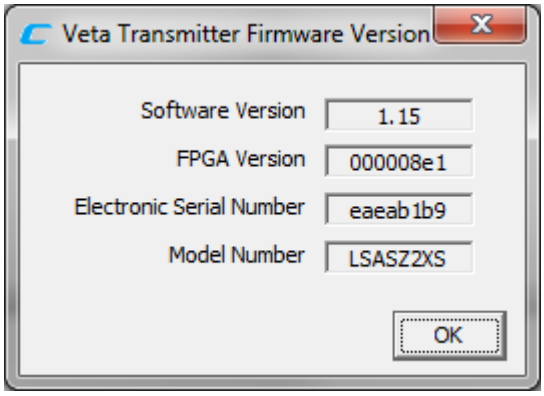


Figure 26 – VMT FW Version Window

4.3.3 About

Choosing this selection displays the *Software* version of the PC control program. See Figure 27.

Figure 27 – About Box Window

5. Status Elements Details

The Status Area includes *Status*, *Connection* and *Front Panel* groups.

5.1 Status Group

The Status group has five indicators.

The RF output status indicates the output power level.

The Video Lock status is an indication that the transmitter has line-locked onto the analog video input signal.

Scrambling Status indicates that outgoing signal is scrambled (Yellow).

Channel Rate Displays channel rate depending on Modulation parameters. Displayed in Mega Bits per Second (Mbps)

FPGA Core Temperature Displays the Core Temperature in Celsius of the VMT FPGA.

Figure 28 – VMT Status

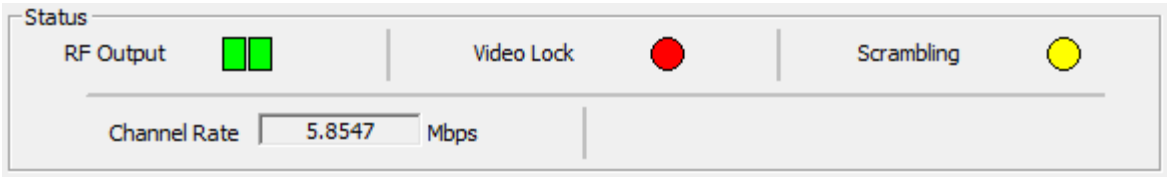


Figure 29 – VT Status

5.2 Connection Group

The left part of drop-down box shows communication ports that had VETA transmitter units connected at the opening of the Control GUI. The transmitter type and the serial number of the corresponding unit are displayed next to the communication port (Figure 30).

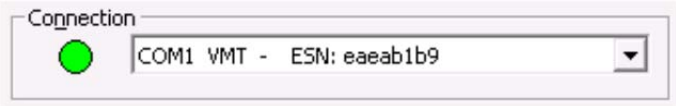


Figure 30 – Connection

If more than one device is connected, the user can switch between devices by clicking on the desired COM port in the drop-down list. The main window will be refreshed and the parameters of the corresponding device will be displayed. (Figure 31)

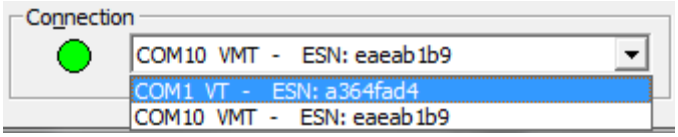


Figure 31 – Multiple Transmitter Availability

The indicator on the left of the drop-down list indicates the connection status. When the indicator is green, the device is operating properly. When the indicator is gray, communications with the transmitter has been lost and the application is trying to reestablish the connection (Figure 32). When it is red, the connection has been lost and the application is requesting user direction (Figure 33 and Figure 34).

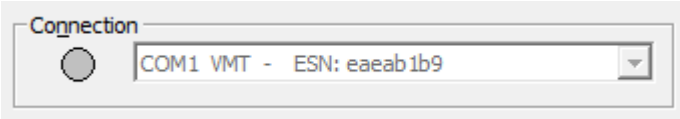


Figure 32 – Trying to Reestablish the Connection

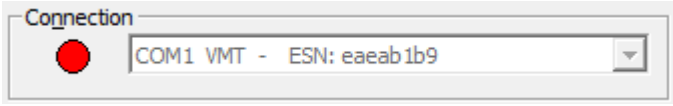


Figure 33 – Connection Lost

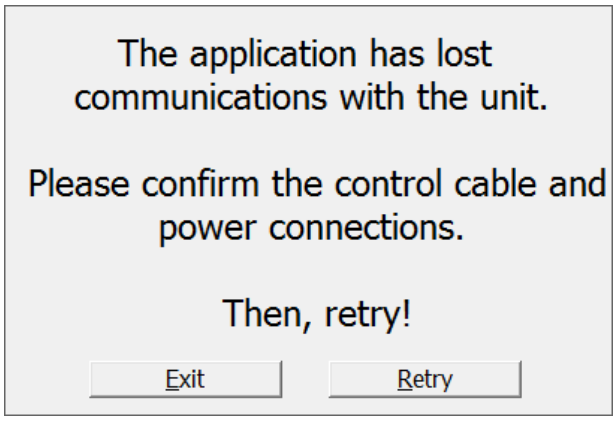


Figure 34 – Request for User Direction

5.3 Front Panel Control Group

This group consists of a *Current Configuration* box (Figure 35 and Figure 36). This field reports the last loaded configuration number. Changes applied after configuration has been loaded are saved immediately into current configuration. The VMT has the additional option to disable the rotary switch by checking the appropriate check box.

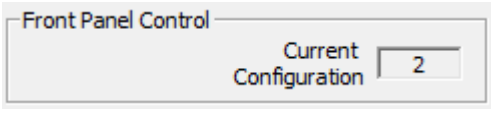


Figure 35 – VT Front Panel Control Group

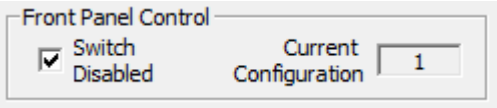


Figure 36 – VMT Front Panel Control Group

6. TAB Definitions

6.1 Main Page Tab

The VETA Transmitter Control software contains eight tabs: *Main Page*, *Video Settings*, *Audio Settings*, *Security*, *User Data*, *Special Setup*, *Transport Stream*, and *Chaining* tabs (see Figure 13). It also has three pull-down menus consisting of the *File*, *Options* and *Help*. Under the menus are additional pull down submenus and selections which are explained in detail later in this document.

The *Main Page* tab consists of the *RF Parameters* group, the *Configuration Group* and the *Video/Audio* group. (See Figure 37)

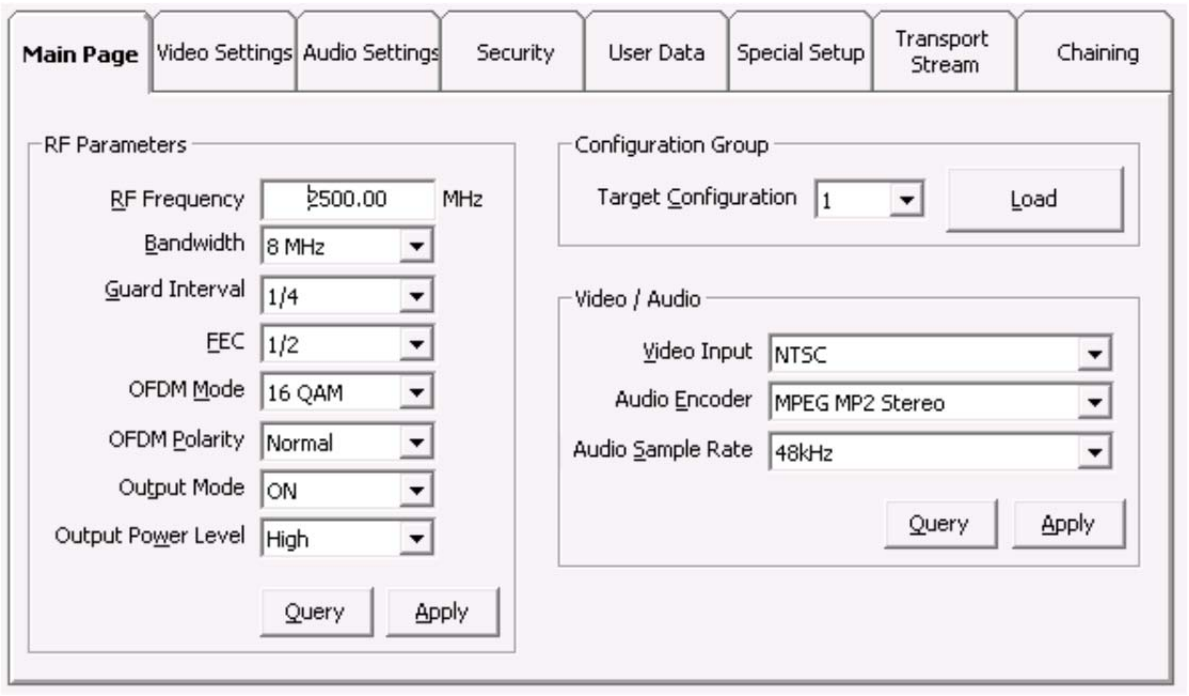


Figure 37 – Main Page Tab

6.1.1 The RF Parameters Group

This group (shown in Figure 38) consists of the following fields as shown Table 2 below along with explanation of each. Any field marked "*R*" *in* the column labeled '*R/W*", indicates that the field is a "read' only (a status indicator). The user cannot change it. Any field marked "*R/W*" or *Read/Write*, indicates that the value can be changed by the user.

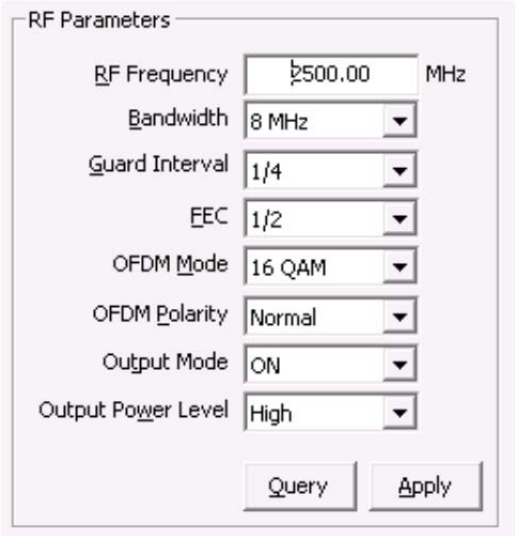
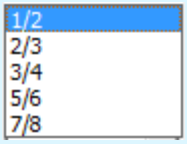
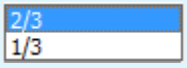
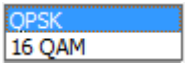
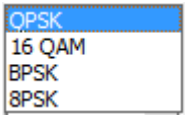
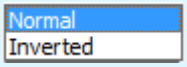
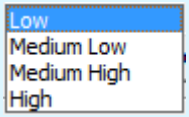
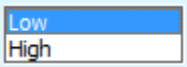


Figure 38 – RF Parameters Group

Table 2 – RF Parameters Field Definitions

Field	R/W	Description
RF Frequency	R/W	RF output frequency. Desired frequency is entered in MHz.
Bandwidth	R/W	Determines the BW of transmit signal. Desired bandwidth is selected from the following values: 6 MHz 7 MHz 8 MHz 2.5 MHz 1.25 MHz 625 KHz Narrow Band Modes (2.5MHz, 1.25MHz and 625KHz BW) are optional and will not be selectable if they have not been licensed.
Guard Interval	R/W	Desired modulation guard interval size is selected; values are dependent on the COFDM Mode bandwidth selected. For DVBT Bandwidth Modes (8 MHz, 7 MHz, and 6 MHz): 1/32 1/16 1/8 1/4 For Narrow Band Modes: 1/16 1/8

Field	R/W	Description
FEC	R/W	Desired modulation FEC rate is selected; values are dependent on the COFDM Mode bandwidth selected. For DVBT Bandwidth Modes  For Narrow Band Modes: 
OFDM Mode	R/W	For DVBT Bandwidth Modes  For Narrow Band Modes: 
OFDM Polarity	R/W	Desired OFDM polarity is selected, 
Output Mode	R/W	Output Mode controls power to the Power Amplifier / RF portion of the Transmitter and allows the following values:  [**NOTE**: If '*OFF*' is selected, the transmitter can still be configured]
Output Power Level	R/W	Output power level. Desired output level of VT is selected:  Desired output level of VMT is selected: 

After changing any "R/W" field with a new value the user must click on the *APPLY* button for the change to take effect. The change that did not yet take place appears in a magenta color. This indicates that the displayed parameters are different from the current unit settings. Clicking on the *Query* button will cancel the operation and restore the display to the current unit values.

6.1.2 Video / Audio Group

This group (see Figure 39) consists of fields that also appear on the Video Settings and Audio Settings tabs. They allow for quick examination and setting of the key video and audio parameters. The fields are described in Table 3.

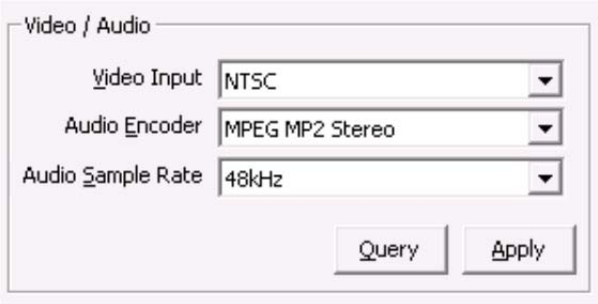


Figure 39 – Video / Audio Group

Table 3 – Video / Audio Field Definitions

Field	R/W	Description
Video Input	R/W	Desired video input format is selected from the following values: OFF PAL NTSC w/ Pedestal NTSC S-Video PAL S-Video NTSC w/ Pedestal S-Video NTSC SDI - PAL SDI - NTSC Note: SDI is optional and will not be selectable if SDI has not been licensed.
Audio Encoder	R/W	Desired mode of operation of the audio encoder is selected from the following values: OFF NICAM Stereo NICAM Mono MPEG MP1 Stereo MPEG MP1 Mono MPEG MP2 Stereo MPEG MP2 Mono
Audio Sample Rate	R/W	Desired sampling rate of the Audio signal is selected from the following values: For NICAM AUDIO: 32KHz, 12bit 32KHz, 8bit 16KHz, 8bit 8KHz, 8bit For MPEG AUDIO: 48kHz

6.1.3 Configuration Group

The Configuration Group (see Figure 40) consists of a pull down box, in which one of sixteen configurations can be selected, along with a *LOAD* button. To change the Configuration Group, select the desired configuration number in the *Target Configuration* drop-down list. Then click the *Load* button. This will update the configuration in the unit. In the Front Panel Control group (located at the lowest right corner), there is a read only box, which shows current configuration.

The VETA transmitter can store (in memory) 16 configurations. These are pre-configured before leaving the factory but can be changed by the user. These 16 configurations are also set to match the receiver before leaving the factory.

Figure 40 – Configuration Group

☞ Warning: If a configuration group is changed, it may not match the receiver configuration group and the digital link may no longer work. Keep in mind the receiver and transmitter configuration groups settings must match.

What you should know about configuration groups:

- Any field that is a read/write (R/W) can be, and is, stored in a configuration group.
- A group is selected by choosing one of the 16 groups and then clicking on the Load button. This action loads all R/W fields (under any of the tabs or pull down menus, not just the Main Page *tab*) with the stored values of that group.
- A group can be changed by editing an R/W field and then clicking on the Apply button ("*APPLY*" also automatically saves). All R/W field values (under any of the tabs or pull down menus, not just the Main Page *tab*) are stored to the current configuration group (the current selected group).

For example, assume that current group 1 is selected and the existing *RF Frequency* is set at 2300 MHz. If the user wants to change the RF frequency to 2250 MHz, the user changes the *RF Frequency* field to 2250 and then clicks on the Apply button. The new frequency is automatically saved to the current group 1.

6.2 Video Settings Tab

This tab allows for various video parameters (see Figure 41) to be selected. It consists of a *Video Selections* section. The fields are explained in Table 4. Once again, you must click on the Apply button after new values have been selected in order for them to take effect.

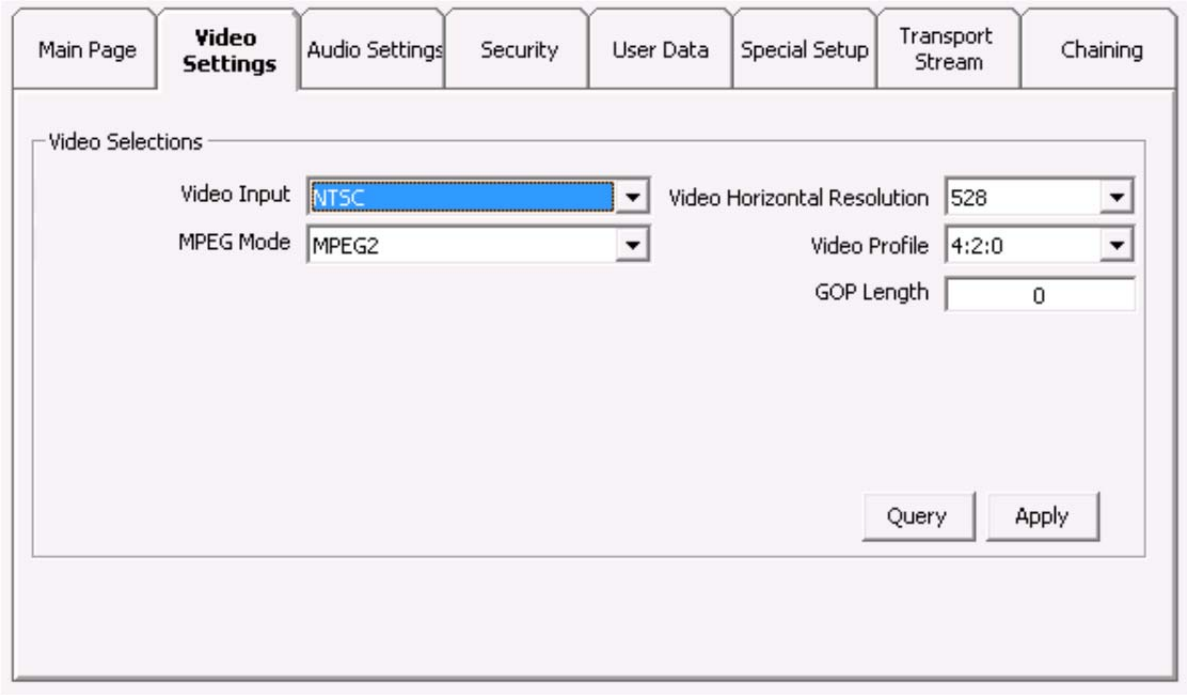


Figure 41 – Video Settings Tab

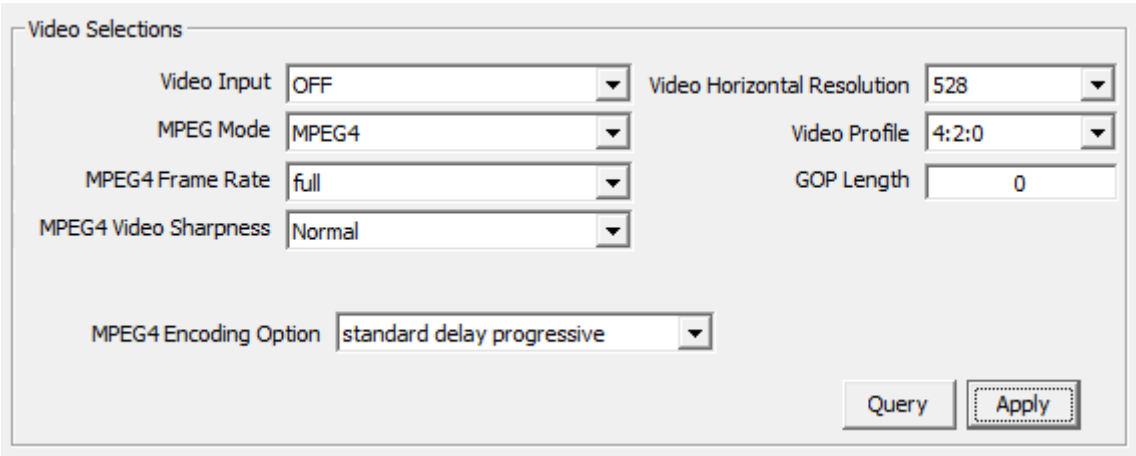
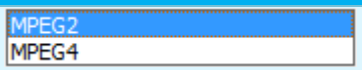
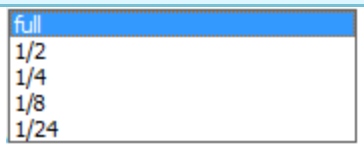
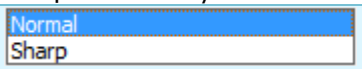
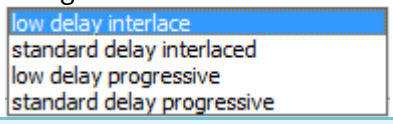
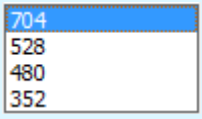


Figure 42 – MPEG4 Settings

Table 4 – Video Selections Field Definitions

Field	R/W	Description
Video Input	R/W	Desired video input format is selected from the following values: OFF PAL NTSC w/ Pedestal NTSC S-Video PAL S-Video NTSC w/ Pedestal S-Video NTSC SDI - PAL SDI - NTSC Note: SDI is optional and will not be selectable if SDI has not been licensed.

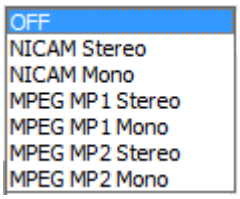
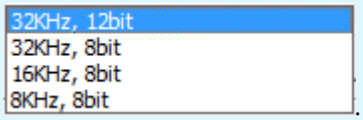
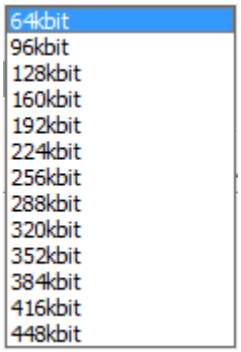
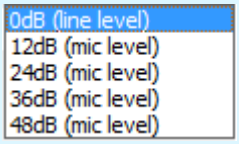
Field	R/W	Description
MPEG Mode	R/W	 This chooses the encoding when in NB only, DVB-T is always encoded MPEG2. MPEG4 is optional and must be licensed with 2.5 MHz, 1.25 MHz, and 625 KHz bandwidth.
MPEG4 Frame Rate	R/W	 This is only valid when RF Bandwidth is in NB mode and MPEG4 has been licensed. In some NB settings the video bit rate may be too low for clear pictures to be decoded, lowering the frame rate can help increase the picture clarity.
MPEG4 Video Sharpness	R/W	 Only valid when encoding MPEG4 when in NB mode. Sharpness is related to the clarity of detail and edge definition of an image. Encoding of video information may remove some higher frequency content in the original video information. The decoded information may appear smoothed and/or somewhat fuzzy when displayed. To improve video image quality additional algorithms might be implemented by setting this parameter to Sharp.
MPEG4 Encoding Option	R/W	The default is low delay interlace. Other modes are available, but advice should be sought before selection. 
Video Horizontal Resolution	R/W	Desired Video Horizontal resolution is selected from the following values:  *Default for NTSC is 704.* Changing the horizontal resolution to lower values will make the coded picture softer. Care should be taken to match the horizontal resolution to the resolution of the camera connected to the transmitter; this will give best image results.
Video Profile	R/W	Selects desired Video Profile:  4:2:2 is optional and must be licensed in order to be selectable.
GOP Length	R/W	By default MPEG2 GOP length is set to a low delay stripe refresh mode (GOP = 0). This option allows the user to set the GOP length for a standard GOP structure at the expensive of an additional delay. Valid GOP values range from 1 – 15 (Where a value of 1 is intra mode only)

6.3 Audio Settings Tab

This tab allows for various audio parameters (see Figure 43, Figure 44, and Figure 45) to be selected. It consists of *Audio Selections* section. The fields are explained in Table 5 – Audio Selections Field Definitions.

Once again, you must click on the Apply button after new values have been selected in order for them to take effect.

Table 5 – Audio Selections Field Definitions

Field	R/W	Description
Audio Encoder	R/W	Desired mode of operation of the audio encoder is selected from the following values: 
Audio Sample Rate	R/W	Desired sampling rate of the Audio signal is selected from the following values: For NICAM AUDIO:  For MPEG AUDIO: 
MPEG Audio Bit Rate	R/W	 Cobham recommends using 256kbps as a minimum to avoid distortion. This is not applicable when in NICAM audio encoder mode.
Audio Input Level	R/W	This control is used to define the audio gain to be applied to the audio input signal. 0dB is used for line level audio.  12dB, 24dB, 36dB and 48dB of gain can be applied for microphone inputs.

Field	R/W	Description
MPEG Audio Offset	R/W	Audio PTS offset when in MPEG audio compression. Default is 0

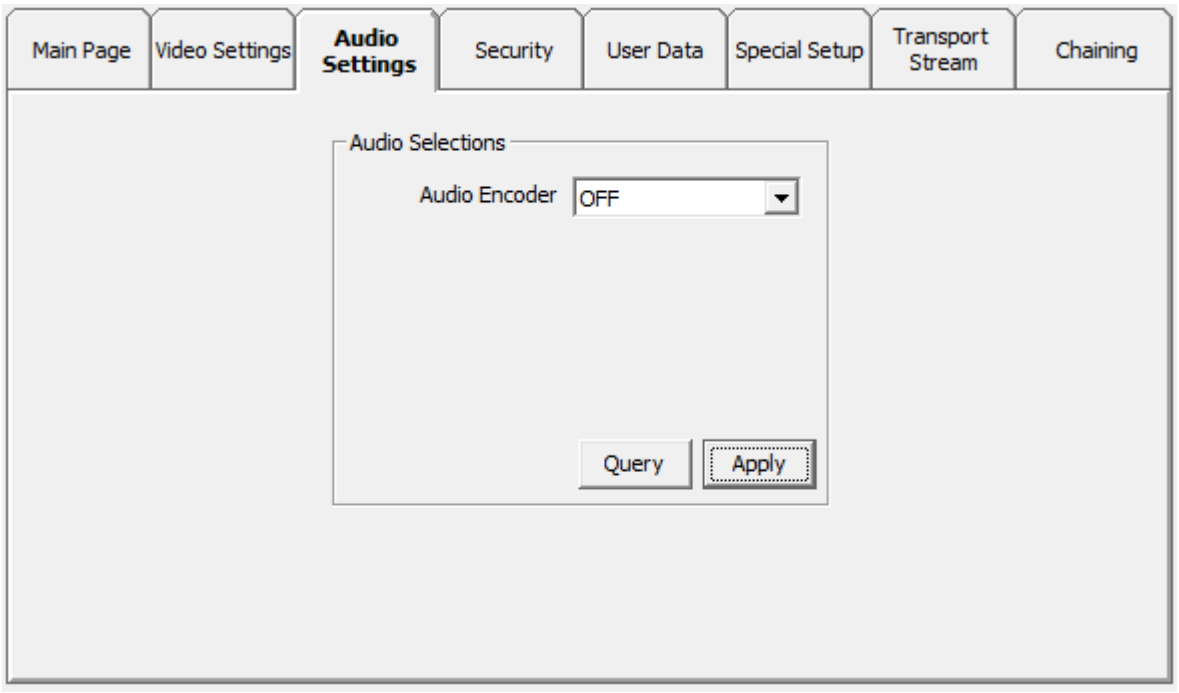


Figure 43 – Audio Encoder OFF Settings

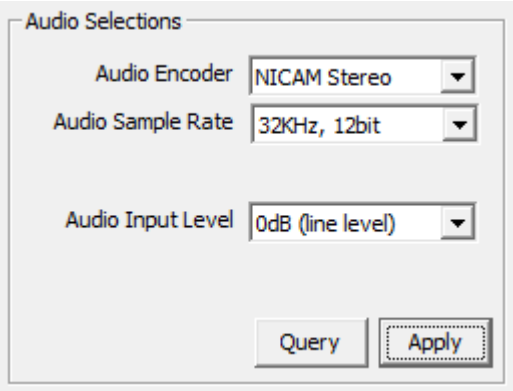


Figure 44 – Audio Encoder NICAM Settings

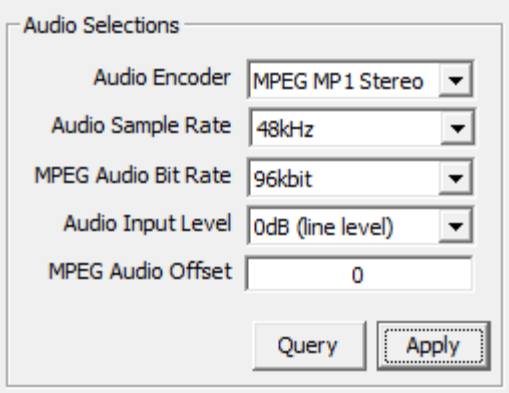


Figure 45 – Audio Encoder MPEG Settings

6.4 Security Tab

This tab allows administrator to enable or disable encryption, to choose type of encryption to be used and enter the encryption key; ABS (supplied with link) and optional AES or AES/BCRYPT. AES and AES/ BCRYPT have 2 sub selections: 128 and 256. 128 requires 32 hex symbols for the Key, while type 256 is more secure and requires 64 hex symbols. If the transmitter in 128 or 256 modes, then the incoming signal can be decoded if the keys are matched or the incoming signal is not encrypted.

If encryption is turned OFF, then the Security Key window is displayed as shown in Figure 46.

The Scrambling Mode pull-down list shows all of the encryption modes. However if the unit does not have the corresponding license, it will return value that is licensed in the unit.

Security key field is different for different encryption modes. The modes that require 64 character key (AES, B-crypt) have to two boxes for lower and upper parts of the key. See Figure 48.

The user must enter the correct key, which must match the key of the receiver. Clicking on the 

button will notify the user if the incorrect number of characters have been entered. The user will not be able to exit this window unless the 

button is clicked or the correct amount of characters are entered.

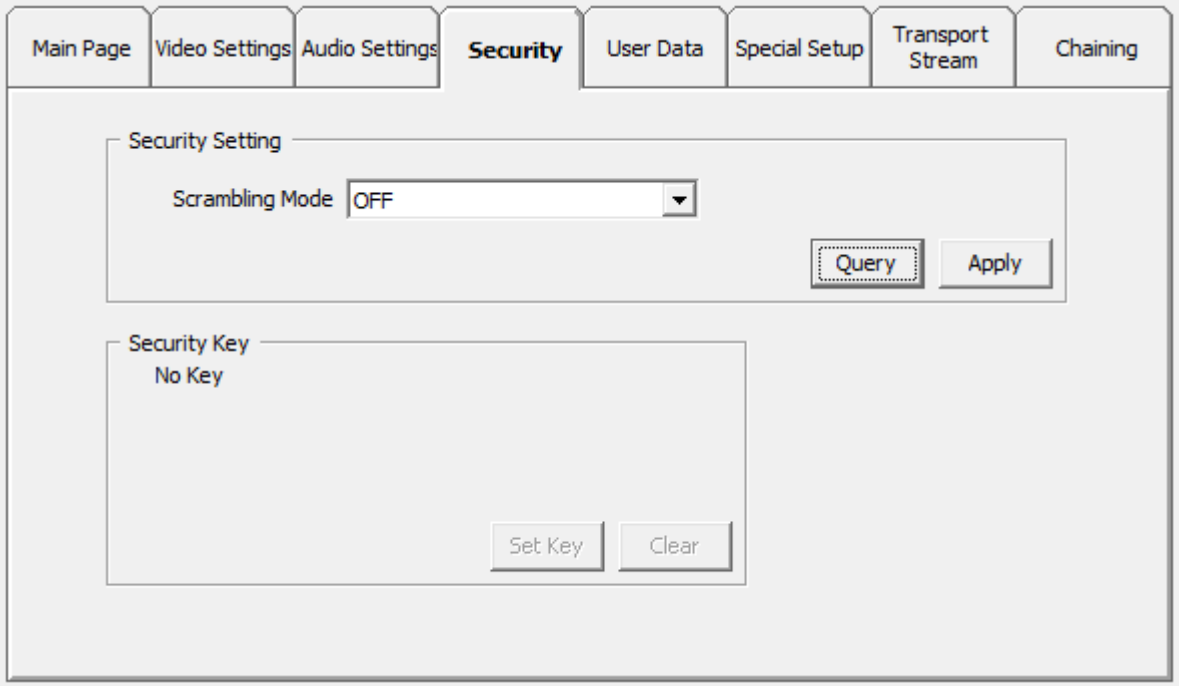


Figure 46 – VMT Security Tab

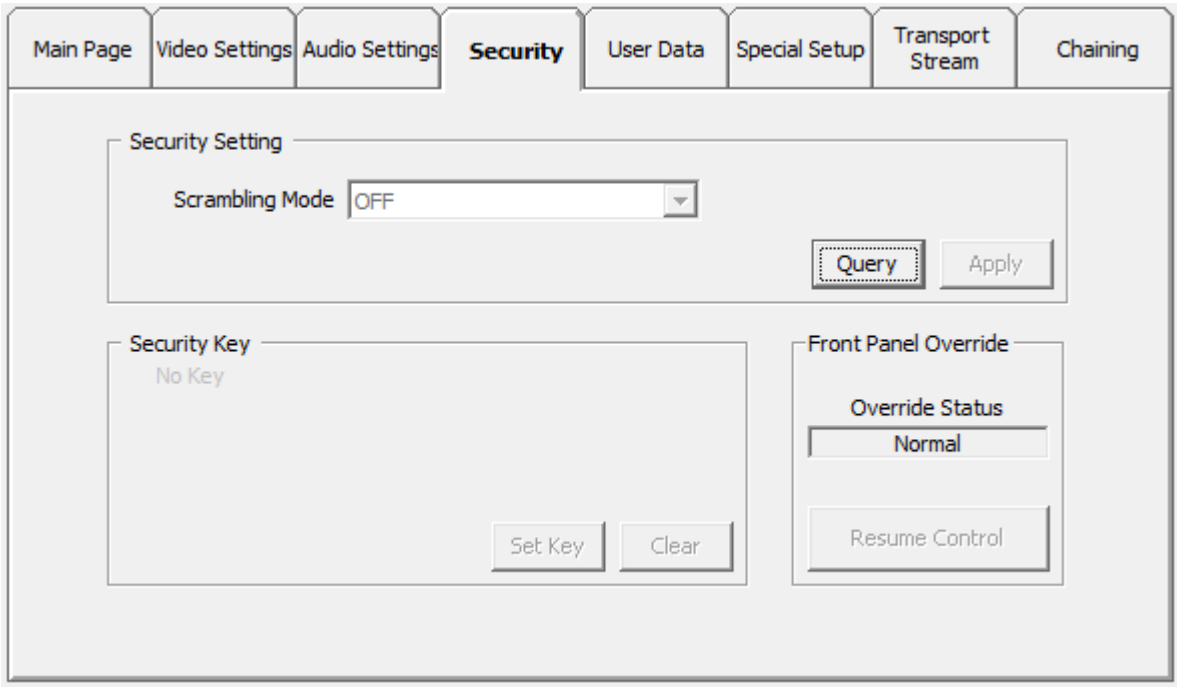


Figure 47 – VT Security Tab

Table 6 – Encryption Field Definitions

Field	R/W	Description
Scrambling Mode	R/W	This field allows user to select between OFF ABS AES 128 AES 256 AES/BCRYPT 128 AES/BCRYPT 256 (AES 128, AES 256, AES / BCRYPT 128, and AES/ BCRYPT 256 are optional).
Security Key	W	When any scrambling option is selected, the user is prompted to enter an encryption key. The difference between scrambling modes is the length of the key measured in characters: 8 for ABS, 32 for AES/BCRYPT 128, or 32 upper and lower (64 characters total) for AES/BCRYPT 256. For security purposes, the Security Key cannot be read back from any Cobham product.

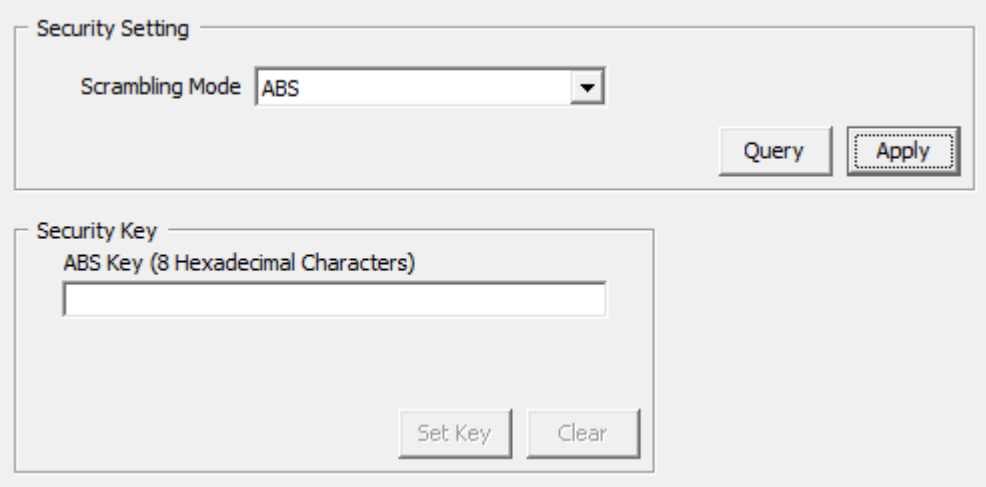


Figure 48 – VMT Security Tab in ABS Mode

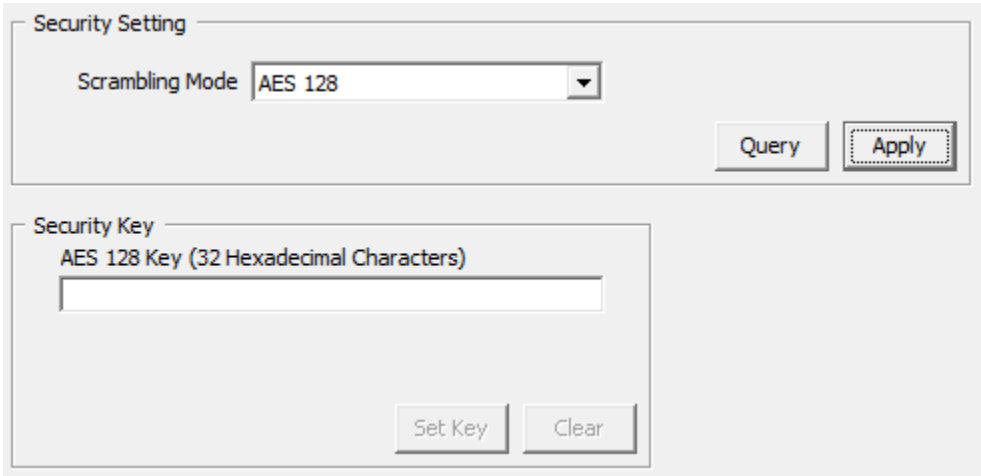


Figure 49 – VMT Security Tab in AES 128 Mode

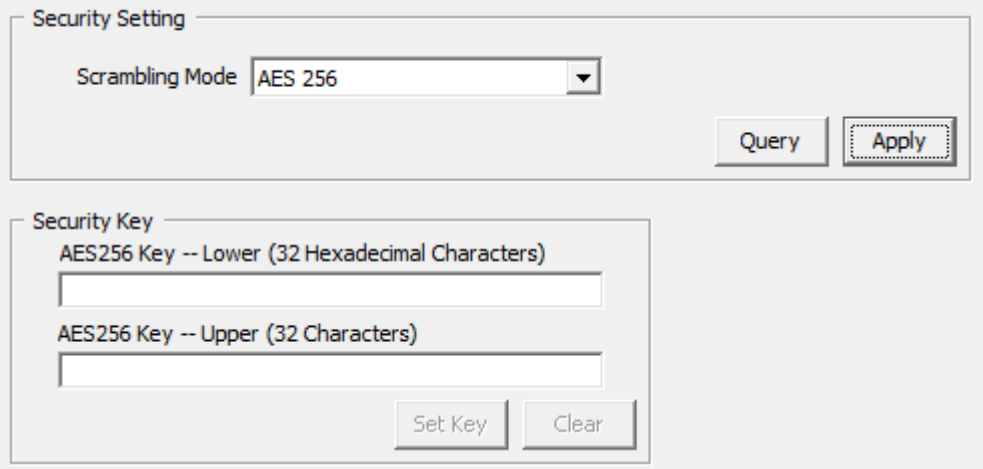


Figure 50 – VMT Security Tab in AES 256 Mode

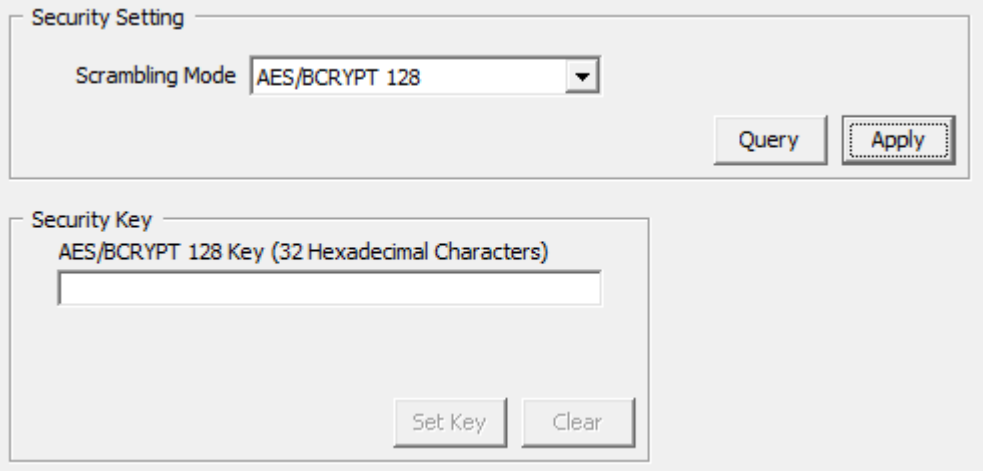


Figure 51 – VMT Security Tab in AES/BCRYPT 128

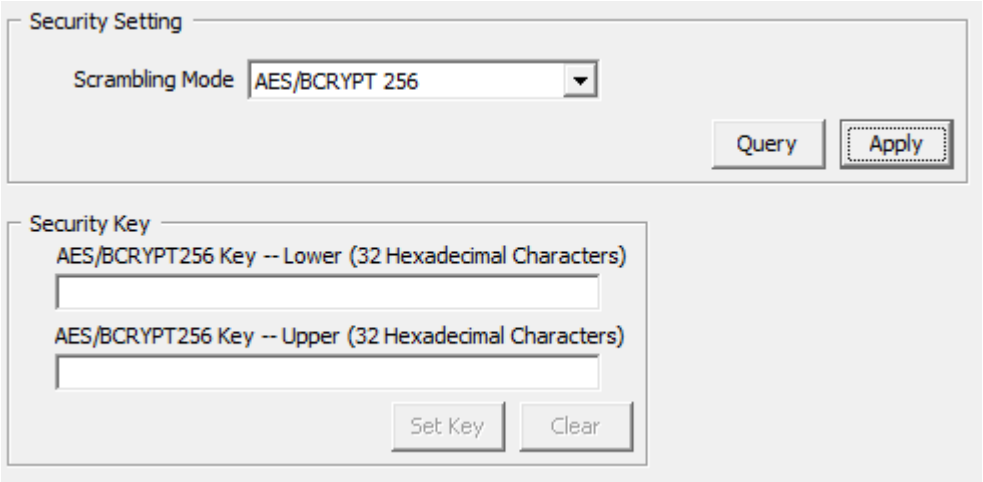


Figure 52 – VMT Security Tab in AES/BCRYPT 256

6.4.1 VT Front Panel Override

The VT has an integral front panel (Figure 53) that can toggle the scrambling mode off and on. When this toggle is used, changes are reflected in the application's status group.

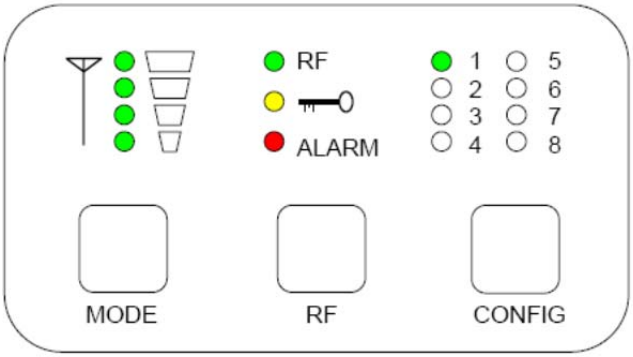


Figure 53 – VT Front Panel

Figure 54 shows the relationship between the status group and security tab displays.

Status Group	Scrambling ◯	Scrambling Override ◯
Security Tab	Front Panel Override Override Status Normal Resume Control	Front Panel Override Override Status Override Active Resume Control

Figure 54 – VT Front Panel Override

Application control of scrambling can be regained by clicking the Resume Control button.

6.5 User Data Tab

This tab (see Figure 55) allows the administrator to turn USER DATA ON or OFF. If turned ON, the transmitter injects any User Data into the transmitted stream. Refer to the corresponding transmitter's operations manual for data inputs.

Table 7 – User Data Field Definitions

Field	R/W	Description
User Data	R/W	This field allows user to select between the following values: OFF Standard Mode: 8 bit no parity Standard Mode: 8 bit even parity Standard Mode: 8 bit odd parity AUX Mode: 8 bit no parity AUX Mode: 8 bit even parity AUX Mode: 8 bit odd parity AUX Mode: 7 bit no parity AUX Mode: 7 bit even parity AUX Mode: 7 bit odd parity When the control is set to other than OFF, the user can introduce RS232 data to the data input port of the receiver.

Field	R/W	Description
Input Data Baud Rate	R/W	This field specifies the baud rate of the RS232 data component. It can be set to: 1200 baud 2400 baud 4800 baud 9600 baud 19200 baud 38400 baud 57600 baud 115200 baud

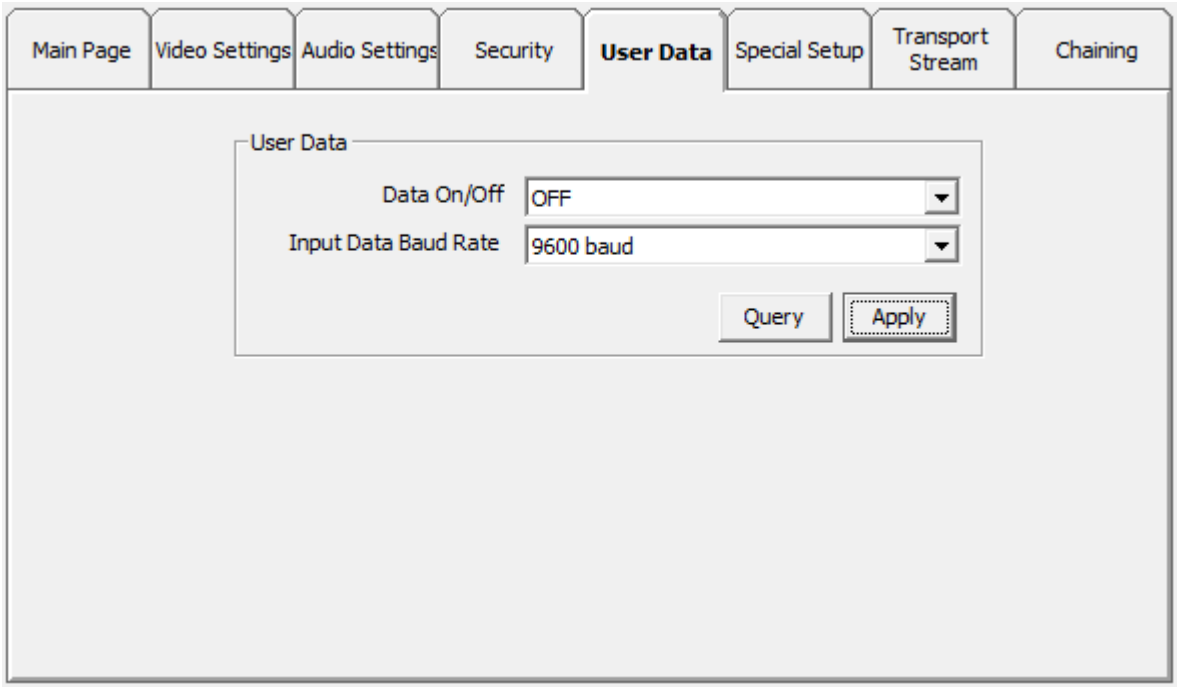


Figure 55 – User Data Tab

6.6 Special Setup Tab

Special Setup is configured at the factory for specific application and for advanced operations only. Consult Cobham before changing any of these parameters.

This selection brings up special parameters (see Figure 56). Selections are described in Table 8.

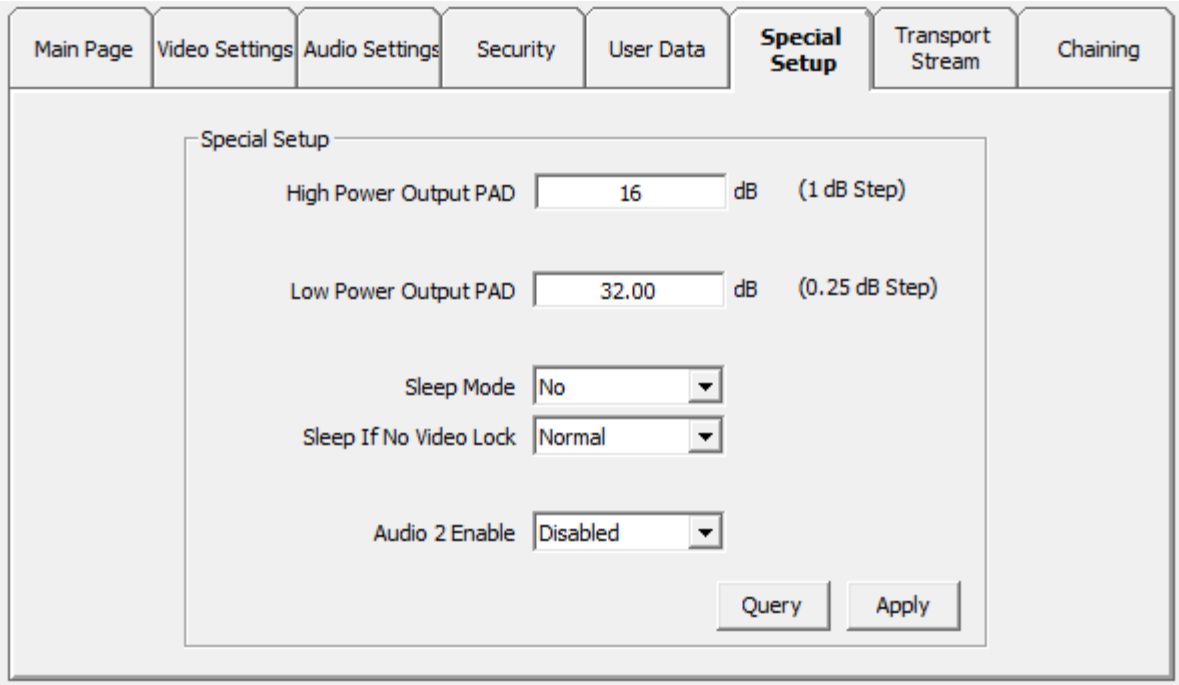


Figure 56 – Special Setup for VMT

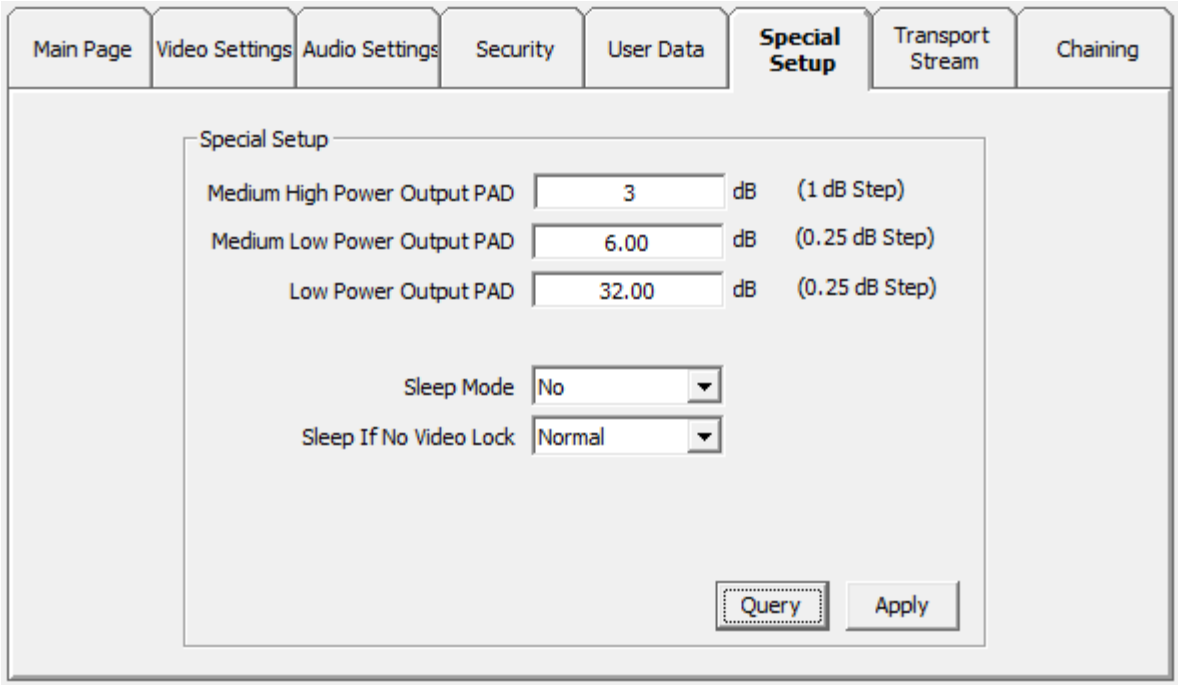
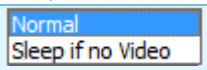
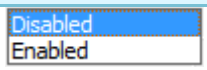


Figure 57 – Special Setup for VT

Table 8 – Special Setup Field Definitions

Field	R/W	Description
High Power Output PAD	R/W	VMT only The High power PAD adds additional attenuation onto the nominal Full power output. This can be used to lower the maximum power out of the VMT. The Default value is 0dB but, the value can be entered in 0.25dB steps to 31.75dB maximum. This value must be less than the Low Power Output PAD value.
Medium High Power Output PAD	R/W	VT only
Medium Low Power Output PAD	R/W	VT only
Low Power Output PAD	R/W	This value determines the Power output of the transmitter when in Low Power Mode. The Default value is 32dB but the value can be entered in 0.25dB steps to 0.25dB minimum. This value must be higher than the High Power Output PAD value.
Sleep Mode	R/W	Selectable  Putting the VMT in sleep mode will disable all functionality except the communication between the VMT and the RS232 control. This is the lowest current usage mode of the transmitter (besides turning the unit off).
Sleep If No Video Lock	R/W	 Default is normal, when in Sleep if no Video, the transmitter will be placed in sleep mode when no video is input to the Transmitter.
Audio 2 Enable	R/W	 Function enables 2nd set of single ended audio.

6.7 Transport Stream Tab

The Transport Stream Tab contains information about the transport stream and allows the user to make changes to these parameters. The Transport Stream Settings Tab is shown in Figure 58 and Figure 59.

Keep in mind you must click on the  button in order for new values to take effect.

Not that the ID and PID values can be returned to their default values (see Table 10) by entering in a value of '0' (And clicking Apply).

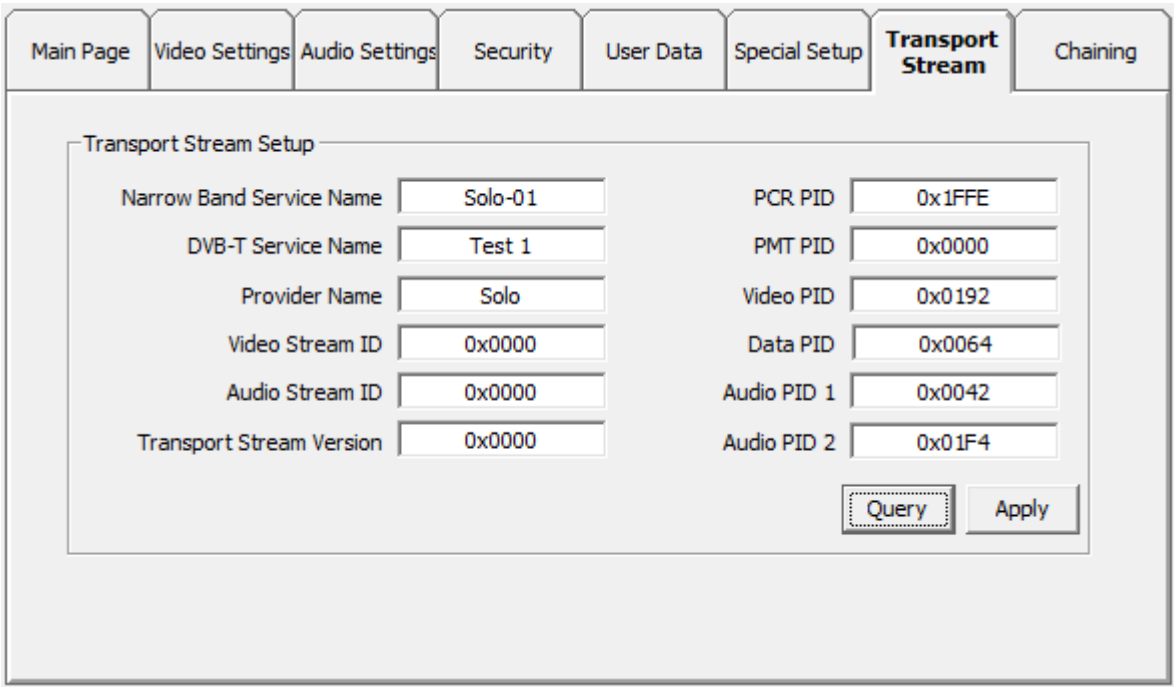


Figure 58 – Transport Stream for VMT

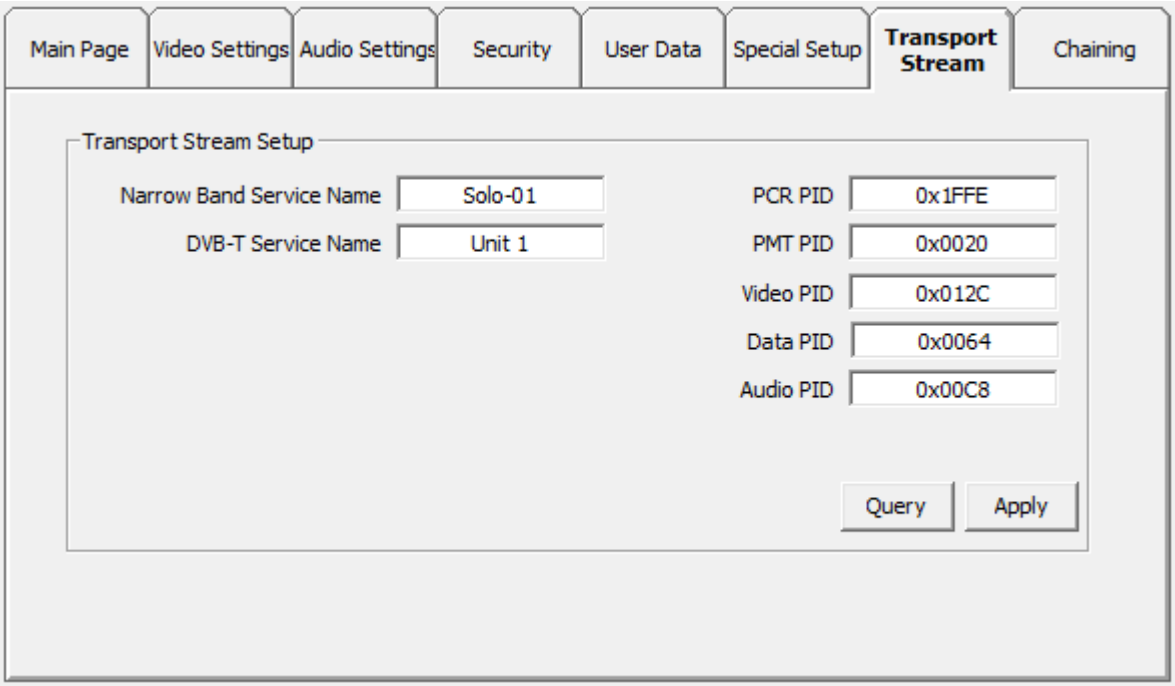


Figure 59 – Transport Stream for VT

See Table 9 for an explanation the fields.

Table 9 – Transport Stream Field Definitions

Field	R/W	Description
Narrow Band Service Name	R/W	Allows for a unique service name to be applied to the Transmitter while broadcasting in Narrow Band Mode

Field	R/W	Description
DVB-T Service Name	R/W	Allows for a unique service name to be applied to the Transmitter while broadcasting in DVB-T Mode
Provider Name	R/W	(VMT Only) User can enter a provider name for the Transmitter
Video Stream ID	R/W	(VMT Only) User can set these to specific values or keep the default.
Audio Stream ID	R/W	(VMT Only) User can set these to specific values or keep the default.
Transport Stream Version	R/W	(VMT Only) User can set these to specific values or keep the default.
PCR PID	R/W	User can set these to specific values or keep the default.
PMT PID	R/W	User can set these to specific values or keep the default.
Video PID	R/W	User can set these to specific values or keep the default.
Data PID	R/W	User can set these to specific values or keep the default.
Audio PID	R/W	(VT Only) User can set these to specific values or keep the default.
Audio PID 1	R/W	(VMT Only) User can set these to specific values or keep the default.
Audio PID 2	R/W	(VMT Only) User can set these to specific values or keep the default.

Table 10 – Default PID Definitions

Chain Number	PMT PID	Video PID	Audio PID	Data PID	PCR PID
0	0x0020	0x012C	0x00C8	0x0064	0x1FFE
1	0x0021	0x012D	0x00C9	0x0065	0x1FFD
2	0x0022	0x012E	0x00CA	0x0066	0x1FFC
3	0x0023	0x012F	0x00CB	0x0067	0x1FFB
4	0x0024	0x0130	0x00CC	0x0068	0x1FFA
5	0x0025	0x0131	0x00CD	0x0069	0x1FF9
6	0x0026	0x0132	0x00CE	0x006A	0x1FF8
7	0x0027	0x0133	0x00CF	0x006B	0x1FF7
8	0x0028	0x0134	0x00D0	0x006C	0x1FF6
9	0x0029	0x0135	0x00D1	0x006D	0x1FF5

6.8 Chaining Tab

This tab allows for customization of the chaining feature within the VETA transmitters. Chaining Input allows the user to set the Tx to act as a relay or to allow multiplexing of transport streams within one Tx. The chaining out feature outputs the transport stream of the Tx to the 'Chaining out' interface.

Keep in mind you must click on the Apply button in order for new values to take effect.

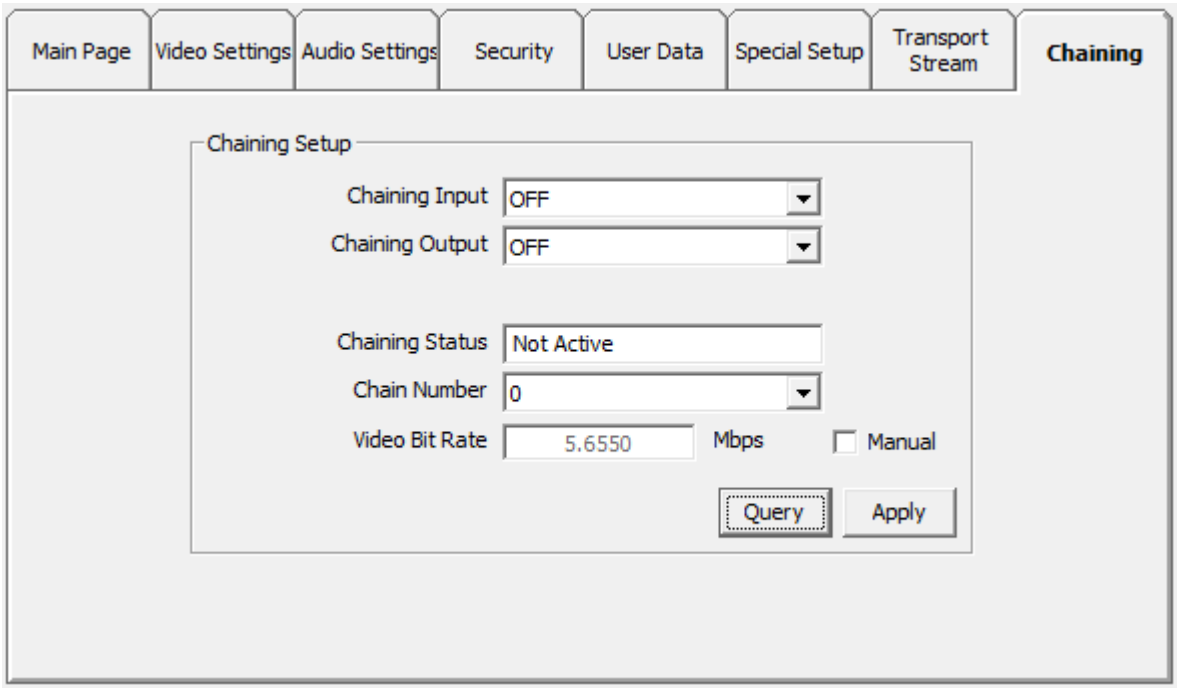


Figure 60 – Chaining for VT

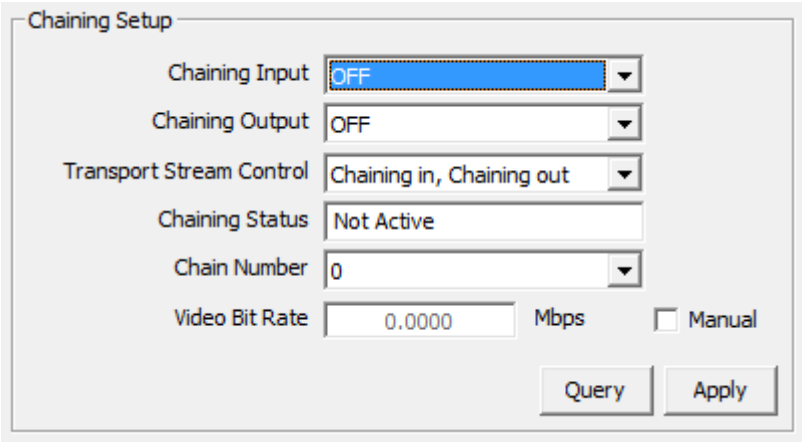


Figure 61 – Chaining for VMT

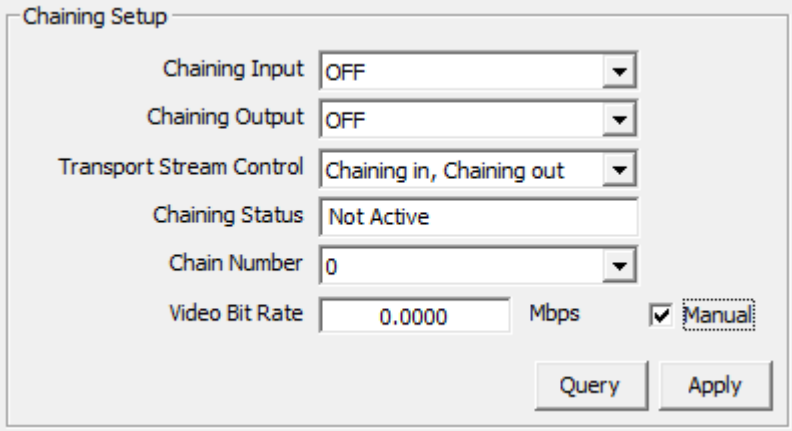
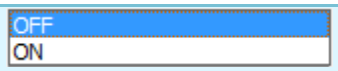


Figure 62 – Chaining for VMT – Manual Video Bit Rate

Table 11 – Chaining Setup Field Definitions

Field	R/W	Description
Chaining Input	R/W	 Off is when using the transmitter as a standard transmitter. *Relay* is used for purely repeater applications. One will notice that ***Video Input***, ***Audio Encoder*** and ***Data ON/OFF*** are all set to *OFF* automatically once ***RELAY*** is set. *ON* is used to multiplex an additional digital stream onto the RF channel. This has the effect of dividing the channel rate equally between the chaining interface and the local video/audio/user data to be sent over the RF link.
Chaining Output	R/W	 This will stream the encoded digital stream out of the Chaining Port
Transport Stream Control	R/W	VMT Only This field is reserved for future expansion. This should be set to ***Chaining In, Chaining Out***.
Chaining Status	R/W	*Active or Not Active.* Chaining Status will register whether a valid chain is input to the VMT, this is only activated when the ***Chaining Input*** is set to *ON or Relay.*
Chain Number	R/W	*Selectable from 0-9.* When multiplexing multiple digital streams, each stream must have a unique chain number. This is used to prevent SI table overlaps between the digital streams.
Video Bit Rate	R/W	This shows the amount of RF channel rate allocated to the local Tx Video Source. This number will divide by two once the ***Chaining Input*** is set to *On,* meaning half of the RF channel is now reserved for the Chaining input. The video bit rate will go to 0.00, when the ***Chaining Input*** is set to *Relay,* meaning all the RF channel is reserved for the Chaining Input Care should be taken if user chooses to manually set the video bit rate for the local video input as this will change the allocation of the channel rate.

7. Default Configurations

Table 12 – Typical VT Default Configurations File

PARAMETER	C2	CONFIGURATIONS							
Config #	glod	1	2	3	4	5	6	7	8
Device Address	gadd	1	1	1	1	1	1	1	1
COFDM BW	owid	2	2	2	2	2	2	2	2
RF Frequency	ofre	4700	4400	4500	4600	4700	4800	4900	5000
Output Mode	oout	1	1	1	1	1	1	1	1
COFDM Mode	odmo	0	0	0	0	0	0	0	0
DVB-T Modulation GI	odgu	1	1	1	1	1	1	1	1
DVB-T Modulation FEC	odfe	0	0	0	0	0	0	0	0
NB Modulation GI	ogua	1	1	1	1	1	1	1	1
NB Modulation FEC	ofec	0	0	0	0	0	0	0	0
Sp Inversion	ospe	0	1	0	0	0	0	0	0
Output Power Level	ohls	3	3	3	3	3	3	3	3
Video Input	vinp	4	4	4	4	4	4	4	4
Audio Encoder	aenc	11	11	11	11	11	11	11	11
MPEG Audio Sample Rate	ampr	8	8	8	8	8	8	8	8
Audio Input Gain	alev	0	0	0	0	0	0	0	0
Auxiliary Data ON/OFF	dinp	1	1	1	1	1	1	1	1
Input Data Rate	dbau	3	3	3	3	3	3	3	3
Scrambling	zscr	0	0	0	0	0	0	0	0
Chaining	cinp	0	0	0	0	0	0	0	0
Output Attenuation: Medium High Power	olev	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
Output Attenuation: Medium Low Power	olml	6	6	6	6	6	6	6	6
Output Attenuation: Low Power	ollv	32	32	32	32	32	32	32	32
Horizontal resolution	ehor	0	0	0	0	0	0	0	0
Sleep Mode	gsle	0	0	0	0	0	0	0	0
Sleep in no Video	vsle	0	0	0	0	0	0	0	0
Front Panel Lock	gfpl	0	0	0	0	0	0	0	0
MPEG Mode	eenc	0	0	0	0	0	0	0	0
MPEG4 Frame Rate	efrm	0	0	0	0	0	0	0	0
Sharpness	esha	0	0	0	0	0	0	0	0
Encoding Option	ecmd	3	3	3	3	3	3	3	3

*Select MPEG4 only for Narrowband

**Select Full Rate only for Low Delay Encoding

Table 13 – Typical VMT Default Configurations File

	S2	CONFIGURATIONS												
Config #	glod	4	5	6	7	8	9	10	11	12	13	14	15	16
Device Address	gadd	1	1	1	1	1	1	1	1	1	1	1	1	1
COFDM BW	owid	2	2	2	2	2	2	2	2	2	2	2	2	2
RF Frequency	ofre	2160	2245	2330	2415	2500	2245	1990	2075	2160	2245	2330	2415	2500
Output Mode	oout	1	1	1	1	1	1	1	1	1	1	1	1	1
DVB-T COFDM Mode	odmo	0	0	0	0	0	0	0	0	0	0	0	0	0
DVB-T Modulation GI	odgu	1	1	1	1	1	1	1	1	1	1	1	1	1
DVB-T Modulation FEC	odfe	0	0	0	0	0	0	0	0	0	0	0	0	0
NB COFDM Mode	omod	0	0	0	0	0	0	0	0	0	0	0	0	0
NB Modulation GI	ogua	1	1	1	1	1	1	1	1	1	1	1	1	1
NB Modulation FEC	ofec	0	0	0	0	0	0	0	0	0	0	0	0	0
Sp Inversion	ospe	0	0	0	0	0	0	0	0	0	0	0	0	0
Output Power Level	ohls	1	1	1	1	1	1	1	1	1	1	1	1	1
Video Input	vinp	4	4	4	4	4	4	4	4	4	4	4	4	4
Audio Encoder	aenc	15	15	15	15	15	15	15	15	15	15	15	15	15
MPEG Audio Sample Rate	ampr	8	8	8	8	8	8	8	8	8	8	8	8	8
Audio Input Gain	alev	0	0	0	0	0	0	0	0	0	0	0	0	0
Auxiliary Data ON/OFF	dinp	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Data Rate	dbau	3	3	3	3	3	3	3	3	3	3	3	3	3
Scrambling	zscr	0	0	0	0	0	0	0	0	0	0	0	0	0
Chaining Input	cinp	0	0	0	0	0	0	0	0	0	0	0	0	0
Chaining Output	cout	0	0	0	0	0	0	0	0	0	0	0	0	0
Chain Number	ccha	0	0	0	0	0	0	0	0	0	0	0	0	0
Transport Stream Control	gosw	12	12	12	12	12	12	12	12	12	12	12	12	12
Output Attenuation: High Power	olev	0	0	0	0	0	0	0	0	0	0	0	0	0
Output Attenuation: Low Power	ollv	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
Horizontal resolution	ehor	0	0	0	0	0	0	0	0	0	0	0	0	0
Sleep Mode	gsle	0	0	0	0	0	0	0	0	0	0	0	0	0
Sleep in no Video	vsle	0	0	0	0	0	0	0	0	0	0	0	0	0
Front Panel Lock	gfpl	0	0	0	0	0	0	0	0	0	0	0	0	0
MPEG Mode	eenc	0	0	0	0	0	0	0	0	0	0	0	0	0
MPEG4 Frame Rate	efrm	0	0	0	0	0	0	0	0	0	0	0	0	0
Sharpness	esha	0	0	0	0	0	0	0	0	0	0	0	0	0
Encoding Option	ecmd	3	3	3	3	3	3	3	3	3	3	3	3	3
Video PID	esid	300	300	300	300	300	300	300	300	300	300	300	300	300
Audio PID	apid	200	200	200	200	200	200	200	200	200	200	200	200	200
Enable Rotary Switch	gcus	1	1	1	1	1	1	1	1	1	1	1	1	1
IQ Inversion Control	oiqc	1	1	1	1	1	1	1	1	1	1	1	1	1
NB IQ Inversion Control	onsp	1	1	1	1	1	1	1	1	1	1	1	1	1

*Select MPEG4 only for Narrowband

**Select Full Rate only for Low Delay Encoding