



## **INSTALLATION AND OPERATING INSTRUCTIONS**

Revision Date: March 3, 2010

**VCX-2400-E** MPEG-2 Encoder, IP  
**VCX-2400-ER** MPEG-2 Encoder, IP Rack Mount

**VCX-2400-D** MPEG-2 Decoder, IP  
**VCX-2400-DR** MPEG-2 Decoder, IP Rack Mount

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## Introduction

The VCX-2400-E and VCX-2400-D are the chassis versions of the Core Tec stand-alone VCX-2400 MPEG-2 IP product series. These units are fully compatible with the “-R” card cage versions of the product series.

The VCX-2400 Digital Video Codec system consists of a video encoder/decoder pair providing the capability for one-way end-end transmission of compressed digital video in IP packets at data rates in the 1.2 to 6.0 Mbps range.

The system employs MPEG-2 MPEG2 standard ISO/IEC 13818-2 (ITU-T H.262) encoding. The encoding-decoding process is applied to an NTSC (or PAL) video input, selected in software.

The video encoder converts the analog video to a serial digital signal, which is multiplexed with any data sub-channels present. The stream is then formatted into a series of IP packets sent to the network through a standard Ethernet connection.

Modification of video format and resolution, data sub-channel characteristics, and basic IP parameters is achieved through one of the following means:

- a) A Terminal Program
- b) Telnet through the Ethernet connection
- c) Core Tec Watchdog software
- d) Web Interface (only available for VCX-2400-E)

The video decoder receives the IP packets, separates the video data from the data sub-channels, and converts the video data to analog form, providing an NTSC (or PAL) output.

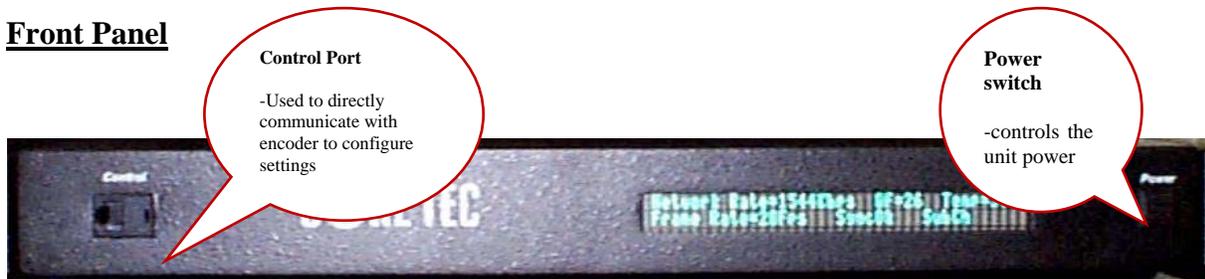
The units feature two bi-directional data sub-channels (programmable for RS-232 or RS-422). Data bits are multiplexed with the digital data stream.

## Familiarization with the VCX2400-E

The VCX-2400-E Video Encoder accepts one video and two data signals. The output from the encoder is a stream of IP packets. It also contains a fluorescent LED display to allow monitoring of unit performance and to facilitate troubleshooting. The encoder has a programmable reset, which prompts the re-initiation of the video stream.

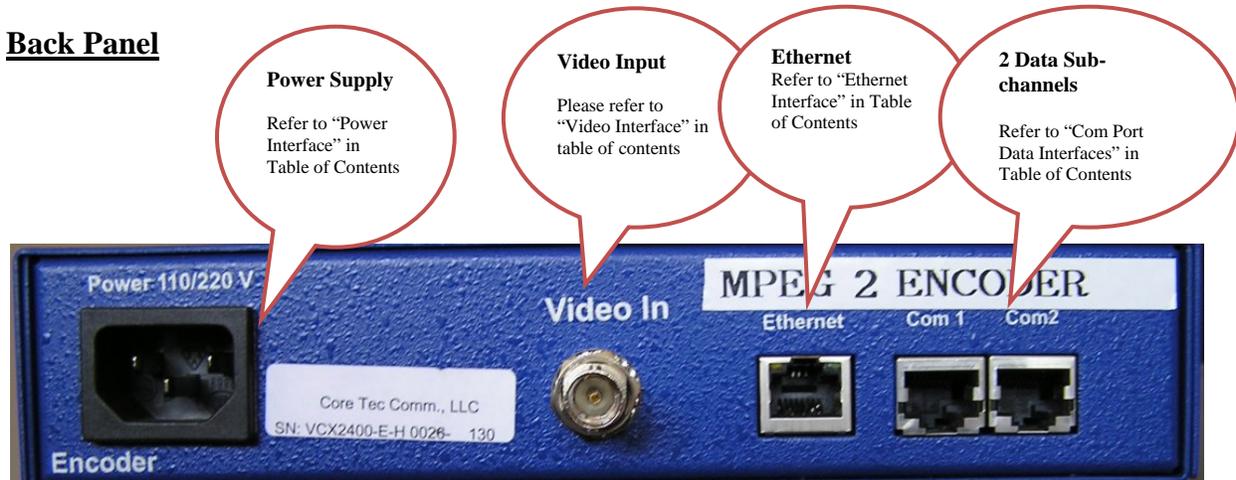
The VCX-2400-D Video Decoder accepts the signal from the network originally generated by a VCX-2400-E video encoder. The unit effectively decompresses this data stream and re-creates an analog waveform in NTSC (or PAL) video format. The unit supports the bi-directional data transmission of two data sub-channels, corresponding to the encoder. The unit also features an LED display. The encoder has a programmable reset, which prompts the re-initiation of the video stream, as well as a reboot command. The decoder also has a programmable reset command, tied to errors in the incoming video stream, as well as a reboot command.

### Front Panel



VCX2400-E-H, Full Size Encoder

### Back Panel



VCX2400-E-H, Half Size Encoder

## Com Port Data Interface

There are 2 bi-directional data interfaces, RS-232 and RS-422 selectable, on the encoder and decoder assemblies. Each interface uses RJ-45 connectors. Refer to Appendix A for the correct pin out. When using the RS-232 configuration pin 7 is ground. Com Port parameters are configured through the system software.

**Refer to Appendix A for the correct pin out.**

## Video Input Interface

Connect a BNC-terminated coaxial cable from a composite video source (e.g., CCTV camera) to the BNC connector labeled “VIDEO IN” (encoder). The composite video input should be in NTSC or PAL format. The maximum length of cable that should be interfaced to the encoder or decoder is 100 feet, although the specific installation environment will dictate the actual permissible length.

## Ethernet Interface

There is one Ethernet interface for encoder and decoder, which uses a standard RJ-45 connector. Refer to Appendix A for the correct pin out.

**Refer to Appendix A for the Straight Through and Crossover Ethernet Pin Out.**

## Audio Interface

There is an optional stereo audio Interface for each assembly, which uses the standard RCA-type audio connector. This is contained on units equipped with the “-A” option. Stereo audio connection is made via the two stacked (red – right channel; white – left channel) RCA type audio connectors. These connectors are located next to the video (BNC) connector.

Audio levels are standard line level (1 v p-p) levels.

Note that the audio is uni-directional, in the same direction as the video.

## Power

Power is applied through a standard IEC type detachable line cord at the rear of the unit. The unit automatically senses 110 VAC or 220 VAC supply and will operate with either.

Note that the LED display will be illuminated when power is applied. The display will show parameters upon activation of the ON/Off switch.

## Display

The fluorescent LED display provides a scrolling list of key parameters when the unit is in its active (non-stand-by) state.

The display is a two-line display. Each parameter is displayed, in turn, for three seconds on the bottom line. It then moves to the top line while the next parameter is displayed on the bottom line.

The parameters displayed are as follows:

- Name of unit
- Software version
- Device IP address
- Sub-net mask
- Video IP (multi-cast group)
- Maximum Bit Rate (encoder only)
- Audio On or Off
- Com 1 On or Off
- Com 1 Bit Rate
- Com 1 IP
- Com 2 On or Off
- Com 2 Bit Rate
- Com 2 IP

## Mounting the Encoder

The VCX-2400-E Encoder and VCX-2400-D Decoder mount in an identical fashion. The 1RU high units are furnished with mounting ears allowing installation in a 19" rack frame.

All signal connections are from the rear, eliminating any need for setback from the front plane of the rack. The user programming port on the front panel is used to alter system parameters via Hyper Terminal.

A circulation fan is located on the side of the unit.

## Quick Start

### If user wishes to test video using the VCX-2400-E and VCX-2400-D:

1. Unpack the VCX-2400-E Video Encoder.
2. Connect a BNC-terminated coaxial cable from a composite NTSC (or PAL) video source (e.g., CCTV camera) to the BNC connector labeled “VIDEO IN” on the VCX-2400-E Video Encoder.
3. Connect a BNC-terminated coaxial cable to a composite NTSC (or PAL) video output (e.g., CCTV monitor) to the BNC connector labeled “VIDEO OUT” on the VCX-2400-D Video Decoder.
4. Connect the VCX-2400-E Video Encoder to the VCX-2400-D Video Decoder via the Ethernet port (RJ-45), located to the left of the two RJ-45 sub channel-ports on the rear of each unit, using a Cat 5 Ethernet cross over cable (the send and receive pairs are swapped end-to end). Normally, when units are connected to an Ethernet Switch, straight through cables are used, unless connecting to a crossover port on the Ethernet Switch.  
**Refer to Appendix A for Ethernet Straight through and Cross Over Pin Outs.**
5. Insert the detachable line cord into the receptacle on the rear of the VCX-2400-E Encoder and VCX-2400-D Decoder. The unit automatically senses 110 VAC or 220VAC supply and will operate with either.
6. The LED display will be illuminated when power is applied.
7. The display will scroll through the parameters currently programmed in the unit.
8. After a few moments, video should appear on the output of the VCX-2400-D Video Decoder.
9. If no video is present on the VCX-2400-D decoder verify the following:
  - a. Both the Encoder and Decoder LED display are in the operate mode. Display should indicate “Core Tec Communications Initializing”.
  - b. The link light on the Ethernet port (RJ-45), located on the upper left of the port connector is lit on both the Encoder and Decoder. If not the Ethernet cross over cable may be defective.
  - c. If the above are correct, please read the network setup installation instructions included in the manual. Note: the setting in default network setup may have been changed.

## If user wishes to configure settings of VCX2400-E via COM Port or Network:

Set up for COM Port:

User may configure VCX2400-E setting using a PC connected to the encoder control port at the front of the unit. A simple 6-wire phone cable (PCA-2400 programming cable) with the **RJ-11 adaptor described in Appendix A** will supply the proper RS-232 connection to the PC's serial port. **Note:** This is not the same as the "Sub-Channel" interface. Do not use the RJ-11 adaptor for this channel.

This configuration will permit the unit configuration by a terminal program running on a PC. Once you have connected the encoder to the PC's serial port open your terminal program. The encoder will boot up then ask for a password. The default password is: **admin**.

### **The PC should have its Com Port configured as:**

Baud rate	38,400 kbps
Data bits	8 bits
Parity	No Parity
Stop Bits	1 Stop Bit
Flow control	None

### **Refer to Appendix A for pin layout for RJ-11 connector.**

Set up for network:

If the operator wishes to configure the unit through the network the user may accomplish this by the following procedure. **Note:** The operator must be sure that the VCX-2400-E is accessible on their SUBNET. **Before completing this step, please refer to the Programming Configuration Section of this Manual.** Here you will set the IP address and SUBNET Mask of the VCX-2400-E so that it is accessible on your SUBNET and has a valid IP address. (An example IP address is being used in the following example.):

Open a "cmd" window and enter the following commands:

```
Telnet 192.168.0.253 <enter>
```

The encoder will reply asking for a password. Default password is "admin".

```
Password: admin
```

**Having used either of these methods, the encoder is ready to receive configuration commands.**

### **Main unit configuration**

The VCX-2400-E units incorporate support for one form of encoding from two different input channels. It is important the operator understand this to be able to configure the unit properly. All commands follow this simple format:

(command<space>parameter<enter>)

From the command prompt, the operator may view the current configuration by entering the “display” command. This will dump the entire configuration status for the selected encoder. Remember there are two encoders in one unit. Enter the following configuration for each of the encoder channels. Take note the IP address must be of valid encoders on the network. The IP addresses below are just used as an example. Locate a VCX-2400-E (MPEG2 encoder).

### **Connection Configuration**

```
ip 192.168.5.150 (use a valid IP on your network)
ipmask 255.255.240.0
name CoreTec Encoder
com1 1
com1ip 192.168.5.151 (IP address of the decoder that is sending sub-channel commands)
com1tcp 1 (assume a universal decoder)
com1server 0
com1timeout 10
com1baud 38400
```

### **MPEG2 Configuration**

The MPEG2 encoder requires the following parameters be configured to your network:

```
videoip 239.5.5.151 (use a valid IP on your network)
port 4570
bitrate 1000
res cif
fps 15
```

### **Saving Configuration**

When all the configuration parameters have been entered, they must be saved to memory and the unit restarted by entering the following command:

Commit <enter> (please wait a moment until the following prompt appears:)

```
COMMIT
DONE
```

Reboot <enter>

# Updating Firmware using VCXNetBurner

## Introduction

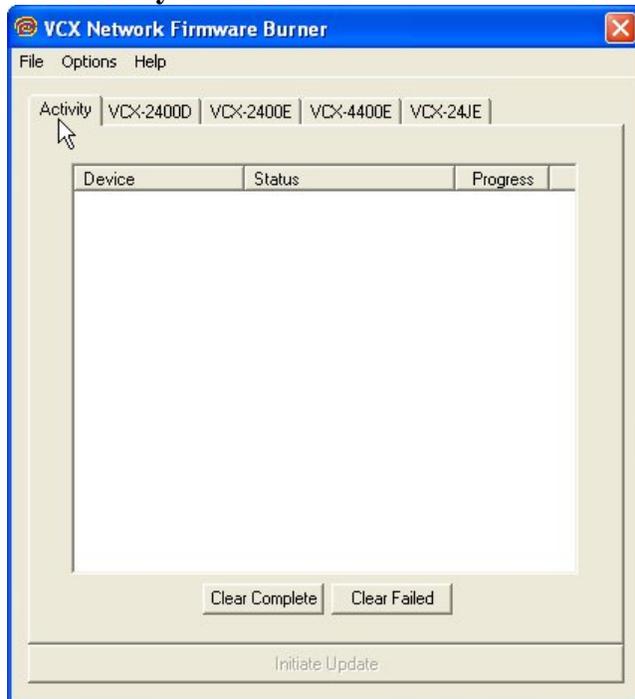
VcxNetburner is a Windows 2000/XP application that allows updating of the VCX-2400 Encoder/Decoder firmware (as well as the VCX4400E and VCX6400E.) VcxNetBurner can simultaneously update the firmware of all VCX-2400 devices that can be accessed on your network. If you can telnet to the device then VcxNetBurner can update the firmware. The only exception is that the device's current firmware version must be v1.5 or higher. Firmware v1.4 does not contain the update feature.

## Overview

VcxNetBurner has a few interface features that the user should be familiar with before attempting to update a device. The basic steps are... 1) import the firmware description, 2) broadcast the server IP, and then 3) initiate the update. However the user needs to be aware of the general process, optional steps, potential problems, and what to do in the case of an error. We will start with an overview of the user interface.

## Screenshots

### The Activity Screen



The Activity screen contains a list of the current activity and a history of past update operations. A VCX-2400 device that has finished updating will indicate either 1) Complete, 2) Version Current, or 3) Failed. The Device column lists the serial number of each unit that is responding to the update command.

**NOTE:** It is important that a VCX-2400 device that has a **Failed** status **NOT** be turned off or rebooted. At the point that the failure occurs the device will not be in a bootable state. If power is cycled or the firmware cannot be updated without failure after repeated attempts then the firmware chip will need to be

replaced. The 10Mbps revision 2.5 devices (in current production) have removable chips that can be replaced in the field. The 100Mbps revision 3.0 devices must be reprogrammed at the factory. Since revision 3.0 is not yet in production there may be other safeguards, such as automatic firmware backup that may modify these instructions.

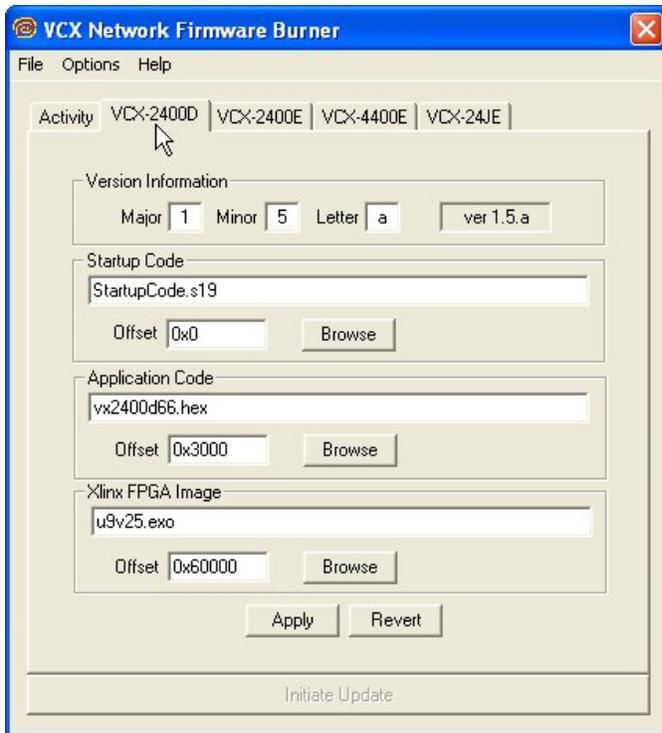
When a device is in the process of upgrading, the Activity screen will show the progress as a percent of complete for each stage. There are four stages.. 1) Erasing, 2) Startup Code, 3) Application Code, and 4) FPGA. When erasing the progress may not update but erasure will complete in a few seconds. The startup code frequently completes so quickly that you don't see it in the Status column.

After the FPGA status reaches completion you should see the Status column change to **Complete**. If it changes to **Failed** at any time during the firmware update you will need to retry updating the firmware for that unit before cycling power or rebooting.

The **Clear Complete** button will clear the list display of any operations that did not fail. The Clear Failed button will clear the list display of any failed operations. **The Initiate Update** will Broadcast a command to all online units to connect to the update server to perform a firmware update. Normally the update server will be the computer that is running VcxNetBurner. However it would be possible to have VCX-2400 devices configured to use a different server. When **Initiate Update** is pressed, all of the VCX-2400 devices within range of multicast packets will connect to its preset update server.

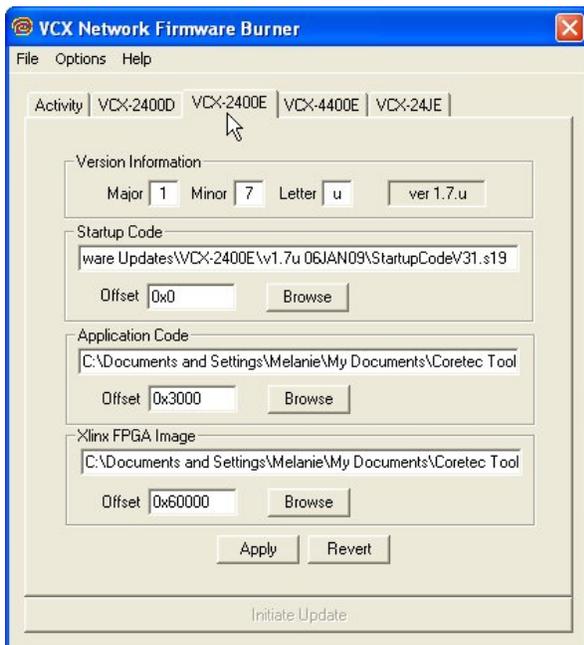
### **The VCX-2400-D Screen**

The VCX2400D is accessed through the VCX-2400D tab and displays the parameters used to select the version of the firmware sent to VCX-2400 decoder devices. This information is imported from a import.ini file that is provided with each firmware update. This screen allows the operator to see what update is selected. It is important to confirm that the files indicated in the file selection boxes are located on your computer. The import file is selected using the menu's File- >Import option. This is explained later in this document. The **Apply** button saves the current setting on this screen so that when VcxNetBurner is loaded these parameters are restored. The **Revert** button will reload the currently saved parameter set. So if you have modified this screen it can be restored if you haven't used apply.



## The Encoder Screens

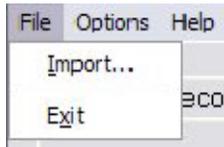
The Encoder screens are accessed through the VCX2400E, VCX440E, & 2/4/J-E tabs and work identically the same as the VCX-2400D, except that the parameters are applied to the firmware sent to the VCX-2400, 4400, or 2/4/J Encoder devices.



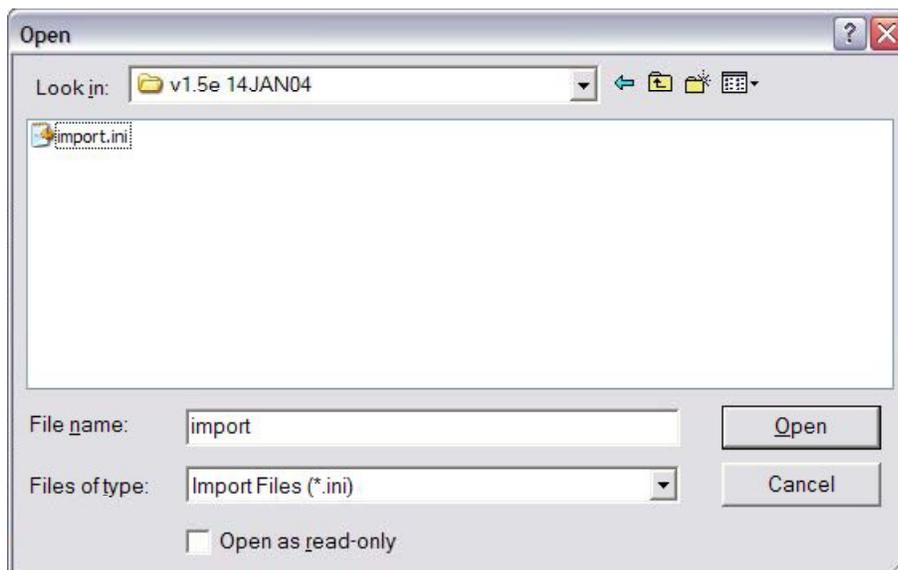
## Menu Bar

### The File Menu

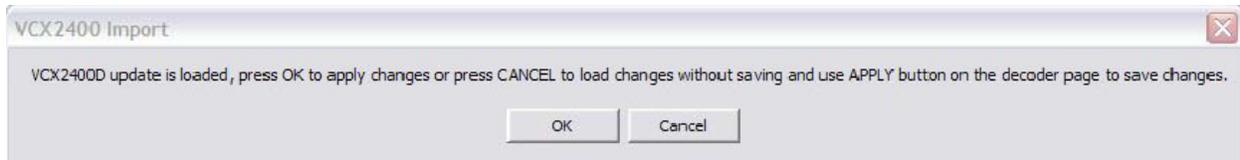
The menu contains selections for 1) File, 2) Options, and 3) Help. The File menu selection presents the following drop down menu:



The **Exit** option will close the application. The **Import** selection is used to select and configure VcxNetBurner for a particular firmware update version. Each firmware update will come with an import.ini file that contains the necessary information and is accessed through the Import menu selection. The import files are normally separate for both the decoder and encoder, and the supplied updates should each be stored in a unique directory so that the various update files are not overwritten. When the operator selects Import, a file selection dialog will be presented. The operator should navigate to the directory where the firmware update is located and the import.ini file will be selected by default as shown in the following picture:



After pressing the **Open** button the following dialog will be displayed.

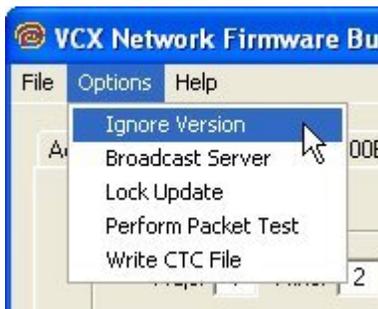


This dialog is telling you that you can save the imported parameters by pressing **OK**. Or by pressing **Cancel** just use the parameters until the application is closed. If you press **Cancel** the parameters are still loaded but the old parameters will be loaded then next time VcxNetBurner is used. Selecting **OK** is the same as selecting **Cancel** and then **Apply**.

**NOTE:** If you have both encoder and decoder devices you will need to perform the Import operation twice. One import should be performed for each type of device.

## The Options Menu

The **Options** menu selection will provide the following dropdown menu.



There are five selections in the **Options** menu... 1) Ignore Version, 2) Broadcast Server, 3) Lock Update 4) Perform Packet Test & 5) Write CTC File.

The **Ignore Version** selection toggles between on and off. It normally should not be checked. It will cause a device to update using the current parameters regardless of the current version. It can be used to change a device to an older version, or even re-update the current version. Devices will normally update only if the current device firmware version is less than the version listed in VcxNetBurner. For example if the current device firmware version is 1.5a and the new version is 1.5a or below, an update command will return the status “Version Current”. See the Activity screen in this document for an example. If the **Ignore Version** selection is checked then you will never get a “Version Current” status.

The second option is **Broadcast Server**. When the operator makes this selection it causes VcxNetBurner to multicast a command to all devices to set their Update Server IP to the computer running VcxNetBurner. The devices will only remember the Update Server IP until the next reboot or power cycle. Reboots automatically occur after a successful firmware update. It is not necessary to perform a Broadcast Server operation if the devices have already been programmed with an Update Server IP. This can be done with Telnet using the command:

```
UPDATEIP xxx.xxx.xxx.xxx
```

It is also possible to configure a device to use a hostname (or URL) to address the server if a DNS server is also configured. The following are example Telnet commands for this operation.

```
UPDATENAME www.myupdateserver.com
DNSIP xxx.xxx.xxx.xxx
```

However, unless you have specific reasons for setting up your update server in the device, the **Broadcast Server** command will suffice for updating your VCX-2400 device.

The **Lock Update** allows you to update all VCX-Devices of one type (i.e.- all VCX-2400E connected to the network) simultaneously. We do not recommend this if you are just beginning to use the software, due to the risk of overlooking a failure of one particular device.

Rather than this, it is suggested to update only one device at a time. This is done by following the first 6 steps of the instructions listed above and then Telnet into the unit you wish to update and issue the following command:

```
UPDATEFIRMWARE
OR
UF
```

You should monitor the Activity screen for progress. The Telnet session will also provide some text display that indicates completion. If the operation is successful then the device will automatically reboot and the Telnet session will be dropped. If the operation failed then you should retry the UPDATEFIRMWARE command.

**TIPS:** If using Telnet, use the DISPLAY IP command to verify that an update server IP is listed. Also ensure that the update server IP is reachable. This would be true if the update server is the same as the computer in the Telnet session.

The **Perform Packet Tests** tests to see if the firmware can be downloaded successfully without actually being burnt into the unit.

The **Write CTC File** is for Coreteks internal use only.

## The Help Menu

The **Help** menu selection will present the following dropdown menu.



At this time the only option is the About box selection. The about box will display the current version of VcxNetConfigure. The current version in this example is V1.1 as shown.



## Instructions for Use

The following steps should be performed to update your VCX-2400 devices.

- 1) Obtain the latest update from Core Tec Communications.
- 2) Place the updates into unique directories for each the decoder and encoder. The updates will be provided on the FTP server in separate directories.
- 3) Use the **Import** menu command to load each update's import.ini file and use the **OK** button to save the current setting.
- 4) Go to both the Encoder and Decoder screens and verify that the file directories and version match the latest desired update.
- 5) Select the Activity screen so that the update process status can be viewed.
- 6) Use the menu option **Options->Broadcast Server** to set the current update server to your computer (optional if configured in the devices).
- 7) Press the **Initiate Update** button to multicast the update command to all devices.
- 8) Monitor the update process on the Activity screen to verify that all units have updated successfully.

## IP Configuration

### Overview

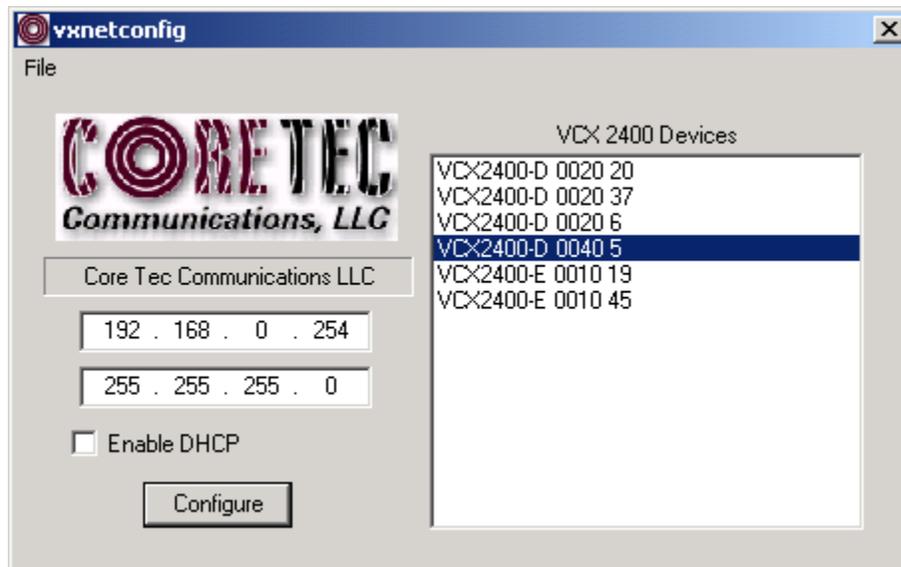
The commands contained in this section provide the means to configure critical network, com ports, encoder, and decoder parameters. The user should consult the factory if specific functions of interest do not appear to be supported.

### Initial IP Addressing

In order to properly set the device parameters, encoder and decoder units must be given appropriate IP addresses, compatible with the network on which they are to be connected. A software module, **VXNETCONFIG** has been developed to allow a network administrator to set the IP and Subnet in the VCX-2400 series encoders and decoders.

#### 1) Installation

To load VXNETCONFIG insert the CORE TEC CD into your CD drive. Select VXNETCONFIG by double clicking on the program. The following window will open:



VCXNETCONFIG Window

## Description of Program Functions

- (a) The first box on the left hand side of the window displays the current IP address of the CORE TEC device being interrogated. Type the new IP address into this space
- (b) The second box is used to change the SUBNET address. Note that the address displayed is always 255.255.255.0. Type the new SUBNET address into this space.
- (c) The Enable DHCP box is checked when DHCP is to be enabled.

**NOTE: Do not enable DHCP if sub-channels are being used or if there is no DHCP server. Check with the Network Administrator, or call Core Tec Tech Support if further assistance is needed.**

- (d) The Configure button is to execute the requested changes to the IP and SUBNET information. Note that future queries of the SUBNET will indicate 255.255.255.0. Therefore, the correct SUBNET address should always be entered prior to using the Configure button.
- (e) The box on the right hand of the window displays all VCX-2400 devices (encoders and decoders) on the network.

### 1) To make a change to the equipment addressing perform the following steps:

- (a) Select the Core Tec device address from the list in the box on the right side of the window.
- (b) Move the cursor to the IP box and select the first octet by highlighting the octet. Enter the new IP data for the selected octet. As the 3 digits are entered, the software will automatically highlight the next octet for change. Complete entering the IP address and then switch to the SUBNET data.
- (c) Move the cursor to the SUBNET box and select the first octet by highlighting the octet. Enter the new SUBNET data for the selected octet. As the 3 digits are entered, the software will automatically highlight the next octet for change. Complete entering the SUBNET data.
- (d) To execute the change press the configure button. The IP address and the SUBNET will be updated in the selected Core Tec equipment. The new IP address will be displayed. The SUBNET will display a default class C- SUBNET there is no read back of the changed SUBNET displayed.
- (e) Repeat this process for all the CORE TEC equipment requiring change.

## Connecting to Unit

There are currently four ways to connect to the VCX-2400-E.

### 1) Telnet

**Password: admin (default)**

To change the default password perform the following:

Type: PASSWORD <followed by your password (up to 11 characters)>

Where <your password> equals the new password.

For configuration using an Ethernet connection, activate the Telnet function by the following:

- a. Initiating from the Command Prompt - Telnet nnn.nnn.nnn.nnn
- b. Use the MS Windows – START – RUN Telnet nnn.nnn.nnn.nnn

(where nnn.nnn.nnn.nnn is the IP address of the unit being configured)

Employ the command set as described below.

Note that the initial IP addresses (factory default) are:

Encoder 192.168.0.253

Decoder 192.168.0.254

Sub net Mask 255.255.255.0

(Alternatively, the end user software SW-2400 is usable when an Ethernet connection is established.)

## 2) Terminal Program

**NOTE:** The following procedure is valid for standalone units only and is not applicable to rack mount units.

The Terminal Program, such as HyperTerminal, configuration procedure uses the serial connection on the front of the unit.

Using the PCA-2400 programming cable, connect to the control port. This cable should be attached to the serial port of an attached PC and the Hyper Terminal program launched. The PC should have its Com Port configured as:

Baud rate	38,400 kbps
Data bits	8 bits
Parity	No Parity
Stop Bits	1 Stop Bit
Flow control	None

Activate the HyperTerminal function, normally found in a sub-menu under ACCESSORIES. Employ the command set as described in the following section.

### **Password: admin (default)**

To change the default password perform the following:

Type: PASSWORD <followed by your password (up to 11 characters)>

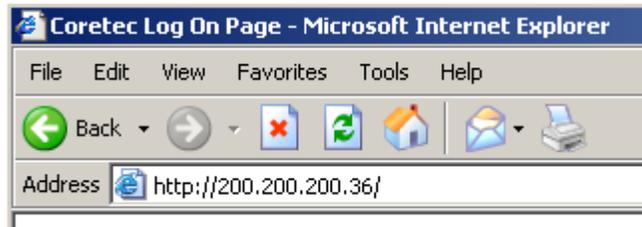
Where <your password> equals the new password

## 3) Web Interface

When the unit accepts the log in (default password: **admin**), the following web page will be displayed. The header identifies the type of unit followed by the page control bar. The basic network configuration is displayed in the appropriate fields giving the operator the option to modify them if needed. There are eight (7) pages to select from each giving the operator control over the unit operation. General, Video, Network, Subchannel1 and Subchannel2 provide all the parameters that an operator may modify grouped as labeled. There are two (2) options to the far right, "Log Out" and "Commit/Reboot", which will terminate the session. Log Out will log the operator out without committing to the changes made in the previous pages and the last will perform the commit function, writing the changes to the unit and performing a reboot. Both operations will log the operator off and close the communications channel. The web page may or may not report the termination of the communications channel. The login process must be performed to access the unit again.

The following pictures show the various parameters available to the operator. The definitions are described below in the command sections.

Open a new Internet Explorer window and enter the IP address of the unit into the explorer address frame. (Review the section INITIAL IP ADDRESSING to obtain this address)



The selected device will respond by opening the following page. Note all internet communication pages will apply while the thread is open.



Type password **XXXXXXXXXXXX**

Where **XXXXXXXXXXXX** is the new password.

The password can be anything up to eleven (11) characters in length.

# Core Tec Communications VCX-2400E Configuration

 **Select Settings Page**

[Network](#) [Video](#) [General](#) [Subchannel 1](#) [Subchannel 2](#) [Log Out](#) [Commit/Reboot](#)

Network Settings				
<b>MAC Address</b>	<input type="text" value="00:0a:fc:00:21:9a"/>			
<b>DHCP</b>	<input type="text" value="No"/> ▼			
<b>Host IP</b>	<input type="text" value="192"/>	<input type="text" value="168"/>	<input type="text" value="4"/>	<input type="text" value="105"/>
<b>Host Subnet</b>	<input type="text" value="255"/>	<input type="text" value="255"/>	<input type="text" value="240"/>	<input type="text" value="0"/>
<b>Default Gateway</b>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<b>DNS IP</b>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<b>Command Port</b>	<input type="text" value="5000"/>			

## Select Settings Page

[Network](#)[Video](#)[General](#)[Subchannel 1](#)[Subchannel 2](#)[Log Out](#)[Commit/Reboot](#)

### Video Settings

<b>Video IP</b>	<input type="text" value="239"/> <input type="text" value="."/> <input type="text" value="5"/> <input type="text" value="."/> <input type="text" value="4"/> <input type="text" value="."/> <input type="text" value="105"/>
<b>Video Port</b>	<input type="text" value="4568"/>
<b>Resolution</b>	<input type="text" value="1/2 D1"/> ▾
<b>Stream Type</b>	<input type="text" value="Transport"/> ▾
<b>Bitrate</b>	<input type="text" value="3000"/>
<b>Video Standard</b>	<input type="text" value="NTSC"/> ▾
<b>Video PID</b>	<input type="text" value="256"/>
<b>Audio PID</b>	<input type="text" value="258"/>
<b>Brightness</b>	<input type="text" value="127"/>
<b>Contrast</b>	<input type="text" value="63"/>
<b>Saturation</b>	<input type="text" value="70"/>
<b>Tint</b>	<input type="text" value="0"/>

## Select Settings Page

[Network](#) [Video](#) [General](#) [Subchannel 1](#) [Subchannel 2](#) [Log Out](#) [Commit/Reboot](#)

### General Settings

<b>Device Name</b>	<input type="text" value="Mpeg2 Lab105 Cohu"/>
<b>Password</b>	<input type="text" value="admin"/>
<b>Camera Type</b>	<input type="text" value="1"/>
<b>Camera ID</b>	<input type="text" value="2"/>
<b>Display Speed</b>	<input type="text" value="1500"/>
<b>Auto Restart</b>	<input type="text" value="28800"/>
<b>Enable Watchdog</b>	<input type="checkbox"/>

Configure

## Select Settings Page

[Network](#)[Video](#)[General](#)[Subchannel 1](#)[Subchannel 2](#)[Log Out](#)[Commit/Reboot](#)

### Subchannel Settings - Serial Subchannel 1

<b>Enable</b>	<input checked="" type="checkbox"/>
<b>Baud Rate</b>	9600 ▾
<b>Line Type</b>	RS422 ▾
<b>Stop Bits</b>	ONE ▾
<b>7/8 Bit</b>	8 ▾
<b>Parity</b>	NONE ▾
<b>Destination IP</b>	192 . 168 . 1 . 28
<b>Port</b>	5004
<b>TCP</b>	<input checked="" type="checkbox"/>
<b>Server</b>	<input checked="" type="checkbox"/>
<b>Xmit Level</b>	100
<b>Idle Time</b>	20

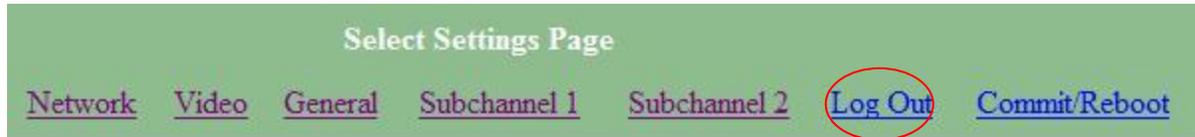
## Select Settings Page

[Network](#)[Video](#)[General](#)[Subchannel 1](#)[Subchannel 2](#)[Log Out](#)[Commit/Reboot](#)

### Subchannel Settings - Serial Subchannel 2

<b>Enable</b>	<input checked="" type="checkbox"/>
<b>Baud Rate</b>	9600 ▾
<b>Line Type</b>	RS422 ▾
<b>Stop Bits</b>	ONE ▾
<b>7/8 Bit</b>	8 ▾
<b>Parity</b>	NONE ▾
<b>Destination IP</b>	192 . 168 . 0 . 254
<b>Port</b>	5002
<b>TCP</b>	<input checked="" type="checkbox"/>
<b>Server</b>	<input checked="" type="checkbox"/>
<b>Xmit Level</b>	100
<b>Idle Time</b>	10

## Logging off



## Commit/Reboot



This process will write all the parameters into nonvolatile memory and then reboot the unit. The reboot process will stop all current operations and restart with the new parameters.

Note: The Commit/Reboot operation, in most cases, will not give the operator an indication the operation has started, in progress or has finished.

#### 4) Core Tec Watchdog Software

Please refer to the Watchdog Manuals.

### Program Commands

#### IMPORTANT NOTES:

1. After entering one or more commands, it is necessary to enter COMMIT and REBOOT for the new settings to take effect.
2. Typing "?" displays a listing of all commands.

### Network Setup

#### *IP (IP Address)*

The IP address setup is in the form of decimal dotted notation. The selection of an IP should come from the person who administrates the network. The current IP selection is static. A dynamic IP setting using DHCP is planned for future enhancement.

#### **Default:**

**Encoder - 192.168.0.253**

**Decoder - 192.168.0.254**

Example command: IP 192.168.0.10 (sets IP address to 192.168.0.10)

#### *IPMASK (IP Subnet Mask)*

The IP Subnet Mask is in the form of decimal dotted notation. The selection of an IP subnet mask should come from the network administrator. It is used to represent the number of bits in the current IP subnet.

Default: 255.255.255.0

Example command: IPMASK 255.255.255.128

#### **GATEWAY**

The GATEWAY command can have either one or three parameters. The first parameter is the IP address of the host that is the gateway. Optionally you may include the IP address and the subnet mask of the subnet you want to route through the gateway. You can program up to five gateway entries.

Default: No Gateways

Example command: GATEWAY 192.168.0.1

The following example indicates that all packets sent to hosts on the 62.41.10.xxx subnet should be routed through the gateway at 192.168.100.2

Example command: GATEWAY 192.168.100.2 62.41.100.0 255.255.255.0

### *CLEARGATEWAY*

Clears the gateway table. There are no parameters. This command clears all entries.

### *CMDPORT (TCP Command Port)*

The TCP command port selection is configurable. However the default setting should be adequate for normal operation. The command port is used by software that can operate the VCX-2400 devices programmatically. For example, a Microsoft Windows GUI based application.

Default: 5000

Example Command: CMDPORT 5010 (sets TCP command port to 5010)

### *VIDEOIP (Video Destination IP)*

The video destination IP is an address that allows the reception of the MPEG-2 stream by a single (unicast) or multiple (multicast) device(s).

NOTE: Class D IP addresses, in the range 224.0.0.0 to 239.255.255.255 are called multicast addresses. The range 224.0.0.0 to 224.0.0.255 is reserved for local purposes and the range 239.0.0.0 to 239.255.255.255 is reserved for administrative scooping. Both the encoder and decoder should be set to the same Video IP for correct operation together.

Default: 239.5.6.8

Example Command: VIDEOIP 234.5.6.10 (sets multicast IP to 234.5.6.10)

### *VIDEOPORT (Video Multicast Port)*

The video multicast port selection is configurable. However the default setting should be adequate for normal operation.

Default: 4568

Example Command: VIDEOPORT 4569 (sets multicast port to 4569)

## Comm Port Setup

The VCX-2400 supports two sub-channels that allow the two way transmission of serial data to selected target devices. The sub-channel can be configured for either RS232 or RS422 operation. It is not necessary for both ends to use the same configuration. The following is a list of the configuration items for the sub-channel:

- Channel Enable
- Baud rate
- Parity
- IP address of target
- TCP port for operation
- RS422 or RS232

Certain VCX-2400 devices can be delivered with either one or two comm ports. The ports are designated as 1 and 2. The commands for configuring the settings use the A or B designation to indicate the port being configured.

Example(s):    COM1xxx for comm port 1 (selects comm port 1)  
                  COM2xxx for comm port 2 (selects comm port 2)

Note: Communications port 2 is also the control port for programming. If this port is also needed for non-programming related data purposes, the user should program the necessary parameters with the jumper in place if using the Hyper Terminal method. Upon completion of programming, removal of the jumper will result in port 2 operating as programmed. If not using Hyper Terminal to program, jumper should be removed if comm port 2 is to be used.

### *COM1, COM2 (Comm Port Enable)*

This command sets the active state of the comm port. The parameter is “0” or “1”, where “1” enables and “0” disables the comm port function. At this time the comm port is always enabled and this command has no effect.

Default: 0 (OFF)

Example Commands: COM1 1 (enables comm port 1)

### *COM1BAUD, COM2BAUD (Comm Port Baud Rate)*

This command sets the baud rate for the comm port. Valid values are 2400, 4800, 9600, 19200, and 38400. Other data rates may be functional but are not tested.

Default: 9600

Example Command: COM1BAUD 4800  
(sets baud rate for comm port 1 at 4800 bps)

### *COM1PARITY, COM2PARITY (Comm Port Parity)*

The parity for the comm port can be set to Odd, Even, or None. The parameters for the COM[1|2]PARITY command are N,O,E, which correspond respectively to None, Odd, Even.

Default: None

Example Command: COM2PARITY N (sets comm port 2 to no parity)

### *COM1IP, COM2IP (Comm Port IP)*

The IP address of the destination for the comm port data is set by this command. A typical setup would have an encoder and a decoder. The *decoder* would have a comm port IP address that is the same as the encoder. And, likewise, the *encoder's* comm port IP would be the same as the decoder. Notice that the default comm ports IP's are the opposite of the default device IP's.

Default:

Encoder comm ports - 192.168.0.253

Decoder comm ports- 192.168.0.254

Example Command: COM2IP 192.168.0.10 (points the comm port data to an encoder, decoder, or other device whose IP address is 192.168.0.10)

### *COM1PORT, COM2PORT (Comm Port Port)*

The comm port port selection is configurable. However the default setting should be adequate for normal operation.

Default:

Comm port 1 - 5002

Comm port 2 – 5004

Example Command: COM1PORT 5010 (sets comm port 1 to port 5010)

### *COM1RS422, COM2RS422 (RS-232, RS-422 Data Format)*

The comm port data format is configurable. The parameter is “0” or “1”, where “1” enables RS-422 and “0” enables RS-232 format.

Default: 0 (RS-232)

Example Command: COM1RS422 0 (sets comm port 1 for RS-232)

### *Comm port Command – Further Examples*

The following examples set up comm port 1:

COM1 1 – Enable comm port 1  
COM1BAUD 9600 – Set comm port 1 baud rate to 9600  
COM1RS422 1 – Set comm port 1 mode to RS422  
COM1PORT 5002 – Set comm port 1 port to 5002  
COM1PARITY E – Set comm port 1 parity to even  
COM1IP 192.168.0.10 – Set destination address for data to 192.168.0.10

### **Encoder Commands**

#### ***PROFILE***

Used to select a desired resolution for the encoded video. It also sets the optimal defaults for other parameters, such as bit rate. The allowable settings are **SIF ½, 2/3, D1**. The half and two thirds settings are relative to the full D1 resolution.

Default: SIF

Example Command: PROFILE ½ (sets resolution to ½ D1)

**Note: Since the Profile command selects defaults for other settings, it should be issued before any other commands relating to the encoded MPEG stream.**

#### ***BRIGHT***

Adjusts image brightness. The acceptable range is from 0 to 255, where a higher number provides more brightness.

Default: 128

Example Command: BRIGHT 170 (increases brightness from default setting)

## *CONTRAST*

Adjusts image contrast. The acceptable range is from 0 to 127, where a higher number provides more contrast.

Default: 63

Example Command: CONTRAST 90 (increases contrast from default)

## *SATURATION*

Adjusts color saturation. The acceptable range is from 0 (no color) to 127.

Default: 63

Example Command: SATURATION 75 (increases color saturation from default)

## *TINT*

Adjusts color tint. The acceptable range is from -128 to 127.

Default: 0

Example Command: TINT -10 (adjusts tint)

## *BITRATE*

Adjusts the bit rate (in kbits/sec) of the encoded MPEG-2 video. This sets the maximum rate (of the variable bit stream) encoded. If audio is in the MPEG-2 stream, then an additional 256 kbits/sec will be added to the rate set by this command.

Default: The default is set by the Profile command

Example Command: BITRATE 2000 (Sets max bit rate to 2 Mbits/sec)

Note: This command should be issued AFTER the Profile command if the Profile command is used.

## *AUDIO*

The audio command is used to enable or disable audio in the MPEG-2 stream. The parameter is "0" or "1", where "1" enables and "0" disables the audio function.

Default: 0

Example Command: AUDIO 1 (enables audio)

*DISPLAY <VIDEO / COM / IP / SAP>*

This command displays current encoder settings. Entering DISPLAY only provides all settings. Adding the VIDEO, COM, or IP qualifiers displays settings for video, comm port, or IP parameters, respectively.

Example Command: DISPLAY IP (displays current IP encoder settings)

## Decoder Commands

### *T (Onscreen Text)*

Allows the placement of a persistent text over the video. The text is placed at the current cursor position if the text cursor positioning commands are sent beforehand. Otherwise the text is justified and placed according to the text justification command.

Default: none

Example Command: T say hi for the camera  
(enters text “say hi for the camera”)

### *TX, TY (Onscreen Text Cursor Position)*

There are two text cursor position commands. One command (TX) is for the horizontal (X) position and the other (TY) is for the vertical (Y) position. The text cursor commands will override the text justification command and vice versa. When text cursor commands are issued, the text will wrap to the next line and scroll the screen at the bottom.

Default: none

Example Commands: To set the cursor at (0,5)

TX 0  
TY 5

### *TPOS (Onscreen Text Justification)*

Overrides cursor positioning commands and causes the text to print at the same location with justification. There are six justification positions. Three are for vertical justification and the others for horizontal justification. For the horizontal there is left, center, and right. For the vertical there is top, center, and bottom. The nine possible combinations are expressed as 0 – 9 as a parameter as follows:

- 1 = Top left
- 2 = Top center
- 3 = Top right
- 4 = Bottom left (Default)
- 5 = Bottom center
- 6 = Bottom right
- 7 = Center left
- 8 = Center
- 9 = Center right

Default: 4

Example Command: TPOS 6 (justifies text at bottom right)

### *CLR (Clear Onscreen Text)*

This command clears the screen and erases the persistent storage of the last text command.

Default: N/A

Example Command: CLR

### *TC xx (Text Color)*

Command sets foreground and background text color. The first character defines foreground color; the second, background color, as follows:

<u>Character</u>	<u>Color</u>
0	Transparent
1	Black
2	White
3	Light Gray
4	Medium Gray
5	Dark Gray
6	Red
7	Blue
8	Green
9	Yellow
A	Purple
B	Teal
C	Orange
D	Pink
E	Flesh
F	Light Blue

(All colors here and below – 75% transparent)

Default: 27 (White text on blue background)

Example Command: TC 60 (red text on transparent background)

### *COLORBAR (Color Bars)*

Used to replace the decoded video with a built-in color bar test pattern generator. The allowed parameters are 0 (color bars off) and 1 (color bars on).

Default: OFF

Example Command: COLORBAR 1 (turns color bars on)

## ***BUFFERLOW, BUFFERHIGH***

These settings define an acceptable range of video frames in the decoder buffer. If the number of frames in the decoder exceeds the buffer high setting, then the decoder starts playing back the buffered frames faster than real time, until the number of frames buffered drops to the buffer low setting. This is used to limit the latency of the encoded video. If the two settings are too close together then the video playback will experience frequent dropped frames and a decrease in the smoothness of the frame rate.

Defaults: BUFFERLOW                   3  
          BUFFERHIGH                 10

Example Commands: BUFFERLOW 5  
                          BUFFERHIGH 7  
                          (tightens buffer settings from default)

## ***RESTARTLEVEL***

Defines the number errors detected in the incoming MPEG stream before a reset of the decoder will occur. If the decoder encounters a large number of stream errors over any period of time it will often get into a state where the displayed video is permanently degraded. By resetting the decoder hardware periodically after the detection of errors, this situation can be managed without user intervention.

Default: 250

Example Command: RESTARTLEVEL 300  
                          (resets the decoder after 300 received errors)

## ***RESTARTTIME***

If a situation is encountered where the decoder receives infrequent errors, but, due to the nature of the errors, gets into a degraded state, then the decoder can be commanded to automatically reset after a set period of time. The timer is triggered after receiving ten errors in the stream. The parameter for this command is in units of milliseconds. An entry of zero disables the timer. The timer is reset if a reset occurs due to the number of errors exceeding the restart level

Default: 300000 (300 seconds)

Example Command: RESTARTTIME 200000  
                          (resets the decoder 200 seconds after receiving 10 errors)

## ***DISPLAY <COM / IP>***

This command displays current decoder settings. Entering DISPLAY only provides all settings. Adding the COM or IP qualifiers displays settings for comm port or IP parameters, respectively.

Example Command: DISPLAY IP (displays current IP decoder settings)

## Common Commands

The following commands apply to both encoder and decoder.

### *AUTOREBOOT*

Sets a periodic timed reboot of the device. The parameter is the number of seconds between reboots.

Default: 0 (off)

Example: AUTOREBOOT 3600

### *AUTOSTART*

Sets a periodic timed restart of the video encoder/decoder. The parameter is the number of seconds between starts.

Default decoder: 0 (off)

Default encoder: 28800 (8 hours)

Example: AUTOSTART 3600

300 seconds equals 5 minutes

3600 seconds equals 1 hour

### *COMMIT*

Saves parameter settings changes in permanent memory. A commit command must be issued before a reboot or power cycle if the new device settings are to be maintained.

### *DEATHBLOW*

Causes a reboot of the device. The purpose of this command is to cause a reboot from the password prompt. If you cannot login into the command prompt because of the "Another administrator is logged in." message, then you can use DEATHBLOW as the password to return the unit to the power up state.

### *EXIT*

Exits from the command prompt and releases the current login. You may also use the following alternatives... LO (LogOff) and QUIT.

### *NTSC*

Sets unit for NTSC video operation.

## *PAL*

Sets unit for PAL video operation.

## *REBOOT*

Restarts device from powerup state. Most changes in device settings require a reboot after a commit.

## *START*

Starts encoding or playback (video out).

## *STREAMTYPE*

Selects between Program or Transport multiplexing of the video stream. Acceptable parameters are T or P, where P is *Program* and T is *Transport*.

Default: P (program stream)

Example: STREAMTYPE T (transport stream)

## *STOP*

Stops encoding or playback (video out).

## *VER*

Displays the software version/build date, BSP (board support package) version/build date, and board revision.

Example response:

Version: VCX2400d3 v1.6a, Date: 29JUN04

BSP VCXV73 v1.2, 04JUN04

Board revision: 3.1

## *WD*

The watchdog is a timer that will perform a complete reset of the device if the firmware encounters a lockup condition. The parameter is “0” or “1”, where “1” enables and “0” disables the watchdog function. Enabling the watchdog allows the VCX-2400 devices to automatically recover from some fatal error conditions without user intervention.

Default: 0 (OFF)

Example Command: WD 1 (enables watchdog)

## **SAP Settings**

The encoder is capable of multicasting SAP (Session Announcement Protocol RFC-2974) packets with SDP (Session Description Protocol RFC-2327) content. There are a number of parameter setting for configuring SAP. They are presented in this section. The user should refer to the referenced RFCs to understand the significance of the SAP/SDP parameter settings.

### ***SAP***

Use to enable or disable the SAP multicast. The allowable parameter is ON or OFF.

Default: OFF

Example: SAP ON

### ***SAPAUTHOR***

Used to set the SDP (RFC-2327) author information. The parameter is an ASCII string with a limitation of 30 characters.

Default: No text

### ***SAPCOPYRIGHT***

Used to set the SDP (RFC-2327) copyright information. The parameter is an ASCII string with a limitation of 30 characters.

Default: No Text

### ***SAPINFO***

Used to set the SDP (RFC-2327) info information. The parameter is an ASCII string with a limitation of 62 characters.

Default: Core Tec VCX2400e

Example: SAPINFO Intersection of 1st and main

### ***SAPINTERVAL***

Sets the interval between SAP packet transmission. The parameter is the number of milliseconds between transmits.

Default: 5000 (5 seconds)

Example: SAPINTERVAL 10000 (10 seconds)

### *SAPIP*

Sets the IP address of the destination host for SAP packets. This address is a multicast address defined in RFC-2974. It is unlikely that the user will need to change this setting.

Default: 224.2.127.254

### *SAPKEYWORD*

Used to set the SDP (RFC-2327) keyword information. The parameter is an ASCII string with a limitation of 30 characters.

Default: No text

### *SAPNAME*

Used to set the SDP (RFC-2327) name information. The parameter is an ASCII string with a limitation of 30 characters.

Default: Core Tec Communications, LLC

Example: SAPNAME Main Street Camera #1

### *SAPPORT*

Sets the destination port for SAP packets. The port number is defined in RFC-2974. It is unlikely that the user will need to change this setting.

Default: 9875

### *SAPUPDATE*

Issue this command after changing the SAP parameters to update all devices listening to SAP multicasts.

## MISCELLANEOUS SETTINGS

### **CAMERA [n]**

Store a user defined camera type code 0..255

This is a current list of the Cameras we support:

Cohu = 1  
Philips\_Bosch = 2  
Pelco = 3  
Vicon = 4  
RVision = 5  
Panasonic = 6

### **CAMERAID [n]**

Store a user defined camera ID code 0..255

### **DISPLAY <VIDEO | COM | IP | SAP | MISC>**

This command displays current encoder settings. Entering DISPLAY only provides all settings. Adding the VIDEO, COM, IP, SAP or MISC displays those respective settings specifically.

Example Command: DISPLAY IP (displays current IP encoder settings)

## **Specifications**

### PHYSICAL AND ENVIRONMENTAL

#### Dimensions

11.0" x 5.25"

#### Mounting

R-12 Card Cage Enclosure

#### Weight

.6 pounds

#### Temperature

-20 degrees to + 70 degrees Centigrade  
(-4 to 158 degrees Fahrenheit)

Humidity  
0 to 95% non-condensing

## POWER REQUIREMENTS

From Enclosure

## CONNECTORS

Video  
NTSC/PAL BNC

Power  
From Back-plane (36 pin Molex)

Data  
Network RJ-45  
Com ports RJ-45

## ELECTRICAL

Video Input (NTSC/PAL)  
Impedance: 75 ohm unbalanced, return loss  $\geq$  30 dB

Dynamic  
Range: 0.5 volts to 2.0 volts peak to peak

Video Output (NTSC/PAL)  
Impedance: 75 ohm unbalanced, return loss  $\geq$  30 dB

Output Level: 1.0 volts peak to peak nominal  
(.9 volts minimum to 1.1 volts maximum)

Sync Level: 257 mV (36 IRE) to 314 mV (44 IRE)

Bar Level: 642 mV (90 IRE) to 785 mV (110 IRE)

Burst Level: 257 mV (36 IRE) to 314 mV (44 IRE)

Resolution: Full D1: 720h x 480v (NTSC); 720h x 576v (PAL)  
1/2 D1: 352h x 480v (NTSC); 480h x 576v (PAL)  
CIF: 352h x 240v (NTSC); 352h x 288v (PAL)  
QCIF: 160x120  
QQCIF: 80x60

Frame Rate: 1 to 30 frames per second maximum

Data (Network)  
Format: Ethernet IEEE 802.3; 10/100 Base T

Line Rate: down to 64kbps

Data (Sub-channels)

Format: RS-232 or RS-422 (programmable) (2)

Data Rates: 2400, 4800, 9600, 19200, 38400 bps

Programming Data

Format: EIA RS-232C (primary data lines)

Rate: 38.4 kbps

Form: 8-bit data, 1 stop bit, no parity

## Model Numbers

### BASE MODELS

VCX-2400-E MPEG 2 Video Encoder – IP

VCX-2400-D MPEG 2 Video Decoder – IP

VCX-2400-E-R MPEG 2 Video Encoder – IP (Card Cage Mount)

VCX-2400-D-R MPEG 2 Video Decoder – IP (Card Cage Mount)

\*Note: Base models feature two data sub-channels

### ACCESSORIES

R-12 Card Cage Enclosure  
(see R-12 data sheet for product options and accessories)

PCA-2400 Programming Cable Assembly

SW-2400 Video Watchdog™ User Software

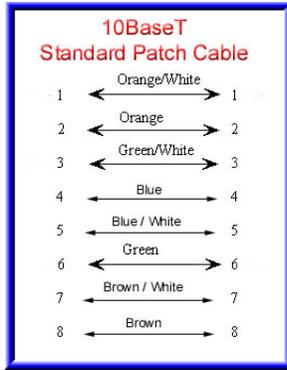
## Appendix A

### Pinouts

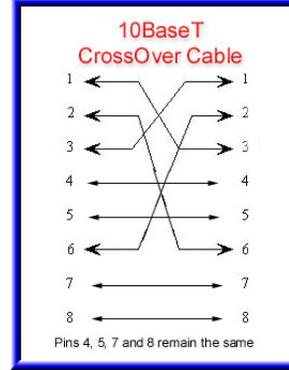
#### Com Port Data Interface Pin Out (uses RJ-45 Plug)

<b>Pin</b>	<b>Signal</b>	<b>Description</b>	<b>Signal Type</b>
1	RS-232	Receive	Input
2	RS-232	RTS	Output
3	RS-232	Transmit	Output
4	RS-232	CTS	Input
5	RS-422	Receive Data +	Input
6	RS-422	Transmit Data -	Output
7	RS-422 RS-232	Receive Data - Ground	Input Ground
8	RS-422	Transmit Data +	Output

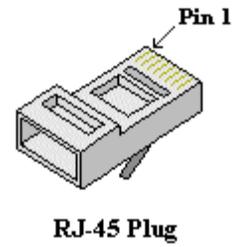
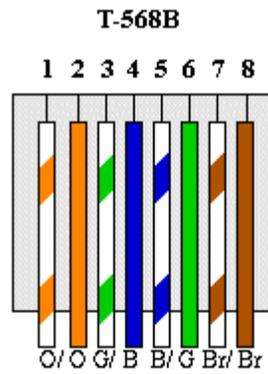
## Standard Ethernet Pin Out



Straight Through Ethernet Pin Out



Cross Over Ethernet Pin Out

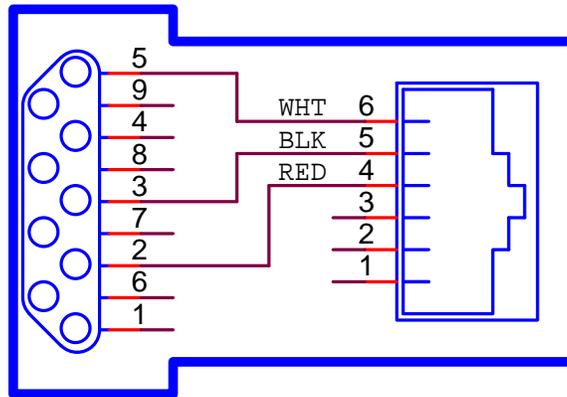


## RJ-11 to Serial Interface Adaptor Pinout

### The PC should have its Com Port configured as:

Baud rate 38,400 kbps  
Data bits 8 bits  
Parity No Parity  
Stop Bits 1 Stop Bit  
Flow control None

RJ-11 Adaptor VCX-Encoder Series  
Front Panel Serial Interface



Manufacturer Supplied Serial Adaptor

Below is the pin layout of the RJ-11:

Pin	Function
1	Ground
2	Unused
3	Unused
4	Serial Out
5	Serial In
6	Ground