INSTALLATION AND OPERATING INSTRUCTIONS

Revision Date: March 3, 2010

VCX-4400-E MPEG-4 Encoder, IP
VCX-4400-ER MPEG-4 Encoder, IP Rack Mount

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Introduction

The VCX-4400-E and the -ER are the chassis versions of the Core Tec stand-alone VCX-4400 MPEG-4 IP product series. These units are fully compatible with the "-ER" card cage versions of the product series.

The VCX-4400 Digital Video Codec system consists of a video encoder and a Core Tec decoder pair providing the capability for one-way end-end transmission of compressed digital video in IP packets at data rates in the 64kbps to 3.5 Mbps range.

The system employs MPEG-4 encoding. The encoding-decoding process is applied to an NTSC (or PAL) video input, selected in software.

The video encoder converts the video to a serial 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 to video format and resolution, data sub-channel characteristics, and basic IP parameters are achieved through one of the following means:

a) a Hyper Terminal accessible menu
b) Telnet through the Ethernet connection
c) Watchdog CCS

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 VCX4400-E

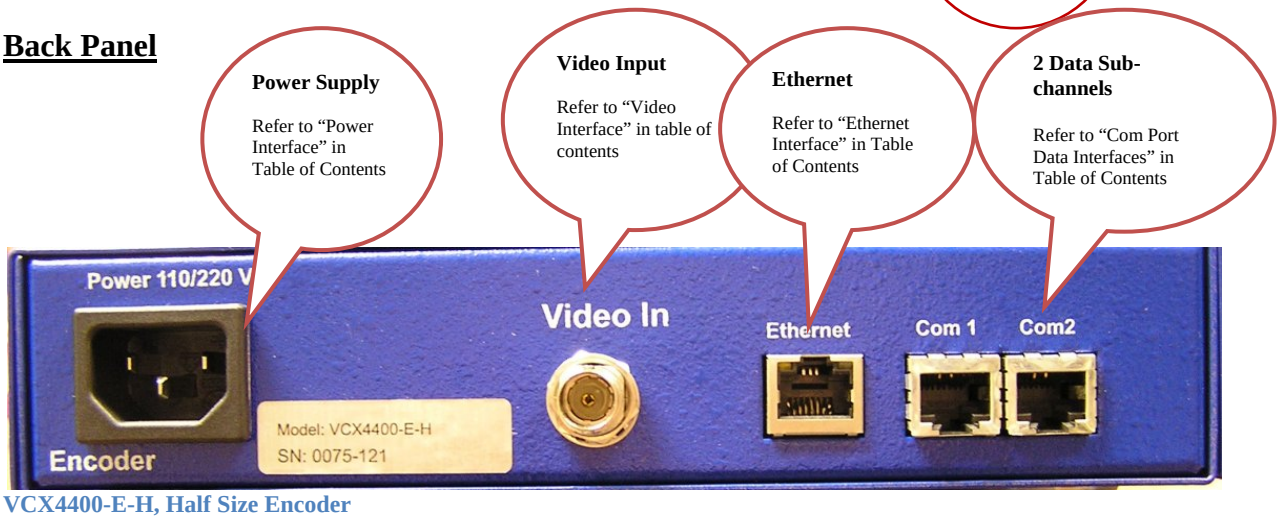
The VCX-4400-E Video Encoder accepts one video and two data signals. The output from the encoder is a stream of IP- packets. It also contains a fluorescent LED display to allow monitoring of unit performance and to facilitate troubleshooting. The encoder has a programmable reset, which prompts the re-initiation of the video stream as well as a reboot command.

The VCX-4400-D Video Decoder accepts the signal from the network originally generated by a VCX-4400-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 decoder also has a programmable reset command, tied to errors in the incoming video stream, as well as a reboot command.

Front Panel

VCX4400-E-H, Half Size Encoder

Back Panel



VCX4400-E-H, Half Size Encoder

Com Port Data Interface

There are two bi-directional data interfaces, RS-232 and RS-422 selectable, on the encoder and decoder assemblies. Each interface uses RJ-45 connectors. Refer to Table below 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 or decoder, which uses a standard RJ-45 connector. The standard method of terminating an ETHERNET cable reflects the TIA568A standard (Telecommunications Industry Association standard).

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

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. The typical current is 1.2 amps from a 110VAC line and drops to .9 amps from a 230 VAC line source.

Display

The fluorescent LED display (Full Width 19" Encoder only) 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)
- Group Length
- FPS (frames per second)
- 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-4400-E Encoder is a 19-inch wide 1U unit and is furnished with mounting ears allowing installation in a 19" rack frame. The VCX-4400-E-H is a desktop like unit that is 8.5 inches wide and designed to be a shelf model without the need to mounting. However if you choose to mount the half size model, extended mounting ears are available. The VCX-4400-E-R is a single card for use in the multi-card chassis, which is a 19-inch 4U unit that will support 12 cards.

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 a Terminal Program such as HyperTerminal.

Quick Start

If user wishes to configure settings with VCX4400-E via COM Port or Network:

Set up for COM Port:

User may configure VCX4400-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-4400-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-4400-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-4400-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 an MPEG4 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

MPEG4 Configuration
The MPEG4 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 with VCXNetBurner

Introduction

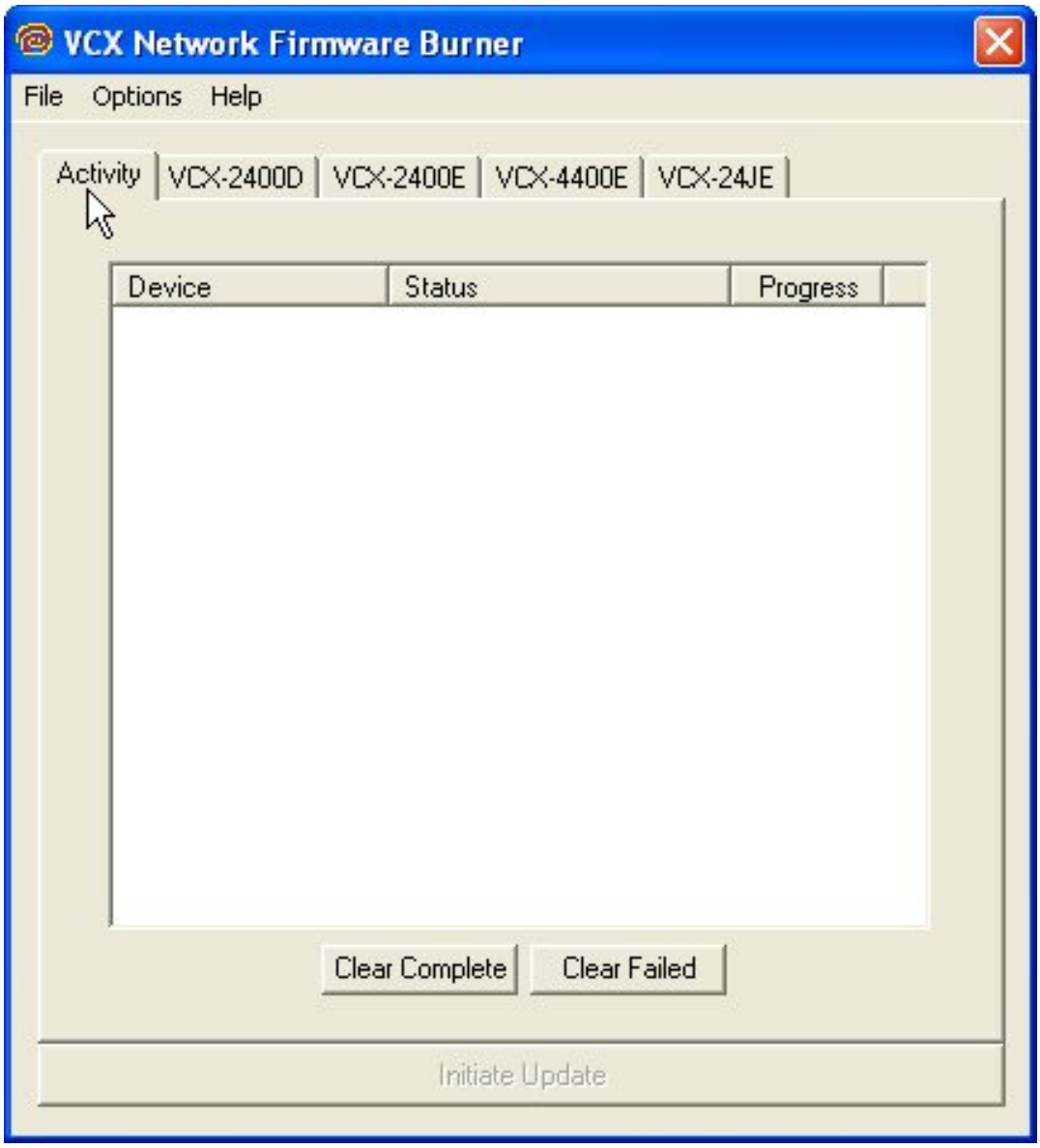
VcxNetburner is a Windows 2000/XP application that allows updating of the VCX-2400 Encoder/Decoder firmware (as well as the VCX4400E and VCX6400E.) VcxNetBurner can simultaneously the firmware of all VCX-2400 devices that can be accessed on your network. If you can telnet to the device then VcxNetBurner 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.

Screens

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 with 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 compete in a few seconds. The startup code frequently completes so quickly that you don't see it in the Status column.

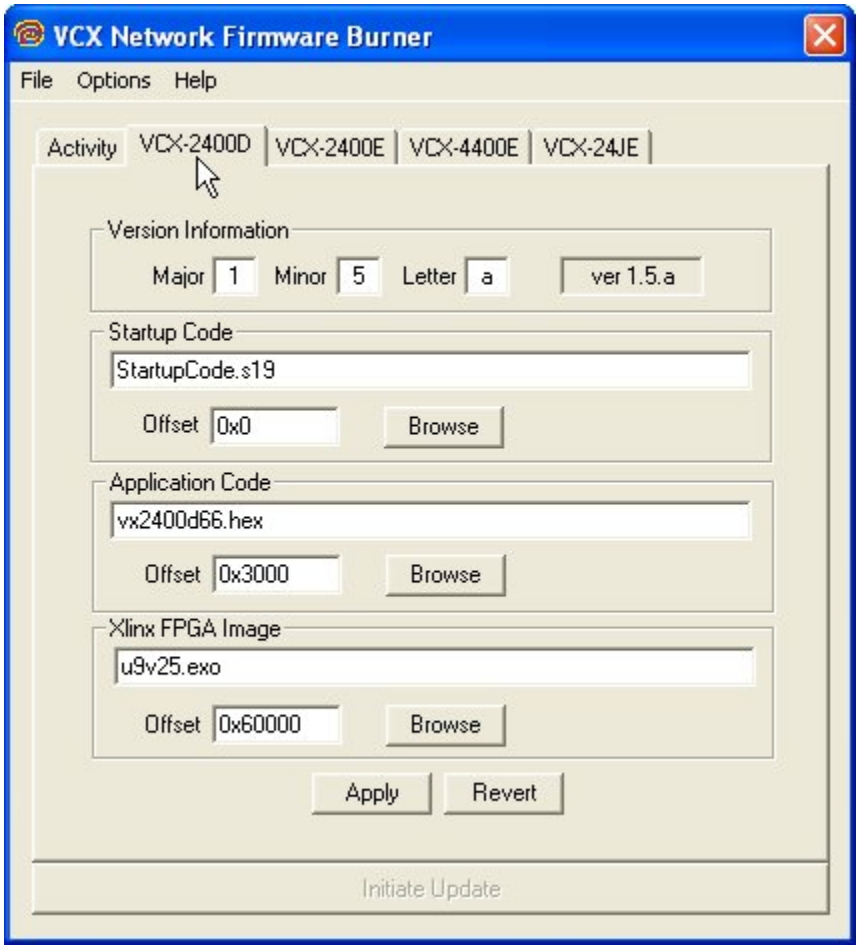
After the FPGA status reaches completion you should see the Status column change to **Complete.** If it changes to **Failed** at any time during the firmware update you will need to retry updating the firmware for that unit before cycling power or rebooting.

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.

VCX2400D Screen

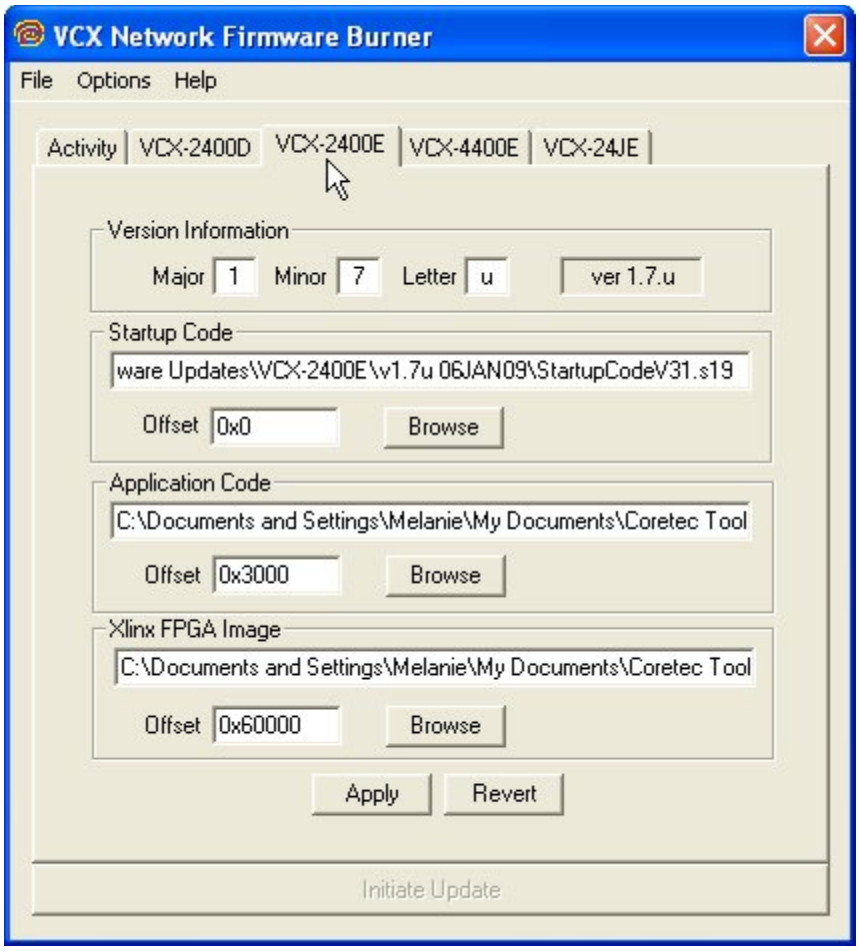
The VCX2400D is accessed through the VCX-2400D tab and displays the parameters used to select the version of the firmware sent to VCX-2400 decoder devices. This information is imported from a import.ini file that is provided with each firmware update. This screen allows the operator to see what update 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

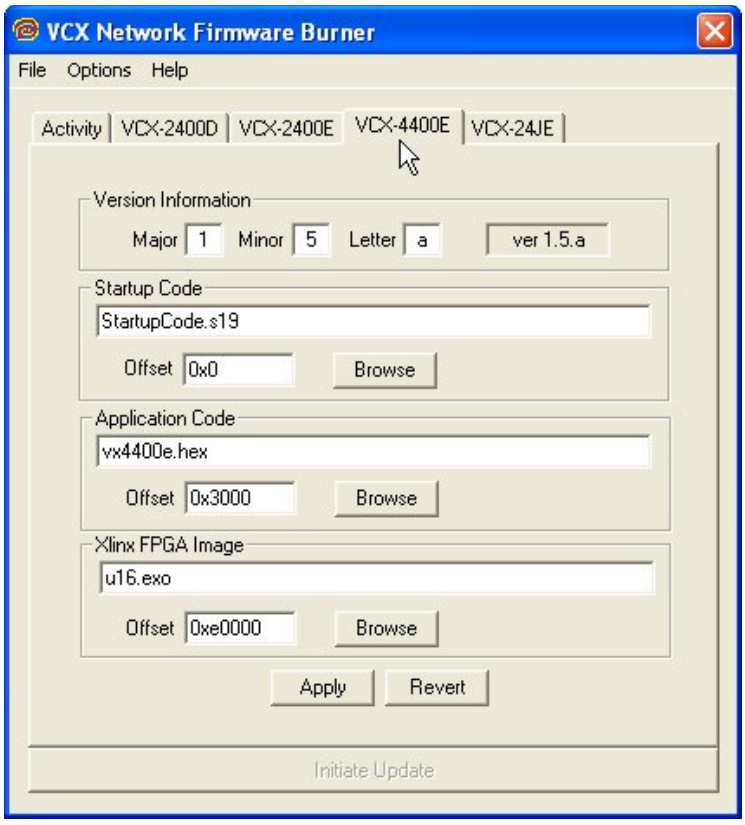
menu's File- >Import option. This is explained later in this document. The **Apply** button saves the current setting on this screen so that when VcxNetBurner is loaded these parameters are restored. The **Revert** button will reload the currently saved parameter set. So if you have modified this screen it can be restored if you haven't used apply.

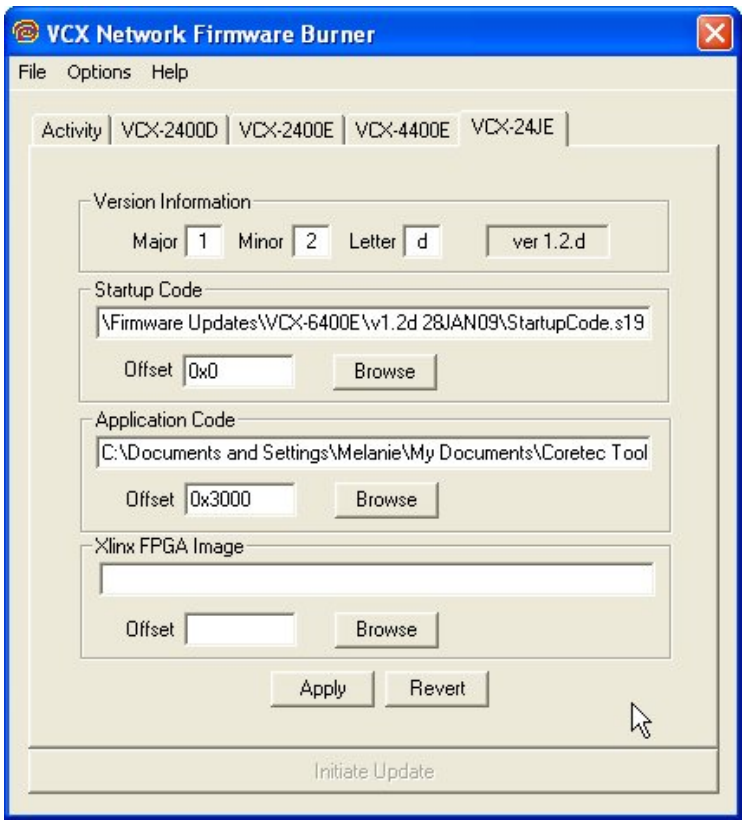


The Encoder Screens- VCX2400E, VCX440E, & VCX6400E (2/4/J-E)

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.


VCX Network Firmware Burner
File
Options
Help
Activity
VCX-2400D
VCX-2400E
VCX-4400E
VCX-24JE
Version Information
Major
1
Minor
7
Letter
u
ver 1.7.u
Startup Code
ware Updates\VCX-2400E\v1.7u 06JAN09\StartupCodeV31.s19
Offset
0x0
Browse
Application Code
C:\Documents and Settings\Melanie\My Documents\Coretec Tool
Offset
0x3000
Browse
Xlinx FPGA Image
C:\Documents and Settings\Melanie\My Documents\Coretec Tool
Offset
0x60000
Browse
Apply
Revert
Initiate Update

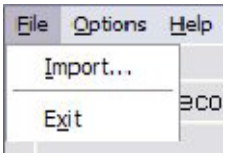

VCX Network Firmware Burner
File Options Help
Activity VCX-2400D VCX-2400E VCX-4400E VCX-24JE
Version Information
Major 1 Minor 5 Letter a ver 1.5.a
Startup Code
StartupCode.s19
Offset 0x0 Browse
Application Code
vx4400e.hex
Offset 0x3000 Browse
Xlinx FPGA Image
u16.exo
Offset 0xe0000 Browse
Apply Revert
Initiate Update


VCX Network Firmware Burner
File Options Help
Activity VCX-2400D VCX-2400E VCX-4400E VCX-24JE
Version Information
Major 1 Minor 2 Letter d ver 1.2.d
Startup Code
\Firmware Updates\VCX-6400E\v1.2d 28JAN09\StartupCode.s19
Offset 0x0 Browse
Application Code
C:\Documents and Settings\Melanie\My Documents\Coretec Tool
Offset 0x3000 Browse
Xlinx FPGA Image
Offset Browse
Apply Revert
Initiate Update

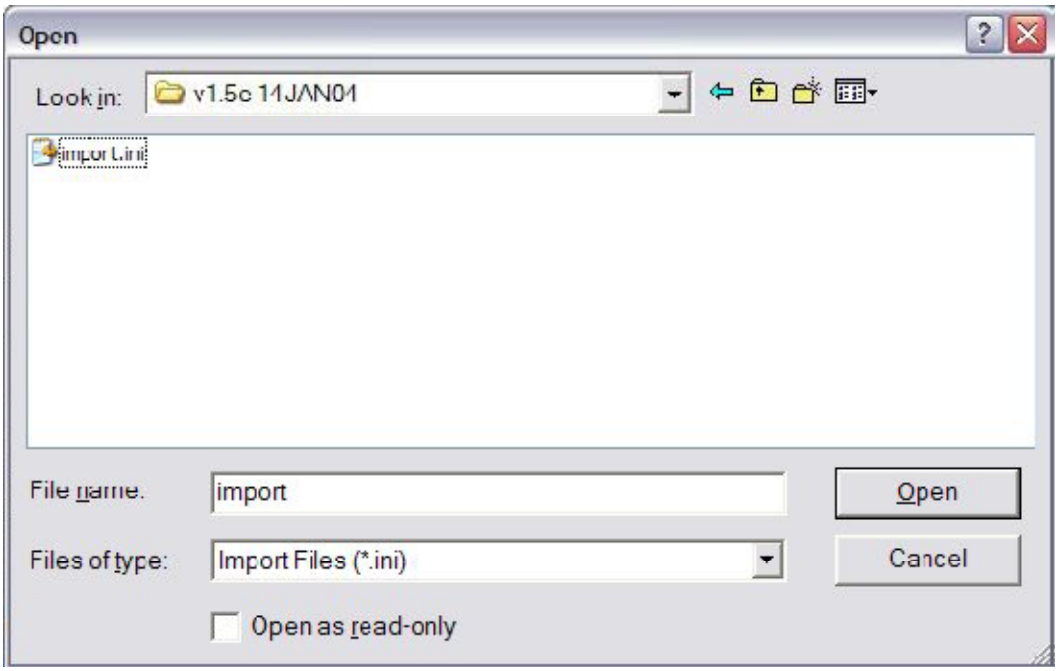
The Menu

File Menu

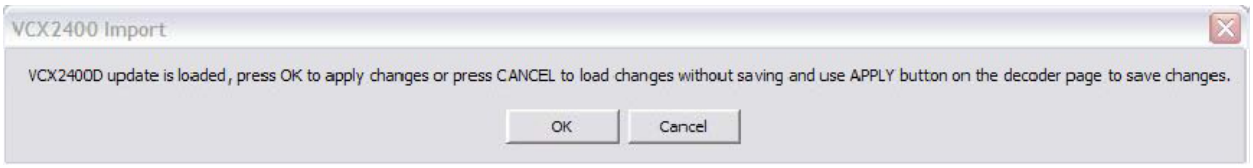
The menu contains selections for 1) File, 2) Options, and 3) Help. The File menu selection presents the following drop down menu:



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 though 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 were the firmware update is located and the import.ini file well be selected by default as shown in the following picture:



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

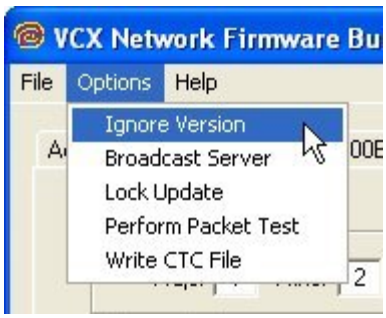


This dialog is telling you that you can save the imported parameters by pressing **OK**. Or by pressing **Cancel** just use the parameters until the application is closed. If you press Cancel the parameters are still loaded but the old parameters will be loaded then next time VcxNetBurner is used. Selecting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

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 Coretecs internal use only.

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

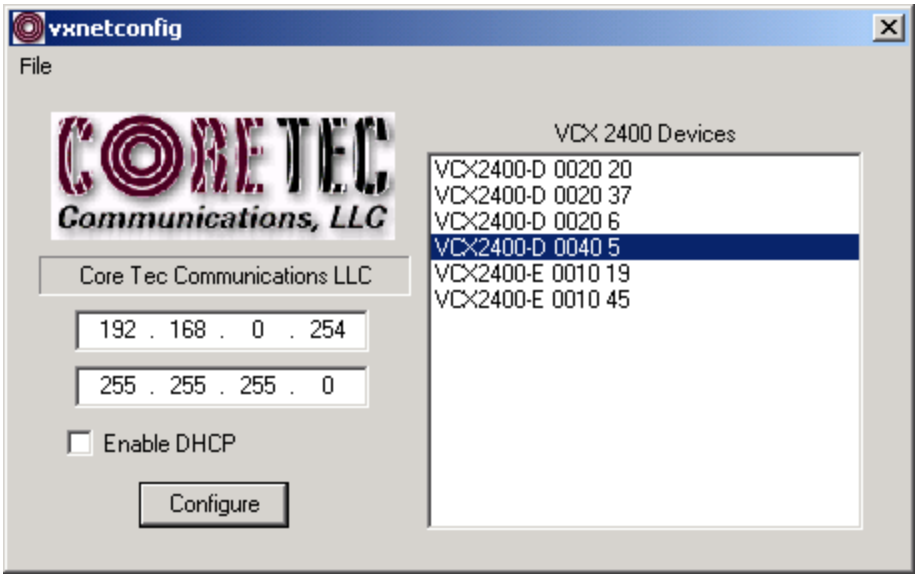
The commands contained in this section provide the means to configure critical network, com ports, encoder, and decoder parameters. The user should consult the factory if specific functions of interest do not appear to be supported.

Initial IP Addressing

To set the device parameters properly, encoder and decoder units must be given appropriate IP addresses, compatible with the network on which they are to be connected. The software module **VXNETCONFIG** was developed to allow a network administrator to set the IP and Subnet in the VCX-4400 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 of 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-4400 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 three ways to connect to the VCX-4400-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) Core Tec Watchdog Lite 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 255.255.240.0

GATEWAY <ip-address> [<ip-subnet address> <subnet mask>]

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 62.41.1.0.xxx subnet should be routed though the gateway at 192.168.0.2

Example command:

GATEWAY 192.168.0.2 62.41.1.0 255.255.255.0

CLEARGATEWAY

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

CMDPORT <TCP command port number>

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-4400 devices programmatically. For example, a Microsoft Windows GUI based application.

Default: 5000

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

VIDEOIP <video destination IP address>

The video destination IP is an address that allows the reception of the MPEG-4 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 number>

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)

Common Commands

The following commands apply to both encoders and decoders.

COMMIT

This command saves the parameter 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

This command 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 (Log Off) and QUIT.

NTSC

This command sets unit for NTSC video operation.

PAL

This command sets unit for PAL video operation.

REBOOT

This command restarts device from power-up state. Most changes in device settings require a reboot after a commit.

START

This command starts encoding or playback (video out).

STOP

This command stops encoding or playback (video out).

VER

This command 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

Encoder Commands

These commands are associated with the encoder functions of the unit. There are two video input ports that may be multiplexed to any of the three encoder channels. The MPEG2, MPEG4 and JPEG functions which are separate hardware and software are in fact separate channels with in the unit.

VIDEOIN <1|2>

This command selects the video input channel to be addressed by all the other commands. Valid options are 1 or 2. Note this command is valid on models with dual video BNC connectors.

Example videoin 1 (the currently selected encoder will receive the video stream from channel 1 connector)

COM Port Setup

The VCX-4400 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-4400 devices can be delivered with either one or two com 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 com port 1 (selects com port 1)
COM2xxx for com port 2 (selects com 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 com port 2 is to be used.

COM1, COM2 (0|1)

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

Default: 0 (OFF)

Example Commands: COM1 1 (enables com 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 com port 1 at 4800 bps)

COM1PARITY, COM2PARITY (Com Port Parity)

The parity for the com 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 com port 2 to no parity)

COM1IP, COM2IP (Com Port IP)

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

Default:

Encoder com ports - 192.168.0.253
Decoder com ports- 192.168.0.254

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

COM1PORT, COM2PORT (Com Port)

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

Default:

Com port 1 - 5002
Com port 2 – 5004

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

COM1RS422, COM2RS422 <0|1>

The com 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 com port 1 for RS-232)

COMM PORT COMMAND – FURTHER EXAMPLES

The following examples set up com port 1:

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

COMxTCP <0|1>

1= Use TCP, 0=Use UDP

COMxSERVER <0|1>

1 = server, 0 = client

OSD COMMANDS (On Screen Display)

These permit the configuration of the On-Screen-Display(OSD) properties of the encoder. This section is for labeling the video stream.

OSD <1…5> <label text>

This command permits up to five lines of text to be configured for display with the outgoing video stream. The text lines must be assigned from 1 to 5 in order and unassigned lines between assigned lines are not permitted. All five lines need not be assigned text strings.

Example

osd 1 This is the first line of text.
osd 2 This is the second.

This is the first line of text.
This is the second

OSDX <1…5> <x pos>

This command will locate the line of text associated with the number 1-5 with the horizontal location defined by the <x pos>.

Example

osdx 1 50 will set the first character of the line of text 1 to x position 50.

OSDY <1…5> <y pos>

This command will locate the line of text associated with the number 1-5 with the horizontal location defined by the <y pos>.

Example

osdy 1 50 will set the first character of the line of text 1 to y position 50.

Note: When using the OSDX and OSDY commands, the screen resolution must be taken into account. Locating the first character outside the video frame will prevent that entire line from being displayed. If the first character is within the field but the string is longer that the video frame the string will wrap around and the line directly below will not be displayed. Characters are 16x16 pixels and relate to the current resolution set by the "PROFILE" command. The range of coordinates starts with 0 and continue to the maximum pixel range divided by 16 (character size) and subtract 1 (because 0 is the first position).

Example

D1 resolution in the vertical (Y direction) is 480 and yields 30 line locations
(480/16)-1=29 so line 0 to line 29 are the available Y locations.

OSDCLEAR

This command will clear all the fields configured by the previous commands.

Video Commands

These are associated with the quality of video being encoded. The resolution both in frame size and in the time domain are supported in this command set.

STREAMTYPE

This command selects between Program and 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)

PROFILE

This command is 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 QQCIF, QCIF, CIF, 1/2, D1.

Default: 1/2

Example Command: PROFILE 1/2 (sets resolution to 1/2 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.

QQCIF	80x60
QCIF	160x120
CIF	352x240
1/2	352x480
D1	720x480

FPS [n]

Sets encoded frames/second. Where n = frames per second of the video stream (i.e. 30, 15, 10, 5, 3, 2, 1)

GROUPLEN[n]

Sets frame spacing between I frames. Where n = number of frames between I-Frames.

Default: 30.

A larger GROUPLEN and smaller FPS increases the startup time of the decoder.

RES <D1|2/3|1/2|SIF|QSIF|VGA|QVGA|QQVGA>

Sets encoder resolution. QSIF, VGA, QVGA, and QQVGA are not supported by MPEG2 (Encoder 1).

QQVGA - 160x120 (cropped horz)
QSIF - 176x120
QVGA - 320x240 (cropped horz)
SIF - 352x240
1/2 - 352x480
VGA - 640x480 (cropped horz)
D1 - 720x480

BRIGHT [n]

This command 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 [n]

This command 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 [n]

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 [n]

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

Default: 0

Example Command: TINT 10 (adjusts tint)

BITRATE [n]

This command adjusts the bit rate (in kbits/sec) of the encoded MPEG-2/4/JPEG video. This sets the maximum rate (of the variable bit stream) encoded. If audio is in the MPEG-2/4/JPEG 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.

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 settings 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

This command is used to enable or disable the SAP multicast. ON or OFF are the permitted parameters.

Default: OFF
Example: SAP ON

SAPAUTHOR

This command is 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

This command is 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

This command is 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

This command sets the interval between SAP packet transmissions. The parameter is the number of milliseconds between transmits.

Default: 5000 ms (5 seconds)
Example: SAPINTERVAL 10000 ms (10 seconds)

SAPIP

This command 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

This command is 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

This command is 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

This command 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)

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-4400 devices to recover from some fatal error conditions without user intervention.

Default: 0 (OFF)

Example Command: WD 1 (enables watchdog)

AUTOREBOOT

This command permits a periodic timed reboot of the device. The parameter is the number of seconds between reboots.

Default: 0 (off)
Example: AUTOREBOOT 3600

AUTOSTART

This command 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

DATE

Example: DATE [yyyy:mm:dd]

TIME

When entering time, it needs to be typed in in 24 hour notation.

Example: TIME [hh:mm<:ss>]

JOIN VIDEO MULTICAST

Example: JVM [1|0]

1=on
0=off

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-4400-E	MPEG 4 Video Encoder – IP
VCX-4400-E-R	MPEG 4 Video Encoder – 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

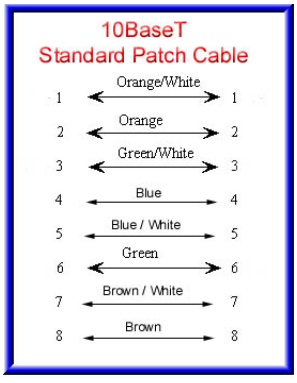
Appendix A

Pinouts

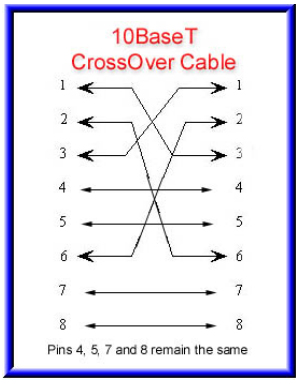
Com Port Data Interface Pin Out (uses RJ-45 Plug)

Pin	Signal	Description	Signal Type
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

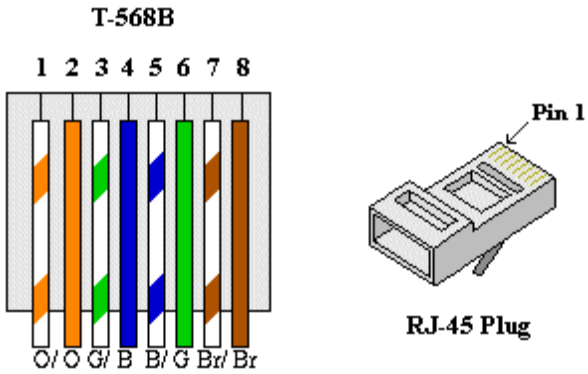
Standard Ethernet Pin Out



Straight Through Ethernet Pin Out



Cross Over Ethernet Pin Out

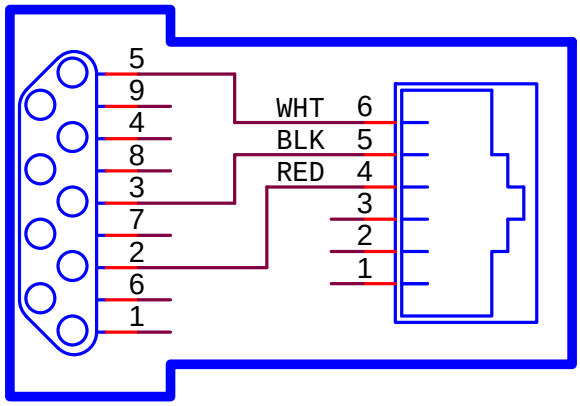


RJ-11 to Serial Interface Adaptor Pinout

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

Troubleshooting