CORETEC
COMMUNICATIONS

INSTALLATION AND OPERATING INSTRUCTIONS
Revision Date: April 5, 2012

VCX-6400-E   MPEG-2/4/JPEG Encoder, IP
VCX-6400-ER   MPEG-2/4/JPEG Encoder, IP Rack Mount

Table of Contents

Introduction

The model VCX-6400-E is the stand-alone MPEG-2/4/JPEG version of the VCX family and is housed in a 19-inch 1U rack mount case with a display, control port and a universal AC power supply. The configuration of the VCX-6400-E-H is akin to desktop like devices being 1U high but only 8.5 inches wide. The model VCX-6400–E-R is a rack mounted card only used in the 4U 19-inch rack unit. See Accessories R-12.

The VCX Digital Video transport system consists of the video encoder and a decoder. These will make up an encoder/decoder pair providing the capability for one-way end-end transmission of the compressed digital video stream in one of three formats. The three formats are MPEG2 standard ISO/IEC 13818-2, MPEG4 standard ISO/IEC 14496 and JPEG standard ISO 10918-1. The transportation process is performed by transmitting and receiving IP packets at data rates in the 64kbps to 4.0 Mbps range. 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) Terminal Program
b) Telnet through the Ethernet connection
c) Watchdog CCS
d) SNMP
e) Web Interface

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 (support for RS-232 or RS-422) and a separate front-panel terminal port. Sub-channel information is removed from the video stream by the encoder thus completing the control link back to the decoder that is supplying the pan-tilt-zoom commands.

Familiarization with the VCX6400-E

The VCX-6400-E Video Encoder accepts one BNC video and one data sub-channel. The output from the encoder is a stream of IP-packets. The Full Full Width (19") Encoder 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.
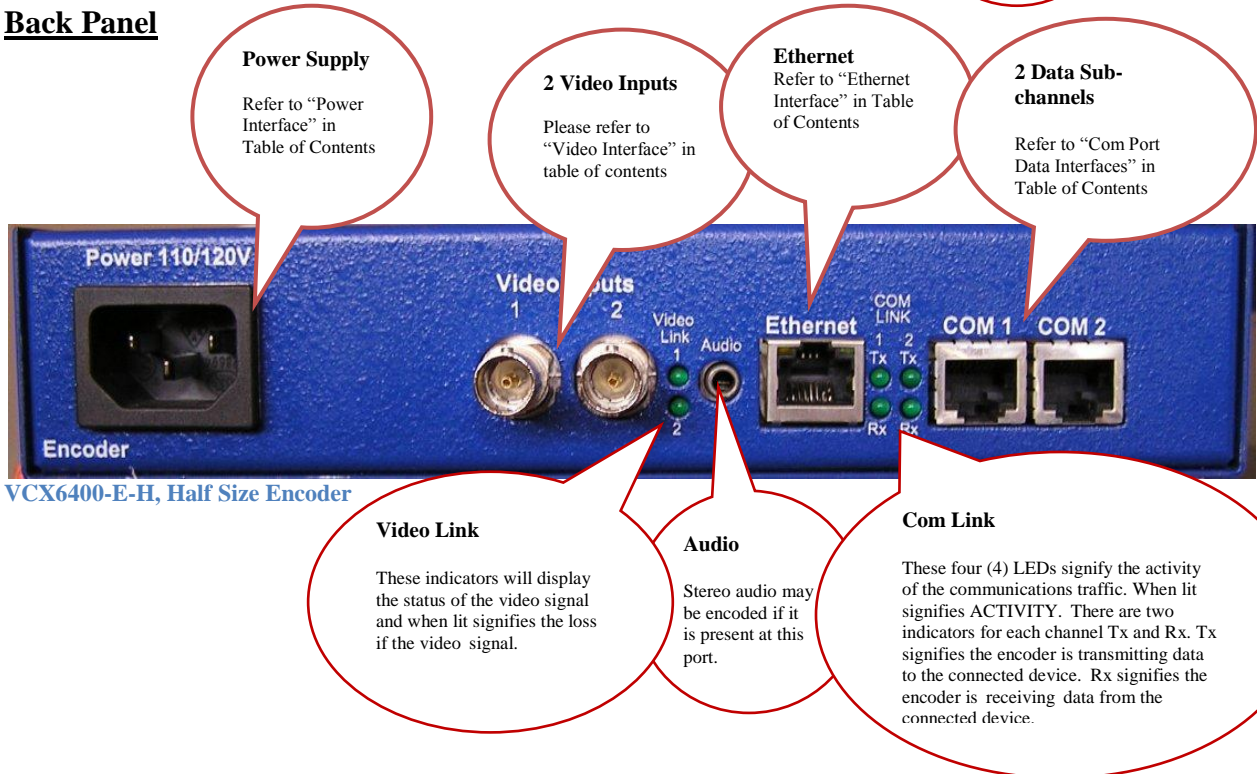
The VCX-6400-E encoder has a programmable reset, which prompts the re-initiation of the video stream, as well as a reboot command. The decoder also has a programmable reset command, tied to errors in the incoming video stream, as well as a reboot command.

<u>Front Panel</u>

Control Port

-Used to directly communicate with encoder to configure settings

VCX6400-E-H, Half Size Encoder

Power switch

-controls the unit power

<u>Back Panel</u>

Power Supply

Refer to "Power Interface" in Table of Contents

2 Video Inputs

Please refer to "Video Interface" in table of contents

Ethernet
Refer to "Ethernet Interface" in Table of Contents

2 Data Sub-channels

Refer to "Com Port Data Interfaces" in Table of Contents

VCX6400-E-H, Half Size Encoder

Video Link

These indicators will display the status of the video signal and when lit signifies the loss if the video signal.

Audio

Stereo audio may be encoded if it is present at this port.

Com Link

These four (4) LEDs signify the activity of the communications traffic. When lit signifies ACTIVITY. There are two indicators for each channel Tx and Rx. Tx signifies the encoder is transmitting data to the connected device. Rx signifies the encoder is receiving data from the connected device.

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. <u>When using the RS-232 configuration pin 7 is ground.</u> Com Port parameters are configured through the system software.

<u>Refer to Appendix A for the correct pin out.</u>

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).

<u>Refer to Appendix A for the Straight Through and Crossover Ethernet Pin Out.</u>

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 (full size encoder only)

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-6400-E Encoder is a 19-inch wide 1U unit and is furnished with mounting ears allowing installation in a 19" rack frame. The VCX-6400-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-6400-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 VCX6400-E via COM Port or Network:

Set up for COM Port:

User may configure VCX6400-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-6400-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-6400-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-6400-E units incorporate support for three different forms 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 three 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 an example. Locate a MPEG2 and MPEG4 encoder and a system to be used as the JPEG file server.

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:
      encoder 1
      videoip 239.5.5.150 (use a valid IP on your network)
      res 2/3 d1
      biterate 3500
      port 4568
      videoin 1

MPEG4 Configuration
The MPEG2 encoder requires the following parameters be configured to your network:
      encoder 2
      videoip 239.5.5.151 (use a valid IP on your network)
      port 4570
      bitrate 1000
      res cif
      fps 15

JPEG Configuration

The JPEG encoder requires access to a file server system to store the captured jpeg images. This function will require a remote access to the computer through a login and password account. Contact your system administrator to facilitate this function.

        encoder 3
        enable 1
        ftpperiod 15
        ftpport 21 (use a valid port number on your network)
        ftpserver 216.53.187.186 (use a valid IP on your network)
        ftplogin CoreTec_Upload (you will need an account on the server)
        ftppassword CoreTec_Upload (you will need an account on the server)
        ftpdir CoreTec_Upload (Use your location on the server)
        ftpfile CoreTec.jpg (Assign any file name you wish)
        videoin 1

NOTE: Encoder 3 must be enabled in order for FTP to be possible.

A list of FTP commands (like the ones above) along with a short description of each can be found in The Program Commands section of this manual.

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>
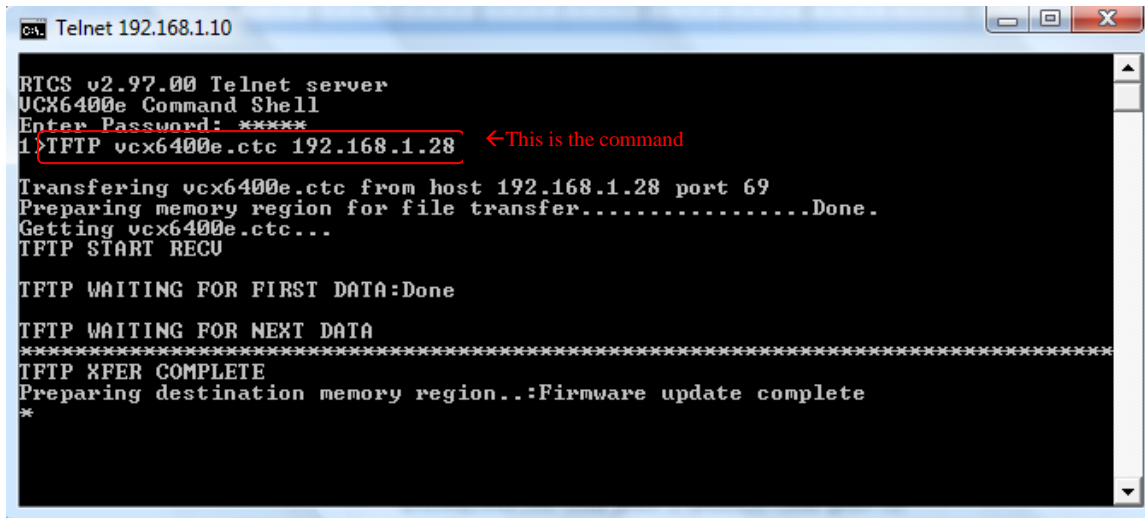
Updating Firmware with TFTP

TFTP is a simple and reliable way of updating the firmware on any device. All that is required is to have access to a TFTP server which will be used as the host and contain the necessary files. (An example file name is VCX4401.ctc).

Via Telnet, enter the following command in order to update the firmware for the device that is being used.

TFTP <File Name> <Server IP Address>

(File Name is the name of the file which contains the firmware update information. In order to receive the latest update files, please contact Coretec.)

Here is an example of what a successful update will look like:

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-6400 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:
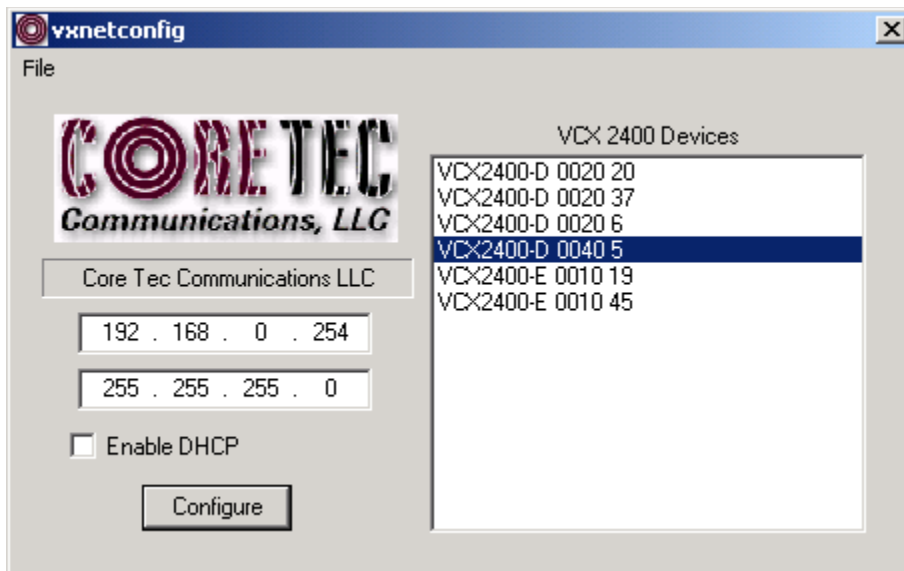
VCXNETCONFIG Window

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 <u>Configure</u> 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-6400 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 five ways to connect to the VCX-6400-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 (8) pages to select from each giving the operator control over the unit operation. General, Network, MPEG2 Video, MPEG4 Video, FTP (for JPEG), OSD (for MPEG4 only), COM1 (subchannel 1), COM2 (subchannel 2) 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)
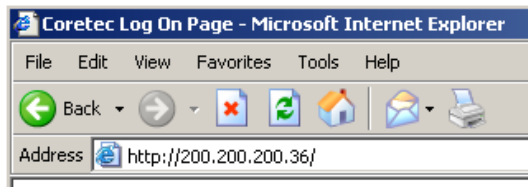
The selected device will respond by opening the following page. Note all internet communication pages will apply while the thread is open.

Type password **XXXXXXXXXXX**

Where **XXXXXXXXXXX** is the new password.
The password can be anything up to eleven (11) characters in length.

GENERAL – Configuration parameters

NETWORK – Configuration parameters

MPEG-2 – Configuration parameters

Select Settings Page

General   Network   MPEG-2   MPEG-4   FTP   OSD   Com 1   Com 2   Log Out   Commit/Reboot

MPEG-2 Video Settings

Enable	☑
Video IP	239 . 5 . 5 . 70
Video Port	4568
Resolution	1/2 D1 ▾
Stream Type	Program ▾
Bitrate	3000
Video Standard	NTSC ▾
Video PID	256
Audio PID	258
Brightness	127
Contrast	63
Saturation	70
Tint	0
Camera Type	0
Camera ID	1

Configure   Start   Stop

MPEG-4 – Configuration parameters

FTP-FTP Settings

OSD – On Screen Display

SUBCHANNEL 1 – Configuration parameters

Select Settings Page

General Network MPEG-2 MPEG-4 FTP OSD Com 1 Com 2 Log Out Commit/Reboot

Subchannel Settings - Serial Subchannel 1

Enable	☐
Baud Rate	9600
Line Type	RS232
Stop Bits	ONE
7/8 Bit	8
Parity	NONE
Destination IP	192 . 168 . 0 . 254
Port	5002
TCP	☐
Server	☑
Xmit Level	100
Idle Time	10

Configure

SUBCHANNEL 2 – Configuration parameters

Select Settings Page

General Network MPEG-2 MPEG-4 FTP OSD Com 1 Com 2 Log Out Commit/Reboot

Subchannel Settings - Serial Subchannel 2

Enable	☐
Baud Rate	9600
Line Type	RS232
Stop Bits	ONE
7/8 Bit	8
Parity	NONE
Destination IP	192 . 168 . 0 . 254
Port	5004
TCP	☐
Server	☑
Xmit Level	100
Idle Time	10

Configure

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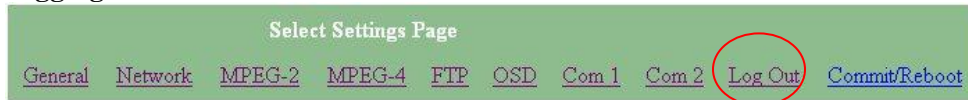
Commit/Reboot
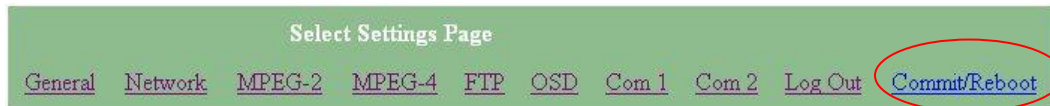
This process will write all the parameters into nonvolatile memory and then reboot the unit. The reboot process will stop all current operations and restart with the new parameters.

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) SNMP

SNMP is available if wanted.

The two (2) .mib files are available at our website (www.coretec.com). A password will be needed to access these files.

5) 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 255.255.240.0

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-6400 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)

TTL <n>
Time to live. TTL is the time that the datagram is allowed to exist on the network. A router that processes the packet decrements this by one. Once the value reaches 0, the packet is discarded. Acceptable range is from 1-255.

Default: 10

Example Command:
TTL   9 (sets the TTL to 10)

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.

ENCODER [MPEG2|MPEG4|JPEG] or [1|2|3]
This command selects the encoding method to be used on the current video input channel. MEPG2 or 1, MPEG4 or 2 and JEPG or 3 are valid options.

Example encoder 1
        encoder mpeg2

The system prompt will reflect the encoder selected by the following display:
        1> (denotes the MPEG2 encoder is selected)

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)

TOS <n>
Type of Service is how the datagram should be used. E.g. delay, precedence, reliability, minimum cost, throughput, ect. The acceptable range is from 0-7F in hexadecimal.

Default: 0

Example: TOS 9

COM Port Setup

The VCX-6400 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-6400 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 video. This sets the maximum rate of MPEG-2 Program or MPEG-4 streams, and the actual bit rate of an MPEG-2 Transport stream. 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)

Notes:

1) This command should be issued AFTER the Profile command if the Profile command is used.
2) MPEG Transport Streams are constant bit rate. MPEG-2 Program stream and MPEG-4 are variable bit rate with an average bit rate at or below the specified bit rate.

FTP Commands

These commands set up the encoder to connect to the FTP server where the JPEG pictures will be stored. The FTP server may be any computer on the network with available storage space for the transactions. Remember the JPEG pictures are taken in a time lock step process. Once set up, the pictures will arrive at the server in the time frame setup in the configuration (ftpperiod). Be aware of the space needed and the incoming stream length.

NOTE: Encoder 3 (JPEG) must be enabled in order for FTP to be possible.

FTPSERVER <server IP address>
> This command sets the FTP server IP address. This is the address of the computer, which is designated as the file server for the JPEG image storage location.

FTPPORT <port number>
> This command configures the port number of the associated with the IP address of the server

FTPPERIOD <time in seconds>
> The number set by this command will serve as the timer for taking the JPEG snap shot picture.

FTPLOGIN <login name>
> The dialog for logging into the file server requires a login name. This command supplies that name during the login dialog.

FTPPASSWORD <login password>
> The dialog for logging into the file server requires a password. This command supplies that password during the login dialog.

FTPDIR <directory path>
> After the login dialog is completed, a location for storing the JPEG pictures must be identified. This command tells the server where to store the JPEG images.

FTPFILE <name>
> This command tells the server what the file name is for the JPEG images.

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.

SNMP Settings

This command allows the encoder to set the SNMP trap receiver. You may add or remove the receiver from the encoder.

Format: SNMPMANAGER [ADD:REMOVE] <n.n.n.n> [abcdef...]

Example: snmpmanager add 192.168.5.66 public

RWCOMMUNITY

This command sets the read/write community name. (The SNMP Manager must know this Community name in order to "Get" or "Set" messages.) It allows the SNMP manager to issue "Get" and "Get Next" messages as well as "Set" messages.

Format: RWCOMMUNITY <abcdef...>

Example: rwcommunity private

ROCOMMUNITY

This command sets the read only community name. (The SNMP Manager must know this Community name in order to "Get" messages.) It allows the SNMP manager to issue "Get" and "Get Next" messages only.

Format: ROCOMMUNITY <abcdef...>

Example: rocommunity public

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 | FTP | SNMP | MISC>
   This command displays current encoder settings. Entering DISPLAY only provides all settings. Adding the VIDEO, COM, IP, SAP, FTP, SNMP, 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-6400 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-6400-E   MPEG 2/4/J Video Encoder – IP

VCX-6400-E-R   MPEG 2/4/J 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

SW-2400   Video Watchdog^{TM} User Software

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
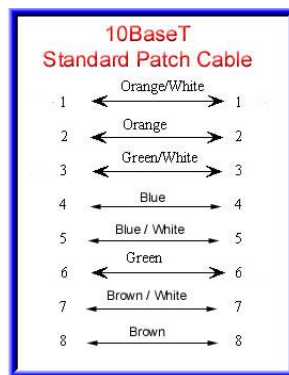
Straight Through Ethernet Pin Out

Cross Over Ethernet Pin Out

T-568B

1 2 3 4 5 6 7 8
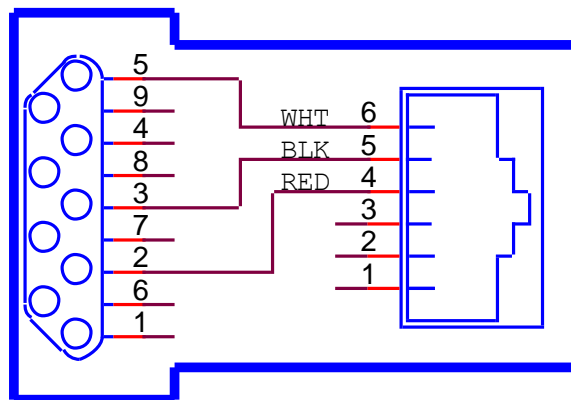
O/ O G/ B B/ G Br/ Br

RJ-45 Plug

Pin 1
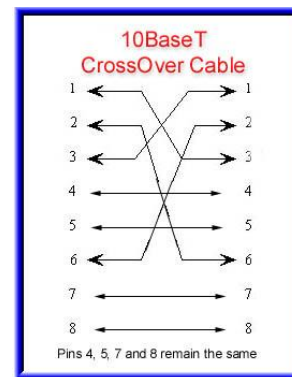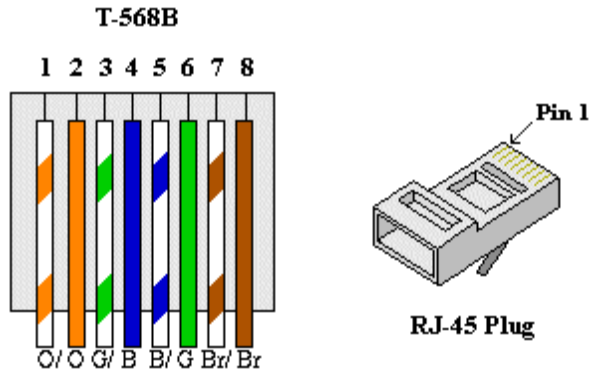
RJ-11 to Serial Interface Adaptor Pinout

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