

# ZEKTOR

## Home Theater Switches

Digital Video / Component Video / Multichannel Audio

# CVS4



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*High Definition Component Video Switch*

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## What's Inside

Thank you for your purchase of your CVS4 High Definition Component Video Switch.

Every care has been taken to assure you of a successful installation and subsequent operations of your new CVS4 video switch, however should something go wrong, and warranty repair work is needed, we request that you hold on to the original packaging materials.

Please take this time to verify the contents of the CVS4 box.

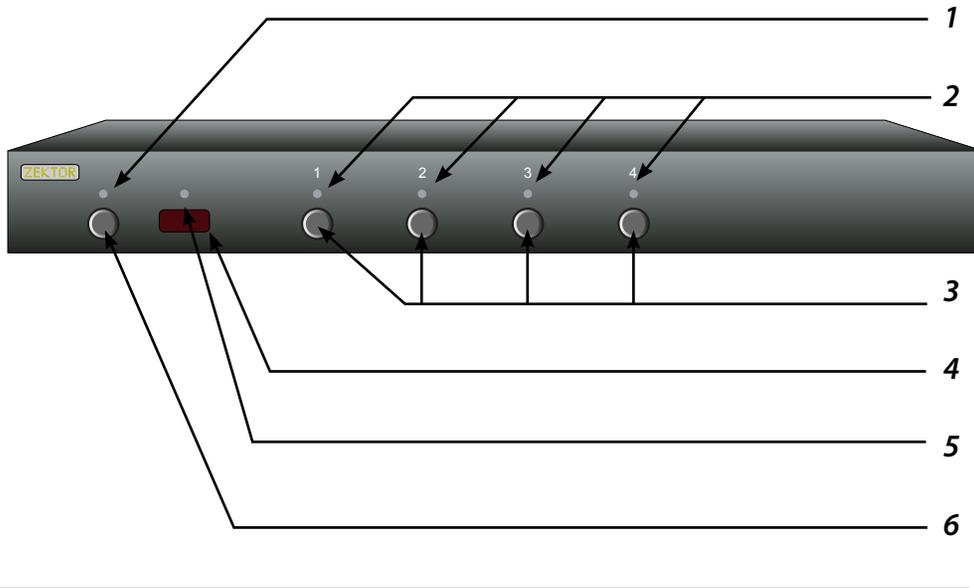
The following should be included:

1. CVS4
2. Power Supply Module
3. This User's Manual

If anything is missing please get in touch with us as soon as possible so that we can correct the situation.

# An Overview of the CVS4

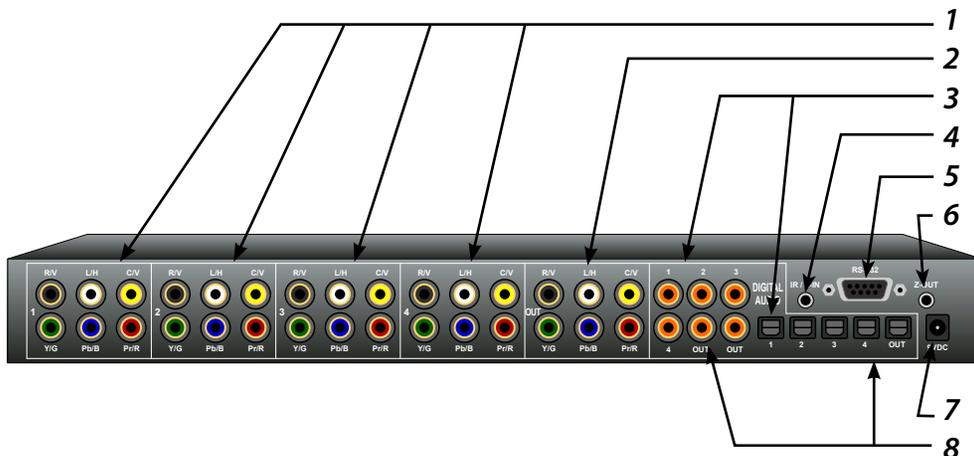
## Front Panel



## Front Panel Controls:

1. Power Indicator. Lights up in standby mode.
2. Selection LEDs. Indicate currently selected inputs.
3. Input Selection Buttons.
4. Infrared Remote Sensor Window.
5. Infrared Received Indicator. Flashes when IR is received.
6. Power Toggle Button.

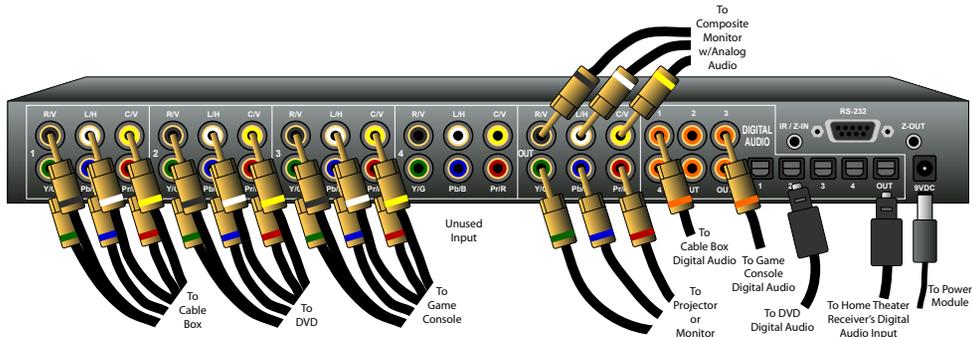
## Rear Panel



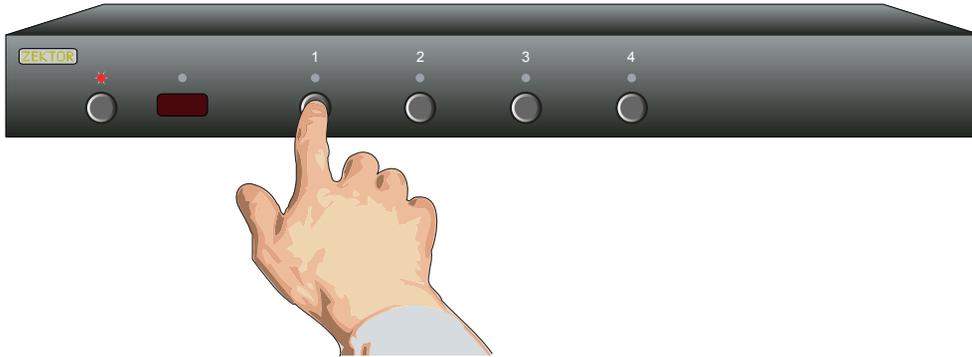
## Rear Panel Connections:

1. Analog Inputs. Each input consists of six equivalent channels. The channels are colored and labeled for convenience, however all six channels are of equivalent bandwidth and functionality, and may be interchanged as desired.
2. Analog Outputs.
3. Digital Audio Inputs. Each input has an associated digital audio channel with both a Coax and an Optical connection. Only one of the two types of inputs can be active at any time. The CVS4 will auto-select between the two types of signals. If a signal is supplied to both the Coax and Optical inputs, the Coax signal is given priority.
4. IR Input. Accepts modulated or unmodulated IR signals.
5. RS-232 Port.
6. Z-OUT currently unused, reserved for future use.
7. DC Power Jack Connector. Plug in the supplied power adapter into this jack.
8. Digital Audio Outputs. All digital audio inputs are automatically converted to both Coax and Optical outputs. All three outputs are available at all times, and are all individually buffered to allow driving three different digital audio devices simultaneously.

## Step 1: Make the appropriate connections.



## Step 2: Press buttons to select an input.



## Step 3: Or use nearly ANY remote to select an input.



**Turn to the next chapter for simple instructions on how to setup the CVS4 for use with any existing remote!**

# Easy, Simple, Instructions!

## Step 1...

- Use the analog input connections to switch component video / composite video / analog audio or any combination of the above signals to the CVS4's analog output connectors. Use the digital audio connectors to switch digital audio signals, with full format conversion between the optical and coax digital audio formats.
- If using a hardwired IR controller to operate the CVS4, connect the controller IR cable to the IR / Z-IN jack.
- If using a PC (or other serial controller), connect it to the RS-232 port using a standard serial cable.
- Plug the power module into the CVS4, and plug the module into a standard A.C. wall receptacle. The standby LED will light up.

## Step 2...

- To switch between any of the four inputs, simply press the button for the desired input. If the CVS4 is in the standby, it will turn on. The CVS4 will then switch to the selected input, and the associated LED will light to indicate this.
- To place the CVS4 back into the standby mode, press and release the Power Toggle button. The channel LEDs will all go blank, and the standby LED will light up. Press the Power Toggle button again to re-select the previously selected input.

## Step 3...

- *Use nearly any remote to control your CVS4!*
- Using any remote to operate the CVS4 is a simple matter of pairing up the CVS4 with the remote. The remote doesn't have to be a universal remote (although it can be), any remote from an old TV or VCR will work just fine.
- Using Zektor's exclusive Intelligent-IR™, setup is easy! The CVS4 does all the work!

***Turn to the next chapter for simple instructions on how to pair up the CVS4 with any remote!***

## Step 1: Put the CVS4 into the Setup Mode



Press and hold the Power Button for 4 secs. The standby LED will blink wildly, and the selection LEDs will start sequencing to the right. (You'll know it when it happens!)

## Step 2: Press the '1' button for Intelligent-IR™ learning



Once the '1' button is pressed...



...the standby LED will flash slower, and all the other LEDs will turn off.

## Step 3: Teach the CVS4 its new IR codes



Press the following sequence of buttons on your remote control:

**Power 1 2 3 4 8 9**

That's it! The CVS4 now operates with your new remote control!

# Three Simple Steps to a Remote!

The CVS4 features Zektor's Exclusive Intelligent-IR™, and with very few exceptions can be setup to use any remote you can point at it!

### *Pick a remote, any remote!*

- Start by picking the remote you'd like to use with the CVS4. If the remote you plan on using is not programmable (for instance, from an old TV), skip the next step.
- If you plan on using a universal remote, start by setting it up as a remote for a TV or VCR that you do not own. (For instance if you don't own a Sony TV, setup your universal remote to control a Sony TV.)

### *Step 1: Put the CVS4 into the Setup Mode*

- The CVS4 is placed into the setup mode by pressing and holding the Power button for about 4 seconds.

### *Step 2: Select the Intelligent-IR™ Learn Mode*

- There are many options available in the setup mode, but for now all we're interested in is the Intelligent-IR™ learning mode. This is selected by pressing the '1' button.
- Once the '1' button is pressed, the standby LED will flash slower and all the other LEDs will turn off. The CVS4 is now waiting for new IR codes to be sent from your remote control.

### *Step 3: Teach the CVS4 your new remote control codes*

- On your remote control, press the following buttons, in the following order:

**Power 1 2 3 4 8 9**

- That's it! The CVS4 will return to the state it was in before setup, and will now work with your new remote!

### *The new control buttons on your remote are...*

- |              |                                    |
|--------------|------------------------------------|
| <b>Power</b> | Toggles the CVS4's power.          |
| <b>1 - 4</b> | Selects inputs 1 through 4.        |
| <b>8</b>     | Turns on the CVS4 (Discrete ON)    |
| <b>9</b>     | Turns off the CVS4 (Discrete OFF). |

**Note:** All remote control codes are saved in non-volatile memory and will not be lost during a power failure.

## Step 1: Place the CVS4 into the Setup Mode



Press and hold the Power Button for 4 secs.  
The standby LED will blink wildly, and the  
selection LEDs will start sequencing to the  
right.

## Step 2: Select "Lighting Mode" option



After '3' is pressed, the standby LED continues to flash, and the front panel will display the current Light Mode setting.



## Step 3: Choose a new lighting mode



Auto-Fade  
Always Bright  
Always Dim  
Always Off  
Exit Setup Mode

# Controlling the Front Panel Lights

There are four different front panel light modes available on the CVS4. They are:

- Front panel lights automatically fade from bright to dim after 4 seconds of inactivity.
- Front panel lights are always at the bright level.
- Front panel lights are always at the dim level.
- Front panel lights are turned off.

Note: The intensities of the both the bright and dim levels can be adjusted as well, this is explained in the next chapter.

To change the front panel lighting mode...

### Step 1: Enter the Setup Mode

- The CVS4 is placed into the setup mode by pressing and holding the Power button for about 4 seconds.

### Step 2: Select the Lighting Mode option

- Press the '3' button to select the "Lighting Mode" option.
- The front panel selection LEDs now indicate the currently selected light mode as follows:

If '1' is lit, then front panel lights are always off.

If '2' is lit, then front panel lights are always dim.

If '3' is lit, then front panel lights are always bright.

If '4' is lit, then front panel lights auto-fade from bright to dim after 4 seconds of inactivity.

### Step 3: Choose a new lighting mode

- Choose a new light control mode by pressing the associated selection button.
- Press the Power Button to save the new mode and return to normal operations.

Note: **The lighting mode setting is saved in non-volatile memory and is not affected by a power failure.**

## Step 1: Place the CVS4 into the Setup Mode



Press and hold the Power Button for 4 secs.  
The standby LED will blink wildly, and the  
selection LEDs will start sequencing to the  
right.

## Step 2: Select "Front Panel Intensity" option



After '4' is pressed, the standby LED con-  
tinues to flash, and the front panel will  
display the current intensity setting.



## Step 3: Adjust front panel intensities



Press to Brighten LEDs  
Press to Dim LEDs  
Selects BRIGHT level  
Selects DIM level  
Exit Setup Mode

# Adjusting the Front Panel Intensity

The bright and dim levels of the front panel lights of the CVS4 are user adjustable, allowing the CVS4 to blend into a wide range of lighting conditions.

To change the front panel intensities...

### Step 1: Enter the Setup Mode

- The CVS4 is placed into the setup mode by pressing and holding the Power button for about 4 seconds.

### Step 2: Select the Front Panel Intensity option

- Press the '4' button to select "Front Panel Intensity" option.
- The front panel selection LEDs now indicate the front panel intensity settings:  
If '1' is lit, then the DIM level is being adjusted.  
If '2' is lit, then the BRIGHT level being adjusted.  
'3' and '4' are always lit.

### Step 3: Adjust Front Panel Intensities

- Use the '1' and '2' buttons to switch between the DIM and BRIGHT settings.
- Use the '3' button to decrease the intensity of the front panel lights.
- Use the '4' button to increase the intensity of the front panel lights.
- You cannot make the DIM level brighter than the BRIGHT level, and you cannot make the BRIGHT level dimmer than the DIM level.
- Once the front panel intensities are acceptable, press the Power button to save the new settings and exit the setup mode.

**Note:** The new intensity settings are saved in non-volatile memory and are not affected by a power failure.

# Setting the Initial Power On State

## Step 1: Set the CVS4 to the preferred initial power on state



Setup the CVS4 to the initial power on state you'd prefer.



As long as the CVS4 is plugged in, it will remember the previously selected input in standby mode. When powered up by pressing the Power button, it will return to that previously selected channel.

However, if power is removed (for instance a plug strip used to power the CVS4 is turned off), and then re-applied, the CVS4's default behavior is to enter into the standby mode.

It is possible to change the power on behavior of the CVS4.

To change the power on defaults...

### *Step 1: Setup the CVS4 to your preferred power on state.*

- Use the front panel buttons to setup the CVS4 to the operating settings you'd like at initial power up.

### *Step 2: Save the new initial power on state.*

1. First press and hold the Power button.
2. While continuing to hold the Power button, press and hold the '1' button.
3. After holding both buttons for about '4' seconds, the display will blink indicating the new power on defaults have been accepted.

### *Test the new initial power on state*

- You can test the new defaults by either disconnecting the power supply from the back of the CVS4 or by unplugging the power supply from the wall.
- Reconnect power. The CVS4 will power up into your new power on default state.

## Step 2: Save the new initial power on state

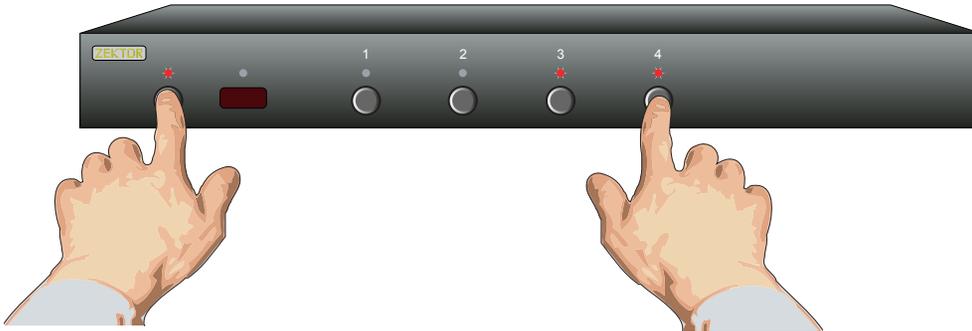


**1** Start by pressing and holding the Power button...

**2** ...while continuing to hold the Power button, press and hold the '1' button.

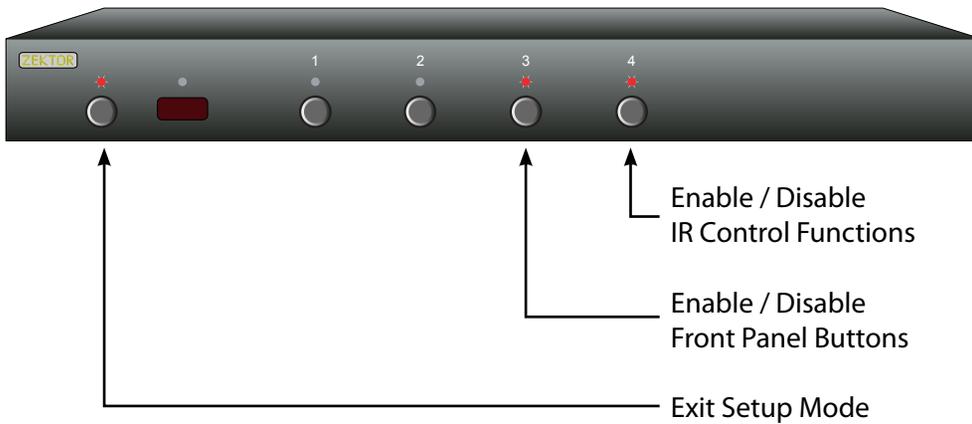
**3** After about 4 seconds, the display will flash indicating the new power on state has been accepted.

## Step 1: Enter the Enable / Disable Control State



- 1 Start by pressing and holding the Power button...
- 2 ...while continuing to hold the Power button, press and hold the '4' button.
- 3 After about 4 seconds, the standby LED will flash quickly, and the display will indicate the current enable / disable statuses.

## Step 2: Enable or Disable Front Panel and / or IR Control Functions



# Disabling Front Panel or Remote

If you are not planning on using a remote control with your CVS4, you might want to disable its remote control function.

Or if you have a household with young curious fingers that likes playing with buttons, you also have the capability of disabling the front panel switches and only operating the CVS4 with a remote.

To enable/disable the front panel switches or remote capabilities...

### Step 1: Enter the Enable / Disable control state

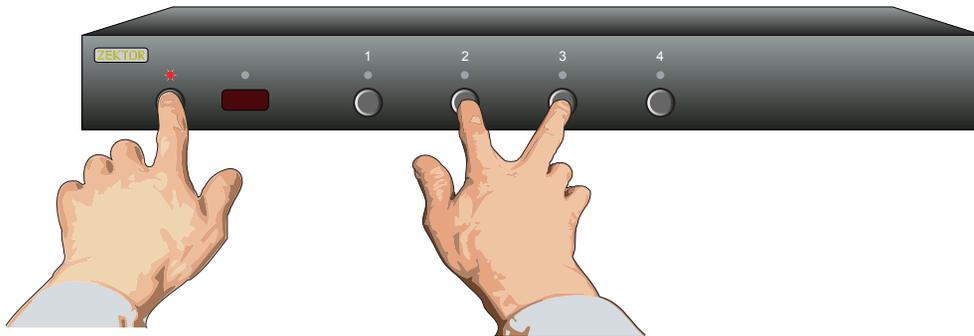
1. First press and hold the Power button
  2. While continuing to hold the Power Button, press and hold the '4' button.
  3. After holding both buttons for about '4' seconds, the standby LED will start flashing quickly indicating you are now able to enable / disable front panel buttons and IR control functions.
- The front panel selection LEDs now indicate the state of the front panel and IR control settings:
    - If '3' is lit, then the Front Panel buttons are ENABLED.
    - If '4' is lit, then the IR remote functions are ENABLED.

### Step 2: Enable or Disable Front Panel and / or IR control

- Use the '3' button to ENABLE / DISABLE the front panel buttons.
- Use the '4' button to ENABLE / DISABLE the IR remote control functions.
- When finished, press the 'Power' button to save new settings and return to normal operations.

**Note:** Disabling the front panel buttons does not disable the ability to enter the Setup Modes. Even with the front panel disabled you can perform the above steps, allowing you to once again enable the front panel buttons.

## Step 1: Reset All Parameters to Factory Defaults



- 1 Start by pressing and holding the Power button...
- 2 ...while continuing to hold the Power button, press and hold both the '2' and the '3' buttons.
- 3 After about 4 seconds, the display will flash indicating all parameters have been restored to their factory programmed values.

# Resetting to Factory Defaults

If, for whatever reason, you'd like to reset your CVS4 back to its factory condition, this is easily done...

## *Step 1: Reset All Parameters to Factory Defaults*

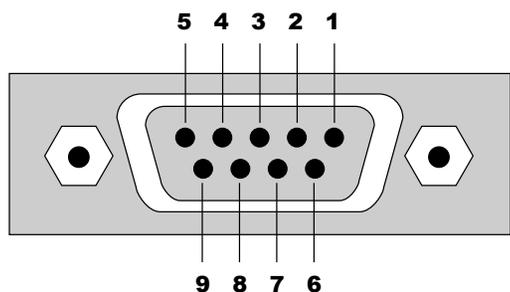
1. First press and hold the Power button
2. While continuing to hold the Power Button, press and hold both the '2' and '3' buttons.
3. After holding all buttons for about '4' seconds, the display will flash indicating all parameters have been restored to their factory programmed values.

# The RS-232 Port

The RS-232 on the CVS4 is the same format as a PC-modem, and uses the same type cable as a serial modem would, which is a standard straight through cable. Do not use a cable that is marked as a "Null Modem" cable.

The CVS4 can also be used with any USB to RS-232 conversion cable, these are all typically straight through cables.

The RS-232 port is a female type DE-9 connector (sometimes mistakenly referred to as a DB-9 connector) with the following pinout:



Pin definitions:

1 - No Connect	6 - No Connect
2 - TX	7 - No Connect
3 - RX	8 - No Connect
4 - No Connect	9 - No Connect
5 - GND	

The port settings used by the CVS4 are:

Baudrate:	9600
Data Bits:	8
Stop Bits:	1
Parity:	NONE

The communications protocol used is Zektor's exclusive K.I.S.S.<sup>™</sup> (Keep It Simple Serial<sup>™</sup>) protocol.

# K.I.S.S.<sup>™</sup> (Keep It Simple Serial!<sup>™</sup>)

Zektor's exclusive K.I.S.S.<sup>™</sup> (Keep It Simple Serial<sup>™</sup>) protocol was designed by engineers who have been controlling RS-232 devices for most of their careers and understand the pitfalls of a badly designed protocol.

*A few features of the K.I.S.S.<sup>™</sup> protocol are:*

- A simple and logically consistent command structure.
- Fully bi-directional operations and can operated in both a Master Slave mode (only responds when spoken to), or in an Asynchronous mode (state changes are sent as they occur).
- All commands and responses can optionally use a checksum or a CRC-8 checkcode to insure reliable communications.
- A command will always generate a response! There are no "timeout" states as part of the protocol. A timeout will always indicate some type of physical connection error (loose cable, extreme noise, etc.).
- Commands and responses have been designed for simple parsing in any language.
- Easy to test using a terminal, or terminal emulation software. (Hyperterm, SecureCRT, etc.)

*A few features of the CVS4 command set are:*

- A full featured command set that goes far beyond simple front panel control operations! Allows full control over *all* features of the CVS4.
- Full notification of *any* state changes. Did the user just change the front panel LED intensities? The controller can be notified of this.
- The ability to disable the front panel, and still have front panel button presses sent to the serial port.
- The ability to read all IR codes sent to the CVS4 by any remote, even those not used by the CVS4. Use the CVS4 to add IR control to any project!
- *Many more features, too numerous to list here...*

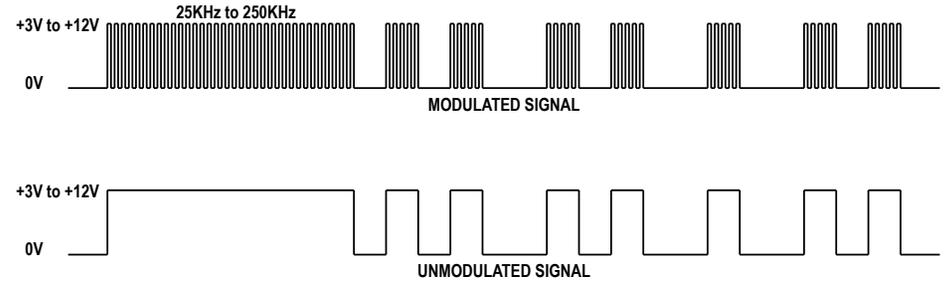
For a full description of K.I.S.S.<sup>™</sup> and a list of the commands supported by the CVS4, download the CVS4 supplemental manual at:

[www.zektor.com/cvs4/downloads.htm](http://www.zektor.com/cvs4/downloads.htm)

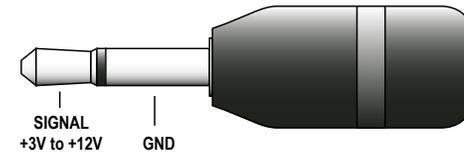
# The Rear Panel IR Jack

The rear panel jack labeled "IR / Z-IN" allows the CVS4 to be controlled by hardwired IR controllers.

The signal can be either modulated or unmodulated:



And uses a standard 1/8" (3.5mm) mini-plug:



The signal voltage can range from +3V to +12V, with a nominal value of +5V recommended.

The signal can be either unmodulated, or modulated with a modulation frequency ranging from 25KHz to 250KHz.

The IR jack recognizes the same IR codes as the front panel IR sensor.

# Specifications

## *Specifications:*

### **Analog Channels**

Bandwidth @ -0.1db:	0Hz - 70MHz, All channels
Bandwidth @ -3db:	Greater than 200MHz, All channels
Resolution:	480i - 1080p, All HDTV modes
Input Coupling:	D.C.
Output Coupling:	D.C.

### **Digital Audio Channels**

Inputs:	4 Coax, 4 Optical, (Auto conversion between formats)
Outputs:	2 Coax, 1 Optical, (Simultaneous)
Maximum Transfer Rate:	13.2Mb/S
Digital Audio Modes:	PCM, DD5.1, DTS, All modes
Coax Input Level Range:	200mV - 7.0V (PC Soundcard Compatible)
Coax Output Level:	500mV Nominal

IR Jack:	+3V to +12V, Un-Mod. or 25KHz to 250KHz Mod. Freq.
Serial Port:	9600 Baud (8N1)

Power Requirements:	90-120VAC, 60Hz, 15W
Optional International:	90-264VAC, 47-63Hz, 15W
Power Supply:	Wall Mount, 9V @ 500ma, U.L. Listed
Dimensions:	Rack Mountable, 17"W x 6.5"D x 1.75"H

**Warranty:** **Two Year Parts and Labor**

# Warranty Policy

## *Warranty Policy*

ZEKTOR warrants this product against defects in material and workmanship under normal use and service for two years from the original date of purchase. ZEKTOR, at its option, shall repair or replace the defective unit covered by this warranty.

In order to keep this warranty in effect, the product must have been handled and used as prescribed in the instructions accompanying this warranty. This warranty does not cover any damage due to accident, misuse, abuse, or negligence. This warranty is valid only if the product is used as specified in the product documentation.

Repair or replacement, as provided under this warranty, is your exclusive remedy. ZEKTOR shall not be liable for any incidental or consequential damages. Implied warranties of merchantability and fitness for a particular purpose on this product are limited in duration to the duration of this warranty.

Some states/countries do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. Some states/countries do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state and country to country.

## *Return & Exchange*

Shipment of product is as advertised by product. Upon receipt of merchandise inspect product carefully, should you find that the product does not meet your expectations, or satisfaction, contact us at once and tell us your concerns, so we may make every effort to satisfy your purchase.

# Contact Information

## *Instructions for Returning Items*

Please retain the dated sales receipt as evidence of the date of purchase. You will need it for any warranty service. If you bought the product through a dealer, installer, or reseller, you will need to return the product to the point of sale.

E-mail us, or call us, using the information listed under "Customer Service Contact Information", for a Return to Manufacturer Authorization (RMA) number. Describe briefly the reasons for your requested return.

You must receive an RMA # before you return any goods to us. The RMA # must appear on your return packing label or on the outside of the box. Merchandise without a RMA # will be refused. RMA's are valid for twenty (20) days from date of issuance.

All returned merchandise must be shipped in the original packaging. If it is not in the original packaging, ZEKTOR will not be held liable for damage during shipment. Shipments of returns must be prepaid, and we will not accept COD returns.

## *Customer Service Contact Information:*

Zektor  
12675 Danielson Ct.  
Suite 401  
Poway, CA 92064

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Fax: 858-748-8224  
E-mail: customerservice@zektor.com  
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# Z E K T O R

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