



USER MANUAL

SCAN CONVERTERS

Models: CS-420, CS-430

IMPORTANT: Before proceeding, please read paragraph entitled
"Unpacking and Contents"



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1 INTRODUCTION

Congratulations on your purchase of this TV One Scan Converter. Since 1991, TV One has been dedicated to the development and manufacture of high quality video/audio equipment. TV One's line of professional video/audio electronics is one of the most versatile and complete available, and is a true leader in terms of quality, workmanship, price/performance ratio and innovation. In addition to the TV One line of high quality Scan Converters, such as the one you have just purchased, TV One also offers a full line of high quality video scalars, matrix switchers, distribution amplifiers, processors, interfaces, lcd monitors, and other computer video related products. This manual includes configuration, operation and option information of the following TV One Scan Converters for the video professional. These Scan Converters are identical in operation, with the only difference being that the CS-420 has a maximum of 4-Line Flicer Reduction and the CS-430 has 6-Line.

CS-420	CS-430
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1.1 A Word about Scan Converters

TV One's Digital Scan Converters are designed to convert computer signals of varying resolutions and vertical refresh rates into standard NTSC and PAL video signals. NTSC and PAL television systems are much lower in resolution than typical computer signals. Computers can often output over three times as many horizontal lines as standard analog television resolutions. Scan Conversion is the process of fitting a higher number of lines of information into a lesser number of available spaces. TV One Scan Converters are designed and manufactured to the highest possible performance standards and are capable of providing high resolution results, however, it is important to understand the overall process of scan conversion and its inherent limitations.

1.2 Factors Affecting Quality of Results

There are many factors affecting the quality of results when computer images are converted to standard video. An entire section of this manual entitled 'Getting the Most from your Scan Converter' goes into detail, but here are a few major points up front.

- **Beginning Resolution** – As a general rule, the less the conversion ratio, the better the results. Standard NTSC and PAL resolutions are near the computer's VGA resolution of 640x480, so generally, the nearer you begin to that resolution the better the results. The common mistake is to assume that the higher the beginning computer resolution, the better the NTSC or PAL results. The reverse of this is the actual fact. Sometimes a lower beginning computer resolution is not possible, but when it is possible, use it.
- **Output Display Device** – The S-Video or RGB output will provide a better final image, because unlike the Composite output, the luminance and color signals are kept separate. This results in less color smearing and a sharper image. When possible, use the S-Video or RGB output, rather than Composite.
- **Distance between the computer and Scan Converter** – This plays a major role in the final result and the distance should be kept to a minimum. The Scan Converter is supplied with a high quality 6' computer input cable. Longer distances are possible, but special measures should be taken in order to avoid cable losses. These include using high quality (coax-type) cables or adding line amplifiers.
- **Output connection cables** – Low quality cables are susceptible to interference. They degrade signal quality due to poor matching and cause elevated noise levels. Therefore, cables should be of the best quality.
- **Interference from neighboring electrical appliances** – These can have an adverse effect on signal quality. For example, an older computer monitor often emits very high electromagnetic fields that can interfere with the performance of video equipment in its proximity.



2 SPECIFICATIONS

	CS-420	CS-430
Computer Input	RGB with HV Sync	RGB with HV Sync
Maximum Input Resolution	1600x1200	1600x1200
Maximum Res without line drops	1024x768	1600x1200
Maximum Vertical Refresh Rate	150Hz	150Hz
Maximum Horizontal Scan Rate	100KHz	100KHz
Computer Input Connection	HD15 Jack	HD15 Jack
Input Level	RGB @ 0.7V Peak Level H&V Sync @ TTL	RGB @ 0.7V H&V Sync @ TTL
Video Outputs	VGA Loop-thru Composite Video @ 1V P-P S-Video @ 1V P-P RGBS @ 0.7V P-P, TTL Sync RGBHV @ 0.7V P-P, TTL Sync	VGA Loop-thru Composite Video @ 1V P-P S-Video @ 1V P-P RGBS @ 0.7V P-P, TTL Sync RGBHV @ 0.7V P-P, TTL Sync
Video Standard	NTSC/PAL Switchable	NTSC/PAL Switchable
Output Connectors	Composite Video on BNC S-Video on 4-Pin Mini-DIN, RGBS on BNCs	Composite Video on BNC S-Video on 4-Pin Mini-DIN, RGBS on BNCs
Image Scaling	Proprietary Method	Proprietary Method
AutoSet™	Proprietary Automatic Image Sizing and Positioning	Proprietary Automatic Image Sizing and Positioning
Zoom & Pan	2X	2X
Flicker Reduction	2 or 4-Line	2, 4 or 6-Line
Control Type	Manual Front Panel Buttons RS-232 Serial Infrared Remote Control	Manual Front Panel Buttons RS-232 Serial Infrared Remote Control
Subcarrier Lock	Locked to Line Frequency	Locked to Line Frequency
Weight	4.4lbs (2.0kg) Approx.	4.4lbs (2.0 kg) Approx.
Dimensions (Wide x Deep x High)	19" x 7" x 1.75" (1RU) (482mm x 178mm x 44.5mm)	19" x 7" x 1.75" (1RU) (482mm x 178mm x 44.5mm)
Power Source	100-240VAC, 50/60 Hz	100-240VAC, 50/60 Hz
Power Consumption	650mA	650mA



3 HOW DO I GET STARTED?

The fastest way to get started is to take your time and do everything right the first time. Taking 15 minutes to read the manual may save you a few hours later. You don't even have to read the whole manual - if a certain section doesn't apply to you, you don't have to spend your time reading it.

4 UNPACKING AND CONTENTS

The items contained in your TV One accessory package are listed below. Please save the original box and packaging materials for possible future transportation and shipment of the unit.

- Scan Converter
- AC Power Cable
- VGA Input Cable
- Composite Video Output Cable
- S-Video Output Cable
- Infrared Remote Control Unit
- Rackmount Screws (Qty 4) for EIA 19" Racks
- User Manual

4.1 Optional Accessories

The following optional accessories, which are available from TV One, can enhance implementation of your Scan Converter. For information regarding these accessories, contact your TV One dealer.

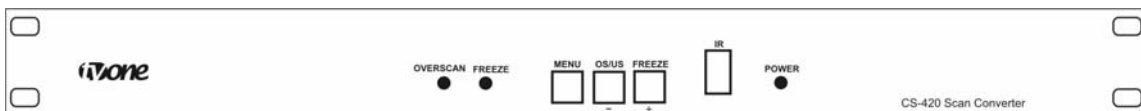
- RGB Output Cable Assembly – 4 or 5 BNC Type
- RS-232 Cable
- BNC Computer Input Adapter – HD15 to 5 BNCs

5 MOUNTING AND CONNECTING THE HARDWARE

The CS-420 and CS-430 are designed for mounting in a standard 19" EIA rack assembly only.

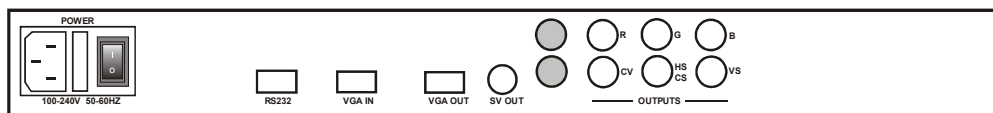
5.1 Rack Mounting the CS-420 and CS-430

The CS-420 and CS-430 come equipped to mount in a standard 19" (1RU) EIA rack assembly. Neither of these devices requires spacing above or below the unit for ventilation. Four standard rackmounting screws are provided for each of the four corner holes in the rack ears.



5.2 Connecting the Scan Converter to a Computer and Monitor

The first step is to connect the Scan Converter and related hardware. Below are rear panel drawings.



Disconnect the computer monitor's input cable from the computer's VGA output connection. Connect this cable to the 'VGA OUT' connector on the back of the Scan Converter. Macintosh computers that do not have an HD15 type output connector may require an additional adapter. Next, use the VGA cable supplied to connect the VGA output connection from the computer to the 'VGA IN' connector on the back of the Scan Converter. After these connections are made and the computer and monitor are switched on, you will see the computer's output displayed on the computer monitor as before, even when there is no power to the Scan Converter.



5.3 Connecting the Video Outputs

The Scan Converter provides several different output types to allow connection to various video displays and other equipment, such as TVs & VCRs. The choice of output type depends on what your equipment can accept.

- **Composite Video** - use the composite video cable provided to connect from the composite video output on the back of the Scan Converter (the BNC connector marked CV) to the composite video input of your target video equipment.
- **S-Video** - use the S-Video cable provided to connect from the S-Video output on the back of the Scan Converter to the S-Video input of your target video equipment. S-Video provides improved performance over Composite Video.
- **RGB with Composite Sync** - Use a 4xBNC to 4xBNC cable to link from the Red, Green, Blue, and HS/CS outputs to the video display. The Scan Converter defaults to outputting negative-going CS (Composite Sync) on the HS/CS connector, but if you encounter problems then it is likely that this has been changed - see 'Advanced Features' later in this manual. **Note** that this output's horizontal scan rate is 15.75KHz and is not intended for connection to a computer monitor.
- **RGB with H&V Sync** - Use a 5xBNC to 5xBNC cable to link from the Red, Green, Blue, HS/CS and VS outputs to the video display. Since the Scan Converter defaults to outputting CS (Composite Sync) on the HS/CS and VS connectors, so you must see 'Advanced Features' later in this manual in order to change this to the required separate H&V Syncs. It is recommended that another output be used, until operation of the unit is understood.

5.4 Connecting the Serial Cable

The CS-420 and CS-430 Scan Converters can be controlled from a computer, and used as a remote Microsoft® serial mouse emulator by connecting its RS-232 port to a computer's RS-232 port. See the section on 'RS-232 Computer Control' later in this manual on how to use this control feature (RS-232 Control is the default, and merely requires connecting a suitable RS-232 cable).

5.5 Connecting the AC Power

The CS-420 and CS-430 Scan Converters have internal power supplies and require the direct connection of an AC input power source of 100-240VAC@50-60Hz. With the Power On/Off switch on the front of the Scan Converter in the Off position, plug the AC Cable supplied into the AC Receptacle on the back of the unit and plug the AC Cable into the power outlet. **Note** – The front panel On/Off Switch only switches DC from the Power Supply to the unit and does not turn the AC on or off.

5.6 Turning the Scan Converter On

Make sure that all cables are connected and that all other equipment is turned on - your computer monitor should be functioning normally. The Scan Converter's Power Switch on the front panel should be switched On. When using a multi-purpose TV-Monitor, be sure and select the correct line input (AUX or AV). The video monitor should now be displaying the same picture as is on the computer monitor.

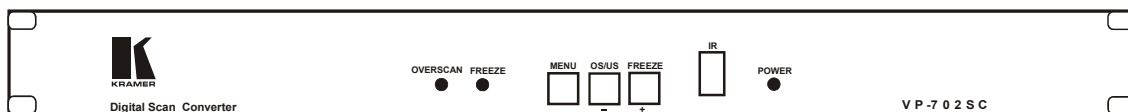
When the Scan Converter is switched on, the green LED indicator on the front panel will illuminate. If there is a picture on the video monitor, but it is the wrong shape, position or color it may be necessary to alter some of the status settings before a good picture is displayed. For example, it may be necessary to switch to PAL or NTSC settings. Further details on selecting the correct settings for your displays follow in the Advanced Features section. If there is no picture on the video monitor, then go to the Trouble Shooting section.

6 ABOUT THE SCAN CONVERTER

There are 3 ways to control the Scan Converter:

- By the Infrared Remote Control unit.
- By the Buttons on the Front Panel.
- Directly from the computer via the RS-232 Serial Port

Each control method has its own section of this manual to describe the operation. Shown below are diagrams that indicate the main features of the front panels of the CS-420 and CS-430. Both models operate in the same manner.



6.1 Front Panel Buttons and LEDs

- **Power On LED** – When the Scan Converter is powered up, the button labelled POWER will illuminate green. It will flash if either the Menu Button or Remote Control Lock functions are enabled, as described later in the manual.
- **Menu Button** – Pressing this button will start the On-Screen Display (OSD) Setup or various functions, which are described later.
- **OS/US LED** – The OS/US (Overscan/Underscan) LED will illuminate when the unit is in the Overscan Mode. When in the Underscan Mode, this LED will not illuminate.
- **OS/US (-) Button** – Pressing the OS/US (Overscan/Underscan) Button once places the unit in the Overscan Mode and illuminates the OS/US LED. Pressing this button again returns the unit to the Underscan Mode and extinguishes the LED. The OS/US Button mimics the remote control key of the same name, and is described later in the manual. This button is also used to Decrease a value displayed with the On-Screen Display.
- **Freeze LED** – The Freeze LED will illuminate and flash when the Freeze Button is pressed to warn the user that other controls are disabled.
- **Freeze (+) Button** – Pressing the Freeze Button places the unit in the Freeze Mode and illuminates the Freeze LED. Pressing this button again returns the unit to the Normal Mode and extinguishes the LED. The Freeze Button mimics the remote control key of the same name, and is described later in the manual. This button is also used to increase a value displayed with the On-Screen Display.

6.2 Special Button Usage on Power-up

Certain buttons can be held down when applying power to the unit, to perform certain functions:

- **Factory Reset** – Hold down both the OS/US and Freeze Buttons when turning the unit on. This will reset the unit to Factory Settings (and set the unit into NTSC video mode). It should only be used if the unit's settings give an invalid output that the user cannot exit from, as all user-settings will be lost. **Note**—use this procedure as a last resort.
- **Set to NTSC Mode** – This is done by holding the OS/US Button down when turning on the unit. This changes the non-volatile PAL/NTSC setting to NTSC, and will be remembered even when power is off.
- **Set to PAL Mode** – This is done by holding the Freeze Button down when turning on the unit. This changes the non-volatile PAL/NTSC setting to PAL, and will be remembered even when power is off.

7 CONTROL AND SETUP USING THE INFRARED REMOTE CONTROL

7.1 Introduction

By now you should have the Scan Converter powered up and working with your computer and video monitor. If you don't get an image on your video monitor, please refer to the Troubleshooting section at the back of this manual. This Scan Converter has been designed for ease of use, and you should find most of the controls simple to understand and apply. Some features, such as Brightness Control, require more than one button press on the Remote Control (IRC-4), but this has only been done to reduce the number of buttons required for operation.

If at any time you find that the Remote Control or Front Panel Buttons are not working, then you may have inadvertently pressed the LOCK Button on the Remote Control Unit. The continual flashing of the Power LED on the Front Panel indicates the Lock Mode. A description of how to turn this feature on and off is provided later in this manual.

This section of the manual covers:

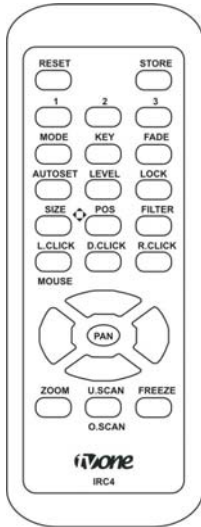
- All the Infrared Remote Control features of the Scan Converter.
- Setup and adjustments for the unit and the effect they have on the final image.
- Storing the settings so they are remembered by the unit the next time.

Therefore, the following is required reading!



Functions of the IRC-4 Infrared Remote Control Unit

Below is a drawing of the IRC-4



7.1.1 Reset Button

As its name implies, this resets the unit back to the last-saved user settings. It is useful if you want to clear any changes made to screen size or position. If you've saved an invalid setting to the non-volatile memory, you may want to do a Factory Reset - as described in the Front Panel Button section later in the manual.

7.1.2 Store Button

This button is used for saving new settings to the Scan Converter's memory and will be remembered even after the unit has been switched off. Just about all feature settings can be saved – e.g. Zoom Mode and Position. **Note** that Button Lock can be saved, but Remote Control Lock cannot. A high-pitched beep will be heard when this function is complete.

7.1.3 U.Scan/O.Scan Button

Pressing this button will toggle between the Underscan and Overscan Modes. Underscan (sometimes know as Compress mode) will leave a border around the image. Overscan has no border and the displayed image, when set correctly, is larger than the video monitor screen. This function is also available via the front-panel button labeled 'OS/US'. Since Underscan is considered the normal mode, the front panel LED labeled Overscan is illuminated only when the Scan Converter is in the Overscan Mode. The position and size of the image in both modes is user-adjustable, and the method of doing so will be described later under the SIZE and POS functions.

7.1.4 Freeze Button

The Freeze function allows you to freeze the current image on the screen, and all the settings of the unit itself. Pressing the freeze button again will unfreeze the image. No other features are accessible while in Freeze Mode, with the exception of RESET. This function is also available via the Front Panel Freeze Button.

Note - The Freeze function will only freeze the image on the video monitor; the image on the computer monitor will not be affected by this function and will continue displaying images as normal.

7.1.5 AutoSet™ Button

AutoSet™ is TV One's unique auto setup button that automatically sizes, shifts and centers the computer image onto the video monitor. Once activated, this feature will scan the incoming computer image to determine its size and position and optimize it for display on the desired video display.

When the Scan Converter first encounters a new screen resolution or refresh rate, it will estimate how to best display this on the video monitor. Sometimes this estimate needs refining and the AutoSet™ function allows the unit to search for the image edges to improve on this.

- Before running the AutoSet™ function, set the computer so that it is displaying a light colored background or wallpaper with defined edges in full screen mode. If you have a Windows operating system, make sure it is maximized to use the full screen. Black or very dark colors along the edge of the image may cause AutoSet™ to misread the source image's size.
- If you are running MS DOS, it is only recommended to use this function when the full DOS screen is being used by a fairly bright color or shade of white.
- Only use this feature when the full area of the computer screen is being used - this will ensure that the unit 'sees' the edges correctly, and performs its task without errors.
- If you encounter problems when running AutoSet™, you can adjust the level at which it works - see the LEVEL button described later.
- Once complete, the AutoSet™ routine will remember this particular resolution and refresh rate so that you should not need to re-do this function next time. The only exceptions are if you change the computer's screen resolution, do a Factory Reset or use this unit with a different computer.
- If the AutoSet™ feature does not look like it is finding the edges of the display correctly, then you can press RESET to stop it going any further.

A high-pitched beep will be heard when this function is complete.

7.1.6 Filter Button

This button will toggle between 2-Line and 4-Line Flicker Reduction Modes on the CS-420 and between 2-Line, 4-Line and 6-Line on the CS-430. The choice of which mode to use will depend upon the computer image being displayed. The size of the image, fonts selected and the computer image resolution will determine which flicker reduction setting best suits your image.

- 6-Line Filter should only be used with input resolutions higher than 1024x768.
- 4-Line Filter will soften the image slightly but will retain most of the image detail and make the image more stable. Since this is the setting normally used, it is the Scan Converter's default setting.
- 2-Line Filter will sharpen the image but may give a slight loss of fine image detail and permit some flickering. It may also improve the display when in Zoom mode.

7.1.7 Size and Pos (Position)Buttons

These buttons allow adjustment of the Size and Position of the image on the video monitor in both the Underscan and Overscan Modes, whichever is currently selected. You can then use the arrow keys to adjust the horizontal and vertical size or position of the image being displayed. **Note** – Ideally, the AutoSet™ function should be run before making these adjustments, so that the unit knows the precise size of the source image from the computer.

- The Scan Converters have two modes of display, Underscan and Overscan, so it is important to have the correct one selected before proceeding to change the values. The blue 'Overscan' LED will be illuminated when in Overscan Mode, i.e. when the image should fill the screen. The Underscan Mode should always be adjusted to leave a slight black border around the image.
- Only SIZE or POS is active at any one time, but you can easily switch from one to the other.
- The values are also separately stored for NTSC and PAL Modes, so adjustment made in one mode will not affect the other.
- Once adjusted, you should STORE these settings, so this process will not have to be repeated next time.

Note - You are setting the screen size and position for the particular video display you are viewing at the time, so the size may appear different on another video display. This is not a fault with the unit, but merely demonstrates that no two TVs, video monitors or projectors are exactly alike. You may have to repeat this procedure for different video displays.

7.1.8 Zoom Button

The Zoom function allows you to view a section of the video image at twice the normal size. This is useful for showing computer images and programs in more detail and is particularly helpful in training applications. Enter this function by pressing the ZOOM Button. Pressing ZOOM again will return you to the normal viewing size.



- You can then 'pan' around the image by using the arrow keys to slide the image around.
- It is possible to STORE this setting to make the unit start in the Zoom mode when powered up and be at a particular pan position.
- Other settings can be adjusted while in Zoom mode. **Note** - you may need to press the PAN button to restore control over the Zoom position, after adjusting other settings.

7.1.9 Lock Button

Pressing this button once will disable the Scan Converter's Front Panel Buttons. To re-enable them, simply press the LOCK Button again. This setting can be stored (STORE Button), to prevent people from adjusting the unit without the Remote Control. **Note** - this feature is intended for use when other users should not disturb the settings of the unit.

Pressing the Lock Button twice (within 1.5 seconds of each press) will lock both the Front Panel Buttons and the Remote Control, so use with care! Obviously, this setting cannot be stored, because the Remote Control is disabled by this time.

- The Power LED will flash slowly when the Front Panel Buttons are disabled.
- The Power LED will double-flash when both the Front Panel Buttons and the Remote Control are disabled.
- Remove and restore power to the unit to bring the Remote Control back to life.
- The Factory Reset method (described in the Front Panel section) will still work.

7.1.10 Level Button

This button allows internal settings to be adjusted, by subsequently pressing a number button (within 1.5 seconds), and then the Up/Down Arrow Keys to adjust the level itself.

- LEVEL 1 will adjust the Brightness of the image on the video monitor.
- LEVEL 2 will adjust the AutoSet™ sense level, from 1 through to 3. A lower setting (using the Down Arrow Key) will allow darker image edges to be detected. The default is 2. If, after running AutoSet™, the image is still too big for the video monitor screen, it may be because the image is too dark and the unit cannot find the edges of the picture. Altering the sense setting will change the brightness needed for the unit to find the correct edges satisfactorily. Run AutoSet™ after changing the sense setting to ensure a good image on the video monitor.

E.g. Press LEVEL, followed by 1, and then adjust the picture Brightness with the Up and Down Arrow Keys.

Note - This feature times-out after about 10 seconds to prevent accidental changes.

7.1.11 Manual Set

This function should only be needed when the AutoSet™ function has failed for some reason, or if the computer image has a dark background around the edges that will not allow AutoSet™ to work properly. Please read the notes on AutoSet™ and LEVEL adjustments in this section before adjusting the Manual Set parameters, in case something else will solve the problem.

These adjustments allow manual selection of the area of the computer's image that is to be captured by the Scan Converter and subsequently displayed on the video monitor. In effect, it is used to determine what goes into the Scan Converter's memory. This is not to be confused with the Size and Position adjustments mentioned earlier in this section, which vary the parameters coming out of the Scan Converter's memory. AutoSet™ and Manual Set are used to get the image correct going into the memory. If the entire image is never stored in memory in the first place, it can never be read out.

Note - it is highly recommended that this method only be used when in the Underscan Mode or you will not know if you have adjusted the values correctly.

- Press AutoSet™ on remote control twice (within 1.5s) - two 'beeps' will be heard.
- Adjust Top and Left edge by pressing the appropriate Arrow Keys.
- Press AutoSet™ again.
- Adjust Bottom and Right edge by pressing the appropriate Arrow Keys.
- Press AutoSet™ again - this will give a high beep to indicate that this has been saved.

Note - Manual Set Mode times out after 20 seconds, ignoring any changes made.



8 CONTROL AND SETUP USING THE FRONT PANEL BUTTONS AND OSD

8.1 Introduction

As well as being controlled via the Infrared Remote Control, the Scan Converter can be controlled by using the Front Panel Buttons in conjunction with the OSD (On-Screen Display) Menu. This feature also allows information relevant to the current settings of the Scan Converter to be displayed on the screen of the video monitor.

8.2 Activating and Navigating the OSD

Pressing the MENU Button will activate the Scan Converter's OSD function and present the start of the Menu Structure on the output video monitor. The top line of the OSD is the Menu name you are currently in, while the lower line will indicate what Sub-Menu is available, or the feature that can be altered.

The top line in bold type is the Main Menu Structure. Lines below it are the Sub-Menu Structures.

Flicker Red.	Auto Track	Screen Size...	Manual Set...	Advanced...	Exit
		↓	↓	↓	
		Out H-Center	VGA Left	Video Std	
		Out H-Width	VGA Width	Sense	
		Out V-Center	VGA Top	RGB Term	
		Out V Height	VGA Bot	RS232	
		Exit	VGA Store	Baud Rate	
			Exit	RS232 ID	
				Sound	
				Infrared	
				Information	
				Exit	

- Use the Menu Button to move from Menu Item to Menu Item along the top Menu Line.
- Use the + Button to enter that Menu Structure, then use the Menu Button again to move down that Structure.
- Pressing the + Button when 'Exit' is displayed will return you out of that part of the Menu Structure or Menu Mode.

For Example:

1. If you wish to change the Sense setting, Press the Menu Button until 'Advanced...' is displayed.
2. Use the + Button to enter this Sub-Menu.
3. Now Press the Menu Button until 'Sense' is displayed,
4. Now, use the - and + Buttons to change its value.
5. Press the Menu Button again until 'Exit' is displayed.

Once in Menu Mode, the buttons labeled '-' and '+' can be used for adjusting the various settings that will be displayed. Sub-Menus (indicated by ... trailing the Sub-Menu text on the lower OSD line) can be entered by press the + Button.

You can 'navigate' to the next feature by pressing the MENU Button again. At the end of every Menu or Sub-Menu list, will be an 'Exit...' option, and then pressing the '+' Button will then exit back to the previous Menu or terminate the OSD.



8.2.1 Flicker Red. Menu (Flicker Reduction)

This performs the same function as mentioned with the Infrared Remote Control section that covers setting the Flicker Reduction to either 2-Line or 4-Line.

8.2.2 AutoSet™ Menu

When 'AutoSet 0' is displayed on the OSD, press the + Button to start this function. The number will increment as the feature gradually progresses, ending in a high-pitched 'beep'.

8.2.3 Screen Size... Menu

This allows entry into a Sub-Menu, by pressing the + Button, to set the SIZE and POS settings. This can also be done from the Infrared Remote Control.

Out H-Center - altering the display's horizontal screen position

- Pressing the + Button moves the image to the right
- Pressing the - Button moves the image to the left.
- Adjust until the image is centred horizontally on the screen.

Out H-Width - altering the display's width

- Press the + Button to increase the width of the picture.
- Press the - Button to decrease the width of the picture.
- Adjust until the desired width of the image is obtained.

Out V-Center - altering the display's vertical screen position

- Press the - Button to move the picture up the screen.
- Press the + Button to move the picture down the screen.
- Adjust until the image is centred on the screen vertically.

Out V-Height - altering the display's height

- Press the + Button to increase the picture height.
- Press the - Button to decrease the picture height.
- Adjust until the desired height of the image is obtained.

Note - Cycling back around to any one of these adjustments is done by repeatedly pressing the MENU button until the desired one is displayed again.

Exit - To exit these adjustments press the + Button) when 'Exit...' is displayed.

8.2.4 Info... Menu (Information)

This Sub-Menu allows access to information relevant to the current screen resolution and is used by the Scan Converter to determine correct settings when converting from computer signals to a video output signal that will be displayed on a video monitor.

Total Lines - for information only

- The number that appears here shows the total number of horizontal video lines on the computer image. This value cannot be altered and is for information only.

Vert. Freq - for information only

- This number that appears here shows the vertical refresh rate of the computer image. This value cannot be altered and is for information only.

Exit - Press the + Button when 'Exit' appears to return to the Main Menu function.

8.2.5 Manual Set... Menu

This function should only be needed when the AutoSet™ function has failed for some reason, or if the computer image has a dark background around the edges that will not allow AutoSet™ to work properly. Please read the notes on AutoSet™ and LEVEL adjustments in this section before adjusting the Manual Set parameters, in case something else will solve the problem.

These adjustments allow manual selection of the area of the computer's image that is to be captured by the Scan Converter and subsequently displayed on the video monitor. In effect, it is used to determine what goes into the Scan Converter's memory. This is not to be confused with the Size and Position adjustments mentioned earlier in this manual, which vary the parameters coming out of the Scan Converter's memory. AutoSet™ and Manual Set are used to get the image correct going into the memory. If the entire image is never stored in memory in the first place, it can never be read out. The 'VGA Store' option can be used to save your new settings in the unit's memory even after it has been switched off.

Note - It is highly recommended that this method only be used when in the Underscan Mode or you will not know if you have adjusted the values correctly.

Follow the method listed below, pressing MENU between each step, to optimize your video display:

- **VGA Left** - Adjust this value using the – Button until you notice that some of the Left image is lost, and then press the + Button one time to bring the image back.
- **VGA Width** - Do the same for the Right image, but this time pressing the + Button until the image just starts to be lost, and then press the - Button once.
- **VGA Top** - Press the + Button until the Top edge of image is lost, or becomes distorted or discolored, then press the – Button once.
- **VGA Bot (Bottom)** - Press the – Button until the Bottom edge of image is lost, then press the + Button once.
- **VGA Store** - Press the + Button once to store the new settings. They will now be remembered in the Scan Converter's memory, even after the power is switched off.
- **Exit** - To exit these adjustments press ' + ' at this prompt, this will return you to the main menu structure.

Note - In order to go back and change any of the above adjustments, press the MENU Button repeatedly, before pressing the 'Exit' Button, until the desired adjustment is displayed and then press the + or - Button to alter the setting.

8.2.6 Advanced... Menu

These options are described later in the manual.

Note - The OSD (On-Screen Display) times out after about 25 seconds of user inactivity.

9 REMOTE MOUSE EMULATOR

9.1 Introduction

Both the CS-420 and CS-430 have an RS-232 communications port that can be made to emulate a Microsoft® Serial Mouse, and all the computer's functions can be controlled from the Infrared Remote Control. This section details how to setup and use this feature.

9.2 Hardware Connection

Setup of this feature requires the connection of an RS-232 Cable by either of these methods:

- Use a (Null Model) Serial Cable to connect the Scan Converter's RS-232 Connector to the first spare COM port on the computer (usually COM 2, but use COM 1 if it is available).
- Disconnect the Mouse from the computer and use an RS-232 Sharer Cable to connect the computer to the Scan Converter by plugging the Mouse back into the RS-232 Sharer Cable.



9.3 Scan Converter Setup

Make sure that RS-232 Mode is set to Mouse (and not 'Control') within the Advanced Menu of the On-screen Display. (RS-232 Control is the default.)

9.4 Using the Mouse Emulator

The Scan Converter uses the computer's standard mouse driver, saving the need to load additional software. Just turn your computer on with Scan Converter attached as described above. If you are using an RS-232 Sharer Cable, both the existing Mouse and the Scan Converter's Remote Control will share the same COM port and software driver. If you are using a separate COM port for the Scan Converter, the computer may recognize that a Mouse is attached when booting up. If it does not, run "Add New Hardware" from the computer's Control Panel to automatically install the "Standard Serial Mouse" driver.

- Use the Remote Control's four Arrow Buttons to move your mouse pointer around the screen.
- L.CLICK (left click) has the same function as a single left click of a standard mouse button.
- D.CLICK (double click) has the same function as a double left click of a standard mouse button.
- R.CLICK (right click) has the same function as a single right click of a standard mouse button.

9.5 Toggling Zoom/Pan and Mouse Modes

Both the Zoom's Pan feature and Mouse Emulation feature can be used at the same time. You can toggle the Arrow Key usage by pressing the PAN button on the Remote Control. If you find the Arrow Keys not controlling the Mouse pointer, simply press PAN once to deselect the PAN Mode. Similarly, to reactivate PAN Mode (to slide a zoomed image around the screen), press PAN again.

10 ADVANCED... (OSD ADVANCED ADJUSTMENTS)

These adjustments are accessed in the same way as the previous OSD features. Press the MENU Button repeatedly until the OSD Menu displays the message 'Advanced...'. Then, press the + Button to select the Advanced Sub-Menu. Subsequent pressing of the MENU Button will select the next Advanced Menu feature to alter.

Note - Any of these new settings can be stored using the 'STORE' Button on the Remote Control.

10.1 Video Std. - PAL/NTSC

This is to set the Scan Converter's output video standard to either NTSC or PAL, as required.

- Press the + Button for PAL or the - Button for NTSC. The image now being displayed on the video monitor should be in color. If the image is not in color and the correct video standard is being used, refer to the Troubleshooting section in this manual.

10.2 Sense - 1, 2 or 3

This is the level used when the unit performs the AutoSet™ function, i.e., to find the picture edges. The default level is 2, but you may need to change this to 1 to improve the edge detection.

- Press the - Button to reduce the number, and the + Button to increase it.

10.3 Infrared On/Off

This function allows you to disable the Infra Red remote control for use with the unit.

- Then you can turn the Infra Red off by pressing the - button or on using the + button.
- This is useful in situations where two Scan Converters are used near one another. Turning off the Infrared will prevent the Infrared Remote Control from affecting both units.

Note - This feature is completely independent of the Remote Control's LOCK Button.



10.4 RGB Term. Auto/Off

If your image is extremely dark or bright, it might mean that the signal from the computer is not being terminated properly. In most cases, the Scan Converter should be set to Auto, which means that it will automatically detect whether or not a computer monitor is connected to the VGA OUT connector on the back of the Scan Converter and adjust itself accordingly.

- Press the – Button to turn the termination Off, and the + Button to switch to Automatic Mode.
- Keep the unit in Auto Mode, unless you find that BOTH your computer and TV displays are dimmer than they should be, in which case turn the RGB Term. Off.

10.5 RS-232

The RS-232 Serial Port on the CS-420 and CS-430 can be used for either Mouse Emulation or Computer Control of the unit, but not both at the same time.

- In order to use the Infrared Remote Control to emulate a Mouse, this RS-232 adjustment must be set to Mouse Mode.
- Similarly, to use a serial connection from the computer to control the unit, it must be set to RS-232 Control Mode. **Note** - The default is RS-232 Control Mode.
- Press the – Button to switch to Mouse Mode, and the + Button to switch to RS-232 Control Mode.

10.6 Baud Rate

In order to control the Scan Converter from a computer, it is necessary to set the same baud rate for both the unit and the controlling computer. The Scan Converter does not display the actual baud rate, but rather a number relating to it. The table in a later section of the manual on RS-232 Computer Control, shows which Baud rate each number represents. For example, to set it to 9600 Baud, the number would be set to 22.

- The Scan Converter default setting is "9600,N,8,1", i.e., no parity is used, 8 data bits are required, and 1 stop bit.
- This number is only used in RS-232 Control Mode. Mouse Mode ignores this number and always uses 1200 Baud.
- Press the + Button and the – Button to change to the required number.

10.7 RS-232 ID

Many units can operate off the same RS-232 connection, so this setting provides an ability to control each unit independently. Set this value to a different number on each unit (from 0 to 255), and read the instructions later on how to use it. The default value is 0.

10.8 Sound - On/Off

This provides a simple way of turning the unit's sound on and off, so you won't hear the beeping during setup.

- Press the – Button to turn sound Off and the + Button to turn it back On again.

Exit - Pressing the + Button will return you to the Main Menu.

11 RS-232 COMPUTER CONTROL OF THE CS-420 AND CS-430

11.1 Setup

All of the functions for the CS-420 and CS-430 can also be controlled via a computer by using the RS-232 port on the unit, an RS-232 Serial Cable and a terminal emulation program on the computer. Alternatively, the Scan Converter can be controlled from your own custom software, provided that you have skills and resources to set up a serial communications port in the programming language you are using.

The Scan Converter uses the following settings on its communications port:

- 8 bit data, no parity, 1 stop bit
- No flow control
- Set the Baud rate on the computer and the Scan Converter to the same value (usually 9600)

Instruction on how to set the above port settings can be found within your own systems help file or the help file of the software you wish to use in sending commands. The following method is based on using a terminal emulation program.

11.2 Sending Commands

- Open the terminal program you wish to use and set the desired port to the settings listed above. You may need to set "Echo" on, to see what you are typing.
- Ensure that you have the Scan Converter RS-232 Cable linked from the same serial port that you have set up to the back of the unit. This must be different from the Mouse port used.
- To alter any setting you see displayed on the On Screen Display, simply type in the name of that setting (e.g. 'Flicker Red') followed by a '=' and then the new setting number or value (e.g. '2').
- If you make a mistake with what you are typing (i.e. your text does not match one of the internal messages in the Scan Converter), then a '?' will be shown next to the offending character.
- Pressing Return at the end of the text will make the Scan Converter act on the command you have given it.

For example. type in:

Flicker Red=2

followed by Return.

The Scan Converter will reply with '>', to confirm that the command has been received, understood and executed.

To find out what the current setting of a function is just type the name of that function and press Return (i.e., without the '=' sign).

For example, type in:

Flicker Red

followed by Return.

The unit will return with the current setting (either 2 or 4).

11.3 Responses to Commands

The response from the Scan Converter can be one of three things:

- ? if something is not understood, e.g., an adjustment name is misspelled.
- > if the command has been executed.
- nnnnn (i.e., a five digit number from 0 to 99999, followed by a CR and LF) if a setting value is returned.

11.4 Notes on Sending Commands

- Settings that are one of two values (e.g. NTSC or PAL), have to be sent as 0 or 1. 0 corresponds to the Off or '-' state, and 1 corresponds to the On or '+' state.
- You only have to send a maximum of 4 characters in order for the command name to be recognised, e.g., "Flicker Red = 2" could be shortened to "Flic = 2".
- Spaces and line-feeds (ASCII code 10) are completely ignored.
- The case is ignored (i.e., you can use upper case or lower case).
- You must always send a carriage-return (ASCII code 13) at the end of your command or value request.
- The Scan Converter response should at most be within 20ms of the receipt of the carriage-return character. Of course, delays due to slow baud rates will play a greater part than this.
- The Scan Converter input buffer is limited to 32 bytes, so do not send any more characters (including CR, LF, etc.) than this.
- For more information on controlling the different functions see the relevant sections earlier in this manual.
- Not all the commands available are listed within the OSD Menus. See the table for a complete list of commands available.



11.5 Restricting RS-232 Commands to Certain Units

If you have a number of units all connected to the same computer serial port, i.e., running in parallel, then you can use the RS-232 ID feature to restrict certain commands to go to only certain Scan Converters. The following points outline this method:

- Make each 'RS-232 ID' setting unique to each Scan Converter, unless you want multiple units to respond to the same commands (in which case, make them the same ID value). The default value is 0.
- Send the command 'ID Restrict nnn' where nnn is the number of the Scan Converter you wish to control (from 0 to 255).
- Follow this with the commands you wish to send. Units where 'RS-232 ID' is not identical to the 'ID Restrict' value will not respond to or acknowledge these commands.
- To disable this feature, you have to make the RS-232 ID the same on all units (recommended value 0), and of course set 'ID Restrict' to this value.

11.6 Changing Baud Rates

Details on how to change the Baud rate are in the Advanced Features section of this manual, but the relationship between number and baud rate is given in the table below.

Any number up to 191 can be selected, but only certain Baud rates are generally used. The most common ones are outlined in the table below. For numbers not included in the table, the Baud rate associated with those numbers can be found by using the following equation:

$$Baud = \frac{223722}{Number + 1}$$

So to obtain the relevant number to be used:

$$Number = \left(\frac{223722}{Baud} \right) - 1$$

Table of commonly used baud rates

Baud Rate	No.	Baud Rate	No.
115200	1	14400	15
57600	3	9600*	22*
38400	5	4800	46
28800	7	2400	92
19200	11	1200	185

*22, Baud rate = 9600 is the default setting.

Table of all RS-232 commands available

Adjustment	Values*	Comment
AutoSet	0 or 1	Set to 1 to initiate Auto Track
Baud Rate	0 to 191	Actual baud rate = 223722/(n+1)
Buttons	Off, On	On=disable front-panel
Clock width:	2 to 3	Adjustment not recommended
DAC Ref.	5 to 25	Brightness level
Flicker Red.	2, 4	Lines of flicker reduction
ID Restrict	n	Restricts RS-232 control only to those units which have RS-232 ID already set to this value.



Image Freeze	Off, On	On=Image Frozen. Do not adjust any other settings when this is active.
Infra Red	Off, On	On=Infra red remote control is enabled.
Locked	Off, On	On=Disables all front-panel buttons and infrared remote control functions. If you Store this value, the only way out is a Factory Reset!
Overscan	Off, On	On=Overscan
Out H-Center:	n	Adjusts image left/right position
Out H-Width:	n	Adjusts image width
Out V-Center:	n	Adjusts image up/down position
Out V-Height:	n	Adjusts image height
Pan X Pos:	n	Adjusts Pan left/right position when in Zoom mode (higher value = Panned to the right).
Pan Y Pos:	n	Adjusts Pan up/down position when in Zoom mode (higher value = Panned to the bottom).
Reset	Off, On	On=does a reset to user settings. Automatically goes back to Off.
RGB Term.	Off, Auto	Auto=try to detect if monitor is attached, and terminate RGB appropriately.
RS-232	Mouse, Control	If you change this to Mouse, RS-232 commands will no longer function!
RS-232 ID	0 to 255	Sets the unit's RS-232 identification, where multiple units are controlled from one serial port.
Sense	1 to 3	Adjusts the AutoTrak feature's sensing level
Sound	Off, On	Turns the internal speaker on or off.
Store Settings	Off, On	On=set the current settings as the user (power-on) default. Returns to Off automatically.
Total Lines	Read only	Returns number of lines in PC image - including vertical blanking lines.
Vert. Freq	Read only	Returns vertical frequency of PC image (to nearest 1Hz).
VGA Bot/4:	n	Tells the unit where the bottom of the image is within the PC signal. (divided by 4).
VGA Left:	n	Tells the unit where the left-hand edge of the image is within the PC signal.
VGA Store	n	Stores the VGA settings, so they are used in the future.
VGA Top/4:	n	Tells the unit where the top of the image is within the PC signal. (divided by 4).
VGA Width:	n	Tells the unit how wide the image is within the PC signal.
Video Std	NTSC, PAL	Sets the video standard
Zoom	Off, On	Turns zoom mode on and off

*Where two text values are given (e.g. Off, On), the first relates to the setting used when '0' is sent to the unit, and the second relates to the setting used when '1' is sent to the unit.

12 GETTING THE MOST FROM YOUR SCAN CONVERTER

These products are high quality scan converters with many functions and applications. The aim of this section is to help you exploit some of these applications and functions to get the best possible results.

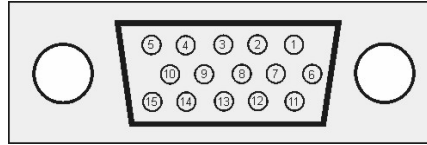
Hints & Tips

1. Use S-Video in preference to Composite Video, if your equipment has such an input. S-Video keeps the color and brightness in a video signal separate, whereas Composite Video requires extra filters to separate them electronically - these filters degrade the image.
2. Don't forget the ZOOM. If you have problems reading the small text, then selecting the ZOOM Mode will make things much easier, especially if using the Composite Video output. This is particularly useful for presentations.
3. Zoom Modes may require a different Flicker Reduction setting. Lowering the Flicker Reduction value may help to increase legibility of small text.
4. The lower the graphics resolution and refresh rate, the better the image quality. All scan converters store the computer image to be converted to video in their own internal memory, and to do so the computer image has to be 'sampled' many times during each scan-line. Each sample stores one pixel of information in the memory. The number of samples taken is proportional to the image quality - i.e. the more samples the better. Higher graphic resolutions take less time to display each scan line than lower ones, so it means that there will be more samples per line for lower resolution modes because there's more time for more samples to be taken, therefore, a better image quality will result.
5. The lower the graphics resolution, the better the 'vertical' image quality. TV's have a fixed number of lines available for displaying pictures - for PAL it is 576, for NTSC it is 480, although some of these are off the top and bottom edges of the screen. So, the more scan lines a graphics resolution has (e.g. an 800x600 resolution has 600 scan lines), the more difficult it is for your Scan Converter to squeeze all these lines into the limited number available on the TV. So lowering your graphic resolution will help improve image quality. (Remember to run AutoSet after you change the resolution).
6. If you experience line dropping, use a higher Flicker Reduction setting. For lower resolutions like 640x480, you may even need to reduce the Flicker Reduction setting to 2-Line. At very high resolutions like 1280x1024, you may wish to consider using a Scan Converter with 6-Line Flicker Reduction ability, like the CS-430.
7. Cables and Connectors. Using good quality cables and connectors like the ones supplied with your Scan Converter unit and ensure that all connectors are properly connected to help maintain a high picture quality.
8. Designing your Display or Presentation. When setting up an image for display or putting together your presentation, keep in mind that people might have to view it from a distance. Using a font that is well defined, graphics and pictures that are uncluttered will all add to the legibility of your display or presentation. Try to make text well spaced and larger than you normally use. Think about the colors you are going to use. Colors that stand out from each other are better for viewing at a distance. As mentioned earlier, choosing the right screen resolution will also add to the clarity and quality of your display. It is worth spending some time experimenting with different screen resolution settings, which will optimize your Scan Converter to its full potential.
9. Freeze function. This function is useful if you wish to change to another image or layout while maintaining an image on your video monitor. For example, when you wish to change from a program that is displaying text to a program that displays a graphic. Before you close the text display program, Freeze the image on the video screen that you are using. You are then free to change to the graphic image program. Once this is done, you can unfreeze the image on the video screen, which will then display your new image. People watching the video monitor would have only seen the text image followed by the graphics image and they would not have seen you close one program and open another.

13 TECHNICAL DATA

13.1 Computer Input

Input to the Scan Converter is via an HD-15 connector.



Pin	Use
1	Red 0.7v max. / 75 Ohms
2	Green 0.7v max. / 75 Ohms
3	Blue 0.7v max. / 75 Ohms
4	ID 2, passed to PC monitor pin 4
5	Ground
6	Red ground
7	Green ground
8	Blue ground

Pin	Use
9	Passed to PC monitor pin 9
10	Ground
11	Ground
12	ID 1, passed to PC monitor pin 12
13	Horizontal Sync TTL
14	Vertical Sync TTL
15	Passed to PC monitor pin 15

13.2 Sub Carrier Adjustments

These presets are Factory Set and should not need adjustment. However, if the colors of your displayed image are not the purity they should be (or the image is black/white), the subcarrier setting may require adjustment. Adjusting the frequency of the PAL or NTSC clock should only be done at the direction of a Factory Engineer. Please call Technical support if you feel this adjustment is necessary.

13.3 Fuse Replacement

The DC fuse is on the main circuit board inside the unit, however, this rarely needs replacing. If replacement is necessary of either fuse, be sure to use the same type and size as the original.



14 TROUBLESHOOTING

Note - If the recommended actions still do not result in satisfactory operation, please consult your TV One Dealer. Before calling for technical assistance, if the problem is image related, please try to find out the screen resolution and refresh rate being used, from the computer - and if the problem only affects one particular resolution.

Problem	Remedy
The picture on the video display is black and white.	<ol style="list-style-type: none">1. If you are using the S-Video or Composite outputs, then make sure that all these cables are connected correctly.2. Make sure that the Scan Converter is adjusted to the right video standard PAL/NTSC (The procedure to change this is found elsewhere in this manual).3. Ensure that the color controls on your TV or video monitor are all set correctly.
There is no picture on the video monitor.	<ol style="list-style-type: none">1. If you're using the unit with a laptop computer, make sure the laptop is set to enable an external display device. Some laptops automatically detect external video connections, but others will need setting up to do so. This is often accomplished by pressing two keys simultaneously on the keyboard.2. If the Power LED on the Scan Converter is off, ensure that the proper AC Power is being supplied to the unit and check the fuse (The procedure located elsewhere in this manual).3. If the Power LED is on: a) Check that the monitor output from the computer is connected to the Scan Converter's VGA IN connector, b) Check that the output you are using from the Scan Converter is also connected at the unit and the video monitor, and c) Check that your video monitor is switched on and set to the correct input (AUX or A/V is selected), also make sure that the Brightness and Contrast on the video monitor are set correctly.
There is no picture on the computer monitor.	<ol style="list-style-type: none">1. Check that the VGA output from the computer is connected to the Scan Converter's VGA IN connector.2. Check that the computer monitor is connected to the VGA OUT connector on the back of the Scan Converter.3. Check that your computer monitor is turned on and the Brightness and Contrast are set correctly.
The display on the TV has a huge border around it.	<ol style="list-style-type: none">1. This usually means that you are using a laptop computer at a resolution lower than the laptop's own screen. When this happens, the laptop fits the smaller resolution into the larger with a border around the edge.2. Since the laptop's screen is of a fixed resolution, the only two solutions are: a) change the resolution you're running at to match the laptop's own internal screen, or b) disable the laptop's own screen, so you just see the image on the video monitor.
The unit does not respond to the Infrared remote control.	<ol style="list-style-type: none">1. Ensure that there are batteries in the Remote Control unit are correctly inserted and that they have enough charge left.2. Make sure that there is no obstruction in front of the Scan Converter's Front Panel Infrared Window.3. Ensure that the Scan Converter is set for control from the IR unit (The procedure to change this is found elsewhere in this manual).
There is excessive flicker on the TV.	<ol style="list-style-type: none">1. Try using a different Flicker Reduction Filter setting (The procedure to change this is found elsewhere in this manual).2. Turning the contrast down and the brightness up on the video monitor can also have a large effect on flicker.

<p>The TV image is distorted.</p> <p>Continued...</p> <p>The TV image is distorted.</p>	<ol style="list-style-type: none"> 1. This often occurs where some of the areas of the image are very dark and others are very bright. These extreme changes in the image are difficult for your video monitor to deal with. 2. Try adjusting the contrast and brightness settings on your video monitor to rectify the problem. On some older or very inexpensive TVs this effect is unavoidable, as they may not be designed with computer images in mind and, therefore, show 'bowing' at the sides for some graphic images. The only solution is to adjust the brightness and contrast on the TV - the Scan Converter is not at fault and cannot correct problems with these type TVs. 3. If the problem still persists it may be due to the screen size settings. Try adjusting the image and its position on the screen.
<p>Some colors come out wrong on the video monitor.</p>	<ol style="list-style-type: none"> 1. Try altering the color (saturation), hue (tint), contrast and brightness settings on your TV or video monitor. These are usually set up for viewing TV programs or video, which is very different from viewing computer graphics. 2. If you are using the RGB video output from the Scan Converter, make sure that the cable is correctly attached to both it and the video monitor.
<p>How can I reduce smearing?</p>	<ol style="list-style-type: none"> 1. Smearing usually occurs on Composite Video connections, and is generally unavoidable, unless you can switch to using S-Video or RGB connections (See connection details elsewhere in this manual). It occurs because the luminance and color information is combined as one signal and the two parts have to be 'bandwidth-limited' to avoid them interfering with each other. 2. Using good quality video cable will help towards reducing this affect.
<p>How do I use the unit with a VCR?</p>	<ol style="list-style-type: none"> 1. Connect one of the Scan Converter's video outputs to the VCR's input. You won't be connecting to the Antenna connector on the VCR, but rather, to one of the VCR's AUX (Auxiliary) inputs, so, therefore, you must elect the proper setting on the VCR's input selector (often it's channel 0, AUX 1, AUX 2, etc). 2. Follow the VCR's recording instructions.
<p>The recorded image is poor.</p>	<ol style="list-style-type: none"> 1. Standard VHS videos are not very good at recording the fine detail present in computer graphics. S-VHS decks offer much better quality, while professional decks will be even better. 2. Color smearing is usually the first thing that causes a problem, but this is because your VCR isn't capable of recording the picture in its full resolution. Try lowering the computer screen resolution; this will bring the image more in line with what your VCR is used to dealing with.
<p>The mouse emulation isn't working.</p>	<ol style="list-style-type: none"> 1. Check that the RS232 cable is connected correctly to both the RS232 port on the back of the Scan Converter and to the Serial Port that the computer uses for the mouse. 2. Check that the Scan Converter is setup for the Mouse and not Serial control. Check that the Infrared Remote Control has good batteries installed and that the Scan Converter is configured to work from the remote. 3. The Scan Converter uses the standard Microsoft® Serial Mouse driver. It will not work with other mouse drivers. If problems arise, it is recommended that the computer be started up with its normal mouse connected, once the computer has finished booting up and the mouse confirmed working, it can be swapped over with the Scan Converter's RS232 cable.



15 WARRANTY POLICY

LIMITED WARRANTY – TV One warrants the original purchaser that the equipment it manufactures will be free from defects in materials and workmanship for a period of two years from the date of purchase. Should this product, in TV One’s opinion, prove defective within this warranty period, TV One, at its option, will repair or replace this product without charge. Any defective parts replaced become the property of TV One. This warranty does not apply to those products which have been damaged due to accident, unauthorized alterations, improper repair, modifications, inadequate maintenance and care, or use in any manner for which the product was not originally intended.

If repairs are necessary under this warranty policy, the original purchaser must obtain a Return Authorization Number from TV One and return the product to a location designated by TV One, freight prepaid. After repairs are complete, the product will be returned, freight prepaid.

LIMITATIONS - All products sold are "as is" and the above Limited Warranty is in lieu of all other warranties for this product, expressed or implied, and is strictly limited to two years from the date of purchase. TV One assumes no liability to distributors, dealers or end-users for any loss of use, revenue or profit.

TV One makes no other representation of warranty as to fitness for the purpose or merchantability or otherwise in respect of any of the products sold. The liability of TV One with respect to any defective products will be limited to the repair or replacement of such products. In no event shall TV One be responsible or liable for any damage arising from the use of such defective products whether such damages be direct, indirect, consequential or otherwise, and whether such damages are incurred by the reseller, end-user or any third party.

16 COMPLIANCE NOTICE

This equipment has been tested to determine compliance with the requirements of:

EN 55022	CE emissions standards, Class B
EN-50081	Generic Immunity standard for residential, commercial and light industrial)
CFR-47	FCC Rules and Regulations: Part 15- “Radio frequency devices: Subpart B- Unintentional radiators

CAUTION!

- ☒ Servicing the Scan Converter can only be done by an authorized TV One technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- ☒ Please use recommended interconnect cables to connect the machine to other components.
- ☒ When used, it is assumed that the unit is grounded by normal means (e.g. via the computer video input cable, rack-mount chassis ground, or video output cable to display device). Use of the equipment without any form of grounding may affect radiated emissions, but will not affect the product's safety.

17 CONTACT INFORMATION

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