

**TV One CS-400 Select & CS-320 Connect  
User's Manual**

**Release 3.00**

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# Introduction

The CS-320 Connect and CS-400 Select scan converters, are powerful assistants for presentations, conferences and exhibitions - in fact anywhere that a need exists for a quality video output from an easy to use unit, when converting text and graphics from a computer.

The CS-320 Connect is the base-line unit, offering:

- ◆ Absolute maximum of 1600x1200 resolution (1024x768 recommended)
- ◆ 4-line flicker reduction for super-stable image on TV
- ◆ Automatic screen adjustment
- ◆ Full-feature infra-red remote control
- ◆ Quick adjust panel buttons for Overscan and Freeze
- ◆ 2x Zoom & pan
- ◆ No driver software required
- ◆ Composite Video, S-Video, RGB outputs
- ◆ Loop-thru to VGA monitor
- ◆ NTSC & PAL switchable
- ◆ Non-volatile memory saves all settings
- ◆ Button Lock feature prevents settings being altered by accident
- ◆ Remote control Lock-out perfect for education and exhibitions
- ◆ Works with very high refresh rates

The CS-400 Select is the higher-level unit, with additional features:

- ◆ Brightness Control - allows video output from the unit to be adjusted to match other video hardware, such as playback of a video tape.
- ◆ On-screen display for ease of use
- ◆ Microsoft® Serial Mouse emulation on infra-red Remote Control
- ◆ Port sharer supplied allows Microsoft® Serial Mouse and infra-red mouse to be connected at the same time
- ◆ RS232 interface for control of unit from your software
- ◆ Dual video outputs (Composite Video and S-Video) make Presentation setups easier.

# Credits

Hardware and Software designed by R.P.D. Mallett, A.W. White BEng AMIEE, and A.J. Reid.

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# Getting Started

*This manual covers both the CS-320 Connect and CS-400 Select - the latter's extra features are covered in a separate section in this manual.*

## ***Package Contents:***

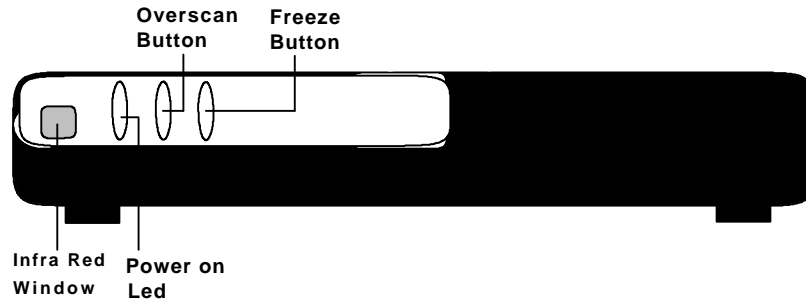
### **CS-320 Connect**

- ◆ 1 x CS-320 Connect unit
- ◆ 1 x Infra Red Remote Control with Batteries
- ◆ 1 x 12v DC Power Adapter
- ◆ 1 x 1 meter Computer Cable with HD-15 Connectors
- ◆ 1 x 2 meter Composite Video Cable with RCA Connectors
- ◆ 1 x 2 meter S-Video cable with 4 pin mini-DIN Connectors
- ◆ 1 x User manual & quick setup guide

### **CS-400 Select**

- ◆ 1 x CS-400 Select unit
- ◆ 1 x Infra Red Remote Control with Batteries
- ◆ 1 x 12v DC Power Adapter
- ◆ 1 x 1 meter Computer Cable HD-15 Connectors
- ◆ 1 x 2 meter Composite Video Cable with RCA Connectors
- ◆ 1 x 2 meter S-Video cable with 4 pin mini-DIN Connectors
- ◆ 1 x 1 meter RS232 port-sharer cable
- ◆ 1 x User manual & quick setup guide

## *Front Panel Button Functions - CS-320 Connect*



### **Power-on LED**

When the CS-320 Connect is powered the button labeled POWER will illuminate green. It will flash if either of the Button or Remote Control Lock functions are enabled, as described later in the manual.

### **O/Scan (Overscan) Button and LED**

The O/Scan button mimics the remote control key of the same name, and is described later in the manual. When in O/Scan mode this button will illuminate.

### **Freeze Button and LED**

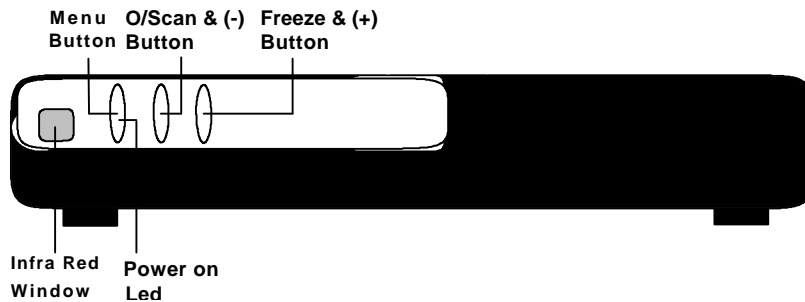
The Freeze button mimics the remote control key of the same name, and is described later in the manual. When in Freeze mode this button will flash, to warn the user that other controls are disabled.

### **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 O/Scan and Freeze button 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.
- ◆ Set to NTSC mode. This is done by holding the O/Scan 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 removed.
- ◆ 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 removed.

### ***Front Panel Button Functions - CS-400 Select***



#### **Power-on LED and Menu button**

When the CS-400 Select is powered the button labeled POWER will illuminate green. It will flash if either of the Button or Remote Control Lock functions are enabled, as described later in the manual. Pressing this Menu button will start the On-screen display setup of various functions, which are described later.

#### **O/Scan (Overscan) / - (decrease) Button and LED**

The O/Scan button mimics the remote control key of the same name, and is described later in the manual. When in O/Scan mode this button will illuminate. This button is also used to decrease a value displayed with the On-screen display.

#### **Freeze Button / + (increase) and LED**

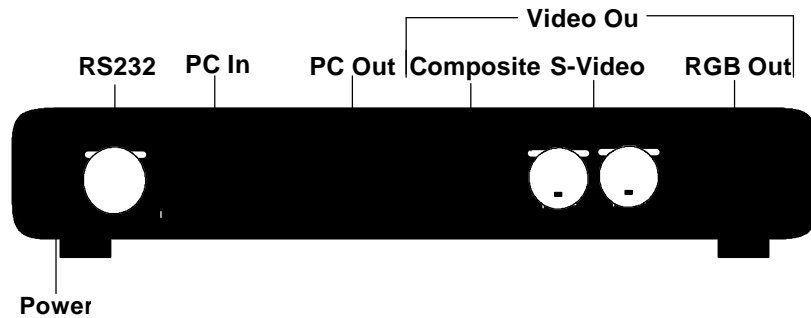
The Freeze button mimics the remote control key of the same name, and is described later in the manual. When in Freeze mode this button will flash, to warn the user that other controls are disabled. This button is also used to increase a value displayed with the On-screen display.

#### **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 O/Scan and Freeze button 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.
- ◆ Set to NTSC mode. This is done by holding the O/Scan 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 removed.
- ◆ 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 removed.

***Connecting & Powering up your CS-320 Connect & CS-400 Select:***



**BEFORE CONNECTING OR REMOVING ANY CABLES IT IS RECOMMENDED THAT ALL EQUIPMENT INVOLVED IS TURNED OFF.**

- ◆ First using the computer cable supplied, connect one end to the VGA output connector on your computer and the other end to the "PC in" connector. Now connect your computer monitor's input cable to the "PC out" connector. Internally, the video signals are looped-through, allowing use even when the unit's power is off.
- ◆ Depending on which video format you are using (Composite, S-Video or RGB) connect the relevant cable, between the connector at the rear of the unit and your TV. Note that there are dual outputs on the CS-400 Select for Composite and S-Video - both are the same.
- ◆ The RS232 connector present on the CS-400 Select is described in detail later in this manual.
- ◆ Connect the power adapter supplied with your unit into an AC Outlet but do not switch on yet, plug the other end in to the power connector on the back of the unit.
- ◆ Before switching on make sure that all cables and connectors are properly attached and in their correct connectors.
- ◆ Switch on your unit followed by your computer and TV, as your computer starts-up you should see a image on the TV and on the computer monitor - but check that you have the appropriate channel or 'AUX' selected on your TV. If no picture is seen, refer to the Trouble Shooting section.
- ◆ If your unit does not display color on the TV, it may be set to the wrong Video Standard (PAL or NTSC). See the earlier section on 'Front Panel Button Functions' for your unit for details of how to change this.
- ◆ Do not worry if the image on your TV monitor is not central or some of the image looks like it may be missing, it just mean's you now need to set your new unit up for use with your computer. See control & set-up.

# Control and Set-up Using the Infra-Red Remote Control

## *Introduction*

By now you should have the unit powered up and working with your computer and TV. If you don't get an image on your TV, please refer to the Troubleshooting section at the back of this manual.

This unit 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, but this has only been done to reduce the number of buttons required to operate the unit.

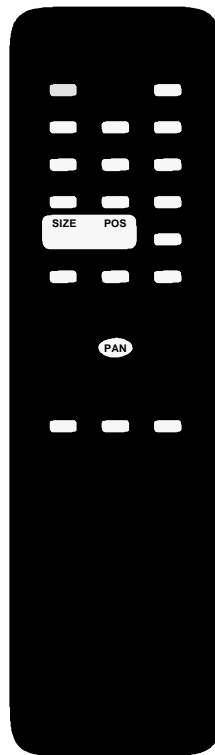
If at any time you find that the remote control or front-panel buttons are not working, then you may have inadvertently pressed the LOCK button on the remote control. Lock mode is indicated by the Power LED on the unit flashing - see later for a description of how to turn this feature on and off.

## *What this section covers*

- ◆ All the infra-red remote control features of the CS-320 Connect and the CS-400 Select.
- ◆ It explains the setup and adjustments for the unit and what effect they have on the final image.
- ◆ How to Store the settings so they are remembered by the unit for next time.

Therefore the following is required reading!

## *Infra Red Remote Control*



### ***RESET***

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.

### ***STORE***

This button is used for saving new settings to the unit's memory and will be remembered even after the unit has been switched off. Just about all feature settings can be saved - eg. 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.

### ***U.SCAN / O.SCAN***

(Underscan / Overscan.) Pressing this button will toggle you between Underscan and Overscan modes.

- ◆ Underscan (sometimes know as Compress mode) will leave a border around your image.
- ◆ Overscan has no border and the displayed image (when set correctly) is larger than your TV monitor screen.

This function is also available via the front-panel button labeled 'O/SCAN'.

The position and size of the image in both modes are user-adjustable, and the method of doing so will be described later under the *SIZE* and *POS* functions.

### ***FREEZE***

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.

Note that the freeze function will only freeze the image on the TV monitor - the image on the computer monitor will not be effected by this function and will carry on displaying images as normal.

No other features are accessible while in Freeze mode, with the exception of *RESET*. This function is also available via the Front-Panel button labeled 'FREEZE' on the unit itself.

### ***AUTOSET***

This is a powerful feature of the CS-320 Connect and CS-400 Select units. Once activated this feature will scan the incoming computer image to determine its size and position - thus optimizing it for display on the desired TV unit.

When your unit first encounters a new screen resolution or refresh rate, it will make a guess on how best to display this on a TV. Sometimes, the guess needs 'refining', and this function makes the unit itself search for the image edges to improve on this.

- ◆ Before running the Autoset function, set your computer so that it is displaying a light colored background or wallpaper with defined edges in full screen mode. If you have windows-based operating system, make sure it is maximized to use the full screen.
- ◆ If you are running MS DOS environment, 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 the Autoset 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. The only exceptions are if you change the setup of the computers 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.

### ***FILTER***

This button will toggle between 2 and 4 line flicker reduction modes. Depending on what you are displaying, the size of the image, fonts you are using and the computer image resolution will depend on what flicker reduction best suits your image

- ◆ 4-line filter will soften the image slightly but will retain most of the image detail and make the image more stable (this is also the units default setting). This is perfect for higher resolutions and CAD drawings.
- ◆ 2-line filter will sharpen the image but you might get a slight loss of fine image detail and some flickering. It may also improve the display when in Zoom mode.

### ***SIZE & POS***

These buttons allow you to adjust the Underscan or Overscan size and position on the TV (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.

Please note: you should ideally have done an AutoSet before making these adjustments, so that the unit knows the size of the "incoming" computer image.

- ◆ The units have 2 modes of display as mentioned earlier (Underscan or Overscan). So it is important to have the correct one selected before proceeding to change the values. The 'O/SCAN' red LED will be lit in Overscan mode - ie. when the image should fill the screen. Underscan modes 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 outputs - adjusting one will not affect the other.
- ◆ Once adjusted, STORE the setting for future use.
- ◆ Note that you are setting the screen size for one particular TV (the one you are watching the results on), and the size may appear different on another TV. This is not a fault with the unit, but merely demonstrates that no two TVs are exactly alike.

## ***ZOOM***

This function allows you to view a section of the video image at twice the normal size, and is useful for showing computer images and programs in more detail. This could be useful in training applications.

Enter the Zoom function by pressing ZOOM on the IR remote control. 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-up (from power on) in Zoom mode, and in a particular pan position. This may be useful for certain applications - such as video conferencing when using a video-in-a-window card.
- ◆ You can adjust other settings while in Zoom mode.
- ◆ (With the CS-400 Select, you may need to press the PAN button to restore control over the Zoom position, after adjusting other settings.)

## ***LOCK***

Pressing this button once will disable your unit's front panel buttons. To re-enable the front panel buttons simply press the LOCK button again. This setting can be STORED, to prevent people from adjusting the unit without the remote control.

Pressing the button twice (within 1.5 seconds of each press) will lock both the front-panel buttons and the remote control - use with care! This setting cannot be stored, because of course 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 buttons and 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.

This feature is intended for use where the settings of the unit should not be disturbed - eg. in an educational environment, or at an exhibition.

## ***LEVEL***

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 (CS-400 Select version only)- will adjust the brightness of the image coming from the unit. This is very useful to match this unit's brightness with that from a video player, thus preventing the need to adjust the TV when changing from displaying computer graphics to playing a video tape.
- ◆ 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 you are left with a image that is too big

for the TV 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 the AUTOSET after changing the sense setting to ensure a good image on the TV.

E.g. Press LEVEL followed by 1, and then adjust the picture brightness with the up and down arrow keys.

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

### ***MANUAL SET***

This function should only be needed when the AutoSet has failed for some reason, or the Computer image that you are using has a dark background which Auto Set cannot see. Please read the notes on AutoSet & Level adjustments in the Infra-red Remote Control section before adjusting these parameters, in case something else will solve the problem.

With these adjustments you can manually set what area of the computer's image is to be used for display on your TV.

It is highly recommended that this method is only used when in Underscan mode, or you will not know if you've adjusted the values correctly.

- ◆ Press AUTOSET on remote control twice (within 1.5s) - two 'beeps' will be heard.
- ◆ Adjust Top and left-hand edge by pressing the arrow keys.
- ◆ Press AUTOSET again.
- ◆ Adjust Bottom and right-hand edge by pressing the arrow keys.
- ◆ Press AUTOSET - this will give a high beep to indicate that this has been saved.

Manual set mode times-out after 20s - ignoring any settings.

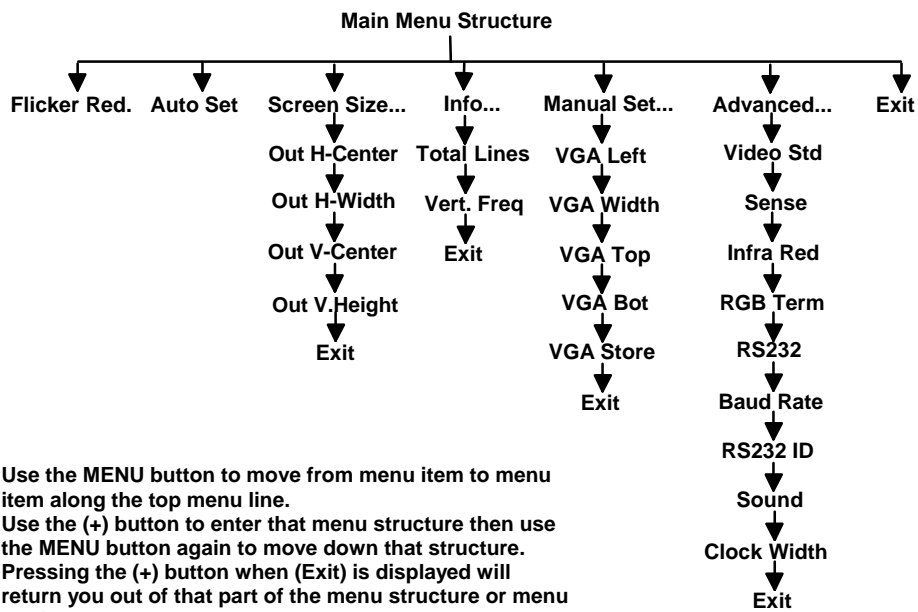
# CS-400 Select On-Screen Display

## Introduction

As well as being controlled via the Infra-Red hand controller, the CS-400 Select can be controlled further using the front panel button array, in conjunction with the On Screen Display menu (OSD). This feature also allows access to information relevant to the current settings of the unit.

## Activating & Navigating the On-Screen Display (OSD)

Pressing the MENU button will activate the CS-400 Select's On Screen Display (OSD) function, presenting you at the start of the Menu Structure. 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.



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.

**Example:**  
If you wish to change the Sense setting press the MENU button until (Advanced...) is displayed. Use (+) button to enter this sub-menu. Now press the MENU button until (Sense) is displayed, you can use the (+) or (-) buttons to change its value.

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 '+' key will then exit back to the previous menu, or terminate the OSD.

### ***Flicker Red.***

Performs the same function as mentioned with the infra red remote control, where you can set the flicker reduction to either 2 line or 4 line use.

### ***Auto Set***

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

### ***Screen Size...***

This allows entry into a sub-menu (using + button), to set the SIZE and POS settings also found on the infra-red remote control.

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

- ◆ Pressing the (+ button) will moves the image to the right, pressing the (- button) will moves it to the left.
- ◆ Adjust until the image is centered horizontally on the screen.

#### **Out H-Width - altering the display's width**

- ◆ Press the (+ button) to increase the width of the picture and (- button) to decrease it.
- ◆ 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 and (+ button) to move it down
- ◆ Adjust until the image is centered on the screen vertically

#### **Out V-Height - altering the display's height**

- ◆ Press the (+ button) to increase the picture height and (- button) to decrease it.
- ◆ Adjust until the desired height of the image is obtained.

You can cycle back round to any one of these adjustments by pressing the MENU button until the desired one is displayed again.

### **Exit**

To exit these adjustments press the (+ button) when 'Exit...' is displayed.

### ***Info...***

This sub menu allows access to information relevant to the current screen resolution, and is used by the CS-400 Select unit to determine correct settings when converting from computer signals to a video output signal that will be displayed on a TV.

#### **Total Lines - for information only**

- ◆ The number that appears here shows the total number of horizontal video lines that are outputted by the Computer per picture. This value cannot be altered, and is for information only.

#### **Vert. Freq - for information only**

- ◆ This number indicates the number of pictures displayed by the Computer every second. This value typically ranges from 60 to 85Hz, but can go higher.

#### **Exit**

Press + when Exit appears to exit back to the main menu function.

### ***Manual Set...***

This function should only be needed when the AutoSet has failed for some reason, or the Computer image that you are using has a dark background which Auto Set cannot see. Please read the notes on AutoSet & Level adjustments in the Infra-red Remote Control section before adjusting these parameters, in case something else will solve the problem.

With these adjustments you can manually set what area of the computer's image is to be used for display on your TV.

It is highly recommended that this mode is only used when in Underscan mode, or you will not know if you've adjusted the values correctly. The 'VGA Store' option can be used to save your new settings in the unit's memory even after it has been switched off.

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

#### **VGA Left**

- ◆ Adjust this value using the '-' until you notice that some of the image is lost, and then press '+' to come back one step.

#### **VGA Width**

- ◆ Do the same for the right hand image, but this time pressing + until the image just starts to be lost, and then press - once.

#### **VGA Top**

- ◆ Press the + button until the top edge of image is lost, or becomes discolored then press - once.

#### **VGA Bot (bottom)**

- ◆ Press the - button until the bottom edge of image is lost, then press + once.

If you wish to go back and change any of the above adjustments press the MENU button until the desired adjustment is being displayed then + or - to alter it's setting.

**VGA Store**

Press + once to store your new settings. They will now be remembered in the CS-400 Select'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.

***Advanced...***

These options are described later in the manual.

The on-screen display times-out after about 25 seconds of user inactivity.

# CS-400 Select Mouse Control

## *Introduction*

The CS-400 Select has an RS232 communications port that can be made to emulate a Microsoft® Serial Mouse, and all the features are controlled from the infra-red remote control. This section details how to setup and use this feature.

## *Hardware setup*

Setup of this feature requires the connection of the RS232 sharer supplied with this unit:-

1. Dis-connect your mouse's 9-pin 'D' connector from the back of the computer.
2. Connect the supplied RS232 sharer cable from the 5-pin mini-DIN 'RS232' connector on the back of the CS-400 Select unit to the now empty mouse port on the computer.
3. Re-connect your mouse to the spare connector on the supplier RS232 sharer.

## *CS-400 Select setup*

Make sure that RS232 mode is set to Mouse (and not 'Control') within the Advanced menu of the On-screen Display. (This is the default.)

## *Using the mouse emulator*

The CS-400 Select uses the computer's standard mouse driver saving the need to load additional software, just turn your computer on with CS-400 Select attached as described above.

- ◆ You can use the 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.

## *Toggling Zoom/Pan and Mouse modes*

Both the Pan feature and Mouse emulation feature can be used at the same time, and 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 de-select PAN mode.
- ◆ Similarly, to re-activate PAN mode (to slide a zoomed image around the screen), press PAN again.

## CS-400 Select On-Screen Display Advanced Adjustments

They 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.

Any of these new settings can be stored using the 'STORE' button on the remote control.

### *Advanced...*

#### **Video Std. - PAL/NTSC**

- ◆ Adjust the unit using (+ button for PAL) or (- button for NTSC) for your country's video standard. The image now being displayed on the TV monitor should be in color. (If your image is not in color and the correct video standard is being used refer to the Problem Solving section in this manual.)

#### **Sense - 1, 2 or 3**

This is the level used when the unit performs an AUTOSET - ie. 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 - to reduce the number, and + to increase.

#### **Infra Red 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 units are used nearby, so that the infra-red will not affect both if one has the Infra Red feature turned off. This feature is completely independent of the remote control's LOCK button.

#### **RGB Term. Auto/Off**

If your image is too dark or too bright it might mean that the video signal from the computer is not being terminated properly. In most cases the CS-400 Select should be set to Auto which means that it will automatically detect whether or not a computer monitor is connected to the PC Out connector on the back of the unit, adjusting 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.

#### **RS232**

The RS232 serial port on the CS-400 Select 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 Infra Red remote control to emulate a mouse, this RS232 adjustment must be set to 'Mouse' mode.
- ◆ Similarly, to use a serial link from the computer to control the CS-400 Select, it must be set to RS232 Control mode.
- ◆ Note that the default is 'Mouse' mode.
- ◆ Press the '-' button to switch to Mouse mode, and the '+' button to switch to RS232 Control mode.

### **Baud Rate**

In order to control the CS-400 Select from a computer it is necessary to set the same baud rate for both the unit and the controlling computer. The CS-400 Select does not display the actual baud rate, but rather a number relating to it. The table in a later section on 'RS232 Computer Control' shows which Baud rate each number relates to. For example: to set to 9600 Baud the number would be set to 22.

- ◆ The CS-400 Select default setting are "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 RS232 'Control' mode. 'Mouse' mode ignores this number, and always uses 1200 baud.
- ◆ Press the + and - buttons to change the required number.

### **RS232 ID**

Many units can operate off the same RS232 connection, and 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.

### **Sound - on/off**

This provides a simple way of turning sound on and off on the unit.

- ◆ Press - to turn sound off, and + to turn it back on again.

### **Clock Width - 2 or 3**

It is not advisable to change this unless instructed to by an engineer. The default value is 3.

### **Exit**

pressing '+' will return you to the main menu.

# RS232 Computer Control for the CS-400 Select

## *Set-up*

All of the functions for the CS-400 Select can also be controlled via a computer, using the RS232 port on the unit, the supplied RS232 sharer serial cable and a Terminal emulation program on the computer. Alternatively, the unit can be controlled from your own software, provided that you have skills and resources to set up a serial communications port in the programming language you are using.

The CS-400 Select 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 CS-400 Select 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

## *Sending commands*

- ◆ First 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 CS-400 Select RS232 sharer cable linked from the same serial port that you have set up to the back of the unit. Note that this must be different to 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 (ie. your text does not match one of the internal messages in the CS-400 Select), then a '?' will be shown next to the offending character.
- ◆ Pressing Return at the end of the text will make the CS-400 Select act on the command you have given it.

E.g. type in:

Flicker Red=2

followed by Return.

The CS-400 Select 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 (ie. without the = sign).

E.g. type in:

Flicker Red

followed by Return.

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

### ***Responses to commands***

The response from the CS-400 Select can be one of three things:

- ◆ ? if something is not understood, e.g. an adjustment name is misspelt;
- ◆ > 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.

### ***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 recognized - 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 (ie. 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 CS-400 Select response should at most be within 20ms of the receipt of the carriage-return character. But of course delays due to slow baud rates will play a greater part than this.
- ◆ The CS-400 Select 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.

### ***Restricting RS232 commands to certain units***

If you have a number of units all connected to the same PC's serial port (i.e. running in parallel), then you can use the RS232 ID feature to restrict certain commands to go to only certain CS-400 Select units. The following points outline this method:

- ◆ Make each 'RS232 ID' setting unique to each CS-400 Select, unless you want two or more 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 CS-400 Select unit you wish to control (from 0 to 255).
- ◆ Follow this with whatever commands you wish to send. Units where 'RS232 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 RS232 ID the same on all units (recommended value 0), and of course set 'ID Restrict' to this value.

### ***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:

$$Baud = \frac{230400}{Number + 1}$$

So to obtain the relevant number to be used:

$$Number = \frac{230400}{Baud} - 1$$

### ***Table of commonly used baud rates***

Baud Rate	No.
115200	1
57600	3
38400	5
28800	7
19200	11

Baud Rate	No.
14400	15
<b>9600*</b>	<b>23*</b>
4800	47
2400	95
1200	191

\*23, Baud rate = 9600 is the default setting.

***Table of all RS232 commands available***

<b>Adjustment</b>	<b>Values*</b>	<b>Comment</b>
Auto Set	0 or 1	Set to 1 to initiate AutoSet
Baud Rate	0 to 191	Actual baud rate = 230400/(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 RS232 control only to those units which have RS232 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 infra red 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.

RS232	Mouse, Control	If you change this to Mouse, RS232 commands will no longer function!
RS232 ID	0 to 255	Sets the unit's RS232 identification, where multiple units are controlled from one serial port.
Sense	1 to 3	Adjusts the AutoSet 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 (eg. 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.

## Appendix A - Getting the Most from your Unit

The CS-400 Select and CS-320 Connect 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 from your unit.

### *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 - and hence will give a better image quality.
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 Unit 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. At very high resolutions like 1600x1200, you may wish to consider using the CS-500 unit which 6 line flicker reduction ability.

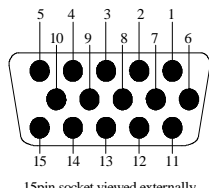
7. Cables and Connectors. Using good quality cables and connectors like the ones supplied with your unit and ensure that all connectors are properly connected to help maintain a high picture quality.
8. Designing your Display or Presentation. When setting up an image for display or putting together your 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 from 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 and settings which will optimize your unit 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 TV monitor, Lets say that 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 TV screen or screen's 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 TV screen which will then display your new image. All that the people watching the TV monitor would have seen is the text image followed by the graphics image they will not have seen you close one program then opening another.

We hope this has given you some idea on how to get the most out of your new unit. There are lots more uses and way to use the CS-320 Connect and CS-400 Select units the only limit is your own imagination.

## Appendix B - Technical Data

### Input

Input to the unit 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

### Resolutions

- ♦ Maximum 1024x768 with no line dropping in NTSC, 1280x1024 in PAL
- ♦ Absolute maximum resolution 1600x1200
- ♦ 24 bit compatible
- ♦ Approx. 24kHz to 100kHz horizontal scan rate
- ♦ Virtually any vertical scan rate accepted - horizontal scan rate is more important

### Synchronization

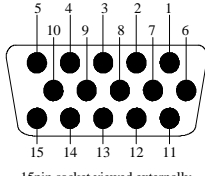
- ♦ Separate TTL-level HSync & VSync positive or negative going

### Outputs

#### Signals

- ♦ Standard VGA 'loop-through' output to go back to monitor
- ♦ PAL & NTSC switchable
- ♦ Composite Video: 1 volt peak-peak on RCA connector(s)
- ♦ S-Video: 1 volt peak-peak on 4-pin mini-DIN connector(s)
- ♦ RGB 0.7v p-p on HD-15 connector

## **RGB output**



Pin	Use
1	Red 0.7v max. / 75 Ohms
2	Green 0.7v max. / 75 Ohms
3	Blue 0.7v max. / 75 Ohms
4	No connection
5	No connection
6	Red ground
7	Green ground
8	Blue ground

Pin	Use
9	+5v through 220 Ohm
10	No connection
11	No connection
12	No connection
13	TTL composite sync through 1k
14	No connection
15	Composite Video output 1.0v p-p

## **Image Scaling & Positioning**

- ◆ Proprietary scaling method
- ◆ Auto-set feature automatically scales computer image to fit TV
- ◆ Underscan & Overscan settings user-adjustable
- ◆ 2x Zoom & panning

## **Image filtering**

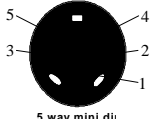
- ◆ Proprietary 2 or 4 line flicker reduction

## ***Control of unit***

### **Control Methods**

- ◆ Infra-red remote control supplied
- ◆ Control via front-panel push buttons
- ◆ Control using OSD (CS-400 Select only)
- ◆ Control via RS232 port. (CS-400 Select only)
- ◆ Emulation of Microsoft® Serial Mouse via RS232 port. (CS-400 Select only)

**RS232/ 5 pin mini-DIN connector**



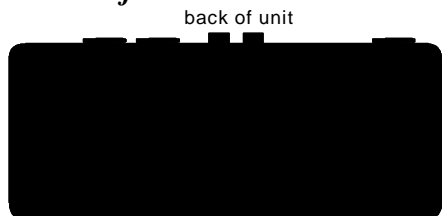
Pin	Use
1	RX - data sent from computer
2	Ground
3	CTS - clear for computer to send
4	TX - data sent to computer
5	RTS - request computer to send

\*RTS is always active, so computer is always allowed to send. CTS is ignored.

***Power requirements***

- ◆ Consumes approx. 300mA @ 12v.
- ◆ Voltage requirements: minimum 12 volts DC, absolute maximum 16v DC.
- ◆ Requires 'center-pin positive' 2.1mm DC power plug input.
- ◆ Reverse polarity protected, internal fuse.
- ◆ Normal 'room temperature' is expected. Operation outside this temperature range is not guaranteed.

***Subcarrier Adjustments - CS-400 Select ONLY.***



*Bottom View of Unit*

These presets are Factory Set before supply 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), you can try adjusting the frequency of the PAL or NTSC clock.

It is a good idea to display a color bar image or a image with lots of different colors in it on your computer while making this adjustment (especially for NTSC). Using a preset adjustment tool, adjust the desired clock preset until the displayed colors are correct.

IF YOU ARE AT ALL UNSURE ABOUT DOING THIS PLEASE CONTACT TECHNICAL SUPPORT.

## Appendix C - Trouble Shooting

If problems are experienced, please go through these help topics to help you resolve the problem. Otherwise, if you need to contact Technical Support, please have the following handy:

1. Details of the problem.
2. Whether the problem happens only at specific times, or has only just started occurring.
3. Hardware and Software revisions, if available. These are displayed on the CS-320 Connect and CS-400 Select when you power-up the unit.
4. 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.

### **The picture on the video display is black and white.**

If you are using the S-Video or Composite outputs, then make sure that all these cables are connected correctly. Make sure that the Unit is adjusted to the right video standard PAL/NTSC (See page 2 to change this). Ensure that the color controls on your TV monitor are all set correctly.

### **There is no picture on my TV monitor.**

If you're using the unit with a laptop computer, you may need to tell the laptop that an external display device is connected. Some laptops automatically detect external video connections, but others will need setting up to do so - often in the form of pressing two keys simultaneously on the keyboard.

If the Green Power LED on the Unit is off, ensure that the power adapter is connected properly. If the LED on the Unit is on, then check that the monitor output from the computer is connected to the Unit's PC IN connector. Check that the output you are using from the Unit is also connected at the unit and the TV. Check that your TV monitor is switched on and set to the correct input (AUX or A/V selected), also make sure that the brightness and contrast are set correctly.

### **There is no picture on the computer monitor.**

Check that the monitor output from the computer is connected to the Unit's PC IN connector. Check that your computer monitor is connected to the PC OUT connector on the back of the Unit, Check that your computer monitor is turned on and the brightness and contrasts are set correctly.

### **The display on the TV has a huge border around it**

You're almost certainly running the unit with 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. Since the laptop's screen is of a fixed resolution, the only two solutions are: 1) change the resolution you're running at to match

the laptop's own internal screen; 2) disable the laptop's own screen, so you just see the image on the TV.

**The unit does not respond to the Infra Red remote control.**

Ensure that there are batteries in the remote control unit are correctly inserted and that they have enough charge left. Make sure that there is no obstruction in front of the Unit's Infra Red window.

(CS-400 Select only) Ensure that the unit is set for control from the IR unit. See page 17 for this adjustment

**There is excessive flicker on the TV.**

Try using a different flicker mode. Turning the contrast down and the brightness up on the TV can have a large effect on flicker.

**The TV image is distorted.**

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 TV monitor to deal with. Try adjusting the contrast and brightness settings on your TV to rectify the problem. On some TVs (usually old ones), 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 your TV - the Unit is not at fault and cannot correct problems with your TV.

If the problem still persists it may be due to the screen size settings, try adjusting the image and its position on the screen.

**Some colors come out incorrectly on the TV.**

Try altering the color, contrast and brightness settings on your TV. These are usually set up for viewing TV programs which is very different from viewing computer graphics.

If you are using the RGB video output from the Unit make sure that the cable is correctly attached to both the Unit and the TV monitor.

**How can I reduce smearing?**

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 on page 4). It occurs because the brightness and color information is transmitted as one signal, and the two parts have to be 'bandwidth-limited' to avoid them interfering with each other. Using good quality video cable will help towards reducing this affect.

**How do I use the unit with a VCR?**

Connect one of the Unit's video outputs to the VCR's input. Note that you won't be connecting to the antenna connector on the VCR, but to one of the VCR's auxiliary (AUX) inputs, so you have to therefore tell the VCR which input to use - often it's channel 0, or AUX 1, AUX 2, etc.

**The recorded image is poor.**

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. Color smearing is usually the first thing that causes a problem, but this is because your video isn't capable of recording the picture in its full resolution - it is not a fault with the Unit or your video. Try lowering the computer screen resolution - this will bring the image more in-line with what your video is used to dealing with.

**The mouse emulation isn't working. (CS-400 Select Only)**

Check that the RS232 cable is connected correctly to both the RS232 port on the back of the CS-400 Select and to the serial port that the computer uses for the mouse.

Check that the CS-400 Select is setup for the Mouse and not Serial control. Check that the infra red remote control has good batteries installed and that the CS-400 Select is configured to work from the remote.

The CS-400 Select 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 CS-400 Select RS232 cable.

IF YOU PROBLEM IS NOT LISTED HERE PLEASE SEE THE NEXT SECTION ON CONTACTING US.

# Technical Support

## ***Telephone support***

859-282-7303

## ***FAX support***

Please photocopy this page, fill in as much of the following as possible, and FAX it to 859-282-8225

Your name/company:	
Your FAX number:	
Unit:	CS-320 Connect / CS-400 Select (Delete as appropriate.)
Serial number:	T320-                      or T400-
Place of purchase:	
Invoice number:	
PC being used with:	
Resolution PC run at:	
Software being used:	
Nature of problem:	

## ***Internet support***

[www.tvone.com](http://www.tvone.com)

## ***Email support***

[tech@tvone.com](mailto:tech@tvone.com)

## **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.

## European EMC 'CE' mark statement

### *EMC standards applied & passed*

Emissions: EN 55022 (ITE emissions standards), Class B

Immunity: EN 50082-1 (Generic Immunity standard for residential, commercial and light industrial)

## FCC statement

Class A Device: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the Instruction Manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Caution: This equipment is intended for use in the manner prescribed in the Instruction Manual. Any user changes or modifications not expressly approved by TV One Multimedia Solutions could void the user's authority to operate the equipment. Connecting this equipment to external devices requires no specially shielded cabling for FCC compliance. The Instruction Manual shows the proper connection of this equipment for operation that insures FCC compliance.

Direct all inquiries regarding FCC compliance to:

TV One Multimedia Solutions  
1445 Jamike Drive #8  
Erlanger, KY 41018  
Ph 859-282-7303  
Fx 859-282-8225