Avocent Emerge® VSM2000 Multi-function Video Scaler

Installer/User Guide

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1.0   DISCLAIMER

This product is intended for professional and/or home use. This product is not intended for use in a medical environment and does not have the required certifications for such use. Similarly, use aboard any aircraft or spacecraft while in flight or as an adjunct to any surface, airborne or marine navigation system or any offshore marine activity, including control of any watercraft, or any use similar to those specifically herein mentioned is prohibited. Use in the aforementioned circumstances would require additional testing and certification.

1.1   Regulatory Agency Acceptance

Emissions: EN 55103-1: 1997(Electromagnetic compatibility. Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Emission)

EN 61000-3-2:2000+A1:2001+A2:2005 (Limits for Harmonic Currents Emissions)

EN 61000-3-3:2000+A1:2001+A2:2005 (Limitation of voltage fluctuations and flicker in low-voltage supply systems)

Immunity: EN55103-2: 1997 (Electromagnetic compatibility. Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Immunity)

1.2   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 a 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 Avocent Corporation 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 or describes the proper connection of this equipment for operation that insures FCC compliance.

Direct all inquiries regarding FCC compliance to:

Avocent Corporation
4991 Corporate Dr.
Huntsville, AL 35805

1.3   Manual Copyright Notice

This Operation Manual is the intellectual property of Avocent Corp. No portion of this manual may be copied or reproduced in any manner or by any means, including, but not limited to electronic and electro-mechanical, without the express written permission of Avocent Corp.

2.0   IMPORTANT SAFETY INSTRUCTION

To insure the best from this product, please read this manual carefully. Keep it in a safe place for future reference.

To reduce the risk of electric shock, do not remove the cover from the unit.
No user serviceable parts inside. Refer servicing to qualified personnel.

2.1   Power and connections

This unit is not disconnected from the AC power source as long as it is connected to the wall outlet. The off state for this unit is called standby mode. In standby mode the unit is designed to consume a reduced quantity of power compared to normal operating modes.

When not using the unit for a long period of time, insure that the AC power cord is disconnected from the wall outlet.

The AC wall outlet should be installed near to the unit and be easily accessible.

Do not plug in or attempt to operate an obviously damaged unit.

2.2   Water and moisture

To reduce the risk of fire and personal injury, operation of this device outdoors and/or exposure to rain, water or excessive moisture is expressly prohibited.

The apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.

2.3   General care

Do not force switches or external connections.

When moving the unit, disconnect the serial port connections first then the power cable and finally the interconnecting cables to other devices.

Do not attempt to clean the unit with chemical solvents or aerosol cleaners, as this may damage the unit. Use a clean dry cloth.

2.4   Location

Installation of this unit should be in a cool dry place, away from sources of excessive heat, vibration, dust, moisture and cold.

2.5   Ventilation

Slots and openings in the sides of the unit are provided for ventilation. To ensure reliable operation, avoid obstruction of these openings and ensure the unit is installed in a well-ventilated area.

2.6   Rack Mount Safety Considerations

Before installing the appliance and other components in the rack (if not already installed), stabilize the rack in a permanent location. Install the equipment starting at the bottom of the rack, then work to the top. Avoid uneven loading or overloading of racks.

- Elevated ambient temperature: In a closed rack assembly, the operation temperature of the rack environment can be greater than room ambient. Use care not to exceed the rated maximum ambient temperature of the unit.

- Reduced air flow: Carefully install the equipment in a rack so that an adequate amount of airflow is maintained for safe operation of the equipment.

- Mechanical loading: Avoid a potentially hazardous condition caused by uneven mechanical loading by carefully mounting the equipment in the rack.

- Circuit overloading: Consider the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on over-current protection and supply wiring.

- Observe equipment nameplate ratings for maximum current.

- Reliable earthing: Maintain reliable earthing of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (for example, use of power strips).

2.7   Intellectual property

Some IC chips in this product include confidential and/or trade secret property. Therefore you may not copy, modify, adapt, translate, distribute, reverse engineer, reverse assemble or decompile the contents thereof.

2.0   IMPORTANT: CONSIGNES DE SECURITE

Afin de tirer le meilleur de ce produit, merci de lire attentivement ce manuel. Gardez-le dans un endroit sûr pour pouvoir le consulter à nouveau.

Afin de réduire le risque de choc électrique, ne retirez pas l'unité de sa protection.

Aucune pièce réparable par l'utilisateur à l'intérieur. Référez-vous à des personnes qualifiées.

2.1 Alimentation électrique et connexions

Cette unité n'est pas déconnectée de la source de courant électrique tant qu'elle est connectée à la prise murale. Le mode éteint de cette unité est appelé mode de veille. En mode de veille, cette unité est conçue pour consommer une quantité réduite de courant par rapport aux modes normaux d'utilisation.

Lorsque vous n'utilisez pas l'unité pendant une longue période, assurez-vous que le câble d'alimentation électrique est déconnecté de la prise murale.

La prise murale de courant doit être installée près de l'unité et aisément accessible.

Ne branchez pas et n'essayez pas d'utiliser une unité visiblement endommagée.

2.2 Eau et humidité

Pour réduire les risques d'incendie et de dommages corporels, l'utilisation de cet appareil à l'extérieur et/ou son exposition à la pluie, l'eau ou une humidité excessive est expressément interdite.

L'appareil ne doit pas être exposé aux gouttes ou aux éclaboussures et aucun objet contenant de l'eau, comme par exemple un vase, ne doit être posé sur l'appareil.

2.3 Entretien général

Ne forcez pas les boutons ou connexions externes.

Lorsque vous déplacez l'unité, déconnectez d'abord les connexions de ports en série puis le câble d'alimentation et enfin les câbles de connexion avec d'autres appareils.
N'essayez pas de nettoyer l'unité avec des dissolvants chimiques ou des produits nettoyants en aérosol, car cela peut endommager l'unité. Utilisez un chiffon propre et sec.

2.4 Emplacement

L'installation de cette unité doit se faire dans un endroit frais et sec, éloigné de sources excessives de chaleur, de vibrations, de poussière, d'humidité et de froid.

2.5 Aération

Les rainures et les ouvertures sur les cotés de l'unité servent à l'aérer. Pour permettre une utilisation sûre, évitez d'obstruer ces ouvertures et assurez-vous que l'unité est installée dans un endroit bien aéré.

2.6 Propriété intellectuelle

Certaines puces IC dans ce produit contiennent des éléments propriétaires confidentiels et/ou des secrets commerciaux. Vous ne devez donc pas copier, modifier, adapter, traduire, distribuer, démonter, désassembler, ou décomposer leur contenu.

2.0 INSTRUCCIONES IMPORTANTES DE SEGURIDAD

Para sacar el mejor provecho de este producto, léase este manual con detenimiento. Guárdelo en un lugar seguro para poder hacerle referencia en el futuro.

Para reducir el riesgo de calambre, no quite la cubierta del aparato.

No hay piezas utilizables dentro. Remítase todo mantenimiento a personal cualificado.

2.1 Corriente y conexiones

Mientras esté conectada a una toma de electricidad, el aparato seguirá conectado a la fuente de corriente CA. A la posición de «off» de este aparato se le denomina posición de espera. En la posición de espera, el aparato está diseñado a consumir una cantidad reducida de electricidad en comparación con los modos de operación normales.

Asegúrese de desconectar el cable de corriente CA de la toma de la pared cuando no va a utilizar el aparato por un periodo largo de tiempo.

La toma CA de la pared ha de estar instalada cerca del aparato y debe ser fácilmente accesible.

No enchufe ni intente operar un aparato que esté evidentemente dañado.

2.2 Agua y humedad

Para reducir el riesgo de fuego o de daños personales, se prohíbe la utilización de este aparato en el exterior y/o su exposición a la lluvia, al agua o a atmósferas de excesiva humedad.

El aparato no debe situarse cerca de zonas en las que haya riesgo de goteo o salpicaduras. Tampoco deben colocarse objetos que contengan agua (jarrones, por ejemplo) en el mismo.

2.3 Cuidado general

No forzar interruptores o conexiones externas.

Al mover el aparato, desconecte las conexiones del puerto en serie primero, luego el cable de electricidad y finalmente los cables interconectados a otros aparatos.
No intente limpiar el aparato con disolventes químicos o productos de limpieza aerosol, ya que podrían dañar el aparato. Utiliza un paño limpio y seco.

2.4 Ubicación

Este aparato se debe instalar en un lugar seco y fresco, lejos de fuentes de calor excesivas, la vibración, el polvo, la humedad y el frío.

2.5 Ventilación

El aparato viene provisto de ranuras y agujeros en los lados para la ventilación.

Para asegurar una operación eficaz, se debe evitar la obstrucción de estos agujeros y también asegurar que el aparato se instale en una zona con adecuada ventilación.

2.6 Propiedad intelectual

Algunos chips con circuito integrado de este producto incluyen propiedad confidencial y/o propiedad de secreto comercial. Por lo tanto queda prohibido copiar, modificar, adaptar, traducir, distribuir, usar técnicas retroactivas, desmontar, o recopilar los contenidos del mismo.

2.0 WICHTIGE SICHERHEITSVORSCHRIFTEN

Lesen Sie diese Bedienungsanleitung bitte sorgfältig, um Ihr Produkt optimal nützen zu können, und bewahren Sie sie zum späteren Nachschlagen an einem sicheren Ort auf.

Entfernen Sie bitte keinesfalls die Abdeckung, um der Gefahr eines Stromschlags vorzubeugen.

Im Inneren des Geräts befinden sich keine Teile, die vom Benutzer gewartet werden können. Lassen Sie Wartungsarbeiten nur von Fachpersonal durchführen.

2.1 Stromversorgung und anschlüsse

Solange das Gerät mit einer Steckdose verbunden ist, bleibt die Stromversorgung aufrecht. Der Ausschaltzustand des Geräts wird als Standbymodus bezeichnet. Im Standbymodus verbraucht das Gerät weniger Strom als in den üblichen Betriebsarten.

Wird das Gerät über einen längeren Zeitraum hinweg nicht verwendet, ziehen Sie bitte das Stromkabel aus der Steckdose.

Die Steckdose sollte sich in der Nähe des Geräts befinden und leicht zugänglich sein.

Verbinden Sie ein offensichtlich beschädigtes Gerät keinesfalls mit einer Steckdose und versuchen Sie auch nicht, es zu bedienen.

2.2 Wasser und feuchtigkeit

Um die Gefahr eines Brandes oder einer Körperverletzung zu verringern, ist es ausdrücklich verboten, dieses Gerät im Freien in Betrieb zu nehmen und/oder es Regen, Wasser oder hoher Feuchtigkeit auszusetzen.

Das Gerät darf keinen Tropfen oder Spritzern ausgesetzt werden und es dürfen keine mit Flüssigkeiten gefüllte Behälter, wie Vasen, auf das Gerät gestellt werden.

2.3 Allgemeine pflege

Wenden Sie bei der Handhabung von Schaltern und Anschlüssen keine Gewalt an.

Beim Umstellen des Geräts entfernen Sie zuerst die seriellen Anschlüsse, dann das Stromkabel und zum Schluss die Verbindungskabel zu anderen Geräten.

Versuchen Sie keinesfalls, das Gerät mit chemischen Lösungsmitteln oder Sprayreinigern zu reinigen, da dies das Gerät beschädigen könnte. Verwenden Sie ein sauberes, trockenes Tuch.

2.3 Aufstellung

Das Gerät sollte an einem kühlen, trockenen Ort aufgestellt werden, fern von übermäßiger Wärme, Vibrationen, Staub, Feuchtigkeit und Kälte.

2.5 Belüftung

Seitliche Schlitze und Öffnungen sorgen für die Belüftung des Geräts. Um die ordnungsgemäße Belüftung zu gewährleisten, dürfen diese Öffnungen nicht verdeckt werden. Sorgen Sie außerdem dafür, dass das Gerät an einem gut belüfteten Ort aufgestellt wird.

2.6 Gewerbliches eigentum

Einige integrierte Schaltkreise in diesem Produkt enthalten vertrauliche

Informationen und/oder Betriebsgeheimnisse. Sie dürfen daher diese Inhalte nicht kopieren, modifizieren, adaptieren, übersetzen, verteilen, rückentwickeln, rückassemblieren oder dekompilieren.

2.0   BELANGRIJKE VEILIGHEIDSINSTRUCTIES

Lees deze handleiding zorgvuldig door om het beste uit uw product te halen. Bewaar het op een veilige plek voor raadpleging in de toekomst.

Haal nooit het omhulsel van de eenheid af, dit om de kans op een elektrische schok te verminderen. Maak het apparaat nooit open: er bevinden zich geen door de gebruiker in te stellen onderdelen in het apparaat. Laat service en onderhoud over aan een gekwalificeerde technicus.

2.1 Elektriciteit en aansluiting

Deze eenheid is niet van de wisselstroom voedingsbron gescheiden wanneer de stekker nog in het stopcontact zit. Wanneer de eenheid uitstaat, staat deze nog in de stand-by modus. In de stand-by modus vergt de eenheid minder stroom dan in de normale "aan" modus.

Wanneer u de eenheid voor langere tijd niet gebruikt, zorg er dan voor dat de stekker van het wisselstroomsnoer uit het stopcontact is getrokken.

Het wisselstroom stopcontact moet dichtbij de eenheid geïnstalleerd worden en makkelijk toegankelijk zijn.

Als de eenheid duidelijk beschadigd is moet u deze nooit op het lichtnet aansluiten of bedienen.

2.2 Water en vocht

Om het risiko op brand en persoonlijk letsel te beperken is het gebruik van dit apparaat buiten en/of blootstelling aan regen, water of overdadige hoeveelheden vocht uitdrukkelijk verboden.

Het apparaat mag niet worden blootgesteld aan druppels of bespatting en er mogen geen objecten die gevuld zijn met vloeistoffen, zoals vazen, op het apparaat geplaatst worden.

2.3 Algemeen onderhoud

Forceer schakelaars of externe aansluitingen nooit.

Bij verplaatsing van de eenheid, de seriële poortaansluitingen eerst loskoppelen, dan de voedingskabel en als laatste de snoeren naar andere apparaten.
Probeer de eenheid nooit met chemische oplosmiddelen of schoonmaakmiddelen in een spuitbus schoon te maken, omdat dit de eenheid kan beschadigen. Gebruik een schone droge doek.

2.4 Plaatsing

Deze eenheid moet geïnstalleerd worden op een koele droge plaats, uit de buurt van bronnen van extreme hitte, vibraties, stof, vocht en kou.

2.5 Ventilatie

De sleuven en openingen aan de zijkant van de eenheid zijn voor ventilatie. Zorg er voor dat de eenheid op een goed geventileerde plek geïnstalleerd wordt zodat deze betrouwbaar werkt.

2.6 Intellectueel eigendom

Sommige IC chips in dit product bevatten vertrouwelijke informatie en/of fabrieksgeheimen. U mag daarom de inhoud hiervan niet kopiëren, wijzigen, aanpassen, vertalen, verspreiden, nabouwen, of decompileren

3.0   CAPABILITY, DEVICE FEATURES AND PRODUCT FEATURES

3.1   Device Capabilities

The VSM2000 scaler uses a proprietary scaling engine to perform its functions. This technology is a powerful toolset for any application requiring high quality video signal conversion or image manipulation.

The product features a single video processing and scaling engine. These functions allow the flexibility for handling a wide range of inputs and outputs, depending on the unit used.

The product is at home in broadcast & display environments. The VSM2000 scaler offers a range of high-level image processing functions.

This unit allows for a standard television video signal, such as Composite Video, to be input into the unit and then converted for use on a computer display. When using this function you can switch back to the computer image by pressing a button. This is known as bypass mode.

3.2   Device Features

General Topography
4:4:4 RGB / YUV sampling provides full bandwidth color which allows precise keying where included in the unit's capabilities. This can be achieved through the transparent (soft) keys on the front of the unit. Each unit's video inputs accommodate multiple video and computer signal formats and resolutions – see specifications at end of manual for full details.

Ultimate flexibility
The VSM2000's output signal format flexibility assures that the native resolution of virtually any display can be matched. Because of the resolution calculator (included in the Windows® Control Panel), even new resolutions can be added to the unit. Signal parameter adjustments can be made for each video input and are stored in individual non-volatile memories for retrieval once the unit's power has been removed. The product employs pixel adaptive motion compensation to de-interlace fast moving images, and automatic 3:2 Pull-down efficiently de-interlaces video from 24 fps NTSC film.

Simple Control
The unit can be controlled in various ways. One option is to control it from the front panel using the transparent (soft) keys on the front of the unit. Another option would be to control the unit from an infra-red remote control. It can also be controlled via RS-232 or via Ethernet using the Windows Control Panel.

The Windows Control Panel is available for download from our Internet site and affords complete control of the unit and adds Scripting to facilitate long, complex sequence of commands.

Upgradeability
The VSM2000 scaler benefits from firmware upgradeability, thus reducing product obsolescence by allowing the installation of the latest version of firmware. This not only applies to the software used to control the unit, but also to the range of resolutions stored inside the unit, the addition of new features, and upgrades to the heart of the image processing hardware – the scaling engine. See http://www.avocent.com/support for more detail.

4.0   PRODUCT IMAGES

Your VSM2000 scaler should look like the following image.
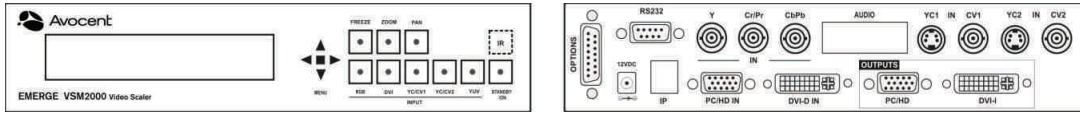
5.0   FRONT PANEL CONTROLS

The range of buttons on the front of the unit provides the user with quick access for selecting a variety of inputs and features.

The multi-directional switch on the front panel provides the user with a way of navigating the Liquid Crystal Display menus (LCD) which is detailed in a later section. The RS232 interface and optional infra-red remote control also provide further ways of controlling the unit, which are detailed in a later section.
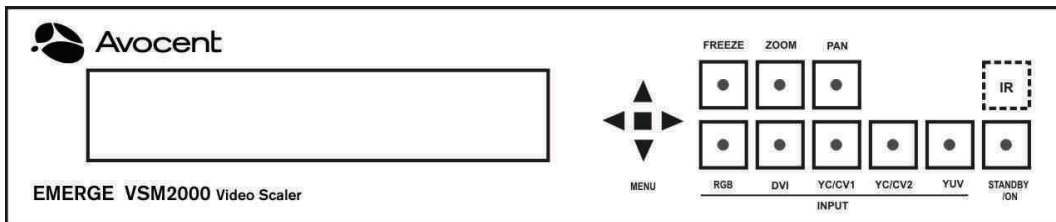
Button controls
A sub-set of the following buttons will be available on the front of the unit, depending on the model in use:

Button	Button Function
Multi-directional switch	Press and hold in to store current settings into memory. They will then be restored on power-on, or when a Restore is done. See next section for more information.
RGB	Selects an RGB input as the current source for conversion.
CV(n)	Selects a CV input as the current source for conversion. *(n) Denotes a number. Some units may have more than one CV input*
YC(n)	Selects a YC input as the current source for conversion. *(n) Denotes a number. Some units may have more than one YC input*
YUV	Selects a RGB input as the current source for conversion on the first press and then YUV on the second.
DVI	Selects a DVI input as the current source for conversion.
FREEZE	Freezes the current image (does not affect any background image)
ZOOM	Jumps to the 'Zoom' menu item. (Further presses step Zoom between 100%, 150%, 200% and 300%)
PAN	Jumps to the Zoom pan menu item and allows immediate panning of a zoomed image using multi-directional switch.

5.1   Multi-directional switch

The LCD is controlled from the front panel by using the multi-directional switch (m/d switch). This switch can be moved left, right, up or down and also pressed in. These functions let the user navigate through the menu structure or change a parameter, and are detailed in a later section.

5.2 Special button combinations and functions

In addition to the ability to perform a factory reset and forcing certain output resolutions, other button combinations are available:

Info: *These button combinations only work when the unit is switched on and active i.e. with the STANDBY/ON LED is off. They will not work in Standby mode, or during power-up.*

5.2.1 Locking front panel buttons & IR remote control

This can be performed by pressing STANDBY/ON and FREEZE at the same time. All front panel buttons and IR remote control commands will be disabled, with the exception of repeating the above combination to un-lock the unit and for storing the current locked buttons setting (thus letting you make sure the unit always starts up with the buttons locked). The IR remote's LOCK and STORE buttons will always be active, giving another way to turn button/IR remote locking off.

The STANDBY/ON button will flash when the unit's buttons are locked.

5.2.2 Restore power-on settings

This can be done (without having to turn off the unit) by pressing STANDBY/ON and the multi-directional switch at the same time until a single beep is heard.

5.2.3 Factory Reset

If you wish to restore all operational parameters to their original condition (for example, if saved settings prevent the unit from working with your display monitor), hold the STANDBY/ON and the multi-directional switch in together until two beeps are heard.

Info: *All stored settings except resolutions are lost when the unit is reset. A Firmware update is the only way to perform a complete factory reset (including resolution data).*

5.2.4 Forcing default output resolution

Press and hold the RGB button and button 3 together, then release. The default output resolution depends on the type of unit you have – see above.

6.0   VIDEO INPUTS AND OUTPUTS

The VSM2000 scaler has a number of different inputs and outputs – see earlier front and rear panel diagrams to see what is available on your unit.
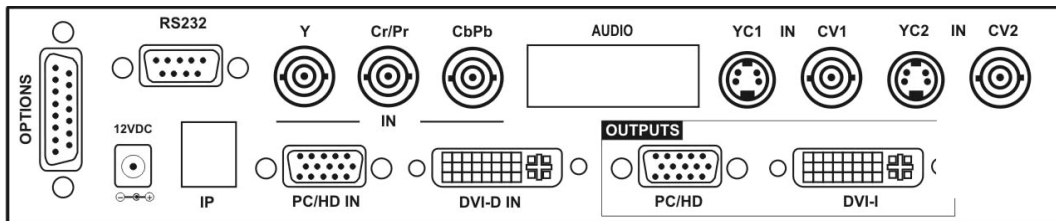
6.1   Computer & Video inputs

PC/HD inputs can accept:

- Analog RGBHV
- RGsB (sync on green)
- RGBS (separate sync at TTL levels)
- YUV/YPbPr (including tri-level)

In most cases, the particular input being used will be auto-detected. See 'Adjust sources' for more information on manually selecting an input type. On some units such as Video Scalers, the RGB input is there just to loop the PC image through to the PC monitor in 'bypass' mode.

YUV/YPbPr (component) inputs can also be switched to RGsB (sync on green) mode if desired – see 'Adjust sources' for more information on manually selecting an input type.

CV and YC inputs can accept either standard NTSC or PAL inputs – for example, from a video camera, VCR, DVD player, gaming device, etc. PAL and NTSC detection is automatic.

The DVI-D input accepts DVI digital connections (but on a DVI-I socket for added flexibility). An EDID signal is used to ensure that the PC or DVD player outputting the DVI signal knows the available range of resolutions in the unit.

6.2   Computer outputs

The PC/HD output can use:

- Analog RGBHV
- RGsB (sync on green)
- RGBS (separate sync at TTL levels)
- YUV/YPbPr (including tri-level).

The DVI-I output offers both digital DVI and analog RGBHV on a DVI-I socket for added flexibility.

6.3   Audio inputs and outputs

The VSM2000 scaler supports audio switching, simultaneous with video switching. This means that audio input 1 might switch at the same time as RGB1, audio input 2 with YC1, etc. Each audio input connector can be configured to be 'linked' to a particular video input connector, so that they switch together.

Once switched, the audio input connector is linked to the audio output connector with no audio processing or buffering taking place. The only processing that is performed is 'click-less' operation.

INPUT 1	INPUT 2	INPUT 3	INPUT 4	OUTPUT
L G R	L G R	L G R	L G R	L G R
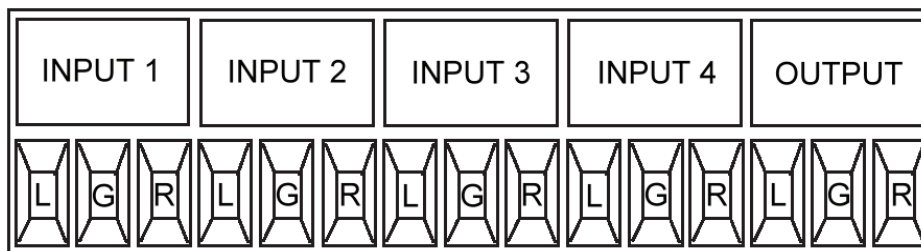
On the back of audio-equipped units are 5 x 3-way connector blocks. These can be removed individually (with care), or can be left in-situ while connections are made (by releasing each terminal using a small screwdriver, and then by clamping it back down again once a new cable has been inserted).

The diagram above shows the 5 connector blocks (as viewed from the rear of the unit), each with Left, Ground and Right terminals.

7.0 UNPACKING AND INSTALLATION

7.1 Shipping Carton

Your unit will arrive double boxed for maximum protection during shipping. You are encouraged to retain both boxes and all packing material so the unit can be returned in the unlikely event that repairs should ever become necessary.

7.2 Important Safety Instructions

The AC power adapter furnished with the unit should conform to the type in use in your country. Please compare the plug on your adapter with the power socket where the unit will be installed.

If you did not receive the correct adapter, **DO NOT** attempt to modify it. Instead, immediately contact your dealer or contact Avocent Corp. at the sales office nearest to your geographic location and request the proper adapter.

The correct PSU specification is that of a 12v DC regulated 1Amp PSU with a 2.5mm locking center-pin positive DC power connector. A non-locking 2.5mm DC power connector will also fit.

Please also note that the power adapter is active whenever it is plugged into the power socket – the 'Standby' mode of this product still leaves the power adapter active.

7.3 Initial Operation Check Using Factory Default Settings

This product can be operated via multiple methods, but for the purposes of initially acquainting you with the operation of the unit, this manual will address the operation using the Front Panel controls.

Please note that the power adapter cable has a 'locking' connector on it, so you will need to turn the power plug once it is inserted until it locks into position.

If you have problems using the unit as described below, see the 'Factory reset' description shortly afterwards.

7.3.1 Initial operation and test of Video Scalers

We'll be using a video source and up-converting to 1024 x 768 @ 60Hz, so you will need a monitor that accepts this resolution.

Disconnect the cable going from a Personal Computer's Monitor to the Personal Computer. Connect the output from the PC video card (the PC connector formerly used by the monitor cable) to the PC/HD input on the rear panel of the unit.

Next, take the cable from the PC monitor and connect it to the PC/HD scaled output (which also functions as a bypass connector when the unit is in Standby mode).
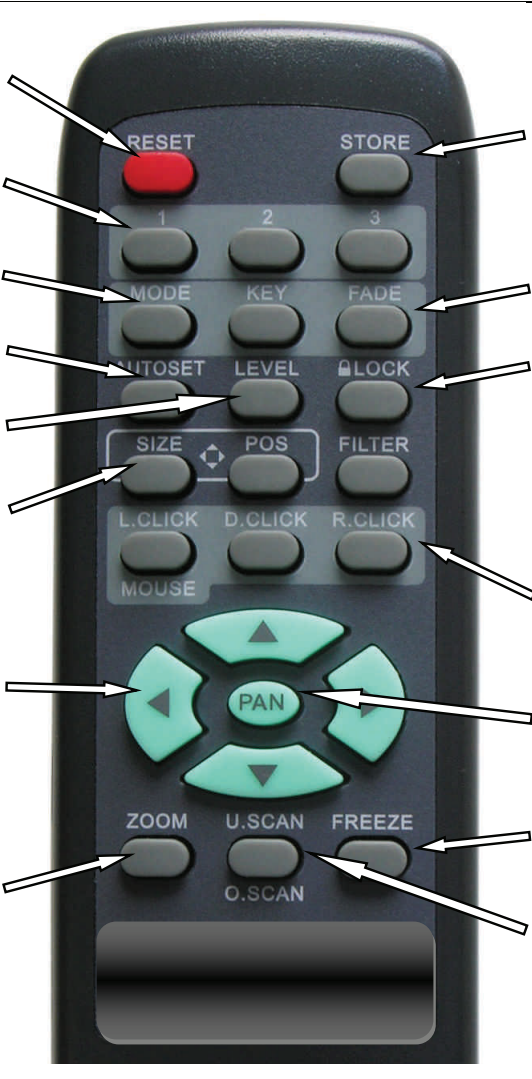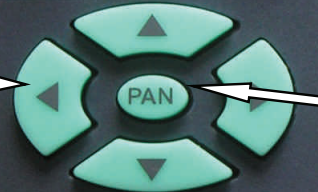
Finally, connect a video source into either the CV1 or YC1 inputs and connect the AC Power Adapter to a working AC outlet, turn on the PC, monitor and then your unit.

Press either CV1 or YC1 on the front panel, and provided you have not changed anything else from the factory defaults a 1024x768@60Hz output will be fed to the PC screen. If this is the result, then your unit is processing signals correctly. If this does not happen, make sure you have plugged your video source into the correct input connector.

8.0   INFRA-RED REMOTE CONTROL

An optional infra-red remote control, part number IR-RC1, is available for your unit. The buttons have the following functions:

Resets back to power-on defaults		Stores current settings
Selects input: 1/2/3=RGB/CV/YC		
Enables Lock & Mix mode		Fades in/out
Starts AutoSet		Locks the IR & panel buttons
(Not used.)		
Sets Shrink size & position		
Adjusts current menu values. Left/right alter current value and up/down alter the next value		Navigates through the menu structure & changes values.
		Toggles between zoom & pan mode
Selects the next zoom level and zoom menu		Toggles freeze on and off
		Activates Shrink mode

The transmit range of the remote control depends on many factors, but is designed to be fairly directional. Therefore you should always aim it directly towards your unit.

The IR remote control can be disabled in the System menu. This can be used in situations where multiple units respond to the same remote control or are located close to one another.

9.0   MENU LAYOUT AND SETTINGS ADJUSTMENT

From here on, we'll be looking at the menu structure employed in the VSM2000 scaler and, more importantly, the individual menu items that allow you to take advantage of the power of the unit.

You'll be using the multi-directional switch and the Liquid Crystal Display (LCD) to view the options and settings available to you. First press the multi-directional button in once to reveal the menu. Next move the multi-directional switch left or right to see where you are in the menu. Go into a sub menu by pressing the multi-directional switch once. To exit a sub-menu, scroll the multi-directional button to the end of the sub-menu to reveal Exit. Push in the multi-directional button to exit the sub menu.

You can edit a value in brackets '[ ]' by pressing the multi-directional switch once (you'll note that the brackets surrounding a particular parameter's value will begin to flash). Change the value by moving the switch left or right. Then finalize your adjustment by pressing the multi-directional switch once more.

A few menu items have multiple parameters within an individual menu selection. In those cases, you can adjust one item at a time. To do this, move to the next, parameter by moving the multi-directional button left or right

```
Adjust windows
H/V zoom pan %      [ 10]   20
```

Or, you can use the up/down positions of the multi-directional switch to alter the value following the one in brackets. Therefore, in the example above, where "[10] 20" is displayed in a menu item, the one in brackets is adjusted using the left and right positions, and the second number be can be altered using the up and down positions of the multi-directional switch.

Holding the multi-directional switch left, right, up or down for a short time will keep adjusting the relevant value, therefore allowing fast changes to a setting – which is very useful for positioning something on screen.

Info: *Pressing the multi-directional switch in for a few seconds stores all changes in memory. Unless you intentionally change it again later, the adjustment will remain even after power is removed from the unit.*

9.1   The High Level Menu Structure

Menus are arranged so that a particular general function has a menu name on the top line and beneath that either a sub-menu or one or more related individual settings are displayed.

In some cases the functionality is global – meaning it has an effect on the unit as a whole (such as changing the output resolution). In the majority of cases, the function is related to a specific operational area of the unit, detailed by the text in the top line.

There are two screens that appear before the Group Menus (sub-menus) are accessed.

```
Avocent
Emerge VSM2000
```

The first is the 'welcome' display shown above indicating the model of the unit.

```
www.avocent.com
SW: 65. PT: 12, BT: 13
```

Moving to the next menu item displays the firmware information screen (the numbers on your unit will be different to those shown). The SW number refers to the version of firmware loaded into the unit, this can be upgraded from the support website: ***http://www.avocent.com/support***

The PT and BT numbers refer to Hardware version information and are of interest to the Technical Support Group should you ever need assistance.

At the end of all Group Menus will be an 'Exit' item. Simply select this to exit the existing menu structure and return to the previous one in the hierarchy.

9.2   Group Names and Descriptions

Menu Group Name	Group Description
Adjust outputs	Controls output parameters
Adjust windows	Controls characteristics of the pip windows
Adjust sources	Controls signal source input parameters
Adjust Ethernet	Controls IP addresses and network parameters
Adjust resolutions	Controls unit's input/output resolution table (hidden by default - only visible when advanced menus are switched on)
System	Controls global system parameters for the unit

9.3   Items Associated with the <u>Adjust outputs group</u>

This menu group allows adjustments to be made that specifically affect the output of the unit, including output resolution and locking/overlaying onto a computer or video source.

```
800 x 600 60Hz
Lock mode            [Off] [RGB1]
```

This menu item allows the lock mode to be selected and the lock source to be defined. The top line of the display shows the current detected resolution of the selected lock source (RGB1 in this example). The lock mode can be either Off, Genlock or Lock & Mix, with the operation of these shown in the following table:

Lock mode	Description

Off	The output resolution of the Output is defined by the setting for Output Resolution and there will be no background source visible.
Genlock	The output video will be "Genlocked" to the selected lock source. The output signal will be synchronous to the input sync and adjustable but there will still be no lock source visible.
Lock & Mix	The output video will be locked to the selected source, the syncs will be locked (but with an additional internal video processing delay) and the background for the output will be that of the Lock source (unless foreground and background are swapped).

In both Genlock and Lock & Mix modes the source selected for the lock input determines the resolution of the Output image. The output resolution for the entire image can be no different than the resolution of the lock source. All synchronization signals are re-generated within the unit so they may look slightly different when compared on an oscilloscope to the original source.

Info: *Before turning the Lock feature on, you first must select a valid Lock source. Not all Lock sources are available, depending on the main Input source in use (see Adjust windows). For instance, you cannot overlay one CV or YC source over a different CV or YC source, or one RGB/YUV source over another RGB/YUV source – you are restricted to overlaying CV/YC over RGB/YUV, or RGB/YUV over CV/YC (the exception is where you can overlay one source over itself).*

```
1024 x 768  60Hz
Output res.                    [28]
```

Your unit can handle a very wide array of inputs and convert them all to a single output signal with defined characteristics. This output resolution will remain in place until changed or it may be overridden by the lock mode and source.

The top line of the display will show the current output resolution selected

```
Adjust outputs
Output type              [RGBHV]
```

This menu item allows you to select the type of signal output your unit will provide. Types of output vary depending on the resolution selected and include the full range of RGB type signals RGBHV, RGBs and RGsB (Sync on green).

9.4   Items Associated with the <u>Adjust windows group</u>

This menu group allows adjustment to be made to window specific parameters such as the window source, its position, size and zoom level.

```
NTSC / 60Hz
Source                    [ YC1]
```

The source display screen allows the input source for the currently selected window to be changed.   The top line of the display shows the detected characteristics of the signal. Valid Input sources match those available on the front of the unit

Info: *If you have Lock mode active (set to either Genlock or Lock & Mix) then you will be restricted in your choice of Source. This is because you cannot overlay one CV or YC source over a different CV or YC source, or one RGB/YUV source over another RGB/YUV source – you are restricted to overlaying CV/YC over RGB/YUV, or RGB/YUV over CV/YC (the exception is where you can overlay one source over itself). Turn Lock mode off in order to select a wider range of sources.*

```
Adjust windows
Zoom level %              [  100]
```

Changing this option, sets the amount of picture magnification you wish to use for the window Source. You are provided with the options to zoom the image from 100% to 1000% (10x zoom).

```
Adjust windows
H/V zoom %      [100] [100]1.333
```

When parameter 'Aspect Adjust' later in this sub-menu is set to 'Advanced', this display is made accessible. It allows the independent setting of the horizontal and vertical zoom values. The third number (1.333 in the example) is the Aspect Ratio resulting from the adjustments, which is automatically calculated for you based on the incoming resolution and the H & V Zoom values.

Most resolutions are 4:3 ratio, thus the third number will be 1.333 (4 divided by 3). Another common aspect ratio is 16:9 (16 divided by 9 = 1.777). PAL and NTSC inputs are physically 4:3 on your video monitor, but their actual pixel/line ratios are different and so will not display as 1.333.

```
Adjust windows
H/V zoom pan %    [  50] [ 50]
```

Once an image has been 'zoomed', this control allows the image to be positioned within the window so that any portion can be seen, not just the middle.

```
Adjust windows
Image freeze              [Off]
```

This menu item allows the image to be frozen or unfrozen – thus keeping a single image on screen indefinitely. Note that images are not stored when power is removed from the unit.

```
Adjust windows
H/V out shift           [  0] [  0]
```

This positions the selected Window horizontally and vertically on the monitor. This should only be used for 'fine tuning' and should not normally require adjustment – use the Shrink H/V adjustment when your image is less than 100% Shrink value.

```
Adjust windows
Shrink level%           [ 50] [On]
```

Shrink Level determines the percentage of the monitor's total available screen space that the selected Window image occupies. Adjustment is provided for a reduction down to 10% of the overall output size.

Note that this feature is 'Off' by default, so that the full image size of 100% is used. It can be activated by the 'U.SCAN' (under-scan) button on the optional infra-red remote control.

```
Adjust windows
Shrink  H/V %    [100] [100] 1.333
```

When parameter 'Aspect Adjust' in the System Menu structure is set to 'Advanced', this display is made accessible. It allows the setting of different Horizontal and Vertical 'shrink' sizes. The third number (1.333 in the example) is the Aspect Ratio resulting from the adjustments, which is automatically calculated for you based on the output resolution (the actual pixels & lines, not your physical screen size) and the H & V Shrink values.

Most resolutions are 4:3 ratio, thus the third number will be 1.333 (4 divided by 3). Another common aspect ratio is 16:9 (16 divided by 9 = 1.777). Therefore, to convert your 4:3 output into a 16:9 output, reduce the vertical (V) Shrink value to 75% and this will simulate a 16:9 output. PAL and NTSC inputs are physically 4:3 on your video monitor, but their actual pixel/line ratios are different and so will not display as 1.333.

```
Adjust windows
H/V position %          [100] [ 50]
```

This menu option determines the position of the shrunken image on the monitor screen. This will move an image that is less than the full screen size left/right or up/down within the monitor's available screen space. It will not let you move the image off the screen, so certain values will appear to have no effect (unless you use a very low Shrink value like 10%).

```
Adjust windows
Aspect adjust           [Simple]
```

This parameter is used in conjunction with the Zoom and Shrink functions. When set to "Advanced", it allows the horizontal (H) and vertical (V) components of the Zoom and Shrink functions to be adjusted independently, thus allowing custom aspect ratios to be created, or to convert from one aspect ratio to another. When left as "Simple", the H/V components of Zoom and Shrink are adjusted equally i.e. H is equal to V.

```
Adjust windows
Image smoothing          [Auto]
```

Image smoothing reduces the jagged-edges sometimes seen within an output image by softening it. It typically improves the quality of a scaled image greatly. There are four possible settings for this adjustment: "Off", "Med.", "High", and "Auto". The "Auto" setting is generally thought to be most desirable and will vary the smoothing process according to the amount of zoom taking palce.

```
Adjust windows
Image flip               [Off]
```

Occasionally, it's necessary to cause the output image to be flipped Vertically, Horizontally or both – most commonly when a video projector is ceiling mounted, or for special effects.

```
Adjust windows
De-glitch                [ On]
```

De-glitch is used to provide clean, seamless switching between video sources, since it is unusual for all the inputs to be synchronized with one another. The De-glitch function ensures that the switches between these inputs do not cause the picture to break-up at the point of the switch (as the unit synchronizes with a new source).

This feature is normally left On. However, if you have a very unstable input, such as a video tape player with a poor (jumping) output signal, you may wish to turn the feature off. The unit will not allow an unstable image to appear on the screen if De-glitch is left On.

9.5   Items Associated with the <u>Adjust sources group</u>

The 'Adjust Sources' menu group accesses the parameters associated with the processing amplifiers used for each input (RGB, CV, YC, etc.). They allow you to fine-tune an incoming signal to optimize its color, brightness or even sharpness. Not all settings are available for all input types.

It is recommended that you Store your settings once you're happy with them in readiness for future use.

```
Source: RGB1
Source to adjust         [RGB1]
```

This menu item selects the input connection for which you want to make adjustments to. As in the image above, changes will only be made to the source connected to RGB1. Once the selection has been made, all changes made using the following operating parameters will only apply to the selected input.

Info: *Selection of a CV/YC source will reveal different menu items that allow adjustments beyond those used for RGB sources. The menu discussions that follow relate first to RGB sources, then to CV / YC type sources.*

9.5.1 RGB Source Menu Items

```
Source: RGB1
Autoset status          [Inactive]
```

Once the Autoset sense setting has been made, this menu item is accessed and activated. The Autoset sense utility will then correct the pixel phase and then position the Top Left portion of the image and the Bottom Right portion of the image. Once complete it then resume inactive status.

```
Source: RGB1
TL pos. adj.            [  0] [  0]
```

This menu item allows manual positioning of the Top and Left portion of the image. It is used to ensure that the input signal is captured correctly, eliminating any black borders. These settings are often used to correct the position of a PC signal on an input, or to eliminate any undesired noise at the top or bottom of a PAL or NTSC video source.

```
Source: RGB1
BR size adj.            [   0] [  0]
```

This menu item allows manual positioning of the Bottom and Right portion of the image. These settings are often used to correct the position of a PC signal on an input, or to eliminate any undesired noise at the top or bottom of a PAL or NTSC video source.

```
Source: RGB1
Audio input             [   1]
```

This menu item selects the desired Audio input for use with the active video source, allowing an audio-follow-video function. This is only functional when your unit is used with an optional Audio Switcher.
The default for the first 4 video inputs is to assign each video input an audio input from 1 to 4. For example, video input 1 receives audio input1, video input 2 receives audio input 2 etc. However this can be easily changed. You could have all video inputs using the same audio input by setting the 'Audio input' value for all video inputs to the desired audio input value.

```
Source: RGB1
Audio           Vol [  1] Bal [  0]
```

This menu item adjusts the audio volume and balance for the selected audio channel. This is only functional when your unit is used with an optional Audio Switcher.

```
Source: RGB1
Input pixel phase       [  16]
```

Since an image pixel is a very small element of the total image, it's possible for your unit's Analog to Digital converters to wrongly sample the picture on the edge of each pixel thereby losing image

resolution and creating image noise. The Input pixel phase adjustment allows you to change the position (from 0 to 31) where the pixels are sampled, relative to the horizontal sync signal.

To make this adjustment, select an RGB source and then provide an image from that source with fine detail, preferably with very sharp vertical lines. Adjust this value until you see the sharpest image. Alternately, adjust this value to give the worst (noisiest/softest) image, and then add or subtract 16 to get the optimum value.

Note that the AUTOSET function (for RGB inputs only) will attempt to automatically work out the best value for this setting.

```
Source: RGB1
RGB input type          [RGBHV]
```

There are several types of signals that are called RGB signals as a generic term. Each has slightly different characteristics that set it apart from similar RGB signals – such as how the synchronization signal is sent. This menu item lets you set the input type to use.

Available options are:
RGBHV - Red, Green, Blue image plus Horizontal and Vertical Sync
RGBS - Red, Green and Blue plus a single TTL level Sync signal
RGsB - Red, Green and a Blue image plus a sync signal superimposed on the Green channel
YUV - also know as YPbPr and common for 720p and 1080i formats, where a sync signal is present on the Y signal

```
Source: RGB1
RGB contr.      [100] [100] [100]
```

This menu item lets you adjust the individual RGB or YUV/YPbPr signals, in case one component is at a different contrast to other, or if they all need to be boosted or lowered.

```
Source : RGB1
De-int              [M.comp med]
```

An interlaced input consists of two fields separated in time. Both fields are required in order to make up the full resolution input image, but since they are sent one after the other, a moving image will have "motion artifacts" if the two fields are simply combined together. The most common artifact is a blurring at the point of maximum movement within an image. Your unit provides some tools to minimize the effects of de-interlacing of an image.

The following options are available for this menu item:

Mode	Function
Normal	The two interlaced fields are simply combined together. This will often show artifacts on moving images, but can be used when the input is known to be still.

Auto	Automatically selects Film 3:2 or Medium Range Motion Compensation (M. Comp Med.) depending on whether Film Mode is detected or not. For 1080i sources, a special de-interlacing mode is selected to eliminate combing effects.
Film 3:2	Enables 3:2 pull down conversion of the incoming NTSC video. (This option is ignored if the source is not NTSC video).
M.Comp Low M.Comp Med. M. Comp High	Enables Pixel Adaptive Motion Compensation. Three levels are available with 'Low' providing the least compensation for Motion and 'High' providing the most compensation.

9.5.2 CV & YC Source Menu Items

Of the above Source Menu items, the Autoset sense and Autoset status functions, RGB type and Pixel phase are specific to RGB signals only. The rest of the Source menu items function with RGB, CV or YC type signals. In addition, there are four additional Menu items that are only used with CV or YC type signals and these are explained below:

```
Source: YC1
Bright [100]         Contrast [100]
```

Adjust the Brightness and Contrast of the image to your requirement.

```
Source: YC1
Satur [100]                Hue [0]
```

Saturation is the amount of color present in the image. Hue is the color "tint" parameter and the adjustment range is +90 degrees through to -90 degrees with 0 being the default.

```
Source: YC1
Sharpness                    [0]
```

Within limits, you can enhance or soften the appearance of detail within an image. The Sharpness values go both negative and positive, with 0 being the default. Note that over-enhancing an image has the side effect of making it appear to be noisy and under-enhancing an image gives the appearance of poor video quality.

```
Source: YC1
Luma delay                 [  0]
```

On occasion, a video source will have the color portion of the signal offset from the luminance portion. If you've ever seen a poor quality comic book that has the outline of the cartoon character's head in one place on the page but the flesh tones for the head offset slightly, you are seeing the print equivalent of Luminance to Chrominance Phase Delay.

Fortunately, your unit provides a way for you to make the two signals occur at the same time on the selected image. The adjustment range provides both positive and negative levels of delay with 0 being the default.

9.5.3   Items associated with the <u>Adjust Ethernet group</u>

Your unit can be remotely controlled via its RS-232 serial port, but some units can also be controlled via a Local Area Network using the Ethernet connector. This provides TCP/IP communications to and from the unit using a custom protocol.

The Adjust Ethernet Menu Group allows the setup of the Ethernet addressing parameters such as IP address and Default Gateway. Access the Adjust Ethernet sub-menu and the following adjustments will be possible:

```
Adjust ethernet
IP enabled              [Auto]
```

This parameter has three possible states: On, Off and Auto. On and off manually control the Ethernet capability of the unit. When in Auto mode, if a valid Ethernet connection is present, remote control of the unit will automatically default to Ethernet and control via RS-232 is disabled.

```
Adjust ethernet
IP add.        [ 10]  1   2   123
```

Enter 4 numbers one by one to form the IP address you wish to assign to the unit. The IP address is a series of four numbers between 0 and 255. Anything above 255 is not a valid number in an IP address range. The unit will not allow you to go above 255.
The IP address must be a unique address on your network, and also must be within the sub-net of your network.

If you are unsure about which IP address to use or don't have a unique IP address, ask your Network Administrator.

```
Adjust ethernet
IP sub.         255.255. [255.000]
```

Adjust the last 2 numbers to set the sub-net address (also know as sub-net mask) of your network. Again, if in doubt ask your Network Administrator.

```
Adjust ethernet
IP gtwy.       [ 10]  1   2   123
```

Enter your network's gateway IP address into this menu item. I in doubt, ask your network administrator.

```
Adjust ethernet
IP port                [10001]
```

Enter the IP port number you wish the unit to communicate on. Keep a note of this as it will be needed when using other devices to communicate with the unit.

9.6   Items associated with the <u>Adjust resolutions group</u>

Info: *The Adjust Resolutions Menu Group only appears when the Advanced Menus function is turned on within the System Menu Group. To turn it on, go to the System Menu Group and then proceed to the item that says "Advanced Menus". Turn the function 'On", exit the Systems menu and return to this menu* structure.

The Resolution Database is used by your unit to identify any incoming video signal and is also used to create an output resolution. It is therefore a very important part of the unit's infrastructure.

Important Cautionary Information

DO NOT ADJUST THESE ITEMS UNLESS YOU'RE CERTAIN YOU KNOW WHAT YOU'RE DOING! THE ONLY METHOD TO UNDO CERTAIN CHANGES IS TO UPDATE THE FIRMWARE.

TRY USING THE AUTOSET, SHRINK, SHRINK POS, TL & BR ADJUSTMENTS <u>FIRST</u>.

The adjustments described herein allow you to create non-standard resolutions that may not be displayable by industry-standard display devices. The resolutions and values within the database conform to industry standards and should require modification under normal circumstances. If circumstances require you to alter these industry-standard settings, please read the following specific notes:

1. *Any changes made to this database take effect instantly and are also stored immediately in non-volatile memory.*
2. *Since this database is used for both input and output image processing, altering a resolution that is used for both (e.g. 1024x768 input and 1024x768 output) may give undesired effects.*

```
800 x 600 60 Hz
Image to adjust            [ 17]
```
 Change the value to select resolution you want to alter.

Info: *Typically, the image number currently being used for input or output would be already be selected otherwise immediate feedback to your changes will not be available via your monitor.*

```
800 x 600 60 Hz
Interlaced                 [ Off]
```
This adjustment specifies whether the image is interlaced or progressive scan. It toggles simply On or Off, so there are no flashing brackets.

```
800 x 600 60 Hz
H.freq.crse          [37.879] Khz
```
Course Frequency Adjust
The H freq.crse (Horizontal Sync Frequency - Course) adjustment provides the option for changing the Horizontal Sync timing Frequency in 100 Hz steps.

```
800 x 600 60 Hz
H.freq.fine          [37.879] Khz
```
Fine Frequency Adjust
The H.freq.fine (Horizontal Sync Frequency) adjustment provides the option for changing the Horizontal Sync timing Frequency in 1 Hz steps. Use this option to fine tune after using the course adjust.

Please note that the internal sync generator may be unable to generate the exact frequency you want.

```
800 x 600 60 Hz
Clks/l [1056] =              40.000Mhz
```

This option changes the total number of image pixels on one line of monitor video including the Horizontal sync pulse and blanking time. This is normally in a multiple of 8. It is very important to get this value correct, or many digital display devices, such as TFT monitors, will display an image with an odd moiré effect – such as soft vertical bands spread evenly across the image.

```
800 x 600 60 Hz
Lines/f [ 628] =             60.317 Hz
```

This menu controls the total number of lines of video present in the image which includes the vertical Sync pulse, the blanking period and the active video. Changing this option affects the final vertical sync frequency.

```
800 x 600 60 Hz
H/V active               [ 800] x  600
```

A video frame includes both the active area, the portion of the image normally containing useful visual information, and a resolution value for a given display standard which only expresses the number of pixels visible in an image.
The well-known 800 x 600 computer resolution standard simply means that there are 800 pixels/line visible horizontally and there are 600 lines visible vertically.

This item provides a way to change the number of active pixels and lines.

```
800 x 600 60 Hz
H/V Start                [ 88] x  23
```

There is a period of time between the end of the Horizontal Sync pulse and the start of Active Video. This portion of the waveform signal is called the "Back Porch", a term originating with the television broadcasting industry and its RS-170A specification. In practice, this will control where the video image starts on the left side of the monitor without changing the width of the sync pulse itself (another way to control where the image area starts). The two parameters control where the back porch is positioned and they interact to a degree.

Info:

By adjusting these parameters, you control the start of the back porch (with respect to the trailing edge of Horizontal Sync) and also its width. The place where the Back Porch begins with respect to the Horizontal Sync pulse and the width of the Back Porch have a direct bearing on where the active (visible) portion of the image begins. Do not attempt this adjustment without monitoring the results with an oscilloscope.

```
800 x 600 60 Hz
H/V Sync                    [ 128] x   4
```

There are standards for all current computer and broadcast resolutions that specify the correct width of both Vertical and Horizontal synchronizing pulses.
If you are creating a special, non-standard resolution, you may wish to adjust the pulse width to fit your new requirements. The H/V Sync screen is where that is accomplished.

Like the H/V Start adjustment, you must use an oscilloscope when making these adjustments so that you know exactly how many milliseconds or microseconds of pulse width you have created. The numbers shown are relative numbers and not an actual time measurement.

```
800 x 600 60 Hz
Sync polarity               [+H+V]
```

Sync can be either negative polarity or positive polarity. To further complicate things, it is possible that you may want to make the Horizontal Sync polarity different from the Vertical Polarity. This control allows you to make that change. You have four possible selections:

    +H+V
    -H+V
    +H-V
    -H-V

9.7   Items Associated with the System group

The final Sub Menu is for adjustments of System parameters. The "System" in this case means the unit's functions that are generally unrelated to individual inputs, outputs or any of the various production features.

```
System
SW: 16,      PT:  12,         BT:    13
```

This screen is an informational screen. Should you require technical assistance with your unit, the technical support personnel may request that you read the contents of this screen to them during the support call.

The first section, "SW", is the version of the software that is installed on your unit. You can update software via the User Support web site (procedure to be described later in this manual) and the updates are currently free of charge. "PT" refers to Product Type and "BT" means Board Type. Both of these are hardware designators and cannot be changed by the user however both designators are important to support personnel.

```
System
SW date:                   2006-7-11
```

This is an information page showing when the currently installed software was released. The information is useful to the user as he or she compares the date to the support website information describing the current software release.

Info: *Normally, the user will examine the added features of each new software release and determine if an update is worth doing in their particular operation. The greater period of time between the current date, and the date shown for the currently installed software, the greater the likelihood that there are useful changes and improvements present in the new release.*

```
System
TAC#          27-56-12-93-28-33
```

The TAC number is a unique identifier for the unit and is for future use.

```
System
Push to store
```

This screen provides a quick and easy way to store all current operating parameters. The unit will remember the set up you are currently using at the time of data storage and also when you next apply power. To store the current settings, press and release the control button.

```
System
Autoset sense              [Medium]
```

In order for Autoset to work properly, it needs a sufficiently bright full-screen image to examine. The sense level lets you change the brightness threshold for detection of the screen edge between Low, Medium, High and V.high. Medium is the default level, which is recommended for normal use (Windows-type images, etc.)

```
System
OSD on power up            [On]
```

This parameter controls whether the 'welcome' screen is displayed or not on power up – it can be disabled as required. This is useful when a unit is installed as part of an overall system.

```
System
Advanced Menus             [Off]
```

When turned on, the previously explained Adjust resolutions menu structure is exposed. The default condition is 'Off', to prevent accidental changes.

```
System
RS232 baud rate            [57600]
```

This menu item allows the adjustment of the serial baud rate used for RS-232 communications. The rate can be adjusted to 9600, 19200, 28800, 33600, 38800, 57600 and 115200. (This adjustment is provided for those instances where you wish to use the RS-232 control system for your own purposes.) The default baud rate is 57600.

```
System
Buzzer                    [ On]
```

The screen labelled 'Buzzer' is actually the control for turning the "Beep" "On" or "Off". Normally this is left in the "On" position to provide positive feedback that your data entries and parameter changes have been accepted.

```
System
Resolutions                88
```

This screen is an informational screen showing the total number of the defined resolutions in the resolution database. Future firmware releases may increase the total number of resolutions defined in the database.

```
System
Power cycles               41
```

Power Cycles refers to how many times the unit has been powered since it left the factory. This is an informational screen. No action is taken regardless of the value shown here, however some users have an equipment cleaning or specification audit procedure and this information may be useful to those users.

```
System
Firmware updates           11
```

Indicates the total number of times the firmware has been changed over the life of the unit. It is quite possible for this to be more than 1, as a unit undergoes numerous tests during production.

```
System
Hours in Use              877
```

This is another informational display for usage audit purposes.

10.0   RS232 CONTROL

10.1 Connection

Your unit is fitted with a standard 'DB9' socket allowing it to be controlled from a computer or other type of terminal or console with a similar interface. Most computers fitted with an RS232 port, known as a 'COM' port, will have a 'DB9' plug on them. To enable connection between the two devices you will require a DB9 male to female cable to link from the computer to your unit. This cable is not the same as a 'null-modem' cable as this has a female socket connector on both ends. See the Specifications section for a detailed pin connection list.

Should your PC not have an RS232/COM port, it is possible to add an interface card into the PC to add this facility. Another option you could use is a USB to RS232 converter. Both methods will add a COM port to your PC, although you should be aware that these generally do not default to being 'COM1' which is the default most RS232 applications will use.

The default baud rate is 57600 with 8 data bits, 1 stop bit and no parity. This baud rate can be changed in the System menu to suit other programs if need be.

10.2 Communications protocol

The standard communications protocol for your unit is text-based and is detailed on the Avocent web site. Also on our website, you can find the Windows Control Panel for your unit.

The protocol is also bi-directional (unit and computer both send messages to each other), so that you can send changes to the unit, and it will also respond with any changes made via alternate methods (front panel buttons, menu changes and infra-red control). This enables any attached computer to be aware of any changes made to the unit from an alternative source rather than itself.

What this means is that you can easily find out the exact command to send to the unit to tell it to perform a certain function. This can be seen by the data that is sent back to the computer when changing values on the unit. For instance, just by turning FREEZE on, by pressing the FREEZE button, will cause RS232 data to be sent to the computer that represents the command required to set FREEZE on. A second press, to turn FREEZE off, then sends the computer the command required to turn the FREEZE off.

Note: Any command you send to the unit will be replied to either with an error code or with the actual changed value. This may be different to the one you sent; for example, if trying to set a value too high or too low. The detailed description of the protocol on our website explains this further.

11.0 TROUBLESHOOTING AND TECHNICAL SUPPORT

If problems are experienced, please read through the symptom topics below in order to resolve the problem. After doing so, if you still need to, contact Technical Support at
http://www.avocent.com/support . Please have the following details of the problem handy:

Whether the problem happens only at specific times or has only just started occurring (and what other things have changed at the same time).

Firmware revision numbers - found in the first item of the System menu:

If the problem relates to a specific source or resolution.

11.1 There is no picture on the output.

If no LEDs are on, then ensure that the AC power adapter is connected properly and the power switch is on at the AC outlet.

If the Standby/ON LED on the unit is off but another blue LED is active then check that the monitor output from the computer is connected at both the computer and the unit. Check that the output connector you are using from the unit is also connected at the unit and the display equipment.

Check that the display video equipment is set to the correct line input and format/standard as appropriate.

Check that the device connected to the output is on and can support the resolution set in the Adjust output menu, ensuring that the Sync type e.g. RGBHV, is also set correctly.

11.2 The image is shifted and not fully viewable

There are several ways to correct this, depending on the actual problem, although it's generally best to perform a factory reset.

Try an AUTOSET if the input is RGB or YUV/YCbCr. Next adjust the TL pos. adj. values in the Setup Program source menu until the incoming video signal is displayed correctly. You may also need to adjust the BR size adj. setting to ensure the incoming video signal is properly displayed.

11.3 The output resolutions no longer appear as expected.

Because any changes made in the Adjust resolutions menu are automatically stored, it may be that the resolution data has become altered or corrupted beyond the ability of a display to show it.

Either manually correct the resolution data, or restore the data to full factory conditions by doing a firmware update. The user should avoid altering the resolution parameter data unless absolutely necessary.

11.4 The Output image is distorted.

This may occur where some of the areas of the image are very dark and others are very bright. The solution is to adjust the contrast and brightness settings on your Output device to rectify the problem.

Alternatively, if the Adjust resolutions menu has been used to the output resolution in question, a firmware update is recommended to perform a FULL factory reset.

11.5 How can I reduce color smearing on CV connections?

Smearing usually occurs on Composite Video connections and is generally unavoidable - unless you can switch to using S-Video or RGB / YUV connections. It occurs because the brightness and color information is transmitted as one combined (composite) signal and the two parts have to be 'bandwidth-limited' to avoid them interfering with each other – which then reduces the quality.

11.6 I can no longer adjust the Output image resolution.

When the unit is in Lock mode, the output resolution is fixed to be the same as the Lock source input resolution. During this time the Output image menu item is not displayed.

11.7 The RGB input is selected but the image is rolling or pink.

Check the Adjust sources menu and confirm that the input type and sync method is set correctly. (Having YUV input selected, instead of RGBHV often causes this problem).

11.8 The video signal from my DVD player does not appear to work.

Some DVD players have a switch at the back that selects between 'Component' and 'S-Video' output, because most will not let you output both at the same time. Make sure it is in the right position for the output you want.

12.0 RETURN PROCEDURE

Before returning your unit for repair, there are several checks you can make yourself to make sure the problem is actually caused by a failure.

12.1 Are you sure there's a fault?

Many 'faults' are due to incorrect set-up or use so a simple checklist is provided below to help you identify potential problems.

Set the unit up with your equipment as described in this manual and run through the checklist. This will hopefully determine whether or not the unit is actually faulty and prevent units from being returned unnecessarily.

Check the Troubleshooting tips of this manual and check out the various FAQ (Frequently Asked Questions) listings on the support website, ***http://www.avocent.com/support*** , which shows the latest Hints, Tips and Solutions.

Don't presume it is the unit that is causing the problem. Check that the equipment being used with it is fully working and setup correctly – bypass the unit if possible by connecting the video source directly to the video display.

Check the AC power. Is it present and is the unit turned on? Check that all cables are properly plugged in and are not damaged and then make certain that all equipment connected to the unit is working properly.

Perhaps you have a "frozen" unit and you cannot change an input nor exit from the current task. In that case, a simple 'Factory Reset' of the product may sort the problem out. See earlier section on Front panel buttons to do this. Note that all user-settings will be lost following an engineering reset.

It is also worth ensuring that the latest firmware is installed in the unit – although, again, user settings are lost during a firmware update.

12.2 To return a unit for repair

First contact Avocent technical support. Support personnel will determine whether a return to the factory is the appropriate solution. If that's the case, a Return Authorization Number will be issued.

Please clearly state the return number on the outside packaging and on any accompanying documentation. This will greatly speed up processing.

IMPORTANT: DO NOT return a unit for warranty repair without first obtaining a Return Authorization Number. No action will be taken on a unit returned in warranty for repair without a Return Authorization Number.

13.0   WARRANTY POLICY

LIMITED WARRANTY – With the exceptions noted in the next paragraph, Avocent Corp. warrants the original purchaser that the equipment it manufactures or sells will be free from defects in materials and workmanship for a period of two years from the date of purchase. Full warranty details are available on the Avocent web site.

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. Avocent Corp. assumes no liability to distributors, resellers or end-users or any third parties for any loss of use, revenue or profit.

Avocent Corp. 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 Avocent Corp. with respect to any defective products will be limited to the repair or replacement of such products. In no event shall Avocent Corp. 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.

14.0 CONNECTOR PINOUTS

14.1 DVI-I connector
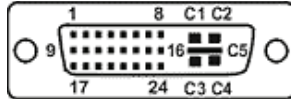
PIN#	SIGNAL	PIN#	SIGNAL
1	T.M.D.S DATA 2-	16	HOT PLUG DETECT
2	T.M.D.S DATA 2+	17	T.M.D.S DATA 0-
3	T.M.D.S DATA 2/4 SHIELD	18	T.M.D.S DATA 0+
4	Not used	19	T.M.D.S DATA 0/5 SHIELD
5	Not used	20	Not used
6	DDC CLOCK	21	Not used
7	DDC DATA	22	T.M.D.S CLOCK SHIELD
8	ANALOG VERT. SYNC	23	T.M.D.S CLOCK+
9	T.M.D.S DATA 1-	24	T.M.D.S CLOCK-
10	T.M.D.S DATA 1+		
11	T.M.D.S DATA 1/3 SHIELD	C1	ANALOG RED
12	Not used	C2	ANALOG GREEN
13	Not used	C3	ANALOG BLUE
14	+5V POWER	C4	ANALOG HORZ SYNC
15	GND	C5	ANALOG GROUND

(DVI-D connectors do not have connections to pins C1 to C5 or pin 8.)

14.2 HD15 connector
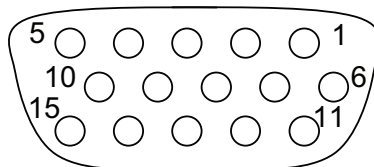
1. Red / Pr / R-Y
2. Green / Y
3. Blue / Pb / B-Y
4. ID2 (input & output linked)
5. GND
6. GND
7. GND
8. GND
9. No connection
10. GND
11. GND on input, pulled high on output (used for auto-termination)
12. SDA (input & output linked)
13. H sync (or composite sync for RGBS)
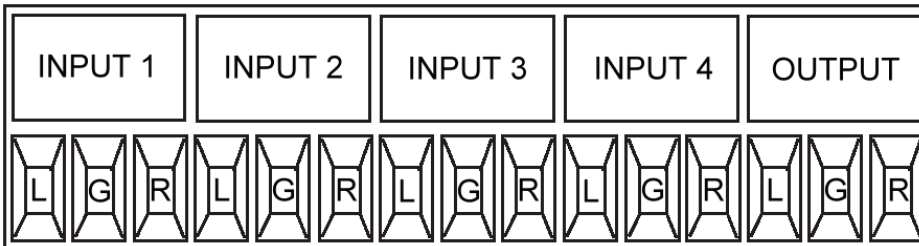14. V sync

15. SCL (input & output linked)

14.3 RS232 / DB9 socket

1. N/C
2. TX (Transmit data)
3. RX (Receive data)
4. N/C
5. GND (Signal return)
6. N/C
7. CTS (Clear to send)
8. RTS (Request to send)
9. N/C

14.4 4 Pin mini-DIN S-video connector (YC) input

1. Y (Luminance)
2. GND
3. GND
4. C (Chrominance)

14.5 Multi-way audio connector

INPUT 1	INPUT 2	INPUT 3	INPUT 4	OUTPUT
L G R	L G R	L G R	L G R	L G R

L = Left signal
G = Signal ground (shared with left and right)
R = Right signal

15.0 SPECIFICATIONS

See product front and rear diagrams for details of product I/O. Not all units in the VSM2000 scaler have all the inputs and outputs listed here.

15.1 Video Inputs

Input impedance: 75 Ohm
Television standards supported: NTSC and PAL
Composite video via BNC
S-Video (YC) via 4-Pin mini-DIN Connector
CV/YC video decoder: 8-bit Digital
De-Interlacing (NTSC-PAL): pixel-level motion adaptive
Comb filter decoding: adaptive
Film mode (NTSC) 3:2 pull down
CV/YC Video adjustments: contrast, brightness, saturation, hue (NTSC)
CV/YC subcarrier lock range: +/- 200Hz for NTSC Operation, +/- 250Hz for PAL Operation
YUV / YPbPr via 3 x BNC

15.2 Computer Input

DVI-D (on DVI-I connector) supporting up to 108MHz (1280x1024 @ 60Hz).
EDID 1.3 data on DVI-D connector to communicate available resolutions.
Analog RGB/YPbPr supporting RGBHV, RGBS, RGsB, YPbPr, auto-terminating into 75 Ohm
Digital sync (in RGBHV or RGBS mode): TTL Level, 10K termination, pos or negative
Analog sync (in RGsB, YPbPr, YUV modes): 0.3v negative.
Analog RGB Level Range: 0.5-2.0 Vp-p approx.
Scan Rate Detection: automatic
Analog PC Resolutions: any up to 2048x2048
Analog HDTV Resolutions: any up to 1080p
Analog max horizontal scan rate: 150kHz

15.3 Computer Outputs

DVI-D output on DVI-I connector, supporting up to 108MHz maximum clock/pixel rate (1280x1024 @ 60Hz) – higher pixel rates are sub-sampled to 108MHz.
Analog output impedance 75 Ohm
Analog RGBHV, RGBS, RGsB, YPbPr (0.7v RGB / 1.0v sync-tip to white)
Connectors: HD-15 and/or 5 x BNC
Analog PC Resolutions: any up to 2048x2048 (user adjustable)
Analog HDTV Resolutions: any up to 1080p
Vertical Refresh Rate: any to 250Hz

15.4 Audio input/output

Inputs: 4 x unbalanced stereo via screw terminals
Output: 1 x unbalanced stereo via screw terminals

Switching resistance: approx. 22 Ohm
Audio-follow-video (user selectable)

15.5 Locking/Mixing

CV/YC SC/H phase adjustments: +/- 180 degrees

15.6 Scaling / sampling / memory

Size and position: automatic via AutoSet or Manual
Image size: user-definable presets
Image freeze: one video frame
Settings memory: non-Volatile
Zoom range: variable to 10x Zoom (1000%)
Shrink range: variable to 10%
Image mirroring: Horizontal and/or Vertical
Horizontal filtering: full digital
Conversion technology: proprietary – CORIO2™
Color resolution: 24-bit (16.8 Million Colors)
Sampling rate: 108MHz maximum
Digital sampling: 24-bit, 4:4:4 format
Firmware memory: flash, upgradeable via RS-232

15.7 Warranty

Limited warranty: 2 years parts and labor

15.8 Regulatory Compliance

Main unit conforms to FCC, CE, RoHS

15.9 Environmental

Operating temperature: +4 to +45 deg.C (+40 to +113 deg. F)
Operating humidity: 10% to 85%, non-condensing
Storage temperature: 0 to +60deg.C (+32 to +140deg. F)
Storage humidity: 10% to 85%, non-condensing

15.10 Power Requirement

External power supply: 12V DC @1A maximum.
Actual current consumption varies between units.
Internal over-voltage & over-current protection.
Full PSU specification: 12v DC regulated 1Amp PSU with a 2.5mm locking center-pin positive DC
power connector. A non-locking 2.5mm DC power connector will also fit.

15.11 Control Methods

The unit can be controlled locally via the front panel buttons, multi-directional switch and Liquid Crystal Display. It can also be controlled remotely via the RS-232 interface using a DB9 female connector or again remotely using Ethernet via a RJ45 Ethernet connector, or using an Infrared remote using the IRC-4 remote unit.

15.12 Mechanical

Size (H x W x D): 1.6" x 8.6" x 5.8" (41.5 x 218 x 147mm)
Weight (Net): 2.6 lbs (1.2 kg)

15.13 Optional Accessories

RMK-61: single/dual rack-mount Kit
IR-RC-1: Infra-red remote control

Where AV and IT Meet