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C2-5000 Series Universal Scaler
Operation Manual

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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.

You have not become the owner of any software - you have merely purchased the right to use the software. You may make one copy of the software for your own use. Other copies will be deemed a breach of copyright.

No warranty is made either expressed or implied including but not limited to any implied warranties of merchantability or fitness for a particular purpose. In no event shall the supplier or manufacturer of this product be liable for errors found within, or be liable for any direct indirect or consequential damages or loss in connection with the purchase or use of this hardware software or manual. The sole and exclusive liability to the supplier and manufacturer regardless of the form of action shall not exceed the replacement cost of the materials described herein.

By using this equipment you have indicated that you have agreed to the terms listed above. If you do not wish to agree or the above terms are contrary to your conditions of purchase you may return the equipment, unused, to your supplier. All trademarks and copyrights are acknowledged. E&OE.

1.1 Regulatory Agency Acceptance

European ‘CE’ Mark Statement

Emissions: BS EN 50081-1 (Generic Immunity Standard for Residential, Commercial and Light Industrial)
Immunity: BS EN 0082-1 (Generic Immunity Standard for Residential, Commercial and Light Industrial)
Low Voltage Directive: BS EN 60950-1:2002 (Information Technology Equipment Safety)

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 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 or describes the proper connection of this equipment for operation that insures FCC compliance.

Direct all inquiries regarding FCC compliance to:

TV One Multimedia Solutions
1350 Jamike Drive
Erlanger, KY 41018
859.282.7303
859.282.8225 (Fax)

Important Production Notice

C2-5100 and C2-5200 are new model numbers for the TV One Universal Scaler product. Other than improvements in capability (a process that is part of all TV One Product Life Cycles), these products are exactly the same as the previous model designations; C2-770 and C2-775.

The C2-5100 replaces the C2-770 and the C2-5200 replaces the C2-775. The principle difference between the two models is the ability to process SDI signals in the case of the C2-5200, a capability not present in the C2-5100.

Manual Copyright Notice

This Operation Manual is the intellectual property of TV One, ©2004. 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 TV One.

2.0 IMPORTANT SAFETY INSTRUCTIONS

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, do not expose the unit to rain, water or excessive moisture.

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 insure reliable operation, avoid obstruction of these openings and insure the unit is installed in a well-ventilated area.

3.0 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 ELECTRIQUE 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 HUMIDITE

Afin de réduire le risque d'incendie n'exposez pas l'unité à la pluie, l'eau ou à une humidité excessive.

2.3 ENTRETIEN GENERAL

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 AERATION

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.

3.0 PROPRIETE 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 incendio no exponga el aparato a la lluvia, el agua o la humedad excesiva.

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.

3.0 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

Setzen Sie das Gerät weder Regen, Wasser noch übermäßiger Feuchtigkeit aus, um der Gefahr eines Brandes vorzubeugen.

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.

2.4 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.

3.0 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 VOCHTIGHEID

Zorg ervoor dat de eenheid niet aan regen, water of extreme vochtigheid wordt blootgesteld, dit om brand te voorkomen.

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.

3.0 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.

4.0 CAPABILITY SUMMARY

The C2-5000 series Universal Scalers use the proprietary CORIO2 Engine to control their capabilities. The CORIO2 series units are the second generation of the successful CORIO products. The features of both units make them powerful tools for any application requiring high quality video signal conversion or image manipulation.

Some of the outstanding features of the C2-5100 Universal Scaler are described below. (The C2-5200 has all the capabilities of the C2-5100 plus SDI I/O including an SDI genlock feature).

4.1 Anything In, Anything Out

With fully customizable resolution data, you define the video input and output parameters.

4.2 Preview Outputs

This feature provides the ability to select the next input for Preview before selecting it as the Program output.

4.3 Automatic Resolution Detection

Any input resolution can be auto detected providing it's specified in the resolution table. 1000 resolutions can be defined including user created resolutions.

4.4 Zoom and Shrink

Horizontal and vertical zoom can be as much as 1000%. Also, the image can be shrunk down to 10% of its original size.

4.5 Image Freeze and Flip

Images can be frozen on screen during presentations. Images can also flipped horizontally, vertically or both.

4.6 Seamless Switching

Clean, glitch free switching between video inputs. Fades between sources are possible with time periods of between .1 and 5 seconds.

4.7 Motion Compensation & Film Mode

3:2 Pulldown for 24fps film-source material. Motion compensation for normal video de-interlacing.

4.8 Luma and Chroma keying

User definable keying of Video outputs.

4.9 Picture in Picture

Place a video window anywhere on the screen with no source format restrictions.

4.10 Genlocking
Lock to RGB, YUV, S-video or composite video. With the C2-5200, SDI video sources can also be used for a genlock source.

4.11 Image Memory
The Program source can also be a stored image, allowing logo insertion and test patterns to be displayed

4.12 External Control
The Scaler is controllable from a Microsoft Windows® control application and via an optional IR remote control.

4.13 Customizable Buttons
10 programmable buttons can be assigned to any input and the image parameters of the input can be modified. Assignments and image parameters can be stored in a non-volatile memory.

5.0 UNPACKING AND INSTALLATION

5.1 Shipping Carton

The Universal Scaler arrives 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.

5.2 Furnished Accessories

Carefully unpack the carton and perform an inventory of the contents. In addition to the C2-5100 or C2-5200 product, the standard accessories include:

1 HD15 to HD15 Cable
1 5 BNC to 5 BNC Cable
1 Y/C Cable
1 Composite Video Cable with BNC Connectors
1 RS-232 Cable (Null Modem)
1 AC Power Cable
1 Instruction Manual

If any items are missing or defective, contact your supplier. If you are unable to resolve the problem with your supplier, contact TV One via the web at **http://tvone.crmdesk.com** for prompt replacement.

6.0 FUNCTIONAL CHECK

Important Safety Instructions

For US Customers:

If the AC outlets available are not suitable for the plug supplied with this unit, the plug should be cut off and an appropriate 3 pin plug attached. For details see below. ***A plug severed from the AC lead must be destroyed, as a plug with bare wires is hazardous if inserted into a live outlet.***

The wires in the AC cable are colored according to the following code:

White: NEUTRAL
Black: LIVE
Green: EARTH GROUND

The wire colored WHITE must be connected to the terminal marked with the letter N or colored BLACK.

The wire colored BLACK must be connected to the terminal marked with the letter L or colored RED. (Make sure that neither of these wires is connected to the earth terminal of the three-pin plug).

The wire colored GREEN must be connected to the terminal marked with the letter E or colored GREEN or GREEN & YELLOW or marked with a ground symbol.

For European Customers:

If the mains socket outlets available are not suitable for the plug supplied with this unit, the plug should be cut off and an appropriate 3-pin plug attached. For details see below. ***A plug severed from the Mains lead must be destroyed, as a plug with bare wires is hazardous if inserted into a live outlet.***

The wires in the Mains Lead are colored according to the following code:

Blue: NEUTRAL
Brown: LIVE
Green and Yellow: EARTH

If the colors of the wires in the AC cable of this unit do not correspond with the colored marks identifying the terminals in your plug, proceed as follows:

The wire colored BLUE must be connected to the terminal marked with the letter N or colored BLACK.

The wire colored BROWN must be connected to the terminal marked with the letter L or colored RED. (Make sure that neither of these wires is connected to the earth terminal of the three-pin plug).

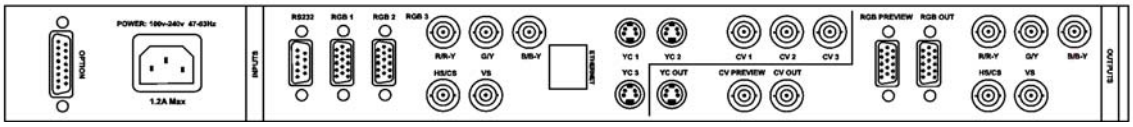
The wire colored GREEN & YELLOW must be connected to the terminal marked with the letter E or colored GREEN or GREEN & YELLOW or marked with a ground symbol.

NOTE: POWER IS NEVER TOTALLY REMOVED FROM THE UNIT WHEN IT'S PLUGGED INTO AN ACTIVE AC OUTLET. PRESSING THE BUTTON AT THE EXTREME RIGHT ON THE FRONT PANEL ONLY PLACES THE UNIT IN A POWERED DOWN MODE. THIS BUTTON IS A STANDBY SWITCH, NOT A TRUE OFF AND ON SWITCH. NEVER REMOVE THE CABINET UNLESS THE UNIT HAS BEEN COMPLETELY DISCONNECTED FROM AC POWER.

6.1 First Time Operation Using Factory Default Settings

The following procedure is a simple functional check using the unit as a VGA Scaler to verify correct operation in the Factory Default configuration. Please perform this check immediately after unpacking the unit and once you have verified all the required accessories are present. In order to carry out this setup you will need a Personal Computer as a signal source and its computer monitor.

First, connect the AC power cable to the unit. (Refer to the diagram below. The cable connects to the socket labeled "Power 100v – 240v 47-63Hz – 1.2A Max").

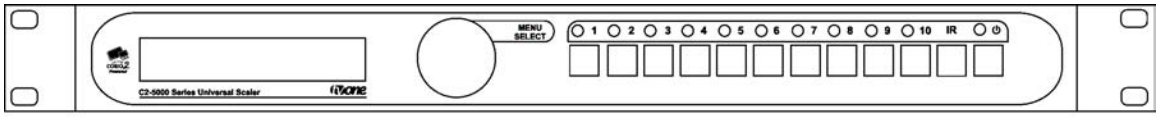


Next, disconnect the cable going from the Monitor to the PC. Connect the output from the PC video card (the PC connector formerly used by the monitor cable) to the input labeled "RGB1" on the rear panel of the Scaler. Use the HD15 – HD15 cable provided in the accessory pack to make this connection.

Finally, connect the cable from the monitor to the connector labeled "RGB Output" on the Scaler. Connect the AC Power Cable to a working AC outlet and turn on the PC, monitor and the Scaler.

Provided you have not changed anything from the Factory Defaults, after a few seconds to initialize, the CORIO2 logo will appear on the output monitor.
You will then need to select the RGB1 input on the Scaler as a signal source.

6.2 Selecting RGB1 using the front panel buttons



There are 10 assignable input buttons on the front of the unit and in the Factory Default setting button number “1” is assigned to the RGB1 input connector.

By pressing button number “1”, the input to the RGB1 connector will be selected as the Program source and the PC image should appear on the monitor. (The Scaler has a preview function that will be explained in greater detail later. When the preview feature is enabled, pressing a button once routes the image from that button to the preview bus and pressing the same button a second time routes the image to the program output. In the Factory Default setting, the Preview Function is set to immediately follow the program source selection and it’s only necessary to press the input button once to cause the selected input to appear at the unit’s Program AND Preview outputs).

Since the input buttons are all assignable and fully programmable, only the Factory Default setting insures that button number 1 is assigned to the RGB1 input. If you are performing this check from a condition other than the Factory Default setting *(e.g. you have used the unit and assigned something other than RGB1 to button 1),* you will need to perform a Factory Reset on the Scaler.

6.3 Factory Reset (Perform Before Each Quick Start Exercise Below)

To restore all operational parameters to their original condition, first insure the unit’s in the operational mode (not in Standby). If it is, press the standby switch and hold Buttons 1 and 2 until the unit beeps. Also perform this step before each of the following exercises. *NOTE: ALL SETTINGS EXCEPT IMAGE PARA-METERS ARE LOST WHEN THE UNIT IS RESET.*

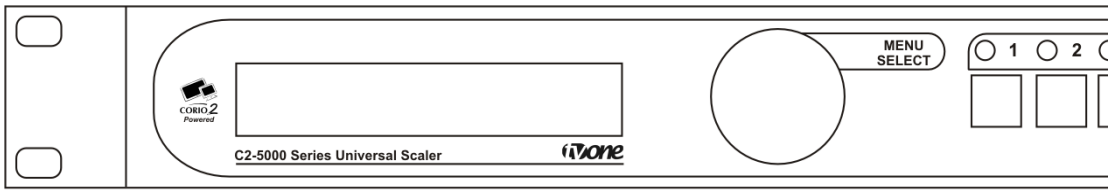
7.0 QUICK START DISCUSSION

You would be a unique user indeed if you didn’t try to start using the unit before you understood all the features that are present. Recognizing that you may want to shortcut the learning process, this section is included to acquaint you with the basics of the four features used most often by the typical Scaler operator:

Assigning Inputs to Specific Buttons
Using Picture-In-Picture (PIP)
Image Keying
Zooming of the Image

7.1 Quick Start: Assigning Inputs to Specific Buttons

The unit has a front panel knob mechanically connected to a Rotary Encoder that has detents you can feel as you turn the knob. The knob is located between the LCD display and the input buttons and is labeled **"Menu Select".**



The following example shows how you would select RGB1 as the input for button number 3. All input assignments are made using the same procedure.

To begin, press button number 3 on the Scaler so you can see the result of your efforts. From this point on, we will be using the Front Panel LCD Display and Menu Select Knob to make changes.

When you first turn the Scaler on, the LCD screen will show the following display:

```
CORIO2 C2-5100
TV One
```

This is called the Banner Screen and is a sort of "Home Base" for the menu system. You should now turn the Menu Select knob Clockwise until you are parked on the following screen:

```
Sub menu
Adjust Buttons
```

Press the Menu Select Knob once to advise the Scaler that you want to make an adjustment to the input assignments of one of the buttons. When you do, you'll be rewarded with the following LCD display:

```
Adjust Buttons
Button [  1]=      input=RGB1
```

Pressing the Menu Select Knob again will cause the brackets surrounding the number "1" to begin flashing. Turn the Menu Select knob to the right until the number "3" appears between the flashing brackets. When it does, press the Menu Select knob again to load the number "3" into the Scaler's memory. The brackets will stop flashing and display should look like this:

```
Adjust Buttons
Button [  3]=      input=RGB3
```

Rotate the Menu Select knob to the right and press the knob again. This notifies the Scaler that you are about to change the input assignment to input number "3". The brackets will disappear from around the input number and will appear around the section of the display that says "Input=RGB3". The LCD screen will look like this:

Adjust Buttons Button 3 = [Input=RGB3]

Press the knob again and the brackets will begin to flash indicating that the Scaler is ready to accept the new input assignment. Rotate the Menu Select knob to the left until the number "1" appears and then select it by pressing the knob again. The flashing will cease and the LCD display will now look like this:

Adjust Buttons Button 3 = [Input=RGB1]

Rotate the Menu Select knob to the right until the below depicted display appears. You should now see the proper Video present Output Monitor.

Adjust Buttons Exit

Pressing the Knob causes an exit of the Adjust Buttons routine. You can now move the Menu Select knob Counter-clockwise until it's back at the Banner Screen. *(NOTE: Selections made in this Quick Start section only store into temporary memory. A way to make your choices permanent will be explained later in this manual)*

7.2 Quick Start: Picture-In-Picture

Picture In Picture (PIP) has four components: Background Source, Foreground Source, Amount of Shrinkage of the inserted image (measured as a percentage with 100% being full screen) and, finally, the Position of the Inserted image.

For this tutorial, we'll use two image sources: RGB1 (the background) and RGB2 (the image to be shrunk). A second PC will do nicely for the number 2 RGB source. Although both sources in this example are RGB images, your sources can be whatever you want. Just remember to substitute your own background image selection for RGB1 and your PIP image selection (the image to be shrunk) for RGB2. Before we begin, perform the Factory Reset procedure explained above.

We'll begin at the Banner Screen. As with the Input Assignment exercise, the screen will look like this:

CORIO2 C2-5100 TV One

Rotate the Menu Select knob to the right until you see the Program Source screen. In our example, we are using RGB video from a PC on the RGB1 input that happens to have 1024 X 768 60 Hz output parameters. The top line of the display will show that resolution and refresh rate as an informational display. The bottom line will show the current Program source. Press Button 1, making the Program Source parameter RGB1. The LCD screen therefore will look like this:

1024 X 768 60Hz Program source [RGB1]

Press the knob to notify the Scaler that you wish to change the Program Source parameter. This will cause the Brackets surrounding the "RGB1" portion of the display to begin flashing. When they do, use the Menu Select knob to change the Program Source parameter to RGB2. In so doing, you will have told the Scaler that you're going to be using RGB2 as the image you wish to shrink. Press the knob once to confirm the choice. The brackets will cease flashing, the image on the Monitor will change to RGB2 and the LCD display will look like this:

1024 X 768 60Hz Program source [RGB2]

Rotate the Menu Select knob to the right and you'll arrive at the Lock Source screen. This is where you set your background source. In our example, because we are operating in the Factory Default mode, RGB1 is already selected. We'll leave it as is for this exercise but you may want to change it to some other background selection later when you're making your own selections. When you want to do that, press the Menu Select knob once and the brackets will begin flashing. Make your selection for the background/Lock image source and press the knob again to confirm your selection.

1024 X 768 60Hz Lock source [RGB1]

Note: *The resolution of the PIP output is governed by the resolution of the background image so if you select a low-resolution image for your background image, the inserted image will also be low resolution. For this reason, you should always use as high a resolution background image as possible.*

Next, rotate the Menu Select knob one detent to the right and you'll be on the Lock Method screen. This is where we tell the Scaler that we want to do a PIP selection. Initially the screen will appear as follows:

```
1024  X  768  60Hz
Lock method          [        Off]
```

Press the Menu Select knob and the brackets surrounding the word "Off" will begin to flash. Rotate the knob to the right until the PIP notation appears between the flashing brackets. Press the knob again to confirm the choice. The brackets will cease their flashing and the LCD screen will show your selection:

```
1024  X  768  60Hz
Lock method          [        PIP]
```

Rotate the Menu Select knob to the right until you see the following LCD screen appear:

```
Sub menu . . .
Adjust Scaler parameters
```

Press the Menu Select knob once and the following screen will appear:

```
Adjust Scaler Parameters
Zoom Level %              [  100%]
```

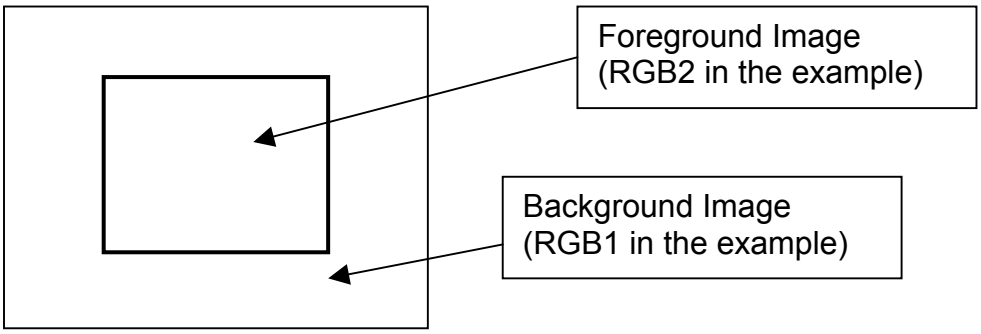
Rotate the knob to the right until you see the following LCD screen:

```
Adjust Scaler Parameters
Shrink Level %            [  100%]
```

Press the Menu Select knob once and the brackets will begin to flash. Rotating the knob to the left will cause the image to shrink revealing the background image. When you reach the desired amount of shrinkage of the foreground image, press the knob again to lock in that value. We'll use 50% as the desired value resulting in an LCD display that looks like this:

```
Adjust Scaler Parameters
Shrink Level %            [   50%]
```

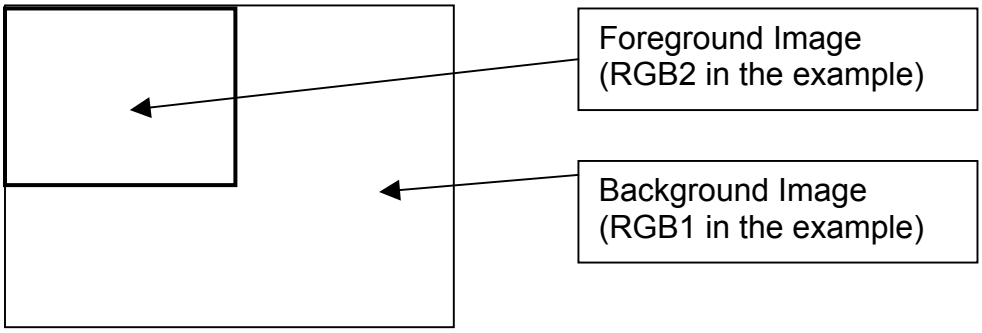
The brackets have now ceased their flashing and on the monitor you should see the foreground image shown at 50% of its full screen size, replacing the middle of the background image:



The last step is to set the position of the PIP. Rotate the Menu Select knob to the right until the H/V Shr. pos % screen will appears on the LCD display:

Adjust Scaler Parameters
H/V shr. pos.% [50] 50

Press the knob once and the brackets will begin to flash. This is where you'll set the Horizontal position of the inserted (PIP) image. Rotating the knob to the left (Counter-clockwise) will cause the inserted image to move to the left. Rotating the knob right (Clockwise) moves the image to the right. When you reach the Horizontal position you desire, press the knob again to lock in that value and stop the brackets from flashing. Rotate the knob one 'click' to the right, press the knob again and the Vertical position of the image can be set. Rotating the knob to the left causes the image to move up and rotating it to the right moves the image down. In this tutorial, we've moved the inserted image to the top, left corner of the monitor's display. Press the knob again to lock in the value and stop the brackets from flashing.



Adjust Scaler Parameters H/V shr. pos.% 25 [25]

Rotate the Menu Select knob to the right until you reach the Adjust Scaler Parameters exit menu:

Adjust Scaler Parameters Exit

Press the Menu Select knob once and then rotate the knob Counter-clockwise until you are back at the Banner screen on the LCD display.

By the way, later on we'll learn how to save a set up such as the PIP scenario we just created so that pressing one button will display the pre-configured PIP without having to go through all these steps during a live presentation.

7.3 Quick Start: Keying

Again, because this is a familiarization exercise, we need to start everything from the Factory Default position to make certain we're all on the same page; so at this time perform the Factory Reset procedure explained above.

To see an example of the Keying capability of the unit, we'll need the source on RGB2 (input 2) to function as a character generator. If you are using PCs for both RGB1 and RGB2, set the desktop background of the PC on RGB2 to Black. For PC operating systems such as XP and Windows 2000, simply right click on the desktop and then left click on Properties. Under the Desktop tab, set the background to "None" and the color to "Black". This will allow us to key the second PC's icons over the PC one background source. (If you are using another operating system, consult the help utility for instructions on how to accomplish this task).

Alternatively, if you have a program (like Microsoft's PowerPoint for instance) installed on your PC (that allows you to create White or Colored text over a black background), just run that program and create some text for keying.

We will be keying the output of input 2 (RGB2) over the background provided by input 1 (RGB1). The sequence for accomplishing this is as follows:

As before, we start from the "Home Base" Banner screen on the LCD display:

CORIO2 C2-5100 TV One

From there, just as in the PIP scenario, we set the Program source parameter to be the foreground image (which in this case is the image we wish to use as a Key source). Rotate the Menu Select knob to the right until the Program source LCD screen is displayed and press the knob once. When the brackets begin to flash, change the Program Source to RGB2. Press the knob once to confirm your choice, the brackets will cease their flashing and the following screen will appear:

1024 X 768 Program source [RGB2]

Rotate the Menu Select knob to the right and confirm that input RGB1 is selected as the Lock Source. (Again, just like PIP, this is where you select the background image. We want RGB1 now so we'll leave it alone but you could change it to whatever you want in day-to-day operations. To change it later on, pressing the knob once starts the brackets flashing. Make your selection and press the knob once again).

In our case, the screen looks like this:

1024 X 768 Lock source [RGB1]

Next, rotate the Menu Select knob to the right until you see the following screen:

1024 X 768 Lock method [Off]

Press the knob and the brackets will begin to flash. Rotate the knob to the right until the word "Overlay" appears. Press the knob again to confirm your choice and to stop the brackets from flashing. You should now see the image from input 2 keyed over the image on input 1.

1024 X 768 Lock method [Overlay]

In many cases, the key will not be as clean as you'd like. This is because the Scaler will construct the key against a default setting since it can't know the quality of the key and background sources in all cases. From here, we need to go to an area where we can "touch up" the key to make it look the very best.

From the Lock Method screen, rotate the Menu Select knob to the right until reaching the following screen:

Sub menu Adjust Lock/Overlay

Press the knob once to notify the Scaler that you want access to these menus and then rotate the knob to the right until the following screen appears:

```
Adjust Lock/Overlay
Y key min/max    [   0]     32
```

Press the knob and, when the brackets surrounding the “0” begin to flash, rotate the knob to the right until the background image disappears. When that happens, rotate the knob back to the left until the background image reappears and then continue for another four detents. Press the knob once, which loads the minimum “Y” value into memory. Rotate the knob to the right and press it once observing the flashing brackets around the right hand number. Rotate the knob to the left until the background image disappears and then rotate it back to the right until the keyed image has no bleeding, tearing or other defects. Press the knob once to load the maximum “Y” value into memory. You will now see a properly keyed image on the monitor and the LCD display will show values somewhere between 0 and 255 in the minimum and maximum readout display areas.

```
Adjust Lock/Overlay
Y key min/max        14    [  32]
```

After you have made your level selections, rotate the Menu Select knob to the right until the following screen appears:

```
Adjust Lock/Overlay
Exit
```

Press the knob once and then rotate the knob to the left until you are back on the Banner screen.

7.4 Quick Start: Zooming the Image

You’ll be happy to know that zooming an image is very simple however we still need to perform the Factory Reset procedure to once again start the tutorial with a clean slate. After you have done so, select either of your input sources by pressing the appropriate input buttons. Starting from the Banner screen, begin rotating the Menu Select knob to the right. The LCD screen we want will be the Adjust Scaler parameters display as shown:

```
Sub menu . . .
Adjust Scaler parameters
```

Pressing the knob once reveals the following screen:

```
Adjust Scaler Parameters
Zoom Level %                [  100%]
```

Pressing the knob again causes the brackets to begin flashing. Rotate the Menu Select knob to the right to zoom the image up to 1000%. Press the knob once to load the value into memory.

Enlarging the center of the image is nice but what if you are interested in something other than the middle of a picture? Fortunately, there are adjustments available that allow you to pan the image both horizontally and vertically.

After you have selected and saved the zoom percentage, rotate the Menu Select knob to the right until you see the following screen:

```
Adjust Scaler Parameters
H/V zoom pan % [ 50]  50
```

Pressing the knob will cause the brackets surrounding the left number to begin flashing. Rotating the knob will cause a horizontal movement of the image with a Clockwise rotation causing the image to move to the left and a Counter-clockwise rotation causing a movement to the right. When you have reached the desired position horizontally, press the knob to load the result into memory. Move the brackets over to the right hand number by rotating the knob one detent to the right and pressing the knob. The brackets will begin to flash again and you can make the vertical adjustment so as to place the image at exactly the desired position. Press the knob to load that value into memory and then rotate the Menu Select knob to the right until the exit screen is reached:

```
Adjust Scaler Parameters
Exit
```

Press the knob to exit the adjustment area and then rotate the knob Counter-clockwise until you are back at the Banner screen.

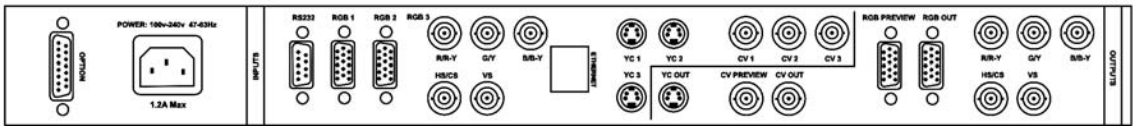
These four features represent the areas of highest user interest. An understanding of these basics is a prerequisite to understanding the C2-5100/C2-5200 Universal Scaler. You should use this Quick Start tutorial as a get acquainted exercise because menu navigation (along with the RS-232 interface) is the basis for unlocking the power of the Scaler. Remember that we haven't touched upon many other features. All of that will come later but for now, become proficient with the four features described above before you move further into the manual.

8.0 I/O Signal Flow

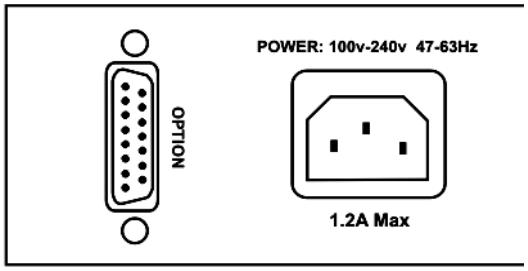
The Scaler has three RGB inputs (two with HD-15 inputs and one with 5 BNC inputs), Three Composite Video inputs and Three YC inputs. Provision is made for RGB outputs (one HD-15 and one set of 5 BNC connectors), a Composite

Video output, a YC output plus RGB and Composite Preview outputs. The C2-5200 adds one SDI input and output that can also function as a genlock source.

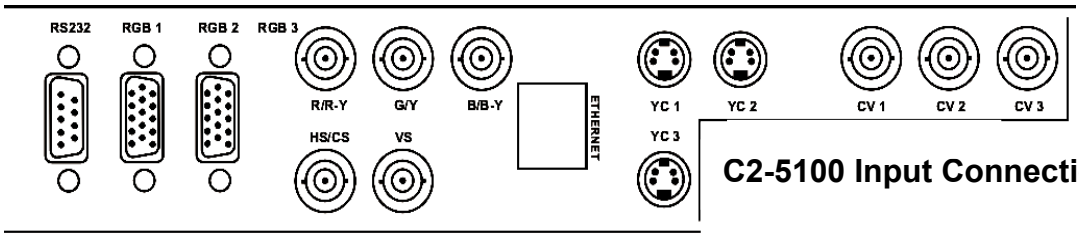
Connectors for RS-232 control and Ethernet based control are provided and will be discussed later in the manual. There is also a connector labeled “Option” that is used to connect the A2-2000 Audio Switcher.



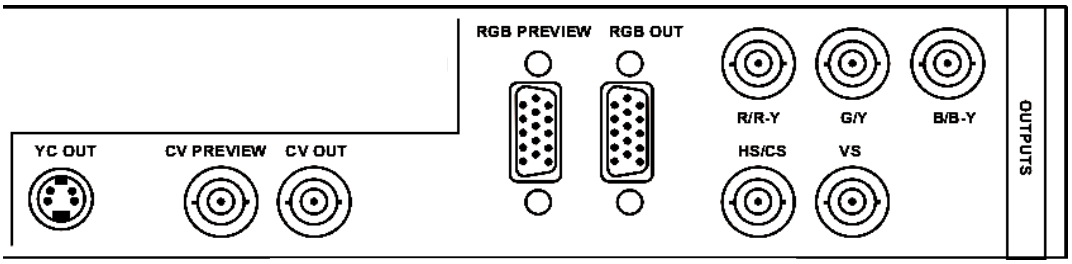
The rear panel layout—from left to right—consists of the option connector and the AC connector in a grouping. In the middle are the various input connectors, clearly labeled and accessible. Lastly, the various outputs are grouped on the right. Please familiarize yourself with these connectors.



Option and AC Socket.



C2-5100 Input Connections



C2-5100 Output Connections

Using these various Inputs and Outputs, the unit can function as a Scaler, an Up or Down converter, a Standards Converter—over 20 functions in fact—but some actions are not possible due to format limitations. You can’t input certain computer resolutions and output usable baseband video for instance. This is not

a limitation of the Scaler but rather a limitation brought about by the Laws of Physics.

But where there are no physical limitations and the Scaler has been set up correctly, simultaneous outputs appear at the various output connectors when a particular input is selected. This capability frees the user from the need to plug and unplug cables when moving from one format or type of signal to another and allows multiple format signal outputs that can be distributed without the need for downstream converters.

With the mention of cables above, it's a good time to stress that the accessory cables furnished with the Universal Scaler are of high quality. The user is cautioned that the input and output signals can be severely degraded by using poor quality cables. Always check the specifications of cables to make certain the impedance, bandwidth, signal loss characteristics, shielding characteristics, etc. are all appropriate before purchasing new cables. Verify that each of these specifications are acceptable plus check the physical condition and soundness of connector attachment before using any cables currently present at your location.

The TV One Z-Plus series of cable products are ideal for use with the Universal Scaler and either the Z-Plus cables or a competitive product that meets the same specifications must be used if full Scaler performance is to be realized.

9.0 OVERVIEW OF CONTROL CHOICES

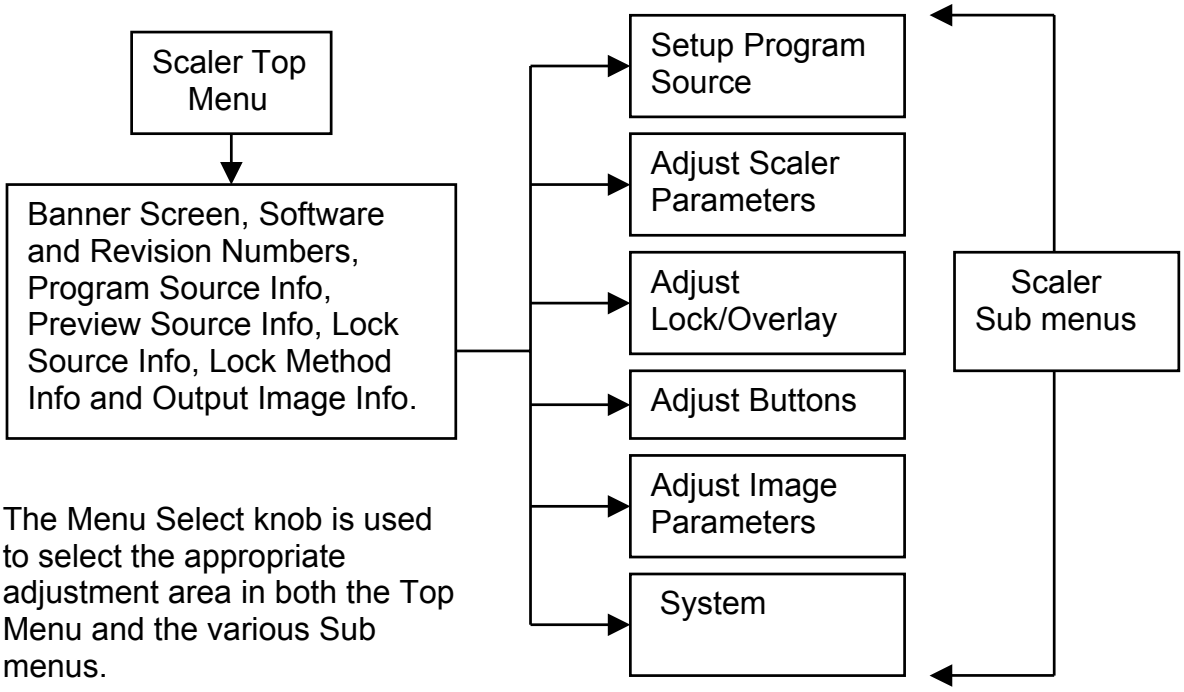
The Front panel controls consist of the LCD Display, the Menu Select knob, the Input Select Buttons and the Standby/Operate Switch. Hidden between the Standby switch and the tenth input button is an Infrared sensor that provides Scaler control via a handheld IR remote control. These controls provide full control over both the operational and System aspects of the unit.
A second method of controlling the Scaler is the control software, downloadable at **http://tvone.crmdesk.com**. Installation and operation of the software will be covered in detail a bit later in this manual.

The third method of control is via the Ethernet connector. The Universal Scaler is IP enabled meaning you can assign an IP address to the unit and control it over your Wide Area Network of even the Internet if you wish to do so.

9.1 Operation via the Front Panel Controls

Although the two other methods of control provide powerful ways to manipulate and adjust the Universal Scaler, the Front Panel controls normally are the first ones explored by the user. Multiple Sub menus result from a practice that programmers call 'drilling down' because you are going deeper and deeper into the menu structure—and getting progressively more and more lost. We chose not to use this approach with the Universal Scaler.

With the Universal Scaler, the menu is only one layer deep. From the top menu you step down just one level and go directly to the area you desire, where you can work within that functionality without ever going deeper into additional sub menus. The Schema of the Universal Scaler Menu Structure looks like this:



Menu Schema

As you learned in the Quick Start section, the way to navigate within the Menu structure is to rotate the Menu Select knob to the area of interest and then press the knob once. This notifies the control logic within the Scaler that you are interested in accessing a particular area.

Similarly, when within a specific area, you use the same 'knob rotation and pressing' steps to move to and select a function or parameter within the unit to change. You then rotate the knob one way or the other to actually effect the change and press the knob again to record your choice.

When you make your choice known with the press of the knob, that action also allows you to move to another area entirely, repeat the same activity within the area where you are located or back up in the selection process all the way to the top menu. Everything done from the front panel involving the Menu Select knob and the LCD Screen is done using this simple procedure.

Since you learned how to navigate within the menu structure in the Quick Start section, the only remaining mysteries now are what each of the individual

selections within the top menu and various sub menus actually “do”. Once that is sorted out, you’ll be an expert with the Universal Scaler in no time.

10.0 THE TOP MENU

The Top Menu is the first menu level. From here, you can make several universal settings and also branch out to the various sub menus. Rotate the Menu Select knob one detent to the right to progress through the Top Menus, pressing the knob once to select the menu of interest.

10.1 Banner Screen

When you first apply power to the Universal Scaler, the LCD screen will be parked on the Banner Screen. It will always have the same information displayed and cannot be changed. The Banner screen will look like this:

```
CORIO2  C2-5100
TV One
```

(A C2-5200 has the same screen but will indicate that the Scaler is a C2-5200 model instead of C2-5100).

10.2 Software and Hardware Version Screen

Turning the Menu Select knob to the right one detent will bring up a screen that displays the Software and Hardware version numbers. When new software is available from the support website, you should compare the version number of the new software to the software currently installed on your Scaler. The features of the new software version will be listed on the website so that you can decide whether or not you wish to upgrade. Information on the upgrade procedure, directions explaining how to register and the URL of the website will be covered a bit later in this manual.

```
www.tvone.com
SW 162,   PT:    3      BT:    6
```

In the screen example shown above, the “SW 162” portion of the display refers to the software revision number. The “PT: 3 and BT: 6” portions of the sample display refer to the Hardware version number. You cannot upgrade the hardware however it’s useful information in the event you contact our Technical Support group.

10.3 Program Source

1024 x 768 60Hz Program Source [RGB1]

The Program Source LCD display shows the signal source that has been selected as the main input to the Scaler engine. This is the only input that supports special processing such as Zoom or Shrink. The top line of the display shows the characteristics of the signal. In this case, the signal is made up of 1024 pixels in the horizontal dimension and 768 pixels in the Vertical dimension.

These pixels, or picture elements, are repeating at a rate of 60 times per second. (The “Hz” in “60 Hz” is an abbreviation for “Hertz”, the name of a physicist who studied electrical waves. Hz refers to how many cycles of a wave occur each second. In this case, the picture is repeating at a cyclic rate of 60 times per second hence the 60 Hz designation in the display).

The bottom line indicates the input chosen for the Scaler engine. This display tracks the input button selected but can also be changed via the Menu Select knob. To change the input by use of the knob, press the knob once while on the above screen. This will cause the brackets surrounding the input selection to begin flashing. When the flashing begins, rotate the Menu Select knob until the desired input appears between the brackets. Pressing the Menu Select knob again will stop the brackets from flashing and will also cause your selection to be loaded into temporary memory where it will remain until manually changed or until the unit’s AC power source is disconnected.

10.4 Preview Source

The Preview Source functionality is provided so you can see the content or quality of an image before you place it on the program channel.
In the Factory Default mode, the Program and Preview outputs track meaning both are switched at the same time. In the Adjust Buttons Submenu, the two functions can be separated allowing the Preview functionality to operate independently of the Program function or act as a fixed pass through. The procedure for separating the two functions will be discussed when we reach the Adjust Buttons submenu.

From the standpoint of the LCD display, the functionality is the same for both Program and Preview meaning all information and selection criteria work the same way for both functions. The top line of the display provides the same image information and the selection shown on the bottom line can be changed using the input buttons or the Menu Select knob, just as is the case for the Program Source. The Preview Source LCD display looks like the following image:

```
1024 x 768   60Hz
Preview Source                [RGB1]
```

10.5 Lock Source

The Lock Source function is where you tell the Scaler what input is to be used for genlocking, Picture in Picture, Overlay and Underlay.

You can designate any input as the Lock Source, independent of your choice for Program Source, however it only becomes active when the Lock Method (see next function below) is set to something other than “Off”. Bear in mind that your Lock Source choice controls the output image resolution so you will normally want to make the Lock Source as high of a resolution as possible. Anytime the Lock Source is something other than “Off”, the Output image is no longer adjustable since it’s controlled by the characteristics of the chosen Lock Source.

The Lock Source display has the image information, as it’s top line. To select the Lock Source, you park the LCD display on Lock Source by rotating the Menu Select knob to the Lock Source screen and press the knob once. When the brackets begin to flash, you rotate the Menu Select knob until your input choice appears at which time you press the knob again. The selection is now stored in memory and the brackets cease flashing.

The Lock Source LCD screen display looks like this:

```
1024 x 768   60Hz
Lock Source                   [RGB1]
```

10.6 Lock Method

Lock Method determines what the Scaler will “do” with the Lock Source signal.

```
1024 x 768   60Hz
Lock Method                   [    Off]
```

The default position for Lock Method is “Off” and there are a total of five (5) possible choices for this parameter. Once again, the top line shows the signal characteristics and selections are made for the Lock Method are accomplished using the Menu Select knob. When you are parked on this LCD screen, press the Menu Select knob once and observe that the brackets flash. Make your selection from the possibilities shown below and press the Menu Select knob a second time to notify the Scaler of your choice. The brackets will stop flashing and your choice will be stored in memory. The possible choices are:

Lock Method	Description
Off	Lock Source is unused and the chosen Output Image determines the resolution to output.
Lock	This is the Genlock mode. The Scaler will synchronize itself to the “Lock Source” signal, overriding the Output Image Settings. You must make certain that you have a stable signal selected as the “Lock Source” or you will experience erratic operation. No signal on the “Lock Source” will likely cause a loss of output from the Scaler.
PIP	This is Picture in Picture mode. The Scaler will synchronize itself to the “Lock Source” signal. The “Program Source” will be placed in a window over the selected “Lock Source” signal. Review the Quick Start section to refresh your mind on how to perform the PIP function.
Overlay	This is the image “Key” mode. The unit will synchronize to the “Lock Source”. When using RGB signals, you adjust the key level as explained in the Quick Start area of this manual.
Underlay	Same as Overlay except this function is used with CV, YC and SDI sources. Key adjustment is accomplished in a similar manner.

10.7 Output Image

Up until now, the top line of the LCD display has been describing the characteristics of an input. Perhaps it was the input that was being sent to the output or perhaps it was the Preview Source of Lock Source input. Now we want to set the Output signal characteristics and this is done from the Output Image LCD screen via the Menu Select knob

The Universal Scaler can handle a very wide array of inputs and convert them all to a single output signal with defined characteristics. This output will remain in place until changed or it can be overridden as explained earlier under the Lock Source and Lock Method discussion. The Output Image LCD display provides information on the type of signal you have chosen for your output format as well as a way to change that selection. The default setting is as follows:

800 x 600 60Hz Output Image [17] [RGBHV]

In the case of the default setting, the output is an RGBHV format signal with a Horizontal and Vertical resolution of 800 X 600 Pixels respectively plus a refresh rate of 60Hz. This is pre-defined output number 17 and was chosen as the Factory Default because virtually all computer monitors, plasma screens and projectors will accept this format without any problem. (Note that the Factory Default is currently stored at memory position 17. If additional resolutions are added in the future, the position may or may not be number 17 but the default resolution is likely to remain at 800 X 600, 60 Hz for the foreseeable future).

There are many additional Output Image formats stored in memory and these pre-determined formats could be augmented in the future allowing up to 1,000 different resolutions. It's unlikely therefore that you will be unable to find a suitable, high-resolution output to fit your needs.

Although they can be changed to other database entries, there are a number of pre-defined outputs in the Scaler's database. Pre-defined Output number 1 is for NTSC Composite Video (CV) or YC (e.g. S-Video output) with a 60Hz vertical rate. Pre-defined output number 2 is for PAL format with a 50 Hz vertical rate and also steers the outputs to either CV or YC. (When you select Output 1 or 2, the various RGB outputs are inoperative).

All the other Pre-defined outputs are for RGBHV, RGBS, RGsB (Sync on Green) or YUV, also known as YCrCb, Y/R-Y/B-Y or YPbPr.

To change the Output characteristics, park the LCD display on the Output Image screen and press the Menu Select knob once. The brackets surrounding the Pre-defined output number will begin to flash. Select the Output type and characteristic you want and press the knob once. If you have selected anything except Pre-defined Outputs 1 or 2, you can then rotate the knob one detent to the right, press the knob again and select RGBHV, RGBS, RGsB or YUV for the output type. Press the knob to load your selection into memory. (Pre-defined Outputs 1 and 2 have their resolution defaulted by design to conform to the industry standards).

11.0 SUB MENUS

There are six sub menus used in conjunction with the Top Menu:

Setup Program Source
Adjust Scaler Parameters
Adjust Lock / Overlay
Adjust Buttons
Adjust Image Parameters
System

Rotating the Menu Select knob to the right from the Banner Screen and then pressing the knob selects one of the sub menus.

12.0 SETUP PROGRAM SOURCE SUB MENU

Sub menu Setup Program source

Rotating the knob to the right from the Banner Screen eventually takes you to the Setup Program source screen. From here, each input parameter can be adjusted plus the changes can be stored in non-volatile memory.

Inputs are grouped by characteristics: RGB signals have different adjustment parameters than do Composite Video and YC video signals and, if you have the C2-5200 Scaler, you have yet another type of signal, the SDI input, that has its own set of parameters.

It isn't necessary to drill down within the Setup Program source sub menu to reach the proper grouping. As you select inputs, the Scaler displays what type of signal you are using and presents you with the proper set of adjustment choices for the signal. The headings that follow will show what types of signals are adjustable for each sub menu. *Remember: you must first select Setup Program Source from the Top Menu to be able to change any of the following settings.*

For the purpose of this manual, we are using the Factory Default settings to explain the sub menus. If you wish to duplicate the signal input structure shown here (the signal type shown in parentheses on the screen display replication), please perform a factory reset.

12.1 Autoset Status (RGB Only)

From the Setup Program Source screen, pressing the Menu Select knob will display the first in the series of Program Source adjustment screens. This first

one is called Autoset Status and the following screen will appear when you press the knob:

Program Source	[RGB1]
Autoset Status	[Inactive]

Unlike most selections you will make, this one doesn't require that you press the Menu Select Knob and then make some sort of change to a parameter located between two flashing brackets. When you press the Menu Select knob with this item displayed, the Scaler will take immediate action to adjust the position of the picture by parking the first pixel of the image at the top, left portion of the screen. Along those same lines, there is a bit of a warning: This function only works with RGB signals. You cannot automatically adjust the position of a Composite Video signal or an YC signal.

Since you cannot change the selected input from within this function, you will have to manually select the input by pressing the appropriate input button. By default, the first input button is displayed so if an autoset routine is desired for another RGB source, press the appropriate input button and you will see that button description appear where the words [RGB1] is displayed in our example.

When you press this Menu Select knob with an unknown RGB signal selected, the LCD display will change from "Inactive" and the image will move abruptly to the right and downwards. The Scaler will then smoothly move the image upwards and to the left plus change the image size until it's correctly displayed. Pressing and holding the Menu Select knob until you hear a 'Beep' (after the autoset routine has finished) will save the result in permanent memory. *Note: Manual adjustments to the positions of the image are also possible as explained in sections 12.2, 12.3 and 12.4 below.*

12.2 TL Position Adjust (RGB, CV, YC, SDI)

The next screen displays the location of the first pixel of the selected image with respect to the top, left portion of the screen.

Program Source		[RGB1]
TL pos. adj.	[-54]	[-9]

Press the input button for the signal source you wish to adjust (any input, not just RGB) and then press the Menu Select knob once. Observe the left hand set of brackets begin to flash. This indicates you can now set the horizontal position of the image by rotating the Menu Select knob Clockwise and Counter-clockwise. (Although the Scaler is referencing the first pixel, you will see the entire image move as you make this adjustment). Press the knob once, the left hand brackets will cease flashing and the right hand set of brackets will begin to flash. Rotating

the Menu Select knob Clockwise and Counter-clockwise will move the image vertically and again, if you press the knob, the brackets will cease to flash.

NOTE*: Any time you make an adjustment to a parameter, you have only written the value to a volatile memory that will be lost should you unplug the Scaler. If you want to make any adjustment permanent, you must press and hold the Menu Select knob for a few seconds (until the Scaler emits a 'beep'). Each time you take this action, all data stored in all of the temporary memories are written to non-volatile memory.*

12.3 BR Size Adjustment (RGB, CV, YC, SDI)

Program Source		[RGB1]
BR size adj.	[-12]	[0]

After setting the image position, move to the screen that allows adjustments to the size of the image. You'll be setting the position of the Bottom, Right pixel.

Although you can zoom and shrink the image using the powerful Corio2 capability, these adjustments are used to set the size of the image before any changes are artificially made using zoom or shrink. You've set the position of the first pixel in the previous adjustments and now you will want make certain the image completely fills the screen without over expanding it in either direction.

Pressing the Menu Select knob once will cause the left hand brackets to begin flashing. You can then adjust the knob Clockwise or Counter-clockwise and expand or shorten the width of the image. Notice that the left side of the image stays locked where you positioned it with the TL Position Adjustment but the image can be adjusted to fill the screen horizontally. Press the knob again and the value is stored in temporary memory, the left-hand brackets cease their flashing and the right hand set of brackets begin to flash. You can now adjust the image vertically to fill the screen. As with the Horizontal adjustment, the first pixel stays locked (and with it the top part of the image) but you can expand or contract the vertical component of the image by rotating the Menu Select knob.

As with the TL Adjustment, you must select the source you wish to adjust via the input buttons.

12.4 Input Pixel Phase (RGB Only)

Program Source	[RGB1]
Input pixel phase	[-12]

Although a pixel is a very small element of the total image, it's possible for the Scaler's A to D converters to randomly sample the picture on the edge of the

pixel thereby losing image resolution. The Input Pixel Phase screen allows you to sample the image precisely in the middle of the pixels.

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 such as a multi-burst signal. In the absence of a multi-burst signal, use something with as fine a vertical detail as possible.

Press the Menu Select knob once and the brackets will begin to flash. Adjust the knob Clockwise and Counter-clockwise for the sharpest picture with the least shadowing or noise. When done correctly, any subsequent image from the adjusted source will be sampled in the middle of its pixels. All images from that source will thus be improved, not just the one you used for the adjustment. When finished press the knob again. The brackets will stop flashing and the value will be stored in temporary memory. Hold the knob in until the unit 'Beeps' to record the value in permanent memory.

12.5 RGB Input Type (RGB Only)

Program 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. Move the Menu Select knob from the Input Pixel Phase screen and bring up the screen shown above. *(Again, we are assuming you performed a factory reset as suggested. If you did not, you won't necessarily see the same screen when you rotate the Menu Select knob. It may be another type of signal [not RGB] or it could be parked on a button other than Input Button number one as it is in our example).*

Assuming you are seeing the same LCD screen as displayed above, press the knob once and the flashing brackets are your notification that you can change the type of RGB signal present on the input button. The device begins its offerings on the default signal type of *RGBHV*. This abbreviation means Red, Green, Blue imagery plus Horizontal and Vertical Sync. If you rotate the knob one detent to the right, you'll see *RGBS. This* means Red, Green and Blue plus a single Sync signal. A further rotation to the right and you will see *RGsB* displayed between the flashing brackets. This means that you have a Red, a Green and a Blue image plus a sync signal superimposed on the Green channel. Finally you have the choice of the *YUV* family of signals (RGB) and also the "tl" variant of YUV with Tri-Level Sync signals for 1080i, 720p HDTV type signals.

Make your choice and then press the knob once to lock in your choice for the input you selected. Press and hold until you hear the beep to permanently store the selection. Manually select any other Input Button that has an RGB signal

present and perform the same selection as before until you have all the RGB signals properly defined.

12.6 RGB Contrast (RGB Only)

Program Source			[RGB1]
RGB contr.	[100]	100	100

One desirable feature of an RGB signal is the ability to adjust the individual signal components with minimal effect on the other components. With a CV (Composite Video) or YC (Component Video) signal it's not easy to make an adjustment to one color without causing a knock on effect on another portion of the image. With RGB images you can (for instance) have an image of green grass and blue sky and make the grass bright green without having any effect on the blue sky. The RGB Contrast LCD screen affords you the opportunity to make such adjustments for each of your RGB Input Buttons.

The RGB Contrast Screen is selected by depressing the Menu Select knob one time immediately after reaching the screen. This will cause the left-hand set of brackets to flash, enabling the adjustment of the "R" or Red portion of the image. Move the Menu Select knob Clockwise or Counter-clockwise until the desired amount of Red enhancement or de-enhancement is reached. Pressing the knob once places the new value in temporary memory. Rotate the knob one 'click' to the right causing the middle set of brackets to start flashing. Press the knob once and then adjust the "G" (Green) image characteristics, pressing the knob once more to store that value. Finally, adjust the Blue component of the signal by rotating the knob to the right, pressing it once and again moving the knob Clockwise or Counter-clockwise until the desired amount of "B" (Blue channel) adjustment is reached. Then press the knob a final time.

When you're done, remember to press and hold the knob until you hear the 'beep' if you wish to make the changes permanent.

12.7 De-Interlace (RGB, CV, YC, SDI)

Program Source		RGB1
De-int.	[	AUTO]

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 acceleration of movement within an image. The Scaler provides some tools to minimize the effects of de-interlacing of an image.

Select this screen by rotating the Menu Select knob until the above screen is present on the LCD display. Press the Menu Select knob and the brackets will begin to flash. Make your selection (the choices are listed in the table below) by rotating the Menu Select knob and then pressing the knob to select your choice.

Mode	Function
Normal	The two interlaced fields are simply combined together. This will often show artifacts on moving images
Auto	Automatically selects Film 3:2 or Medium Range Motion Compensation (M. Comp Med.) depending on whether Film Mode is detected or not.
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.

Remember to press and hold the knob until you hear the 'beep' (or see the information change on the LCD screen) to make your changes permanent otherwise the choice will be lost if you unplug the Scaler.

12.8 Aspect Ratio (RGB, CV, YC, SDI)

Program Source	RGB1
Aspect ratio.	[4:3]

Most television monitors and projection systems default to a 4:3 display ratio. When the original television standards were being developed in the mid 20th century, it was decided that an electronic picture should have a rectangular appearance since that was the custom with the motion pictures of the day.

Since then, various wide screen motion picture standards have been developed but a Horizontal to Vertical ratio of 16:9 has become the wide screen television standard.

By rotating the Menu Select knob until the Aspect Ratio screen appears, you can change the appearance of the output image from 4:3 to 16:9. Since there are only two selections, no preliminary step is required to notify the Scaler that you want to make a change. In other words, there are no flashing brackets to contend with. Simply access the screen and each time you press the Menu Select knob, the Aspect Ratio will toggle between 4:3 and 16:9. To make the change permanent, hold the knob down until you hear the 'Beep'.

12.9 Brightness and Contrast (CV, YC)

When your input selection is Composite Video (CV) or S-Video (YC), you have access to several screens that only work with those two signal formats.

Brightness and Contrast are terms known to virtually anyone who has ever operated a television receiver and the adjustment is straightforward.

After selecting the CV or YC image, (we are using CV1), rotate the Menu Select knob until the following screen appears:

Program Source	CV1
Bright [100]	Contrast 100

Press the Menu Select knob and the left-hand brackets will begin to flash. Using the knob, adjust the Brightness of the image to your requirement. Note that the adjustment range is 0 to 180 with 100 being the default level. Once you have made the adjustment, pressing the knob once stores the value in temporary memory and causes the left brackets to stop flashing. Next, rotate the knob to the right and press it once to start the right-hand set of brackets flashing.

The value within these brackets is the setting for the picture Contrast value and it also has a range of 0 to 180 with 100 being the default. Pressing the Menu Select knob will store your new Contrast value in temporary memory. As always, if you want to make the settings permanent, press and hold the Menu Select knob until you hear the 'Beep' for both Brightness and Contrast.

12.10 Saturation and Hue (CV, YC)

Again using the television receiver analogy, you probably already know what functions Saturation and Hue represent. Adjustment of Saturation increases or decreases the amount of color in the image and adjusting Hue changes the appearance of the various colors within an image.

Program Source			CV1
Satur	[100]	Hue	0

Select a CV or YC image (we're using CV1 again in our example) and then rotate the Menu Select knob until you're displaying the LCD screen shown above. The mechanics of selecting the item to be adjusted are the same as before: after you are parked on the screen, press the Menu Select knob and the left-hand brackets will begin to flash. Rotate the knob between the values of 0 and 180 until you have the desired amount of Saturation (with 100 being the default value) and then press the knob to load your selection into temporary memory. With this selection made, the left-hand set of brackets will cease flashing. Rotate the knob to the right and press it once which will start the right hand brackets flashing. You

can now adjust Hue as necessary. In the case of the Hue control, the available values are –90 through +90 with a default value of 0. Press the knob to load your new value into temporary memory. And press and hold the knob until you hear the 'Beep' to make each change permanent.

12.11 Sharpness (CV, YC)

Within limits, you can enhance or soften the appearance of detail within an image. The Sharpness values are restricted to a range of –7 to +7 with 0 being the default. 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. The adjustment range is restricted for this reason.

Select a CV or YC image and rotate the Menu Select knob until you see the following LCD screen:

Program Source	CV1
Sharpness	[0]

Press the knob once and the Brackets will begin to flash. Make your adjustment and then press the knob again to record your new value in temporary memory. Press and hold the knob until you hear the 'Beep' to make the change permanent.

12.12 Television Standard (CV, YC)

There is no single standard for television signal characteristics. Not only are there three general standards in use throughout the world, there are sub-groups within two of the standards. The Scaler can determine the general signal characteristics automatically but needs some help with the various subsets.

The three general standards are **NTSC** (the initials of the National Television Standards Committee, the group that developed the United States color television system), **PAL** (Phased, Alternate Line) and **SECAM** (Systeme Electronique Couleur Avec Memoire).

In the mid 20th century when these standards were being developed, engineers joked that **NTSC** actually stood for *Never Twice the Same Color*, **PAL** meant *Phased At Last* and **SECAM** was short for *System Essentially Contrary to the American Method*. Funny and to some extent true.

Program Source	CV1
[PAL BGDHI / NTSC M	]

The default LCD display for selecting the signal format is shown above. As long as you are using NTSC, PAL or SECAM and not one of the subsets, the Scaler will automatically select the proper standard. If you are using a subset of a general standard, you will need to identify the subset for the Scaler.

Identify the standard or subset you are using and then advise the Scaler of the signal format by selecting from the list shown below.

Setting	Used For
PAL BGDHI / NTSC M	Normal PAL and NTSC
NTSC 4.43 50 / PAL 60	Specialized PAL and NTSC
PAL N / NTSC 4.43 60	Specialized PAL and NTSC
NTSC N / PAL M	Specialized PAL and NTSC
NTSC – Japan 3.58	Specialized NTSC
SECAM	SECAM

Press the Menu Select knob while parked on the LCD screen shown above and the brackets will begin to flash. Rotate the Menu Select knob until the proper standard is displayed and press the knob to select the standard. Press and hold the Menu Select until the 'Beep' is heard to make the change permanent.

12.13 Luminance to Chrominance Phase Delay (CV, YC)

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 a bit, you are seeing the print equivalent of Luminance to Chrominance Phase Delay.

Fortunately, the Scaler provides a way for you to make the two signals occur at the same time on the selected image.

The LCD screen is called Luma Delay and looks like this:

Program Source	CV1
Luma Delay	[0]

Press the Menu Select knob and the brackets will start to flash. Look at the monitor and use the knob to merge the chrominance and luminance signals.

The adjustment range of the knob is limited to values of –4 through +3 with 0 being the default. This may seem to be an insufficient range but it is enough to cancel out any delay you are likely to encounter.

Press the knob once after you have merged the two images to load the correction value into memory. Press and hold the knob until you hear the 'Beep' to permanently store the correction.

Rotate the Menu Select knob to the right until you see the Exit screen and press the knob once. You will be taken to the same Top Menu screen where you began the journey through the Program Source sub menus:

```
Sub menu
Setup  Program  source
```

12.14 Logo (Internal Scaler Video Source)

While displaying the Setup Program Source selection screen (from the Top Menu), press the Logo button on the Scaler (the last input button on the right) and then press the Menu Select knob once. You'll see the following LCD screen appear:

```
Program Source          Logo
Testcard                [  1]
```

The Scaler has the ability to store and display up to 15 test cards and comes loaded with 4 images. These images can be used and manipulated just as if they were coming from an external source and consist of a CORIO2 Logo and three test signals.

To select a Test Card signal, press the Menu Select knob. As the brackets flash, select the image you want to make your test signal (1 through 4 on a stock Scaler) by rotating the knob. Note that the image has to be read into the Scaler's working memory from a Read Only Memory and will take a second or two to appear as you rotate through the possible choices.

Once you have determined which signal you want to make your test signal, press and hold the Menu Select knob until you hear the 'Beep'.

Rotate the Menu Select knob to the right until you reach the Exit display and press the knob again. You will be taken to the Setup Program Source LCD screen from which you can move to "Adjust Scaler Parameters", the next Sub menu, one detent to the right from the Setup Program Source screen.

13.0 ADJUST SCALER PARAMETERS SUB MENU

```
Sub menu…
Adjust  Scaler  parameters
```

Much of the work being done by the CORIO2 Scaler engine is controlled from the Adjust Scaler Parameters Sub menu—the next in the series of Sub menus we will investigate.

Pressing the Menu Select knob while on the Adjust Scaler Parameters screen will take you to the first in a series of adjustment screens. Some you will recognize from this manual's Quick Start section. In fact, the first screen in this sub menu is one you'll recognize:

13.1 Zoom Level Adjust

```
Adjust Scaler Parameters
Zoom Level %              [  100%]
```

Once the above screen is display, pressing the knob again causes the brackets to begin flashing. Rotate the Menu Select knob to the right to zoom the image up to 1000%. Press the knob once to load the value into temporary memory. Press and hold until you hear the 'Beep' to permanently enter the zoom parameter into memory.

Enlarging the center of the image is nice but what if you are interested in something other than the middle of a picture? Fortunately, there are adjustments available that allow you to pan the image both horizontally and vertically.

After you have selected and saved the zoom percentage, rotate the Menu Select knob one detent to the right. The following screen will appear:

```
Adjust Scaler Parameters
H/V zoom pan % [ 50]  50
```

Pressing the knob will cause the brackets surrounding the left number to begin flashing. Rotating the knob will cause a horizontal movement of the image with a Clockwise rotation causing the image to move to the left and a Counter-clockwise rotation causing a movement to the right. When you have reached the desired position horizontally, press the knob to load the result into temporary memory. Next, move the brackets over to the right hand number by rotating the knob one detent to the right and pressing the knob. The brackets will begin to flash again and you can make the vertical adjustment so as to place the image at exactly the desired position. Press the knob to load that value into temporary memory. Press and hold the Menu Select knob until you hear a 'Beep', so you don't lose the

adjustments should the Scaler be unplugged. For these adjustment selections, you would need to permanently save both the Horizontal and Vertical values.

13.2 Image Freeze

Adjust Scaler Parameters	
Image freeze	[Off]

The next screen in sequence is the Image Freeze control. It's a simple toggle control so once you are at the screen, pressing the Menu Select knob turns the feature On or Off. When on, whatever image is visible on the program out bus will be frozen and, with the exception of the Logo input, additional input selections will be ignored as long as the Image Freeze parameter is set to 'On'.

13.3 H/V Out Shift

Adjust Scaler Parameters		
H/V out shift	[0]	0

This LCD screen, next in sequence after the Image Freeze screen, allows you to change the position of the picture either Horizontally or Vertically. Press the Menu Select knob once and the brackets will begin to flash. Rotating the knob Counter-clockwise moves the picture to the left and rotating the knob Clockwise will move the picture to the right. When you have reached the desired position, press the knob again to store the new value in temporary memory. Rotate the knob to the right one detent and the brackets will be moved to the vertical adjustment area. Once again, pressing the knob allows you to make an adjustment. Counter-clockwise rotation of the knob moves the image upwards and Clockwise rotation moves it downwards. Press the knob to load your new value into temporary memory. Press and hold the knob until you hear the beep to make each of the changes permanent.

13.4 Shrink Level %

Adjust Scaler Parameters	
Shrink level %	[100]

This is an adjustment you are already familiar with if you did the Quick Start exercises earlier in the manual.

It sets the amount of reduction to be applied to the output image, from none to 90%. The display will show 100% when the image is full size and 10% when it has been shrunk to the smallest level permitted. Press the Menu Select knob and the brackets will begin to flash. Rotate the knob until you have reached the

desired amount of shrinkage of the image and press the knob again to load the new value into memory and stop the brackets from flashing. Press the knob until you hear the 'Beep' to make the change permanent, otherwise the change will be lost if you unplug the Scaler from the AC source.

13.5 H/V Shrink Position %

Adjust Scaler Parameters		
H/V shr. pos.%	[50]	50

The adjustment was also covered in the Quick Start area of the manual. Immediately after the Shrink Level % LCD screen, you'll find the adjustments that allow you to position the shrunken image somewhere other than the center of the screen. Once you've arrived at the screen shown above, press the Menu Select knob. This will cause the Brackets surrounding the left-hand numbers to start flashing and allow you to move the image left or right. Rotating the knob Counter-clockwise will move the image to the left and Clockwise will move it to the right. Upon reaching the desired position, press the knob again to load the new value into temporary memory. Rotate the knob to the right one detent and press it again. The brackets will now surround the right-hand number and the brackets will flash. Rotate the knob Counter-clockwise to move the shrunken image upwards and Clockwise to move the image downwards. Press the knob again to load the new value into temporary memory. Remember to press and hold the knob until you hear the "Beep" if you want to permanently save the new values.

13.6 Flicker Reduction

Adjust Scaler Parameters	
Flicker Reduction	[Off]

The Flicker Reduction menu will only appear if you have selected a CV or SV output format. (See Output Image selection criteria in the Top Menu area). If you are using CV or YC outputs, this adjustment may be of interest, particularly when you have line drawings or similar fine detail. Pressing the Menu Select knob will allow you to choose from four possible Flicker Reduction settings. You should use as little Flicker Reduction as possible because the Vertical detail will be considerably softened at the highest setting.

When you press the Menu Select knob, the brackets will begin to flash and you can choose "Off", "Low", "Med." or "High" Flicker Reduction Settings by rotating the Menu Select knob Clockwise and Counter-clockwise. Make your selection based on the table shown below and then press the knob once again to store your choice in Temporary memory.

Flicker Mode	Function
Off	Disables Flicker Reduction
Low	Suitable for most program sources
Med.	Enough for most situations such as thin line drawings.
High	Highest amount of Flicker Reduction. Can cause loss of Vertical Detail in some images.

Press and hold the knob until you hear the “Beep” to make the selection permanent. *Again, you will not see this menu unless you have selected either CV or YC as an output format.*

13.7 Image Smoothing

Adjust Scaler Parameters	
Image smoothing	[High]

Image smoothing reduces the jagged-edges sometimes seen within an output image by softening them. It typically greatly improves the quality of an scaled image. There are four possible settings for this adjustment: “Off”, “Auto”, “Med.” and “High”. The “Auto” setting is generally thought to be most desirable. To make a change in the amount of Image Smoothing, press the Menu Select knob while on the LCD screen illustrated above. This will cause the brackets to begin flashing and you may then rotate the Menu Select knob Clockwise and Counter-clockwise until the desired choice appears. Press the knob once again to store the new choice in temporary memory or press and hold the knob until you hear the “Beep” to make the change permanent.

13.8 Image Flip

Adjust Scaler Parameters	
Image flip	[Off]

Occasionally, it’s necessary to cause the output image to be flipped Vertically, Horizontally or both. This adjustment allows you to make that change to the output’s appearance. While on the screen shown above, press the Menu Select knob. The brackets will begin to flash and you can choose from “Off”, “Horiz.”, “Vertical” or ”H & V”. Make your selection and press the Menu Select knob to record your change in temporary memory. If you want to make the change permanent, press and hold the Menu Select knob until you hear the “Beep”.

13.9 De-Glitch

Adjust Scaler Parameters	
De-glitch	[Off]

De-glitch is used to provide clean, seamless switching between video sources. With the Universal Scaler, it is unusual for the inputs to be synchronized with one another and the De-glitch function insures that the switches between these inputs do not cause the picture to breakup at the point of the switch. This feature is normally left on however, if you have a very unstable input, such as a video tape machine in need of mechanical adjustment, you may wish to turn the feature off since the Scaler will not allow a unstable image to appear on the screen if De-glitch is left on.

From the screen shown above, press the Menu Select knob to make a change. Since there are only two choices, “On” or “Off”, there are no flashing brackets to deal with. Each time you press the knob, the function toggles to the other state. Once there, pressing and holding the knob until you hear the “Beep” makes the change permanent in the event of loss of power.

13.10 Switching Fade Time

Adjust Scaler Parameters	
Switching Fade Time	[.5]

For subjective reasons, it may be desirable to change the way the Scaler handles a switch between its inputs. The Switching Fade Time parameter can be adjusted to allow from 0 seconds (instant change) to 5 seconds of delay between the time one image disappears and another one appears. (During the absence of an image, the screen may be black).

The delay can be adjusted in 1/10th second increments with the default setting being .5 seconds.

To make this adjustment, press the Menu Select knob and observe the flashing brackets. Rotate the Menu Select knob until you have the desired amount of delay displayed and then press the knob once again. To make the change permanent, press and hold the knob until you hear the “Beep”.

13.11 Output RGB Level

Adjust Scaler Parameters	
Output RGB Level	[81]

Output RGB Level only works when in the RGB or YUV mode. The output signal type must therefore be RGB or YUV (not be CV or YC) for this menu to appear. (See Output Image selection criteria in the Top Menu area to set the output format).

Provided you have an RGB or YUV output selected, once at this menu simply press the Menu Select knob (which will start the brackets flashing) and then adjust the Menu Select knob until you have the desired RGB signal level displayed on the Scaler's output. Press the knob again to store the new value in temporary memory. Press and hold until you hear a "Beep" to permanently store the new value.

13.12 Output SC/H Phase

Adjust Scaler Parameters	
SC/H phase	[0]

SC/H phase is an adjustment only available when either CV or YC output is selected for the Scaler. (See Output Image selection criteria in the Top Menu area to set the output format).

This control is used to reduce color shifts when genlocking to an incoming CV or YC signal. From the LCD screen shown above, press the Menu Select knob and adjust the Menu Select knob to minimize any color shift apparent on the output image. Press the Menu Select knob again to store the new value in temporary memory. Press the knob and hold it until you hear the "Beep" to permanently store the value.

13.13 Cross Color Reduction

Adjust Scaler Parameters	
Cross-col. red.	[Off]

This adjustment also only applies to CV or YC output signals. (See Output Image selection criteria in the Top Menu area to set the output format).

The adjustment minimizes the tendency of CV/YC signals with high-level luminance components to be decoded as color signals thereby corrupting the output image. The control functions by reducing the bandwidth of the luminance channel of the signal. Aggressively reducing the bandwidth can result in a loss of image detail so the feature normally is turned off or one of the two lower settings are used.

Pressing the Menu Select knob while on the above screen causes the brackets to flash. Use the Menu Select knob to select from four possible modes of

operation: “Off”, “Low”, “Med.” or “High”. Once you have made your selection, press the Menu Select knob once to store the new value in temporary memory. Press and hold the knob until you hear the “Beep” to make a permanent change.

13.14 Aspect Ratio

Adjust Scaler Parameters Aspect Ratio [4:3]

Earlier, you learned how to set aspect ratios for an input. This adjustment is for the output. When you are parked on the LCD screen shown above, press the menu select knob to change from 4:3 to 16:9 and vice versa. This adjustment is a simple toggle meaning it will be in one status or the other. To make your change permanent, press and hold the Menu Select knob until you hear the “Beep”.

14.0 ADJUST LOCK/OVERLAY SUB MENU

The Third Sub Menu is called Adjust Lock/Overlay. The word “**Lock**” refers to the action of locking the Scaler to one of the input sources. Locking the Scaler in this manner allows you to perform Picture-In-Picture as well as Keys and similar special effects. The word “**Overlay**” actually encompasses both Overlay and Underlay features. The Lock feature is tied to the background image and the Overlay/Underlay refers to the foreground image.

On occasion, the foreground image has to be positioned with respect to the background image’s synchronizing pulses so that both appear to have the same centering characteristics to the viewer. In other words, if the foreground image’s synchronizing pulses are shifted a bit with respect to the background image’s synchronizing pulses, you need a means to line things up so that the pictures themselves are not offset with respect to one another.

The **Lock Pixel Offset** function and **Lock Line Offset** functions are used to make the adjustments to time the synchronizing signals with respect to one another.

Y Key Min/Max, U Key Min/Max and V Key Min/Max adjustments are used to make the keying function as “clean” as possible, meaning the image keyed over the background stands out sharply and clearly from the background.

Note that if at all possible you want the background to be a high-resolution image, i.e. an RGB computer image. This is because the quality of the background image controls the quality of the foreground image as well.

It’s normally not necessary for you to adjust the Lock Pixel and Lock Line parameters but in the event you need to do so, here are the procedures:

From the TV One Banner Screen, rotate the Menu Select knob to the right until the following screen appears:

```
Sub menu . . .
Adjust lock/overlay
```

Press the Menu Select knob once and the following screen will appear:

```
Adjust lock/overlay
Dig RGB Lock source          [Off]
```

14.1 Dig RGB Lock source

Normally, any RGB Lock source remains as an unprocessed signal with any Program source simply inserted into it. (For instance, with 'PIP' as the Lock method, the scaled Program source image would just be inserted into the RGB Lock source. Underlay would thus be impossible, since the RGB source's signal is not processed and therefore cannot be compared to any key levels.

When 'Dig RGB Lock source' is active, and the Program source is a CV, YC or SDI input, the RGB Lock source IS processed and mixed digitally. Thus switching Program sources would cause the scaled Program source to fade into the Lock source (instead of fading to black).

It also means that underlay now becomes possible with an RGB Lock source - i.e. with the Program source being scaled and locked to the RGB Lock source's resolution, but with the (unscaled) RGB Lock source appearing 'in front' of the Program source (in other words, the Program source is underneath - hence the term Underlay).

Notes:
1. This setting defaults to Off to preserve the same functionality as earlier firmware versions.
2. The On state has no effect when the Program source is an RGB or YUV input.
3. When On and Locking to an RGB connector source, seamless switching between RGB and non-RGB inputs will have glitches (as the unit needs to switch between two very different operating modes).

This function is a toggle function so when you press the Menu Select knob, the feature is turned “On” or “Off” and there are no flashing brackets involved.

14.2 Lock Pixel Offset

Adjust lock/overlay Lock pixel offset [0]

When parked on the Lock Pixel Offset LCD screen, pressing the Menu Select knob will cause the brackets to begin flashing. You can then rotate the knob one direction or the other as required to position the Locked image correctly (in the horizontal plane) with respect to the locked image. Once correctly positioned, press the knob to load the new value into temporary memory or press and hold the knob until you hear the “Beep” to load the new value into permanent memory.

14.3 Lock Line Offset

Adjust lock/overlay Lock line offset [0]

Lock Line Offset works like Lock Pixel Offset except the adjustment moves the Locked image vertically with respect to the locked image. When on the screen shown above, press the Menu Select knob once and the brackets will begin to flash. Make the adjustment as required then press the Menu Select knob to store the new value in temporary memory. Press and hold to lod the new value into permanent memory.

14.4 Y Key, U Key, V Key Min/Max

Adjust lock/overlay Y key min/max [0] 255

Adjust lock/overlay U key min/max [0] 255

Adjust lock/overlay V key min/max [0] 255

In the quick start section on setting up a key, you learned how to do a key of one source over another. In that case, you were dealing with a luminance key but you can also do more exotic keying such as Chroma Keying.

Note: Chroma keying is the type of key you see every day in weather segments of your local news where a weather forecaster appears to stand in front of a weather map. Actually, the forecaster is standing in front of a wall that is painted a uniform color, usually medium blue. The image of the map is keyed into the picture anywhere there is medium blue present in the picture. (Although medium

blue is the norm, it can be any color. Medium blue has become such a standard that there is a paint color called Chroma Key Blue.

For a step-by-step tutorial on setting the values for a luminance key, refer back to the quick start segment of this manual. In that documentation you were told to adjust the min/max value of the Y channel until the key was clean and free of objectionable image artifacts. The same basic procedure is used to set up a Chroma key using the U and V channels but a more in depth discussion goes like this:

Where the pixel color is within the luminance (Y) and chrominance (U & V) minimum and maximum values, the pixel is 'keyed-out' and becomes transparent. When not within the min/max limits, the pixel is displayed.

The key values are provided in YUV format in order to select luma (Y) and chroma (U & V) keying. A simple method to set a key color to an on screen color is to set all the YUV key min/max values to 0 and 255 - at which point all pixels will become transparent.

Then increase the Y key min value until the required pixel color re-appears. Go back a few steps until it disappears which gives you the Y key min value for that pixel color. Do the same with the Y key max value, reducing it instead from 255 until the pixel appears and then retreating a few detents until it disappears again.

The methodology to accomplish this change is the same as for all other adjustments: When you are parked on the LCD screen of interest, press the Menu Select knob once and the brackets will begin to flash. Make your adjustment and then press the knob. This stores your new value in temporary memory. Rotate the Menu Select knob one detent to the right and press the knob again, this will move the brackets to the right and cause them to start flashing in their new position. Again make an adjustment and press the knob to store the new value in temporary memory. Press and hold the knob down until you hear the “Beep” in each case to make the change permanent.

Repeat the above for the U & V key min/max settings. You should then have the YUV key min/max values for the required pixel color. Leaving the U & V Min/Max values at 0 and 255 will create a Luminance key - where only the Y Key Min/Max value has an effect.

Note: The C2-5200 also has adjustments for the SDI input, selectable between NTSC and PAL. These adjustments set the conditions for the SDI lock input.

14.5 SDI2 Input Type (C2-5200 Only)

```
Adjust lock/overlay
SDI2 Input Type              [NTSC]
```

This parameter allows the selection of the second SDI input (Genlock) to be set. This can only be set to either the PAL or NTSC standard.

15.0 ADJUST BUTTONS SUB MENU

The Fourth Sub Menu is for changing the Button assignments. This was covered in the Quick Start section of the manual and is presented again here along with adjustment procedures for **Preset**, **Instant Program Select** and **Preview Follow** modes:

The following example shows how you would select RGB1 as the input for button number 3. All input assignments are made using the same procedure. To begin, press button number 3 on the Scaler so you can see the result of your efforts. Turn the Menu Select knob until you are parked on the following screen:

```
Sub menu
Adjust Buttons
```

Press the Menu Select Knob once to advise the Scaler that you want to make an adjustment to the input assignments of one of the buttons. When you do, you'll be rewarded with the following LCD display:

```
Adjust Buttons
Button [  1]=      input=RGB1
```

Pressing the Menu Select Knob again will cause the brackets surrounding the number "1" to begin flashing. Turn the Menu Select knob to the right until the number "3" appears between the flashing brackets. When it does, press the Menu Select knob again to load the number "3" into the Scaler's memory. The brackets will stop flashing and display should look like this:

```
Adjust Buttons
Button [  3]=      input=RGB3
```

Rotate the Menu Select knob one detent to the right and press the knob again. This notifies the Scaler that you are about to change the input assignment to input number "3". The brackets will disappear from around the input number and will appear around the section of the display that says "input=RGB3". The LCD screen will look like this:

```
Adjust Buttons
Button   3 =      [input=RGB3]
```

Press the knob again and the brackets will begin to flash indicating that the Scaler is ready to accept the new input assignment. Rotate the Menu Select knob to the left until the number “1” appears and then select it by pressing the knob again. The flashing will cease and the LCD display will now look like the screen shown below, indicating that the reassignment is complete. (You may now press input button 3 to activate the input). As always, press and hold the Menu Select knob until you hear the “Beep” to make the change permanent.

```
Adjust Buttons
Button   3 =      [input=RGB1]
```

15.1 Button Presets

You can store up to 5 preset condition and associate them with 5 different buttons. It is also a good idea to assign another button to the Restore function. This restore function allows the unit to be returned to it previously saved state, thus allowing you to toggle between a preset condition and this saved state.

As an example, we will set up a picture in picture condition as a preset for button eight (8) and make button nine (9) the restore function.

Begin at the Adjust Buttons sub menu:

```
Sub menu
Adjust buttons
```

Press the menu select knob to indicate to the Scaler that you want to make an adjustment to the input assignments of one of the buttons, and then rotate the knob clockwise until the following menu item is shown:

```
Adjust Buttons
Button   [1] =      input=RGB1
```

Press the menu knob when you reach this menu and the brackets surrounding the number "1" will begin flashing. Turn the menu select now to the right until the number "8" appears between the flashing brackets. When it appears, press the menu select knob again to load the number "8" into the Scaler’s memory. The brackets will stop flashing and the display should look like this:

```
Adjust Buttons
Button   [8] =      input=YC2
```

Rotate then menu select knob to the right so that the brackets surround the "input=YC2":

```
Adjust Buttons
Button   8 =      input=[YC2]
```

Now press the menu select knob and the brackets will start to flash. This notifies that Scaler that you are about to change the input assignment, rotate the knob right until the word 'Preset 1' is shown and then select it by pressing the knob again. The flashing will cease and the display will now look like this:

```
Adjust Buttons
Button   8 =      input=[Preset1]
```

This has assigned button 8 to be Preset 1, we will now repeat the process to assign button 9 as Restore which will become the default condition.

Rotate the menu select knob back so the at the brackets are surrounding the button number "8", press the menu select knob to indicate that you wish to make a new assignment and change the "8" to a "9", then press the knob again to accept this new assignment. The display will now show:

```
Adjust Buttons
Button   [9] =      input=YC3
```

Rotate then menu select knob to the right so that the brackets surround the "input=YC3"

```
Adjust Buttons
Button   9 =      input=[YC3]
```

Now press the menu select knob and the brackets will start to flash. This notifies that Scaler that you are about to change the input assignment. Rotate the knob clockwise until the word 'Restore' is shown and then select it by pressing the knob. The flashing will cease and the display will now look like this.

```
Adjust Buttons
Button   9 =      [Restore]
```

This has assigned button 9 to be the restore function of the Scaler.

Next, press and hold the menu select knob until you hear a beep and the info message appears:

```
Info:
Settings Stored
```

This action has now stored all of the Scaler settings to memory. They will be the settings that are recalled when the Restore button (9) is pressed.

The next step is to set the lock source and method associated with button number 8 so we next go to the Lock Source Menu:

```
1024x768 60 Hz
Lock Source  [RGB1]
```

Confirm that the Lock source is set to RGB1 and then rotate the knob one detent to the right where you will see the following screen:

```
1024x768 60 Hz
Lock Method         [Off]
```

Press the Menu Select knob and the brackets will start to flash. When they are flashing, rotate the knob to the right until you see PIP between the brackets.

Press and hold button number 8 until you hear a Beep and the following message is displayed

```
Info:
Added to Preset
```

The Scaler has now accepted the first layer of information associated with button number 8's preset.

If the brackets are still flashing on the LCD panel, press the Menu Select knob once to stop the flashing and then rotate the knob until you arrive at the Adjust Scaler Parameters display on the LCD screen.

```
Sub menu . . .
Adjust Scaler parameters
```

Press the Menu Select knob once and then rotate it until you are parked on the Shrink Level Screen:

```
Adjust Scaler parameters
Shrink level %   [100]
```

Press the Menu Select knob and observe that the brackets begin to flash. When they do, rotate the knob to the left until the foreground image has shrunk to 30% normal size as evidenced by the LCD display:

```
Adjust Scaler parameters
Shrink level %    [ 30]
```

Press and hold button number 8 until you hear a Beep and the info message 'Added to preset' is shown. (This records the second layer of information associated with button number 8's preset condition).

If the brackets are still flashing, press the Menu Select knob once and observe that the brackets are no longer flashing. Rotate the Menu Select knob one detent to the right and you will see the following screen:

```
Adjust Scaler parameters
H/V shr. pos. %   [50]     50
```

Press the Menu Select knob and the brackets will begin to flash. Rotate the knob to the left until you see the number 25 displayed between the flashing brackets. Press and hold button number 8 until you hear a Beep and the info message 'Added to preset' is shown. The third layer of information has now been successfully recorded.

```
Adjust Scaler parameters
H/V shr. pos. %   [25]     50
```

If the brackets are still flashing, press the Menu Select knob again and then rotate it one detent to the right. The brackets will now surround the right hand number and you should press the knob yet another time. The brackets will flash and you should rotate the Menu Select knob to the left until you have the number 25 displayed between the flashing brackets.

```
Adjust Scaler parameters
H/V shr. pos. %    25    [25]
```

Press and hold button number 8 until you hear the Beep and the info message 'Added to preset' is shown . The fourth and final layer has now been successfully recorded for button number 8.

If the brackets are still flashing, press the Menu Sect knob to make them cease.

You have now successfully set a preset condition for button number 8 that will cause the Picture-In-Picture image to be shrunk to 30% normal size and positioned in the top left corner of the background image.

You should now be able to press button number 8 and have a PIP image displayed. Pressing button 1 through 7 will place any video present on those buttons in the PIP window. When you press button number 9 the Scaler will be restored the last saved state.

15.2 Instant Program Select

Another feature within the Adjust Buttons Sub Menu controls how the Scaler performs its output switching. To adjust this feature, rotate the Menu Select knob until you see the following LCD display:

Adjust Buttons	
Instant prog. select	[On]

If Instant Program Select is set to “On”, anytime an input button is pressed, the program output will instantly change to the new selection. If set to “Off”, pressing the input button will cause the image to appear on the Preview monitor and the selected input button will begin to flash. Pressing the input button a second time will cause the image to be switched onto the program bus. This feature allows you to examine the image before you display it for everyone else to see. The feature is a simple toggle so there are no flashing brackets. Just press the Menu Select knob to switch from one mode to the other.

15.3 Preview Follow Mode

There may be occasions where you want to set the preview feature to continuously monitor a single input. An example would be a live camera showing a scene that is only important when some specific event occurs. If you could monitor the preview monitor and determine when the event was about to occur, you could switch to it just before the event so those watching the program display could be viewing other material until the event occurred. The Preview Follow Mode is used for just this sort of situation.

Adjust Buttons	
Preview follow mode	[Off]

The Preview Follow Mode screen only appears when the Instant Program Select feature is set to “On”. If the Instant Program Select feature is set to “On”, you will see the above screen when you rotate the Menu Select knob one detent to the right. When the above screen appears, pressing the Menu Select knob will toggle the feature between “On” and “Off”. When it is “Off”, the Preview monitor will be locked on the image it is displaying and it will not change regardless of what selections you make on the input select buttons.

For Instant Program Select and Preview Follow Mode, remember to press and hold the Menu Select knob until you hear the “Beep” if you want your changes to survive should the Scaler be unplugged from the AC outlet.

16.0 ADJUST IMAGE PARAMETERS SUB MENU

This is the Fifth Sub Menu. It provides access to the Resolution Database within the Scaler.

Sub menu . . . Adjust image parameters

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

Important Cautionary Information

DO NOT ADJUST THESE ITEMS UNLESS YOU'RE CERTAIN YOU KNOW WHAT YOU'RE DOING!

Making adjustments here risks creating a non-standard resolution that is not displayable on a monitor. The resolutions and values within the database are industry standards and should not normally be altered by the user. That said, there may be times when it is necessary to create a custom resolution with specific parameters. If circumstances require you to make such a change, 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) A white border will appear when adjusting most of these settings.

(3) Since this database is used for both input and output image processing, altering a resolution that is used for both (eg. 1024x768 input and 1024x768 output) may give unusual effects.

16.1 Image to Adjust

Pressing the Menu Select knob while parked on the Adjust Image Parameters Sub Menu screen will bring up the following LCD display:

800 x 600 60 Hz Image to adjust [17]

By pressing the Menu Select knob, you will cause the brackets to begin to flash and you can then rotate the knob to select one of the many database resolutions you want to change.

Typically, the image number currently being used for input or output would be selected otherwise immediate feedback to your changes will not be available via your monitor. Press the Menu Select knob to confirm your selection and then rotate the knob one detent to the right to make the next LCD screen appear.

800 x 600 60 Hz Interlaced [Off]

This adjustment specifies whether the image is interlaced or progressive scan. It's a toggle so there are no flashing brackets. Simply press the Menu Select knob to make the change from one standard to the other.

16.2 Horz. Frequency Course and Horz. Frequency Fine

800 x 600 60 Hz H.freq.crse [37.879] Khz

The H freq. crse. adjustment provides for changing the Horizontal Sync timing Frequency in 100 Hz steps. When parked on the screen shown above, press the Menu Select knob and the brackets will begin to flash. Make the desired adjustment and press the knob again to record your change in memory.

800 x 600 60 Hz H.freq.fine [37.879] Khz

H.freq.fine adjusts the Horizontal Sync Frequency in steps of 1 Hz. The adjustment procedure is the same as for the Course Frequency Adjust: When on the LCD screen, press the Menu Select knob and when the brackets begin to flash, make your adjustment. Press the knob again to record you changes.

16.3 Pixel Clocks Per Line

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

This is the total number of image pixels on one line of monitor video (including the Horizontal sync pulse) and is normally a multiple of 8. It controls how well a digital display device (such as an TFT monitor) will display an image. An incorrect value will often cause vertical bands to appear in the image on such a device.

To make a change in this value, rotate the Menu Select knob until the above screen is visible and press the Menu Select knob. The Brackets will begin to

flash and you can then adjust the number visible between the brackets. When you have finished your adjustment, press the knob again to record the change.

16.4 Lines per Frame

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

This screen controls the total number of lines of video present in the image and includes the vertical Sync pulse as well as the active video.

Adjustment is made by rotating the Menu Select knob until the above screen is visible and then pressing the Menu Select knob. The brackets will flash and you can make your adjustment as desired. Press the Menu Select knob a second time to record your new value.

16.5 H/V Active

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) as well as the area occupied by the Vertical and Horizontal synchronizing pulses. A resolution value for a given display standard 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 pixels/line visible vertically.

The H/V active LCD screen provides a way to change the number of pixels and lines. When parked on the above screen, press the Menu Select knob and the brackets surrounding the Horizontal value will begin to flash. Make your adjustment and press the knob again. The value will be recorded and the flashing will cease. Rotate the Menu Select knob one detent to the right and press the knob again. The brackets will be repositioned and you can now adjust the Vertical value. Press the knob once more to record your new value.

16.6 H/V Start

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

There is a period of time between the end of a 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).

By adjusting this parameter, you can 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.

When parked on the above screen, press the Menu Select knob and the brackets will begin to flash. Adjust the parameter and press the knob again. Rotate the knob one detent to the right, press the knob and adjust the second parameter. Press the knob again to record that value. There is a certain amount of interaction between the two controls so make your adjustments carefully and slowly. To make this adjustment, an oscilloscope must be employed so you can see the results of your actions in a more graphic manner. Do not attempt this adjustment without monitoring the results with an oscilloscope.

16.7 H/V Sync

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.

When the above screen is visible, press the Menu Select knob until the brackets begin to flash. Set the value for the Horizontal Pulse and press the knob again to record your choice. Rotate the knob one detent to the right and repeat the process for the Vertical Sync pulse width. 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 on the LCD screen are relative numbers and not an actual time measurement.

16.8 Sync Polarity

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. From the screen shown above, press the Menu Select knob and the brackets will begin to flash. You have four possible selections: “+H+V”, “-H+V”, “+H-V” and “-H-V”. Rotate the Menu Select knob until your desired selection appears and then press the knob to record the choice.

17.0 SYSTEM SUB MENU

Sub menu . . . System

The final Sub Menu is for adjustments of System parameters. The “System” in this case is the Scaler functions unrelated to individual inputs, outputs or any of the various production features. Most of the screens are informational but two screens offer “On” and “Off” control of some low level functions plus one stores all current Scaler settings.

17.1 Software and Hardware Numbers

From the System Sub Menu, press the Menu Select knob and the first in a series of System screens will appear.

System SW: 162, PT: 3, BT: 6

This screen is an informational screen. Should you require technical assistance with your Universal Scaler, 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 Scaler. 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.

17.2 Software Date

System SW date: 2004-7-11

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.

Normally, the user will examine the added features of each new software release and determine if an update is worth doing. The greater period of time between the current date, and the date shown here, the greater the likelihood that there are useful changes and improvements present in the new release.

You may wish to make it a practice to update on a date basis rather than a release basis in which case the date information shown here is especially important.

17.3 Push To Store

System Push to store

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

17.4 RS-232 Baud Rate

System	
RS232 baud rate	[57600]

This menu item allows the adjustment of the serial baud rate used for RS-232 communications. Pressing the Menu Select knob will cause the brackets to flash and the rate can be adjusted to 9600, 19200, 28800, 33600, 38800 and 57600. Press and hold the knob until you hear the “Beep” to make the change permanent. (This adjustment is provided for those instances where you wish to use a third party RS-232 control system. Leave the baud rate set to 57600 when using the bundled Windows controller in the RS-232 mode).

17.5 Buzzer On/Off

System	
Buzzer	[On]

The screen labeled ‘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. There is also a low level audio ‘Click’ that occurs each time you rotate the Menu Select knob. Turn the ‘Buzzer’ “Off” also turn off the detent ‘Click’ feature.

To turn the Buzzer “On” or “Off”, go to the above screen and press the Menu Select knob. This function is a simple Toggle and there are no flashing brackets.

Just press the Menu Select knob and the ‘Buzzer’ will either be turned “On” or “Off”.

17.6 IR Remote On/Off

System	
IR Remote	[On]

The Universal Scaler can be controlled by an Infrared (IR) remote control. Normally this function is left in the “On” state but it’s possible that you could have some sort of interference present that would require you to disable the function. Like the ‘Buzzer’ control this is a simple toggle with no flashing brackets to contend with. Simply park the Scaler’s LCD screen on the above display and press the Menu Select knob to toggle between the two possible states.

17.7 Resolutions

System	
Resolutions	78

At the time this manual was written, there are 78 different screen resolutions stored in the Universal Scaler’s database. This screen is an informational screen showing the total number of the defined resolutions that the Scaler will recognize. Future software releases may increase the total number of resolutions defined in the Scaler’s database any time a new standard is developed.

17.8 Test Cards

System	
Test Cards	4

Test cards are permanently installed, instantly available video images normally used to test the Scaler or provide some soft of information. The standard configuration for the Universal Scaler has 4 permanently stored items under the Test Card nomenclature. In addition to the Coreo2 logo, you also have a linearity/resolution display and two color bar displays. The images stored here can be treated just like any input image. If you wish to zoom shrink or use these images in PIP, you may do so.

17.9 Power Cycles

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.

17.10 Firmware Updates

System	
Firmware updates	7

Indicates the total number of times the firmware has been flashed over the life of the Scaler.

17.11 Hours in Use

System	
Hours in Use	877

This is another informational display useful for usage audit purposes as well as for specification auditing or determining the need for software version upgrades.

17.12 Board Temperature in Degrees Centigrade

System	
Board temp. (deg. C)	30

If the ambient temperature of the internal components becomes excessively high or low, the unit will shut down to prevent harm. This display shows the current value of the ambient temperature within the case and can be an early predictor of a shutdown before the shutdown actually occurs. In a comfortable room, at sea level, the temperature should be approximately as shown in the image above.

17.13 Fan Speed

System	
Fan speed (rpm)	5988

The fan speed is monitored and if it deviates from standard very much, this will be taken as an indication of insufficient airflow over critical components and shutdown action will be taken.

If the value is much below 5500 RPM, inspect the installation for blockage of either the air inputs or outputs and correct the situation immediately before the shutdown occurs to prevent loss of use during a critical presentation.

17.14 Input Parameters

System		
In 4687Hz	625lns	+H+V

This informational screen indicates the signal characteristics of the currently selected input image. Note that the number of lines includes the non-visible lines as well as the visible lines so it therefore could be misleading to someone that doesn't have an understanding of the relationship of video and synchronizing pulses.

17.15 Pixels Stored

System	
Pixels Stored	800

This screen shows the total number of pixels present in a single line of video. The number of pixels per line that can be stored is 1024. If the input signal has more than 1024 pixels per line (e.g. 2048), the Scaler will sub-sample the line of video.

17.16 Lines Stored

System	
Lines Stored	600

Lines stored is an informational display showing how many individual lines of video are currently residing in memory within the Scaler. As with the Pixel limitation, the maximum allowable number of lines is 1024 and any resolution above 1024 will force a sub-sampling of the input.

17.17 Fault Screen

If the protection circuits within the Scaler detect a fault condition, the Scaler will shut down and generate a Fault Screen. Examples of faults include (but aren't limited to) over-temperature, Slow Fan Speed, Circuitry Fault, etc.

If the Scaler should exhibit one of these fault alarms, unplug it from the AC power and feel the case to see if it's hot to the touch. If so, the fault will not clear until the unit has cooled down. If hot to the touch, allow the unit to cool to room

temperature and then plug it in to the AC source, turn it on again and see if the fault has cleared.

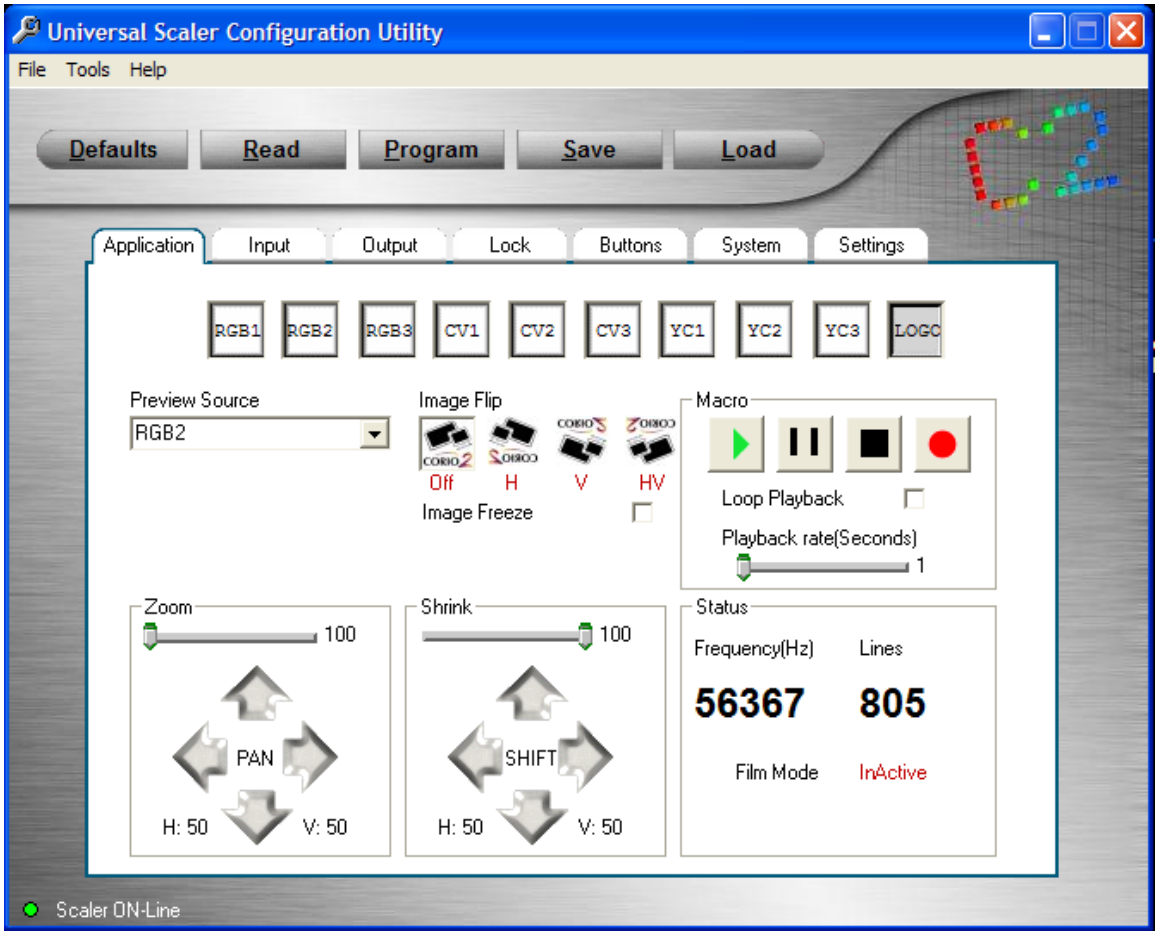
For faults not related to heat, Unplug the unit, wait five (5) minutes and then plug the unit into the AC source once again. Turn the Scaler back on and see if the fault has disappeared. If the fault does not clear or if it returns, you should contact your dealer for repair. There are no user serviceable items inside so you should not open the case and attempt to effect repairs yourself.

18.0 CONFIGURATION UTILITY INTERFACE

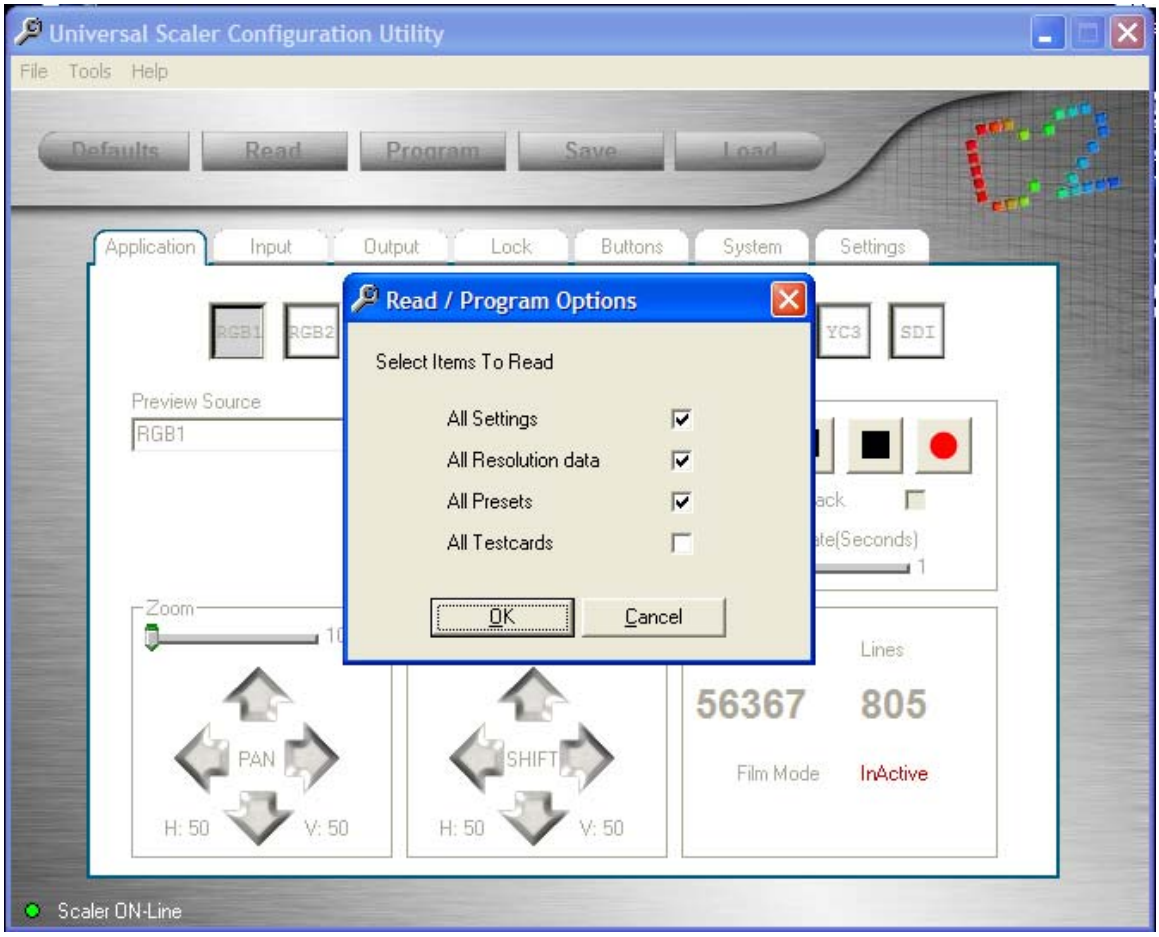
A powerful utility is available for the C2-5100 Universal Scaler. Download the utility from **http://tvone.crmdesk.com** and run the set up program. Follow the on screen instructions to install the program on your PC. Once installed, you will be able to control multiple Scalers from your PC as well as change settings and modify system parameters. The utility will function as a RS-232 tool via the PCs serial port as well as via an Ethernet connection after assignment of an IP address to the Scaler.

18.1 Opening Screen

When you run the utility, the program will display an opening “Billboard” screen while it loads and then the first operational screen will appear:



In order to use the utility, you will first need to make it aware of the current operating conditions present within the Scaler. To do this, connect the Scaler to the PC using the PC’s serial port. Press the button labeled “Read”. Check the first 3 boxes on the sub menu that appears and then click OK.



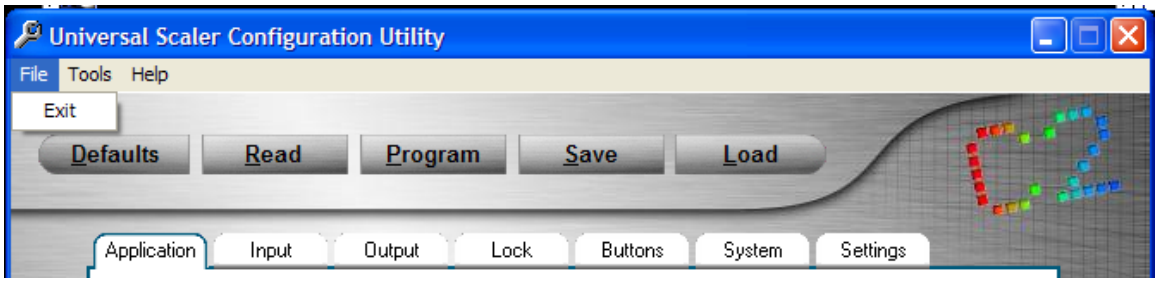
All current settings, resolutions and presets will be copied to a file on your computer and at this point, you can start controlling the Scaler from your computer. You could also check the Testcards item but it takes a long time to read the testcard data and you can still select the testcard button regardless of whether you have copied the actual data over to your PC.

18.1.1 Toolbar Options

Across the top of the application are the toolbar menu options. As you've probably already noticed, the "look" of the utility is much like any other Windows based application in that there's a toolbar menu plus various buttons, folder tabs and slider controls. We'll tackle the toolbar options first and then look at the screens present under each folder tab.

Normally, when you click on the "File" menu item, you expose a way to save and recall files as well as the "Exit" menu item. Since there's more than one "File save" option associated with the Scaler, this application only provides a way to gracefully exit the utility for this toolbar item. Although you can simply click on the "X" box located at the top, right corner of the utility to close the utility, all Windows applications release memory more quickly if you use the Exit path provided under

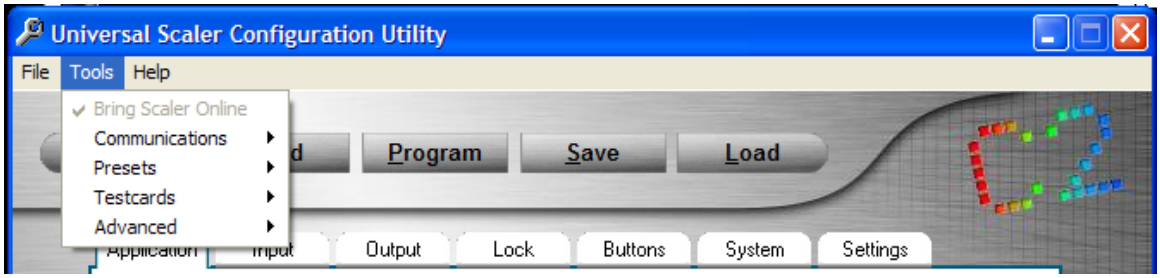
the “File” section of the tool bar. Using the Exit menu item instead of the “X” box to quit a program is called “Gracefully Exiting.”



“File” Toolbar Item

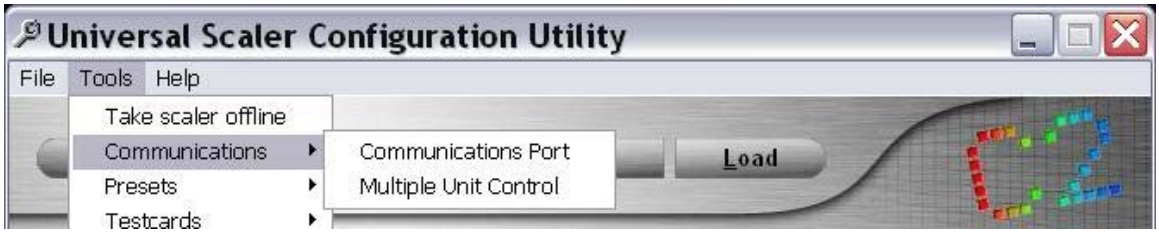
18.1.2 Tools Toolbar Item

The “Tools” menu item provides access to several functions associated with the utility. We’ll take a moment to look at each of these items so you’ll be better acquainted with their operation.



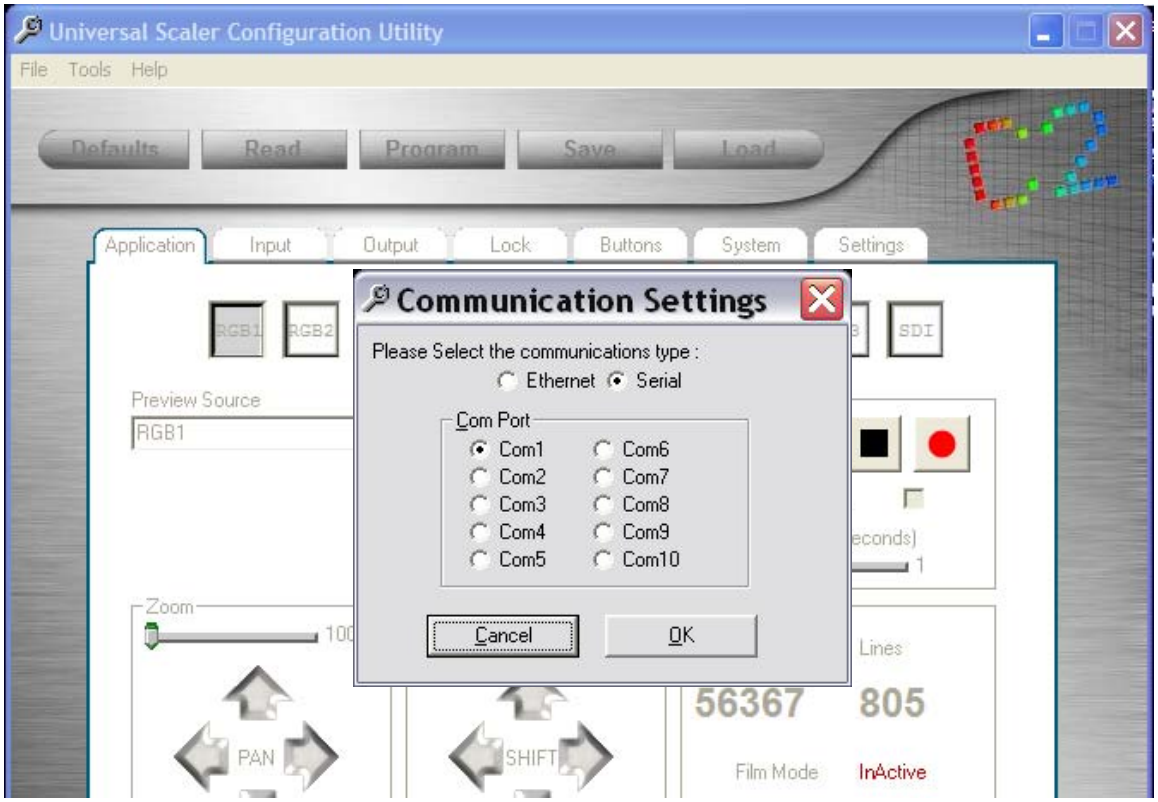
“Tools” Toolbar Item

The “Bring Scaler Online” item is selected ‘On’ by default and is normally not accessed. The other items are very important to the utility set up however and we’ll look at the “Communications”, “Presets”, “Testcards” and “Advanced” items individually.



Selecting “Communications Port” from the toolbar menu exposes two sub menu items: Communications Port and Multiple-Unit Control. (Early firmware also had a feature called “Auto-Detect” but with the expansion of capability to Ethernet access, this feature is no longer available.)

18.2.1 Selecting the Communications Port or IP Address

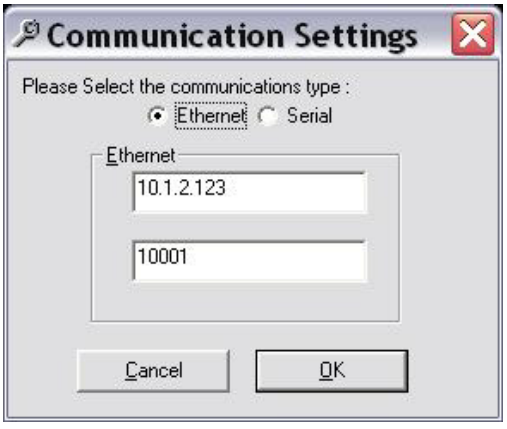


"Serial Port" Toolbar Item

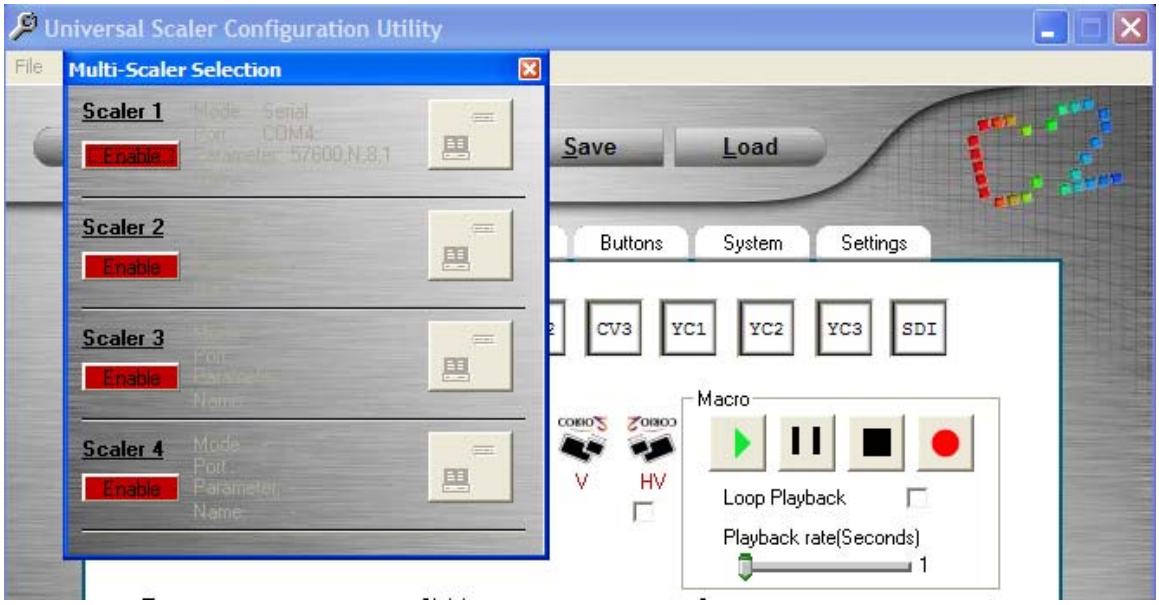
Selecting a Serial Port: Select the "Communications Port" item on the Toolbar's Communications sub menu, check the "Serial" item on the pop-up menu shown above and then check the port you wish to use. Click "OK" to create the communications path. *Notes: Although the utility shows 10 ports, your PC may not have all the ports available. Also, when selecting a port you must be certain that no other device is using the same port else there will be a resource conflict and one or perhaps both devices will not work. If you encounter this situation, use the device manager function of your PC to resolve the conflict.*

Adding an IP address: If you select the Ethernet item on the pop-up window, a second window will appear where you can set the IP address for the Scaler to use on your network.

Once you've selected either a serial port or entered an IP address, press the OK button to save the selection.



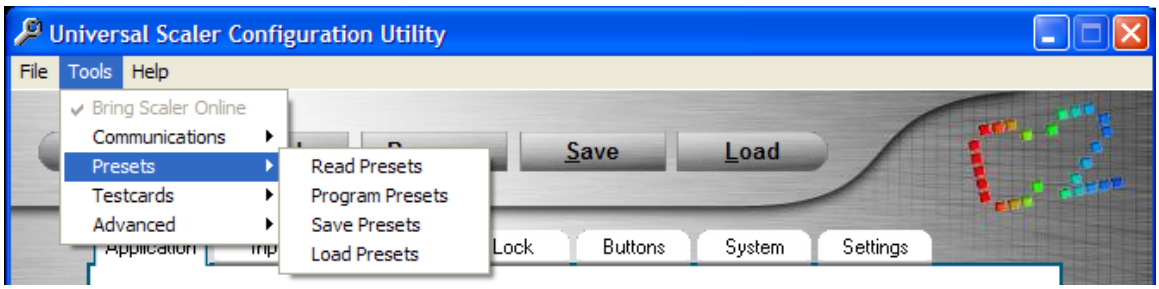
18.2.2 Multiple-Unit Control



"Multiple Scaler" Toolbar Item

With a suitable serial port router or Ethernet connection, you can control multiple Universal Scalers from the utility. This menu item allows you to enable paths to more than one Scaler and then control the Scaler in sequential fashion. The majority of users will only control one Scaler in which case only Scaler 1 will be enabled. (In this case, the selection of Scaler 1 is automatically done for you as part of the initialization process when you first establish a communications link).

18.3 Presets Menu

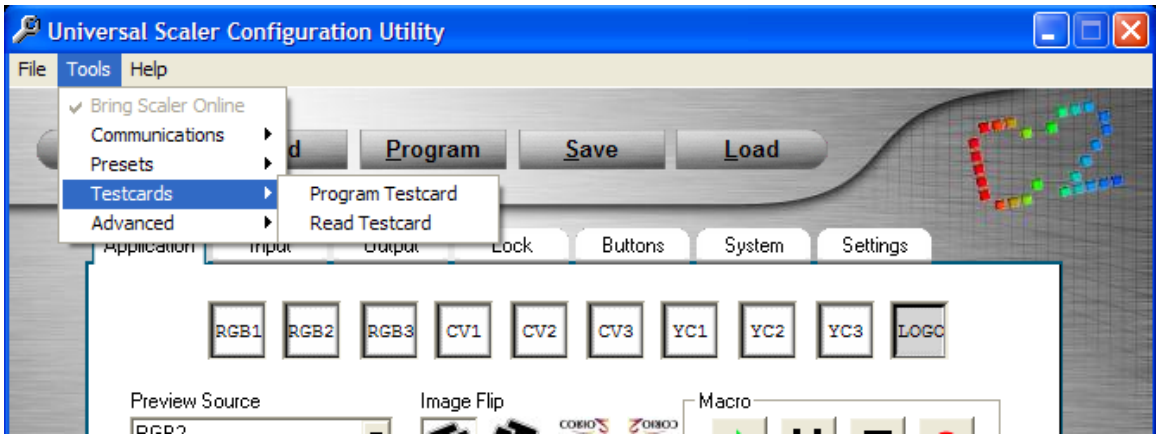


"Presets" Toolbar Items

The "Preset" sub menu items are all associated with either reading or creating presets associated with an individual input button. "Read Presets" transfers any preset information (built manually using the Menu Select knob and Rotary Encoder) into the PC's memory. You can then use the utility to execute these previously created preset conditions. "Program Presets" and "Save Presets" allow the creation and storage of new preset conditions from the utility itself. And

"Load Presets" recalls previous saved preset conditions from the PC's disk memory for execution. Note that a saved file is an ASCII file that can be manually edited as desired to create a complex presentation object.

18.4 Testcards Menu

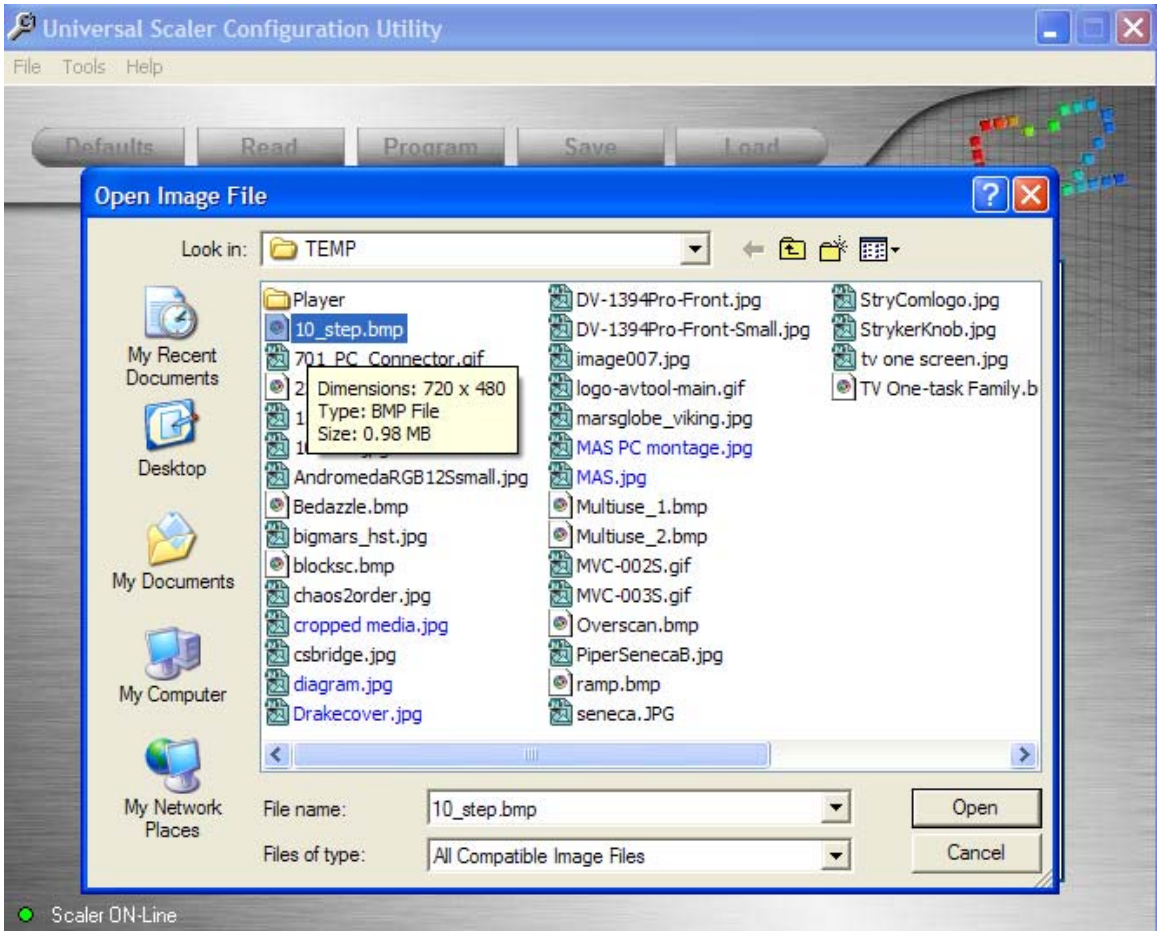


"Testcards" Toolbar Items

The Universal Scaler has room in its memory for several custom images (called testcards) that can be used as system maintenance signals or logos. The configuration utility provides a way to create and load new images into memory or read out the contents of existing images if desired.

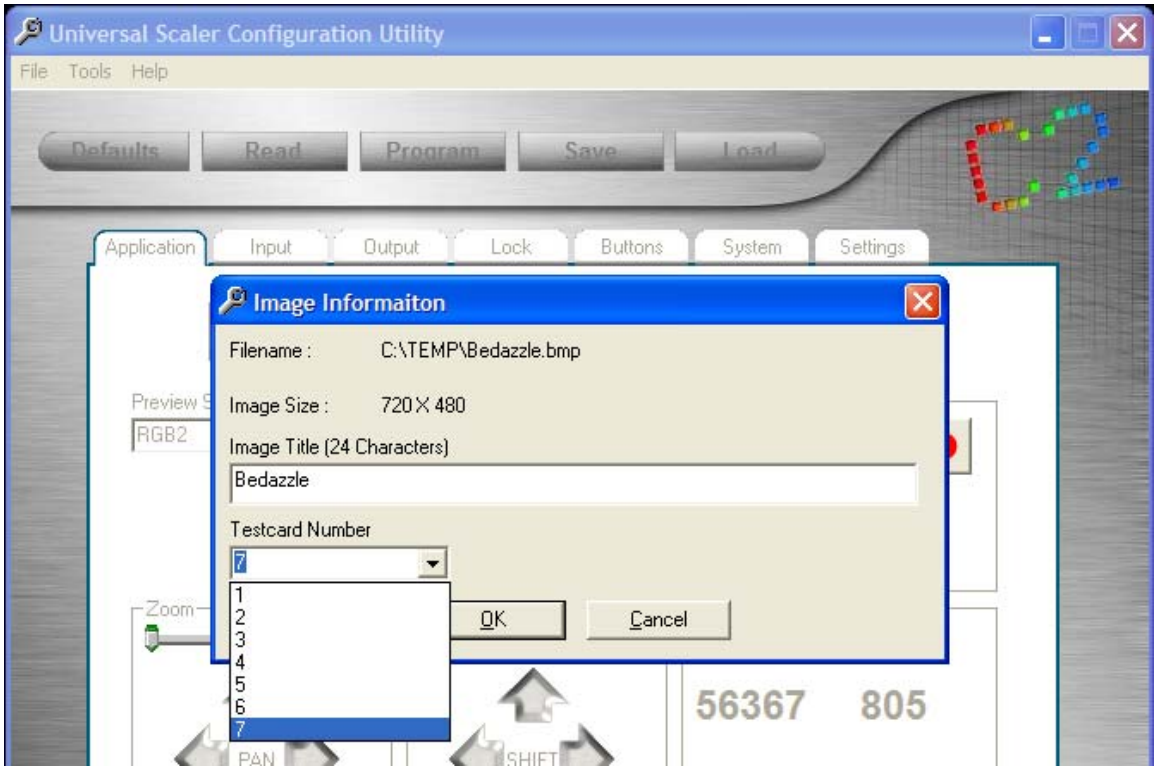
Although you can read the stored data via the "Read Testcard" menu item, the most common use of this functionality is the creation and storage of new test card images. The imported image needs to be in an acceptable format with *.jpg, *.gif and .bmp image formats all supported plus the Scaler saves files in a proprietary format that uses a **"**.tc" suffix. (Keep in mind that jpg and gif images are all compressed images and should not be used to create test signals used for system maintenance although, depending on their resolution, they may be acceptable for logo creation).

When you select "Program Testcard", you will open the standard Windows File Load Dialog Box. Select the directory where the image you wish to load into the Scaler resides from the displayed list.



Step One: Select the Image to Import

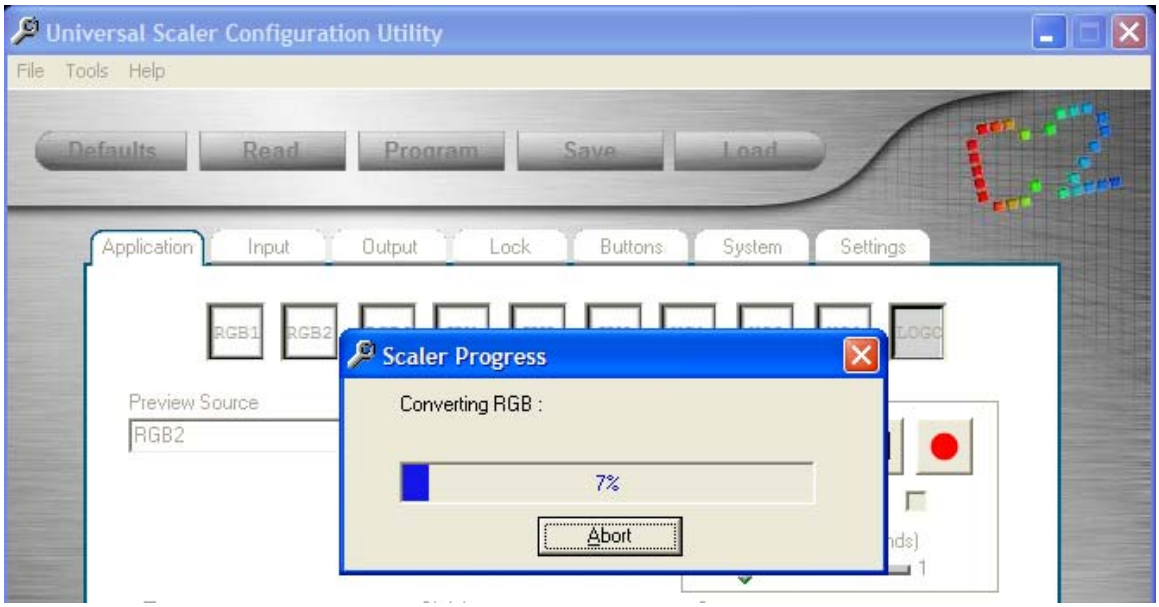
Double click on the image you wish to import after which you'll see the screen shown on the next page. We have decided to create a test card from a bitmap file called "Bedazzle" in the following example.



Step Two: Selecting the Test Card name and Number

You should accept the current file name or change it. (This is the name that the testcard fill will be assigned). Finally select the test card number and click the "OK" button.

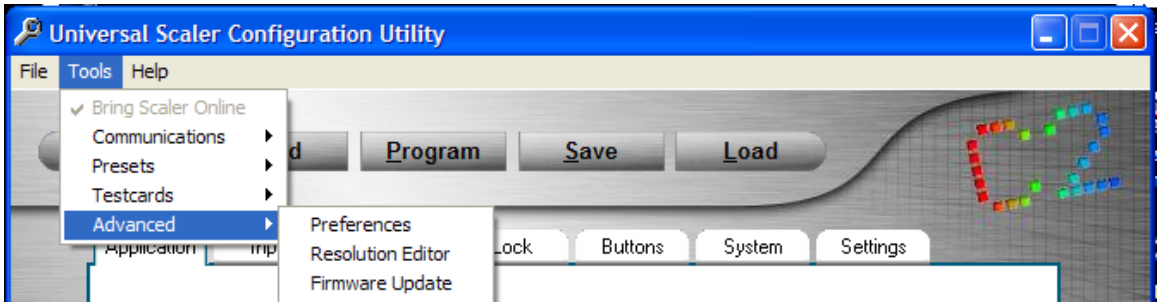
Note that testcard number 1 will be displayed as the default and the last number shown is the next blank testcard memory location. If you fail to select the last number as the testcard number desired, the testcard in position number 1 will be overwritten. Note also that there is not an unlimited amount of testcard storage space available within the Scaler's memory structure. If you load several large files into the Scaler's memory, you will eventually reach the point where the Scaler will be unable to accept new testcards. Choose large files carefully therefore and only store those you feel will be used.



Step Three: Converting the image file to a Testcard

Once you select the storage location, the image conversion routine will begin after which the Scaler will store the new Testcard in the designated location. You'll also be offered the opportunity to store the image on your PC as a testcard file as a *.tc format file.

18.5 Advanced Menu

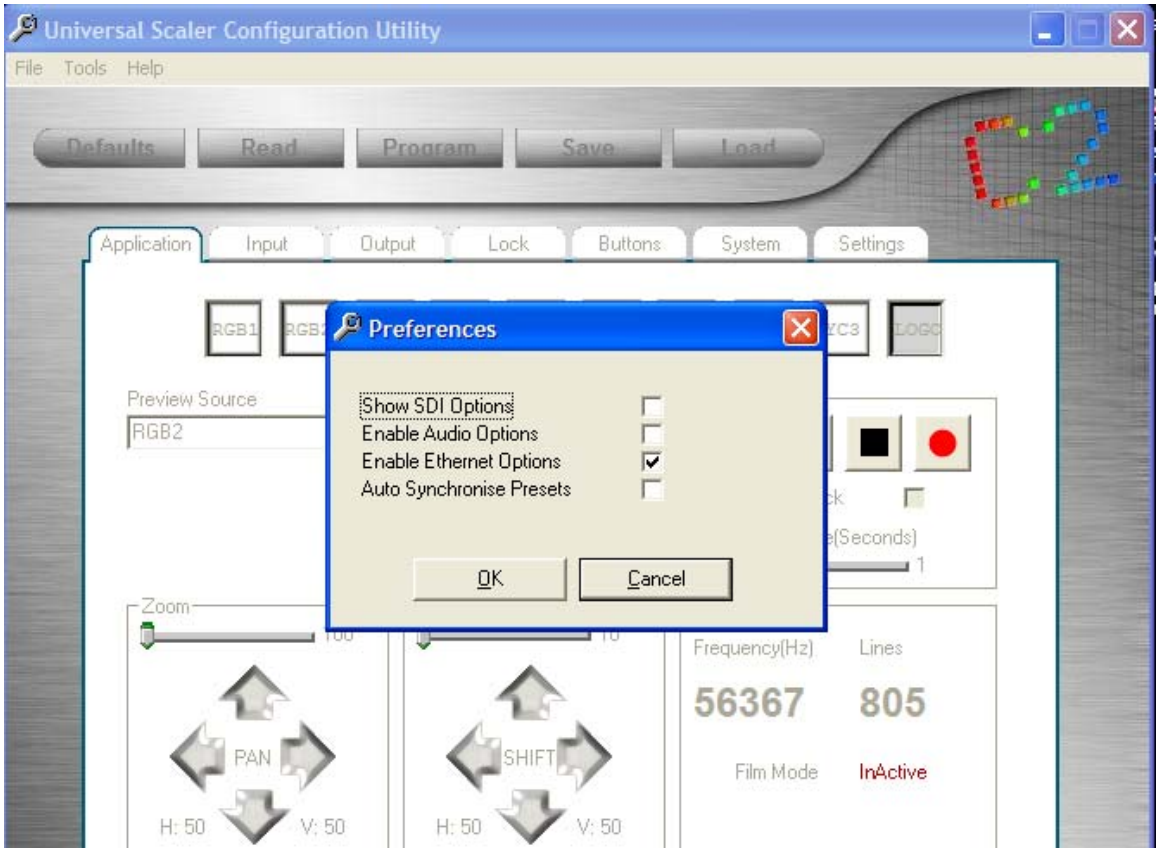


"Advanced" Toolbar Items

The "Advanced" toolbar menu item is where you modify Preferences; edit the stored Image Resolution matrix and is also where you install firmware updates.

"Advanced" is a good name because use of these sub menus should best be left to those who understand the terminology used and the dangers of misapplication of the functionality exposed here.

18.6 Preferences



"Preferences" Toolbar Items

Of the three "Advanced" options, this one is the most benign. "Show SDI Options" will be required only if you are operating a C2-5200 Universal Scaler that has SDI capabilities. Similarly, unless you have the companion Audio Router, you won't need to enable "Audio Options". The "Enable Ethernet Options" checkbox existed on early firmware but has been dropped from current versions since the Enable Ethernet is assumed when you enter an IP address. It's shown only for backwards compatibility.

Finally, unless you are going to be changing Presets often, you don't need to select the "Auto Synchronize Presets" option.

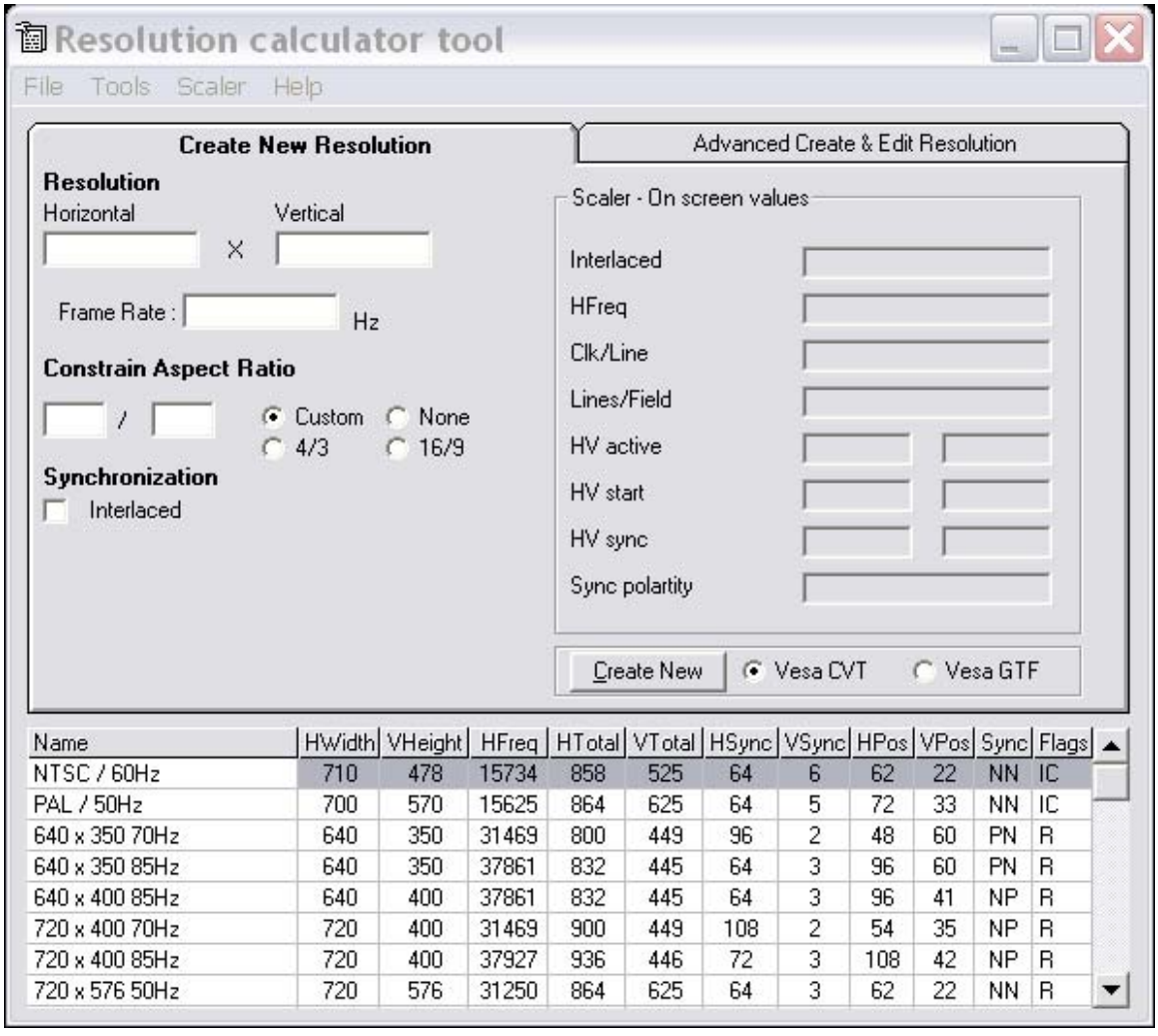
The first two items shown above enable menus elsewhere within the configuration application. Should you find a 'grayed out' section elsewhere in the application, return to this section to see if the appropriate functionality has been enabled.

18.7 Resolution Editor

As explained in an earlier tutorial on operating the Scaler from the Menu Select knob, changing resolution settings is an excellent way to destroy the Scaler's usefulness unless you are totally sure you understand the theory behind the entries and are comfortable dealing with the resolution matrix.

Whereas the process was cumbersome using the Menu Select knob and Rotary Encoder, it's very simple to make changes using the Windows based utility. This is both a blessing and a curse so please make certain you know what you're doing before making any changes to the stored information.

From the Utility's Control panel select Tools->Advanced->Resolution Create and Edit; the edit tool will then start:

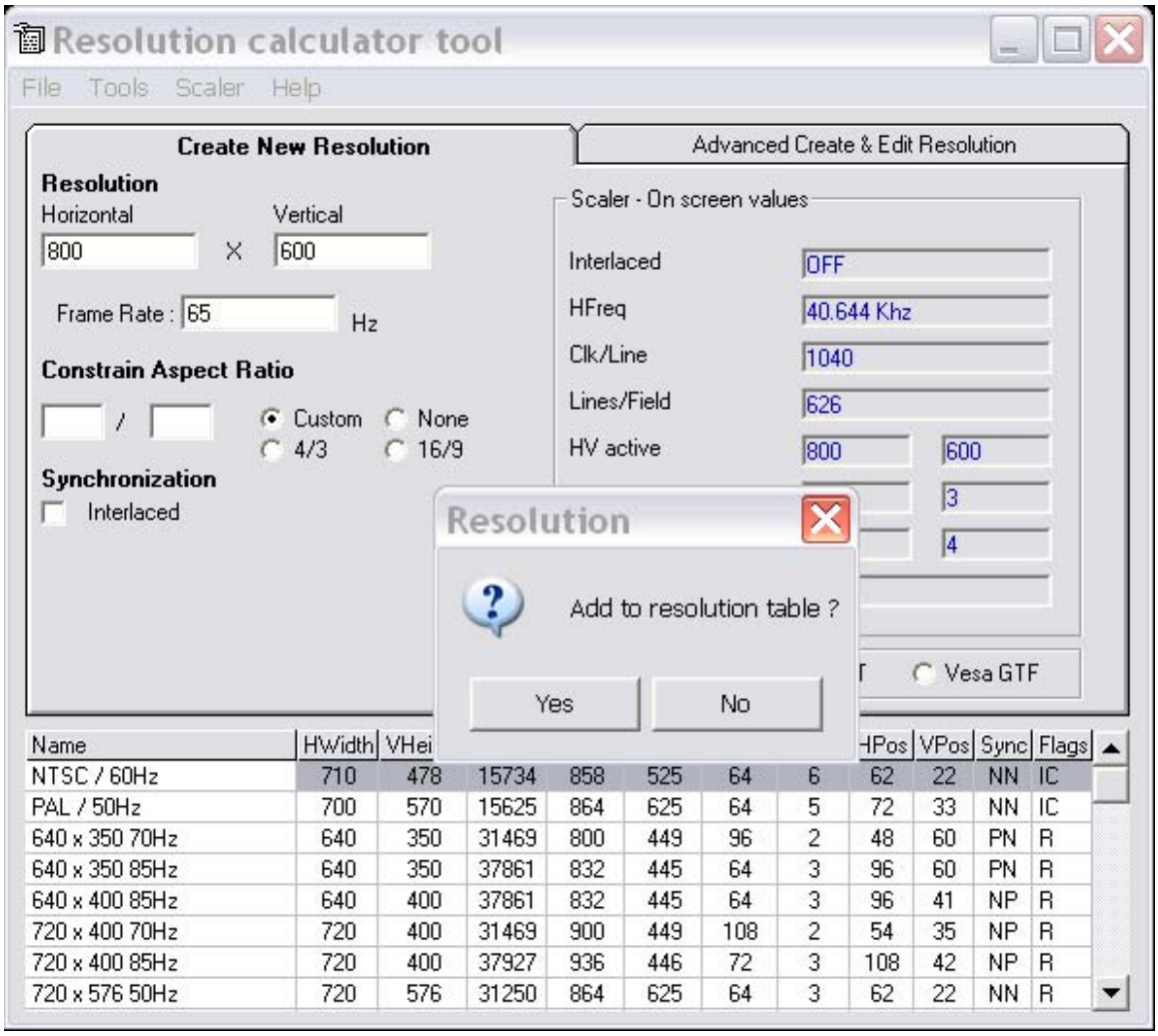


Name	HWidth	VHeight	HFreq	HTotal	VTotal	HSync	VSync	HPos	VPos	Sync	Flags
NTSC / 60Hz	710	478	15734	858	525	64	6	62	22	NN	IC
PAL / 50Hz	700	570	15625	864	625	64	5	72	33	NN	IC
640 x 350 70Hz	640	350	31469	800	449	96	2	48	60	PN	R
640 x 350 85Hz	640	350	37861	832	445	64	3	96	60	PN	R
640 x 400 85Hz	640	400	37861	832	445	64	3	96	41	NP	R
720 x 400 70Hz	720	400	31469	900	449	108	2	54	35	NP	R
720 x 400 85Hz	720	400	37927	936	446	72	3	108	42	NP	R
720 x 576 50Hz	720	576	31250	864	625	64	3	62	22	NN	R

There are 3 ways to create a resolution using this tool. The easiest, shown on the start screen, allows you to create a new resolution using the minimum information of Horizontal and Vertical size and the desired refresh rate. It's also

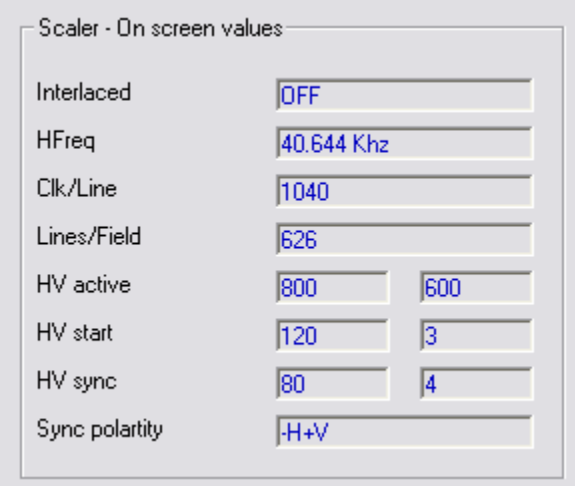
possible to constrain the Vertical size of the resolution by selecting a custom, 4:3 or 16/9 aspect ratio and then left clicking your mouse on the Vertical Resolution box which will then automatically calculate the Vertical Resolution for the given Horizontal Resolution and Aspect Ratio.

Once you have entered the required information it's simply a matter of pressing the 'Create New' button. The resolutions are created using one of two VESA® standards, Coordinated Video Timings (CVT) or Generalized Timing Formula (GTF) in order to make the created resolutions as compatible as possible with standard video equipment.



Once you press the Create New button, you're asked if you want to add this new entry to the resolution table. If you select No, the resolution can only be added to the table using the Advanced Create and edit screen.

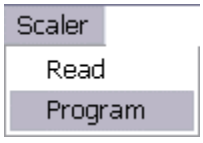
Once the new resolution is created the 'Create New Resolution Screen' will show what the Scaler's on-screen values would be if you were at the front panel of the scaler in the 'Adjust Image Parameters' screen.



If the resolution was added to the resolution table, then the table at the bottom of the screen will update and show the newly created resolution and all its timing parameters. New resolutions are named using the resolution H and V size; refresh rate and the letter U to signify a user created resolution. Using the advanced screen you can alter this text, as we'll see later.

Name	HWidth	VHeight	HFreq	HTotal	VTotal	HSync	VSync	HPos	VPos	Sync	Flags
1920 x 1200 60Hz Rd.Blnk	1920	1080	74037	2080	1235	32	6	80	26	PN	R
1920 x 1200 60Hz	1920	1200	74555	2592	1245	200	6	336	36	NP	R
1920 x 1200 65Hz	1920	1200	81249	2584	1250	256	3	336	44	NP	R
1920 x 1200 70Hz	1920	1200	87499	2584	1250	256	3	336	44	NP	R
1920 x 1200 75Hz	1920	1200	94037	2608	1255	208	6	344	46	NP	R
1920 x 1200 85Hz	1920	1200	107183	2624	1262	208	6	352	53	NP	R
1920 x 1440 60Hz	1920	1440	89999	2600	1500	208	3	344	56	NP	R
800 x 600 65Hz U	800	600	40644	1040	626	80	4	120	3	NP	R

Once your new resolution is added, you can program the resolution into the Scaler using the 'Scaler' menu and then selecting 'Program'. The application will proceed to program all the resolutions on the list into the scaler.



Note that this will overwrite any resolutions currently in the scaler.

Using this menu it's also possible to read all the resolutions out of the Scaler into the windows application by selecting 'Scaler'->'Read' from the above menu. At any time you can also use the 'File' menu and load a previously saved resolution table or save the current one as shown below:



Creating resolutions can also be achieved by using a 'Linux' style video mode line. Simply press 'tools'->'Linux modeline' and then type in or paste from another application the modeline and press ok.

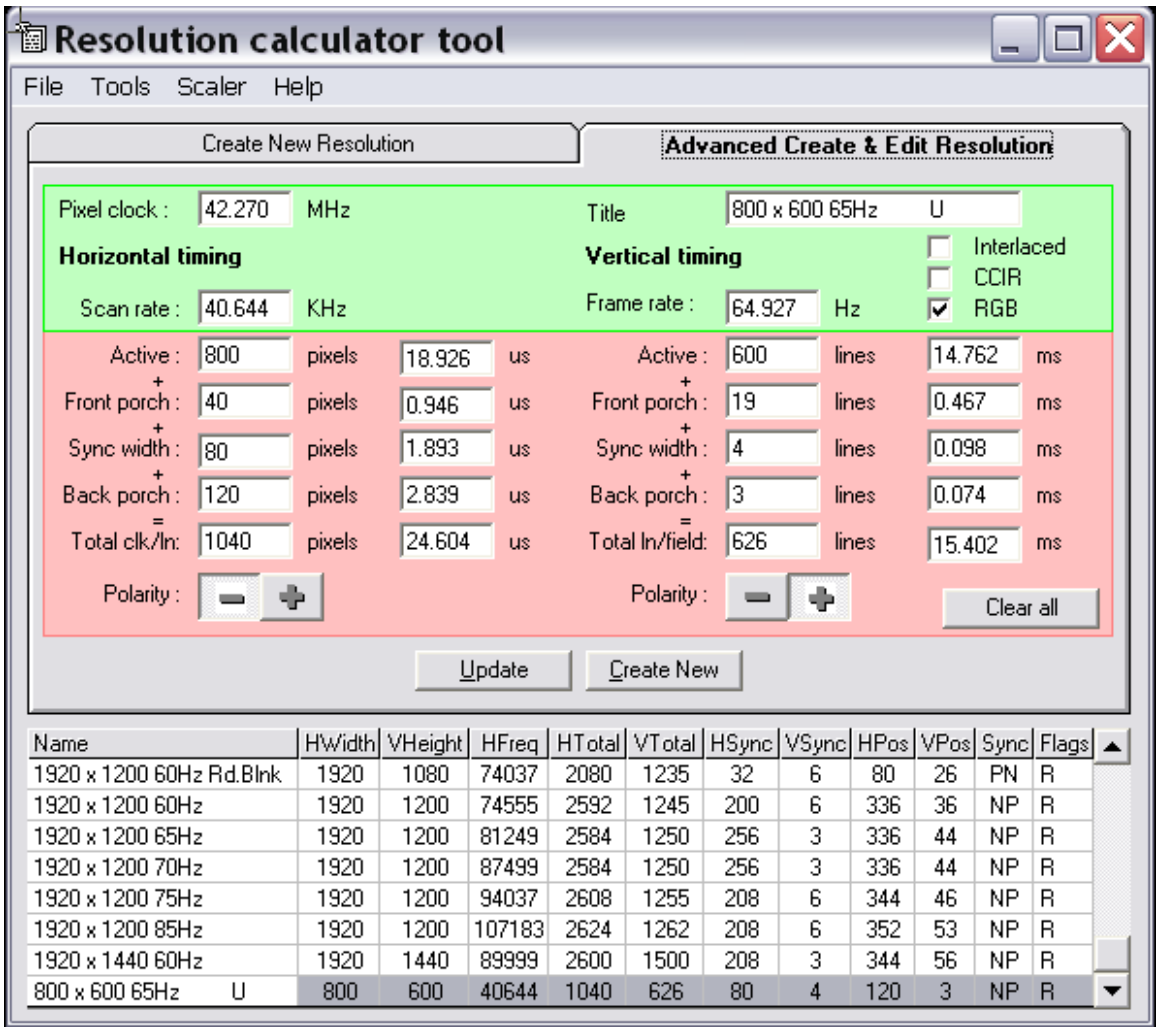


The third and final way to create or edit a resolution is to use the Advanced Create and edit resolution screen. This screen allows all the video parameters to be directly entered or an entry from the resolution table to be edited. To edit a resolution already added to the resolution table, simply click on it and its detailed timing information will be shown.

The edit will automatically calculate some of the fields. For example the sum of the Active, Front, Sync and Back fields is used to create the Total field. Adjusting the Pixel clock frame rate or scan rate will cause all the effected timing entries to be recalculated.

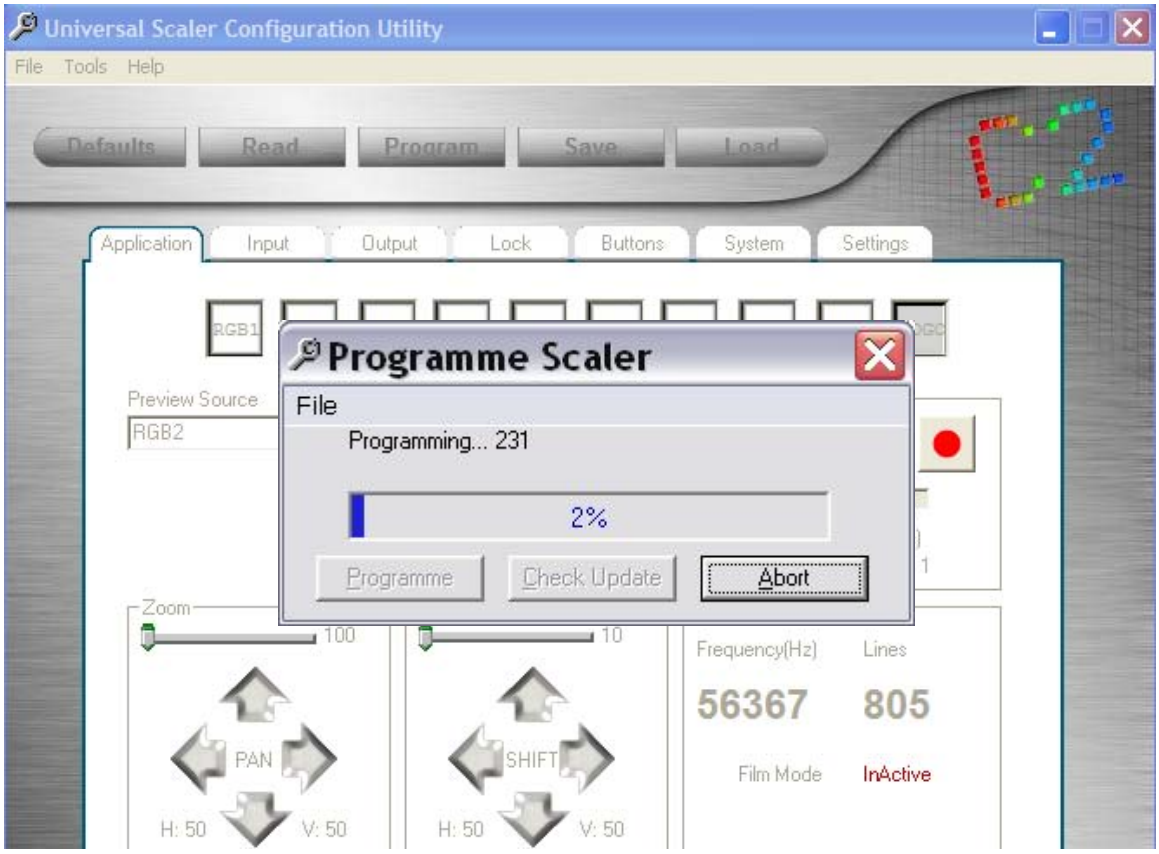
Once you've finished editing a resolution, simply press 'Update' to change the current resolution or 'Create New' to create a new entry in the resolution table.

This screen allows all the video timing information to be altered, the title of the resolution entry to be changed (limited to 24 characters) and the mode of the entry to be altered. The legal modes are shown as Interlaced – for interlaced video signals, CCIR for video that would normally be output on CV or YC connectors and RGB for video that would be output on RGB or Component type connections.



Once you exit the resolution, create and edit tool, there will be a short delay while the resolution changes are updated in the main application.

18.8 Firmware Updater



"Firmware Update" Toolbar Item

Selecting the "Firmware Update" toolbar item will display the above screen.

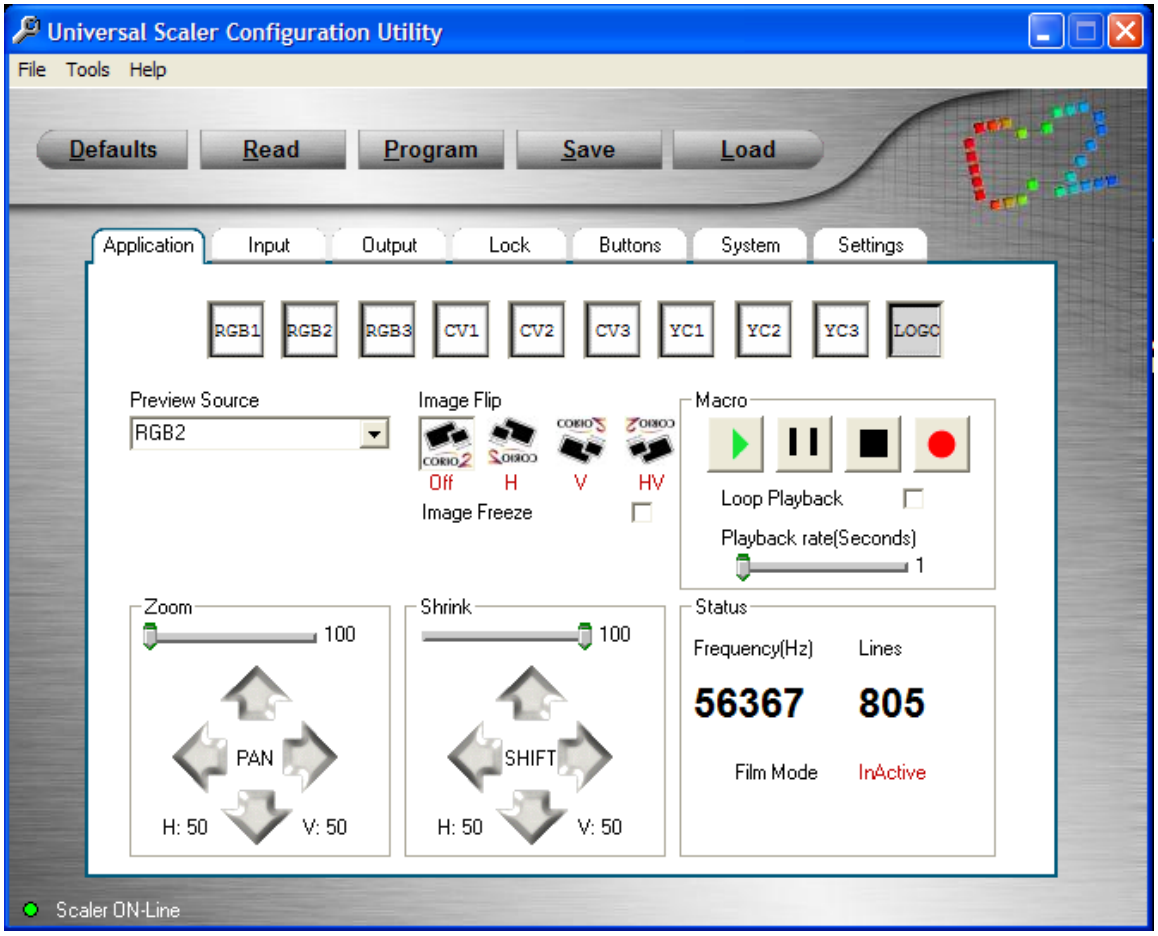
Pressing the "Programmer" button will immediately start loading the version of software present in the CORIO2 sub-directory on your PC. (The CORIO2 directory is where the utility resides. It can be found as a sub-directory under the Program Files directory on your "C" drive). Unless you have updated the files that reside there with the newest firmware version, you may actually go backwards in revision version.

To download the latest version of the C2-5100 or C2-5200's firmware, go to the support website located at ***tvone.crmhelpdesk.com***. Once there, you'll answer a few questions and become eligible to download firmware. Place the firmware revision in the CORIO2 subdirectory of your PC, replacing the firmware version that is currently present. (It's always desirable to copy the current file to another directory before updating so that you have a backup.)

Note that once you press the "Programmer" button, it can be aborted but should you abort the upload, the Scaler will not function properly or perhaps won't

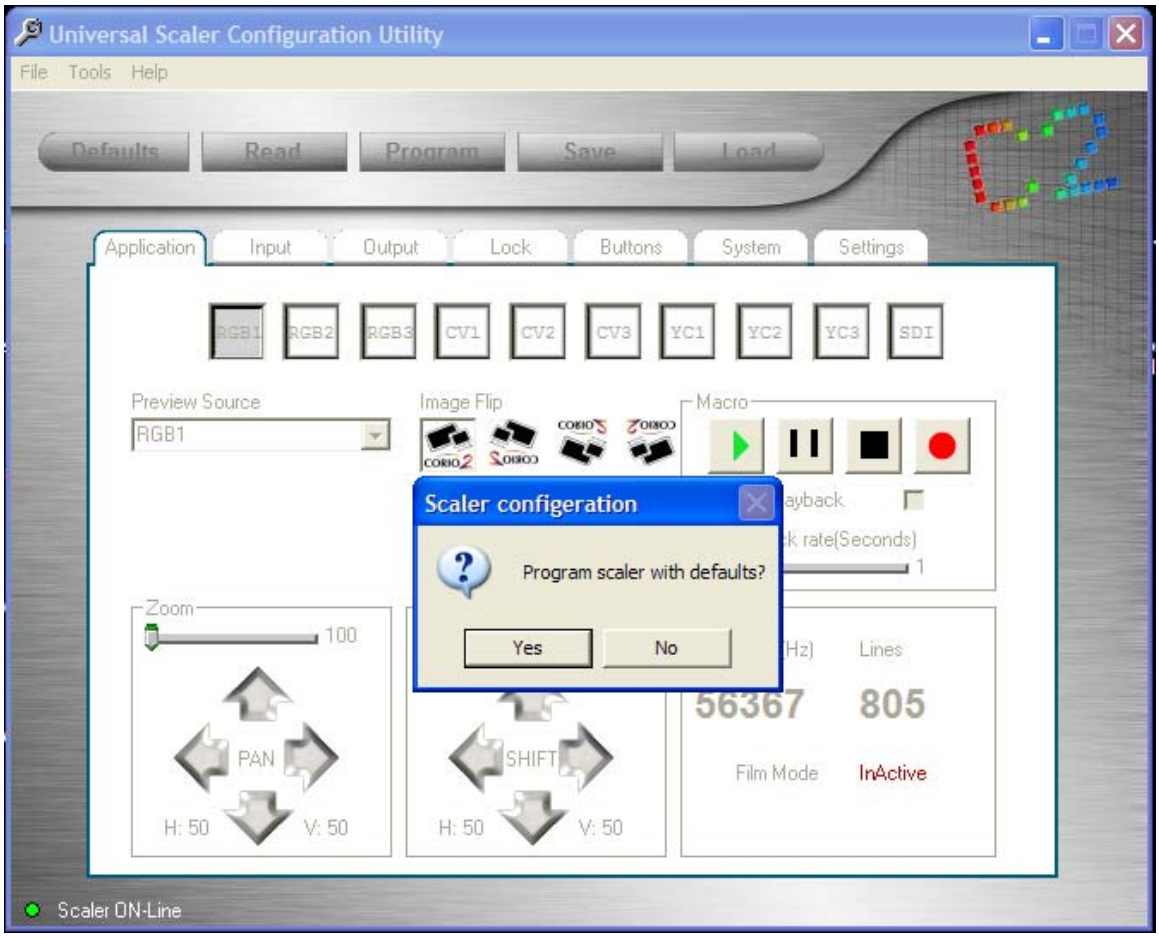
function at all, particularly if the power is interrupted during the process. Should you encounter problems during a firmware update, check to see if the progress bar is still moving, indicating an update is in progress. If it stops for several minutes, abort the process and start again from the beginning. If there are still problems, disconnect the unit from the AC power source, wait a few moments, plug it back in and turn it back on. After you've done that, try to install the new firmware version again.

18.9 Main Control Buttons



Main Control Buttons

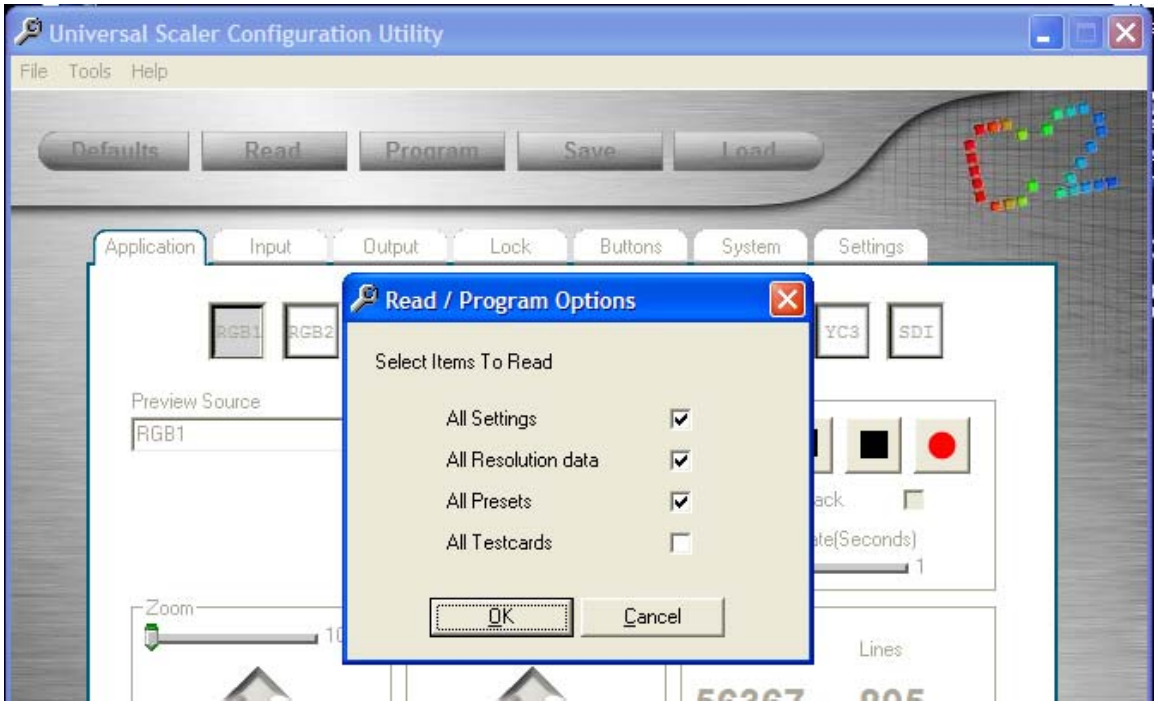
18.9.1 Default Button: Pressing the “Defaults” button displays the following screen:



“Load Defaults” Function

Clicking on the “Yes” button will restore the Scaler to the Factory Default Setting and override most of the changes you may have made to the Scaler set up. Click “No” if you do not wish to revert to Factory Default Setting.

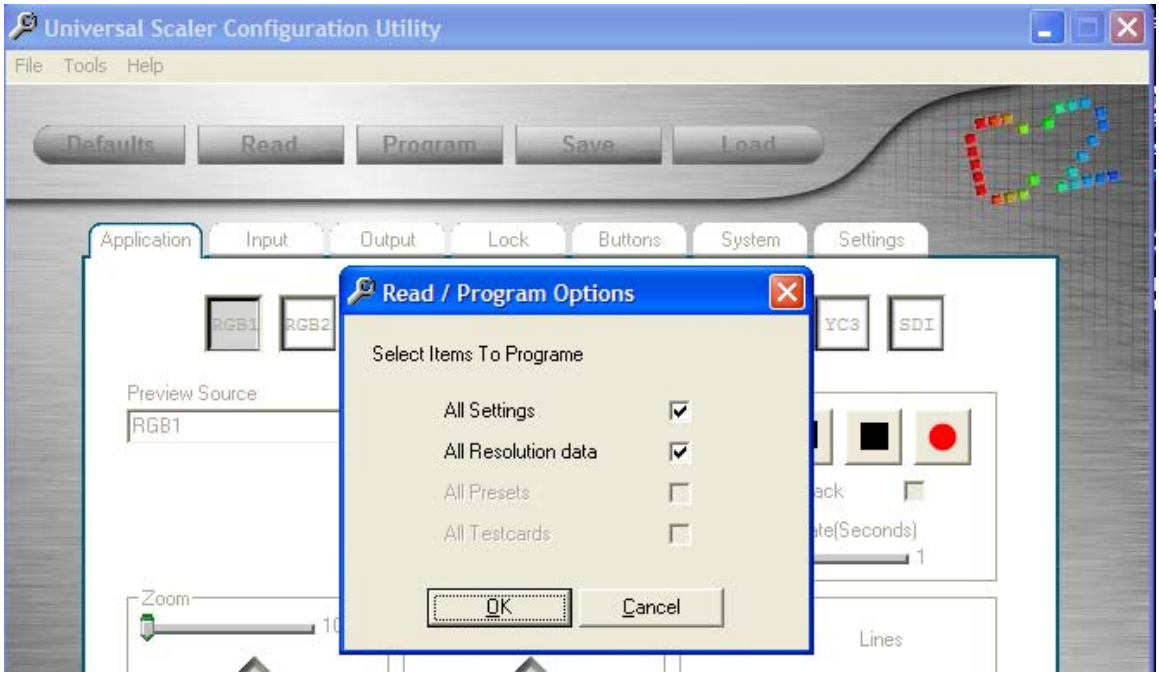
18.9.2 Read Button: Pressing the Read Button loads the current settings from the Scaler into the utility's memory. Reading this data does not unload the Scaler's memory. It merely copies it to your PC.



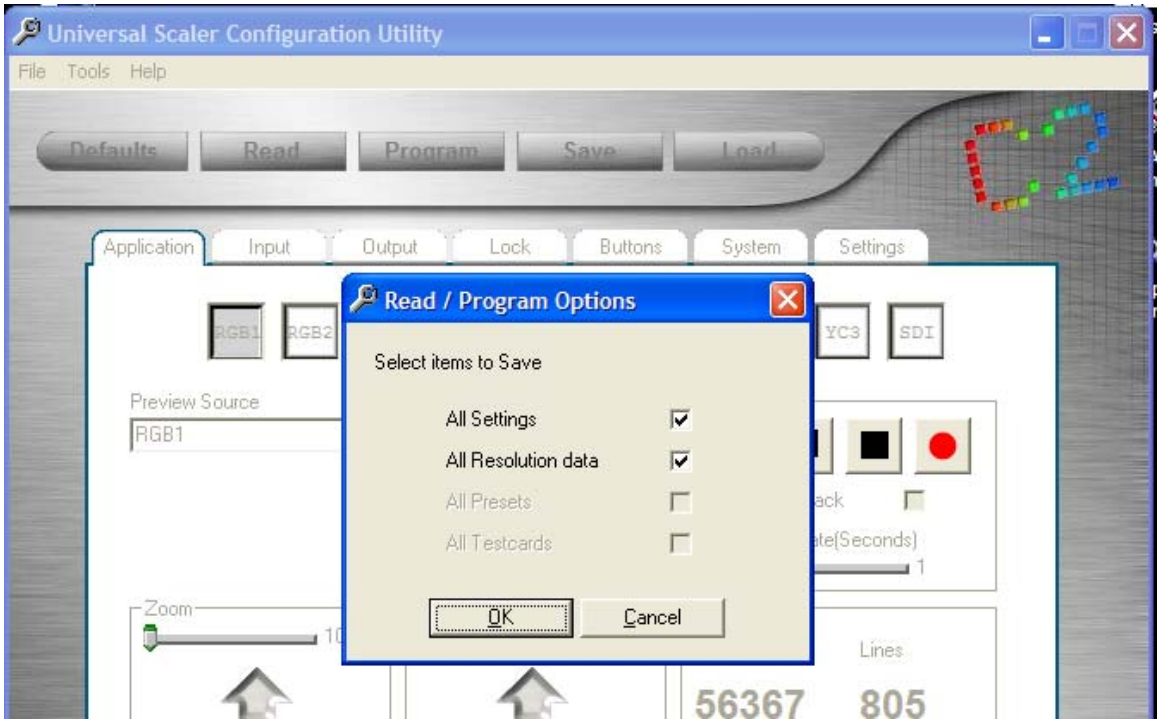
Read Scaler Function

As explained earlier, you should check the top three selections but it is not necessary to check the Testcard checkbox unless you plan to perform some sort of activity on the testcard data.

18.9.3 Program Button: Pressing the Program button yields the program Scaler screen. If the Program action is taken all the way through (by checking the appropriate checkboxes and then clicking "OK"), the utility will load its configuration contents into the Scaler. If you did not perform a "Read" function as explained above, the utility's memory will contain random data resulting in unpredictable results when loaded into the Scaler. The Program Button can therefore be thought of as a quick recovery method whereby you load the normal conditions into the memory, make some sort of adjustment to the operating conditions of the Scaler and then press the Program button to revert to the original condition.



Program Scaler Function

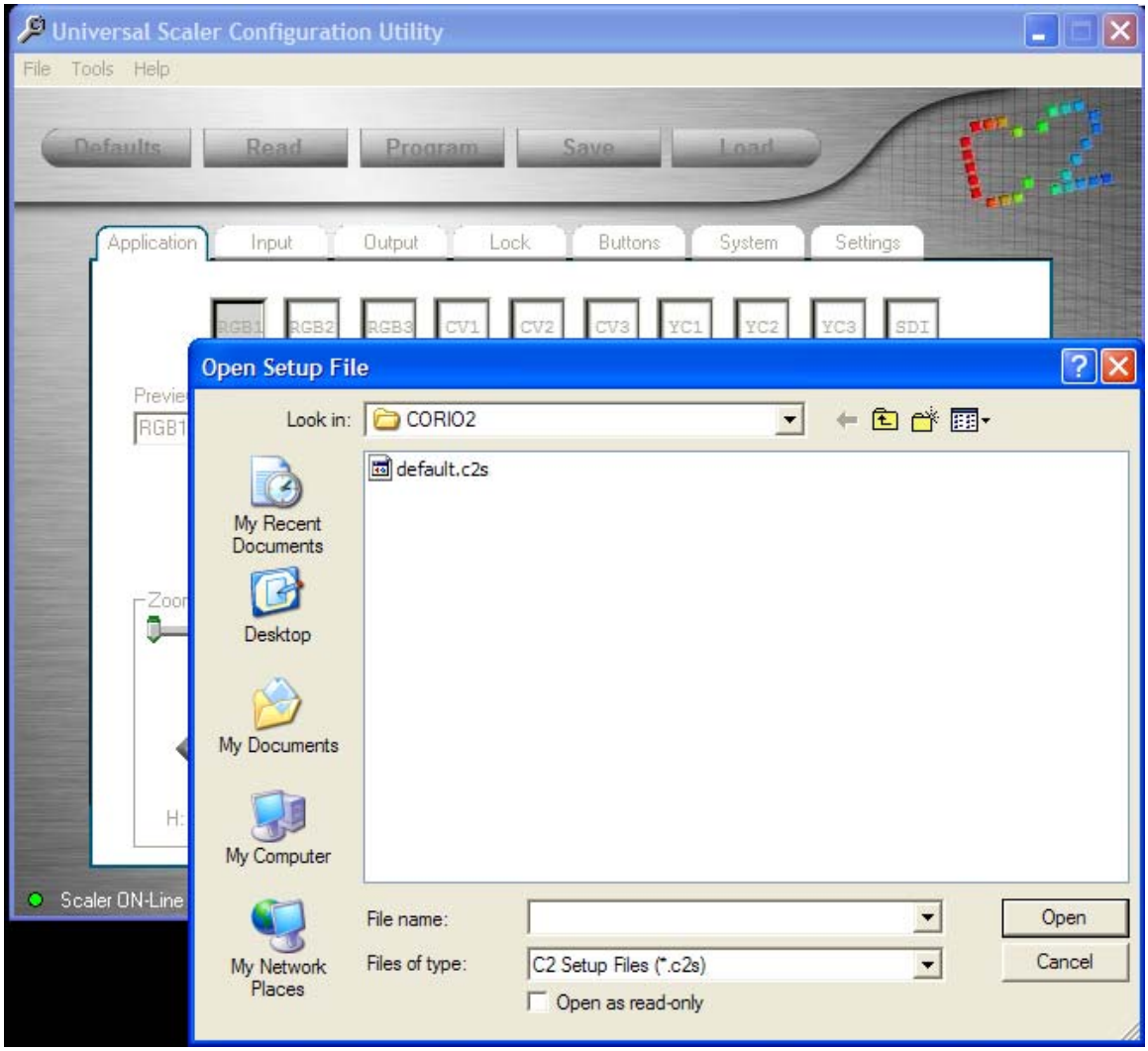


Save Configuration Function

18.9.4 Save Button: If you have created a special set of operating conditions, pressing the Save Button will cause the above screen to appear. If you press the "OK" button, you will open a file storage window where you can give a unique

name to the custom configuration and save it for future recall via the “Load” button.

18.9.5 Load Button: The “Load” button brings up a file access window where you can select from all your stored configurations. Select the desired file, click “Open” and it will be loaded into the Scaler’s memory.

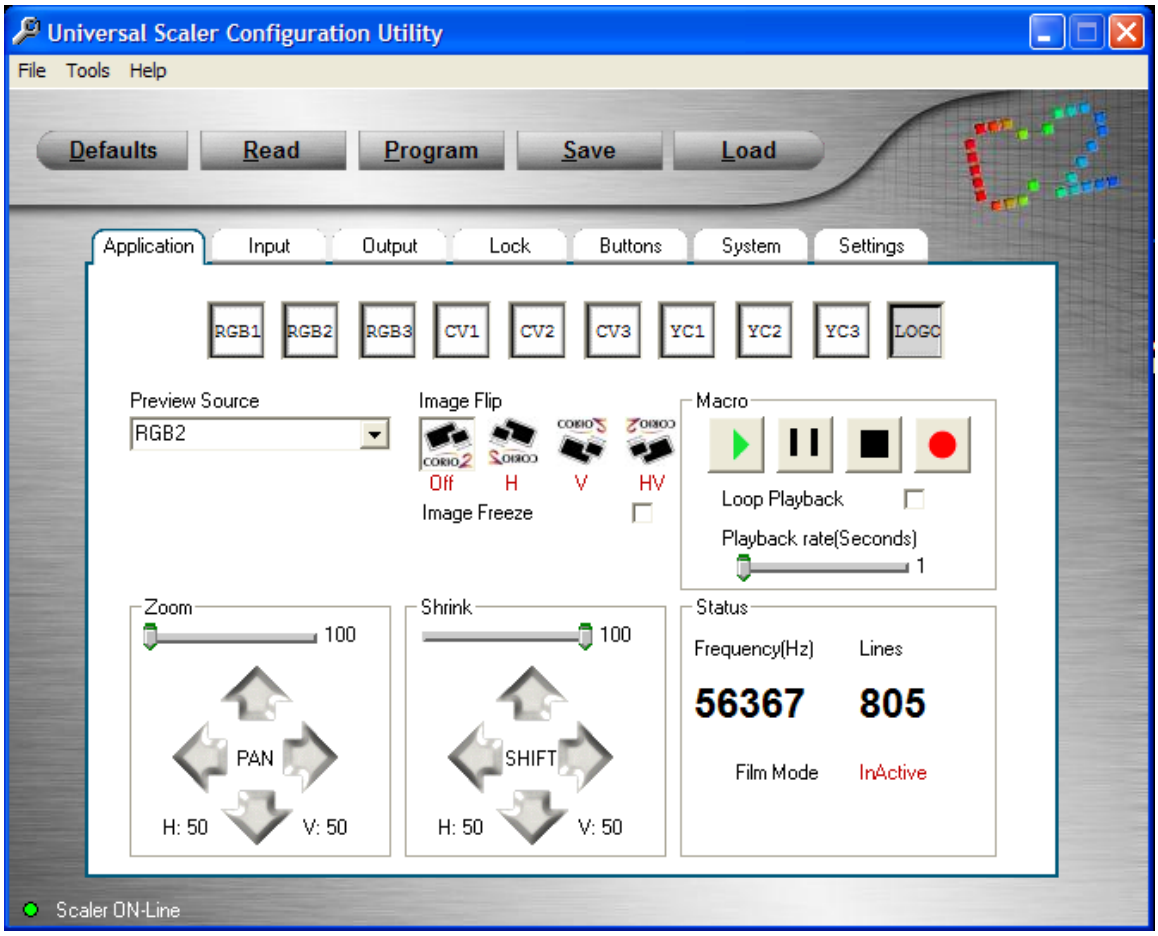


Load Configuration Function

18.10 "Tabbed" Screens

There are seven folder tabs that contain the configuration information for the Scaler. Each folder Tab has a unique function for controlling some portion of the Scaler and can be either universal in nature or specific.

18.10.1 Application Tab:



"Application" Tab

The row of buttons along the top of the "Application" folder duplicates the input buttons on the Scaler itself. Their actions mirror the actual buttons in that if you have the Preview function selected it takes two clicks on the virtual button to make an image appear on the output.

Note that there is no polling of the buttons. If you select a button on the actual control panel, that change will not be picked up by the utility's display. It is important in some situations that you operate using one mode or the other but not both. In other situations, it is not important that the two control methods be in sync. The main thing is to be aware of the way the functionality works.

Below the buttons is a drop down list used to select the preview image, a way to flip and invert the output image and a Macro (or more correctly, a Keystroke recorder) recorder utility. The first two items are self-explanatory but the Macro recorder needs a short tutorial.

To use the Macro recorder, click on the Red button. From then until you click the stop button, every image manipulation event is recorded in a scratchpad memory. When you click the stop button, you'll be prompted for a file name to be used to store your activities. Later, when you press the play button, you're taken to a file access screen where you can load the macro and play it back as required. You have the ability to loop the output if you wish which becomes a special effect in and of itself.

The Macro recorder is normally used to save a complex set of image manipulations that would be difficult to perform in real time during a presentation.

Finally, at the bottom of the screen are slider controls and direction buttons that allow you to either zoom or shrink an image and move it around on the screen. And there is a small System window that shows a few of the higher-level system parameters.

18.10.2 Input Tab:

The "Input" folder contains the image adjustment controls. First, an input is selected from the drop down list labeled Program Source. Making a selection here will cause the output of the Scaler to display the selection and will override any selection made via the buttons in the Application folder.

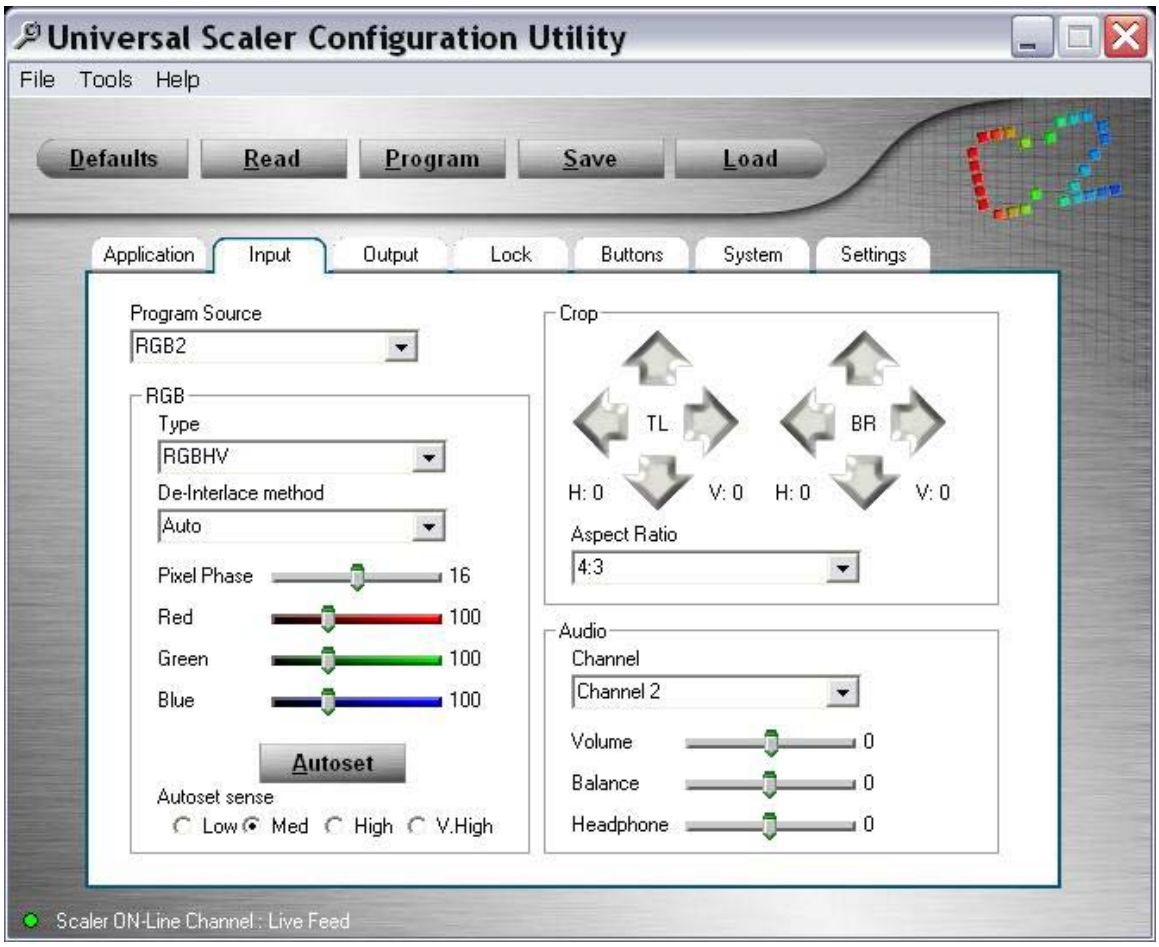
Once the selection has been made, you can change the signal type or make adjustments to the image parameters.

The heading directly beneath the drop down list (labeled 'RGB' in the example below) will change depending on the type of signal. For instance, selecting an input with composite video present (CV) will cause different adjustment parameters to appear than are used for RGB signals.

In essence, the left hand side of this folder's screen is used to make adjustments to the appearance of the image and the top, right portion of the screen allows the position of the image to be adjusted and the aspect ratio changed.

If you have the companion Audio Router (and you enabled control of the audio router via the previously discussed Preferences adjustments) you would also be able to make audio adjustments from this screen.

The "Input" folder's screen is shown on the next page.



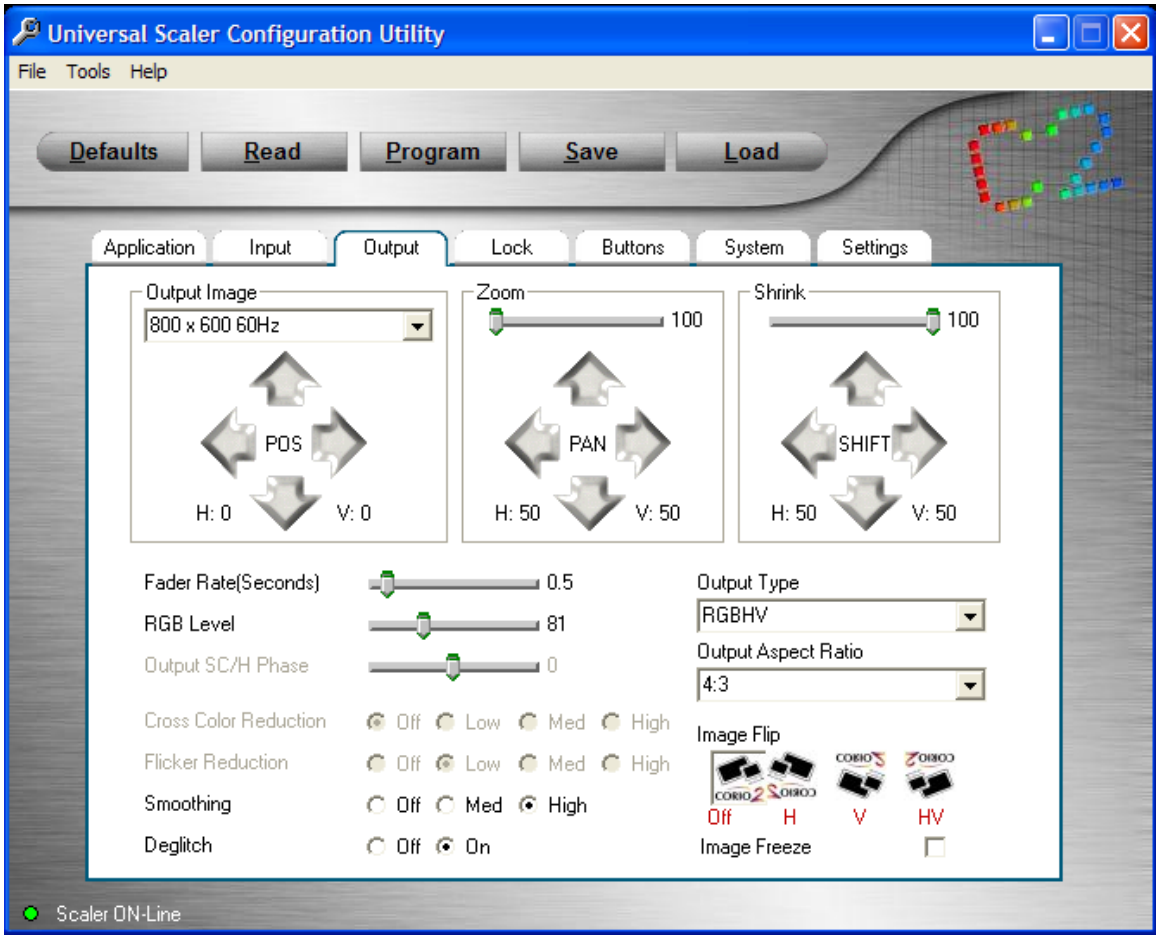
"Input" Tab

Note: Changes made using the utility are temporary unless you save the entire setup as a custom configuration. In other words, adjustments made here are treated the same way that control panel adjustments are treated if you neglect to press and hold the Menu Select knob until you heard the "Beep".

As long as the Scaler is powered up, the changes are retained but if power is lost or if a subsequent change is made, the change made using the utility will be lost.

Keep this in mind and if you do need to make a change permanent either save the configuration using the utility's configuration save/load capability or make the change using the Menu Select knob and save it by pressing and holding the Knob until you hear the "Beep". You'll then need to press the Read button on the utility to re-sync the utility to the Scaler.

18.10.3 Output Tab:



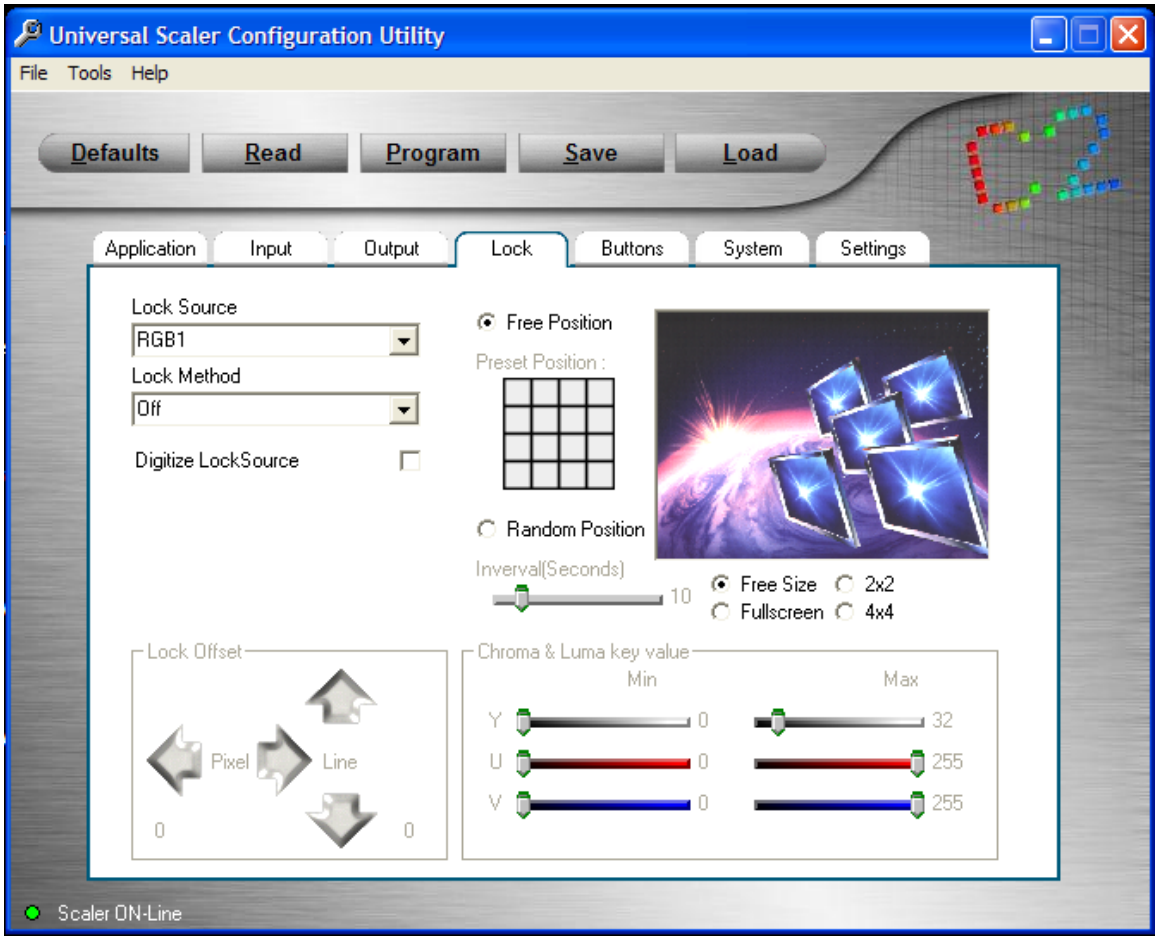
"Output" Tab

The "Output" folder's screen controls the characteristics of the Scaler's output. Using the drop down list labeled 'Output Image', you can select NTSC or PAL as the output type or choose from several dozen RGB image formats.

You can position the full size output image on the monitor, Zoom or Shrink the image and position the modified image within the full screen. Beneath the positioning controls, you can make adjustments to how fast or slowly the images change in response to input selections (Fade Rate) as well as adjust the image parameters for the output. Finally, you can specify the type of output image you desire, the aspect ratio, flip the output image and freeze the image.

Note: You performed similar image manipulations via the Inputs tab but those only applied to a specific input. These adjustments apply to the output and therefore have an effect on all images output by the Scaler).

18.10.4 Lock Tab:



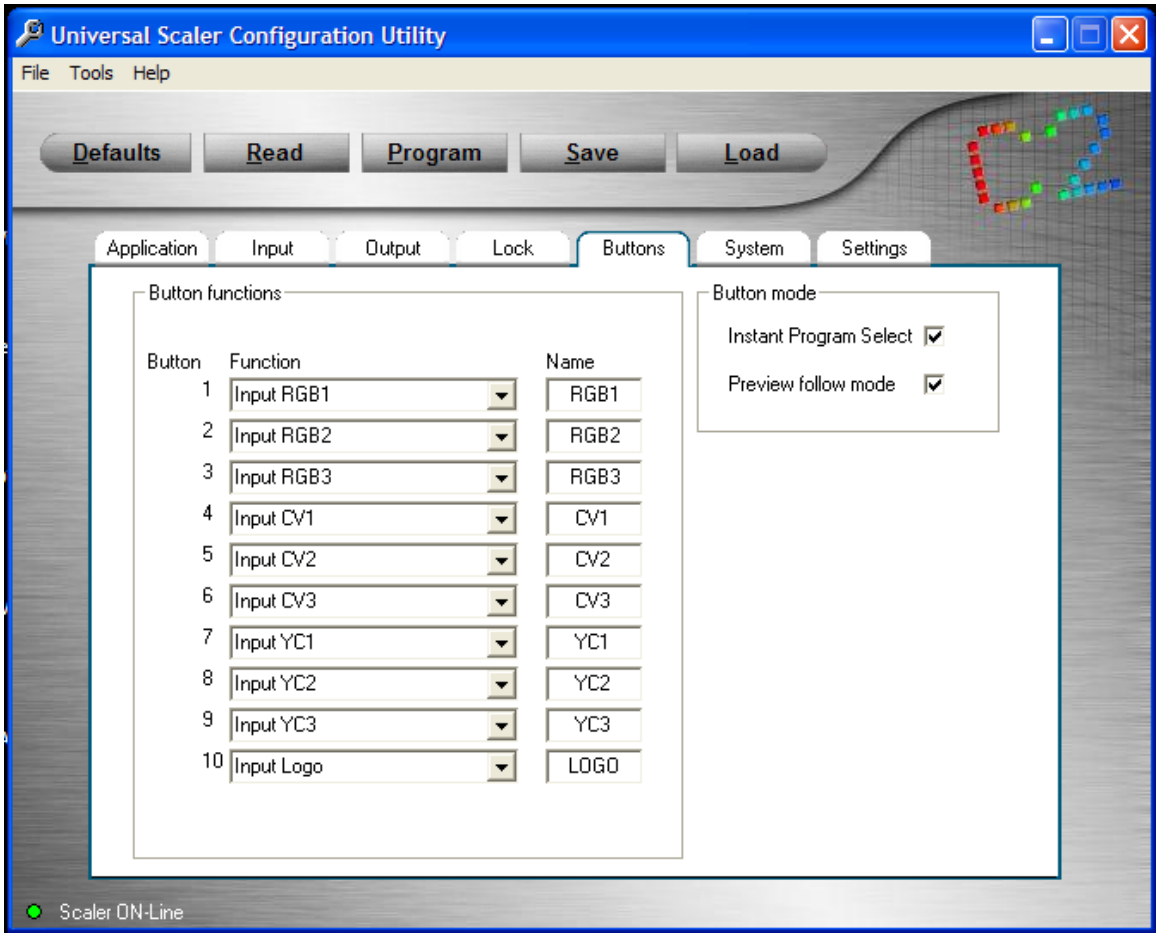
"Lock" Tab

The "Lock" tab screen duplicates the Lock method and Lock Source functionality of the Scaler's front panel controls. Lock Source and Method are chosen from drop down lists and Digital Lock Source can also be selected here. You can set the pixel offset as well as the position of Keys and you can adjust the quality of the Key by using the slider controls in the lower right portion of the screen.

The 'Free Position/Random Position' selection controls the position and size of the inserted image. In the 'Free Position' setting, you control where the inserted image is placed. In the 'Random Position' setting, the inserted image can appear anywhere on the screen and further, it can be made to move in a random manner in intervals you control by setting the 'Interval (Seconds)' slider.

Finally, by selecting one of the four choices (Free Size, 2X2, 4X4, Full Screen), you control the size of the inserted image: either free form—controlled by you in other words—or one of three presets.

18.10.5 Buttons Tab:



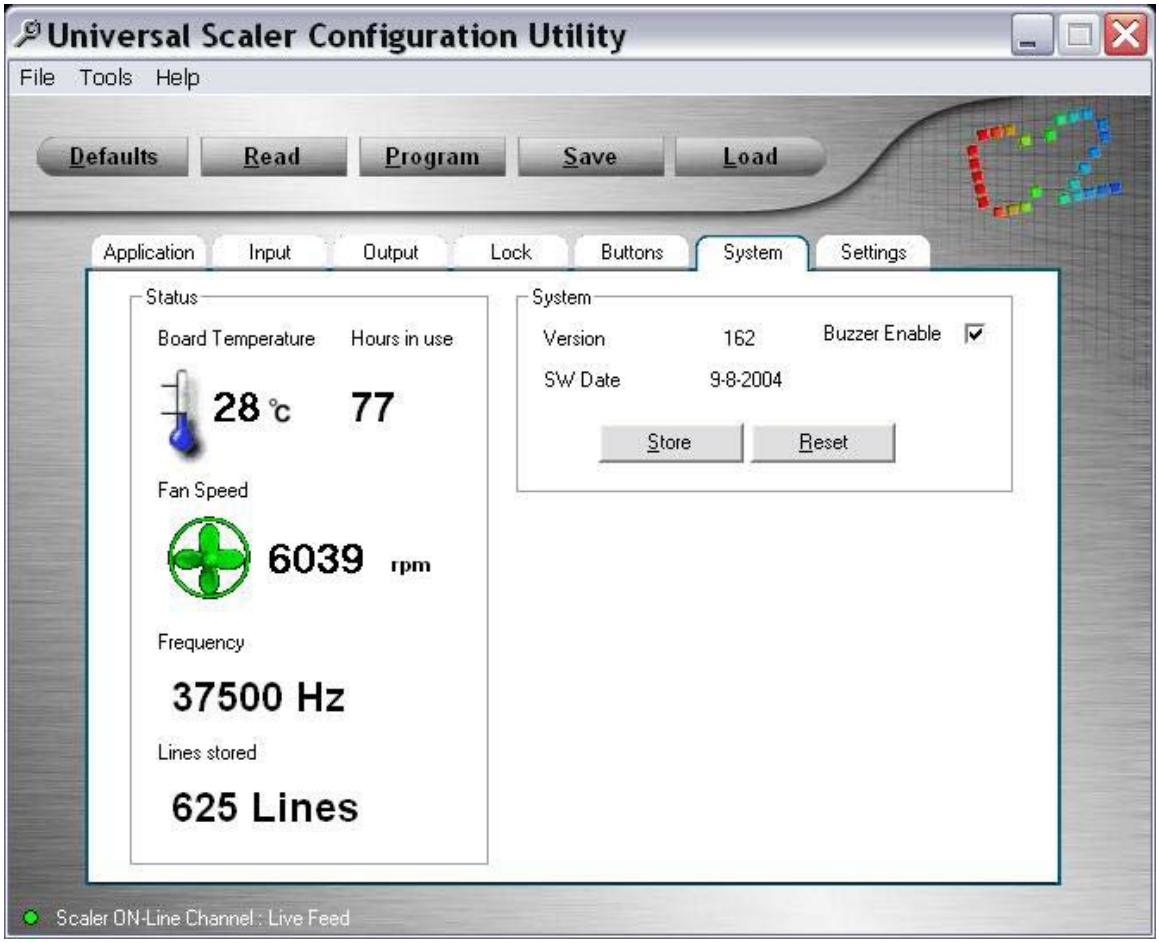
"Buttons" Tab

To change a button's signal type or image parameter, you use the drop down list associated with each button. If you want to make the first button a YUV button, you can make the change just as you would with the front panel controls. You can also set up the program follows preview functionality here or park the preview on one particular input.

What you *CANNOT* do here is build and save a Preset situation for a given button. Although you can make the Preset selection for a button, you have no way to individually save each of the layers associated with the individual button.

Use this screen to change input types but use the front panel controls to build button presets. As previously noted, you also need to save the entire configuration as a file should you make any changes or your changes will be lost in the event of power loss or a subsequent parameter change in the same area.

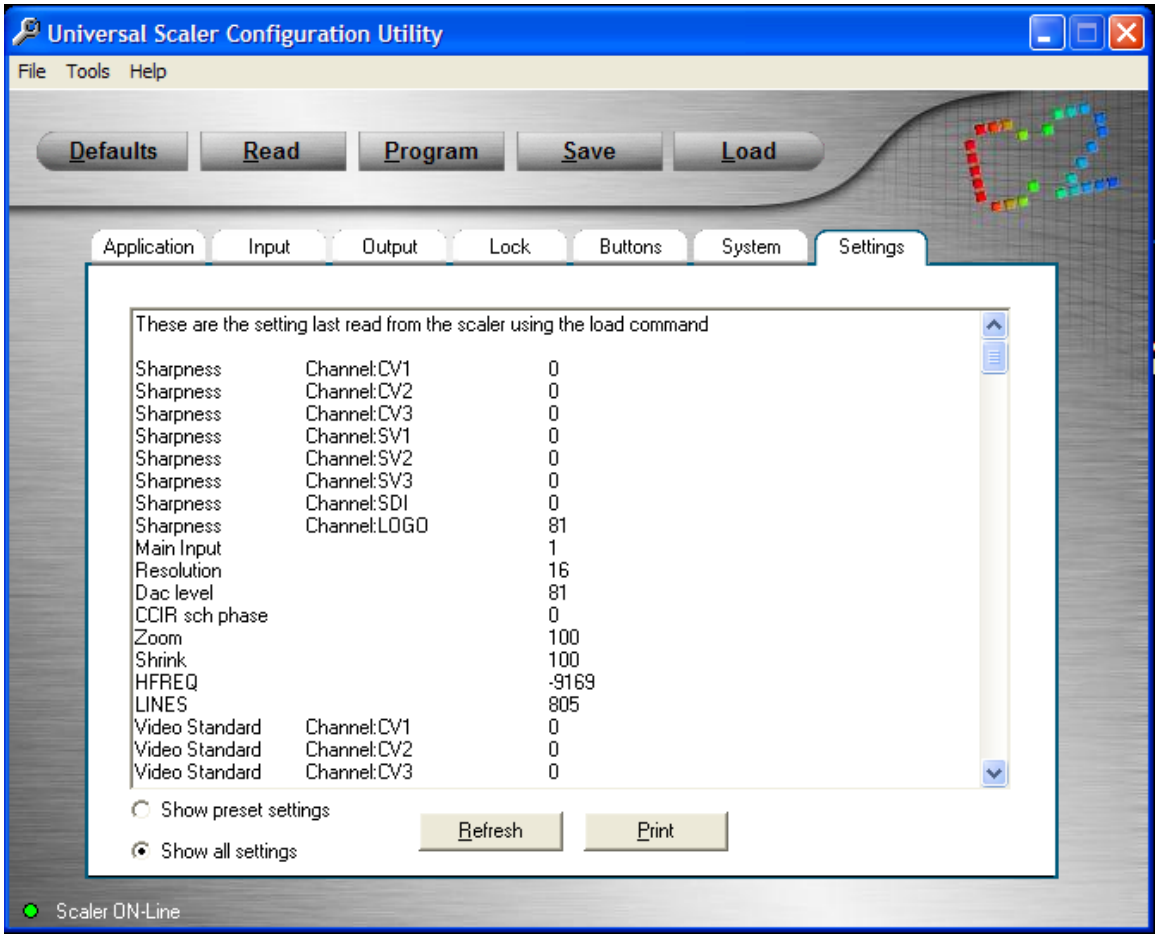
18.10.6 System Tab



"System" Tab

The "System" folder screen shows the software version number, date of issuance, and the status of various monitored parameters (which are updated every 10 seconds). Pressing the 'Store' button causes the current operating parameters to be written to non-volatile memory so that settings will not be lost in the event of interruption of AC power. The other button, the 'Reset' button, causes a System Reset to Factory Defaults to occur in the same manner that holding down input buttons 1 and 2 plus the power standby switch causes a reset from the control panel.

18.10.7 Settings Tab:



"Settings" Tab

The "Settings" folder's screen shows the contents of the Scaler's configuration memory. You can view all settings or settings for button presets only. This screen does not periodically refresh like the System screen described previously so a 'Refresh' button has been provided to update the display in the event you make a change to any of the monitored parameters.

You can also print a hard copy of the information by clicking on the 'Print' button.

18.11 Summary:

The Configuration utility provides an ergonomically friendly, intuitive way to control one or more C2-5100 Universal Scalers either via a dedicated serial port or via an Ethernet network. Control of the Scaler's operating parameters is provided plus updates to the CORIO2 processor engine can be accomplished quickly and without unwanted complexity.

19.0 THEORY OF OPERATION

The Scaler supports up to 10 inputs and when an operator selects an input, the Scaler routes the video from the selected connector to the correct decoder for the signal type.

The RGB and YUV inputs are routed to a triple 8bit analog to digital converter and then passed to the input of the scaling engine. The synchronization pulses from these signals are buffered and passed to the scaling engine and, in the case of composite sync, sync on green or sync on Y, the sync pulses are separated from the video and then passed to the scaling engine.

The Composite video and S-video signals are routed to video decoders with adaptive filtering and color correction that convert the video signal to CCIR656 video data which is then passed to the scaling engine. The SDI input is deserialized and converted to the same CCIR656 video data. Synchronization information is extracted from the CCIR data by the sync processing circuit of the scaling engine and then used in the same way as the RGB synchronization signals.

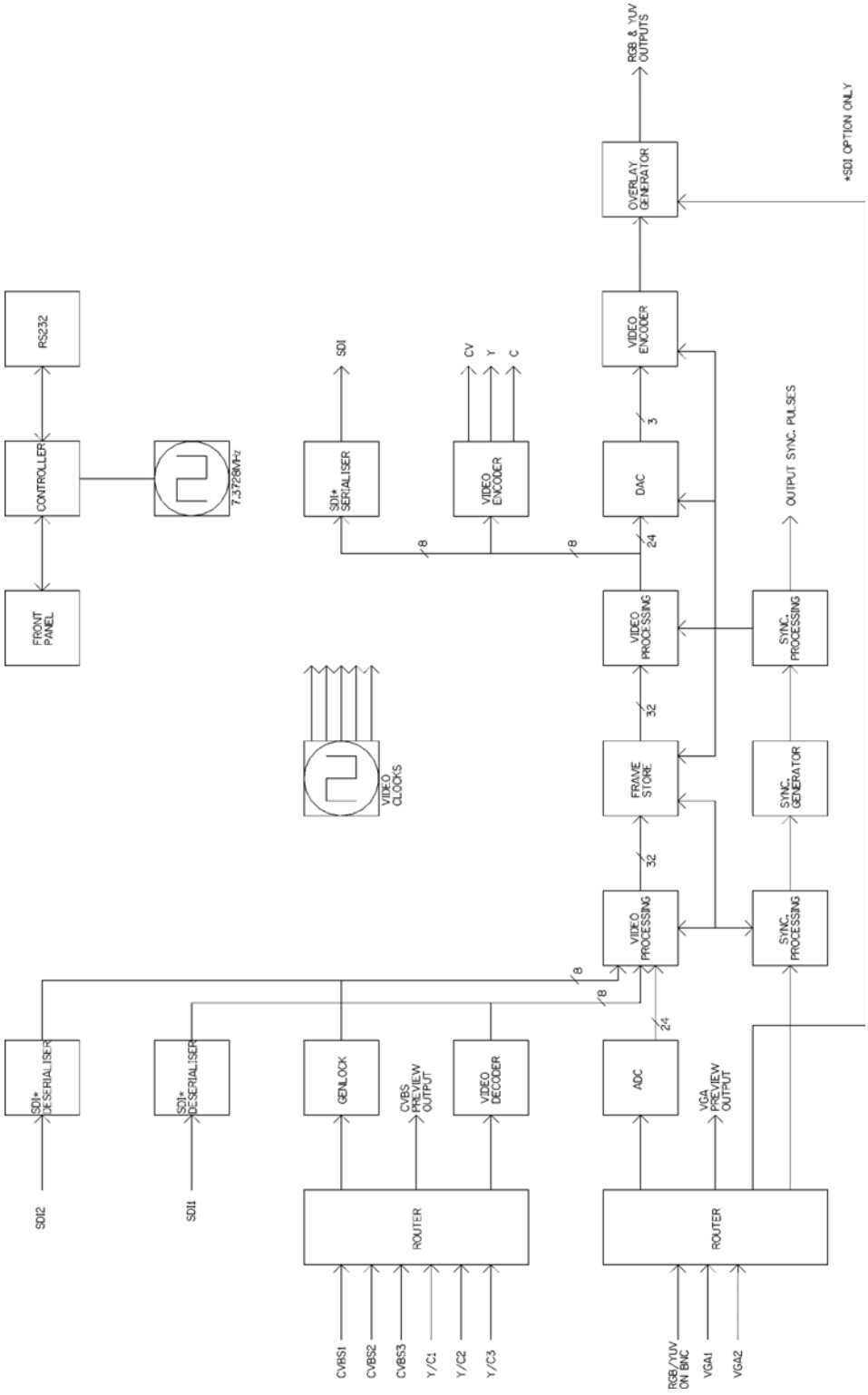
When a Genlock input is selected, the initial processing is handled the same way as the program input for Composite, S-video and SDI input types—by decoding to CCIR data. RGB and YUV data are handled slightly differently; the signal is not converted to digital—it's kept in the analog format.

For a Preview input, the signal is simply routed and then buffered before being output.

The input video processing circuit of the scaling engine converts the video data to YUV 4:2:2, scales to a suitable internal resolution and stores the image in the double-buffered frame store memory. Motion compensation or 3:2 pull down is applied before storing in memory.

If the Scaler is in a Genlock mode, genlock information is used to generate the signals needed to read the data from the double-buffered memory and the output sync signals. If the Scaler is not in genlock mode, the selected output resolution is used to generate signals required to read the data from the double buffer memory.

The double buffer output is then scaled to the proper resolution and sent to the correct encoder. For RGB and YUV signals, the output of the scaling engine is fed into a triple digital to analog converter. For the CV/YC and SDI outputs the Scaler engine outputs CCIR656 video data that are then used by the Video encoder for CV and YC and as serial data for SDI.



C2-5100/5200 Block Diagram

20.0 RETURN PROCEDURE

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

20.1 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 in Section 21.0 of this manual and check out the various FAQ (Frequently Asked Questions) listings on the support website, ***tvone.crmdesk.com***, which shows the latest Hints, Tips and Solutions.

Don’t presume it is the Scaler that is causing the problem. Check that the equipment being used with it is fully working and setup correctly.

First, 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 Scaler is working properly.

Perhaps you have a “frozen” Scaler and you cannot change an input nor exit from the current task. IN that case, a simple 'Engineering Reset' of the product may sort the problem out. To do this hold down programmable buttons 1 and 2 along with the suspend switch until the unit beeps. Engineering reset should only be used if the unit's settings give an invalid output that the user cannot exit from. All user-settings will be lost following an engineering reset.

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

20.2 To return a unit for repair

First contact TV One using the ***tvone.crmdesk.com*** website. 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. You should provide the following information for each unit:

Product type
Serial number of the faulty unit (this is on the underside of the unit)
Full details of fault
Invoice number (if available)

Units should be returned via insured carrier or registered mail (thus allowing a trace to be made if the Scaler is lost in transit), with shipping costs and insurance arranged at your own risk and expense. Goods in transit are the responsibility of the sender and the supplier will not be responsible for transit losses.

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.

21.0 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://tvone.crmdesk.com***, please have the following handy:

21.1 Details of the problem:

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 is image related, use the 'Input parameters' menu to find out the number of lines, refresh rate and sync type being used.

21.2 Symptoms

21.2.1 There is no picture on the Output.

If the power LED on the unit is off or red and there is nothing displayed on the LCD, then insure that the AC power cord is connected properly and the power switch is on at the AC outlet. Press the standby button on the unit to turn it on.

If the power on the unit is green and the LCD is displaying the correct text 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 Output image menu, ensuring that the Output image type (eg. RGBHV) is also set correctly.

21.2.2 The image is shifted and not fully viewable

There are several ways to correct this, depending on the actual problem.

First adjust the output H/V shift value in the Output parameters menu until the white border that is displayed is centered on the Scaler output. Next adjust the TL pos. adj. values in the Setup Program source menu until the incoming video signal is displayed correctly in the white-bordered box. You may also need to adjust the BR size adj. setting to insure the incoming video signal is properly displayed.

21.2.3 The output resolutions no longer appear as expected.

Because any changes made in the Image parameters menu are automatically stored, it may be that the resolution data has become altered beyond the parameters of a new piece of equipment. Either manually correct the resolution data, or restore the data to factory conditions by doing a Firmware Update. The user should avoid altering the Image parameter data unless absolutely necessary.

21.2.4 There is excessive flicker on the Output.

Try using a different Flicker reduction mode. Turning the contrast down and the brightness up on the output device can have a large effect on flicker. Or try adjusting the brightness and contrast of the source input by selecting the Input adjust menu.

21.2.5 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.

21.2.6 Some colors appear to be incorrect on the CV/YC output

First try altering the color, contrast and brightness settings on your TV or video display. These are usually set up for a very different reason than viewing computer graphics and may need changing to suit. If you cannot achieve exactly what you desire then alter the inputs levels (Sub menu...Setup Program source) until the correct colors are restored.

21.2.7 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 connections. 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.

21.2.8 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 adjustable.

21.2.9 There is no picture on the preview output.

Because the preview output is an unscaled output, insure that the connected output device is capable of showing the resolution on the currently selected preview input. Also note that if previewing a CV or YC source, you will need to connect to the CV Preview and not the RGB Preview.

21.2.10 The picture on the video display is black and white.

Insure that all the cables are correctly connected. If you are using a PAL TV to display the output then the unit may be providing resolution set to NTSC mode, or vice versa.

21.2.12 The picture on the video display is green.

The Output image type is probably set to YUV mode, whereas you are connecting to an RGB monitor.

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

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

22.0 CONNECTOR PINOUTS

RGB HD-15 female connector

1 Red 0.7v max. / 75 Ohms
2 Green 0.7v max. / 75 Ohms
3 Blue 0.7v max. / 75 Ohms
4 N/C
5 Ground
6 Red ground
7 Green ground
8 Blue ground
9 N/C
10 Ground
11 Ground
12 N/C
13 Horizontal Sync TTL
14 Vertical Sync TTL
15 Reserved

RS232 / D-9 male connector

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

4 pin mini-DIN S-video connector (YC input)

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

RGB / Component connections

RGBHV, RGBS, RGsB, YUV

23.0 TECHNICAL SPECIFICATIONS

RGB video inputs and output

Voltage levels: 0.5 to 1.0 Vpp input, 0.7Vpp output
Sync types: RGBHV, RGBS, RGsB, YUV Sync on green / YUV sync 0.3V to 1.0 Vpp input, 0.3Vpp output
RGBHV / RGBS sync: TTL pos. or neg.
Video signal impedance: 75 Ohms
Horizontal frequency: 15kHz to 130kHz
Vertical frequency: 43Hz to 150Hz
Digital sampling: 24 bit, 8 bits per color, 80MHz max.
Resolutions supported: Virtually any Interlaced or progressive.
(Resolutions beyond 1024x1024 are sub-sampled)

Composite Video (CV) and S-Video (YC) video inputs & output

Voltage levels: 0.6 to 1.4 Vpp input, 1.0Vpp output
Video signal impedance: 75 Ohms
Decoder: 9-bit digital
Encoder: 10-bit digital
Flicker reduction: 4 levels

CV & YC Video standards supported

Input: PAL BGDHIMN,
NTSC: 3.58 / 4.43, SECAM
Output: PAL 4.43 50Hz, NTSC 3.58 60Hz

Serial Digital Interface

Standard SMPTE, 259M compliant

Scaling features

Scaling engine: Proprietary design CORIO®2.
Aspect ratio conversion: 4:3 to 16:9 and vice-versa.
Color depth: 16.7 million
Internal storage format: 4:2:2

User Interface

Display: 24x2 character blue backlit LCD
Front Panel: 10 programmable buttons with LED indication
Serial communications: RS-232 D9 male connector

Environmental

Power: 100 to 240V AC, 50/60 Hz
Storage Temperature: 0 to +60 deg. C
Storage Humidity 10% to 85%, non-condensing
Operating Temperature: +10 to +45 deg. C
Operating Humidity 10% to 85%, non-condensing

General

1 RU 19" Metal case
Dimensions: 1 3/4" x 16 1/2" x 7 7/8" approx. (44 x 420 x 200mm approx.)
Enclosure type: Metal
Ventilation Fan: Ventilated with on-board temperature monitor
Weight 5lbs / 2.2kg approx.
Compliance: CE, FCC Class A, IEC60950,
UL-list: internal PSU

24.0 WARRANTY POLICY

LIMITED WARRANTY – With the exceptions noted in the next paragraph, TV One 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. 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.

Items integrated into TV One products that are made by other manufacturers, notably computer hard drives and liquid crystal display panels, are limited to the term of the warranty offered by the respective manufacturers. Such specific warranties are available upon request to TV One.

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, resellers or end-users or any third parties 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.

25.0 Contact Information

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