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REVISION HISTORY

REVISION	DESCRIPTION	DATE
0.1	Preliminary version	Oct 06
0.2	Updated menu items	Nov 06
0.3	Minor corrections throughout the manual	Dec 06
1.0	Added screen captures to section 9.5	Feb 07
1.1	Updated specifications	Jan 08

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1. OVERVIEW

The 7710ARC and the 7710ARC-F modules are dual standard (525/625) serial digital 270Mb/s high quality motion adaptive video aspect ratio converters (ARC) designed for use in television production facilities, DBS satellite operations, outside broadcast vehicles, MSO cable facilities, production and post-production facilities.

From this point forward, the 7710ARC, and the 7710ARC-F modules will be referred to as the "ARC Series", unless the feature in question is applicable only to one of the modules, in which case the specific model number will be referenced.

With full 10-bit processing, the ARC Series modules convert any aspect ratio picture input to any aspect ratio picture output maintaining excellent image quality. The ARC Series modules read Active Format Description (AFD), Pan-Scan and Wide Screen Signalling (WSS) data to automatically set the input image aspect ratio. The module also supports full AFD, Pan-Scan and WSS insertion capability on the output side, along with transparent handling of other HANC and VANC from the input to the output. All parameters may be controlled by use of the on screen display menu and/or via SNMP (using VistaLINK® PRO or 9000NCP Network Control Panel).

The 7710ARC-F modules have a built in digital keyer. This allows for insertion of static or animated logos into any of the panels generated after an aspect ratio conversion.

The ARC Series provide card edge Light Emitting Diodes (LED's) to indicate signal presence, input and output modes, and occupies one card slot in the *7700FR-C* frame that will hold up to 16 modules.

Features:

- Any aspect ratio to any aspect ratio, with standard support for 16:9 letterbox, 14:9 letterbox, 4:3 center crop, and 4:3 anamorphic squeeze aspect ratio conversions
- Flexible ARC control: manual configuration or slave to incoming AFD, Pan-Scan or WSS – can be controlled via GPI or VistaLINK®
- Motion adaptive de-interlace for exceptional vertical resolution
- High quality 10-bit video processing
- Full AFD/Bar Data, Pan-Scan and WSS input handling and output insertion
- Full VANC and HANC transfer from input to output with same delay as the video
- 10 user presets for storing custom module configurations
- GPI inputs to recall module configuration
- Auto detecting 525 or 625 SD-SDI video (per SMPTE 259M) inputs
- 1 SDI Program input and 1 SDI Program Backup input. The video input source is user selectable. - (7710ARC version only)
- 1 SDI Program input and 1 SDI Fill input. Fill input may be keyed into output program side-panels - (7710ARC-F version only)
- On screen display used to configure the operating modes
- Card Edge LED's for signal presence, input and output modes, and module status
- VistaLINK® - enabled offering remote control and configuration capabilities via SNMP (using VistaLINK® PRO or 9000NCP Network Control Panel). Available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller.

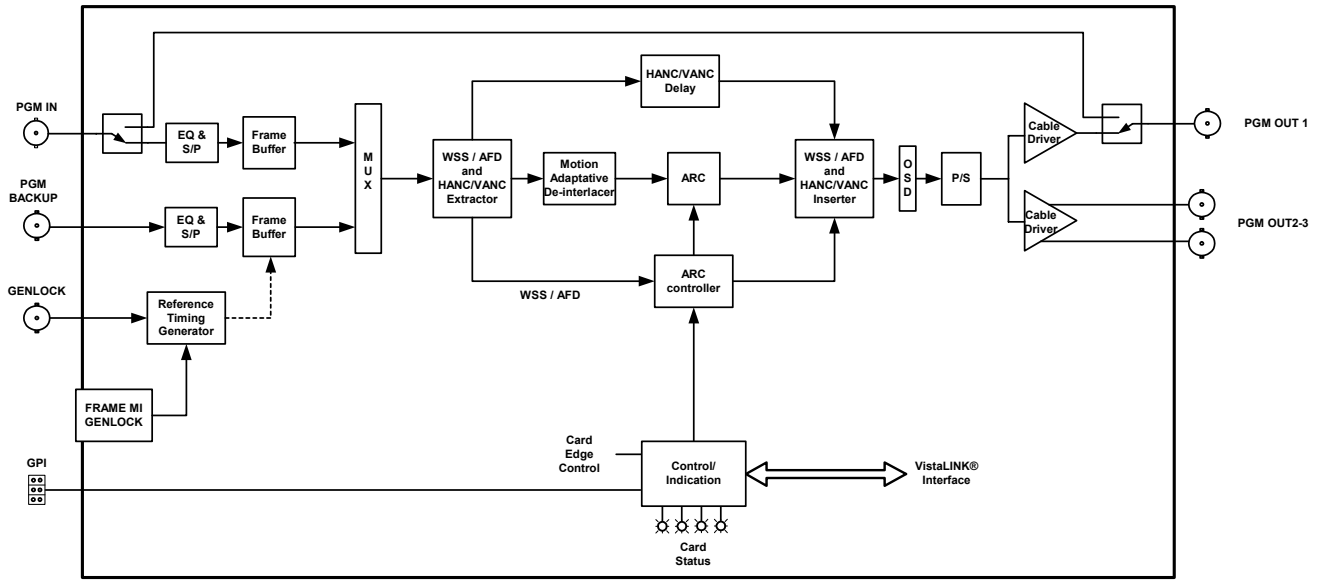

Figure 1-1: 7710ARC Block Diagram

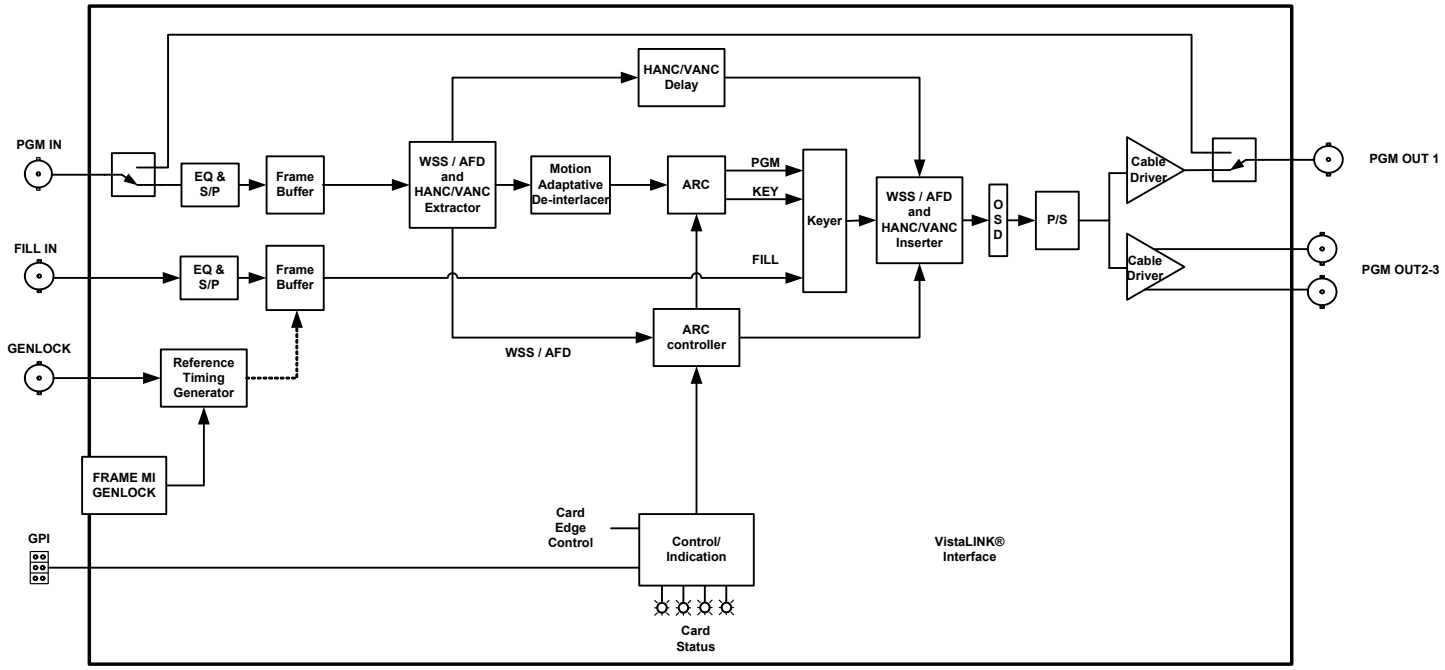

Figure 1-2: 7710ARC-F Block Diagram

1.1. DEFINITIONS

Throughout this manual the following terms are used:

Image lattice: A two-dimensional array of pixels.

Image: The image lattice that represents the portion of the video picture area (frame) that is being utilized for program content. The image area usually excludes letterbox bars and pillarbox bars. May also be referred to as active image.

Image aspect ratio: The ratio of horizontal dimension to vertical dimension of the image area, when displayed so that object shapes will retain their original shape (e.g. circles will remain as circles).

Frame: The image lattice that represents the maximum active picture area permitted in the video signal. For baseband digital systems it has the specific meaning of the picture area where the V bits and H bits are both set to 0.

Source frame: The image lattice that represents the maximum active picture area permitted in the input video signal.

Source frame aspect ratio: The ratio of horizontal dimension to vertical dimension of the source frame when displayed so that object shapes within images that completely fill the source frame will retain their original shape (e.g. circles will remain as circles).

Destination frame: The image lattice that represents the maximum active picture area permitted in the output video signal. This rectangular area represents the result of the image conversion process.

Destination frame aspect ratio: The ratio of horizontal dimension to vertical dimension of the destination frame when displayed so that object shapes within images that completely fill the source frame will retain their original shape (e.g. circles will remain as circles).

Bar: A region of a frame that is outside the image area. This region is often filled with a uniform image (e.g. black or blue) or with an alternate image.

Cropping: The action of removing part of the image in order to change the shape of the image.

Filling: The action of scaling an image equally in both dimensions, and then filling unused image areas with a bar in order to change the aspect ratio of the image. See “letterbox” and “pillarbox”

Stretching (squeezing): The action of compressing or expanding one dimension of an image in order to change the aspect ratio of the image.

Letterbox: Describes a frame where the image does not fill vertically, requiring bars without image information at the top and/or the bottom of the image.

Pillarbox: Describes a frame that the image does not fill horizontally, requiring bars at the left and/or right sides of the image. Some publications refer to pillarbox in a 16:9 display area by the term “sidebar”.

Output video: The output video signal of the aspect ratio converter.

Source video: The input video signal to the aspect ratio converter.

Viewport: A selected rectangular area of a source frame that will be used to create a destination frame.

2. INSTALLATION

The ARC Series modules come with a companion rear panel that occupies one slot in the frame. For information on inserting the module into the frame refer to section 1.3 of the 7700FR module installation guide.

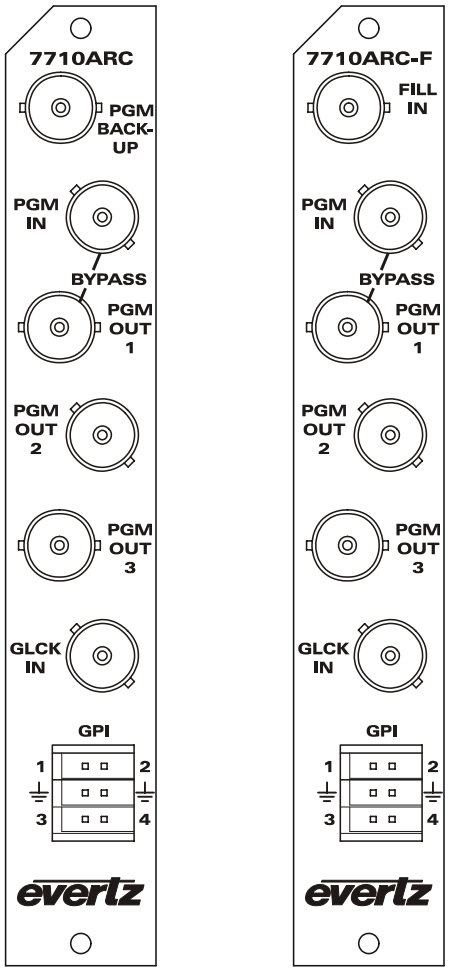

Figure 2-1: 7710ARC and 7710ARC-F Rear IO Modules

2.1. VIDEO CONNECTIONS

PGM BACK-UP: This BNC connector is only available on the 7710ARC module, and is used as the secondary or back-up program video input. This input can be selected as the primary program video input source via the menu system. (See section 7.3.1)

FILL IN: This BNC connector is only available on the 7710ARC-F module, and is used as the video fill input that is keyed into unused portions of the output raster. The video fill must be frequency locked to the program video input.

PGM IN: This BNC connector is the primary program video input for 10-bit serial digital video signals compatible with the SMPTE 259M.

PGM OUT 1, 2, 3: These three BNC connectors are used for the program video output. The output video standard is the same as the input video standard. The **PGM OUT 1** output is protected by a bypass relay, which will activate in the event that power to the module is lost or the module is removed. **PGM OUT 2** and **PGM OUT 3** are identical to **PGM OUT 1** except that these outputs are not bypass relay protected.

GLCK IN: This BNC connector is used as the Genlock input. The Genlock signal may be NTSC or PAL colour black. The reference input type is auto-detected.

The input program video and fill video must be in the same video standard as the genlock colour black and clock locked (constant phase) with respect to the genlock signal.

2.2. GENERAL PURPOSE INPUTS

The 6-pin terminal strip has four general purpose inputs (GPI's). The GPI's are active low with internal pull-ups to +5 or +12 volts DC, set by jumper J16 (see section 8.3 and Figure 8-1). If an input is left floating (not connected) it will not be activated. Lowering the GPI input to a voltage below 0.5 volts will activate the input. GPI's can be activated by simply connecting the GPI input pins to ground using a button, switch, relay, or an open collector transistor.

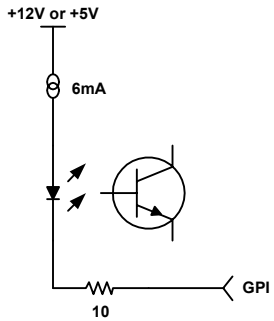

Figure 2-2: Typical GPI Circuitry

3. SPECIFICATIONS

3.1. SERIAL VIDEO INPUT

Standard: 270 Mb/s SMPTE 259M-C (525/625) – Auto-detect
Number of Inputs: 2
Connector: BNC per IEC 60169-8 Amendment 2.
Input Equalization: Automatic to 300m @ 270Mb/s with Belden 8281 (or equivalent) cable
Return Loss: >15 dB up to 270MHz

3.2. SERIAL VIDEO OUTPUTS

Standard: SMPTE 259M-C (270 Mb/s) – same as input
Number of Outputs: 3 Per module
Connector: BNC per IEC 60169-8 Amendment 2
Signal Level: 800mV nominal
DC Offset: 0V ±0.5V
Rise and Fall Time: 750ps nominal
Overshoot: <10% of amplitude
Return Loss: > 15 dB at 270 Mb/s
Jitter: < 0.2 UI

3.3. GENLOCK INPUT

Standard: NTSC, PAL black or tri-level auto detect
Number of Inputs: 1
Connector: BNC per IEC 60169-8 Amendment 2
Impedance: Hi-Z or 75 Ω (jumper configurable)
Return Loss: >40dB up to 10MHz

3.4. GENERAL PURPOSE INPUTS

Number: 4 (configurable as inputs or outputs)
Type: Opto-isolated, active low with internal pull-ups to +5 or +12V (jumper settable)
Connector: 6-pin removable terminal block
Signal Level: Closure to ground
Inputs: User Preset select

3.5. ELECTRICAL

Voltage: +12VDC
Power: 13.25 Watts.
EMI/RFI: Complies with FCC regulations for class A devices.
Complies with EU EMC directive.

3.6. PHYSICAL

Number of slots:
7700 frame mounting: 2
7701 frame mounting: 1

4. STATUS INDICATORS

The ARC series modules have 10 LED Status indicators on the card edge of the circuit board to show operational status of the card at a glance (refer to Figure 4-1).

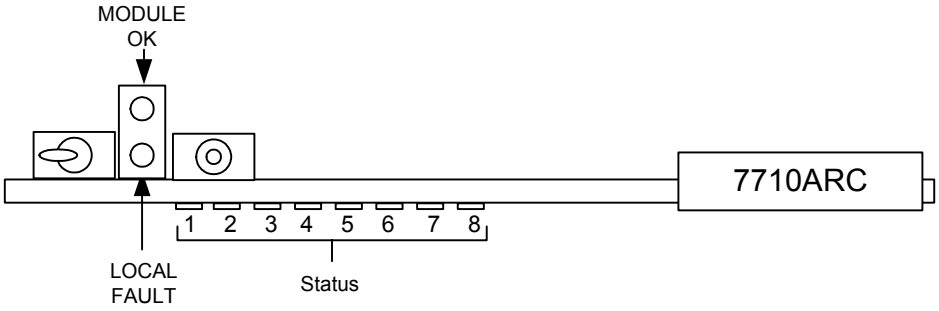

Figure 4-1: LED Status Indicators

Two large LEDs on the front of the board indicate the general health of the module.

LOCAL FAULT: This red LED indicates poor module health and will be ON during the absence of a valid input signal or if a local input power fault exists (i.e.: a blown fuse), or if the Genlock input standard does not match the program input video standard. The **LOCAL FAULT** indication can also be reported to the frame through the **FRAME STATUS** jumper J4 (refer to Figure 8-1).

MODULE OK: This green LED indicates good module health. It will be ON when the inputs are valid and the board power is good.

STATUS: These eight LEDs are used to indicate operational status of the program video inputs.

LED 1: This green LED reports the status of the **FILL IN** BNC on the 7710ARC-F module and the **PGM BACK-UP** on the 7710ARC module. The LED will be ON when the module has detected a valid standard definition (525 or 625) SD-SDI signal to be present.

LED 2: This orange LED reports the status of the **FILL IN** BNC on the 7710ARC-F module and the **PGM BACK-UP** on the 7710ARC module. The LED will be ON if the module does not detect a valid standard definition (525 or 625) SD-SDI signal to be present.

LED 1 and LED 2 are similar, in that they both detect for valid signal presence. However, LED 2 provides detection at the entry point only, whereas LED 1 provides detection at a deeper processing level. These two LEDs are mutually exclusive to one another. For normal operation with valid inputs, LED 1 should remain ON and LED 2 should remain OFF.

LED 3: This green LED reports the status of the **PGM IN** BNC on the module. The LED will be ON when the module has detected a valid standard definition (525 or 625) SD-SDI signal to be present.

LED 4: This orange LED reports the status of the **PGM IN** BNC on the module. The LED will be ON if the module does not detect a valid standard definition (525 or 625) SD-SDI signal to be present.

LED 3 and LED 4 are similar, in that they both detect for valid signal presence. However, LED 4 provides detection at the entry point only, where as LED 3 provides detection at a deeper processing level. These two LEDs are mutually exclusive to one another. For normal operation with valid inputs, LED 3 should remain ON and LED 4 should remain OFF.

LED 5: Not used.

LED 6: This green LED reports when the CPU is configuring the scaler.

LED 7: Not used.

LED 8: This green LED reports the status of the **GENLOCK** input signal (selected by the *External Genlock* control – see section 7.3.5). The LED will be ON if the module detects a valid Genlock signal to be present.

5. CARD EDGE CONTROLS

The ARC Series modules are equipped with a toggle switch and a push button to allow the user to select various functions and navigate through the menu system (refer to Figure 5-1).

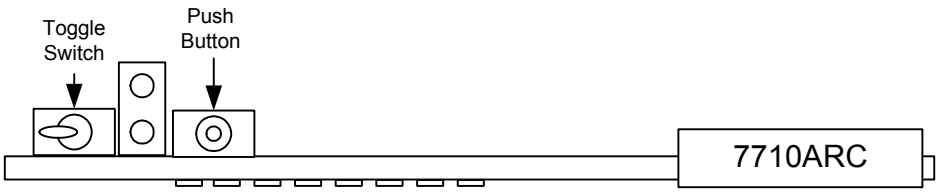

Figure 5-1: Card Edge Controls

6. OPERATION OVERVIEW

This section provides some concepts and understanding to take advantage of the ARC Series modules.

6.1. QUICK CONFIGURATION

The 7710ARC has been designed so that the most common aspect ratio conversions are available as aspect ratio presets. To make use of these presets, set the *Scaler Mode* menu item on the *ARC Control* menu to *aspect ratio* and select the appropriate preset from the *AR* menu (refer to section 7.4.1.1). Choosing one of the quick select presets will adjust the remaining menus to the correct settings in order to accomplish the desired conversion.

6.2. DETAILED CONFIGURATION OVERVIEW

For additional control of the conversion process there are two methods of control provided (set using the *Scaler mode* menu item on the *ARC Control* menu). The first method, called *Aspect Ratio* mode, controls the conversion process by selecting the input and output aspect ratios. See section 6.2.1 for a general discussion of *Aspect Ratio* mode concepts and section 7.4.1 for information on how to use the specific controls. The second method, called *Manual* mode, controls the conversion process by specifying the pixels and lines of the input and output images. See section 6.2.4 for a general discussion of *Manual* mode concepts and section 7.4.2 for information on how to use the specific controls.

6.2.1. Aspect Ratio Mode – General Concepts

For many applications you can avoid the manual calculations necessary to prevent the image from distorting during the conversion process by configuring the aspect ratio converter in *Aspect Ratio* mode. When the aspect ratio converter is in this mode, the pixel aspect ratio, and image aspect ratio are taken into account while calculating where the input and output images are located.

There are a few terms that need to be understood in order to properly control the aspect ratio converter while it is in *Aspect Ratio* mode. These terms are *Source frame Aspect Ratio*, *Image Aspect Ratio*, *Cropping*, *Stretch*ing and *Filling*.

6.2.1.1. Source Frame Aspect Ratio

The *Source frame Aspect Ratio* is the ratio of the horizontal dimension to the vertical dimension of the maximum active picture area permitted in a video signal when displayed so that images, that completely fill the source frame, will retain their original shape.

In the most general case, the Source frame lattice is simply a two-dimensional array of pixels used to transport a sequence of images. The aspect ratio of the intended display device must be known when the image is placed into the source frame lattice to accurately display the source frame without distortion of the original image.

For example, HD video is commonly down converted using an anamorphic process that takes the full HD raster and places it over the full SD raster. A circle contained within the HD source video will be seen as an ellipse in the SD video, unless viewed on a 16:9 SD monitor. In this example, the SD video's source frame aspect ratio is 16:9.

Another example is in film to tape transfers where the film image may have an aspect ratio of 2.40. A telecine may take this video and anamorphically compress it into a 1080i/59.94 video raster. Therefore, if the film contained a circle after it is transferred to 1080i/59.94 video, the circle will look like a tall thin ellipse. In this case, even though SMPTE274M specifies an aspect ratio of 16:9 for 1080i/59.94 video, the source frame aspect ratio is 2.40.

6.2.1.2. Image Aspect Ratio

The *Input Image Aspect Ratio* refers to the aspect ratio of the portion of the source frame that is being utilized for program content when displayed on a display device that is the same aspect ratio as the source frame. The *Output Image Aspect Ratio* refers to the aspect ratio of the portion of the destination frame that is being utilized for program content when displayed on a display device that is the same aspect ratio as the destination frame. The aspect ratio converter will either, take the full height of the raster and calculate the width of the image based on the image aspect ratio, or it will take the full width and calculate the height.

Figure 6-1 to Figure 6-4 provide four common examples of aspect ratio conversion using a 4:3 destination frame aspect ratio. Note that the distorted circle shown in Figure 6-3, and the undesirable postage effect in Figure 6-4, are the result of the aspect ratio conversion process being executed without careful consideration.

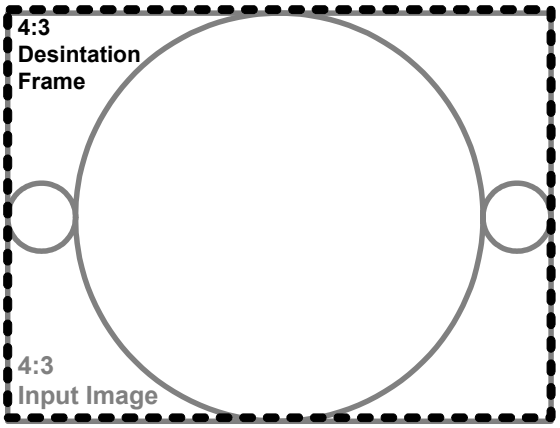

Figure 6-1: 4:3 Full Screen Image

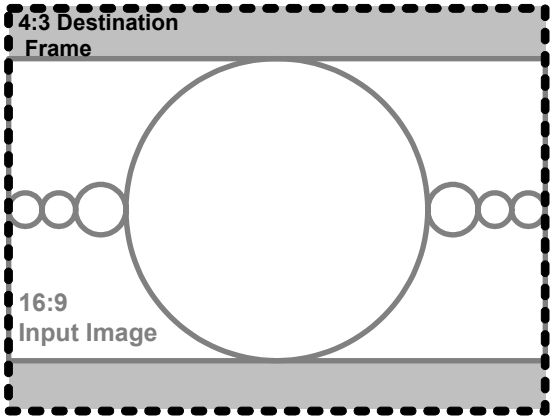

Figure 6-2: 16:9 Letterbox Image

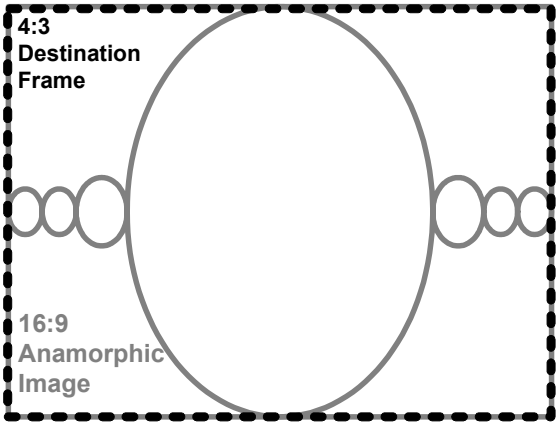

Figure 6-3: 16:9 Distorted Image

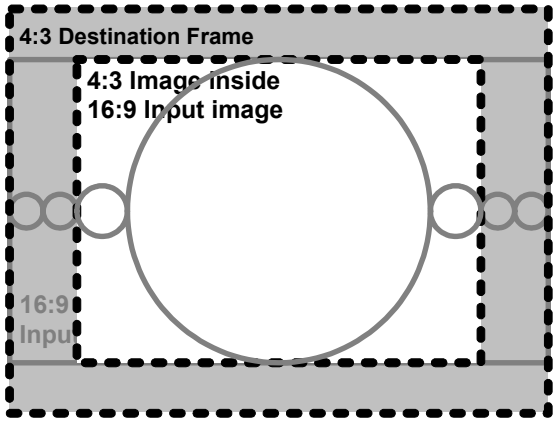

Figure 6-4: 4:3 Postage Stamp

Figure 6-5 to Figure 6-8 provide four common examples of aspect ratio conversion using a 16:9 destination frame aspect ratio. Note that the distorted circle shown in Figure 6-7, and the undesirable postage effect in Figure 6-8, are the result of the aspect ratio conversion process being executed without careful consideration.

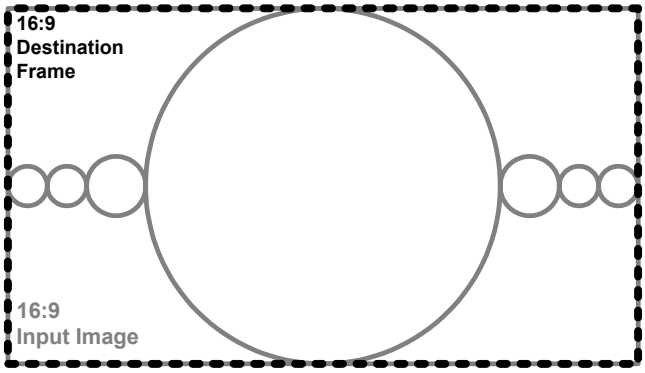

Figure 6-5: 16:9 Full Screen Image

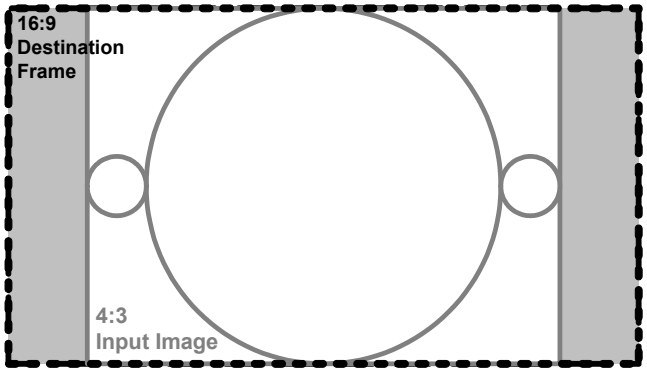

Figure 6-6: 4:3 Side Panels

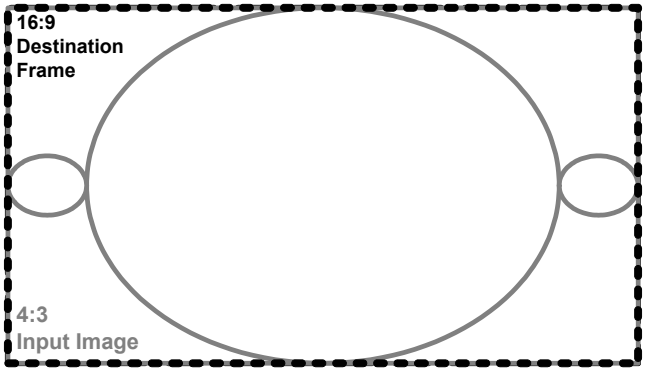

Figure 6-7: 4:3 Distorted Image

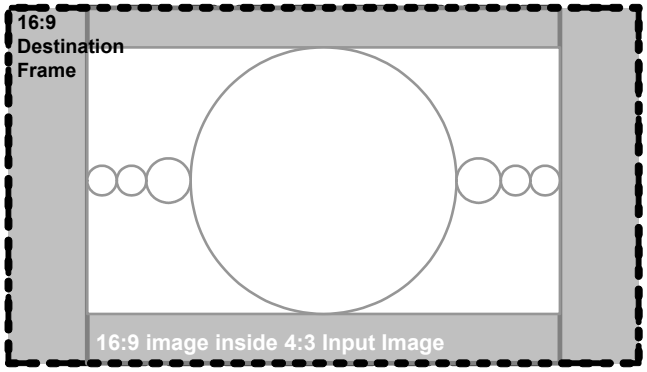

Figure 6-8: 16:9 Postage Stamp

6.2.2. Relationship Between Input and Output Image

Both card input and output images follow the model outlined above in section 6.2.1.2. The source frame, input image, destination frame and output image aspect ratios are totally independent of each other. When the input image aspect ratio is different from the output image aspect ratio, the input image is converted to “fit” into the output image aspect ratio using 1 of the 3 following methods:

- Cropping
- Stretching
- Filling

The following descriptions and diagrams will illustrate cropping, stretching and filling based on the following reference input image:

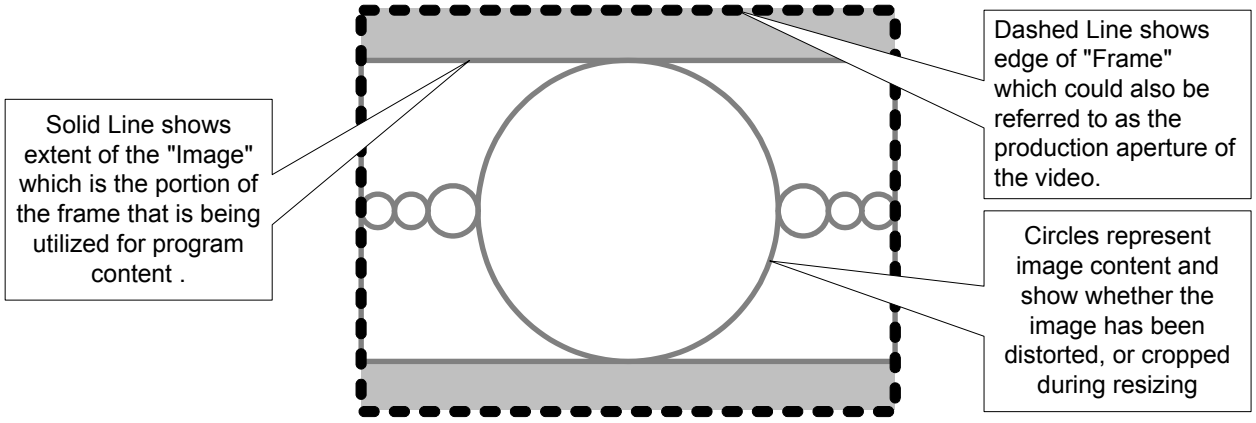

Figure 6-9: Reference Image

6.2.2.1. Cropping

In cropping mode, parts of the input image are removed to make it "fit" into the output image. The aspect ratio of objects inside the output image area is preserved (i.e. circles remain as circles, squares remain as squares, etc.).

If the input image aspect ratio is greater than the output image aspect ratio, the entire height of the input image is used and only a portion of the width is used. When an equal amount of the image is removed on each side it is commonly referred to as centre crop or side cut mode.

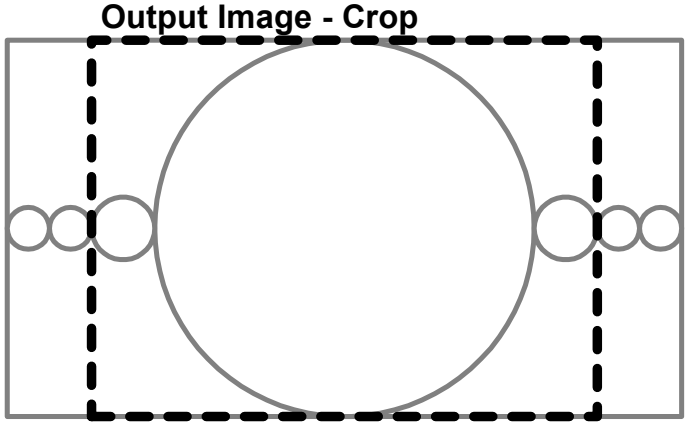

Figure 6-10: Large to small aspect ratio crop - Side Cropping

If the input image aspect ratio is smaller than the output image aspect ratio the entire width of the input image is used and only a portion of the height is used.

6.2.2.2. Stretching (Squeezing)

In stretching mode, the input image is stretched (squeezed) in one dimension so that it occupies the entire output image. In this mode, often referred to as “anamorphic mode”, the aspect ratio of objects inside the output image areas is distorted (i.e. circles become ellipses, squares become rectangles, etc.).

If the input aspect ratio is greater than the output image aspect ratio, typically the entire height of the input image is used as is and the width of the input image is compressed horizontally making objects "look" taller and skinnier.

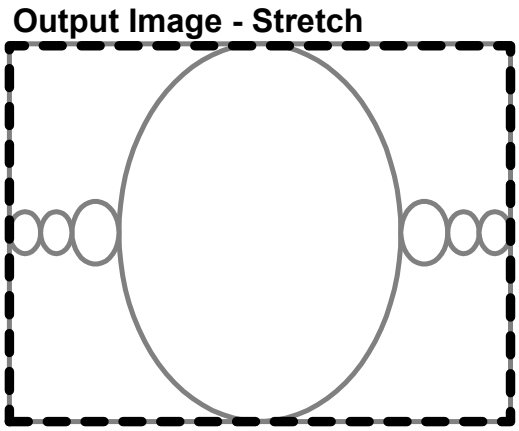

Figure 6-11: Large to small aspect ratio squeeze – anamorphic squeeze

If the input image aspect ratio is smaller than the output image aspect ratio, the entire width of the input image is used as is and the height of the input image is squeezed vertically making objects "look" shorter and fatter.

6.2.2.3. Filling

In filling mode, the input image is resized in both dimensions to fit the output image preserving the input image aspect ratio (i.e. circles remain as circles, squares remain as squares, etc.). The portions of the destination frame that are not occupied by the scaled input image are filled with a “bar” that can either be a flat field image or, on the 7710ARC-F model, the bar may be filled with a background image.

If the input image aspect ratio is greater than the output image aspect ratio, the width of the input image completely fills the width of the output image and the input image height is scaled by the same amount. The portions of the height of the destination frame that are not occupied by the scaled input image are filled with horizontal bars. This destination frame configuration is referred to as a “letterboxed” image.

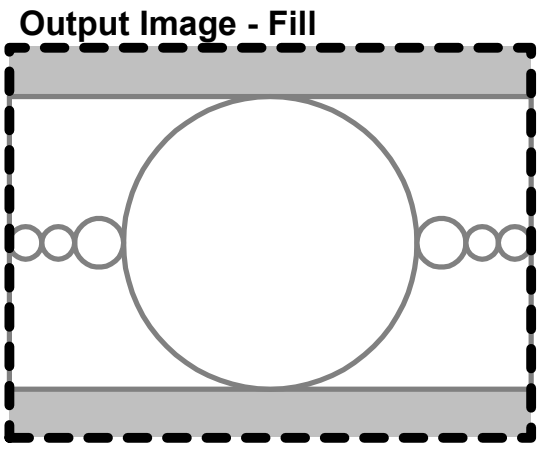

Figure 6-12: Large to small aspect ratio fill – Letterboxed image

If the input image aspect ratio is smaller than the output image aspect ratio, the height of the input image completely fills the height of the destination frame and the input image width is scaled by the same amount. The portion of the width of the destination frame not filled by the input image is filled with a background image referred to as a vertical bar or side bar (sometimes incorrectly referred to as a pillarbar). This destination frame configuration is referred to as a "pillarboxed" image.

6.2.3. Relationship Between Output Image and Destination Frame

After the output image is created using the input image aspect ratio and conversion type settings, it is placed on the destination frame. If the destination frame aspect ratio and output image aspect ratio are the same then the output image will fill the entire destination frame. If the aspect ratios are different, the output image will be placed inside the destination frame so that it fills the entire height or width of the destination frame. Unused portions of the destination frame will be filled with bars.

Since the Source frame or Output image may already contain bars (see section 6.2.2), incorrect aspect ratio conversion may produce a destination frame containing bars on all four sides resulting in a "postage stamp" image. In the example below, the output image aspect ratio is smaller than the destination frame aspect ratio.

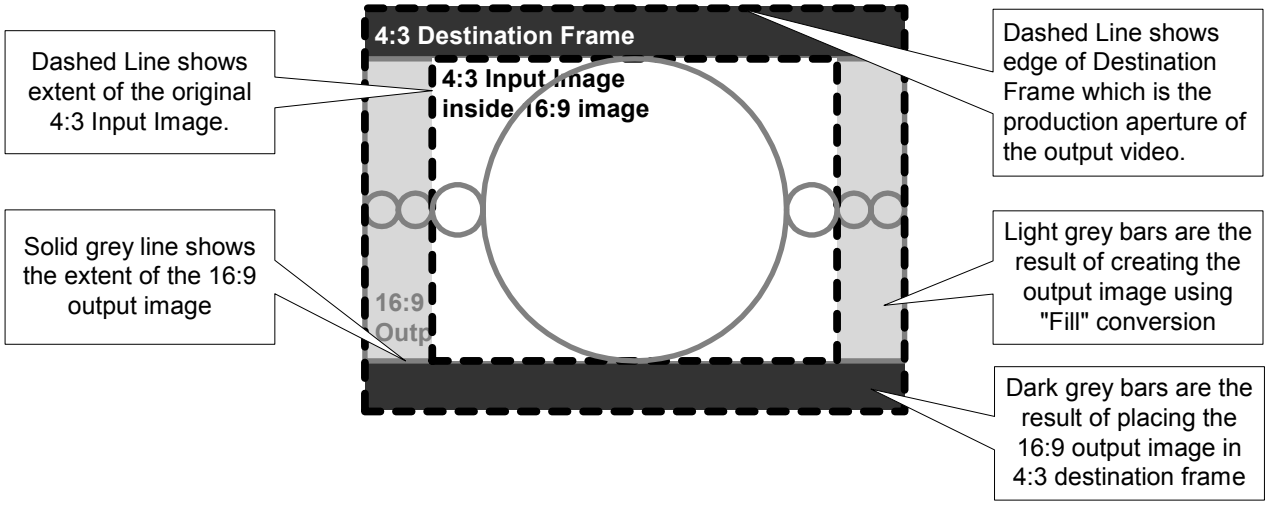

Figure 6-13: Postage Stamp Image from Incorrect Aspect Ratio conversion

6.2.4. Manual Mode

For applications where you need to precisely control the pixels that are used in the aspect ratio conversion process, configure the aspect ratio converter in *Manual* mode. Firstly, the image lattice inside the source frame, that defines the boundaries of the input image, must be selected. Secondly, the image lattice inside the destination frame, that defines the region where the output image will be placed, must be selected. The aspect ratio converter will resize the input image and fill the entire output image.

7. ON SCREEN MENUS

7.1. NAVIGATING THE ON SCREEN MENU SYSTEM

A toggle switch and pushbutton allows for card edge navigation of a set of on-screen menus used to configure the card. The on-screen menu will appear on all three program outputs. To enter the on-screen menu system press the pushbutton once. This will bring you to the main Setup menu where you can use the toggle switch to move up and down the list of available sub-menus. An arrow (➔) moves up and down the left hand side of the menu items to indicate which item you are currently choosing. Once the arrow is on the desired item, press the pushbutton to select the next menu level.

On all menus there are two extra selectable items: Back and Exit. Selecting *BACK* will take you to the previous menu (the one that was used to get into the current menu), while *EXIT* will return the display to its normal operating mode. On the main menu, BACK and EXIT will both take you to the normal operating mode.

Once in a sub menu, there may be another menu layer, or there may be a list of parameters to adjust. If there is another set of menu choices, use the toggle switch to select the desired menu item and press the pushbutton.

To adjust any parameter, use the toggle switch to move up or down to the desired parameter and press the pushbutton. The arrow will move to the right hand side of the line (➔) indicating that you can now adjust the parameter. Using the toggle switch, adjust the parameter to its desired value. If the parameter is a numerical value, the number will increase if you lift the toggle switch and decrease if you push down on the toggle switch.

When you have stopped at the desired value, depress the pushbutton. This will update the parameter to the selected value and move the arrow back to the left side of the parameter list (➔). Continue selecting and adjusting other parameters or use the BACK or EXIT commands.

7.2. ON SCREEN DISPLAY – MAIN MENU

The On-screen display (OSD) menu is arranged in a layered structure that groups similar configuration items together. The following section gives a brief description of the first level of menus that appear when you enter the OSD screens. Selecting one of these items will take you to the next menu level. Sections 7.3 to 7.6 provide detailed descriptions of each of the sub-menus. The tables within these sections are arranged in an indented structure to indicate the path taken to reach the control. Menu items or parameters that are underlined indicate the factory default values.

Video	Adjust properties of the program video output
ARC Control	Adjust the aspect ratio converter filters and parameters
Video Proc	Control Video Proc Amp Functions
Image Enhancement	Control Image Enhancement Functions
Utilities	Miscellaneous options

Table 7-1: Main Menu

7.3. CONFIGURING THE VIDEO CONTROLS

The *Video* menus are used to configure parameters associated with the input and output video standards and handling. Table 7-2 shows the items available in the *Video* menu. Sections 7.3.1 to 7.3.9 provide detailed information about each of the menu items.

Video Source	Selects which input is to be used (7710ARC only)
Video Input	Set the input video standard
Loss of Video	Selects the action to take when program video input is missing
Reference Select	Selects the source of the program video output reference
External Genlock	Selects the source of external Genlock
H Phase offset	Selects the horizontal phase offset
V Phase offset	Selects the vertical phase offset
Ancillary Data	Select if ancillary data (non-video) is passed to the output
AP Blanking Bypass Line	Bypass selected lines of input image before sending it to the image conversion process – bypass captions and other data to output

Table 7-2: Video Controls

7.3.1. Set The Video Input Source (7710ARC version only)

Video
- *Video source*
  - *PGM In*
  - *PGM Backup*

This control is used to select the video input source. This control is only available on the 7710ARC module.

When set to *PGM IN*, the video input source will be supplied by the program input BNC.

When set to *PGM Backup*, the video input source will be supplied by the program backup BNC.

7.3.2. Set The Video Input Standard

Video
- *Video input*
  - *auto*
  - *525i/59.94*
  - *625i/50*

This control is used to set the input video standard.

When set to *auto,* the module will auto detect the standard.

When set to *525i/59.94*, the module will be set to accept only 525i/59.94 video signals.

When set to *625i/50*, the module will be set to accept only 625i/50 video signals.

7.3.3. Selects The Action To Take When Input Video Is Missing

Video
Loss of video
black
blue
pass

This control is used to set the behaviour of the program video output when the program video input is missing.

When set to *black,* the program video output will be black when the program video input is missing.

When set to *blue,* the program video output will be blue when the program video input is missing.

When set to *pass,* the program video output will be incoherent when the program video input is missing.

7.3.4. Selects The Source Of Genlock Reference

Video
Reference select
external
video

This control is used to set the program video output reference source.

Select *external* to lock the program video output to the genlock source selected by the *External Genlock* control. If the reference is not present, or is in a different standard then the program video, the module will lock to the program video input.

Select *video* to lock the program video output to the program video input. When there is no program video input the program video output will free run.

When the *Reference Select* is set to *External video* the input video must be clock locked to the reference source.

7.3.5. Selects The Source Of External Genlock

Video
External Genlock
GLCK IN BNC
frame 2
frame 1

This control is used to set the source of the external Genlock reference. This source will be used to lock the program output when the *Reference select* control is set to *external.*

Select *GLCK IN BNC* to source the external reference from the **GENLOCK** BNC.

Select *frame 2* to source the external reference from FRAME REF #2

Select *frame 1* to source the external reference from FRAME REF #1

When selecting either *frame 2* or *frame 1* from the *External Genlock* reference menu, the modules must be used within the Evertz 7700FR-G frame. The 7700FR-G frame has two BNCs for connecting two separate Genlock references for modules equipped to take a frame reference input.

7.3.6. Selects The Horizontal Phase Offset

Video
- *H phase offset*
  - *0*
  - *0 to Max*

This control is used to set the H phase of the program video output with respect to the reference set by the *Reference select* and *External Genlock* controls.

The range of this parameter is 0 to max samples, where max represents the maximum number of horizontal samples per line for the program video input standard.

7.3.7. Selects The Vertical Phase Offset

Video
- *V phase offset*
  - *0*
  - *0 to Max*

This control is used to set the V phase of the program video output with respect to the reference set by the *Reference select* and *External Genlock* controls.

The range of this parameter is 0 to max lines, where max represents the maximum number of vertical lines per frame for the program video input standard.

7.3.8. Select If Ancillary Data (Non-Video) Is Passed To The Output

Video
- *Ancillary data*
  - *Pass*
  - *Blank*

This control determines if the ancillary data from the program video input is passed to the program video output.

When set to *pass,* the module will take all the ancillary data (audio, time code, VANC data etc.) and pass it to the program video output.

When set to blank, the module will not pass any of this data to the program video output.

7.3.9. Bypass Blanking Of Active Picture Before The Selected Line

Video
- *AP Blanking Bypass Line*
  - *Line 0 to 5*

This control determines if any of the source frame lines are to be treated as part of the blanking region and passed to the program video output when the *Ancillary Data* control is set to *pass*. This allows waveforms such as closed captioning to be passed to the program video output instead of being passed through the image conversion process.

When set to *0*, all the lines of the source frame (Line 20 for 525i/59.94 and line 23 for 625i/59.94 and beyond) will go through the scaling process.

Otherwise, the top *x* (where *x* is the value of this control) source frame lines will bypass the image conversion process and be passed directly from the program video input to the program video output. If the scaler input and output controls include these lines, they will be blanked prior to sending them to the scaler.

7.4. CONFIGURING THE ASPECT RATIO CONVERTER

The *ARC Control* menus are used to configure parameters associated with the aspect ratio conversion processing block. Table 7-3 shows the items available in the *ARC Control* menu.

Aspect Ratio Scaler Mode	Configure the aspect ratio conversion by specifying the input and output aspect ratios. (active when *Scaler Mode* is set to *Aspect Ratio*)
Manual Scaler Mode	Configure the aspect ratio conversion by directly specifying the input and output pixels and lines (active when *Scaler Mode* is set to *Manual*)
SMPTE 2016 Setup	Configure the handling of SMPTE 2016 Active Format Description (AFD/Bar data) and Pan-Scan parameters
WSS Setup	Configure the handling of Wide Screen Signalling (WSS) parameters
Scaler mode	Selects whether the *Aspect Ratio Scaler Mode* or *Manual Scaler Mode* menus will be used to configure the aspect ratio conversion.
Fill Source	Use video or color fill for the background (7710ARC-F only)
Panel Colour Red	Change the custom panel colour – red
Panel Colour Green	Change the custom panel colour – green
Panel Colour Blue	Change the custom panel colour – blue

Table 7-3: Aspect Ratio Converter Controls

7.4.1. Configuring The Aspect Ratio Scaler Mode

The *Aspect Ratio Scaler Mode* menus are used to configure the aspect ratio converter using parameters associated with the ARC mode. The ARC mode uses standard aspect ratios to set the behaviour of the ARC Series modules. Table 7-4 shows the items available in the *Aspect Ratio Scaler Mode* menu. Sections 7.4.1.1 to 7.4.1.17 give detailed information about each of the menu items.

The *Aspect Ratio Scaler Mode* menu items are only used when the *Scaler Mode* is set to *Aspect Ratio*. See section 7.4.5.

Changes to the *Aspect Ratio Scaler Mode* parameters will cause the video output to be interrupted momentarily. The internal timing is automatically adjusted to achieve the desired phase with respect to the reference

AR	Presets values in input and output aspect ratio menu items to quickly configure common aspect ratio conversions
Input image aspect	Set the aspect ratio of the input image
Input image custom aspect	Set a custom aspect ratio for the input image
Source frame aspect	Set the aspect ratio of the source frame (production aperture of input video)
Source frame custom aspect	Set a custom aspect ratio for the source frame
Input image pan	Set horizontal position of the input image in the source frame
Input image tilt	Set vertical position of the input image in the source frame
Input image crop	Selects how many pixels to crop from the edges of the input image before conversion
Conversion Type	Select cropping, stretching or filling to convert the input image into the output image
Crop Pan	Select where cropped images will be taken from in the input image - horizontal position
Crop Tilt	Select where cropped images will be taken from in the input image - vertical position
Output image aspect	Set the aspect ratio of the output image – standard values
Output image custom aspect	Set a custom aspect ratio for the output image
Dest. frame aspect	Set the aspect ratio of the destination frame (production aperture of output video) – standard values
Dest. frame custom aspect	Set a custom aspect ratio for the destination frame (production aperture of output video)
Output image pan	Set horizontal position of the output image in the destination frame
Output image tilt	Set vertical position of the output image in the destination frame

Table 7-4: Aspect Ratio Scaler Mode Controls

7.4.1.1. Quick Selection Of Common Conversions Using Menu Presets

This control is used to configure the aspect ratio conversion of the program video output using pre-defined aspect ratios. This control will allow you to choose many of the common conversions that you will encounter. When you select one of the quick select modes, appropriate values are automatically entered into the Source Frame Aspect Ratio, Input Image Aspect Ratio, Destination Frame Aspect Ratio, and Output Image Aspect Ratio menus. Minor changes can then be made to the conversion by adjusting one or more of the appropriate menus.

ARC Control	
Aspect ratio scaler mode	
AR	
Full raster	*Full Raster* - converts the full input raster to full output raster. If the input and output aspect ratios are not equivalent there will be aspect distortion.
4:3 Side Panel to 16:9 TB Cut *13:9 Letter Box to 16:9 TB Cut* *14:9 Letter Box to 16:9 TB Cut* *13:9 Stretch to 16:9 TB Cut* *14:9 Stretch to 16:9 TB Cut* *16:9 Stretch to 16:9 TB Cut*	These settings convert the input picture to 16:9 top and bottom cuts.
13:9 Stretch to 4:3 Side Panel *14:9 Stretch to 4:3 Side Panel* *16:9 Stretch to 4:3 Side Panel*	These settings squeeze common stretched input video back to 4:3 side panel (pillar box) images on a 16:9 aspect raster.
4:3 to 4:3 Side Panel on 16:9 *4:3 to 13:9 Stretch on 16:9* *4:3 to 14:9 Stretch on 16:9* *4:3 to 16:9 Stretch on 16:9* *4:3 to 13:9 Crop on 16:9* *4:3 to 14:9 Crop on 16:9* *4:3 to 16:9 Crop on 16:9*	These settings are used for converting 4:3 aspect ratio images to common 16:9 formats.
16:9 to 16:9 Letter Box on 4:3 *16:9 to 14:9 Letter Box on 4:3* *16:9 to 13:9 Letter Box on 4:3* *16:9 to 4:3 Side Cut on 4:3* *16:9 to 4:3 Squeeze on 4:3*	These settings are used for converting 16:9 aspect ratio images to common 4:3 formats.
16:9 Postage Stamp to 16:9 *4:3 Postage Stamp to 4:3*	These settings are used for converting postage stamp images to 4:3 or 16:9 formats.
Cancel	Returns up one menu level without making any changes.

7.4.1.2. Set The Aspect Ratio Of The Input Image

ARC Control	This control selects the aspect ratio of the image area of the input video. See section 6.2.1.2 for complete discussion of image aspect ratio.
Aspect ratio scaler mode	
Input image aspect	
WSS	Aspect ratio set by Wide Screen Signalling (WSS) signal.
SMPTE 2016	Aspect ratio set by SMPTE 2016 (AFD) or Pan-Scan VANC packet.
input video	Aspect ratio is the same as the input video.
custom	Aspect ratio set by value in *Input image custom aspect* control
16:9	Aspect ratio is 16:9
14:9	Aspect ratio is 14:9
13:9	Aspect ratio is 13:9
4:3	Aspect ratio is 4:3

7.4.1.3. Set Custom Aspect Ratios Of The Input Image

ARC Control	This control is used to specify a non-standard input image aspect ratio.
Aspect ratio scaler mode	
Input image custom aspect	
1.78	The range of this parameter is 1.00 to 3.00 and adjusted in 0.01 increments.
1.00 to 3.00	

To apply the *Input Image Custom Aspect* control, the *Input image aspect* control needs to be set to *custom* (refer to section 7.4.1.2).

7.4.1.4. Set The Aspect Ratio Of The Source Frame

ARC Control	This control selects the aspect ratio of the source frame (production aperture) on the program video input. See section 6.2.1.2 for complete discussion of source frame aspect ratio.
Aspect ratio scaler mode	
Source frame aspect	
SMPTE 2016	Aspect ratio set by SMPTE 2016 (AFD) or Pan-Scan VANC packet.
input video	Aspect ratio is the same as the input video.
custom	Aspect ratio set by value in *Source frame custom aspect* control
16:9	Aspect ratio is 16:9
14:9	Aspect ratio is 14:9
13:9	Aspect ratio is 13:9
4:3	Aspect ratio is 4:3

7.4.1.5. Set Custom Aspect Ratios Of The Source Frame

ARC Control	This control is used to specify a non-standard source frame aspect ratio.
Aspect ratio scaler mode	
Source frame Custom Aspect	
1.78	The range of this parameter is 1.00 to 3.00 and adjusted in 0.01 increments.
1.00 to 3.00	

To apply the *Source Frame Custom Aspect* control, the *Source frame aspect* control needs to be set to *custom* (refer to section 7.4.1.4).

7.4.1.6. Select Input Image Horizontal Position In Source Frame

ARC Control
Aspect ratio scaler mode
Input image pan
right
centre
left

This control sets the horizontal position of the input image in the source frame. The control has no effect when the input image fills the entire width of the source frame.
Input image is at the right of the source frame
Input image is centred horizontally in the source frame
Input image is at the left of the source frame

Input image pan control is ignored when input image aspect is set to follow SMPTE 2016

7.4.1.7. Select Input Image Vertical Position In Source Frame

ARC Control
Aspect ratio scaler mode
Input image tilt
bottom
centre
top

This control sets the vertical position of the input image in the source frame. The control has no effect when the input image fills the entire height of the source frame.
Input image is at the bottom of the source frame
Input image is centred vertically in the source frame
Input image is at the top of the source frame

Input image tilt control is ignored when input image aspect is set to follow SMPTE 2016

7.4.1.8. Selects How Many Pixels To Crop From The Left And Right Of The Input Image

ARC Control
Aspect ratio scaler mode
Input image crop
0
0 to 25

This control provides the ability to crop a set of the number of pixels from the sides of the input image before conversion takes place. A proportionate number of lines are cropped from the top and bottom to preserve the aspect ratio of the input image (before conversion takes place).

7.4.1.9. Determines How To Convert The Input Image Into The Output Image

ARC Control
Aspect ratio scaler mode
Conversion type
fill
stretch
crop

This control selects the conversion method to use to "fit" the input image into the output image.

Select *Fill*, to preserve the input image aspect ratio through the resizing process. The portions of the output image that are not occupied by the resized image are covered with bars. You can select the colour of the bars using the *Panel Colour* menu items. On the 7710ARC-F model you can also choose to fill the bars from the Fill video input. See sections 7.4.6 and 7.4.7.

Select *stretch*, to modify the input image aspect ratio and resize the image to occupy the entire output image.

Select *crop*, to remove parts of the input image before resizing it to fill the destination frame. The object inside the cropped image will retain its original aspect ratio even though the aspect ratio of the image will change.

Refer to section 6.2.2 for further explanation of the three types of conversion and section 6.2.3 for information on how the output image fits into the destination frame.

7.4.1.10. Set Crop Horizontal Offset

ARC Control
Aspect ratio scaler mode
Crop pan
right
centre
left

This control sets the horizontal position of the cropping of an input image when the conversion type is set to *crop*.

Cropped image will retain the right side of the input image
Cropped image will retain the horizontal centre of the input image
Cropped image will retain the left side of the input image

7.4.1.11. Set Crop Vertical Offset

ARC Control
Aspect ratio scaler mode
Crop tilt
bottom
centre
top

This control sets the vertical position of the cropping of an input image when the conversion type is set to *crop*.

Cropped image will retain the bottom of the input image
Cropped image will retain the vertical centre of the input image
Cropped image will retain the top of the input image

7.4.1.12. Set The Aspect Ratio Of The Output Image

ARC Control	
Aspect ratio scaler mode	
Output image aspect	
output video	Aspect ratio is the same as the output video standard
input image	Aspect ratio is the same as the input image aspect ratio
custom	Aspect ratio set by value in *Output image custom aspect* control
16:9	Aspect ratio is 16:9
14:9	Aspect ratio is 14:9
13:9	Aspect ratio is 13:9
4:3	Aspect ratio is 4:3

This control selects the aspect ratio of the image area of the output video. See section 6.2.1.2 for a complete discussion of image aspect ratio.

7.4.1.13. Set Custom Aspect Ratios Of The Output Image

ARC Control	
Aspect ratio scaler mode	
Output image custom aspect	
1.78	
1.00 to 3.00	

This control is used to specify a non-standard output image aspect ratio.

The range of this parameter is 1.00 to 3.00 and adjusted in 0.01 increments.

To apply the *Output image custom aspect* control, the *Output image aspect* control needs to be set to *custom* (refer to section 7.4.1.12).

7.4.1.14. Set The Aspect Ratio Of The Destination Frame

ARC Control	
Aspect ratio scaler mode	
Dest. frame aspect	
output video	Aspect ratio is the same as the output video standard.
custom	Aspect ratio set by value in *Dest. frame custom aspect* control.
16:9	Aspect ratio is 16:9
14:9	Aspect ratio is 14:9
13:9	Aspect ratio is 13:9
4:3	Aspect ratio is 4:3

This control selects the aspect ratio of the destination frame (production aperture) on the program video output. See section 6.2.1.2 for a complete discussion of destination frame aspect ratio.

7.4.1.15. Set Custom Aspect Ratios Of The Destination Frame

ARC Control	
Aspect ratio scaler mode	
Dest. frame custom aspect	
1.78	
1.00 to 3.00	

This control is used to specify a non-standard destination frame aspect ratio.

The range of this parameter is 1.00 to 3.00 and adjusted in 0.01 increments.

To apply the *Dest. frame custom aspect* control, the *Dest. frame aspect* control needs to be set to *custom* (refer to section 7.4.1.14).

7.4.1.16. Set Output Image Horizontal Position

ARC Control → *Aspect ratio scaler mode* → *Output image pan*	This control sets the horizontal position of the output image in the destination frame.
right	Image is at the right of the destination frame
centre	Image is centred horizontally in the destination frame
left	Image is at the left of the destination frame

7.4.1.17. Set Output Image Vertical Position

ARC Control → *Aspect ratio scaler mode* → *Output image tilt*	This control sets the vertical position of the output image in the destination frame.
Bottom	Image is at the bottom of the destination frame
centre	Image is centred vertically in the destination frame
top	Image is at the top of the destination frame

7.4.2. Configuring The Manual Scaler Mode

The *Manual Scaler Mode* menus are used to configure parameters associated with the Manual Aspect ratio conversion mode. The Manual ARC Mode allows for creation of non-standard aspect ratios that can be applied to the ARC series modules. Table 7-5 shows the items available in the *Manual Scaler Mode* menu. Sections 7.4.2.1 and 7.4.2.2, give detailed information about each of the menu items.

The *Manual Scaler Mode* menu items are only used when the *Scaler Mode* is set to *Manual*. See section 7.4.5.

Get ARC	Populates the manual scaler menus with the values calculated from the current aspect ratio settings.
Input H start	Set first sample of input image
Input H stop	Set last sample of input image
Input V start	Set first line of input image
Input V stop	Set last line of input image
Output H start	Set first sample of scaled image on output video raster
Output H stop	Set last sample of scaled image on output video raster
Output V start	Set first line of scaled image on output video raster
Output V stop	Set last line of scaled image on output video raster

Table 7-5: Manual Scaler Controls

When calculating these parameters, it is important to take the pixel aspect ratio into account.

7.4.2.1. Converts Aspect Ratio Conversion Setup Into Scaler Parameters

ARC Control
Manual scaler mode
Get ARC
Cancel
Yes

This parameter allows users to use menu settings from the Aspect Ratio Mode menu items as a starting point to create user-defined conversion settings.

Choose *yes* to load Aspect ratio mode settings to the Input and output start and stop menu items.

7.4.2.2. Setting User Defined Aspect Ratios

There are four controls for each input video standard that set the portion of the input picture that will be converted. These controls do not have any effect when the pre-defined aspect ratios are used.

Changes to the *Input H/V and Output H/V* aspect ratio parameters will cause the video output to be interrupted momentarily. The internal timing is automatically adjusted to achieve the desired phase with respect to the reference.

ARC Control
Manual scaler mode
Input H start
Input H stop

The *Input H start* and *Input H stop* define where the first and last pixels of the input image are within the source frame.
Source frame pixel of left side of input image (first pixel)
Source frame pixel of right side of input image (last pixel)

ARC Control
Manual scaler mode
Input V start
Input V stop

The *Input V start* and *Input V stop* define where the first and last lines of the input image are within the source frame.
Source frame line of top of input image (first line)
Source frame line of bottom of input image (last line)

There are four controls for each output video standard that define the size of the output image and where to place the resulting image on the destination frame.

ARC Control
Manual scaler mode
Output H start
Output H stop

The *Output H start* and *Output H stop* define where the first and last pixels of the output image are within the destination frame.
Destination frame pixel of left side of output image (first pixel)
Destination frame pixel of right side of output image (last pixel)

ARC Control
Manual scaler mode
Output V start
Output V stop

The *Output V start* and *Output V stop* define where the first and last lines of the output image are within the destination frame.
Destination frame line of top of output image (first line)
Destination frame line of bottom of output image (last line)

7.4.3. Configuring The Active Format Description And Pan-Scan Parameters

SMPTE standard 2016 is a four-part document that standardizes Active Format Description and Pan-Scan coding.

Active Format Description (AFD) is a 4-bit code that describes a video picture in terms of the aspect ratio and other characteristics of the image within the frame. 4:3, 14:9 and 16:9 aspect ratio images are each defined by a specific AFD code. When non-standard aspect ratios are used, a special AFD code is accompanied by Bar data that describes the size and location of the bars that fill out the area of the video outside the image. AFD and Bar Data are intended to be broadcasted with the video signal that they describe. AFD information is intended to guide DTV receivers and/or intermediate professional video equipment regarding the display of the video of one aspect ratio on a display of another aspect ratio. Bar Data information is used to signal the precise unused areas of active video when the image does not completely fill the picture area, in particular, widescreen cinema material carried letterboxed in a frame with bars at the top and bottom. Hence, AFD codes are only designed to describe the common aspect ratio configurations including full frame, 4:3, 14:9 and 16:9 crop, letterbox and pillarbox modes encountered in a broadcast plant. AFD codes cannot be used to describe anamorphic or stretched image configurations. SMPTE has standardized the carriage of AFD codes and Bar data in the vertical ancillary data space in the SMPTE 2016-1 and 2016-3 standards.

Pan-Scan information is a set of data that is intended to guide professional video equipment in extracting an image to be presented in an aspect ratio that is different from that in which the material was produced or distributed. Independent parameters are provided for pan (horizontal offset), tilt (vertical offset), vertical size, horizontal size and output aspect ratio. More than one set of Pan-Scan parameters may be defined for a video signal, and up to eight Pan-Scan data sets may be carried in each Pan-Scan ancillary data packet. Each Pan-Scan data set is labeled by a Data Set identification code. The intended use of the Data Set ID is to signal a unique pan-scan version. SMPTE has standardized the carriage of Pan-Scan data in the vertical ancillary (VANC) data space in the SMPTE 2016-2 and 2016-4 standards.

The *SMPTE 2016 Setup* menus are used to configure how the ARC Series modules will handle AFD, Bar and Pan-Scan ancillary data. Table 7-6 shows the items available in the *SMPTE 2016 Setup* menu. Sections 7.4.3.1 to 7.4.3.8 provide detailed information about each of the menu items.

AFD out enable	Enables embedding of AFD VANC packets on the output video
AFD output line	Sets line number to insert AFD VANC packets
Pan-Scan out enable	Enables embedding of Pan-Scan VANC packets on the output video
Pan-Scan output line	Sets line number to insert Pan-Scan VANC packets
Shoot and Protect	Set whether to extract the shoot and protect area of the image
Read Pan-Scan data set ID	Sets data set ID that will be used for incoming Pan-Scan packets
Write Pan-Scan data set ID	Sets data set ID that will be used for Pan-Scan VANC packet insertion
Priority 1	Set highest priority for SMPTE 2016 VANC packet processing
Priority 2	Set mid priority for SMPTE 2016 VANC packet processing
Priority 3	Set lowest priority for SMPTE 2016 VANC packet processing

Table 7-6: Active Format Description Parameters

7.4.3.1. Enable Insertion of AFD/Bar Data VANC packets on the Output Video

ARC Control
- *SMPTE 2016 Setup*
  - *AFD out enable*
    - *enable*
    - *disable*

This control is used to determine if AFD/Bar data VANC packets will be embedded into the program video output. The ARC series modules will select the AFD code and bar data that describes the destination frame configuration in use. When the output image configuration is anamorphic, the AFD code 0000 will be used. Packets will be inserted on the line specified by the *AFD output line* control.

7.4.3.2. Set The AFD Output Line Number

ARC Control
- *SMPTE 2016 Setup*
  - *AFD output line*
    - *12*
    - *9 to 19*

This control determines what line the AFD VANC embedder will use.

The range of this parameter is 9 to 19.

7.4.3.3. Enable Insertion of Pan-Scan VANC packets on the Output Video

ARC Control
- *SMPTE 2016 Setup*
  - *Pan-Scan out enable*
    - *enable*
    - *disable*

This control is used to determine if Pan-Scan VANC packets will be embedded into the program video output. The ARC series modules will select the Pan-Scan values that describe the destination frame configuration in use and will use the Data Set ID specified in the *Write pan-scan data set ID* control. Packets will be inserted on the line specified by the *Pan-Scan output line* control.

7.4.3.4. Set The Pan-Scan Output Line Number

ARC Control
SMPTE 2016 Setup
Pan-Scan output line
12
9 to 19

This control determines what line the Pan-Scan VANC embedder will use.

The range of this parameter is 9 to 19.

7.4.3.5. Set The Handling Of Shoot And Protect

ARC Control
SMPTE 2016 Setup
Shoot and Protect
Use
ignore

Some AFD codes describe two different image configurations. This control selects if the shoot and protect area should be used to determine the location of the input image. This is also called the "alternate centre".

For example, if AFD code specifies a letterbox 16:9 image with alternate 14:9 centre cut, setting this control to "ignore" will result in the letterbox 16:9 image being used as the input image area. Setting it to "use" will result in the 14:9 area in the centre being used as the input image area.

7.4.3.6. Set The Read Pan-Scan Data Set ID

ARC Control
SMPTE 2016 Setup
Read Pan-Scan data set ID
Any
1 to 254
1

This control is used to select the Data Set ID to extract from incoming Pan-Scan packets.

The ID value of 1 is used to indicate a universal or generic Pan-Scan data set. The ID values from 2 to 63 may be assigned by SMPTE to indicate specific Pan-Scan data sets. The ID values from 64 to 254 may be defined privately.

Select *any* to respond to the first Pan-Scan data set encountered in the incoming packets

7.4.3.7. Set The Write Pan-Scan Data Set ID

ARC Control
SMPTE 2016 Setup
Write Pan-Scan data set ID
1 to 254
1

This control is used to select the Data Set ID used when embedding a Pan-Scan packet.

The ID value of 1 is used to indicate a universal or generic Pan-Scan data set. The ID values from 2 to 63 may be assigned by SMPTE to indicate specific Pan-Scan data sets. The ID values from 64 to 254 maybe defined privately.

7.4.3.8. Setting The Priority Level for Processing Incoming SMPTE 2016 Packets

When the *Input image Aspect* and *Source Frame Aspect* controls are set to *SMPTE 2016*, there are three priority controls that determine whether the ARC series modules should respond to AFD/Bar Data or Pan-Scan VANC packet information. Priority 1 has the highest priority, and priority 3 has the lowest priority. For the sake of simplicity only Priority 1 menu item will be shown in the manual.

ARC Control
- *SMPTE 2016 Setup*
  - *Priority 1*
    - *Pan - Scan*
    - *Bar Data Only*
    - *AFD/Bar Data*
    - *None*

When *AFD/Bar Data* is selected, and if both the AFD/Bar Data and Pan-Scan packets are present and valid, the AFD/Bar data packet is used to determine the image location. If only pan-scan packets are present, they will be ignored. This is the default value for the *Priority 1* control.

When *Bar Data Only* is selected, the Bar data parts of the AFD/Bar data packet will be used to determine the image location. AFD information in the packet will be ignored. This setting should only be used if the AFD and Bar Data parts of the packet are inconsistent with each other and the user wishes to give the Bar data priority over the AFD. This is the default value for the *Priority 2* control.

When *Pan- Scan* is selected, and if both the AFD/Bar Data and Pan-Scan packets are present and valid, the Pan-Scan packet is used to determine the image location. If only AFD/Bar Data packets are present, they will be ignored.

When *None* is selected both AFD/Bar Data and Pan-Scan packet information will be ignored. This is the default value for the *Priority 3* control. The image location must be determined using other means. See sections 7.4.1.2 and 7.4.1.4.

The default settings of the priority controls define the following processing priority.

Priority 1: Use AFD to determine input image location if it is present, except where the image does not extend to the full height or width of the source frame and AFD alone is insufficient to describe the extent of the image. (AFD codes 0100 and 0000) For these codes the bar data will be used.

Priority 2: If AFD/Bar data is not present then use Pan-Scan packets to determine the image location.

Priority 3: Ignore all SMPTE 2016 packets

7.4.4. Configuring The Wide Screen Signalling Parameters

The Wide Screen Signaling signal is typically carried on lines 23 in 625-line systems. The wide-screen signaling information is a data burst containing information on the aspect ratio range of the image in the transmitted signal and its position, as it would appear on a conventional 4:3 display and on the position of the subtitles and on the camera/film mode.

The WSS *Setup* menus are used to configure how the ARC Series modules will handle WSS. Table 7-7 shows the items available in the WSS *Setup* menu. Sections 7.4.4.1 to 7.4.4.3 provide detailed information about each of the menu items.

WSS Out Enable	Enables WSS insertion on the output video
WSS Read Line	Selects which line number to read WSS signal from
WSS Write Line	Selects which line number to insert WSS signal on

Table 7-7: Wide Screen Signalling Parameters

7.4.4.1. Enable WSS Insertion on the Output Video

ARC Control
- *WSS Setup*
  - *WSS Out Enable*
    - *enable*
    - *disable*

This control is used to determine if the WSS signal will be inserted into the program video output. The ARC series modules will select the WSS code that describes the destination frame configuration in use.

When set to *Enable*, the ARC series modules will select the WSS code that describes the destination frame configuration in use and inserts the WSS signal inserted on the line specified by the *WSS Write Line* control.

When set to *Disable* the program video output signal of the module will not have a WSS signal inserted.

7.4.4.2. Set The WSS Read Line

ARC Control
- *WSS Setup*
  - *WSS read line*
    - *23 (22 for 525i/59.94)*
    - *Min to Max*

This control determines what line WSS is read from.

The range of this parameter is 10 to 22 for 525i/59.95 and 6 to 23 for 625i/50 video formats.

7.4.4.3. Set The WSS Write Line

ARC Control
- *WSS Setup*
  - *WSS write line*
    - *23 (22 for 525i/59.94)*
    - *Min to Max*

This control determines what line WSS is inserted on.

The range of this parameter is 10 to 22 for 525i/59.95 and 6 to 23 for 625i/50 video formats.

7.4.5. Selecting The Conversion Mode

ARC Control
Scaler mode
aspect ratio
manual

This control is used to select how the aspect ratio converter is configured.

When set to *aspect ratio* the controls in the *Aspect Ratio Scaler Mode* menu (refer to section 7.4.1) are used to configure the conversion process.

When set to *Manual*, the controls in the *Manual Scaler Mode* menu (refer to section 7.4.2) are used to configure the conversion process.

7.4.6. Selecting The Source Of The Fill (7710ARC-F version only)

ARC Control
Fill source
panel
fill BNC

Select what will be used to create the pixels outside of the output image area. This control is only available on the 7710ARC-F.

When set to *panel*, the module will insert a solid colour into the panel area. The solid colour can be adjusted using the *Panel colour* controls, refer to section 7.4.7.

When set to Fill BNC, the FILL input frame is placed over the entire destination frame, before the output image is inserted. The Fill video signal must be in the same video standard as the program video input and must be clock locked to the program input.

7.4.7. Set The Colour Of The Letterbox Panels

There are three menu items used to set the panel colour. The menu item for each colour component functions in the same way. For simplicity, only the menu item for the *Red* component will be shown in the manual.

ARC Control
Panel colour red
0 to 255

This control defines one of the component colours for the colour of the letterbox or pillarbox panels. Set the R, G or B value for the desired panel colour.

7.5. CONFIGURING THE VIDEO PROCESSING FUNCTIONS

The *Video Proc* menus are used to configure parameters associated with the video processing functions. Table 7-8 shows the items available in the *Video Proc* menu. Sections 7.5.1 to 7.5.6 provide detailed information about each of the menu items.

Gamma Adjust Enable	Enable/Disable Gamma Adjustment
Gamma Level	Adjust Gamma correction
RGB Clip Enable/Disable	Enable/Disable Clipping the video to valid R, G, B values
Y Gain	Set the Y Gain of the output video
Y Offset	Set the Y Offset of the output video
Cr Gain	Set the Cr Gain of the output video
Cr Offset	Set the Cr Offset of the output video
Cb Gain	Set the Cb Gain of the output video
Cb Offset	Set the Cb Offset of the output video
Hue	Set the Hue of the output video
R Gain	Set the R Gain of the output video
G Gain	Set the G Gain of the output video
B Gain	Set the B Gain of the output video

Table 7-8: Video Processing Functions

7.5.1. Enabling Gamma Adjust

Video Proc *Gamma Enable/Disable* *enable* *disable*	This control enables the gamma adjust processor. When enabled, the module will allow the user to adjust the gamma level (refer to section 7.5.2). If disabled, then the gamma level is set to 0.

7.5.2. Setting the Gamma Level

Video Proc
Gamma Level
-128 to +127

This control provides the ability to adjust the gamma correction factor from
-128 to +127 in increments of 1. In order to adjust the gamma you must set the *Gamma Enable/Disable* control to *enable*. See section 7.5.1.

7.5.3. Enabling RGB Clipping

Video Proc
RGB Clip Enable/Disable
enable
disable

This control enables the RGB clipper.

When enabled, the module will clip any illegal levels of R, G, and B (individually) to Black and White Levels. If disabled, then the illegal values are passed unmodified.

7.5.4. Setting the Gain Levels

There are six controls that set the gain of the video. These controls provide the ability to adjust the gain of the 3 components in either the Y, Cr, Cb domain or the R, G, B domain over a range of +/-10% in 0.1% steps.

Gain adjustments in the Y, Cb, Cr domain are made first, then gain adjustments in the RGB domain. Illegal values are clipped after gain adjustments

For simplicity, only one control will be shown in the manual.

Video Proc
Y Gain
+/- 10%

This control provides the ability to adjust the Y gain in the Y, Cr, Cb domain over a range of +/-10% in 0.1% steps.

7.5.5. Setting the DC Offset

There are three controls that set the DC Offset of each component of the video in the Y, Cb, Cr domain. For simplicity, only one control will be shown in the manual.

Video Proc
Y Offset
+/- 100

This control provides the ability to adjust the DC offset of the Y components in the Y Cr Cb domain in +/- 100 quantization levels.

7.5.6. Setting the Hue

Video Proc
Hue
+/- 30

This control provides the ability to adjust the Hue or colour of components +/- 30 degrees

7.6. CONFIGURING IMAGE ENHANCEMENT

The *Image Enhancement* menus are used to configure parameters associated with the image enhancement functions. Table 7-9 shows the items available in the *Image Enhancement* menu. Sections 7.6.1 to 7.6.7 provide detailed information about each of the menu items.

Image Enhancement Enable	Enable/Disable Image Enhancement
Detail Gain	Set the Detail Gain for image enhancement
Luma Floor	Select minimum Luma value
Detail Noise Floor	Select noise floor
Enhancement Limit	Select the largest detail value to be added back into the signal
Horizontal Band	Select the horizontal frequency band to be enhanced
Vertical Intensity	Select the intensity of the vertical enhancement process

Table 7-9: Image Enhancement Controls

7.6.1. Enabling Image Enhancement

Image Enhancement
  Image enhancement
  enable
  disable
	This control enables or disables the Image Enhancement processor.
	
	When enabled, the module will provide the ability to adjust the image enhancement parameters. If disabled, the image enhancement processor has no effect on the video.

7.6.2. Setting the Detail Gain

Image Enhancement
  Detail Gain
  20
  0 to 127
	This control provides the ability to adjust the amount of detail enhancement.
	
	This control can be adjusted in increments of 1 from 0 to 127.

7.6.3. Setting the Luma Floor

Image Enhancement
  Luma Floor
  1
  0 to 15
	This control selects the minimum Luma value that will be enhanced. Pixels with a luma value below this floor will be left untouched.

7.6.4. Setting the Detail Noise Floor

Image Enhancement
Detail Noise Floor
2 *0 to 15*

This control provides the ability to set the *Detail Noise Floor.*

When the image detail has a value that is below this floor it will be deemed to consist mostly of noise. As such, the pixel associated with that detail level will be left untouched.

7.6.5. Setting the Enhancement Limit

Image Enhancement
Enhancement Limit
44 *0 to 63*

This control selects the largest detail value to be added back into the signal.

Detail that has a value larger than this value will be clipped.

7.6.6. Setting the Horizontal Band

Image Enhancement
Horizontal Band
15 *0, 5, 10, 15, 20*

This control selects the horizontal frequency band to be enhanced.

Where 0 selects the lowest frequency band available and 20 the highest.

7.6.7. Setting the V Enhancement

Image Enhancement
Vertical Intensity
25% *0-100%*

This control selects the intensity of the vertical enhancement process, as a ratio of the horizontal enhancement.

The range is 0 to 100% in increments of 25%, where 0% refers to no vertical enhancement and 100% provides a vertical intensity that is equivalent to the horizontal.

7.7. UTILITIES

The *Utilities* menus are used to list the module firmware version, upgrade the firmware, and manage the user presets. Table 7-10 shows the items available in the *Utilities* menu. Sections 7.7.1 to 7.7.6 provide detailed information about each of the parameters.

Status Window	Enable the Status window
Load preset	Select a preset to load
Store preset	Select a preset to save the current configuration
GPI 1 Action	Select preset to recall when GPI 1 goes active
GPI 2 Action	Select preset to recall when GPI 2 goes active
GPI 3 Action	Select preset to recall when GPI 3 goes active
GPI 4 Action	Select preset to recall when GPI 4 goes active
Upgrade	Upgrade the application firmware
About…	Display information about the ARC Series module

Table 7-10: Utility Controls

7.7.1. Selecting the On Screen Display

Utilities
- *Status Window*
  - *enable*
  - *disable*

This control enables or disables the *Status Window* on all the outputs.

The status window shows the module's status at a glance.

7.7.2. Recalling Configurations From The User Presets Or The Factory Preset

The ARC Series modules provide ten user preset areas to store the complete set of controls from the on screen menu.

Utilities
- *Load preset*
  - *user preset 1 to 10*
  - *factory preset*
  - *cancel*

This control is used to recall the current card configuration from one of the user presets or from the default factory preset.

Use the toggle switch to select the preset you wish to recall. After selecting the preset, you must press the pushbutton before the recall will take place. You can abort the operation by pressing the pushbutton when *cancel* is displayed.

The current state of the card will be forgotten if it has not been saved to a preset before a recall is performed.

There will be a slight disturbance in the operation of the card and the on-screen display while the new preset is being recalled.

7.7.3. Saving Configurations To The User Presets

The ARC Series modules provide ten user preset areas to store the complete set of controls.

Utilities
- *Store Preset*
  - *user preset 1 to 10*
  - *cancel*

This control is used to store the current card configuration into one of the user presets.

Use the toggle switch to select the preset location where you want to store the module configuration. After selecting the preset, you must press the pushbutton before the store will take place. You can abort the operation by pressing the pushbutton when *Cancel* is displayed.

7.7.4. Recall Presets Via GPIs

The ARC Series provides ten user preset areas, which can be recalled using one of the four GPI inputs. There is a separate control for each input. For simplicity, only one control will be shown in the manual.

Utilities
- *GPI 1*
  - *Preset 10*
  - *Preset 9*
  - *Preset 8*
  - *Preset 7*
  - *Preset 6*
  - *Preset 5*
  - *Preset 4*
  - *Preset 3*
  - *Preset 2*
  - *Preset 1*
  - *No action*

This control is used to set which preset will be recalled when the GPI 1 input is closed to ground. To disable the GPI 1 input set it to *no action.*

See sections 2.2 and 8.3 for more information on how to activate a GPI.

GPI settings are also stored in the User Presets in addition to the other settings. If the GPI settings are not the same for each video input and output combination, unexpected results may occur. Ensure GPI settings are the same for each User Preset. Before you attempt to recall presets using the GPIs.

7.7.5. Initiating a Software Upgrade

Utilities
Upgrade
yes
cancel

This control is used to initiate an upgrade of the module software.

In addition to the software upgrade method detailed in section 8.2, you can initiate an upgrade with this control. This will allow you to upgrade the software without unplugging the card and changing the upgrade jumper.

After selecting the upgrade operation, you must change the command to *Yes* and press the pushbutton before the upgrade can take place. See the instructions in the *Upgrading Firmware* chapter for information on how to connect the PC and upload the firmware. You can abort the operation by pressing the pushbutton when *Cancel* is displayed.

After the upgrade has finished, the unit will automatically restart and run in normal operating mode.

Note that the baud rate for firmware upgrades is 115200 baud.

In systems where the ARC series module is installed in a frame fitted with a 7700FC VistaLINK® Frame Controller module, you can also upgrade the module firmware over Ethernet using the VistaLINK® Pro software.

7.7.6. Accessing Information About this Module and its Firmware

Utilities
About…

This control lists the particulars about the module and the firmware residing within it. It gives quick access information about revisions that can be used to determine when upgrades are required.

8. LOCATION OF JUMPERS

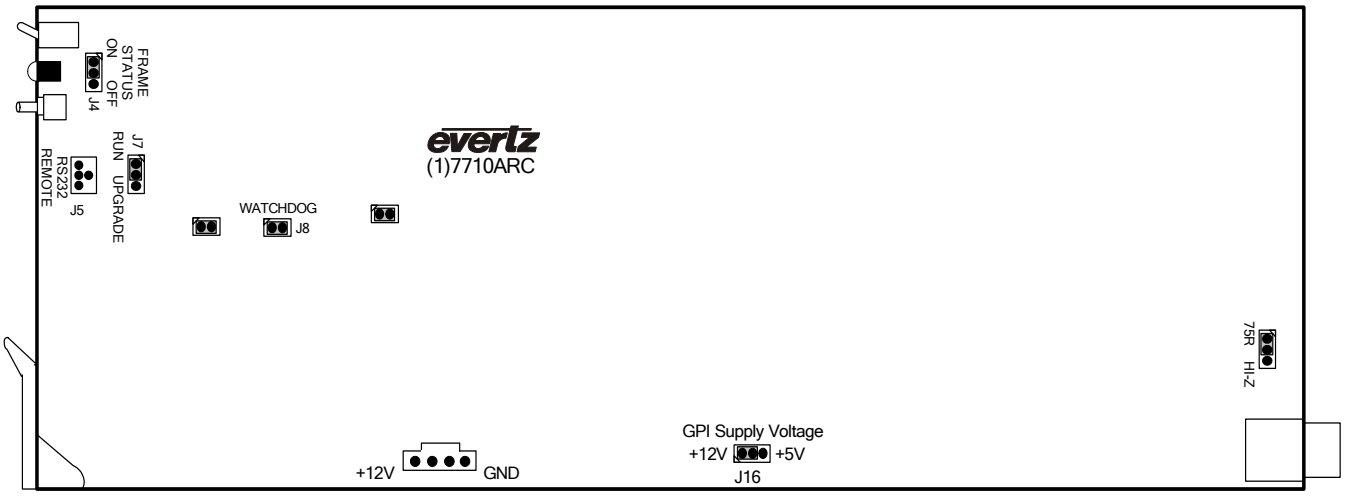

Figure 8-1: Jumper Locations

8.1. SELECTING WHETHER LOCAL FAULTS WILL BE MONITORED BY THE GLOBAL FRAME STATUS

The FRAME STATUS jumper J4, located at the front of the module determines whether local faults (as shown by the Local Fault indicator) will be connected to the 7700FR frame's global status bus.

FRAME STATUS: To monitor faults on this module with the frame status indicators (on the power supply's FRAME STATUS LEDs and on the Frame's Fault Tally output), install this jumper in the ON position.

When this jumper is installed in the off position local faults on this module will not be monitored.

8.2. CONFIGURING THE MODULE FOR FIRMWARE UPGRADES

UPGRADE: The **UPGRADE** jumper J7 located towards the front of the module, near the serial port header, is used when firmware upgrades are being done to the module. For normal operation it should be installed in the *RUN* position. See the *Upgrading Firmware* section in the front of the binder for more information.

To upgrade the firmware in the module, pull it out of the frame. Move Jumper J7 into the *UPGRADE* position. Install the Upgrade cable provided (located in the vinyl pouch in the front of this manual) onto header J5 near the push button. Re-install the module into the frame. Run the upgrade as described in the *Upgrading Firmware* section in the front of the binder. Once the upgrade is completed, remove the module from the frame, move J7 into the *RUN* position, remove the upgrade cable and re-install the module. The module is now ready for normal operation.

Note that the baud rate for firmware upgrades is 115200 baud.

In systems where the ARC series module is installed in a frame fitted with a 7700FC VistaLINK® Frame Controller module, you can also upgrade the module firmware over Ethernet using the VistaLINK® Pro software.

8.3. CONTROLLING GPI PULLUP VOLTAGE

Jumper J16, is located near the centre, bottom edge of the module and controls whether the GPI inputs are pulled up to 5 volts or 12 volts. See section 2.2 for more information about activating a GPI input.

GPI SELECT: To pull the GPI inputs and outputs up to +12 volts install this jumper in the position closest to the front card edge of the module.

To pull the GPI inputs and outputs up to +5 volts install this jumper in the position closest to the rear edge of the module.

8.4. CONTROLLING THE GENLOCK BNC TERMINATION

The TERMINATION jumper J21, located at the rear of the module near the GLCK IN BNC, determines whether the input signal will be terminated with 75 ohms or not.

When set in the "75R" position, the input impedance is set to 75 Ohm. Use this position when the cable stops at this card. It will provide the proper impedance to eliminate electrical reflections.

If set to "HI-Z", the input will be high impedance. Use this position when the signal does NOT stop at this card. Install a "T" connector on the GLCK IN BNC to "loop" the signal through this card.

WARNING: Make sure that the final destination of the signal is terminated into a 75 Ohm load. Otherwise, reflections will occur affecting the signal throughout the cable.

9. VistaLINK® REMOTE MONITORING/CONTROL

9.1. WHAT IS VistaLINK® ?

VistaLINK® is Evertz's remote monitoring and configuration platform which operates over an Ethernet network using Simple Network Management Protocol (SNMP). SNMP is a standard computer network protocol that enables different devices sharing the same network to communicate with each other. VistaLINK® provides centralized alarm management, which monitors, reports, and logs all incoming alarm events and dispatches alerts to all the VLPro Clients connected to the server. Card configuration through VistaLINK® PRO can be performed on an individual or multi-card basis using simple copy and paste routines, which reduces the time to configure each module separately. Finally, VistaLINK® enables the user to configure devices in the network from a central station and receive feedback that the configuration has been carried out.

There are 3 components of SNMP:

1. An SNMP manager, also known as a Network Management System (NMS), is a computer running special software that communicates with the devices in the network. Evertz VistaLINK® Pro Manager graphical user interface (GUI), third-party, or custom manager software may be used to monitor and control Evertz VistaLINK® *enabled* products.

2. Managed devices (such as the ARC Series), each with a unique address (OID), communicate with the NMS through an SNMP Agent. Evertz VistaLINK® enabled 7700 series modules reside in the 3RU 7700FR-C MultiFrame and communicate with the manager via the 7700FC VistaLINK® frame controller module, which serves as the Agent.

3. A virtual database known as the Management Information Base (MIB) lists all the variables being monitored in which both the Manager and Agent understand. Please contact Evertz for further information about obtaining a copy of the MIB for interfacing to a third party Manager/NMS.

For more information on connecting and configuring the VistaLINK® network, refer to the 7700FC Frame Controller chapter.

9.2. VistaLINK® MONITORED PARAMETERS

The following parameters can be remotely monitored through the VistaLINK® interface.

Parameter	Description
Program Video Standard	Indicates the current detected program video standard
Fill Video Standard (ARC-F only)	Indicates the current detected fill video standard
Ext GL Standard	Indicates the current detected Genlock video standard
GPI 1	Indicates the current state of the GPI 1
GPI 2	Indicates the current state of the GPI 2
GPI 3	Indicates the current state of the GPI 3
GPI 4	Indicates the current state of the GPI 4

Table 9-1: VistaLINK® Monitored Parameters

9.3. VistaLINK® CONTROLLED PARAMETERS

The following parameters can be remotely controlled through the VistaLINK® interface.

Parameter	Description
Video Program Select	Selects the video input source (available on the 710ARC only)
Video Standard Program	Sets the input video standard.
Video Loss of Program	Sets the behaviour of the program video output upon loss of the program video input.
Video Card Ref Source	Sets the program video output reference source.
Ext GL Source	Sets the source of the external Genlock reference.
Video Phase Offset Horizontal	Sets the H phase of the program video output with respect to the reference.
Video Phase Offset Vertical	Sets the V phase of the program video output with respect to the reference.
Ancillary Data Blanking	Sets if the ancillary data from the program video input is passed to the program video output.
Active Picture Blanking Bypass	Sets the last line of the active picture that is to be treated as part of the blanking region by the ancillary data bypass module. This allows waveforms such as closed captioning to be passed to the program video output.
Gamma Enable	This control enables the gamma adjust processor.
Gamma Level	This control provides the ability to adjust the gamma correction factor from -128 to +127 in steps of 1.
RGB Clip	Enables the RGB clipper.
Y Gain	Provides the ability to adjust the gain of the Y component.
Y Offset	Provides the ability to adjust the DC offset of the Y component in the Y Cr Cb domain in +/- 100 quantization levels.
Cr Gain	Provides the ability to adjust the gain of the Cr component.
Cr Offset	Provides the ability to adjust the DC offset of the Y component in the Y Cr Cb domain in +/- 100 quantization levels.
Cb Gain	Provides the ability to adjust the gain of the Cb component.
Cb Offset	Provides the ability to adjust the DC offset of the Y component in the Y Cr Cb domain in +/- 100 quantization levels.
Hue	Provides the ability to adjust the Hue or colour of components +/- 30 degrees.
R Gain	Provides the ability to adjust the gain of the R component.
G Gain	Provides the ability to adjust the gain of the G component.
B Gain	Provides the ability to adjust the gain of the B component.
Image Enhancement Enable	Enables or disables Image Enhancement processor.
Detail Gain	Provides the ability to adjust the amount of detail enhancement.
Luma Floor	Selects the minimum Luma value that will be enhanced.
Detail Noise Floor	Provides the ability to set the detail noise floor.
Enhancement Limit	Selects the largest detail value to be added back into the signal.
Horizontal Band	Selects the horizontal frequency band to be enhanced.
Vertical Intensity	Selects the intensity of the vertical enhancement process, as a ratio of the horizontal enhancement.
Fixed Arc	Configures the aspect ratio of the program video output using pre-defined aspect ratios.
Input Image Aspect	Selects the aspect ratio of the program input image. The parameter allows the user to select standard aspect ratios, custom aspect ratios, or aspect ratios specified by Active Format Description (AFD).

Input Image Custom Aspect	Provides the ability to specify an image aspect ratio that is not available in the Input Image Aspect control.
Input Video Aspect	Selects the aspect ratio of the image in the program video input.
Input Video Custom Aspect	Provides the ability to specify a video aspect ratio that is not available in the Input Video Aspect control.
Input Image Pan	Sets the pan (horizontal offset) of the image in the input program video.
Input Image Tilt	Sets the tilt (vertical offset) of the image in the input program video.
Input Image Crop	Provides the ability to set the number of pixels to be cropped off the outer edges of the input image.
Conversion Type	Selects the method used to “fit” the input image into the output image.
Crop Pan	Sets the pan (horizontal offset) of the cropped image.
Crop Tilt	Sets the tilt (vertical offset) of the cropped image.
Output Image Aspect	Selects the aspect ratio of the program video output image.
Output Image Custom Aspect	Provides the ability to specify an image aspect ratio that is not available in the Output Image Aspect control.
Destination frame Aspect	Selects the aspect ratio of the destination frame.
Destination frame Custom Aspect	Provides the ability to specify a custom destination frame aspect ratio
Output Image Pan	Sets the pan (horizontal offset) of the image in the destination frame.
Output Image Tilt	Sets the tilt (vertical offset) of the image in the destination frame.
Scaler Mode	Selects the behaviour of the Aspect Ratio Converter.
Fill Source	Selects what will be used to create the pixels outside of the output image area.
Panel Colour Red	Defines the R component for the colour of the panels.
Panel Colour Green	Defines the G component for the colour of the panels.
Panel Colour Blue	Defines the B component for the colour of the panels.
AFD Out Enable	Determines if AFD/Bar Data packets will be embedded into the program video output.
AFD Out Line	Determines what line the AFD/Bar Data embedder will use.
Pan Scan Out Enable	Determines if Pan-Scan data is embedded into the program video output.
Pan Scan Out Line	Sets what line the Pan-Scan data embedder will use.
Shoot Protect	Determines if the shoot and protect area should be used to determine the location of the image on the program video input.
Pan Scan Read Id	Selects the Data Set ID to extract from the incoming Pan-Scan packet.
Pan Scan Write Id	Selects the Data Set ID used when embedding a Pan-Scan packet.
Priority 1, 2, 3	In the event that multiple AFD packets are received, the priority controls are used to determine which packet to use. Priority 1 has the highest priority.
WSS Enable	Enables or disables the WSS processor
WSS read line	Selects which line to read the WSS data from
WSS write line	Selects which line to insert the WSS data on
Input H Start	The Input H Start defines the horizontal portion of the input image to process to the output.
Input H Stop	The Input H Stop defines the horizontal portion of the input image to process to the output.
Input V Start	The Input V start defines the vertical portion of the input image to process to the output.

Input V Stop	The Input V Stop defines the vertical portion of the input image to process to the output.
Output H Start	The Output H Start defines how to scale the cropped input image horizontally and where to place it horizontally on the output raster.
Output H Stop	The Output H Stop defines how to scale the cropped input image horizontally and where to place it horizontally on the output raster.
Output V Start	The Output V Start defines how to scale the cropped input image vertically and where to place it horizontally on the output raster.
Output V Stop	The Output V stop define how to scale the cropped input image vertically and where to place it horizontally on the output raster.
Status Window	Enables or disables the status window on all the outputs.
Recall Preset	Initiates a recall of the current card configuration from one of the user presets or from the default preset.
Store Preset	Initiates a store of the current card configuration into one of the user presets.
GPI 1, 2, 3, 4	Sets which preset will be recalled when respective GPI input is closed to ground.

Table 9-2: VistaLINK® Controlled Parameters

9.4. VistaLINK® TRAPS

The following traps can be relayed to the VistaLINK® interface by the ARC Series modules.

Parameter	Description
Program Video Missing	Alerts when the program video is missing
Fill Video Missing	Alerts when the fill video is missing
Local Fault	Alerts when a local fault has been detected
Ext GL Missing	Alerts when the external Genlock reference is missing
Ext GL Valid	Alerts when the external Genlock is Valid
AFD Missing	Alerts when AFD/Bar Data VANC packets are not detected
Pan Scan Missing	Alerts when Pan and Scan VANC packets are missing
Program Video Standard Changed	Alerts when the program video standard has changed
Fill Video Standard Changed	Alerts when the fill video standard has changed
Firmware Upgrade	Alerts when the module is in firmware upgrade mode
Factory Reset	Alerts when a factory reset is applied to the ARC series module
Ext GL Video Standard Changed	Alerts when the external Genlock reference video standard has changed

Table 9-3: VistaLINK® Traps Parameters

9.5. VistaLINK® PRO Configuration Windows

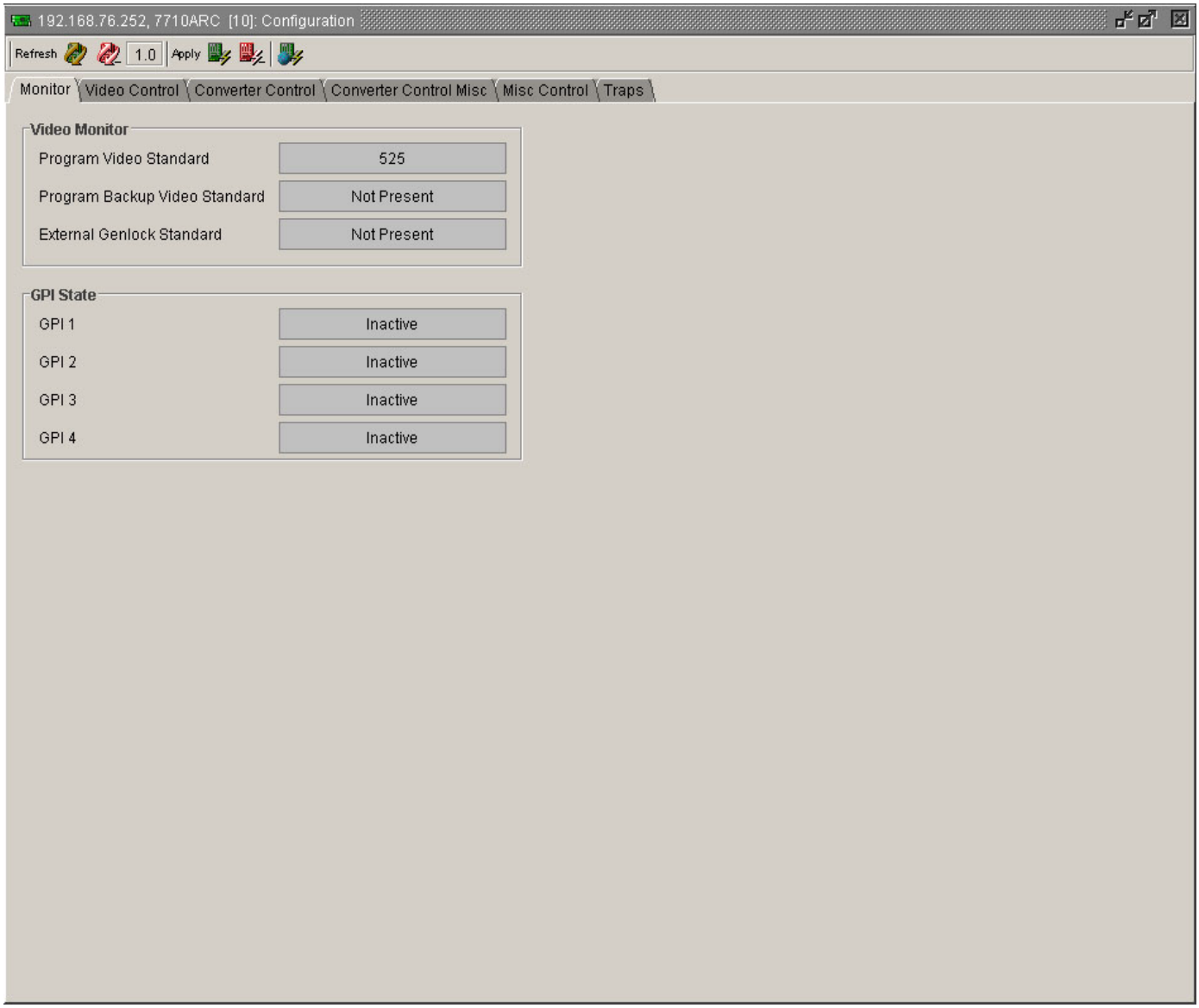

Figure 9-1: Monitor Window

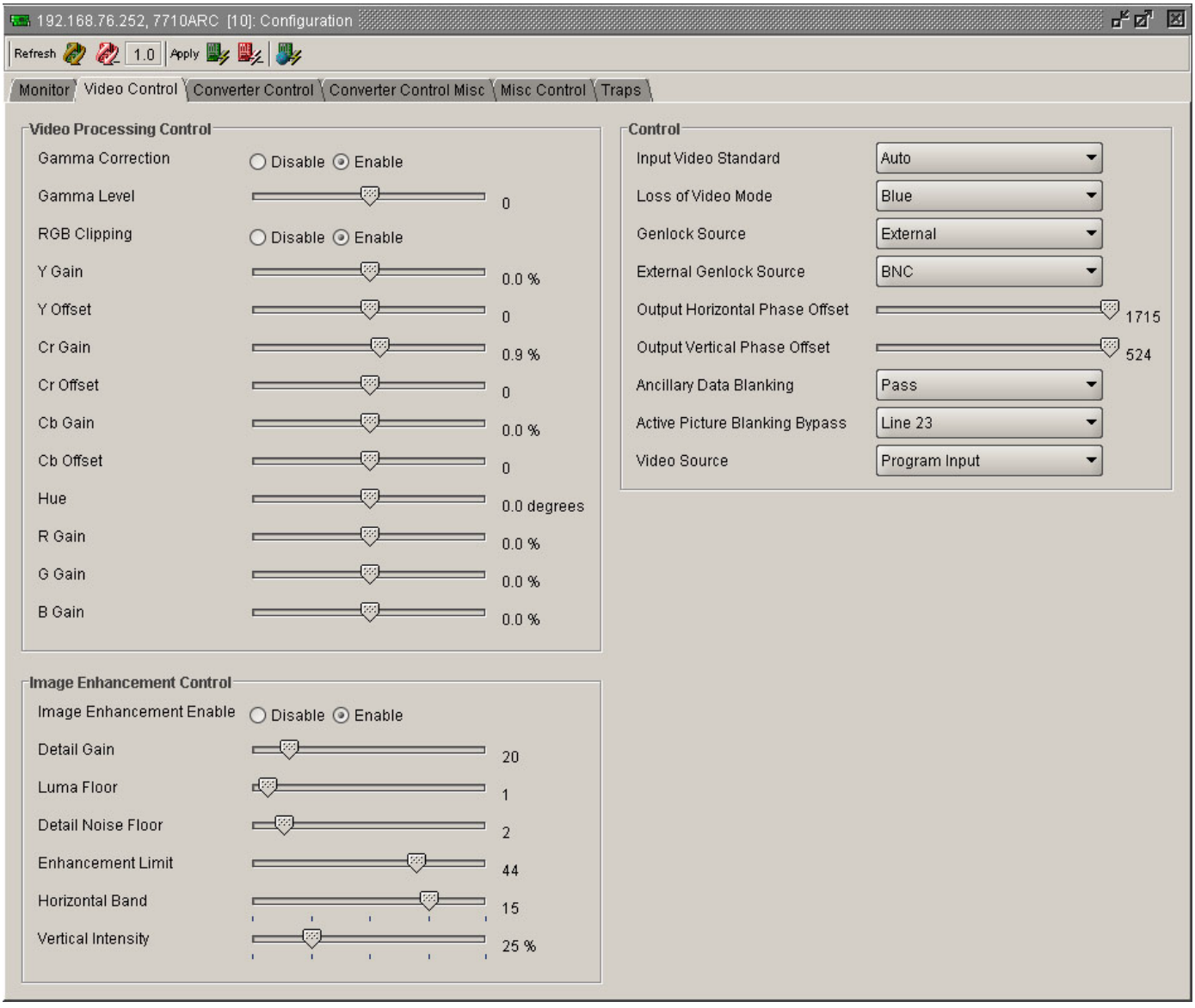

Figure 9-2: Video Control Window

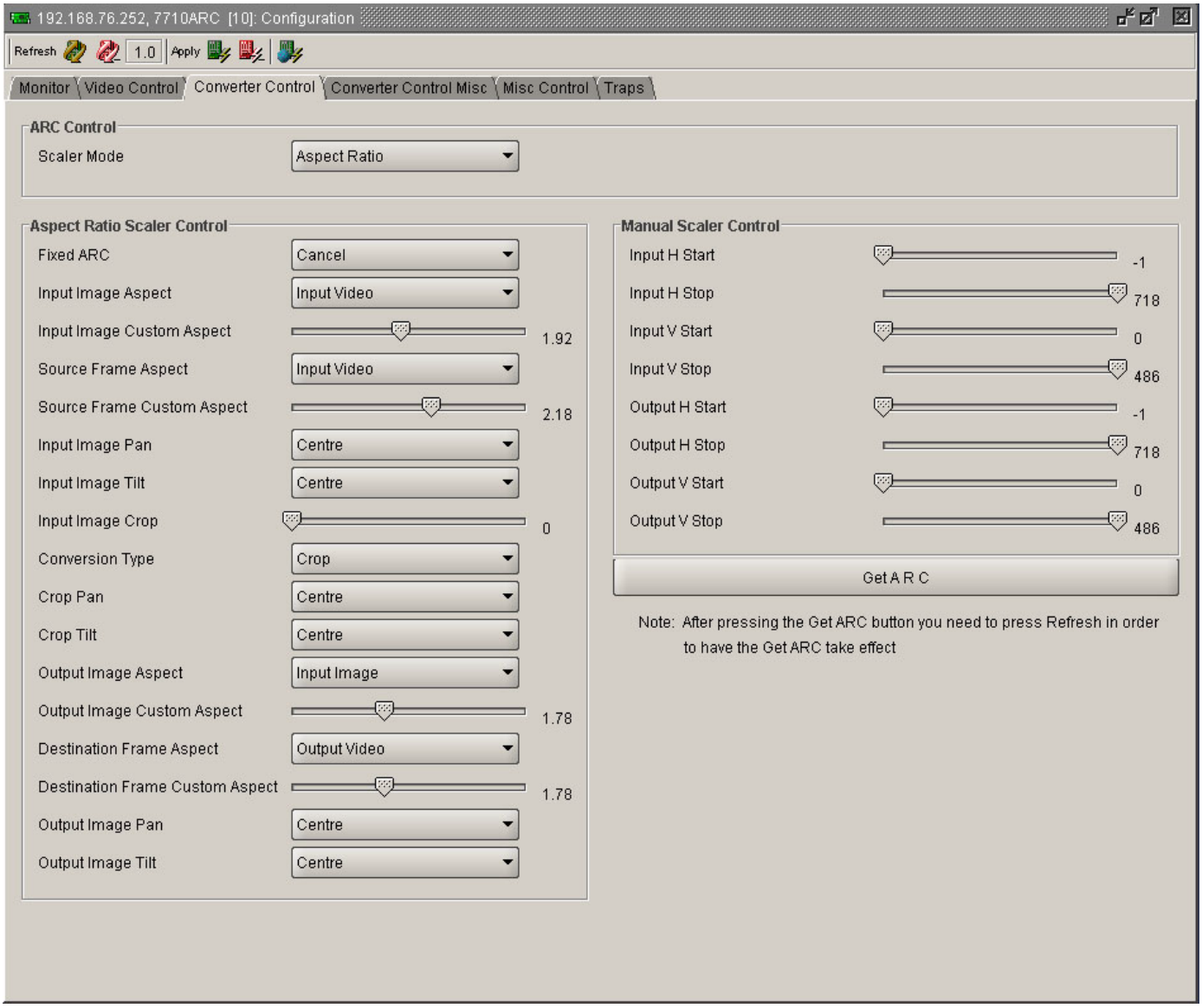

Figure 9-3: Converter Control Window

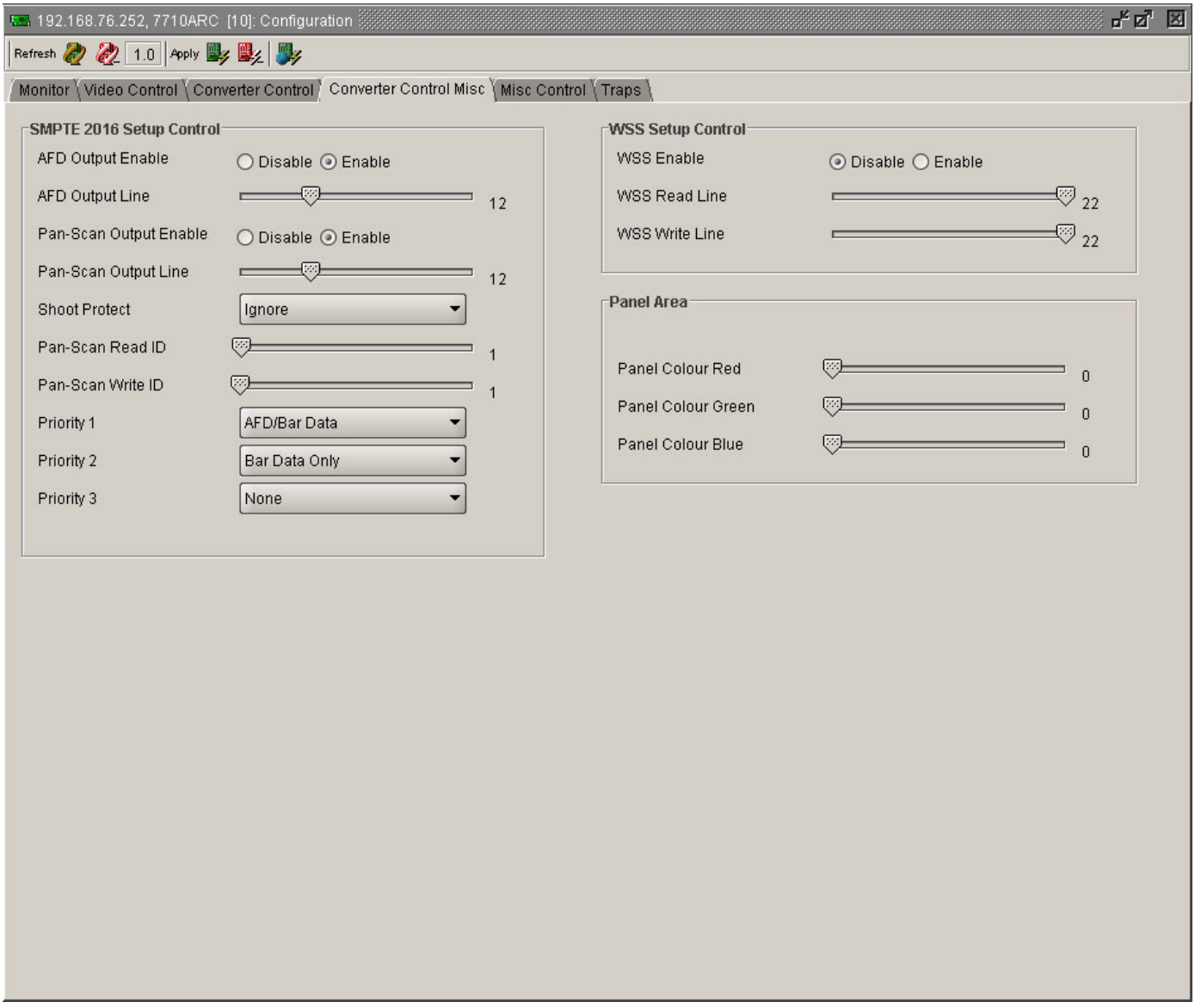

Figure 9-4: Converter Control Misc. Window

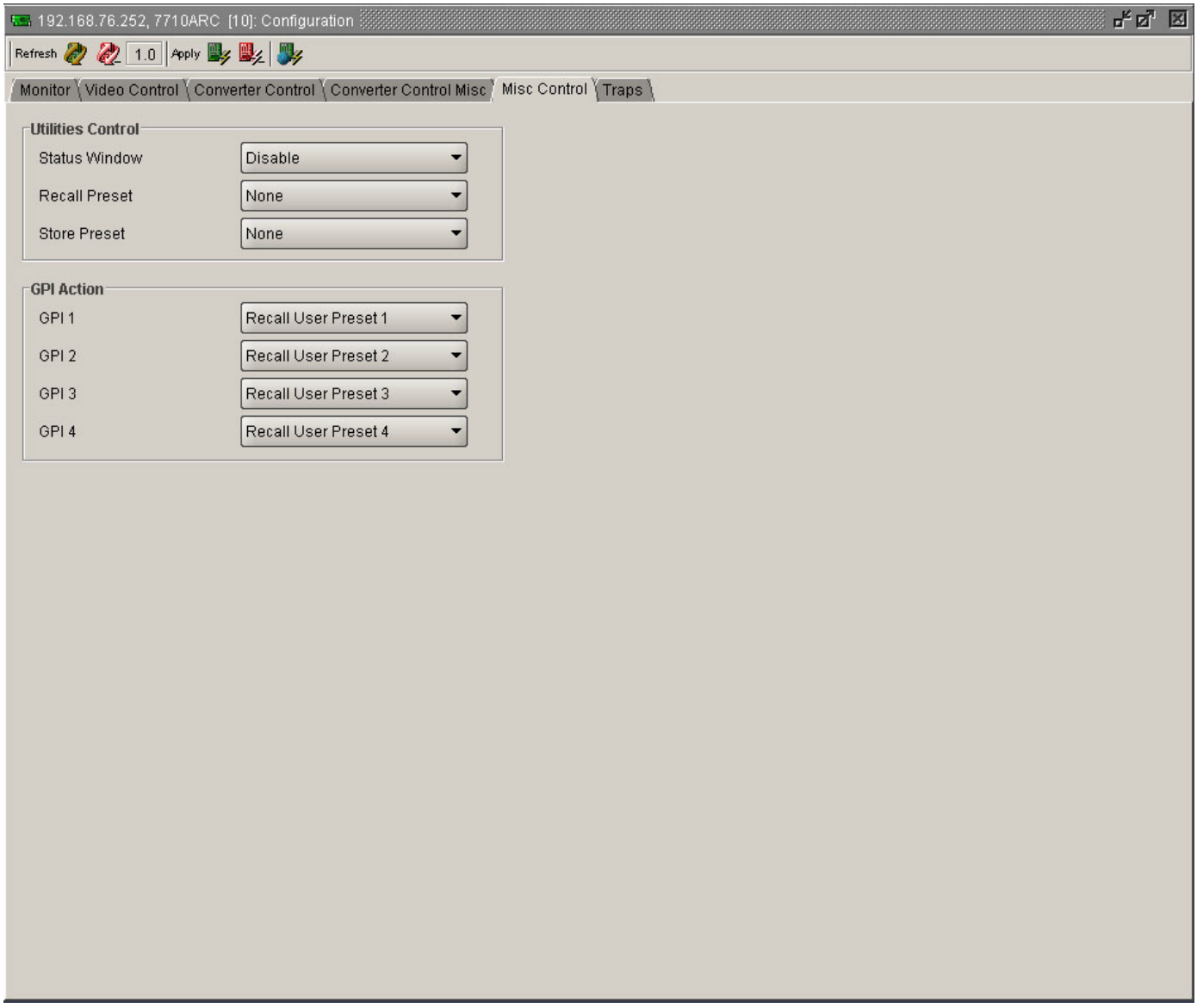

Figure 9-5: Misc. Control Window

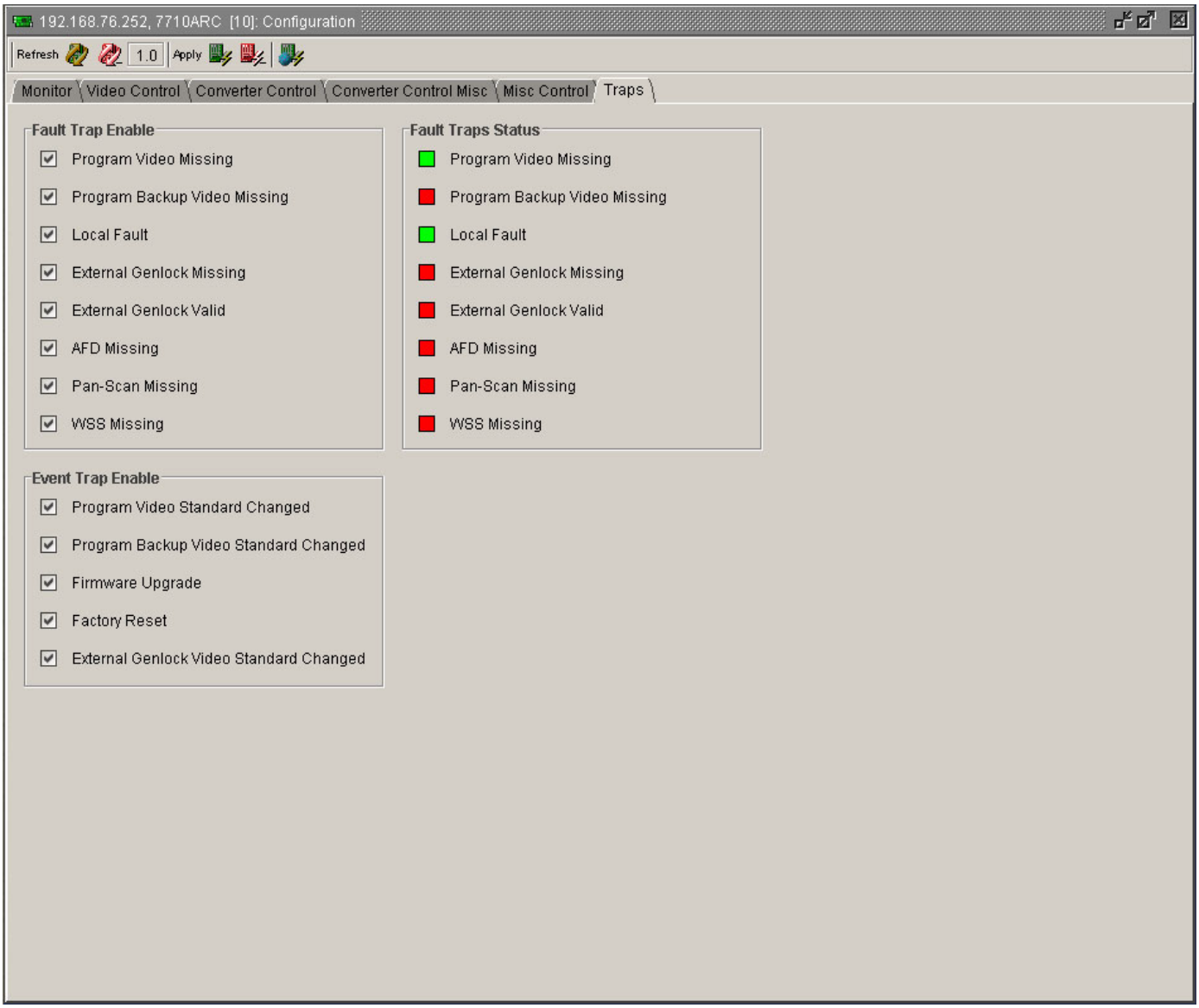

Figure 9-6: Traps Window

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