HQV INSIGHT
Video Processor IVP-1

HQV Insight IVP-1 Video Processor

User Manual

MKT-0044-UMN-1.001F

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Preface

These sections provide information you must read before using the HQV Insight IVP-1.

Limited Warranty

All Silicon Optix Inc. system products are designed and tested to the highest standards and backed by a two year parts and labor warranty. Warranties are effective upon the first delivery date to the   customer and are non-transferable.

Warranty-related repairs include parts and labor, but do not include repair of faults resulting from user negligence, special modifications, abuse (mechanical damage), shipping damage, and/or other unusual damages.

The customer shall pay shipping charges when the unit is returned for repair.   shall pay shipping charges for return shipments to customers.

Silicon Optix Inc. does not assume responsibility for consequential damages, expenses or loss of revenue, inconvenience or interruption in operation experienced by the customer. Warranty service shall not automatically extend the warranty period.

No other warranty, expressed or implied, shall apply.

Return Material Authorization (RMA)

In the event that a product needs to be returned for repair, call Silicon Optix Inc. at 416-490-7779 and ask for an Applications Engineer to issue a Return Material Authorization number, or send an e-mail to SystemsProductSupport@siliconoptix.com.

RMA Conditions

Refer to these conditions when returning a product:

- Prior to returning any item, you must receive a Return Material Authorization (RMA) number.
- All RMA numbers must appear on the return-shipping label.
- All RMA numbers are valid for ten (10) days from the issue date.
- All shipping and insurance charges in all RMAs must be prepaid by the customer.

FCC Statement

This equipment has been tested and found to comply with the limits for Class B digital devices, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential/office installation. The equipment generates and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular

installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced Radio/TV technician for help.

- Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Safety

Take note of all the safety instructions presented in this section before using the IVP-1.

Warnings and Warning Symbols

The Lightning Flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of un-insulated "dangerous voltage" within the product enclosure, voltage that may be of sufficient magnitude to constitute a risk of shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

Warning! To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture and objects filled with liquids, such as vases, should not be placed on this apparatus.

Warning! This apparatus is intended to be connected to a power outlet that includes a protective earthing connection (i.e. a third pin ground). do not remove the third pin of the power cable or connect the unit in any way that does not connect this pin to ground.

Important Safety Label Information

A label indicating important safety information is located on the bottom surface of the IVP-1.

Important Safety Instructions

General

- Read these instructions.
- Keep these instructions.
- Take note of all warnings.
- Follow all instructions.

Installation

- Do not use this apparatus near water.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not defeat the safety purpose of the polarized or grounding-type plug.

  A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade and the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

Operation

- Clean only with dry cloth.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel.

  Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged; liquid has been spilled or objects have fallen into the apparatus; the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Installation

Attachments

Do not use attachments not recommended by the manufacturer, as they may result in the risk of fire, electric shock, or injury to persons.

Water and Moisture

Do not use this unit near water; for example, near a bathtub, washbasin, kitchen sink or laundry tub, in a wet basement, or near a swimming pool, water spa, or the like.

Heat

Do not use this unit near sources of heat, including heating vents, stoves, or other appliances that generate heat. Also, do not place this product in temperature environments greater than 45°C (104°F).

Mounting Surface

If not installing the unit in a standard equipment rack using the recommended mounting brackets, place the unit on a flat, even surface. Do not place the unit on an unstable cart, stand, tripod, bracket, or table. The unit may fall causing serious injury to a person and/or serious damage to the appliance.

Portable Cart

An appliance and cart combination should be moved with extreme care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.

Ventilation

Locate the unit with adequate space around it so that proper heat ventilation is assured. Allow 10 cm (4 in) clearance from the rear and top of the unit, and 5 cm (2 in) from each side.

Slots and Openings

Slots and openings in the unit's case are provided for ventilation to ensure reliable operation of the unit and to prevent overheating. These openings must not be blocked or covered. The openings should never be blocked by operating the unit while placed on a bed, sofa, rug, or similar surface. This unit should not be placed in a built-in installation such as a bookcase unless adequate ventilation is provided.

Entry of Foreign Objects and Liquids

Never push foreign objects of any kind into this unit through the ventilation slots as they may touch dangerous voltage points or short-circuit electrical/electronic parts that could result in fire, or electric shock, or both. Never spill liquid of any kind onto the unit.

Electric Power

Only operate the unit from the type of electric power source indicated on the unit's labeling. If you are not sure of the type of power supply that is available in your home or workplace, consult your appliance supplier or local power company.

Grounding or Polarization

This unit is provided with a 3-pin, grounded, alternating current line plug. This plug will fit into the power outlet only one way. This is a safety feature. Do not try to defeat the safety purpose of the plug.

Power Cord Protection

Route power supply cords so that they are not likely to be walked on or pinched by placing items upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.

Overloading

Do not overload wall power outlets, extension cords, or integral convenience receptacles as this can result in a risk of fire or electric shock.

Lightning

For added protection for this unit during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the power outlet. This will prevent damage to the unit due to lightning or power surges.

Maintenance

Cleaning

Unplug this unit from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Only use a soft cloth dampened with a mild detergent solution. Do not use strong solvents such as alcohol, benzene, or paint thinner.

Damage Requiring Service

Unplug this unit from the power outlet and refer servicing to qualified service personnel under the following conditions:

- When the power cord or plug is damaged.
- If liquid has been spilled or foreign objects have fallen into the unit.
- If the unit has been exposed to rain or water.
- If the unit does not operate normally, following the operating instructions. Adjust only those controls that are covered by the operating instructions as improper adjustment of other controls may result in damage and may require extensive work by a qualified technician to restore the unit to normal operation.
- If the unit has been dropped or the case has been damaged.
- When the unit exhibits a distinct change in performance—this indicates a need for service.

Warning! Do not attempt to service this unit yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

Disconnecting Instructions

In the event that power needs to be quickly disconnected from the IVP-1, the user may separate the power cable from the processor at the power entry module by firmly grasping the power cable and pulling until the cable comes free.

Related Documents

Refer to the following for additional information:

- *HQV Insight IVP-1 Video Processor Service Manual*

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1. Introduction

Refer to these sections for a description of the product and a list of features and capabilities:

- **General Description** (page 1)
- **Features and Specifications** (page 2)

1.1 General Description

The HQV Insight IVP-1 (see **Figure 1**) is a high performance video signal processor intended as a companion for plasma and projector displays. IVP-1 brings the power of Silicon Optix Hollywood Quality Video^TM (HQV^TM) technology to viewers of flat panel and projector displays. Initially conceived in the military research labs of Lockheed Martin and then refined and commercialized by Teranex and Silicon Optix, HQV video processing has been the technology of choice of film and video professionals in broadcast and studio environments for years. A breakthrough in cost reduction and packaging now enables this revolutionary technology—previously found only in Professional Post Production, Film Editing and Broadcast Studios—to be delivered to your home or business viewing environment.

Figure 1: HQV Insight IVP-1 Video Processor

As a video signal processor, IVP-1 receives the video signals generated by a wide variety of consumer electronic and professional devices, switches between them, and applies HQV signal processing to the selected signal (see **Figure 2**). The processed signal is then scaled to the appropriate resolution and aspect ratio of the plasma panel, projector, or other display device.

HQV signal processing includes the following powerful features:

- State-of-the-art, motion-adaptive de-interlacing for both SDTV and HDTV
- Temporal Recursive Noise Reduction
- Codec Noise Reduction (includes mosquito noise reduction and block artifact removal)
- Detail Enhancement
- Fully-automatic detection and correction for multiple film/video cadences (3:2, 2:2, vari-speed, 6:4, 8:7, etc.)
- Brightness-Contrast Enhancement
- Color Space Conversion and Color Temperature Adjustment

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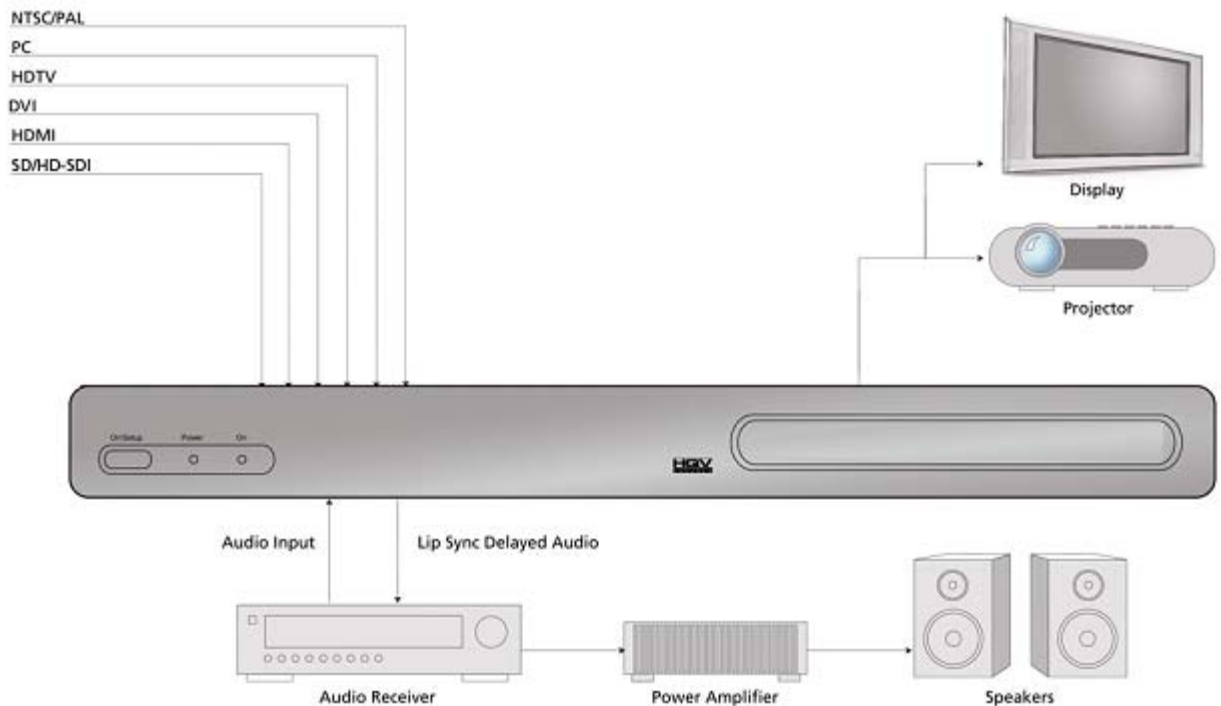For more information on HQV technology, visit http://www.hqv.com.

Figure 2: Typical IVP-1 Application

The IVP-1 also performs a number of useful signal processing functions such as high-quality video scaling, switching, and audio delay, thus eliminating the requirement for stand-alone scalers or audio delay units within your system.

The IVP-1 offers access to a truly wide range of signal inputs—everything from SDTV (composite, S-Video and component) to HD-SDI and all popular video and computer graphics signals in between (including analog RGB, DVI, and HDMI) may be selected as inputs.

The IVP-1 provides video output in HDMI, DVI and analog RGB formats on dedicated connectors.

All this functionality can be controlled through a simple 20-button IR remote control unit (see **Figure 5**). Simple navigation keys bring access to a simple, yet elegant OSD (On Screen Display). Video input device selection is accomplished using dedicated IR remote buttons. Access to the HQV features is also provided through dedicated IR remote buttons. Also, IVP-1 provides the professional user with flexible control methodologies of RS-232, USB, and Ethernet. For details on the control programming protocol, refer to the *HQV Insight IVP-1 Video Processor Service Manual*.

The IVP-1 is implemented in a compact and attractive desktop package that can be rapidly fitted to a standard 19" rack using a rack mounting kit.

1.2   Features and Specifications

Refer to the following for details:

- **Video and Audio Signals** (page 3)

1.2.1 Video and Audio Signals

Table 1 lists the audio and video signals supported.

Table 1: Video and Audio Signals

Signal Type	Input	Output
Video	• Composite Video (NTSC, PAL, and SECAM) • S-Video (NTSC and PAL) • Component (YPbPr for SDTV and HDTV in American and European formats) • Analog RGB (VGA to SXGA60Hz) • DVI (VGA to QXGA) • HDMI • SDI (including HD-SDI and audio)	• Analog RGB (VGA to UXGA) • DVI (VGA to QXGA) • HDMI
Audio	• S/PDIF • Toslink • HDMI	• S/PDIF • Toslink • HDMI

1.2.2 Video and Audio Processing Capability

These are the video and audio features supported:

- Scaling
- Audio Delay
- Input Switching
- Aspect Ratio Correction
- HQV Video Processing
  - Temporal-Recursive Noise Reduction
  - Codec Noise Reduction
  - Fully-automatic cadence detection and correction
  - Detail Enhancement
- Advanced motion-adaptive de-interlacing

1.2.3 Controls

These are the control entry points:

- IR Remote Control
- RS-232
- USB (for connection to Crestron / AMX boxes)
- Ethernet

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1.2.4   Physical Characteristics

These are the physical characteristics of the IVP-1.

Dimensions	17.0" x 9.7" x 1.75"(43.2 x 24.6 x 4.4 cm)
Weigh	7 lbs. (3.2 kg)
Power	100-240V, 47-63 Hz, 27W (typical)

1.2.5   Panel Diagrams

Figure 3 and **Figure 4** illustrate the front and rear panels, respectively.

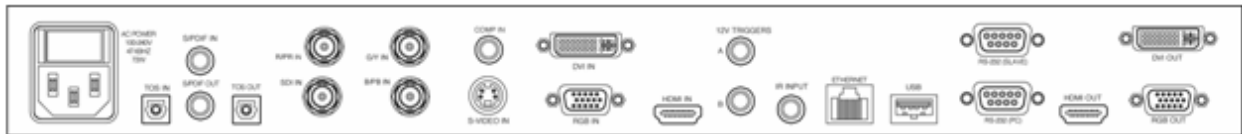**Figure 3: IVP-1 Front Panel Drawing**

Figure 4: IVP-1 Rear Panel Drawing

2. Installation

Refer to these sections for help on installing the IVP-1:

- **List of Standard Components** (page 5)
- **Setting Up Your IVP-1** (page 5)

2.1 List of Standard Components

The IVP-1 ships with a number of standard components. When unpacking your unit, verify that the following items are included:

- HQV Insight IVP-1 unit (qty. 1)
- IEC-320 American AC power cord (qty. 1)
- Infrared remote control (qty. 1)
- Rack-mount adapter kit (qty. 1, ordered separately)
- *HQV Insight IVP-1 Video Processor User Manual*
- *HQV Insight IVP-1 Video Processor Service Manual*

2.2 Setting Up Your IVP-1

To set up your IVP-1 unit

1. Connect the IVP-1 unit to the video input sources.
2. Connect the IVP-1 unit to the display device.
3. To power up the unit, press the **Power** switch located on the rear of the unit, close to the power cord.

   The Power switch may be left on in normal operation. The **On/Setup** button on the front panel may be used to put the unit into a low-power state (Setup Mode).

   Note: When the IVP-1 is in the Setup (Stand-by) Mode, the output to the projector or panel is temporarily suspended. The system is in a low power mode.

4. Select the output resolution to match the native resolution of the display device:

   4.1 Place the unit in Setup (Stand-by) Mode by toggling the **On/Setup** button on the IR remote.

   Alternatively, you may use the **On/Setup** button on the unit's front panel.

   4.2 Press the **Menu** button. Then use the **up/down** arrow keys of the remote to cycle through the different setup modes (which will be displayed on the box LCD display) until the output resolution mode is selected.

   "OUT = xxx" appears on the LCD display, where 'xxx' is the current active output resolution.

   4.3 Using the **left/right** arrow keys, select the desired output resolution.

5. Return the IVP-1 to On Mode by pushing the **On/Setup** button on the front panel or the **Power** button on the IR Remote.

   This activates the IVP-1 output circuits. Further adjustments may be made using the IVP-1's OSD (On Screen Display).

3. IVP-1 User Interface

Refer to these sections for details on the IVP-1 user interface:

- **Infrared Remote Control** (page 6)
- **IVP-1 Operational Modes** (page 7)

3.1 Infrared Remote Control

All IVP-1's user interface controls are accessed via infrared (IR) remote control. The remote has the following groups of controls:

- **OSD Navigation Buttons** (page 7), including the **On/Setup** Key
- **Video Source Selection Buttons** (page 7)
- **HQV Feature Selection Buttons** (page 7)

You may also select video sources and HQV processing features through the OSD navigation controls; however, dedicated IR remote keys provide you with quick one-touch access to the most frequently used commands. **Figure 5** illustrates the IVP-1's remote control.

Figure 5: IVP-1 Remote Control

3.1.1   OSD Navigation Buttons

These are the OSD navigation buttons on the IR remote.

- The **On/Setup** (indicated as **Power**) button toggles the IVP-1 between On and Setup modes of operation (as described in the **IVP-1 Operational Modes** on page 7).
- The **Menu** button is used to invoke the OSD main menu.
- The **Up/Down/Left/Right** arrow buttons are used to navigate the OSD.
- The **Enter/Select** button is used to activate an OSD menu selection.

3.1.2   Video Source Selection Buttons

Direct (one-touch) input selection is possible using the following buttons:

- The **RGB** button selects the VGA port as the active input.
- The **DVI** button selects the DVI port as the active input.
- The **Video** button selects the composite video port as the active input.
- The **S-Video** button selects the S-Video port as the active input.
- The **YPbPr** button selects component video as the active input.
- The **HDMI** button selects HDMI as the active input.
- The **SDI** button selects the SDI port as the active input

3.1.3   HQV Feature Selection Buttons

Additional buttons are available to directly access key video processing features and to cycle through the available enhancements:

- The **Aspect Ratio** button cycles through and selects the available aspect ratio treatments available for the current input and output mode combination. (for a description of aspect ratio treatments, see **Aspect Ratio** on page 20).
- The **TRNR** button accesses the Temporal Recursive Noise Reduction feature, cycling through the four available settings (Off, Low, Medium, and High).
- The **CNR** button accesses the Codec Noise Reduction feature, cycling through the four available settings (Off, Low, Medium, and High).
- The **Film** button cycles through the three available film mode treatments for active video (Auto Film/Video mode detect, Force to Video mode, Force to Film mode).
- The **Split** button activates/deactivates a split-screen mode for direct comparison of the image with and without noise reduction activated.

3.2   IVP-1 Operational Modes

The IVP-1 has two operational modes, On and Setup (Stand-by). These modes are selected by a dedicated key on the IR remote. The IVP-1 also enables selection of the On Mode with RS-232, USB, or Ethernet.

3.2.1   On Mode

On Mode is entered by toggling the **On/Setup** button on the IR remote. A brief transition of about three seconds occurs when On Mode is entered. During this transition period, the 24 x 2 LCD Display indicates

```
HQV Insight IVP-1
Please Wait
```

In On Mode, the video output signals are activated, and you may control all of IVP-1's parameters with the remote control (except for Setup restricted parameters, as noted below). The LCD front panel display indicates the following information in its 24 x 2 character matrix:

```
(Selected Input Connector) = (Input Signal Detected)
Output = (Output Resolution currently selected)
```

Depending on which IR remote key you select, the operation of the OSD is slightly different:

- If you select the **Menu** key, the IVP-1's OSD appears on the screen.

  The OSD remains on the screen until you press the Menu key once again or until 30 seconds with no IR remote activity passes. Complete details on the OSD may be found in the **On Screen Display** on page 12.

- If you select one of the dedicated HQV Feature keys, the HQV feature is immediately activated.

  A brief message indicating the status of the selected HQV feature appears momentarily on the screen (e.g. TRNR = Medium or CNR = Off).

- If you select one of the Input Source keys, the selected source is chosen as the input.

  The previously selected HQV Features, Aspect Ratio Treatment, Scaling and Video Parameters are all preserved for each input; each input appears exactly as you left it.

The IVP-1 powers up in On Mode. All operational parameters are retained from the previous session. A Factory Reset returns all parameters to the default state (defaults are described in the **On Screen Display** on page 12), except for the input signal. The input signal most recently used is retained as the power-up input signal.

3.2.2   Setup (Stand-by) Mode

Setup mode is entered by toggling the **On/Setup** button on the IR remote.

In Setup mode, the IVP-1 is in a low-power state. The output signals are de-activated (no output will appear on your display device). Setup mode enables you to power the unit down, but still leaves the IR receiver circuitry energized so that you can re-start the system with the IR remote. When the unit is in Setup Mode, you can also make adjustments to certain sensitive parameters, such as Output Resolution. Visual feedback for the adjustments of Setup Mode is seen on the 24 x 2 LCD display, rather than on OSD of the main screen. Sensitive parameters are placed in the Setup Menu so that an inadvertent key stroke with the IR remote does not cause a change in a parameter from which that would be difficult to recover.

Table 2 lists the setup parameters, and **Table 3** lists the output resolutions currently supported in the unit.

Table 2: Setup Parameters (1 of 2)

Parameter	Description[1]
OUT = XXX ## Hz	Cycles through all of the available IVP-1 output modes (see **Table 3** for a list of Output Resolutions).
LCD Brightness = **On** (Off)	Turns On (Off) the 24 x 2 LCD Display during On Mode
BAUD = #####	Lets you choose a baud rate of 1200, 9600, 19200, 57600, or **115000**.
OSD Location = **Input** (Output)	The OSD may be located pre (Input side) or post (Output side) scaling

Table 2: Setup Parameters (2 of 2)

Parameter	Description[1]
PC Control = **Active** (Inactive)	Turns On (Off) the computer control capability
DHCP = **Enabled** (Disabled)	Turns on Dynamic IP Address Selection
IP=aaa.bbb.ccc.ddd	Select IP Address (selectable only if DHCP = Disabled)
DNS=aaa.bbb.ccc.ddd	Select DNS Address (selectable only if DHCP = Disabled)
2nd DNS=aaa.bbb.ccc.ddd	Select Alternate DNS Address (selectable only if DHCP = Disabled)
Gateway=aaa.bbb.ccc.ddd	Select Gateway Address (selectable only if DHCP = Disabled)
SubMask=aaa.bbb.ccc.ddd	Select SubNet Mask (selectable only if DHCP = Disabled)
MAC = ## ## ## ## ## ##	Indicates the MAC Address of IVP-1 unit
Serial No = ######	Indicates the serial number of IVP-1 unit
µProc Rev = #.##	Indicates the revision number of the Front Panel microprocessor.

1. The default parameter configurations are highlighted in bold.

Table 3: IVP-1 Output Modes (1 of 2)

Output Mode	Comments
VGA 60 Hz (640 x 480)	VESA Standard
VGA 50 Hz (640 x 480)	VESA Standard
848 x 480 60 Hz	-
SVGA 60 Hz (800 x 600)	VESA Standard
SVGA 50 Hz (800 x 600)	VESA Standard
720p 60 Hz (1280 x 720)	SMPTE Standard
720p 50 Hz (1280 x 720)	SMPTE Standard
XGA 60 Hz (1024 x 768)	VESA Standard
XGA 72 Hz (1024 x 768)	VESA Standard
XGA 50 Hz (1024 x 768)	VESA Standard
1360 x 768 60 Hz	-
1365 x 768 60 Hz	-
1400 x 788 60 Hz	-
SXGA 60 Hz (1280 x 1024)	VESA Standard
SXGA 50 Hz (1280 x 1024)	VESA Standard
SXGA+ 60 Hz (1400 x 1050)	VESA Standard
SXGA+ 50 Hz (1400 x 1050)	VESA Standard

Table 3: IVP-1 Output Modes (2 of 2)

Output Mode	Comments
1080p 60 Hz (1920 x 1080)	SMPTE Standard
1080p 50 Hz (1920 x 1080)	SMPTE Standard
1080p 48 Hz (1920 x 1080)	SMPTE Standard
QXGA 60 Hz (2048 x 1536)	-
QXGA 50 Hz (2048 x 1536)	-
QXGA 48 Hz (2048 x 1536)	-
UXGA 60Hz (1600 x 1200)	VESA Standard
1365 x 1024 50 Hz	-
1365 x 1024 60 Hz	-
1360 x 1024 60 Hz	-
Digital Cinema 60 Hz (2048 x 1080)	-
Digital Cinema 24 Hz (2048 x 1080)	-
WUXGA 60 Hz (1920 x 1200)	-
1366 x 768	Panasonic Timing
Reserved 9	Reserved for future use
Reserved 10	Reserved for future use
Reserved 11	Reserved for future use
Reserved 12	Reserved for future use

3.2.2.1 Setting Up the Unit

On entry to the Setup mode, the 24 x 2 LCD display indicates the following:

```
HQV Insight IVP-1
Setup
```

Select the **Menu** key on your IR remote to bring up the Setup Menu on the 24 x 2 LCD display. The LCD display indicates the following:

```
"Parameter" = ???
Setup Mode
```

Using the **up/down** navigation keys on the remote, you can select the next parameter in a circular list of parameters. Using the **left/right** navigation keys on the remote, you can select the value of the parameter. In some cases, the parameter is visible in the setup menu, but may not be altered (such as Serial Number or MAC Address).

Selection of IP addresses is slightly different. IP addresses may only be selected if the DHCP parameter has been set to "Off". In this case, you use the **left/right** navigation key to "enter" the IP address. The **left** key will highlight the rightmost octet; the **right** key will select the leftmost octet. The **up/down** keys may then be used

to increase/decrease the value of the octet. Subsequent presses of the **left/right** key highlight the octet immediately to the left/right. The **up/down** keys may then be used to increase/decrease the value of the octet. When the leftmost/rightmost octet is selected, an additional **left/right** key selection "exits" the IP address. The **up/down** arrows may then be used to select the next parameter. Table 2 on page 8 lists the Setup parameters.

4.   On Screen Display

Refer to these section for details on the On Screen Display (OSD):

- **OSD Menu Structure** (page 12)
- **Aspect Ratio** (page 20)

4.1   OSD Menu Structure

The OSD is the primary way of controlling and selecting functions in the IVP-1 system. When first powered up, the IVP-1 is in a Factory Default configuration, with English as the OSD language, Component Video as Video Input, and S/PDIF Audio as Audio input. All other Factory Default parameters are indicated in **Table 5** on page 13.

When you select the **Factory Reset** from the OSD menu, IVP-1 reloads all of these default parameters, replacing any adjustments previously made. Certain parameters are not affected by the Factory Reset and are left in their most recently selected position. These parameters are: Language, Selected Input, and Selected Audio Input. As indicated in the **IVP-1 User Interface** on page 6, the Setup Parameters are not affected by Factory Reset.

IVP-1 preserves all the signal processing parameters on a selected input basis. When you power down or select a different input, the processing parameters previously selected are automatically re-established when returning to that input. An Input Reset sets the currently selected input to its default parameters. (This allows you to reset a specific input channel without disturbing selections that affect the entire IVP-1 operation).

A complete view of the OSD menu structure is shown in **Table 4** on page 12 and **Table 5** on page 13.

4.1.1   OSD Main Menu Structure

Table 4 presents the OSD Main Menu structure.

Table 4: OSD Main Menu Structure (1 of 2)

Icon		Label	Functionality
On	**Off**		
		Inputs	Enter this submenu to select the video or audio input.
		Picture	Enter this menu to adjust the image brightness, contrast, sharpness, gamma correction, black level, color temperature, color, hue, tint, and aspect ratio.
		Setup	Enter this submenu to review the video system, select the background color, reset to default settings, and setup the menu position.

Table 4: OSD Main Menu Structure (2 of 2)

Icon		Label	Functionality
On	**Off**		
		Language	Enter this submenu to select the language used by the OSD.
		Info	Enter this submenu to view information about the system (input resolution, horizontal and vertical frequency, output resolution, horizontal and vertical frequency, firmware revision, FPGA revision, serial number, and IP address).
		Advanced	Enter this submenu to access the advanced menu options.

4.1.2   OSD Complete Menu Structure

Table 5 presents the complete OSD menu structure.

Note: Default values are marked in bold.

Table 5: OSD Complete Menu Structure (1 of 8)

OSD Menu Level					Comments
Level 1	**Level 2**	**Level 2**	**Level 4**	**Level 5**	
Inputs	Video	Component	-	-	HDTV or SDTV
		VGA	-	-	SDTV, HDTV, or Graphics
		DVI	-	-	Graphics, RGB HDTV
		S-Video	-	-	SDTV
		Composite	-	-	SDTV
		SDI	-	-	SDI input selection
		HDMI	-	-	HDMI input selection
	Audio	TosLink	-	-	Selects TosLink as audio source
		S/PDIF	-	-	Selects S/PDIF as audio source
	Audio Delay	-100 - +100, **0 (default)**	-	-	Adjusts the Audio Delay through IVP-1. The Audio Delay is calibrated in milliseconds. A delay of '0' selects a delay that is automatically adjusted to the number of frames of delay introduced by IVP-1 processing. The Audio Delay adjustment allows the user to compensate for Audio or Video delay that is introduced by other system components

Table 5: OSD Complete Menu Structure (2 of 8)

OSD Menu Level					Comments
Level 1	Level 2	Level 2	Level 4	Level 5	
Picture	Picture Settings	Brightness	0 - 100, **50 (default)**	-	The higher the setting, the greater the brightness. The lower the setting, the lower the brightness.
		Contrast	0 - 100, **50 (default)**	-	The higher the setting, the greater the contrast. The lower the setting, the lower the contrast.
		Sharpness	0 - 100, **50 (default)**	-	The higher the setting, the sharper the image (edge enhancement). The lower the setting, the lower the sharpness.
		Detail Enhancement	0 - 100, **0 (default)**	-	The higher the setting, the better the image (detail enhancement). The lower the setting, the lower the detail enhancement.
		Gamma Mode	Input Gamma	Gamma 1.0 **(default)**	Gamma LUT for linear response (1.0).
				Gamma 1.5	Gamma LUT for non-linear response (1.5).
				Gamma 2.2	Gamma LUT for non-linear response (2.2).
				Gamma 2.4	Gamma LUT for non-linear response (2.4).
				Gamma 2.5	Gamma LUT for non-linear response (2.5).
				Gamma 2.8	Gamma LUT for non-linear response (2.8).
			Output Gamma	Gamma 1.0 **(default)**	Gamma LUT for linear response (1.0).
				Gamma 2.2	Gamma LUT for non-linear response (2.2).
				Gamma 2.4	Gamma LUT for non-linear response (2.4).
				Gamma 2.5	Gamma LUT for non-linear response (2.5).
				Gamma 2.8	Gamma LUT for non-linear response (2.8).
		Color Temp	9300K	-	Gives a blue tint to the white colors.
			6500K **(default)**	-	Gives a neutral tint to the white colors.
			5500K	-	Gives a red tint to the white colors.
		Color	0 - 100, **50 (default)**	-	The higher the setting, the greater the intensity. The lower the setting, the lower the intensity.
		Hue	0 - 360, **180 (default)**	-	The higher the setting, the more greenish the picture. The lower the setting, the more purplish the picture.
		Input Reset	Confirm YES/NO	-	Returns all of the adjustments for a single input to the Factory Default state. All the other inputs and selections that affect the IVP-1 operation are unaffected

Table 5: OSD Complete Menu Structure (3 of 8)

OSD Menu Level					Comments
Level 1	Level 2	Level 2	Level 4	Level 5	
Picture	Aspect Ratio	Standard (**default**)	-	-	Maintains the aspect ratio: • 4:3 input and 16:9 output - Output image would be displayed with black pillar bars (maintains input aspect ratio) • 4:3 input and 4:3 output - No change • 16:9 input and 16:9 output - No change • 16:9 input and 4:3 output - Output image would be displayed with black letter box bars (maintains input aspect ratio)
		Full Screen	-	-	Fills the Output Screen by stretching the image (distorting the aspect ratio): • 4:3 input and 4:3 output – Grayed out, no action • 4:3 input and 16:9 output – Image is linearly stretched horizontally to fill the output screen • 16:9 input and 4:3 output - Image is linearly stretched vertically to fill the output screen • 16:9 input and 16:9 output – Grayed out, no action See **Aspect Ratio** (page 20) for more information.
		Crop	-	-	Fills the Output Screen by cropping the image (maintaining aspect ratio). • 4:3 input and 4:3 output – Grayed out, no action • 4:3 input and 16:9 output – Top and bottom portions of the image are cropped • 16:9 input and 4:3 output – Left and right portions of the image are cropped • 16:9 input and 16:9 output – Grayed out, no action See **Aspect Ratio** (page 20) for more information.
		Anamorphic	-	-	This mode is used with DVDs (Standard Definition) that are in Widescreen [16:9] format: • 4:3 input and 4:3 output – The image is letter boxed • 4:3 input and 16:9 output – The image appears full screen • 16:9 input and 4:3 output – Grayed out, no action • 16:9 input and 16:9 output – Grayed out, no action See **Aspect Ratio** (page 20) for more information.
		Flexview	-	-	Fills the Output Screen by stretching the image (distorting the aspect ratio): • 4:3 input and 4:3 output – Grayed out, no action • 4:3 input and 16:9 output – Image is non-linearly stretched horizontally to fill the output screen • 16:9 input and 4:3 output – Grayed out, no action • 16:9 input and 16:9 output – Grayed out, no action See **Aspect Ratio** (page 20) for more information.

Table 5: OSD Complete Menu Structure (4 of 8)

OSD Menu Level					Comments
Level 1	Level 2	Level 2	Level 4	Level 5	
Picture	Aspect Ratio	Squeeze	-	-	Squeezes 16:9 pre-stretched inputs to 4:3 presentation • 4:3 input and 4:3 output – grayed out, no action • 4:3 input and 16:9 output – grayed out, no action • 16:9 input and 4:3 output – full screen 16:9 input is squeezed to full screen 4:3 (this aspect ratio treatment assumes 16:9 input that has been horizontally pre-stretched from a 4:3 source) • 16:9 input and 16:9 output – full screen 16:9 input is squeezed to 4:3 and presented in a pillar box (This aspect ratio treatment assumes 16:9 input that has been horizontally pre-stretched from a 4:3 source) See **Aspect Ratio** (page 20) for more information.
		Theater Scope	-	-	Provides aspect ratio treatments for a system that includes an Anamorphic Lens. • 4:3 input and 4:3 output – the central 16:9 aspect ratio strip is cropped and scaled to full screen output. • 4:3 input and 16:9 output - the central 2.35 aspect ratio strip is cropped, and scaled to full screen output. • 16:9 input and 4:3 output – full screen 16:9 input is squeezed to full screen output • 16:9 input and 16:9 output – the central 2.35 aspect ratio strip is cropped, and scaled to full screen output. See **Aspect Ratio** (page 20) for more information.
	Picture Position	Vertical	0 - 100	-	Adjusts the vertical position of image (default setting depends on the input video/graphics source).
		Horizontal	0 - 400	-	Adjusts the horizontal position of image (default setting depends on the input video/graphics source).
	Autosync	-	-	-	Automatically centers the image for graphic inputs.
	Sync	Clock	0 - 200, **100 (default)**	-	Adjusts clock sync.
		Phase	0 - 100, **50 (default)**	-	Adjusts clock phase.

Table 5: OSD Complete Menu Structure (5 of 8)

OSD Menu Level					Comments
Level 1	Level 2	Level 2	Level 4	Level 5	
Picture	Overscan	Status	Off	-	Sets Overscan off.
			On	-	Sets Overscan on.
		Left	0.0 – 10.0 0.0 (**default**)	-	Sets the percentage of Overscan on the left edge
		Right	0.0 – 10.0 0.0 (**default**)	-	Sets the percentage of Overscan on the right edge
		Top	0.0 – 10.0 0.0 (**default**)	-	Sets the percentage of Overscan on the top edge
		Bottom	0.0 – 10.0 0.0 (**default**)	-	Sets the percentage of Overscan on the bottom edge
Setup	Menu Position	Center	-	-	Sets the OSD menu position in the center of the display
		Top Left	-	-	Sets the OSD menu position in the top left corner of the display
		Top Right	-	-	Sets the OSD menu position in the top right corner of the display
		Bottom Left	-	-	Sets the OSD menu position in the bottom left corner of the display
		Bottom Right	-	-	Sets the OSD menu position in the bottom right corner of the display
	Test Patterns	-	-	-	Displays test pattern images on screen, with OSD off. Up- and down-arrows navigate user through all 10 available test patterns. Left-arrow key returns user to Test Pattern menu. Test patterns: • Screen boundary with circle • 100% Color bars • Full White • Full Black • White Adjustment (levels 253, 254, 255) • Black Adjustment (levels 0, 1, 2) • Gray Bars • Resolution alignment • RGB Bars • Grid

Table 5: OSD Complete Menu Structure (6 of 8)

OSD Menu Level					Comments
Level 1	Level 2	Level 2	Level 4	Level 5	
Setup	12 V Triggers	Trigger A	Off (**default**)	-	Sets Trigger A off.
			On	-	Sets Trigger A on.
		Trigger B	Off (**default**)	-	Sets Trigger B off.
			On	-	Sets Trigger B on.
	Factory Reset	Confirm YES/NO	-	-	Resets to default settings
Language	English	-	-	-	Selects the language for the OSD menus
	French	-	-	-	Selects the language for the OSD menus
	German	-	-	-	Selects the language for the OSD menus
	Italian	-	-	-	Selects the language for the OSD menus
	Spanish	-	-	-	Selects the language for the OSD menus
	Portuguese	-	-	-	Selects the language for the OSD menus
	Swedish	-	-	-	Selects the language for the OSD menus
	Russian	-	-	-	Selects the language for the OSD menus
	Japanese	-	-	-	Selects the language for the OSD menus
	Chinese Simplified	-	-	-	Selects the language for the OSD menus
	Chinese Traditional	-	-	-	Selects the language for the OSD menus
	Korean	-	-	-	Selects the language for the OSD menus
Info	Input Resolution	-	-	-	Shows the source resolution
	Input H Frequency	-	-	-	Shows the source H frequency
	Input V Frequency	-	-	-	Shows the source V frequency
	Output Mode	-	-	-	Shows the display mode
	Output Resolution	-	-	-	Shows the display resolution
	Output H Frequency	-	-	-	Shows the display H frequency
	Output V Frequency	-	-	-	Shows the display V frequency
	Sync	-	-	-	Shows the synchronization type
	Firmware Revision	-	-	-	Shows the firmware revision number
	Serial Number	-	-	-	Shows the board serial number.
	IP Address	-	-	-	Shows the IP address only if the Ethernet cable is connected to the board and the IP address has been assigned by DHCP
	FPGA Revision	-	-	-	Shows the current revision number for the FPGA code
	Standby Micro Rev. #	-	-	-	Shows the firmware revision number for the standby-mode microcontroller

Table 5: OSD Complete Menu Structure (7 of 8)

OSD Menu Level					Comments
Level 1	**Level 2**	**Level 2**	**Level 4**	**Level 5**	
Advanced	Projection	Projection Mounting	Front Tabletop (**default**)	-	Normal projection mode
			Front Ceiling	-	Compensate the image for ceiling-mounting scenario
			Rear Tabletop	-	Compensate the image for projection from behind the screen
			Rear Ceiling	-	Compensate the image for ceiling-mounted rear-projection scenario
	Video Processing Mode	HQV On (**default**)	-	-	Process main image in the TVP
		HQV Off (Bypass)	-	-	Process main image in Overlay Scaler (bypass the TVP processor)
	HQV Film Mode	Auto (**default**)	-	-	The system automatically selects the best mode for de-interlacing (film or video)
		Video	-	-	Forces to video mode for de-interlacing
		Film	-	-	Forces to film mode for de-interlacing
	BCE	Video [1]	-	-	Expands video range signals (16-235) linearly to full range output
		Cinema	-	-	Provides Luma processing optimized for movies; expands video range signals.
		Vivid	-	-	Enhances color, expands video range signals.
		Dark Scene	-	-	Enhances detail in dark scenes, expands video range signals.
		Bright Scene	-	-	Enhances detail in bright scenes, expands video range signals.
		Graphics [2]	-	-	Transfers full range input signals (0-255) to full range output

Table 5: OSD Complete Menu Structure (8 of 8)

OSD Menu Level					Comments
Level 1	Level 2	Level 2	Level 4	Level 5	
Advanced	HQV Noise Reduction	TRNR	Off	-	Turns off Temporal Recursive Noise Reduction (TRNR)
			Low (**default**)	-	Select TRNR -- low bias setting
			Med	-	Select TRNR -- medium bias setting
			High	-	Select TRNR -- high bias setting
		CNR	Off (**default**)	-	Turns off the Codec Noise Reduction
			Low	-	Select Codec Noise Reduction, low level
			Medium	-	Select Codec Noise Reduction, medium level
			High	-	Select Codec Noise Reduction, high level
	Split	Off (**default**)	-	-	Toggles the split screen mode
		On	-	-	Toggles the split screen mode

1. Default for HDMI, Component, Composite, S-Video, and SDI inputs.

2. Default for DVI and Analog RGB inputs.

4.2   Aspect Ratio

The IVP-1 provides several different aspect ratio treatments. The operation mode of these treatments depends on the aspect ratio of the input channel and the output display.

4.2.1   Supported Aspect Ratios

The IVP-1 assumes that the aspect ratio of input and output is consistent with the industry standard definition of the aspect ratio of the particular input signal and video mode. Output aspect ratio is thus determined by the resolution selected by the user in Setup Mode. Input aspect ratio is determined by the IVP-1 video mode recognition circuitry.

Note: Only two output aspect ratios are supported, 4:3 and 16:9[1].

Inputs considered to have 4:3 aspect ratio are as follows:

*   Computer Graphics signals with a 4:3 aspect ratio appearing on the DVI and Analog RGB inputs

*   SDTV signals (NTSC and PAL derived) appearing on the Composite, S-Video, and Component inputs

*   SDTV signals (NTSC and PAL derived) appearing on the SDI input

*   SDTV signals (NTSC and PAL derived) appearing on the HDMI input

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1. The special case of 1280 x 1024 SXGA (an aspect ratio of 5:4) on output is treated as if it were 4:3. The output of a 1280 x 1024 display will be slightly distorted; circles will appear to be vertically oriented ovals. Since the IVP-1 is intended for wide screen processing, the 1280 x 1024 SXGA is not a frequently encountered case. Input of 1280 x 1024 will be treated as a pillar boxed 4:3 signal (i.e. it will have narrow black bars on the Right and Left); aspect ratio of the picture content will be undistorted.

Inputs considered to have 16:9 aspect ratio are as follows:

- Computer Graphics signals with a 16:9 aspect ratio appearing on the DVI and Analog RGB inputs
- HDTV signals (480p, 720p, 1080i, 1080p) appearing on the Component input
- HDTV signals (480p, 720p, 1080i, 1080p) appearing on the SDI input
- HDTV signals (480p, 720p, 1080i, 1080p) appearing on the HDMI input

4.2.2 Aspect Ratio Treatments—Objectives

The aspect ratio treatments achieve different aspect ratio objectives, and therefore behave differently depending on which input and output aspect ratios are currently selected.

The Aspect Ratio objectives are the following:

- **Standard** always displays the correct aspect ratio of the input picture; adds black bars at the top and bottom or sides of the picture to achieve this objective.
- **Full Screen** always fills the screen with the complete picture; linearly distorts the picture to achieve this objective.
- **Crop** always fills the screen with the correct aspect ratio of the input picture; crops the picture's top and bottom or sides to achieve this objective.
- **Anamorphic** handles the specific case of 16:9 aspect ratio anamorphically encoded into a 4:3 aspect ratio signal (e.g. an NTSC DVD encoded with a 16:9 picture).
- **Flexview** handles the specific case of a 4:3 input aspect ratio and 16:9 output aspect ratio.
- **Squeeze** compensates for signals that are incorrectly presented as 16:9. This often occurs in cable TV situations, where a 4:3 aspect ratio signal is mistakenly stretched to 16:9.
- **Theater Scope** prepares presentations for use with an Anamorphic lens, which optically stretches images in the horizontal direction. With such a lens, a 4:3 projector fills a 16:9 screen, and a 16:9 projector fills a 2.35 aspect ratio screen. Viewed without the lens, the treatment appears distorted (stretched vertically).

4.2.3 Aspect Ratio Treatments—Input and Output Combinations

Table 6 to Table 9 present the aspect ratio treatments over the various combinations of Input Aspect Ratio and Output Aspect Ratio.

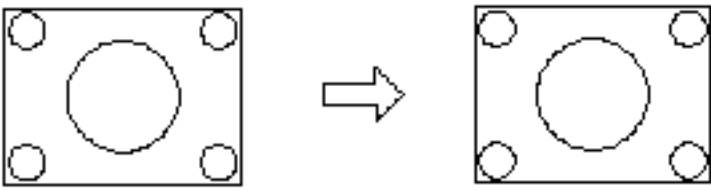**Table 6: Aspect Ratio Treatments for 4:3 Input with 4:3 Output (1 of 2)**

OSD Menu Name	Description
Standard	4:3 input signals shown full screen on 4:3 output display
Full Screen	Grayed out. No action.
Crop	Same as "Standard" mode above.

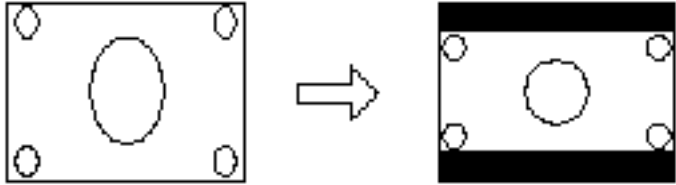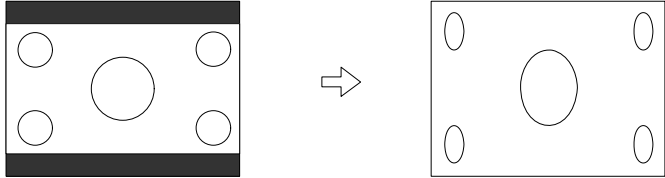**Table 6: Aspect Ratio Treatments for 4:3 Input with 4:3 Output (2 of 2)**
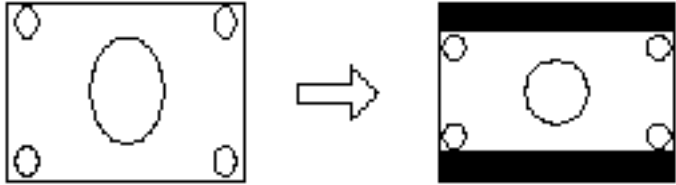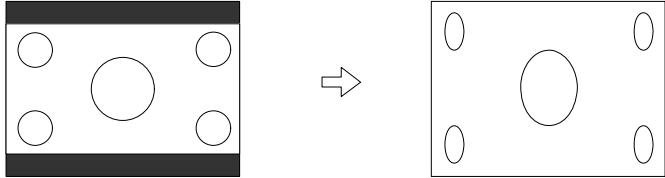
OSD Menu Name	Description
Anamorphic	Anamorphic or widescreen encoded DVDs shown letterbox on 4:3 output display. These DVDs have 16:9 content that has been compressed and expanded vertically to fit the NTSC or PAL signal.
Flexview	Grayed out. No action.
Squeeze	Grayed out. No action.
Theater Scope	Vertically distorted 4:3 output image will be stretched horizontally to 16:9 by Anamorphic lens.

Table 6: Aspect Ratio Treatments for 4:3 Input with 4:3 Output (2 of 2)
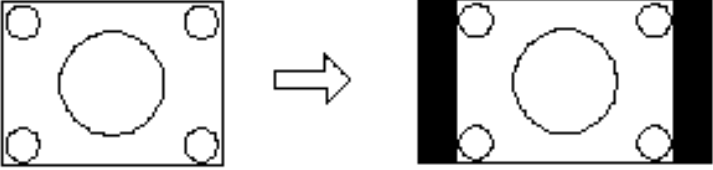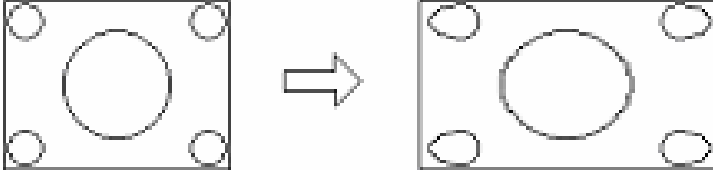
OSD Menu Name	Description
Anamorphic	Anamorphic or widescreen encoded DVDs shown letterbox on 4:3 output display. These DVDs have 16:9 content that has been compressed and expanded vertically to fit the NTSC or PAL signal.
Flexview	Grayed out. No action.
Squeeze	Grayed out. No action.
Theater Scope	Vertically distorted 4:3 output image will be stretched horizontally to 16:9 by Anamorphic lens.

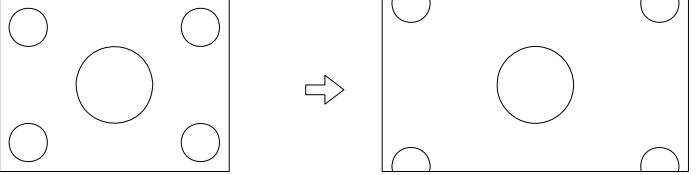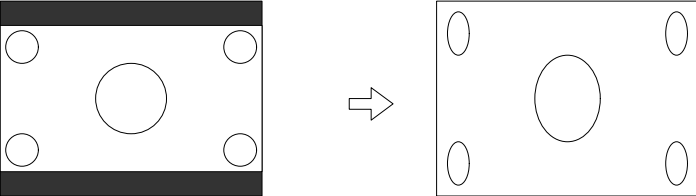**Table 7: Aspect Ratio Treatments for 4:3 Input with 16:9 Output (1 of 2)**
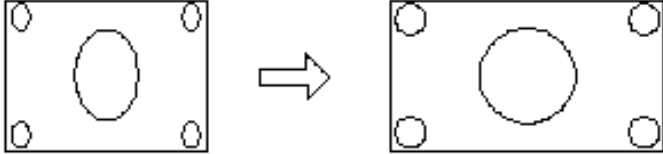
OSD Menu Name	Description
Standard	4:3 input signals are shown in a pillar box on the 16:9 output display
Full Screen	4:3 input is linearly stretched horizontally to fill the 16:9 screen
Crop	Top and bottom of image are cropped
Anamorphic	SDTV input is displayed on a full screen 16:9 output display

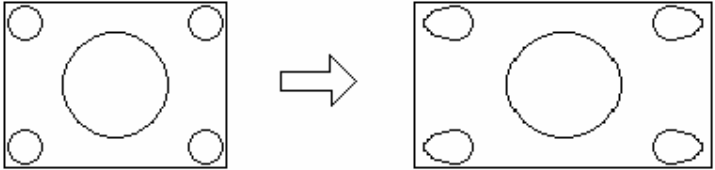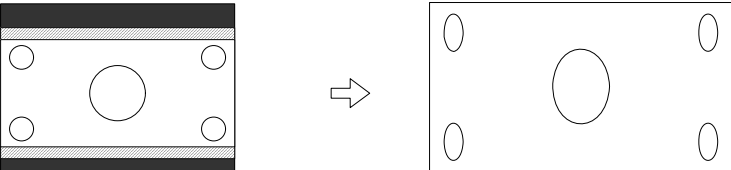**Table 7: Aspect Ratio Treatments for 4:3 Input with 16:9 Output (2 of 2)**

OSD Menu Name	Description
Flexview	4:3 input signals are non-linearly stretched in the horizontal direction to fill 16:9 output displays. Horizontal and vertical scaling is equal in the middle, more horizontal stretching towards left and right sides to fill 16:9 outputs
Squeeze	Grayed out. No action.
Theater Scope	Vertically distorted 16:9 image will be stretched to 2.35 by Anamorphic lens.

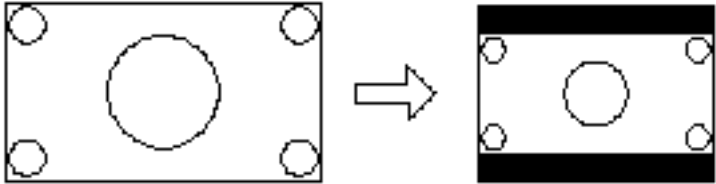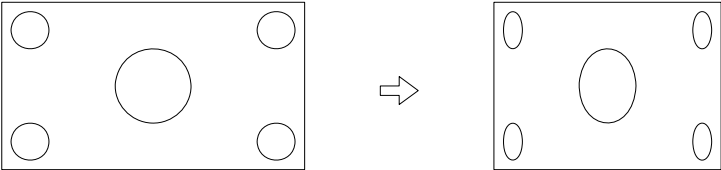**Table 8: Aspect Ratio Treatments for 16:9 Input with 4:3 Output**
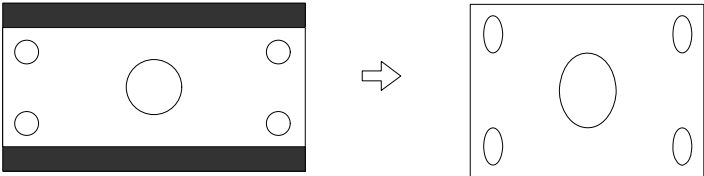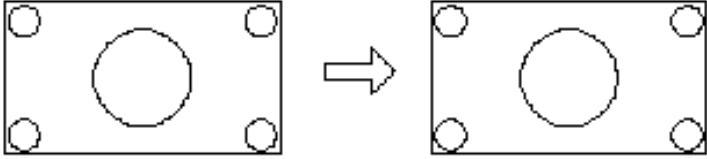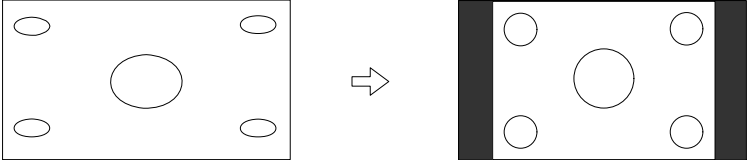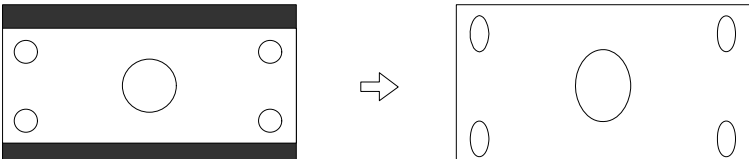
OSD Menu Name	Description
Standard	All HDTV inputs are assumed to be 16:9. HDTV input signals (1080i and 720p) are shown in a letterbox on the 4:3 output display
Full Screen	Image stretched vertically to fill full screen.
Crop	16:9 HDTV input signals shown in 4:3 output display, cropped on left and right sides
Anamorphic	Grayed out. No action.
Flexview	Grayed out. No action.
Squeeze	16:9 Input is squeezed to 4:3.
Theater Scope	Vertically distorted 16:9 image will be stretched to 16:9 by Anamorphic lens.

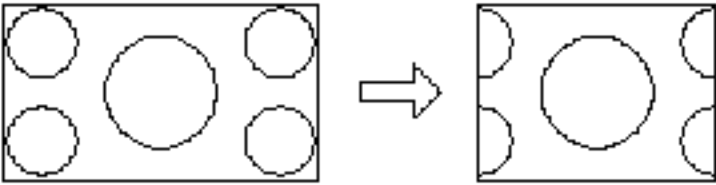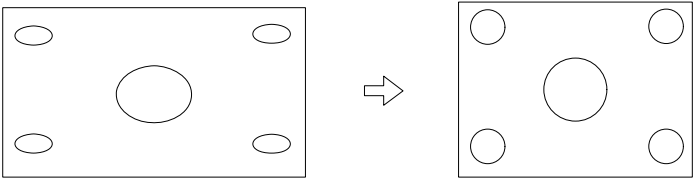**Table 9: Aspect Ratio Treatments for 16:9 Input with 16:9 Output**

OSD Menu Name	Description
Standard	16:9 input signals shown full screen on 16:9 output display
Full Screen	Grayed out. No action.
Crop	Grayed out. No action.
Anamorphic	Grayed out. No action.
Flexview	Grayed out. No action.
Squeeze	16:9 Input will be squeezed and pillar boxed.
Theater Scope	Vertically distorted 16:9 image will be stretched to 2.35 by Anamorphic lens.

A. Input Modes Supported

Table 10 lists the input modes supported.

Table 10: Input Modes Supported(1 of 2)

#	Input Timing Format			Input Video Source						
	Description	Resolution	Frequency	RGB	DVI	HDMI	Composite	S-Video	Component	SDI
1.	480i (NTSC)	720x485	60Hz	NO	-	YES	YES	YES	YES	YES
2.	576i (PAL)	720x576	50Hz	NO	-	YES	YES	YES	YES	YES
3.	576i (SECAM)	720x576	50Hz	-	-	-	YES	YES	-	-
4.	480p	720x483	60Hz	YES	YES	YES	-	-	YES	NO
5.	576p	720x576	50Hz	YES	YES	YES	-	-	YES	NO
6.	HDTV 720 PROGRESSIVE	1280x720	60Hz	YES	YES	YES	-	-	YES	YES
7.	HDTV 720 PROGRESSIVE	1280x720	50Hz	YES	YES	YES	-	-	YES	YES
8.	HDTV 1080i @ 60Hz	1920x1080	60Hz	YES	YES	YES	-	-	YES	YES
9.	HDTV 1080i @ 50Hz	1920x1080	50Hz	YES	YES	YES	-	-	YES	YES
10.	1080p @ 24Hz	1920x1080	24Hz	NO	YES	YES	-	-	YES	YES
11.	1080p @ 25Hz	1920x1080	25Hz	NO	YES	YES	-	-	YES	YES
12.	1080p @ 30Hz	1920x1080	30Hz	NO	YES	YES	-	-	YES	YES
13.	1080p @ 24sF (1080i48)	1920x1080	48Hz	NO	YES	YES	-	-	-	YES
14.	1080p @ 25sF (1080i50)	1920x1080	50Hz	NO	YES	YES	-	-	YES	YES
15.	1080p @ 30sF (1080i60)	1920x1080	60Hz	NO	YES	YES	-	-	YES	YES
16.	1080p @ 50Hz	1920x1080	50Hz	NO	YES	YES	-	-	-	-
17.	1080p @ 60Hz	1920x1080	60Hz	NO	YES	YES	-	-	-	-
18.	DOS TEXT	640x400	70Hz	YES	YES	YES	-	-	-	-
19.	VGA @ 60Hz	640x480	60Hz	YES	YES	YES	-	-	-	-
20.	SVGA @ 75Hz	800x600	75Hz	YES	YES	YES	-	-	-	-
21.	SVGA @ 60Hz	800x600	60Hz	YES	YES	YES	-	-	-	-
22.	848 x 480	848 x 480	60Hz	YES	YES	YES	-	-	-	-
23.	1024 x 576	1024 x 576	60Hz	YES	YES	YES	-	-	-	-
24.	1400x788	1400x788	60Hz	YES	YES	YES	-	-	-	-
25.	XGA @ 75Hz	1024x768	75Hz	YES	YES	YES	-	-	-	-
26.	XGA @ 60Hz	1024x768	60Hz	YES	YES	YES	-	-	-	-
27.	SXGA @ 75Hz	1280x1024	75Hz	YES	YES	YES	-	-	-	-

Table 10: Input Modes Supported(2 of 2)

#	Input Timing Format			Input Video Source						
	Description	Resolution	Frequency	RGB	DVI	HDMI	Composite	S-Video	Component	SDI
28.	SXGA @ 60Hz	1280x1024	60Hz	YES	YES	YES	-	-	-	-
29.	1360 x 768	1360x768	60Hz	YES	YES	YES	-	-	-	-
30.	1365 x 768	1365x768	60Hz	YES	YES	YES	-	-	-	-
31.	SXGA+	1400x1050	60Hz	YES	YES	YES	-	-	-	-
32.	UXGA	1600x1200	60Hz	-	YES	YES	-	-	-	-
33.	WUXGA	1920x1200	60Hz	-	YES	-	-	-	-	-
34.	QXGA	2048x1536	60Hz	-	YES	-	-	-	-	-
35.	MAC II Normal 13in	640x480	67Hz	YES	YES	YES	-	-	-	-
36.	MAC II Normal 16in	832x624	75Hz	YES	YES	YES	-	-	-	-
37.	MAC II Normal 19in	1024x768	75Hz	YES	YES	-	-	-	-	-
38.	MAC II Normal 21in	1152x870	75Hz	YES	YES	YES	-	-	-	-
39.	MAC	1440x960	96Hz	-	YES	-	-	-	-	-
40.	MAC 20	1680x1050	88Hz	-	YES	-	-	-	-	-
41.	MAC 23	1920x1200	76Hz	-	YES	-	-	-	-	-

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b.7.2 Export Regulations

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b.7.3 Severability

If any provision of this Agreement is held by a court of competent jurisdiction to be contrary to law the remaining provisions of this Agreement shall remain in full force and effect.

b.7.4 Governing Law and Jurisdiction

This Agreement shall not be governed by the 1980 United Nations Convention on Contracts for the International Sale of Goods; rather, this Agreement shall be governed by and construed under the laws of the State of California without reference to conflict of laws principles. All disputes arising out of or related to this

Agreement shall be subject to the exclusive jurisdiction of the state and federal courts located in Santa Clara County, California, and the parties agree and submit to the personal and exclusive jurisdiction and venue of these courts.

b.7.5 Modification

This is the entire agreement between the parties relating to the subject matter hereof and all other terms are rejected. No waiver or modification of this Agreement shall be valid unless in writing signed by each party. The waiver of a breach of any term hereof shall in no way be construed as a waiver of any other term or breach hereof.

Glossary

provides a list of acronyms and terms used throughout this manual.

Table 11: Terms and Acronyms

Term	Description
BCE	Brightness/Contrast Enhancement
DOS	Disk Operating System
DVI	Digital Video Interface
HDMI	High Definition Multi-media Interface
HDTV	High-Definition Television
HQV	Hollywood Quality Video
IP	Internet Protocol
IR	InfraRed
LCD	Liquid-Crystal Display
LUT	Look-Up Table
NTSC	National Television System(s) Committee
OEM	Original Equipment Manufacturer
OSD	On-Screen Display
PAL	Phase Alternating Line
QXGA	Quad eXtended Graphics Array
RGB	Red Green Blue (color model)
SDTV	Standard Definition Television
SECAM	Séquentiel Couleur À Mémoire (sequential color with memory)
SVGA	Super Video Graphics Array
SXGA	Super Extended Graphics Array
TCP/IP	Transmission Control Protocol/Internet Protocol
TRNR	Temporal Recursive Noise Reduction
USB	Universal Serial Bus
VGA	Video Graphics Array
XVGA	eXtended Video Graphics Array
YCbCr	• **Y**: luminance (brightness) component • **Cb**: blue minus luminance (B-Y) • **Cr**: red minus luminance (R-Y)

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