Image AnyPlace IA-200

User's Manual

Version 1.01

Copyright Information

Contact Information

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Revision History

Version	Date	Description
1.01	March 8, 2009	Initial release.

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Preface

These sections provide information you must read before using the IA-200.

Limited Warranty

All Flexible Picture Systems products are designed and tested to the highest standards and backed by a one 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. Flexible Picture Systems will pay shipping charges for return shipments to customers.

Flexible Picture Systems 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 Flexible Picture Systems at 905-707-1664 and ask for an Applications Engineer to issue a Return Material Authorization number, or send an e-mail to support@flexiblepicturesystems.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 IA-200.

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 IA-200.

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 45ºC (104ºF).

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 IA-200 Processor, 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.

1 Introduction

1.1 General Description

The Image AnyPlace IA-200 is a high performance video signal processor intended for use in Pro AV applications. In addition to top ranked scaler features, the IA-200 adds Keystone Correction capability (i. e. the ability to correct for the distortion caused by projecting off-axis onto a flat screen). Variations on the IA-200 design add Image Geometry Correction (ability to correct for projection onto a curved or irregular screen) and Edge Blending (the ability to invisibly blend the overlapping output of 2 projectors) to the product. All IA-200 processors can be updated in the field to add Image Geometry Correction and/or Edge Blending. Choosing the SDI option (available at slight extra cost at the time of purchase) enables the user to add HD-SDI (and SDI) input capability.

As a Scaler, the IA-200 offers the top quality image scaling provided by the Silicon Optix Realta IC. All popular resolutions are supported on both input and output. In addition, the IA-200 functions as a switcher, supporting several different signal input types (see section 1.3.1).

As a Keystone Corrector, the IA-200 enables precision Keystone Correction for projection onto any flat screen. All flat screen Keystone adjustments may be made with just 4 corner controls internally available from the OSD (i. e. the user adjusts each corner of the projected image to match the desired projection area in real time). In addition to off axis distortion, this approach also simultaneously corrects for Screen/Projector Rotation, Screen Slant, and incorrect Screen Aspect Ratio. The IA-200's sub-pixel precision makes it an ideal choice of multiple projector applications such as Projector Stacking for added brightness, and 2 projector 3D applications.

As a Geometry Correcter, the IA-200_EX extends precision Geometry Correction to image shaping onto curved, spherical and even irregular screens. The IA-200_EX accomplishes this sophisticated Geometry Correction using the eWarp Designer 200 PC based program. eWarp Designer 200 enables the user to precisely shape the screen using a flexible grid[1].

As an Edge Blender, IA-200_BEX adds Edge Blending to Keystone Correction and Geometry Correction. Any number of projectors' output may be blended on any type of surface. Edge Blending is controlled by the Edge Blending 200 PC based program.

[1] For Image AnyPlace IA-100 users: IA-100 grid files larger than 7x9 are compatible with IA-200; use the internal 4 point method of IA-200's for 4 point Keystone Correction.

Figure 1: IA-200 Video Processor

In addition to its professional grade Scaler features and its unique Keystone Correction and Geometry Correction and Edge Blending, the IA-200 adds HQV technology video processing features to all video signals. 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. 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

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

Figure 2: Typical IA-200 Application

IA-200 is 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.

IA-200 provides the professional user with flexible control methodologies of RS-232, USB, and Ethernet. For details on the control programming protocol, refer to the IA-200 Programming Manual.

IA-200 is implemented in a compact and attractive desktop package that can be rapidly fitted to a standard 19" rack using a separately ordered rack mounting kit, part number IA-200_RM.

1.2 Product Variations and Nomenclature

The IA-200 product has several different variations, described below:

IA-200	IA-200 scaler with Keystone Correction. Keystone Correction is implemented internally. No PC software is required.
IA-200_EX	Adds Geometry Correction to the IA-200. Geometry Correction is implemented with the eWarp Designer 200 software (which creates the grid based Warp Maps, and downloads them to the IA-200 hardware). eWarp Designer 200 access is enabled through a serial number based key, which is permanently stored (in the manufacturing process or by field upgrade) on the IA-200 hardware. If you have an IA-200 and you would like to add Geometry Correction, you can purchase an IA-200_eWARP_Key.
IA-200_BEX	Adds Edge Blending capability to the IA-200_EX. Blending is implemented with the Edge Blending Utility 200 software (which creates

	the blend regions, and downloads them to the IA-200 hardware). Edge Blending Utility 200 access is enabled through a serial number based key, which is permanently stored (in the manufacturing process or by field upgrade) on the IA-200 hardware. If you have an IA-200 or IA-200_EX and you would like to add Edge Blending, you can purchase an IA-200_EB_Key. The Edge Blending Key is different than the eWarp Key. The IA-200_BEX product definition includes both Keys.
IA-200_XXX_SDI	Any of the IA-200 options can be ordered with or without SDI (actually HD-SDI, but accepts SDI as well). Since the SDI option involves hardware (i.e. connectors and components that are loaded or not at the time of manufacture), no field upgrade is possible.

1.3 Features and Specifications

1.3.1 Video and Audio Signals

Table 1: Video and Audio Signals (see section 5 for resolution range)

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) (included with SDI option only)	• Analog RGB (VGA to UXGA) • DVI (VGA to QXGA) • HDMI
Audio	• S/PDIF • Toslink • HDMI	• S/PDIF • Toslink • HDMI

1.3.2 Video and Audio Processing Capability

These are the video and audio features supported:

- Scaling
- Extreme Keystone Correction (+/- 40º horizontal, +/- 30º vertical)
- Geometry Correction for projection on curved or irregular surfaces (with EX versions)
- Edge Blending for blending multiple projectors' output (BEX versions)
- 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

1.3.3 Controls

IA-200 may be remotely controlled over 3 different interfaces, as well as the user operated IR Remote. IA-200 may be controlled by any of IA-200's application programs (eWARP Designer 200, IA-200 Control Tool, Updater and Router Manager) and for connection to Crestron/AMX type systems:

- RS-232
- USB
- Ethernet

1.3.4 Physical Characteristics

These are the physical characteristics of the IA-200:

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)

1.3.5 Panel Diagrams

Figure 3: Front Panel Drawing

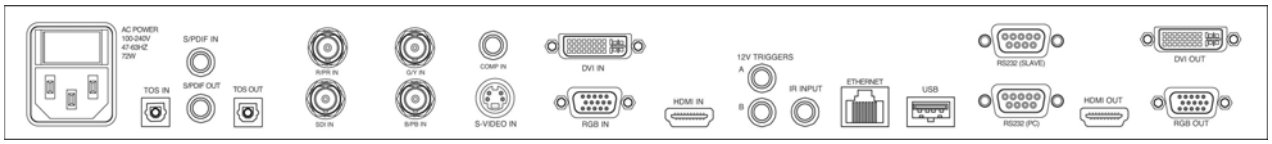


Figure 4: Rear Panel Drawing

2 Installation and Operating Environment

2.1 Setting up Your IA-200

The IA-200 Quick Start Guide is intended to provide a quick list of steps that you can follow to get things working in 95% of installations. Please refer to the *Quick Start Guide* for basic installation instructions. This section and the subsequent User Interface is intended for more advanced installations, problem solving and the general background of the product.

2.2 Standby Mode

The IA-200's power switch is located on the back of the system.

A momentary contact **Standby/Operate** button is located at the extreme left of the front panel (and is also implemented as a red button on the IR Remote.)

Standby mode is a low power mode which suspends the IA-200's output to the projector. During Standby mode, the IA-200's front panel display is active and Remote Control are active, but in a different context. In addition to provide an **Instant On** IR response from its low power output setting, the Standby state enables the user to adjust parameters that would generally not be adjusted during normal OSD operation. One benefit of this operation is that the user cannot make a casual OSD keystroke error that, for example, resets the display resolution to something that the display cannot support (causing the screen to go blank and depriving the user of the visual feedback that he needs to fix the problem).

2.3 Software Operating Environment

IA-200 comes with a CD with several different applications. Depending on your intended use, you may require none, some or all of the applications. The Quick Start Guide describes how to install the CD. This section briefly describes the software environment.

2.3.1 IA-200 Users (Keystone Correction Only)

No software is required (as long as you do not need to control anything over RS-232, USB or Ethernet). All operation is achieved through the IR remote Control and OSD.

2.3.2 Router Manager

If you want to do anything else other than basic scaling and Keystone Correction, you need to run Router Manager and install your specific IA-200. Router Manager is the common

communications and control layer that enables each IA-200 application to quickly identify that a specific IA-200 is attached and ready to communicate. Basic details on how to quickly connect are provided in the Quick Start Guide. In depth explanation is provided in the Router Manager Manual.

2.3.3 IA-200 Control Tool

IA-200 Control is intended as Control Program Emulator and Control Script Development tool. Use the IA-200 Control Tool to experiment with IA-200 Control Protocol, and develop scripts of ASCII based protocol (described in the IA-200 Programmer's Guide). These scripts can then be imported into popular Pro AV controllers such as Crestron and AMX for control of the IA-200 in a large installation. The IA-200 Control Utility does not require a software key for operation. Installation with Router Manager is not required for IA-200 Control Tool.

2.3.4 eWarp Designer 200

eWarp Designer 200 is used to develop grid based Geometry Correction for the IA-200_EX and IA-200_BEX versions. eWarp Designer 200 requires a serial number based Key for operation. The key is installed during manufacturing or may be installed in the field (key installation is accomplished with eWarp Designer 200 itself). Correct installation with Router Manager is required for eWarp Designer 200operation.

2.3.5 Edge Blending Utility 200

Edge Blending Utility 200 is used to control Edge Blending in IA-200_BEX versions. Edge Blending Utility 200 requires a serial number based Key for operation. The key is installed during manufacturing or may be installed in the field (key installation is accomplished with Edge Blending Utility 200 itself). Correct installation with Router Manager is required for Edge Blending Utility 200 operation.

2.3.6 Updater

Update is used to provide firmware updates to all versions of IA-200. Updater connects directly to the IA-200 in Service Mode. Please see the Updater manual for details on Service Mode and the use of Updater. Updater does not require Router Manager.

3 User Interface

3.1 IR Remote Control

All IA-200 user interface controls are accessed via infrared (IR) remote control. The remote has following groups of controls:

- OSD Navigation (including the On/Setup Key)
- Video Source Selection
- IA-200 Special Feature Selection

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 IA-200 remote control.

Figure 5: 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 IA-200 between On and Setup modes of operation (as described in Operational Modes).
- 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 IA-200 Special Feature Selection Buttons

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

- The **LUT** button cycles through pre-loaded, and user programmed input LUT (Look Up Tables, which can be used to brighten or darken the appearance of incoming video
- 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 **eWarp** button cycles through the available User defined Warp Maps (created by eWarp Generator and stored in Index 1 through Index 8)
- The **Split** button activates/deactivates a split-screen mode for direct comparison of the image with and without noise reduction activated.
- The **Test** cycles through a series of embedded Test Patterns which are instantly rendered at the current output resolution

3.2 Operational Modes

The IA-200 has two operational modes, **On** and **Setup** (**Stand-by**). These modes are selected by a dedicated key on the IR remote. The IA-200 also enables selection using the On Mode using the ASCII control protocol with RS-232, USB, or Ethernet.

3.2.1.1 On Mode

On Mode is entered by toggling the **On/Setup** button on the IR remote. A brief transition of about 3 seconds occurs when **On Mode** is entered. During this transition period, the 24 x 2 LCD Display indicates

```
IA-200
Please Wait
```

In On Mode, the video output signals are activated and you may control all of IA-200 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:

```
Input=Connector Resolution
Output=Resolution
```

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

- If you select the **Menu** key, the IA-200'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.

- If you select one of the dedicated IA-200 Special Feature keys, the IA-200 special feature is immediately activated.

  A brief message indicating the status of the selected IA-200 special 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 IA-200 Special Features, Scaling and Video Parameters are all preserved for each input; each input appears exactly as you left it.

The IA-200 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), except for the input signal. The input signal most recently used is retained as the power-up input signal.

3.2.1.2 Setup (Stand-by) Mode

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

In Setup mode, the IA-200 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

Parameter	Description*
OUT = XXX ## Hz	Cycles through all of the available IA-200 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 and keystone correction
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 IA-200 unit
Serial No = ######	Indicates the Serial # of IA-200 unit
µProc Rev = #.##	Indicates the Rev # of the Front Panel microprocessor.

* The default parameters configurations are highlighted in bold.

Table 3: Output Modes

Output Mode	Comments
VGA 60 Hz (640 x 480)	VESA Standard
VGA 50 Hz (640 x 480)	VESA Standard
848 x 480 60 Hz	Panel timing
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	NEC timing
1365 x 768 60 Hz	NEC timing
1400 x 788 60 Hz	Panel timing
SXGA 60 Hz (1280 x 1024)	VESA Standard

Output Mode	Comments
SXGA 50 Hz (1280 x 1024)	VESA Standard
SXGA+ 60 Hz (1400 x 1050)	VESA Standard
SXGA+ 50 Hz (1400 x 1050)	VESA Standard
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	JVC timing
1365 x 1024 60 Hz	JVC timing
1360 x 1024 60 Hz	JVC timing
1280 x 768 60 Hz	VESA Standard
Digital Cinema 60 Hz (2048 x 1080)	-
Digital Cinema 24 Hz (2048 x 1080)	-
WUXGA 60 Hz (1920 x 1200)	VESA Standard
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

3.2.1.3 Setting Up the Unit

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

```
IA-200
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 = Value
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 lists the Setup parameters.

4 On Screen Display

4.1 OSD Menu Structure

The OSD is the primary way of controlling and selecting functions in the IA-200 system. When first powered up, the IA-200 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.

When you select the **Factory Reset** from the OSD menu, IA-200 reloads all of these default parameters, replacing any adjustments previously made. As indicated in the User Interface, the Setup Parameters are not affected by Factory Reset.

IA-200 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 IA-200 operation).

A complete view of the OSD menu structure is shown in Table 4 and Table 5.

Table 4: OSD Main Menu Structure

Icon On	Icon Off	Description	Functionality
		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.
		Language	Enter this submenu to select the language used by the OSD.

Icon On	Icon Off	Description	Functionality
		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.

Table 5: OSD Complete Menu Structure

OSD Menu Level					Comments
Level 1	**Level 2**	**Level 3**	**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
		HDMI			Selects HDMI as audio source
		SDI	-	-	Selects SDI as audio source
	Audio Delay	-100 - +100, **0 (default)**	-	-	Adjusts the Audio Delay through IA-200. 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 IA-200 processing. The Audio Delay adjustment allows the user to compensate for Audio or Video delay that is introduced by other system components
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.

OSD Menu Level					Comments
Level 1	**Level 2**	**Level 3**	**Level 4**	**Level 5**	
Picture	Picture Settings	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 processing response.
				Gamma 1.5	Gamma LUT
				Gamma 2.2	Gamma LUT
				Gamma 2.4	Gamma LUT
				Gamma 2.5	Gamma LUT
				Gamma 2.8	Gamma LUT
			Output Gamma	Gamma 1.0 **(default)**	Gamma LUT for linear processing response.
				Gamma 2.2	Gamma LUT
				Gamma 2.4	Gamma LUT
				Gamma 2.5	Gamma LUT
				Gamma 2.8	Gamma LUT
		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 Color Saturation. The lower the setting, the lower the Color Saturation.

OSD Menu Level					Comments
Level 1	**Level 2**	**Level 3**	**Level 4**	**Level 5**	
Picture	Picture Settings	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 IA-200 operation (such as Keystone Correction) are unaffected
	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 Treatments for more information.

OSD Menu Level					Comments
Level 1	**Level 2**	**Level 3**	**Level 4**	**Level 5**	
Picture	Aspect Ratio	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 Treatments 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 Treatments 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 Treatment for more information.

OSD Menu Level					Comments
Level 1	**Level 2**	**Level 3**	**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
		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.
	Picture Position	Vertical	0 - 100	-	Adjusts the vertical position of image (default setting depends on the input video/graphics source)

OSD Menu Level					Comments
Level 1	**Level 2**	**Level 3**	**Level 4**	**Level 5**	
Picture	Picture Position	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
	Overscan	Status	Off	-	-
			On	-	-
	Overscan	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

OSD Menu Level					Comments
Level 1	**Level 2**	**Level 3**	**Level 4**	**Level 5**	
Setup	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
	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	-	-	-	
	German	-	-	-	
	Italian	-	-	-	
	Spanish	-	-	-	
	Portuguese	-	-	-	
	Swedish	-	-	-	
	Russian	-	-	-	
	Japanese	-	-	-	
	Chinese Simplified	-	-	-	
	Chinese Traditional	-	-	-	
	Korean	-	-	-	
Info	Input Resolution	-	-	-	Shows the source resolution

OSD Menu Level					Comments
Level 1	**Level 2**	**Level 3**	**Level 4**	**Level 5**	
Info	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

OSD Menu Level					Comments
Level 1	**Level 2**	**Level 3**	**Level 4**	**Level 5**	
Advanced	Projection	Keystone	Top Left	H	Top Left Corner H deviation in + pixels
				V	Top Left Corner V deviation in + pixels
				Reset	Resets Top Left Corner
			Bottom Left	H	Bottom Left Corner H deviation in + pixels
				V	Bottom Left Corner V deviation in - pixels
				Reset	Resets Bottom Left Corner
			Top Right	H	Top Right Corner H deviation in - pixels
				V	Top Right Corner V deviation in + pixels
				Reset	Resets Top Right Corner
			Bottom Left	H	Bottom Right Corner H deviation in - pixels
				V	Bottom Right Corner V deviation in - pixels
				Reset	Resets Top Right Corner
			Reset	-	Resets Entire Keystone Projection
	Low Latency	Off	-	-	Low Latency Mode is Off; HQV De-interlacing and Noise Reduction is enabled
		On	-	-	Low Latency Mode is On; HQV De-Interlacing and Noise Reduction is disabled
		Extra Low	-	-	Extra Low Latency Mode is On; HQV De-interlacing and Noise Reduction is disabled; VJam or VAdjust Sync Modes are forced
	BCE	Video	-	-	Full range video is 16 - 235; use for video sources
		Cinema	-	-	Film Enhancement for video sources
		Vivid	-	-	High Color Saturation Enhancement for video sources
		Dark Scene	-	-	Dark Scene Enhancement for video sources
		Bright Scene	-	-	Bright Scene Enhancement for video sources
		Graphics	-	-	Full range video is 0 - 255; use for computer graphics sources

OSD Menu Level					Comments
Level 1	**Level 2**	**Level 3**	**Level 4**	**Level 5**	
Advanced	HQV Processing	HQV Processing	Auto	-	Automatically sets up Noise Reduction according to Auto Bias
			TRNR	-	Enables specific adjustment of Temporal Recursive Noise Reduction
			CNR	-	Enables specific adjustment of Codec Noise Reduction
		Auto Bias	0-4	-	Selects amount of HQV processing 0 - 4
		TRNR Level	Off	-	No adjustment
			Low	-	Adjusts TRNR
			Mid	-	Adjusts TRNR
			High	-	Adjusts TRNR
		CNR Level	Off	-	No adjustment
			Low	-	Adjusts CNR
			Mid	-	Adjusts CNR
			High	-	Adjusts CNR
		Split	-	-	Enables/Disables Screen Split
	Edge Blending	Bottom	-	-	Enable Edge Blending on Bottom Edge
		Left	-	-	Enable Edge Blending on Left Edge
		Right	-	-	Enable Edge Blending on Right Edge
		Top	-	-	Enable Edge Blending on Top Edge
		Enable	-	-	Overall Enable/Disable on Edge Blending
	User Warp Map Selection	Off	-	-	No Custom Warp Map Selection (Keystone is enabled)
		Index 1 - 8	-	-	Selects user warp map by index

5 Keystone and Geometry Correction

5.1 Operation of Keystone Control

Keystone Control is activated by selecting the Keystone sub-menu from the Projection sub-menu in the Advanced main menu. Keystone Control operates significantly differently from the IA-100 predecessor product's Keystone Control.

Keystone Control can only be operated from the OSD Menu and Control Protocol (i.e. there is no 4 point equivalent to the eWarp Designer program used with IA-100). To use Keystone Control, take the following steps:

1. Ensure that the output resolution and aspect ratio of the IA-200 are the same as those of the projector in use.
2. Select one of the IA-200's source channels.
3. Play live content to the selected source channel (the best content is a complete white test pattern; since the OSD of IA-200 is used to render the internal IA-200 test patterns, it is unfortunately not possible to use the internal test patterns for this purpose) . Ensure that the source content has sufficient contrast such that you can clearly see all of the corners of the input.
4. Adjust the position of the display to match the screen's corners using the Keystone controls.
5. The Keystone adjustment is adjustable in single pixel increments. Adjustments downwards and to the left are taken as positive. Adjustments upwards and to the left are taken as negative. Each control is active using only the Horizontal arrows (i.e. you cycle between H and V adjustments using Up and Down Arrows only; you adjust the value of H and V adjustments using the Left and Right Arrows only.
6. Each corner of the display is separately adjusted. The total amount of adjustment is interdependent with other concurrent Keystone adjustments (i.e. on a 1080p output, you can adjust the H range of a given corner to a maximum deviation, if there is no concurrently selected V deviation. You can also adjust a corner's V deviation to 350 pixels if there is no H deviation. If you have a combination of both H and V, both parameters are reduced from their independent maxima. In practice, there is enough range to cover all practical situations.
7. You can reset each corner independently or reset the entire display.
8. Keystone parameters remain in effect until reset, or until they are changed or until a User Warp Map is selected.
9. Aspect ratio treatment remains in effect with Keystone Control.

5.2 User Warp Maps

If you have the IA-200_EX or IA-200_BEX version, then User Warp Maps (i.e. Geometry Corrections for cylindrical, spherical or irregular surfaces) created by the eWarp Designer 200 companion software program may be loaded into 8 locations, labeled Index 1 to Index 8. These

Warp Maps may be selected with the IR remote (using the dedicated eWarp button or by navigating to the menu.) User Warp Maps may also be selected using the Control Protocol.

User Warp Maps are activated by selecting the User Warp Map Selection sub-menu from the Projection sub-menu in the Advanced main menu. Up to 8 Warp Indices may be selected. User Warp Maps Indices are grayed out if User Warp Maps have not been loaded into these locations.

Please note that aspect ratio treatments do not work with User Warp Maps. If you want to configure different aspect ratio treatments in User Warp Map, you must create a specific User Warp Map for each aspect ratio treatment that you wish to achieve.

Please refer to the *eWarp Designer 200 User's Guide* for complete detail on how to create and download User Warp Maps.

6 Aspect Ratio Treatment

6.1 Aspect Ratio Treatments

The IA-200 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.

Warning: Aspect ratio treatments are not functional when using custom warp geometries. If you want to use custom warps with different aspect ratio treatments, you will have to create a specific warp map for every aspect ratio treatment that you want to view.

6.1.1 Supported Aspect Ratios

The IA-200 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 IA-200 video mode recognition circuitry.

Note: Only two output aspect ratios are supported, 4:3 and 16:9[2].

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

[2]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 IA-200_EX 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

6.1.2 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, stetching the 4:3 input to the 16:9 output in a non-linear fashion.
- *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).

6.1.3 Input and Output Combinations

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

Table 6: Aspect Ratio Treatments for 4:3 Input with 4:3 Output

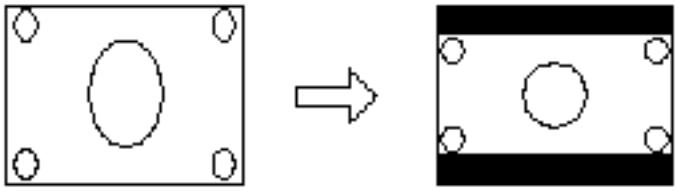
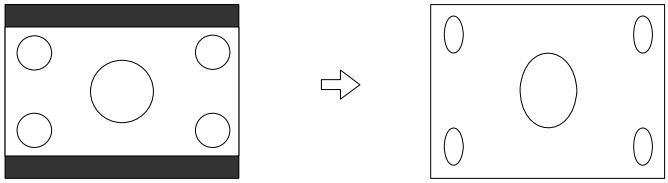
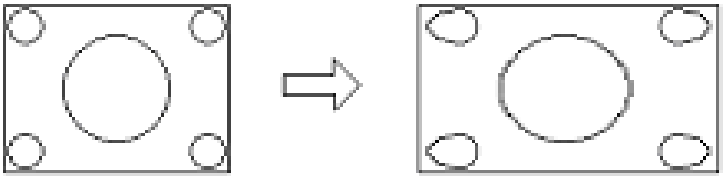
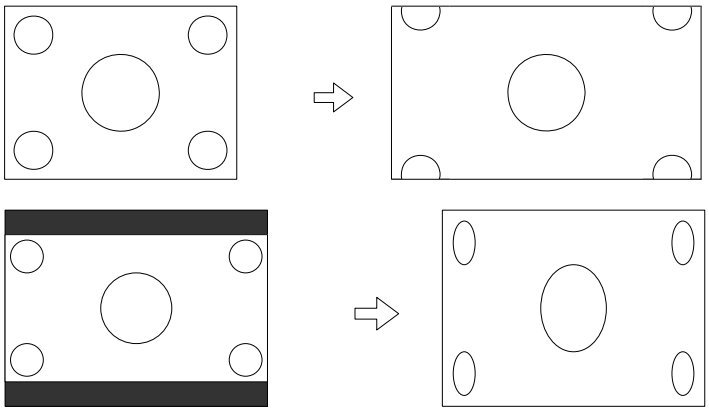
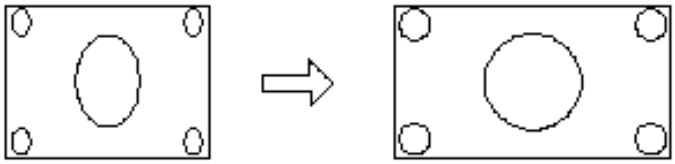
OSD Menu Name	Description
Standard	4:3 input signals shown full screen on 4:3 output display 
Full Screen	Grayed out. No action.
Crop	Same as "Standard" mode above.
Anamorphic	Anamorphic or widescreen encoded DVDs shown letterbox on 4:3 output display. These DVDs have 16:9 contents that has been compressed 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

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 

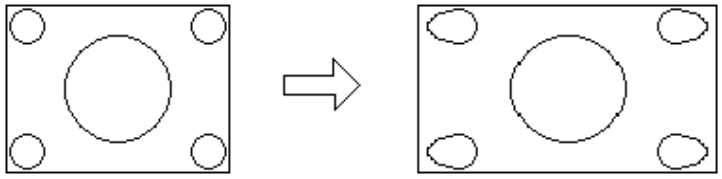
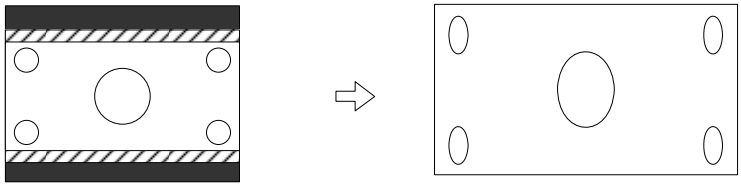
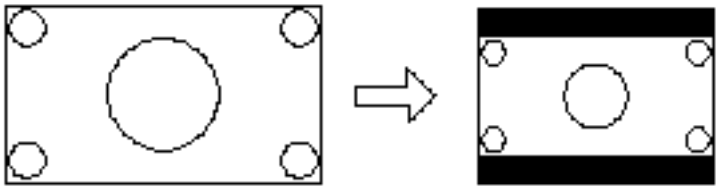
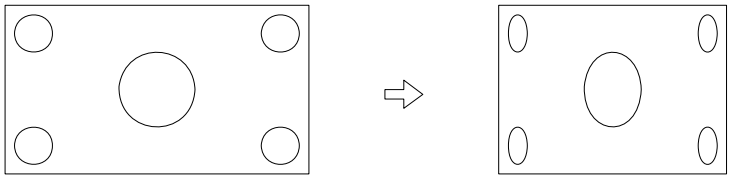
OSD Menu Name	Description
Flexview	4:3 input signals are non-linearly stretched in the horizontal direction to fill 16:9 output displays. Horizontal and vertical scaling is equal in the middle, more horizontal stretching towards left and right sides to fill 16:9 outputs 
Squeeze	Grayed out. No action.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

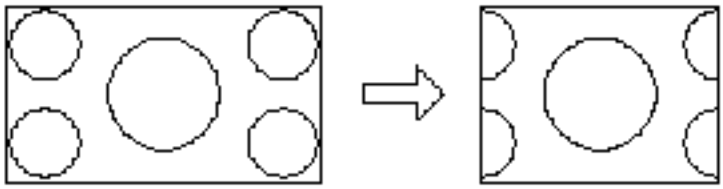
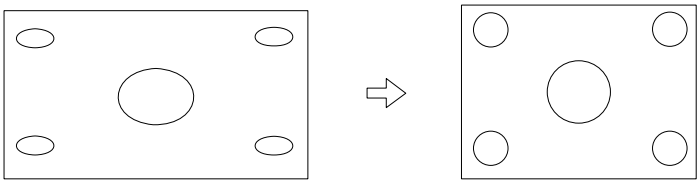
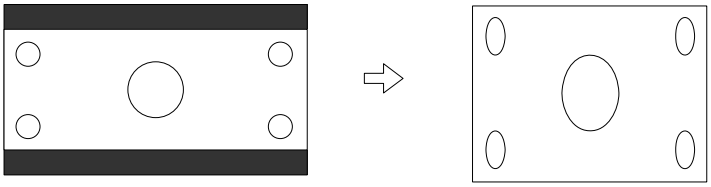
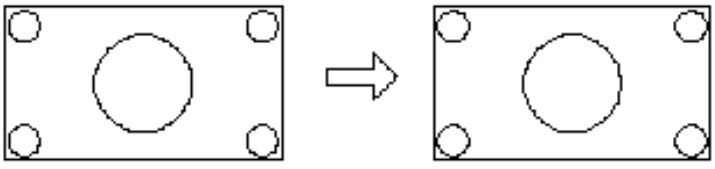
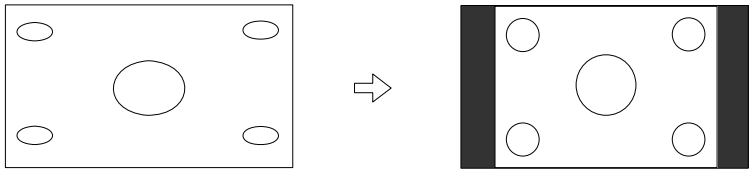
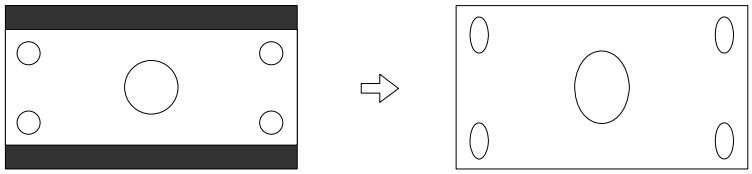
OSD Menu Name	Description
	
Anamorphic	Grayed out. No action.
Flexview	Grayed out. No action.
Squeeze	16:9 Input is squeezed to 4:3. 
Theater Scope	Vertically distorted 16:9 image will be stretched to 16:9 by Anamorphic lens. 

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.

OSD Menu Name	Description
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. 

7 Input Modes Supported

Table 10: Input Modes Supported

Input Timing Format				Input Video Source						
Item No.	Mode 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	-	-	-	-
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	-	-	-	-

Input Timing Format				Input Video Source						
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	-	-	-	-	-

8 Latency Considerations

All IA-200 variations necessarily introduce some latency between the input and output. The amount of latency varies greatly, depending on which features are selected. There are two factors influencing the latency: 1) Choice of Latency mode and 2) Relative Frame rate between input and output. The following table indicates the relationship between these items. A third item, Synchronization Mode is affected by Latency and Frame Rate Difference.

8.1 Low Latency Mode Configuration

Input frame rate (Hz)	Output frame rate (Hz)	Latency Mode	Low Latency mode (ON/OFF)	Total Frame delays (# of frames)
50	50	ELL	ON	2
60	60	ELL	ON	2
50	50	LL	OFF	2.5
60	60	LL	OFF	2.5
50	60	ELL	ON	5.5
60	50	ELL	ON	5.5
50	60	LL	OFF	6.1
60	50	LL	OFF	6.1
50	50	ON	OFF	7.6
60	60	ON	OFF	7.6
50	60	ON	OFF	9.2
60	50	ON	OFF	9.2

Low Latency mode	TVP processing
OFF	TVP = ON
Low Latency	TVP = OFF, All Sync Modes
Extra Low Latency	TVP = OFF, Only Vjam and Vadjust

There are two latency modes, Low Latency and Extra Low Latency. Low Latency mode achieves its effect by bypassing the HQV advanced video functions. This means that Noise Reduction, Advanced De-interlacing and Cadence detection will not work in Low Latency mode. In practice, for most ProAV applications Low Latency is more important than video noise reduction, so Low Latency is the Default mode. Low Latency reduces the latency to between 2 and 3 input frames.

Extra Low Latency mode enables a small amount of extra latency reduction by forcing frame rate synchronization of the output to the input (using the VJam or VAdjust methods described below). By using Extra Low Latency, the Latency is reduced to two input frames. In both cases of Latency reduction, things operate best when the Frame Rates are approximately equal. Big differences in Frame Rates will increase average latency.

The Synchronization Mode offers three choices for Synchronization. Free Run, VJam and VAdjust. These Synchronization Modes are adjustable using the IR Remote buttons and the Control Protocol only. To cycle through the available Synchronization Modes, Enter the following Key Sequence on the IR Remote:

```
Enter, Right, Left
```

You will see an OSD box with Free Run, VJam or VAdjust box appear momentarily. If Extra Low Latency mode is selected, the sequence will only go through VJam and VAdjust. Not all displays will accept VJam or VAdjust. If your display goes blank or fails to synchronize after adjusting Synchronization Mode, continue with the above sequence until Free Run Mode returns or switch to an unused input channel. Your display will re-synchronize, and you will now be able to use the above sequence to cycle back to Free Run mode.

9 Glossary

Term	Description
ASCII	American Standard Code for Information Interchange
CNR	Codec Noise Reduction
CSC	Color Space Converter
DCE	Data Communications Equipment
DHCP	Dynamic Host Configuration Protocol
DVI	Digital Video Interface
FPGA	Field Programmable Gate Array
HDMI	High Definition Multi-media Interface
HDTV	High-Definition Television
HQV	Hollywood Quality Video
IP	Internet Protocol
LCD	Liquid-Crystal Display
LUT	Look-Up Table
NCR	No Carriage Return
OEM	Original Equipment Manufacturer
OSD	On-Screen Display
QXGA	Quad eXtended Graphics Array
RGB	Red Green Blue (color model)
SDTV	Standard Definition Television
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
VPN	Virtual Private Network
XVGA	eXtended Video Graphics Array
YCbCr	Y: luminance (brightness) component Cb: blue minus luminance (B-Y) Cr: red minus luminance (R-Y)