HD Hanna™
Digital Video Processor
OPERATING INSTRUCTIONS

The new **HD Hanna™** hits the "sweet spot" for the Custom Installation market by providing HD Set Top Box and Scaling functionality in one product, with high quality, versatility, and value. You'll enjoy the added functionality of True Digital Path (Digital-In to Digital-Out, including Firewire/5C) and the pristine picture from Key Digital's® renowned Scaler equipped with the proprietary, motion-assisted de-interlacing algorithm *Clear Matrix Pro®*.

Key digital®

The Experts in Digital Video Technology and Solutions.

HD Hanna™ Operating Instructions

HD HANNA™ – Digital STB/Scaler Model KD-FIRE1080P

Safety Instructions – Please be sure to follow these instructions for safe operation of your unit

1   Read these instructions.

2   Keep these instructions.

3   Heed all warnings.

4   Follow all instructions.

5   Do not use this apparatus near water

6   Clean only with dry cloth.

7   Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

8   Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9   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 or 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.

10   Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

11   Only use attachments/accessories specified by the manufacturer

12   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.

13   Unplug this apparatus during lightning storms or when unused for long periods of time.

14   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.

HD Hanna™ Operating Instructions

BASICS

SET-UP DETAILS

APPENDICES

HD Hanna™ Operating Instructions

1.INTRODUCTION TO HD HANNA™, MODEL KD-FIRE1080P

Key Digital's® "HD Hanna™" (Model KD-FIRE1080P) is a state-of-the-art ATSC/NTSC Set Top Box that also provides high-quality scaling to your display's native resolution. It offers flexible analog and digital I/O, including DVI-D with HDCP out and Firewire I/O with 5C.

1.1 What is HD Hanna™?

HD Hanna™ is a very versatile all-in-one ATSC/NTSC Set Top Box and Video Scaler that receives, decodes, and scales the video program to match your display's native resolution. Custom Installers and Home Theater buffs will be delighted with HD Hanna™, because it offers so much value and quality all in one economical unit, including:

Video decoding (ATSC and NTSC, PAL, PAL-M, SECAM)
High-quality scaling to HD and SD resolutions
Flexible I/O with:
- Two IEEE 1394 Firewire I/O ports with 5C, capable of HDTV and SDTV
- Inputs: RF (ATSC and all analog formats), Component Video (YPbPr) for 480i, all world formats accepted in Composite and S-Video, and an optional plug-in card available for DVI-D/HDCP HDTV digital input
- Outputs: HD RGBHV and Component, DVI-D/HDCP, Composite and S-Video
Scales to output resolutions of:
- 1080 and 480: interlaced and progressive scan
- 1280x720, 1280x768 and 1368x768, 1920x540, 1400x1050: progressive scan
- 1920 x 1080 @ 24 Hz is also available.

Delivers simultaneous HD and SD outputs (480i) for each output resolution
Analog audio I/O; Toslink optical and digital coaxial audio out
User-friendly on-screen-display, front-panel pushbutton controls, and a programmable IR Remote with "Hot" buttons
Picture adjustments, linked to each input and conveniently stored and include: sharpness, brightness, contrast, saturation, and hue
Works with all control systems (like Crestron)
Customers can upgrade firmware over the Internet
It is rack-mountable, has no fan noise, and is easy to install and integrate into your home theater system

HD Hanna™ Operating Instructions

1.2 Why you need HD Hanna™

Key Digital® engineered *HD Hanna™* (Model KD-FIRE1080P) as a convenient, high-quality Set Top Box (STB), Scaler, and home theater I/O backbone. *HD Hanna™* offers just what the custom home theater buffs and installers are looking for -– a unique "one-stop shopping" solution for applications where you need the Input/Output flexibility to decode off-the-air or Cable (RF) ATSC & NTSC, Firewire/5C, or select 480i baseband (YPbPr, CVBS Composite and S-Video) input signals, and scale them to the native resolution of your display.

HD Hanna™ incorporates a high-quality Scaler equipped with Key Digital's® advanced, motion-assisted de-interlacing algorithm called "Clear Matrix Pro", that lets you up-, down-, and cross-convert the STB RF or baseband input to your display's native resolution. *HD Hanna™* accepts all world formats at its inputs, and can scale to output formats of interlaced and progressive scan 1080 and 480; and progressive scan 1280x720, 1280x768 and 1368x768, 1920x540, and 1400x1050; 60 Hz output refresh rates; and aspect ratios in and out of 16:9 and 4:3.The HD Hanna™ can scale to an output resolution of 1920 x 1080 @ 24 Hz.

HD Hanna™ also handles your audio requirements, with four analog inputs (Left & Right stereo pairs). The audio output of *HD Hanna™* provides for analog (Left & Right stereo pairs), digital coaxial audio, and Toslink optical audio. This audio I/O flexibility allows you to take maximum advantage of all the video input ports on your *HD Hanna™* unit and correspondingly switch the associated program audio.

With its user-friendly On-Screen-Display (OSD), programmable IR Remote with "Hot" buttons (discrete IR commands are available), and user-selectable output resolutions and aspect ratios, *HD Hanna™* is easy to control and operate. It is rack-mountable (2RU), has no fan noise, and is easy to install and integrate into your system. The RS-232C port is equipped with discrete command protocol compatible with all control systems (like Crestron, AMX, CNMSX-PRO), and is even designed to allow customers to upgrade firmware over the Internet.

1.3 Summary Specifications for HD Hanna™

Features:
- Scaler equipped with advanced, motion-assisted de-interlacing algorithm *Clear Matrix Pro™*
- HDTV and SDTV Colorimetry Matrix
- 3-D Comb Filtering for Composite Video
- Optional HD Input plug-in card, for DVI-D/HDCP inputs and HD baseband scaling applications
- Flexible I/O, including Firewire with 5C
- User-friendly on-screen-display
- IR Remote with "Hot" keys
- Channel / status display and controls for complete navigation and operation from the front panel
- Picture adjustments are linked to each input and conveniently stored and include: sharpness, brightness, contrast, saturation, and hue
- RS-232C port for external control of *HD Hanna™* (Crestron-compatible), and firmware upgrades

HD Hanna™ Operating Instructions

Supported Input types include:

• Video Inputs:
- two IEEE 1394 5C-enabled Firewire I/O ports supporting HDTV and SDTV
- two RF tuner inputs supporting ATSC (8 VSB) and analog TV (NTSC, PAL, PAL-M, SECAM)
- two Component Video (YPbPr) supporting 480i baseband
  * one Component input available for pass-through
- two each Composite Video (CV) and S-Video accepting all world formats (NTSC, PAL, PAL-M, SECAM)
- one RGBHV pass-through
- optional plug-in card available for DVI-D/HDCP HDTV inputs
- 60 Hz refresh rates
- 16:9 and 4:3 Aspect Ratios

• Audio Inputs:
- four analog (standard line-type Left & Right pairs) inputs

Supported Output types include:

• Video Output Formats:
- 1080 interlaced and progressive, 720 and 768 progressive, and 480 interlaced and progressive
- 60 Hz output refresh rates
- both SD (480i) out and HD out simultaneously for each output resolution
- 1920 x 1080 @ 24 Hz is also available.

• Video Outputs:
- two IEEE 1394 5C-enabled Firewire I/O ports supporting HDTV and SDTV
- one HD Component Video (YPbPr)
- one HD RGBHV
- one DVI-D with HDCP
- one SD Composite Video and S-Video

• Audio Outputs:
- one analog (standard line-type Left & Right pairs) output
- one digital coaxial audio output
- Toslink optical audio output

2. INCLUDED WITH HD HANNA™, MODEL KD-FIRE1080P

Open the carton and you will find inside the following contents:
1. One *HD Hanna™* unit
2. Standard power cord
3. IR Remote Control with 2 AAA batteries included
4. Rack mounting hardware: brackets, screws, and clips
5. This Instruction Manual
6. Warranty card

HD Hanna™ Operating Instructions

3. QUICK SETUP OF HD HANNA™, MODEL KD-FIRE1080P

Connecting and using your Key Digital® *HD Hanna*™ (Model KD-FIRE1080P) combination Set


Top Box and Scaler with flexible analog and digital I/O is straightforward:

1. Become familiar with *HD Hanna*™.
2. Determine your particular application requirements.
3. Connect the A/V Inputs and Outputs to suit your particular configuration.
4. Place the unit in a convenient location.
5. Make the final connections.
6. Learn to operate the unit with its user-friendly OSD and controls.

Please follow these Steps carefully, as described below.

3.1 Determine your particular application requirement

A typical application for *HD Hanna*™ is in your home theater environment where you have an off-the-air or cable ATSC/NTSC (or any world format) feed that you want to decode and scale to the native resolution of your display. You may need scaling for Firewire/5C digital, or base-band analog video as well. With *HD Hanna*™, you have all of these capabilities in one convenient package. Some typical Application configurations are depicted in the example below.

Key digital®
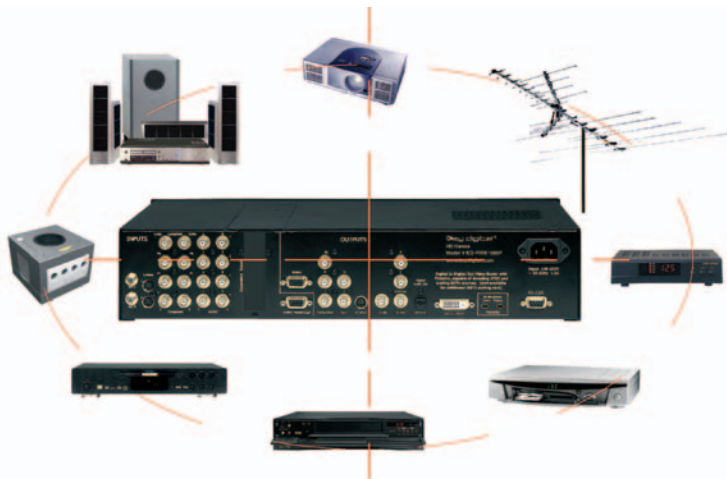
HD Hanna™ Operating Instructions

When considering the type of configuration you require, you'll need to know your Video and Audio Input and Output requirements.

HD Hanna™ supports the following Video Inputs:
- two IEEE 1394 5C-enabled Firewire I/O ports supporting HDTV and SDTV
- two RF tuner inputs supporting ATSC (8 VSB) and analog TV (NTSC, PAL, PAL-M, SECAM) for off-the-air or cable
- two Component Video (YPbPr) inputs supporting 480i baseband
  - one Component input available for pass-through
- two each baseband Composite Video (CVBS) and S-Video inputs accepting all world formats TV (NTSC, PAL, PAL-M, SECAM)
- one RGBHV pass-through
- optional plug-in card available for DVI-D with HDCP HDTV input

HD Hanna™ supports the following Audio Inputs:
- four analog (standard line-type Left & Right pairs) inputs

On the output side, *HD Hanna™* supports interlaced and progressive scan displays at 1080 and 480; and progressive scan displays at 1280x720, 1280x768 and 1368x768, 1920x540, and 1400x1050. Video Output format of 1920 x 1080 @ 24 Hz is also available. You'll need to determine if you are driving a DVI/HDCP, Component Video (YPbPr), or VGA (RGBHV) display. The audio can be analog, digital, or Toslink optical. Both SD (480i) out and HD out are available simultaneously for each output resolution, one of many sought-after features provided by *HD Hanna™*.

HD Hanna™ supports the following Video Outputs:
- two IEEE 1394 5C-enabled Firewire I/O ports supporting HDTV and SDTV
- one HD Component Video (YPbPr) output
- one HD VGA (RGBHV) output
- one DVI-D with HDCP output
- one SD Composite Video output
- one SD S-Video output

HD Hanna™ supports the following Audio Outputs:
- one analog (standard line-type Left & Right pairs) output
- one digital coaxial audio output
- Toslink optical audio output

HD Hanna™ Operating Instructions

3.2 Connect the A/V Inputs and Outputs to suit your particular configuration

First, become familiar with the I/O back panel, which is at the rear of your *HD Hanna™* unit.

Note the back (rear) panel configuration of *HD Hanna™* for all I/O

HD HANNA™ INPUTS

The INPUTS to *HD Hanna™* are to the left when looking at the back panel and include:
- two F-type RF (cable or antenna) inputs (Ant A&B)
- two S-Video input connectors
- two separate Composite Video (CVBS) and Component Video (YPbPr) BNC connector banks
- four separate audio left and right BNC stereo pairs
- one DB-15 VGA (RGBHV) by-pass input

Composite 1&2 (CVBS)

Audio L&R 1,2,3,4

Ant A & B

S-Video 1&2

Component Video (YPbPr) 1&2
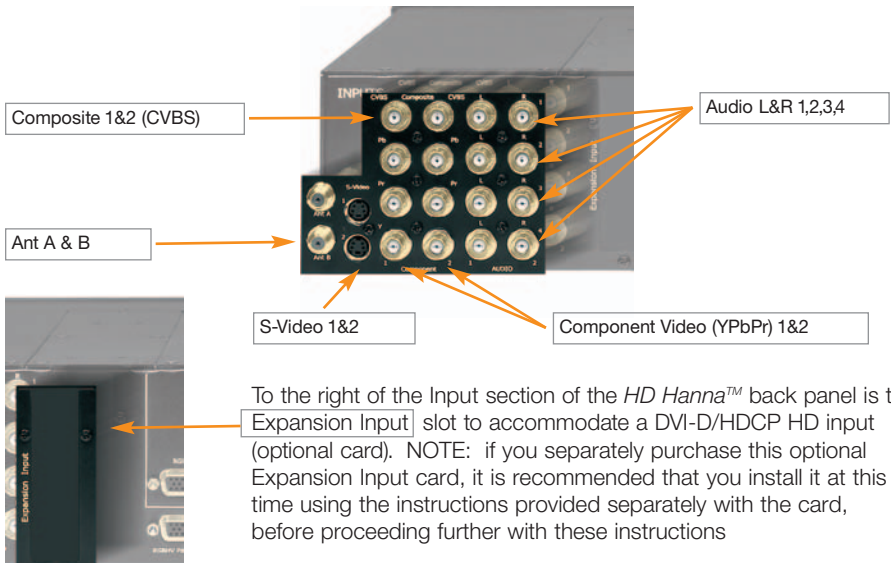
To the right of the Input section of the *HD Hanna™* back panel is the Expansion Input slot to accommodate a DVI-D/HDCP HD input (optional card). NOTE: if you separately purchase this optional Expansion Input card, it is recommended that you install it at this time using the instructions provided separately with the card, before proceeding further with these instructions

Key digital®
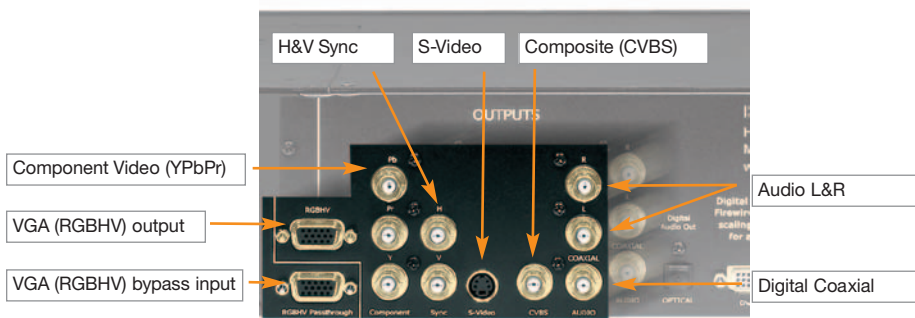
HD Hanna™ Operating Instructions

HD HANNA™ OUTPUTS

To the right of the Expansion Input slot is the DB-15 VGA (RGBHV) by-pass input, followed by the *HD Hanna™* OUTPUTS towards the center when looking at the back panel, which include:

- one VGA (RGBHV) DB-15 connector video output
- one Component Video (YPbPr) BNC bank
- separate H and V sync BNC outputs
- one S-Video output connector
- one CVBS Composite Video BNC output
- one analog audio standard line-type Left & Right pairs BNC outputs
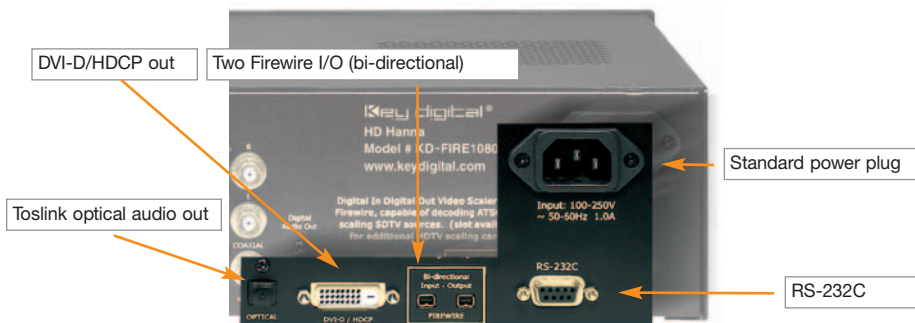- one digital audio BNC coaxial output

HD HANNA™ OUTPUTS

The remaining connectors are to the far-right when looking at the back panel of *HD Hanna™*,

and include:

- Toslink optical audio output
- one DVI-D connector (supports HDCP) output
- two IEEE 1394 5C-enabled Firewire I/O ports supporting HDTV and SDTV
- one RS-232, D-sub 9-pin female connector
- one standard power plug

HD Hanna™ Operating Instructions

3.3 Place your HD Hanna™ unit in a convenient location

This is a good time to rack-mount your *HD Hanna™* unit, with the 2 RU mounting hardware included. The unit weighs 10 pounds. Rubber feet also allow you to place the unit on a counter. Note that the top left of the unit has a grate with openings, which you should keep unobstructed to permit air-flow to the power supply and the rest of the unit. Also, do not obstruct the IR path for the IR Remote Control (a red lens on the right side of the front panel).

3.4 Make the final connections

Be sure to connect the power cord to the rear of the unit and to a standard wall outlet (Input Power requirements: 100 to 240V AC, 1 A). If you have set-up your *HD Hanna™* and then unplug the unit or lose power, it will store the most-recent values before the power was lost.

You may also connect the RS-232C port to your Home Theater Automation System (like Crestron, AMX, or CNMSX-Pro), or in the future use this port with your personal computer for *HD Hanna™* firmware upgrades. *Please see the Appendices at the end of this manual for instructions on using the RS-232C port for firmware upgrades and external control of your HD Hanna™ unit.*

3.5 Learn to operate HD Hanna™ with its user-friendly OSD and controls

First learn the basics of NAVIGATION / CONTROL of your HD Hanna™. Then, use the controls to bring the user-friendly ON-SCREEN DISPLAY (OSD) MENUS and actually configure and operate your HD Hanna™ unit.

NAVIGATION / CONTROL

It is most convenient to operate your *HD Hanna™* unit with the provided IR Remote Control. However, you also have the option to go directly to the front panel and use the front-panel Pushbutton switches. It is recommended that you first learn the basic functionalities of the front-panel Pushbuttons / LCD, IR Remote Control, and On-screen Display (OSD) menus to set-up and control your *HD Hanna™* unit. If you have set-up your *HD Hanna™* and then unplug the unit or lose power, it will store the most-recent values before the power was lost.

You first need to "Navigate" (learn to get to the functions you wish to configure and control) and then "Control" (actually invoke the set-up, function, or operation) your *HD Hanna™* unit. Navigating and Controlling your Key Digital® *HD Hanna™* combination Set Top Box and Scaler with flexible analog and digital I/O is straightforward:

1. First, follow the Quick Set-Up instructions provided in this Operating Manual to physically connect *HD Hanna™* into your system.
2. Next, you will start "Navigating" and "Controlling" your *HD Hanna™* unit, with the front-panel Pushbutton switches, LCD display, and basic IR Remote Control functions.
3. Bring up the OSD Main Menu on your output display.
4. Learn the basic operations provided by the OSD menus.
5. Learn the "Hot" Pushbuttons on the front panel.
6. Learn the "Hot" buttons on your Remote Control.

HD Hanna™ Operating Instructions

You will now be walked step-by-step through these six steps. *Please follow these Steps carefully, as described below.*

Step-by-step Navigating and Controlling Directions
for your HD Hanna™, Model KD-FIRE1080P

1. First, follow the Quick Set-Up instructions provided in this Operating Manual to physically connect *HD Hanna™* into your system.
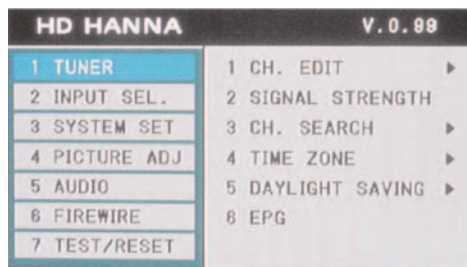
Then, apply power to the unit and batteries to your Remote Control, and turn the unit "On" with either the front-panel Power switch on the far left, or the red POWER switch on the Remote Control. The front panel Power switches toggle the unit On/Off. When you Power On, the *HD Hanna™* front-panel LCD Display will indicate the power-up status by scrolling "Welcome to HD Hanna™" as the unit goes through its power-up cycle. When you turn the unit Off, the LCD will display "Bye" and can then display the current time-of-day. Please note that the remote control has two separate buttons for Power On and Off.

2. Next, you will start "Navigating" and "Controlling" your *HD Hanna™* unit, with the front-panel Pushbutton switches and basic IR Remote Control functions.

To learn to Set-up and Control *HD Hanna™*, you will need to Navigate the OSD Menus with either the front-panel Pushbuttons, or the IR Remote Control provided with *HD Hanna™*. As you Navigate and Control, you will receive feedback through the front-panel LCD Display on your *HD Hanna™* unit. Much more detail is provided via the OSD that will appear on the picture display(s) connected to any of the *HD Hanna™* outputs.

HD Hanna™ OSD (On-screen Display) Menus

The OSD Menus are intuitive and will appear on any of your display devices you connect to the output of *HD Hanna™*. You will need to understand that the OSD Menus are in "Levels". You will Navigate between Levels and make your selections. For example, consider the Main Menu that appears when you press the front-panel Menu Pushbutton, or the MENU button on the IR Remote Control:

HD HANNA	V.0.88
1 TUNER	1 CH. EDIT ▶
2 INPUT SEL.	2 SIGNAL STRENGTH
3 SYSTEM SET	3 CH. SEARCH ▶
4 PICTURE ADJ	4 TIME ZONE ▶
5 AUDIO	5 DAYLIGHT SAVING ▶
6 FIREWIRE	6 EPG
7 TEST/RESET	

NOTE:
OSD Menus in this manual are illustrative -- the firmware version in your *HD Hanna™* may produce Menus that vary slightly from these examples
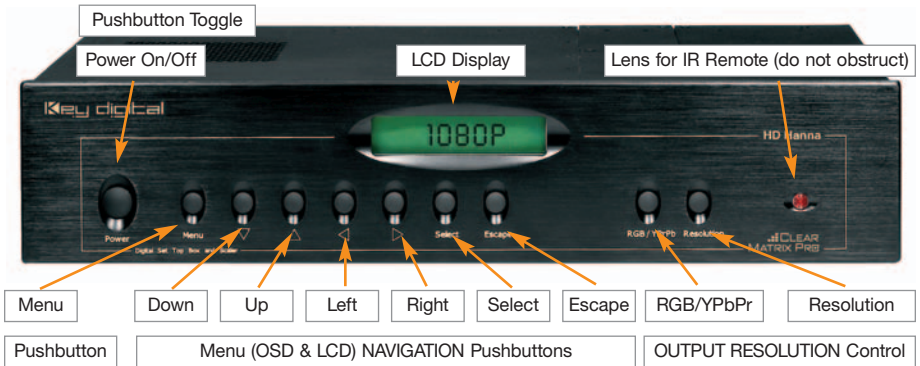
"LEVEL 1"   "LEVEL 2"
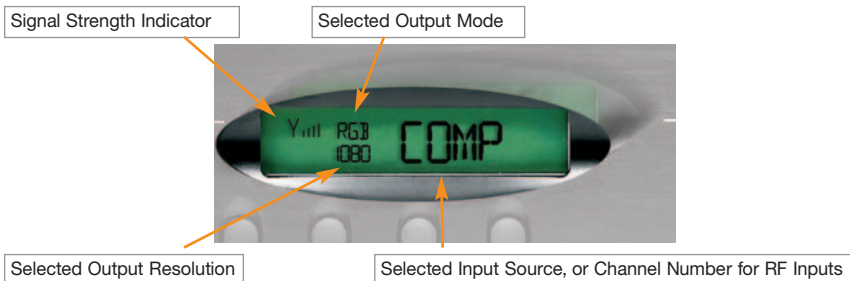
HD Hanna™ Operating Instructions

Now, familiarize yourself with *HD Hanna's™* front-panel Pushbuttons and LCD Display.

HD Hanna™ front-panel Pushbuttons and LCD Display

Pushbutton Toggle
Power On/Off
LCD Display
Lens for IR Remote (do not obstruct)

1080P

Menu	Down	Up	Left	Right	Select	Escape	RGB/YPbPr	Resolution
Pushbutton	Menu (OSD & LCD) NAVIGATION Pushbuttons						OUTPUT RESOLUTION Control	

HD Hanna™ Front-panel LCD Display

The front-panel LCD provides convenient indication of the status of your *HD Hanna™* unit. For more detailed operations you will want to take advantage of the user-friendly On-screen Display menus and use the included IR Remote Control, but it is handy to have the capability to walk up to your *HD Hanna™* unit and perform operations from the front-panel Pushbuttons without the need of your display device.   The figure below shows how the LCD on the front-panel of *HD Hanna™* indicates Output Type and Output Resolution selected, as well as the Input Source. If the Input Source selected is RF (like from an antenna or STB), then the LCD also indicates the Signal Strength and Channel Number.

Signal Strength Indicator
Selected Output Mode

RGB 1080 COMP

Selected Output Resolution
Selected Input Source, or Channel Number for RF Inputs

Key digital

HD Hanna™ Operating Instructions

HD Hanna™ IR Remote Control

Examine the IR Remote Control included with your *HD Hanna™* and become familiar with the basic functionality for navigation and control, comparable to the control provided by the front-panel Pushbuttons. Then, you can learn the remote control "Hot Buttons". At this time, you will want to focus on the simple navigation control buttons on the provided IR Remote Control:

- POWER ON
- POWER OFF
- MENU (brings up the OSD menu)
- EXIT ((Duplicates the function of the *Escape* front-panel Pushbutton)
- UP, DOWN, RIGHT, and LEFT (OSD navigation arrows: UP and DOWN let you navigate within any given Level of the OSD menu; LEFT and RIGHT let you go to the next or previous Level (respectively) of the OSD menu
- OK (like the *Select* front-panel Pushbutton)

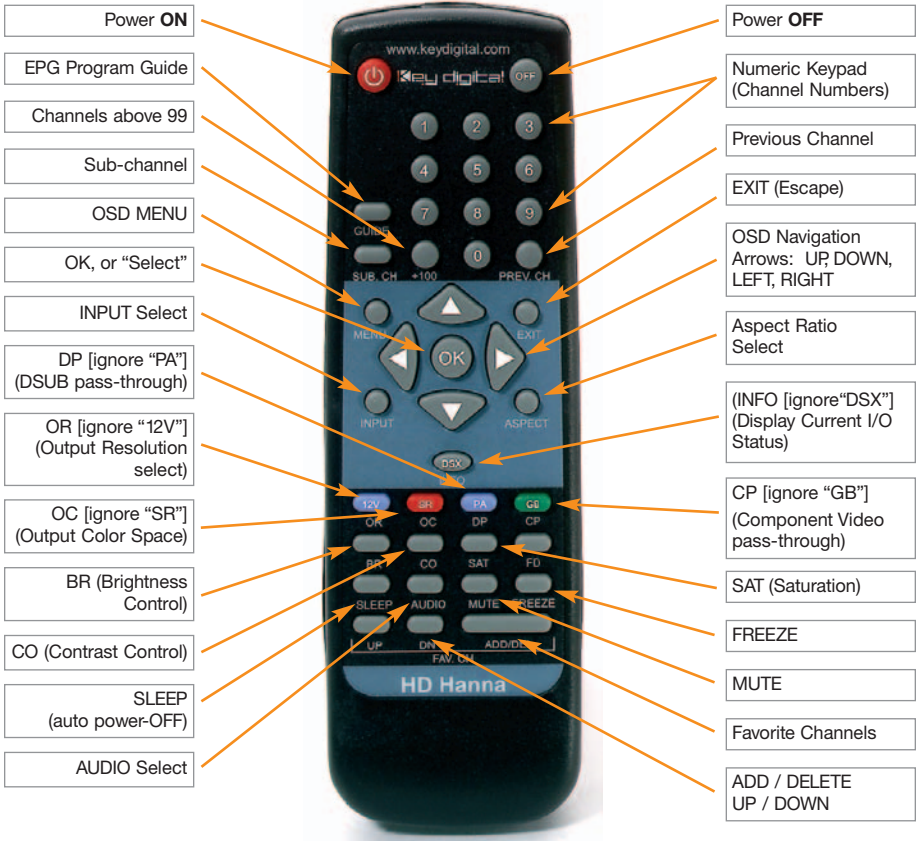*Other HD Hanna™ Remote Control Keys To Note:*

It is possible that the version of the Remote Control supplied with your *HD Hanna™* may have silk-screened on its face some labels which are not pertinent to the operation of the unit. For example, the following functions are not used: DSX, 12V, SR, PA, GB. However, the silkscreen under these buttons indicate the true operation of these buttons: INFO, OR, OC, DP, CP.

INFO: Display Current Input and Output Status Using Small OSD
OR: Select Output Resolution
OC: Select Output Color Space
DP: DSUB Input is Pass-through Function to DSUB output
CP: Component Input is Pass-through Function to Component Output

To change program Channels, use the Up and Down Arrow buttons.
To adjust Audio Volume, use the Left and Right Arrow buttons.

HD Hanna™ Operating Instructions

HD Hanna™ IR Remote Control

Power **ON**

EPG Program Guide

Channels above 99

Sub-channel

OSD MENU

OK, or "Select"

INPUT Select

DP [ignore "PA"]
(DSUB pass-through)

OR [ignore "12V"]
(Output Resolution
select)

OC [ignore "SR"]
(Output Color Space)

BR (Brightness
Control)

CO (Contrast Control)

SLEEP
(auto power-OFF)

AUDIO Select

Power **OFF**

Numeric Keypad
(Channel Numbers)

Previous Channel

EXIT (Escape)

OSD Navigation
Arrows: UP, DOWN,
LEFT, RIGHT

Aspect Ratio
Select

(INFO [ignore"DSX"]
(Display Current I/O
Status)

CP [ignore "GB"]
(Component Video
pass-through)

SAT (Saturation)

FREEZE

MUTE

Favorite Channels

ADD / DELETE
UP / DOWN

SEE END OF THIS MANUAL FOR A SUMMARY OF THESE BUTTONS

HD Hanna™ Operating Instructions

3.Bring up the OSD Main Menu on your output display by either:

- Pressing the MENU button on the Remote Control
- Pressing the Menu Pushbutton on the front panel of the unit

If the OSD (On-Screen Display) does not appear after engaging the menu button, please go to the front panel and press the escape button to exit the menu system. (Please note that if you are in the middle of the menu system, the front panel resolution and RGB/YPrPb will not function.) Then press the front panel resolution button which will then go to the next output resolution available. Continue cycling through the available resolutions till you get resolution status on your display. You can then continue with the process of going through the available menus. If you can not get output or resolution status to show on your display, recheck your connections from the output of the HD Hanna to your display.
For further information please contact Key Digital at the email address or phone numbers listed in this manual.

4.Learn the basic operations provided by the OSD menus.

Once you bring up the main Menu, push the Navigation arrows on the Remote Control or four front-panel Pushbuttons, as follows:

- Pressing the Down and Up arrows allows you to scroll *within* a "Level" of the menu through the different options. For example, if you are in the "SYSTEM SET" menu, you can scroll through the main Video functions in that Level, like "Resolution" or "Aspect (Ratio) Control".
- The selected function has white text with blue highlighting on the OSD.
- Pressing the Left and Right arrows allows you to go to the next or previous logical "Level" of the menu. For example, if you are in the "SYSTEM SET" / "RESOLUTION" menu, you can then press "Right" to bring you to the next Level of the menu, namely the various Resolution options, like 1920x540p, 720x480p, or 720x480i. Then, press Down and Up arrows to scroll through the resolutions until you have reached the desired one, such as 720x480p. See the example OSD Menu below:

How to select Video Output Resolution on the RGB port to be 720x480p:
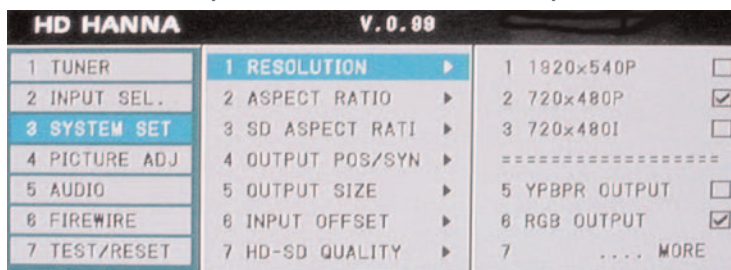
| "LEVEL 1" | "LEVEL 2" | "LEVEL 3" |

a *Use the Left and Right arrows <> to navigate from Level-to-Level.*
b *Scroll Up and Down within any level until you find the function you would like to control (the selected function will be highlighted).*
c *Then use the Select Pushbutton (OK on the Remote Control) to invoke your selection*

HD Hanna™ Operating Instructions

- When you are in a Menu and have reached your desired selection, such as in the "SYSTEM SET" / "Resolution" / "1280x768p" example, then press the Select (front-panel) or OK (Remote Control) button to make and store your selection.
- You can go back to the prior level using Escape (front-panel) or EXIT (Remote Control).
- When you are completed with your set-up, you can press Escape (front-panel) or EXIT (Remote Control) to remove the OSD and resume normal viewing.
- Normally when the unit is ON with an RF input and you are not "Navigating", the LCD will display the Channel Number.

> This is a good time to point out that the configuration selections you make (like output Resolution type, Brightness, Positioning, etc.) for each HD Hanna™ output are stored in memory. This handy feature allows you to customize each output to your particular display and viewing conditions/preferences.

5.Learn the "Hot" Pushbuttons on the front panel.

You may want to go directly to a particular Menu function, without having to "Navigate" from the Main Menu. This time-saving feature is provided for via an extensive list of buttons on the IR Remote Control, Additionally, you have two "Hot" buttons available on the front panel of your *HD Hanna™*:

RESOLUTION "Hot" Pushbutton:
By pressing this button and observing the LCD front-panel display, you can cycle through the various output resolution options available, namely 1920x1080p, 1920x1080i, 1280x720p, 1280x768p and 1368x768p, 1920x540 p, 1400x1050p, 480p, 480i.
This is a particularly useful feature in the event you use the front-panel navigation to select an output display option that is not compatible with your current display device, and you "lose" the OSD feature. Simply press the front-panel Resolution button and make your selection by observing the LCD display on the front-panel of your *HD Hanna™* unit.

RGB / YPbPr "Hot" Pushbutton:
By pressing this button and observing the LCD front-panel display, you can toggle the active output mode between VGA (RGB) and Component Video (YPbPr). Note that the 480i output (like Composite Video CVBS) is always simultaneously active on the output of your *HD Hanna™* unit.

HD Hanna™ Operating Instructions

6.Learn the "Hot" buttons on your Remote Control.

In addition to Remote Control unit pushbuttons described above, and the VOL. +/- (Volume Up/Down), MUTE, and CH +/- (Channel Up/Down) pushbuttons, consider these "Hot" buttons on the Remote Control provided with your *HD Hanna*™ that will take you directly to specific menu adjustments:

- GUIDE [EPG, Electronic Program Guide]
- ASPECT [Output Aspect Ratio selection, 16:9 or 4:3, letter box, pillar box]
- INPUT [Select Antenna A/B (1/2), Component, S-Video, or Composite Video In]
- OC [Output Color Space for selection of RGB/YPbPr]
- BR [Brightness Control]
- CO [Contrast Control]
- OR [Output Resolution select]

You may also use the upper area of the Remote Control unit to select the channel number and add/delete channels to your "Favorite" channel list.

OSD MENUS

OSD Menus: Now that you know how to navigate through the basic Main Menu functions for *HD Hanna*™ using the Remote Control or front-panel Pushbutton switches, learn the full extent of the OSD Menus. The OSD Menus allow you to configure *HD Hanna*™ to match your specific application and configuration requirements. The user-friendly OSD Menu Structure for your *HD Hanna*™ unit is outlined below. The structure also gives you a clear idea of what aspects of *HD Hanna*™ you can configure and control. Level 1 is the Main OSD Menu, and each level thereafter provides further detail of the selected feature.

You can see that the first and second levels in the OSD Menu Structure include user controls as listed in the following table. You would use the Down and Up arrows on the Remote Control or front-panel Pushbuttons to scroll through the first-level controls, then use the Left and Right arrows to move from Level-to-Level. The function or operation you select will have white text with blue highlighting on the OSD.

HD Hanna™ Operating Instructions

HD HANNA™ OSD MENU STRUCTURE LEVELS 1 AND 2

LEVEL 1	LEVEL 2	Description
Tuner	•CH Edit •Signal Strength •CH Search •Time Zone •Daylight Saving •EPG	•Show CH. List and Edit CH. •Show Signal Strength •Automatically searches for active RF channels •Select your Time Zone •Select Daylight Saving Time ON/OFF •Display the Electronic Program Guide
Input Select	•Antenna •Component •Composite •S-Video •Expansion •Comp1 Pass-Thru •RGB Pass-Thru	Select the source (type) Input Signal you want to process and display ATTENTION: OSD Menus in this manual are illustrative -- the firmware version in your HD Hanna™ may produce Menus that vary slightly from these examples.
System SET.	•Resolution •Aspect Control •SD Aspect Control •Output Position •Output Size •Input Offset •HD-SD Quality	•Select the Output Resolution to match the native resolution of your display: 1080p, 1080i, 768p, 720p, 540p, 480i, or 480p •Select the Aspect Ratio to match your display and desired mode, including 16:9, 4:3, Full-screen, Letter box, Pillar Box •Select the Aspect Ratio to match your display and desired mode, including 16:9, 4:3, Full-screen, Letter box, Pillar Box •Fine-tune the Horizontal and Vertical Position, Size, and Input Offset of the output video, to properly fill your display screen
Picture Adj.	•Brightness •Contrast •Saturation •Hue •Sharpness •Default •SD Adjust	•Adjust the brightness, contrast, saturation, hue, and sharpness for each HD Hanna™ input (settings are linked to each input and conveniently stored)
Audio	•Dual Mode •Digital Out •Volume Control •Ext In Setup	•Main/Sub, Main, Sub, Mono •Select AC3 or PCM out •On/Off, Volume Control by Set Top Box •Select Digital or Analog (sets reference channel input for Volume Control) •SPDIF/Ext. PCM
Firewire	•Control •Device Setup •Time Record #1 •Time Record #2 •Time Record #3	Control of the two I/O Firewire ports
Test/ Reset	•Menu Opacity •Test Pattern •Factory Default	•Select Opacity 1 (minimum) to 4 (maximum) •Select video test patterns to your output: H-Ramp, V-Ramp, Color Bars, Gray Scale, Cross Hatch, and White Window •Resets all settings to Factory Default levels

NOTE:
OSD Menus in this manual are illustrative -- the firmware version in your HD Hanna™ may produce Menus that vary slightly from these examples

Key digital®

HD Hanna™ Operating Instructions

The actual Menus provided by the *HD Hanna™* OSD (On-screen Display) are summarized here. We will now look at the Level 1 Functions, and the corresponding Level 2 and 3 options. Remember, when you are Navigating within the Menus, the selected function has white text with blue highlighting on the OSD.

LEVEL 1: 1 - TUNER options

[Note: Ant 1&2 on the On-screen Display Menu refer to Ant A&B silk-screened respectively on the back panel of HD Hanna™]

"LEVEL 2"

For selected "TUNER" LEVEL 1

"LEVEL 3"

For selected "CH EDIT" LEVEL 2

LEVEL 1: 2 - INPUT SELECT options

"LEVEL 2"

"LEVEL 3"

HD Hanna™ Operating Instructions

LEVEL 1: 3 - SYSTEM SET options

```
HD HANNA                        V.0.99

1 TUNER          1 RESOLUTION       ▶    1 FULL            ☑
2 INPUT SEL.     2 ASPECT RATIO     ▶    2 HORIZONT. ZOOM  ☐
3 SYSTEM SET     3 SD ASPECT RATI   ▶    3 VERTICAL ZOOM   ☐
4 PICTURE ADJ    4 OUTPUT POS/SYN   ▶    4 LETTER BOX      ☐
5 AUDIO          5 OUTPUT SIZE      ▶    5 PILLAR BOX      ☐
6 FIREWIRE       6 INPUT OFFSET     ▶    ==================
7 TEST/RESET     7 HD-SD QUALITY    ▶    7 2.40 : 1 INPUT  ☐
```

"LEVEL 2"   "LEVEL 3"

LEVEL 1: 4 - PICTURE ADJUSTMENT options

```
HD HANNA                        V.0.99

1 TUNER          1 BRIGHT.    ◀ 0 ▶
2 INPUT SEL.     2 CONTRAST   ◀ 0 ▶
3 SYSTEM SET     3 SATURAT.   ◀ 0 ▶
4 PICTURE ADJ    4 HUE        ◀ 0 ▶       "LEVEL 2"
5 AUDIO          5 SHARP.     ◀ 0 ▶
6 FIREWIRE       6 DEFAULT
7 TEST/RESET     7 SD INPUT ADJ.     ▶
```

LEVEL 1: 5 - AUDIO options

```
HD HANNA                        V.0.99

1 TUNER          1 DUAL MODE     ▶    1 VOLUME      ◀ 50
2 INPUT SEL.     2 DIGITAL OUT   ▶
3 SYSTEM SET     3 VOLUME CTRL   ▶
4 PICTURE ADJ    4 EXT. IN SETUP ▶
5 AUDIO
6 FIREWIRE
7 TEST/RESET
```

"LEVEL 2"   "LEVEL 3"

Key digital®

HD Hanna™ Operating Instructions

LEVEL 1: 6 - FIREWIRE options

LEVEL 1: 7 - TEST/RESET options

Built-in Video Test Patterns available: V-Ramp, Color Bars, Gray Scale, Cross Hatch, White Window, and Black Window

"LEVEL 2"   "LEVEL 3"

HD Hanna™ Operating Instructions

4. HOW TO CONTACT KEY DIGITAL®

Repairs and Warranty Service:

▫ Should your HD Hanna™ require warranty service, please contact Key Digital® to obtain a Returned Materials Authorization (RMA) number

▫ Please contact us at either:

  ▫ Toll-free 1-914-667-9700

  ▫ email tech@keydigital.com

Technical Support:

▫ For technical questions about using our products, please contact us at either:

  ▫ 1-914-667-9700 or Toll-free 1-888-258-2028

  ▫ email tech@keydigital.com

Customer Support:

▫ For customer support questions about using our products, please contact us at either:

  ▫ 1-914-667-9700

  ▫ email customersupport@keydigital.com

5. WARRANTY

All Key Digital® products are built to high manufacturing standards and should provide years of trouble-free operation. They are backed by a limited two-year parts and labor warranty.

HD Hanna™ Operating Instructions

Appendix A: HD Hanna™ Technical Specifications

Product Summary

Combination ATSC/NTSC Set Top Box and SD/HD Video Scaler that converts to any display's native resolutions, with flexible analog and digital (Firewire I/O with 5C, and DVI-D HDCP Output) ports

Inputs

• Video inputs supported:
- two IEEE 1394 Firewire I/O ports supporting HDTV/5C and SDTV
- two RF tuner inputs, each accept ATSC and analog TV (NTSC, PAL, PAL-M, SECAM) formats
- two Component Video (YPbPr) (480i)

one Component input available for pass-through
- one RGBHV pass-through
- two Composite Video (CV)
- two S-Video
- optional HD Input plug-in card, for DVI-D/HDCP inputs and HD baseband scaling applications

• Audio inputs supported:
- four analog (standard line-type Left & Right pairs) Audio inputs

HD Hanna™ Operating Instructions

Scaling and Processing

• Scaling SDTV and HDTV to popular native resolutions and output formats of:
- 1920x1080i, 1920x1080p, 1920x540p
- 1400x1050p
- 1368x768p, 1280x768p
- 1280x720p
- 720x480i and 720x480p
- 1920 x 1080p @ 24 Hz

• Scaler equipped with advanced, motion-assisted de-interlacing algorithm "Clear Matrix Pro"
• Aspect Ratios in and out: 16:9 and 4:3
• HDTV and SDTV Colorimetry Matrix
• 3-D Comb Filtering for Composite Video
• Optional HD Input plug-in card, for DVI-D/HDCP inputs and HD baseband scaling applications

Outputs

• Supports output formats of:
- 1920x1080i, 1920x1080p, 1920x540p
- 1400x1050p
- 1368x768p, 1280x768p
- 1280x720p
- 720x480i and 720x480p
- 1920 x 1080p @ 24 Hz

• 60 Hz output refresh rate
• Both SD (480i) out and HD out simultaneously for each output resolution
• Video outputs supported:
- two IEEE 1394 5C-enabled Firewire I/O ports supporting HDTV and SDTV
- one HD Component Video (YPbPr)
- one HD RGBHV
- one DVI-D with HDCP
- one SD Composite Video
- one S-Video

• Audio outputs supported:
- one analog (standard line-type Left & Right pairs) output
- one digital coaxial audio output
- Toslink optical audio output

• Built-in Video Test Patterns available: H-Ramp, V-Ramp, Color Bars, Gray Scale, Cross Hatch, and White Window

Control

• User-control of Brightness, Contrast, Saturation, Hue, and Sharpness
• Infrared Remote Control with "Hot" buttons; discrete IR commands available
• User-friendly on-screen-display
• LCD Display on front panel
• Picture adjustments include: sharpness, brightness, contrast, saturation, and hue
• Picture adjustment settings are linked to each input and conveniently stored
• Each audio input can be matched to any video source via the menu
• RS232 port equipped with discrete command protocol compatible with control systems (e.g., Crestron, AMX, CNMSX-PRO)
• Firmware upgradeable

Key digital®

HD Hanna™ Operating Instructions

Connectors

- Input Video Connectors:
  - two F-type RF tuner inputs, both capable of ATSC (8 VSB) and analog TV (NTSC)
  - two sets of three BNC connectors for Component Video (YPbPr)
  - two S-Video connectors
  - two sets of BNC connectors for Composite Video (CVBS)
  - one VGA (RGBHV) DB-15 connector for video input bypass
- Input Audio Connectors:
  - four pairs of BNC connectors for analog Audio (standard line-type stereo Left & Right pairs)

- Output Video Connectors:
  - one set of three BNC connectors for HD Component Video (YPbPr) out
  - one HD VGA (RGBHV) DB-15 connector video out
  - one DVI-D with HDCP output connector
  - one SD Composite Video BNC connector
  - one S-Video connector
  - separate H&V sync output BNC connectors

- Output Audio Connectors:
  - one analog (standard line-type Left & Right pairs) BNC pairs
  - one digital BNC coaxial
  - Toslink optical audio output

- Other Connectors:
  - two IEEE 1394 5C-enabled Firewire I/O ports supporting HDTV and SDTV
  - RS-232C D-sub 9-pin female connector
  - Standard power plug

Mechanical

- Rack mountable: 2U (brackets included)
- No fan noise
- Size: 17" x 10" x 3.5" (W x D x H)
- Weight: 10 lbs.
- Enclosure type: Metal
- Input Power: 100 to 240V AC, 1 A

Appendix B: Firmware Upgrade Instructions

From time to time, Key Digital® may offer firmware upgrades for *HD Hanna™*. These upgrades will enhance the operation of your *HD Hanna™* unit, and are easily installed by connecting the RS-232C port (D-sub, 9-pin female connector) on the upper-left rear panel of your *HD Hanna™* unit to a desktop or notebook PC using a standard RS-232 cable. The files you will need to perform any upgrades are available via e-mail by contacting us at tech@keydigital.com, or you can download them from our Key Digital® web site at http://www.keydigital.com/downloads/FIRE1080Pupgrade.zip

Once you have downloaded the necessary executables and firmware upgrade files from our Key Digital® web site onto your computer, please follow these simple steps for Firmware Upgrade using the Boot Loader:

1 With your *HD Hanna™* unit in the Power-OFF condition, connect the RS-232C port of your *HD Hanna™* unit to the COM port of your computer using a pin-pin RS-232 cable (*not* a null modem cable).

WARNING!!! Do not plug this cable into HD Hanna™ for any other reason -- it will erase ALL the firmware inside and you will need to follow all the steps below to reset HDHanna™.

2 Execute "flashman.exe" on your PC and select a COM port (COM1 or COM2). If you select an occupied COM port, an error message will alert you to close the program and execute it again.

3 Press the [LOAD] button and select the binary file ("flash_xxxx.bin"). If the file is loaded correctly, the program will display a check sum value that must have the same value as in file name.

4 Press the [PROGRAM] button ("Looking for a STB connected... ") and press the POWER button on the *HD Hanna™* front panel (Power-ON). If the download process is proceeding properly, a message will advise you of the download progress.   The download process may take up to 8 minutes — please wait for the entire download to complete, and do not disrupt this process.

5 NOTE: If the "flashman.exe" does not execute properly, then repeat the steps 2 – 4 above. The "flashman.exe" generates a "flashman.cfg" file in the first execution. If the download message does not appear, try powering OFF and ON your *HD Hanna™* unit.

6 If the download has been successful, the "All Programming Done" message will appear. At this time, Power OFF your *HD Hanna™* unit.   Then, close the Boot Loader program and again turn ON the Power to your *HD Hanna™* unit, execute the "FACTORY DEFAULT" in the menu function, and check the unity.

7 It is now a good idea to check the basic operation of your *HD Hanna™* unit to be sure that it is working properly and the upgrade was indeed successful. Should you encounter any problems during or after your firmware upgrade procedure, call us toll-free at 1-888-258-2028 or contact us by e-mail at tech@keydigital.com.

HD Hanna™ Operating Instructions

Appendix C: Controlling HD Hanna™ from your

Home Theater Automation System

For integration with your existing equipment, your HD Hanna™ unit can be conveniently con-trolled from your existing Home Theater Automation System (like Crestron, AMX, or CNMSX-Pro) by using the discrete command protocol. You will need to locate the RS-232C port (D-sub, 9-pin female connector) on the Lower-left rear panel of your HD Hanna™ unit, and con-nect it to your Home Theater Automation System using a standard RS-232-cable. You will be able to use your existing Home Theater Automation System to control the following HD Hanna™ functions:

Items	Command Name	Parameter - [#]	Description
1. Input Selection	input [#]	0 : ANT A	
		1 : ANT B	
		2 : COMPONENT1	
		3 : COMPONENT2	
		4 : COMPOSITE1	
		5 : COMPOSITE2	
		6 : SVIDEO1	
		7 : SVIDEO2	
		8 : EXPANSION_DVI	optional
		9 : EXPANSION_COMP	optional
	comppt	-	Component 1 Input Pass Through
	rgbpt	-	RGBHV Pass Through
2. Tuner Channel Change	chup	-	Channel Up
	chdn	-	Channel Down
	channel [##] [#]	## : major ch, # : sub ch	Direct channel setting.
3. Aspect Ratio	ar [#]	0 : full	Full
	arsd [#]	1 : H-Zoom	Horizontal Zoom
		2 : V-Zoom	Vertical Zoom
		3 : Letter Box	Letter Box
		4 : Pillar Box	Pillar Box

HD Hanna™ Operating Instructions

	resolution [#]	0 : 1920x1080P	
		1 : 1920x1080P @ 24Hz	
		2 : 1920x1080I	
		3 : 1400x1050P	
4. Output Resolution		4 : 1280x768P	
		5 : 1368x768P	
		6 : 1280x720P	
		7 : 1920x540P	
		8 : 720x480P	
		9 : 720x480I	
5. Output CSC	csc [#]	0 : YPbPr	
		1 : RGB	
6. Picture Adjust	outbrightup	-	Output Brightness Up
	outbrightdown	-	Output Brightness Down
	outbrightness [#]	-	Direct setting of Output Brightness
	outcontup	-	Output Contrast Up
	outcontdown	-	Output Contrast Down
	outcontrast [#]	-	Direct setting of Output Contrast
	outsatup	-	Output Saturation Up
	outsatdown	-	Output Saturation Down
	outsaturation [#]	-	Direct setting of Output Saturation
	outhueup	-	Output Hue Up
	outhuedown	-	Output Hue Down
	outputhue [#]	-	Direct setting of Output Hue
	outsharpup	-	Output Sharpness Up
	outsharpdown	-	Output Sharpness Down
	outsharpness [#]	-	Direct setting of Output Sharpness
	picturedefault	-	Setting Picture Adjust to default
	outposhup	-	Output Horizontal Position Up
	outposhdown	-	Output Horizontal Position Down
	outposvup	-	Output Vertical Position Up
	outposvdown	-	Output Vertical Position Down
	polarity [#]	0 : active low	Output Sync Polarity : Active Low
		1 : active high	Output Sync Polarity : Active High
	outsizehup	-	Output Horizontal Size Up

HD Hanna™ Operating Instructions

	outsizevup	-	Output Vertical Size Up
	outsizevdown	-	Output Vetical Size Down
7. SD Input Picture Adjust Default	sdinputdefault	-	Setting SD Input Picture Adjust to default
8. Audio Volume Control	volup	-	Audio Volume Up
	voldown	-	Audio Volume Down
	volume [#]	range form 0 to 50	Direct setting of Audio Volume
9. Firewire	imodeon	-	Firewire Mode ON
	imodeoff	-	Firewrite Mode OFF
	irec	-	Firewire Recoding
	iplay	-	Firewire Play
	istop	-	Firewire Stop
	iff	-	Firewire Fast Forward
	irew	-	Firewire Rewind
	ibs	-	Firewire Back Skip
	ifs	-	Firewire Forward Skip
	ipause	-	Firewire Pause
		-	
10. Factory Default	fdefault	-	Setting all data to factory default
11. Channel Auto Search	autosearch [#]	0 : ant A	Auto channel search for ANT A
		1 : ant B	Auto channel search for ANT B
12. Show EPG	epg	-	VIEW EPG
13. Power Off	poweroff	-	Power OFF
14. OSD Exit	exitosd	-	Erase OSD
15. Audio Mute	muteon		Audio Mute On
	muteoff		Audio Mute Off
16. Video Freeze	freezeon		Output Video Freeze On
	freezeoff		Output Video Freeze Off
17. Information Window	infowinon		Information window On
	infowinoff		Information Window Off
18. Etc.	Exit		Exit from command mode

See an Example of the commands on the following page.

HD Hanna™ Operating Instructions

Following is an example of how to use a communication program (such as Hyper Terminal) to generate the commands to control the above functions of your HD Hanna™ unit using the discrete command protocol:

1   With your HD Hanna™ unit in the Power-OFF condition, use a straight RS-232 cable (not a null modem cable) to connect the RS-232C port of your HD Hanna™ unit to the RS-232C port on your PC. Use the following settings:
          • Set the Hyper Terminal to COM1*
          • Baud Rate: 57600
          • Data: 8-bit
          • Parity: None
          • Stop: 1 bit

*Note: make sure you are not running any other active program using COM1, such as the "Hot Sync" Palm program

2   WTurn ON the Power to your HD Hanna™ unit. In your Hyper Terminal window, press [ENTER]. You will be prompted with:
          Key Digital® HD Hanna™ RS-232C control
          HDHanna>

        The help menu and the rest of the commands should be very simple
          The commands of the above table are listed.

        Note that in RS-232C command mode, the HD Hanna™ Remote Control and

   front-panel Pushbuttons are non-functional.

3   WIf at any time you want to escape from the RS-232C command mode, type "exit" on your terminal and press [ENTER].

4   WShould you encounter any problems during any of these steps, call us toll-free at 1-888-258-2028 or contact us by e-mail at tech@keydigital.com.

August 2004

Key digital®

Key digital®

The Experts in Digital Video Technology and Solutions.
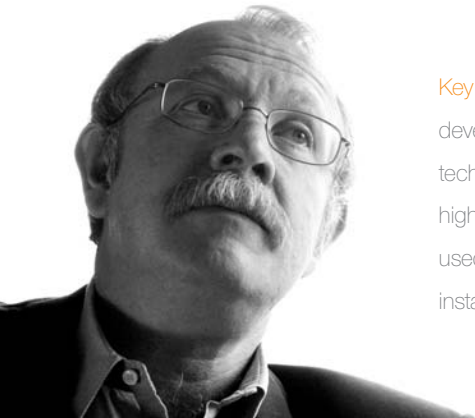
Key Digital®, led by digital video pioneer Mike Tsinberg, develops and manufactures high quality, cutting-edge technology solutions for virtually all applications where high quality video imaging is important. Our products are used by professional broadcasters, corporations, custom installers, home theater retailers, and consumers.

Web :: www.keydigital.com

Phone :: 914-667-9700   Fax :: 914-668-8666