ImageStar HD

User Guide

ELECTROSONIC

IMAGESTAR HD USER GUIDE
Part No. I460GB issue 4 (27-Aug-08)

IMPORTANT SAFETY MARKINGS

The following symbols are used throughout this User Guide to advise you of important instructions:

This symbol warns the presence of a voltage of sufficient magnitude to cause a severe or fatal electric shock. Follow the appropriate instructions carefully to avoid the risk of injury.

This symbol indicates an important instruction for the correct and safe installation, operation or maintenance of your *ImageStar HD* system. Failure to comply with such instructions may result in injury to personnel or damage to the *ImageStar HD* hardware.

Contents

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SECTION 1:

Introduction

What is ImageStar HD?

ImageStar HD is a compact, high performance image processor for scaling a variety of input source types, including high definition video or graphics, across up to four displays. Using additional units it is possible to create larger target displays.

Up to four inputs may be simultaneously connected to the unit. A built-in switcher allows the displayed source to be selected. Each output can display a magnified component of the selected source.

Firmware & Software Versions

This User Guide is based on the following *ImageStar HD* firmware and software versions:

- ImageStar HD firmware   v1.0.0.23
- ImageStar Configuration software   v1.2.3

Electrosonic may periodically release updates to the firmware or configuration software in order to provide new or enhanced functionality. Details of any updates can be obtained by:

- Clicking the **Product Support** link on the System Disc browser, or
- Selecting the **Check for Updates** option in the Help menu of ImageStar HD Configuration, or
- Visiting the Electrosonic web site **www.electrosonic.com/support**

Typical System Application

Single Unit Example

Using a single *ImageStar HD* to show a source on a 2×2 target display:

Multiple Unit Example

Using four *ImageStar HD* units to show a source on a 4×4 target display. Each *ImageStar HD* drives four screens in the display:

Front Panel Features

CONTROL PANEL

SELECT button   *Infra Red Sensor*

Active Input Indicators
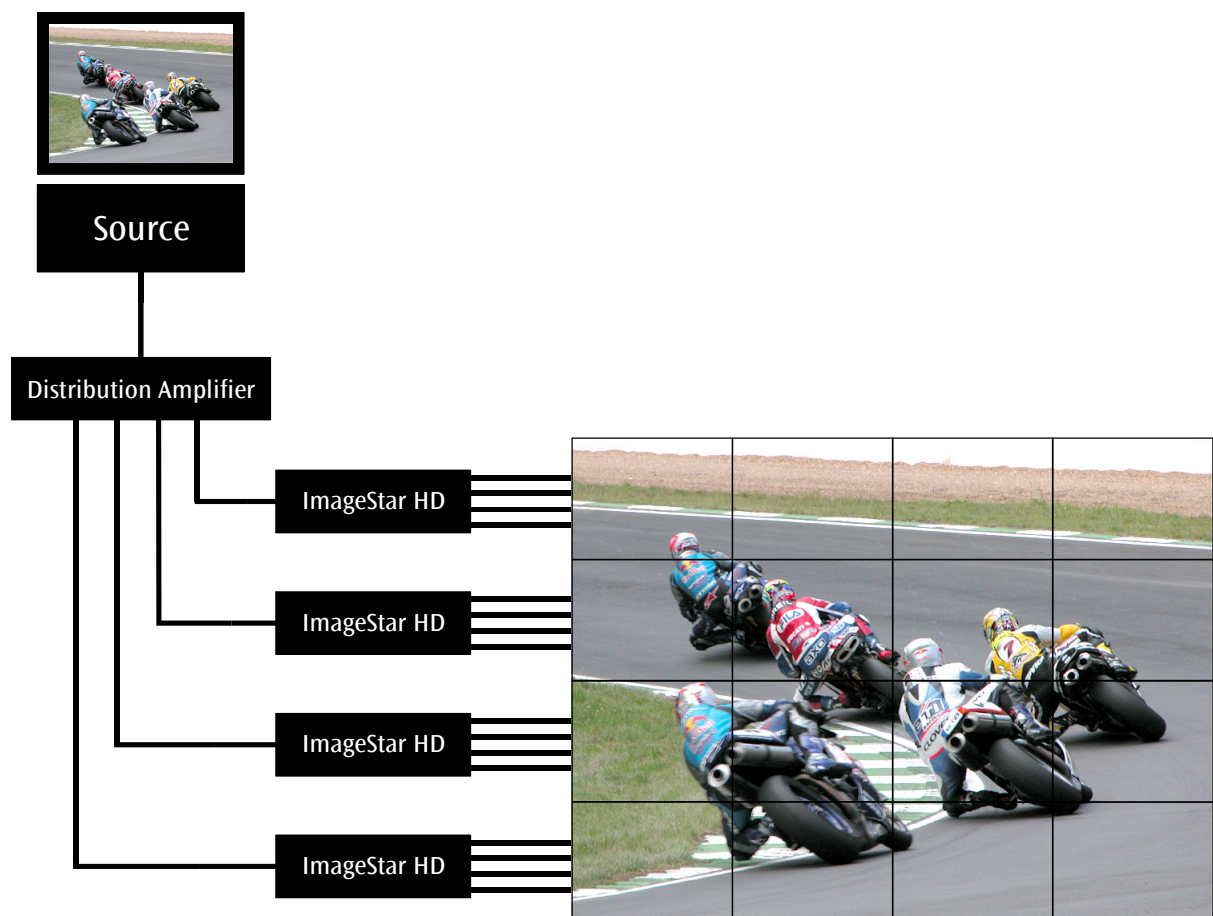
POWER   *NETWORK*
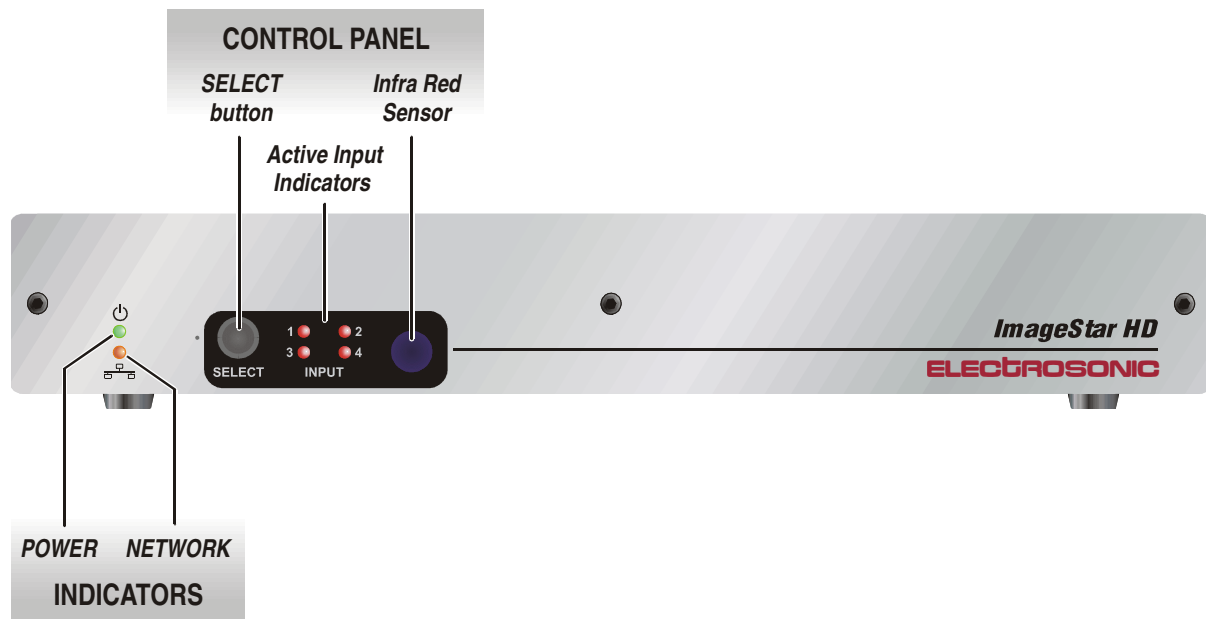
INDICATORS

Indicators

⏻   The **green** power indicator is lit continuously when the unit is receiving power from the external PSU.

⊟   The **amber** network indicator flashes when network data is being received or transmitted.

SELECT Button

A push-button used to switch between connected source inputs.

INPUT (1-4) Indicators

During normal operation the lit indicator shows which input is currently selected for display. During the boot-up period (around 30 seconds after power is applied or following a reset) these indicators will cycle through various diagnostic patterns.

Infra Red Sensor

Reserved for future use.

Rear Panel Features
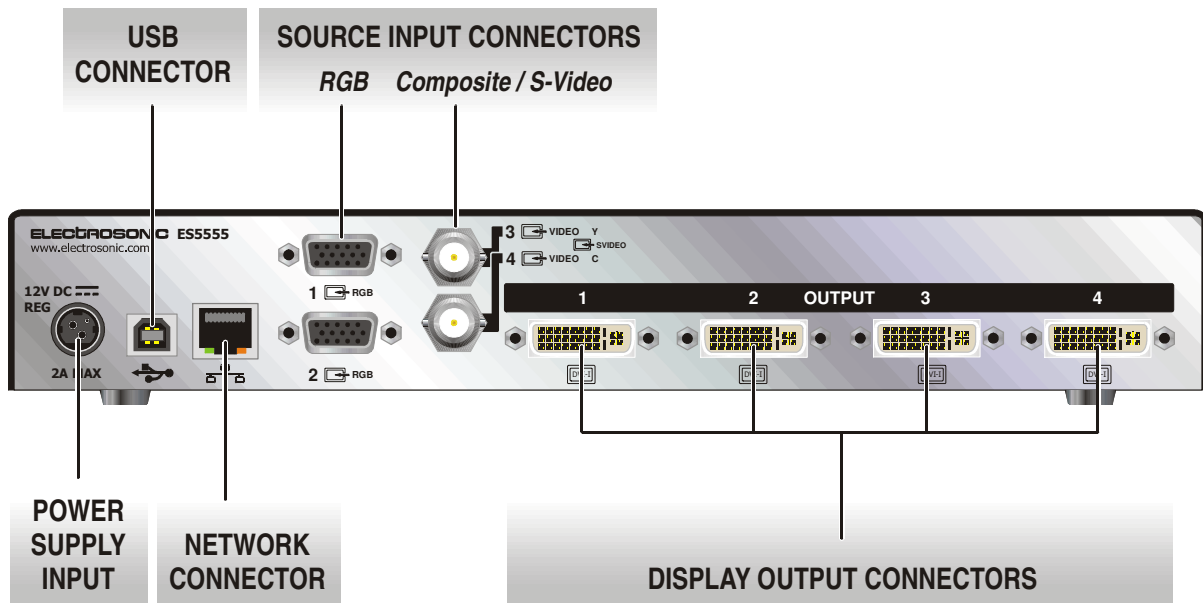
Full details of connector types, pin-outs and specifications can be found in Section 5: Technical Data. Briefly, these are as follows:

Power Supply Input

The **ImageStar HD** requires a 12V power supply via this connector. A suitable mains operated power supply unit (PSU) is provided.

IMPORTANT: *When cycling the mains power to the PSU, wait at least 45 seconds after powering down before powering up again.*

Network Connector

Used for device setup/configuration and downloading new firmware.

USB Connector

Used for downloading new firmware.

Source Input Connectors

Input connectors for up to two analog RGB/component video sources, plus up to two Composite sources or one S-Video source. See pages 27 to 29 for connection methods.

Display Output Connectors

Output connectors for up to four analog or digital display devices. Each output can be mapped to any position in a tiled display. See pages 30 and 31 for connection methods.

IMPORTANT: *Clip-on Ferrites (e.g. Würth part no. 74271132) must be fitted to each output cable as near as possible to the output connector.*

Source Compatibility

Source Types

ImageStar HD provides inputs for up to four sources, which can comprise:

- Up to two analog RGB or component video (YCrCb or YPrPb) sources, plus
- Up to two Composite sources or one S-Video source.

A built-in source switcher is used to select the input to be displayed. This can be operated either by pressing the **SELECT** button on the front panel, or using remote commands via the network control port.

Full auto-detection is provided on each input, allowing a wide range of standard source types to be connected without the need for any further configuration. For a full list of supported standard modes see page 80.

NOTE: *PAL 60 format is not supported. PAL 60 is commonly output by European VCRs when playing back an NTSC tape.*

Automatic gain control (AGC) ensures optimum source display with signals as low as 20% of normal amplitude.

NOTE: *Due to the dynamic nature of AGC an identical source fed to different inputs may not display with identical results.*

Macrovision-encoded Sources

Many pre-recorded videos and DVD's are copy-protected by a system called Macrovision®. It works by inserting variable intensity signals into the non-visible region of the source signal. These 'false' signals 'confuse' the AGC circuit of conventional recording devices, preventing the source from being copied satisfactorily.

Typically more than 90% of Macrovision (type 1, 2 or 3) encoded sources can be viewed successfully using **ImageStar HD**. However, certain sources may suffer some visual disturbance or fail to achieve full signal lock.

Display Capability

ImageStar HD allows any one of the four possible inputs to be scaled up to fill the target display.

Output Channels

The *ImageStar HD* has four output channels, each capable of driving a wide range of display devices. Up to four outputs can be driven with a resolution of up to SXGA (1280 × 1024 pixels). Beyond this resolution and up to SXGA+ (1408 ×1050) or 1080i (1920 × 1080i) up to two outputs can be driven.

Output/Display Mapping

By default, the *ImageStar HD* output channels are configured to drive a 2×2 target display. However, any rectangular arrangement of screens can be accommodated by changing the output mapping.

On a single unit, for example, display layouts of 1×2, 1×3, 1×4, 2×1, 3×1 or 4×1 screens are possible.

By using multiple units, the overall size of the target display can be extended to 8×8 screens (or equivalent rectangular arrangement using up to 64 screens).

Even larger displays are possible but these are difficult to quantify because size limits become dependant on source and display screen resolutions. Furthermore, an 8×8 target display will require 16 *ImageStar HD* units to drive it and may not be the most cost-effective solution to driving such a large display!

Source Scaling & Viewporting

Typically the selected input source will be scaled to fill the entire target display area. Where the aspect ratio of the display does not match the aspect ratio of the source, the source will usually be stretched (either horizontally or vertically) to fit the display.

The following examples show the effect of source scaling on different display layouts:

Original 4:3 Source

Stretched Vertically
for a 1 x 4 Display

Stretched Horizontally
for a 4 x 1 Display
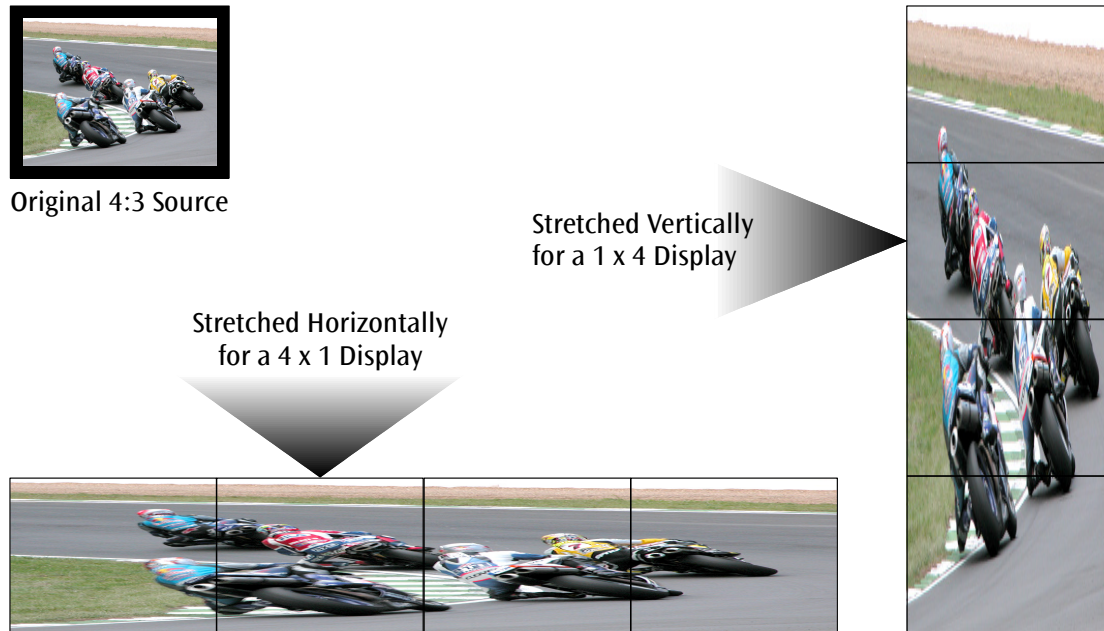
Alternatively, *ImageStar HD* offers Viewporting capability which allows you to display a specific area of the source frame. One possible use of this capability is to show specially created source content to be used on a rectangular display without distortion:

Original
'Letterbox' Source

Original
'Pillarbox' Source

Viewported
for a 1 x 4 Display

Viewported
for a 4 x 1 Display
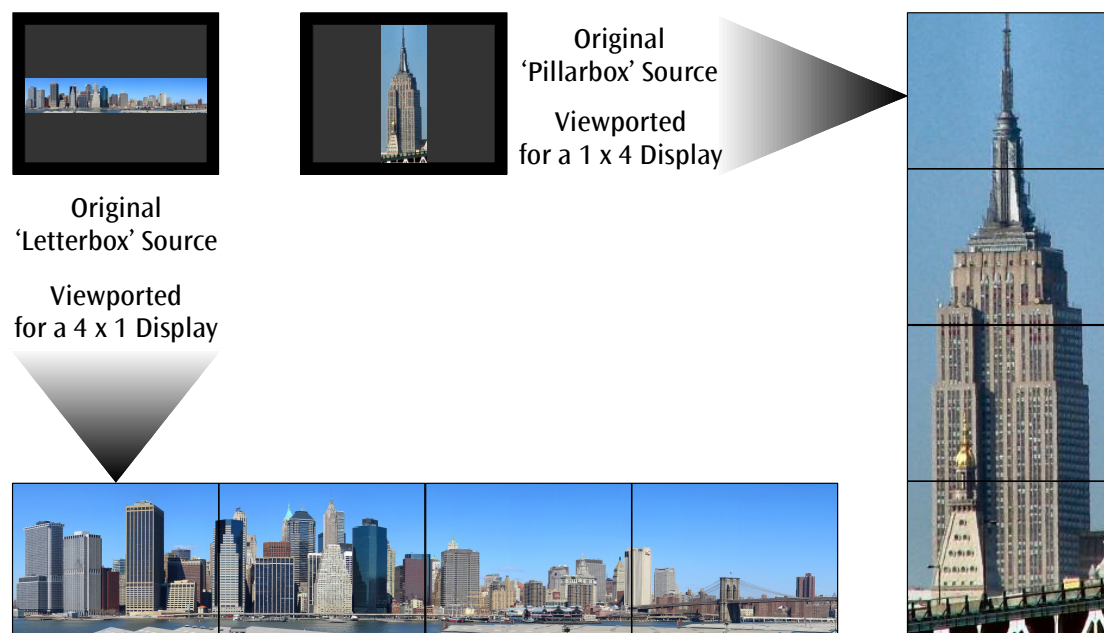
Control Capability

Front Panel Control

The **SELECT** push-button on the front panel provides source selection. Each press will switch to the next source input. The currently selected source input is shown by the four **INPUT** indicators (labeled **1** to **4**).

IR Control

This feature is not currently supported.

Configuration Software

Initial setup and remote control of the ***ImageStar HD*** is achieved using the ImageStar HD Configuration software running on a separate PC or laptop. For further details, see Section 3.

NOTE: *For more detailed information about the control protocol used by ImageStar HD and how to control it via HyperTerminal, refer to Appendix A.*

Accessories

Supplied Accessories

In addition to this User Guide, the **ImageStar HD** is supplied with the following accessories. If any of these items is missing or damaged, please contact your Electrosonic dealer immediately:

Item	Qty	Re-order Code
12V Power Supply Unit (PSU)	1	ES5555-PSU
IEC Mains Cord for PSU (with 3-pin 'Edison' plug) *For use in the USA.*	1	CA4291LF
IEC Mains Cord for PSU (unterminated) *For use in Europe and all other countries. See page 25 for plug wiring instructions.*	1	CA429LF
DVI-A to 15-pin HD Adapter *Used to connect 15-pin VGA style connectors to the DVI outputs.*	4	CA10026LF
System Disc *A CD containing user documentation, support information, firmware files and configuration software.*	1	M20080

Optional Accessories

The following optional accessories are also available for use with the **ImageStar HD** – these must be ordered separately from your Electrosonic dealer:

Item	Order Code
Rack Mounting Kit *A kit that allows an **ImageStar HD** to be installed in a 19inch equipment rack. Full instructions are included with the kit.*	ES5555-RM

SECTION 2:

Installation

Choosing a Suitable Location

The **ImageStar HD** is designed to be used either as a free-standing unit or (by using the optional kit available) to be mounted in a 19 inch equipment rack.

CAUTION

Whichever installation method you choose there are certain environmental requirements, detailed on page 21, which must be observed in order to ensure safe and reliable operation.

For rack-mounted applications the criteria detailed on page 22, must also be observed.

Environmental Requirements

	CAUTION
⚠	The criteria on this page must be observed for all installations of the ***ImageStar HD***, whether free-standing or rack-mounted.

Orientation

The ***ImageStar HD*** must be operated in the horizontal position only. When used free-standing it must be placed on a stable, flat and level surface. Ensure that the surface finish will not be affected by the heat produced by the ***ImageStar HD*** when in use.

Temperature

DO NOT install or operate the ***ImageStar HD*** in an area where the ambient temperature exceeds 35°C (95°F) or falls below 5°C (35°F).

Remember that, as with all electronic equipment, the ***ImageStar HD*** and its associated PSU also produces heat which may affect the ambient temperature.

After the ***ImageStar HD*** has been in use for a period of time the external casing will be very warm to the touch. While the temperature is well within safe limits please be aware that it may be hotter than you are expecting. Ensure that any adjacent surfaces will not be affected by the heat.

Ventilation

No special ventilation is required. However, it is recommended that free air circulation is permitted around the unit.

Humidity & Water

DO NOT install or operate the ***ImageStar HD*** in an area in which the ambient relative humidity exceeds 85% or in an area that is prone to condensation.

DO NOT install or operate the ***ImageStar HD*** near water or in a location which may be prone to water seepage — the ***ImageStar HD*** is not waterproof.

Rack-mount Requirements

CAUTION

For rack-mounted installations, the following criteria must be observed (in addition to the Environmental Requirements listed on page 21)

Mounting & Support

ALWAYS use the special rack-mount kit (available separately) to secure the *ImageStar HD*. Full details on using the kit are included with the kit.

DO NOT stand other units directly on top of the *ImageStar HD* when it is rack-mounted as this will place excessive strain on the mounting brackets.

Ventilation

ALWAYS ensure that the rack enclosure is adequately ventilated. Sufficient airflow must be achieved (by convection or forced-air cooling) to satisfy the ventilation requirements of **all** items of equipment installed within the rack.

A ventilation gap of at least 44mm (1U) is recommended above and below the *ImageStar HD* and adjacent surfaces or equipment.

Mains Supply

ALWAYS ensure that the mains power supply is of the correct voltage and frequency for **all** equipment within the rack, and that it has a good ground/earth connection.

Where a power strip (mains distribution batten) is used (of either a hard-wired or plug and socket type), always ensure that the current rating of both the power strip and the supply is sufficient for all equipment within the rack.

Mains Power Connection (via PSU)

The **ImageStar HD** must be powered from a 12 Volt DC regulated supply. A suitable mains-operated power supply unit (PSU) is provided. The mains connection details that follow relate to the PSU.

> **NEVER CONNECT THE *ImageStar HD* DIRECTLY TO THE MAINS.**
>
> **ALWAYS use the PSU provided. If a backup/replacement PSU is required, always use an Electrosonic approved PSU.**

Supply Requirements (for PSU)

> **ALWAYS observe the following instructions to ensure safe and reliable operation of the PSU.**

ALWAYS ensure that the mains supply voltage is single phase only and is within the permitted range:

• 100 – 240V AC (0.45A Max.) 50 – 60Hz.

NEVER connect the PSU to a DC supply.

DO NOT allow the mains power point to be overloaded. This is particularly important to check when powering several items of equipment from a single power point (*e.g.* within rack-mounted installations).

WARNING: *To avoid the possible risk of electric shock or product damage due to condensation, ALWAYS allow the PSU to become acclimatized to ambient temperature and humidity for at least thirty minutes BEFORE switching on. This is particularly important when moving the unit from a cold to a warm location.*

IMPORTANT: *When cycling the mains power to the PSU, wait at least 45 seconds after powering down before powering up again.*

NOTE: *The PSU is double-insulated and does not require an earth/ground connection*.

Mains Power Cord (for PSU)

The mains PSU is equipped with a 3-pin (male) type mains connector which requires a power cord fitted with a corresponding 3-pin IEC320 (female) connector.

Two power cords are supplied with the PSU, each having a different termination; you must use the lead appropriate for your country:

In...	Use the...	Re-order Code
USA and Canada	cord fitted with the 3-pin American-style 'Edison' plug.	CA4291
UK, Europe and all other countries	unterminated cord and fit a suitable plug as described on page 25.	CA429

WARNING: Do not allow anything to rest on the mains power cord.

Fitting a Mains Plug

If you are fitting a plug to the unterminated power cord (or replacing an existing plug), you must fit a plug that:

- is rated for use with mains voltage
- is equipped with a grounding pin/connection
- complies with any applicable National or Local electrical regulations
- is fitted with a correctly rated fuse (applicable to UK-style plugs only – see page 26.)

WARNING: Never attempt to fit or use a plug without a ground or earth pin/connection.

Wiring Details

The wires of both mains power cords (supplied with each **ImageStar HD**) are color-coded as shown in the table below; be sure to connect your plug in accordance with the following guidelines:

Connect the wire colored...	to the plug terminal identified with...
Brown	'L' or 'Live' or 'Line' (*or colored red or brown*)
Blue	'N' or 'Neutral' (*or colored blue or black*)
Green & Yellow	'E ' or 'E' or 'Earth' or 'Ground' (*or colored green or green & yellow*)
⚠	*WARNING* — *If you are unsure of the connections, or if the markings in your plug do not match those given above, CONSULT A QUALIFIED ELECTRICIAN.*

NOTE: *The PSU is double-insulated and does not require an earth/ground connection. However, the earth cable of the mains lead must be connected in the plug.*

External Supply Protection

⚠ The mains power cord supplied with this product is rated at 10A maximum and must be protected from overload by an external fuse or circuit breaker.

Fused Plugs (UK-style)

If the power cord is fitted with a UK-style BS1363 3-pin plug (*i.e.* with provision for an internal fuse), then it must be fitted with a BS1362 ASTA approved 1 inch cartridge fuse.

This fuse must be rated at a **maximum of 10A/250V**. Since the current draw of the PSU is less than 1A, a fuse of a lower rating **not less that 3A/250V** may be used.

WARNING: Never attempt to fit a fuse or circuit breaker of a higher maximum rating than shown above.

Unfused Plugs or Hard-wired

If the power cord is fitted with an unfused plug, or is hard-wired into a power strip (mains distribution batten), then the power cord must be protected by an external fuse or circuit breaker of a rating shown in the table below:

Supply Voltage	110V nominal	230V nominal
Maximum Fuse Rating	10A	10A
Minimum Fuse Rating	3A	3A
WARNING: Never attempt to fit a fuse or circuit breaker of a higher maximum rating than shown above.		

Source Connections

RGB Sources

Component sources (*e.g.* RGB, YCrCb or YPrPb) can be connected to either input **1** or **2**:

> **NOTE:** *For pin-out details of the RGB inputs, see page 52.*
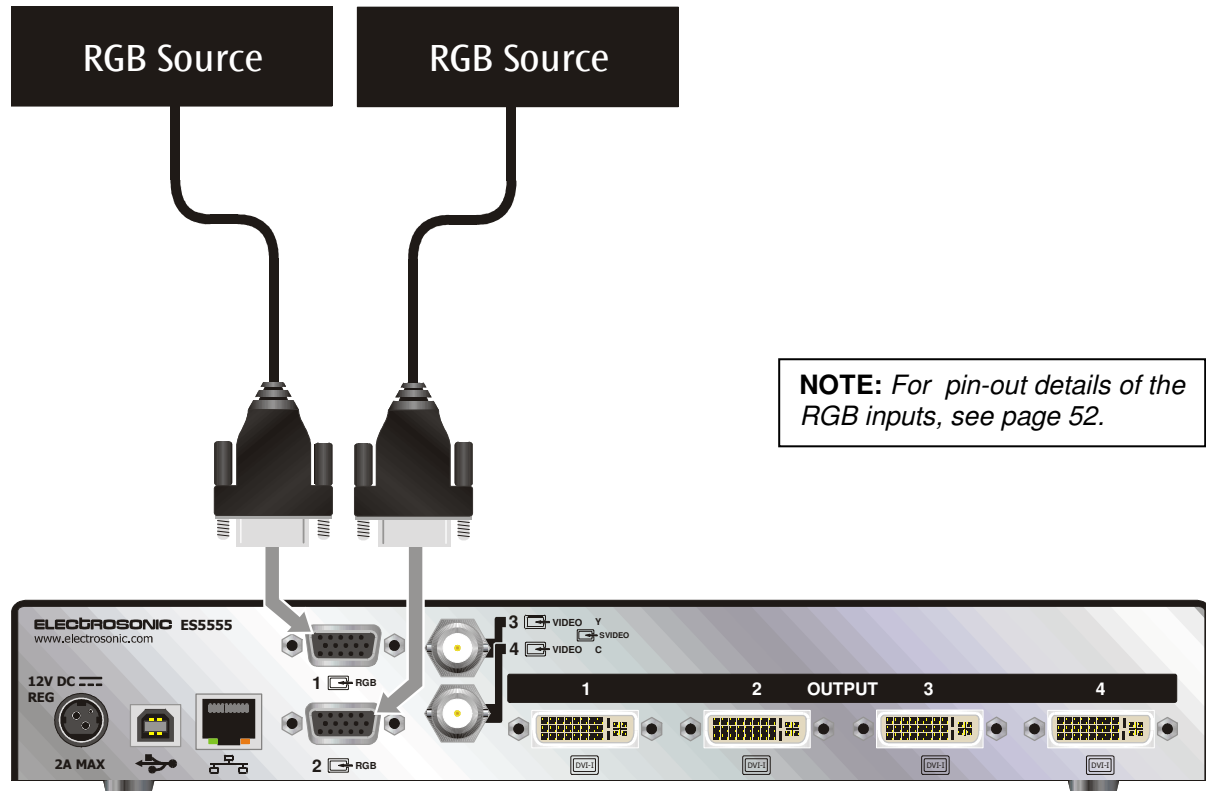
Composite Sources

Composite sources (*e.g.* CVBS) can be connected to either input **3** or **4**:
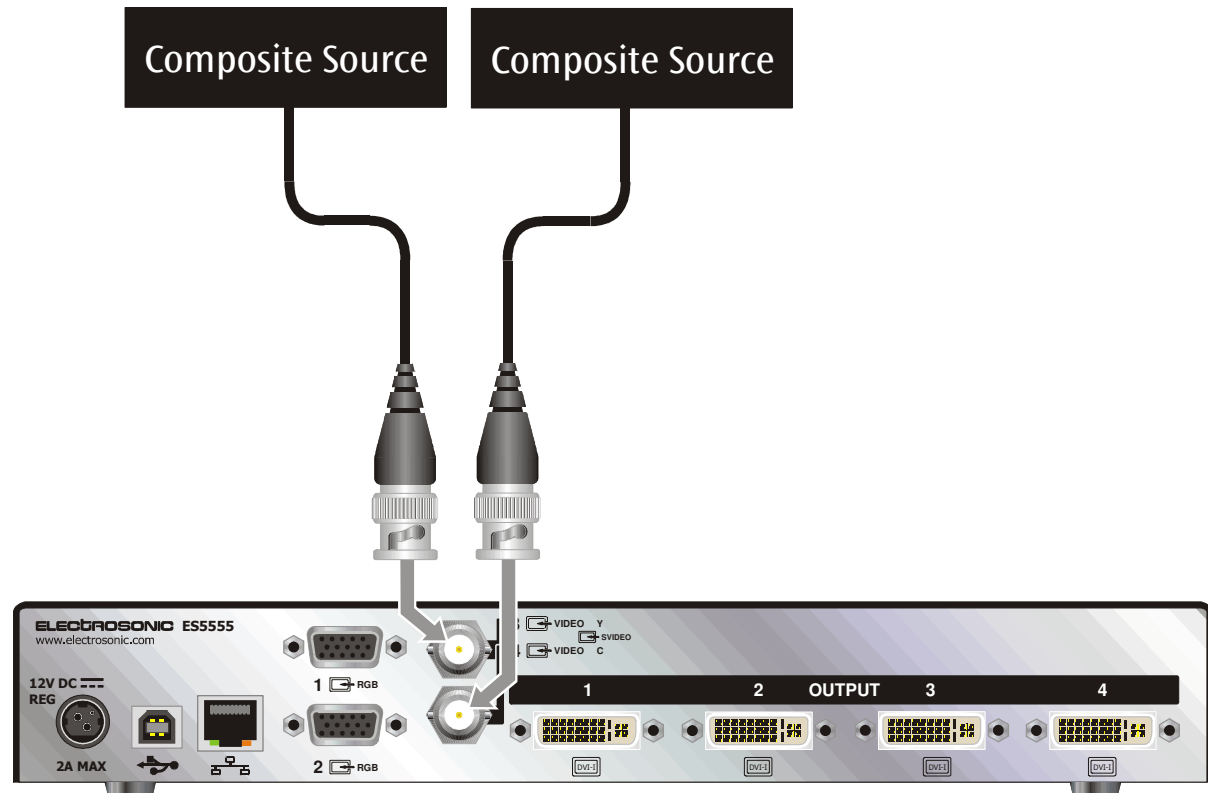
S-Video Source

S-Video sources (*e.g.* YC) can be connected using input **3** <u>and</u> **4**, Luma (Y) to input **3** and Chroma (C) to input **4**:
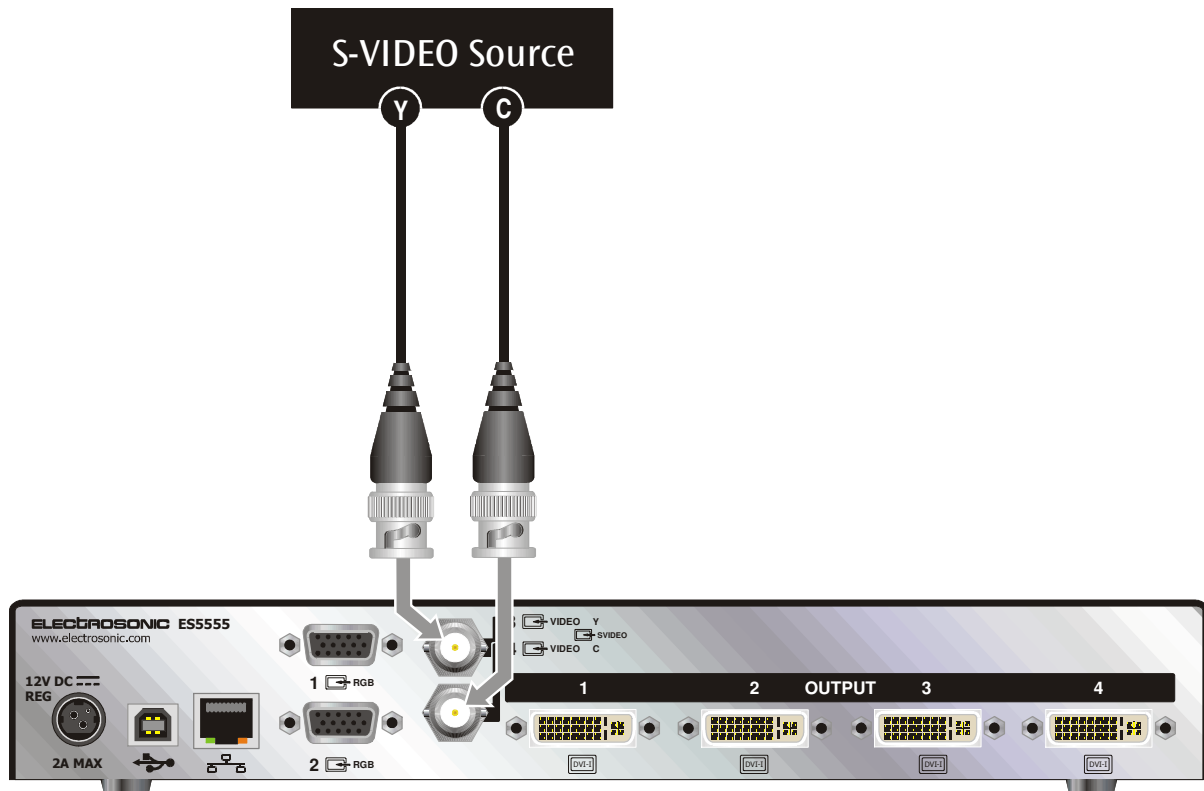
Display Connections

Digital Displays

Connect analog display devices to the outputs using suitable DVI-D type connectors and cables. The diagram below shows the default output mapping for a 2×2 target display:

IMPORTANT:
Clip-on Ferrites (*e.g.* Würth part no. 74271132) must be fitted to each output cable as close as possible to the output connector.

NOTE: *For pin-out details of the DVI-I outputs, see page 53.*
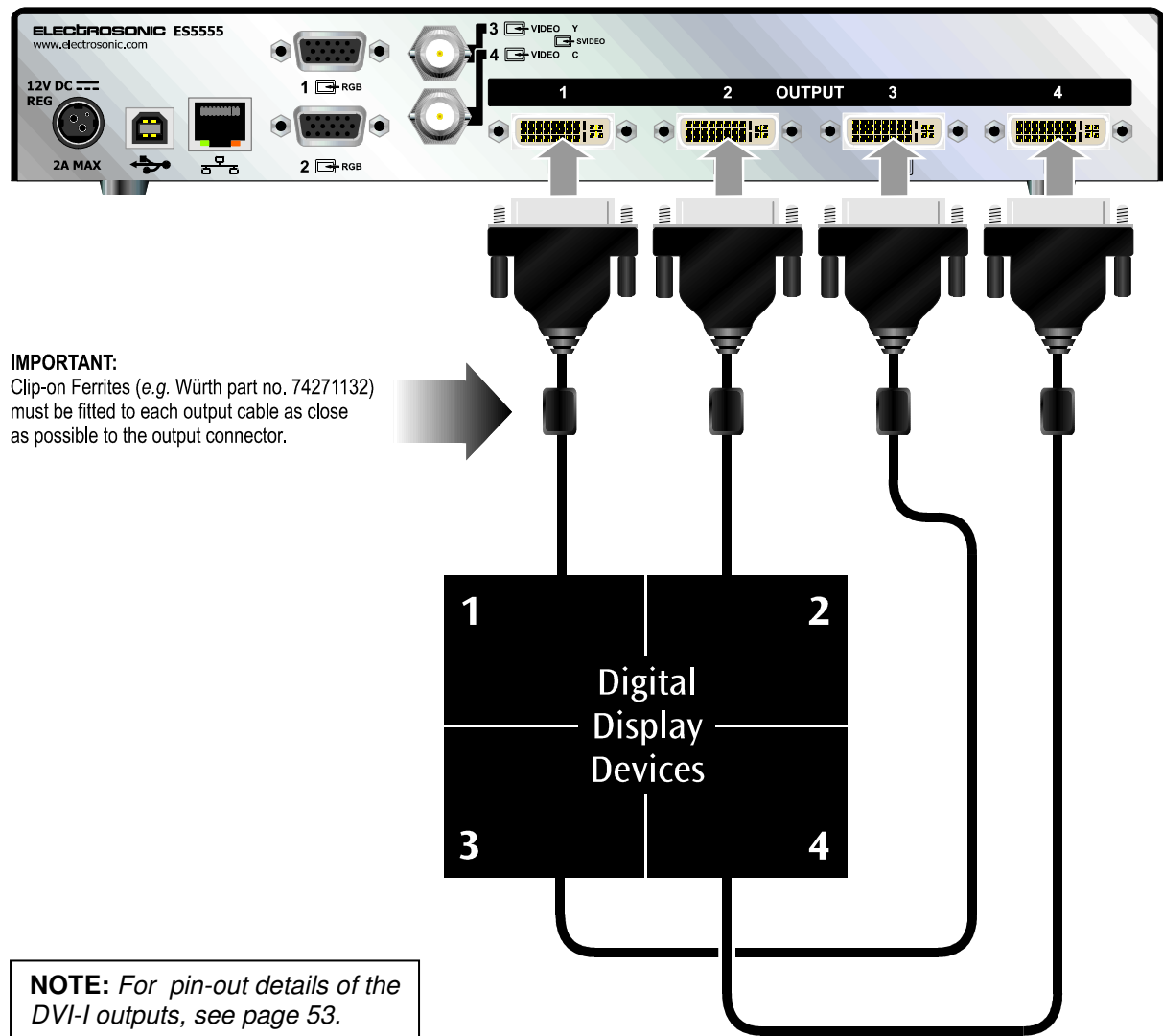
Analog Displays

Connect analog display devices to the outputs using suitable DVI-A type connectors and cables.

NOTE: *15-pin RGB type connectors and cables can also be used with DVI-A to 15-pin adapters as shown below. However, this method may prevent 'wide' modes (e.g. WXGA) from displaying correctly.*

The diagram below shows the default output mapping for a 2×2 target display:
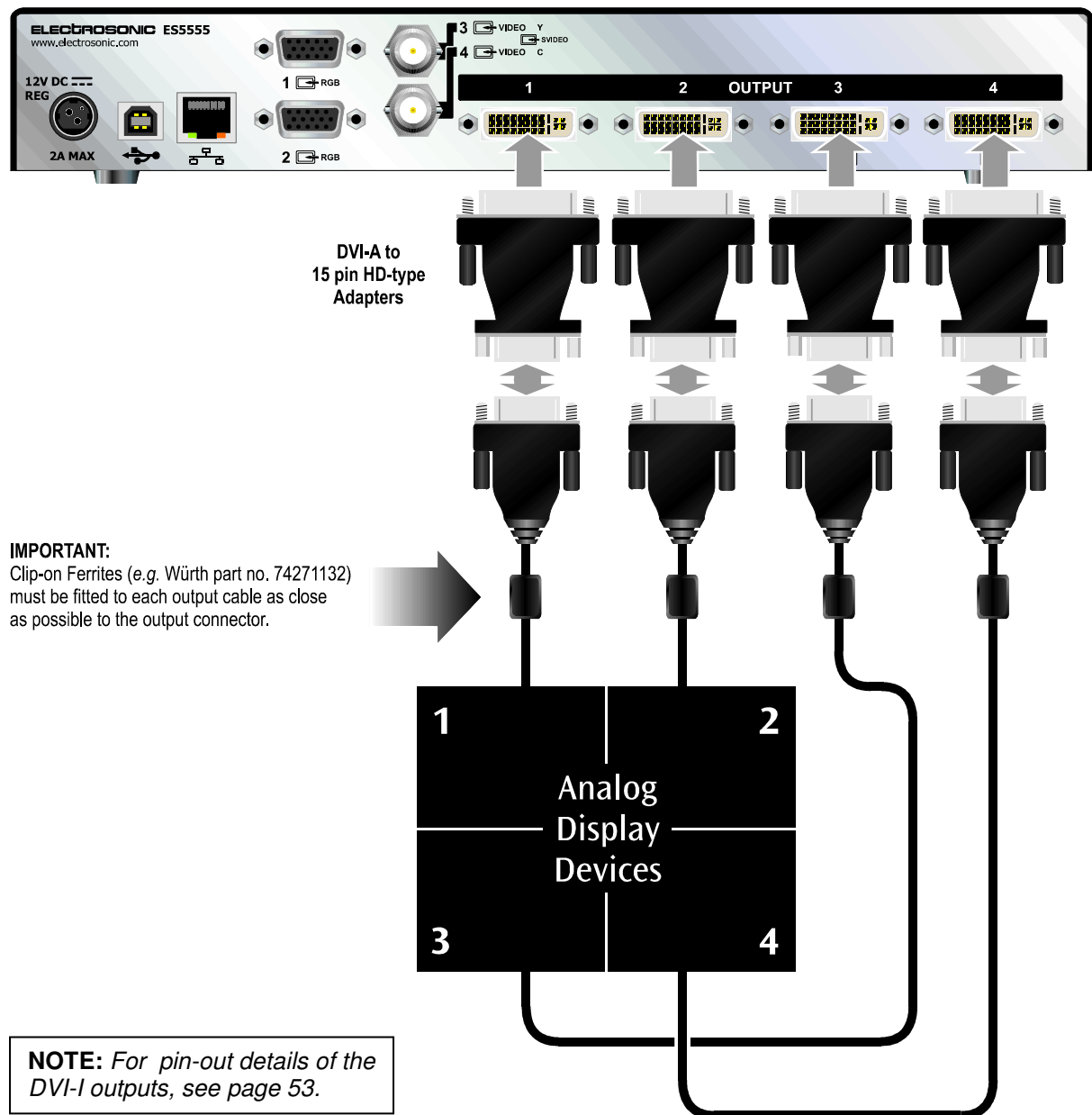
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SECTION 3:

Configuration

Introduction & Overview

ImageStar HD Configuration is a Windows software application that is used to configure the inputs and outputs of the **_ImageStar HD_** image processor.

NOTE: *For more detailed information about the control protocol used by ImageStar HD and how to control it via HyperTerminal, refer to Appendix A.*

Installing the ImageStar HD Configuration Software

ImageStar HD Configuration can be installed on any suitable PC or laptop provided that the following minimum requirements are met:

Operating System:	Windows XP (service pack 2) with .NET framework
Network Port:	Ethernet 10Mbps or higher
Free Disk Space:	At least 10MB
Optical Drive:	CD-ROM compatible

The application installer is located on the ImageStar HD System Disc. Insert the disc into the optical drive on your PC or laptop and wait for the disc browser to run automatically. If the browser doesn't run, or you have disc auto play disabled, run the setup.exe file located on the root of the System Disc.

Follow the onscreen instructions to perform the installation.

Starting the Application

Once ImageStar HD Configuration has been installed it can be run from the main start menu:

☞   Click on **Start** | **All Programs** | **Electrosonic** | **ImageStar HD Configuration**

Overview of the Workspace

After starting ImageStar HD Configuration you will be presented with an application window similar to the following example:
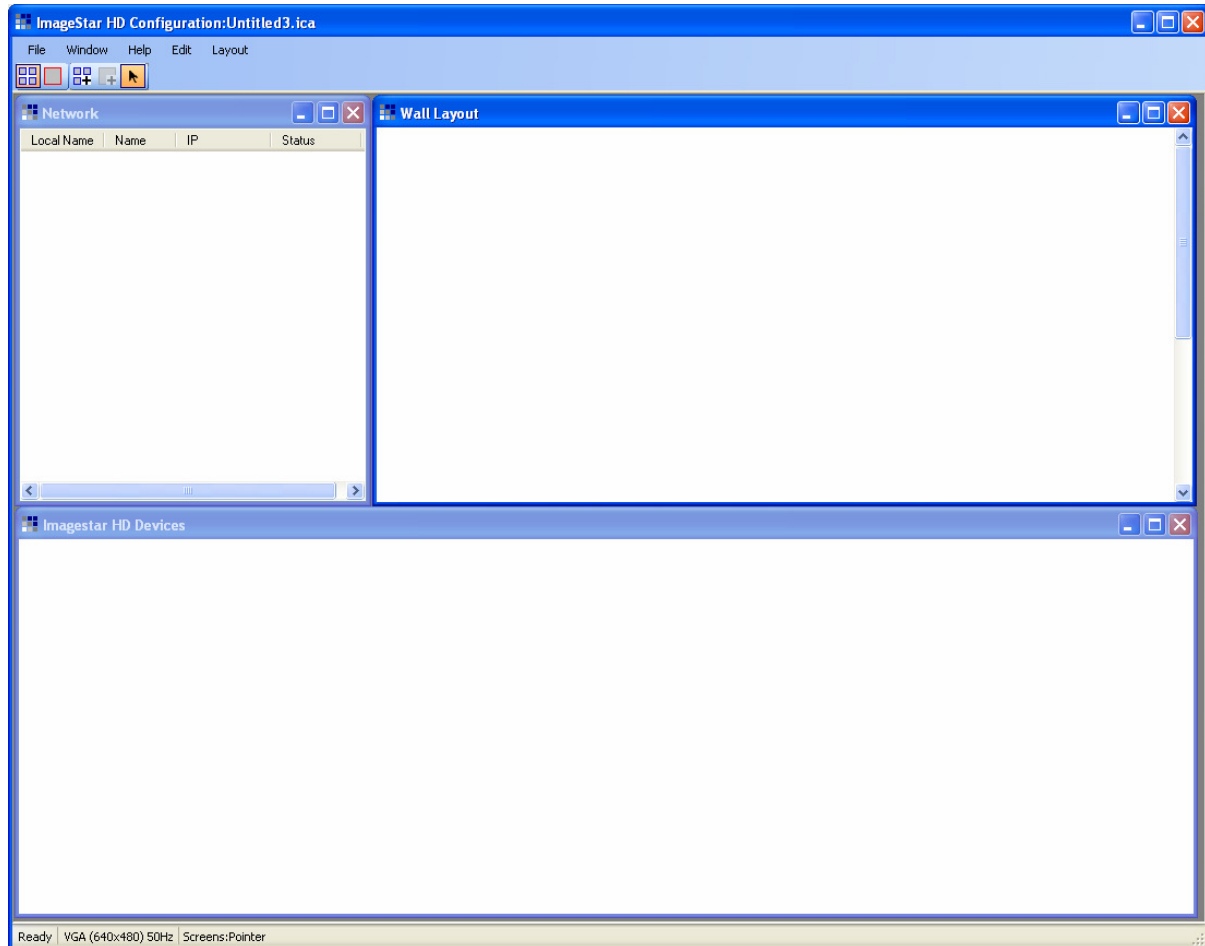
Windows

The application has three main working areas or windows:

- **Network Window**: used to manage ImageStar HD devices on the network, including the setting-up of network communications (IP Address, etc).

- **ImageStar HD Devices Window**: used to configure and select inputs on ImageStar HD devices and assign devices to clips.

- **Wall Layout Window**: used to configure the target display for your ImageStar HD system.

A fourth window – the **ImageStar HD Discovery Window** (accessible via the Window menu) is used to find or 'discover' **ImageStar HD** devices connected to the network.

Menu Bar
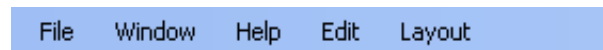
The menu bar provides access to various functions. The basic **File**, **Window** and **Help** menus are always available and these are supplemented with additional context-sensitive menus according to which one of the three windows is currently selected:

- **Edit** and **Layout** menus for the Wall Layout Window,
- **Network** menu for the Network Window,
- **Devices** menu for the ImageStar HD Devices Window, and
- **Discovery** menu for the ImageStar HD Discovery Window.

Toolbar

The toolbar is used in conjunction with the Wall Layout Window when creating wall layouts.

Status Bar
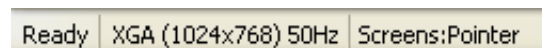
The status bar shows various pieces of information about the status of the application.
From left to right, these are:

General operation or connection status (*e.g.*):

Ready
Connecting…please wait
Discovering…please wait

The current output format selected (*e.g.*):

XGA (1024x768) 50Hz

The current mouse control state for the Wall Layout Window (*e.g.*)

Screens:Pointer
Screens:Screen
Clips:Pointer
Clips:Clip

Example Layout

The following view shows an example of ImageStar HD Configuration in use and gives an indication of what you can expect to see in each window:
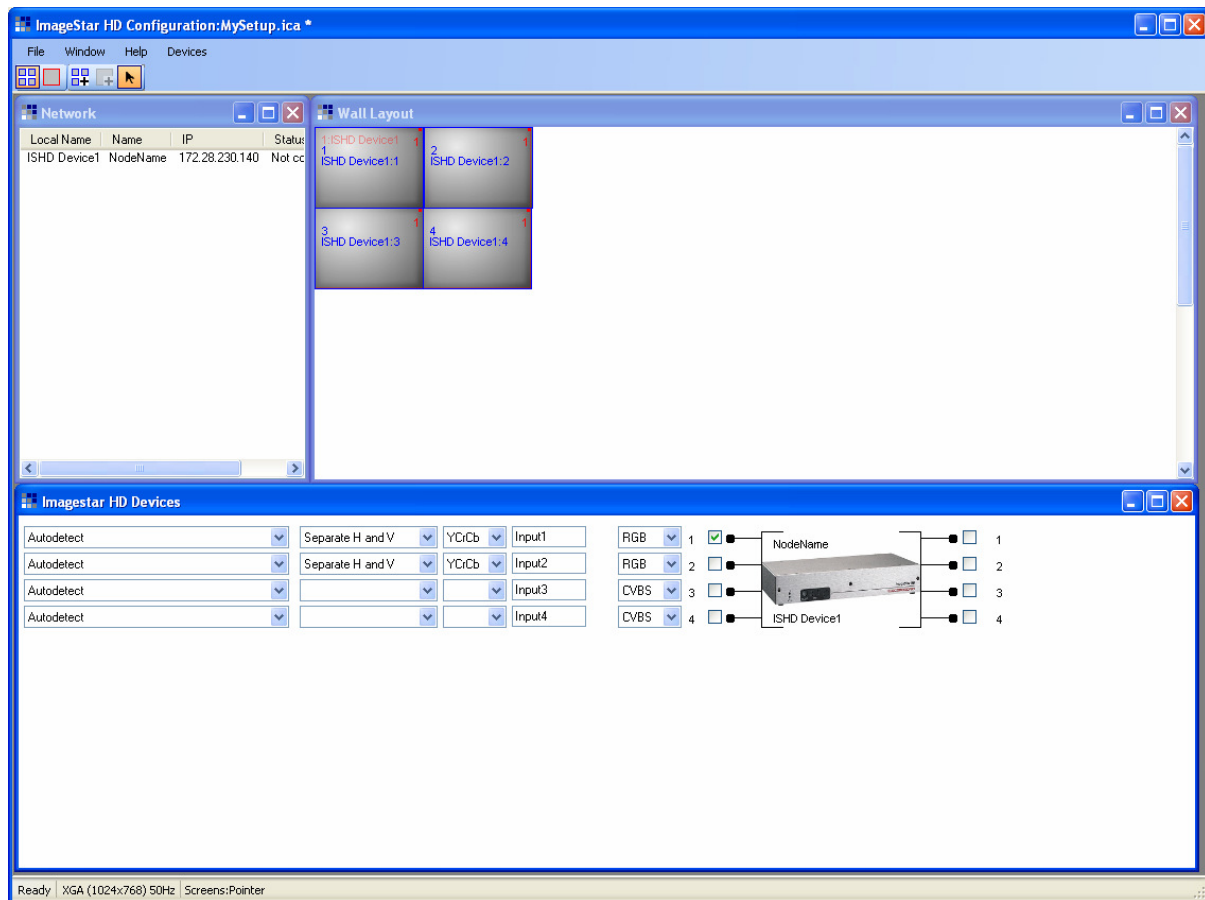
Reorganising the Workspace Layout

Each time ImageStar HD Configuration is started it will show the default window arrangement. However, you can resize, reposition, show or hide windows to suit your preferred working style.

To return to the original default window arrangement…

☞   Click the **Window** menu and choose **Arrange**.

To hide or show particular windows…

☞   Click the **Window** menu and choose the required window by name. A check mark next to the window name indicates that it is visible; no check mark means it is hidden.

Saving and Opening Configuration Files

The settings that you define in ImageStar Configuration can be saved as a configuration file. This allows you to keep a safe backup of the ImageStar HD setup and to build-up a library of useful configurations which can opened when needed.

Configuration files are saved with a **.ica** file extension.

To Save a Configuration File…

☞ Click the **File** menu and choose **Save** (to a copy of the current setup file) or **Save As** (to create a copy of the current file under a new name).

Choosing **Save As** (or **Save** on an 'untitled' setup) will display the standard Windows **Save As** dialog:
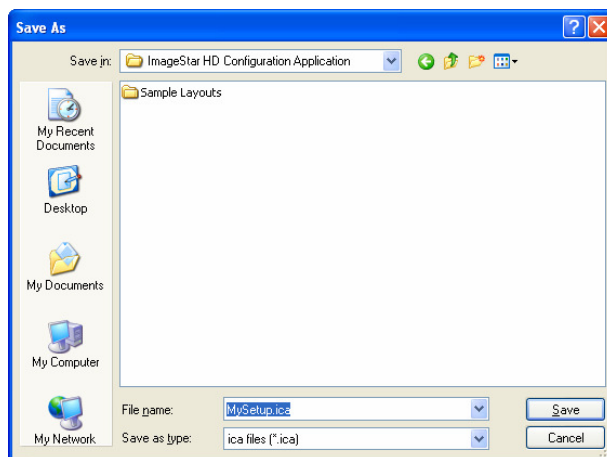
☞ Choose the required location for the file and type an appropriate **File name**.

☞ Click the **Save** button.

To Load an Existing Configuration File…

☞   Click the **File** menu and choose **Open**.

The standard **Windows Open** dialog will appear:
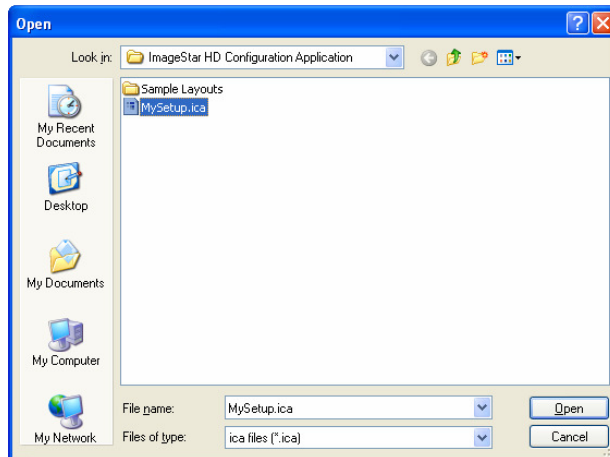
> **HINT**: *Some sample configuration files are provided with ImageStar Configuration and these can be found in the **Sample Layouts** folder.*

☞   Locate the required configuration file.

☞   Click the **Open** button.

Using ImageStar HD on a Network

In normal standalone operation, the **ImageStar HD** does not require a network connection.

However, to configure the unit, it is necessary to connect a PC/laptop (running the ISC App software) to the device via its Ethernet port.

This can be achieved either by:

• A direct connection between the PC and the **ImageStar HD** using a CAT5 crossover cable, or
• An indirect connection via a network.

Direct Connection (via crossover cable)
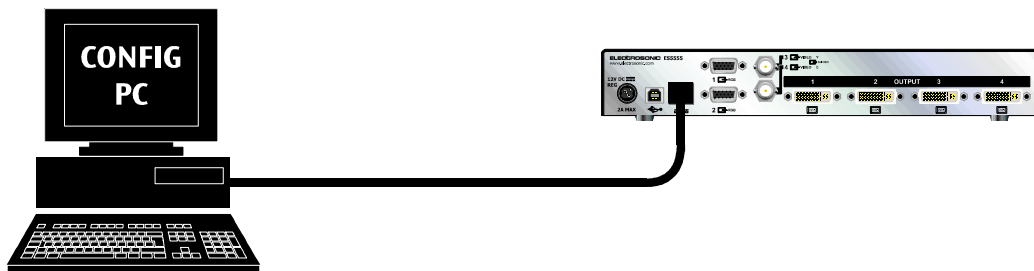
Indirect Connection (via local area network)
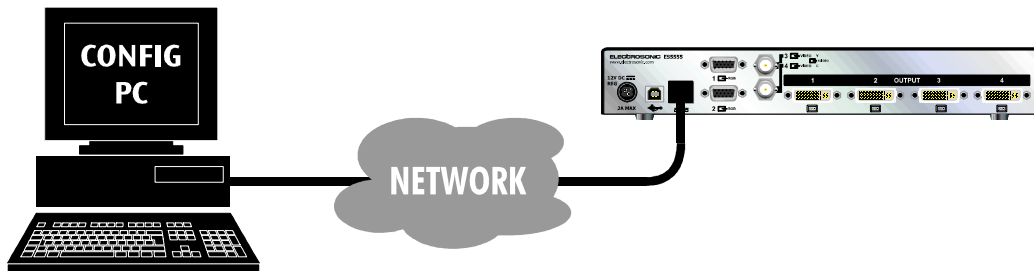
Whichever method is used, the network settings of the PC must be compatible with the ImageStar HD, *i.e.* both devices must have the same Subnet Mask.

The **ImageStar HD** is shipped with the following default network settings:

IP Address: 192.168.0.65
Subnet Mask: 255.255.255.0

This enables the device to be connected directly to a Class C type network using IP Addresses in the range 192.168.0.XXX provided that no other device is presently allocated the address 192.18.0.65.

Therefore, the PC must have the settings:

IP Address: 192.168.0.XXX   (where XXX is in the range 1 thru 254, but not 65)
Subnet Mask: 255.255.255.0

Rebooting the ImageStar HD

In certain circumstances it will be necessary to reboot the **ImageStar HD** to ensure that new settings are correctly implemented. For example:

- When changing network settings.
- When change the output resolution to or from SXGA+.

IMPORTANT NOTE: *The control connection established between an **ImageStar HD** and ImageStar Configuration is not maintained following a reboot operation. Therefore, you will need to 'disconnect' then 'reconnect' to the device to restore the connection.*

To reboot the unit…

☞ Ensure that ImageStar Configuration is 'disconnected' from the unit to be rebooted.

☞ Disconnect the power to the unit.

☞ <u>Wait for at least 45 seconds</u> and then reconnect the power.

The unit will then go through its initialisation/self-test phase (approx. 30 seconds). Once this is complete, you can 'connect' to the unit again if required.

Using ImageStar HD Configuration

The remaining pages in this section contain various procedures for creating a configuration for **ImageStar HD**.

Set up falls broadly into four stages:

- **Setting-up Network Communications** *(page 43 onwards)*
  How to change network settings (IP Address, etc)

- **Setting-up the Source Inputs** *(see page 50)*
  How to define input modes and select an input to display

- **Setting-up the Display Outputs** *(see page 51 onwards)*
  How to define the output mode, screen arrangement, source scaling and positioning

- **Fine-tuning the ImageStar HD** *(see page 59 onwards)*
  How to adjust RGB inputs, screen overscan and offsets

Setting-up Network Communications

Adding ImageStar HD Devices

If the PC or laptop running ImageStar HD Configuration is connected to the same network as an **ImageStar HD** processor, use the Discovery function as described below to find it and add it to the list of devices.

If you are working 'offline' you can add an **ImageStar HD** device manually (see page 45).

To add a device using the Discovery Function…

☞   Click the **Window** menu and choose **ImageStar HD Discovery**.

The **ImageStar HD Discovery** window will open:
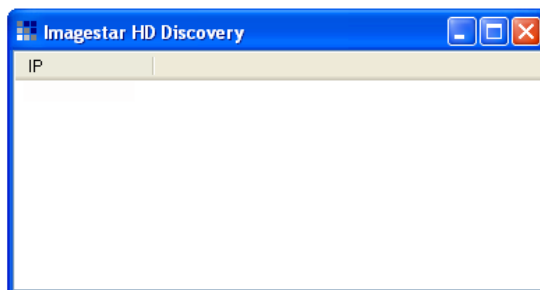
☞   Click the **Discovery** menu and choose **Discover** to check for active **ImageStar HD** devices on the network.

Any devices found will be listed by their current IP Address:

☞   Click on a device IP Address to highlight it.

☞   Click the **Discovery** menu and choose **Add to Network**.

A new device entry will appear in both the Network and ImageStar HD Devices windows:
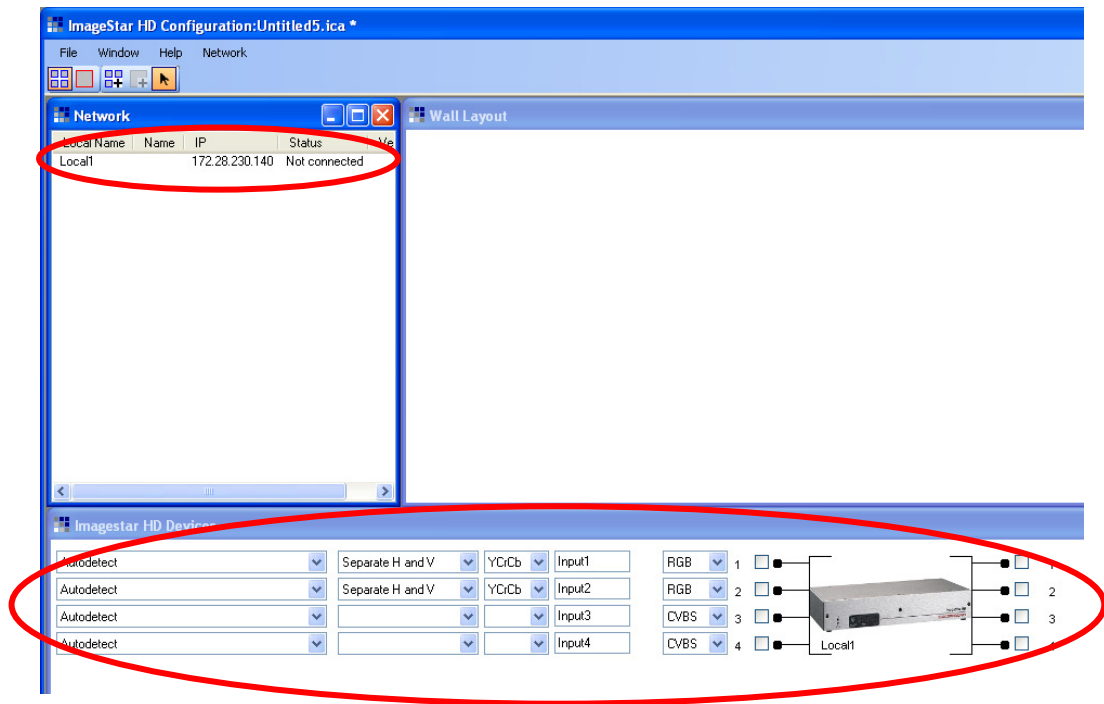
☞   If you need to change the device name or IP settings for this device, please refer to 'Changing Network Settings for a Device' on page 46.

IMPORTANT: *Remember that in order to communicate with an ImageStar HD device, it must be on the same subnet as the control PC/laptop (see page 40).*
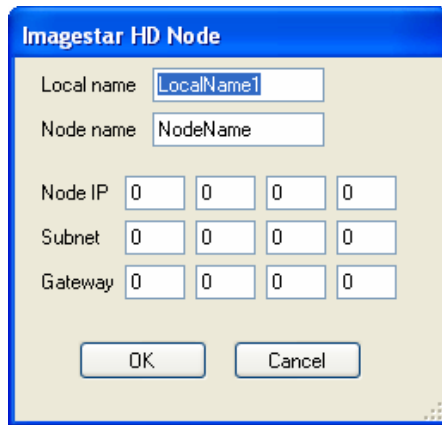
Otherwise, you can now move on to 'Setting-up ImageStar HD Inputs' on page 50.

HINT: *By activating* **Link Selection** *in the* **Window** *menu, selecting a device in either the Network or ImageStar HD Devices windows will automatically select/highlight the corresponding device entry in the other window.*

To add a device manually…

☞   Click the **Network** window.

☞   Click the **Network** menu and choose **Add**.

The **ImageStar HD Node** dialog box will appear:

☞   If required, change the **Local name** label to something more meaningful.

NOTE: *The **Node name** currently serves no purpose and can be ignored.*

☞   Enter a suitable **Node IP** address and **Subnet** mask for the device.

NOTE: *The **Gateway** address currently serves no purpose and can be left as zeros.*

☞   When the details are correct, click **OK**.

A new device entry will appear in both the Network and ImageStar HD Devices windows.
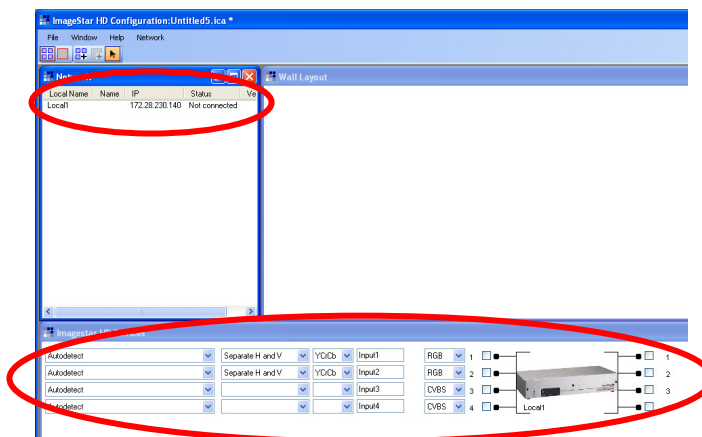
☞   If you need to change the device name or IP settings for this device, please refer to 'Changing Network Settings for a Device' on page 46.
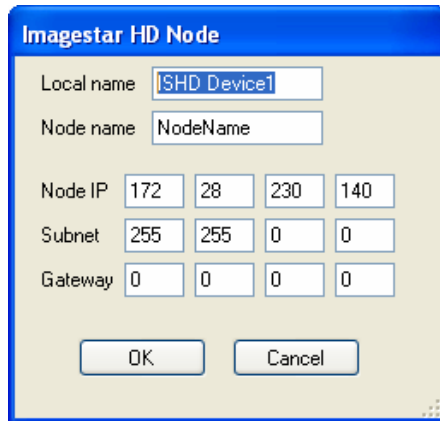
IMPORTANT: *Remember that in order to communicate with an ImageStar HD device, it must be on the same subnet as the control PC/laptop (see page 40).*

Otherwise, you can now move on to 'Setting-up ImageStar HD Inputs' on page 50.

Changing Network Settings for a Device

☞ In the **Network** window, double-click the **Local Name** of the required device.

The **ImageStar HD Node** dialog box will appear:

☞ If required, change the **Local name** label to something more meaningful.

NOTE: *The **Node name** currently serves no purpose and can be ignored.*

☞ Enter a suitable **Node IP** address and **Subnet** mask for the device.

NOTE: *The **Gateway** address currently serves no purpose and can be left as zeros.*

☞ When the details are correct, click **OK**.

IMPORTANT: *You will need to 'connect' to the device and 'update' it for the new network settings to take effect (see page 47).*

Removing a Device

☞ In the **Network** window, click the **Local Name** of the required device.

☞ Click the **Network** menu and choose **Remove**.

Updating an ImageStar HD (Network Settings)

Any changes that you make to the network settings in ImageStar HD Configuration are not automatically sent to the actual *ImageStar HD* device. To implement any new settings you must first 'connect' to the device and then 'update' it.

To connect to an ImageStar HD…

☞ In the **Network** window, click the **Local Name** of the required device.

☞ Click the **Network** menu and choose **Connect** (or **Connect All** to connect all devices at once).

The **Status** of the device will now show **Connected**:

NOTE: *If the connection attempt fails for any reason, the following message will appear:*

To disconnect from an ImageStar HD…

☞ In the **Network** window, click the **Local Name** of the required device:

☞ Click the **Network** menu and choose **Disconnect** (or **Disconnect All** to disconnect from all devices at once).

The **Status** of the device will now show **Not connected**:

NOTE: *If the following message appears it indicates that the device was already disconnected:*

To update the Network Settings of an ImageStar HD…

☞ In the **Network** window, click the **Local Name** of the required device.

☞ Click the **Network** menu and choose **Update**.

The **Commands** dialog will appear, showing a list of commands that will be sent to the ImageStar HD device:
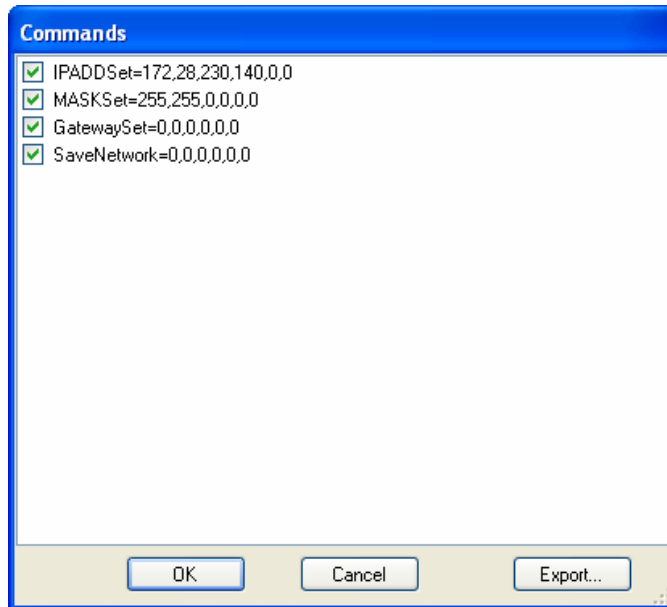
If required, you can prevent a command from being sent by deselecting the checkbox next to the command line.

HINT: *Clicking the Export button saves the 'checked' commands into a text file.*

☞ To send the selected commands, click **OK**.

The following message will appear:
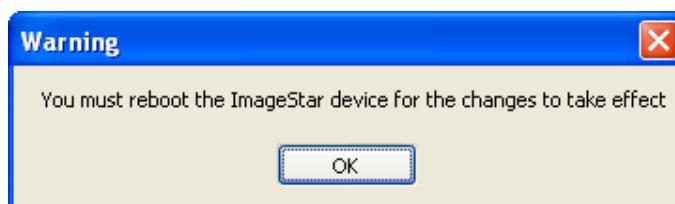
☞ Click **OK** and, when you are ready to do so, reboot the device (see page 41).

IMPORTANT NOTE: *Remember that the control connection established between ImageStar Configuration and the **ImageStar HD** is not maintained following a reboot operation. Therefore, you will need to 'disconnect' then 'reconnect' to the device to restore the connection.*

Using the Identify Function

The Identify function causes the red source LEDs on the front of the *ImageStar HD* to flash briefly. In a multi-processor system this can be used to help identify which device is which.

IMPORTANT: *All current wall layout and clip settings will be cleared from the ImageStar HD. These settings will need to be reapplied following use of the Identify function.*

☞   In the **Network** window, click the **Local Name** of the required device.

☞   Click the **Network** menu and choose **Identify**.

The red source LEDs on the front of the corresponding *ImageStar HD* will switch to input 1 (for 3 seconds) then to input 2 (for 3 seconds) and finally back to input 1.

Setting-up the Source Inputs

☞   In the **ImageStar HD Devices** window, choose the required settings for one or more inputs, using the drop-down boxes:
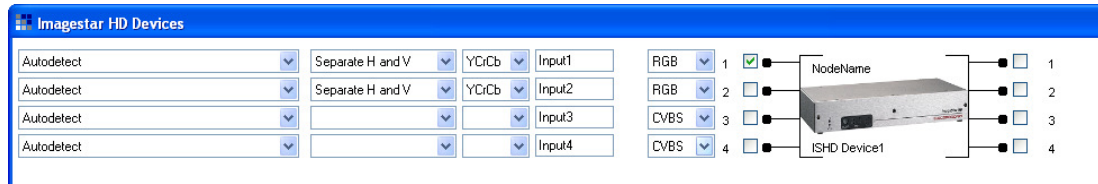
Typically, the default input mode of **Autodetect** is recommended. This allows the *ImageStar HD* to choose the input format that best matches the source.

☞   Ensure that the required input is selected by choosing the corresponding checkbox (**1** to **4**).

NOTE: *The checkboxes on the right-hand side are reserved for future use and currently should be left unchecked.*

Setting-up the Display Outputs

Setting the Output Mode

Setting the Output Mode determines the signal type that the *ImageStar HD* outputs to the display devices. It also defines the size/resolution of the screen icons in the Wall Layout window.

☞   Click on the **Wall Layout** window to highlight it.

☞   Click the **Layout** menu and choose **Set Resolution**.

The **Screen Resolution** dialog will appear:
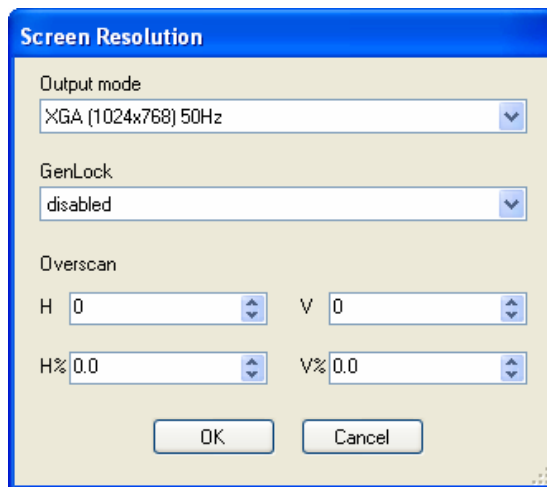
☞   Select the appropriate **Output mode** for driving your display devices.

☞   If required, choose **GenLock** mode and specify any **Overscan** settings.

HINT: *Overscan settings can also be adjusted interactively (see page 60).*

☞   Click the **OK** button.

Adding Screens to the Wall Layout

The Wall Layout provides a representation of the target display. One screen is required for each display device in the target display and these must be positioned and aligned to match the real display.

☞ Click the ⊞ button to select the Screen Layer.

☞ Click the ⊞ button to select Add Screen mode.

☞ Click in the **Wall Layout** window – each click will add a new screen to the layout.
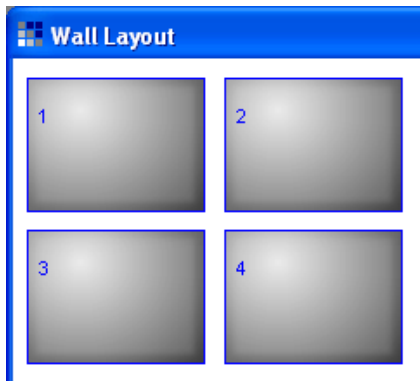
☞ To turn off Add Screen mode, click the ▲ button.

☞ Move each screen into the required position by dragging it with the mouse or by using the keyboard arrow keys.

   NOTE: *The arrow keys move the screen in increments of 10 pixels.*

☞ To delete a screen from the layout, click on it and press the **Delete** key (or choose **Delete** from the **Edit** menu).

☞ To precisely adjust a screen position, double click a screen to open its **Properties** dialog (or choose **Properties** from the **Edit** menu).
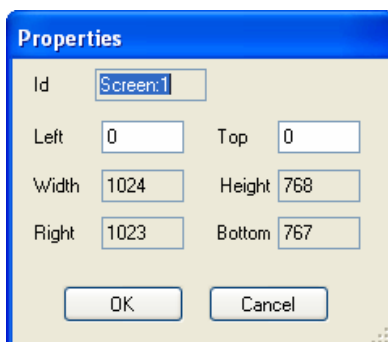
☞ Adjust the **Top** and **Left** pixel coordinates as required, and click **OK**.

   NOTE: *Pixel coordinates are measured from the extreme top left corner of the Wall Layout window, i.e. Top=0, Left=0. Pixel coordinates sent to the ImageStar HD are relative to the top-left corner of the associated source clip.*

☞ Click the **OK** button.

Add a Clip

A clip defines the area or window that the source input occupies on the target display. For example, if your target display is arrange as 2x2 screens, typically the clip will be sized so that it fills the entire display.

☞   Click the ☐ button to select the Clip Layer.

☞   Click the ⊞ button to select Add Clip mode.

☞   Click in the **Wall Layout** window – each click will add a new clip to the layout.
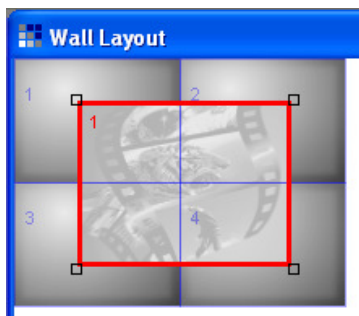
☞   To turn off Add Clip mode, click the ➤ button.

☞   Move or resize the clip into the required position by simply clicking and dragging the handles.

   NOTE: *The arrow keys can also be used to move the clip in increments of 10 pixels.*

☞   To delete a clip from the layout, click on it and press the **Delete** key (or choose **Delete** from the **Edit** menu).

☞   To precisely adjust the position of a clip, double click the clip to open its **Properties** dialog (or choose **Properties** from the **Edit** menu).
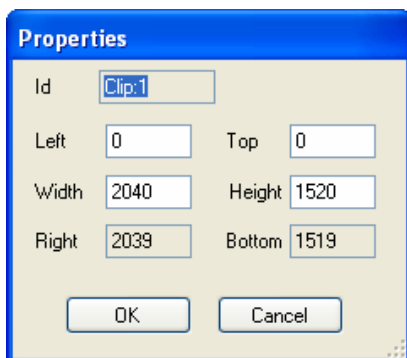
☞   Adjust the **Top** and **Left** pixel coordinates to alter the position and **Height** and **Width** values to alter the size, and click **OK**.

   NOTE: *Pixel coordinates are measured from the extreme top left corner of the Wall Layout window, i.e. Top=0, Left=0.*

☞   Click the **OK** button.

Assign Screens to ImageStar Outputs

Each screen in the Wall Layout must be assigned to one of the *ImageStar HD* outputs.

☞   Click on the **Wall Layout** window.

☞   Click the ▢▢ button to select the Screen Layer.

☞   Click on a screen to highlight it (thick blue outline):
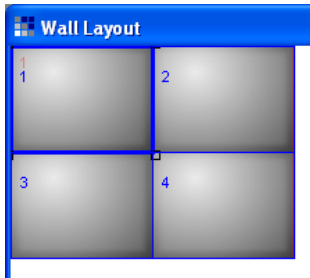
☞   Click the **Layout** menu and choose **Assign screen to output**.

The **Object Mapping** dialog will appear:
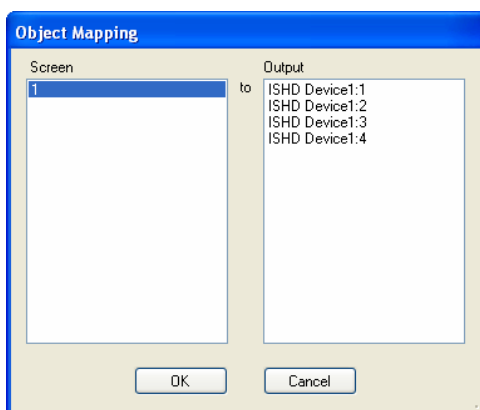
☞   In the **Output** column, click on the device output that will be used to drive the selected **Screen**.

☞   Click the **OK** button.

The Wall Layout will now show the output assigned to the screen:
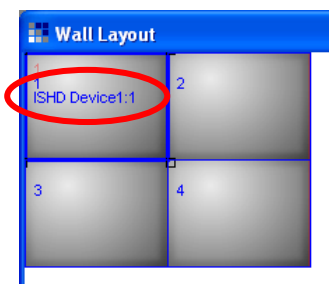
☞   Repeat this process for each screen in the Wall Layout.

Assign an ImageStar to a Clip

Each clip in the Wall Layout needs to be assigned to one of the *ImageStar HD* devices, to allow the clip to show an input source.

☞   In the **ImageStar HD Devices** window click on the ImageStar icon to highlight it (thick red outline):
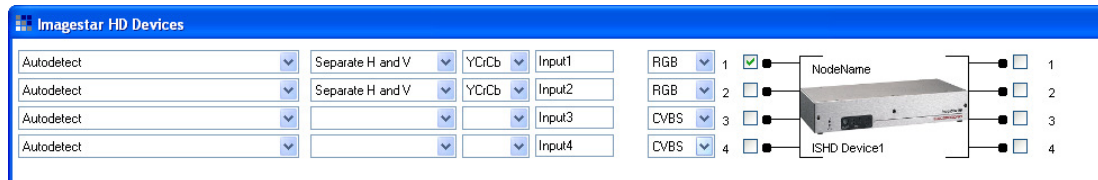
☞   Click the **Devices** menu and choose **Assign device to clip**.

The **Object Mapping** dialog will appear:
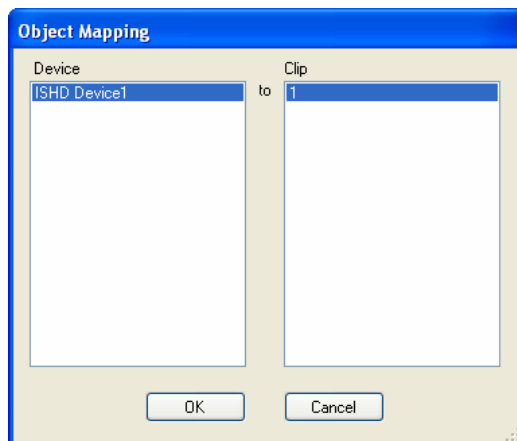
☞   Click the **OK** button to confirm the assignment.

The Wall Layout will now show the device assigned to the clip:

Assign Screens to a Clip

Each screen in the Wall Layout needs to be assigned to a clip, to allow it to display the corresponding portion of the clip.

☞ Click on the **Wall Layout** window.

☞ Click the ⊞ button to select the Screen Layer.

☞ Click on a screen to highlight it (thick blue outline):
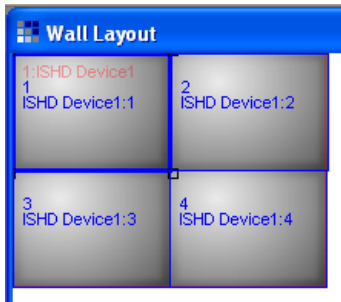
☞ Click the **Layout** menu and choose **Assign screen to clip**.

The Object Mapping dialog will appear:
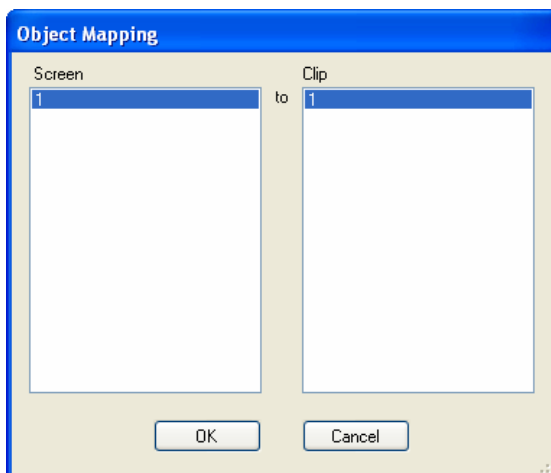
☞ Click the **OK** button.

The Wall Layout will now show the screen assigned to the clip:
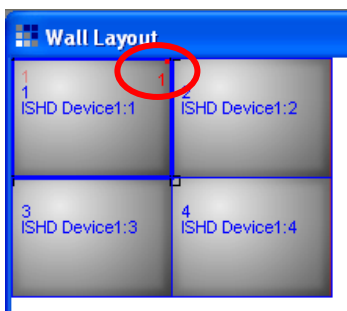
Updating an ImageStar HD (Input/Output Settings)

Any changes that you make to the network settings in ImageStar HD Configuration are not automatically sent to the actual *ImageStar HD* device. To implement any new settings you must first 'connect' to the device and then 'update' it.

To connect to an ImageStar HD…

☞ In the **Network** window, click the **Local Name** of the required device.

☞ Click the **Network** menu and choose **Connect** (or **Connect All** to connect all devices at once).

The **Status** of the device will now show **Connected**:

NOTE: *If the connection attempt fails for any reason, the following message will appear:*

To disconnect from an ImageStar HD…

☞ In the **Network** window, click the **Local Name** of the required device:

☞ Click the **Network** menu and choose **Disconnect** (or **Disconnect All** to disconnect from all devices at once).

The **Status** of the device will now show **Not connected**:

NOTE: *If the following message appears it indicates that the device was already disconnected:*

To update the Input/Output Settings of an ImageStar HD…

☞ In the **ImageStar HD Devices** window click on the ImageStar icon to highlight it (thick red outline):
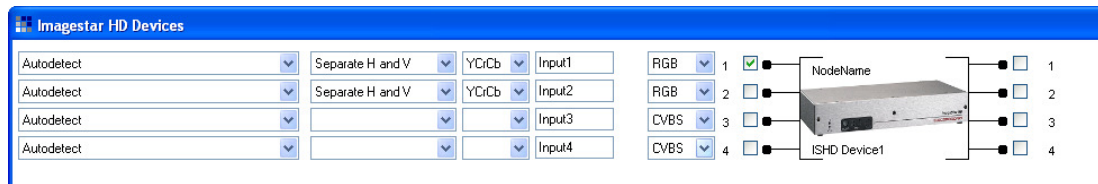
☞ Click the **Devices** menu and choose **Update**.

The **Commands** dialog will appear, showing a list of commands that will be sent to the *ImageStar HD* device:
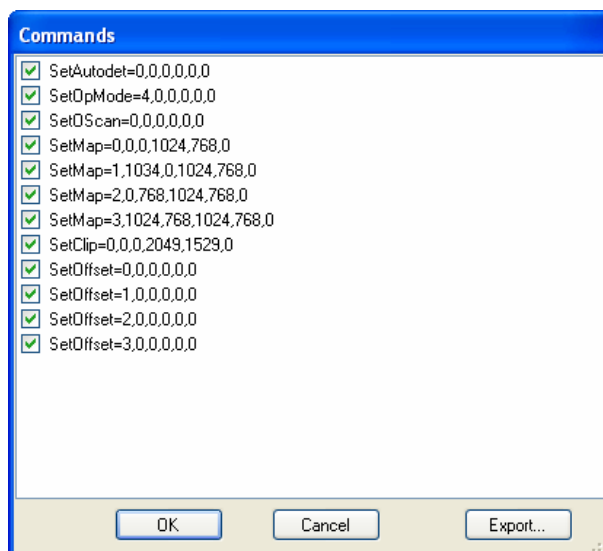
> **HINT**: *If required, you can prevent a command from being sent by deselecting the checkbox next to the command line. You can also save the command list as a text file by clicking the **Export** button.*

☞ To send the selected commands, click **OK**.
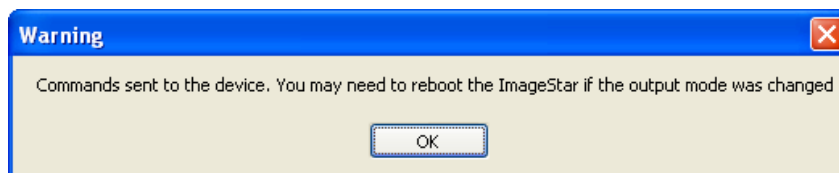
The following message will appear:

> **NOTE**: *A reboot is only necessary when changing the Output Format to or from SXGA+.*

☞ Click **OK** and, if necessary, reboot the device (see page 41).

IMPORTANT NOTE: *Remember that the control connection established between ImageStar Configuration and the **ImageStar HD** is not maintained following a reboot operation. Therefore, you will need to 'disconnect' then 'reconnect' to the device to restore the connection.*

Fine-tuning the ImageStar HD (Interactive Settings)

ImageStar HD Configuration allows various settings to be adjusted or fine-tuned while connected to an **ImageStar HD** device:

- • **RGB Inputs** – including brightness, contrast and active video alignment.
- • **Display Overscan**
- • **Display Offset**

Adjusting RGB Inputs

Some RGB sources may require some manual fine-tuning to achieve the best possible image on the target display. **ImageStar HD** provides control of various input parameters including brightness, contrast, active video alignment and clock phase.

☞ Ensure that the **ImageStar HD** is currently connected (see page 57).

☞ In the **ImageStar HD Devices** window click on the ImageStar icon to highlight it (thick red outline):
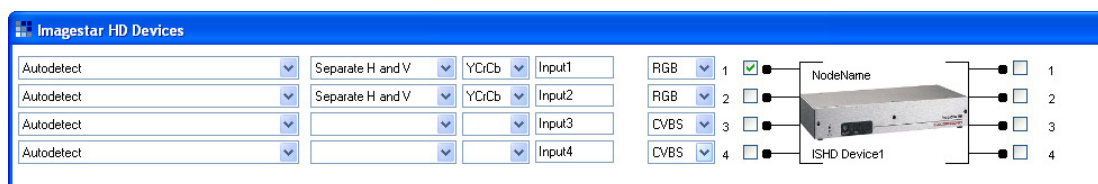
☞ Click the **Devices** menu and choose **Interactive Inputs**.

The **Interactive Inputs** dialog will appear:
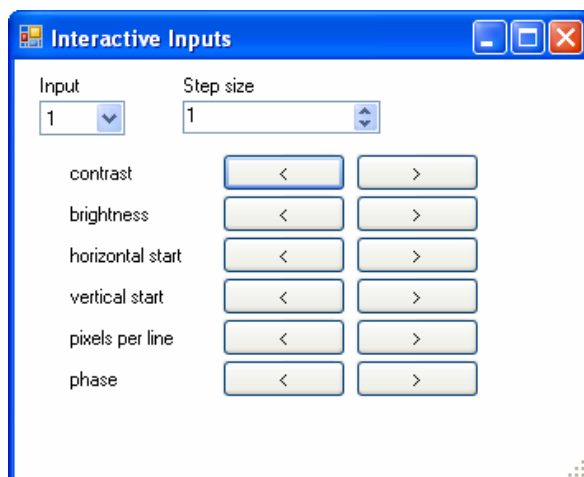
☞ Select the required **Input**.

☞ Click the ⟩ buttons to increase a value, or the ⟨ buttons to decrease a value, by the amount specified by the **Step size**.

Setting the Correct Overscan

☞ Ensure that the *ImageStar HD* is currently connected (see page 57).

☞ Click on the **Wall Layout** window to highlight it.

☞ Click the **Layout** menu and choose **Set overscan**.

The Interactive Overscan dialog will appear:

☞ Adjust either the absolute values **H** and **V** or percentage values **H%** and **V%** as required, using the spin controls or by typing a value directly into a field.

For example, if the display devices have an overscan of 7%, set both H% and V% to 7.

☞ Click **Send** to update the display with the new settings.

HINT: *By selecting the **Auto** checkbox, each click of the spin controls will update the target display without needing to click **Send**. This is useful for making small adjustments. Typing a value and pressing the Enter key will also update the display immediately.*

Adjusting Screen Offsets

☞ Ensure that the *ImageStar HD* is currently connected (see page 57).

☞ In the **ImageStar HD Devices** window click on the ImageStar icon to highlight it (thick red outline):
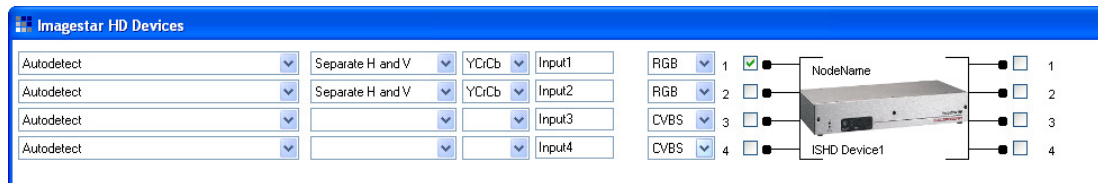
☞ Click the **Devices** menu and choose **Interactive Outputs**.

The **Interactive Outputs** dialog will appear:
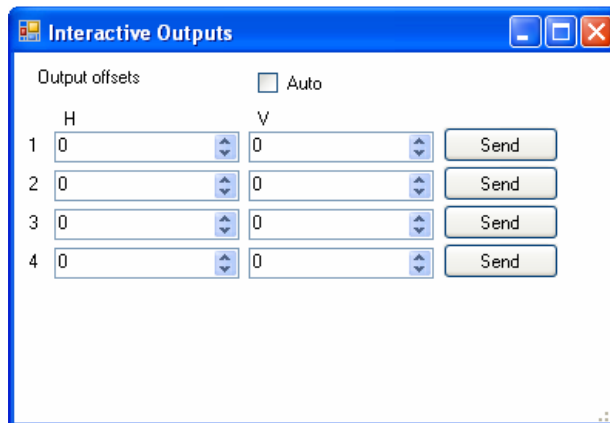
Note that separate **H** and **V** values can be specified for each output (**1** thru **4**).

☞ Use the spin controls to set the required offsets or type a value directly into the appropriate field.

☞ Click the corresponding **Send** button(s) to update the display with the new settings.

HINT: *By selecting the **Auto** checkbox, each click of the spin controls will update the target display without needing to click **Send**. This is useful for making small adjustments. Typing a value and pressing the Enter key will also update the display immediately.*

Restoring Default Settings

An **ImageStar HD** can be returned to its default factory setup by using the Set Defaults function. All current settings will be lost.

The default settings are:

- Output Mode: XGA 60Hz (mode 5) no genlock
- Screen Map: 2×2 XGA with no over/underscan or offset
- Source Clip: 2×2 XGA from current graphics source

To restore the Default Settings…

☞ In the **ImageStar HD Devices** window click on the ImageStar icon to highlight it (thick red outline):
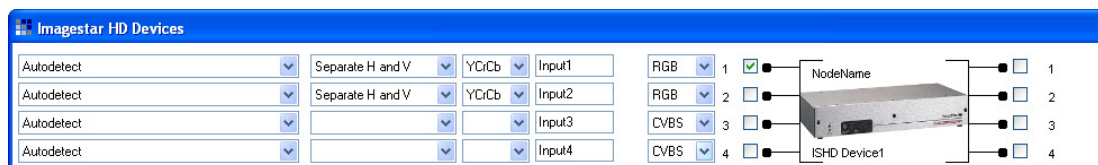

☞ Click the **Devices** menu and choose **Set Defaults**.

The **Commands** dialog will appear, showing the SetDefaults command string:
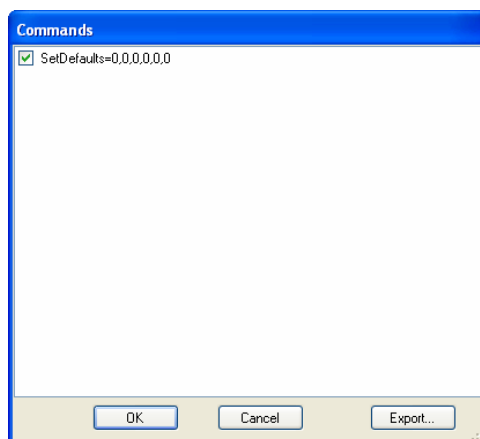
☞ To send the command, click **OK**. Remember that all current settings will be lost.

The following message will appear:
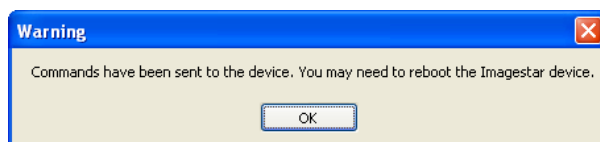
NOTE: *A reboot is only necessary when changing the Output Format to or from SXGA+.*

☞ Click **OK** and, if necessary, reboot the device (see page 41).

IMPORTANT NOTE: Remember that the control connection established between ImageStar Configuration and the **ImageStar HD** is not maintained following a reboot operation. Therefore, you will need to 'disconnect' then 'reconnect' to the device to restore the connection.

SECTION 4:

Technical Data

Mechanical Data

Overall Dimensions: *Width:*   293mm (11.55 inches)
                     Depth: 185mm (7.30 inches)   [*including rear sockets*]
                     Height: 44mm (1.75 inches)   [*excluding rubber feet*]
                                  47mm (1.85 inches)   [*including rubber feet*]
     Average Weight: 0.65 kg (1.45 lbs)

Operating Conditions

Ambient Temperature: 5°C to 35°C (41°F to 95°F).
   Ambient Humidity: 85% maximum (non-condensing).
           Location: Free-standing or 19" Rack-mounting (using approved kit).

Power Supply

ImageStar HD

          Supply Voltage: 12V DC Regulated.
          Supply Current: 2.0A max.

PSU

            Supply Voltage: 100 – 240V AC nominal.
          Supply Frequency: 50 – 60 Hz nominal.
            Supply Current: 0.45A maximum.
    Supply Inlet Connector: IEC320 (C14)
   Supply Mating Connector: IEC320 (C13); suitable 2m (6ft) mains cord supplied.

Control Inputs/Outputs

USB Connector

Function: Downloading new firmware.
Connector Type: USB type 'B' Socket.
Pin-out Details:
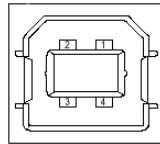
(view into socket)

Pin	Function
1	+5V
2	Data –
3	Data +
4	Ground

Mating Connector: USB type 'B' Plug with metal cover.
Recommended Cable: USB Cable.
Maximum Cable Length: 5 metres (16 feet).
Comms Standard: USB 2.0.

Network Connector

Function: Device setup and for downloading new firmware.
Connector Type: Shielded RJ-45 Socket.
Pin-out Details:

(View into socket)
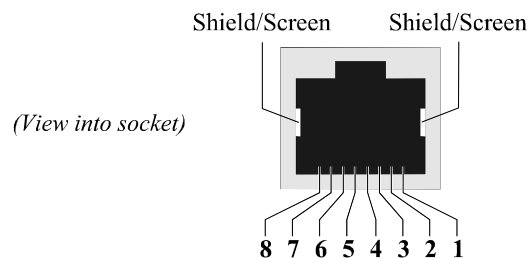
Pin	Function	Pin	Function
1	TX_D1+ (TX+)	5	BI_D3–
2	TX_D1– (TX–)	6	RX_D2– (RX–)
3	RX_D2+ (RX+)	7	BI_D4+
4	BI_D3+	8	BI_D4–

Mating Connector: Shielded RJ-45 Plug.
Recommended Cable: Shielded twisted pair (STP).
Max. Cable Length: 100 metres (330 feet).
Comms Standard: 10/100BASE-T (Fast Ethernet)
Default IP Address: Factory-set to 172.28.232.65.
                       User-definable via control software.

Source Inputs

RGB Inputs

Function: Two connectors labeled as **1** and **2**, allowing up to two analog component video/graphics sources to be connected.

Connector Type: 15-pin High Density D-type.

Pin-out Details:

(View into socket)

Pin **1**

Connector Shell = Screen
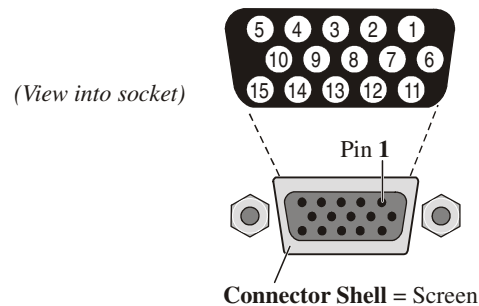
Pin	Function	Pin	Function	Pin	Function
1	Red	6	Gnd (Red)	11	Ground
2	Green	7	Gnd (Green)	12	DDC Data
3	Blue	8	Gnd (Blue)	13	H Sync
4	NC	9	+5V Input	14	V Sync
5	Ground	10	Gnd (Sync)	15	DDC Clock

Mating Connector: 15-pin High Density D-type.

Recommended Cable: SVGA Monitor Cable (overall screen).

Maximum Cable Length: 2.95 metres (9.5 feet)

Signal Type: Component YCrCb, YPrPb, RGB.

Pixel Clock: 10MHz – 165MHz.

Resolution: Graphics: Up to 1600 x 1200 pixels (UXGA).
Video: 525i, 625i, 720p, 1080i, 1080p.

Video Level: 0.7V

RGB Sync Modes: RGsB (sync on green);
RGBS (composite sync);
RGBHV (separate H & V sync).

Sync Level: 0.3V into 75Ω (RGsB, RGBS, YCrCb, YPrPb);
2.0V minimum into 2.2KΩ (RGBHV).

Scan Mode: Interlaced (for video sources);
Progressive (for graphics sources).

De-Interlace Mode: 1i ('bob' / single field interpolated)

VIDEO Inputs

Function: Two connectors labeled **3** and **4**, allowing up to two composite sources to be connected, or one S-Video using input 3 for luma (Y) and input 4 for chroma (C).

Connector Type: BNC.

Signal Type: CVBS or YC.
PAL (B,D,G,H,I,M,N,Nc)
NTSC (J,M,4.43)
SECAM (B,D,G,K,K1,L)

Input Setup: Auto detect.

De-Interlace Mode: 1i ('bob' / single field interpolated)

Display Outputs

Function:	Final scaled analog or digital output to the target display, labeled **OUTPUT 1**, **2**, **3** and **4**. Up to four display devices are supported, depending on output resolution
Card Weight:	0.29 kg (0.63 lb).
Connector Type:	DVI-I (female).
Pin-out Details:	

(View into socket)

Pin **1**

Connector Shell = Screen
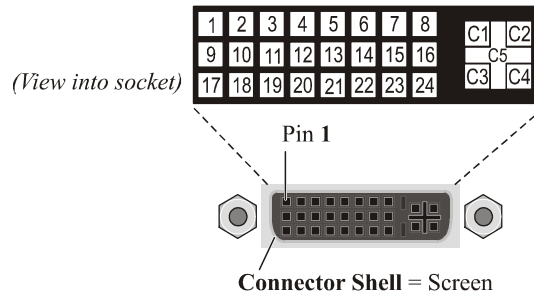
Digital Connections

Pin	Function	Pin	Function	Pin	Function
1	TMDS 2-	9	TMDS 1-	17	TMDS 0-
2	TMDS 2+	10	TMDS 1+	18	TMDS 0+
3	Ground (2/4)	11	Ground (1/3)	19	Ground (0/5)
4	*No connection*	12	*No connection*	20	*No connection*
5	*No connection*	13	*No connection*	21	*No connection*
6	DDC Clock	14	+5V supply*	22	Ground (Clk)
7	DDC Data	15	Ground (for 5v)	23	TMDS Clock+
8	Analog V-Sync	16	Hot Plug Detect	24	TMDS Clock-

* 5V on pin 14 limited to 100mA by thermal fuse on each output.

Analog Connections

Pin	Function
C1	Red Signal
C2	Green Signal
C3	Blue Signal
C4	Horizontal Sync
C5	Ground

NOTE: Analog Vertical Sync is on pin 8.

Mating Connector:	DVI-D, DVI-A or DVI-I (male).
Recommended Cable:	Digital: DVI Single or Dual Link Digital Video Cable; Analog: DVI Analog Video Cable.
Max. Cable Length:	Digital: 5 metres (16 feet); Analog: 10 metres (32 feet).

IMPORTANT: *Clip-on Ferrites (e.g. Würth part no. 74271132) must be fitted to each output cable as near as possible to the output connector.*

Signal Type:	DVI-1.0 or Analog RGB.
RGB Levels:	Video: 0.7V ±1% into 75Ω;
	Sync: 2.4V into 2K2.
RGB Sync:	RBGHV (H & V TTL sync).
Pixel Clock:	25MHz – 165MHz.
Output Formats:	Up to SXGA (1280x1024) 50Hz using four outputs;
	Up to SXGA+ (1408x1050) 59.94Hz using two outputs;
	(for a full list of output formats see page 85)
Color Depth:	24-bit maximum.
Scan Rate:	50 or 59.94 Hz.
Scan Mode:	Progressive or Interlaced.
DDC:	Not supported.
Scaling Engine:	370Mpixels/s real-time using ES patented convolver.
Scaling Factor:	Variable from unity up to 16 times native resolution, both
	horizontally and vertically.

APPENDIX A:
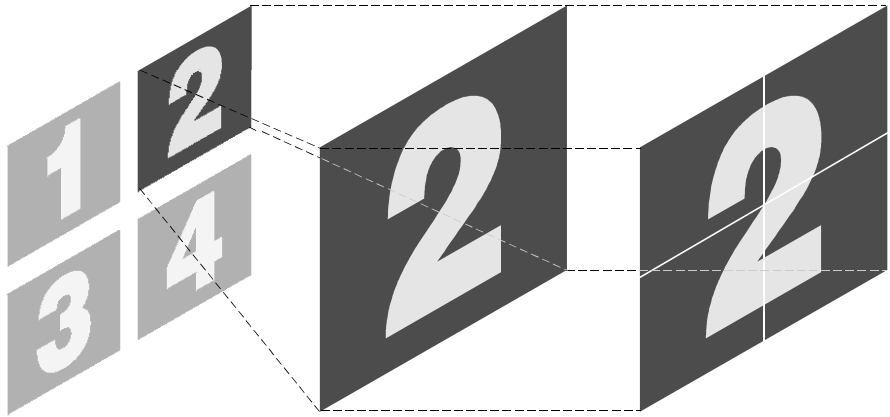
Control Protocol

Command Summary

Setup and control commands for *ImageStar HD* fall broadly into three categories, according to their function and/or place within the signal processing chain:

- **Device Setup**   *e.g.* defining network settings
- **Input Setup**   *e.g.* selecting the source type, adjusting image quality,
- **Source Processing**   *e.g.* setting the magnification factor,
- **Output Setup**   *e.g.* setting the screen resolution and mapping.

The following diagram shows the processing chain, summarizes each of the commands and shows how each fits into the chain:

Device Setup	Input Setup	Source Processing	Output Setup
IPADDSet Sets the IP Address of the device. **MASKSet** Sets the subnet mask of the device **GatewaySet** Sets the IP Address of the default network gateway server **SaveNetwork** Commits new network settings to the device memory **SetDefaults** Returns device setup to the factory-set default. **GetVersion** Obtains details of the currently installed firmware.	**SetAutoDet** Enables Auto Detect mode on a specified input or, if already in this mode, forces the source to be re-detected. **SetIpMode** Disables Auto Detect mode on a specified input and configures it for a predefined source type. **SetIpModeCurrent** Disables Auto Detect mode and retains the current configuration for the specified input. **SetViewport** Adjusts the viewport for the specified source. **SetAdjust** Adjusts the contrast, brightness, clocking and positioning of the specified source (applies to RGB Inputs 1 & 2 only)	**SetClip** Specifies the source to be displayed by the outputs and sets the magnification applied.	**SetOpMode** Sets the format/resolution for all four display outputs. **SetOscan** Sets the overscan or underscan factor required by the display devices. **SetMap** Defines the region of the magnified image to be displayed by a specified output. **SetOffset** Applies a position offset to the image on a specified output, to allow correct stitching of the target display screens.

Command String Format

The format of each command string comprises the command name (*e.g.* SetAutoDet) followed by six user-definable values or arguments:

        <command name>=*<a*rg1*>*,*<arg2>*,*<arg3>*,*<arg4>*,*<arg5>*,*<arg6>*\r

Taking the example of SetAutoDet, the command string would look as follows:

        SetAutoDet=0,0,0,0,0,0\r

Please note:

- All six arguments must be present even if they are not used. Unused arguments are ignored but we recommend that they be set to **0**

- Commas must separate each argument

- The command string must terminate with **\r**

Sending Commands to ImageStar HD

The recommended method of sending commands to **ImageStar HD** is to use HyperTerminal™. HyperTerminal is a terminal emulation program that is supplied with Windows operating systems.

You will need a PC or laptop (running HyperTerminal) connected to **ImageStar HD** either via a LAN or direct connection using a crossover patch cable:

Direct Connection (via crossover cable)
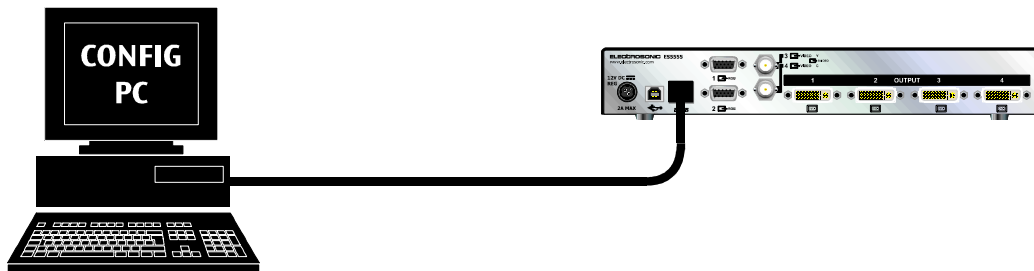
Indirect Connection (via local area network)
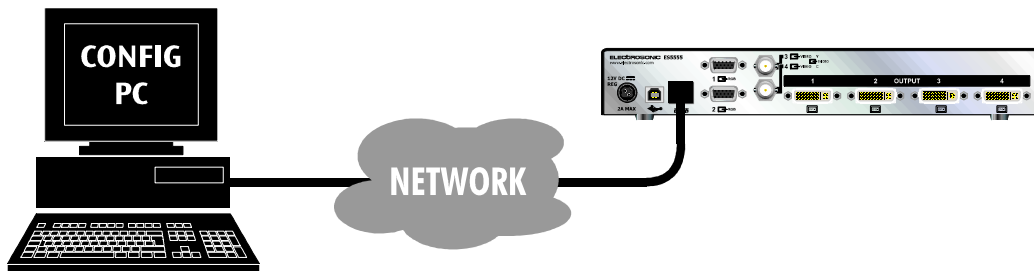
IMPORTANT: *The PC/laptop will need to be on the same subnet as the **ImageStar HD**.*

Creating a Command File

The command(s) that you want to send to **ImageStar HD** must be saved in an ASCII text file. The easiest way to do this is to use Windows Notepad.

HINT: *The ImageStar HD Configuration software can export commands to a text file.*

For example, the following shows a text file containing five commands that set up the outputs of one **ImageStar HD** as part of a 3 × 3 target display, using 1280×720p screens:

> **IMPORTANT NOTES**:
> • Each line must start with a space character.
> • A blank line is recommended at the start of the file and between each command type.
> • The order in which commands are sent is not critical.

Preparing HyperTerminal

☞   Start HyperTerminal – **Start** | **All Programs** | **Accessories** | **Communications** | **HyperTerminal**.

The following dialog will appear:

☞   Type in a **Name** for the new connection (*e.g.* ImageStar Setup).

☞   Click **OK** – the following dialog will appear:
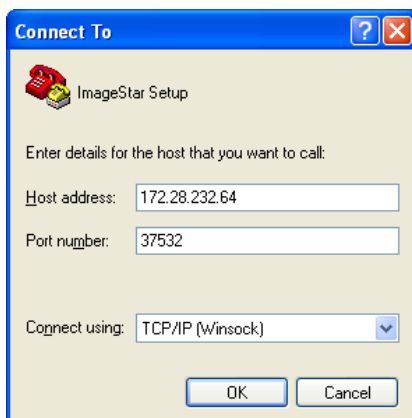
☞   In the **Connect using** list box choose the **TCP/IP (Winsock)** option.

☞   Type in the IP address of the *ImageStar HD* in the **Host address** box.

☞   Type the number **37532** in the **Port number** box.

☞   Click **OK**.

HyperTerminal will now try to connect to the *ImageStar HD*. If the connection is successful the status bar will show 'Connected' on the left hand side:
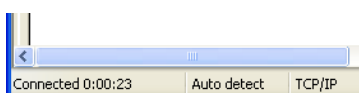
If the connection fails for any reason the status bar will show 'Disconnected' and a warning message will appear, *e.g.*:
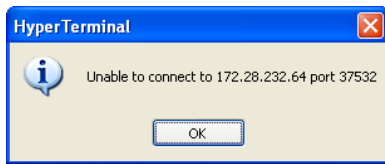
If this occurs check the cable connections and that your PC/laptop is on the same subnet as *ImageStar HD*.

☞ From the **File** menu, choose **Properties** to open the following dialog:
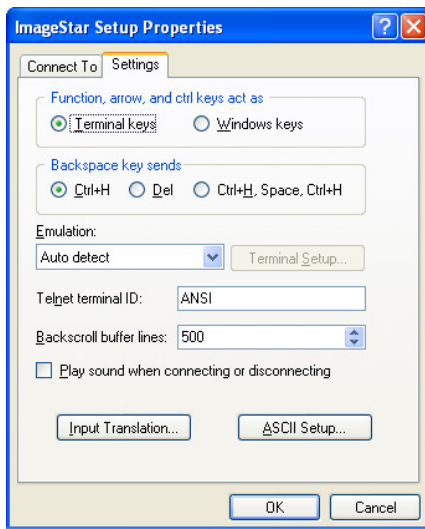
☞ Select the **Settings** tab and click the **ASCII Setup** button.
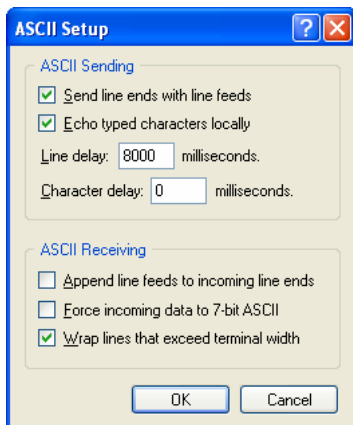
☞ Ensure that both **Send line ends with line feeds** and **Echo typed characters locally** are selected.

☞ Type in a **Line Delay** of **8000** milliseconds.

This will create an 8 second delay between each command in your command file. This delay is necessary to allow *ImageStar HD* enough time to process and act on each command.

☞ Click **OK** on all open dialog boxes.

☞ From the **File** menu choose **Save**.

Sending a Command File

NOTE: *Before following this procedure you need to have created one or more command files. See 'Creating a Command File' on page 72.*

☞ From the HyperTerminal **Transfer** menu choose **Send Text File**.

The browse dialog will open:
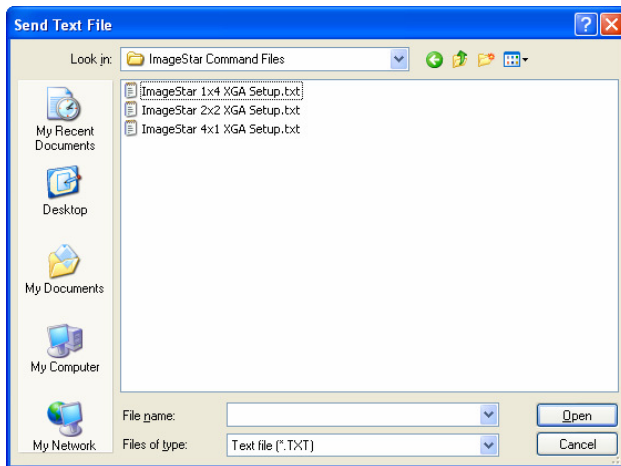
☞ Browse to the required file, select it and click **Open**.

HyperTerminal will begin sending the commands in the file. Note that, because of the line delay, this will take approximately 8 seconds per command.

☞ To send another file simply repeat the above process.

☞ When you have finished setting up the *ImageStar HD* terminate the connection by clicking the 📞 (Disconnect) button in HyperTerminal.

Device Setup Commands

IPADDSet

Function	Sets the IP Address of the device. **NOTE**: *The new address is not saved until the SaveNetwork command is issued. The device must then be rebooted to start using the new address.*
Format	**IPADDSet=**<*ip1*>**,**<*ip2*>**,**<*ip3*>**,**<*ip4*>**,0,0\r**
Arguments	<*ip1… 4*> are the four parts of the IP address, each in the range **0** to **255** with no leading zeros.
Example	**IPADDSet=172,28,232,21,0,0\r** Sets the IP Address to 172.28.232.21.

MASKSet

Function	Sets the subnet mask of the device. **NOTE**: *The new subnet mask is not saved until the SaveNetwork command is issued. The device must then be rebooted to start using the new subnet mask.*
Format	**MASKSet=**<*sn1*>**,**<*sn2*>**,**<*sn3*>**,**<*sn4*>**,0,0\r**
Arguments	<*sn1… 4*> are the four parts of the subnet mask, each in the range **0** to **255** with no leading zeros.
Example	**IPADDSet=255,255,0,0,0,0\r** Sets the IP Address to 255.255.0.0.

GatewaySet

Function	Specifies the IP Address of the default Gateway server on the network. **NOTE**: *The new address is not saved until the SaveNetwork command is issued. The device must then be rebooted to start using the new address.*
Format	**GatewaySet=**<*ip1*>**,**<*ip2*>**,**<*ip3*>**,**<*ip4*>**,0,0\r**
Arguments	<*ip1… 4*> are the four parts of the IP address, each in the range **0** to **255** with no leading zeros.
Example	**GatewaySet =172,28,230,20,0,0\r** Specifies the Gateway IP Address as 172.28.230.20.

SaveNetwork

Function	Commits new network settings (using IPADDSet, MASKSet and GatewaySet) to the ImageStar HD flash memory. **NOTE**: *The device must be rebooted after issuing this command before it will start using the new settings.*
Format	**SaveNetwork=0,0,0,0,0,0\r**
Arguments	None.
Example	**SaveNetwork=0,0,0,0,0,0\r** Saves the current network settings to flash memory.

SetDefaults

Function	Returns the device setup (excluding network settings) to the factory-set defaults. All current settings will be lost. The default settings are: Output Mode: XGA 60Hz (mode 5) no genlock Screen Map: 2×2 XGA with no over/underscan or offset Source Clip: 2×2 XGA from current graphics source
Format	**SetDefaults=0,0,0,0,0,0\r**
Arguments	None.
Example	**SetDefaults=0,0,0,0,0,0\r** Returns the device setup (excluding network settings) to the factory-set defaults

GetVersion

Function	Obtains details about the currently installed firmware.
Format	**GetVersion=0,0,0,0,0,0\r**
Arguments	None.
Example	Type **GetVersion=0,0,0,0,0,0\r** into the HyperTerminal window and press the <**enter**> key. The firmware and flex versions will be displayed:

Input Setup Commands

SetAutoDet

Function	Enables Auto Detect mode on a specified input or, if already in this mode, forces the source to be re-detected.
Format	**SetAutoDet=**<*channel*>**,0,0,0,0,0\r**
Arguments	<*channel*> is the input channel number: **0** = Input 1 (RGB) **1** = Input 2 (RGB) **2** = Input 3 (VIDEO / S-VIDEO) **3** = Input 4 (VIDEO)
Example	**SetAutoDet=3,0,0,0,0,0\r** Sets Input 4 to auto detect mode.

SetIpMode

Function	Disables Auto Detect mode on a specified input and configures it for a predefined source type.
Format	**SetIpMode=**<*channel*>**,**<*mode number*>**,**<*sync type*>**,**<*color space*>**,0,0\r**

Arguments	<*channel*> is the input channel number:
	
	       0 = Input 1 (RGB)
	       1 = Input 2 (RGB)
	       2 = Input 3 (VIDEO / S-VIDEO)
	       3 = Input 4 (VIDEO)
	
	<*mode number*> is a number representing the required source type:
	
	     Refer to table on page 80.
	
	<*sync type*> is a number representing the sync type for an RGB signal:
	
	     For inputs 1 and 2 only, using RGB sources:
	
	     0 = Separate H and V
	     1 = Composite Sync (on H channel)
	     2 = Sync on Green/Tri-Level
	
	     For input 3 only:
	
	     0 = CVBS
	     1 = S-Video (Y on input 3, C on input 4)
	
	<*color space*> is a number representing the color space:
	
	     For inputs 1 and 2 only:
	
	     0 = YCrCb
	     1 = YPrPb
	     2 = RGB

Examples	**SetIpMode=1,30,0,2,0,0\r** Configures input 2 to XGA 60Hz DMT using RGB with separate H and V sync. **SetIpMode=2,8,1,0,0,0\r** Configures input 3 (and 4) to NTSC 4.43 TAPE using S-Video.

SetIpMode – RGB Mode Numbers (where *<channel>* = 0 or 1)

0	= VGA 60Hz [640x480] DMT		**44**	= HD 720p VESA 60Hz [1280x720] GTF
1	= VGA 60Hz [640x480] GTF		**45**	= HD 720p VESA 60Hz [1280x720] CVT
2	= VGA 60Hz [640x480] CVT		**46**	= HD 720p SMPTE 50Hz [1280x720]
3	= VGA 72Hz [640x480] DMT		**47**	= HD 720p SMPTE 59.94Hz [1280x720]
4	= VGA 72Hz [640x480] GTF		**48**	= WXGA 60Hz CVT [1280x768]
5	= VGA 72Hz [640x480] CVT		**49**	= WXGA 75Hz SOG [1280x768]
6	= VGA 75Hz [640x480] DMT		**50**	= WXGA 85Hz [1280x768] CVT
7	= VGA 75Hz [640x480] GTF		**51**	= WXGA 85Hz SOG [1280x768]
8	= VGA 75Hz [640x480] CVT		**52**	= SXGA 60Hz [1280x1024] DMT
9	= VGA 85Hz [640x480] DMT		**53**	= SXGA 60Hz [1280x1024] GTF
10	= VGA 85Hz [640x480] GTF		**54**	= SXGA 60Hz [1280x1024] CVT
11	= VGA 85Hz [640x480] CVT		**55**	= SXGA 70Hz [1280x1024] GTF
12	= IBM 70Hz TEXT [720x400]		**56**	= SXGA 70Hz [1280x1024] CVT
13	= NTSC 60		**57**	= SXGA 75Hz [1280x1024] DMT
14	= PAL 50		**58**	= SXGA 75Hz [1280x1024] GTF
15	= SVGA 56Hz [800x600] DMT		**59**	= SXGA 75Hz [1280x1024] CVT
16	= SVGA 56Hz [800x600] GTF		**60**	= SXGA 85Hz [1280x1024] DMT
17	= SVGA 56Hz [800x600] CVT		**61**	= SXGA 85Hz [1280x1024] GTF
18	= SVGA 60Hz [800x600] DMT		**62**	= SXGA 85Hz [1280x1024] CVT
19	= SVGA 60Hz [800x600] GTF		**63**	= SXGA+ 60Hz [1400x1050] GTF
20	= SVGA 60Hz [800x600] CVT		**64**	= SXGA+ 60Hz [1400x1050] CVT
21	= SVGA 72Hz [800x600] DMT		**65**	= UXGA 60Hz [1600x1200] DMT
22	= SVGA 72Hz [800x600] GTF		**66**	= UXGA 60Hz [1600x1200] GTF
23	= SVGA 72Hz [800x600] CVT		**67**	= UXGA 60Hz [1600x1200] CVT
24	= SVGA 75Hz [800x600] DMT		**68**	= UXGA 70Hz [1600x1200] DMT
25	= SVGA 75Hz [800x600] GTF		**69**	= UXGA 70Hz [1600x1200] GTF
26	= SVGA 75Hz [800x600] CVT		**70**	= UXGA 70Hz [1600x1200] CVT
27	= SVGA 85Hz [800x600] DMT		**71**	= UXGA 75Hz [1600x1200] DMT
28	= SVGA 85Hz [800x600] GTF		**72**	= UXGA 75Hz [1600x1200] CVT
29	= SVGA 85Hz [800x600] CVT		**73**	= 1080p 50Hz [1920x1080] SMPTE
30	= XGA 60Hz [1024x768] DMT		**74**	= 1080p 59.94Hz [1920x1080] SMPTE
31	= XGA 60Hz [1024x768] GTF		**75**	= 1080i 50Hz [1920x1080] SMPTE
32	= XGA 60Hz [1024x768] CVT		**76**	= 1080i 59.94Hz [1920x1080] SMPTE
33	= XGA 70Hz [1024x768] DMT		**77**	= 1080p 50Hz [1920x1080] VESA GTF
34	= XGA 70Hz [1024x768] GTF		**78**	= 1080p 50Hz [1920x1080] VESA CVT
35	= XGA 70Hz [1024x768] CVT		**79**	= 1080p 60Hz [1920x1080] VESA GTF
36	= XGA 75Hz [1024x768] DMT		**80**	= 1080p 60Hz [1920x1080] VESA CVT
37	= XGA 75Hz [1024x768] GTF		**81**	= HD 720p SMPTE 60Hz [1280x720]
38	= XGA 75Hz [1024x768] CVT		**82**	= 1080p 60Hz [1920x1080] SMPTE
39	= XGA 85Hz [1024x768] DMT		**83**	= 1080i 60Hz [1920x1080] SMPTE
40	= XGA 85Hz [1024x768] GTF			
41	= XGA 85Hz [1024x768] CVT		NOTE: CVT	= Coordinated Video Timing
42	= HD 720p VESA 50Hz [1280x720] GTF		DMT	= Discrete Monitor Timings
43	= HD 720p VESA 50Hz [1280x720] CVT		GTF	= Generalized Timing Formula
			SMPTE	= SMPTE 274M Standard (for 1080i/p)
				or SMPTE 292M Standard (for 720p)

SetIpMode – Video Mode Numbers (where *<channel>* = 2 or 3)

0	= NTSC M TAPE		**6**	= PAL COMBINATION-N TAPE
1	= NTSC M DISK		**7**	= PAL COMBINATION-N DISK
2	= PAL B-D-G-H-I-N TAPE		**8**	= NTSC 4.43 TAPE
3	= PAL B-D-G-H-I-N DISK		**9**	= NTSC 4.43 DISK
4	= PAL M TAPE		**10**	= SECAM TAPE
5	= PAL M DISK		**11**	= SECAM DISK

SetIpModeCurrent

Function	Retains the current configuration and disables Auto Detect for the specified input.
Format	**SetIpModeCurrent=**<channel>**,**<color space override>**,**<color space>**,0,0,0\r**

Arguments	<channel> is the input channel number:
	
	    0 = Input 1 (RGB)
	    1 = Input 2 (RGB)
	    2 = Input 3 (VIDEO / S-VIDEO)
	    3 = Input 4 (VIDEO)
	
	<color space override> defines whether or not the color space is retained for RGB/YPrPb/YCrCb sources:
	
	    0 = retain current color space
	    1 = replace current color space with that specified by <color space>
	
	<color space> defines the new color space:
	
	    0 = YCrCb
	    1 = YPrPb
	    2 = RGB

Examples	**SetIpModeCurrent =1,0,0,0,0,0\r** Saves the current configuration for input 2, retaining the current color space. **SetIpModeCurrent =0,1,2,0,0,0\r** Saves the current configuration for input 1, but forcing the color space to RGB.

SetViewport

Function	Adjusts the viewport for the specified source. **NOTE**: *A minimum viewport of 95% is always applied to video sources to remove unwanted blanking, etc.*
Format	**SetViewport=**<*channel*>,<*horizontal size*>,<*vertical size*>, <*horizontal position*>,<*vertical position*>,**0\r**

Arguments	<*channel*> is the input channel number:
	
	      0 = Input 1 (RGB)
	      1 = Input 2 (RGB)
	      2 = Input 3 (VIDEO / S-VIDEO)
	      3 = Input 4 (VIDEO)
	
	The two <*…size*> values set the size of the viewport relative to the entire source frame and are defined as follows:
	
	      percentage viewport × 4096 ÷ 100
	
	      For example 90% = 90 × 4096 ÷ 100 = **3686**.
	
	The two <*…position*> values are measured in pixels and define the top left corner of the viewport relative to the input source.

Example	**SetViewport=3,3686,3686,5,5,0\r** Creates a 90% viewport for input 4 with the top left corner 5 pixels in from the left of the source and 5 pixel down from the top.

SetAdjust

Function	Adjusts the contrast, brightness, clocking or positioning of the specified source (applies to RGB Inputs 1 & 2 only)
Format	**SetAdjust=**<*channel*>**,**<*parameter*>**,**<*adjustment*>**,0,0,0\r**

Arguments	<*channel*> is the input channel number:
	
	      0 = Input 1 (RGB)
	      1 = Input 2 (RGB)
	
	<*parameter*> defines which attribute of the source to adjust:
	
	      0 = contrast
	      1 = brightness
	      2 = horizontal start
	      3 = vertical start
	      4 = pixels per line
	      5 = clock phase
	
	<*adjustment*> defines the amount of adjustment required and must be a number between −32 and +32.

Examples	**SetAdjust =0,0,-5,0,0,0\r** Decreases the contrast of input 1 by a factor of 5. **SetAdjust =1,3,10,0,0,0\r** Shifts the vertical start position of input 2 down by 10 pixels.

Source Processing Commands

SetClip

Function	Specifies the source to be placed on the target display and sets the magnification to be applied.
Format	**SetClip=**<*channel*>**,**<*top left horizontal position*>**,**<*top left vertical position*>**,** <*bottom right horizontal position*>**,**<*bottom right vertical position*>**,0\r**

Arguments	<*channel*> is the input channel number:
	
	         0 = Input 1 (RGB)
	         1 = Input 2 (RGB)
	         2 = Input 3 (VIDEO / S-VIDEO)
	         3 = Input 4 (VIDEO)
	
	The four <*…position*> values are measured in pixels and define the boundary of the selected source on the target display. The source is magnified to fit the specified area. To make the source fill the target display area, this will always be relative to the output mode resolution. For example, on a 2×2 display using XGA (1024×768) screens:
	
	         <*top left horizontal position*> = **0**
	         <*top left vertical position*> = **0**
	         <*bottom right horizontal position*> = (2 × 1024) − 1 = **2047**
	         <*bottom right vertical position*> = (2 × 768) − 1 = **1535**

Example	**SetClip=2,0,0,2047,1535,0\r** Places source input 3 on a 2×2 display using XGA display devices.

Output Setup Commands

SetOpMode

Function	Sets the output format for all four output channels.
Format	**SetOpMode=**<*mode number*>**,**<*genlock mode*>**,0,0,0,0\r**
Arguments	<*mode number*> is a number representing the required output type: **0** = VGA (640x480) 50Hz **1** = VGA (640x480) 59.94 **2** = SVGA (800x600) 50Hz **3** = SVGA (800x600) 59.94Hz **4** = XGA (1024x768) 50Hz **5** = XGA (1024x768) 59.94Hz **6** = 1152x870 50Hz **7** = 1152x870 59.94Hz **8** = SXGA (1280x1024) 50Hz **9** = SXGA (1280x1024) 59.94Hz **10** = SXGA+ (1408x1050) 50Hz* **11** = SXGA+ (1408x1050) 59.94Hz* **16** = HD 720p (1280x720) 50Hz **17** = HD 720p (1280x720) 59.94Hz **18** = WXGA (1376x768) 50Hz **19** = WXGA (1376x768) 59.94Hz **20** = WXGA (1280x768) 50Hz **21** = WXGA (1280x768) 59.94Hz **22** = PAL (704x574I) 50Hz **23** = NTSC (704x482I) 59.94Hz **24** = 1080i (1920x1080I) 50Hz* **25** = 1080i (1920x1080I) 60Hz* **26** = 1080i (1920x1080I) 59.94Hz * **NOTE**: *Modes marked * provide outputs on channel 1 and 2 only.* <*genlock mode*> is a number representing the genlock function: **0** = Genlock disabled (always use for RGB graphics) **1** = Genlock enabled and locked to the active YPrPb/YCrCb input **2** = Genlock enabled and locked to the active CVBS or S-Video input
Example	**SetOpMode=5,1,0,0,0,0\r** Configures all four outputs to XGA 59.94Hz with RGB genlock enabled.

SetOscan

Function	Sets the overscan or underscan factor required by the display devices.
Format	**SetOscan=**<*horizontal overscan*>**,**<*vertical overscan*>**,0,0,0,0\r**
Arguments	<*horizontal overscan*> and <*vertical overscan*> are specified as either a positive number representing the amount of overscan or a negative number representing the amount of underscan. Typically the required overscan/underscan will be quoted as a percentage, *e.g.* 8.5%. To obtain the value for this argument, multiply the percentage value by 1024 then divide by 100. Using the example of 8.5% will give 8.5×1024÷100 = 87.04. Round the answer up or down to the nearest whole number, *i.e.* 87.
Example	**SetOscan=87,87,0,0,0,0\r** Configures the outputs for 8.5% overscan horizontally and vertically. Values derived from 8.5×1024÷100 = 87.04 (rounded to 87). **SetOscan=–90, –120,0,0,0,0\r** Configures the outputs for –8.8% underscan horizontally and –11.7% underscan vertically. Values derived from –8.8×1024÷100 = –90.112 (rounded to –90) and –11.7×1024÷100 = –119.808 (rounded to –120)

SetMap

Function	Defines the region of the magnified image to be displayed by a specified output.
Format	**SetMap=**<*output number*>**,**<*top left horizontal position*>**,**<*top left vertical position*>**,** <*horizontal size*>**,**<*vertical size*>**,0\r**

Arguments	<*output number*> is the output channel number:
	
	        0 = Output 1
	        1 = Output 2
	        2 = Output 3
	        3 = Output 4
	
	The two <*…position*> and two <*…size*> values are measured in pixels and define the boundary of the selected output on the target display. These are measured relative to the source Clip (see SetClip). The <*…size*> values should always match the screen resolution of each output (see SetOpMode).

Example	**SetMap=0,0,0,1024,768,0\r** **SetMap=1,0,1024,1024,768,0\r** **SetMap=2,0,768,1024,768,0\r** **SetMap=3,1024,768,1024,768,0\r** Maps the outputs to a 2×2 target display using XGA display devices.

SetOffset

Function	Applies a position offset to the image on a specified output, to allow correct stitching of the target display screens.
Format	**SetOffset=**<*output number*>**,**<*horizontal offset*>**,**<*vertical offset*>**,0,0,0\r**
Arguments	<*output number*> is the output channel number: **0** = Output 1 **1** = Output 2 **2** = Output 3 **3** = Output 4 <*horizontal offset*> is an offset value measured in pixels. A negative value shifts the image to the left, a positive number shifts it to the right. <*vertical offset*> is an offset value measured in pixels. A negative value shifts the image up, a positive number shifts it down.
Example	**SetOffset=1,5,-10,0,0,0\r** Shifts the image on output 2 to the right by 5 pixels and up by 10 pixels.

ELECTROSONIC

UK - London
Hawley Mill, Hawley Road, Dartford, Kent. DA2 7SY
Tel: +44 1322 222 211 Fax: +44 1322 282 282
E-mail: information@electrosonic-uk.com

Sweden - Stockholm
Åsögatan 155, S-116 32 Stockholm, Sweden
Tel: +46 8 522 057 00 Fax: +46 8 223 181
E-mail: info.sweden@electrosonic.com

USA - Minneapolis
10320 Bren Road East, Minnetonka, MN 55343
Tel: +1 952 931 7500 Fax: +1 952 938 9311
E-mail: information@electrosonic.com

USA - Los Angeles
3320 North San Fernando Blvd, Burbank, CA 91504
Tel: +1 818 566 3045 Fax: +1 818 566 4923
E-mail: information@electrosonic.com

USA - New York
Suite 204, 36-36 33rd Street, Long Island City, NY 11106
Tel: +1 609 349 8600 Fax: +1 718 349 8635
E-mail: information@electrosonic.com

USA - Orlando
Suite 105, 4501 Vineland Road, Orlando, FL 32811
Tel: +1 407 839 1154 Fax: +1 407 839 2055
E-mail: information@electrosonic.com

Hong Kong
UnitB, 12/F Shun Point Commercial Building
5-11 Thomson Road, Wanchai, Hong Kong
Tel: +852 2525 1828 Fax: +852 2877 5811
E-mail: infoasia@electrosonic-uk.com

Web Site: www.electrosonic.com

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