Video Explorer™ 2
Installation Manual

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About This Manual

Congratulations on your purchase of the Video Explorer™ 2. This manual is designed as a reference to guide you in the setup and use of your Video Explorer 2 system.

Some important points that you should know about this manual:

1. The manual is divided into sections which cover both hardware and software. Card installation instructions and precautions as well as technical specifications may be found in the hardware sections.

2. Important points will be contained in “Notes” and “Warnings”. The text for these notes is in Italics. Major subject changes are announced by bold headings.

Prepare to enjoy a new world of productivity with your Video Explorer 2.

Table of Contents

Video Explorer™ 2

Introduction

Thank you for choosing to purchase Intelligent Paradigm's Video Explorer™ 2.

The Video Explorer 2 system is more than just a video card for your computer. In fact, it is a stand-alone video processor. Just as the computer uses a processor to control its basic functions, the Video Explorer 2 card uses Intelligent Paradigm's MSIC™ chips for processing power.

Intelligent Paradigm has also developed MediaBahn™, a custom-designed digital video bus for the distribution of high-speed, broadcast-quality digital video, opening the door to a wealth of add-on capabilities and features for your Video Explorer 2 system. MediaBahn's unique design allows the Video Explorer 2 to manipulate video much in the same way that your computer manipulates data.

When coupled with the new generation of Video Explorer 2 aware applications, the Video Explorer 2 becomes the ultimate video peripheral. With software support, the Video Explorer 2 can function as a high-end character generator, video switcher, digital effects generator, frame buffer, paint system, and more.

We designed the Video Explorer 2 as the heart of the industry's new generation of video processing equipment. When installed in your computer, the Video Explorer 2 transforms your computer into a highly versatile and powerful video workstation.

We are excited about the future the Video Explorer 2 card holds for the professional videographer. We hope that you will be too!

George Sheng
President
Intelligent Paradigm, Inc.

Video Explorer™ 2

System Overview

The Intelligent Paradigm's Video Explorer™ 2 system and MediaBahn™ can link your computer to the world of video in a variety of ways. The versatility of the Video Explorer 2 allows you to build and configure your new video system to satisfy your individual needs.

For multiple-card systems, Intelligent Paradigm designed MediaBahn, a real-time digital video bus, which functions as a high-speed, inter-card communications pathway. The MediaBahn opens the door to system expansion by allowing you to interconnect multiple Video Explorer 2 cards. For example, a MediaBahn-2 connector can route video information in real-time between two Video Explorer cards for synchronous real-time digital processing and effects. MediaBahn connectors are available in different configurations to support two to six MediaBahn-compatible cards.

The Video Explorer 2's driver integrates and controls the Video Explorer 2 hardware in your computer. For the Macintosh platform the Video Explorer 2's driver is contained on the board in ROM and requires no installation.

Video Explorer™ 2

Hardware Overview

Video Explorer™ 2 System

The Video Explorer 2 card is an advanced video processing card for Mac OS, Windows NT, and Linux platforms. The board is designed with Intelligent Paradigm's custom processing chips, which allow a wide range of high quality video processing. The board is currently available with drivers for the Mac OS platform. Drivers for the Windows NT and Linux platforms will be available 4th quarter 2000. Please consult the factory for more information.

The Intelligent Paradigm Video Explorer 2 product traces its roots in the Video Explorer (from intelligent Resources) which established itself as the de-facto standard for high-end digital video production. The Video Explorer 2 is designed for exceptional performance. The Video Explorer 2 is a high quality digital video engine which works with a variety of applications to support functions such as special effects generation, frame capture, character generation, image editing, animation, multimedia, and 2D or 3D modeling and rendering. The Video Explorer 2 is easily integrated into professional level video systems to product broadcast quality video. The Video Explorer 2 is the ideal video card for graphics professionals who demand the highest video quality for their creations. It is also an ideal candidate for system designers looking for high quality I/O.

The Video Explorer 2 can perform a wide variety of video effects such as blends, fades, wipes, and dissolves in real time. The Video Explorer 2 can digitally combine live video sources, computer graphics, and computer animation in real time. For increased functionality, use the MediaBahn™ intercard interface to connect multiple Video Explorer 2's or to connect Video Explorer 2 to third party cards with MediaBahn interfaces.

MediaBahn™

MediaBahn is Intelligent Paradigm's custom-designed digital video bus, a high-speed video communications pathway. MediaBahn opens the door to system expansion by allowing interconnection of multiple Intelligent Paradigm cards.

Intelligent Paradigm developed the MediaBahn interface as a multi-channel, bi-directional bus for expansion in a Video Explorer 2 system WITHOUT THE NEED TO SEND HIGH BANDWIDTH VIDEO DATA OVER THE PCI BUS. MediaBahn provides real-time routing of video streams between MediaBahn-compatible devices such as between a Video Explorer 2 card and an I/O Docking card. MediaBahn connectors are available in different configurations to support two to six MediaBahn-compatible cards.

Video Explorer™ 2

VE-2 System Requirements

PCI

- A Video Explorer™ 2 requires a single full-size PCI 2.1 compliant 5V/32 bit slot inside your computer.
- Each additional MediaBahn™ connected card in a Video Explorer 2 system requires an additional full size PCI slot.

Operating System Software

The Video Explorer 2 currently supports Mac® OS 8.6 or later. Support for Microsoft® Windows® NT and Linux is anticipated in Q4 2000.

Other Requirements

Other requirements, such as RAM or hard disk space, are a function of the application software running on your system. Consult the manual accompanying your software application for its specific needs.

VE-2 General Specifications

All Intelligent Paradigm system card specifications are subject to change without notice.

Host System Requirements

System Software:	MacOS 8.6 or greater Support for Windows NT and Linux expected Q4 2000
Recommended RAM:	32 MB Min.
Computer Monitor:	17” Color Preferred
Number/Kind of Slots:	One full size, +5V 32 bit, 33Mhz PCI 2.1 Compliant Slot

General Specifications

Mac OS Computer	G3 or G4 desktop models recommended
Interface:	PCI 2.1 Compliant
Card Dimensions:	12.7” x 3.9” (32.258 cm x 9.906 cm)
Operating Temperature:	0 to 70ºC
Framebuffer Memory:	64 MB SDRAM

Video Explorer™ 2

VE-2 Technical Specifications

All Intelligent Paradigm system card specifications are subject to change without notice.

Architecture: The Video Explorer 2 is designed around Intelligent Paradigm's custom video processing integrated circuit, the MSIC™ (Market Specific Integrated Circuit).

Display Compatibility: The Video Explorer 2 card supports standard 32-bits per pixel, direct video display formats. The Video Explorer 2 card also supports 40-bits per pixel and 64-bits per pixel formats.

Timing Standards: The Video Explorer 2 card supports multiple video timing standards. Currently the Video Explorer 2 supports:

NTSC: 720 X 486 (525 Lines)
PAL: 720 X 576 (625 Lines)

Input/Output Modules: Both the Video Explorer 2 card and the I/O Docking Card accept interchangeable plug-in modules for different video I/O formats, such as standard definition Serial Digital and Analog modules as well as High Definition modules.

MediaBahn: The Video Explorer 2 card and the I/O Docking Card support the custom-designed MediaBahn digital video bus interface, which interconnects multiple MediaBahn-compatible cards.

Framebuffer Memory: The Video Explorer 2 card comes with a Framebuffer module that contains 64Mbytes of memory that can be used for output display and other effects.

Effects: The Video Explorer 2 card's capabilities include multiple live and graphic video signal operations involving real-time transitions, text and graphic overlay, alpha and chroma keying, true-color frame capture, and more.

Alpha Channel: The Video Explorer card supports an alpha channel for traditional alpha effects such as masks and linear keys. Alpha channel sources may be another Video Explorer 2 card, an internal buffer, or an input module signal across MediaBahn. The I/O Docking Card can simultaneously transmit and receive an alpha channel, which can be routed to a Video Explorer 2 card via MediaBahn. Note that alpha channel I/O capabilities depend on your I/O module configuration.

Video Explorer™ 2 Precautions

The following precautions should be followed when handling Intelligent Paradigm system cards and the MediaBahn connector.

Static Electricity

WARNING: INTELLIGENT PARADIGM VIDEO EXPLORER 2 CARDS ARE STATIC-SENSITIVE! STATIC DISCHARGE CAN DAMAGE THE CARDS AND MAY VOID YOUR WARRANTY. WHILE THE MEDIABAHN CONNECTOR IS NOT STATIC-SENSITIVE, STATIC DISCHARGE CAN DAMAGE THE CARDS TO WHICH IT IS CONNECTED. PROPER ESD (ELECTRO-STATIC DISCHARGE) PROCEDURES MUST BE USED DURING INSTALLATION.

Handling, Storage & Use

Card Damage: Do not remove an Intelligent Paradigm system card from its anti-static packaging until you are ready to install it in your computer. Exposure to any amount of static electricity, large or small, can permanently damage the cards.

Anti-Static Packaging: Save the anti-static packaging supplied with each piece of Video Explorer hardware. You will need this packaging for storing the hardware when it is not in use or for shipping purposes. Avoid handling the circuitry after removing the packaging. Discharge any accumulated static electricity by touching the computer's power supply before handling the hardware.

Storage Conditions: Do not store or use the hardware where it may be exposed to extreme high or low temperatures, direct sunlight, excessive humidity, or moisture. Never store objects on top of or apply pressure to the hardware; doing so may damage the circuitry.

Static Build Up/Discharge: Walking around can build up static electricity on your body and clothing. Always discharge static electricity by touching the computer's power supply before handling the hardware or any other component inside the computer.

Video Explorer™ 2

Power, Cables & Connections

Grounding: Before connecting or installing any system device, plug the computer's power cord and any peripheral devices into a grounded power strip or outlet. Three-prong plugs ground the system components and protect them from electrical damage.

WARNING: NEVER TRY TO INSTALL OR REMOVE A VIDEO EXPLORER 2 CARD WHILE THE COMPUTER IS POWERED. REMOVING A CARD OR A MODULE WHILE THE COMPUTER IS POWERED WILL SHORT OUT THE COMPUTER.

Power: To prevent equipment damage during installation, all power cords should be plugged in with the power turned off.

PCI Bus Connection: Never force an Intelligent Paradigm system card into a PCI slot; doing so can cause damage to the board or the PCI connector. If you experience resistance when installing the Video Explorer 2 card, remove the card. Check for and remove any obstructions in the PCI slot and.retry the installation.

I/O Connections: Never force a connection. If you experience resistance when connecting a cable to a Video Explorer 2 system input/output module, remove that cable. Check the pin alignment on the cable. Carefully retry the connection by pushing the connector components together, gently but firmly.

Board Configuration

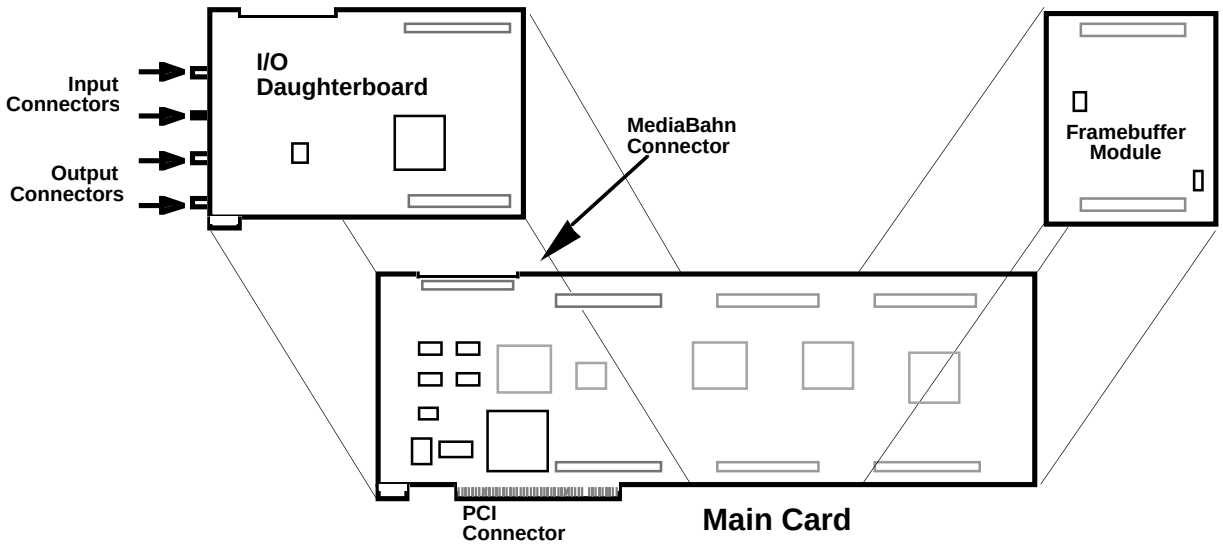


Figure 1 Exploded view of the card that made up the Video Explorer 2 system

Video Explorer™ 2

Installation

The physical installation procedure for the Video Explorer 2 card will vary depending upon your computer type. Be sure to read the "Installing Cards" section of your computer's owner's manual for important information about installing video cards in your specific model.

The Video Explorer 2 card is typically used in a multiple-card, multiple-monitor system. For this type of system, you can adjust the system default settings through Intelligent Paradigm Software. Consult the Control Panel Setup and Driver Installer sections in the Software chapter of the user manual for more information.

Notes:

- Save all anti-static packaging for storing your Video Explorer 2 card when it is not installed in your computer.

- Make sure that the I/O module is installed on your Video Explorer 2 card before installing the card in your computer.

WARNING: VIDEO EXPLORER 2 CARDS ARE STATIC-SENSITIVE! STATIC DISCHARGE CAN DAMAGE THE CARD AND MAY VOID YOUR WARRANTY. PROPER ESD (ELECTRO-STATIC DISCHARGE) PROCEDURES MUST BE USED DURING INSTALLATION.

Preparation

1. Plug the AC power cord of your computer into a grounded electrical outlet.

2. Turn off the power to your computer.

3. Turn off the power to all peripheral equipment.

4. Wrap the disposable grounding strap provided for control of static electricity around your wrist, and connect the free end to the computer power supply ground before handling any hardware or components.
   ***Note**: Please carefully follow the instructions found on disposable wrist strap packaging to correctly wrap the strap to your wrist and attach to an electrical ground.*

Installation Procedure

1. Open the case of your computer. Consult your particular computer's instructions regarding gaining access to PCI board slots.

2. Touch the top of the computer's power supply with your hand to discharge excess static electricity from your body and clothing. Consult your computer's owner's manual to locate the power supply on your specific model.

   WARNING: WALKING AROUND CAN BUILD UP STATIC ELECTRICITY ON YOUR BODY AND CLOTHING! DISCHARGE STATIC ELECTRICITY BY TOUCHING YOUR COMPUTER'S POWER SUPPLY BEFORE HANDLING THE HARDWARE OR COMPONENTS INSIDE THE COMPUTER.

3. Remove the Video Explorer 2 (See Figure 2) from its anti-static packaging, taking care to ground yourself by touching the computer's power supply before handling the card as described in step 4 of Preparation section.

Video Explorer™ 2

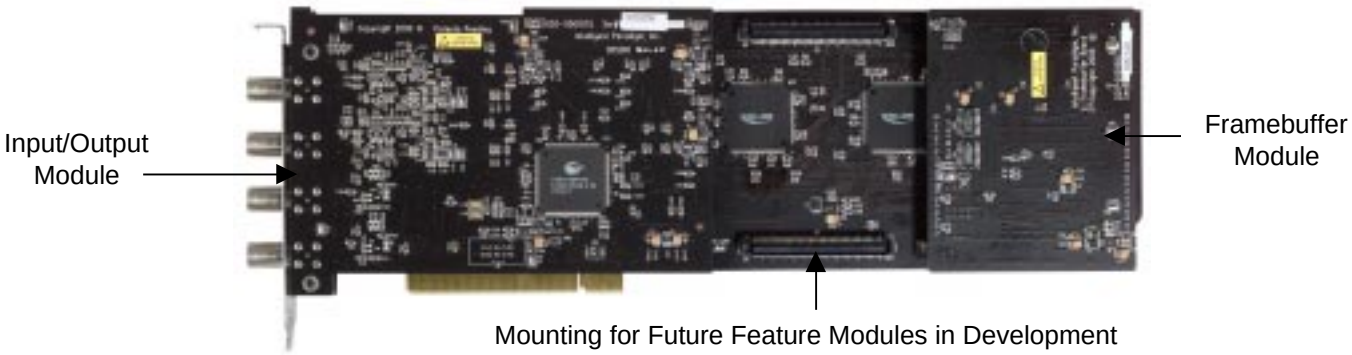


Figure 2 Video Explorer 2 System with Dual Serial Digital I/O Module and Framebuffer Module

***Note**: Save the anti-static packaging supplied with each piece of Video Explorer 2 hardware. You will need this packaging for storing the hardware when it is not in use. Avoid handling the circuitry after removing the packaging. Discharge any accumulated static electricity by touching the computer's power supply before handling the hardware.*

4. Align the card over the chosen PCI slot, making sure the card's input and output connectors face the rear of the computer. When the card's PCI connector makes contact with the slot connector, gently but firmly push down on the top edge of the card until it is properly seated inside the computer.

Notes:

- *Never force a card into a PCI slot. If you experience resistance when installing the card into the PCI slot, remove it and carefully retry the connection.*
- *Cards configured with Double Digital Serial Digital I/O daughterboard (DDSDIO) may encounter a tight fit inside your computer. You may have to spread the front and back panels of the computer casing slightly in order to seat the card.*
- *If you are using a MediaBahn connector, avoid leaving open PCI slots between video cards. In most cases, you will want to install the Video Explorer card or Docking Card in the next available slot. If you are installing multiple cards in your Video Explorer system, consult the MediaBahn installation section on Page 15.*

5. Install any MediaBahn connectors required for multiple board systems. Please refer to the MediaBahn connector instructions, which immediately follow this section.

6. Close the case of your computer. Consult your particular computer's instructions on how to do this.

7. Connect the desired input and output cables and devices to the Video Explorer 2 card. Consult the manual accompanying your specific I/O daughterboard. For example, if your Video Explorer card is configured with a DDSDIO daughterboard, consult the DDSDIO daughterboard section of the user manual. Refer to Page 18.

8. Consult the Software chapter of this user manual to properly configure the settings for your hardware for use with your particular system.

WARNING: NEVER TRY TO INSTALL OR REMOVE A VIDEO EXPLORER 2 CARD OR MODULE WHILE THE COMPUTER IS POWERED. REMOVING A CARD OR MODULE WHILE THE COMPUTER IS POWERED WILL SHORT OUT THE COMPUTER.

MediaBahn™

Intelligent Paradigm offers the MediaBahn connector in configurations to accommodate between two and six PCI cards. The MediaBahn design requires that you match the number of cards used to the MediaBahn model. For example, if you are using a Video Explorer card and a Docking Card as an additional input source, use the MediaBahn-2 connector to interconnect both cards. See Figure 3.

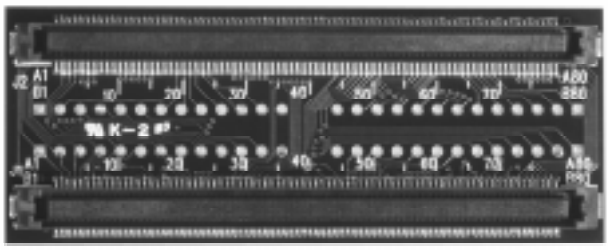


Figure 3 - MediaBahn™ Connector for 2 MediaBahn compatible cards

MediaBahn Installation Procedure

Installing the MediaBahn onto the PCI cards seated in your computer is a simple procedure. Remember that proper MediaBahn usage includes following the ESD (electro-static discharge) procedures during installation. See the Precautions section on Page 12 before proceeding with the installation.

Never connect less than the total number of video cards your MediaBahn connector is designed for. For example, connecting only three video cards to a MediaBahn-4 connector will limit your ability to route signals between cards.

> ***Note**: Before connecting or installing any system device, plug the computer power cord and any peripheral devices into a grounded power strip or outlet. Three-prong plugs ground the system components and protect them from electrical damage. Make sure that the power to the computer is turned off.*

1. Touch the top of the computer's power supply with your hand to discharge excess static electricity from your body and clothing. Consult your computer's owner's manual to locate the power supply on your specific model.

2. Remove the MediaBahn connector from its anti-static packaging.

3. With the MediaBahn connectors facing downward, align the white arrow located on each connector with the white arrow located on each MediaBahn mating connector at the top of each seated MediaBahn-compatible card.

4. Gently but firmly push the MediaBahn connector down onto the cards until it is properly seated. Do not force the connection!

WARNING: NEVER FORCE A CONNECTION. IF YOU EXPERIENCE RESISTANCE WHEN CONNECTING THE MEDIABAHN CONNECTOR TO THE PCI CARDS, REMOVE THE MEDIABAHN CONNECTOR, REALIGN THE CONNECTOR PINS WITH THE SOCKET, AND CAREFULLY RETRY THE CONNECTION BY PUSHING THE COMPONENTS TOGETHER, GENTLY BUT FIRMLY.

Dual Serial Digital Input/Output Module

Dual Serial Digital Input/Output Module (DDSDIO)

A Video Explorer 2 base card with the Dual Serial Digital Daughterboard allows connections directly with standard component digital video equipment such as digital video tape recorders, digital monitors, and other peripherals.

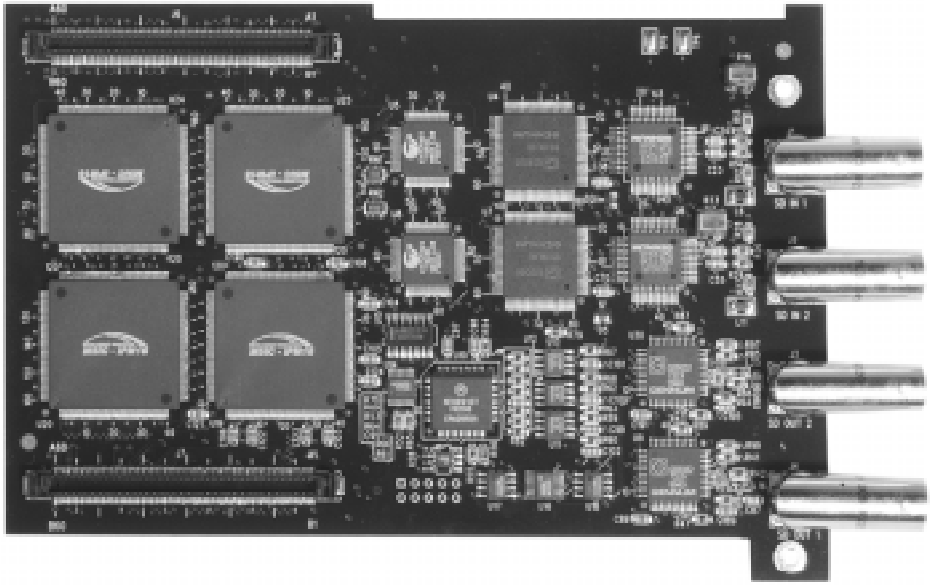


Figure 4 Dual Serial Digital Input/Output Module

Serial Digital Module Features

SMPTE 259M Compatibility

The Serial Digital Daughterboard supports communications with digital component devices such as VTR's (D1, DCT and Digital BetaCam), switchers, DDR's and other peripherals. The board accepts and generates Component 4:2:2 signals at data rates from 270Mb/s to 540Mb/s.

Multi-Channel Support

The Dual Serial Digital Daughterboard accepts up to two component serial digital inputs. The second input can be used as a second video stream or as a key channel input.
The board also supports two Component Serial Digital outputs. The second output can be used to mirror the primary output, can output a key channel, or can output any other video stream in the Video Explorer 2 system.

MSIC Digital Processing

The Video Explorer 2's internal 4:4:4:4, 10/16 bits per component digital processing provides flexible signal processing with exceptional fidelity. The MSIC processing ICs are primarily used to provide color space conversion, gamma correction, and adjustments of the video parameters, but many other video effects can be performed on the video flowing through these devices.

Dual Serial Digital Input/Output Module

General Specifications

Video Ports: 2 Serial Digital Inputs
2 Serial Digital Outputs

Video I/O Standards: SMPTE 259M
(currently supported) Component 4:2:2
NTSC 720 x 486 (4:3 aspect)
PAL 720 x 576 (4:3 aspect)

Data Word Length: 10 bits per component

Bit Rates: 270Mb/s
360Mb/s
540Mb/s

Genlock:
Source Sync Embedded in Serial Digital Stream.
Lock Criteria Stable Source - TBC or VTR w/Time Base Correction.

Video Input

Color Space Conversion: YUV 4:2:2 to RGB 4:4:4, or
YUV 4:2:2 Internal

Sampling Structure: 4:2:2 In
4:4:4:4 Internal
4:2:2 Output

Gamma Correction: MSIC Programmable

YCrCb Range: MSIC Programmable

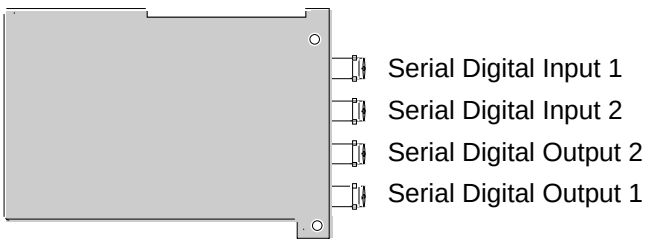
Video Output

Component Digital: 800mV ± 10% @ 75Ω, 1%

YCrCb Range: MSIC Programmable

Gamma Correction: MSIC Programmable

I/O Connections



Dual Serial Digital Input/Output Module

DDSDIO Video Connections

1. Refer to the Video Explorer 2 installation section of this user manual to install the main card into the PCI slot inside your computer. When the Video Explorer 2 base card is seated properly in the PCI slot, the BNC connectors of the Serial Digital Input/Output module will protrude through the back of the computer.

2. Connect standard video cables with BNC connectors from the video input and output devices to the input and output module connectors on the Serial Digital Input/Output Module.

   ***Note**: The Video Explorer 2 supports both NTSC and PAL resolutions*

3. Power up the computer and video input and output devices.

4. Consult the Software chapter of this user manual install the Video Explorer application software.

WARNING: NEVER TRY TO INSTALL OR REMOVE A VIDEO EXPLORER 2 CARD OR MODULE WHILE THE COMPUTER IS POWERED. REMOVING A CARD OR MODULE WHILE THE COMPUTER IS POWERED WILL SHORT OUT THE COMPUTER.

Video Flow

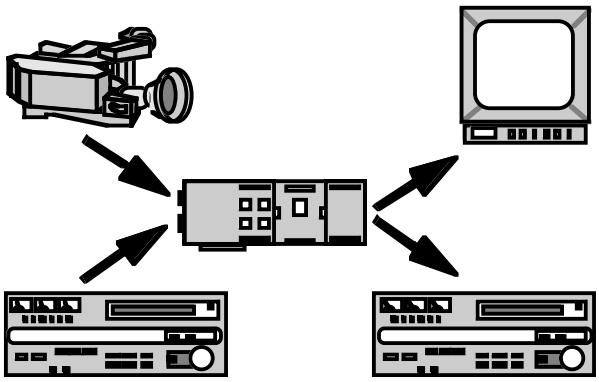


Figure 5 Examples of video input and output devices for a Video Explorer 2 system

Standard Definition Framebuffer Module

Below is a Standard Definition Framebuffer Module. It attaches to the Video Explorer 2 base card as shown in Figure 1 on Page 7. It has a 64 megabyte of SD RAM capacity which allows storage of approximately 45 video frames captured in 4:2:2 16 bit format.

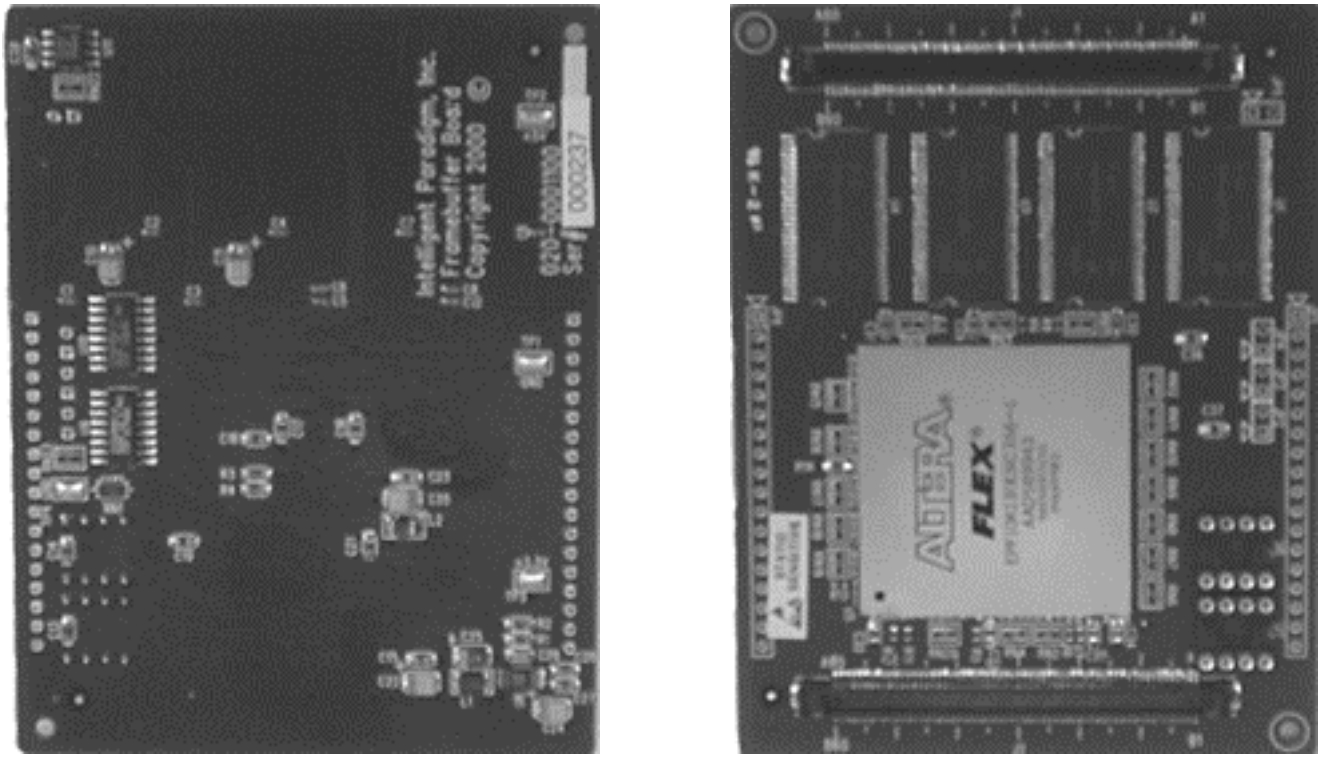


Figure 6 Standard Definition Framebuffer Module, Outside View and Inside View

Software

Mac OS Software Installation (For MacOS 8.6 or later)

Before continuing, you must ensure that you have the Video Explorer 2 hardware installed in your system. For help in installing the Video Explorer, see “Installation” in the Video Explorer section of this manual. For help in connecting your serial digital monitor, please see “Installation in the Dual Serial Digital Input/Output section of this manual.

To install the Video Explorer 2 application software, follow the directions below.

1. Insert the Video Explorer 2 CD into your CD drive and copy the folders to your local hard drive.

2. Double click on the Video Explorer 2 Folder.

3. A folder labeled “Into System Folder” will appear. Inside that folder are two folders, “Into Control Panels” and “Into Extensions”. Simply drag and drop the individual files into the correct folders in your system folder. i.e. place the *Video Explorer 2* file into the Control Panels folder and the *VE2Support Lib, VE2 QuickTime* and *VE2 VDIG* files into the Extensions folder.

4. The Video Explorer 2 application software has now been installed. Restart your computer before using it.

Video Explorer 2 Control Panel

1. The Video Explorer 2 application software consists of the Video Explorer 2 Control Panel. Open this control panel on the path: System Folder: Control Panels: Video Explorer 2. See Figure 7.

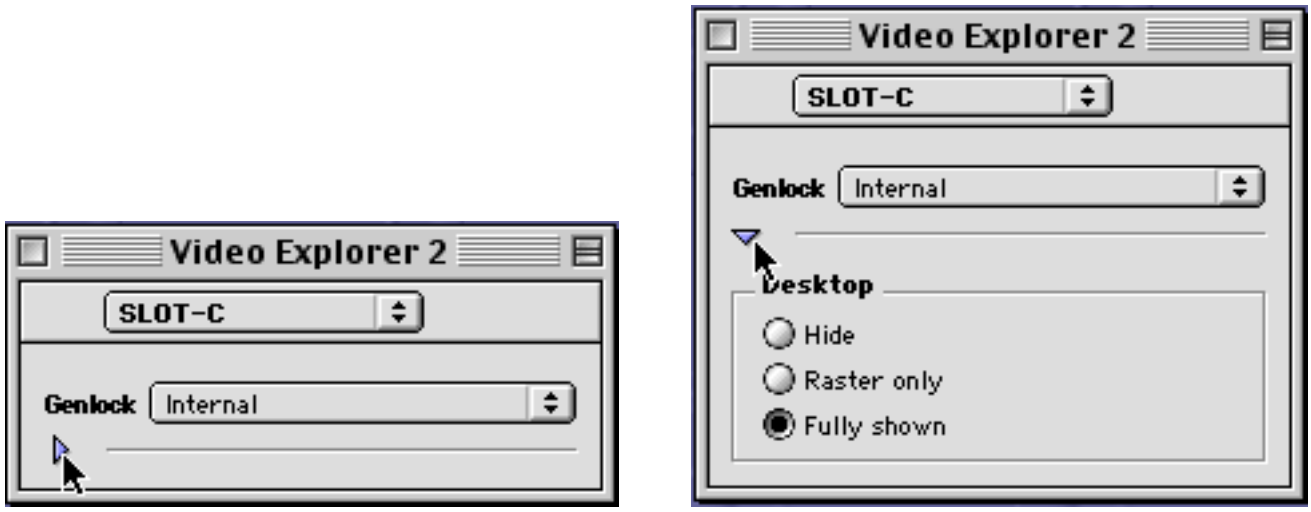


Figure 7 Video Explorer 2 Control Panel, Collapsed and Expanded

2. The **Desktop** section of the Video Explorer 2 Control Panel indicates the state of the desktop. This section is normally used for troubleshooting only. See Figure 7 above.

a. **Hide** - If the user experiences a software crash, that crash may hide the desktop. This event could be verified by opening the Video Explorer 2 Control Panel and seeing the **Hide** button selected. To return the desktop to the output monitor, the user would simply check the **Fully Shown** button.
b. **Raster Only** - A state used only by developers.
c. **Fully Shown** - The normal state is **Fully Shown**.

3. The Video Explorer 2 Control Panel indicates which PCI slots in the computer hold Video Explorer 2 cards. Use this pop-up to select which Video Explorer 2 card to configure. See Figure 8 below.

Figure 8 Video Explorer 2 Control Panel showing Video Explorer 2 cards in Slots C and D of the computer.

4. The **Genlock** pop-up controls which source a Video Explorer 2 card is genlocked to. See Figure 9 below. The choices are:

a. **None** - A default state that may be encountered after a software crash. Cannot be user selected.
b. **Internal** - The Video Explorer 2 acts as its own timing source.
c. **Input 1** - Genlocks to the device connected to Input 1
d. **Input 2** - Genlocks to the device connected to Input 2

Figure 9 Video Explorer 2 Control Panel showing Sources for Genlock

5. Close the Video Explorer 2 Control Panel. Open your video application software such as Apple's *Final Cut Pro* or Adobe's *Premiere* or *PhotoShop* and begin to capture or lay off your video.

Troubleshooting

Q: When my Macintosh wakes up from sleep, I get a dialog that says the PCI bus was left powered on because a PCI card does not support removing bus power during sleep Is there a problem with my Video Explorer 2?

A: Don't worry. Your Video Explorer 2 and your computer are working just fine. It is true that some PCI cards do not allow the host computer to remove power without rebooting the system. Video Explorer 2 is one of those cards. This allows Video Explorer 2 to continue processing video even after the host computer has gone to sleep. If you like, you may check the "Don't remind me again" box in that dialog and you won't see it again.

Technical Support

Intelligent Paradigm offers its technical support service for each product you purchase from our Video Explorer 2 family. Please take the time to record relevant information about your Video Explorer product(s). Be sure to fax or e-mail this information before calling for assistance. Intelligent Paradigm needs this information in order to assist you in your troubleshooting efforts.

Our technical support specialists are available weekdays, 6 a.m. to 5 p.m. Central Time.

Phone (847) 413-1808
FAX (847) 413-1828,
E-Mail: support@intellgentparadigm.com

Information Needed for Technical Support

Company Name: _____

Individual Responsible: _____

Address: _____

City: _____ State: _____ Zip: _____

E-Mail Address:_____

Environment:
Type of Computer_____ Operating System_____ Version No._____

Video Explorer 2 Software Version No.:_____

Video Explorer 2 Serial Numbers:
Base Card _____
Framebuffer _____
Dual Serial Digital I/O _____
HD I/O _____
Feature Module _____

Nature of Problem: _____

_____

_____

System Configuration: _____

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