IEI Technology Corp.

MODEL:

VWBOX-E133

Video Wall Controller
3x3 LCD Panel Array
Scalable

User Manual

Rev. 1.00 – 9 September, 2009

GeniMask™

RoHS Lead Free

Revision

Date	Version	Changes
9 September, 2009	1.01	Firmware upgrade guide added
8 June, 2009	1.00	Initial release

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Chapter

1

Introduction

1.1 Introduction

Figure 1-1: VWBOX-E133

The VWBOX-E133 video wall controller box is for displaying a single video input on an array of monitors, implementing a large display without the inherent high costs of a single large monitor. The VWBOX-E133 is for large displays where high definition video output is also essential. The video wall controller accepts a single DVI input, which is split over all the monitors in the array.

1.2 Benefits

The benefits of the VWBOX-E133 include:

- Accurate, high-definition image
- Silent operation
- Simple setup
- Cheap implementation of a large display
- Major power savings over PC-based implementation
- Space saving

1.3 Features

The features of the VWBOX-E133 include:

- DVI video input
- Nine DVI video outputs
- Support for up to 1920 x 1200 output resolution (per monitor)
- Multiple video output combinations including full video wall mode, clone mode and vertical replication mode
- Bezel control compensates for gaps between monitors

1.4 External Interfaces, Switches and LEDs

This section provides an overview of the connectors, switches and indicators on the VWBOX-E133.

1.4.1 Front Panel

The front panel has the following buttons and indicators:

- Power indicator LED
- Video output LEDs
- Video input LED
- OSD menu keypad

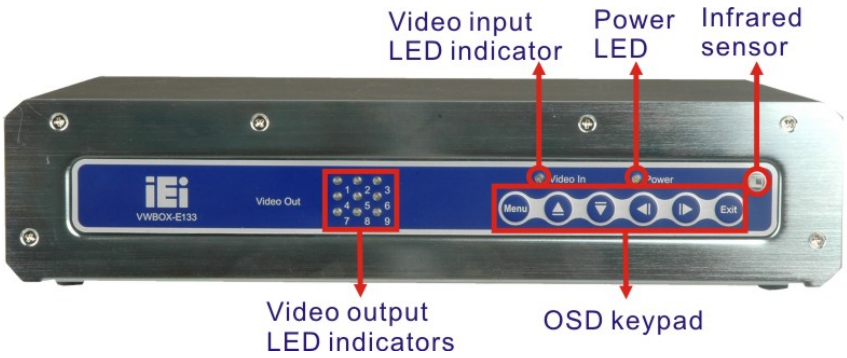


Figure 1-2: VWBOX-E133 Front Panel

1.4.2 Rear Panel

The rear panel has the following connectors, switches and indicators:

- 9 x DVI outputs
- 1 x DVI video input
- 1 x Power input
- 1 x Power switch
- 1 x Serial port

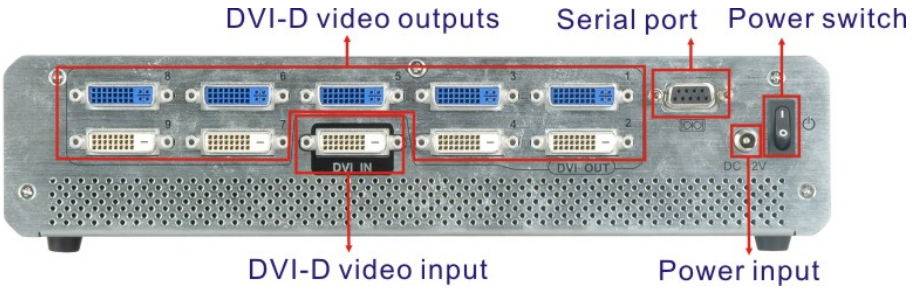


Figure 1-3: Rear Panel

1.5 Technical Specifications

VWBOX-E133 video box features are listed in **Table 1-1**. See **Chapter 2** for details.

Specification	Detail
Model Name	VWBOX-E133
Main Features	1. Multiple viewing modes 2. Software OSD 3. Remote control 4. Bezel masking
Inputs	One DVI-D single link
Outputs	Nine DVI-D single link
Dimensions (W x D x H)	295 mm x 190 mm x 65 mm (71.4mm with rubber feet)
Cooling	Fan
Input Resolution	800x600, 1024x768, 1152x864, 1280x768, 1280x960, 1280x1024, 1600x1200, 1680x1050, 1920x1200
Output Resolution	1024 x 768, 1360 x 768, 1280 x 1024, 1400 x 1500, 1680 x 1050, 1600 x 1200, 1920 x 1200, 1366 x 768, 1920 x 1080 (with auto scaling up to 3072x2304, 4080x2304, 3840x3072, 4200x3150, 4980x3150, 4800x3600, 5760x3600)
Power Adapter Input	90 VAC to 264 VAC / 47 Hz to 63 Hz
Power Adapter Output	12 V / 3.33 A / 40 W

Specification	Detail
Safety and Emission	CCC, CE, FCC
Temperature	0ºC – 40ºC
Power Consumption	35 W

Table 1-1: Technical Specifications

1.6 Dimensions

- **Height**: 65 mm (71.4mm with rubber feet)
- **Width**: 295 mm
- **Depth**: 190 mm

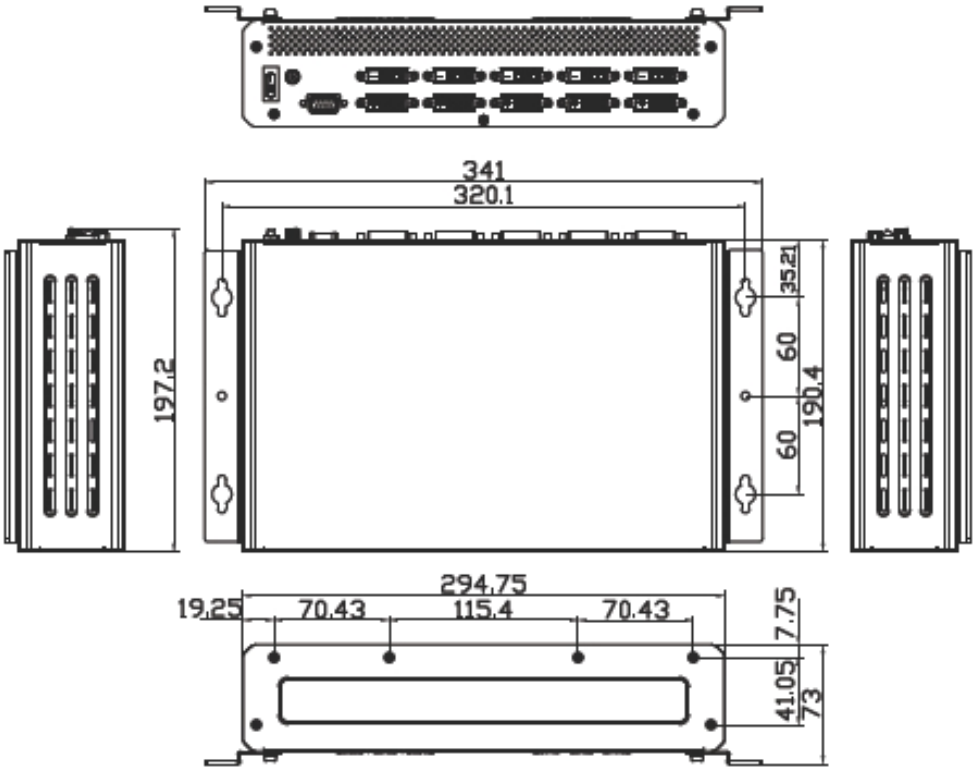


Figure 1-4: VWBOX-E133 Dimensions

Chapter

2

Unpacking List

2.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the VWBOX-E133may result in permanent damage to the VWBOX-E133and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the VWBOX-E133. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the VWBOX-E133 or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the VWBOX-E133, place it on an antic-static pad. This reduces the possibility of ESD damaging the VWBOX-E133.
- ***Only handle the edges of the PCB***: When handling the PCB, hold the PCB by the edges.

2.2 Unpacking Precautions

When the VWBOX-E133 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 2.1**.
- Make sure the packing box is facing upwards so the VWBOX-E133 does not fall out of the box.
- Make sure all the components shown in **Section 2.3** are present.

2.3 Packing List

NOTE:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor that sold the VWBOX-E133 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The VWBOX-E133 is shipped with the following components:

No.	Description	Image
1	VWBOX-E133	
1	Power cord (European illustrated here)	
1	Power adapter	
1	Single-link DVI-D cable	
1	Remote control	
1	Mounting brackets	
1	Screw kit	

No.	Description	Image
1	User manual CD	

Table 2-1: Package List Contents

2.4 Optional Items

The following optional items are available for the VWBOX-E133:

No.	Description	Image
1	Single-link DVI-D cable	

Table 2-2: Package List Contents

Chapter

3

Installation

3.1 Installation Overview

The VWBOX-E133 supports 4-panel, 6-panel, 9-panel, 36-panel (requires five video boxes) and 81-panel setups (requires ten video boxes).

3.1.1 Four (2x2) Panel Overview

The implementation of a 4-panel (2x2) array is shown in **Figure 3-4** below.

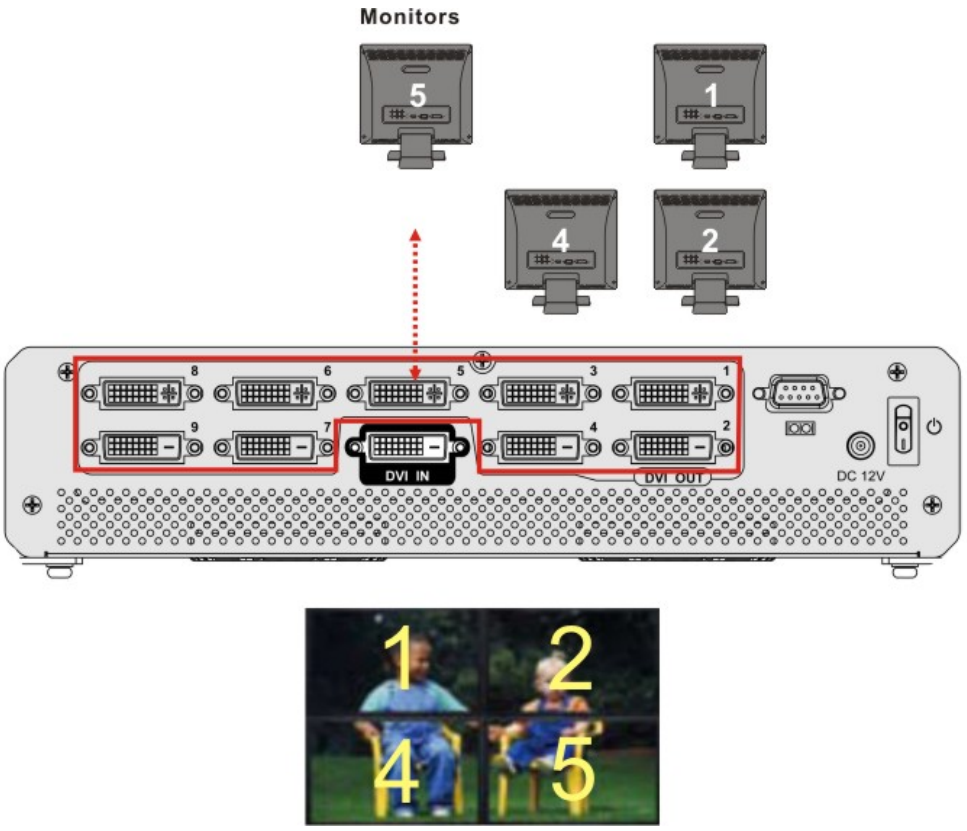


Figure 3-1: Four (2x2) Panel Setup

3.1.2 Six (2x3) Panel Overview

The implementation of a 6-panel (2x3) array is shown in **Figure 3-4** below.

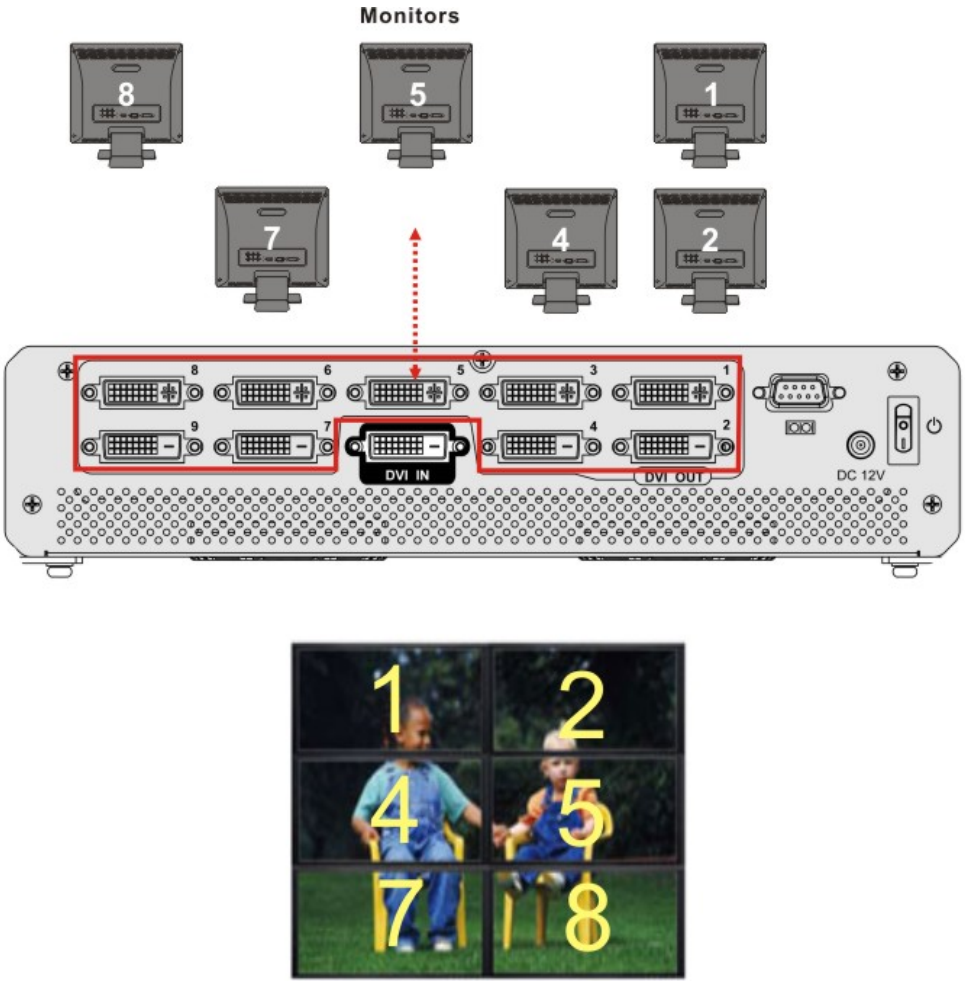


Figure 3-2: Six (2x3) Panel Setup

3.1.3 Six (3x2) Panel Overview

The implementation of a 6-panel (3x2) array is shown in **Figure 3-4** below.

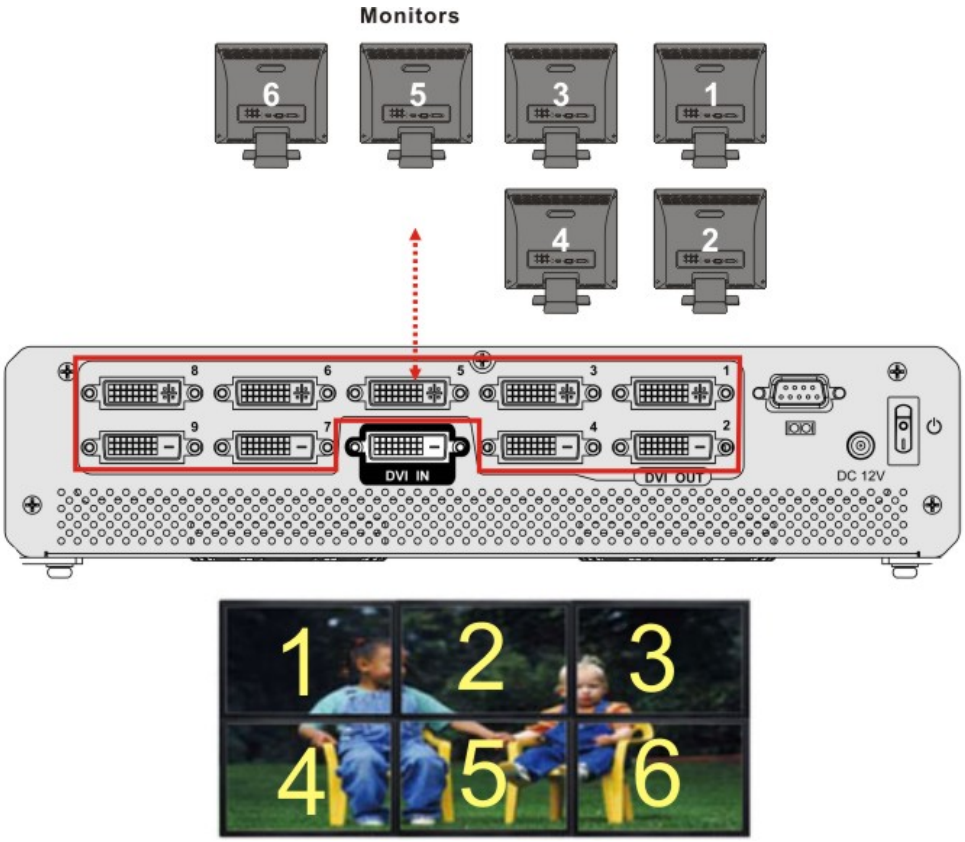


Figure 3-3: Six (3x2) Panel Setup

3.1.4 Nine (3x3) Panel Overview

The implementation of a 9-panel (3x3) array is shown in **Figure 3-4** below.

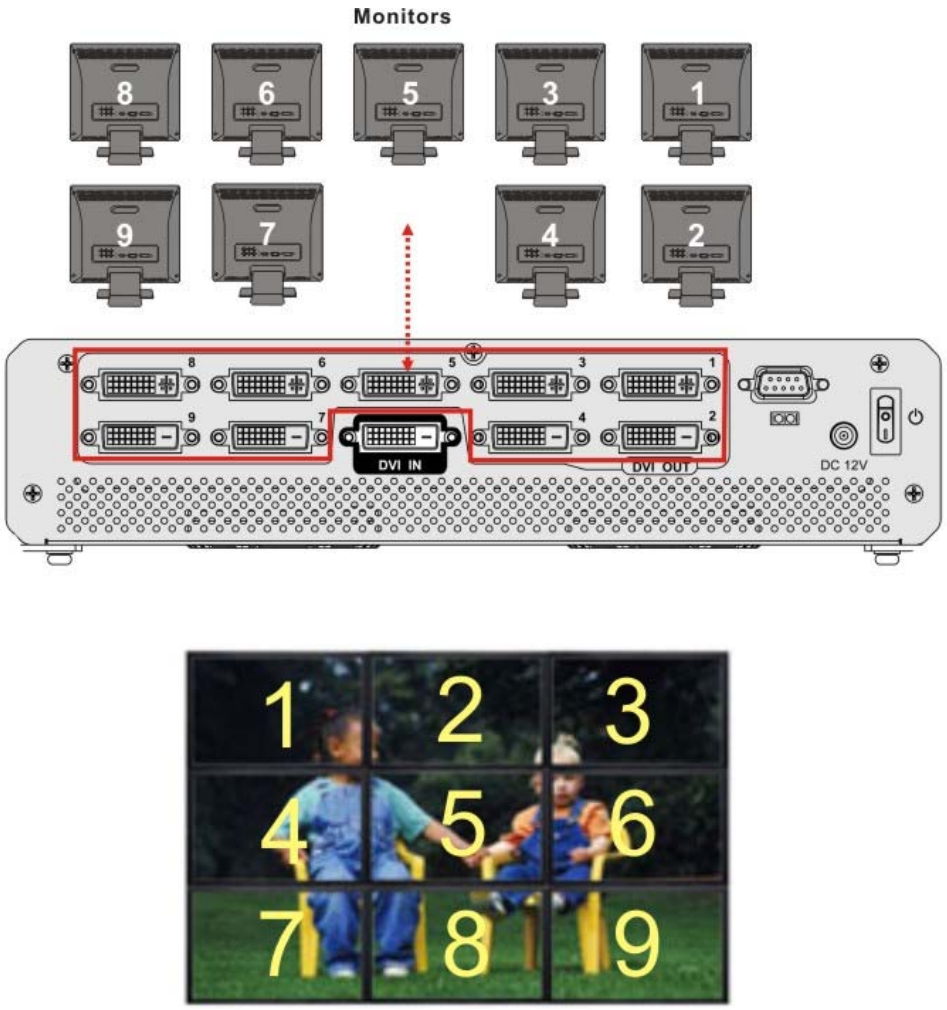


Figure 3-4: Nine Panel Setup

3.1.5 36 Panel, Multi-controller Installation Overview

The implementation of a 36-panel array using one VWBOX-E133 as the master device and nine VWBOX-E122 controllers as slave devices is shown in **Figure 3-5** below. Each VWBOX-E122 slave controller connects to four display panels. Refer to the VWBOX-E122 User Manual for installation guides to connect the controller in a 2x2 array.

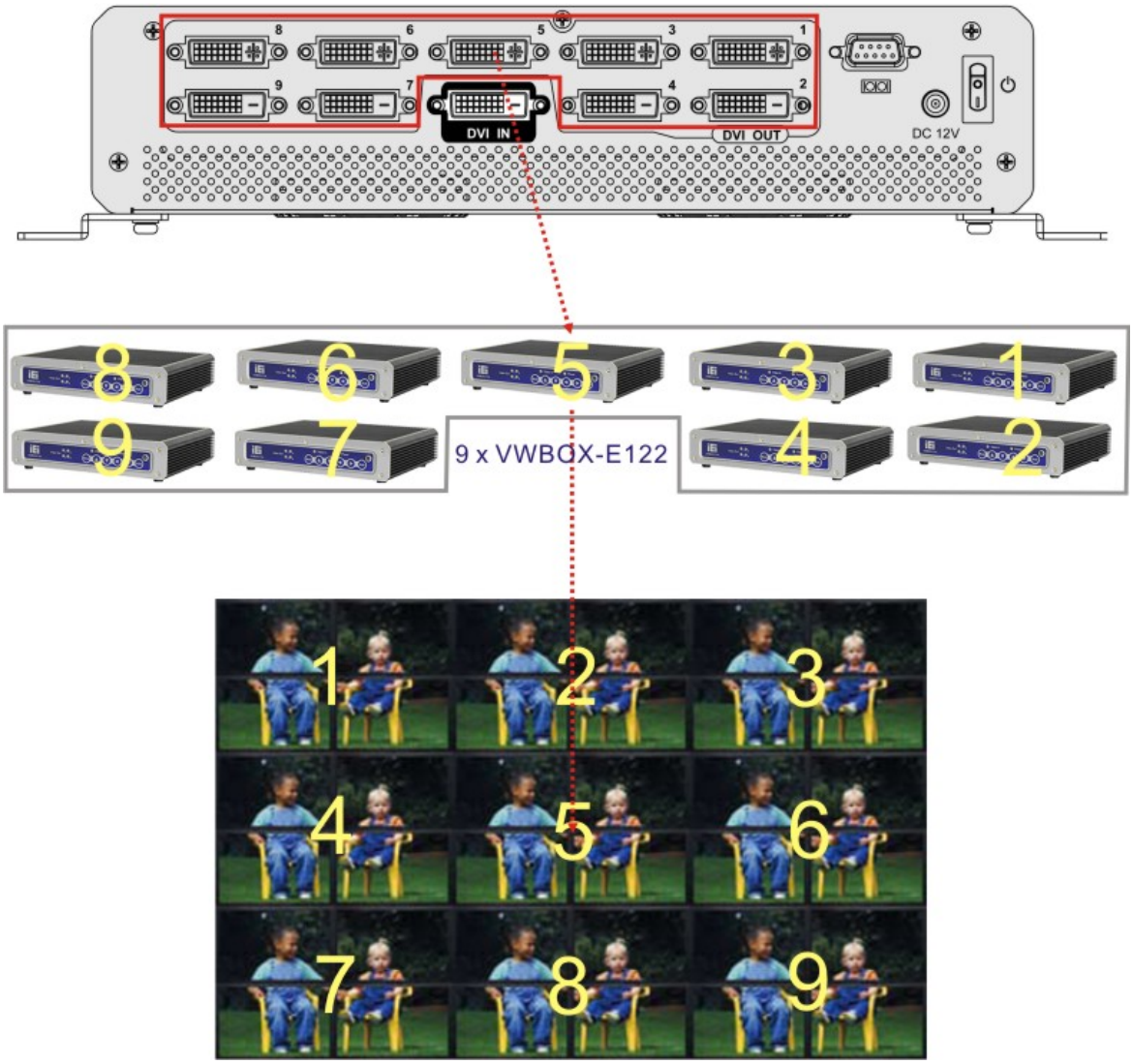


Figure 3-5: 36 Panel Setup

3.1.6 81 Panel, Multi-controller Installation Overview (VWBOX-133A Master controller)

The implementation of an 81-panel array using one VWBOX-133A as the master device and nine VWBOX-E133 controllers as slave devices is shown in **Figure 3-5** below. Each VWBOX-E133 slave controller connects to nine display panels in a 3x3 array.

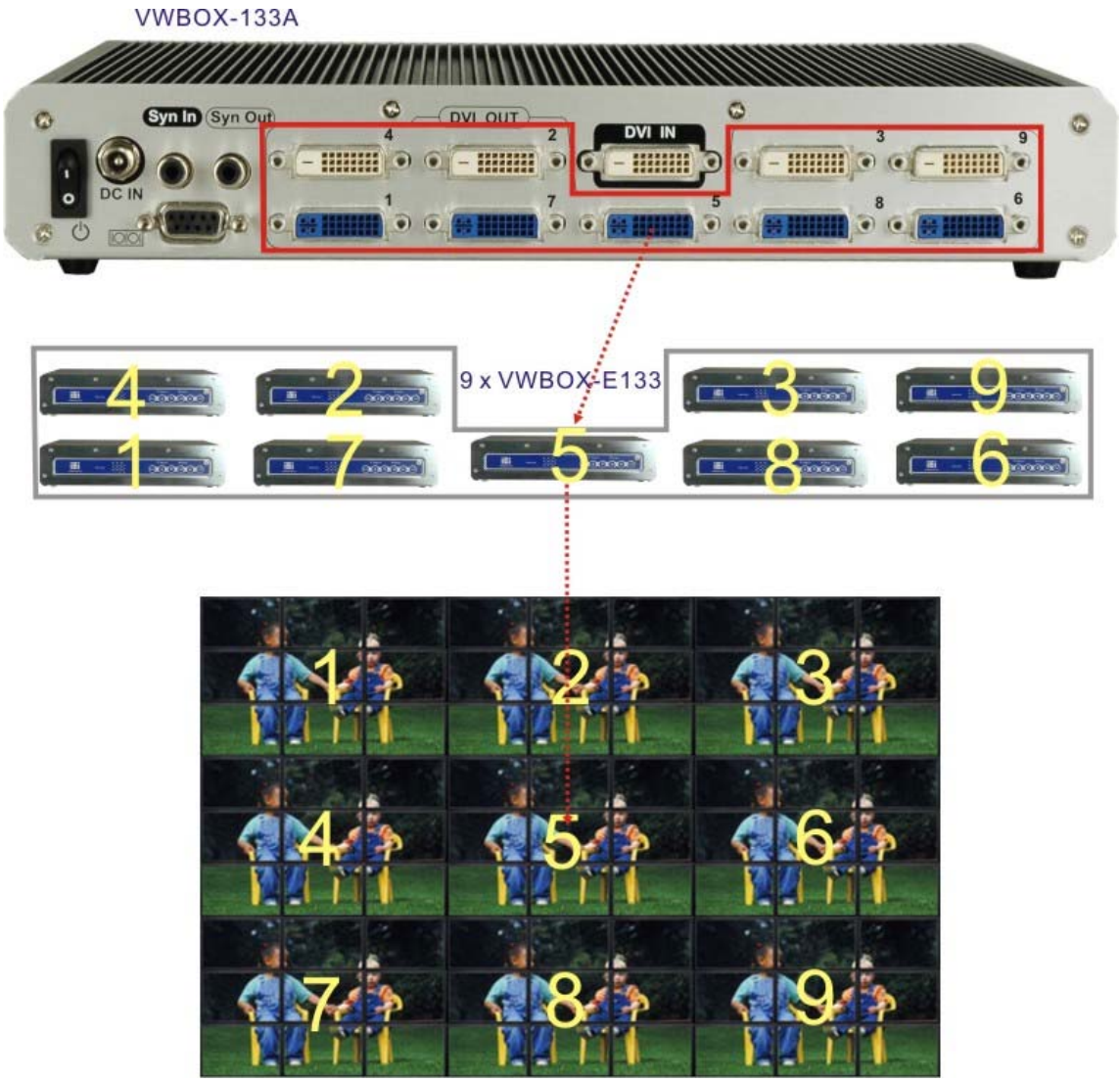


Figure 3-6: 81 Panel Setup With VWBOX-133A Master Controller

3.2 Installation Steps

To install the VWBOX-E133 please follow the installation steps below:

Step 1: Install the LCD panels.

Step 2: Mount the VWBOX-E133.

Step 3: Connect DVI output cables, video input cable (DVI-D), RS-232 cable and power adapter to the VWBOX-E133.

Step 4: Adjust the screen resolution output settings.

Step 5: Select a screen mode for display output.

Step 6: Adjust the VWBOX-E133 mask settings to align the images.

3.3 Install LCD Panels

The LCD panels are installed as a square array, with two rows and two columns, for a total of four monitors.

Recommended installation procedures are to

- Use all identical monitors
- Keep gaps between panels as small as possible for the best image
- Keep all horizontal gaps between monitors in the array consistent
- Keep all vertical gaps between monitors in the array consistent

3.4 Mounting

The VWBOX-E133 must be placed on a table, desk or other firm surface. Optionally, the VWBOX-E133 can be mounted using the included mounting brackets. The installation location must be:

- Out of direct sunlight
- Without anything on top of it
- On a firm surface
- Away from moisture and liquids

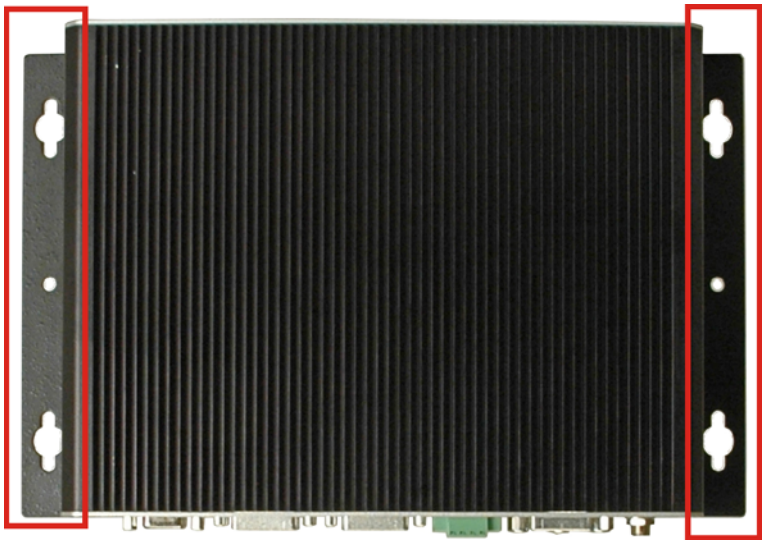


Figure 3-7: Mounting Brackets

3.5 Connect Cables

The cables that need to be attached are listed below and their connections are shown in **Figure 3-8**:

- **DVI-D input cable** – from the video source or computer to the VWBOX-E133
- **DVI-D output cables** – from the VWBOX-E133 to the LCD panels or other slave video box controllers. Make sure the cables are connected to the correct monitors as shown in **Figure 3-8**.
- **Power cable** – from the power adapter
- **RS-232 cable** (optional) – connected to a computer with smartOSD software installed

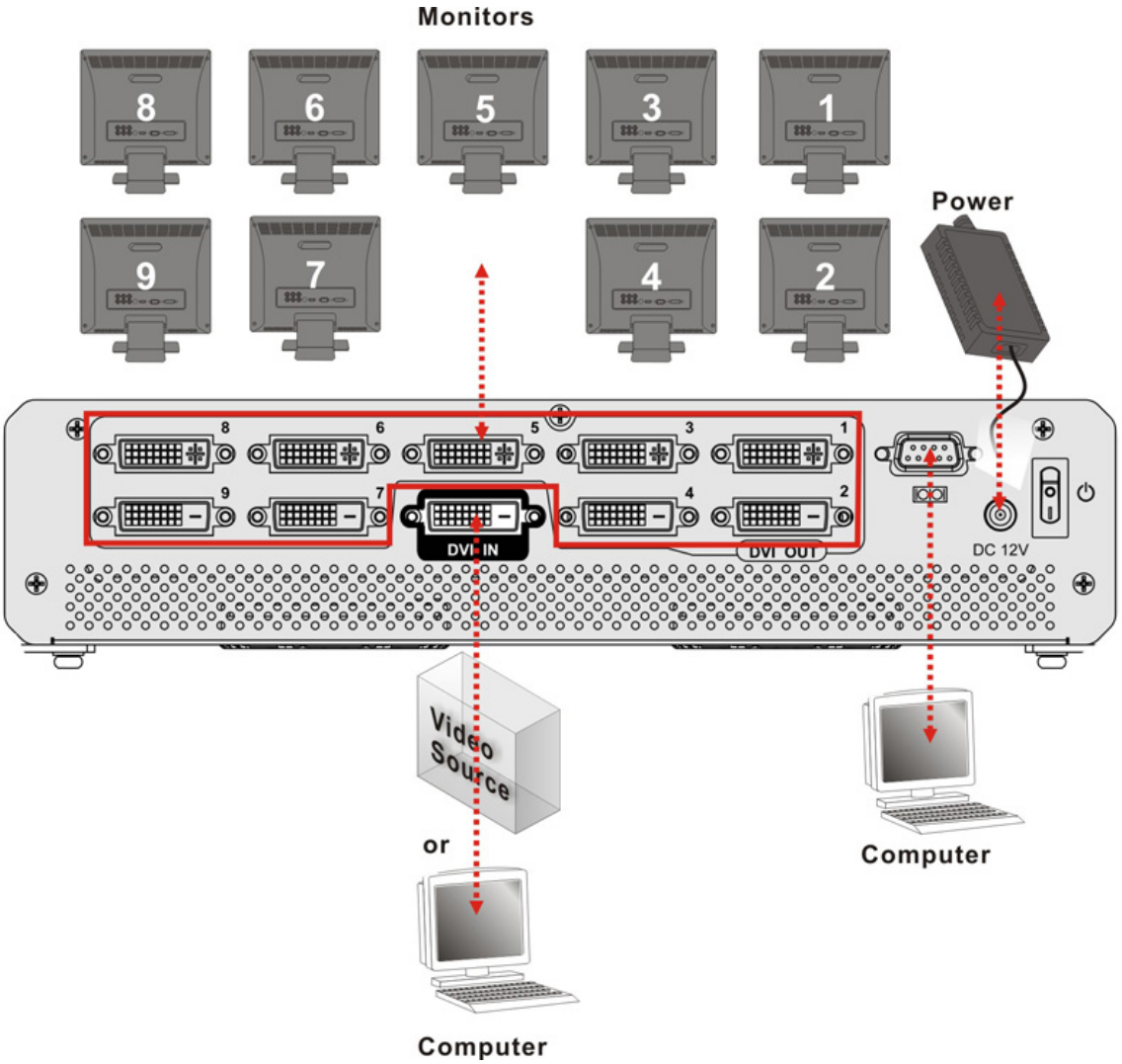


Figure 3-8: Cable Connections

3.5.1 Connect the Video Source and VWBOX-E133

Connect the video source to the VWBOX-E133. If the video source is a computer with the smartOSD software installed, that computer can be used to adjust the monitor settings without using the OSD.

The video source connects directly to the VWBOX-E133 through a DVI-D single link cable. To connect the video source to the VWBOX-E133, follow the steps below.

Step 1: Attach the DVI video cable to the DVI output of the video source.

Step 2: Attach the DVI video cable to the DVI input on the VWBOX-E133.

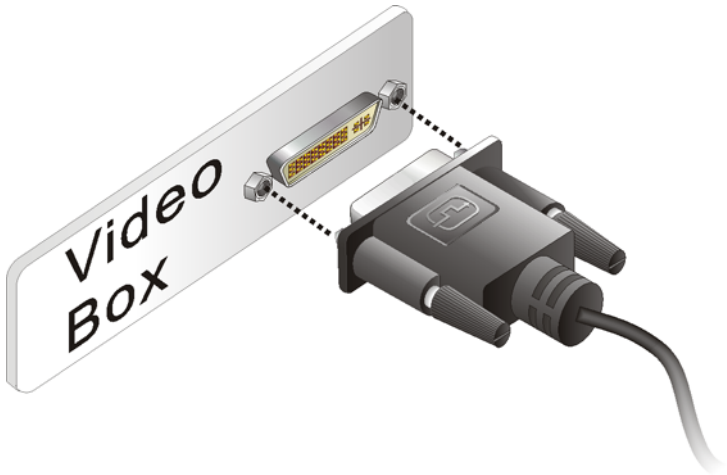


Figure 3-9: VWBOX-E133 Video Input

3.5.2 Connect the RS-232 Cable to the VWBOX-E133 (Optional)

The VWBOX-E133 has a male DB-9 connector on the rear panel. The RS-232 cable connects to a computer that has the smartOSD software installed. This enables the computer to control the screen setup. If the video source is from a PC the image screen setup can be controlled through the DVI cable. Follow the steps below to connect a serial device to the VWBOX-E133.

Step 1: **Locate the DB-9 connector**. The location of the DB-9 connector is shown in **Chapter 3**.

Step 2: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See **Figure 3-10**.

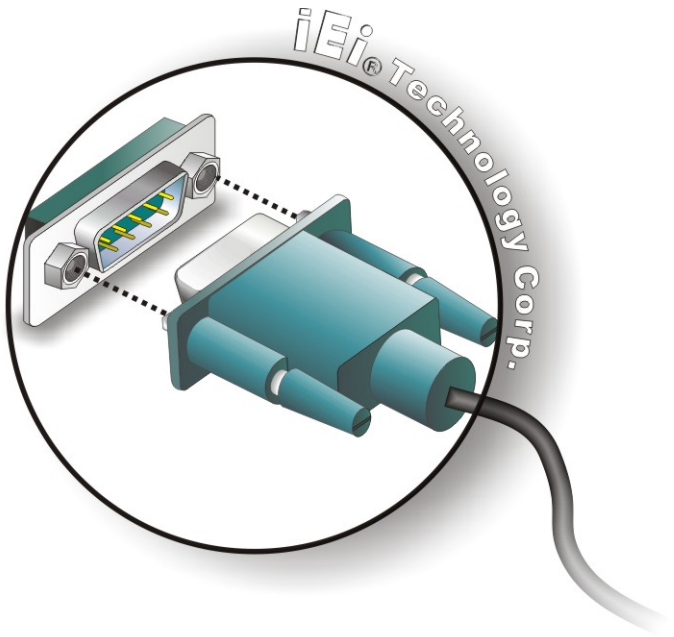


Figure 3-10: Serial Device Connector

Step 3: Secure the connector. Secure the serial device connector to the external interface by tightening the two retention screws.

3.5.3 Connect the VWBOX-E133 to the Power Supply

Connect the included PSU into an AC power supply then connect the PSU to the VWBOX-E133. The figure below shows the typical setup. There is no power switch, and the VWBOX-E133 turns on as soon as it is connected to the PSU.

3.6 Input and Output Resolution

Correct adjustment of the input and output resolutions gives a much better quality final image. Follow the steps outlined in the subsections below to get the best image quality from the video wall controller.

3.6.1 Screen Ratio

With auto-scaling it is not necessary to match the input and output aspect ratios.

3.6.2 Input Resolution

Input resolution should be set as high as possible. Pick a resolution that meets the following criteria:

- Matches the LCD panel aspect ratio (as shown in Error! Reference source not found.)
- Is the maximum possible (without exceeding input resolution limits)

3.6.3 Output Resolution

The output resolution should be set as high as possible, and meet the following criteria for best results:

- Matches video input and LCD panel resolution ratios
- Is the maximum possible
- Has a minimum width greater than half input width
- Has a minimum height greater than half input height

3.7 Display Mode

There are five display mode options available. The display mode can be set through the smartOSD (**4.2.2.2**) or OSD menu (**4.3.1**). The modes are shown in **Figure 3-11** below.

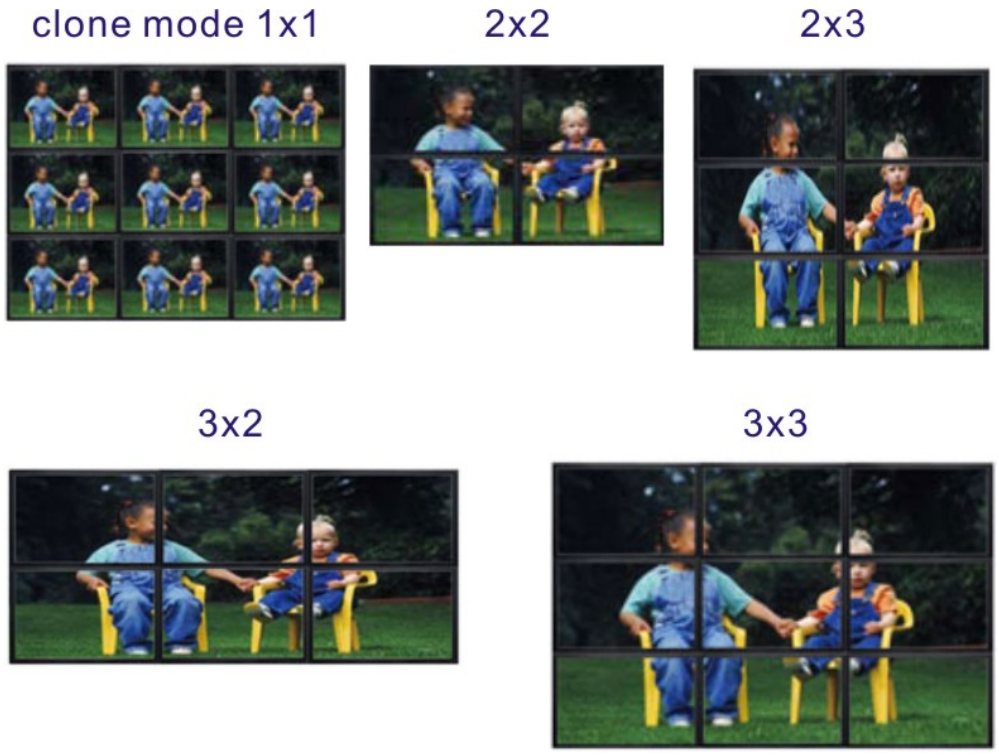


Figure 3-11: Display Mode

Chapter

4

OSD Functions

4.1 Mask Setup

The GeniMask masking control allows images to be adjusted slightly larger than the visible screen size, to compensate for the gaps between panels. GeniMask simplifies this process, allowing the masking to be adjusted simultaneously from a single controller. For a setup with one controller and four panels the horizontal and vertical gaps are easily adjusted according to the installation. With a master controller and four slave controllers, the mask setup remains just a simple. While adjusting the master controller, all the slave controllers are automatically adjusted, making setup time up to five times faster then individually setting up each video controller.

Use either the smartOSD (**4.2.2.2**) or OSD menu (**4.3.4.1**) to set the mask value.

4.2 smartOSD

IEI smartOSD is a proprietary On-Screen-Display (OSD) software solution from IEI that enables easy, remote monitor setting adjustments in a Windows environment. IEI smartOSD delivers excellent performance and provides more flexibility than the typical OSD hardware solutions when adjusting a monitor. smartOSD also allows the screen output screen resolution and mask size to be adjusted using the DVI connection.

4.2.1 Pre-installation Notice

Before installing smartOSD software, please make sure one of the following operating systems is installed:

- Windows 95
- Windows NT 4.0
- Windows 98
- Windows 2000
- Windows 2003
- Windows XP
- Windows Vista

4.2.2 Software Illustration

The table below shows the smartOSD menu structure (**Table 4-1**).

Menu	Options
Interface	Interface Selection
Display	Display Resolution Display Mode Mask Setting
Setting	Digital I/O Test (for VWBOX-E122 only) Input Source Power Factory Reset OSD Lock
About	Company Contact Details

Table 4-1: smartOSD Menu Structure

4.2.2.1 Interface Page

The interface page is for choosing the interface between the computer and the VWBOX-E133.

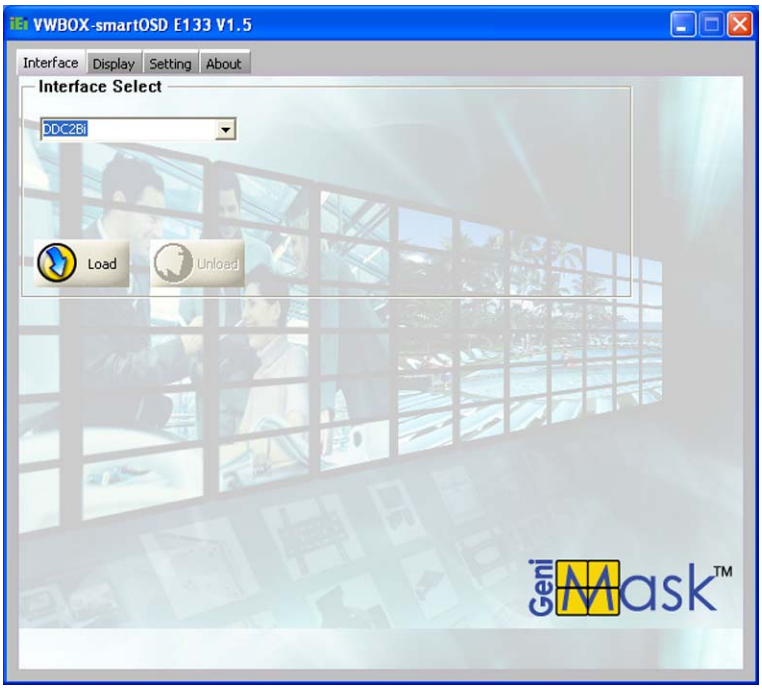


Figure 4-1: smartOSD Interface Page

➔ **Interface Select**

The **Interface Select** option selects the data communication method between the computer and the VWBOX-E133. If the computer also provides the video input, then communication can be done over the DVI cable. Serial ports can also be used for data communication. The dropdown list shows all communications ports by default. The following are shown for reference, as the exact ports available are system dependent.

- ➔ **DDC2Bi** DVI input
- ➔ **COM1** First serial port
- ➔ **COM3** Third serial port

4.2.2.2 Display Page

The Display Page adjusts the configuration of the panels in the video wall array.

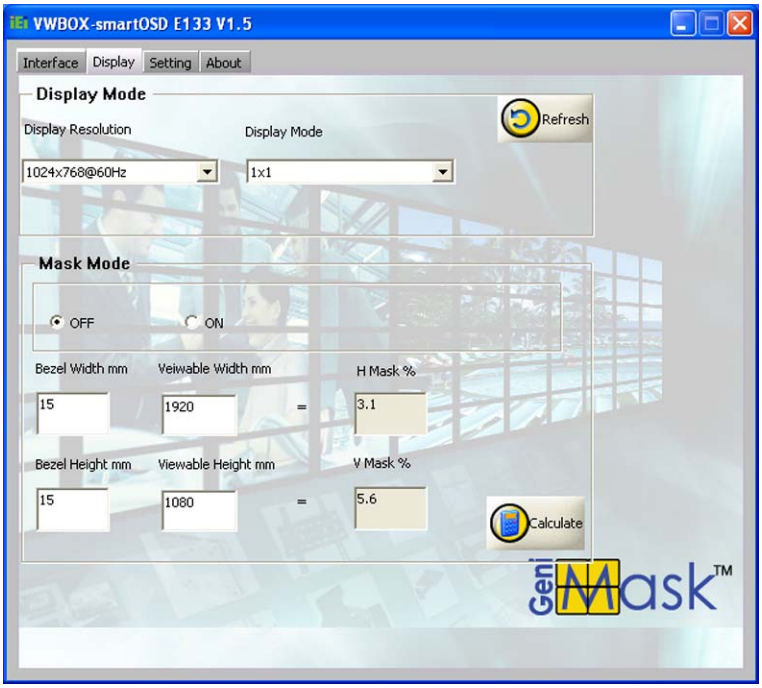


Figure 4-2: smartOSD Display Page

➔ **Display Resolution**

The Display Resolution setting shows the resolution of the video image output. Display output setting options are shown below.

- 1024 x 768 @ 60 MHz
- 1360 x 768 @ 60 MHz
- 1280 x 1024 @ 60 MHz
- 1400 x 1050 @ 60 MHz
- 1680 x 1050 @ 60 MHz
- 1600 x 1200 @ 60 MHz
- 1920 x 1200 @ 60 MHz
- 1366 x 768 @ 60 MHz
- 1920 x 1080 @ 60 MHz

➔ **Display Mode**

The display mode option configures how the image is displayed on the screen.

➔ **1 x 1**	**DEFAULT**	The video input is cloned on all the monitors
➔ **2 x 2**		The video input is tiled over all the panels.
➔ **2 x 3**		The video input is split across a six-panel array in a 2 x 3 setup
➔ **3 x 2**		The video input is split across a six-panel array in a 3 x 2 setup
➔ **3 x 3**		The video input is split across a nine-panel array in a 3 x 3 setup

➔ **Mask Mode**

Mask mode toggles the masking function.

➔ **Off**		The video box doesn't compensate for gaps between LCD panels
➔ **On**	**DEFAULT**	The video box compensates for the gaps between LCD panels

➔ **H Mask %**

The horizontal mask compensates for the horizontal gap between panels. Enter the bezel width (mm) and viewable width (mm) into the corresponding data box to calculate the correct figure.

➔ **V Mask %**

The vertical mask compensates for the vertical gap between panels. Enter the bezel height (mm) and viewable height (mm) into the corresponding data box to calculate the correct figure.

4.2.2.3 Setting Page

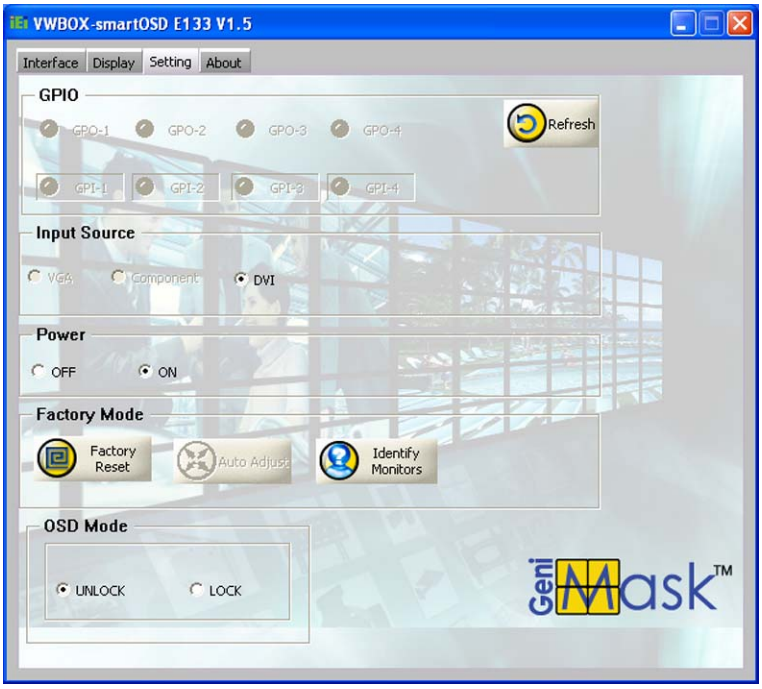


Figure 4-3: smartOSD Setting Page

➔ **GPIO**

The GPIO settings are for the VWBOX-E122 only.

➔ **Input Source**

The input video source is automatically selected by the VWBOX-E133.

➔ **DVI** Input video source is DVI

➔ **Power**

The power option turns the VWBOX-E133 on and off. Select one of the options below.

➔ **On** The video box displays the video source image onto the video outputs.

➔ **Off** The video box is in standby mode. No images are displayed on the video outputs, but the video box is ready to receive data commands.

➔ **Factory Mode**

Factory mode resets the VWBOX-E133 to default settings. Two options are available for resetting the values.

➔ **Factory Default** Resets the video box to the factory defaults.

➔ **OSD Mode**

Two sets of options are available. The lock/unlock option sets whether the front panel OSD buttons can be used for adjusting settings. The normal/rotation option sets the onscreen OSD to a horizontal or vertical position.

➔ **Lock** The front panel OSD buttons cannot be used to adjust settings

➔ **Unlock** The front panel OSD buttons can be used to adjust settings

4.2.2.4 About Page

The About Page displays contact information. The smartOSD logo links to the IEI website.

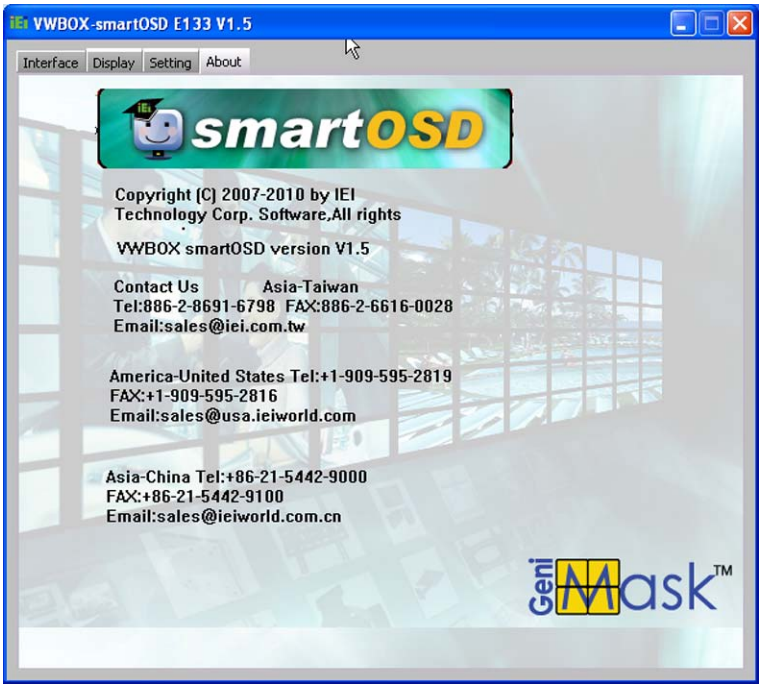


Figure 4-4: smartOSD About Page

4.2.3 Install Software

To install the software, please follow the steps below:

Step 1: Follow the instructions from the interactive installer to install the IEI smartOSD on the system.

Step 2: Insert the installation disk that came with the system and open the installation file.

Step 3: The welcome screen shown below appears.

Figure 4-5: smartOSD Setup Wizard

Step 4: Click **Next** to continue.

Step 5: The screen below appears.

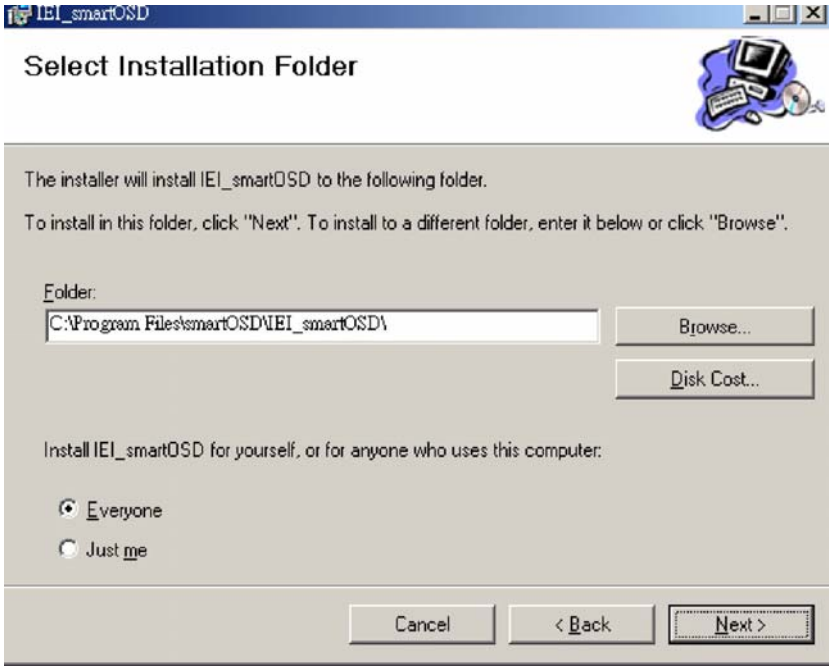


Figure 4-6: smartOSD Select Installation Folder

Step 6: Select the installation folder from the screen shown above.

Step 7: Click **Next** to continue.

Step 8: The screen shown below appears.

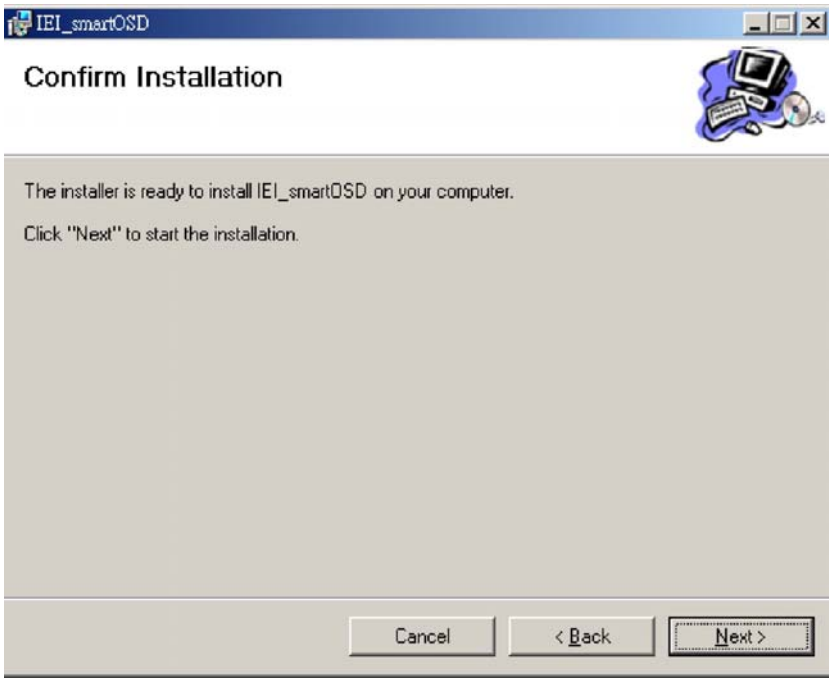


Figure 4-7: smartOSD Confirm Installation

Step 9: Confirm the installation by clicking **Next** in the screen above.

Step 10: The program starts to install and the progress bar shown below appears.

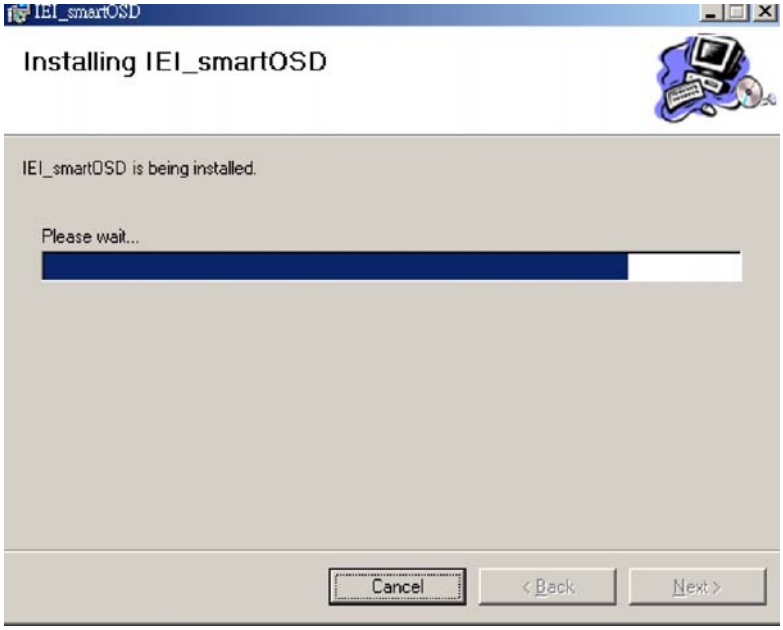


Figure 4-8: smartOSD Installing

Step 11: When the installation is complete the screen below appears.

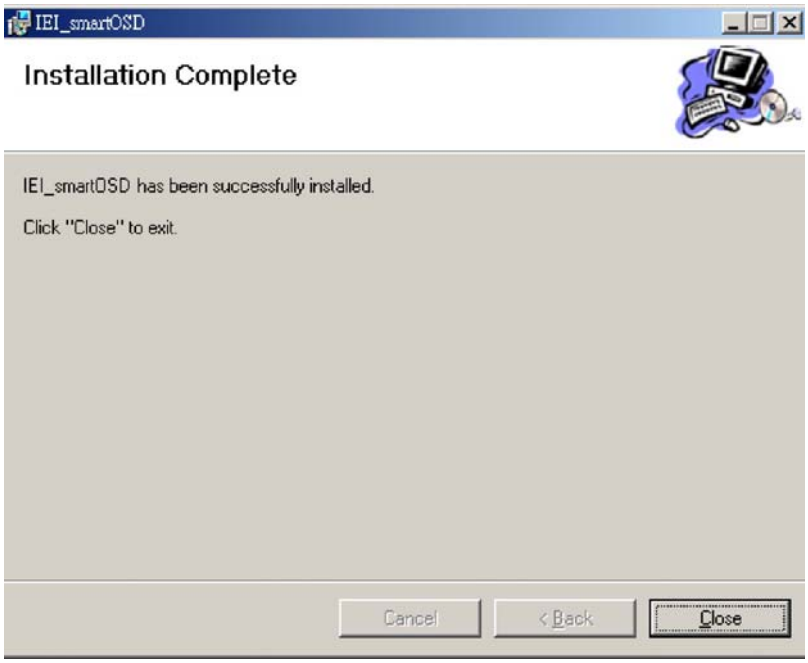


Figure 4-9: smartOSD Installation Complete

Step 12: Click **Close** in the screen above.

Step 13: After quick setup is complete, the IEI smartOSD wizard logo appears on the desktop as shown in the screen below.

Step 14: To access the smartOSD, click the smartOSD wizard logo on the desktop.

4.2.4 Troubleshooting

For troubleshooting, please see the steps below:

4.2.4.1 Windows 2000 Installation Failure

Installation fails under Windows 2000 and shows the following image:

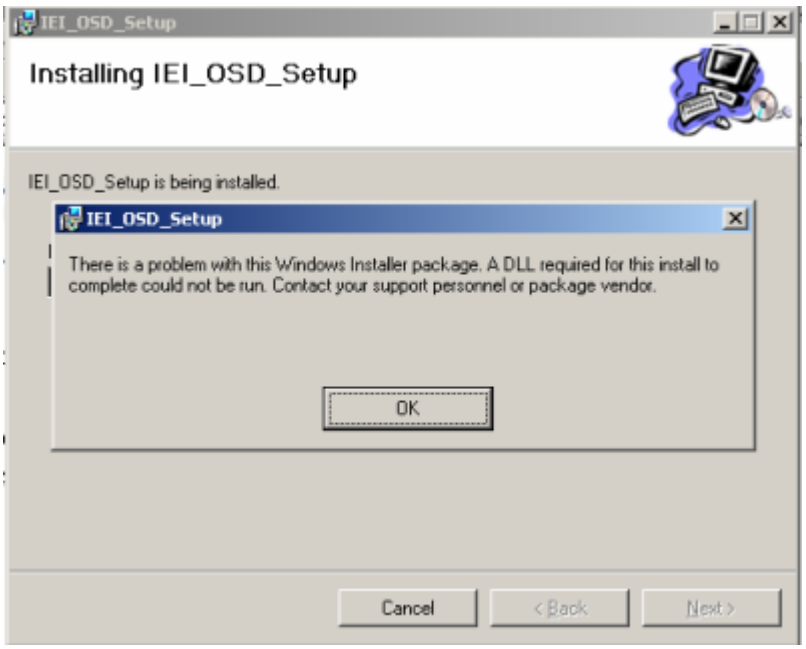


Figure 4-10: DLL Missing

Solution: Download and install service pack Windows Installer 3.1

4.2.4.2 Vista Installation Failure

Installation fails under Vista while showing following image:

Figure 4-11: Windows Vista Error

Solution: Install smartOSD.exe as the administrator authority

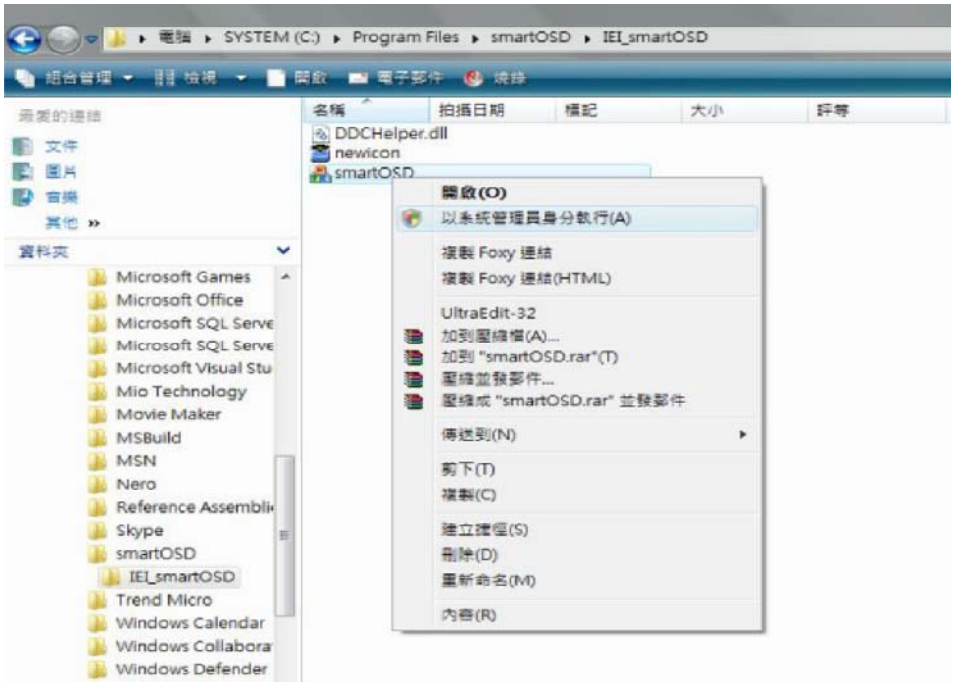


Figure 4-12: Install as Administrator

4.3 Using the OSD

The OSD menu functions are described below.

4.3.1 OSD Buttons

There are several on-screen-display (OSD) control buttons oriented either vertically on the right side of the monitor front panel or on the bottom of the monitor front panel. **Figure 4-13** shows a typical arrangement of OSD controls.

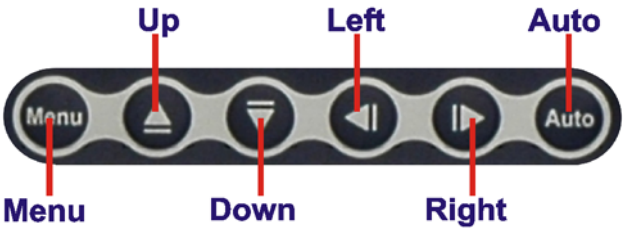


Figure 4-13: OSD Buttons

- **Power**. Turns the video box on and off.
- **Menu/Enter**. Enters the OSD, selects items and sets the new values entered.
- **Left**. Moves the selection left.
- **Right**. Moves the selection right.
- **Up**. Moves the selection up.
- **Down**. Moves the selection down.
- **Auto/Exit**. Exits from any menu.

4.3.2 OSD Lock

The OSD front panel buttons can be locked using the OSD lock function. To turn the OSD lock on and off, follow the steps below. (The OSD can also be locked using the smartOSD).

Step 1: Push the "**Right**" and "**Auto/Exit**" buttons simultaneously for a few seconds.

Step 2: The OSD display shows the current status as locked or unlocked.

4.3.3 Menu Structure

The table below shows the OSD menu structure.

Menu	Options / Submenu	Options	
Display	Output		
	Display Mode		
	Mask ->	Horizontal Mask	
		Vertical Mask	
		Mask On/Off	
Setting	Factory		
	Information		
	Input ->	DVI	
		Component	
	Miscellaneous ->	OSD ->	OSD Timer
			OSD Rotation
	Identify		

Table 4-2: OSD Menu Structure

4.3.4 Display Menu

Image menu options are shown in **Figure 4-14** and described below.

Figure 4-14: Display Menu

➔ **Display Resolution**

The Display Resolution setting shows the resolution of the video image output. Display output setting options are shown below.

- 1024 x 768 @ 60 MHz
- 1360 x 768 @ 60 MHz
- 1280 x 1024 @ 60 MHz
- 1400 x 1050 @ 60 MHz
- 1680 x 1050 @ 60 MHz
- 1600 x 1200 @ 60 MHz
- 1920 x 1200 @ 60 MHz
- 1366 x 768 @ 60 MHz
- 1920 x 1080 @ 60 MHz

➔ **Display Mode**

The display mode option configures how the image is displayed on the screen.

➔ **1 x 1**	**DEFAULT**	The video input is cloned on all the monitors
➔ **2 x 2**		The video input is tiled over all the panels.
➔ **2 x 3**		The video input is split across a six-panel array in a 2 x 3 setup
➔ **3 x 2**		The video input is split across a six-panel array in a 3 x 2 setup
➔ **3 x 3**		The video input is split across a nine-panel array in a 3 x 3 setup

➔ **Mask Control**

The Mask control compensates for the gaps between monitors in the video wall array. These settings are shown in **4.3.4.1**.

4.3.4.1 Mask Control

The mask control menu adjusts the mask settings. The mask settings compensate for the gaps between monitors in the video wall array. The mask control options are shown and described below.

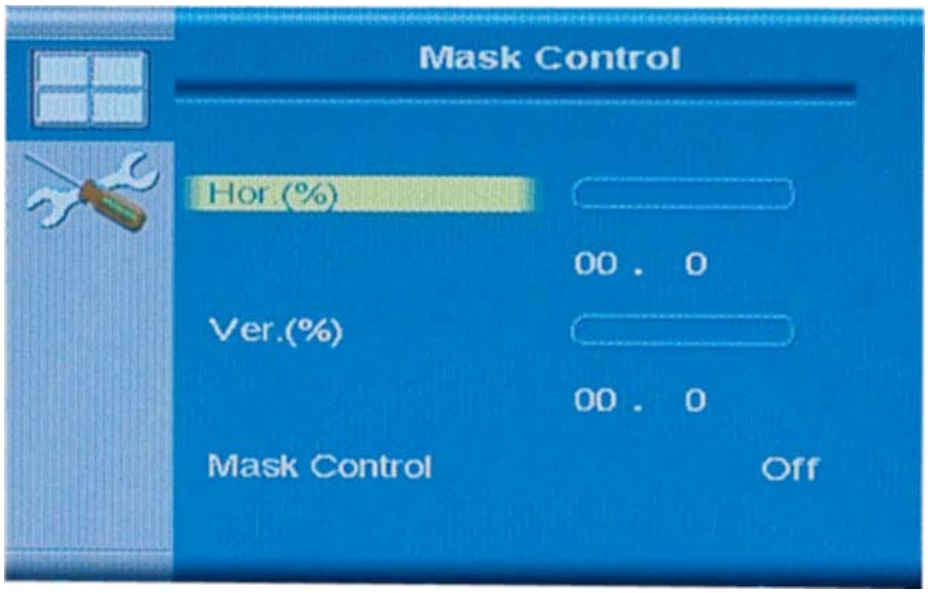


Figure 4-15: Mask Control

➔ **Horizontal Mask**

Set the horizontal mask according to the formula in **Figure 4-16.**

➔ **Vertical Mask**

Set the vertical mask according to the formula in **Figure 4-16.**

Figure 4-16: Mask Formula

➔ **Mask Control**

The mask control option turns the mask control on and off.

➔ **Off** **DEFAULT** The video box doesn't compensate for the gap between monitors

➔ **On** The video box compensates for the gap between monitors

4.3.5 System Menu

System menu options are shown in **Figure 4-17** and described in the subsections below.

Figure 4-17: Display Menu

➔ **Factory Reset**

Factory reset returns all the settings to the factory default settings.

➔ **Information**

Shows video box version information. The information details are shown in **4.3.5.1**.

➔ **Input Select**

Input select allows selection of the input source. Input selection is shown in **4.3.5.2**.

➔ **Misc**

Misc allows other OSD features to be adjusted. Misc options are shown in **4.3.5.3**.

➔ **Identify Monitors**

Identify monitors displays the monitor's ID within the monitor array.

4.3.5.1 Information

The information screen in **Figure 4-18** shows some basic information about the video box and the monitor. The details are described below.

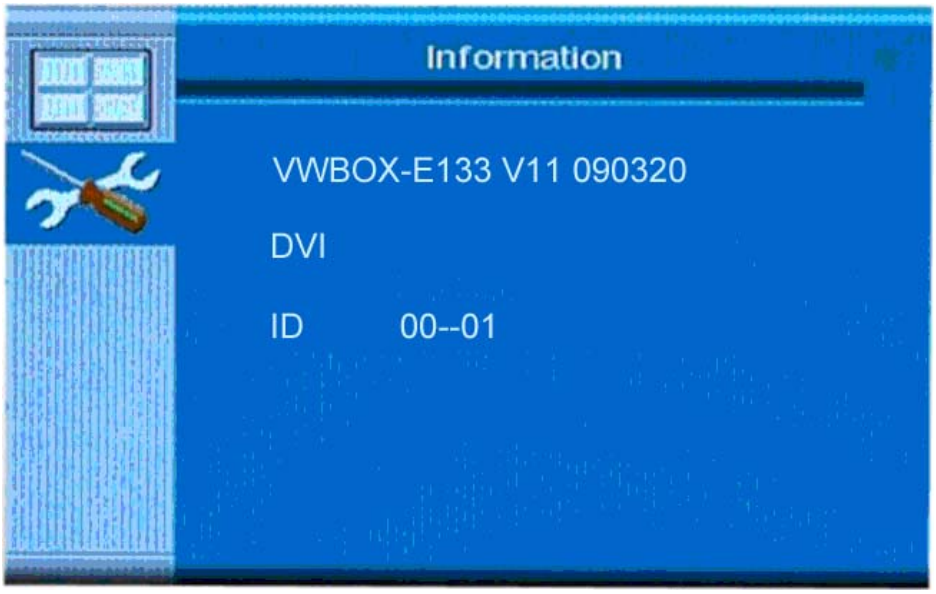


Figure 4-18: Information Screen

- Model name, firmware version and date
- Input type
- Video box ID (identifies the current video box in a larger array of video boxes)

4.3.5.2 Input Select

The input select screen in **Figure 4-19** shows the input options.

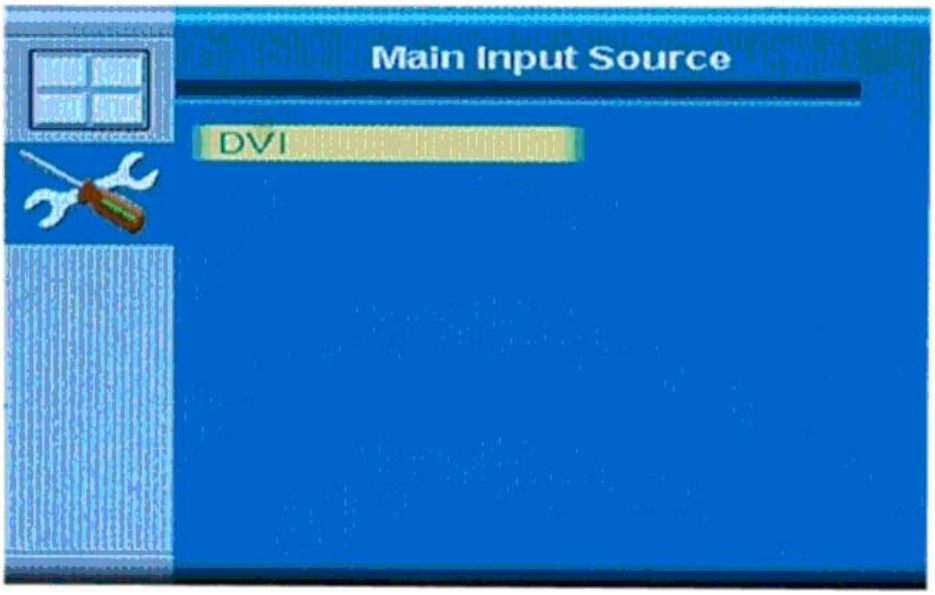


Figure 4-19: Input Select

The video box automatically selects the correct input source setting. The following options are available.

- DVI

4.3.5.3 Miscellaneous

The miscellaneous menu (**Figure 4-20**) allows the option to go to the OSD setup menu.

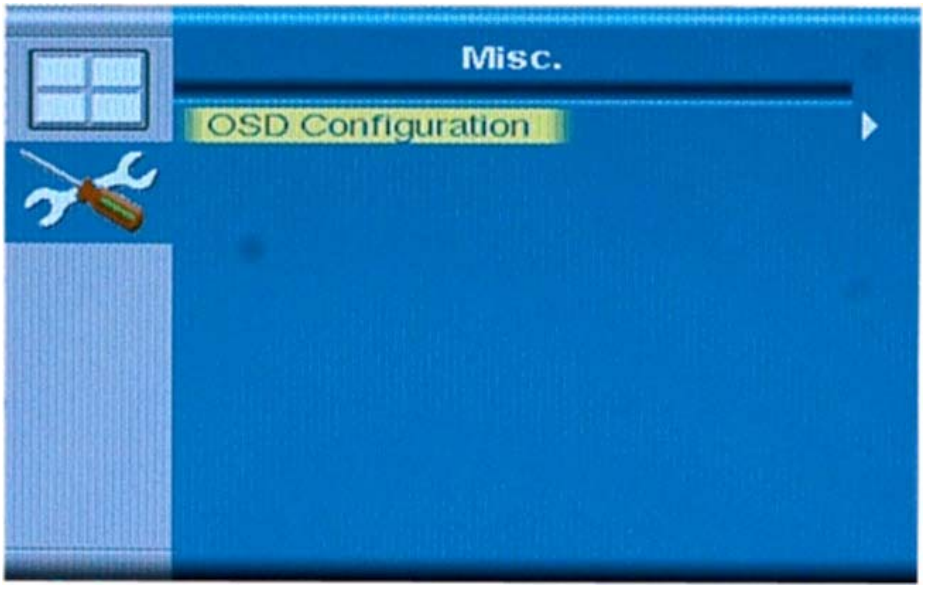


Figure 4-20: Input Select

➔ **OSD Configuration**

OSD configuration adjusts the display settings for the OSD display. OSD configuration settings are shown in **4.3.5.3.1**.

4.3.5.3.1 OSD Configuration

The OSD configuration menu (**Figure 4-21**) adjusts the rotation of the OSD, and how long it displays for.

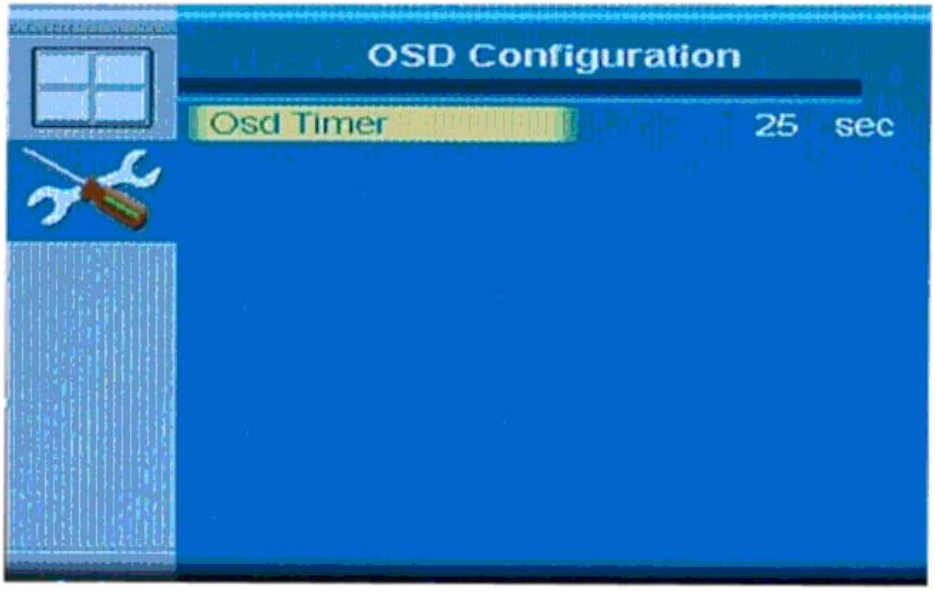


Figure 4-21: Input Select

➔ **OSD Timer**

The OSD Timer sets how long the OSD screen stays on after the last button press.

4.4 Remote Control

The VWBOX-E133 comes with a remote control for easy configuration of OSD settings. **Figure 4-22** shows the remote control and its function keys.

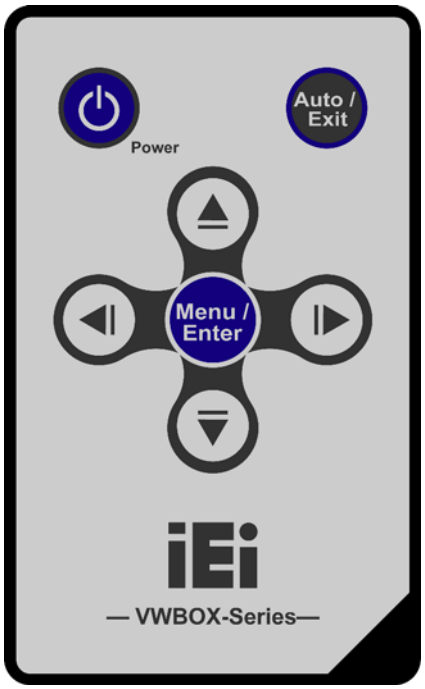


Figure 4-22: Remote Control

- **Power**. Turns the video box on and off.
- **Menu/Enter**. Enters the OSD, selects items and sets the new values entered.
- **Left**. Moves the selection left.
- **Right**. Moves the selection right.
- **Up**. Moves the selection up.
- **Down**. Moves the selection down.
- **Auto/Exit**. Exits from any menu.

Chapter

5

Firmware Upgrades

5.1 Hardware and Software Requirements

Description	Image
Windows 2000/XP	
RS-232 cable	
GProbe 5	

Table 5-1: Upgrade Requirements

5.2 Software Setup

Step 1: Install GProbe using the installation wizard.

Figure 5–1: Genesis GProbe 5 Setup Wizard

Step 2: Copy the Genesis folder to a local drive (these instructions use C: for simplicity)

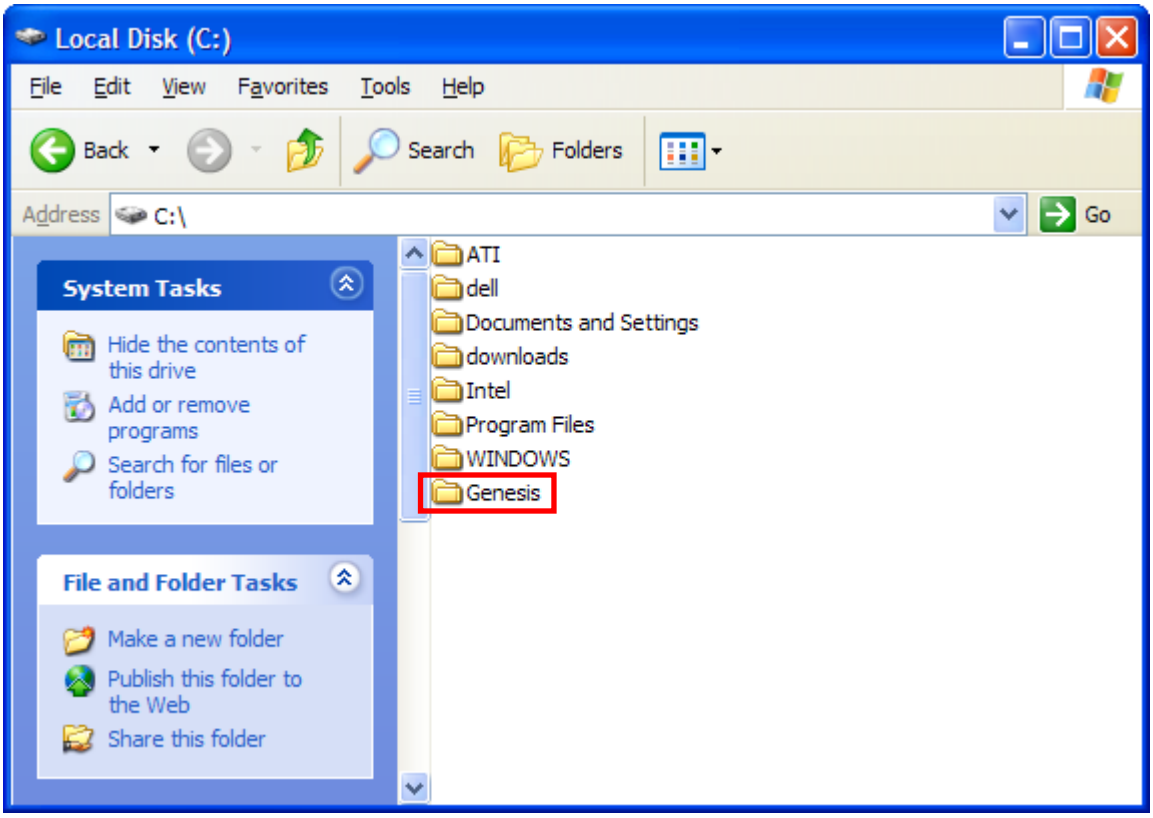


Figure 5–2: Genesis Directory

Step 3: The firmware file is C:\Genesis\D301_V17.bin

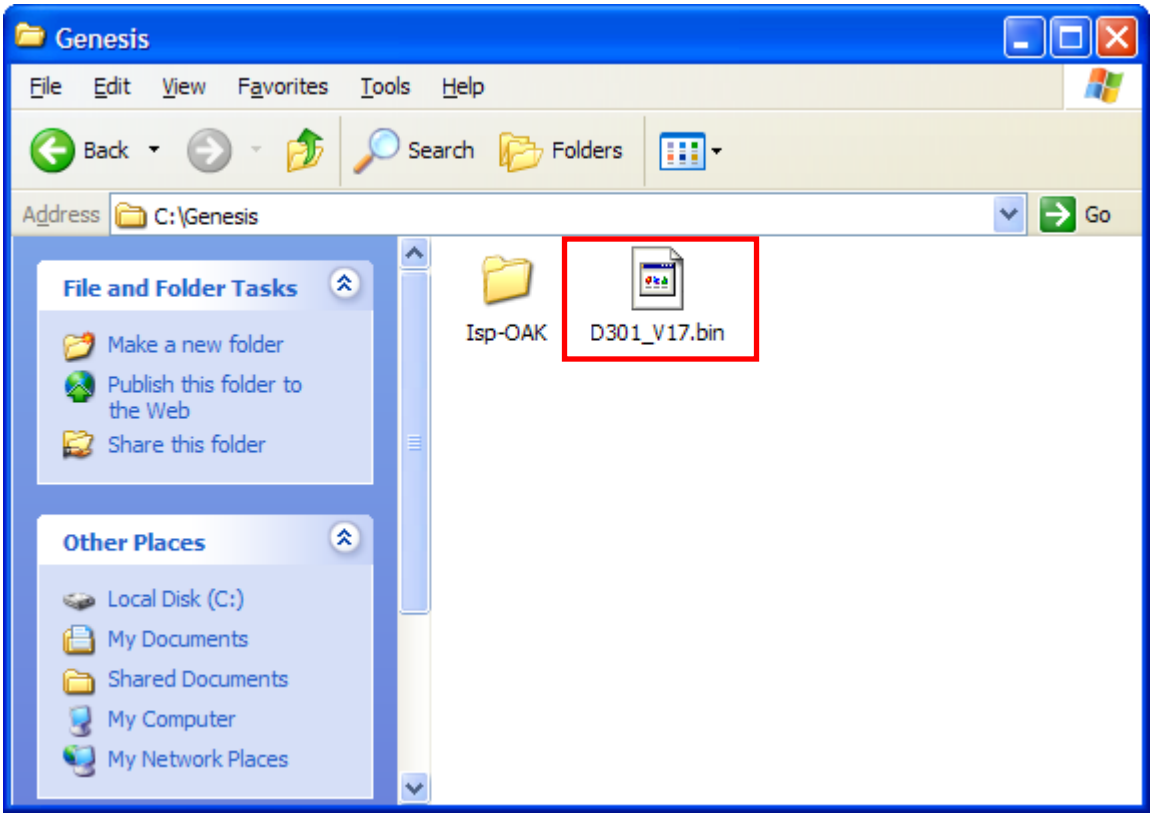


Figure 5–3: Binary File

Step 4: Change the flashing settings by editing C:\Genesis\Isp-OAK\spi_flash_5962.txt in Notepad.

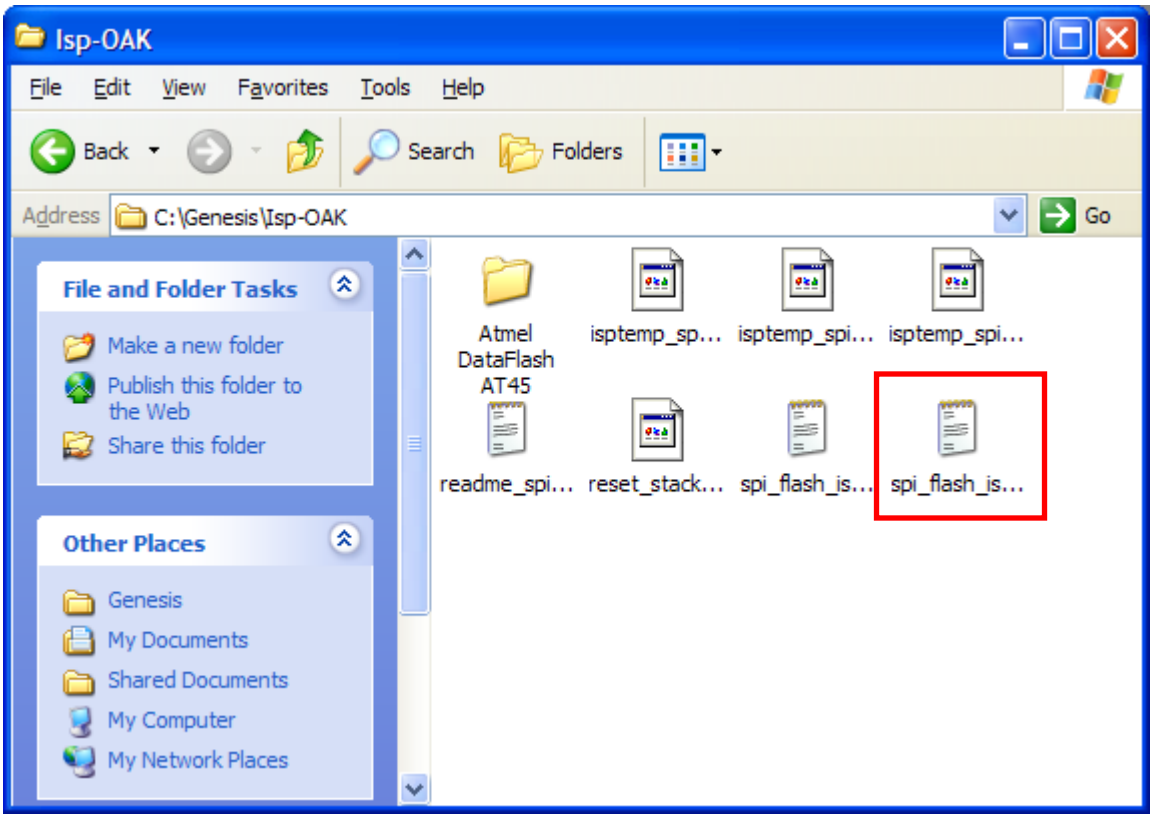


Figure 5–4: Flash Setup File

Step 5: Insert the directory and name of the flash file in the space indicated below. Add "0x20000" to the end of the same line.

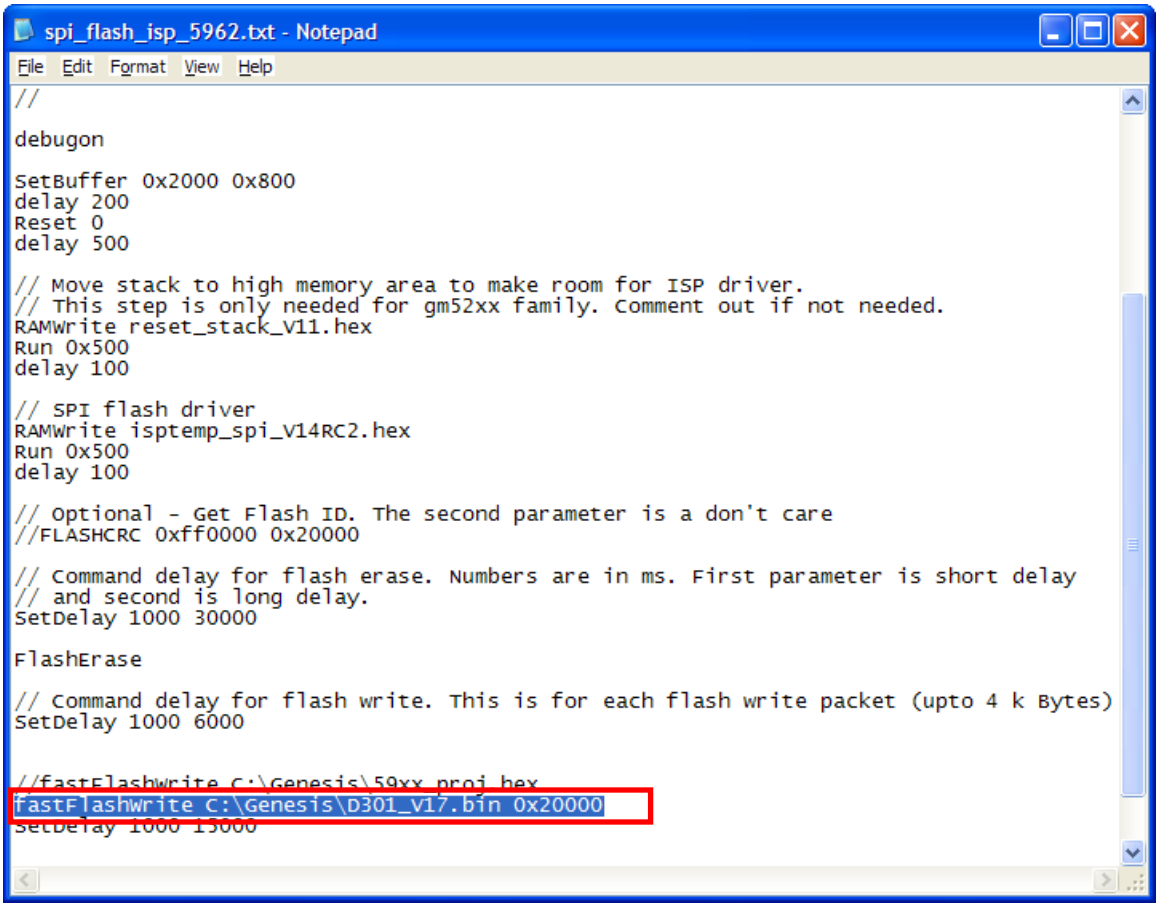


Figure 5–5: Flash Setup Line

5.3 Connection Setup

Step 1: Open GProbe. Click "Options >> Connection Setup" (or just press F10).

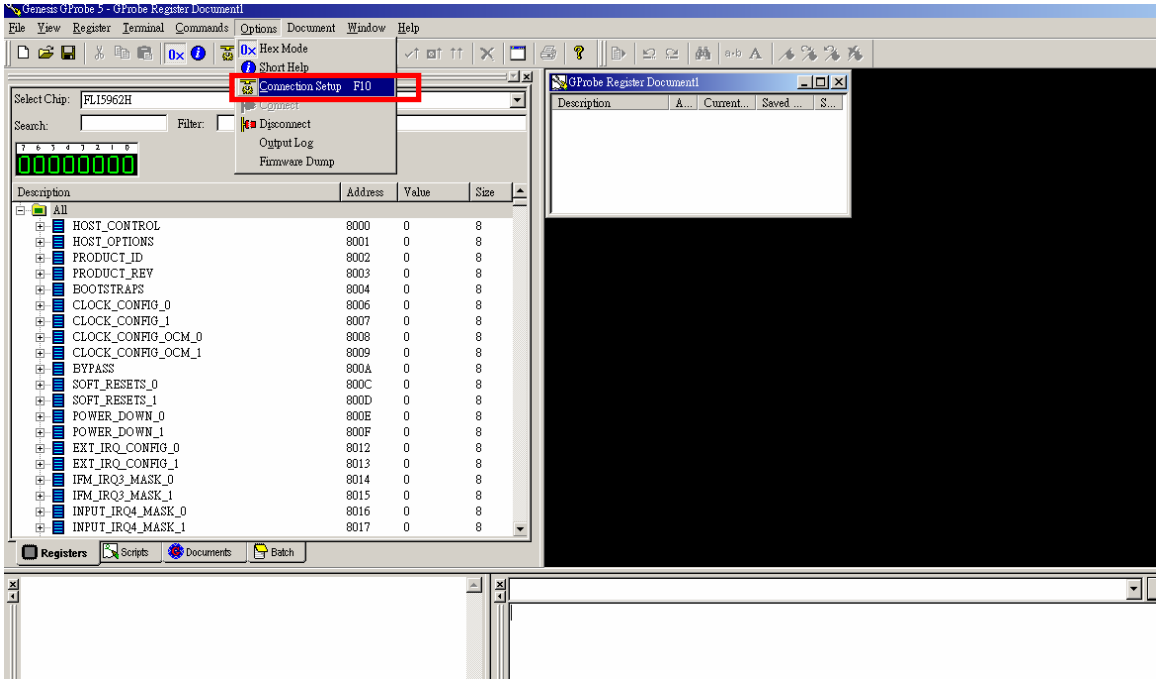


Figure 5–6: Flash Connection Settings

Step 2: Select the "Connection" tab. Set the device to "Serial" and protocol to "SERIAL1". Click OK.

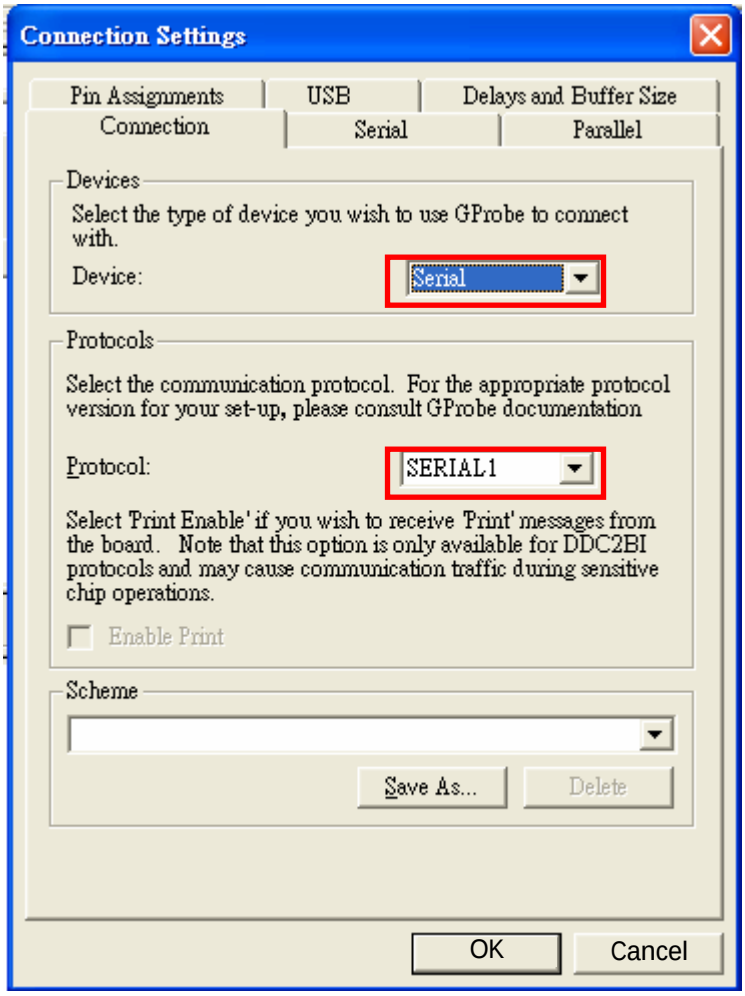


Figure 5–7: Connection Settings - Connection

Step 3: Select the "Serial" tab. Set Port to COM1 and Baud Rate to 115200. Click OK.

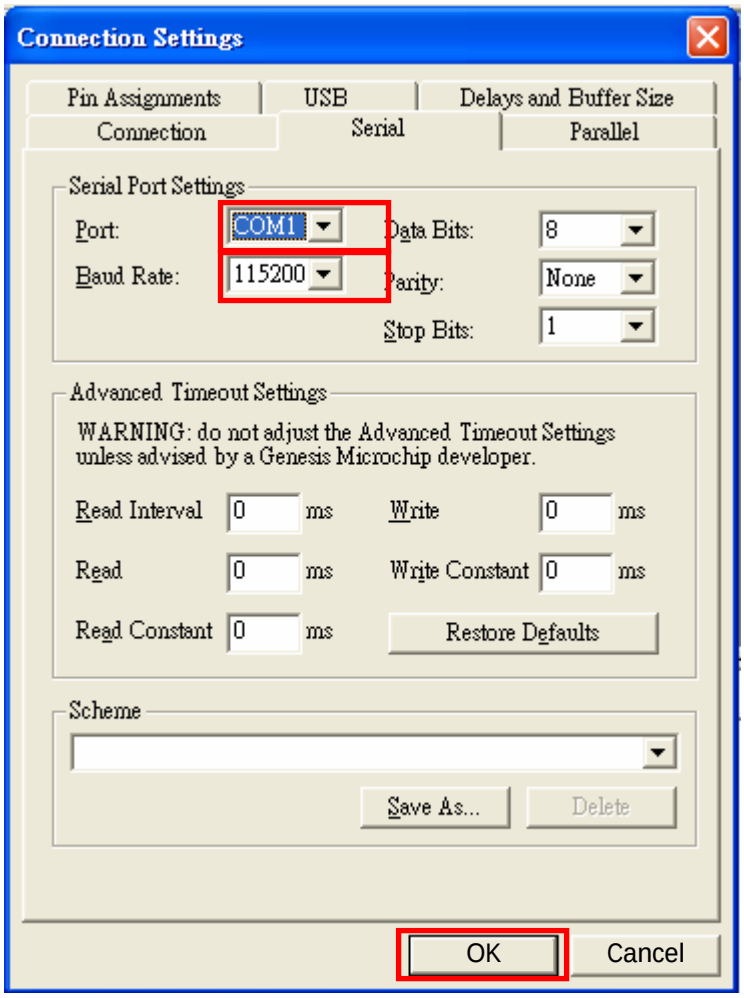


Figure 5–8: Connection Settings - Serial

Step 4: Connect one end of the serial cable to the serial port on the video box and the other end to the serial port on the computer.

Step 5: Connect the power cable.

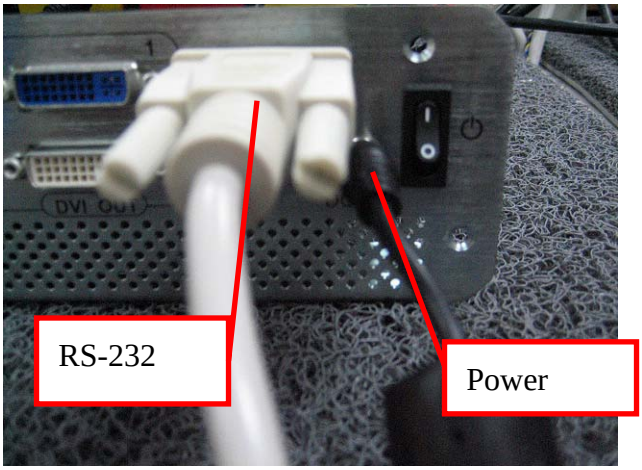


Figure 5–9: Serial and Power Setup

Step 6: If the connection is successful a message will appear in the message window.

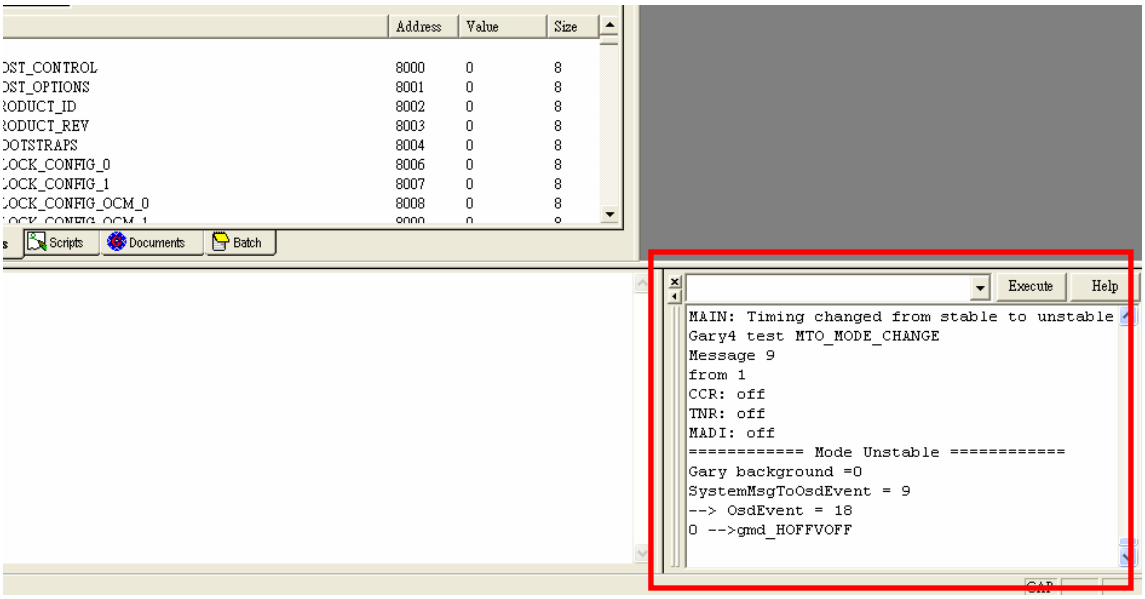


Figure 5–10: Flash Messages

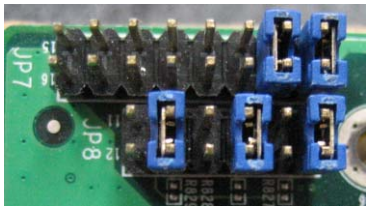
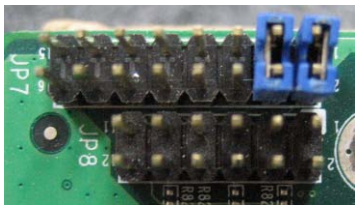
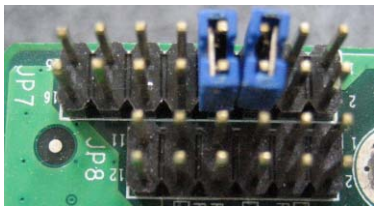
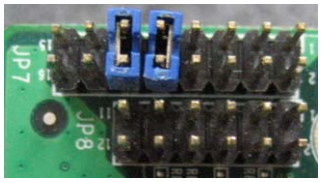
5.4 Flash New Firmware (Repeat for all 9 ports)

NOTE:

There is one video chip per video channel. All video chips must be flashed separately.

This section describes flashing new firmware onto each of the chips on the video box. Each video chip (one per video output) must be flashed separately. Follow these steps for each of the video chips.

Step 1: Set the jumpers according to the table below:

Setting	JP8	JP7	Picture
Default	1-2, 5-6, 9-10	1-2, 3-4	
Flash port 1	Open	1-2, 3-4	
Flash port 2	Open	5-6, 7-8	
Flash port 3	Open	9-10, 11-12	

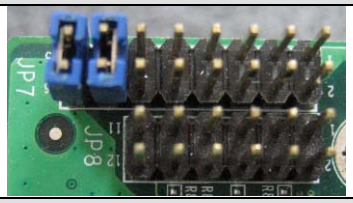
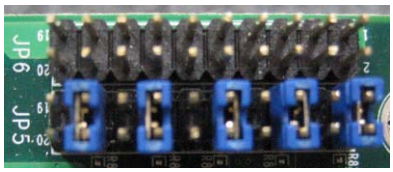
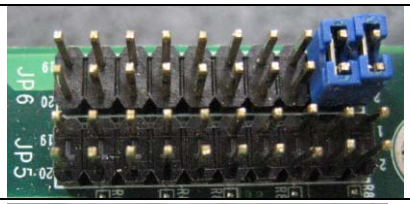
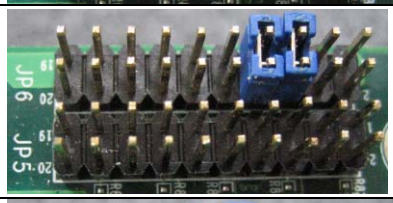
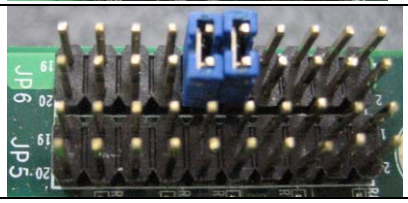
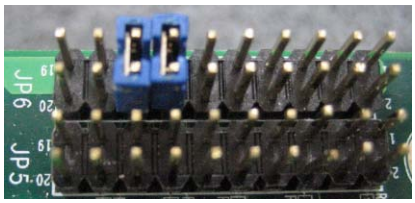
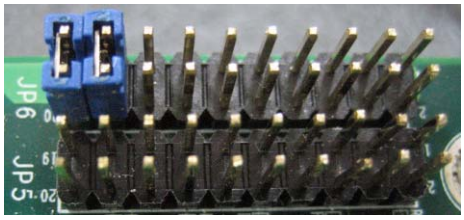
Setting	JP8	JP7	Picture
Flash port 4	Open	13-14, 15-16	
Setting	**JP5**	**JP6**	Picture
Default	1-2, 5-6, 9-10, 13-14, 17-18	Open	
Flash port 5	Open	1-2, 3-4	
Flash port 6	Open	5-6, 7-8	
Flash port 7	Open	9-10, 11-12	
Flash port 8	Open	13-14, 15-16	
Flash port 9	Open	17-18, 19-20	

Table 5-2: Upgrade Requirements

Step 2: Enter "C:\Genesis\isp-oak\spi_flash_isp_5962.txt" in the space indicated, then click Execute.

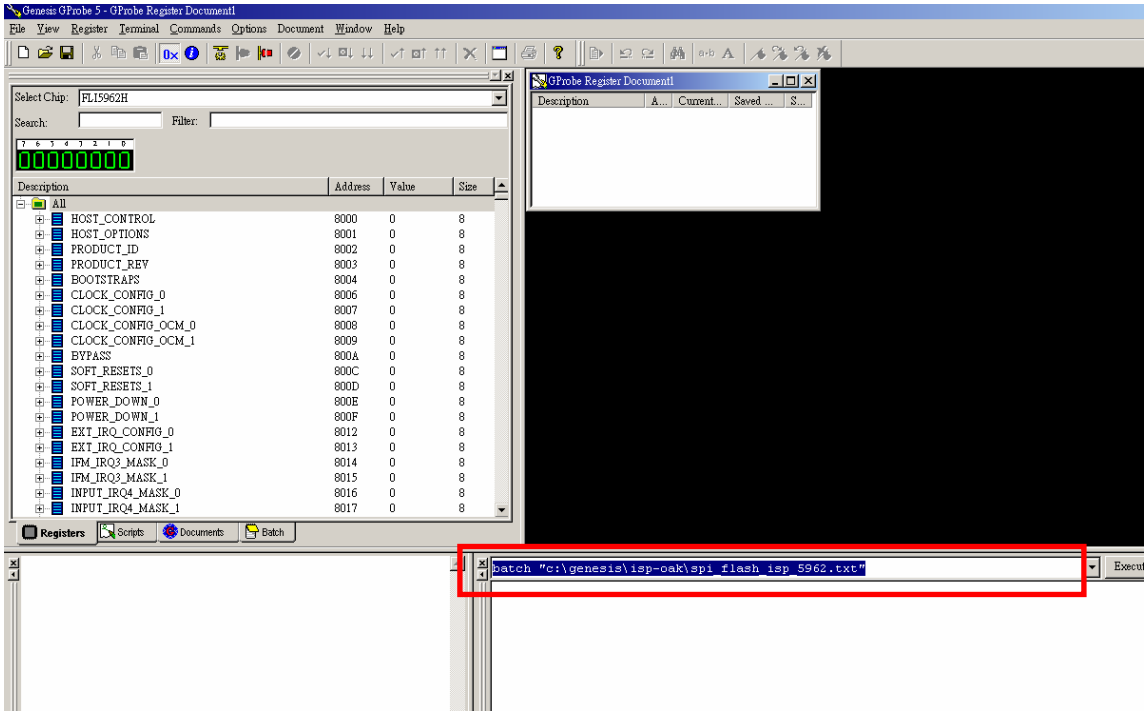


Figure 5–11: Flash Burning Command

The message window shows the following:

```
DebugOn: Command Successful.
SetBuffer: Command Successful.
Delay: Command Successful.
Reset: Command Successful.
Delay: Command Successful.
RAMWrite: Command Successful.
Run: Command Successful.
Delay: Command Successful.
RAMWrite: Command Successful.
Run: Command Successful.
Delay: Command Successful.
SetDelay: Command Successful.
Erasing FLASH... Done.
SetDelay: Command Successful.
Writing FLASH... Done.
SetDelay: Command Successful.
Execution time: 69.08s
Batch: Command Successful.
```

Step 3: Repeat for next video port.

5.5 Confirm Upgrade

Step 1: Put the jumpers back in their default positions.

Step 2: Restart the video box.

Step 3: Check the new settings using the OSD.

Step 4: Under the "Identify Monitors" setting, check that each monitor shows V17.

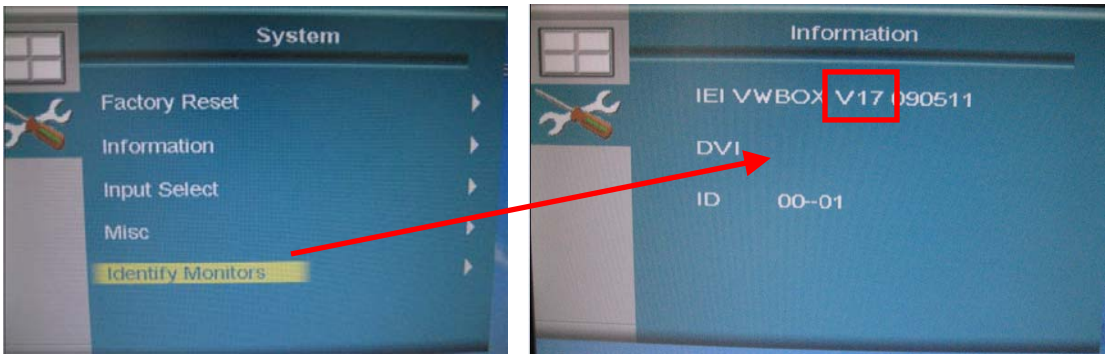


Figure 5–12: OSD Version Check

Chapter

6

Troubleshooting and Maintenance

WARNING:

Take Anti-Static precautions whenever maintenance is being carried out on the embedded system components. Failure to take anti-static precautions can cause permanent embedded system damage.

6.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the VWBOX-E133 may result in permanent damage to the VWBOX-E133 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including theVWBOX-E133. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the VWBOX-E133 or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board or opening the embedded system, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring theVWBOX-E133, place it on an antic-static pad. This reduces the possibility of ESD damaging theVWBOX-E133.
- ***Only handle the edges of the PCB***: When handling the PCB, hold the PCB by the edges.

6.2 Maintenance Overview

NOTE:

There are no user-serviceable parts inside. Make sure to carefully follow all the instructions in this section to diagnose any problems. If the problem persists, email sales@iei.com.tw for help from an IEI sales representative

To preserve the working integrity of the VWBOX-E133 embedded system, the embedded system must be properly maintained. If embedded system components need replacement, the proper maintenance procedures must be followed to ensure the embedded system can continue to operate normally.

6.3 Troubleshooting

This section provides some simple troubleshooting suggestions.

6.3.1 No Image on One Monitor

If there is no image on one monitor, follow these steps to remedy the problem.

6.3.1.1 Check Monitor Power

Step 1: Check that the monitor is turned on.

Step 2: Check that the power source for the monitor is turned on.

Step 3: Check that the power source has the correct power rating (check panel specifications for details).

Step 4: Make sure the LCD panel power cables are securely fastened to the monitor and to the power source.

6.3.1.2 Check Panel Video Connection

Check to see that the video cable is fitted correctly.

Step 1: Check that the monitor is connected to the VWBOX-E133.

Step 2: Securely attach the video cable to the panel and to the VWBOX-E133.

Step 3: Fasten the video cable at both ends and tighten the video cable screws.

6.3.2 No Image Two or Three Monitors

If there is no image on more than one of the panels, then repeat the steps in **Section 6.3.1** for all of the monitors in the array.

6.3.3 No Image on Any Monitor

If no image displays on any monitors, repeat the steps in **Section 6.3.1** for all the monitors in the array, then try the following additional steps.

6.3.3.1 Check Video Box Power

Make sure that the video box is powered on.

Step 1: Check the power supply is connected to the power source.

Step 2: Check that the VWBOX-E133 is connected to the power supply.

6.3.3.2 Check Source Video Connection

Check to that the source video cable is securely connected to the VWBOX-E133.

Step 1: Securely attach the video cable from the video source to the VWBOX-E133.

Step 2: Fasten the video cable at both ends and tighten the video cable screws.

Appendix

A

RS-232 Setup

A.1 Setup

The serial port is used to remotely set and get the settings from the VWBOX-E133. The serial port is used by user applications to change the settings of the VWBOX-E133 through a software interface. The serial port should be setup as indicated in **Table 6-1**

Description	Setting
Baud rate	115200
Parity	Non-parity
Data bit	8
Stop bit	1
Flow control	None

Table 6-1: RS-232 Setup

A.2 Packet Format

The generalized format of a single data packet on the RS-232 communications port is shown in **Table 6-2**. The specific setup details for all the commands are shown in the next section.

Byte	Function
[1]	The number of bytes in the signal
[2]	This byte indicates the command to perform
[3]-[n-1]*	These bytes contain the data needed for the command
[n]*	Checksum byte

Table 6-2: n-Byte Data Output Format

* n indicates the number of bytes (length) of the data packet. This value depends on the command that is being used.

A.3 Command Reference

This section details the commands that can be sent over the RS-232 communications port.

The following commands are detailed:

- Get display status 83
- Get factory defaults 84
- Set mask control 85
- Set display mode 86
- Set display resolution 86
- Set input source 87
- Set power control 87
- Set to default 88
- Set OSD mode 88

A.3.1 Get Display Status

Byte	Value
[1]	0x08
[2]	0x03
[3]	Output resolution: 0 – 1024 x 768 1 – 1360 x 768 2 – 1280 x 1024 3 – 1400 x 1500 4 – 1680 x 1050 5 – 1600 x 1200 6 – 1920 x 1200 7 – 1366 x 768 8 – 1920 x 1080
[4]	Output display mode 0 – 1 x 1 mode 1 – 2 x 2 mode 2 – 2 x 3 mode 3 – 3 x 2 mode 4 – 3 x 3 mode
[5]	Mask control 0 – Off 1 – On
[6]	Horizontal mask percent 0 – 10%
[7]	Vertical mask percent 0 – 10%
[8]	Checksum 0xff-([1]+[2]+[3]+[4]+[5]+[6]+[7]+[9])

Table 6-3: Get Display Status

A.3.2 Get Factory Defaults

Byte	Value
[1]	0x09
[2]	0x04
[3]	Input source 2 - DVI
[4]	Power 0 – Power off 1 – Power on
[5]	OSD lock/unlock 0: OSD unlock 1: OSD lock
[9]	Checksum 0xff-([1]+[2]+[3]+[4]+[5]+[6]+[7]+[8]+[9])

Table 6-4: Get Factory Defaults

A.3.3 Set Mask Control

Byte	Value
[1]	0x07
[2]	0x18
[3]	Display mode 0 – 1 x 1 mode 1 – 2 x 2 mode 2 – 2 x 3 mode 3 – 3 x 2 mode 4 – 3 x 3 mode
[4]	Horizontal mask percent 0 – 10%
[5]	Vertical mask percent 0 – 10%
[6]	Mask control 0 – Off 1 – On
[7]	0xff-([1]+[2]+[3]+[4]+[5]+[6])

Table 6-5: Set Mask Control

A.3.4 Set Display Mode

Byte	Value
[1]	0x04
[2]	0x19
[3]	Display mode 0 – 1 x 1 mode 1 – 2 x 2 mode 2 – 2 x 3 mode 3 – 3 x 2 mode 4 – 3 x 3 mode
[4]	0xff-([1]+[2]+[3])

Table 6-6: Set Display Mode

A.3.5 Set Display Resolution

Byte	Value
[1]	0x04
[2]	0x1A
[3]	Output resolution 0 – 1024 x 768 1 – 1360 x 768 2 – 1280 x 1024 3 – 1400 x 1500 4 – 1680 x 1050 5 – 1600 x 1200 6 – 1920 x 1200 7 – 1366 x 768 8 – 1920 x 1080
[4]	0xff-([1]+[2]+[3])

Table 6-7: Set Display Resolution

A.3.6 Set Input Source

Byte	Value
[1]	0x04
[2]	0x1B
[3]	Input source 2 - DVI
[4]	0xff-([1]+[2]+[3])

Table 6-8: Set Input Source

A.3.7 Set Power Control

Byte	Value
[1]	0x04
[2]	0x1C
[3]	Power control 0 – power off 1 – power on
[4]	0xff-([1]+[2]+[3])

Table 6-9: Set Power Control

A.3.8 Set to Default

Byte	Value
[1]	0x04
[2]	0x01
[3]	Defaults 0 – auto adjust 1 – factory defaults
[4]	0xff-([1]+[2]+[3])

Table 6-10: Set to Default

A.3.9 Set OSD Mode

Byte	Value
[1]	0x04
[2]	0x02
[3]	OSD Mode 0 – OSD unlock 1 – OSD lock 4 – OSD ID information
[4]	0xff-([1]+[2]+[3]+[4])

Table 6-11: Set OSD Mode

Appendix

B

DDC2BI Setup

B.1 Introduction

The DDC2BI setup is for reading and setting the video box options through a DVI cable connected to the VWBOX-E133 from the video source.

B.2 Command Reference

The digital I/O port is for external machines to read and write settings to the VWBOX-E133.

Code	VCP Code Names	Type	Description
B0h	Display Resolution	Read/Write	0 – 1024x768 1 – 1360x768 2 – 128x1024 3 – 1400x1050 4 – 1680x1050 5 – 1600x1200 6 – 1920x1200 7 – 1366 x 768 8 – 1920 x 1080
B1h	Display Mode	Read/Write	0 – 1x1 1 – 2x2 2 – 2x3 3 – 3x2 4 – 3x3
B2h	Mask Mode	Read/Write	H percent – high byte V percent – low byte Mask control (bit 8) 0 – off 1 – on
ECh	Auto Adjust	Write only	1 – automatically adjust the settings
D6h	Power Mode	Read/Write	0 – Power On 1 – Power Off

Code	VCP Code Names	Type	Description
60h	Video Source	Read/Write	2 – DVI
14h	Factory reset	Write only	1 – reset to factory defaults
FCh	OSD Mode	Read/Write	0 – OSD Unlock 1 – OSD Lock 2 – OSD Normal
F8h	Get Model ID	Read only	word: Model ID Ox801:E133

Table 6-12: Set Power Control

Appendix

C

Terminology

COM	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male DB-9 connector.
DIO	The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.
DVI	The Digital Video Interface standard allows analog and digital video transmission
GPIO	General purpose input/output
LCD	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.
LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.

Appendix

D

Hazardous Materials Disclosure

D.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。