

MX-2000A

Dual-View Video Processor with Audio Path

User Manual



rev: 120518
Made in Taiwan



Safety and Notice

The **MX-2000A Dual-View Video Processor with Audio Path** has been tested for conformity to safety regulations and requirements, and has been certified for international use. However, like all electronic equipments, the **MX-2000A** should be used with care. Please read and follow the safety instructions to protect yourself from possible injury and to minimize the risk of damage to the unit.

- Follow all instructions and warnings marked on this unit.
- Do not attempt to service this unit yourself, except where explained in this manual.
- Provide proper ventilation and air circulation and do not use near water.
- Keep objects that might damage the device and assure that the placement of this unit is on a stable surface.
- Use only the power adapter and power cords and connection cables designed for this unit.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.



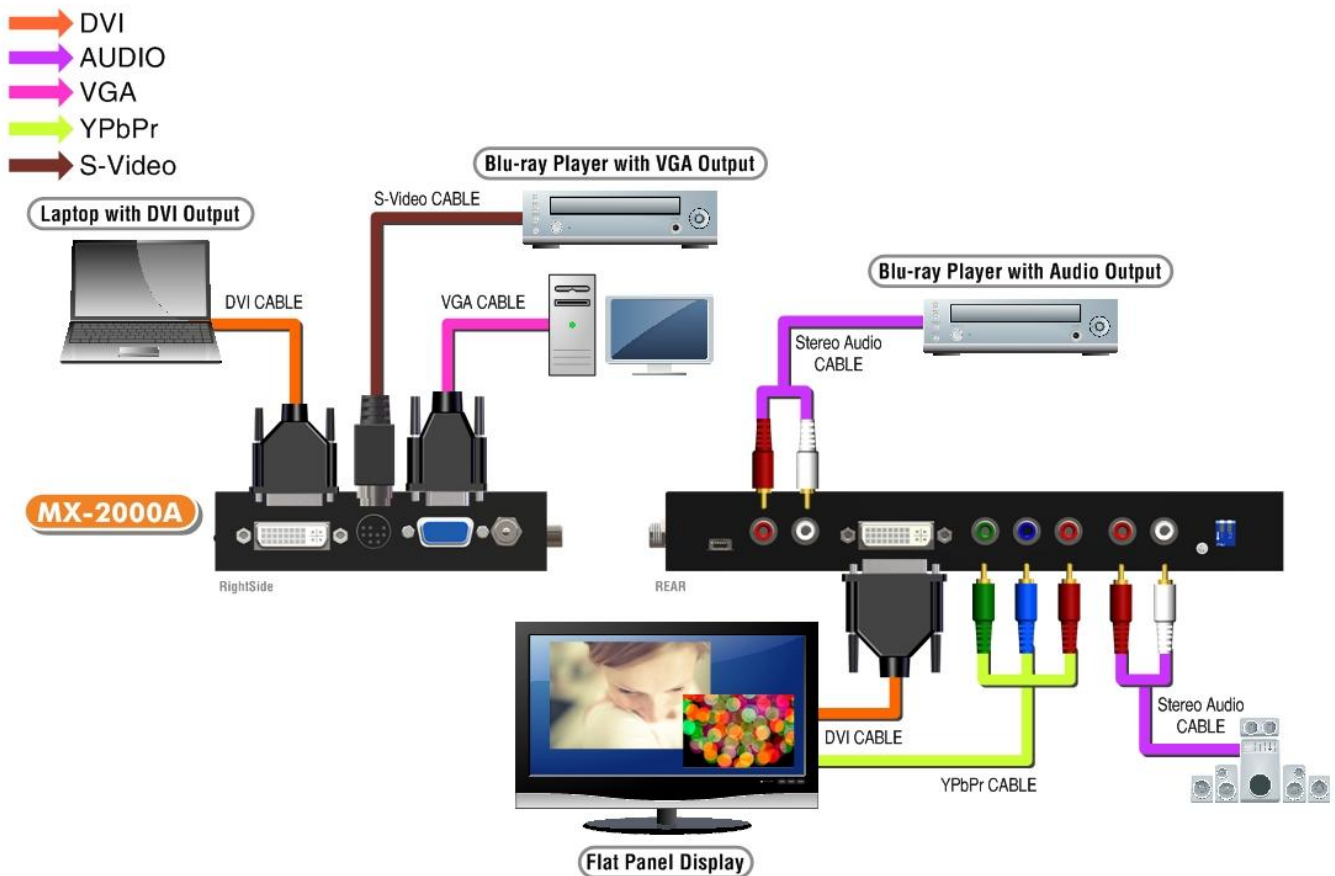
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INTRODUCTION

The **MX-2000A Dual-View Video Processor with Audio Path** is an advanced video processor for multimedia presentations. It is an ideal solution for applications where two video signals must be displayed on a single display. It supports up to four video inputs, of which two can be outputted simultaneously in Picture-In-Picture (PIP) or Picture-Aside-Picture (PAP) modes. The MX-2000A allows you to manipulate output images, wherever position and whatever sizes you want for viewing two computers or two video signals or a combination. Despite the advanced video features, MX-2000A also equips audio processor allowing users to do analog switching and convert analog stereo into HDMI streams.

The embedded scaler converts signals from input sources to match the native resolution of monitors, flat panel displays, projectors as well as user-selectable output settings up to WUXGA (1920x1200). Dual outputs are provided in both analog (VGA) and digital (HDMI/DVI) format, one is connected to remote display and the other is connected to on-site display for real time monitoring.



FEATURES

- Three graphic (DVI / VGA) and four video (HDMI /Component / S-Video / Composite) Inputs, from 640x480 to 1920x1200, interlaced or progressive.
- Dual video outputs (DVI / HDMI), 640x480 to 1920x1200, and YPbPr, HD 720p.
- HDCP 1.1 Support
- PIP, PAB, Full screen modes and adjustable size& position through software.
- Titles, borders and colored backgrounds.
- Resize, position, flip, zoom& pan and blend output video.
- Can be cascaded to obtain more images.
- Image parameters and layouts are automatically saved in flash memory and can be recalled for later use.
- Several Image parameters and layouts can be saved in flash memory and can be recalled for later use.
- Video parameters adjustable (brightness, contrast, color temperature, etc.)
- User-selectable output settings, up to 1920x1200.
- Perfectly as a video screen splitter, a video converter and a video switcher.
- Analog audio switcher
- Analog stereo to HDMI audio conversion
- Hardware Fail-safe protection for YPbPr video and stereo audio path
- Firmware upgradable for support of new features and technology enhancements.
- IR control and software control through USB.
- Portable size.
- Automatically power-saving mode.

PACKAGE CONTENTS

- 1x MX-2003B or MX-2000A
- 1x DVI to DVI&VGA breakout cable
- 1x VGA to component breakout cable
- 1x VGA to DVI adapter
- 1x 5V power adapter
- IR remote controller
- Installation software CD
- User Manual

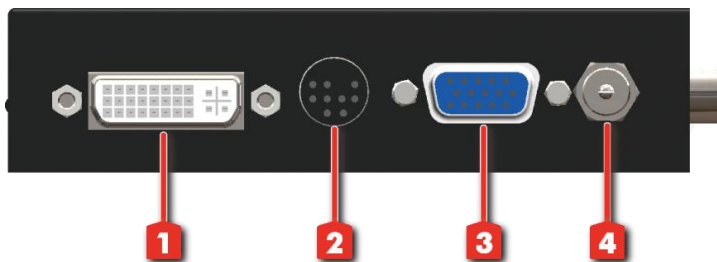
SPECIFICATIONS

Model Name	MX-2003B	MX-2000A	
Technical			
Role of usage	Multiplexer / video processor		
Dual output support	Yes [DVI + VGA]	Yes [HDMI/DVI + YPbPr]	
HDCP compliance	Yes		
Video bandwidth	HDMI/DVI [Single-link 4.95Gbps]	HDMI/DVI [Single-link 4.95Gbps]	
Input Video support	480i / 480p / 720p / 1080i / 1080p60 / 1920x1200@75 / 1600x1200@60		
Audio support	No	Yes	
Control	RS-232 and IR	USB and IR	
PIP / PAP	Yes		
Cascadable	Yes		
Input TMDS signal	1.2 Volts [peak-to-peak]		
ESD protection	Human body model — ±19kV [air-gap discharge] & ±12kV [contact discharge]		
PCB stack-up	6-layer board [impedance control — differential 100Ω; single 50Ω]		
Input	2x VGA + 1x DVI/HDMI + 1x	1x VGA + 1x DVI/HDMI + 1x	
Output	1x HDMI/DVI + 1x VGA	1x DVI + 1x YPbPr + 1 x Stereo	
IR remote control	Electro-optical characteristics: $\tau = 25^\circ$ / Carrier frequency: 38kHz		
DVI connector	DVI-I [29-pin female, digital only]		
VGA connector	HD-15 [15-pin D-sub female]	None	
USB connector	Mini USB		
RCA connector	75Ω female		
Mechanical			
Housing	Metal case		
Dimensions [L x W x H]	Model	180 x 103 x 23mm [7.1" x 4" x 0.9"]	208 x 111.5 x 27mm [8.1" x 4.3" x 1.1"]
	Package	330 x 200 x 95mm [1'1" x 7.9" x 3.7"]	325 x 196 x 92mm [1'1" x 7.6" x 3.6"]
	Carton	495 x 440 x 380mm [1'7" x 1'5" x 1'3"]	490 x 426 x 352mm [1'7.3" x 1'4.8" x 1'1.9"]
Weight	Model	480g [1.1 lbs]	680g [1.5 lbs]
	Package	1345g [3.0 lbs]	1545g [3.4 lbs]
Fixedness	Wall-mounting case or wall hanging holes upon request		
Power supply	5V 4A DC		
Power consumption	10 Watts [max]		
Operation temperature	0~40°C [32~104°F]		
Storage temperature	-20~60°C [-4~140°F]		
Relative humidity	20~90% RH [no condensation]		

PANEL DESCRIPTIONS

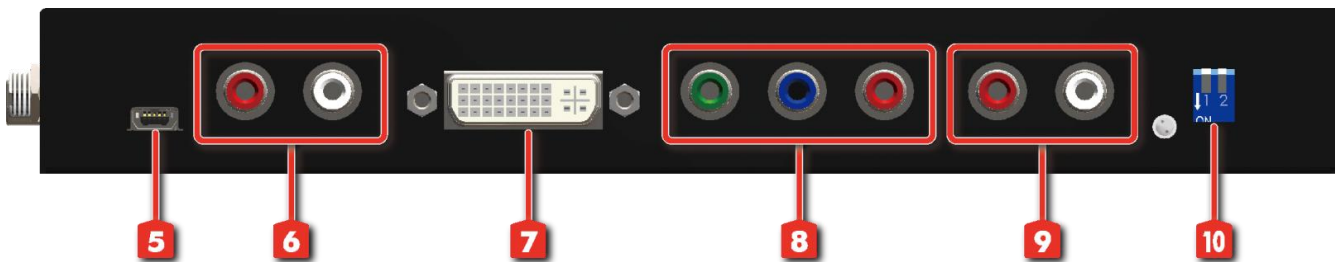
The MX-2000A has four inputs and accepts both graphics and video signals, which come from computers and NTSC/PAL video sources respectively. There is a concept of main channel and sub channel for this device. You can choose two of the four inputs, one is for main channel and another is for sub channel. Then display two of them simultaneously on the same screen. Figure 2 shows the rear panel connectors of the MX-2000A; Table 1 illustrates how you can connect video devices and display to the MX-2000A.

Side Panel



1. DVI/VGA input
2. S-Video and composite input
3. VGA input
4. Power connector

Rear Panel



5. USB
6. Audio input
7. DVI output
8. YPbPr output
9. Audio output
10. DIP switch* (for firmware & system reset)



* Default: Turn on the MX-2000A then switch both two DIP switches simultaneously up and down to factory default mode.

*These IO ports support various resolution from 640x480 up to 1920x1200, for more detail of the supported modes, please refer to the Appendix – Supported Resolution.

TABLE 1: I/O CONNECTORS

Input Connector	Video Source
DVI-IN	[1] DVI
	[2] VGA — with a DVI-to-VGA adapter (DVA01)
	[3] Component (YPbPr) — with a DVI-to-VGA adapter (DVA01) and a VGA-to-component breakout cable (VYPBA01)
	[4] 1x DVI + 1x VGA — with a DVI-to-DVI/VGA breakout cable (DDVY01)
	[5] 1x DVI + 1x Component (YPbPr) — with a DVI-to-DVI&VGA breakout cable (DDVY01) and a VGA-to-component breakout cable (VYPBA01)
VGA IN 2	[1] VGA — with a DVI-to-VGA adapter (DVA01)
Composite/S-Video	[1] Through a RCA cable
Output Connector	Display
DVI-I OUT	[1] HDMI/DVI display
YPbPr OUT	[1] Component display

HARDWARE INSTALLATION

Safety Precautions

1. To prevent fire or shock hazards, do not expose this device to rain or moisture.
2. When connecting other products such as DVD players, and personal computers, you should turn off the power of this product for protection against electric shocks.
3. The product should be placed more than one foot away from heat sources such as radiators, heat registers, stoves, and other products (including amplifiers) that produce heat. In addition, do not cover any material or devices on the top of the device.
4. Do not use immediately after moving from a low temperature to high temperature, as this causes condensation.
5. Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious injury to a child or adult and serious damage to the product.
6. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
7. Do not allow the same still picture to be projected for a long time or an abnormally bright video picture to be projected. The video image could be burned in to the display device.

Installation Procedures

Unpacking

Remove the MX-2000A from the shipping container and examine it for any signs of shipping damage or missing items (check with package contents above). All shipping items should be saved if the product is to be moved or returned for service. Shipping unit back to dealers for service not in the original box may result in voiding warranty or additional cost.

Placement

The unit uses convection to cool. A fan is not needed, so do not block the sides of this device or stack another device on the top or bottom of the MX-2000A.

Connections

We recommend the highest quality cables for both input and output connections.

1. Switch off the MX-2000A and all devices that you want to connect.
2. Connect a monitor, a projector or other displays that comes with DVI and/or VGA inputs by using 1 male-to-male DVI (VGA) cable to MX-2000A DVI output (you can connect 2 displays equipped with DVI and VGA respectively by a DVI to DVI/VGA breakout cable (DDVY01)) .
3. Plug in DVI to DVI/VGA breakout cable (DDVY01) to DVI-IN and plug in VGA to component breakout cable (VYPBA01) to the VGA connector of the breakout cable.
4. Connect a device equipped with DVI output (such as PC) to the DVI connector of the breakout cable.
5. Connect a device equipped with component video output (YPbPr such as DVD player or camera) to the 3-RCA jack of the VYPBA01.
6. Connect a device equipped with VGA output (such as laptop) to the VGA connector of the MX-2000A.
7. Connect a device equipped with composite video output to composite input of the MX-2000A.
8. Connect your computer with the MX-2000A by a Mini USB cable and then install the software.
9. Plug in power adapter cable into 5V DC power jack.
10. Switch on all devices connected and then switch on the video processor and then press “menu” to display OSD menu.
11. Press down arrow key dropping down sub-menu to select the first channel (Main Channel) video/graphic source.
12. Once the Main Channel has a video selected, press “exit” key to exit the sub-menu, and then move right to the next item of OSD menu, which allows you to select the second channel (Sub Channel).
13. For detailed IR remote control operation, please refer to the On Screen Display menu and IR operating instruction.

IR Remote Control

The MX-2000A is now shipped with a compact remote control that allows for direct access to most commands used to control the video processor.

TABLE 2: IR FUNCTIONALITIES

(1)	Mute	Mute the audio output
(2)	Power	Power on/off the device
(3)	Pip	Change to PIP Display mode
(4)	Scan	Enter Auto TV Tuner Mode while the input is TV
(5)	Split	Change to PAP Display mode
(6)	Pip Asp	PIP Display Aspect Ratio Adjustment
(7)	Pip Source	Press to select a source for PIP channel
(8)	Pip Size	Press to change PIP channel size
(9)	Pip Pos	Press to change PIP channel position on Display
(10)	0-9	Number input
(11)	Vol+	Increase audio volume
(12)	Vol-	Decrease audio volume
(13)	Ch+	Increase TV channel number
(14)	Ch-	Decrease TV channel number
(15)	Jump	Switch back and forth between the two recently TV channels
(16)	Reset	Factory Reset
(17)	Freeze	Freeze output display
(18)	Sleep	Enter sleep mode
(19)	Left/Right/ Up/Down	Direction Control keys
(20)	Enter	Confirm Button
(21)	Menu	Display OSD menu
(22)	Exit	Move back to previous option or exit OSD menu
(23)	Source	Press to select a source for main channel
(24)	Info	Show the timer and input channel name
(25)	HDMI	HDMI Switch **
(26)	CC	Show close caption if embedded
(27)	Mode	Reserved
(28)	Auto	Auto adjustment when VGA is selected
(29)	Aspect	Display Aspect Ratio Adjustment
(30)	TV	Hot key to select TV input
(31)	CV1	Hot key to select composite input 1
(32)	CV2	Hot key to select composite input 2
(33)	YUV1	Hot key to select component input 1
(34)	YUV2	Hot key to select component input 2
(35)	SV1	Hot key to select S-Video input 1
(36)	SV2	Hot key to select S-Video input 2
(37)	VGA	Hot key to select VGA input
(38)	DVI	Hot key to select DVI/HDMI input
(39)	F1	Function Key 1
(40)	F2	Function Key 2
(41)	F3	Function Key 3



On Screen Display Menu

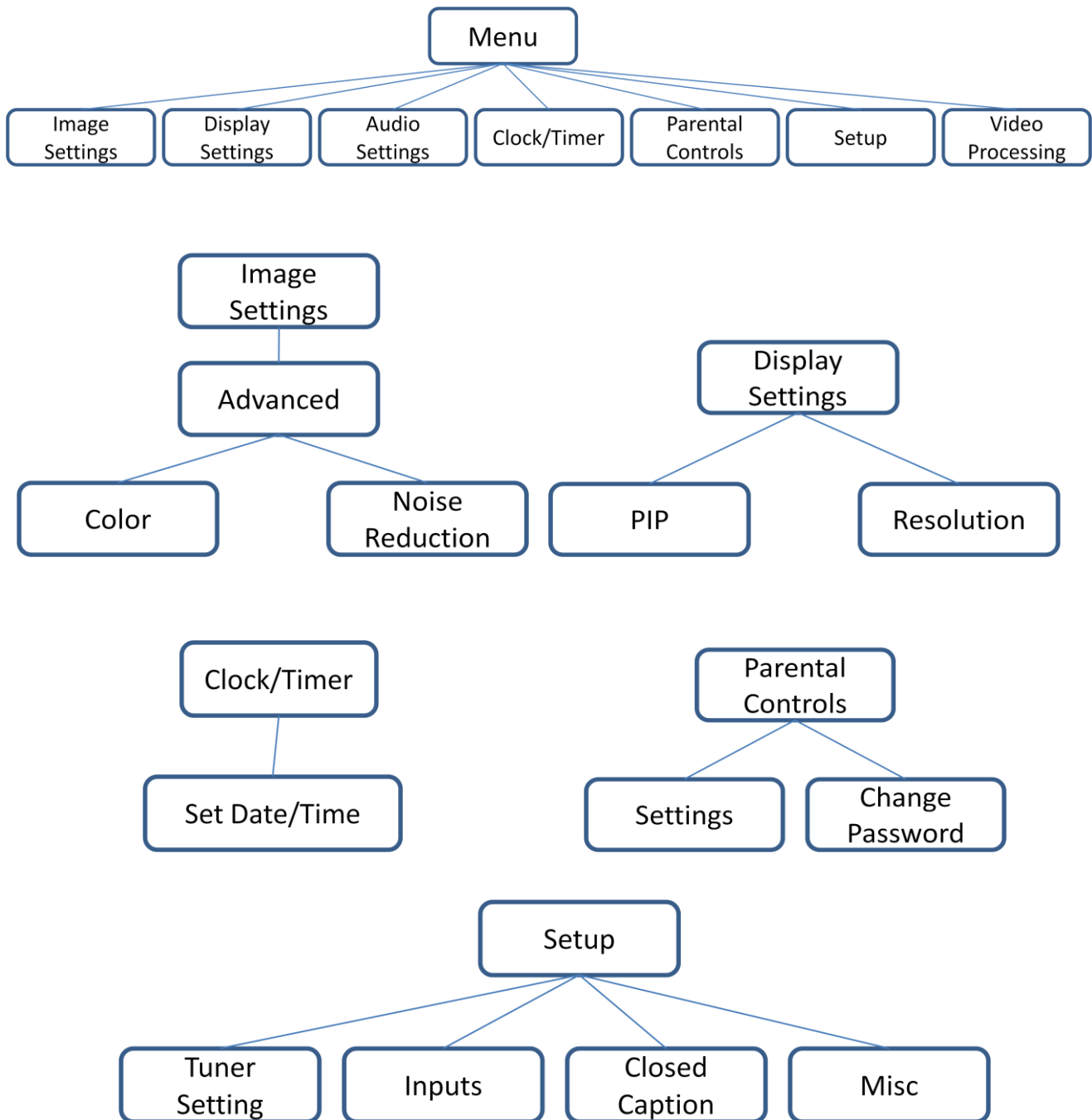


Image Settings

Scheme: Normal, Vivid, Cinema, Game, Sport

Five slider controls for video quality: Brightness, Contrast, Saturation, Hue, Sharpness

Advanced: Noise Reduction, Flash tone, Dynamic Contrast, Color

Noise Reduction: MPEG NR (MPEG Noise Reduction) Temporal NR (Temporal Noise Reduction)

Flash tone: Enhance Flash

Dynamic Contrast: 5 Level Controls

Color: User Defined Color Temperature

Display Settings

Auto Aspect Ratio

Aspect Ratio: 16:9, Letter Box, Pillow Box Expand

Resolution: Define the output's resolution

800x600@60, 1024x768@60, 1280x1024@60, 1280x720@60, 1366x768@60, 1440x900@60,
1400x1050@60, 1920x1080@60, 1920x1200@60, 1600x1200@60

PIP: PIP Mode: off, Large PIP, Small PIP, Side by Side (PBP)

PIP Position: Bottom-Right, Bottom-Left, Top-Left, Top-Right

Multi-PIP Configuration: POP7, 3x3 GRID, POP3, POP12

Multi-PIP On*: YES, NO

Pip Blend: Slider Control on the level of blending Main & Sub Channels

Audio Settings

Three Slider Control of Audio: Bass, Treble, Balance

Auto Volume*: On, Off

Sound Mode: Stereo, Mono, and SAP

Line Out: Fixed Volume*: Fixed Volume, Variable Volume

Speakers: On, Off

SPDIF Out*: On, Off

Clock / Timer

Sleep Timer: On, Off

Wake Alarm: On, Off

Set Date/Time: To setup the date and time

Parental Controls

Password: Default 1111

Setup

Inputs: Name each input.

Closed Caption: Embedded CC decoder for various formats.

Misc: OSD language, Factory Reset

Video Processing

Noise Reduction, Video Processing

System Requirement and Precautions

1. The MX-2000A provides a software control program which runs under Microsoft Windows 98, 2000, XP through the interface of USB interface.
2. Before you click on the icon of the software, make sure you have secured the connection between your computer COM port and the MX-2000A, also switched on the MX-2000A with green LED light.
3. The MX-2000A has remote control and software control. To make sure all information shown in the software is synchronized with those in the device, please click "Connect" to acquire the latest data from the MX-2000A after you press any key on the remote control.

Instruction of Software Connection

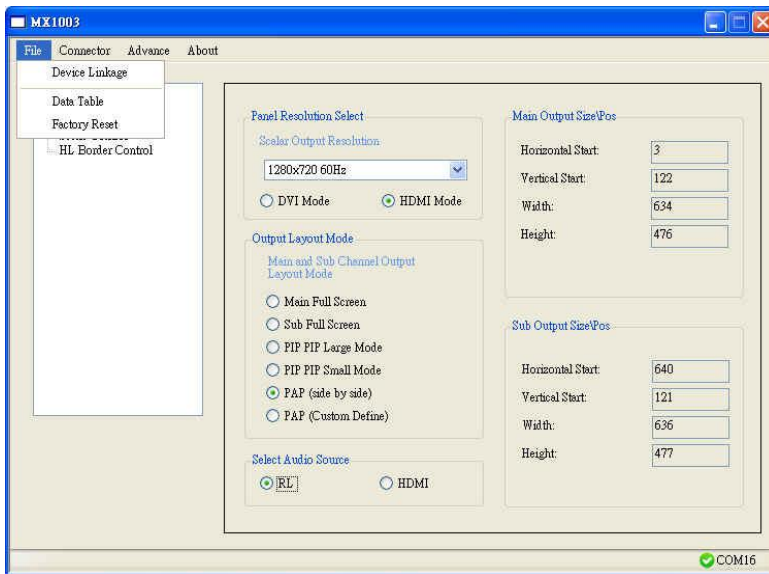
1. Power up the MX-2000A and you can see both red and green LEDs on the front panel blink. Make sure the serial port USB connection secure.
2. The first step after running the software is to automatically detect if the device responses correctly through USB port. The process takes 15-20 seconds. If the response is not accurate, a warning window will show up as the figure below.



The possible reasons causing this failure could be:

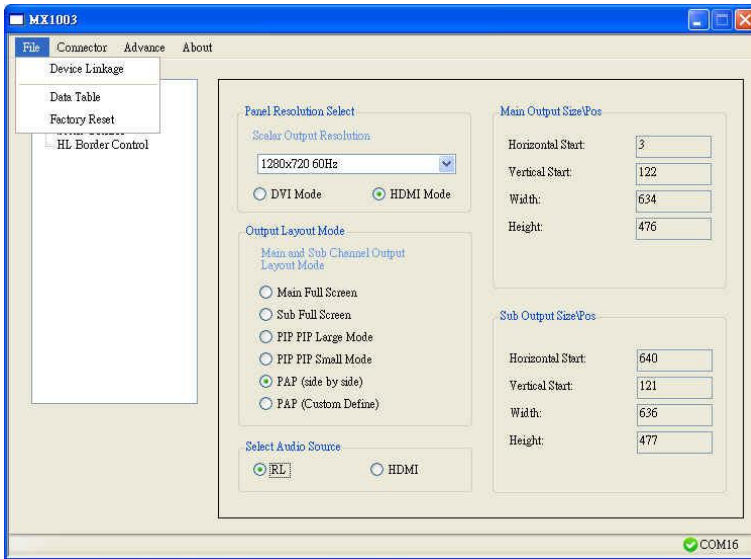
- ***The MX-2000A is not supplied with power or the MX-2000A enters deep sleep state. Please check the current status, and reboot the MX-2000A.***
- ***The serial connection through USB is not well established or some other software has taken the available serial ports. Please make sure the USB cable is well connected and the available serial port is free to be used by the MX-2000A.***
- ***Com setting is not correct. Please make sure that from Menu→ Connector→ Setting.***

3. If the serial connection is well established, you can see similar work window as below.



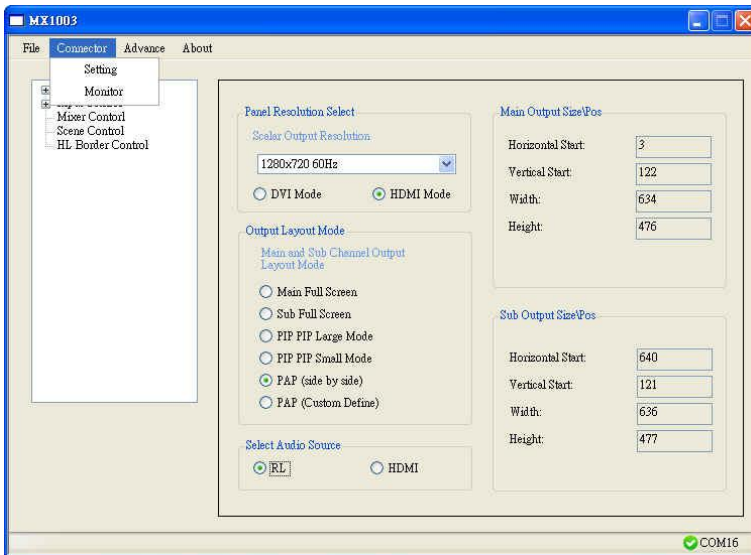
Instruction of Software Operation

Menu



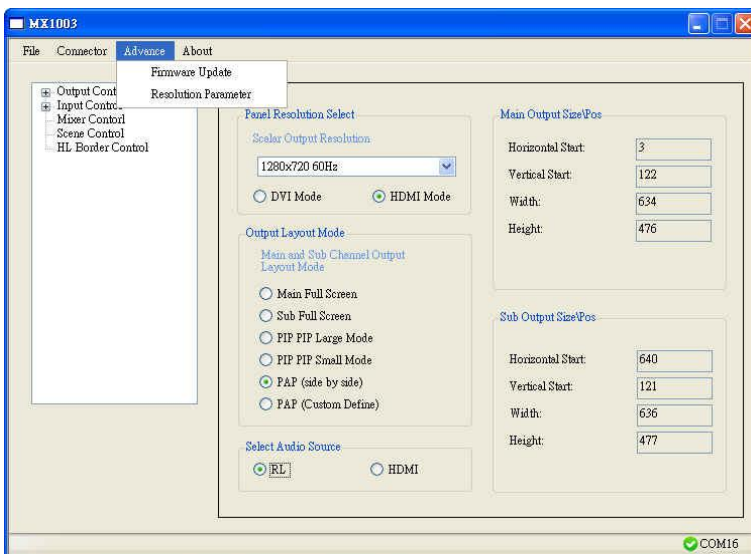
File

- a. **Device Linkage:** This will synchronize the status or the MX-2000A with the software, especially after IR commands sent.
- b. **Data Table:** It will show a dialog that will list the input and resolution data.
- c. **Factory Reset:** This will restore all the system values back to the factory default.



Connector

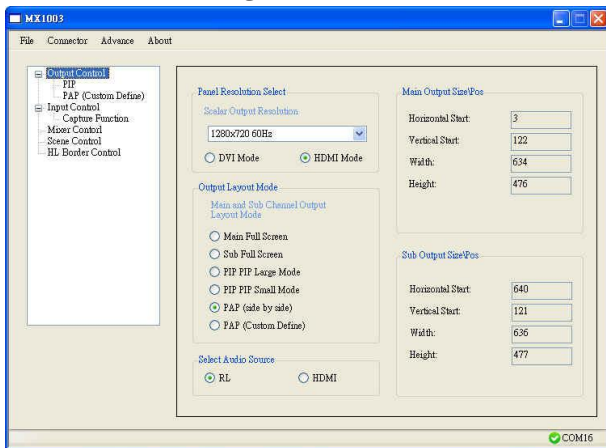
- d. **Setting:** It will show a dialog, you could modify serial port setting from there.
- e. **Monitor:** It will show a dialog that will display the send and receive values.



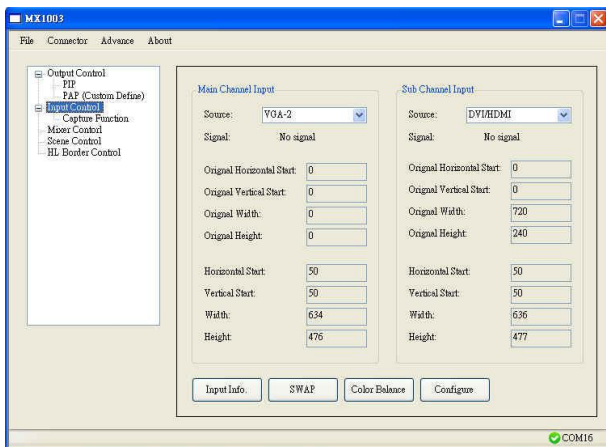
Advance

- f. **Firmware Update:** It will show a dialog, that that for update the firmware to the newest version.
- g. **Resolution Parameter:** It will show a dialog that for custom output resolution.

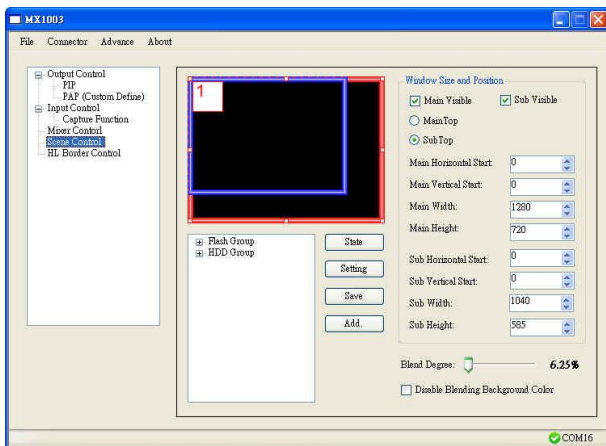
Tree List Dialog



- Output Resolution and Type
- Layout Mode
- Select audio source is from RL or HDMI
- Main channel's size and position Information
- Sub channel's size and position information

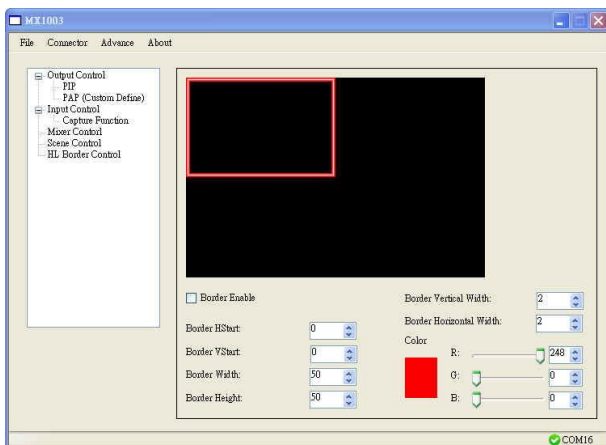


- Main channel's input signal select and information.
- Sub channel's input signal select and information.
- "Input Info." Button: Update the current signal status.
- "SWAP" Button: Switch the input signal between the main and sub channel.
- "Color Balance" Button: Auto adjust the AD gain value.
- "Configure" Button: For configure VGA input signal.



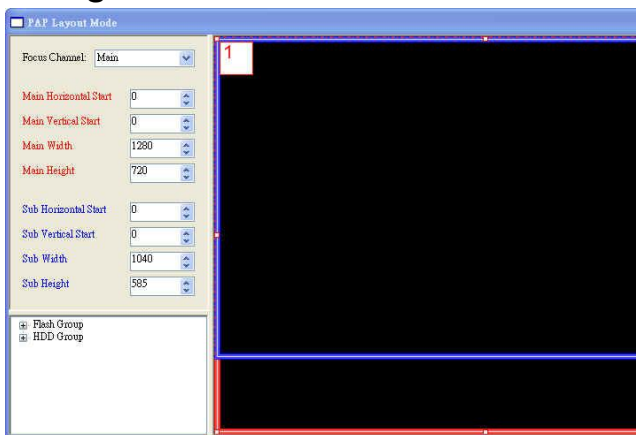
Flash Group: There are having 5 groups of custom PAP Mode Layout in the device

HDD Group: This is saved in Pc.



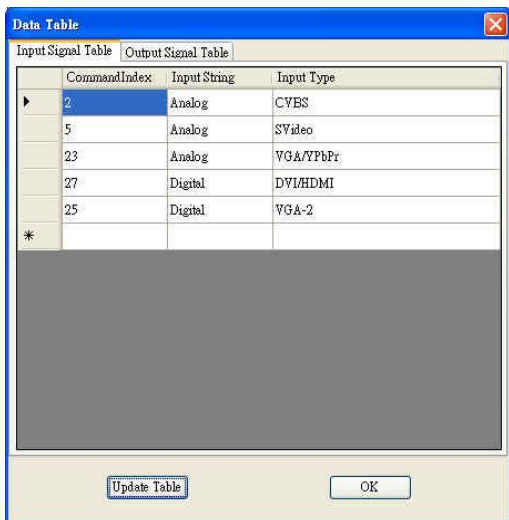
- The border control
- Size and Position
- Width
- Color

Dialog



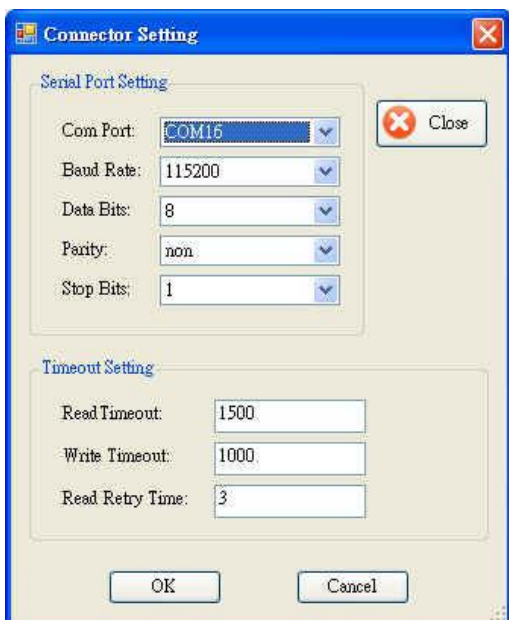
1. PAP control dialog:

While you move the mouse's cursor near the borders, in either red or blue, the icon of the cursor will change as the figure below.



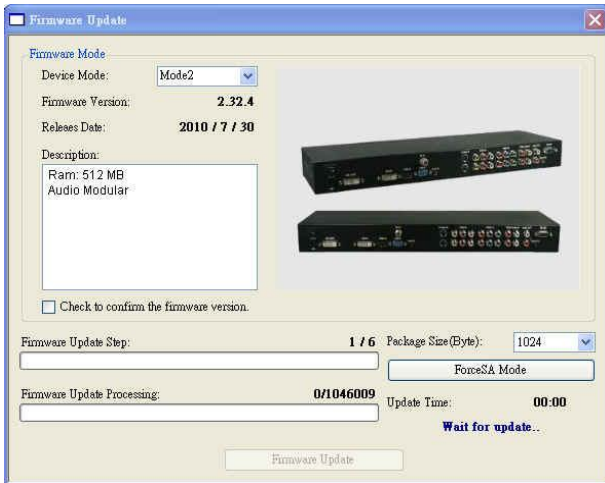
2. Data dialog:

About output resolution and input signal data. The information is only for software development.



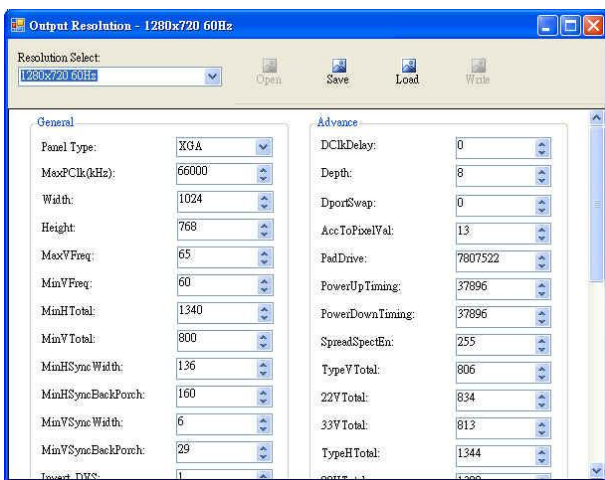
3. Serial port dialog:

Please select the correct number of serial port.



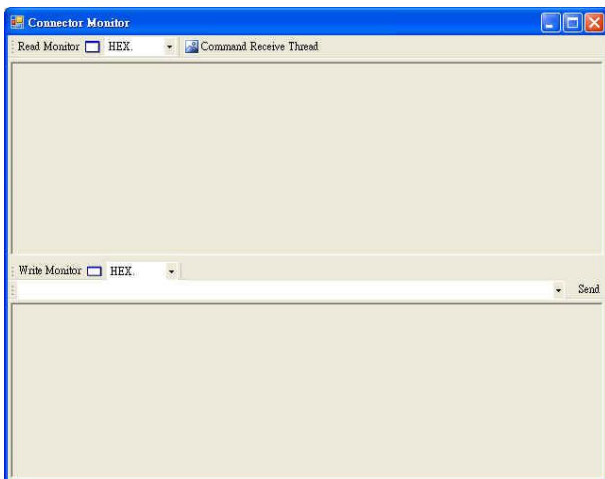
4. Firmware Update dialog:

It supports to update the firmware to the newest version.



5. Resolution Parameter dialog:



It can edit and save the parameter of output resolution in device. And it also can save the parameters in PC.



6. Serial Port Monitor

Monitor the send and receive data with serial port.

TROUBLESHOOTING

Problem	Recommendations
<p>No power</p>	<ul style="list-style-type: none"> ✓ Check if you are using 5V DC adapter and it is firmly plugged into the MX-2000A ✓ If you are recovering from power outage, accidentally unplug the adapter or other power surge conditions, leave the device off for a while and then power it on again.
<p>No/ Erratic video</p>	<ul style="list-style-type: none"> ✓ Make sure all cables are in good working condition and properly connected to the MX-2000A and displays. ✓ Configure the output video resolution so that it doesn't exceed the native resolution of the display. (in this case, the message of "out of range" is usually showed on your screen) ✓ Make sure a video source is selected to the main channel. (press "Menu" and check if the first item has a video source selected or press "Source" to select a video source for the main channel)
<p>Poor quality</p>	<ul style="list-style-type: none"> ✓ We suggest that don't use T-connectors to split your video source into to images displayed on two different screens. That will lower output video quality. Use a distribution amplifier instead of T-connectors. ✓ Make sure the video source is not compressed and maintains the highest native resolution.
<p>Image position shifted</p>	<ul style="list-style-type: none"> ✓ Press "Auto" key on the remote control. <div data-bbox="469 1290 1430 1361" style="background-color: #cccccc; padding: 5px; border: 1px solid #000;">  Auto color configuration only works at VGA and component inputs. </div>
<p>Wrong color</p>	<ul style="list-style-type: none"> ✓ Press "Color" key for auto color configuration. <div data-bbox="469 1462 1430 1534" style="background-color: #cccccc; padding: 5px; border: 1px solid #000;">  Auto color configuration only works at VGA and component inputs. </div>

LIMITED WARRANTY

The SELLER warrants the **MX-2000A Dual-View Video Processor Audio Path** to be free from defects in the material and workmanship for 1 year from the date of purchase from the SELLER or an authorized dealer. Should this product fail to be in good working order within 1 year warranty period, The SELLER, at its option, repair or replace the unit, provided that the unit has not been subjected to accident, disaster, abuse or any unauthorized modifications including static discharge and power surges.

Unit that fails under conditions other than those covered will be repaired at the current price of parts and labor in effect at the time of repair. Such repairs are warranted for 90 days from the day of reshipment to the BUYER. If the unit is delivered by mail, customers agree to insure the unit or assume the risk of loss or damage in transit. Under no circumstances will a unit be accepted without a return authorization number.

The warranty is in lieu of all other warranties expressed or implied, including without limitations, any other implied warranty or fitness or merchantability for any particular purpose, all of which are expressly disclaimed.

Proof of sale may be required in order to claim warranty. Customers outside Taiwan are responsible for shipping charges to and from the SELLER. Cables are limited to a 30 day warranty and cable must be free from any markings, scratches, and neatly coiled.

The content of this manual has been carefully checked and is believed to be accurate. However, The SELLER assumes no responsibility for any inaccuracies that may be contained in this manual. The SELLER will NOT be liable for direct, indirect, incidental, special, or consequential damages resulting from any defect or omission in this manual, even if advised of the possibility of such damages. Also, the technical information contained herein regarding the MX-2000A features and specifications is subject to change without further notice.

APPENDIX - SUPPORTED RESOLUTION

[DVI-IN] socket

Supported Mode	Resolution	Supported Mode	Resolution
NTSC – 480i / 525i	720x240 @60Hz	MAC	832x624 @75Hz
PAL– 576i / 625i	720x288 @50Hz	VESA	1024x768 @60Hz
PAL– 480p / 525p	720x483 @60Hz	MAC	1024x768 @60Hz
PAL– 480p (16:9)	960x483 @60Hz	VESA	1024x768 @70Hz
PAL– 576p / 625p	720x756 @50Hz	IBM	1024x768 @72Hz
HDTV – 720p	1280x720 @50Hz	VESA	1024x768 @75Hz
HDTV – 720p	1280x720 @60Hz	MAC	1024x768 @75Hz
HDTV – 1080i	1920x540 @50Hz	VESA	1024x768 @85Hz
HDTV – 1080i	1920x540 @60Hz	VESA	1152x864 @75Hz
HDTV - 1080p	1920x1080 @30Hz	MAC	1152x870 @75Hz
VESA	720x400 @85Hz	SUN	1152x900 @66Hz
VESA	640x350 @85Hz	SUN	1152x900 @76Hz
VESA	640x400 @85Hz	VESA	1280x960 @60Hz
IBM	720x400 @70Hz	VESA	1280x960 @85Hz
IBM	720x350 @70Hz	VESA	1280x1024 @60Hz
IBM	640x350 @70Hz	HP	1280x1024 @60Hz
IBM	640x400 @70Hz	IBM	1280x1024 @67Hz
VESA	640x480 @60Hz	HP	1280x1024 @72Hz
MAC	640x480 @67Hz	VESA	1280x1024 @75Hz
VESA	640x480 @72Hz	SUN	1280x1024 @76Hz
VESA	640x480 @75Hz	VESA	1600x1200 @60Hz
VESA	640x480 @85Hz	VESA	1920x1200 @60Hz
VESA	800x600 @56Hz		
VESA	800x600 @60Hz		
VESA	800x600 @72Hz		
VESA	800x600 @75Hz		
VESA	800x600 @85Hz		

[DVI-IN] socket

Supported Mode	Resolution	Supported Mode	Resolution
480p / 525p	720x483 @60Hz	VESA	800x600 @56Hz
480p (16:9)	960x483 @60Hz	VESA	800x600 @60Hz
HDTV – 720p	1280x720 @50Hz	VESA	800x600 @72Hz
HDTV – 720p	1280x720 @60Hz	VESA	800x600 @75Hz
HDTV – 1080i	1920x1080 @30Hz	VESA	800x600 @85Hz
HDTV - 1080p	1920x1080 @60Hz	VESA	1024x768 @60Hz
VESA	640x350 @85Hz	VESA	1024x768 @70Hz
VESA	640x400 @85Hz	VESA	1024x768 @75Hz
VESA	640x480 @60Hz	VESA	1024x768 @85Hz
VESA	640x480 @72Hz	VESA	1152x864 @75Hz
VESA	640x480 @75Hz	VESA	1280x960 @60Hz
VESA	640x480 @85Hz	VESA	1280x960 @85Hz
VESA	720x400 @85Hz	VESA	1280x1024 @60Hz
		VESA	1600x1200 @60Hz
		VESA	1920x1200 @60Hz

[DVI-OUT] socket

Supported Mode	Resolution	Supported Mode	Resolution
HDTV – 720p	1280x720 @60Hz	VESA	1366x768 @60Hz
HDTV – 1080p	1920x1080 @60Hz	VESA	1400x900 @60Hz
VESA	800x600 @60Hz	VESA	1400x1050 @60Hz
VESA	1024x768 @60Hz	VESA	1600x1200 @60Hz
VESA	1152x864 @75Hz	VESA	1920x1200 @60Hz
VESA	1280x1024 @60Hz		