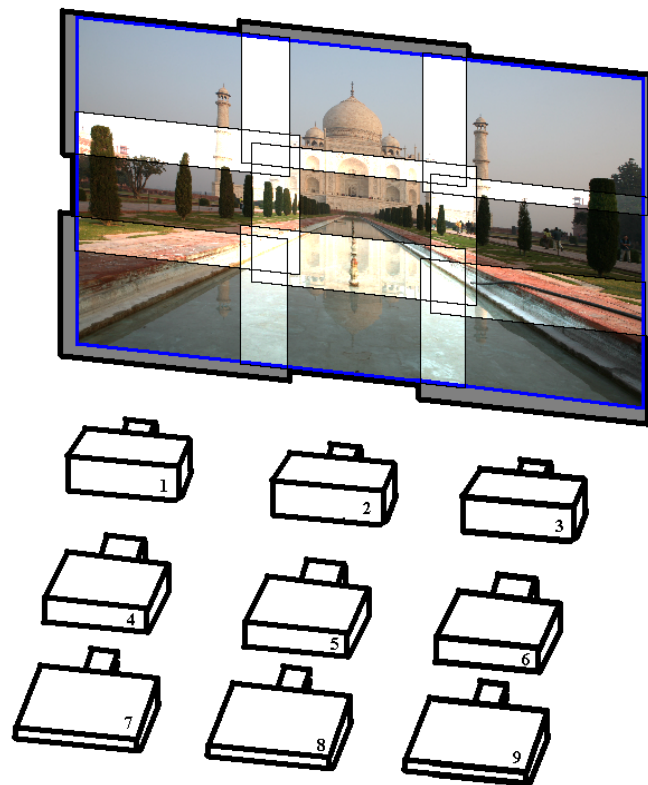# MX-2101

Dual-View Edge Blender

User Manual
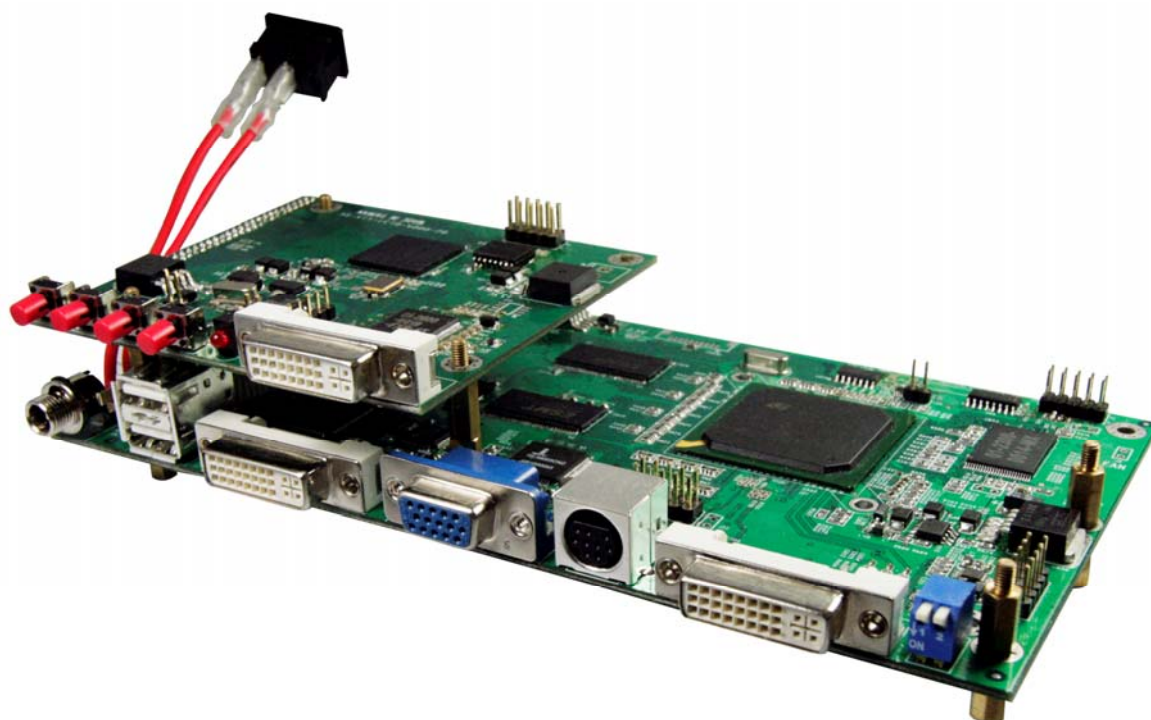
Safety and Notice

The **MX-2101 Dual-View Edge Blender** has been tested for conformity to safety regulations and requirements, and has been certified for international use. However, like all electronic equipments, the MX-2101 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.

General

The **MX-2101 Dual-View Edge Blender** is an advanced video processor for multiple projector presentations. It is an ideal solution for applications where two video signals must be displayed on a single display and must be displayed through 2 or more projectors. To create a single large display area using multiple projectors, it is unavoidable to overlap the images from projectors to get well tiled displays. Without perfect alignment, the resulting video especially for moving objects shows up with the objectionable gap or bright seam. To eliminate or lessen the effect causing by overlapped images such that the banding becomes invisible, modifying the video overlapping edges becomes a very important feature in such an application. MX-2101 offers users to adjust the overlapped range horizontally or vertically, single edge or both edges on the same display at the same time. In this way, eye-catching, super high resolution, and bright display can be readily achieved. Typical applications include education, advertising, virtual reality, digital cinema, and video game. In addition to handle overlapped edges, MX-2101 is also built up with graphics format conversion, for instance, VGA to DVI or DVI to VGA. Also, in order eliminate the requirement to synchronize a couple of sources, such as PCs, working with cost effective video splitters, MX-2101s can actually be fed with the same input and programmed to crop some portion of the video input independently and individual unit can zoom the selected part to the desired resolution with full screen. This setup will ease the synchronization tasks among different sources and even the preprocess jobs to save the overall cost for projector applications.

Figure 1: Setup for multiple Projectors to create high resolution display

As a video mixer, MX-2101 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-2101 allows you to manipulate output images, wherever position and whatever sizes you want for viewing two computers or two video signals or a combination. 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).
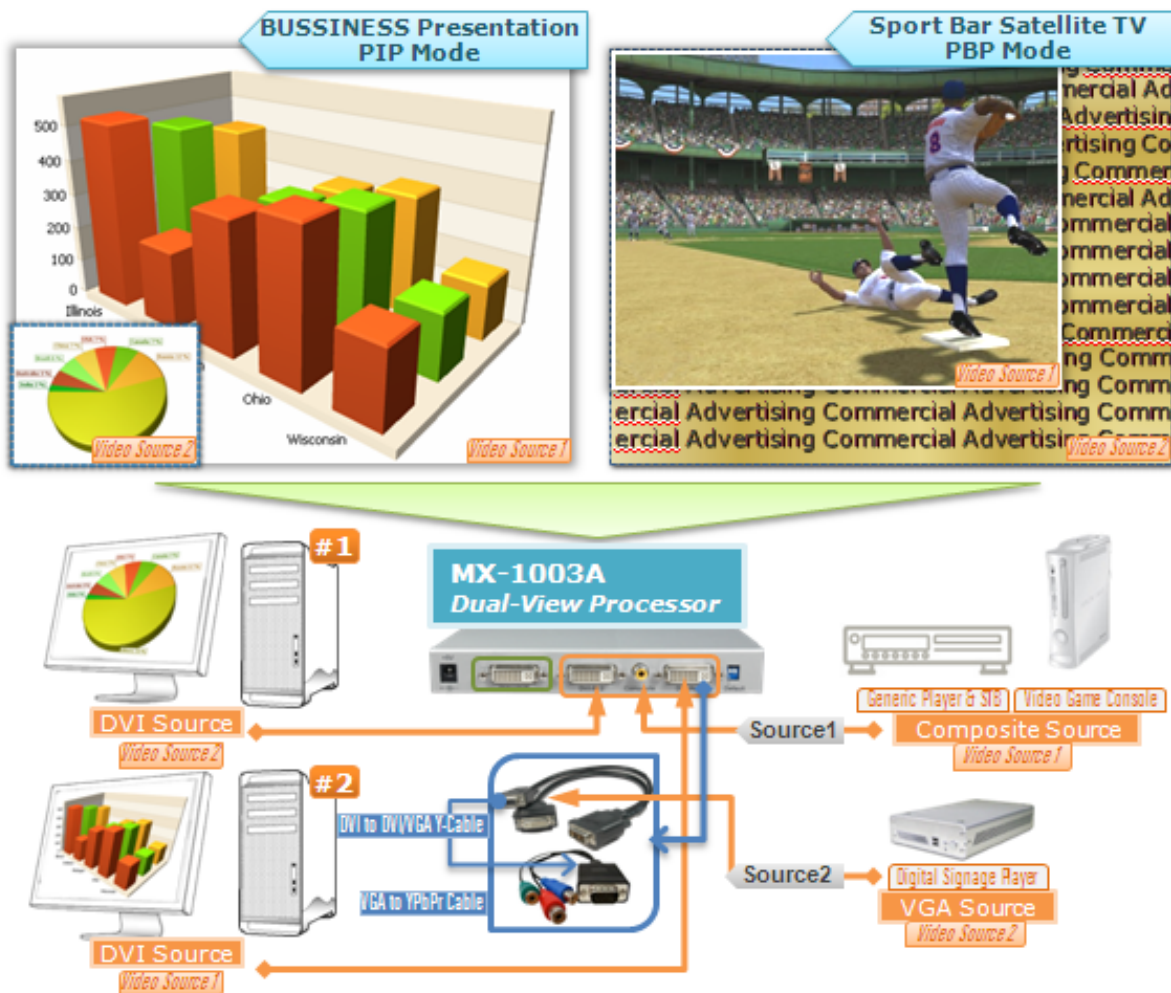

Figure 1: Configuration Diagram

Features

- Three graphic (DVI / VGA) and four video (HDMI /Component / S-Video / Composite) Inputs, from 640x480 to 1920x1200, interlaced or progressive.

- DVI output, 640x480 to 1920x1200.

- HDCP 1.1 Support

- HDMI 1.2a 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.

- Firmware upgradable for support of new features and technology enhancements.

- IR control and software control through RS-232.

- Portable size.

- Serial command set available

- Easy installation

Specifications

Model Name	MX-2101	CV-101p
Technical		
Role of usage	Multiplexer / video processor / Edge Blender	Multiplexer / Edge Blender
Output support	DVI	[DVI + VGA]
HDCP compliance	Yes	
Video bandwidth	HDMI/DVI [Single-link 4.95Gbps] VGA [165MHz] Component [30MHz] S-Video/Composite [13.5MHz]	DVI [Single-link 4.95Gbps] VGA [165MHz]
Video support	480i / 480p / 720p / 1080i / 1080p60 / 1920x1200@60 / 1600x1200@60	720p / 1080p60 / 1920x1200@60 / 1600x1200@60
Audio support	No	
Control	RS-232 and IR	RS-232
PIP / PAP	Yes	No
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 component + 1xS-Video + 1x composite + 1x RS-232	1x VGA + 1x DVI + 1x RS-232
Output	1x DVI	1x DVI + 1x VGA
IR remote control	Electro-optical characteristics: τ = 25° / Carrier frequency: 38kHz	N/A
DVI connector	DVI-I [29-pin female, digital only]	
VGA connector	HD-15 [15-pin D-sub female]	
RS-232 connector	DE-9 [9-pin D-sub female]	
RCA connector	75Ω female	
Mechanical		
Housing	Metal case	
Dimensions (L x W x H) — Model	180 x 103 x 23mm [7.1"x4"x0.9"]	
Dimensions (L x W x H) — Package	330 x 200 x 95mm [1'1"x7.9"x3.7"]	
Dimensions (L x W x H) — Carton	495 x 440 x 380mm [1'7.5"x1'5.3"x1'3"]	
Weight — Model	480g [1.1 lbs]	
Weight — Package	1345g [3.0 lbs]	
Fixedness	Wall-mounting case or wall hanging holes upon request	
Power supply	5V 4A DC	5V 2A 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]	
Package Contents	1x MX-2101 1x DVI to DVI&VGA breakout cable 1x VGA to component breakout cable 1x VGA to DVI adapter 1x 5V power adapter 1x IR remote controller 1x Installation software CD 1x User Manual	1x CV-101p 1x Installation software CD 1x User Manual 1x RS-232 to USB adapter 1x 5V 2A interlocked wall wart power adapter

Package Contents

1. MX-2101

2. DVI to DVI & VGA breakout cable (DDVY01)

3.VGA to component breakout cable (VYPBA01)

4. DVI to VGA adapter (DVA01)

5. 5V DC power adapter

6.IR remote controller

7. Installation software CD

8. User Manual

Inputs and Outputs

The MX-2101 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 pick up two of the four inputs, one is for main channel and the other is for sub channel, and then display two of them simultaneously on the same screen. Figure 2 shows the rear panel connectors of a MX-2101 and Table 1 illustrates how you can connect video devices and display to the MX-2101.
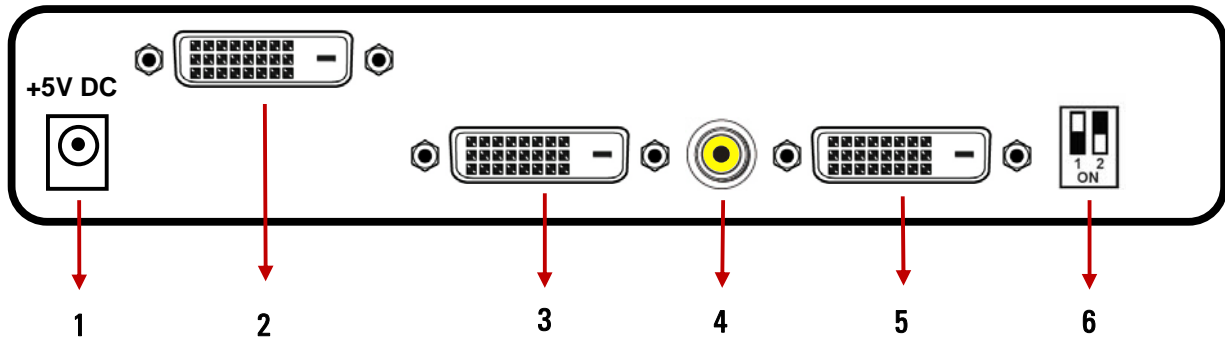
Figure 2: Rear Panel

1. Power connector
2. DVI output
3. VGA input
4. Composite input
5. DVI / VGA / Component input
6. DIP switch* (for firmware & system reset)

Default: Turn on the MX-2101 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	[1] With a RCA cable
Output Connector	**Display**
DVI-I OUT	[1] HDMI/DVI display

Safety Precautions

I.   To prevent fire or shock hazards, do not expose this device to rain or moisture.

II. 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.

III. 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.

IV. Do not use immediately after moving from a low temperature to high temperature, as this causes condensation,

V.   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.

VI. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

VII. 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-2101 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-2101.

Connections

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

1. Switch off the MX- MX-2101 and all devices that you want to connect.

2. Connect a projector or other displays that comes with DVI input to MX-2101 DVI output.

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.

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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 MX-2101.

7. Connect a device equipped with composite video output to composite input of the MX-2101.

8. Connect your computer with the MX-2101 by a 9-pin RS-232 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.

Figure 3: Connection Diagram
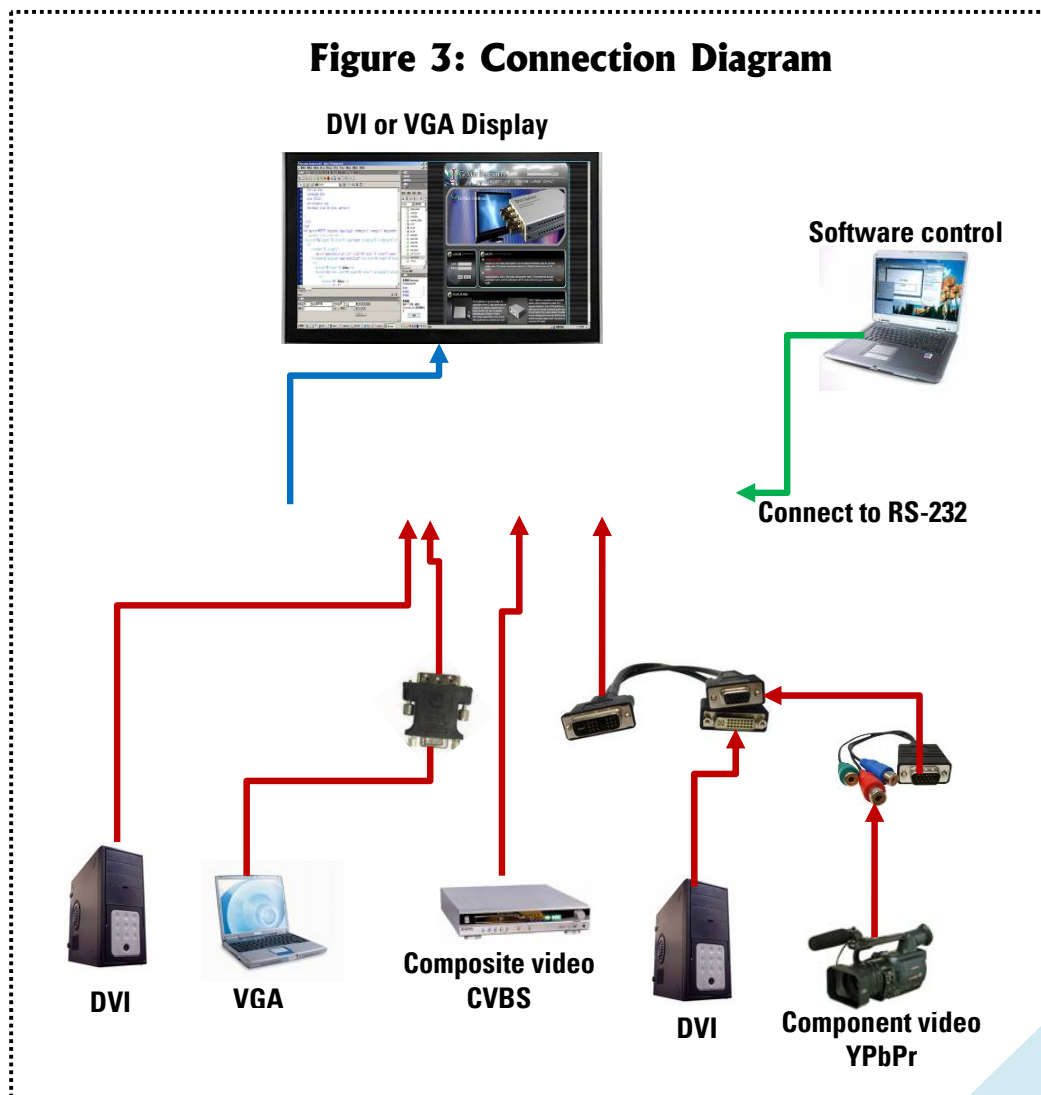
IR Remote Control

The MX-2101 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 Control
  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, SAP   Line Out: Fixed Volume*: Fixed Volume, Variable Volume   Speakers: On, Off
SPDFI 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

The MX-2101 provides a software control program which runs under Microsoft Windows 98, 2000, XP through the interface of RS-232 serial control. Please see the software manual for more details.

Troubleshooting

Problem	Recommendations
No power	✓ Check if you are using 5V DC adapter and it is firmly plugged into the MX-2101
	✓ 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.
No/ Erratic video	✓ Make sure all cables are in good working condition and properly connected to the MX-2101 and displays.
	✓ Configure the output video resolution so that it doesn't excess 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)
Poor quality	✓ 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.
Image position shifted	✓ Press "Auto" key on the remote control.

ℹ️ *Auto color configuration only works at VGA and component inputs.*

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Wrong color

✓ Press "Color" key for auto color configuration.

> ℹ️ *Auto color configuration only works at VGA and component inputs.*

The SELLER warrants the **MX-2101 Dual-View Edge Blender** 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-2101 features and specifications is subject to change without further notice.

Appendix – Supported Resolution

[DVI-IN1] Socket

Supported Mode	Resolution
NTSC/480I/525I	720x240 @60Hz
PAL/576I/625I	720x288 @50Hz
480P/525P	720x483 @60Hz
480P (16:9)	960x483 @60Hz
576P/625P	720x756 @50Hz
(HDTV) 720p	1280x720 @50Hz
(HDTV) 720p	1280x720 @60Hz
(HDTV) 1080i	1920x1080 @50Hz
(HDTV) 1080i	1920x1080 @60Hz
(HDTV) 1080p	1920x1080 @30Hz
VESA	720x400 @85Hz
VESA	640x350 @85Hz
VESA	640x400 @85Hz
IBM	720x400 @70Hz
IBM	720x350 @70Hz
IBM	640x350 @70Hz
IBM	640x400 @70Hz
VESA	640x480 @60Hz
MAC	640x480 @67Hz
VESA	640x480 @72Hz
VESA	640x480 @75Hz
VESA	640x480 @85Hz
VESA	800x600 @56Hz
VESA	800x600 @60Hz
VESA	800x600 @72Hz
VESA	800x600 @75Hz
VESA	800x600 @85Hz

Supported Mode	Resolution
MAC	832x624 @75Hz
VESA	1024x768 @60Hz
MAC	1024x768 @60Hz
VESA	1024x768 @70Hz
IBM	1024x768 @72Hz
VESA	1024x768 @75Hz
MAC	1024x768 @75Hz
VESA	1024x768 @85Hz
VESA	1152x864 @75Hz
MAC	1152x870 @75Hz
SUN	1152x900 @66Hz
SUN	1152x900 @76Hz
VESA	1280x960 @60Hz
VESA	1280x960 @85Hz
VESA	1280x1024 @60Hz
HP	1280x1024 @60Hz
IBM	1280x1024 @67Hz
HP	1280x1024 @72Hz
VESA	1280x1024 @75Hz
SUN	1280x1024 @76Hz
VESA	1600x1200 @60Hz
VESA	1920x1200 @60Hz

[DVI-IN2] Socket

Supported Mode	Resolution
VESA	640x480 @60Hz
VESA	800x600 @60Hz
VESA	1024x768 @60Hz
VESA	1280x1024 @60Hz
VESA	1600x1200 @60Hz
VESA	1920x1200 @60Hz

[DVI-I OUT] Socket

Supported Mode	Resolution
(HDTV) 720p	1280x720 @50Hz
(HDTV) 720p	1280x720 @60Hz
(HDTV) 1080p	1920x1080 @60Hz
VESA	640x480 @60Hz
VESA	800x600 @60Hz
VESA	1024x768 @60Hz
VESA	1152x864 @75Hz
VESA	1280x1024 @60Hz
VESA	1280x1024 @50Hz
VESA	1280x768 @60Hz
VESA	1366x768 @60Hz
VESA	1400x1050 @60Hz
VESA	1400x1050 @50Hz
VESA	1152x864 @75Hz
VESA	1600x1200 @60Hz
VESA	1920x1200 @50Hz
VESA	1920x1200 @60Hz