

# MX-3004

## 3G/HD/SD-SDI Quad-view Video Processor

### User Manual



**3G-HD-SD**





## **Safety and Notice**

The **MX-3004 3G/HD/SD-SDI Quad-view Video Processor** has been tested for conformity to safety regulations and requirements, and has been certified for international use. However, like all electronic equipments, the **MX-3004** 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-3004 3G/HD/SD-SDI Quad-view Video Processor** is an advanced video processor for multimedia presentations. It is an ideal solution for some applications such as surveillance, where up to four SDI video signals must be displayed on a single display. It supports up to 4 SDI video inputs, of which four can be outputted simultaneously with the desired display layout through software control. The advanced video processor allows you to manipulate output images, wherever positions and whatever sizes you want for viewing two computers or two video signals or a combination.

The embedded processor 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 digital (SDI) and digital (DVI) format, one is connected to remote display and the other is connected to on-site display for real time monitoring.

## FEATURES

- Supports 3G/HD/SD SDI video formats
- Input resolutions support interlaced or progressive video under SMPTE.
- Dual outputs DVI(640x480 to 1920x1200) / SDI(720P, 1080P)
- Each SDI channel has 1 re-clocked SDI loop-outs.
- Adjustable size& position through software.
- Image parameters and layouts are automatically saved in flash memory and can be recalled for later use.
- User-selectable output settings, up to 1920x1200(Only for DVI).
- Perfectly as a video screen splitter, a video converter and a video switcher.
- Firmware upgradable for support of new features and technology enhancements.
- Software control through RS-232.
- Control protocol available for customer proprietary design
- 1U size.

## PACKAGE CONTENTS

- 1x MX-3004
- 1x USB to RS-232 cable
- 2x 1U rack mounting-ear
- 1x Installation software CD
- 1x UL 12V power adapter
- 1x UL AC power cord
- 1x User Manual

# SPECIFICATIONS

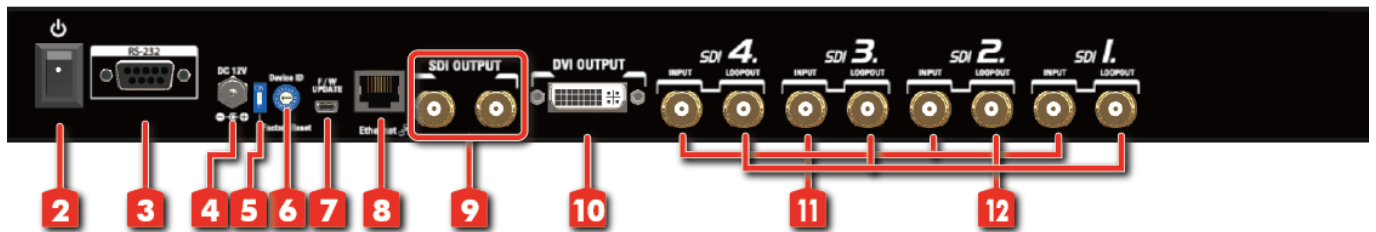
Model Name	MX-1004S	MX-3004	
<b>Technical</b>			
Role of usage	Multiplexer / video processor		
Dual output support	Yes [DVI & VGA]	Yes [DVI & SDI]	
Background video input	No	No	
Video bandwidth	Composite [13.5MHz] SDI [2.97Gpbs & 2.97/1.001Gpbs]	DVI/HDMI[165MHz] SDI 3G/HD/SD	
Video Input support	480i / 576i/ 720p / 1080i / 1080p	480i / 576i/ 720p / 1080i / 1080p	
Audio support	No	No	
Control	RS-232 and RS-485	RS-232 and Ethernet	
Embedded video mixer	Yes		
Cascadable	No	No	
Input TMDS signal	N/A	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	4x SDI or CVBS 1x RS-232 + 2x RS-485	4x SDI 1x RS-232 + 1x RJ-45	
Output	8 x SDI Loop-out + 1x DVI + 1x VGA	1x DVI + 2x SDI	
DVI connector	DVI-I [femal,29-pin]		
BNC connector	75Ω inter-locked socket		
VGA connector	HD-15 [15-pin D-sub female]	No	
RS-232 connector	DE-9 [9-pin D-sub female]		
RCA connector	75Ω female		
RJ-45 connector	WE/SS 8P8C with 2 LED indicators		
<b>Mechanical</b>			
Housing	Metal enclosure		
Dimensions (L x W x H)	Model	300 x 440 x 44mm [11.8" x 1'5.3" x 1.7"]	170 x 440 x 45mm [6.7" x 1'5.3" x 1.8"]
	Package	528 x 398 x 130mm [1'9" x 1'4" x 5.1"]	310 x 525 x 155mm [1'0.2"x1'8.7"x6.1"]
	Carton	548 x 422 x 282mm [1'10" x 1'5" x 11.1"]	570 x 580 x 260mm [1'10.5"x1'10.9"x10.2"]
Weight	Model	3800g [8.4 lbs]	2100g [4.6 lbs]
	Package	5900g [13.0 lbs]	5000g [11 lbs]
Fixedness	1RU rack-mount with ears		
Power supply	AC Power 100-240V		
Power consumption	35 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

## Front Panel



## Rear Panel



- |                           |                         |                               |
|---------------------------|-------------------------|-------------------------------|
| <b>1. Power Indicator</b> | <b>5. Factory Reset</b> | <b>9. SDI output</b>          |
| <b>2. Power On/Off</b>    | <b>F/W Default</b>      | <b>10. DVI output</b>         |
| <b>3. RS-232</b>          | <b>6. Device ID</b>     | <b>11. SDI input</b>          |
| <b>4. +12V DC</b>         | <b>7. USB</b>           | <b>12. SDI local loop out</b> |
|                           | <b>8. Ethernet</b>      |                               |

The MX-3004 has 4 SDI and user can display four of them simultaneously on the same screen. Figure 2 shows the rear panel connectors of a MX-3004 and Table 1 illustrates how you can connect video devices and display to the MX-3004.



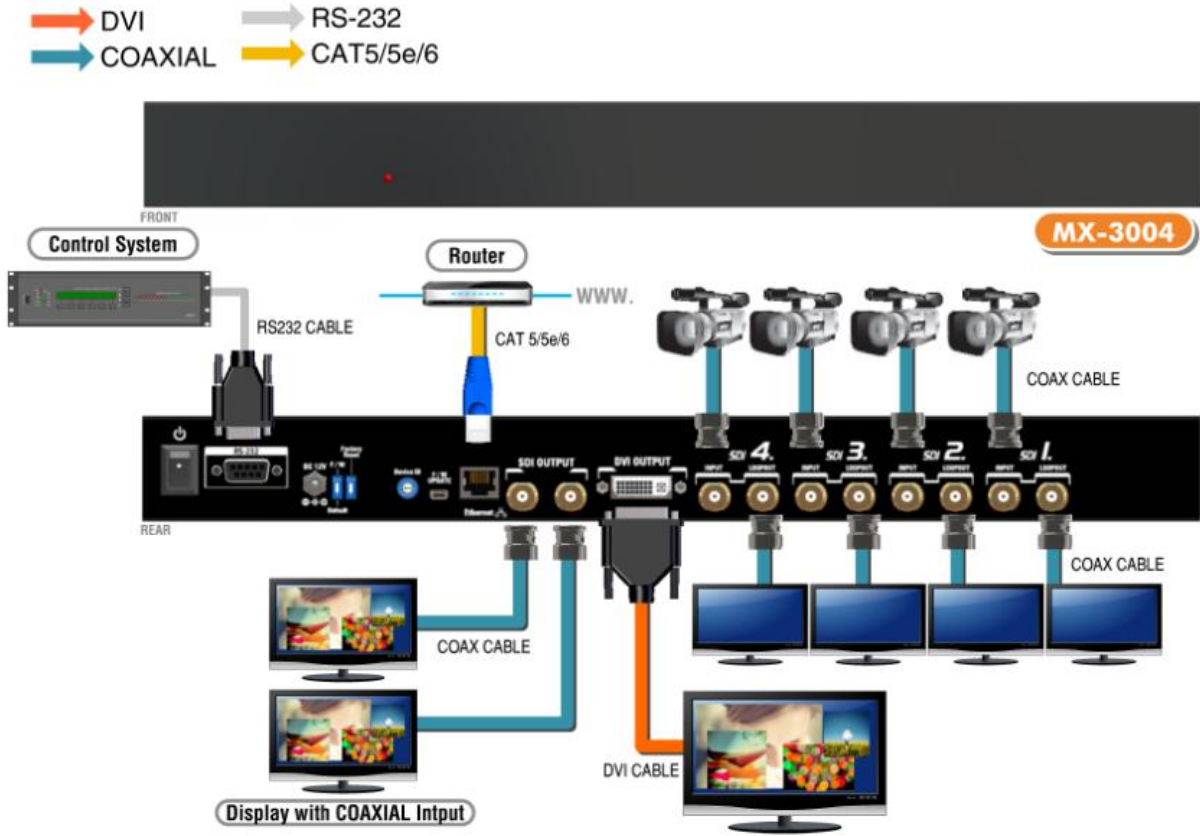
*\*Default: Turn on the MX-3004 then switch the circled DIP switch simultaneously up and down to factory default mode.*

*\*These IO ports support various resolutions from 480i up to 1920x1080p, for more details of the supported modes, please refer to the Appendix – Supported Resolution.*

**TABLE 1: I/O CONNECTORS**

Input Connector	Video Source
DVI-x [x = 1~4]	[1] SDI: SD/HD/3G
Output Connector	Display
DVI-I OUT	[1] DVI display
	[2] SDI*2 display

# APPLICATION DIAGRA



# HARDWARE INSTALLATION

## Safety Precautions

1. To prevent fire or shock hazards, do not expose this device to rain or moisture.
2. 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.
3. Do not use immediately after moving from a low temperature to high temperature, as this causes condensation.
4. 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.
5. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
6. 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-3004 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-3004.

### Connections

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

1. Switch off the MX-3004 and all devices that you want to connect.
2. Connect a monitor, a projector or other displays that comes with DVI / SDI inputs
3. Connect a device equipped with SDI output including SD/HD/3G to the BNC input connector of MX-3004.
4. Connect a device equipped with composite video output to the BNC input connector of the MX-3004.
5. Connect your computer with the MX-3004 by a 9-pin RS-232 cable and then install the software.
6. Plug in AD power cord into AC power socket.
7. Execute the control software and establish the connection between PC/Laptop and MX-3004.
8. For detailed software control operation, please refer to the software instruction section.

## System Requirement and Precautions

1. The device provides a software control program, Quartet, which runs under Microsoft Windows 98, 2000, XP, Vista, 7 through the interface of RS-232 serial control.
2. Before you click the icon of the software, make sure you have secured the connection between your computer COM port and the device and switched on the device with green LED light.

Support Software: V1.4

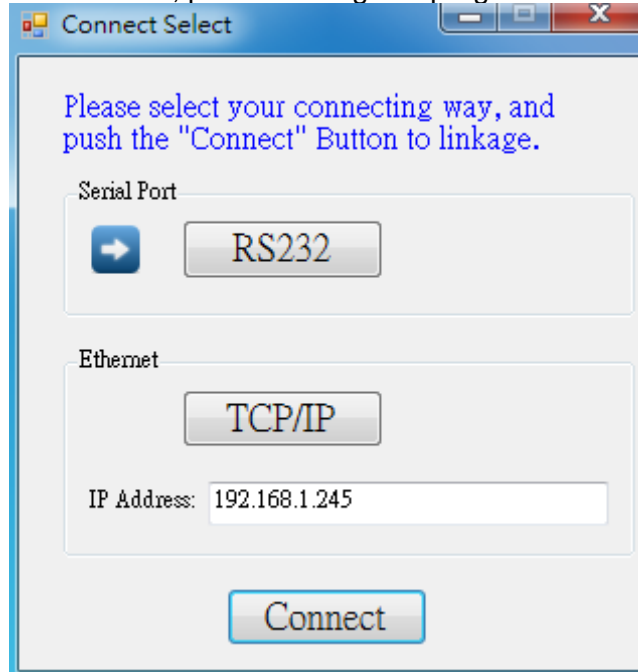
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Support Firmware: V1.7

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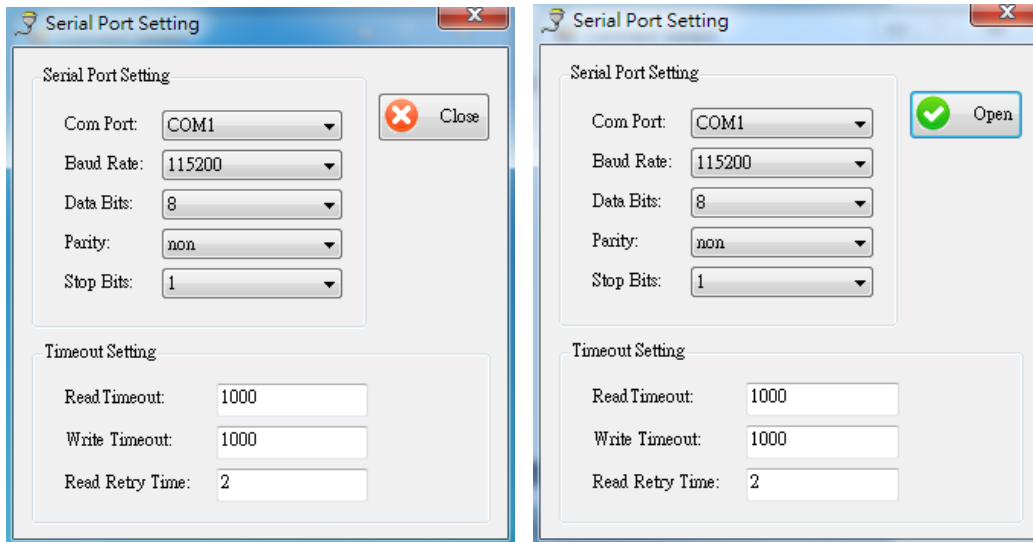
### Start the Operation Software

When you click the .exe file, the below dialog will pop-up. You can use two ways to control device RS232 and TCP/IP (under Microsoft Windows 7, please setting this program as an administrator).



RS232 Mode: Push “RS232” button, the below dialog will pop-up. Select correct Com port. Click the button to open the “Com Port” like right picture, then closing the dialog. If your setting is correct and the device is ready. It will enter directly to control dialog.

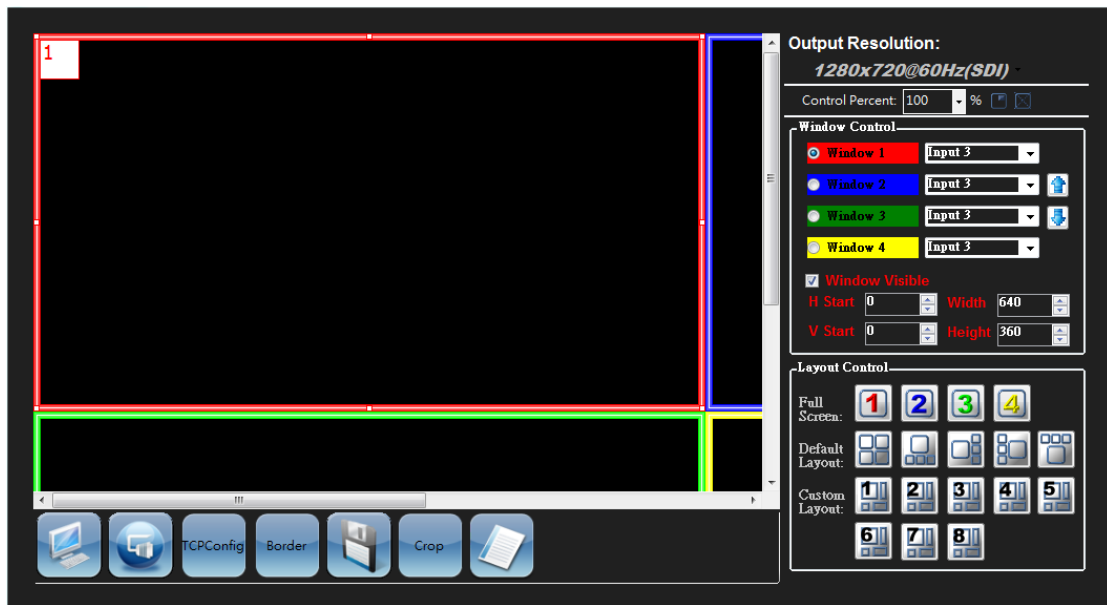




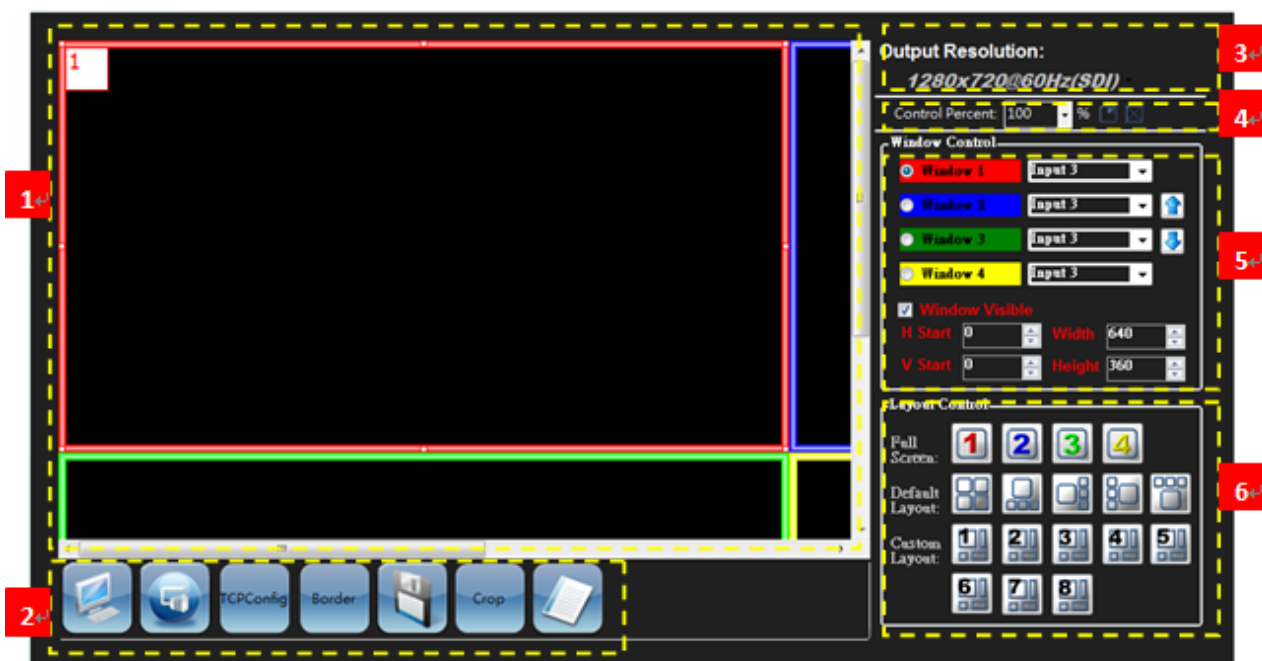
TCP/IP Mode: Enter the device IP address and click the "Connect" Button. (How to set the IP address, please refer the part "TCPConfig" of "Tool Bar List").



After you select the connecting way to connect the device, it will be pop-up the window as below.






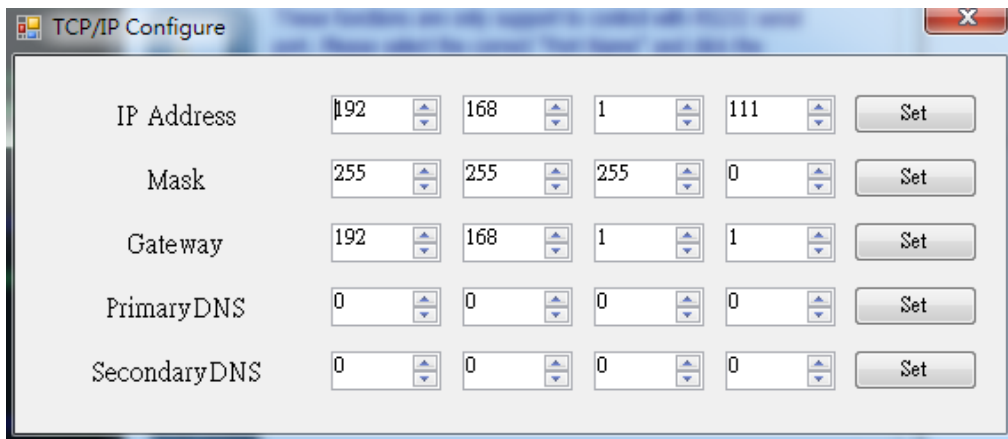
## Instruction of Software Connection (connect with RS232)



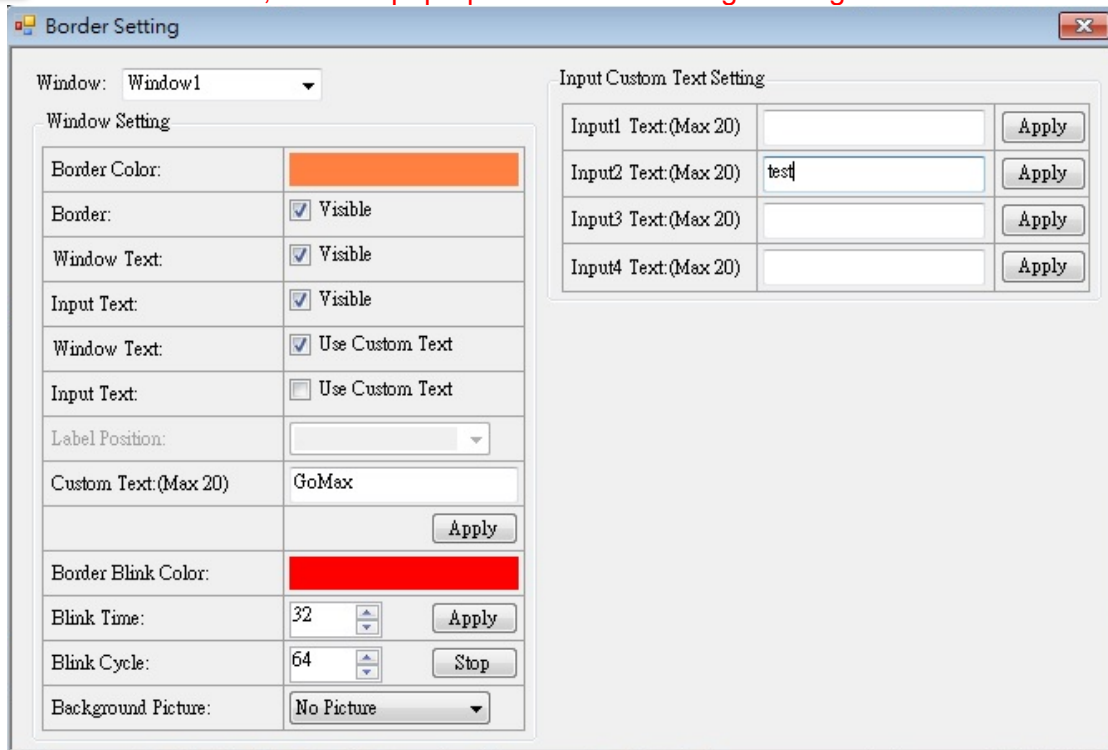
1. PAP Panel: Display and adjust the window size and position.
2. Tool Bar List:



- (1) : Get all information of the device and update this software state.
- (2) : Port setting: Pop-up the "Connect Select" dialog, **user can select the connecting way.**
- (3) : TCP configure setting, **we are recommend you to set with RS232.**

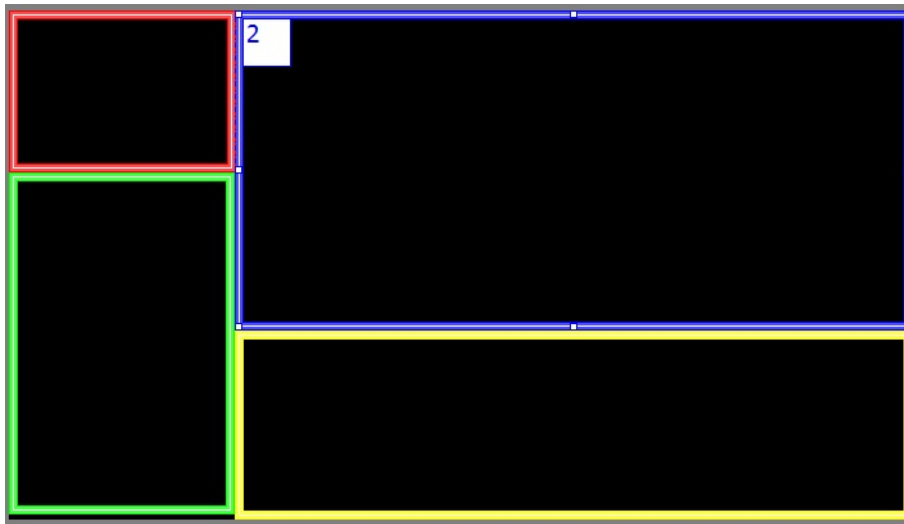


(4) : Click this button, it will be pop-up the “Border Setting” management interface.

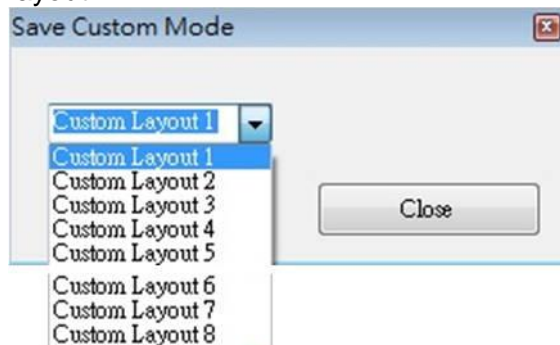


- **Window drop-down list:** Setting for window 1~4.
- **Window Setting**
  - Border Color: Change the border color of window which you want.
  - Border: Display the border or not.
  - Window Text: Display the window text or not.
  - Input Text: Display the input text or not.
  - Window Text: Reveal the windows text which you are setting in the custom text.
  - Input Text: Reveal the input text which you are setting in the input custom text.
  - Custom Text (Max 20): To set up the window text which you want to reveal in the window. Please take a closer look at the length of string (Max 20).
  - Border Blink Color: Change the color of the window border which you want to blink.
  - Blink Time: Setting the blink time of border blink.
  - Blink Cycle: Setting the blink cycle of border blink. If you want to stop the border blink, you can click the stop button.
  - Background Picture: To set up the background picture of window.
- **Input Custom Text Setting:** Setting the input text which you want to show in the window. Please take a closer look at the length of string (Max 20).

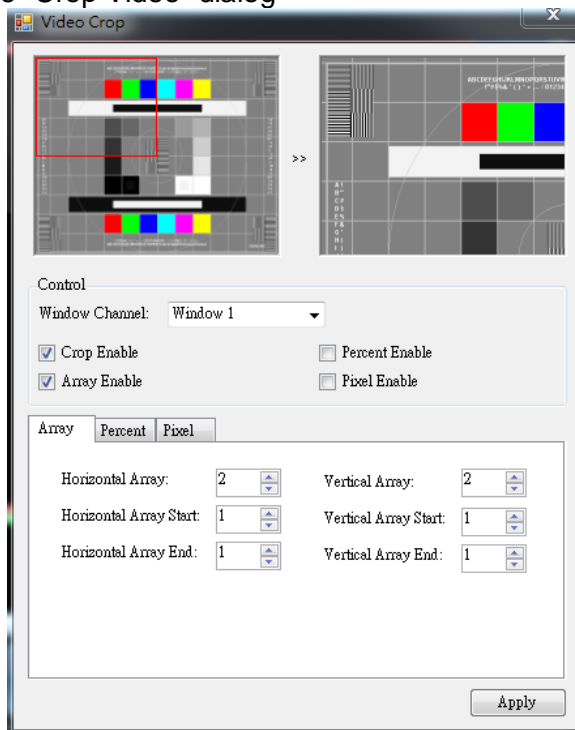
(5)  : Pop-up the “Save Custom Mode” dialog.



User can adjust the window size and position, and basing on the user setting, they can save the different PAP mode in custom layout.



(6) Crop Function: Pop-up the “Crop Video” dialog



Picture Box: It is preview the range and effect of video crop with the adjustment.

Window Channel: Choose the window to crop the video.

Crop Enable: Enable crop function

Array Enable: Enable array parameter.

Percent Enable: Enable percent parameter.

Pixel Enable: Enable pixel parameter

Array Tab:

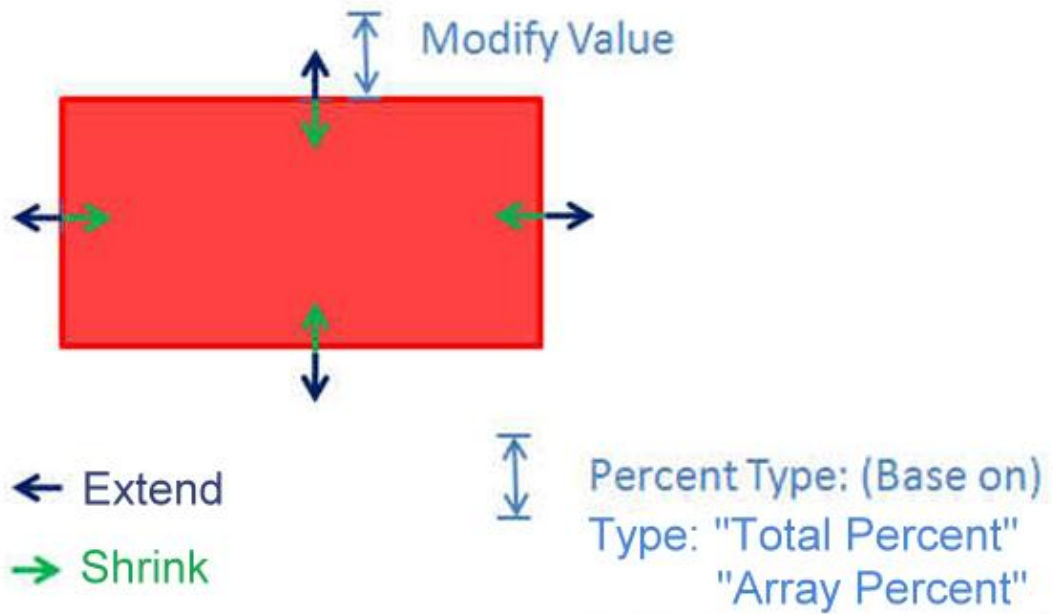
Array	Percent	Pixel	
Horizontal Array:	2	Vertical Array:	2
Horizontal Array Start:	1	Vertical Array Start:	1
Horizontal Array End:	1	Vertical Array End:	1



Horizontal Array Total = 3  
 Horizontal Array Start = 1  
 Horizontal Array End = 2  
 Vertical Array Total = 3  
 Vertical Array Start = 1  
 Vertical Array End = 2

**Percent Tab:**

Array	Percent	Pixel	
Type:	<input checked="" type="radio"/> Total Percent	<input type="radio"/> Array Percent	
Top:	<input checked="" type="radio"/> Shrink	<input type="radio"/> Extend	10
Bottom:	<input checked="" type="radio"/> Shrink	<input type="radio"/> Extend	10
Left:	<input checked="" type="radio"/> Shrink	<input type="radio"/> Extend	0
Right:	<input checked="" type="radio"/> Shrink	<input type="radio"/> Extend	0



Pixel Tab:

	Array	Percent	Pixel		
Top:	<input checked="" type="radio"/>	Shrink	<input type="radio"/>	Extend	0
Bottom	<input checked="" type="radio"/>	Shrink	<input type="radio"/>	Extend	0
Left	<input checked="" type="radio"/>	Shrink	<input type="radio"/>	Extend	0
Right	<input checked="" type="radio"/>	Shrink	<input type="radio"/>	Extend	0

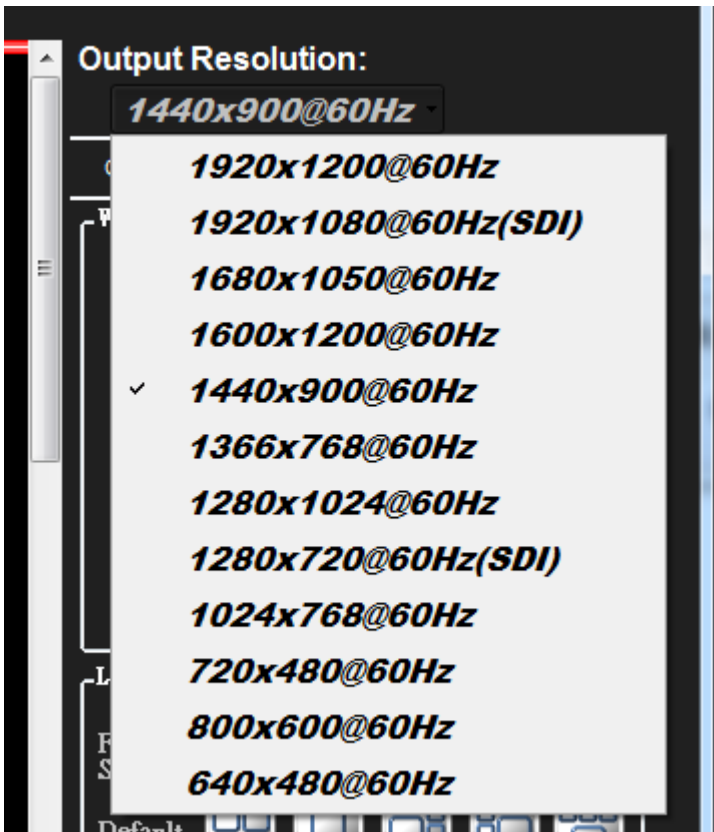
"Pixel" and "Percent" crop are almost same. It is different from modify value.



(7) : Version, click this button to show version information.



3. Output Resolution: Set the output resolution. When set the different resolution, the parameters of PAP and custom layout (position and size) will change.

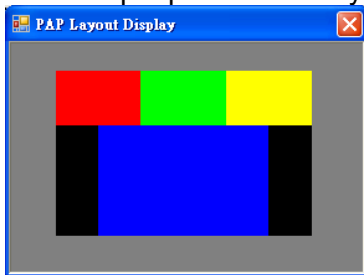



4. Control Bar: For PAP Panel Setting.




(1) Control Percent: 10~100% to set the PAP Panel display/control size.


(2)  : Pop-Up the “PAP Layout Display” Dialog




(3)  : Fix the size ratio when the window is resizing.


5. PAP Mode Control / Input Selection

(1) Major Window:  The major window for set the visible, position, size, polarity and default layout.

(2) Input Selection:  Set the window image is which input signal.

(3) Window Polarity:  Set the major window layer polarity in “PAP Mode”.


(4) Window Visible:  Set the window visible in “PAP Mode”.


(5) Window Position and Size:  Set the window position and size in “PAP Mode”.


6. Full Screen / PAP Mode

(1) Full Screen: Set the major window to full Screen.

 Set Window 1 Full Screen

 Set Window 2 Full Screen

 Set Window 3 Full Screen

 Set Window 4 Full Screen

(2) PAP Mode: Set to last PAP layout.

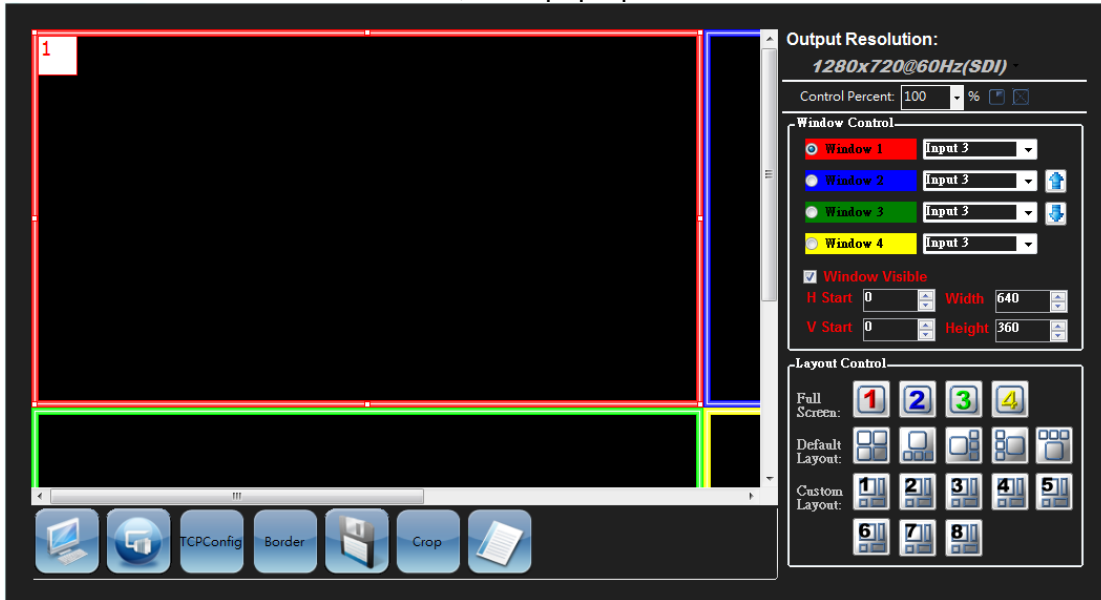
- Default Layout:  Set the default position and size with icon picture. The “major window” will be the largest size in the icon.

- Custom Layout:  Set the custom layout by customize saving with “Tool Bar List” .

## Instruction of Software Connection (connect with TCP/IP)

Please take a closer look at the TCP/IP connection. After setting, user should reboot the device, or it will connect failed.

If the connect of TCP/IP is succeed, it will pop-up the window as below.



## Group Control

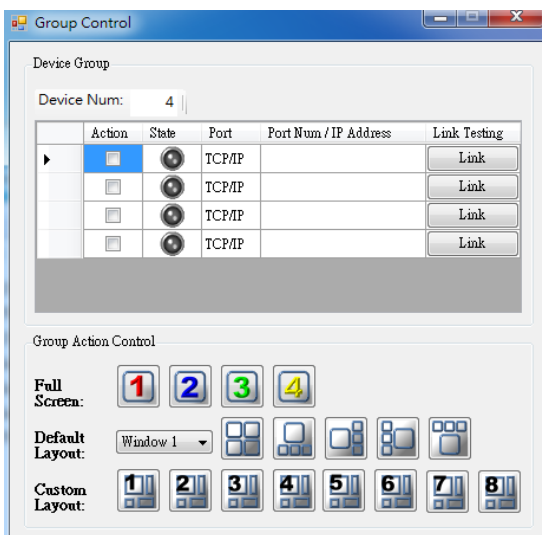
Action: The checked devices will action when you click the button in the “Group Action Control”

State: The device is under control or not.

“Port” or “Port Num / IP Address”:

You can click to set the “RS232” and “TCP” and it will display the state.

Link: Retry to link the device, When the device isn’t on control.

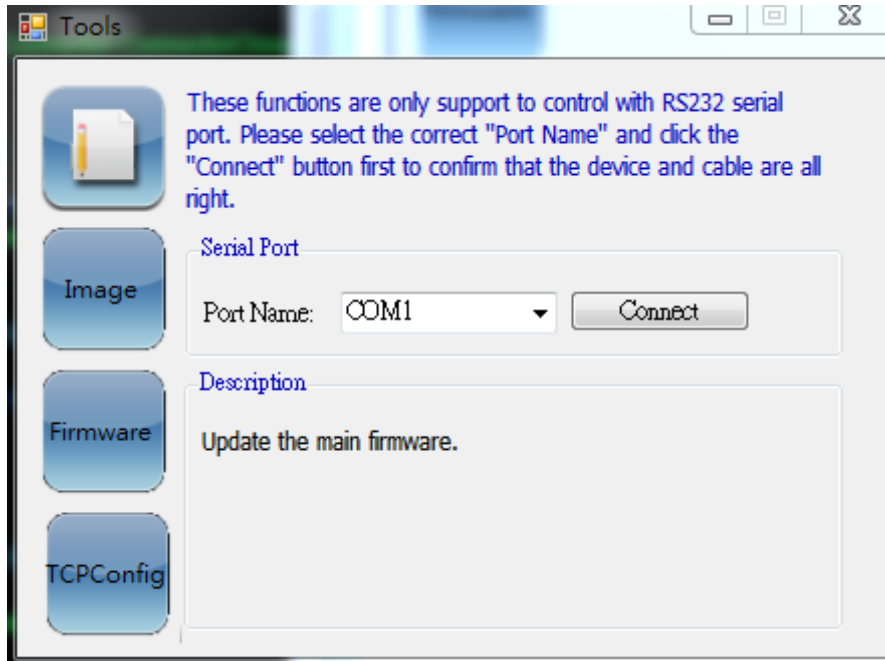




## Tool

It is especially different between connect with RS232 and TCP/IP.

Using TCP/IP connecting way, the function is limit to set up the flash setting, image update and firmware update. But the other function user can follow the instruction manual of the RS232



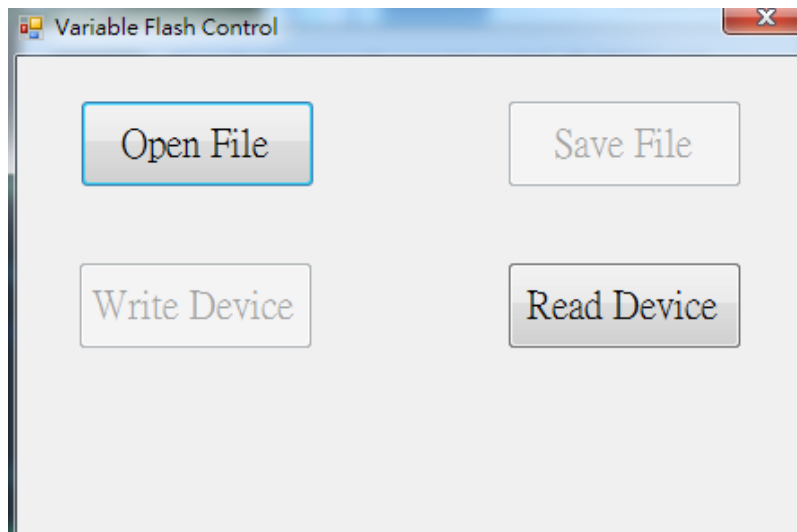
: Device flash Setting, it will pop-up the "Variable Flash Control" dialog.

**Step 1:** user can click the "Read Device" button to read this device information

**Step 2:** Save the device information to bin file.

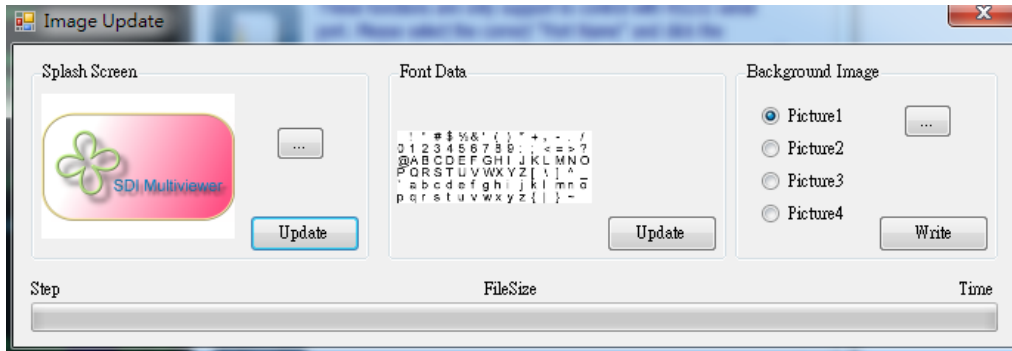
**Step 3:** If user have other device want to set the same mode, they can click the "Open File" button to open the bin file.

**Step 4:** Write the bin file to other device.





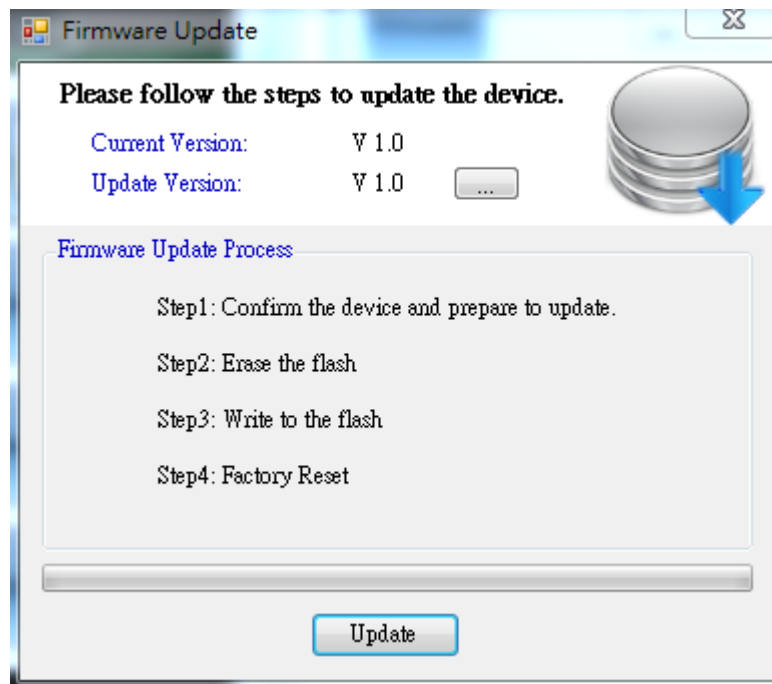
: Image updating, it shall be pop-up the “Image Update” dialog. User can set up the image information for this device.



- Splash Screen: change the startup screen for the software.
- Font Data: To set up the display font.
- Background Image: User can install the picture into the device.



: Firmware update, click this button, it shall be pop-up the “Firmware update” dialog. User can select this to update the firmware of the device.



# TROUBLE SHOOTING

Problem	Recommendations
<b>No power</b>	<ul style="list-style-type: none"><li>✓ Check if you correctly and firmly plug AC power core into MX-3004</li><li>✓ If you are recovering from power outage, accidentally unplug the power core or other power surge conditions, leave the device off for a while and then power it on again.</li></ul>
<b>No/ Erratic video</b>	<ul style="list-style-type: none"><li>✓ Make sure all cables are in good working condition and properly connected to the MX-3004 and displays.</li><li>✓ 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)</li><li>✓ Make sure video sources are accurately selected to the right channels.</li></ul>
<b>Poor quality</b>	<ul style="list-style-type: none"><li>✓ 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.</li><li>✓ Make sure the video source is not compressed and maintains the highest native resolution.</li></ul>
<b>Wrong color</b>	<ul style="list-style-type: none"><li>✓ Use color balance or auto configuration .</li></ul>

# LIMITED WARRANTY

The SELLER warrants the **MX-3004 3G/HD/SD-SDI Quad-view Video Processor** 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-3004 features and specifications is subject to change without further notice.**