101280 - BMV-4 Broadcast Multiviewer

User Manual

- Revision: V1.0

BMV-4·User Manual

Thank you for choosing our products!
In order to allow you to learn how to use the Video Processor quickly, we bring you the detailed user manual. You can read the introduction and directions before using the Video Processor, please read all the information we provide carefully to use our products correctly.

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Safe Operation Summary

The general safety information in this summary is for operating personnel.

Do Not Remove Covers or Panels

There are no user-serviceable parts within the unit. Removal of the top panel will expose dangerous voltages. To avoid personal injury, do not remove the top panel. Do not operate the unit without the panel installed.

Use the Proper Properly

This product is intended to operate from a power source that will not apply more than 230 volts rms between the supply conductors or between both supply conductor and ground. A protective ground connection by way of grounding conductor in the power cord is essential for safe operation.

Ground the Product Properly

This product is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before connecting to the product input or output terminals. A protective-ground connection by way of the grounding conductor in the power cord is essential for safe operation.

Use the Proper Power Cord

Use only the power cord and connector specified for your product. Use only a power cord that is in good condition. Refer cord and connector changes to qualified service personnel.

Use the Proper Fuse

To avoid fire hazard, use only the fuse having identical type, voltage rating, and current rating characteristics. Refer fuse replacement to qualified

service personnel.

Do Not Operate in Explosive Dangerous Atmospheres

To avoid explosion, do not operate this product in an explosive atmosphere.

Terms and Equipment Mark in This Manual

WARNING

Highlight an operating procedure, practice, condition, statement, etc, which, if not strictly observed, could result in injury or death of personnel.

Note

Highlights an essential operating procedure, condition or statement.

CAUTION

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Amendment Record

The table below lists the changes to the Video Processor User Manual.

Format	Time	ECO#	Description	Principal
1.0	2013-05-16	0000	Release	Vira

CONTENT

1. Brief Introduction

This chapter is designed to introduce you to the BMV-4 User Manual. It covers:

- Chapter Structure
- Manual Usage
- Terms and Definitions
- System Overview
- Application Questions

Chapter Structure

The following chapters provide instructions for all aspects of BMV-4 operations:

Manual Usage

Following are important tips for streamlining your use of this User Manual in its electronic “PDF” form.

Navigation

Use Acrobat Reader’s “bookmarks” to navigate to the desired location. All chapter files have the same bookmark structure for instant navigation to any section. Please note:

- Extensive hyperlinks are provided within the chapters。

- Use Acrobat’s “**Go to Previous View**” and “**Return to next View**” buttons to trace your complete navigational path.

- Use the “**Previous Page**” and “**Next Page**” buttons to go to the previous or next page within a file.
- Use Acrobat’s extensive search capabilities, such as the “**Find**” tool and “**Search Index**” tool to perform comprehensive searches as required.

Catalogue and Index

Use the Table of Contents bookmarks to navigate a desired topic. Click any item to instantly jump to that section of the guide. You can also use the **Index** to jump to specific topics within a chapter. Each page number in the **Index** is a hyperlink.

General Operations

To ensure trouble-free operation, please follow all procedures as listed below:

- For detailed installation instructions, refer to chapter 3 “Hardware Installation” on page 36.
- For system setup and operations, refer to Chapter 5, “System Setup and Operations” on page 43.

Should you have any questions regarding the installation or operation of BMV-4, please consult with the factory. Refer to Appendix B, “Contact information” on page 66 for contact information.

Terms and Definitions

The following terms and definitions are used throughout this guide;

- **“ASCII”:** American Standard for Information Interchange. The standard code consisting of 7-bit coded characters (8 bits including parity check) used to exchange information between data processing systems, data communication systems, and associated equipment. The ASCII set contains control characters and graphic characters.

- **“Aspect ratio”:** The relationship of the horizontal dimension to the vertical dimension of an image. In viewing screens, standard TV is 4:3, or 1.33:1; HDTV is 16:9, or 1.78:1. Sometimes the “:1” is implicit, making TV = 1.33 and HDTV = 1.78.

- **“AV”:** Audio visual or audio video.

- A **“Background”** is an unscaled source, typically originating from a computer. A background source appears at the system’s lowest priority — visually in back of all other sources.

- **“Baudrate”：** Named of J.M.E. Baudot, the inventor of the Baudot telegraph code. The number of the electrical oscillations per second, called baud rate. Related to, but not the same as, transfer rate in bits per second (bps).

- **“Blackburst”:** The video waveform without the video elements. It includes the vertical sync, horizontal sync, and the chroma burst information. Blackburst is used to synchronize video equipment to align the video output. One signal is normally used to set up an entire video system or facility. Sometimes it is called House sync.

- **“BNC”:** Bayonet Neill-Concel man. A cable connector used extensively in television and named for its inventors. A cylindrical bayonet connector that operates with a twist-locking motion. To make the connection, align the two curved grooves in the collar of the male connector with the two projections on the outside of the female collar, push, and twist. This allows the connector to lock into place without tools.

- **“Brightness”:** Usually refers to the amount or intensity of video light produced on a screen without regard to color. Sometimes called “black level.

- “**CAT 5**”**:** Category 5. Describes the network cabling standard that consists of four unshielded twisted pairs of copper wire terminated by RJ-45 connectors. CAT 5 cabling supports data rates up to 100 Mbps. CAT 5 is based on the EIA/TIA 568 Commercial Building Telecommunications Wiring Standard.

- **“Color bars”:** A standard test pattern of several basic colors (white, yellow, cyan, green, magenta, red, blue, and black) as a reference for system alignment and testing. In NTSC video, the most commonly used color bars are the SMPTE standard color bars. In PAL video, the most commonly used color bars are eight full field bars. In the

computer, the most commonly used color bars are two rows of reversed color bars.

- **“Color burst”:** In color TV systems, a burst of sub-carrier frequency located on the back porch of the composite video signal. This serves as a color synchronizing signal to establish a frequency and phase reference for the chrome signal. Color burst is 3.58 MHz for NTSC and 4.43 MHz for PAL.

- **“Color temperature”:** The color quality, expressed in degrees Kelvin (K), of a light source. The higher the color temperature, the bluer the light. The lower the temperature, the redder the light. Benchmark color temperature for the A/V industry includes 5000°K, 6500°K, and 9000°K.

- **“Contrast ratio”:** The radio of the high light output level divided by the low light output level. In theory, the contrast radio of the television system should be at least 100:1, if not 300:1. In reality, there are several limitations. In the CRT, light from adjacent elements contaminate the area of each element. Room ambient light will contaminate the light emitted from the CRT. Well-controlled viewing conditions should yield a practical contrast ratio of 30:1 to 50:1.

- **“DVI”:** Digital Visual Interface. The digital video connectivity standard that was developed by DDWG (Digital Display Work Group). This connection standard offers two different connectors: one with 24 pins that handles digital video signals only, and one with 29 pins that handles both digital and analog video.

- **“EDID”:** Extended Display Identification Data – EDID is a data structure used to communicate video display information, including native resolution and vertical interval refresh rate requirements, to a source device. The source device will then output the optimal video format for the display based on the provided EDID data, ensuring proper video image quality. This communication takes place over the DDC – Display Data Channel.

- **“Ethernet”:** A Local Area Network (LAN) standard officially known as IEEE 802.3. Ethernet and other LAN technologies are used for interconnecting computers, printers, workstations, terminals, servers, etc. within the same building or campus. Ethernet operates over twisted pair and over coaxial cable at speeds starting at 10Mbps. For LAN interconnectivity, Ethernet is physical link and data link protocol reflecting the two lowest layers of the OSI Reference Model.

- **“Frame”:** In interlaced video, a frame is one complete picture. A video frame is made up of two fields, or two sets of interlaced lines. In a film, a frame is one still picture of a series that makes up a motion picture.

- **“Gamma”:** The light output of a CRT is not linear with respect to the voltage input. The difference between what you should have and what is actually output is known as gamma.

- **“HDMI” - High – Definition Multimedia Interface:** An interface used primarily in consumer electronics for the transmission of

uncompressed high definition video, up to 8 channels of audio, and control signals, over a single cable. HDMI is the de facto standard for HDTV displays, Blu-ray Disc players, and other HDTV electronics. Introduced in 2003, the HDMI specification has gone through several revisions.

- **"HDSDI":** The high-definition version of SDI specified in SMPTE-292M. This signal standard transmits audio and video with 10 bit depth and 4:2:2 color quantization over a single coaxial cable with a data rate of 1.485 Gbit/second. Multiple video resolutions exist including progressive 1280x720 and interlaced 1920x1080 resolutions. Up to 32 audio signals are carried in the ancillary data.

- **"JPEG" (Joint photographic Expects Group):** Commonly used method of lost compression for photographic images using a discreet cosine transfer function. The degree of compression can be adjusted, allowing a selectable tradeoff between storage size and image quality. JPEG typically achieves 10:1 compression with little perceptible loss in image quality. Produces blocking artifacts.

- **"MPEG":** Motion Picture Expect Group. A standard committee under the auspices of the International Standards Organization working on algorithm standards that allow digital compression, storage and transmission of moving image information such as motion video, CD-quality audio, and control data at CD-ROM bandwidth. The MPEG algorithm provides inter-frame compression of video images and can have an effective compression rate of 100:1 to 200:1.

- **"NTSC":** The color video standard used in North America and some other parts of the world created by the National Television Standards Committee in the 1950s. A color signal must be compatible with black-and-white TV sets. NTSC utilizes an interlaced video signals, 525 lines of resolution with a refresh rate of 60 fields per second (60 Hz). Each frame is comprised of two fields of 262.5 lines each, running at an effective rate of 30 frames per second.

- **"PAL":** Phase Alternate Line. A television standard in which the phase of the color carrier is alternated from line to line. It takes four full pictures (8 fields) for the color-to-horizontal phase relationship to return to the reference point. This alternation helps cancel out phase errors. For this reason, the hue control is not needed on a PAL TV set. PAL, in many transmission forms, is widely used in Western Europe, Australia, Africa, the Middle East, and Micronesia. PAL uses 625-line, 50-filed (25 fps) composite color transmission system.

- **"Operator":** Refers to the person who uses the system.

- **"PIP":** Picture-in-Picture. A small picture within a larger picture created by scaling down one of the images to make it smaller. Each picture requires a separate video source such as a camera, VCR, or computer. Other forms of PIP displays include Picture-by-Picture (PBP) and Picture-with-Picture (PWP), which are commonly used with 16:9 aspect display devices. PBP and PWP image formats require a

separate scaler for each video window.

- **“Polarity”:** The positive and negative orientation of a signal. Polarity usually refers to the direction or a level with respect to a reference (e.g. positive sync polarity means that sync occurs when the signal is going in the positive direction).

- **“RJ-45”:** Registered Jack-45. A connector similar to a telephone connector that holds up to eight wires used for connecting Ethernet devices.

- “**RS-232”:** An Electronic Industries Association (EIA) serial digital interface standard specifying the characteristics of the communication path between two devices using either DB-9 or DB-25 connectors. This standard is used for relatively short-range communication and does not specify balanced control lines. RS-232 is a serial control standard with a set number of conductors, data rate, word length, and type of connector to be used. The standard specifies component connection standards with regard to the computer interface. It is also called RS-232-C, which is the third version of the RS-232 standard, and is functionally identical to the CCITT V.24 standard.
- **“Saturation”:** Chroma, chroma gain. The intensity of the color, or the extent to which a given color in any image is free from white. The less white in a color, the truer the color or the greater its saturation. On a display device, the color control adjusts the saturation. Not to be confused with the brightness, saturation is the amount of pigment in a color, and not the intensity. Low saturation is like adding white to the color. For example, a low-saturated red looks pink.

- **“Scaling”:** A conversion of a video or computer graphic signal from a starting resolution to a new resolution. Scaling from one resolution to another is typically done to optimize the signal for input to an image processor, transmission path or to improve its quality when presented on a particular display.

- **“SDI”:** Serial Digital Interface. The standard based on a 270 Mbps transfer rate. This is a 10-bit, scrambled, polarity independent interface with common scrambling for both component ITU-R 601 and composite digital video and four channels of (embedded) digital audio.

- **“Seamless Switching”:** A feature found on many Extron video switchers. This feature causes the switcher to wait until the vertical interval to switch. This avoids a glitch (temporary scrambling) which

normally is seen when switching between sources.

- **"SMPTE":** Society of Motion Picture and Television Engineers. A global organization, based in the United States that sets standards for base band visual communications. This includes film as well as video and television standards.

- **"S-video":** A composite video signal separated into the luma ("Y" is for luma, or black and white information; brightness) and the chroma ("C" is an abbreviation for chroma, or color information).

- **"Sync":** Synchronization. In video, sync is a means of controlling the timing of an event with respect to other events. This is accomplished with timing pulses to insure that each step in a process occurs at the correct time. For example, horizontal sync determines exactly when to begin each horizontal scan line. Vertical sync determines when the image is to be refreshed to start a new field or frame. There are many other types of sync in video system.(Also known as "sync signal" or "sync pulse.")

- **"TCP/IP":** Transmission Control Protocol/Internet Protocol. The communication protocol of the Internet. Computers and devices with direct access to the Internet are provided with a copy of the TCP/IP program to allow them to send and receive information in an understandable form.

- **"USB":** Universal Serial Bus. USB was developed by seven PC and telecom industry leaders (Compaq, DEC, IBM, Intel, Microsoft, NEC, and Northern Telecom). The goal was easy plug-and-play expansion outside the box, requiring no additional circuit cards. Up to 127 external computer devices may be added through a USB hub, which may be conveniently located in a keyboard or monitor. USB devices can be attached or detached without removing computer power. The number of devices being designed for USB continues to grow, from keyboards, mice, and printers to scanners, digital cameras, and ZIP drives.

- **"VESA":** Video Electronics Standards Association. A nonprofit number organization dedicated to facilitating and promoting personal computer graphics through improved standards for the benefit of the end-user. www.vesa.org.

- **"VGA":** Video Graphics Array. Introduced by IBM in 1987, VGA is an

analog signal with TTL level separate horizontal and vertical sync. The video outputs to a 15-pin HD connector and has a horizontal scan frequency of 31.5 kHz and vertical frequency of 70 Hz (Mode 1, 2) and 60 Hz (Mode 3). The signal is non-interlaced in modes 1, 2, and 3 and interlaced when using the 8514/A card (35.5 kHz, 86 Hz) in mode 4. It has a pixel by line resolution of 640×480 with a color palette of 16 bits and 256,000 colors.

- **"YCrCb":** Used to describe the color space for interlaced component video.

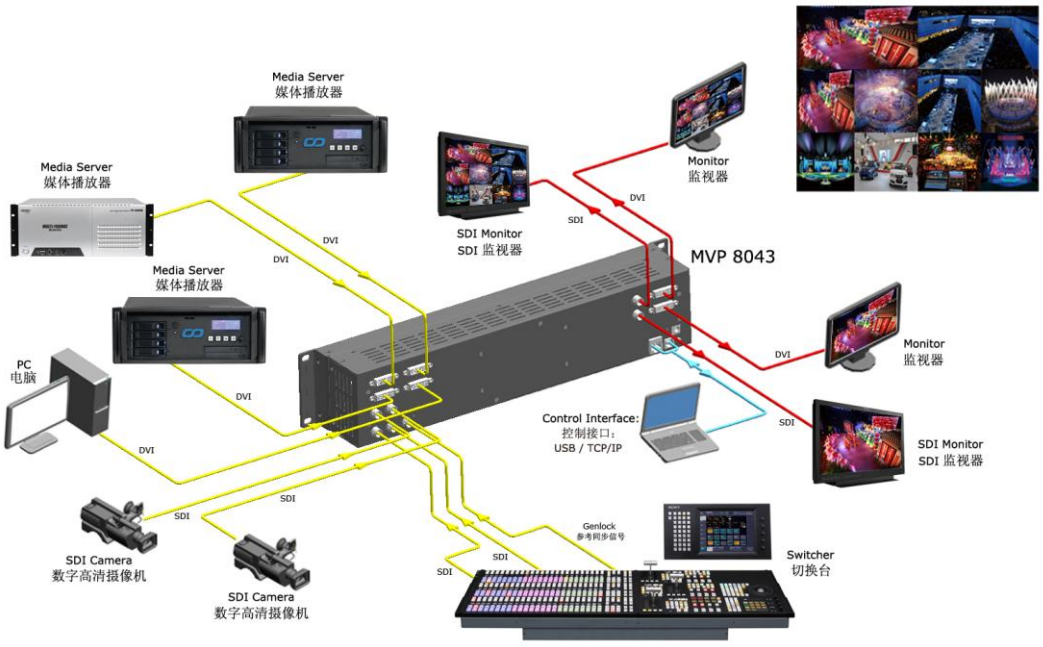
- **"YPbPr":** Used to describe the color space for progressive-scan (non-interlaced) component video.

System Overview

BMV-4 is a pure-hardware professional multi-screen video wall controller, which is capable of showing and displaying multi-dynamic pictures on multi-screens to realize the function of splicing multi-windows. It supports signal input, including SDI (SD/HD-SDI, 3G-SDI), high-definition digital signal (HDMI or high resolution DVI signal). Single output channel supports maximum resolution 2560×816@60Hz. It is specially designed for the needs for displaying multi-pictures with high quality, especially suitable for flexibly controlling various types of screens and resolutions. BMV-4 is ideal for the application in command centers, video conference, and multi-media hall.

Application Questions

DMT offers solutions to demand technical problems. Any application questions, or required further information, please contact with our Customer Support Engineers. Refer to Appendix B for contact details.



2. Hardware Orientation

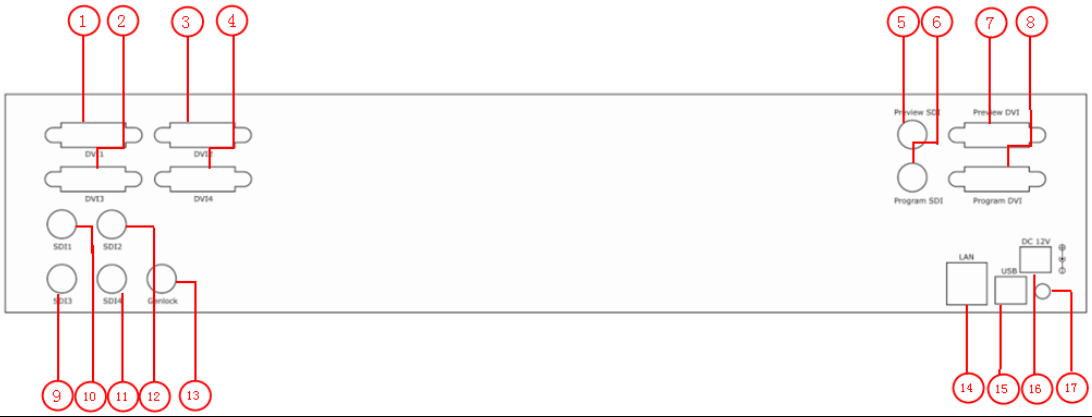
In This Chapter

This chapter provides detailed information about the BMV-4 hardware. The following topics are discussed:

- BMV-4 Back Panel
- BMV-4 Front Panel

BMV-4 Back Panel

The figure below illustrates the professional interface and control signals of BMV-4 back panel.



NO.	INTERFACE	NO.	INTERFACE
1~4	DVI Input	13	Genlock Input
5	Preview SDI Output	14	10/100M Interface RJ45
6	Program SDI Output	15	USB Interface
7	Preview DVI Output	16	Power
8	Program DVI Output	17	Upgrade Button
9~12	SDI Input		

CONT Interface

14：10/100M Interface

15：USB Interface

Used to device upgrade.

17：Upgrade Button

Connect USB cable and power, press the button to upgrade process.

INPUT Interface

It includes 4 DVI inputs (DVI-I interface compatible with the HDMI input) , 4 SDI inputs, and 1 Genlock Input.

2. Hardware Orientation

BMV-4 Back Panel

1~4：DVI Input

DVI 1/2/3/4 input. Input the video signal from HD player, DVD, and computer. Connect to the same DVI interface on BMV-4.

（This Connection does not support hot-plugging）

Note

DVI-I is compatible with HDMI.

9~12：SDI Input

SDI input, can receive video signal from HD player, and HD camera. Connect interface 16 via 75 ohms BNC port., and connect LED screens via network cable.

13：Genlock Input

Genlock input, can receive video signal from controller or signal generator, etc.

OUTPUT Interface

5：Preview SDI Output

Preview SDI output, output can be programmed as preview output, connect to the display with SDI interface.

Support resolution: 1280x720@50Hz, 1280x720@60Hz, 1920x1080@24, 1920x1080@25, 1920x1080@30.

6：Program SDI Output

Program SDI output, can connect with next displayer or send signal to LED through sending card. Output signal through SDI interface.

Support resolution: 720x480@60i, 720x576@50i, 800x600@60, 1024x768@60, 1280x720@23.98, 1280x720@24, 1280x720@25, 1280x720@29.97, 1280x720@30, 1280x720@50, 1280x720@59.94,

1280x720@60, 1280x768@60, 1280x800@60, 1280x1024@60, 1360x768@60, 1366x768@60, 1440x900@60, 1400x1050@60, 1600x1200@60, 1680x1050@60, 1920x1080@50i, 1920x1080@59.94i, 1920x1080@60i, 1920x1080@23.98, 1920x1080@24, 1920x1080@25, 1920x1080@29.97, 1920x1080@30, 1920x1080@50, 1920x1080@59.94, 1920x1080@60, 1920x1200@60, 2048x1152@60, 2560x816@60.

7：Preview DVI Output

Preview DVI output, output can be programmed as preview output, output DVI signal, connect to the display with DVI-I interface.

Note

DVI-I is compatible with HDMI.

Support resolution: 1280x720@50Hz, 1280x720@60Hz, 1920x1080@24, 1920x1080@25, 1920x1080@30.

8：Program DVI Output

Program DVI output, can connect with next displayer or send signal to LED through sending card. Output signal through DVI-I interface.

Note

DVI-I is compatible with HDMI.

Support resolution: 720x480@60i, 720x576@50i, 800x600@60, 1024x768@60, 1280x720@23.98, 1280x720@24, 1280x720@25, 1280x720@29.97, 1280x720@30, 1280x720@50, 1280x720@59.94, 1280x720@60, 1280x768@60, 1280x800@60, 1280x1024@60, 1360x768@60, 1366x768@60, 1440x900@60, 1400x1050@60, 1600x1200@60, 1680x1050@60, 1920x1080@50i, 1920x1080@59.94i, 1920x1080@60i, 1920x1080@23.98, 1920x1080@24, 1920x1080@25, 1920x1080@29.97, 1920x1080@30, 1920x1080@50, 1920x1080@59.94, 1920x1080@60, 1920x1200@60, 2048x1152@60, 2560x816@60.

Power

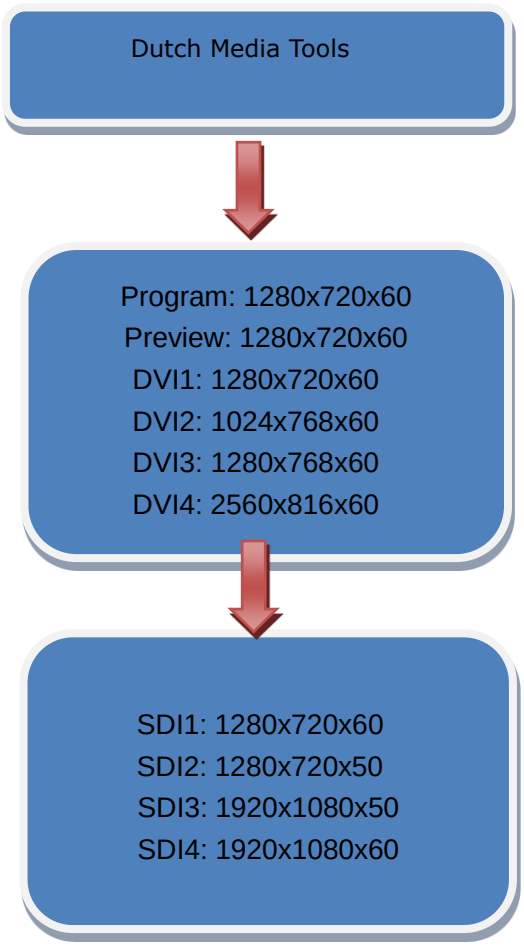
16：Power

This device use the standard 12V/3A power supply.

BMV-4 Front Panel

Insert power cord. LCD module on the front panel will show company information and go into self verification before it load last setting and send processed image to the target monitor. With front panel keyboard, user can operate BMV-4 through the menus on LCD panel.

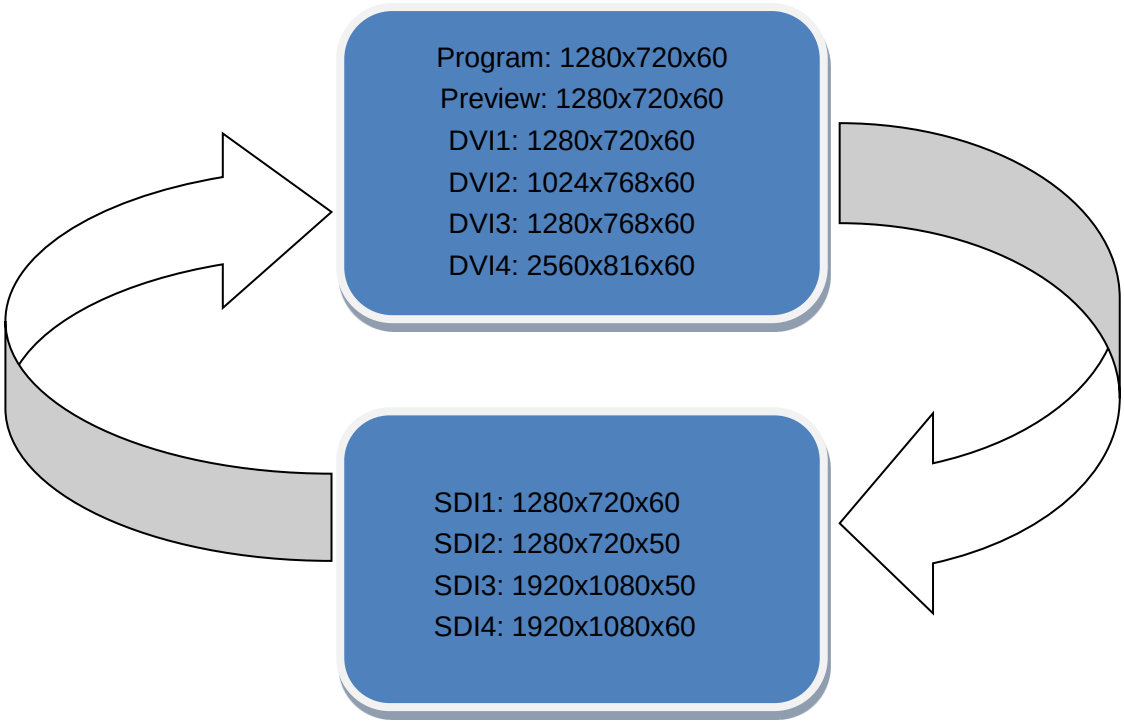
BMV-4 front panel shown as in figure:



2. Hardware Orientation

BMV-4 Front Panel

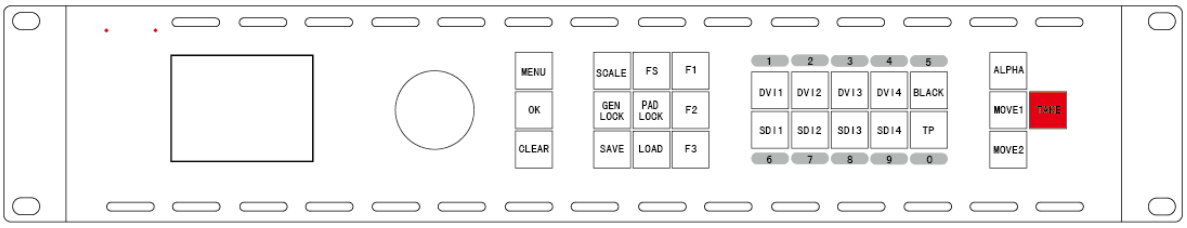
Then, system goes into the circulation statement. Cycle process displays the current input signal source and the current output format.



2. Hardware Orientation

BMV-4 Front Panel

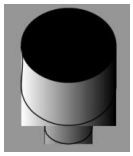
BMV-4 front panel is as following:



LCD Panel

Used to show button menu and menus for interactive communication.

Menu Button



Used to adjust LCD menu and information interaction and with the same function with Enter to confirm current options.

Signal Buttons

DVI1 input selection button, press it, its LED light blinks, then press TAKE button, program will be switched to this channel.

DVI2 input selection button, press it, its LED light blinks, then press TAKE button, program will be switched to this channel.

DVI3 input selection button, press it, its LED light blinks, then press TAKE button, program will be switched to this channel.

DVI4 input selection button, press it, its LED light blinks, then press TAKE button, program will be switched to this channel.

SDI1 input selection button, press it, its LED light blinks, then press TAKE button, program will be switched to this channel.

2. Hardware Orientation

BMV-4 Front Panel

SDI2 input selection button, press it, its LED light blinks, then press TAKE button, program will be switched to this channel.

SDI3 input selection button, press it, its LED light blinks, then press TAKE button, program will be switched to this channel.

SDI4 input selection button, press it, its LED light blinks, then press TAKE button, program will be switched to this channel.

Function Buttons

Scale size and position size setting. Press the button and goes from Hsize→Vsize→HPOS→VPOS to set Size value and position value.

Press the button to input reference from external switcher or device, output will be sync to the reference input timing.

Screen setting. Press the button, its LED light is on, user can switch the function on or off, and set screen width, height, posX and posY.

Key lock button, press the button, its LED light is on, all buttons are locked, and any operations are unavailable. Press it again to cancel this function.

Preview image full display button. Choose the preview image, and press the button, then the image will be full displayed.

Undefined currently.

2. Hardware Orientation

BMV-4 Front Panel

Crop setting, press the button, its LED light is on, rotate the knob to crop the current layer image, user can adjust the cropping position and size.

Press the button, its LED light blinks, then press TAKE button, Program or Preview will be black. Press BLACK again will cancel this function.

Test pattern, press the button, its LED light blinks, then press TAKE button, Program or Preview will be switched to test pattern. Press TP again will cancel this function.

Advanced menu: press the **MENU** to enter the main menu, the submenus: Device information, Factory Reset, Language and Alpha setting are all included. Rotate the knob to select the relevant submenu. For details please refer to MENU in menu orientation.

Effect switch button, press the button, its LED light blinks, then press TAKE button, Program and Preview will be effect switched.

Move effect shortcut key 1, user can set the move effect in MENU, then press the button, its LED light blinks, choose the signal to be switched, and press TAKE button to achieve move effect switching.

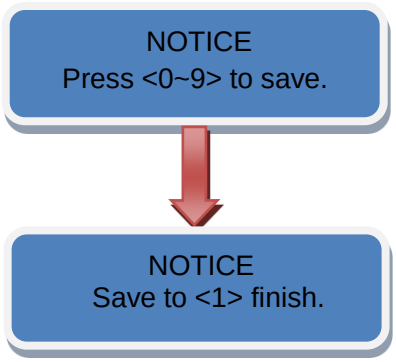
Move effect shortcut key 2, user can set the move effect in MENU, then press the button, its LED light blinks, choose the signal to be switched, and press TAKE button to achieve move effect switching.

Signal, Black, TP and Effect switch button, choose the signal and effect, and press TAKE button to get the switch.

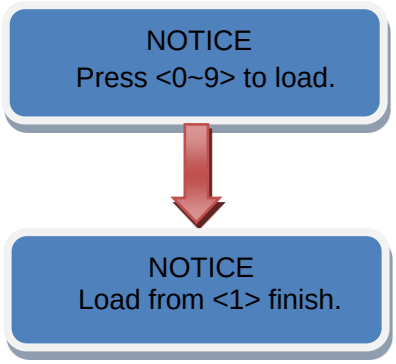
2. Hardware Orientation

BMV-4 Front Panel

Press the button to save user data. When the key lights on, together keys of DVI1, DVI2, DVI3, DVI4, SDI1, SDI2, SDI3, SDI4, BLACK, TP will light on, the corresponding numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 0 are the saving mode 1~10, select the number as the route to save the current user data, LCD screen will present the saving state. After saving, the chosen key keeps on, and all the other keys light off. For example, choose SAVE1:



Press the button to load the saved user data. When the key lights on, together keys of DVI1, DVI2, DVI3, DVI4, SDI1, SDI2, SDI3, SDI4, BLACK, TP will light on, the corresponding numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 0 are the saving mode 1~10 that can be loaded, select the wanted number. After loading, the chosen key keeps on, and all the other keys light off. For example, choose LOAD1:



Press the button to confirm the current choice item.

2. Hardware Orientation

BMV-4 Front Panel

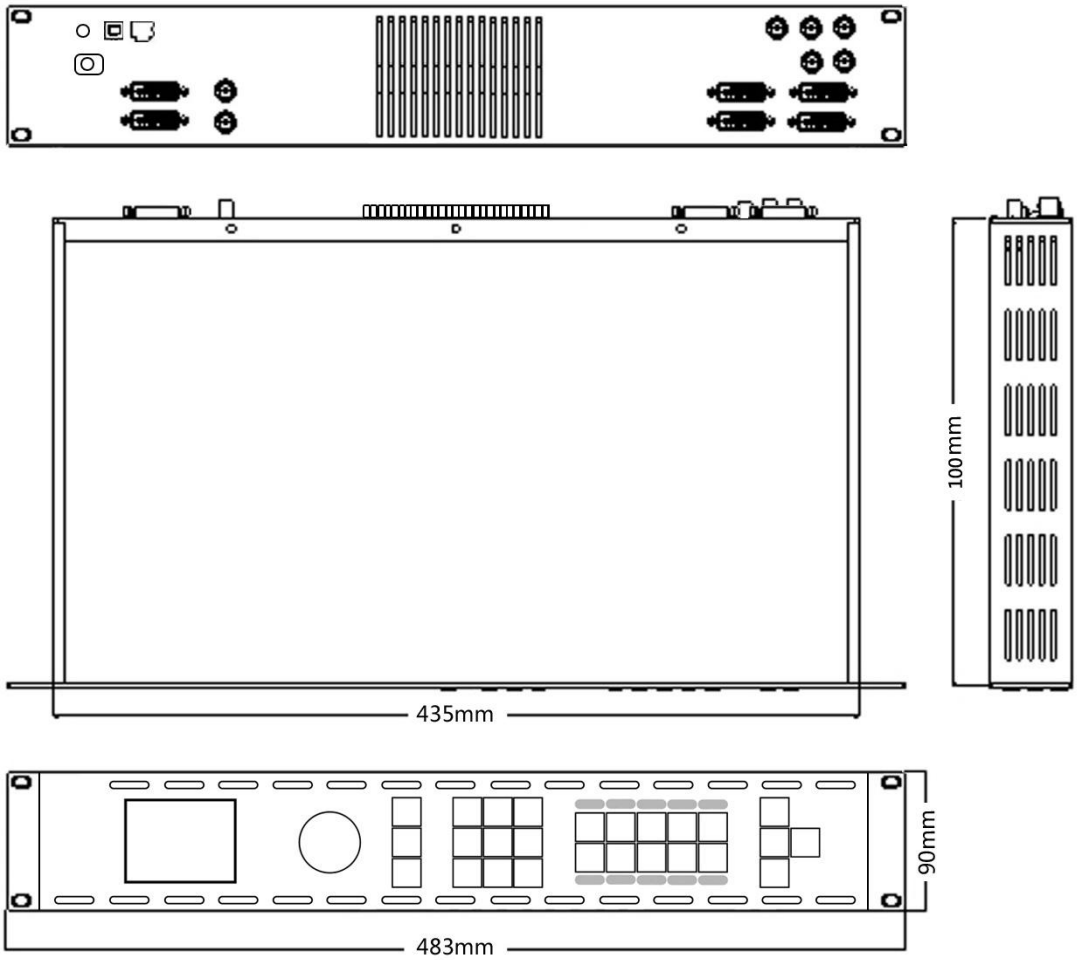
Digital clear button, press it can directly clear the setting value of SCALE, FS and F3, press the wanted number to set the needed value quickly, after setting, press OK to confirm.

3. Hardware Installation

In This Chapter

This chapter provides comprehensive installation instruction for BMV-4 hardware.

Following is the size of BMV-4 for your reference:



Safety Precautions

For all BMV-4 processor installation procedures, please observe the following important safety and handling rules to avoid damage to yourself and the equipment.

- To protect users from electric shock, ensure that the chassis connects to earth via the ground wire provided in the AC power Cord.
- The AC Socket-outlet should be installed near the equipment and be easily accessible.

Unpacking and Inspection

Before opening BMV-4 process shipping box, inspect it for damage. If you find any damage, notify the shipping carrier immediately for all claims adjustments. As you open the box, compare its contents against the packing slip. If you find any shortages, contact your sales representative.

Once you have removed all the components from their packaging and checked that all the listed components are present, visually inspect the system to ensure there was no damage during shipping. If there is damage, notify the shipping carrier immediately for all claims adjustments.

Site Preparation

The environment in which you install your BMV-4 should be clean, properly lit, free from static, and have adequate power, ventilation, and space for all components.

4. Menu Orientation

In This Chapter

This chapter describes all BMV-4 processor menus, including how they are accessed, the functions that are available, and descriptions of each menu tree (in block diagram format).

The following topics are discussed:

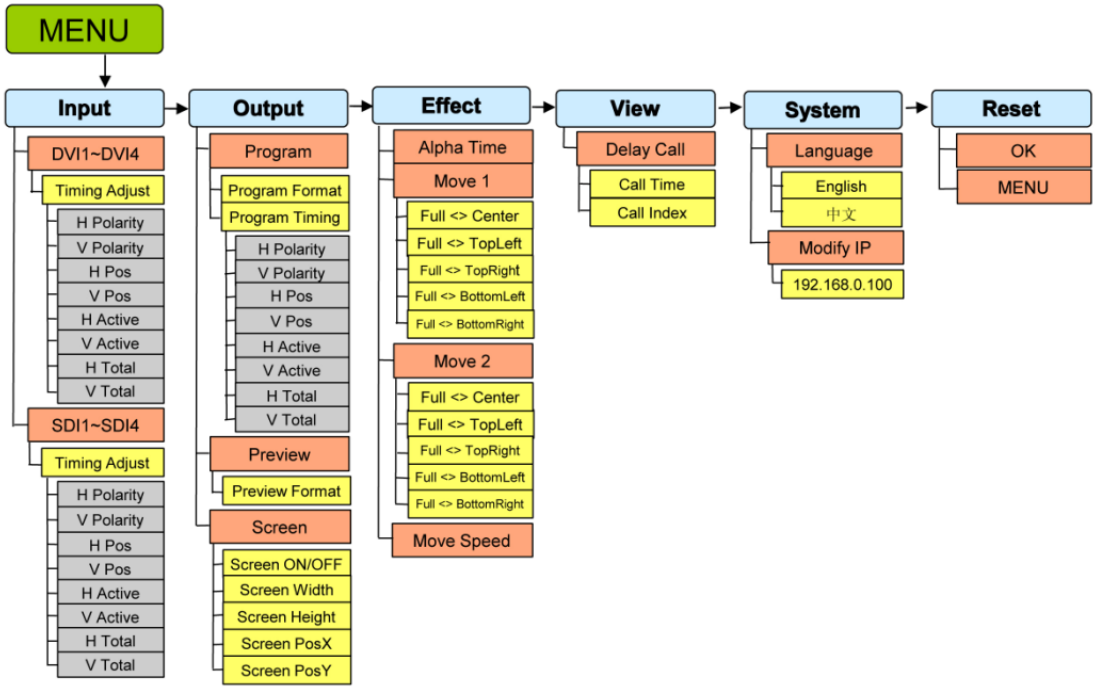
- **MENU**
  - Input
  - Output
  - Effect
  - View
  - System
  - Reset

4. Menu Orientation

MENU

MENU

Press the **MENU** to main menu, main menu as shown: rotate knob to select menu item and press knob to enter corresponding setting or view the menu.



MENU---Input

Select Input, press the knob to confirm, show level 2 menus as follows:

DVI1: Timing Adjust, including:

H Polarity: Horizontal polarity, can choose positive and negative.

V Polarity: Vertical polarity, can choose positive and negative.

H Pos: Horizontal phase setting.

V Pos: Vertical phase setting.

H Active: Line points in video signal timing sequence.

V Active: Field rows in video signal timing sequence.

H Total: Total line points in video signal timing sequence, including blank.

V Total: Total field rows in video signal timing sequence, including blank.

DVI2, **DVI3**, **DVI4**, **SDI1**, **SDI2**, **SDI3**, **SDI4** are same with DVI1.

4. Menu Orientation

MENU

MENU---Output

Select Output, press the knob to confirm, show level 2 menus as follows:

Program: Including Program Format and Program Timing.

Program Format: Mainly display the current output signal and output resolution.

User can choose different output formats by rotating the knob, this option includes 35 common output resolutions: 720x480@60i, 720x576@50i, 800x600@60, 1024x768@60, 1280x720@23.98, 1280x720@24, 1280x720@25, 1280x720@29.97, 1280x720@30, 1280x720@50, 1280x720@59.94, 1280x720@60, 1280x768@60, 1280x800@60, 1280x1024@60, 1360x768@60, 1366x768@60, 1440x900@60, 1400x1050@60, 1600x1200@60, 1680x1050@60, 1920x1080@50i, 1920x1080@59.94i, 1920x1080@60i, 1920x1080@23.98, 1920x1080@24, 1920x1080@25, 1920x1080@29.97, 1920x1080@30, 1920x1080@50, 1920x1080@59.94, 1920x1080@60, 1920x1200@60, 2048x1152@60, 2560x816@60.

Program Format: Timing Adjust, including:

H Polarity: Horizontal polarity, can choose positive and negative.

V Polarity: Vertical polarity, can choose positive and negative.

H Pos: Horizontal phase setting.

V Pos: Vertical phase setting.

H Active: Line points in video signal timing sequence.

V Active: Field rows in video signal timing sequence.

H Total: Total line points in video signal timing sequence, including blank.

V Total: Total field rows in video signal timing sequence, including blank.

Preview: Including Preview Format, total 35 common output resolutions: 1280x720@50Hz, 1280x720@60Hz, 1920x1080@24, 1920x1080@25, 1920x1080@30.

4. Menu Orientation

MENU

Screen: Screen setting, user can change the screen through the digital setting parameters to easily change the screen size and position. Mainly used in the LED large screen users. Settings as follow:

Screen ON/OFF: Choose screen on or off.

Screen Width: Width setting.

Screen Height: Height setting.

Screen PosX: Horizontal phase setting.

Screen PosY: Vertical phase setting.

Note

The FS button can also fulfill this setting.

MENU---Effect

Select Effect, press the knob to confirm, show level 2 menus as follows:

Alpha Time: Effect switch time setting, rotate the knob, choose the switch time user need, press the knob to confirm.

Move 1: Move mode 1, including:

Full <> Center.

Full <> TopLeft.

Full <> TopRight.

Full <> BottomLeft.

Full <> BottomRight.

Move 2: Move mode 2, modes are same with Move 1.

Move Speed: Move speed setting, rotate the knob, choose the switch time user need, press the knob to confirm.

MENU---View

Select View, press the knob to confirm, and enter Delay Call option, including:

Call Time: Call time setting.

Call Index: Call index, can choose among 1 to 10.

4. Menu Orientation

MENU

MENU---System

Select System, press the knob to confirm, show level 2 menus as follows:

Language: Rotate the knob, can choose the language English or Chinese.

Modify IP: Modify IP address.

MENU---Reset

Enter Reset to reset the IP, choose OK and press the knob to confirm, then BMV-4 is reset to its factory settings. After 5 seconds, it completes factory settings and is ready for more operations.

5. System Setup and Operations

In This Chapter

This chapter provides comprehensive instructions for system setup and operations. The following topics are discussed:

Interface and Signal Option

NO.	INTERFACE	NO.	INTERFACE
1~4	DVI Input	13	Genlock Input
5	Preview SDI Output	14	10/100M Interface RJ45
6	Program SDI Output	15	USB Interface
7	Preview DVI Output	16	Power
8	Program DVI Output	17	Upgrade Button
9~12	SDI Input		

5. Preview SDI Output, output can be programmed as preview output, connect to the display with SDI interface.

Support resolution: 1280x720@50Hz, 1280x720@60Hz, 1920x1080@24, 1920x1080@25, 1920x1080@30.

6. Program SDI Output, can connect with next displayer or send signal to LED through sending card. Output signal through SDI interface.

Support resolution: 720x480@60i, 720x576@50i, 800x600@60, 1024x768@60, 1280x720@23.98, 1280x720@24, 1280x720@25, 1280x720@29.97, 1280x720@30, 1280x720@50, 1280x720@59.94, 1280x720@60, 1280x768@60, 1280x800@60, 1280x1024@60, 1360x768@60, 1366x768@60, 1440x900@60, 1400x1050@60, 1600x1200@60, 1680x1050@60, 1920x1080@50i, 1920x1080@59.94i, 1920x1080@60i, 1920x1080@23.98, 1920x1080@24, 1920x1080@25,

1920x1080@29.97, 1920x1080@30, 1920x1080@50, 1920x1080@59.94, 1920x1080@60, 1920x1200@60, 2048x1152@60, 2560x816@60.

7. Preview DVI Output, output can be programmed as preview output, output DVI signal, connect to the display with DVI-I interface.

Note

DVI-I is compatible with HDMI.

Support resolution: 1280x720@50Hz, 1280x720@60Hz, 1920x1080@24, 1920x1080@25, 1920x1080@30.

8. Program DVI Output, can connect with next displayer or send signal to LED through sending card. Output signal through DVI-I interface.

Note

DVI-I is compatible with HDMI.

Support resolution: 720x480@60i, 720x576@50i, 800x600@60, 1024x768@60, 1280x720@23.98, 1280x720@24, 1280x720@25, 1280x720@29.97, 1280x720@30, 1280x720@50, 1280x720@59.94, 1280x720@60, 1280x768@60, 1280x800@60, 1280x1024@60, 1360x768@60, 1366x768@60, 1440x900@60, 1400x1050@60, 1600x1200@60, 1680x1050@60, 1920x1080@50i, 1920x1080@59.94i, 1920x1080@60i, 1920x1080@23.98, 1920x1080@24, 1920x1080@25, 1920x1080@29.97, 1920x1080@30, 1920x1080@50, 1920x1080@59.94, 1920x1080@60, 1920x1200@60, 2048x1152@60, 2560x816@60.

1~4. DVI 1/2/3/4 Input: Input the video signal from HD player, DVD, and computer. Connect to the same DVI interface on BMV-4.

（This Connection does not support hot-plugging）.

Note

DVI-I is compatible with HDMI.

9~12. SDI Input: Can receive video signal from HD player, and HD camera. Connect interface 16 via 75 ohms BNC port., and connect LED screens via

network cable.

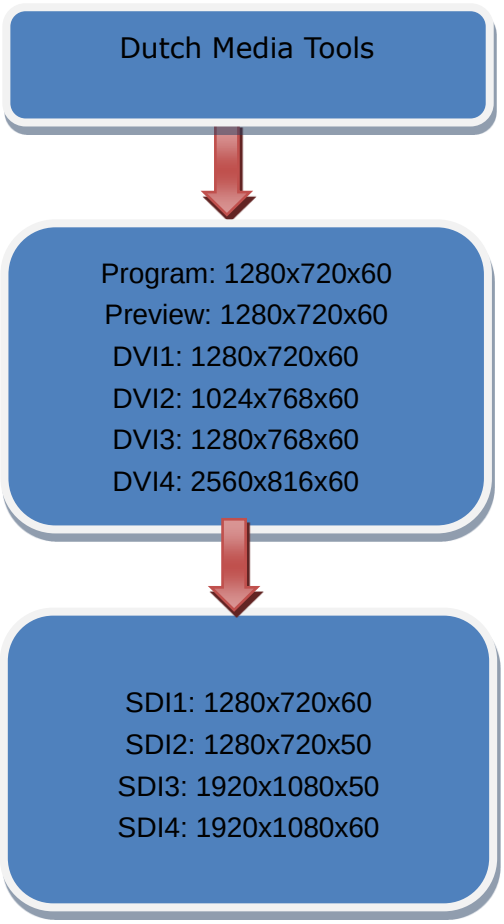
13. Genlock Input: can receive video signal from controller or signal generator, etc.

15. USB Interface: Used to device upgrade.

16. Power: This device use the standard 12V/3A power supply.

How to Confirm the Device is in Normal Operation

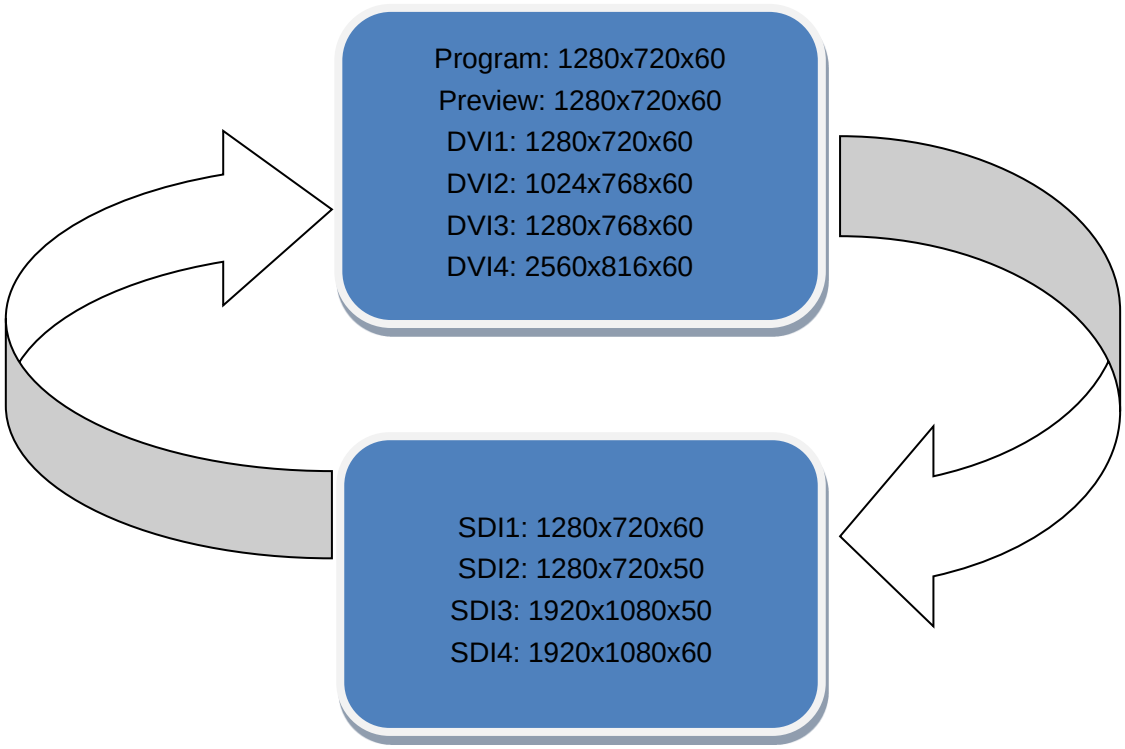
1. Make sure device is powered on and in normal operation.
2. LCD module shows company information and go into self verification.
3. Device starts system, LCD screen shows as below:



4. Then, system goes into the circulation statement. Cycle process displays the current input signal source and the current output format.

5. System Setup and Operations

How to Confirm the Device is in Normal Operation



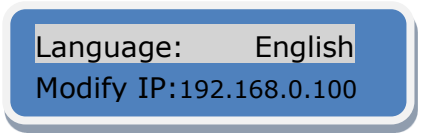
5. System into the circulation state and device is normally starting.

How to Choose the Language on the LCD

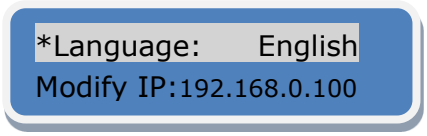
1. Press MENU button to enter menu option.

2. Rotate the knob and choose【System】option:

3. Press the knob to confirm, LCD displays as follows:



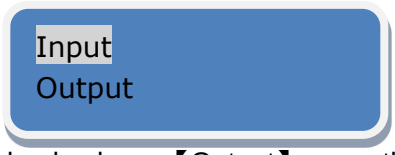
4. Rotate the knob, choose【Language】option, it is selected when appear "*" before option:



5. Press knob to confirm, then rotate the knob, and change "English" LCD displays to "Chinese".

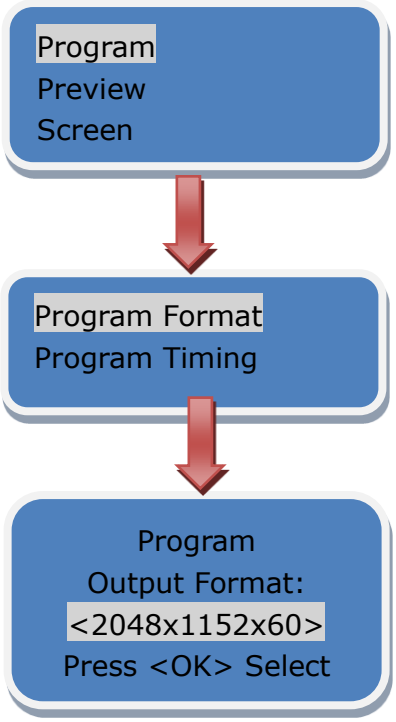
How to Adjust the Output Resolution

1. Press MENU button to enter menu option:

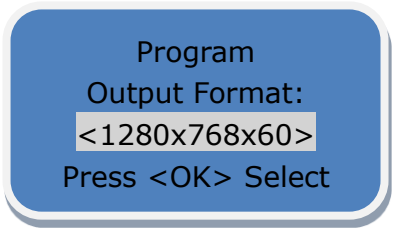


2. Rotate the knob, choose【Output】, press the knob to confirm, and enter next level menu.

3. Choose 【Program】, and enter 【Program Format】, press the knob to confirm:



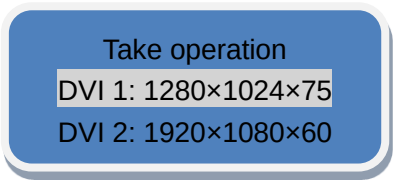
4. Choose the required output resolution, for example: 1280x768x60.



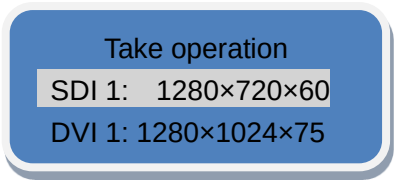
5. Press the knob to confirm, finish the choice of resolution.

How to Realize Signal Switching

Boot the system default DVI1 to the current input source (key lights), LCD displays as follows:



If need switch to other source such as SDI1, direct press SDI1 button, key blinks, again press TAKE button, SDI1 key lights, and switch SDI1 to Program output, LCD displays as follows:

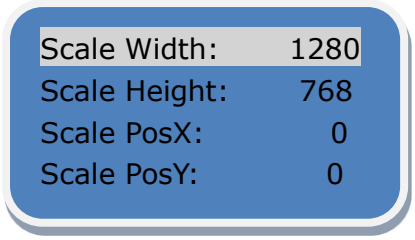


After choose SDI1 signal, the former button DVI1 blinks, and SDI1 key lights, it realize the input signal switching (Switch input signal DVI1 to SDI1).

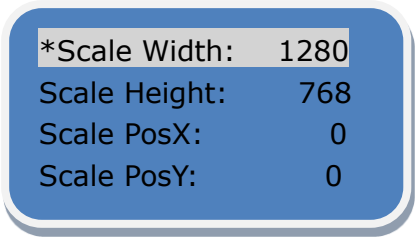
The same method can switch DVI2, DVI3, DVI4, SDI2, SDI3, SDI4.

How to Set Up the Size and Position of Signal Image

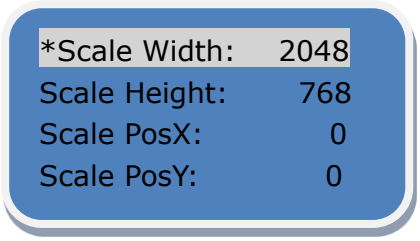
1. Press SCALE to enter menu option.



2. Choose the needed item, press the knob to confirm, it is selected when appear "*" before the item need to set, for example, choose Scale Width:



3. Rotate the knob, choose the required value, for example: 2048:



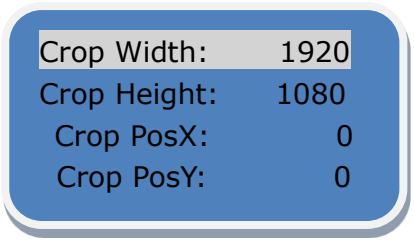
4. Press the knob to confirm, and finish the setting.

Note

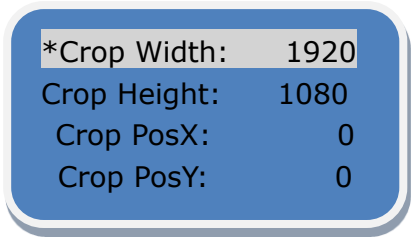
Value setting in Step3, user can also use CLEAR button to clear the selected value directly, and press the number button to input the required value, press OK to confirm.

How to Crop Input Image

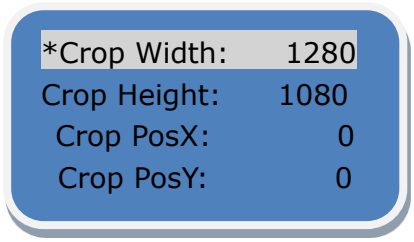
1. Press F3 to enter menu option:



2. Choose the needed item, press the knob to confirm, it is selected when appear "*" before the item need to set, for example, choose Crop Width:



3. Rotate the knob, choose the required value, for example: 1280:



4. Press the knob to confirm, and finish the crop setting.

Note

Value setting in Step3, user can also use CLEAR button to clear the selected value directly, and press the number button to input the required value, press OK to confirm.

How to Use BLACK

BLACK description:

BLACK signal realizes one-key-touch to a black screen.

BMV-4 BLACK provides effect processing on Program output and Preview output, BLACK uses fade in fade out effect. Operations are as follows:

1. Choose output signal.
2. Press BLACK button, key light blinks.
3. Then press TAKE button, BLACK key light, then output switch to black with fade in fade out effect, as shown below:




4. Again press TAKE button, BLACK key blinks, and return to output image.

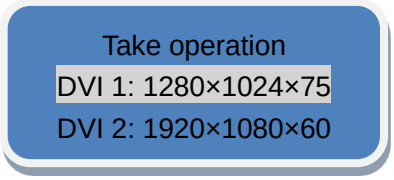
How to Realize GENLOCK

1. Input sync signal from controller or signal generator.
2. Press GENLOCK button, key lights, the output will be sync to the reference input timing. Each time the button push, will sync to the reference input once.

   When press GENLOCK button again, the function is cancel, and the sync signal has no effect on the device.

How to Switch Between Preview and Program

1. Boot the system default DVI1 to the current input source (key lights), LCD displays as follows:



2. Choose any other signal, for example, DVI2, DVI2 button blinks, red frame of HDVI2 corresponding image blinks, and the image is in Preview state.
3. Press TAKE, DVI2 key lights, and it is switched to Program output, and the former DVI1 key blinks. red frame of DVI1 corresponding image blinks, the image is in Preview state.

   The same method, it can realize the Preview and program switching among DVI3, DVI4, SDI1, SDI2, SDI3, SDI4.

How to Realize Preview Image Full Display

1. Choose Preview signal, for example: DVI2, DVI2 key blinks, red frame of DVI2 corresponding image blinks, and the image is in Preview state.

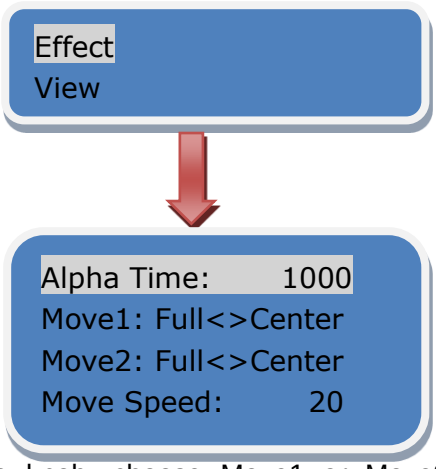
2. Press F1, F1 key lights, and the Preview image is full displayed:

3. Press F1 again, F1 key is off, and exit full display.

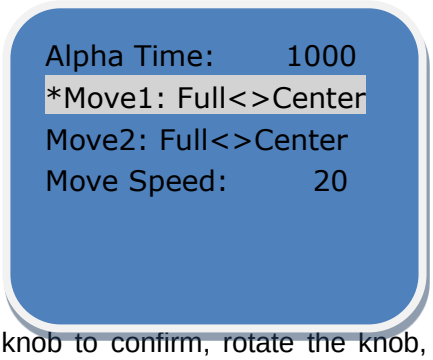
How to Select Move Effects Switching

1. Press MENU to enter menu option.

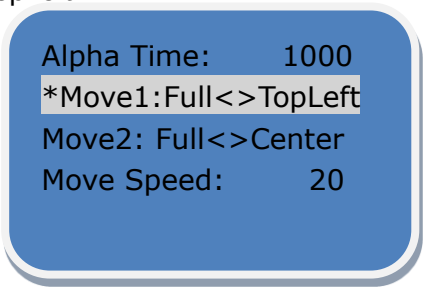
2. Rotate the knob, choose【Effect】, press the knob to confirm, and enter to next level menu:



3. Rotate the knob, choose Move1 or Move2, for example, choose Move1:



4. Press the knob to confirm, rotate the knob, choose move effect, for example, TopLeft::



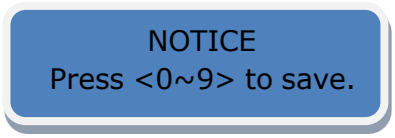
5. Press the knob to confirm, finish MOVE1 effect shortcut setting, press MOVE1, and then press TAKE, it can achieve MOVE1 effect switching.

6. The same method, set and achieve MOVE2 effect switching.

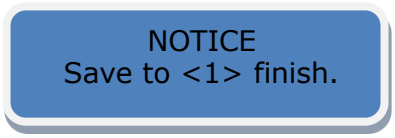
How to Save the Parameter

Save user mode to the customer for different scene directly call; leave out the edit operation inconvenience, BMV-4 provides ten save modes.

1. Press SAVE button, the key lights, and start SAVE function.



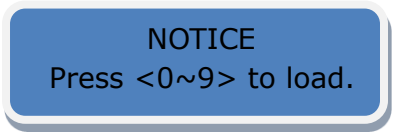
2. DVI1, DVI2, DVI3, DVI4, SDI1, SDI2, SDI3, SDI4, BLACK, TP light on together.
3. The corresponding numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 0 are the saving mode 1~10, select the number as the route to save the current user data. For example, choose SAVE1, press 1 corresponding button to finish the parameter saving.



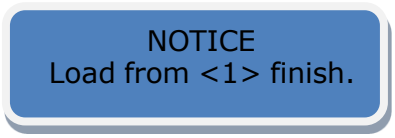
How to Load the Saved Parameter

Load user mode to the customer for different scene directly call; leave out the edit operation inconvenience, BMV-4 provides ten load modes.

1. Press LOAD button, the key lights, and start LOAD function.



2. DVI1, DVI2, DVI3, DVI4, SDI1, SDI2, SDI3, SDI4, BLACK, TP light on together.
3. The corresponding numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 0 are the loading mode 1~10, select the wanted number. For example, choose LOAD1, press 1 corresponding button to finish the parameter loading.



6. Common Questions and Solution

In This Chapter

This chapter provides the common questions and solution for the video processor. The following topics are provided:

The Output Image Cannot be Displayed

Cause:

1. No input of signal.
2. Output cable is damaged or beyond the transmission distance.
3. Problem with the LED display.
4. The output resolution is wrong.

Solution:

1. Check the input signal source, confirm if the input signal channel is normal.
2. Check the OUT connecting output equipment, and IN connecting the input equipment.
3. Use high-quality cable to make sure stable and high quality image.
4. Check if the LED display is in standby mode or damaged.
5. Check if the output solution is beyond LED display's max resolution, if so, please change it in the menu.

Color Shading in Image

Cause:

1. The port is not well connected, which results in the poor touch.
2. Broken signal wire.
3. Wrong color adjustment of the equipment.

Solution:

1. After the connecting the port, please tighten the screw and prevent the movement caused by pulling.
2. Please replace with a good quality cable.
3. Adjust the color balance of the display equipment by referring to the manuals of the display equipment.

Shaking and Spotted Image

Cause:

1. The cable is too long to make the despairing of the signal.
2. Unstable input signal or the damaged wire.

Solution:

1. Suggest use the signal extension to make sure the minimum wire damage.
2. Adjust the input signal function definition and use the good wire line.

Dark Edge Appears in LED Display

Cause:

1. The display equipment has down the back cutting to signal.
2. Too much adjustment to the images.

Solution:

1. Adjust to the default setting in the software according to the equipment instructions.
2. Re-adjust the picture location to get the expected effects.

A. Specification

DVI Input	
Number of Inputs	4
Connector	Standard DVI-I socket
Supported Resolution	SMPTE：625/25 PAL, 525/29.97 NTSC, 625/50p PAL, 525/59.94p NTSC, 480i60,576i50,720P23.97/24/25/29.97/30/50/59.94/60,1080i50/59.94/60,1080P23.97/24/25/29.97/30/50/59.94/60 VESA：800×600×60，1024×768×60，1024×768×75，1024×768×85，1280×720×50，1280×720×60，1280×768×60，1280×800×60，1280×1024×60，1360×768×60，1366×768×60，1400×1050×60，1440×900×60，1600×1200×60，1680×1050×60，1920×1080×50，1920×1080×60，1920×1200×60，2048×1152×60，2560×816×60
Signal Level	TMDS pwl, single pixel input,165MHz bandwidth
Format Standard	HDMI 1.3
SDI Input	
Number of Inputs	4
Connector	BNC
Supported Resolution	SMPTE：625/25 PAL, 525/29.97 NTSC, 625/50p PAL, 525/59.94p NTSC, 480i60,576i50,720P23.97/24/25/29.97/30/50/59.94/60,1080i50/59.94/60,1080P23.97/24/25/29.97/30/50/59.94/60 VESA：1280×720×50，1280×720×60，1920×1080×50，1920×1080×60
Transmission speed	19.4Mbps~1.5Gbps
Supported Standard	ITU-R BT.656,ITU-R BT.601,SMPTE 259M, SMPTE 292, SMPTE 297
Balance	Belden 1694A 100m self-adaptive 3G,200m self-adaptive 1.485G,350m self-adaptive 270Mbps
Preview SDI Output	
Number of Outputs	1
Connector	BNC
Supported Resolution	SMPTE：625/25 PAL, 525/29.97 NTSC, 625/50p PAL, 525/59.94p NTSC, 720P60 VESA：1280×720×50，1280×720×60，1920×1080×50，1920×1080×60

Supported Standard	ITU-R BT.656,ITU-R BT.601,SMPTE 259M, SMPTE 292, SMPTE 297
Program SDI Output	
Number of Outputs	1
Connector	BNC
Supported Resolution	SMPTE：625/25 PAL, 525/29.97 NTSC, 625/50p PAL, 525/59.94p NTSC, 720P23.97/24/25/29.97/30/50/59.94/60,1080i50/59.94/60,1080P23.97/24/25/29.97/30/50/59.94/60 VESA：1280×720×50，1280×720×60，1920×1080×50，1920×1080×60
Supported Resolution	ITU-R BT.656,ITU-R BT.601,SMPTE 259M, SMPTE 292, SMPTE 297
Preview DVI Output	
Number of Outputs	1
Connector	Standard DVI-I socket
Signal Level	TMDS pwl, 165MHz bandwidth
Supported Resolution	SMPTE：625/25 PAL, 525/29.97 NTSC, 625/50p PAL, 525/59.94p NTSC, 720P60 VESA：1280×720×50，1280×720×60，1920×1080×50，1920×1080×60
Program DVI Output	
Number of Outputs	1
Connector	Standard DVI-I socket
Signal Level	TMDS pwl, 165MHz bandwidth
Supported Resolution	SMPTE：625/25 PAL, 525/29.97 NTSC, 625/50p PAL, 525/59.94p NTSC, 720P23.97/24/25/29.97/30/50/59.94/60,1080i50/59.94/60,1080P23.97/24/25/29.97/30/50/59.94/60 VESA：800×600×60，1024×768×60，1024×768×75，1280×720×50，1280×720×60，1280×768×60，1280×800×60，1280×1024×60，1360×768×60，1366×768×60，1400×1050×60，1440×900×60，1600×1200×60，1680×1050×60，1920×1080×50，1920×1080×60，1920×1200×60，2048×1152×60，2560×816×60
Extras	
Communication	USB,TCP/IP
Power Supply	DC 12V
Working Environment	0°C~45°C
Stored Environment	10% to 90%
Product Warranty	1-year parts and labor warranty

B. Contact Information

Warranty:

All video products are designed and tested to the highest quality standard and backed by a full 1-year parts and labor warranty. Warranties are effective upon delivery date to customer and are non-transferable. DMT warranties are only valid to the original purchase/owner. Warranty related repairs include parts and labor, but do not include faults resulting from user negligence, special modification, lighting strikes, abuse(drop/crush), and/or other unusual damages.

The customer shall pay shipping charges when unit is returned for repair.

Company Address

Highlite International BV

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