plura®

Operating Instructions

MVM Series Monitors

MVM - Series

MVM-124

MVM-140

MVM-146

MVM-147-16CH

Important Safety Instructions

1. Please read this manual thoroughly before operating the monitor.
2. Unplug monitor from the wall outlet before cleaning the LCD screen. Do not use liquid cleaners or aerosol cleaners. Use ONLY a damp cloth provided.
3. Don't use any unauthorized accessories not recommended by the manufacturer as they may cause hazards.
4. Don't operate this monitor near damp or wet surfaces.
5. Use only the recommend manufacturer mounting hardware accessories. Slots and openings in the cabinet and the back or bottom are provided for ventilation, and to insure reliable operation of the monitor and to protect it from overheating, these openings must not be blocked or covered.
6. This appliance should be operated only from the type of power source indicated on the marking label.

   If you are not sure of the type of power supplied to your home, consult your dealer or local power company. For appliance designed to operate from battery power, refer to the operating instructions.

PORTABLE CART WARNING
(symbol provided by RETAC)

7. This appliance system is equipped with a 3-wire grounding type plug (a plug having a third (grounding) pin). This plug will only fit into a grounding-type power outlet. This is a safety feature.
   If you are unable to insert the plug into the outlet, contact your electrician to replace your outlet.
   Do not ignore the safety purpose of the grounding plug.
8. For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet. This will prevent damage to the product due to lightning and power-line surges.
9. Do not allow anything to rest on the power cord.
10. Follow all warnings and instructions marked on the appliance.
11. Do not overload wall outlets and extension cords as this can result in fire or electric shock.
12. Do not attempt to service this monitor without a qualified service personnel.

FCC Notice

This device complies with Part 15 of FCC Rules.

Operation is subject to the following two conditions:

(1)This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

To assure continued compliance, follow the attached installation instruction and do not make any unauthorized modifications.

Note:

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

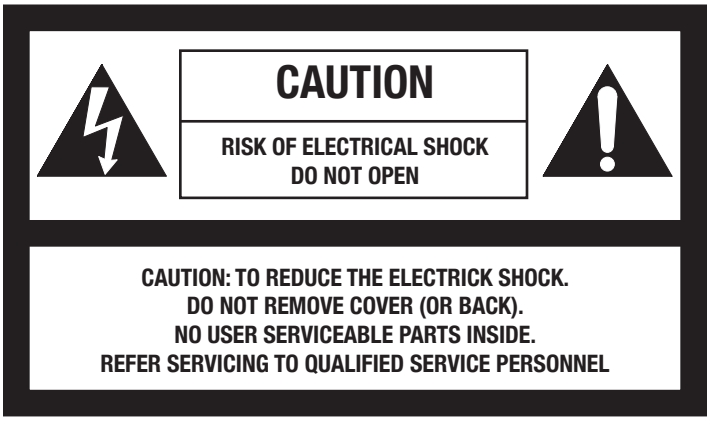
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The user may find the booklet “Something About Interference” available from FCC local regional offices helpful.

Warning:

To assure continued FCC emission limit compliance, the user must use only shielded interface cables when connecting to host computer or peripheral devices. Also, any unauthorized changes or modifications to this equipment could void the user’s authority to operate this device.

Safety Precautions



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

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.

THIS EQUIPEMNT MUST BE GROUNDED

To ensure safe operation, the three-pin plug must be inserted only into a standard three-pin power outlet which is effectively grounded through normal household wiring. Extension cords used with the equipment must have three cores and be correctly wired to provide connection to the ground. Wrongly wired extension cords are a major cause of fatalities. The fact that the equipment operates satisfactorily does not imply that the power outlet is grounded or that the installation is completely safe.

For your safety, if you are in any doubt about the effective grounding of the power outlet, please consult a qualified electrician.

CAUTION:

THE AC RECEPTACLE (MAINS SOCKET OUTLET) SHALL BE INSTALLED NEAR THE EQUIPMENT AND SHALL BE EASILY ACCESSIBLE.

TO COMPLETELY DISCONNECT THIS EQUIPMENT FROM THE AC MAINS, DISCONNECT THE POWER CORD PLUG FROM THE AC RECEPTACLE.

WARNING:

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, KEEP THIS EQUIPMENT AWAY FROM ALL LIQUIDS. USE AND STORE ONLY IN LOCATIONS WHICH ARE NOT EXPOSED TO THE RISK OF DRIPPING OR SPLASHING LIQUIDS, AND DO NOT PLACE ANY LIQUID CONTAINERS ON TOP OF THE EQUIPMENT.

CAUTION:

In order to maintain adequate ventilation, do not install or place this unit in a bookcase, built-in cabinet or any other confined space. To prevent risk of electric shock or fire hazard due to overheating, ensure that curtains and any other materials do not obstruct the ventilation.

CAUTION:

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

CAUTION:

This apparatus can be operated at a voltage in the range of 100-240 V AC.

Voltage other than 120V are not intended for U.S.A and Canada.

CAUTION:

Operation at a voltage other than 120V AC may require the use of a different AC plug. Please contact either a local service center for assistance in selecting an alternate AC plug.

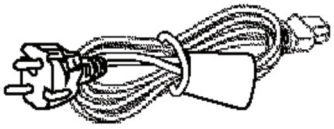
Notice (U.S.A. only):

This product has a fluorescent lamp that contains a small amount of mercury. It also contains lead in some components. Disposal of these materials may be regulated in your community due to environmental considerations. For disposal or recycling information please contact your local authorities, or the Electronics Industries Alliance: http://www.eiae.org.

Caution for AC Power Cord

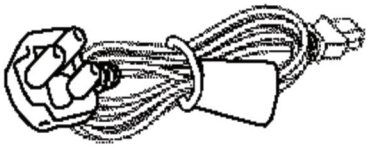
FOR YOUR SAFETY PLEASE READ THE FOLLOWING TEXT CAREFULLY.
Appropriate AC Power Cord must be used in each local area.

FOR CONTINENTAL EUROPE, ETC
Not for use in the U.K.

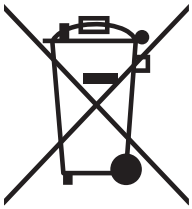


FOR U.S.A. and Canada

FOR U.K. ONLY
If the plug supplied is not suitable for your socket outlet, it should be cut off and appropriate one fitted.



Information on Disposal for Users of Waste Electrical & Electronic Equipment (private households)



This symbol on the products and/or accompanying documents means that used electrical and electronic products should not be mixed with general household waste.

For proper treatment, recovery and recycling, please take these products to designated collection points, where they will be accepted on a free of charge basis. Alternatively, in some countries you may be able to return your products to your local retailer upon the purchase of an equivalent new product.

Disposing of this product correctly will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling. Please contact your local authority for further details of your nearest designated collection point.

Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.

For business users in the European Union

If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

Information on Disposal in other Countries outside the European Union

This symbol is only valid in the European Union.

If you wish to discard this product, please contact your local authorities or dealer and ask for the correct method of disposal.

CE NOTICE

CE

This is Class B product. In a domestic environment this may cause radio interference in which case the user may be required to take adequate measures.

The apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.

Important Safety Warnings

Power

Operate unit only on the specified supply voltage.

Disconnect power cord by connector only. Do not pull on cable portion.

Do not place or drop heavy or sharp-edged objects on power cord. A damaged cord can cause fire or electrical shock hazards. Regularly check power cord for excessive wear or damage to avoid possible fire / electrical hazards.

Grounding

Ensure unit is properly grounded at all times to prevent electrical shock hazard.

Do not ground the unit to gas lines, units, or fixtures of an explosive or dangerous nature.

Ensure power cord is firmly plugged into AC outlet.

Operation

Do not operate unit in hazardous or potentially explosive atmospheres. Doing so could result in fire, explosion, or other dangerous results.

Do not allow liquids, metal pieces, or other foreign materials to enter the unit. Doing so could result in fire, other hazards, or unit malfunction.

If foreign material does enter the unit, turn power off and disconnect power cord immediately. Remove material and contact authorized service representative if damage has occurred.

Transportation

Handle with care to avoid shocks in transit. Shocks may cause malfunction. When you need to transport the unit, use the original packing materials or alternate adequate packing.

Circuitry Access

Do not remove covers, panels, casing, or access circuitry with power applied to the unit! Turn power off and disconnect power cord prior to removal. Internal servicing / adjustment of unit should only be performed by qualified personnel.

Do not touch any parts / circuitry with a high heat factor.

Capacitors can retain enough electric charge to cause mild to serious shock, even after power is disconnected. Capacitors associated with the power supply are especially hazardous. Avoid contact with any capacitors.

Unit should not be operated or stored with cover, panels, and / or casing removed. Operating unit with circuitry exposed could result in electric shock / fire hazards or unit malfunction.

Potential Hazards

If abnormal smells or noises are noticed coming from the unit, turn power off immediately and disconnect power cord to avoid potentially hazardous conditions. If problems similar to above occur, contact authorized service representative before attempting to again operate unit.

Consumables

The consumables used in unit must be replaced periodically. For further details on which parts are consumables and when they should be replaced, refer to the specifications at the end of the Operation Manual. Since the service life of the consumables varies greatly depending on the environment in which they are used, they should be replaced at an early date. For details on replacing the consumables, contact your dealer.

Rubber Feet

If this product has come with rubber feet attached by screws, do not insert the screws again without rubber feet after removing the rubber feet and screws. It may cause damage to the internal circuits or components of the unit. To install the rubber feet again to the unit, do not use other than the supplied rubber feet and screws.

Upon Receipt

Unpacking

MVM units and their accessories are fully inspected and adjusted prior to shipment. Operation can be performed immediately upon completing all required connections and operational settings.

Check your received items against the packing lists below.

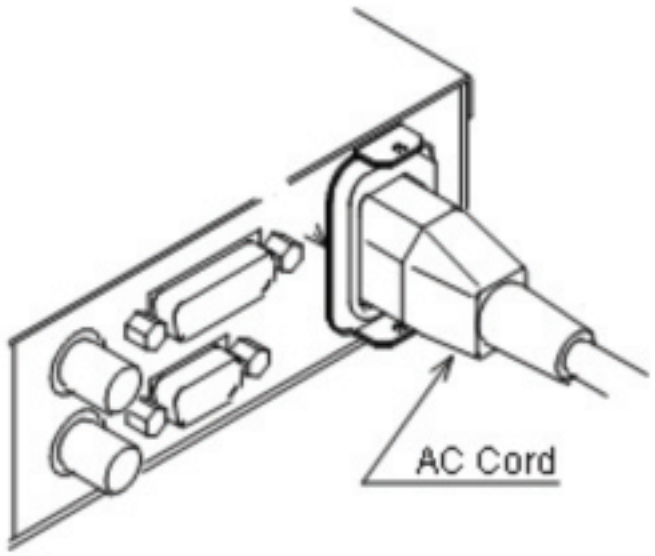
ITEM	QTY	REMARKS
MVM	1	
AC Cord	1 set	One AC cord, and one AC cord retaining clip
Operation Manual	1 set	This manual (Includes Layout Editor, Live Viewer, and Web Browser Operation Manuals, and Layout Editor Tutorial.)
Layout Editor / Dedicated Viewer Software	1	CD-ROM

Check

Check to ensure no damage has occurred during shipment. If damage has occurred, or items are missing, inform your supplier immediately.

Installing AC Cord

1. Securely plug the AC cord into the AC inlet
2. Attach Retaining Clip 1 onto the the AC cord.



Contents

1. Prior to Starting

1-1. Welcome

Congratulations! By purchasing MVM Multi Viewer you have entered the world of PLURA BROADCAST and its many innovative products. Thank you for your patronage and we hope you will turn to PLURA BROADCAST products again and again to satisfy your video and audio needs.

PLURA BROADCAST provides a wide range of products, from basic support units to complex monitoring systems, which have been increasingly joined by products for computer video based systems. Whatever your needs, talk to your PLURA BROADCAST representative. We will do our best to be of continuing service to you.

1-2. About MVM

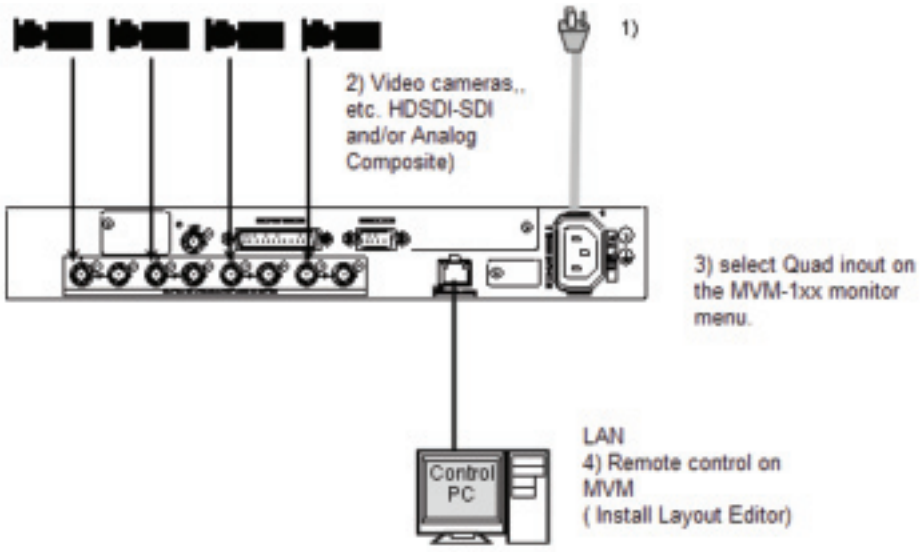
The MVM Multi Viewer is a four split-screen multi viewer that accepts four inputs (of HD-SDI, SD-SDI, and Analog Composite signals), resizes the images and display on a single screen. The audio level meter display of embedded audios of each SDI inputs is provided for monitoring the presence of audio signals. Supported video transmission over a network also enables to remotely monitor output images. The provided layout editor allows user to freely arrange the viewer screen layout. The MVM is most suitable for monitoring the system with mixed input of HD-SDI, SD-SDI and analog composite signals.

- Support for mixed input of HD-SDI, SD-SDI, and Analog composite signals
- Audio level meter display for HD/SD-SDI embedded audio signals (8ch display)
- DVI connector for high definision image output (Not applicable when it is integrated within MVM monitor)
- Video loss detection function
- Analog clock and Digital clock display
- Border display of two selectable colors (red and green) on each channel frame by external tally intput
- Title display of up to 16 charactors for each input (alphanumeric and symbol)
- Remote control: Contact inputs, RS-232C/422/485 interface and LAN interface
- Includes layout editor for enabling users to make any changes to split-screen patterns from a computer
- SNMP support for monitoring power supply and fan alarm status (Planned future option)
- Redundant power supply option for ensuring the system reliability
- Video transfer at the maximum frame rate of 60fps (By the dedicated viewer software MVM Live Viewer)
- The maximum frame rate may not be obtained due to the various factors, such as size of transmitted image, JPEG compression rate, connected PC or network environment.

2. Quick Start

This chapter describes the basic operations to set up the system for your MVM multi viewer. Refer to the section given for each operation you may need more details, if necessary.

2-1. Connection



1. Connect the MVM to an AC power source using the supplied accessory cord.
2. Connect the signal source device(s) to the left connector(s) of each set of 1 to 4 HD-SDI/SD-SDI/COMPOSITE INPUT connectors to supply input signal(s). The right connectors are for active through outputs which we are not using now.
3. Select Quad input on the MVM monitor.
4. Connect a PC which you are going to use to edit layout by installing the supplied Layout Editor. In the figure above the shown connection is for the LAN interface that you need for Layout Editor operation.

The system requirements for the PC is shown in the section 16-2. “System Requirements” of the part 3, MVM Layout Editor of this manual.

2-2. Displaying Image on MVM-1XX Monitor

1. Checking Monitor Display of Output Image

Turn on the power switch on the MVM front panel. When power switch is turned on, the image is displayed on the MVM-1XX monitor. Is the image displayed on the monitor? Follow the steps given for each case

The output screen size is set to 1920 x 1200 in 60Hz at the factory.

2-3. Connecting MVM and PC over LAN

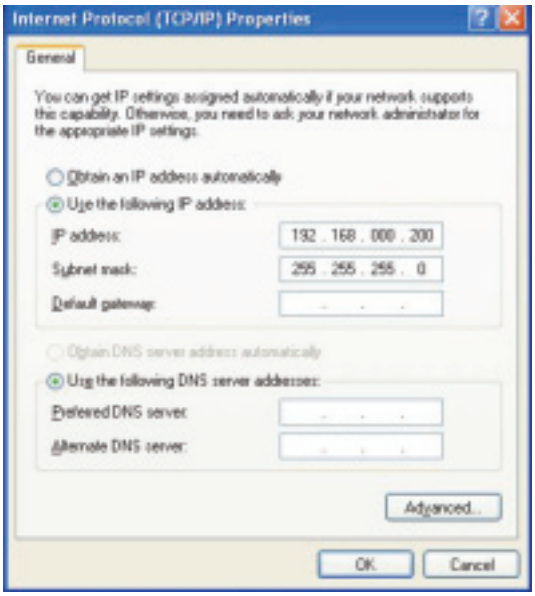
Connect the MVM and a PC (on which you are going to install the Layout Editor) over a LAN interface. This setting example shows the case when connecting to the MVM with the default settings. The MVM default settings are shown below.

ID	ROOT
PASSWORD	0
IP address	192.168.0.1
Subnet mask length	24
Gateway	0.0.0.0

2-3-1. PC Network Settings

The PC network settings need to match that of the MVM. The procedure for making the network settings at the PC vary depending on the OS, so refer to the OS manual for details.

1. Setting in Windows XP with the default Start menu setting



Click Start on the taskbar, open [Control Panel], and double-click “Network Connections”. Right-click “Local Area Connection” icon to open [Properties] window. Double-clicking “Internet Protocol (TCP/IP)” under the [General] tab opens the [Internet Protocol (TCP/IP) Properties] window. Make the settings as shown in the example below. Make a note of the settings before changing them in case you need to return the IP address to its original settings later.

IP address for PC	192.168.0.yyy (yyy is any number from 2 to 254 except for the number set for the MVM unit and the gateway number. In this example, the setting is yyy=200.)
Subnet mask	Set to 255.255.255.0.

2. Setting in Windows XP with the Start menu setting changed to Classic

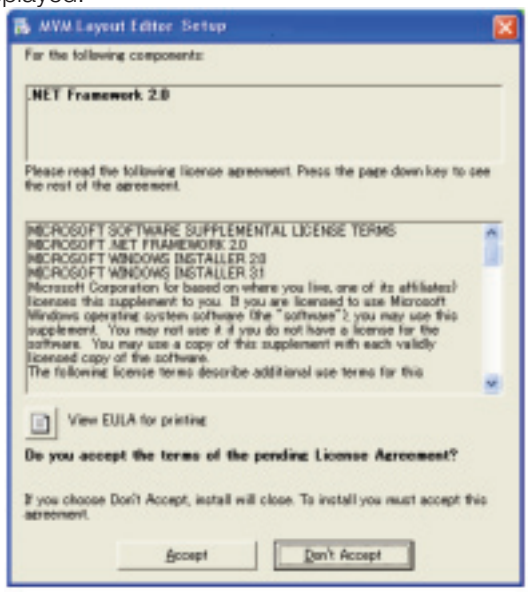
Click Start on the taskbar, select “Settings” -> “Network Connections” and then right-click the “Local Area Connection” icon to open [Properties] window. Double-clicking “Internet Protocol (TCP/IP)” under the [General] tab opens the [Internet Protocol (TCP/IP) Properties] window. The settings are then made in the same way as 1) above. When the settings are completed, click OK, and then close all setting windows.

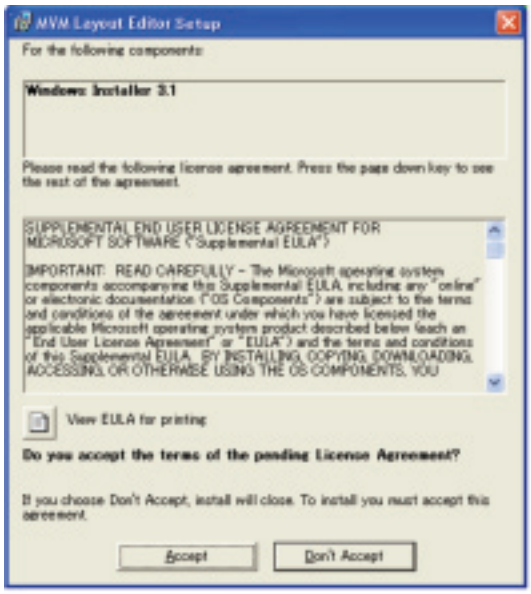
2-3-2. Installing MVM Layout Editor

Install the MVM Layout Editor on the PC using the supplied CD-ROM. In this section a rough instruction for the installation is given. For more details see section 16-4. “Installing MVM Layout Editor” in the part 3, MVM Layout Editor of this manual.

1. Load the supplied Installation CD-ROM into the PC, and open the CD-ROM drive. Run the file “setup.exe” to start the setup wizard.

2. If [.NET Framework 2.0] or [Windows Installer 3.1] is not installed on your PC, one of the screens shown below is displayed. Click Accept. If either one is already installed on your PC, any of these screen is not displayed.



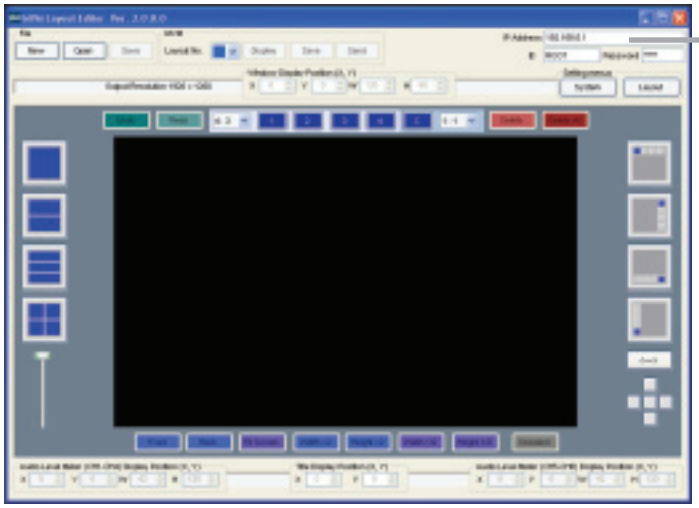


3. When installation of [.NET Framework 2.0] is complete, the screen shown below is displayed requiring a reboot. Click Yes to reboot your PC.

4. After the setup wizard is restarted, follow the guide to complete the installation.

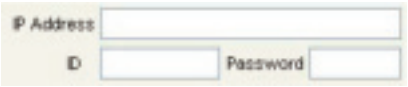
2-3-3. Starting MVM Layout Editor

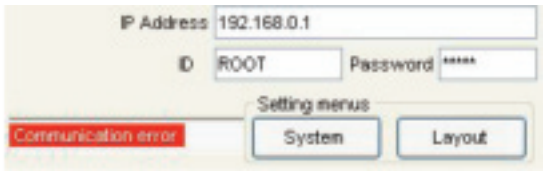
1. To start MVM Layout Editor, go to Start > Programs > PLURA and select “MVM Layout Editor”.
2. After the application is started the screen shown below is displayed.



3. Enter the IP address, ID and password of the MVM that you wish to connect in the MVM ID boxes at the top-right of the main screen. (The factory default of the MVM is as below.)

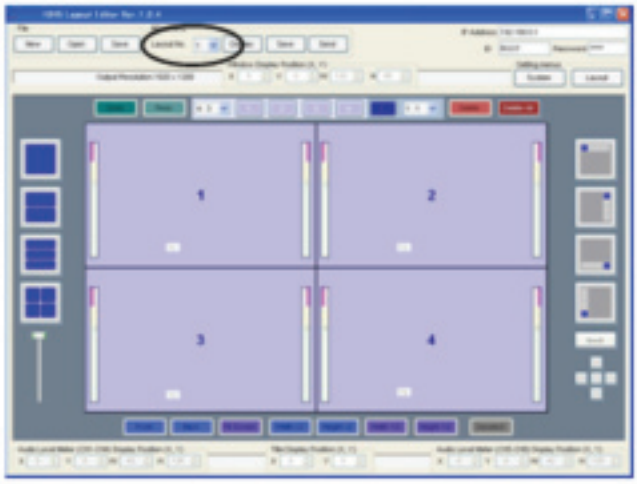
IP address:	192.168.0.1
ID:	ROOT
Password:	00000





If the entered IP address, ID, or password is not correct, the error message as shown to the right will be displayed. Correct the error.

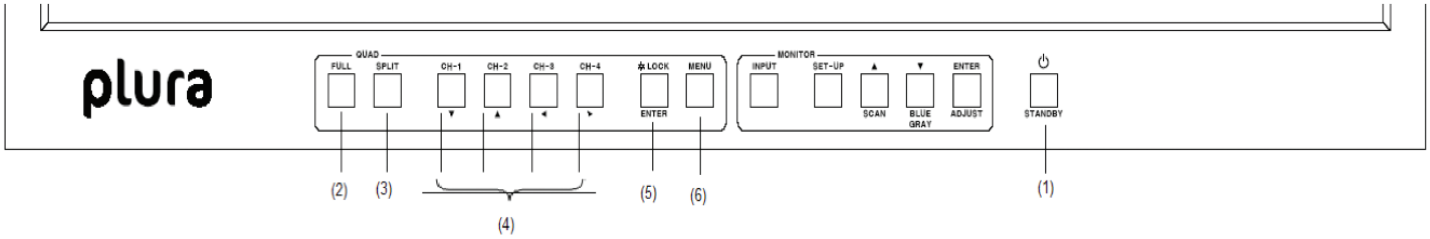
4. Select the layout number as shown below. The selected layout is loaded and displayed in the layout editing area, and the connection is established. Clicking the Display button next to the Layout No. box will display the same layout on the monitor screen. You can edit the layout watching the display on the monitor screen.



5. If you are going to edit the layout, see section 19-3. “Editing Layouts” in the part 3, MVM Layout Editor of this manual for details.

3. Panel Descriptions

3-1. Front Panel



1. **POWER1 switch**
   Used to turn the power unit 1 On/Off. Pressing “ ” side turns power on.

2. **FULL (Full screen display button)**
   Used to set the display in full screen mode.

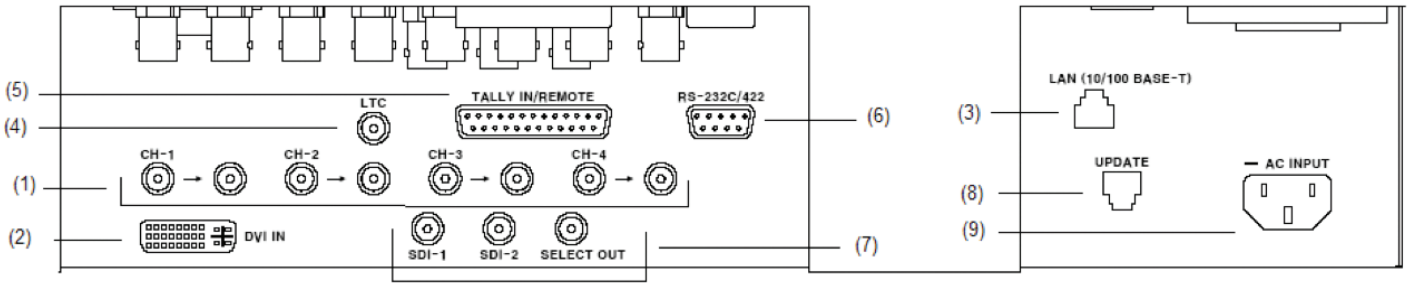
3. **SPLIT (Split screen display button)**
   Used to set the display in split screen mode.

4. **VIDEO SELECT 1 - 4 (Input switches)**
   In the full screen mode, these buttons are used to select inputs to be displayed.
   In the split screen mode, these buttons are used to select the screen layout designed using the Layout Editor.
   All four buttons are set to display standard 4-split screen at the factory shipment.
   While displaying menus, these buttons are used to navigate menu screens.

5. **LOCK (Operation lock button)**
   Used to disable or enable the operation from the front panel buttons.
   • To unlock the operation, press and hold down the button at least 2 seconds.
   While displaying menus, this button is used to confirm the settings for each menu item.

6. **MENU (Menu button)**
   Used to open Main menu. While displaying menus, used to return to Main menu or submenu, or exit Main menu.
   • To open Main menu, press and hold down the button at least 2 seconds.

3-2. Rear Panel



1. **HD-SDI/SD-SDI/COMPOSITE INPUT 1 - 4**
   Used to input HD/SD-SDI or analog composite signals (Automatic recognision supported)
   The respective right connectors are active through output connectors to output signals from left connectors to monitors.
   • Active through output (for monitors) is available for HD-SDI and SD-SDI.
   • No jitter correction. The existing jitter will be carried to the active through output. The total jitter may exceed the jitter limit of signal standard.

2. **DVI IN**
   Used to connect a DVI-I signals

3. **LAN(10/100BASE-T)**
   Used to control unit or arrange layouts from a PC over a LAN (Ethernet) interface. Transmitting video to a PC is also possible.

4. **LTC**
   Used to input time code to synchronize the analog or digital clock display. (Hour, minute and second only)

5. **TALLY/REMOTE**
   Used for Tally input to add red or green borders to each channel frame, or remote control on selecting screen layout by GPI inputs.

6. **RS-232C/422/485**
   Used to connect a PC for remote control on menu operation.

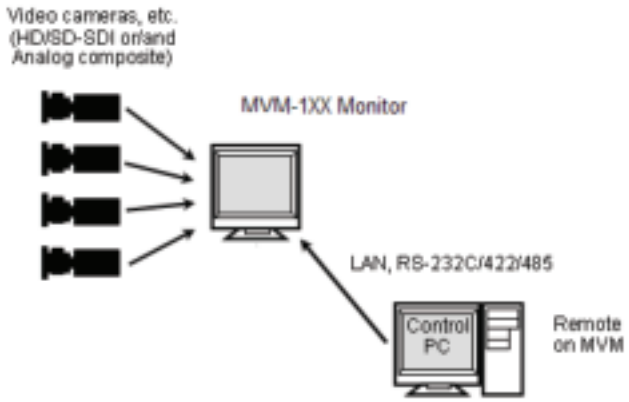
7. **HD-SDI/SD-SDI INPUT with Select OUTPUT**
   Used as two extra inputs to simulate PBM monitors functionality

8. **Update Firmware port**

9. **AC IN (100-240VAC 50/60Hz)**
   Used for connecting to an AC power source using the supplied accessory cord.

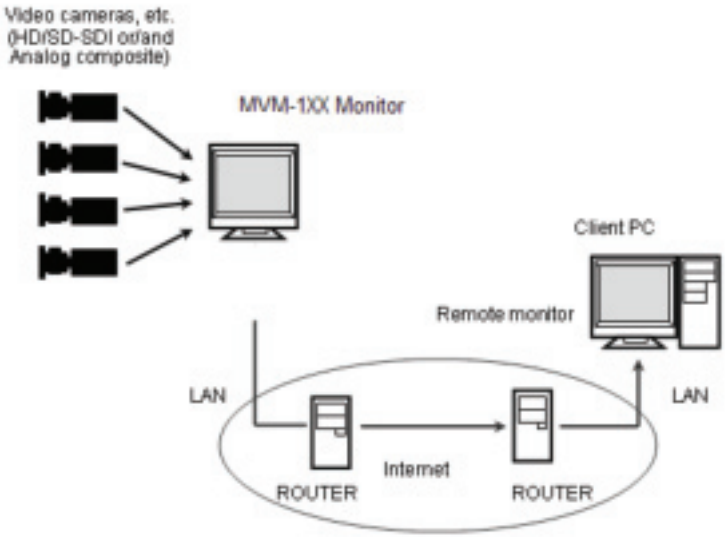
4. Connection

4-1. System directly with PC



IMPORTANT: To directly connect PC and MVM, use a crossover LAN cable for the connection. To connect PC and MVM using a hub or such device, use a straight LAN cable.

4-2. System with Video Transmission

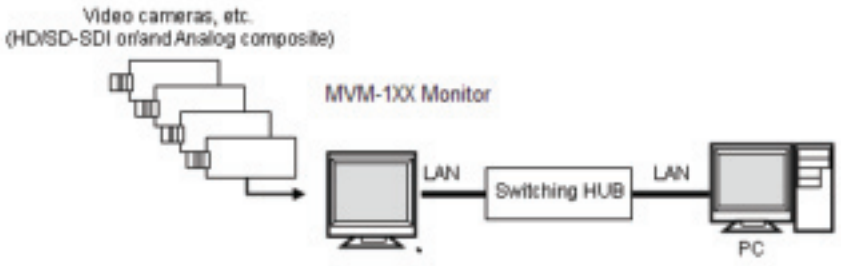


4-2-1. Network Mode

The system with video transmission has two different network modes such as ‘Unicast mode’ and ‘Multicast mode’. For the mode settings, see section 7-2. “SYSTEM” and 7-3. “LAN”.

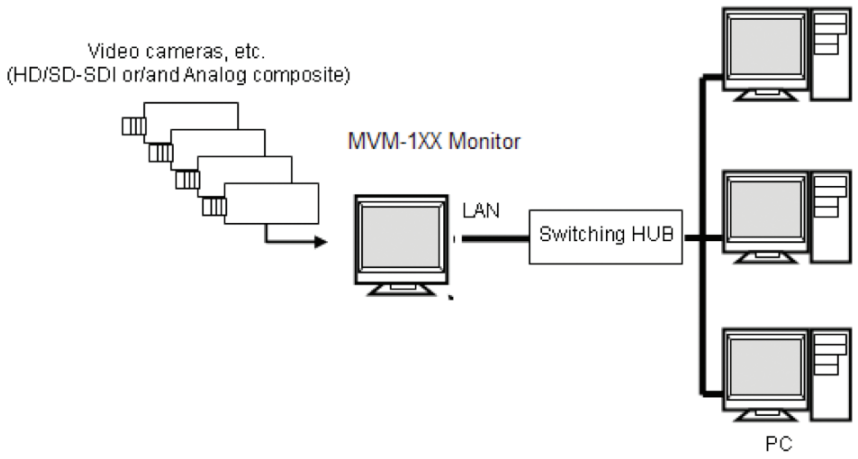
4-2-1-1. UNICAST Mode

The UNICAST mode using TCP/IP protocol supports the system that can provide video output to one monitor by MVM Live Viewer.



4-2-1-2. MULTICAST Mode

The MULTICAST mode using IP multicast supports the system that can provide video outputs to multiple monitors through the MVM as shown below.



IMPORTANT: Due to the UDP protocol used in MULTICAST mode, the video output may not be updated at the packet loss which occurs under the unstable network condition.

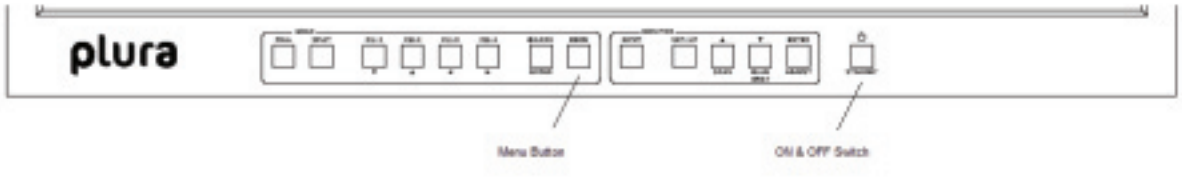
5. Operations

5-1. Operation at Startup

After the power is turned on, operation resumes from the last screen before the power was turned off. If a menu screen was displayed when the unit was turned off, operation resumes from the status before the menu screen.

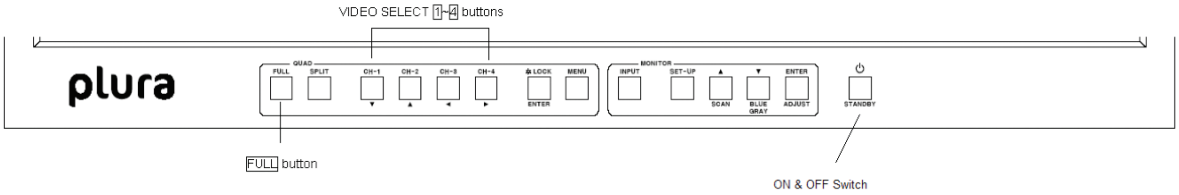
5-2. Data Initialization

Although initialization is normally not required, you can restore the MVM factory settings by the data initialization when the previous data is no longer needed such as after relocation or system modification. Turn on the power while holding down the MENU button. “MEMORY CLEAR” appears on the monitor screen and the setting data will be initialized.



5-3. Displaying Full Screen

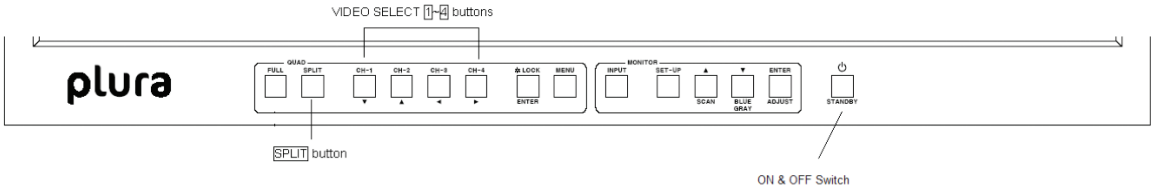
To display your desired channel in full screen, press the FULL button and then press the VIDEO SELECT 1 to 4 buttons. For instance, to view channel 3 in full screen, press the FULL button and then press the SELECT 3 button.



IMPORTANT: The image distortion occurs while switching layouts. A black screen is shown for channels with no input signals.

5-4. Displaying Split Screens

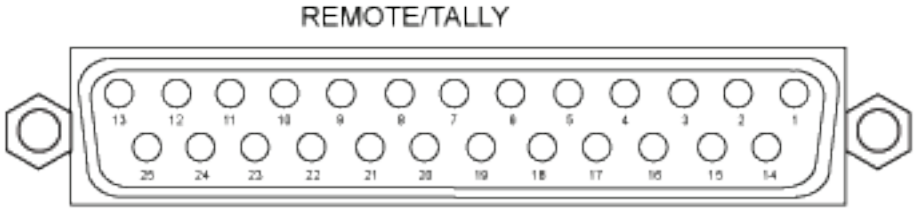
To display split screens, press the SPLIT button. Pressing a VIDEO SELECT button while displaying split screen will change the displayed split screen layout to another layout.



IMPORTANT: The image distortion occurs while switching layouts. A black screen is shown for channels with no input signals.

5-5. REMOTE/TALLY

MVM can be remotely controlled using contact inputs to the TALLY IN/REMOTE connector on the rear panel. The connector is also provided with pins for external tally inputs that enable to display two color borders on video frames.



Connector pin assignments (25-pin, D-sub female) Inch screws

Pin no.	Function	Description
1	IN1 TALLY (Red)	INPUT1 TALLY border (Red) display
2	IN2 TALLY (Red)	INPUT2 TALLY border (Red) display
3	IN3 TALLY (Red)	INPUT3 TALLY border (Red) display
4	IN4 TALLY (Red)	INPUT4 TALLY border (Red) display
5	IN1 TALLY (Green)	INPUT1 TALLY border (Green) display
6	IN2 TALLY (Green)	INPUT2 TALLY border (Green) display
7	IN3 TALLY (Green)	INPUT3 TALLY border (Green) display
8	IN4 TALLY (Green)	INPUT4 TALLY border (Green) display
9	FULL 1	INPUT1 Full screen display
10	FULL 2	INPUT2 Full screen display
11	FULL 3	INPUT3 Full screen display
12	FULL 4	INPUT4 Full screen display
13	+5V	+5V output (maximum 200mA DC)
14	GND	GND
15	USER1	Preset layout 1
16	USER2	Preset layout 2
17	USER3	Preset layout 3
18	USER4	Preset layout 4
19	ADJ_IN	Time adjustment input
20	ADJ_OUT	Time adjustment output
21	FAN_ALARM	Fan alarm output
22	NC	Do not use.
23	NC	Do not use.
24	NC	Do not use.
25	NC	Do not use.

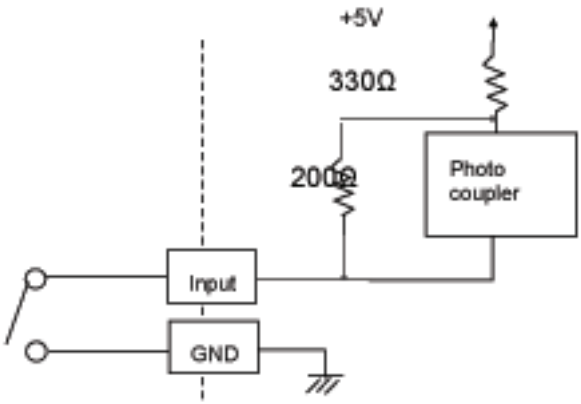
Compatible connector: DB-25PF-N(JAE)
Cover: DB-C4-J11-S1(JAE)
Signal standard: Make contact, TTL level negative logic pulse

IMPORTANT: The input signal pulse width should be 100ms or more. The input signal interval should also be 100ms or more.

5-5. REMOTE/TALLY continued

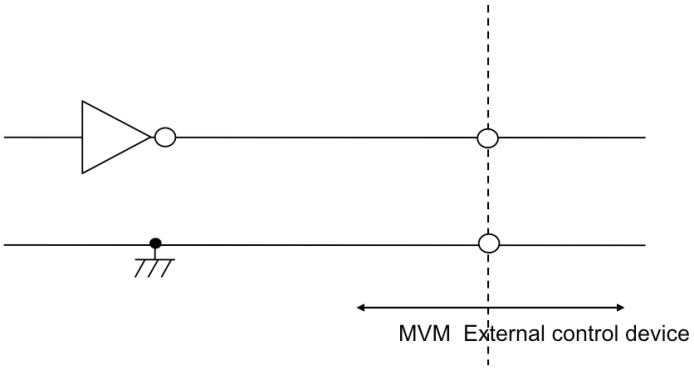
Input Connector

The figure at right depicts the MVM circuit for each input pin.



Output Connector

The figure at right depicts the MVM circuit for each output pin. Outputs 5V TTL level alarm signal.



5-5-1. Control using REMOTE Connector

Control via REMOTE connector operates the same as control from front panel buttons. Commands from both REMOTE connector and front panel buttons are accepted at the same time.

5-5-2. ADJ_IN (External Time Adjustment Input)

Time adjustment made by the falling edge of the external pulse input (pulse width 100ms or more) is shown below.

1. When second digit displays 1 to 29 -> Correct to 0 second
2. When second digit displays 30 to 59 -> Correct to 0 second and add 1 minute

5-5-3. ADJ_OUT (External Time Adjustment Output)

Outputs a pulse signal (500ms) at the interval set at the ADJUST in the [SYSTEM].

IMPORTANT: ADJ_OUT pin outputs a pulse signal at the set interval triggered by the internal clock. ADJ_IN pin does not supply buffered output.

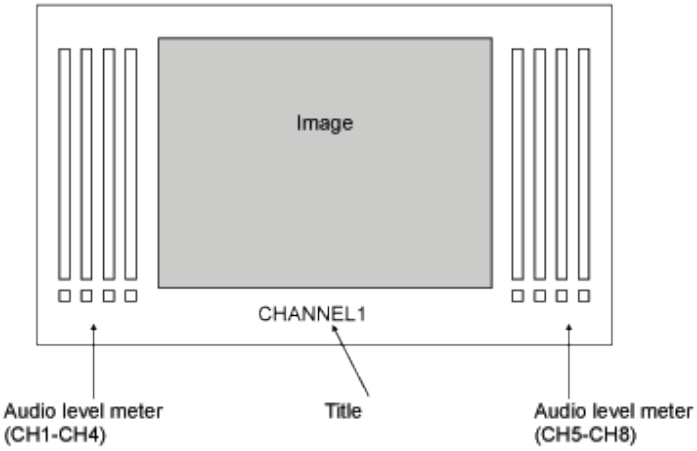
6. Screen Display

6-1. Full Screen

The display mode can be selected from three options. See section 18-2-1. “System” in the part 3, MVM Layout Editor of this manual for details on setting display mode.

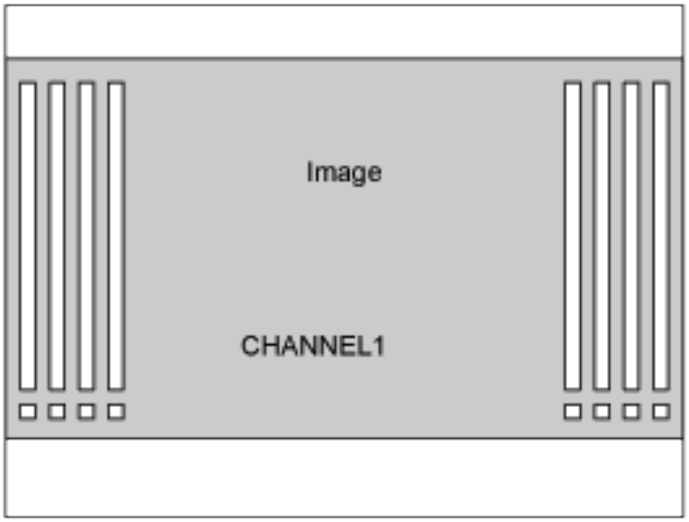
MODE1

Displays the title and audio level meters without overlapping on the video image. The aspect ratio of the input signal is retained. The example (right) is displaying 4:3 material in 16:9 display mode.



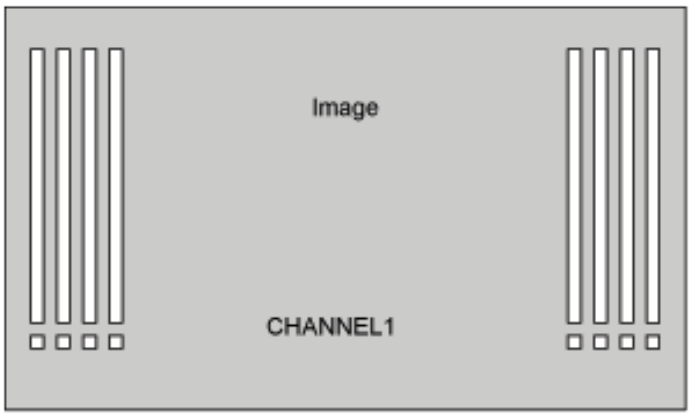
MODE2

Overlaps the title and audio level meters on the video image. The aspect ratio of the input signal is retained. The example (right) is displaying 16:9 material in 4:3 display mode.



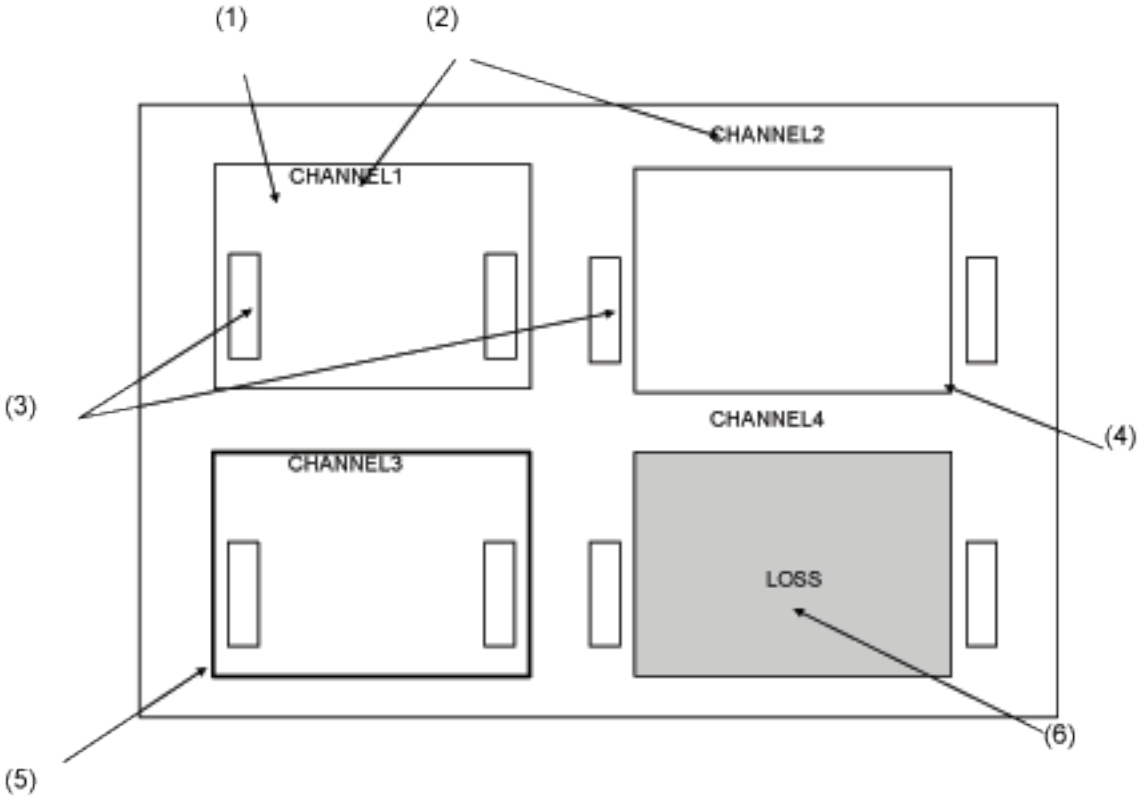
MODE3

Overlaps the title and audio level meters on the video image. The aspect ratio of the input signal is not retained, and the image is displayed to fill the selected display mode screen.



6-2. Split Screen

The split screen layout can be freely arranged using the supplied Layout Editor.



1. **Image Display Window**
   Windows to display each channel input. Display mode within the windows varies depending on the settings of display mode. See section 18-2-1. “System” in the part 3, MVM Layout Editor of this manual for details.

   If MODE1 or MODE2 is selected
   Maximizes the image to best fit the window while retaining the aspect ratio.
   If MODE3 is selected
   Maximizes the image to best fit the window without retaining the aspect ratio.

2. **Title display**
   Titles of each channel input. Titles can be displayed either within or outside the windows.

3. **Audio Level Meter display**
   Audio level meters of each channel input. Audio level meters can be displayed either within or outside the windows.

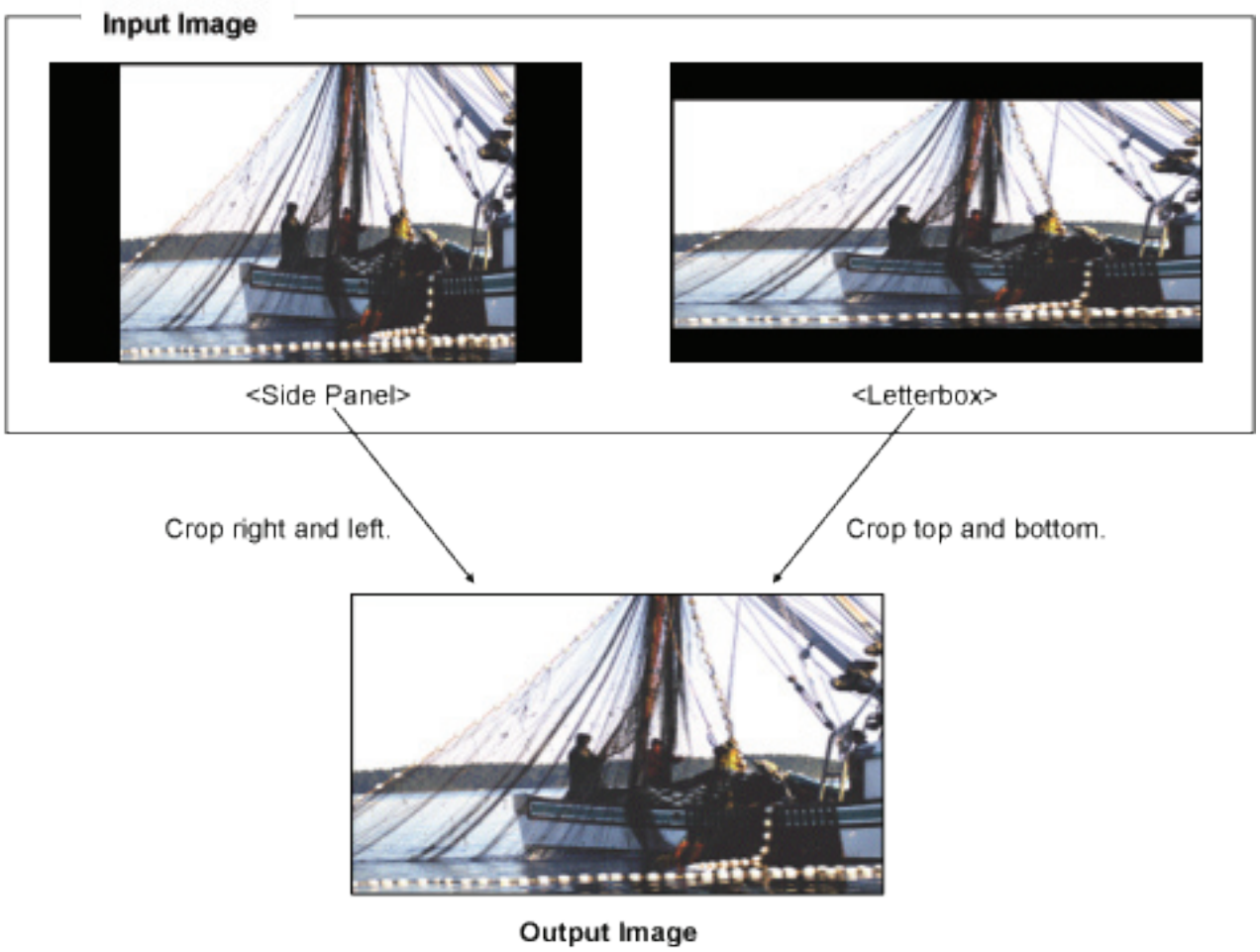
4. **Border display**
   Border display is available on each window frame. Line width of border can be changed using Layout Editor. See section 18-3-1. “Border” in the part 3, MVM Layout Editor of this manual for details.

5. **Tally display**
   Two tally inputs (red and green) are available for each channel input. Tally is displayed outside the border. Tally display color for simultaneous inputs of red tally and green tally can be selected from red or orange. See section 18-2-3. “Tally” in the part 3, MVM Layout Editor of this manual for details.

6. **Video loss display**
   The video loss alarm is displayed when video signal is lost. The display time length for the alarm can be changed using Layout Editor. See section 18-2-4. “Video Loss” in the part 3, MVM Layout Editor of this manual for details.

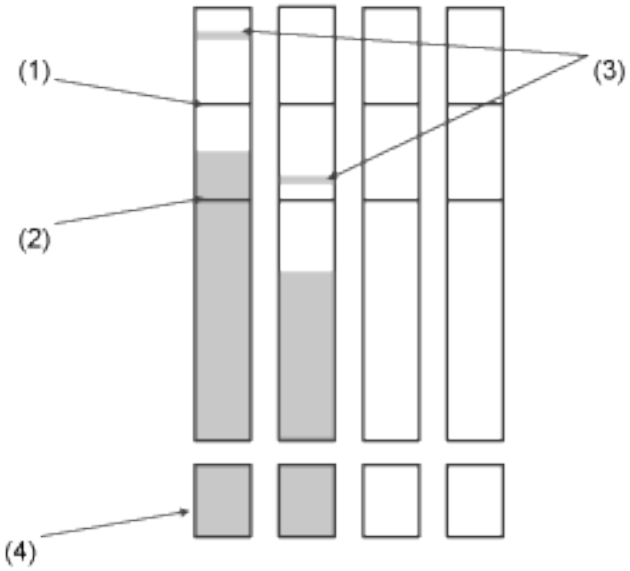
6-3. Crop

The effective pixel area (where picture exists) of the input display can be set. The black area produced by converting images to 4:3 or 16:9 can be reduced or eliminated, and the images can be enlarged and displayed to best fit the output screen. See section 18-2-6. “Crop” in the part 3, MVM Layout Editor of this manual for details on crop settings.



6-4. Audio Level Meter

Audio level meter for up to 8 channels can be displayed for each HD-SDI and SD-SDI input. For the details on audio level meter settings, see section 19-3-8. “Changing Display Position of Audio Level Meters” in the part 3, MVM Layout Editor of this manual.



1. **Peak Level**
   Peak level can be set in the range of -30dBFS to 0dBFS.
   The level bar rises above the peak level, the exceeded part is displayed in red.

2. **Reference Level**
   Reference level can be set in the range of -60dBFS to -1dBFS.
   The level bar rises above the reference level, the exceeded part is displayed in yellow.
   The bar below the reference level is displayed in green.

3. **Peak Hold**
   Shows the maximum level reached in the set length of the time.
   If the higher peak is reached, the display changes to indicate the higher peak. When the peak hold time is elapsed without reaching to any higher peak, it displays the current audio level. If the peak hold time is set to 0 sec, no peak hold display is provided.

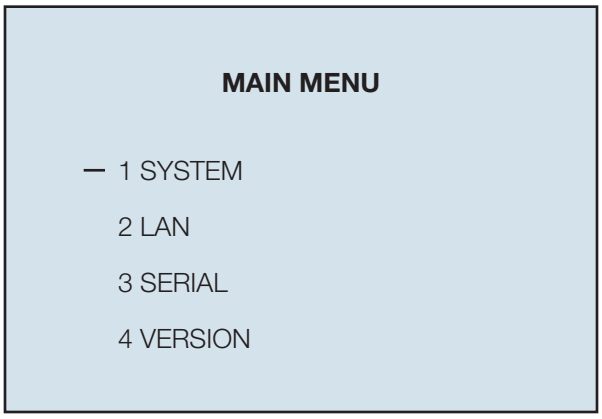
4. **Audio data indicator**
   Indicates the presence of audio data.
   When there is an audio input, it is displayed in green. When there is no audio input, it is displayed in black.
   HD-SDI: Detects active audio data, and indicates the presence or absence of audio data.
   SD-SDI: Detects active audio data or audio data of above -60dBFS, and indicates the presence or absence of the data.

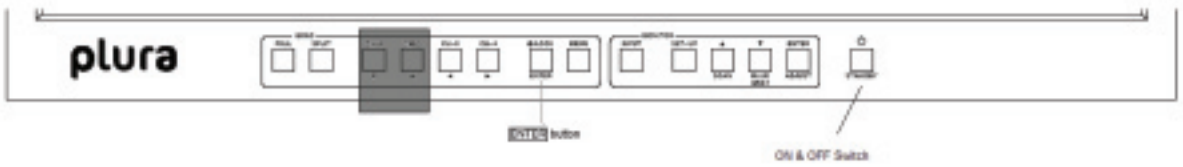
7. Menu Operations

Submenus can be accessed from the main menu for completing various settings.

7-1. Main Menu Screen

Press and hold down the MENU button for at least two seconds to display the MAIN MENU.





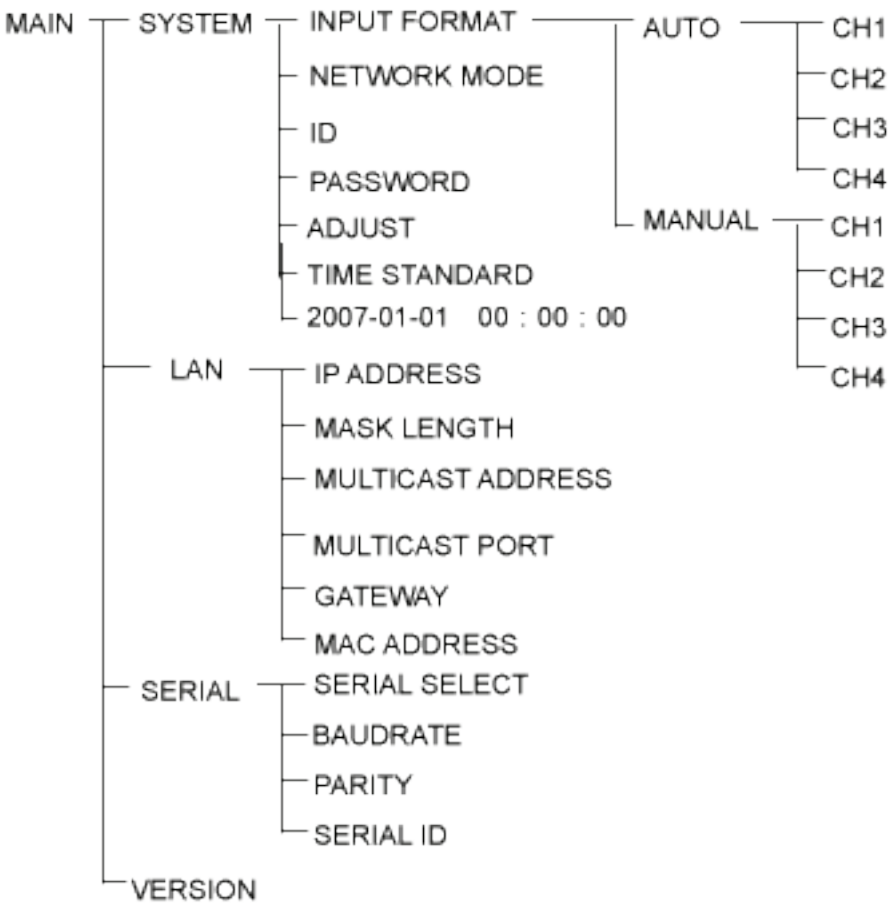
Operating Procedure

Button	Action
▲	Moves the cursor up.
▼	Moves the cursor down.
ENTER	Accesses the submenu of the selected item.

Setting items

Item	Setting details	Reference
1 SYSTEM	Input signal format settings	7-2.SYSTEM
	Network mode settings	
	ID and Password settings	
	Date and time settings	
2 LAN	Network settings	7-3.LAN
3 SERIAL	Serial interface settings	7-4.SERIAL
4 VERSION	Version display	7-5.VERSION

Menu Diagram



7-1. Main Menu Screen

On the MAIN MENU, move the cursor to [SYSTEM] and press the ENTER button. The SYSTEM screen is displayed as shown below.

SYSTEM

INPUT FORMAT	AUTO
NETWORK MODE	UNICAST
ID	ROOT
PASSWORD	00000
ADJUST	1/MINUTE
TIME STANDARD	INTERNAL
2007-01-01	00:00:00

*The settings in the figure above are the factory defaults.

Operating Procedure

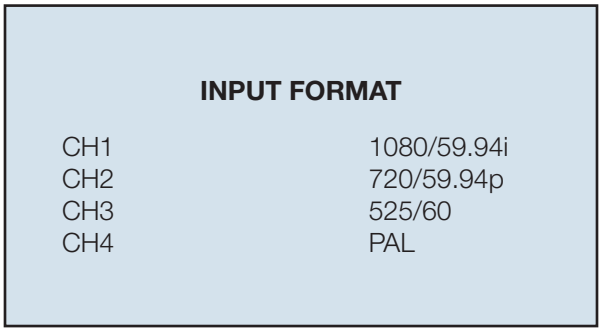
Button	Action
▲	Moves the cursor up.
▼	Moves the cursor down.
◀	Changes the setting item value. (Reverse)
▶	Changes the setting item value. (Forward)
MENU	Returns from SYSTEM menu to MAIN MENU, or from ID, PASSWORD, or Time setting mode to SYSTEM menu.
ENTER	Accesses INPUT FORMAT submenu or enter input mode for ID, PASSWORD, or Time when the cursor is on those items. Returns from ID, PASSWORD, or Time input mode to SYSTEM menu.

Setting items

Item	Setting range	Setting details
INPUT FORMAT	AUTO	Automatically recognizes input signal formats.
	MANUAL	Accepts manually set signal formats only.
NETWORK MODE	MULTICAST	Sets to Multicast mode.
UNICAST	Sets to Unicast mode.	
ID	8 alphanumeric characters	Used to set ID for the connection with PC over a LAN. ID of 8 space characters is not authenticated.
PASSWORD	00000 - 99999	Used to set Password for the connection with PC over a LAN.
ADJUST	MINUTE/HOUR/DAY	Sets the interval of time adjustment pulse output that is output from TALLY/REMOTE connector pin 20. (every minute/hour/day)
TIME STANDARD	INTERNAL	Uses internal clock signal.
	LTC	Uses LTC time code signal.
DATE AND TIME	Year: 2000 - 2099	Used to set the current time.
	Month: 01 - 12	
	Day: 01 - 31	
	Time: 00 - 23	
	Minute: 00 - 59	
	Second: 00 - 59	

7-1. Main Menu Screen

On the SYSTEM screen, move the cursor to [INPUT FORMAT] and press the ENTER button. The INPUT FORMAT screen is displayed as shown below. On the INPUT FORMAT screen, formats of input signals can be seen and set.



Operating Procedure

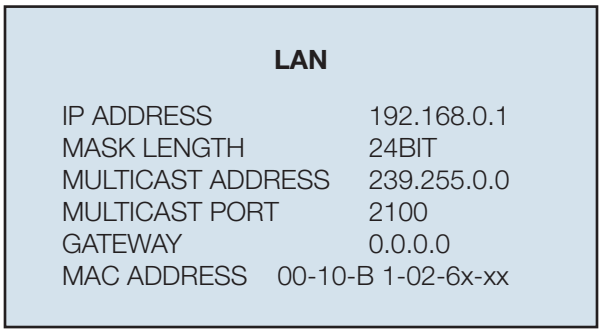
Button	Action
▲	Moves the cursor up. (Only in manual mode)
▼	Moves the cursor down. (Only in manual mode)
◀	Changes the setting item value. (Reverse) (Only in manual mode)
▶	Changes the setting item value. (Forward) (Only in manual mode)
MENU	Returns to SYSTEM menu.
ENTER	Accesses INPUT FORMAT submenu or enter input mode for ID, PASSWORD, or Time when the cursor is on those items. Returns from ID, PASSWORD, or Time input mode to SYSTEM menu.

Setting items

Item	Setting range	Setting details
CH1 - 4	1080/59.94i, 1080/50i 720/59.94p, 720/50p 525/60, 625/50	*525/60, and 625/50 represent SD-SDI signals. NTSC, and PAL represent analog composite signals. Accepts manually set signal formats only. Sets to Multicast mode.

7-3. LAN

On the MAIN MENU screen, move the cursor to [LAN] and press the ENTER button. The LAN screen is displayed as shown below. On the LAN screen network setting can be seen and changed.



*The settings in the figure above are the factory defaults.

Operating Procedure

Button	Action
▲	Moves the cursor up.
▼	Moves the cursor down.
◀	Changes the setting item value. (Reverse)
▶	Changes the setting item value. (Forward)
ENTER	Entering value while pressing down ENTER will change the value of the tens digit. (For MULTICAST PORT, changes the value of the thousands digit.) (Except MASK LENGTH)
MENU	Returns to MAIN menu.

IMPORTANT: If you change the value for the items other than MULTICAST ADDRESS and MULTICAST PORT, a warning message appears to require the restart of the unit. Whenever you have changed these settings, power off the MVM once and power on again.

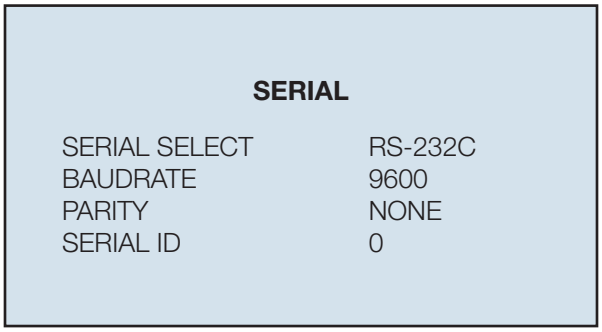
Setting items

Item	Setting range	Setting details
IP ADDRESS	0.0.0.0 - 255.255.255.255 (except 0.0.0.0, and 1.0.0.0)	Used to set IP ADDRESS. This setting is necessary for the communication over a LAN interface. Please consult with your system administrator if using in your existing network.
MASK LENGTH	0 - 31	Used to set subnet mask length for the device.
MULTICAST ADDRESS	224.0.0.0 - 239.255.255.255 (except 224.0.0.0 - 224.0.0.255)	Used to set multicast address to use in multicast mode.
MULTICAST PORT	1024 - 65535	Used to set multicast port for the connection in multicast mode. *This setting is not required for the connection in unicast mode.
GATEWAY	0.0.0.0 - 255.255.255.255	If your using network does not have a gateway, this setting is not required.
MAC ADDRESS	Do not change	Displays the MAC addresses of the device. The value cannot be changed.

IMPORTANT: If the MENU button is pressed when the entered value is invalid, an error message will be displayed. Press or button to clear the error and correct the invalid value.

7-4. SERIAL

On the MAIN MENU screen, move the cursor to [SERIAL] and press the ENTER button. The SERIAL screen is displayed as shown below.



Operating Procedure

Button	Action
▲	Moves the cursor up.
▼	Moves the cursor down.
◀	Changes the setting item value. (Reverse)
▶	Changes the setting item value. (Forward)
MENU	Returns to MAIN menu.
ENTER	Accesses INPUT FORMAT submenu or enter input mode for ID, PASSWORD, or Time when the cursor is on those items. Returns from ID, PASSWORD, or Time input mode to SYSTEM menu.

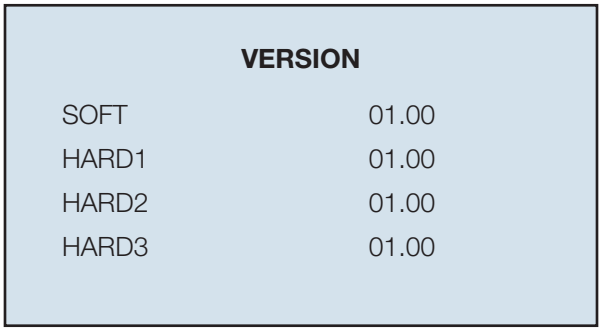
Setting items

Item	Setting range	Setting details
SERIAL SELECT	RS-232C/RS-422/RS-485	Selects interface to be used.
BAUDRATE	9600/19200/38400	Sets baud rate.
PARITY	NONE/ODD/EVEN	Sets parity.
SERIAL ID	0 - 31	Sets serial ID for the device.

IMPORTANT: If you are using RS-422 or RS-485, you must adjust jumper switch settings on MVM main unit. See section 9. “RS-232C/422/485 Interface” for details on adjusting switches.

7-5. VERSION

On the MAIN MENU screen, move the cursor to [VERSION] and press the ENTER button. The VERSION screen is displayed as shown below. On the VERSION screen, the version information of MVM can be seen.



*The settings in the figure above are the factory defaults.

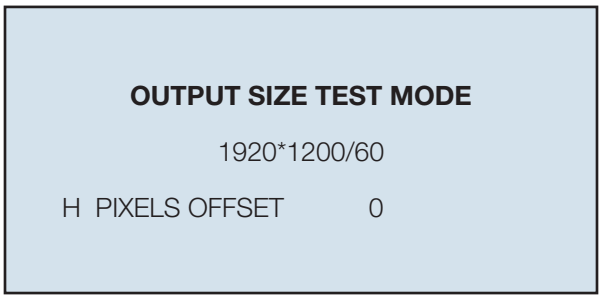
Operating Procedure

Button	Action
Button	Action
MENU	Returns to MAIN menu.

8. Output Size Test Mode

This mode is used to verify that the connected monitor can display the output image in the format set on the MVM.

Turn the power on while pressing the LOCK button, the screen shown below will be displayed in the format used last time the power was turn off. The LEDs on the front panel are also turned on according to the format selected for the output. The LED indication details are shown in the table below. The factory default is set to 1920x1200/60.



Operating Procedure

Button	Action
▲	Changes the output resolution. (Reverse)
▼	Changes the output resolution. (Forward)
◀	Changes the value of H PIXELS OFFSET. (Reverse) *Minimum -4 pixels
▶	Changes the value of H PIXELS OFFSET. (Forward) *Maximum 4 pixels
ENTER	Changes the output frequency.
MENU	Resumes start-up of the MVM. (The setting of the output frequency is stored.)

Assessing Status

If the connected monitor does not display the image in the format set on the MVM, verify the format actually output by the LEDs on the front panel. See the table below for the verification. If you need to change the format for the display according to the test result, change the format using the Layout Editor.

1. Output resolution

Setting order	Resolution	3	4	LOCK	MENU
1	1280 x 1024	Flash	Flash	Flash	Flash
2	1360 x 768	Flash	Flash	Flash	Lit
3	1600 x 1200	Flash	Flash	Lit	Flash
4	1920 x 1200	Flash	Flash	Lit	Lit
5	1440 x 900	Flash	Lit	Flash	Flash
6	1680 x 1050	Flash	Lit	Flash	Lit
7	1920 x 1080	Flash	Lit	Lit	Flash
8	1280 x 720	Flash	Lit	Lit	Lit

2. Output Frequency

Setting order	Frequency	FULL	SPLIT	1	2
1	60Hz	Flash	Flash	Flash	Flash
2	59.94Hz	Flash	Flash	Flash	Lit
3	50Hz	Flash	Flash	Lit	Flash

IMPORTANT: If the image of your desired format is not properly displayed, change the “H PIXELS OFFSET” value and check if the monitor can display the image. Normally set H PIXELS OFFSET to 0 for operating the MVM.

9. RS-232C/422/485 Interface

The factory default is set to RS-232C interface. To change the interface from RS-232C to RS-422 or RS-485, or to change the termination ON/OFF setting, change the settings at [SERIAL SELECT] in the SERIAL menu and the jumper switches in the main unit. See sections 7-4. “SERIAL” and 9-1. “Changing RS-422/RS-485 or Termination”. Once the setting is changed to RS-422 or RS-485, the same adjustments are required to return to RS-232C again. The command format for the RS-422 interface and RS-485 interface is common.

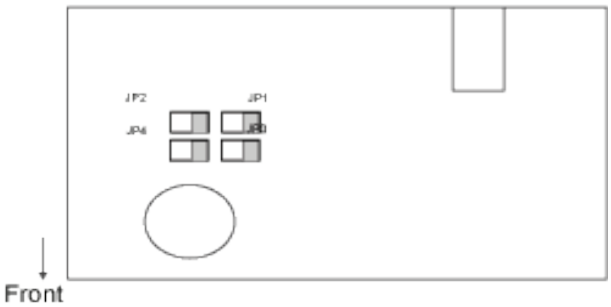
Item to change		Adjustments made for	
Original	Change to	Menu setting at SERIAL SELECT	Jumper switches
RS-232C	RS-485	Required	Required
	RS-422	Required	Required
RS-485	RS-232C	Required	Not required
	RS-422	Required	Required
RS-422	RS-232C	Required	Not required
	RS-485	Required	Required

CAUTION: Do not access internal cards or make connections with the unit powered ON. Always power OFF all connected units / disconnect power cords prior to accessing interior. The repair or adjustment that requires opening the unit should only be done by qualified technical personnel.

9-1. Changing RS-422/RS-485 or Termination

To change the interface from/to RS-422/RS-485 or to change the termination ON/OFF setting, remove the main unit top panel, and adjust the jumper switch settings on the SUB card inside.

1. Remove screws from the back panel of the monitor.
2. Lift and completely remove the back panel.
3. Change the settings at JP3 and JP4 to switch interface to RS-422 or RS-485. To change the termination ON/OFF setting, change the settings at JP1 and JP2.



Interface to use	JP3	JP4
RS-422	1-2	1-2
RS-485	2-3	2-3

Termination	JP1	JP2
ON	1-2	1-2
OFF	2-3	2-3

4. Return the top panel in place and secure with screws.
5. Power on the MVM. Open [SERIAL] Menu screen, and select RS-422 or RS-485 at [SERIAL SELECT].

IMPORTANT: Before performing the above operation to change interface selection, disconnect the serial cable from the connector on the rear panel. The operations as an example below may cause unit a malfunction. (E.g.) Switching from RS-232C to RS-485 or RS-422 while a cable is connected for RS-232C on the rear panel.

To return to RS-232C interface from RS-422 or RS-485 interface, only the menu setting for SERIAL SELECT must be changed to RS-232C. No need to change the jumper switch settings at JP1 - JP4 on SUB card.

9-2. RS-232C/422/485 Connector

RS-232C connector pin assignment (9-pin, D-sub male)

Pin no.	Signal	In/Out	Description
1	-		Unassigned
2	TXD	Output	Transmit data
3	RXD	Input	Receive data
4	DSR	Input	Data set ready
5	GND		Signal ground
6	DTR	Output	Data terminal ready
7	CTS	Input	Clear to send
8	RTS	Output	Request to send
9	-		Unassigned

RS-422 connector pin assignment (9-pin, D-sub male)

Pin no.	Signal	In/Out	Description
1	-		Unassigned
2	RX+	Input	Receive data
3	TX-	Output	Transmit data
4	-		Unassigned
5	GND		Signal ground
6	-		Unassigned
7	RX-	Input	Receive data
8	TX+	Output	Transmit data
9	-		Unassigned

RS-485 connector pin assignment (9-pin, D-sub male)

Pin no.	Signal	In/Out	Description
1	NC		Unassigned
2	TX/RX+	In/Out	Transmit/Receive data
3	NC		Unassigned
4	NC		Unassigned
5	GND		Signal ground
6	NC		Unassigned
7	TX/RX-	In/Out	Transmit/Receive data
8	NC		Unassigned
9	NC		Unassigned

Serial communication standard

Transmission mode	Asynchronous, Full-duplex (RS-232C, RS-422), Half-duplex (RS-485)
Baud rate	Select from 9600, 19200, or 38400[bps]
Data length	8 [bit]
Stop bit	1 [bit]
Parity	Select from NONE, ODD, or EVEN
Flow control	None

IMPORTANT: DSR/DTR and RTS/CTS are looped back in the MVM. Use a RS-232C straight cable or 422 straight cable to connect another device such as a PC.

9-3. RS-232C Connection Example

MVM

Pin no.	Signal
1	Not used
2	TxD
3	RxD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS
9	Not used
Case	9-pin D-sub male

PC

Pin no.	Signal
1	Not used
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	Not used
Case	9-pin D-sub female

IMPORTANT: Use straight cables. (The wiring and connector depend on the type of computer.) DSR/DTR and RTS/CTS are looped back in the MVM.

10. Troubleshooting

9-2. RS-232C/422/485 Connector

If any of the following problems occur during operation of the MVM, before assuming a unit malfunction has occurred, follow the troubleshooting procedures below to see if the problem can be corrected.

IMPORTANT: If the problem is not corrected by performing the procedures below, turn the unit off and then on again. If this still does not correct the problem, contact your dealer.

Problem	Check	Action
No information is displayed on the screen.	Are all information display settings in the Parameter page set to ON?	Check the display settings by the Layout Editor
Unable to operate front panel buttons.	Is the LOCK button flashing?	Front panel operation is locked. Cancel the switch lock by pressing the LOCK button for at least 2 seconds.
I want to restore the default settings.		Turn the unit power on while pressing and holding down the MENU button.
Image is not properly displayed.	Is the used monitor compatible with the format set on the MVM?	If not, change the format of the MVM output . If the monitor is compatible, change the H PIXELS OFFSET value using the OUTPUT SIZE TEST MODE (See section 8. “Output Size Test Mode”) and verify the output image can be displayed.
Image noise appears.	Is the output frequency (vertical frequency) set to 50Hz?	Check that the monitor is compatible with 50Hz. If not compatible, change the monitor to the 50Hz compatible monitor.

11. Specifications and Dimensions

11-1. Specifications

TV Standard	HD:	1080/60i, 1080/59.94i, 1080/50i, 720/60p, 720/59.94p, 720/50p
	SD:	525/60 (NTSC), 625/50 (PAL)
Video Input	4 inputs of any inputs below (Mix input, asynchronous acceptable)	
	HD-SDI:	1.485Gbps or 1.485/1.001Gbps 75 BNC
	SD-SDI:	270Mbps 75 BNC
	Analog composite:	1.0V(p-p) 75 BNC
LTC Input	1 input	
	SMPTE time code	appr. 1.0Vp-p within ±6dB
Video Output	DVI output (Outputs Digital and Analog outputs at the same time.)	
	DVI-I connector	1 output
	Resolution:	1920x1200, 1600x1200, 1280x1024, 1360x768 1440x900, 1680x1050, 1920x1080, 1280x720
	Frequency:	Refer to the table below.
	*No input/output frame rate converter. Frame rate difference between input and output results the repeat frame or drop frame.	

DVI / Analog RGB output frequency chart (When H PIXEL OFFSET is set to 0.)

	1920x1200			1600x1200			1280x1024			1360x768		
Mode Hz	60	59.94	50	60	59.94	50	60	59.94	50	60	59.94	50
H(Horizontal) kHz	74.06	74.05	61.90	75	74.93	61.91	63.98	63.91	52.87	47.71	47.66	39.66
V(Vertical) Hz	59.96	59.95	50.00	60	59.94	50.01	60.02	59.95	50.02	60.02	59.95	50.01

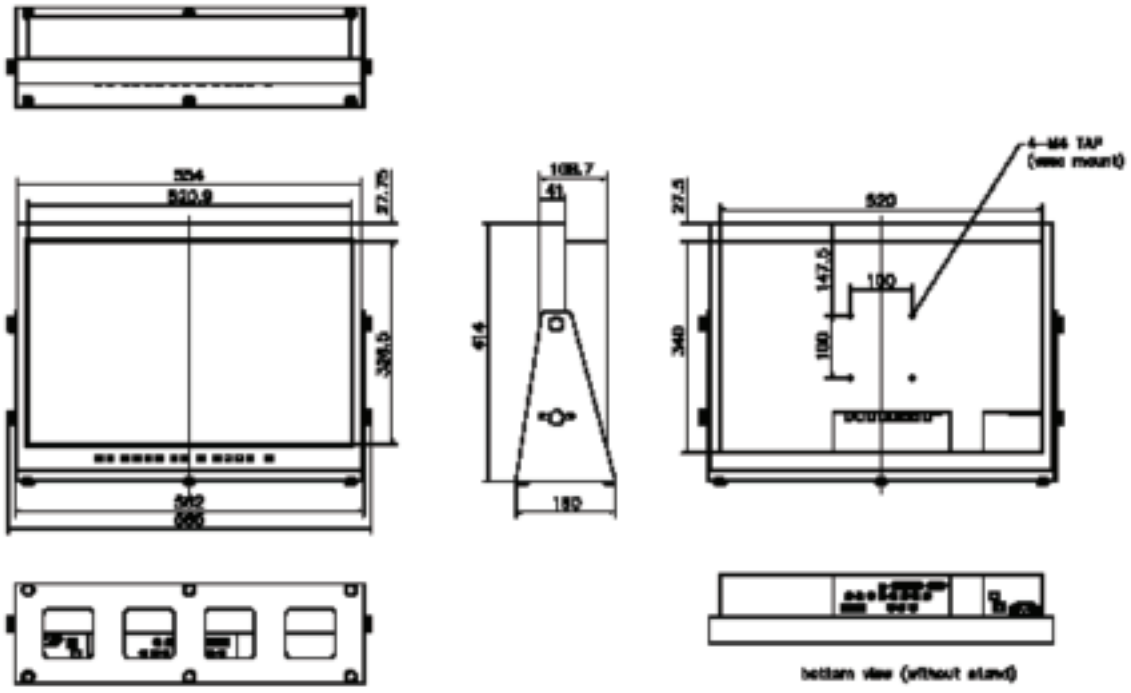
	1440x900			1680x1050			1920x1080			1280x720		
Mode Hz	60	59.94	50	60	59.94	50	60	59.94	50	60	59.94	50
H(Horizontal) kHz	55.96	56.02	46.47	65.26	65.26	54.15	67.5	67.44	56.25	45	44.95	37.5
V(Vertical) Hz	59.91	59.97	50.03	59.93	59.93	50.01	60	59.95	50	60	59.93	50
*60Hz mode is most similar to the VESA standard.												

Active loop through output (for a monitor)	HD-SDI:	1.485Gbps or 1.485/1.001Gbps
	SD-SDI:	270Mbps 75 BNC
	* Available only when input is either HD-SDI or SD-SDI.	
	* No jitter correction. The jitter in the input will be carried to the active loop through output. The total jitter may exceed the jitter limit of signal standard.	
Quantization	8 bit	
I/O Delay	1 - 2 frames	
Screen Display Types	Full screen, User customized layout	
Title display	Character capacity:	Max. 16 characters x 1 line for each input channel
	Character types:	Alphanumeric characters and symbols
Tally Indication	Frame:	Red or Green per input. (Red or Umber selectable for the display at the simultaneous inputs of red and green tallies.)
Audio Level Meters	8 embedded audio channels per input	
	* Embedded audio signals are not passed through.	
Time Display	Real-time display (provided with the internal clock)	
	*Accuracy within ±10 seconds per month (at 25°C)	

11-1. Specifications

Interfaces	RS-232C/RS-422/RS-485: 9-pin D-sub male, 1 port	
	Baud rate:	9,600/19, 200/38, 400bps, data length 8bit, stop bit 1bit, parity NONE/ODD/EVEN
	TALLY IN:	25-pin D-sub female *Shared use with REMOTE IN
		4 inputs x 2colors (red or green border display)
		TTL negative logic pulse level or Make contact
	REMOTE IN:	25-pin D-sub female *Shared use with TALLY IN
		Control over switching channels or display modes of full screen or split screen
		TTL negative logic pulse level or Make contact
	LAN:	10Base-T/100Base-TX, RJ-45 (Category 5), 1 port
	Video transmission:	Compress and transmit DVI/Analog RGB output and image, JPEG compression
Layout Editor	Edit size and position of windows in split screen	
Temprature/ Humidity	0°C - 40°C, 30% - 90% (no condensation)	
Backup battery	Internal lithium battery (to maintain time)	
Consumption	43VA (42W) at 100VAC	
	53VA (40W) at 200VAC	
Power	100VAC - 240VAC ±10%, 50Hz/60Hz	
Weight	5.5kg (with redundant power supply option installed)	
Dimentions	430 (W) x 44 (H) x 400 (D)mm, EIA1RU	
Accessories	Operation Manual, AC cord, Rack mount brackets, CD-R (Layout Editor, Live Viewer)	
Option	• SNMP compatible (for Power/Fan status observation)(future release)	
	• Redundant power supply	
Consumables	Power unit:	Replace every 4 years (at room temperature)
	Fan:	P1399 (front and rear) Replace every 5 years (at room temperature)
	Battery:	CR2450 Replace every 7 years (at room temperature)

11-1. Specifications



RS-232C/422/485/ LAN COMMAND

Version 2.0 - Higher

12. Communication Setting

12-1. RS-232C / 422 / 485 Interface Communication Standards

The communication standards when connecting the unit to a serial controller via RS-232C, RS-422 or RS-485 are as follows.

Transmission speed	9600bps, 19200bps or 38400bps
Data length	8 [bit]
Stop bit	1 [bit]
Parity	None, Odd, Even
X parameter (flow control)	None

12-2. LAN Interface Communication Setting

The communication standards when connecting the unit to a serial controller via LAN are as follows.

Communication Protocols

Application Layer	Original protocol described in this appendix manual
Transport Layer	TCP, UDP
Network Layer	IP, ICMP, ARP, RARP
Network Interface Layer	Ethernet (CSMA/CD, 10BASE-T/100BASE-TX)

Network Setting

Item	Default Setting	Setting Range
IP address	192.168.0.1	[0-255].[0-255].[0-255].[0-255] (Except 0.0.0.0 and 1.0.0.0)
Subnet mask (Mask length)	24	0-31
Multcast address	239.255.0.0	[224-239].[0-255].[0-255].[0-255] (Except 224.0.0.0 to 224.0.0.255)
Multcast port	2100	1024 to 65535
Gateway	0.0.0.0	[0-255].[0-255].[0-255].[0-255] Gateway (0.0.0.0) means the default gateway is not set.
Port number	-	2010: Used to send and receive commands 2000: Used to receive image data (Cannot be changed)
MAC address	Set at the factory	(Cannot be changed.)

NOTE: The network settings above are made in the LAN menu in MVM. See “LAN menu” in the MVM Operation Manual for details.

12-3. Notes on the LAN Interface

1. IP address, Subnet mask, Gateway and Port number settings must be set to suit your network system.
2. Consult your system administrator before setting IP address, Subnet mask, Gateway and Port number to avoid troubles, if configuring the system in an existing LAN.
3. The MVM cannot establish connections to multiple PCs via LAN.
4. Release the port on the MVM when terminating the control from the PC, so that the MVM can establish a connection again to the PC or to another PC.
5. It takes approxmately 10 seconds to release port2000 on MVM after port2000 (for image data transmission) is released on the computer, and during this period you cannot establish a connection.
6. The command port (port2010) automatically closes the socket connection to the computer if the socket connection is left unused for 5 seconds.

State Transition Diagram of MVM

13. Command Protocol Format

All command contents are transmitted and received in ASCII code. Follow each format to make and send message commands. The command formats are as shown in the following pages.

13-1. Commands Formats for RS-232C, RS-422 and LAN (without Password)

Command Format

Command code + Command parameter + CR + LF (3 byte) (Bytes specified for each parameter)

(Works without LF as well)

(Ex.) When sending a command to display in full screen

Byte	Parameter	Command	Description
1-3	Command code	SDF	
4	Reserve	0	Fixed to "0"
5-6	Input channel	01-04	Channel no. 1-4
7	End code	CR	
8		LF	

NOTE: The MVM sends a response or a message when receiving a command. Do not send the next command before receiving the response or the message transmitted by the MVM; Otherwise, the command cannot be read properly.

13-2. Commands Formats for RS-485

The ID header is located in front of the Command code. The ID number specifies the ID of MVM (00-31) to be controlled. The ID number is set in the menu of MVM.

Command Format

I + ID number + Command code + Command parameter + CR + LF (2 byte) (3 byte) (Bytes specified for each parameter)

(Works without LF as well)

(Ex.) When sending a command to display in full screen

Byte	Parameter	Command	Description
1	ID header	I	Fixed to "0"
2-3		00-31	
4	Command code	S	
5		D	
6		F	
7	Reserve	0	Fixed to "0"
8-9	Input channel	01-04	Channel no. 1-4
10	End code	CR	
11		LF	

NOTE: The MVM sends a response or a message when receiving a command. Do not send the next command before receiving the response or the message transmitted by the MVM. Otherwise, the command cannot be read properly.

Do not use the same ID number for two or more devices in an RS-485 system. If there exists any device which has the same ID number as MVM in the RS-485 system, the MVM connection does not work properly.

All command contents are transmitted and received in ASCII code. Follow each format to make and send message commands. The command formats are as shown in the following pages.

13-3. Commands Formats for LAN (with Password)

Command Format

ID number + Password + Command code + Command parameter + CR + LF (n byte) (5 byte) (3 byte) (Bytes specified for each parameter)

(Works without LF as well)

(Ex.) When sending a command to display in full screen

Byte	Parameter	Command	Description
1	Number of characters for ID	1-8	1- 8 characters
2 to n	ID		ID set for the controlled MVM.
n+1	Password	1-9	1st digit
n+2		1-9	2nd digit
n+3		1-9	3rd digit
n+4		1-9	4th digit
n+5		1-9	5th digit
n+6	Command code	S	
n+7		D	
n+8		F	
n+9	Reserve	0	Fixed to "0"
n+10 to n+11	Input channel	01-04	Channel no. 1-4
n+12	End code	CR	
n+13		LF	

NOTE: The MVM sends a response or a message when receiving a command. Do not send the next command before receiving the response or the message transmitted by the MVM. Otherwise, the command cannot be read properly.

13-4. Response Message Format

Normal end

Messages in the following format are returned after normal reception and processing.

Byte	Parameter	Command	Description
1-2	Message code	OK	"OK"
3	End code	CR	
4		LF	

Abnormal end

If something prevents commands from being issued normally, messages in the following format are returned.

Byte	Parameter	Command	Description
1-3	Message code	ERR	"ERR"
4-6	Error code	1	Command Error
		2	Command Length Error
		3	Parameter Range Error
		4	MVM is in menu mode.
		5	Setting not-available (function not-installed)
		006-999	Future use
7	End code	CR	
8		LF	

14. Control Commands

14-1. Full Screen Display

Displays the specified channel in full screen.
With normal reception and processing, the response message is “OK.”
“ERR004” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1-3	Command code	SDF	
4	Reserve	0	Fixed to "0"
5-6	Input channel	01-04	Channel no. 1-4
7	End code	CR	
8		LF	

14-2. Layout Display

Displays the specified layout.
With normal reception and processing, the response message is “OK.”
“ERR004” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1-3	Command code	SDS	
4	Reserve	0	Fixed to "0"
5-6	Layout	01-04	Layout no. 1-4
7	End code	CR	
8		LF	

14-3. Frame Rate Setting for Video Transmission

Sets a frame rate for video transmission.
With normal reception and processing, the response message is “OK.”

Byte	Parameter	Command	Description
1-3	Command code	SNF	
4	Frame rate	0	0fps (No video transmission)
1		1fps (60Hz, 59.94Hz)	1fps (50Hz)
2		5fps (60Hz, 59.94Hz)	4fps (50Hz)
3		10fps (60Hz, 59.94Hz)	8fps (50Hz)
4		15fps (60Hz, 59.94Hz)	12fps (50Hz)
5		30fps (60Hz, 59.94Hz)	25fps (50Hz)
6		60fps (60Hz, 59.94Hz)	50fps (50Hz)
5	End code	CR	
6		LF	

NOTE: Video transmission starts when “Frame rate” is set other than “0.” To stop video transmission, set “Frame rate” to “0.”

In some cases video cannot be sent by the specified frame rate due to the video resolution, JPEG compression ratio, PC performance or the network environment. In this case, increase the JPEG compression ratio to reduce the data size.

14-4. JPEG Compression Setting for Transmission

Sets a JPEG compression ratio for video transmission.
With normal reception and processing, the response message is “OK.”

Byte	Parameter	Command	Description
1-3	Command code	SNJ	
4	JPEG compression ratio	0	Low quality
		1	Normal quality
		2	Fine quality
		3	Superfine quality
5	End code	CR	
6		LF	

14-5. Output Video Frequency Setting

Sets the output video frequency.
With normal reception and processing, the response message is “OK.”
“ERR004” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1-3	Command code	SOF	
4	Reserve	0	Fixed to "0"
5	Frequency	0	60Hz
		1	59.94Hz
		2	50Hz
6	End code	CR	
7		LF	

14. Control Commands

14-6. Display Mode Setting

Selects a display mode.
With normal reception and processing, the response message is “OK.”
“ERR004” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1-3	Command code	SAM	
4-5	Reserve	0	Fixed to "00"
6	Display mode	0	Mode1
		1	Mode2
		2	Mode3
7	End code	CR	
8		LF	

Display mode

Mode1 *	The aspect ratio of input video is retained. In full screen, title (caption) and audio level meter are displayed outside images
Mode2 *	The aspect ratio of input video is retained. In full screen, title (caption) and audio level meter are displayed on images
Mode3	The aspect ratio of input video is not retained and video image is fitted to screen width.

* In split screen, mode1 and mode 2 have the same appearance.

14-7. Output Resolution Setting for Layout Screen

Sets an output resolution for layout screen.
With normal reception and processing, the response message is “OK.”
“ERR004” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1-3	Command code	SLO	
4	Reserve	0	Fixed to "0"
5-6	Layout	01-04	Layout no. 1-4
7-8	Output Resolution	0	1280 x 1024
		1	1360 x 768
		2	1600 x 1200
		3	1920 x 1200
		4	1440 x 900
		5	1680 x 1050
		6	1920 x 1080
		7	1280 x 720
9	End code	CR	
10		LF	

NOTE: All channel assignments are cleared when the output size is changed.

14-8. Screen Layout Setting

Defines each screen layout (Layout1-4).
With normal reception and processing, the response message is “OK.”
“ERR004” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1-3	Command code	SLD	
4	Reserve	0	Fixed to "0"
5-6	Layout screen	01-04	Layout no. 1-4
7-8	Displayed channel	01-04	Channel no. 1-4
		80	CLOCK
9	Display ON/OFF	0	OFF
		1	ON
10-11	Layer (display priority)	01-05	Sets layer priority in the layout (*1) 01(Lowest) to 05(Highest)
12-15	Window position: LEFT	0000-1800	Set in multiples of 2. (*1)
16-19	Window position: TOP	0000-1120	Set in multiples of 2. (*1)
20-23	Window size: WIDTH	0120-1920	Set in multiples of 8. (*1)
24-27	Window size: HEIGHT	0080-1200	Set in multiples of 8. (*1)
28-31	Title position: LEFT	0000-1920	Set in multiples of 2. (*1)
32-35	Title position: TOP	0000-1200	Set in multiples of 2. (*1)
36-39	Level meter (L) position: LEFT	0000-1920	Set in multiples of 2. (*2)
40-43	Level meter (L) position: TOP	0000-1200	Set in multiples of 2. (*2)
44-47	Level meter (R) position: LEFT	0000-1920	Set in multiples of 2. (*2)
48-51	Level meter (R) position: TOP	0000-1200	Set in multiples of 2. (*2)
52	Level meter size: WIDTH	1-3	(*2)
53-54	Level meter size: HEIGHT	01-10	(*2)
55	End code	CR	
56		LF	

*1 - Set all digits to “0” when “Display ON/OFF” is set “OFF”.
*2 - Set all digits to “0” when “Display ON/OFF” is set “OFF” or “CLOCK” is selected for “Displayed channel.”

NOTE: “ERR003” message is returned if any number other than the specified multiples is set, or the total of the values set for window position and window size exceeds the actual output resolution.

14-9. Crop Area Setting

Specifies the area and size to crop images.
With normal reception and processing, the response message is “OK.”
“ERR004” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1-3	Command code	SRG	
4-5	Displayed channel	01-04	
6-9	Crop area size (Top)	0000-0120	Set in multiples of 4.
10-13	Crop area size (Bottom)	0000-0120	Set in multiples of 4.
14-17	Crop area size (Left)	0000-0120	Set in multiples of 4. (1=2pixels)
18-21	Crop area size (Right)	0000-0120	Set in multiples of 4. (1=2pixels)
22	End code	CR	
23		LF	

14-10. Save Layout

Saves screen layouts.
With normal reception and processing, the response message is “OK.”
“ERR004” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1-3	Command code	SLS	
4	Reserve	0	Fixed to "0"
5-6	Layout screen	01-04	Layout no. 1-4
7	End code	CR	
8		LF	

14-11. Audio Level Meter Display

Selects audio level meter display ON/OFF and audio channels to be displayed for each channel.
With normal reception and processing, the response message is “OK.”
“ERR004” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1-3	Command code	SAC	
4	Reserve	0	Fixed to "0"
5-6	Screen Layout	0	Full screen
		01-04	Layout no. 1-4
7-8	Displayed channel	01-04	Channel no. 1-4
9	Level meter display	0	OFF
		1	ON
10	Number of audio channels in level meter	0	2CH
		1	4CH
		2	8CH
11-15	Reserve	0	
16	End code	CR	
17		LF	

14-12. Audio Level Meter Display Function Setting

Sets display functions in audio level meter. With normal reception and processing, the response message is “OK.”
“ERR004” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1-3	Command code	SAD	
4-5	Reference level	01-60	-1dBFS to -60dBFS
6-7	Peak level	00-30	0dBFS to -30dBFS * Peak level must be set higher than the Reference level.
8-9	Peak hold time	0	OFF
		01-10	1sec to 10sec
10-14	Reserve	0	
15	End code	CR	
16		LF	

14-13. Title Setting

Specifies the title settings for each channel.
With normal reception and processing, the response message is “OK.”
“ERR004” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1-3	Command code	STT	
4	Reserve	0	Fixed to "0"
5-6	Screen Display	0	Full screen
		01-04	Layout no. 1-4
7-8	Title setting channel	01-04	Channel no. 1-4
		80	CLOCK
9	Title display	0	OFF
		1	ON
10	Title character size	0	SMALL
		1	MEDIUM
		2	LARGE
11-12	Title color	0	WHITE
		1	YELLOW
		2	GREEN
		3	CYAN
		4	RED
		5	MAGENTA
		6	BLUE
		7	GRAY
		8	BLACK
13- (n –2)	Text data (1byte/character)	ASCII code	Maximum of 16 characters
n-1	End code	CR	
n		LF	

14-14. Border Setting

Specifies the border settings for each channel.
With normal reception and processing, the response message is “OK.”
“ERR004” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1-3	Command code	SBD	
4	Reserve	0	Fixed to "0"
5-6	Screen Display	01-04	Layout no. 1-4
7-8	Border setting channel	0	Fixed to "00"
9	Border Display	0	OFF
		1	ON
10-11	Border width: TOP	00-50	In 2-line steps (0-100lines)
12-13	Border width: BOTTOM	00-50	In 2-line steps (0-100lines)
14-15	Border width: LEFT	00-50	In 2-pixel steps (0-100pixels)
16-17	Border width: RIGHT	00-50	In 2-pixel steps (0-100pixels)
18-19	Border color	0	WHITE
		1	YELLOW
		3	CYAN
		5	MAGENTA
		6	BLUE
		7	GRAY
		8	BLACK
20-21	Reserve	0	
22	End code	CR	
23		LF	

14-15. Full Screen Setting

Specifies the settings for full screen display.
With normal reception and processing, the response message is “OK.”
“ERR004” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1-3	Command code	SFL	
4	Reserve	0	Fixed to "0"
5-6	Full screen output size (Resolution)	0	1280 x 1024
		1	1360 x 768
		2	1600 x 1200
		3	1920 x 1200
		4	1440 x 900
		5	1680 x 1050
		6	1920 x 1080
		7	1280 x 720
7	End code	CR	
8		LF	

14-16. Tally Display Setting

Specifies the settings for tally display.
With normal reception and processing, the response message is “OK.”
“ERR004” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1-3	Command code	STL	
4-5	Reserve	0	Fixed to "00"
6	Tally detection	0	OFF
		1	ON
7	Simultaneous tallies indication	0	RED
		1	UMBER
8-12	Reserve	0	
13	End code	CR	
14		LF	

14-17. Video Loss ON/OFF

Sets video loss detection ON/OFF.
With normal reception and processing, the response message is “OK.”
“ERR004” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1-3	Command code	SVO	
4-5	Video loss setting channel	01-04	Channel no. 1-4
6	Video loss detection	0	OFF
		1	ON
7	End code	CR	
8		LF	

14-18. Video Loss Display Setting

Specifies the setting for video loss alarm display.
With normal reception and processing, the response message is “OK.”
“ERR004” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1-3	Command code	SVL	
4-6	Video loss display time	0	Reset by "Video loss reset command", video switching or input restoration.
		001-100	1-100sec (Reset after a specified-second display)
7-11	Reserve	0	
12	End code	CR	
13		LF	

14-19. Video Loss Reset

Performs alarm reset for video loss.
With normal reception and processing, the response message is “OK.”
“ERR004” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1-3	Command code	SVR	
4	End code	CR	
5		LF	

14-20. Reference Clock Selection

Selects the reference clock to synchronize the analog or digital clock display.
With normal reception and processing, the response message is “OK.”
“ERR004” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1-3	Command code	SDC	
4	Time source	0	Internal clock
		1	LTC
5	End code	CR	
6		LF	

14-21. Clock Display Selection

Selects a clock type for the clock display.
With normal reception and processing, the response message is “OK.”
“ERR004” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1-3	Command code	SDD	
4	Output channel	0	
5	Clock type	0	Analog clock
		1	Digital clock
6-7	Display type	00-01	
8-12	Reserve	0	
13	End code	CR	
14		LF	

14-22. Internal Clock Adjustment

Adjusts date and time for the internal clock, on which the analog clock display on the screen or other clock functions are based.
With normal reception and processing, the response message is “OK.”
“ERR004” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1-3	Command code	SDT	
4-15	Date and Time	00-99	Year (last two digits)
		01-12	Month
		01-31	Day
		00-23	Hour
		00-59	Minute
		00-59	Second
16	End code	CR	
17		LF	

15. Status Request Commands

15-1. Version

Requests the software version and hardware version of the MVM.
Returns a message as shown below after normal reception and processing.

[RVS] Status Request Command

Byte	Parameter	Command	Description
1-3	Command code	RVS	
4	End code	CR	
5		LF	

[AVS] Status Request Response Messages

Byte	Parameter	Message	Description
1-3	Message code	AVS	
4-7	Software version	AAAA	Software version (AA.AA)
8-11	Hardware1 version	BBBB	Hardware1 version (BB.BB)
12-15	Hardware2 version	CCCC	Hardware2 version (CC.CC)
16-19	Hardware3 version	DDDD	Hardware3 version (DD.DD)
20	End code	CR	
21		LF	

15-2. Input Video Format

Requests the video format of current input.
Returns a message as shown below after normal reception and processing.

[RIF] Status Request Command

Byte	Parameter	Command	Description
1-3	Command code	RIF	
4-5	Target channel	01-04	Channel no. 1-4
6	End code	CR	
7		LF	

[AIF] Status Request Response Message

Byte	Parameter	Message	Description
1-3	Message code	AIF	
4-5	Target channel	01-04	Channel no. 1-4
6-7	Input Format	0	1080/59.94i
		1	1080/50i
		10	720/59.94p
		11	720/50p
		20	8 3/4
		21	12 1/2
		30	NTSC
		31	PAL
		80	LOSS
8	End code	CR	
9		LF	

15-3. Output Screen Status

Requests the current status of “Output channel.”
Returns a message as shown below after normal reception and processing.

[RDP] Status Request Command

Byte	Parameter	Command	Description
1-3	Command code	RDP	
4	Reserve	0	Fixed to "0"
5	End code	CR	
6		LF	

[ADP] Status Request Response Message

Byte	Parameter	Message	Description
1-3	Message code	ADP	
4	Reserve	0	
5	Display mode	0	Video display mode
		2	Menu display mode
6	Screen display (Fixed to "0" in MENU mode)	0	Full screen display
		1	Split screen display
7	Selected screen (Fixed to "01" in MENU mode)	01-04	In Full screen display: Channel no. 1-4 In Split screen display: Layout no. 1-4
8	End code	CR	
9		LF	

15-4. Fan Alarm Status

Requests the current status of “Fan alarm.”
Returns a message as shown below after normal reception and processing.

[RFA] Status Request Command

Byte	Parameter	Command	Description
1-3	Command code	RFA	
4	End code	CR	
5		LF	

[AFA] Status Request Response Message

Byte	Parameter	Message	Description
1-3	Message code	AFA	
4	Fan alarm Status	0	No fan alarm
		1	Fan alarm
5	End code	CR	
6		LF	

15-5. Video Transmission Information

Requests the current status of “Video transmission.”
Returns a message as shown below after normal reception and processing.

[RNR] Status Request Command

Byte	Parameter	Command	Description
1-3	Command code	RNR	
4	End code	CR	
5		LF	

[ANR] Status Request Response Message

Byte	Parameter	Message	Description
1-3	Message code	ANR	
4	Frame rate	0	0fps (No video transmission)
		1	1fps (60Hz, 59.94Hz) 1fps (50Hz)
		2	5fps (60Hz, 59.94Hz) 4fps (50Hz)
		3	10fps (60Hz, 59.94Hz) 8fps (50Hz)
		4	15fps (60Hz, 59.94Hz) 12fps (50Hz)
		5	30fps (60Hz, 59.94Hz) 25fps (50Hz)
		6	60fps (60Hz, 59.94Hz) 50fps (50Hz)
5	JPEG compression ratio	0	Low quality
		1	Normal quality
		2	Fine quality
		3	Superfine quality
6	End code	CR	
7		LF	

15-6. Output Video Frequency

Requests the setting status of output video frequency.
Returns a message as shown below after normal reception and processing.

[ROF] Status Request Command

Byte	Parameter	Command	Description
1-3	Command code	ROF	
4	Reserve	0	Fixed to "0"
5	End code	CR	
6		LF	

[ROF] Status Request Command

Byte	Parameter	Message	Description
1-3	Message code	AOF	
4	Reserve	0	
5	Frequency	0	60Hz
		1	59.94Hz
		2	50Hz
6	End code	CR	
7		LF	

15-7. Display Mode

Requests the setting status of display mode.
Returns a message as shown below after normal reception and processing.

[RAM] Status Request Command

Byte	Parameter	Command	Description
1-3	Command code	RAM	
4-5	Reserve	0	Fixed to "00"
6	End code	CR	
7		LF	

[AAM] Status Request Response Message

Byte	Parameter	Message	Description
1-3	Message code	AAM	
4-5	Reserve	0	
6	Screen display mode	0	Mode1
		1	Mode2
		2	Mode3
7	End code	CR	
8		LF	

15-8. Output Resolution of Layout Screen

Requests the setting status of “Output resolution” for each layout screen.
Returns a message as shown below after normal reception and processing.

[RLO] Status Request Command

Byte	Parameter	Command	Description
1-3	Command code	RLO	
4	Reserve	0	Fixed to "0"
5-6	Target screen	01-04	
7	End code	CR	
8		LF	

[AFA] Status Request Response Message

Byte	Parameter	Message	Description
1-3	Message code	ALO	
4	Reserve	0	
5-6	Target screen	01-04	Layout no. 1-4
7-8	Output Resolution	0	1280 x 1024
		1	1360 x 768
		2	1600 x 1200
		3	1920 x 1200
		4	1440 x 900
		5	1680 x 1050
		6	1920 x 1080
		7	1280 x 720
9	End code	CR	
10		LF	

15-9. Layout Screen Information

Requests the information of each layout screen.
Returns a message as shown below after normal reception and processing.

[RLD] Status Request Command

Byte	Parameter	Command	Description
1-3	Command code	RLD	
4	Reserve	0	Fixed to "0"
5-6	Target screen	01-04	Layout no. 1-4
7-8	Target channel	01-04	Channel no. 1-4
		80	CLOCK
9	End code	CR	
10		LF	

[ALD] Status Request Response Message

Byte	Parameter	Message	Description
1-3	Message code	ALD	
4	Reserve	0	
5-6	Target screen	01-04	Layout no. 1-4
7-8	Target channel	01-04	Channels no. 1-4
		80	CLOCK
9	Display ON/OFF	0	OFF
		1	ON
10-11	Layer (display priority)	00-05	Layer priority in layout screen
12-15	Window position: LEFT	0000-1800	(*1)
16-19	Window position: TOP	0000-1120	(*1)
20-23	Window size: WIDTH	0120-1920	(*1)
24-27	Window size: HEIGHT	0080-1200	(*1)
28-31	Title position: LEFT	0000-1920	(*1)
32-35	Title position: TOP	0000-1200	(*1)
36-39	Level meter (L) position: LEFT	0000-1920	(*2)
40-43	Level meter (L) position: TOP	0000-1200	(*2)
44-47	Level meter (R) position: LEFT	0000-1920	(*2)
48-51	Level meter (R) position: TOP	0000-1200	(*2)
52	Level meter size: WIDTH	1-3	(*2)
53-54	Level meter size: HEIGHT	01-10	(*2)
55	End code	CR	
56		LF	

*1 - All digits are “0” when “Display ON/OFF” is set “OFF”.
*2 - All digits are “0” when “Display ON/OFF” is set “OFF or “CLOCK” is selected for “Target channel.”

15-10. Crop Area Setting

Requests the setting status of “Crop area”.
Returns a message as shown below after normal reception and processing.

[RRG] Status Request Command

Byte	Parameter	Command	Description
1-3	Command code	RRG	
4-5	Target channel	01-04	Channel no. 1-4
6	End code	CR	
7		LF	

[ARG] Status Request Response Message

Byte	Parameter	Message	Description
1-3	Command code	ARG	
4-5	Target channel	01-04	Channel no. 1-4
6-9	Crop area size (Top)	0000-0120	Set in multiples of 4.
10-13	Crop area size (Bottom)	0000-0120	Set in multiples of 4.
14-17	Crop area size (Left)	0000-0120	Set in multiples of 4. (1=2pixels)
18-21	Crop area size (Right)	0000-0120	Set in multiples of 4. (1=2pixels)
22	End code	CR	
23		LF	

15-11. Audio Level Meter Display

Requests the display status (ON/OFF) and audio channel selection of “Audio level meter.”
Returns a message as shown below after normal reception and processing.

[RAC] Status Request Command

Byte	Parameter	Command	Description
1-3	Command code	RAC	
2	A		
3	C		
4	Reserve	0	Fixed to "0"
5-6	Target screen	0	Full screen
		01-04	Layout no. 1-4
7-8	Target channel	01-04	Channel no. 1-4
9	End code	CR	
10		LF	

[AAC] Status Request Response Message

Byte	Parameter	Message	Description
1-3	Message code	AAC	
4	Reserve	0	
5-6	Target screen	0	Full screen
		01-04	Layout no. 1-4
7-8	Target channel	01-04	Channel no. 1-4
9	Level meter display	0	OFF
		1	ON
10	Number of channels to be displayed	0	2CH
		1	4CH
		2	8CH
11-15	Reserve	0	
16	End code	CR	
17		LF	

15-12. Audio Level Meter Display Function Setting

Requests the display setting status of “Audio level meter.”
Returns a message as shown below after normal reception and processing.

[RAD] Status Request Command

Byte	Parameter	Command	Description
1-3	Command code	RAD	
4	End code	CR	
5		LF	

[AAD] Status Request Response Message

Byte	Parameter	Message	Description
1-3	Message code	AAD	
4-5	Reference level	01-60	-1dBFS to -60dBFS
6-7	Peak level	00-30	0dBFS to -30dBFS
8-9	Peak hold time	0	OFF
		01-10	1sec to 10sec
10-14	Reserve	0	
15	End code	CR	
16		LF	

15-13. Title Information

Requests the title information for each channel.
Returns a message as shown below after normal reception and processing.

[RTT] Status Request Command

Byte	Parameter	Command	Description
1-3	Command code	RTT	
4	Reserve	0	Fixed to "0"
5-6	Target screen	0	Full screen
		01-04	Layout no. 1-4
7-8	Target channel	01-04	Channel no. 1-4
		80	CLOCK
9	End code	CR	
10		LF	

[ATT] Status Request Response Message

Byte	Parameter	Message	Description
1-3	Message code	ATT	
4	Reserve	0	
5-6	Target screen	0	Full screen
		01-04	Layout no. 1-4
7-8	Target channel	01-04	Channel no. 1-4
		80	CLOCK
9	Title display	0	OFF
		1	ON
10	Title character size	0	SMALL
		1	MEDIUM
		2	LARGE
11-12	Title color	0	WHITE
		1	YELLOW
		2	GREEN
		3	CYAN
		4	RED
		5	MAGENTA
		6	BLUE
		7	GRAY
		8	BLACK
13- (n-2)	Text data (1byte/character)	ASCII code	Maximum of 16 characters
n-1	End code	CR	
n		LF	

15-14. Border Information

Requests the border information for each layout screen.
Returns a message as shown below after normal reception and processing.

[RBD] Status Request Command

Byte	Parameter	Command	Description
1-3	Command code	RBD	
4	Reserve	0	Fixed to "0"
5-6	Target screen	01-04	Layout no. 1-4
7-8	Target channel	0	
9	End code	CR	
10		LF	

[ABD] Status Request Response Message

Byte	Parameter	Message	Description
1-3	Message code	ABD	
4	Reserve	0	
5-6	Target screen	01-04	Layout no. 1-4
7-8	Target channel	0	
9	Border Display	0	OFF
		1	ON
10-11	Border width: TOP	00-50	0-100 lines
12-13	Border width: BOTTOM	00-50	0-100 lines
14-15	Border width: LEFT	00-50	0-100 pixels
16-17	Border width: RIGHT	00-50	0-100 pixels
18-19	Border color	0	WHITE
		1	YELLOW
		3	CYAN
		5	MAGENTA
		6	BLUE
		7	GRAY
		8	BLACK
20-21	Reserve	0	
22	End code	CR	
23		LF	

15-15. Full Screen Information

Requests the setting status of “Output resolution” and “Display mode” for full screen.
Returns a message as shown below after normal reception and processing.

[RFL] Status Request Command

Byte	Parameter	Command	Description
1-3	Command code	RFL	
4	Reserve	0	Fixed to "0"
5	End code	CR	
6		LF	

[AFL] Status Request Response Message

Byte	Parameter	Message	Description
1-3	Message code	AFL	
4	Reserve	0	
5-6	Full screen output Resolution	0	1280 x 1024
		1	1360 x 768
		2	1600 x 1200
		3	1920 x 1200
		4	1440 x 900
		5	1680 x 1050
		6	1920 x 1080
		7	1280 x 720
7	End code	CR	
8		LF	

15-16. Tally Display Setting

Requests the setting status of tally display.
Returns a message as shown below after normal reception and processing.

[RTL] Status Request Command

Byte	Parameter	Command	Description
1-3	Command code	RTL	
4-5	Reserve	0	Fixed to "00"
6	End code	CR	
7		LF	

[ATL] Status Request Response Message

Byte	Parameter	Message	Description
1-3	Message code	ATL	
4-5	Reserve	0	
6	Tally detection	0	OFF
		1	ON
7	Simultaneous tallies indication	0	RED
		1	UMBER
8-12	Reserve	0	
13	End code	CR	
14		LF	

15-17.Video Loss ON/OFF

Requests the setting status of “Video loss detection.”
Returns a message as shown below after normal reception and processing.

[RBD] Status Request Command

Byte	Parameter	Command	Description
1-3	Command code	RVO	
4-5	Target channel	01-04	Channel no. 1-4
6	End code	CR	
7		LF	

[ABD] Status Request Response Message

Byte	Parameter	Message	Description
1-3	Message code	AVO	
4-5	Target channel	01-04	Channel no. 1-4
6	Video loss detection	0	OFF
		1	ON
7	End code	CR	
8		LF	

15-18. Video Loss Display Time Setting

Requests the setting status of “Video loss display time.”
Returns a message as shown below after normal reception and processing.

[RVL] Status Request Command

Byte	Parameter	Command	Description
1-3	Command code	RVL	
4	End code	CR	
5		LF	

[AVL] Status Request Response Message

Byte	Parameter	Message	Description
1-3	Message code	AVL	
4-6	Video loss display time	0	Reset by "Video loss reset command", video switching or input restoration.
		001-100	1-100sec (Reset after a specified-second display.)
7-11	Reserve	0	
12	End code	CR	
13		LF	

15-19. Reference Clock Selection

Requests the setting status of “Reference Clock” for the clock display.
Returns a message as shown below after normal reception and processing.

[RDC] Status Request Command

Byte	Parameter	Command	Description
1-3	Command code	RDC	
4	End code	CR	
5		LF	

[AFL] Status Request Response Message

Byte	Parameter	Message	Description
1-3	Command code	ADC	
4	Time source	0	Internal clock
		1	LTC
5	End code	CR	
6		LF	

15-20. Clock Display Selection

Request the setting status of “Clock display types”.
Returns a message as shown below after normal reception and processing.

[RDD] Status Request Command

Byte	Parameter	Command	Description
1-3	Command code	RDD	
4	Reserve	0	
5	End code	CR	
6		LF	

[ADD] Status Request Response Message

Byte	Parameter	Message	Description
1-3	Command code	ADD	
4	Reserve	0	
5	Clock type	0	Analog clock
		1	Digital clock
6-7	Display type	00-01	
8-12	Reserve	0	
13	End code	CR	
14		LF	

15-21. Internal Clock Time

Requests the current internal clock time.
Returns a message as shown below after normal reception and processing.

[RDT] Status Request Command

Byte	Parameter	Command	Description
1-3	Command code	RDT	
4	End code	CR	
5		LF	

[ADT] Status Request Response Message

Byte	Parameter	Message	Description
1	Message code	A	
2	D		
3	T		
4-15	Date/Time	00-99	Year (last two digits)
		01-12	Month
		01-31	Day
		00-23	Hour
		00-59	Minute
		00-59	Second
16	End code	CR	
17		LF	

MVM Layout Editor

Version 2.0

16. Setup

16-1. Overview

MVM Layout Editor is a software to customize the layout of the MVM split screen from a computer. Up to 4 preset patterns (SPLIT 1 to 4) can be stored. Those stored layouts are easily recalled by using the SPLIT button on the front panel of MVM. MVM and a computer can be connected via LAN.

16-2. System Requirements

To install MVM Layout Editor, your computer must meet the following requirements.

OS (Platform) Software	Windows XP SP2 or later (Professional or Home Edition) .NET Framework2.0 (Supplied on the CD-ROM) Windows Installer 3.1 (Supplied on the CD-ROM)
CPU Memory	Pentium4 1.2GHz or faster 512MB or more
Display	Resolution of 1024 x 768pixels or better
	A graphics card with 64MB or more of memory (OpenGL1.0 or 2.0)
LAN port	At least one 10BASE-T/100BASE-TX compatible port
LAN cable	Category 5 twisted-pair cable (UTP or STP) or better is recommended

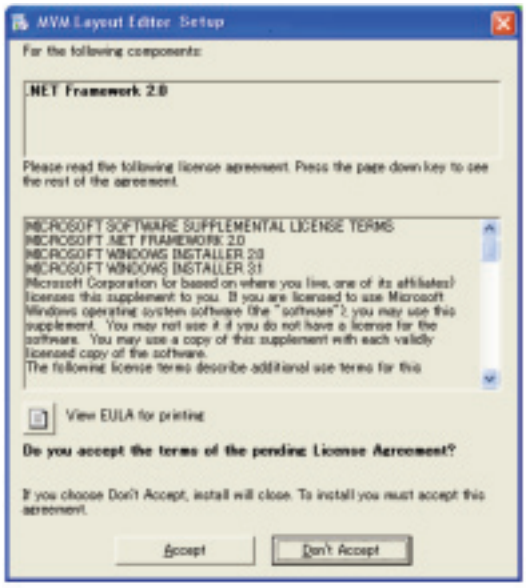
16-3. Operation Flow

1. Installing MVM Layout Editor
2. Connecting MVM Layout Editor installed PC to MVM
3. Starting MVM and MVM Layout Editor
4. Creating a split screen layout
5. Displaying a split screen layout

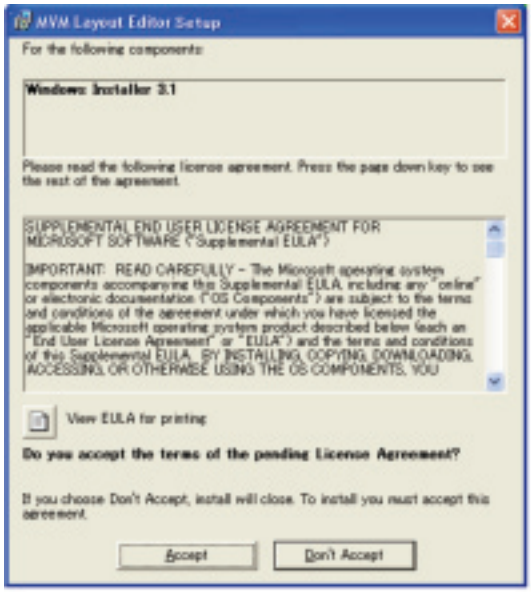
16-4. Installing MVM Layout Editor

1. Load the supplied Installation CD-ROM into the PC, and open the CD-ROM drive. Run the file “setup.exe” to start the setup wizard.

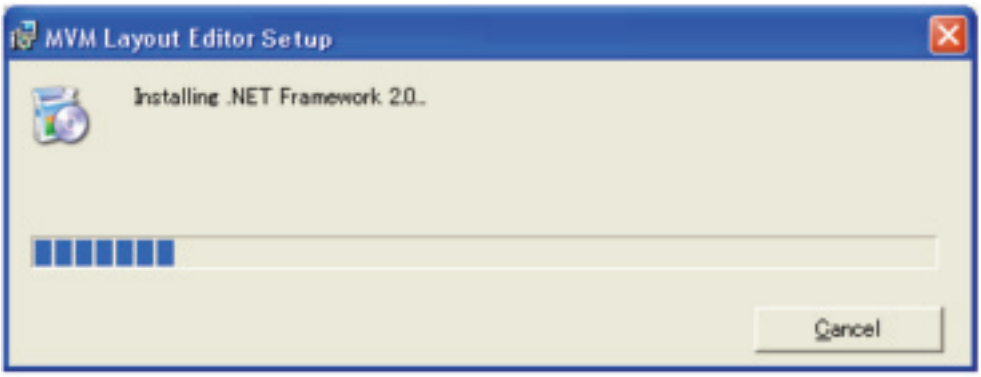
2. If [.NET Framework 2.0] is not installed on your PC, the screen shown below is displayed. Click Accept. If [.NET Framework 2.0] is already installed on your PC, this screen is not displayed.



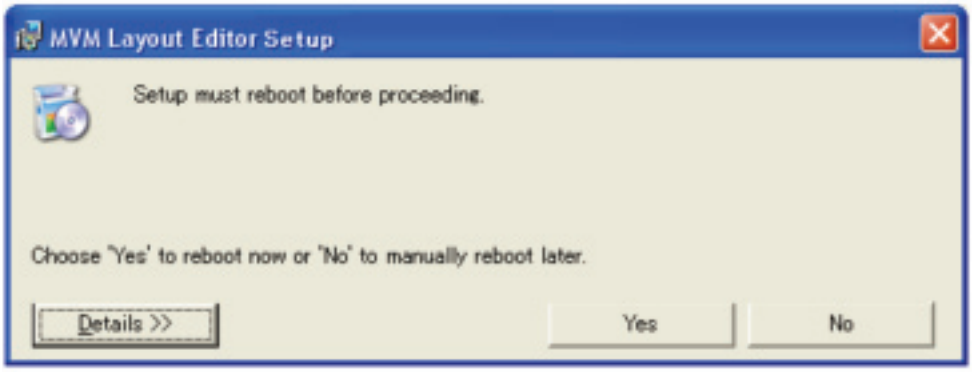
3. If [Windows Installer 3.1] is not installed on your PC, the screen shown below is displayed. Click Accept. If [Windows Installer 3.1] is already installed on your PC, this screen is not displayed.



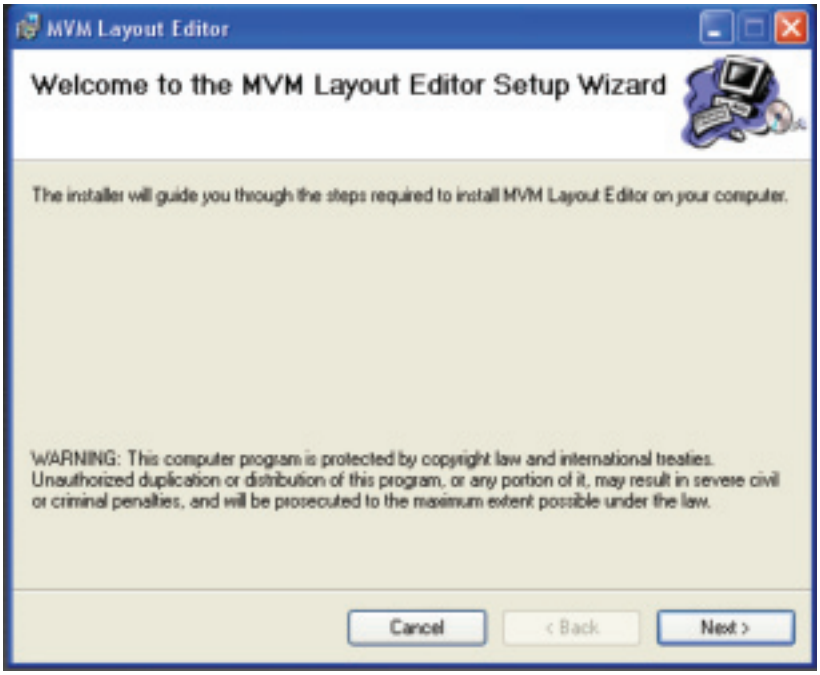
4. If [.NET Framework 2.0] is not installed, the installation starts.



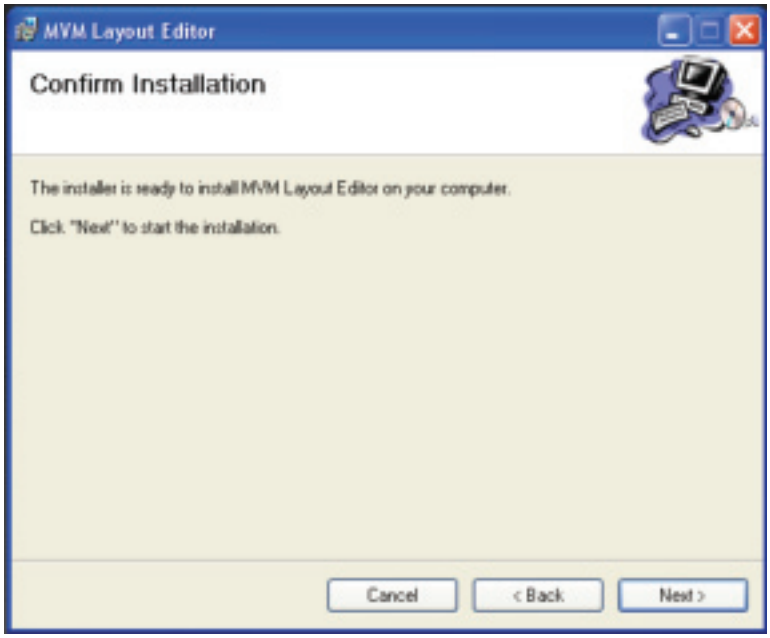
5. When installation of [.NET Framework 2.0] is complete, the screen shown below is displayed requiring a reboot. Click Yes to reboot your PC.



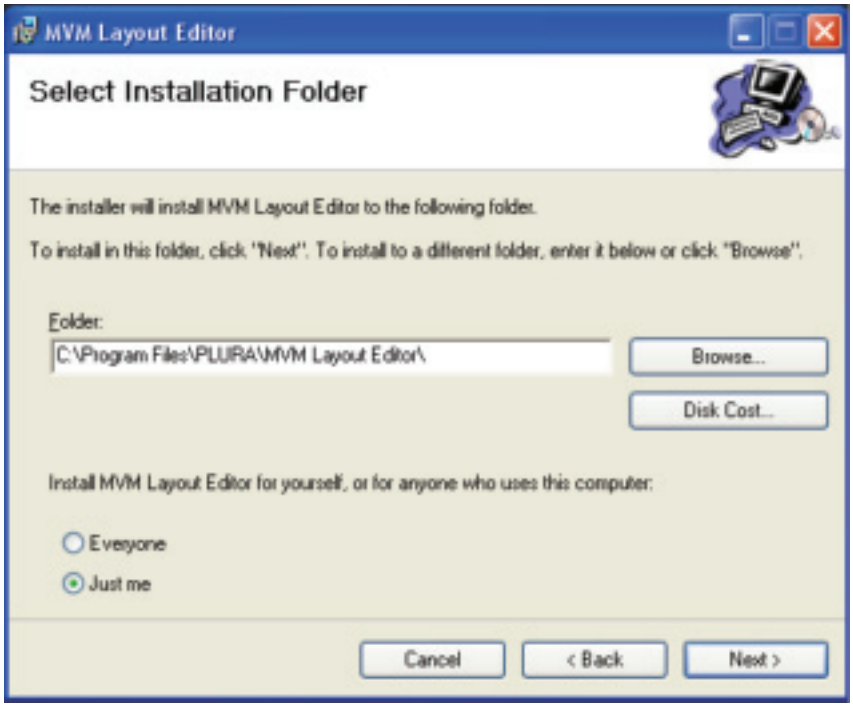
6. After the setup wizard is started, click Next.



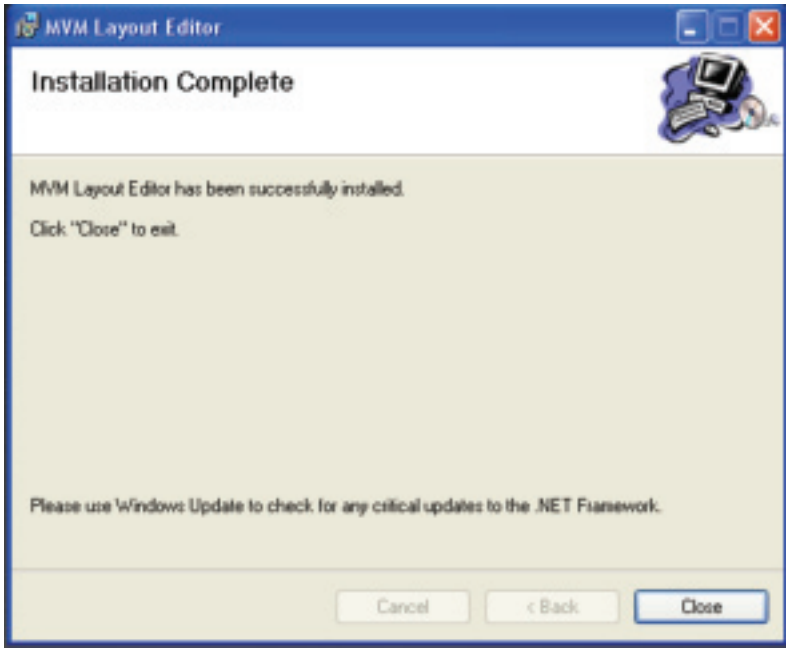
7. Select the installation directory. It is not necessary to change the folder. Select whether to install MVM Layout Editor for current user only or for all users. The default is set to the current user. When the settings are completed, click NEXT>.



8. Click NEXT> to start the installation.



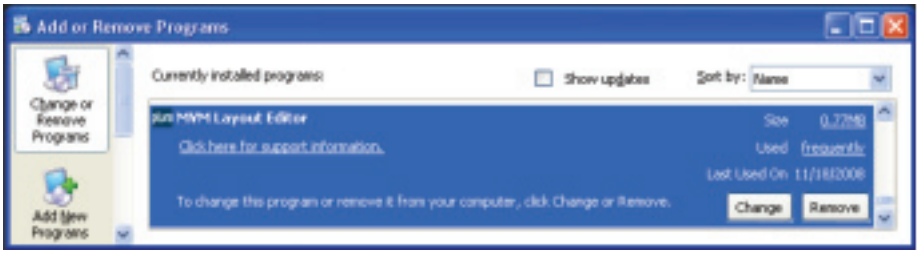
9. When installation is completed normally, the screen shown below is displayed. Click Close to quit the setup wizard.



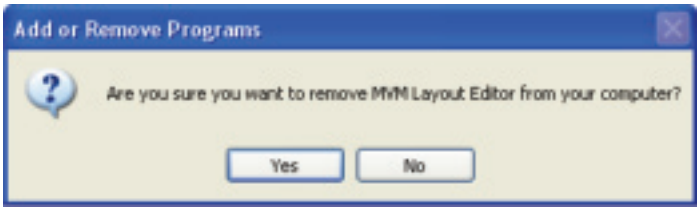
16-5. Removing MVM Layout Editor

To remove MVM Layout Editor, follow the procedure below.

1. Go to Start > Control Panel. In the Add or Remove Programs window, select “MVM Layout Editor”, and click Remove.



2. The confirmation dialog shown below is displayed. Click Yes to start the uninstallation.



The “Windows Installer 3.1” and “Microsoft .NET Framework 2.0” do not need to be removed.

16-6. Connections

To use MVM Layout Editor, connect MVM and PC over a LAN interface. Be aware that the cables and equipment used vary depending on the connection method. Use a crossover LAN cable to connect the computer directly to the MVM. Use a straight through LAN cable for the connection using a router or a hub.

16-7. Communication Standard

The communication standards for serial control over a LAN interface is as follows.

Protocol	TCP/IP Protocol
IP address	Setting range: 0.0.0.0 to 255.255.255.255 However, there also are limitations on IP addresses set by the PC as shown below. Set the IP address in this range. 1st octet: 1 to 223 (except 127) 2nd octet: 0 to 255 3rd octet: 0 to 255 4th octet: 1 to 254 • This is set in the menu screen on the main unit. • The default setting is 192.168.0.1.
Subnet mask length	Setting range: 0 to 31 • This is set in the menu screen on the main unit. • The default setting is 24.
Gateway	Setting range: 0.0.0.0 to 255.255.255.255 • This is set in the menu screen on the main unit. • The value 0.0.0.0 signifies that the gateway has not been set. • The default setting is 0.0.0.0.
MAC address	This is already set at factory shipping (cannot be changed). • The setting can be confirmed in the menu screen on the main unit.

16. Setup

16-6. Connections

To use MVM Layout Editor, connect MVM and PC over a LAN interface. Be aware that the cables and equipment used vary depending on the connection method. Use a crossover LAN cable to connect the computer directly to the MVM. Use a straight through LAN cable for the connection using a router or a hub.

IP address	192. 168. 0.1
Subnet mask length	24
Gateway	0.0.0.0

1. Setting in Windows XP with the default Start menu setting

Click Start on the taskbar, open [Control Panel], and double-click “Network Connections”. Right-click “Local Area Connection” icon to open [Properties] window. Double-clicking “Internet Protocol (TCP/IP)” under the [General] tab opens the [Internet Protocol (TCP/IP) Properties] window. Make the settings as shown in the example below. Make a note of the settings before changing them in case you need to return the IP address to its original settings later.

IP address for PC	192.168.0.yyy (yyy is any number from 2 to 254 except for the number set for the MVM unit and the gateway number. In this example, the setting is yyy=200.)
Subnet mask	Set to 255.255.255.0.
Gateway	0.0.0.0

2. Setting in Windows XP with the Start menu setting changed to Classic

Click Start on the taskbar, select “Settings” -> “Network Connections” and then right-click the “Local Area Connection” icon to open [Properties] window. Double-clicking “Internet Protocol (TCP/IP)” under the [General] tab opens the [Internet Protocol (TCP/IP) Properties] window. The settings are then made in the same way as 1) above. When the settings are completed, click OK, and then close all setting windows.

17. Starting & Exiting MVM Layout Editor

17-1. Starting MVM Layout Editor

To start MVM Layout Editor, go to Start > Programs > PLURA and select “MVM Layout Editor”.

17-2. Exiting MVM Layout Editor

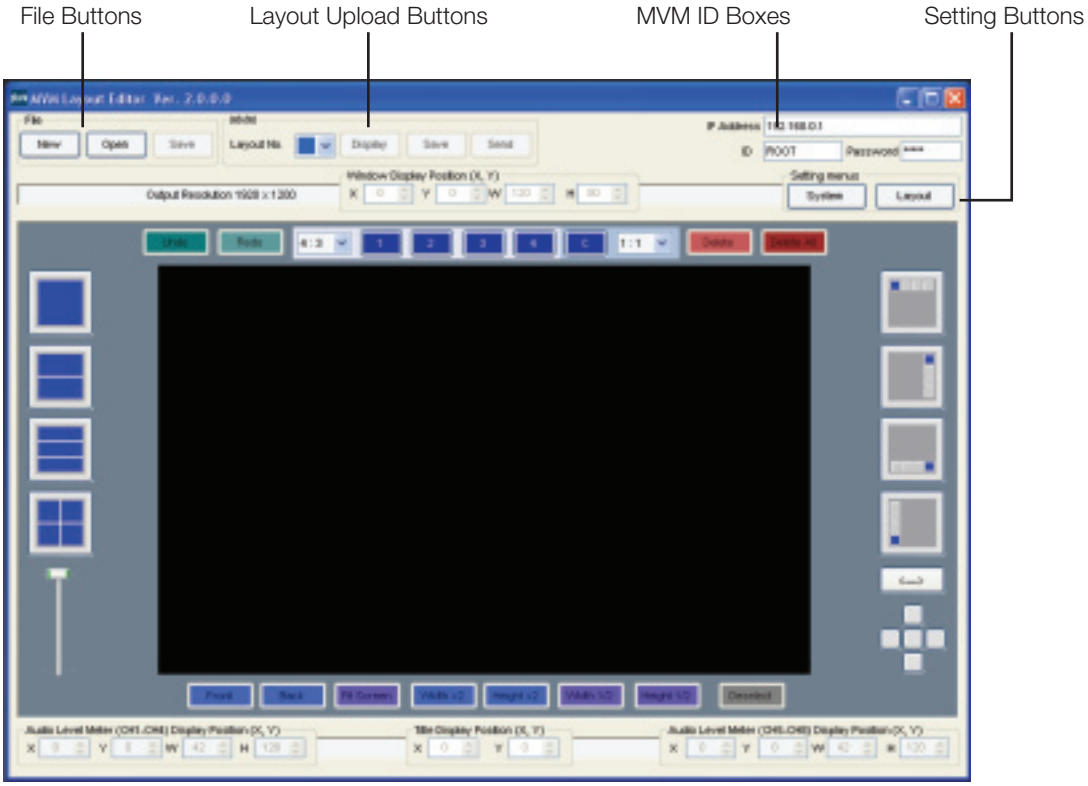
To exit MVM Layout Editor, click the x button at the top-right corner of the screen.

NOTE: All unsaved changes will be lost when the application is closed. Save the current layout to MVM or to your computer before closing the application.

18. Main Screen and Dialog Boxes

18-1. Main Screen

After the application is started the screen shown below is displayed.

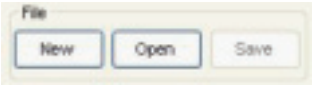


18-1-1. MVM ID Boxes

1. **IP address**
   Enter the IP address of MVM to be connected.
2. **ID**
   Enter the ID specified in MVM.
3. **Password**
   Enter the password specified in MVM.

18-1-2. File Buttons

1. **New**
   Creates a new layout.
2. **Open**
   Opens a layout saved on the computer.
3. **Save**
   Save the currently opened layout on the computer.

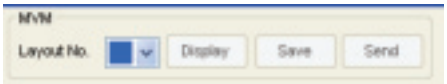


NOTE: All unsaved changes will be lost when a new layout is created. Save the current layout to MVM or to your computer before creating a new layout.

NOTE: All unsaved changes will be lost when a layout saved on the computer is opened. Save the current layout to MVM or to your computer before opening a layout.

NOTE: The MVM system settings as well as the layout settings are saved as a layout file.

18-1-3. Layout Upload Buttons



1. **Layout Number**
   Selects a layout number of the layout to be edited or saved. Up to 4 patterns can be saved to MVM. Once the layout number is selected, the layout is loaded from MVM into the layout editing area.

> **NOTE:** Selecting the same number as the layout number of MVM allows users to easily check the layout, since the changes in the layout editing area are applied to MVM in real-time. However, all unsaved changes will be lost when MVM is powered off. Save the current layout to MVM before powering off MVM.

Layout Number is empty right after the application is started. In this status, layouts can be created without communicating with MVM (off-line). The created layouts can be saved on the computer and loaded into MVM when connected.

2. **Display**
   Displays the layout selected in the Layout Number drop-down list on MVM output monitor.

3. **Save**
   Saves the current layout to MVM.

> **NOTE:** All unsaved changes will be lost when MVM is powered off. Save the current layout to MVM before powering off MVM.

4. **Send**
   Sends the current layout to MVM. Normally you do not need to click the Send button since the changes of the layout are sent real-time to MVM. If the layouts in the layout editing area and MVM do not match due to a communication error, click the Send button.

18-1-4. Setting Buttons

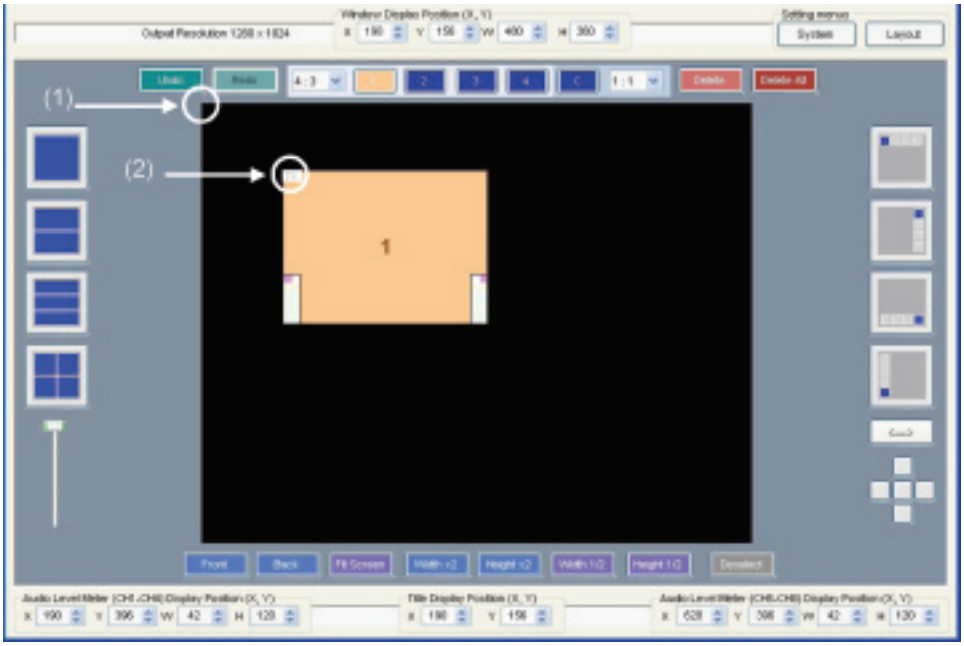
1. **System**
   The MVM system settings and full screen display settings can be made. See section 18-2. “System Setting” for details.

> **NOTE:** The layout cannot be edited while the System Setting dialog box is displayed. To edit the layout, close the System Setting dialog box.

2. **Layout**
   The layout settings can be made for each layout separately. See section 18-3. “Layout Setting” for details.

> **NOTE:** The layout cannot be edited while the Layout Setting dialog box is displayed. To edit the layout, close the Layout Setting dialog box.

18-1-5. Layout editing area and Editing Tools



1. **Layout editing area base point**
   The coordinate (0, 0) base point of the layout editing area is the top-left corner of the area. The X coordinate value increases from left to right. (The right end is the highest.) The Y coordinate value increases from top to bottom. (The bottom end is the highest.)

2. **Window base point**
   The location of a window is determined by the X coordinate of the left edge of the window, and the Y coordinate of the top edge of the window.

> **NOTE:** The valid coordinate range for placing a window varies depending on the output resolution.

3. **Output Resolution**
   Displays the output resolution of the selected layout.

> **NOTE:** The output resolution can only be selected when creating a new layout. The resolution of the layout loaded from MVM or the layout opened from the computer cannot be changed.

4. **Window Display Position (X, Y)**
   Displays the display position of the selected window. Also the window display position can be adjusted by changing the numeric values.

> **NOTE:** Window Display Position for both X and Y can be adjusted in units of 2 pixels.

5. Window Size (W, H)

Displays the size of the selected window. Also the window size can be adjusted by changing the numeric values. If Aspect Ratio is set to other than Free, changing either of W (width) or H (height) changes the other automatically.

6. Undo

Cancels the last action performed.

7. Redo

Cancels the last undo command.

8. Aspect Ratio

Changes the aspect ratio of the selected window. The window size can be changed while retaining the specified aspect ratio.

16:9	Used for the window that displays an HD signal.
4:3	Used for the window that displays an SD signal.
1:1	Selectable for the clock window only.
Free	The window size can be changed without retaining the aspect ratio.

NOTE: The Aspect Ratio drop-down list to the left of the 1 button is for the video windows. The Aspect Ratio drop-down list to the right of the C button is for the clock window.

9. Add / Select Window

Selects a window for changing the settings. Clicking either of 1, 2, 3, or 4 selects the window of the selected number. Clicking C selects the clock window. If the selected window is not displayed in the layout editing area, a window is added to the layout editing area.

NOTE: The number displayed in a window and the channel number of the input video signal displayed within the window are the same.

10. Delete Window

Clicking Delete deletes the selected window from the layout edit screen. Clicking Delete All deletes all windows from the layout edit screen.

11. Select Preset Pattern

Clicking any one of the split screen icons at the left of the layout editing area selects a preset pattern of split screen. If multiple patterns of the same number split screen exist, the displayed pattern can be changed to other pattern by the lever beneath the split screen icons. Every click on the split screen icon also changes the pattern display.

12. Add / Move 1/16 size window

Clicking any one of the add 1/16 size window icon at the right of the layout editing area adds a 1/16 size window at the place each icon depicts. Every click add a window in a row shown in the icon. The arrow button beneath the add 1/16 size window icon changes the direction of the window line opposite.

Five buttons under the icons instantly move a window right next to the other window in each direction. If there is no window in the direction, the window is moved to the edge of the layout editing area. The center button positions a window at the center.

13. Front (Bring to front)

Arranges the selected window to the front.

14. Back (Send to back)

Arranges the selected window to the back.

15. Fit Screen

Maximizes the window to best fit the selected window size. If Aspect Ratio is set to other than Free, the aspect ratio is retained.

16. Width x 2

Sets the width of the selected window to double the width of the original window. If Aspect Ratio is set to other than Free, the aspect ratio is retained.

17. Height x 2

Doubles the height of the selected window to double the height of the original window. If Aspect Ratio is set to other than Free, the aspect ratio is retained.

18. Width 1/2

Sets the width of the selected window to half the width of the original window. If Aspect Ratio is set to other than Free, the aspect ratio is retained.

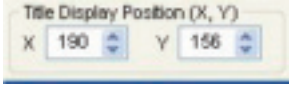
19. Height 1/2

Sets the height of the selected window to half the height of the original window. If Aspect Ratio is set to other than Free, the aspect ratio is retained.

20. Deselect

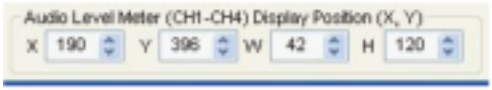
Deselects the selected window.

21. Title Display Position (X, Y)



Displays the display position of the selected window title. Also the title display position can be adjusted by changing the numeric value. The X value represents the position of the left edge of title and the Y value represents the top edge of title.

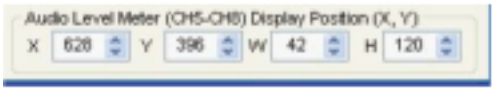
22. Audio Level Meter (CH1-CH4) Display Position (X, Y)



Display order of Audio Level Meter (CH1-CH4)

Displays the display positions of the audio level meters (CH1-CH4) of the selected window. Also the audio level meter display position can be adjusted by changing the numeric value. The X value represents the position of the left edge of audio level meter and the Y value represents the bottom edge of audio level meter.

23. Audio Level Meter (CH5-CH8) Display Position (X, Y)



Display order of Audio Level Meter (CH5-CH8)

Displays the display positions of the audio level meters (CH5-CH8) of the selected window. Also the audio level meter display position can be adjusted by changing the numeric value. The X value represents the position of the left edge of audio level meter and the Y coordinate represents the bottom edge of audio level meter.

24. Audio Level Meter Display Size (W, H)

Displays the display size of the audio level meter of the selected window. Also the audio level meter display size can be adjusted by changing the numeric value.

NOTE: Audio Level Meter Display Size for Width can be adjusted in units of 16 pixels and Height can be adjusted in units of 120 pixels. These settings are common to both CH1-CH4 and CH5-CH8.

18-2. System Setting

Clicking the System Setting button in the main screen displays the System Setting dialog box as shown below.

18-2-1. System

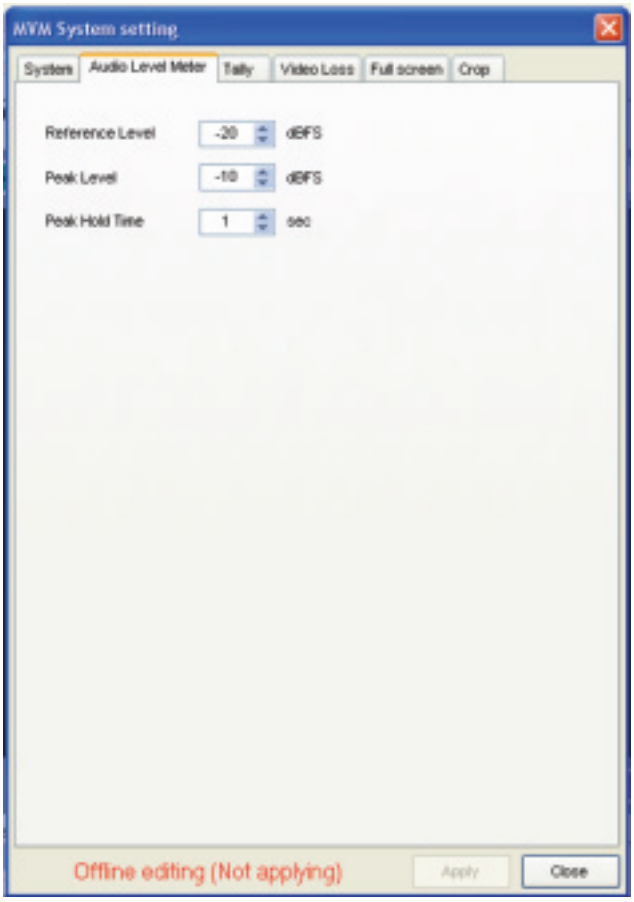
Clicking the System tab displays the screen as shown below.

Item	Description
Date/Time	Click Change and then enter the date and time set for MVM. Clicking Set applies the settings to MVM.
Clock Type	Selects the type of clock display. • Followings are the images to give you an idea of each type of clocks. <Analog 1> <Analog 2> <Digital 1> <Digital 2> Dark frame Light frame
Display Mode	Selects the screen display mode. MODE1 [In Full screen display] Displays the title and audio level meters without overlapping on the video image. The aspect ratio of the input signal is retained. [In Split screen display] Auto detects the aspect ratio of the input video signals and maximizes the images to best fit the each window while retaining the aspect ratio. MODE2 [In Full screen display] Overlaps the title and audio level meters on the video image. The aspect ratio of the input signal is retained. [In Split screen display] Auto detects the aspect ratio of the input video signals and maximizes the images to best fit the each window while retaining the aspect ratio. MODE3 [In Full screen display] Maximizes the image to best fit the window. The aspect ratio of the input signal is not retained. The title and audio level meters are overlapped on the video image. [In Split screen display] Maximizes the image to best fit the window. The aspect ratio of the input signal is not retained.
Frequency	Selects frequency for MVM output signal from among 60Hz, 59.94Hz, and 50Hz. Those are approximate frequencies. See section 11-1. "Specifications" in the part 1, MVM Operation Manual of this manual for details.
Apply	Applies the changes made in this screen to MVM. To save the settings in MVM, click Save on the main screen; otherwise, the changes will be lost when the MVM is powered off.
Close	Closes System Setting dialog and returns to main screen.

IMPORTANT: If MODE1 is selected in full screen display, the space for 8 level meters is prepared regardless of the Level Meter Display setting or Display Channel setting.

18-2-2. Audio Level Meter

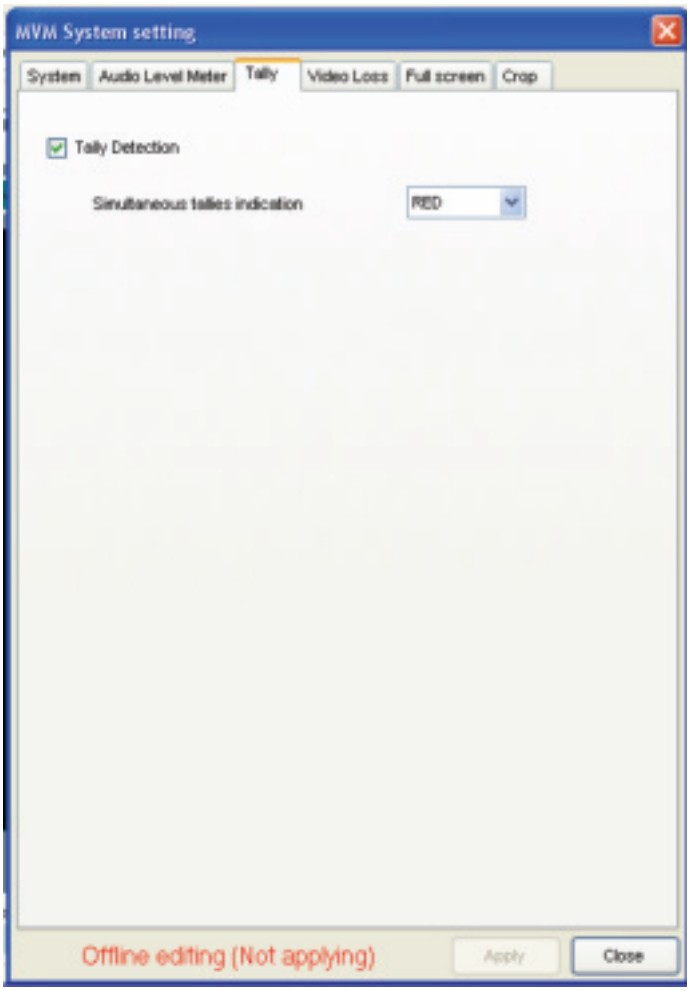
Clicking the Audio Level Meter tab displays the screen as shown below.



Item	Description
Reference Level	Sets the reference level in the range from -60dBFS to -1dBFS.
Peak Level	Sets the peak level in the range from -30dBFS to 0dBFS. Peak Level must always be larger than Reference Level.
Peak Hold Time	Sets the peak hold time in the range from 0 sec to 10 sec. If set to 0 sec, no Peak Hold display is provided.
Apply	Applies the changes made in this screen to MVM. To save the settings in MVM, click Save on the main screen; otherwise, the changes will be lost when the MVM is powered off.
Close	Closes System Setting dialog and returns to main screen.

18-2-3. Tally

Clicking the Tally tab displays the screen as shown below.



Item	Description
Tally Detection	Enables and disables the tally detection. Selecting the checkbox enables the tally detection.
Simultaneous tallies indication	Sets the color of tally display for when the red tally and the green tally are input at the same time. RED Displays a red frame if the red tally and the green tally are input at the same time. UMBER Displays an orange frame if the red tally and the green tally are input at the same time.
Apply	Applies the changes made in this screen to MVM. To save the settings in MVM, click Save on the main screen; otherwise, the changes will be lost when the MVM is powered off.
Close	Closes System Setting dialog and returns to main screen.

18-2-4. Video Loss

Clicking the Video Loss tab displays the screen as shown below.

Item	Description
Video Loss Detection	Enables and disables the video loss detection. Selecting the checkbox enables the video loss detection.
Alarm Display Time	When a video loss is detected, an alarm is displayed within the window for the time length set in this box. The setting range is 00 second to 100 seconds. The value 00 second continues the alarm display until the video loss is recovered or output channel is switched to another channel.
Apply	Applies the changes made in this screen to MVM. To save the settings in MVM, click Save on the main screen; otherwise, the changes will be lost when the MVM is powered off.
Close	Closes System Setting dialog and returns to main screen.

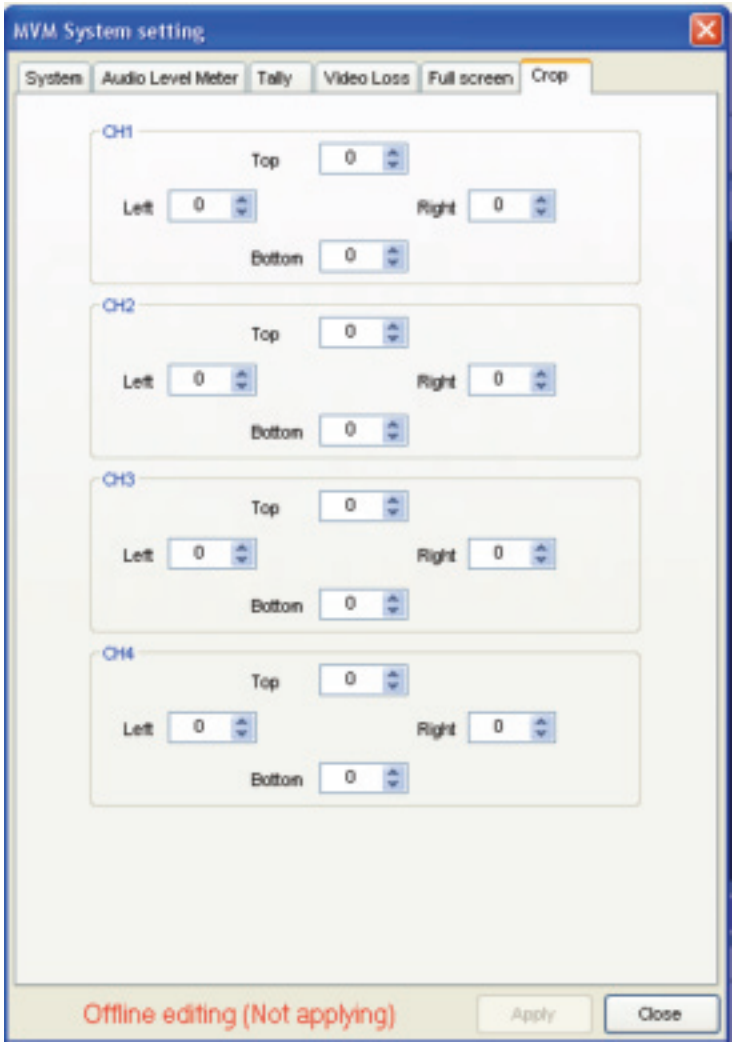
18-2-5. Full Screen

Clicking the Full Screen tab displays the screen as shown below.

Item	Description
Full Screen Output Resolution	Selects the output resolution for full screen display. The available settings are as follows: 1280 x 1024, 1360 x 768, 1600 x 1200, 1920 x 1200, 1440 x 900, 1680 x 1050, 1920 x 1080, 1280 x 720
Level Meter Display	Shows and hides the audio level meter for full screen display. Selecting the checkbox shows the audio level meter.
Display Channel	Specifies the number of audio level meter channels displayed for full screen display. The available settings are: 2CH, 4CH, and 8CH.
Title Display	Shows and hides the title. Selecting the checkbox shows the title.
Title	Sets the title to be displayed. Up to 16 characters can be used.
Text Size	Selects the text size. The available settings are: SMALL, MEDIUM, and LARGE.
Color	Selects the title color. The available settings are: WHITE, YELLOW, GREEN, CYAN, RED, MAGENTA, BLUE, GRAY, and BLACK.
Apply	Applies the changes made in this screen to MVM. To save the settings in MVM, click Save on the main screen; otherwise, the changes will be lost when the MVM is powered off.
Close	Closes System Setting dialog and returns to main screen.

18-2-6. Crop

Clicking the Crop tab displays the screen as shown below.



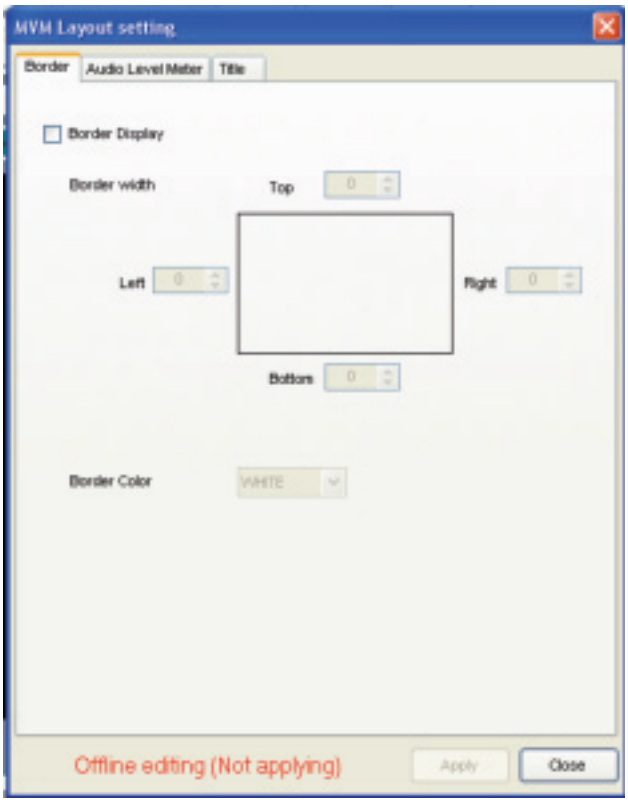
Item	Description
Crop (Top)	Sets how much to crop from the top edge of images. Setting range: 0 to 120
Crop (Bottom)	Sets how much to crop from the bottom edge of images. Setting range: 0 to 120
Crop (Left)	Sets how much to crop from the left side of images. Setting range: 0 to 120
Crop (Right)	Sets how much to crop from the right side of images. Setting range: 0 to 120
Apply	Applies the changes made in this screen to MVM. To save the settings in MVM, click Save on the main screen; otherwise, the changes will be lost when the MVM is powered off.
Close	Closes System Setting dialog and returns to main screen.

18-3. Layout Setting

Clicking the Layout Setting button in the main screen displays the Layout Setting dialog box as shown below. The parameters for each layout can be set separately with this dialog box.

18-3-1. Border

Clicking the Border tab displays the screen as shown below.



Item	Description
Border Display	Shows and hides the borders. Selecting the checkbox shows the borders.
Border width (Top)	Sets the top border line width in the range from 0 to 50.
Border width (Bottom)	Sets the bottom border line width in the range from 0 to 50.
Border width (Left)	Sets the left border line width in the range from 0 to 50.
Border width (Right)	Sets the right border line width in the range from 0 to 50.
Border Color	Selects the border color. The available settings are: WHITE, YELLOW, CYAN, MAGENTA, BLUE, GRAY, and BLACK
Apply	Applies the changes made in this screen to MVM. To save the settings in MVM, click Save on the main screen; otherwise, the changes will be lost when the MVM is powered off.
Close	Closes Layout Setting dialog and returns to main screen.

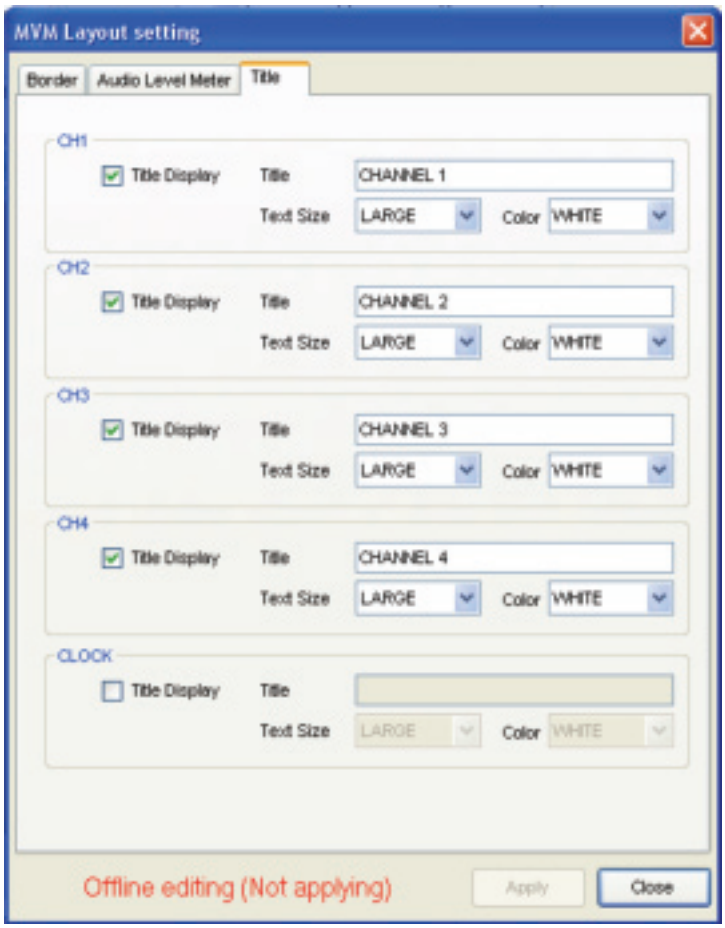
18-3-2. Audio Level Meter

Clicking the Audio Level Meter tab displays the screen as shown below.

Item	Description
Level Meter Display	Shows and hides the audio level meter. Selecting the checkbox shows the audio level meter.
Display Channel	Selects how many audio channels to display. The available settings are: 2CH, 4CH, and 8CH.
Apply	Applies the changes made in this screen to MVM. To save the settings in MVM, click Save on the main screen; otherwise, the changes will be lost when the MVM is powered off.
Close	Closes Layout Setting dialog and returns to main screen.

18-3-3. Title

Clicking the Title tab displays the screen as shown below.

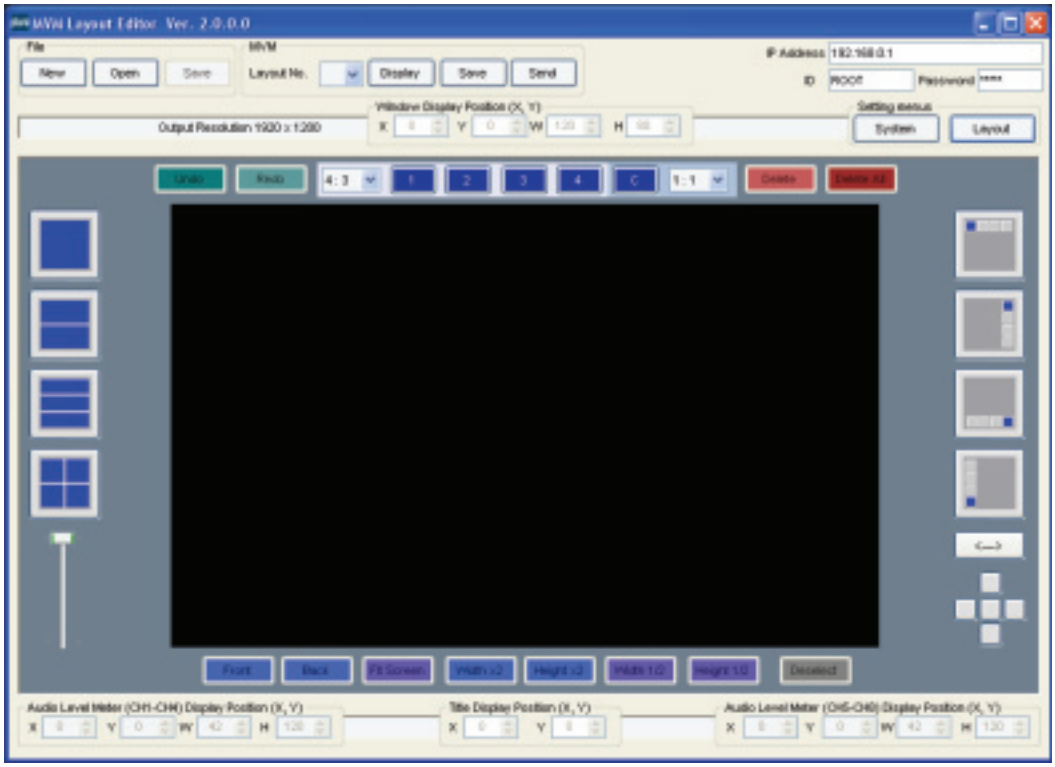


Item	Description
Title Display	Shows and hides the title. Selecting the checkbox shows the title.
Title	Sets the title to be displayed. Up to 16 characters can be used.
Text Size	Selects the text size. The available settings are: SMALL, MEDIUM, and LARGE.
Color	Selects the title color. The available settings are: WHITE, YELLOW, GREEN, CYAN, RED, MAGENTA, BLUE, GRAY, and BLACK.
Apply	Applies the changes made in this screen to MVM. To save the settings in MVM, click Save on the main screen; otherwise, the changes will be lost when the MVM is powered off.
Close	Closes Layout Setting dialog and returns to main screen.

19. Using MVM Layout Editor

19-1. Establishing Connection

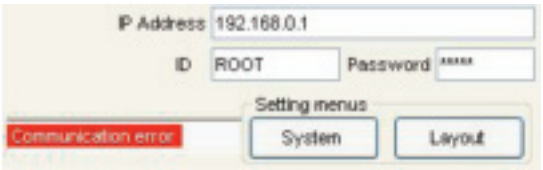
To start MVM Layout Editor, go to Start > Programs > PLURA and select “MVM Layout Editor”. After the application is started the screen shown below is displayed.



Enter the IP address, ID and password of MVM that you wish to connect.

The default settings of MVM are as follows:

IP address:	192.168.0.1
ID:	ROOT
Password:	00000



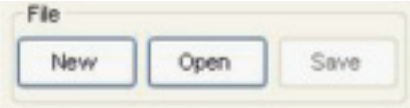
If a communication error occurs as shown above, make sure that the IP address, ID, and password are set correctly.

19-2. Creating and Loading Layout

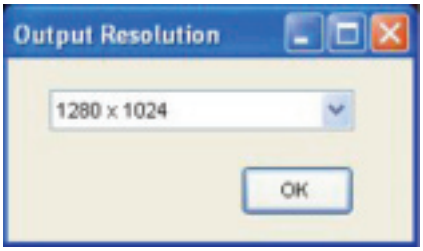
This section explains how to create a new layout or edit a layout loaded from MVM. The created layout can also be saved on the computer and reloaded for editing. The output resolution can only be selected for the newly created layouts and it cannot be changed for the layouts loaded from MVM or the layouts stored in the computer.

19-2-1. Creating New Layout

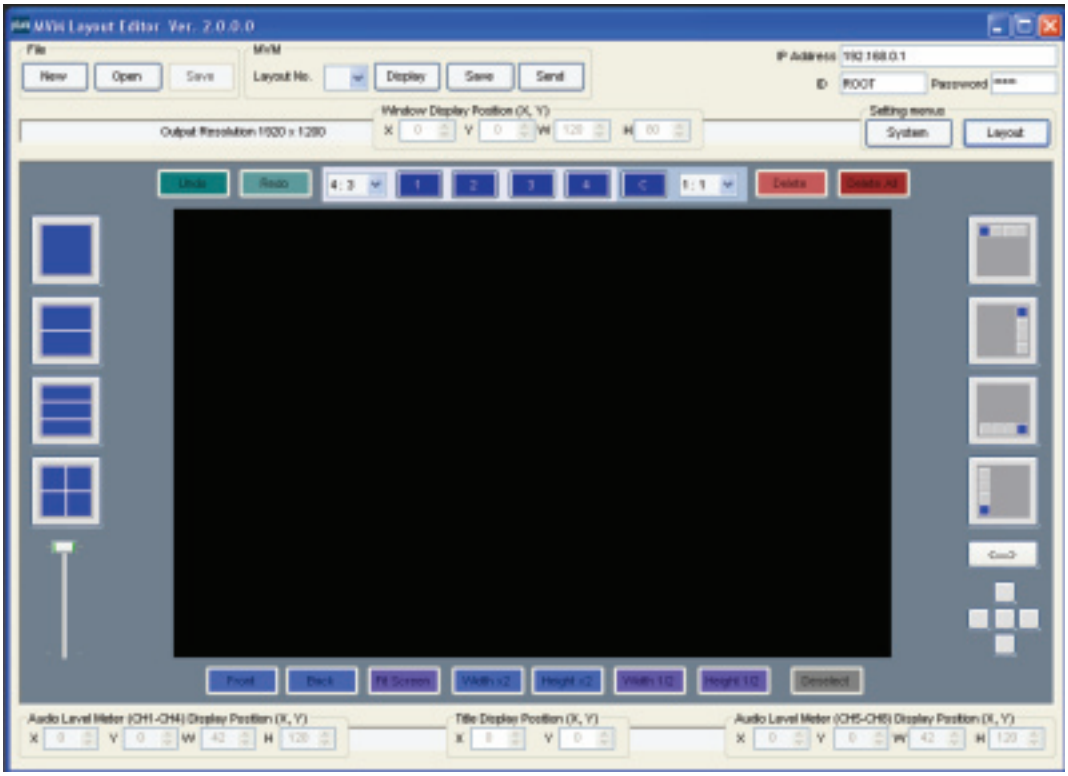
1. To create a new layout, select a layout number from 1-4 and click the New button in File at the top of the main screen.



2. The Output Resolution dialog box is displayed. Set the output resolution and click OK.

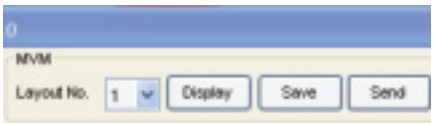


3. Edit the layout in the layout editing area that is currently opened. For example, add and move windows, or change the window size. See section 19-3. “Editing Layouts” for details.

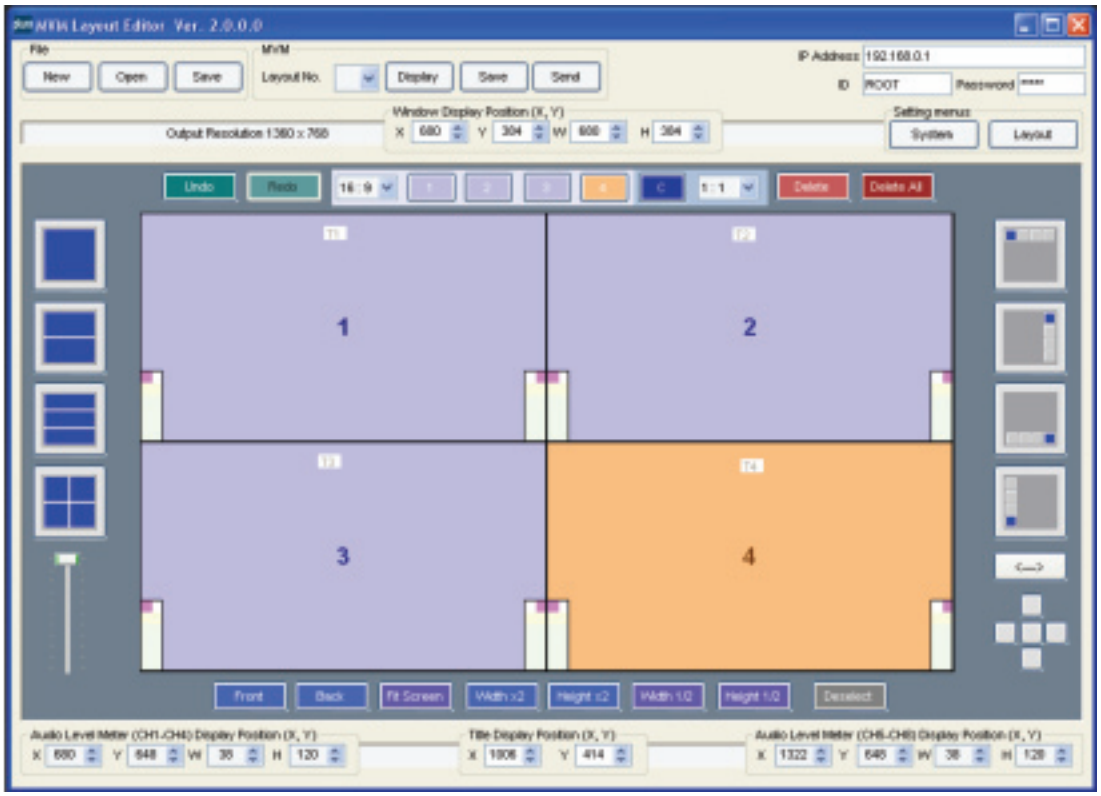


19-2-2. Loading Existing Layout

To edit a layout in MVM, first select a layout number from the Layout Number drop-down list in MVM in the main screen.



The layouts of the layout numbers 1-4 correspond to the layouts of the 1 – 4 VIDEO SELECT buttons on the front panel of MVM. Selecting a layout loads and displays the layout in the layout editing area as shown below. Edit the layout. (See section 19-3 “Editing Layouts” for details.) Clicking the Display button displays the layout selected in the Layout Number drop-down list on MVM output screen.

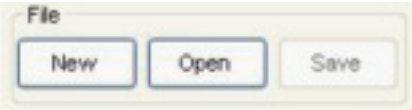


If the editing layout and the layout output from MVM matches, users can easily check the layout, since the changes in the layout editing area are applied to MVM in real-time.

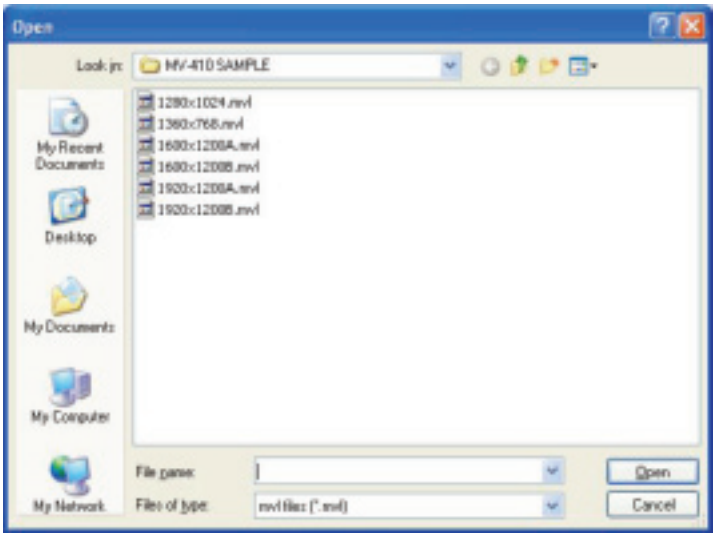
NOTE: The output resolution can only be selected when creating a new layout. The resolution of the layout loaded from MVM or the layout stored in the computer cannot be changed.

19-2-3. Opening Saved Layout

1. To edit the layout saved on the computer, click the Open button in File.



2. Selecting a layout file and clicking Open opens the layout.



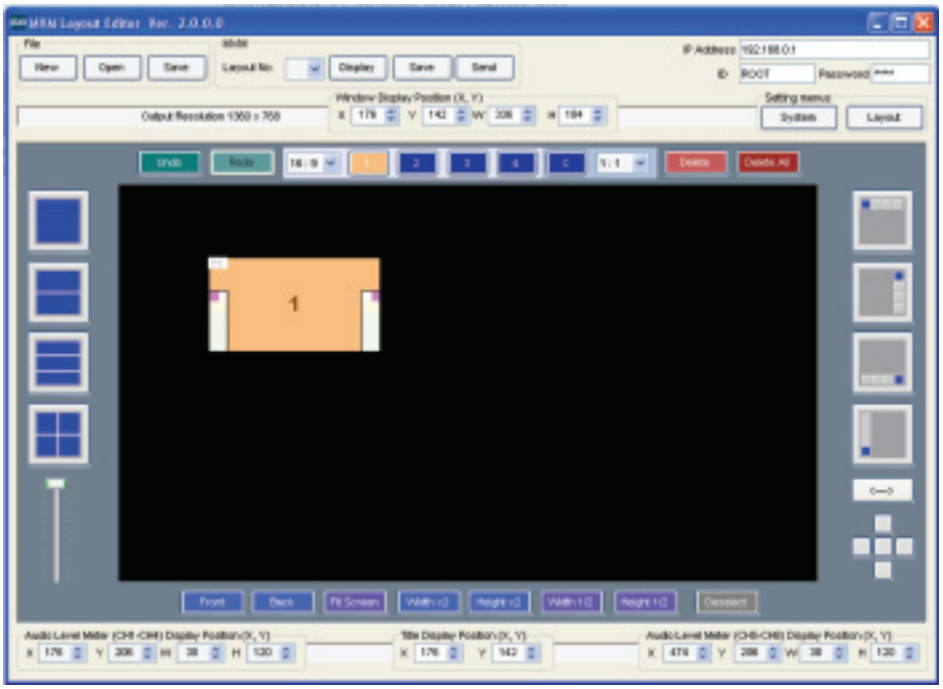
NOTE: The output resolution can only be selected when creating a new layout. The resolution of the layout loaded from MVM or the layout stored in the computer cannot be changed.

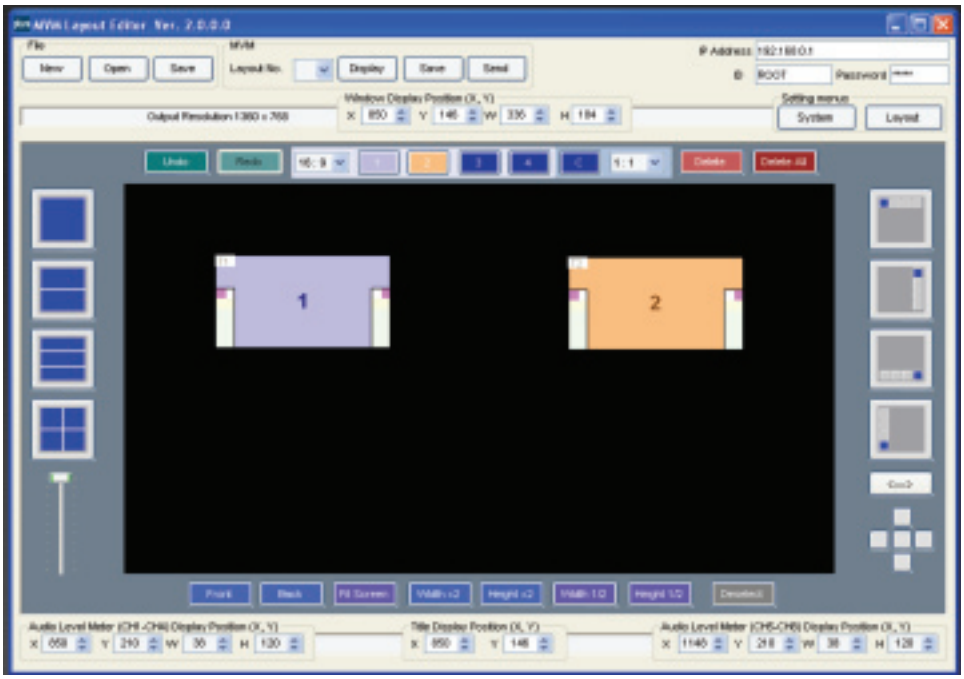
19-3. Editing Layouts

19-3-1. Adding Windows

Windows can be added using the buttons 1, 2, 3, 4, and C.

Clicking the button of window that is not displayed in the layout editing area adds the window to the layout editing area. Up to four video windows and one clock window can be added.

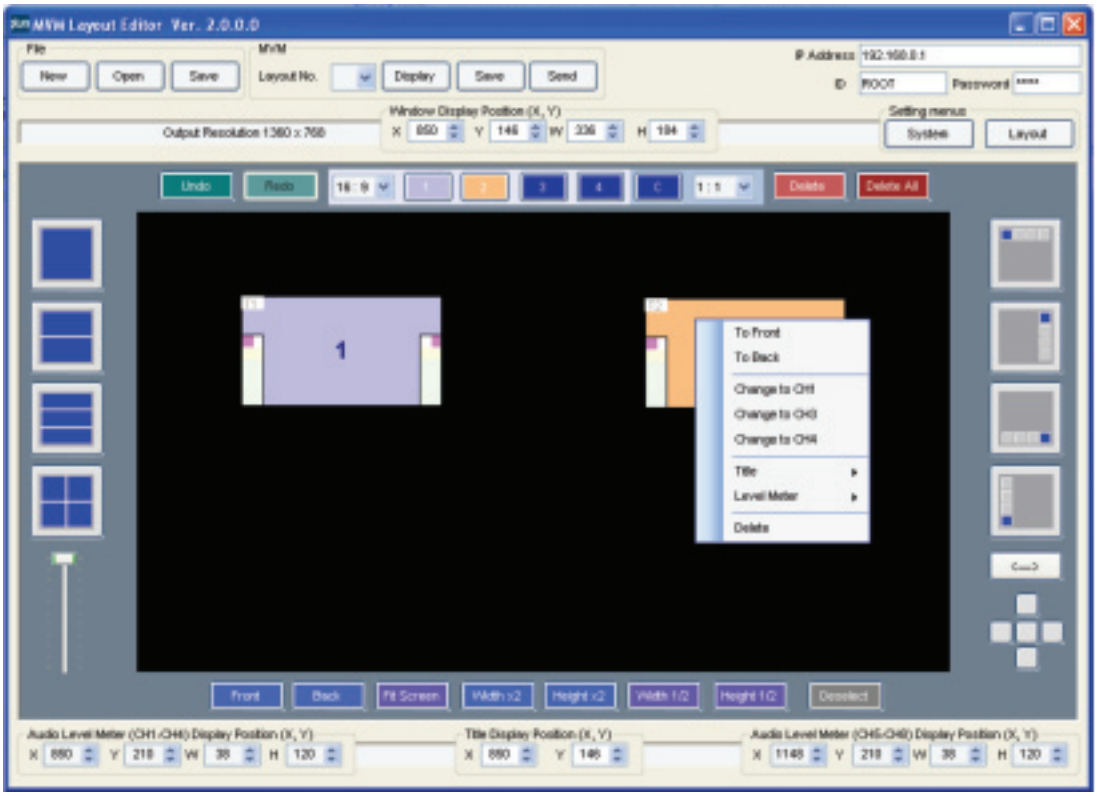




19-3-2. Deleting Windows

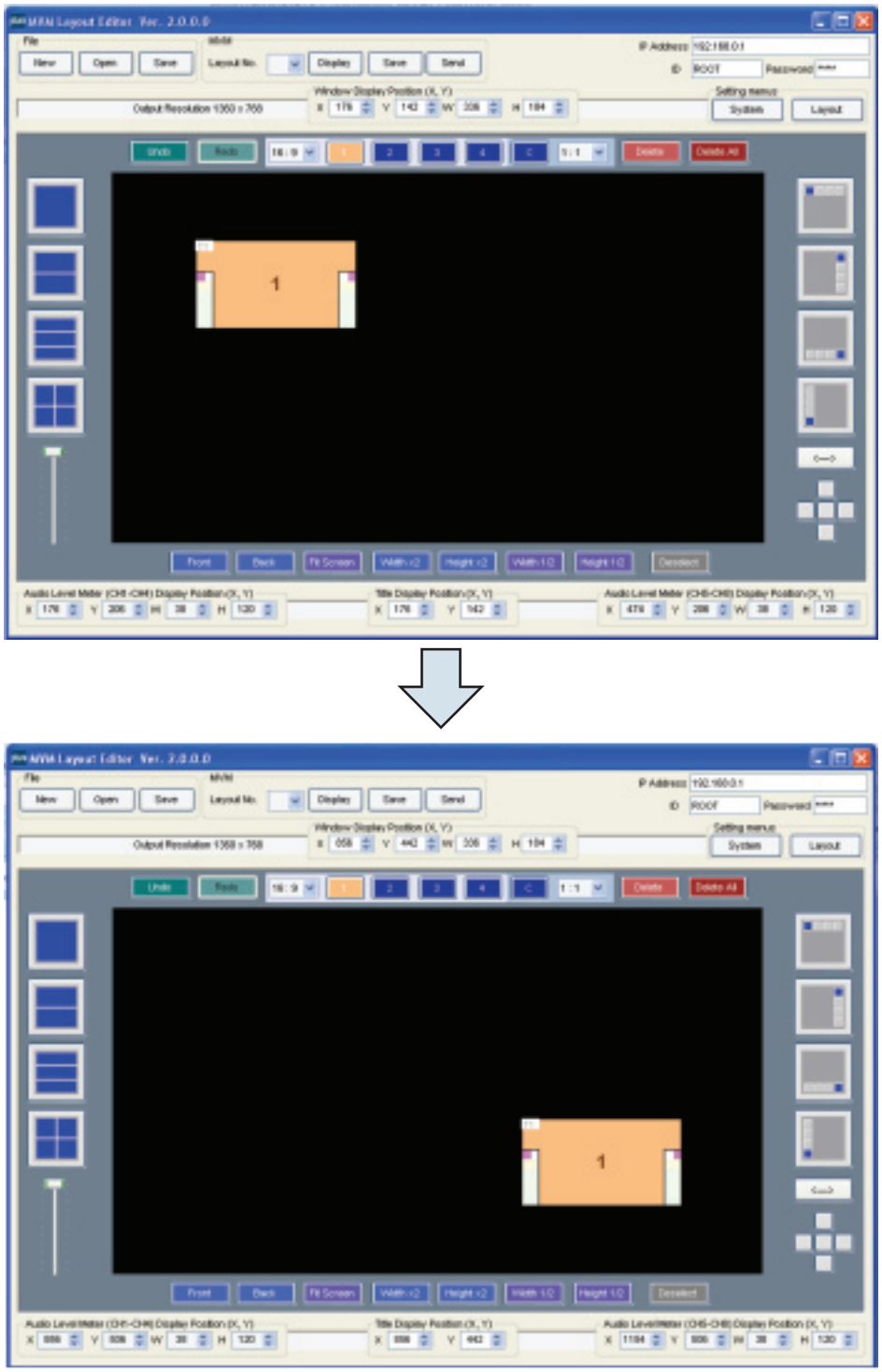
To delete a window, select a window and click Delete. To delete all windows in the editing are, click Delete All.

A window can also be deleted by selecting a window and choosing Delete from the right-click menu.



19-3-3. Moving Window

To move a window, drag the window to the desired position and release the mouse button.

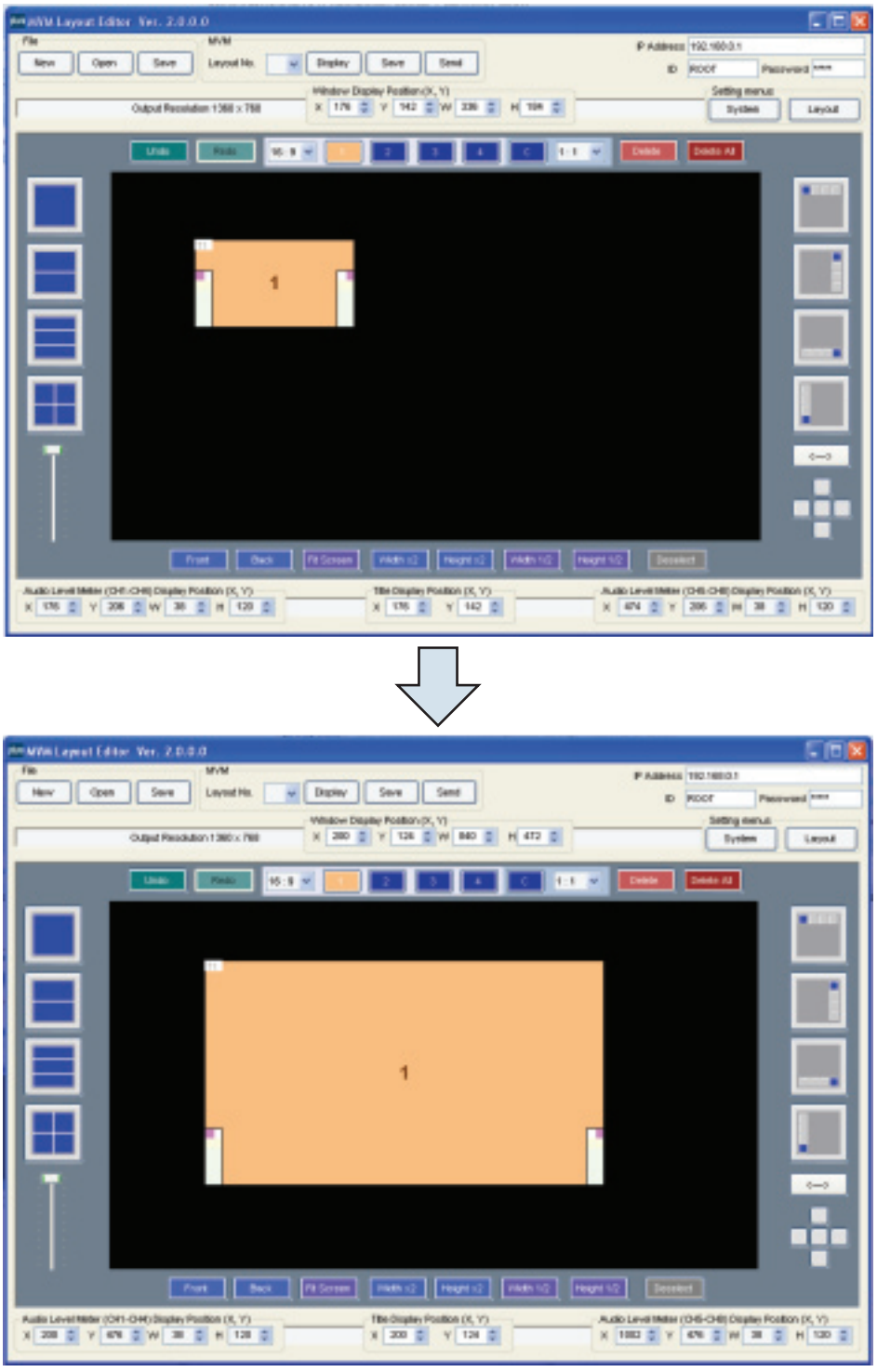


A window can also be moved by changing the numeric values in X and Y at the top of the edit window or using the arrow keys on the keyboard. (Select the window first.) Only one window can be moved at a time.

NOTE: When a window is moved, its title and audio level meters also move along with the window. The title and audio level meters located outside the window move inside if they are reached to the edge of the edit screen.

19-3-4. Setting Window Size

To change the window size, drag the edge of the window until the desired window size is obtained and release the mouse button. The window size can also be adjusted by selecting a window and changing the numeric values in W and H.



If Aspect Ratio is set to other than Free, the size can be adjusted while retaining the aspect ratio.

The window size can also be changed by clicking the Fit Screen, Double Width, Double Height, Half Width, and Half Height buttons.

The actual video display is within the area left after the removal of areas for tally and border displays from the set window size.

NOTE:

• The minimum window size is 120 (W) x 80 (H). However, due to the minimum video display area requirement of 96 (W) x 56 (H), the border width will be automatically reduced to obtain the display area.

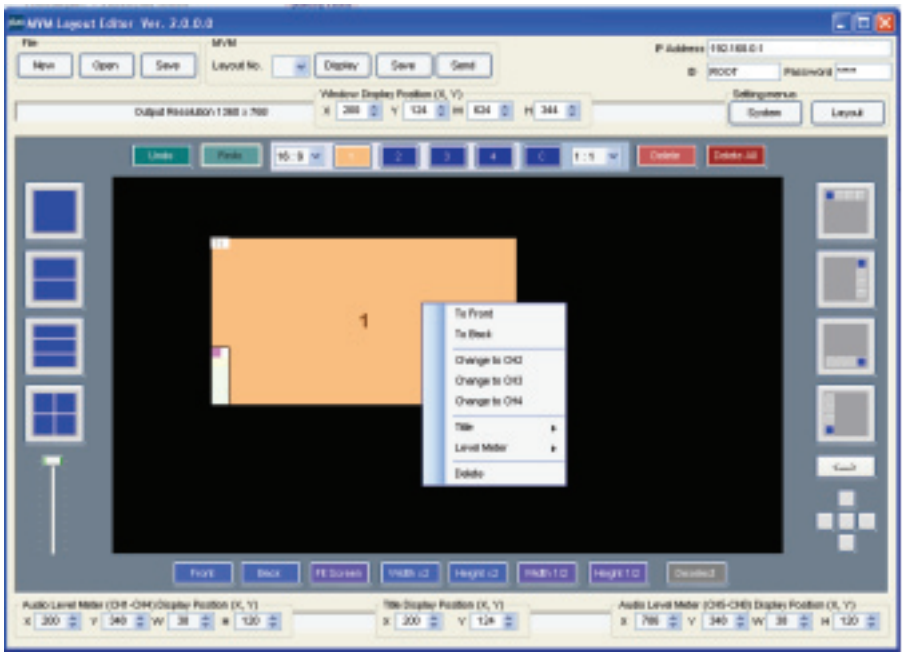
• How a video signal is displayed in each window in Split Screen Display Mode differs depending on the Display Mode in System Setting.

If MODE1 or MODE2 is selected
Auto detects the aspect ratio of the input video signal and maximizes the image to best fit the window while retaining the aspect ratio.

If MODE3 is selected
Maximizes the image to best fit the window. The aspect ratio of the input signal is not retained.

19-3-5. Changing Channel of Window

To change the display channel of a window, select the window and right-click to display the menu. From the right-click menu, choose a channel.



NOTE: Displaying the video signal of the same channel to multiple windows is not possible. If the channel that is already existed in the layout editing area is chosen, the window (channel) numbers will be exchanged.

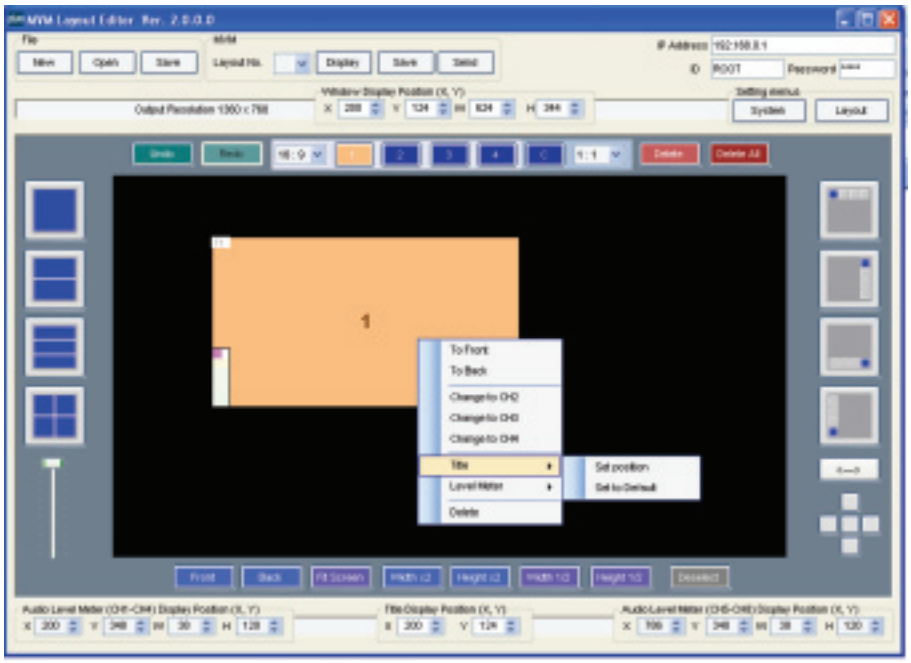
19-3-6. Changing Layer Order of Windows

To change the layer order of overlapped windows, follow the instruction below.

First select a window you wish to change the layer order. To bring the window to the front, click Front. To send the window to the back, click Back. The layer order can also be changed by selecting a window and choosing To Front or To Back from the right-click menu.

19-3-7. Changing Display Position of a Title

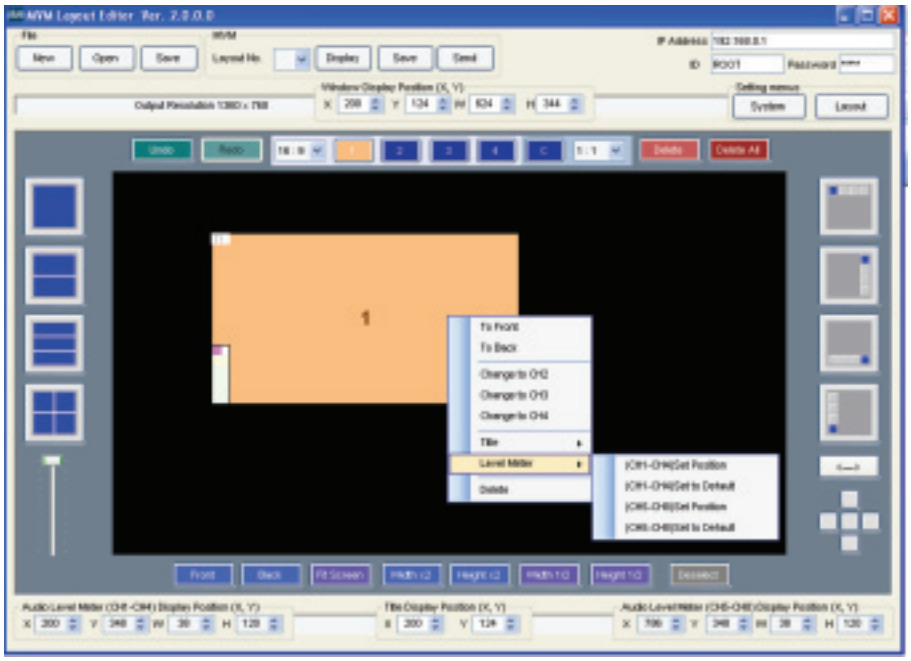
To change the display position of a title, select the window of the title that you wish to move and choose Title > Set Position from the right-click menu. The title moves along with the cursor as you drag the mouse. Move the cursor to the desired position and click the left mouse button. The display position of a title can also be adjusted by selecting a title and changing the numeric values in X and Y at the bottom of the edit window.



To reset the display position of the title to the default value, choose Title > Set to Default from the right-click menu.

19-3-8. Changing Display Position of Audio Level Meters

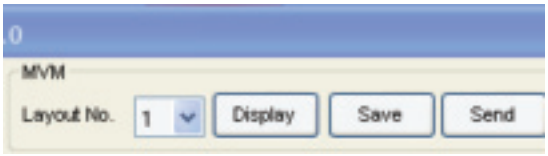
To change the display position of the audio level meters, select the window of the audio level meters that you wish to move and choose Level Meter > (CH1-CH4) or (CH5-CH8) Set Position from the right-click menu. The audio level meters move along with the cursor as you drag the mouse. Move the cursor to the desired position and click the left mouse button. The display position of the audio level meters can also be adjusted by selecting the audio level meters (CH1-CH4) or (CH5-CH8) and changing the numeric values in X and Y at the bottom of the edit window.



To reset the display position of the audio level meter to the default value, choose Level Meter > (CH1-CH4) or (CH5-CH8) Set to Default from the right-click menu.

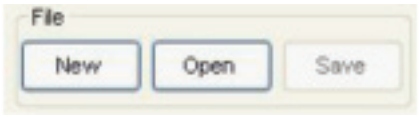
19-4. Saving Layout to MVM

Once the connection between MVM and Layout Editor is established, the changes of the layout are applied real-time to MVM. However, since the changes are not backed up to the memory, unsaved changes will be lost when MVM is powered off. To save changes to MVM, click the Save button in MVM in the main screen.



19-5. Saving Layout as File on Computer

To save the created layout as a file on the computer, click the Save button in File and give a desired name. The saved file can be loaded by clicking the Open button in File.



19-6. Closing MVM Layout Editor

To close the application, Click x at the top-right corner of the screen.

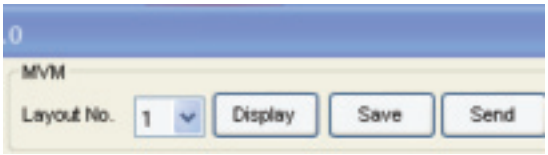
20. Displaying Layout on MVM Output

20-1. MVM

Pressing the SPLIT button on the front panel of MVM and pressing either of 1, 2, 3, or 4 button displays a pattern of four patterns preset in MVM Layout Editor.

20-2. MVM Layout Editor

Choose a layout number from the Layout Number drop-down list and press the Display button.



MVM Live Viewer

Version 1.0 - Rev. 1

21. Setup

21-1. Overview

MVM Multi viewer is enabled to transmit videos to PC by the connection through a network. Use this MVM Live Viewer to verify the transmitted videos.

21-2. System Requirements

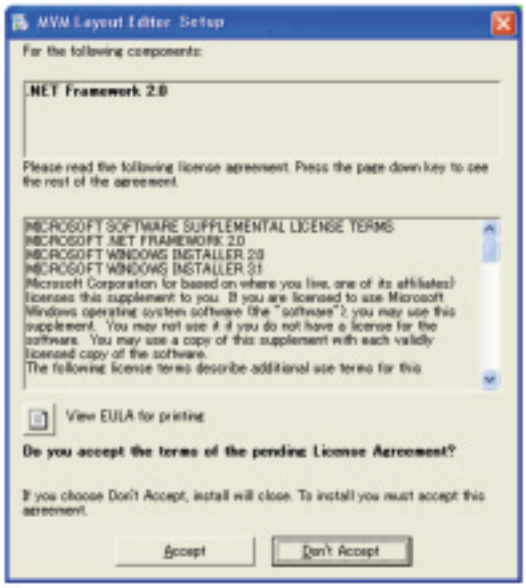
To install MVM Live Viewer, your computer must meet the following requirements.

OS (Platform)	Windows XP SP2 or later (Professional or Home Edition)
Software	.NET Framework2.0 (Supplied on the CD-ROM)
	Windows Installer 3.1 (Supplied on the CD-ROM)
	Visual C++2005 Redistributable (Supplied on the CD-ROM)
CPU	Pentium IV 3GHz or faster
Memory	1GB or more (Without Multicast mode: 512MB or more)
Display	Resolution of 1024 x 768 pixels or better Must be capable of 24 bit color display.
LAN port	At least one 10BASE-T/100BASE-TX compatible port
LAN cable	Enhanced Category 5 or better

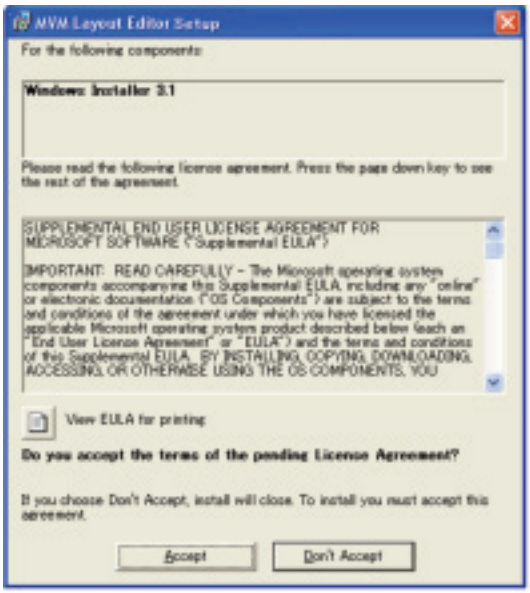
21-3. Installing MVM Live Viewer

1. Load the supplied Installation CD-ROM into the PC, and open the CD-ROM drive. Run the file “setup.exe” to start the setup wizard.

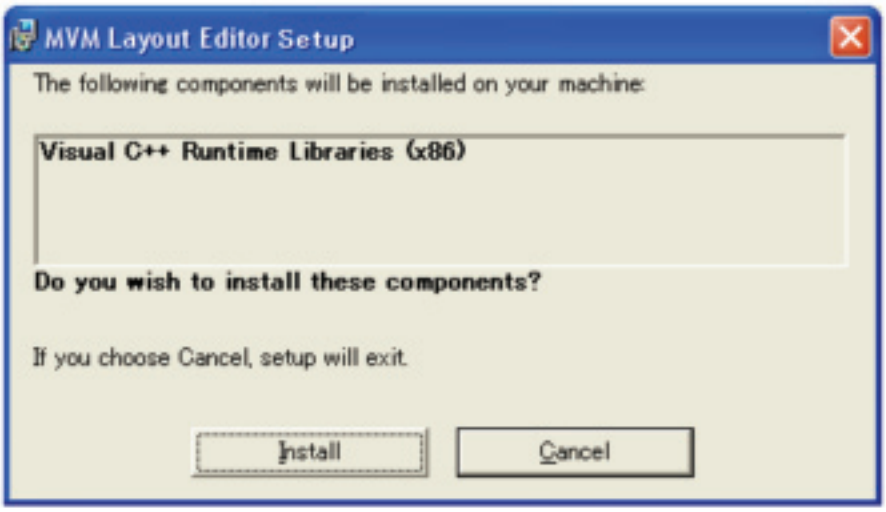
2. If [.NET Framework 2.0] is not installed on your PC, the screen shown below is displayed. Click Accept. If [.NET Framework 2.0] is already installed on your PC, this screen is not displayed.



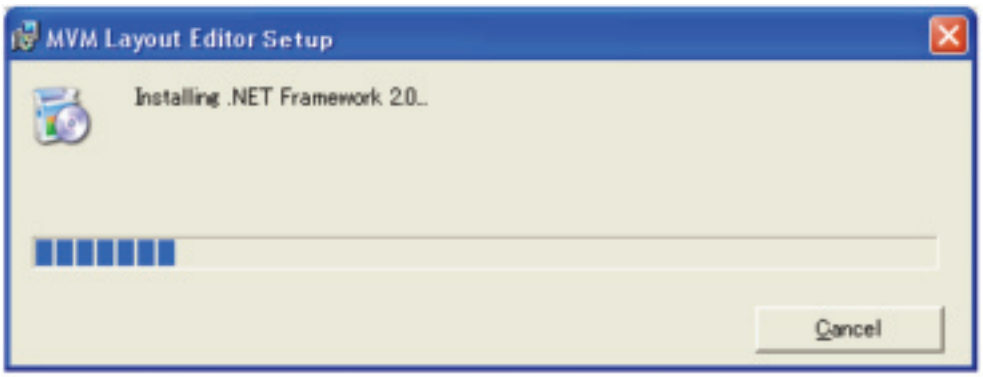
3. If [Windows Installer 3.1] is not installed on your PC, the screen shown below is displayed. Click Accept. If [Windows Installer 3.1] is already installed on your PC, this screen is not displayed.



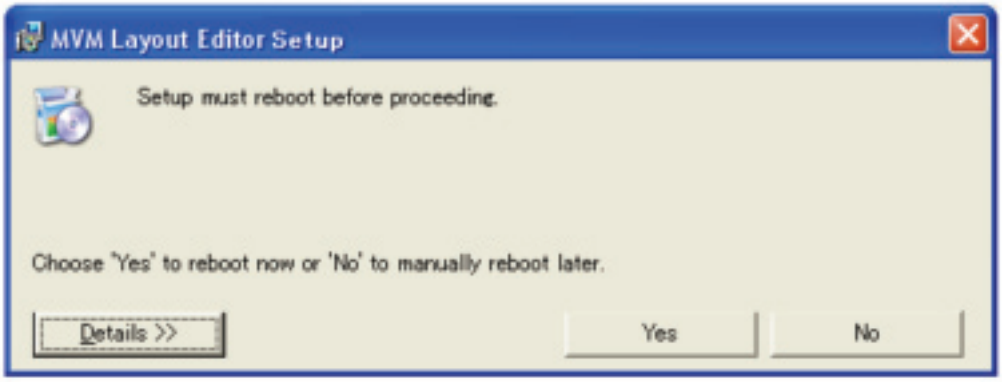
4. The confirmation dialog for installing Visual C++ Runtime Libraries appears. Click Install.



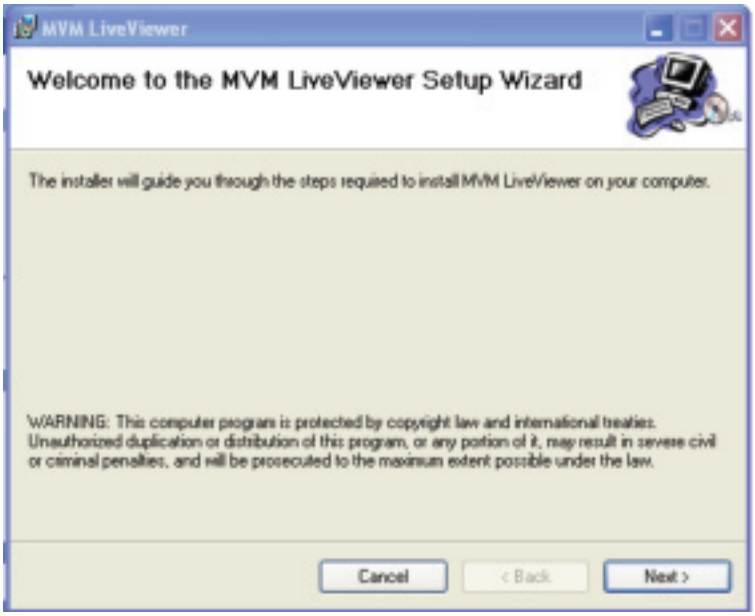
5. If [.NET Framework 2.0] is not installed, the installation starts.



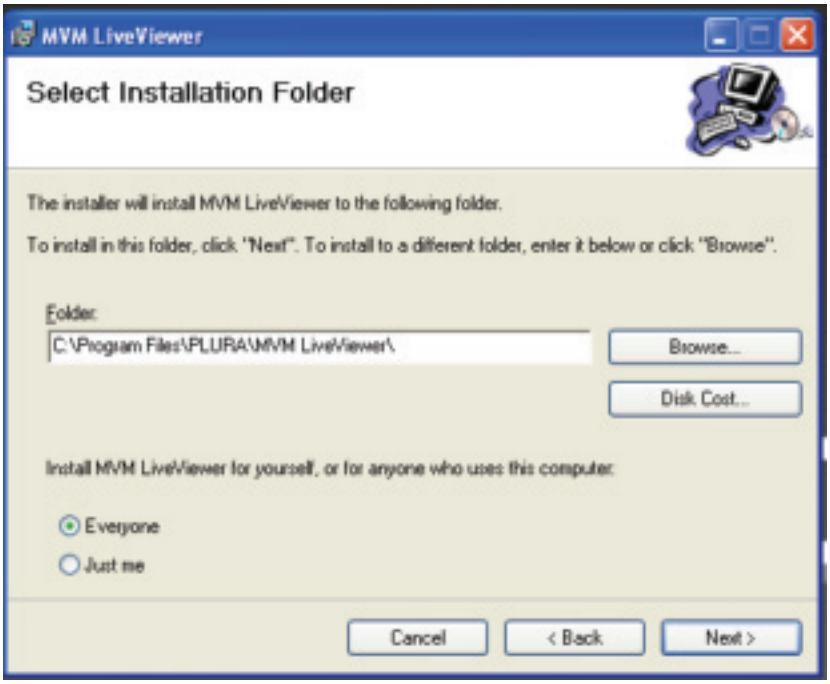
6. When installation of [.NET Framework 2.0] is complete, the screen shown below is displayed requiring a reboot. Click Yes to reboot your PC.



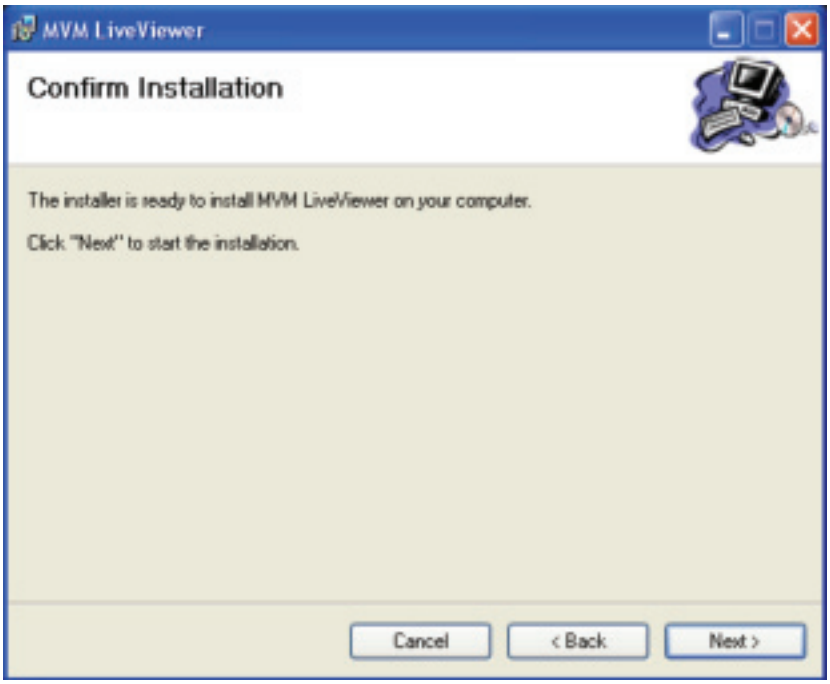
7. After the setup wizard is started, click Next.



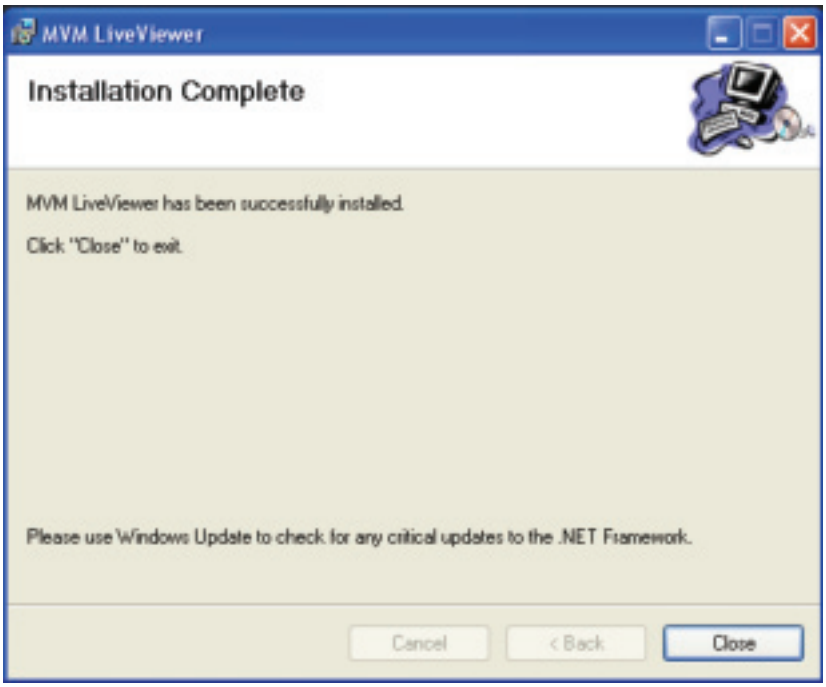
8. Select the installation directory. It is not necessary to change the folder. Select whether to install MVM Layout Editor for current user only or for all users. When the settings are completed, click NEXT>.



9. Click NEXT> to start the installation.



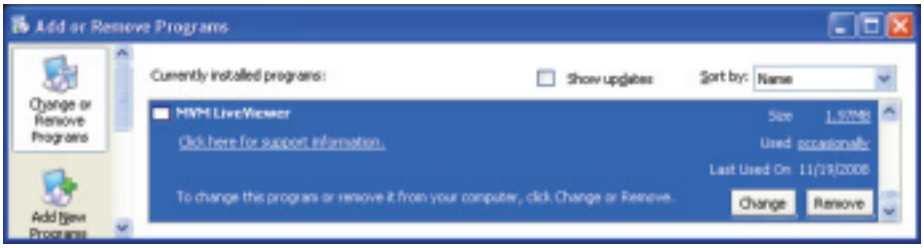
10. When installation is completed normally, the screen shown below is displayed. Click Close to quit the setup wizard.



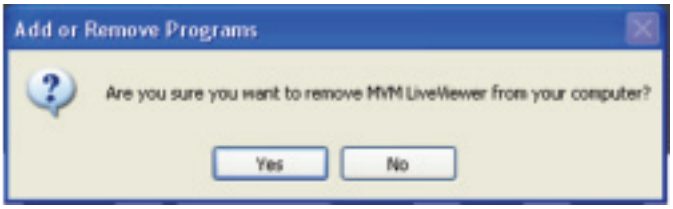
21-4. Removing MVM Live Viewer

To remove MVM Live Viewer, follow the procedure below.

1. Go to Start > Control Panel. In the Add or Remove Programs window, select “MVM Live Viewer”, and click Remove.



2. The confirmation dialog shown below is displayed. Click Yes to start the uninstallation.



The “Windows Installer 3.1”, “Microsoft .NET Framework 2.0”, and “Microsoft Visual C++2005 Redistributable” do not need to be removed.

21-5. Connections

To control MVM over a LAN interface, be aware that the cables and equipment used vary depending on the connection method. Use a crossover LAN cable to connect the computer directly to the MVM. Use a straight through LAN cable for the connection using a router or a hub.

IMPORTANT: In UNICAST mode, the connection with one PC is available for one MVM.

21-6. Communication Standard

The communication standards for serial control over a LAN interface is as follows.

Protocol	TCP/IP Protocol
IP address	Setting range: 0.0.0.0 to 255.255.255.255 However, there also are limitations on IP addresses set by the PC as shown below. Set the IP address in this range. 1st octet: 1 to 223 (except 127) 2nd octet: 0 to 255 3rd octet: 0 to 255 4th octet: 1 to 254 • This is set in the menu screen on the main unit. • The default setting is 192.168.0.1.
Subnet mask length	Setting range: 0 to 31 • This is set in the menu screen on the main unit. • The default setting is 24.
Gateway	Setting range: 0.0.0.0 to 255.255.255.255 • This is set in the menu screen on the main unit. • The value 0.0.0.0 signifies that the gateway has not been set. • The default setting is 0.0.0.0.
MAC address	This is already set at factory shipping (cannot be changed). • The setting can be confirmed in the menu screen on the main unit.

IMPORTANT: You cannot change the LAN communication standard settings for MVM main unit from PC. The changes can be made on MVM main unit. See MVM Operation Manual, section 7-3. “LAN” for details.

21-7. PC Network Settings

The PC network settings need to match that of the MVM. The procedure for making the network settings at the PC vary depending on the OS, so refer to the OS manual for details. This setting example shows the case when connecting to the MVM with the default settings. The MVM default settings are shown below.

IP address	192. 168. 0.1
Subnet mask length	24
Gateway	0.0.0.0

1. Setting in Windows XP with the default Start menu setting

Click Start on the taskbar, open [Control Panel], and double-click “Network Connections”. Right-click “Local Area Connection” icon to open [Properties] window. Double-clicking “Internet Protocol (TCP/IP)” under the [General] tab opens the [Internet Protocol (TCP/IP) Properties] window. Make the settings as shown in the example below. Make a note of the settings before changing them in case you need to return the IP address to its original settings later.

IP address for PC	192.168.0.yyy (yyy is any number from 2 to 254 except for the number set for the MVM unit and the gateway number. In this example, the setting is yyy=200.)
Subnet mask	Set to 255.255.255.0.

2. Setting in Windows XP with the Start menu setting changed to Classic

Click Start on the taskbar, select “Settings” -> “Network Connections” and then right-click the “Local Area Connection” icon to open [Properties] window. Double-clicking “Internet Protocol (TCP/IP)” under the [General] tab opens the [Internet Protocol (TCP/IP) Properties] window. The settings are then made in the same way as 1) above. When the settings are completed, click OK, and then close all setting windows.

22. Video Transmission using Live Viewer

22-1. Starting and Exiting MVM Live Viewer

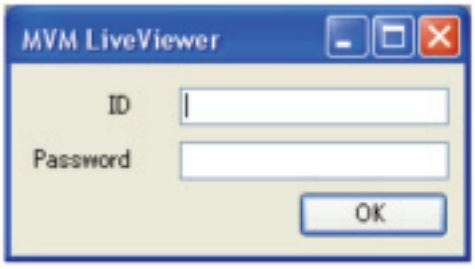
To start MVM Live Viewer, go to Start > Programs > PLURA and select “Live Viewer”.

The Controller dialog shown below is displayed.

1. To connect in Unicast Mode

Enter the IP address of the MVM to be connected in the IP address box, and then click CONNECT.

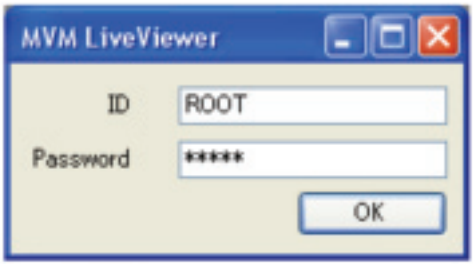
If ID is set, the authentication window shown below is displayed.
* If ID is not set , the Viewer screen opens.



Enter ID and password and click OK. When the entered ID and password match the stored data, the Viewer screen opens.

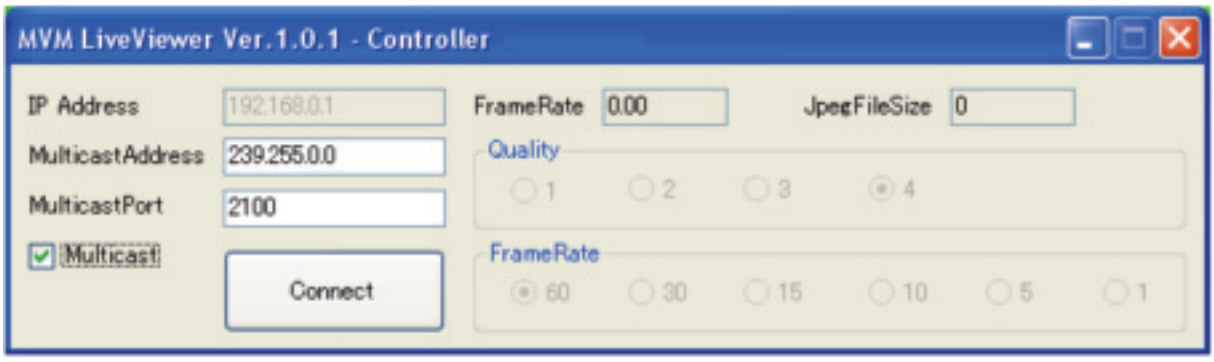
The default settings on MVM are as follows.

ID	ROOT
Password	0000



2. To connect in Multicast Mode

Put a check in the Multicast check box, and enter the Multicast address and Multicast port of the MVM to be connected. Click CONNECT. When the connection is established, the Viewer screen is displayed.

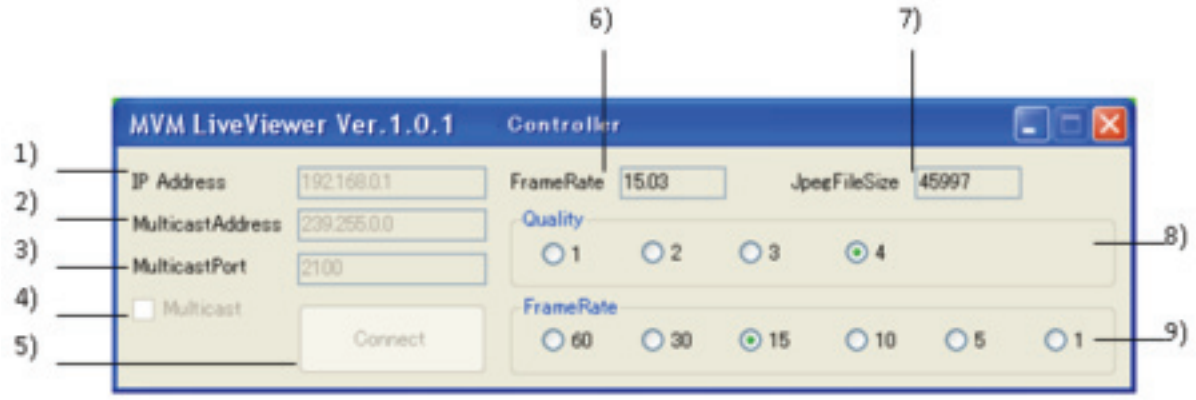


IMPORTANT: Due to the UDP protocol used in MULTICAST mode, the video output may not be updated at the packet loss which occurs under the unstable network condition.

22-2. Closing Connection and MVM Live Viewer

To close the communication with the MVM, click at the top-right corner of the Viewer screen. To exit the MV410HS Live Viewer, click at the top-right corner of the control window.

22-3. MVM Live Viewer - Controller



1. **IP Address**
   Displays the IP address of the connected MVM. To change the connection with MVM, close the Viewer screen, enter the IP address, and then click Connect again.

2. **Multicast Address**
   Displays the Multicast address of the connected MVM. To change the Multicast address to connect to, close the Viewer screen, enter the Multicast address and then click Connect again.

3. **Multicast Port**
   Displays the Multicast port of the connected MVM. To change the Multicast port to connect to, close the Viewer screen, enter the Multicast port and then click Connect again.

4. **Multicast**
   Selects whether to connect in Unicast mode or Multicast mode.

Unchecked:	Connects in Unicast mode.
Checked:	Connects in Multicast mode.

5. **Connect**
   Establishes the connection with the MVM specified by the IP Address and opens the Viewer screen.

6. **Frame Rate**
   Measures and displays the actual frame rate.

7. **Jpeg File Size**
   Displays the file size of the transmitted video image in Bytes.

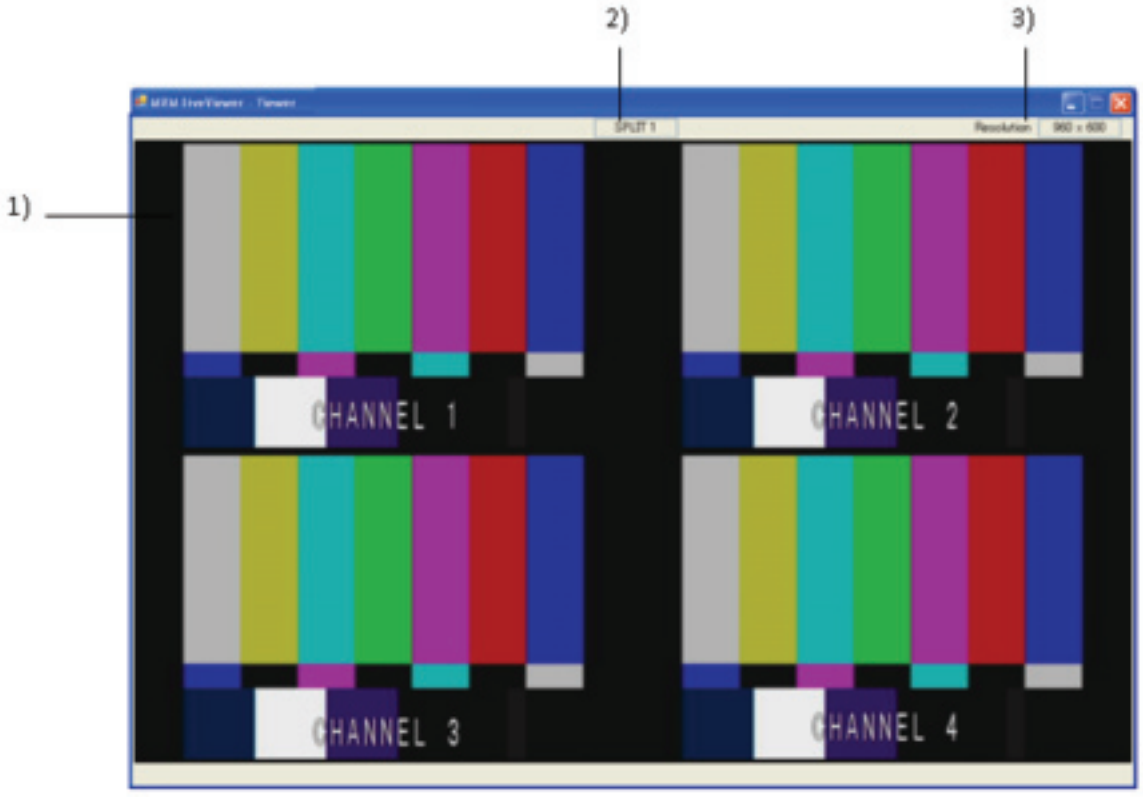
8. **Quality**
   Selects the compression rate for the JPEG image to transmit from 1 to 4. The larger number provides higher resolution.

9. **Frame Rate**
   Selects the frame rate for the video image transmission.
   When the output frequency of MVM is set to 60Hz or 59.94Hz, frame rate of 1FPS, 5FPS, 10FPS, 15FPS, 30FPS, and 60FPS are available.
   When the output frequency of MVM is set to 50Hz, frame rate of 1FPS, 4FPS, 8FPS, 12FPS, 25FPS, and 50FPS are available.

IMPORTANT: The sufficient frame rate may not be obtained due to the transmitted video images, JPEG compression ratio, specifications of the connected PC, network environment, and other factors. If It occurs, change the JPEG compression ratio to reduce the data volume being transmitted. If the MVM is connected in Multicast mode, settings of QUALITY and FRAME RATE cannot be changed. To change the settings, change the connection to Unicast mode. Although settings for any of the followings are changed using Layout Editor, RS-232C/422/485/LAN command, or Web Browser while displaying MVM Live Viewer screen, the parameter display on the Live Viewer - Controller dialog will not be updated.

- Output frequency
- JPEG compression ratio
- Frame rate

22-4. MVM Live Viewer - Viewer Screen



1. **Image Display Area**
   Displays the image transmitted from MVM. MVM streams the image data from image processor into both horizontally and vertically half size JPEG format and transmit the data.

2. **Output Screen**
   Displays the output screen type selected on MVM.

3. **Resolution**
   Displays the resolution of the image transmitted from MVM.

23. Troubleshooting

If any of the following problems occur during operation of your MVM Live Viewer, proceed as indicated below to see if the problem can be corrected before assuming unit malfunction has occurred.

IMPORTANT: If the problem is not corrected by processing the actions below, power off the unit and power on again. If it does not correct the problem either, contact your dealer.

Problem	Check	Action
MVM Live Viewer does not start.	Does the PC meet the operating environment conditions?	Start with a PC that meets the operating environment conditions.
	Is other software currently running?	There may be a conflict with another software program. Close all other programs, and then start the MVM Live Viewer again.
The connection with MVM cannot be established.	Is the MVM turned on?	Check the MVM is turned on.
	Is the network connected correctly?	Check that the network wires and cables are connected properly.
		Check that the cable type is correct.
	Are the LAN adapter and other hardware operating properly?	Use the device manager or diagnostic program to check if the hardware is operating properly.
		Check that the drivers are installed correctly.
	Were the PC network settings made correctly?	Check that the TCP/IP protocol is installed and that the IP address and other settings are correct.
	Were the MVM network setting made correctly?	From the MVM menu, check that the IP address and other settings are correct.
	Is the same IP address being used?	Check that no IP addresses are duplicated among all PCs and MVM units in the network.
	Is the network mode set correctly?	Check that the MVM network mode matches to that of the MVM Live Viewer.

MVM Web Browser

Version 1.0 - Rev.1

24. Setup

24-1. Overview

MVM Multi viewer is enabled to transmit videos to PC by the connection through a network. Use the Web browser, Internet Explorer to verify the transmitted videos.

24-2. System Requirements

To install MVM Web Browser, your computer must meet the following requirements.

OS (Platform)	Windows XP SP2 or later (Professional or Home Edition)
Software	Internet Explorer 6.0 or later
	Java (TM) 6 (Supplied on the CD-ROM)
CPU	Pentium4 3GHz or faster
Memory	512MB or more
Display	Resolution of 1024 x 768 pixels or better Must be capable of 24 bit color display.
LAN port	At least one 10BASE-T/100BASE-TX compatible port
LAN cable	Enhanced Category 5 or better

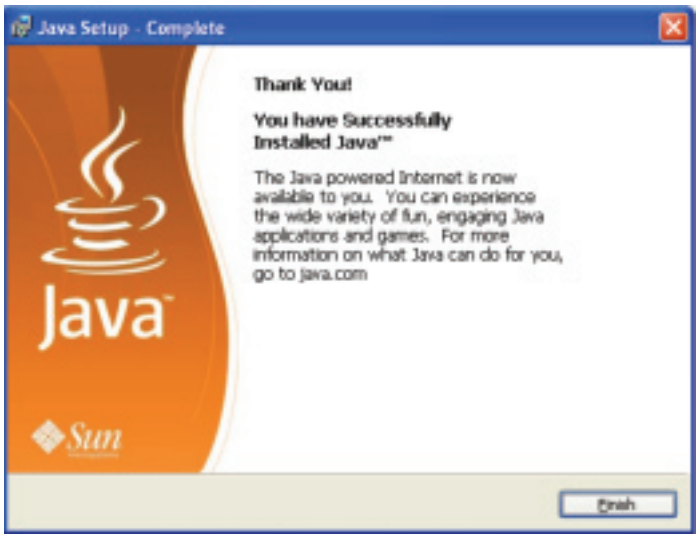
IMPORTANT: Using Java (TM) version other than 6 may cause improper operation of the Viewer screen. To get the correct operation, install Java (TM) 6 from the supplied CD-ROM, or remove the earlier version in the “Add or Remove Programs” window.

24-3. Installing Java™

1. Load the supplied Installation CD-ROM into the PC, and open the CD-ROM drive. Run the file “jre-6u3-windows-i586-p-s.exe” to start the setup wizard.

2. After the setup wizard is started, the setup window appears. Click Accept to start the installation.

3. When installation is completed normally, the screen shown below is displayed. Click Finish to quit the setup wizard.



24-4. Connections

To control MVM over a LAN interface, be aware that the cables and equipment used vary depending on the connection method. Use a crossover LAN cable to connect the computer directly to the MVM. Use a straight through LAN cable for the connection using a router or a hub.

IMPORTANT: A MVM can accept the connection with one PC.

24-5. Communication Standard

The communication standards for serial control over a LAN interface is as follows.

Protocol	TCP/IP Protocol
IP address	Setting range: 0.0.0.0 to 255.255.255.255 However, there also are limitations on IP addresses set by the PC as shown below. Set the IP address in this range. 1st octet: 1 to 223 (except 127) 2nd octet: 0 to 255 3rd octet: 0 to 255 4th octet: 1 to 254 • This is set in the menu screen on the main unit. • The default setting is 192.168.0.1.
Subnet mask length	Setting range: 0 to 31 • This is set in the menu screen on the main unit. • The default setting is 24.
Gateway	Setting range: 0.0.0.0 to 255.255.255.255 • This is set in the menu screen on the main unit. • The value 0.0.0.0 signifies that the gateway has not been set. • The default setting is 0.0.0.0.
MAC address	This is already set at factory shipping (cannot be changed). • The setting can be confirmed in the menu screen on the main unit.

IMPORTANT: You cannot change the LAN communication standard settings for MVM main unit from PC. The changes can be made on MVM main unit. See MVM Operation Manual, section 7-3. “LAN” for details.

24-6. PC Network Settings

The PC network settings need to match that of the MVM. The procedure for making the network settings at the PC vary depending on the OS, so refer to the OS manual for details. This setting example shows the case when connecting to the MVM with the default settings. The MVM default settings are shown below.

IP address	192.168.0.1
Subnet mask length	24
Gateway	0.0.0.0

1. Setting in Windows XP with the default Start menu setting

Click Start on the taskbar, open [Control Panel], and double-click “Network Connections”. Right-click “Local Area Connection” icon to open [Properties] window. Double-clicking “Internet Protocol (TCP/IP)” under the [General] tab opens the [Internet Protocol (TCP/IP) Properties] window. Make the settings as shown in the example below. Make a note of the settings before changing them in case you need to return the IP address to its original settings later.

IP address for PC	192.168.0.yyy (yyy is any number from 2 to 254 except for the number set for the MVM unit and the gateway number. In this example, the setting is yyy=200.)
Subnet mask	Set to 255.255.255.0.

2. Setting in Windows XP with the Start menu setting changed to Classic

Click Start on the taskbar, select “Settings” -> “Network Connections” and then right-click the “Local Area Connection” icon to open [Properties] window. Double-clicking “Internet Protocol (TCP/IP)” under the [General] tab opens the [Internet Protocol (TCP/IP) Properties] window. The settings are then made in the same way as 1) above. When the settings are completed, click OK, and then close all setting windows.

21-6. Communication Standard

1. Setting in Windows XP with the default Start menu setting

Click Start on the taskbar, open [Control Panel], and double-click “Network Connections”. Right-click “Local Area Connection” icon to open [Properties] window. Double-clicking “Internet Protocol (TCP/IP)” under the [General] tab opens the [Internet Protocol (TCP/IP) Properties] window. Make the settings as shown in the example below. Make a note of the settings before changing them in case you need to return the IP address to its original settings later.

IP address for PC	192.168.0.yyy (yyy is any number from 2 to 254 except for the number set for the MVM unit and the gateway number. In this example, the setting is yyy=200.)
Subnet mask	Set to 255.255.255.0.

2. Setting in Windows XP with the Start menu setting changed to Classic

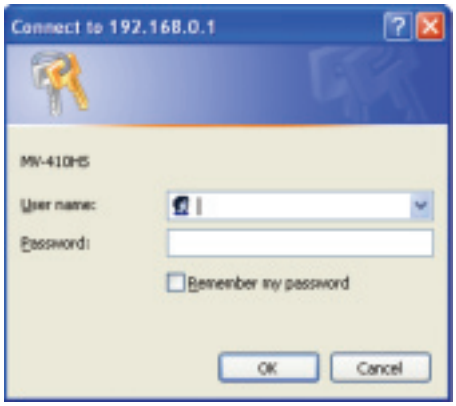
Click Start on the taskbar, select “Settings” -> “Network Connections” and then right-click the “Local Area Connection” icon to open [Properties] window. Double-clicking “Internet Protocol (TCP/IP)” under the [General] tab opens the [Internet Protocol (TCP/IP) Properties] window. The settings are then made in the same way as 1) above. When the settings are completed, click OK, and then close all setting windows.

25. Remote Control using Internet Explorer

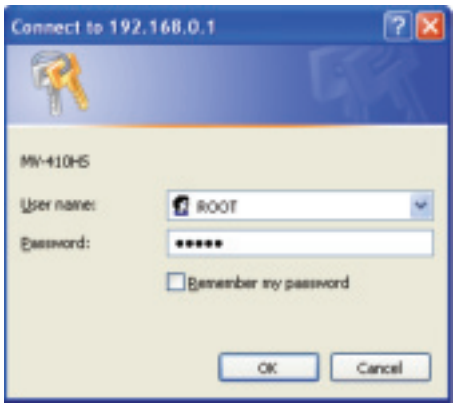
25-1. Starting and Exiting Internet Explorer

To start Internet Explorer, go to Start > Programs and select “Internet Explorer”.The Controller dialog shown below is displayed.

1. Enter the IP address of MVM which is set in the LAN menu of MVM in the IP address box. If you have not changed the IP address, enter the default IP address “192.168.0.1”. Then, click ENTER. If ID is set, the authentication window shown below is displayed.
   * If ID is not set , the control screen opens when the connection is established.



2. Enter ID and password and click OK. When the entered ID and password match the stored data, the control screen opens.



The default settings on MVM are as follows.

ID	ROOT
Password	0000

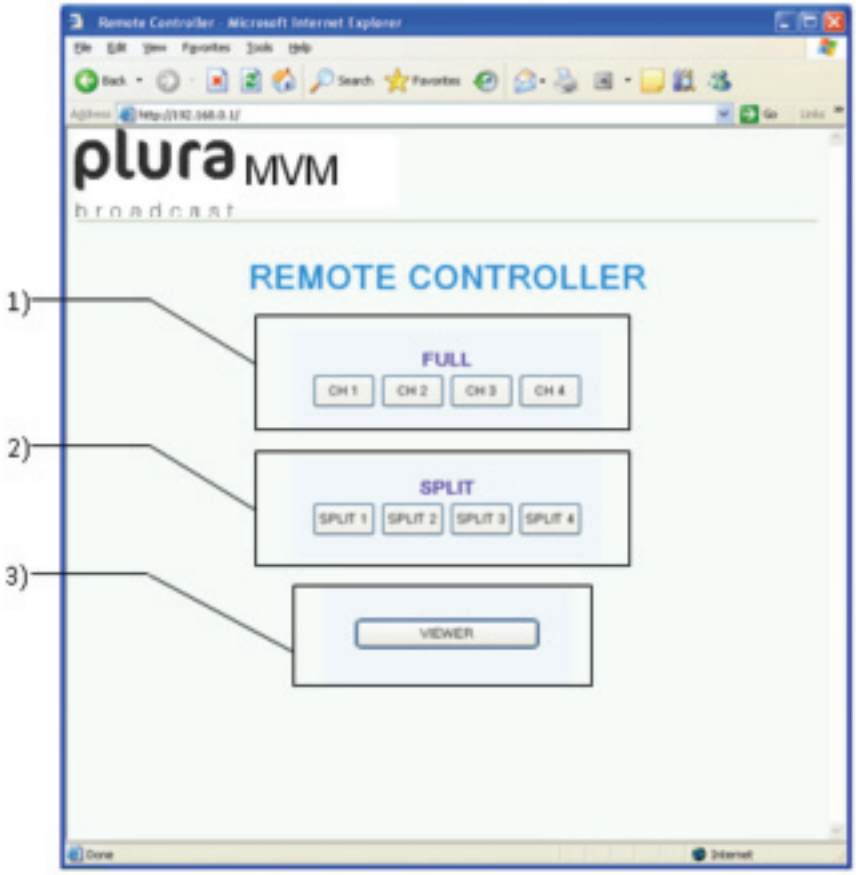
IMPORTANT: If the MVM is rebooted while the connection is active, the operation of Internet Explorer may become unstable. Whenever you reboot the MVM, restart the Internet Explorer.

25-2. Closing Internet Explorer

To close the Internet Explorer, click x at the top-right corner of the Internet Explorer window.

25-3. Internet Explorer - Controller

If the communication is established the window shown below is displayed.



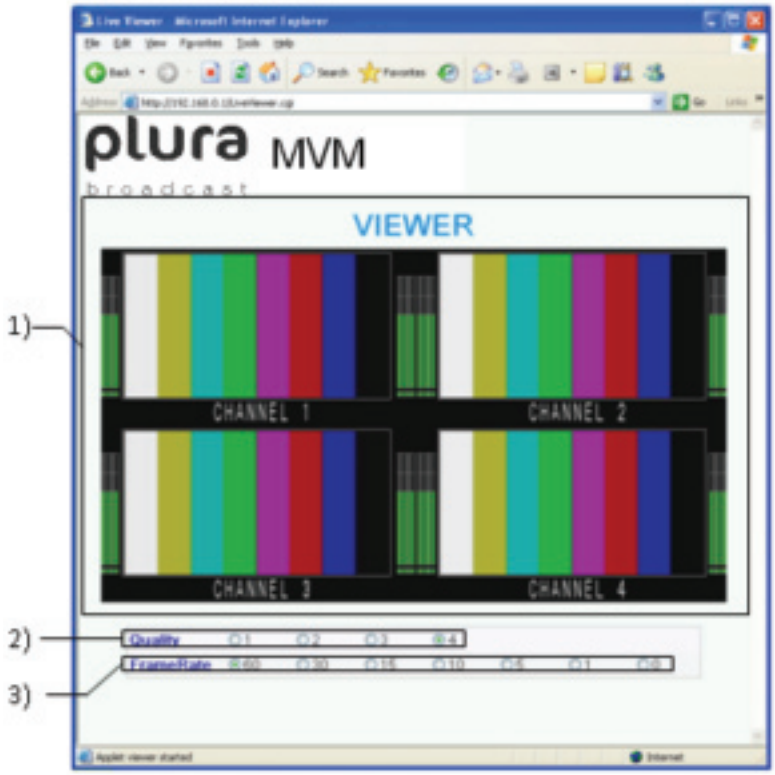
1. **FULL CH1~CH4**
   Displays the selected channel in full screen.

2. **SPLIT 1~4**
   Displays the selected split screen layout.

3. **VIEWER**
   Displays the Viewer screen of the Live Viewer.

25-4. Video Image Transmission (VIEWER)

Click the VIEWER button to open the VIEWER screen as shown below.



1. VIEWER Screen

Displays the image transmitted from MVM. MVM streams the image data from image processor into both horizontally and vertically half size JPEG format and transmit the data.

2. Quality

Selects compression rate from numbers 1 to 4 for the JPEG image to transmit. The larger the number the higher the quality of image.

3. Frame Rate

Selects frame rate for the video image transmission.
If output frequency is set to 60Hz or 59.94Hz in the System page of Layout Editor System setting, the following rates are available: 0FPS, 1FPS, 5FPS, 10FPS, 15FPS, 30FPS, 60FPS
Also, if set to 50Hz, available rates are: 0FPS, 1FPS, 4FPS, 8FPS, 12FPS, 25FPS, 50FPS
0FPS stops the video image transmission. To regain the processing speed of the control screen that becomes slow, set the frame rate to 0FPS to stop the video image transmission.

IMPORTANT: The sufficient frame rate may not be obtained due to the transmitted video images, JPEG compression ratio, capability of the connected PC, network environment, or other factors. If It occurs, change the JPEG compression ratio to reduce the data volume being transmitted, or use the dedicated software, MVM Live Viewer. If the frame rate is insufficient, the displayed image may become jerky. In this case, set the frame rate lower. Although settings for any of the followings are changed using Layout Editor, RS-232c/422/485/LAN command, or MVM Live Viewer while displaying VIEWER screen, the parameter display on the VIEWER screen will not be updated.

- Output frequency
- JPEG compression ratio
- Frame rate

26. Troubleshooting

If any of the following problems occur during operation of your MVM Live Viewer, proceed as indicated below to see if the problem can be corrected before assuming unit malfunction has occurred.

IMPORTANT: If the problem is not corrected by processing the actions below, power off the unit and power on again. If it does not correct the problem either, contact your dealer.

Problem	Check	Action
Unable to establish the connection with MVM.	Is the MVM powered on?	Check the MVM is powered on.
	Does the PC meet the operating environment conditions?	Start with a PC that meets the operating environment conditions.
	Is the network connected correctly?	Check that the network wires and cables are connected properly.
		Check that the cable type is correct.
	Are the LAN adapter and other hardware operating properly?	Use the device manager or diagnostic program to check if the hardware is operating properly.
		Check that the drivers are installed correctly.
	Were the PC network settings made correctly?	Check that the TCP/IP protocol is installed and that the IP address and other settings are correct.
	Were the MVM network setting made correctly?	From the MVM menu, check that the IP address and other settings are correct.
	Is the same IP address being used?	Check that no IP addresses are duplicated among all PCs and MVM units in the network.
VIEWER screen is not displayed.	Is the installed Java version correct?	Check that the running Java software is Java(TM) 6 in the "Add or Remove Programs" in control panel. If the running version is not Java(TM) 6, install Java(TM) 6 and remove any other version of Java(TM).

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www.plurabroadcast.com

Plura Broadcast, Inc. - West Coast
1930 W. Quail Ave
Phoenix, AZ 85027
Tel: (602) 944-1044
Fax: (602) 324-9688

Plura Broadcast, Inc. - East Coast
67 Grand avenue
Massapequa, NY 1175
Tel: (516) 997-5675
Fax: (516) 593-7900