FOR.A®
INNOVATIONS IN VIDEO
and AUDIO TECHNOLOGY

OPERATION MANUAL

MV-400

Multi Viewer

S

4th Edition

FOR-A COMPANY LIMITED

Precautions

Important Safety Warnings

[Power]

 Caution	Operate unit **only** on the specified supply voltage.
	Disconnect power cord by connector only. **Do not** pull on cable portion.
 Stop	**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]

 Caution	**Ensure** unit is properly grounded at all times to prevent electrical shock hazard.
 Hazard	**Do not** ground the unit to gas lines, units, or fixtures of an explosive or dangerous nature.
 Caution	**Ensure** power cord is firmly plugged into AC outlet.

[Operation]

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

 Caution	**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.
 Stop	**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.
 Hazard	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]

 Caution	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.

[Rack Mount Brackets, Ground Terminal, and Rubber Feet]

 Caution	To rack mount or ground the unit, or to install rubber feet, **do not** use screws or materials other than those supplied. Otherwise, it may cause damage to the internal circuits or components of the unit. If you remove the rubber feet attached on the unit, **do not** reinsert the screws securing the rubber feet.

[Consumables]

 Caution	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.

Upon Receipt

Unpacking

The MV-400 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
MV-400	1	
AC Cable	1	
Remote Control Software	1	CD-ROM
Operation Manual	1 set	One for main unit. One for software.

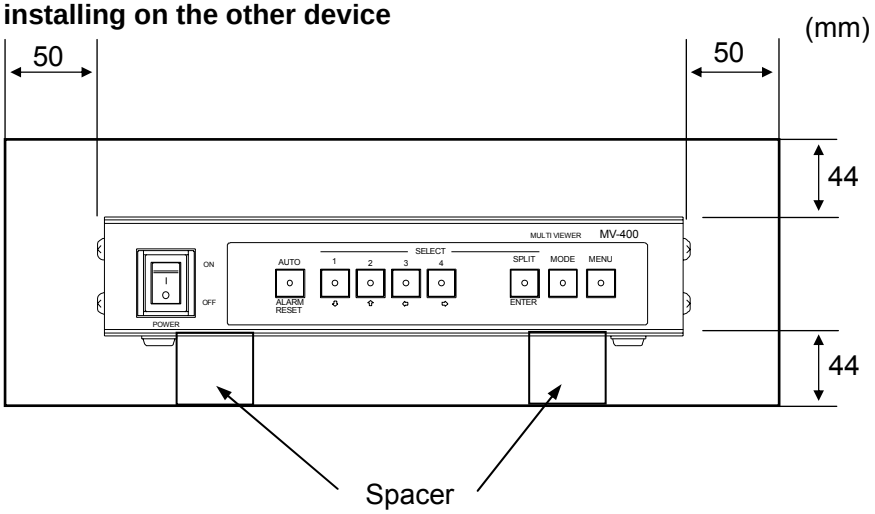
Check

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

Installation Instructions

When installing MV-400, always keep the distance as instructed in figure below from other devices. The sufficient distance can prevent heat accumulation that causes malfunctions.

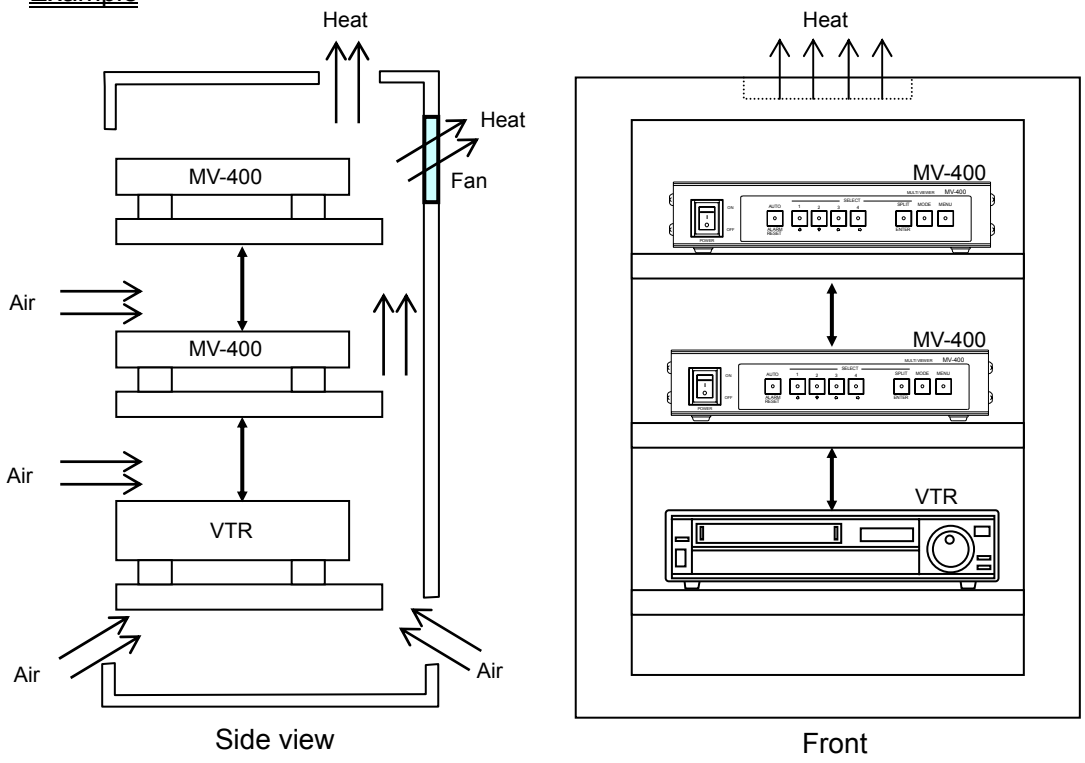
◆ **When installing on the other device**



◆ **When installing in the rack**

1) It is recommended to equip a fan or fans on the rack. Location of the fan should be on the top or back of the rack.
2) Leave distance between each device at least 1 pitch (44mm).
3) It is better to power off the device when it is not in use.

Example



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1. Overview and Features

1-1. Overview

The MV-400 Multi Viewer is a four split-screen multi viewer that accepts video signals from four asynchronous color/black and white video cameras and reformats the images for display on a single screen. Monitor output includes two analog composite video outputs and one analog RGB SXGA output. SXGA output enables Quad screen monitoring at a higher resolution than conventional multi viewers with virtually no size reduction of the video for each camera. If SXGA output is not used, video transfer over a network is possible for easily expanding the existing analog video monitoring system to a remote monitoring system. The authentication by user ID and password is available for high security remote monitoring system. The optional software (MV-40EX) enables simultaneous use of the SXGA output and the video transfer over a network. It also supports the multicast function to display on multiple PC monitors.
If you install the sensor option (MV-40SEN), it enables you to detect motion and display the motion alarm on the analog composite and SXGA high resolution outputs.
In addition to in-store monitoring, the MV-400 supports a wide range of other monitoring applications in banks, hotels, amusement parks, theaters, and production lines.

1-2. Features

- Supports single and mixed usage of aynchronous, color, and B/W signals.
- Easy system expansion using input loopthrough
- Monitor output includes SXGA high-resolution output in addition to analog composite output
- Two analog composite output lines. One line can be selected from full screen, 2-split screen, and quad screen. The other line is fixed at quad screen output
- SXGA output can be selected from full screen, 2-split screen, and quad screen.
- Video transfer function with maximum frame rate of 60 fps (when using the MV-400 Live Viewer software)
  *A frame rate of 60 fps may not be obtained due to the conditions of transferred video signal, JPEG compression ratio, connected PC, or network environment.
- Auto sequencing between four channels is possible in full screen display
- Built-in input/output connector for external alarm. Enables linking of display to alarm system
- Parallel remote connection. Control over a RS-232C interface is supported.
- Supports control over a LAN (100BASE-TX) interface
- Security system by user ID and password is supported.
- Supports display of titles up to 8 characters for each camera (alphanumeric characters, Japanese kana, symbols)
- Optional software (MV-40EX) enables concurrent use of SXGA output and video transfer over a network *Basic function without the option software supports either one of SXGA output or network transfer at a time
- Optional software (MV-40EX) can add image size option 1280 x 960pixels for the network transfer. *Basic network transfer without the optional software is fixed to 640 x 480pixels.
- Optional software (MV-40EX) can offer network mode options of the unicast and the multicast. * Without the optional software, the unicast only.
- Optional software (MV-40SEN) enables motion alarm display (video sensor: detects motion).

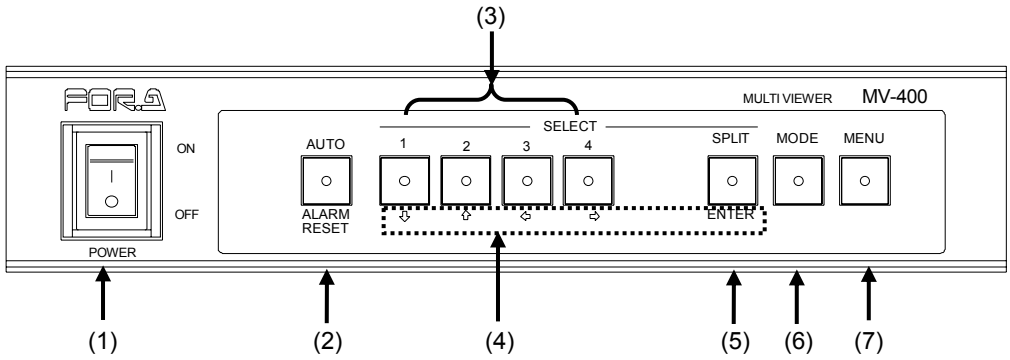
1-3. About This Manual

Be sure to read this operation manual thoroughly to ensure the correct operation of this product. After reading, keep this manual in a safe and easily accessible place for reference. This manual uses the following notation.

- Characters enclosed by □ (such as MATT) indicate buttons on the operation panel.
- Characters enclosed by square brackets (such as [SETUP]) indicate menu commands.
- The motion alarm display is supported by the sensor option. However, there may be descriptions of the motion alarm display in this manual without mentioning the function is optional.

2. Panel Descriptions

2-1. Front Panel



(1) POWER switch
Used to turn unit power ON / OFF.

IMPORTANT
When powered on, the MV-400 attempts to pick the video standard (NTSC or PAL) automatically based on the input signal it receives. If there is not a video input, it selects the format, which was used at the last operation. Using NTSC and PAL at the same time is not supported. Be sure not to use different formats together. It may cause malfunctions.

(2) AUTO/ALARM RESET
AUTO: When this button is pressed and lamp is lit, display auto sequencing function is on.
ALARM RESET: The button flashes when an external alarm signal is received, video loss occurs (when the image is cut), or the motion alarm is activated (when motion is detected: sensor option). Press this button to clear the alarm.

IMPORTANT
External alarms cannot be cleared when LEVEL is chosen for ALARM INPUT. (See section 5-3. "ALARM/VIDEO LOSS (Alarm and Video Loss Settings)".)

(3) SELECT 1-4 (Camera select buttons)
Used to select a camera input for full screen display.

(4) ⇩⇧⇦⇨ ENTER
Used to select menu options.

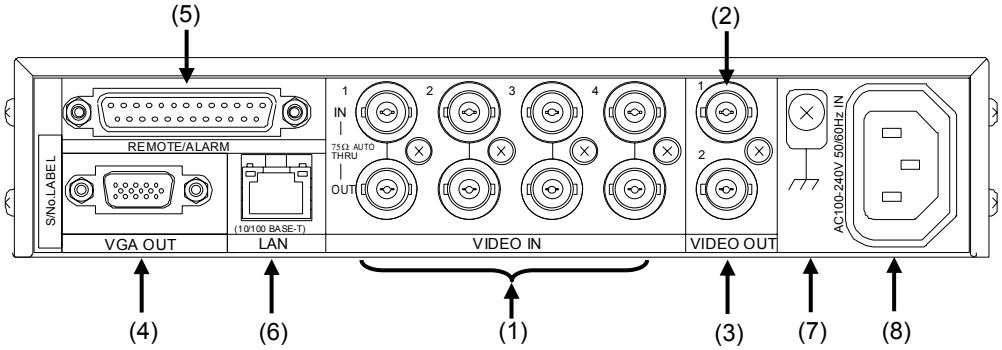
(5) SPLIT (Split Display Button)
Used to display in Split Screen Mode

(6) MODE (Mode Button)
Used to select monitor output for front panel operation.
SXGA Mode (Indicator unlit): Enables operation of SXGA output from VGA OUT connector.
VIDEO Mode (Indicator lit): Enables operation of VIDEO output from VGA OUT 1 connector.

IMPORTANT
Indicator flashes whenever the fan failure occurs.

(7) MENU (Menu button)
Used to start menu mode. In menu mode, this button is also used to return to the previous menu screen or to exit menu mode.
* To display the menu, press and hold the MENU button for about 2 seconds.

2-2. Rear Panel



(1) VIDEO IN1-4

The top connectors are for video signal input. For loopthrough operation, connect other system equipment from the OUT connectors at the bottom. The bottom connectors are auto-terminated. The auto-termination is canceled by connecting cables.

(2) VIDEO OUT1

Used for analog composite monitor output connection. Able to select full or split screen output by front panel operations or by external control.

(3) VIDEO OUT2

Used for analog composite monitor output connection. Always full screen output.

(4) VGA OUT

Used for analog RGB monitor output connection. Connect SXGA (1280 x 1024 pixel 60 Hz) monitor.

IMPORTANT
If the optional software is not installed and the setting is made to select video transfer over network, SXGA output cannot be used. To use SXGA output, select SXGA or SXGA & NETWORK (available with optional software) for FUNCTION at System settings. For details see 5-7. "SYSTEM (System Settings)".

(5) REMOTE/ALARM

Used for the external control connection (remote unit or RS-232C interface), the alarm input connection or the motion alarm output connection.

(6) LAN（10/100BASE-T）

LAN interface used for remote control by computer. This can be also used for video output via LAN interface.

IMPORTANT
If the optional software is not installed and the setting is made to select SXGA output, video transfer over network cannot be performed. In this case, this function is only available for remote control. To enable the video transfer function via PC, set FUNCTION to NETWORK. If the optional software is installed, this function is ready to use regardless of FUNCTION setting. For details see 5-7. "SYSTEM (System Settings)".

(7) GROUNDING TERMINAL

Used to ground unit to protect operators against static electricity and / or electrical shock.

(8) AC IN（AC100-240V 50/60Hz）

Used to supply 100-240 VAC via supplied cable.

(9) FAN (Right side)

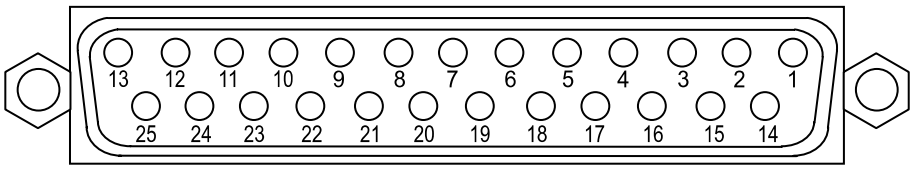
Used to air cool unit to prevent overheating. Do not block the fan intake at the right side of the unit with other equipment or objects.

2-3. Interface

2-3-1. REMOTE/ALARM

2-3-1-1. Connector Pin Assignment

REMOTE/ALARM



Compatible connector (male): DB-25PF-N(JAE)
Cover: DB-C4-J11-S1(JAE)
*Use inch type screws.

Connector pin assignments and functions are shown below;

Pin no.	Function	Pin no.	Function
1	REMOTE AUTO/RST	14	REMOTE VIDEO
2	REMOTE CH1	15	MOTION CH2 OUT
3	REMOTE CH2	16	MOTION CH3 OUT
4	REMOTE CH3	17	MOTION CH4 OUT
5	REMOTE CH4	18	RS-232C RXD
6	N.C.	19	RS-232C TXD
7	REMOTE SPLIT	20	RS-232C DTR
8	MOTION CH1 OUT	21	RS-232C DSR
9	ALARM CH1 IN	22	RS-232C RTS
10	ALARM CH2 IN	23	RS-232C CTS
11	ALARM CH3 IN	24	GND
12	ALARM CH4 IN	25	GND
13	REMOTE SXGA	—	—

IMPORTANT

Do not connect anything to pins described with N.C. Connecting to those pins may cause breakdowns or malfunctions. Connector pins of MOTION CH1 to CH4 OUT are active when the sensor option is installed.

2-3-1-2. REMOTE

◆ **Pin assignments and functions**

<Pin assignment>

Refer to section 2-3-1-1. "Connector Pin Assignment".

<Functions>

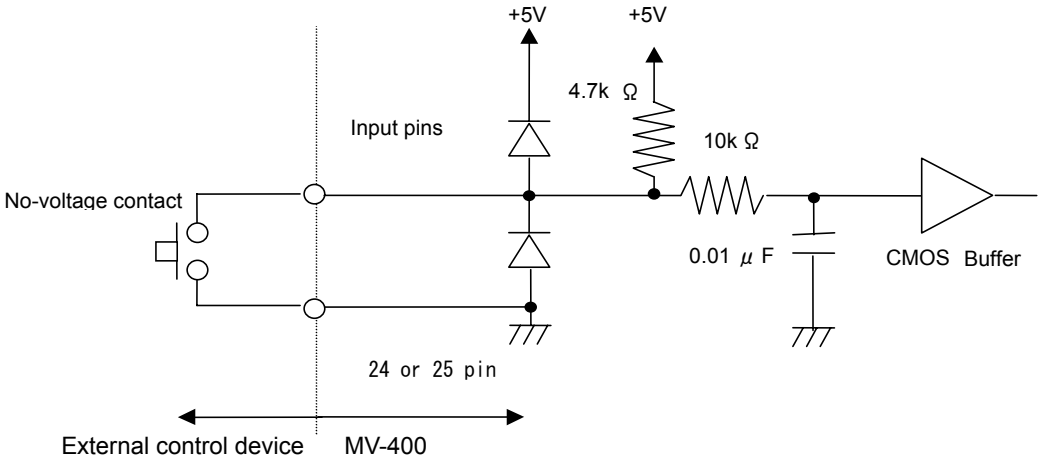
REMOTE Interface

Function	Description	Reference
REMOTE AUTO/RST	Same with AUTO/ALARM RESET button on front panel	4-3-3."Full Screen Auto Sequencing" 4-4-4."Full Screen Auto Sequencing" 4-5-3. "Motion Alarm System"
REMOTE CH1	Same with SELECT1 button on front panel	4-3-2. "Displaying Full Screen" 4-4-2. "Displaying Full Screen"
REMOTE CH2	Same with SELECT2 button on front panel	
REMOTE CH3	Same with SELECT3 button on front panel	
REMOTE CH4	Same with SELECT4 button on front panel	
REMOTE SPLIT	Same with SPLIT button on front panel	4-3-4. "Displaying Split Screens" 4-4-4. "Displaying Split Screens"
REMOTE SXGA	Selects SXGA output operation mode	4-3-1. "Selecting the SXGA Mode"
REMOTE VIDEO	Selects VIDEO output operation mode	4-4. "Video Output Control"
MOTION CH1 OUT	Outputs low level signal when motion is detected in CH1.	5-8. "Motion Detector (Motion Detection Settings)"
MOTION CH2 OUT	Outputs low level signal when motion is detected in CH2.	
MOTION CH3 OUT	Outputs low level signal when motion is detected in CH3.	
MOTION CH4 OUT	Outputs low level signal when motion is detected in CH4.	

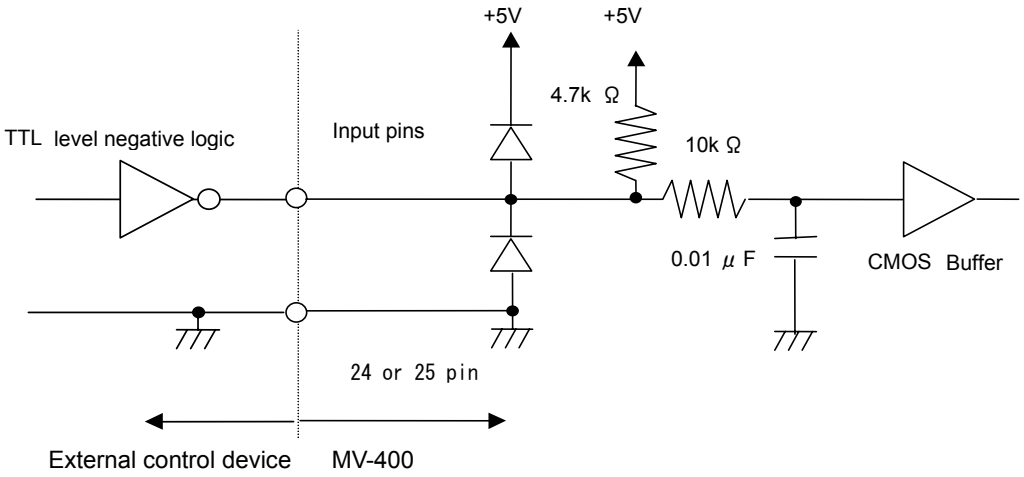
Circuit Example

*The input signal pulse width should be 100ms or more. Also the input signal interval should be 100ms or more.

1)



2)



2-3-1-3. ALARM

◆ Pin assignments and functions

<Pin assignments>

Refer to section 2-3-1-1. "Connector Pin Assignment".

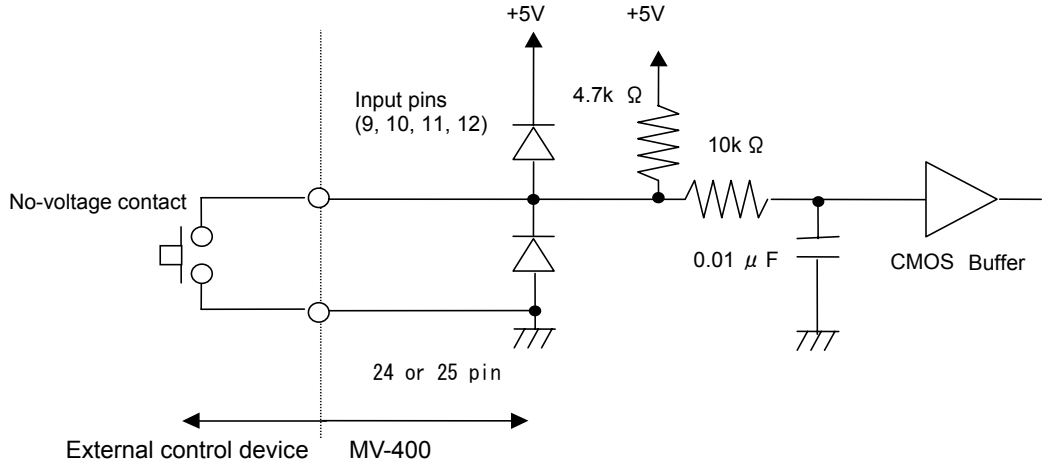
<Functions>

Refer to section 4-5. "Alarm Screen Display".

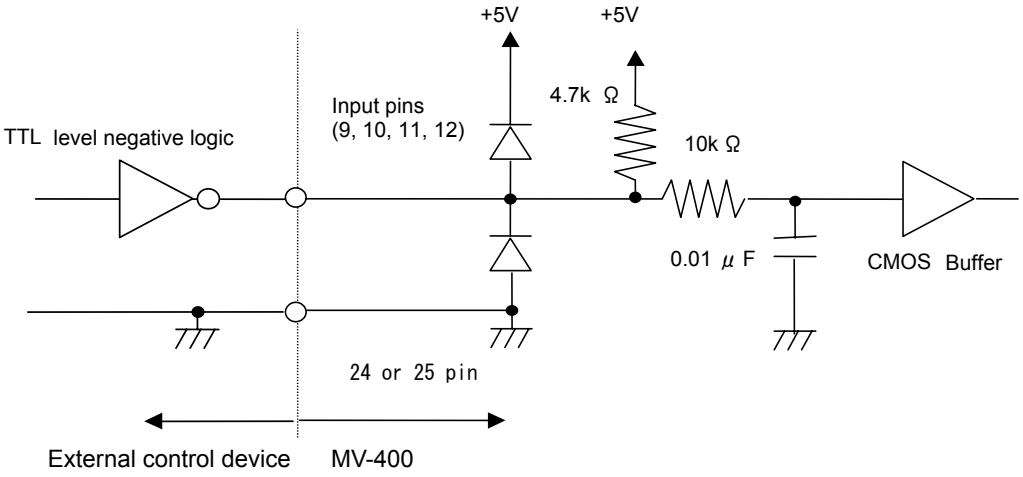
◆ Alarm input circuit example

*The input signal pulse width should be 100ms or more. (For the trigger signal)

1)



2)



2-3-1-4. Motion Alarm Output

◆ **Pin assignments and functions**

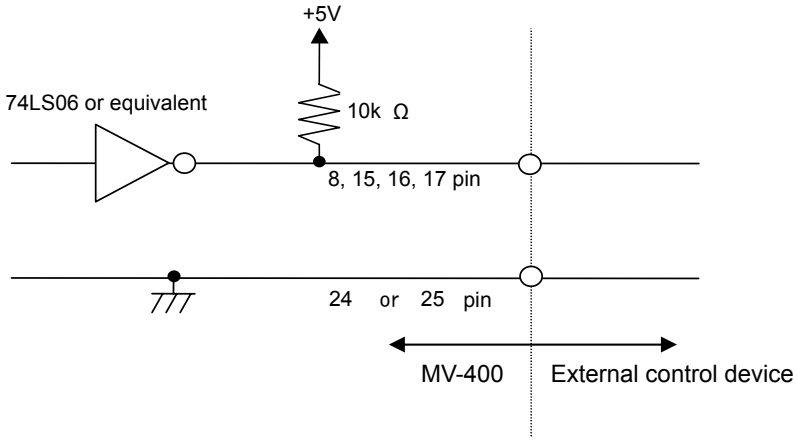
<Pin assignments>

Refer to section 2-3-1-1. "Connector Pin Assignment".

<Functions>

The pin corresponding to each channel outputs +5V TTL level alarm signal.
When the motion alarm is activated, it outputs low level signal.

◆ **Alarm output circuit**



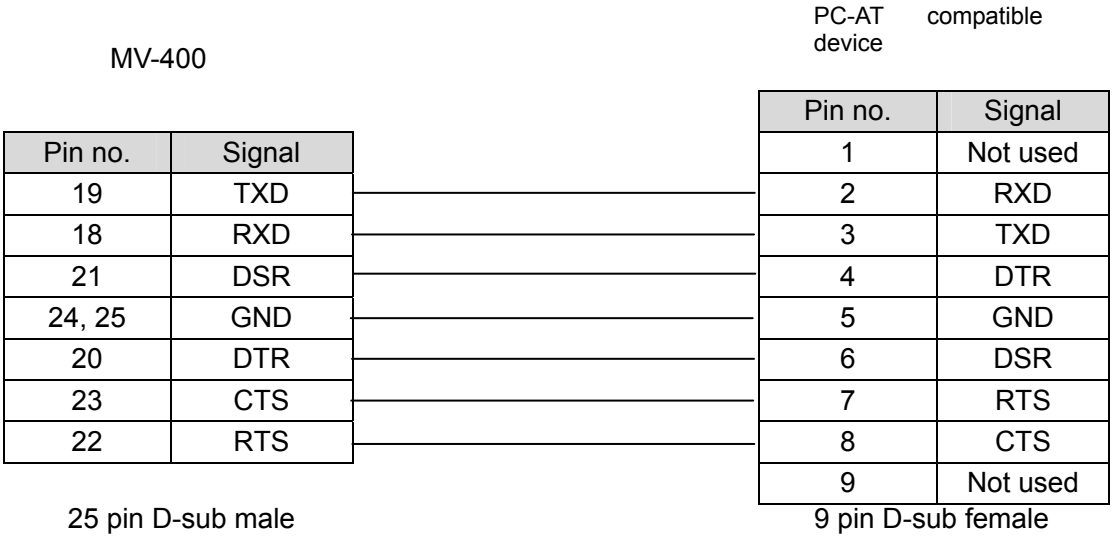
2-3-1-5. RS-232C

Command formats for RS-232C interface and LAN interface are the same. See appendix "RS-232C/LAN command" for the protocol.

◆ **RS-232C Connector**

RS-232C signals are assigned on REMOTE/ALARM connector pins. Pin assignments are shown in section 2-3-1-1. "Connector Pin Assignment".

◆ **Cable Connection Example**



IMPORTANT
DSR/DTR and RTS/CTS are looped back internally.

◆ **Signal Format**

<Communication parameters>

Transmission mode	Asynchronous, Full-duplex
Baud rate	9600bps
Data length	8bit
Stop bit	1bit
Parity	None

2-3-2. LAN

Command formats for RS-232C interface and LAN interface are the same. See appendix "RS-232C/LAN command" for the protocol.

◆ **LAN Connector**

<LAN connector pin assignments>＞

Pin no.	Signal	Signal details
1	TXD＋	Signal transmission line +
2	TXD－	Signal transmission line -
3	RXD＋	Signal reception line +
4	－	Not assigned
5	－	Not assigned
6	RXD－	Signal reception -
7	－	Not assigned
8	－	Not assigned

◆ **Ethernet Protocol**

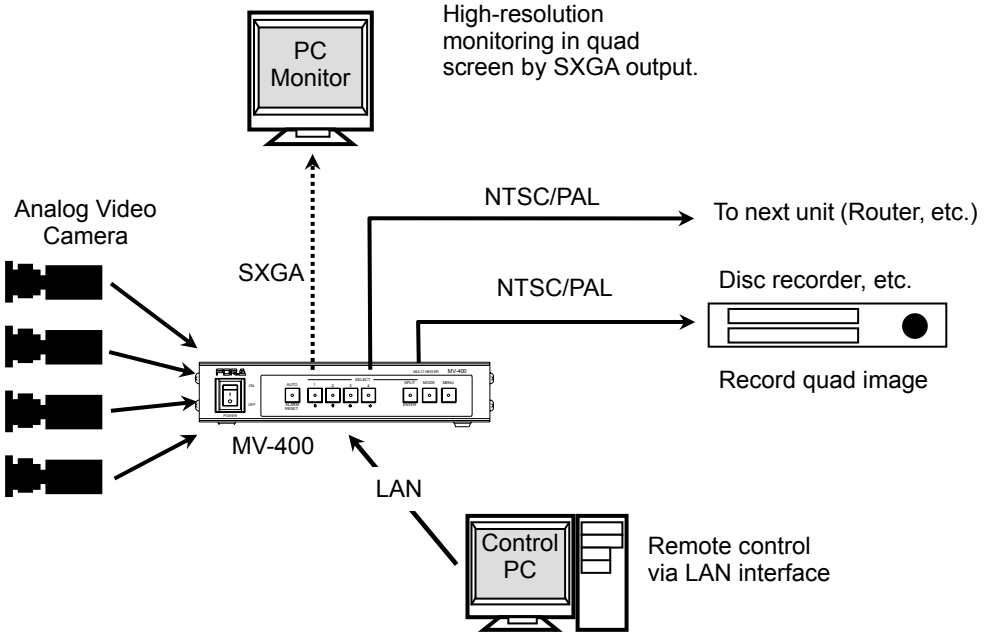
<Ethernet parameters>

Bit rate	10Mbps/100Mbps, half-duplex, auto switching
Access method	CSMA/CD (IEEE802.3 compliance)
Communication standard	10BASE-T/100BASE-TX
Connector	RJ-45, category 5
Cable	Category 5 cable, twisted pair cable (UTP or STP)

IMPORTANT
It takes a few minutes or more to restore the connection, if the connection is abruptly closed for some reason. In such a case, wait for a while or restart the main system before reconnecting.

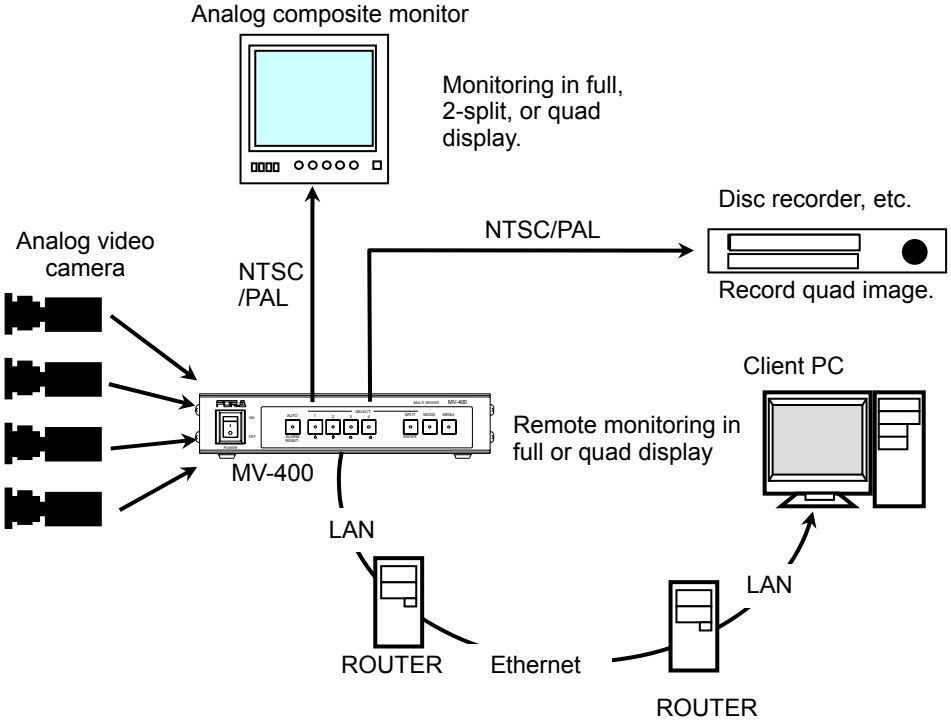
3. Connection

3-1. Connection for SXGA Output



IMPORTANT
To connect a PC and MV-400 directly, use a crossover LAN cable. If you are connecting a hub or such device in between PC and MV-400, use a straight LAN cable.

3-2. Connection for Video Transmission

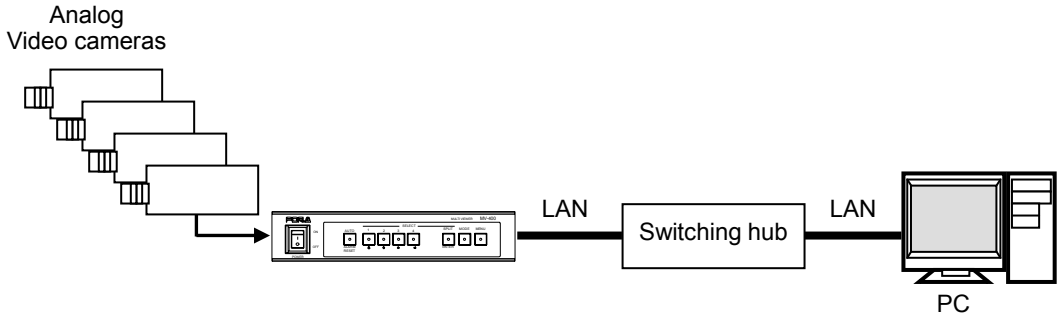


3-2-1. Network Options

There are two network modes for video transmission. The UNICAST mode and the MULTICAST mode. The MULTICAST mode is available with the optional software.
See section 5-7. “SYSTEM (System Settings)" for the setting procedures.

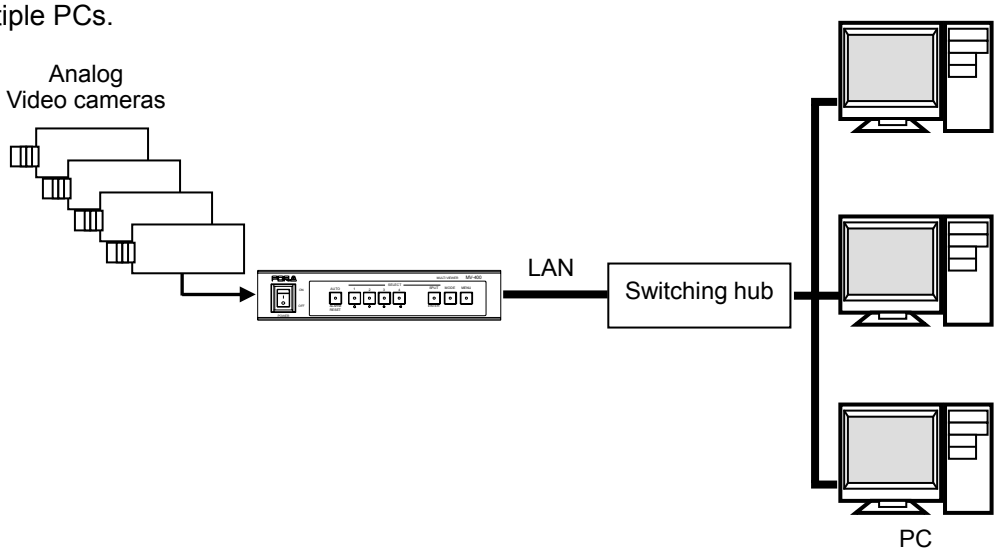
3-2-1-1. UNICAST Mode

The UNICAST mode uses TCP/IP protocol and the video output can be displayed on one PC by using MV-400 Live Viewer.



3-2-1-2. MULTICAST Mode

The MULTICAST mode uses the IP multicast and that enables you to output video to multiple PCs.



IMPORTANT
The MV-400 Live Viewer cannot control video output in the MULTICAST mode. To control the output video, use the VIEWER screen of Internet Explorer. This network uses the UDP protocol. Due to the UDP protocol, the image refreshment may get disturbed at the packet loss which occurs under the unstable network condition.

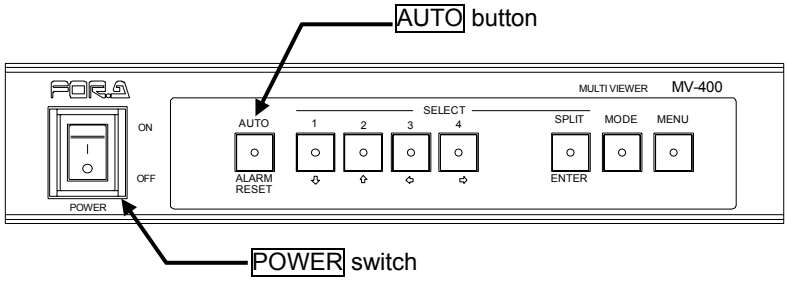
4. Operating Procedures

4-1. 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 or alarm screen was displayed when the unit was turned off, operation resumes from the status before the respective screen.

4-2. Data Initialization

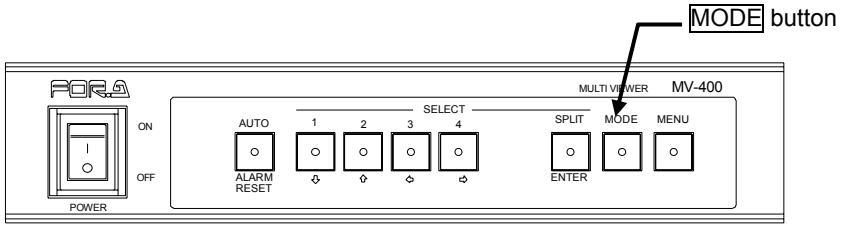
Although initialization is normally not required, you can restore the MV-400 factory settings using the data initialization operation when the previous data is no longer needed such as after relocation or system modification. Turn on the power while holding down the AUTO button to initialize the data settings.



4-3. SXGA Output Control

4-3-1. Selecting the SXGA Mode

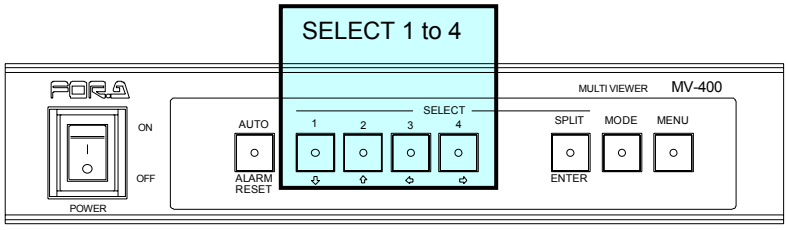
To use the SXGA output screen that is output from the VGA OUT connector, the unit must be set to SXGA mode (MODE button is not lit). If the MODE button is lit, press the MODE button to turn it off.



IMPORTANT
If the optional software is not installed and the setting is made to select video transfer over network, SXGA output cannot be used. To use SXGA output, select SXGA or SXGA & NETWORK (available with optional software) for FUNCTION at System settings. For details see "5-7. SYSTEM (System Settings)".

4-3-2. Displaying Full Screen

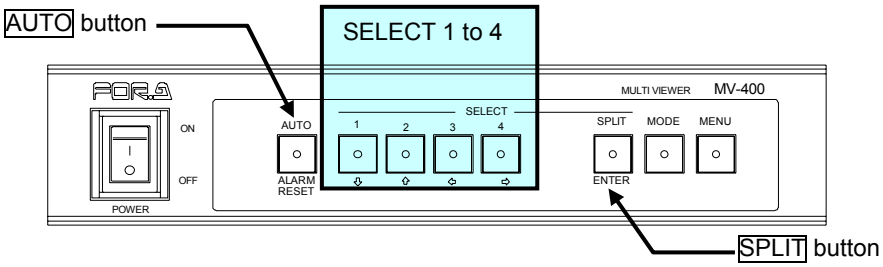
To display your desired channel as a full screen video, use the SELECT 1 to 4 buttons. For instance, to view channel 3, press the SELECT 3 button to display the video in full screen.



IMPORTANT
A black screen is shown for channels with no input signals.

4-3-3. Full Screen Auto Sequencing

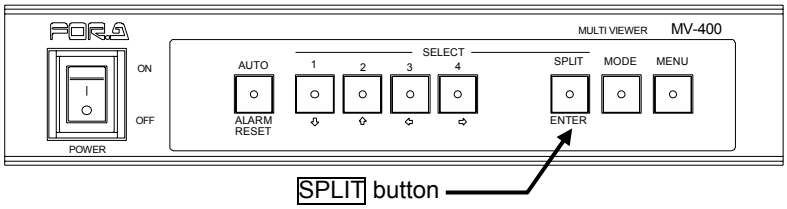
Pressing the AUTO button during full screen display activates automatic video sequencing. Channels with no input signals are automatically skipped, and the next channel is displayed. Auto sequencing is deactivated by pressing the SELECT 1 to 4 buttons or the SPLIT button.



IMPORTANT
Auto sequencing is not possible when a split-screen is being displayed. The Auto Sequence interval settings are made in AUTO SEQUENCE page. For details, see section 5-2. “TIME SETUP (Time Settings)”.

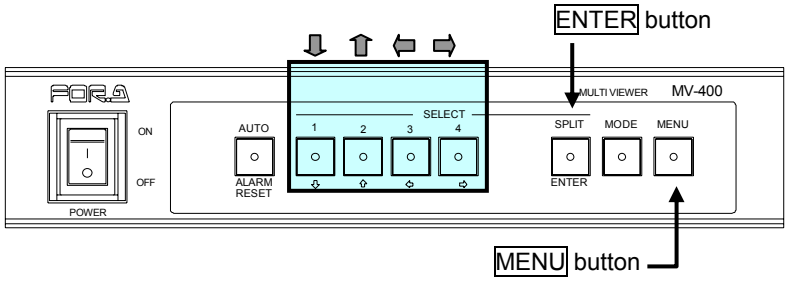
4-3-4. Displaying Split Screens

To display split screens (quad screen or 2-split screen), press the SPLIT button so that it lights up.



4-3-5. Selecting Split Screens

In the MV-400, the available split screen displays are quad and 2-split screens. The selection procedure is shown below.



(1) Press and hold the MENU button for at least two seconds to display the main menu.

Use the ⇩ ⇧ buttons to move the cursor to [DISPLAY], and then press the ENTER button.

(2) Check that there is a cursor at [DISPLAY TYPE] in the SXGA output settings (top section), and then use the ⇦ ⇨ buttons to select the setting value from the options below.

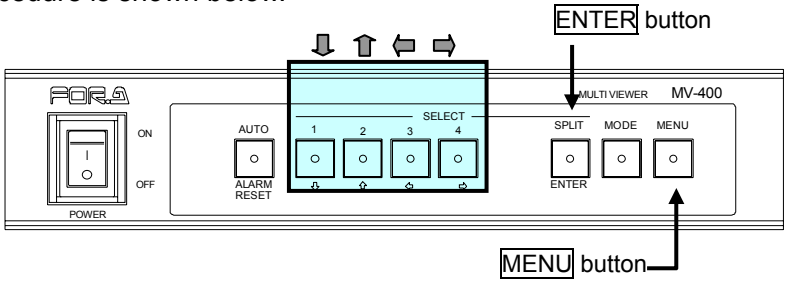
・quad screen: [QUAD]
・2-split screen (left and right split): [V2]

(3) Press the MENU button twice to exit the menu.

NOTE
For details on menu operations, see section 5. “Menu Operations”. For details on split-screen settings, see section 5-5. “DISPLAY (Screen Display Settings)”.

4-3-6. Channel Assignment for 2-split Screen

In the MV-400, you can set the channels for displaying 2-split screen.
The procedure is shown below.



(1) Press and hold the MENU button for at least two seconds to display the main menu.

(2) Use the ⇩ ⇧ buttons to move the cursor to [DISPLAY], and then press the ENTER button.

(3) Check that there is a cursor at [DISPLAY TYPE], and then press the ENTER button. The [CHANNEL ASSIGN (SXGA)] screen is displayed.
*Check that [DISPLAY TYPE] is set to [V2].

(4) The channel assignment for the screen whose camera title is flashing can be changed using the ⇦ ⇨ buttons.

(5) Press the ENTER button, then the camera title of the next screen starts to flash.

(6) Once the settings for all channels are made, press the MENU button to return to the [DISPLAY] screen.

(7) Press the MENU button twice to exit the menu.

IMPORTANT
One channel cannot be set to multiple sub-screens on a single split screen display.

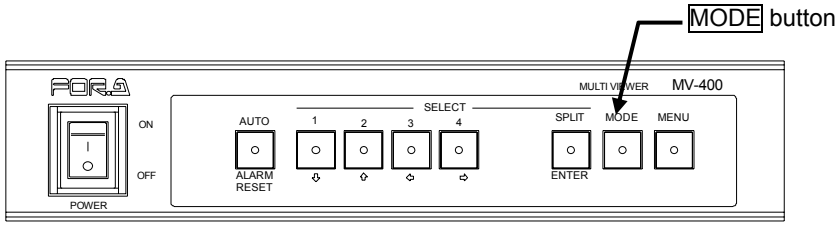
NOTE
For details on menu operations, see section 5. “Menu Operations”. For details on channel settings, see section 5-5-1. “ CHANNEL ASSIGN (Display Channel Settings)”.

IMPORTANT
The menu screen displayed on VGA OUT is slightly cropped compared to the menu screen displayed on VIDEO OUT 1, but this is not a malfunction.

4-4. Video Output Control

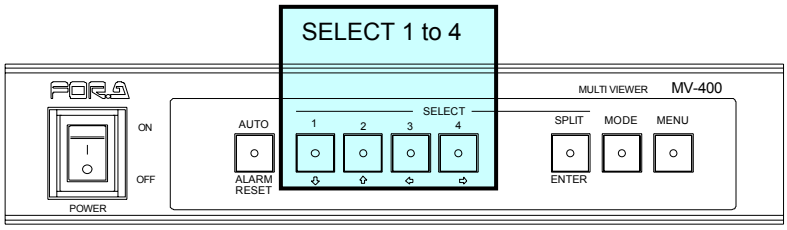
4-4-1. Selecting the Video Mode

To use the VIDEO output screen that is output from the VIDEO OUT1 connector, the unit must be set to VIDEO mode (MODE button is lit).If the MODE button is not lit, press the button to turn it on.



4-4-2. Displaying Full Screen

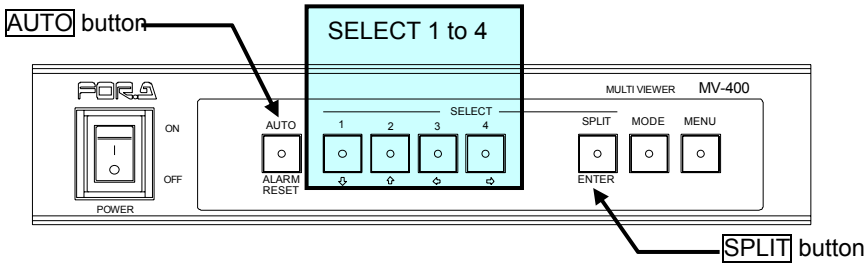
To display your desired channel as a full screen, use the SELECT 1 - 4 buttons. For instance, to view channel 3, press the SELECT 3 button to display the video in full screen.



IMPORTANT
A black screen is shown for channels with no input signals.

4-4-3. Full Screen Auto Sequencing

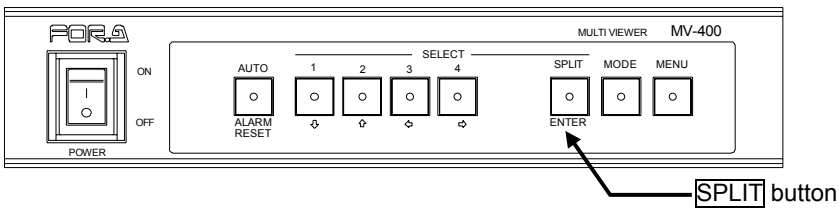
Pressing the AUTO button during full screen display activates automatic video sequencing. Channels with no input signals are automatically skipped, and the next channel is displayed. Auto sequencing is deactivated by pressing the SELECT 1 to 4 buttons or the SPLIT button.



IMPORTANT
Auto sequencing is not possible when a split-screen is being displayed. The Auto Sequence interval settings are made in AUTO SEQUENCE page. For details, see section 5-2. “TIME SETUP (Time Settings)”.

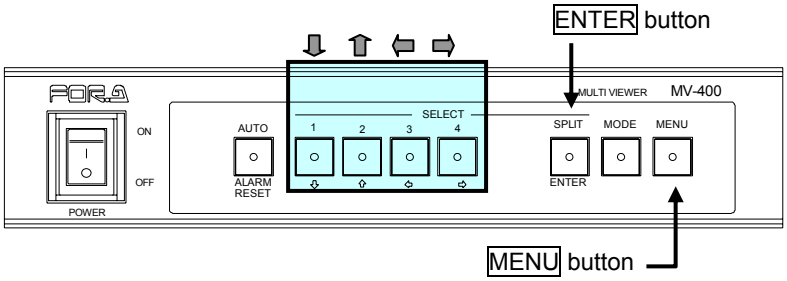
4-4-4. Displaying Split Screens

To display split screens (quad screen or 2-split screen), press the SPLIT button so that it lights up.



4-4-5. Selecting Split Screens

In the MV-400, the available split screen displays are quad and 2-split (V2, H2) screens. The selection procedure is shown below.



(1) Press and hold the MENU button for at least two seconds to display the main menu.

(2) Use the ⇩ ⇧ buttons to move the cursor to [DISPLAY], and then press the ENTER button.

(3) Check that there is a cursor at [DISPLAY TYPE] in the Video output settings (bottom section), and then use the ⇦ ⇨ buttons to select the setting value from the options below.

- Quad screen: [QUAD]
- Vertical 2-split screen: [V2-1] (left and right split)
- Horizontal 2-split screen: [H2-1] (Top and bottom split)
- Reduced vertical 2-split screen: [V2-2]
- Reduced horizontal 2-split screen: [H2-2]

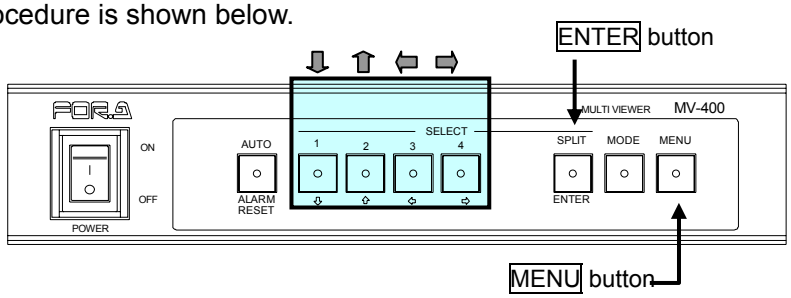
(4) Press the MENU button twice to exit the menu.

NOTE
For details on menu operations, see section “5. Menu Operations”. For details on split-screen settings, see section 5-5. “DISPLAY (Screen Display Settings)”.

IMPORTANT
In either Reduced vertical 2-split screen or Reduced horizontal 2-split screen, display images are down scaled vertically or horizontally due to display in the half size screen in each way. Therefore the images are displayed in different aspect ratio from the original input images.

4-4-6. Channel Assignment for 2-split Screen

In the MV-400, you can set the channels for displaying 2-split screen.
The procedure is shown below.



(1) Press and hold the MENU button for at least two seconds to display the main menu.

(2) Use the ⇩ ⇧ buttons to move the cursor to [DISPLAY], and then press the ENTER button.

(3) Check that there is a cursor at [DISPLAY TYPE] of the VIDEO section (bottom section), and then press the ENTER button. The [CHANNEL ASSIGN (VIDEO)] screen is displayed.
*Check that [DISPLAY TYPE] is set to any of V2-1, H2-1, V2-2 or H2-2.

(4) The channel assignment for the screen whose camera title is flashing can be changed using the ⇦ ⇨ buttons.

(5) Press the ENTER button, then the camera title of the next screen starts to flash.

(6) Once the settings for all channels are made, press the MENU button to return to the [DISPLAY] screen.

(7) Press the MENU button twice to exit the menu.

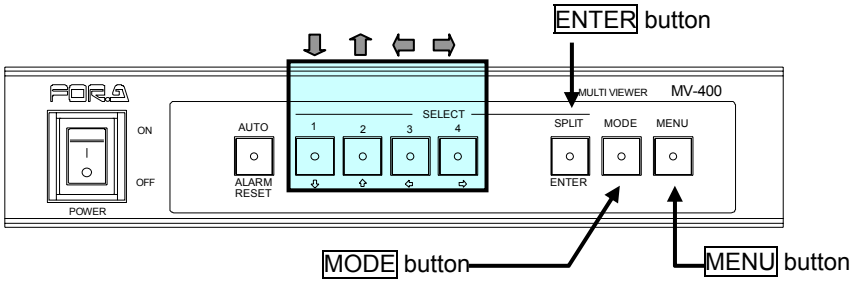
IMPORTANT
One channel cannot be set to multiple sub-screens on a single split screen display.

NOTE
For details on menu operations, see section 5. “Menu Operations”. For details on channel settings, see section 5-5-1. “ CHANNEL ASSIGN (Display Channel Settings)”.

IMPORTANT
The menu screen displayed on VGA OUT is slightly cropped compared to the menu screen displayed on VIDEO OUT 1, but this is not a malfunction.

4-4-7. Setting View Area in 2-split Screen

In MV-400, you can change the viewing area of camera display in 2-split screen in original scale. The procedure is shown below.



(1) Press and hold the MENU button for at least two seconds to display the main menu.

(2) Use the ⇩ ⇧ buttons to move the cursor to [DISPLAY], and then press the ENTER button.

(3) Check that there is a cursor at [DISPLAY TYPE] of the VIDEO section (bottom section), and then press the ENTER button. The [CHANNEL ASSIGN (VIDEO)] screen is displayed.
*Check that [DISPLAY TYPE] is set to any of V2-1, H2-1, V2-2 or H2-2.

(4) Press the MODE button. [DISPLAY SET (VIDEO)] screen is displayed.

(5) The camera title of the screen for adjustment is flashing. Use ⇩ ⇧ ⇦ ⇨ buttons to move the view area.
*Up/down arrows ⇩ ⇧ are for H2-1 screen for horizontal movement, and right/left arrows ⇦ ⇨ for V2-1 screen for vertical movement.

(6) Press the ENTER button, then the camera title of the next screen starts to flash.

(7) Once the settings for all channels are made, press the MENU button to return to the [DISPLAY] screen.

(8) Press the MENU button twice to exit the menu.

NOTE
For details on menu operations, see section 5. "Menu Operations”. For details on channel settings, see section 5-5-2. "DISPLAY SET (1/2 screen View Area Settings)".

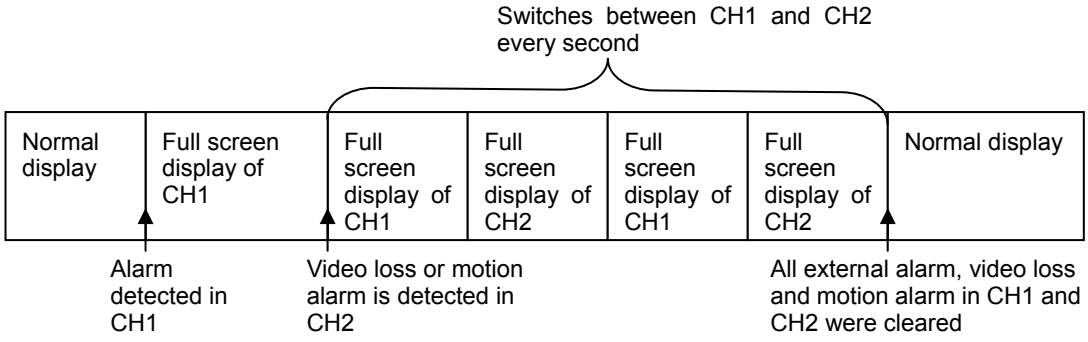
IMPORTANT
The menu screen displayed on VGA OUT is slightly cropped compared to the menu screen displayed on VIDEO OUT 1, but this is not a malfunction. Check the view area on VIDEO OUT 1 menu screen.

4-5. Alarm Screen Display

When an external alarm, a video loss or motion (motion alarm: sensor option) is detected, the unit can be automatically switched to the following two alarm screens (alarm display mode). The settings for alarm display mode are made in the menu screen. For details on setting, see section 5-3. “ALARM/VIDEO LOSS (Alarm and Video Loss Settings)”.

4-5-1. Full Screen Setting

In this setting, when an external alarm, a video loss or motion (motion alarm: sensor option) is detected, the detected channel is displayed in full screen mode. If more than one channel is detected, the display switches between all detected channels at one-second intervals. Regular display operation is restored after all external alarms, video loss signals and motion alarms are cleared.



IMPORTANT

If ALARM is set to OFF in the menu settings, no alarm screen is shown when an alarm is detected. For details, see section 5-3. “ALARM/VIDEO LOSS (Alarm and Video Loss Settings)”.

If LOSS is set to OFF in the menu settings, no alarm screen is shown when a video loss is detected. For details, see section 5-3. “ALARM/VIDEO LOSS (Alarm and Video Loss Settings)”.

If SENSOR is set to OFF in the menu settings, no alarm screen is shown when motion is detected. For details, see section 5-8. “Motion Detector (Motion Detection Settings)".

If an alarm is input during display of the menu screen, the alarm input is not detected. If there is still an alarm input when returning to regular operation after exiting the menu screen, the alarm input is detected.

Video loss or motion detection is not performed while displaying the menu screen. If the input video is not restored or the motion exists when returning to regular operation after exiting the menu screen, the video loss and the motion is detected.

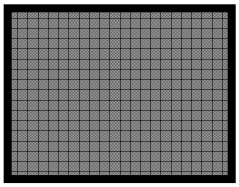
If the input video is not synchronized, the video may be distorted when switching.

◆ **SXGA Output Screen**

This displays the tally frame in the alarm input channel and the motion detected channel.
The video loss channel becomes a black screen, and the tally frame is displayed.

Alarm/Motion alarm channel display

Video loss channel display



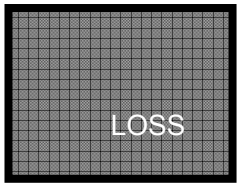
IMPORTANT
If TALLY is set to OFF in the menu settings, no tally frame is displayed. For details, see section 5-5. “DISPLAY (Screen Display Settings)”.

◆ **VIDEO Output Screen**

The “ALARM” text flashes in the alarm input channel.
The video loss channel becomes a black screen, and the “LOSS” text flashes.
The "MOTION" text flashes in the motion detected channel.

Alarm channel display

Video loss channel display

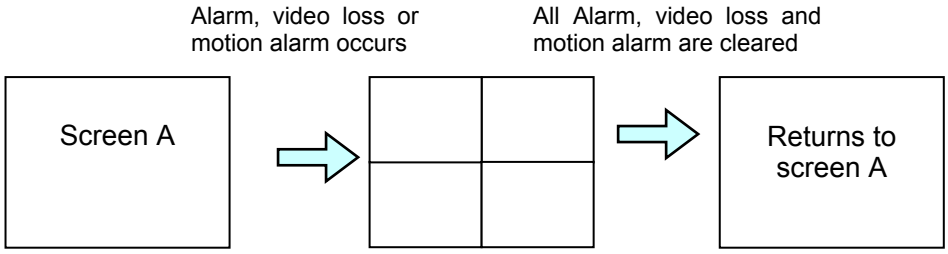


Motion alarm channel display

IMPORTANT
If MARK is set to OFF in the menu settings, the “ALARM”, “LOSS” and "MOTION" texts are not displayed. For details, see section 5-5. “DISPLAY (Screen Display Settings)”.

4-5-2. Split Screen Setting

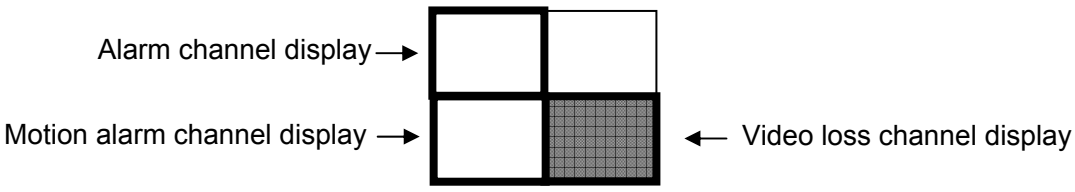
In this setting, when an external alarm, video loss or motion (motion alarm: sensor option) is detected, all channels are displayed in quad screen mode. Regular display operation is restored after all external alarms, video loss signals and motion alarms are cleared.



IMPORTANT
If ALARM is set to OFF in the menu settings, no alarm screen is shown when an alarm is detected. For details, see section 5-3. “ALARM/VIDEO LOSS (Alarm and Video Loss Settings)”.
If LOSS is set to OFF in the menu settings, no alarm screen is shown when a video loss is detected. For details, see section 5-3. “ALARM/VIDEO LOSS (Alarm and Video Loss Settings)”.
If SENSOR is set to OFF in the menu settings, no alarm screen is shown when motion is detected. For details, see section 5-8. “Motion Detector (Motion Detection Settings)".
If an alarm is input during display of the menu screen, the alarm input is not detected. If there is still an alarm input when returning to regular operation after exiting the menu screen, the alarm input is detected.
Video loss or motion detection is not performed while displaying the menu screen. If the input video is not restored or the motion exists when returning to regular operation after exiting the menu screen, the video loss and the motion is detected.

◆ **SXGA Output Screen**

This displays the tally frame in the alarm input channel and the motion detected channel. The video loss channel becomes a black screen, and the tally frame is displayed.



IMPORTANT
If TALLY is set to OFF in the menu settings, no tally frame is displayed. For details, see section 5-5. “DISPLAY (Screen Display Settings)”.

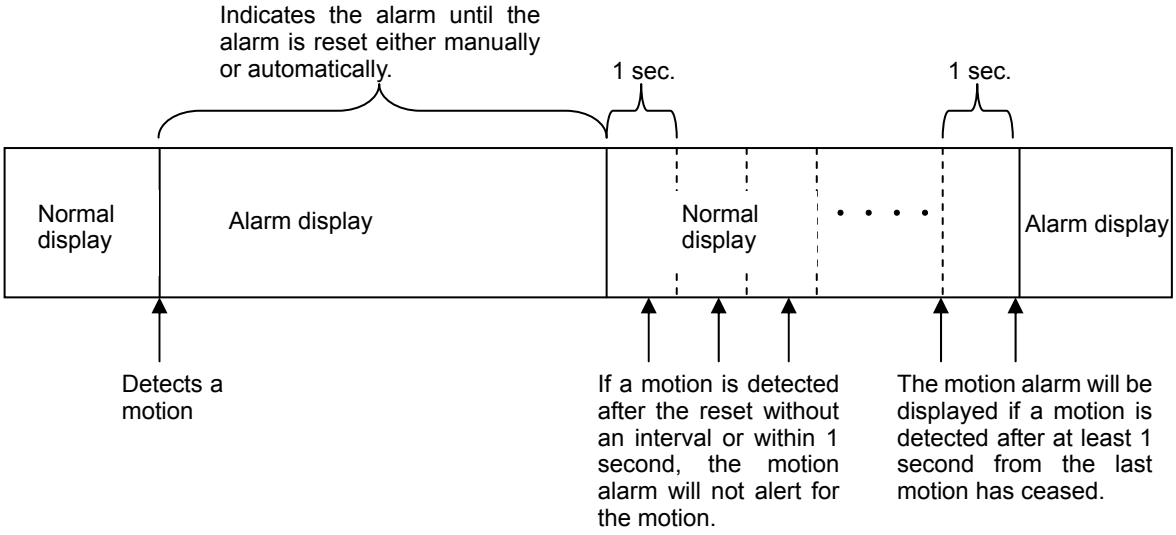
◆ **VIDEO Output Screen**

The “ALARM” text flashes in the alarm input channel.
The video loss channel becomes a black screen, and the “LOSS” text flashes.
The "MOTION" text flashes in the motion detected channel.

IMPORTANT
If MARK is set to OFF in the menu settings, the “ALARM”, “LOSS” and "MOTION" texts are not displayed. For details, see section 5-5. “DISPLAY (Screen Display Settings)”.

4-5-3. Motion Alarm System

When a motion is detected, the motion alarm will display either “MOTION” for the Video output or a tally frame for the SXGA output. Once the alarm is triggered it can be cleared either manually or automatically (1 to 60 second auto-reset). In either case, upon reset, if the scene is static, motion alarm will remain inactive for 1 second, lapse after which normal operation will resume. (if there is motion at the time of the reset, motion detection will not be active until a second after all motion stops.)



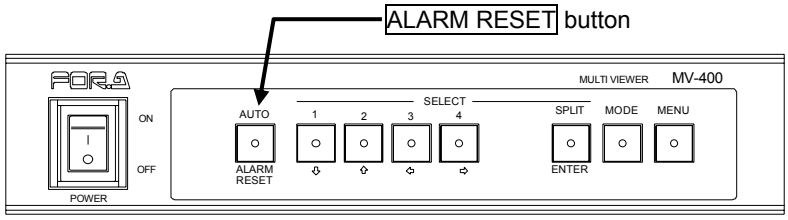
4-5-4. Alarm, Video Loss and Motion Alarm Reset

◆ **Reset of Alarm Operation**

You can perform a reset of alarm operation using the ALARM RESET button when the alarm input mode is set to [TRIG] (see section 5-3. “ALARM/VIDEO LOSS (Alarm and Video Loss Settings)”.) However, the reset cannot be applied when the alarm input mode is set to [LEVEL].

◆ **Reset of Video Loss and Motion Alarm Operations**

You can always perform a reset of video loss and motion alarm operations using the ALARM RESET button.



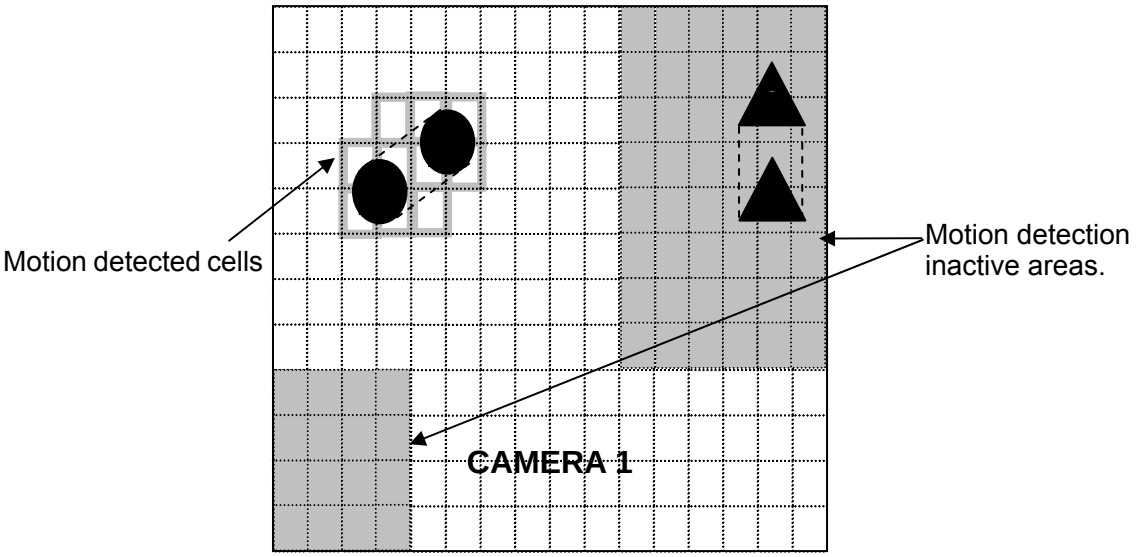
IMPORTANT
The reset for the alarm, video loss and motion alarm resets all alarm operation, video loss operation and motion alarm operation regardless of whether it is in the SXGA or VIDEO output mode.

4-6. Motion Alarm (Sensor Option)

The motion alarm is triggered when it detects certain amount of luminance difference in the specified motion detection area by scanning the area constantly with the specified interval.

4-6-1. Motion Detection Display in Full Screen (Video Output)

The video output from the VIDEO OUT 1 connector can display the image with highlighted area (cells) where the motion is detected. To display the image in full screen, select the channel and set SUPER on in the MOTION DITECTOR menu screen. Then press the camera select button of the channel. The screen as shown below is displayed.



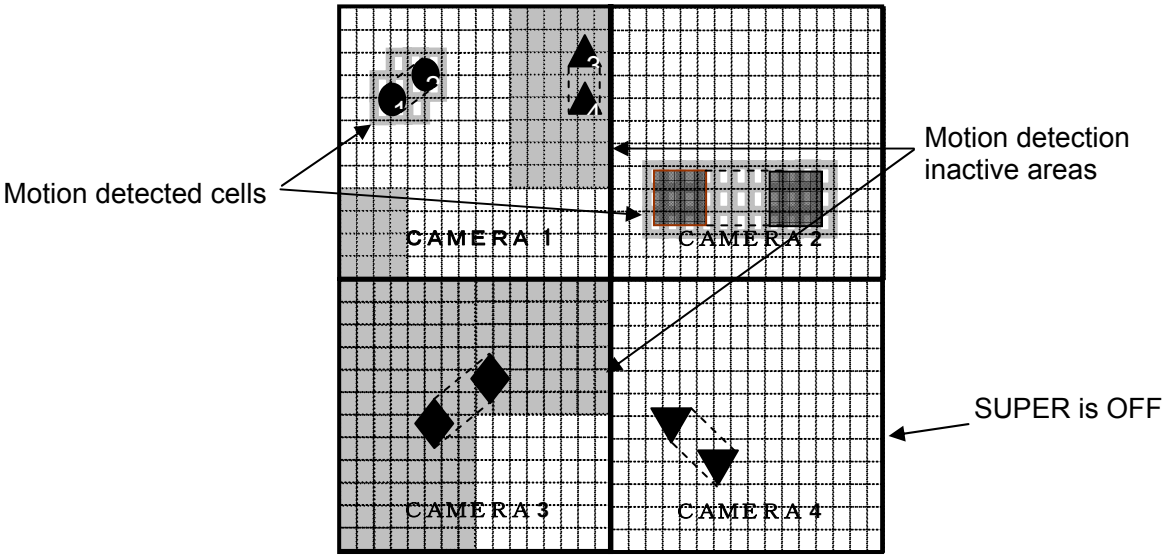
<Full screen display>

- If a movement of an object (● in the above figure) is detected in the motion detection area, the frames of the cells in which the movement is detected are highlighted in white (75% luminance).
- Any movement (▲ in the above figure) which occurs in the motion detection inactive area is not subjected to the motion detection.
- If SUPER is set to off in the menu, the motion detection display is not supplied.

IMPORTANT
The motion detection inactive areas are also displayed in the motion detection display screen. For the details on menu settings, see section 5-8. “Motion Detector (Motion Detection Settings)".

4-6-2. Motion Detection Display in Quad Screen (Video Output)

To display the motion detected image in quad screen, select the channel and set SUPER on in the MOTION DITECTOR menu screen. Then press the split display button. The screen as shown below is displayed.



<Quad Screen>

- If movements of objects (● and ■in the above figure) are detected in the motion detection area, the frames of the cells in which the movements are detected are highlighted in white (75% luminance).
- Any movements (▲ and ♦ in the above figure) that occur in the motion detection inactive area are not subjected to the motion detection.
- If SUPER is set to off in the menu, the motion detection display is not supplied.

IMPORTANT
The motion detection inactive areas are also displayed in the motion detection display screen. For the details on menu settings, see section 5-8. “Motion Detector (Motion Detection Settings)".

4-6-3. 2-Split Screen (Video Output)

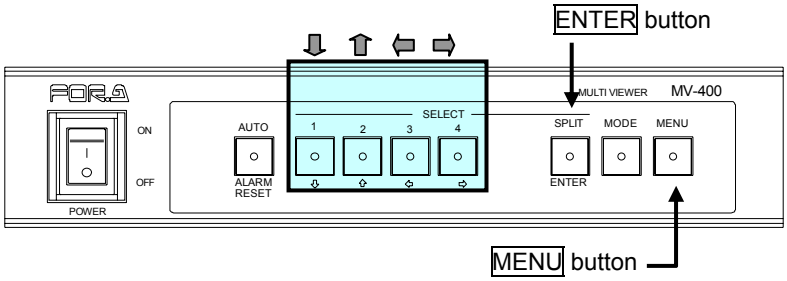
The motion detection display is not available in 2-split screen.
To observe the motion detection, open full screen or quad screen.

4-6-4. SXGA Output

The motion detection display is not available in SXGA output.
To observe the motion detection, open full screen or quad screen in VIDEO output.

4-7. Automatic Recovery to Split-screen

The FULL DISPLAY setting in the menu screen enables the unit to automatically switch from full screen display mode to split-screen mode (either quad screen or 2-split screen) after a preset time. The procedure is shown below.



(1) Press and hold the MENU button for at least two seconds to display the main menu.

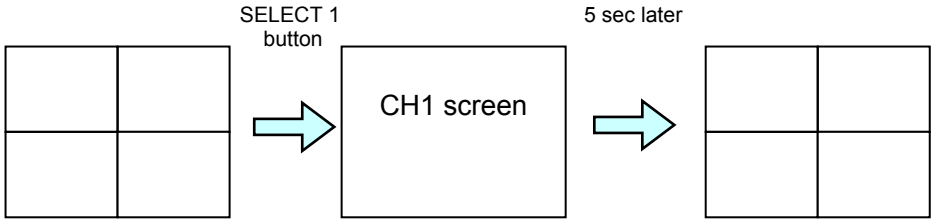
(2) Check that there is a cursor at [TIME SETUP] , and then press the ENTER button.

(3) Use the ⇩ ⇧ buttons to move the cursor to [FULL DISPLAY].

(4) The ⇦ ⇨ buttons can be used to change the setting value (OFF, 1 to 60 seconds).
*When set to [OFF], the split-screen recovery operation cannot be performed.

(5) After the settings are completed, press the MENU button twice to exit the menu.

◆ **Operation Example: When FULL DISPLAY is set to [05S]**



IMPORTANT
The FULL DISPLAY setting applies to both SXGA output and video output.

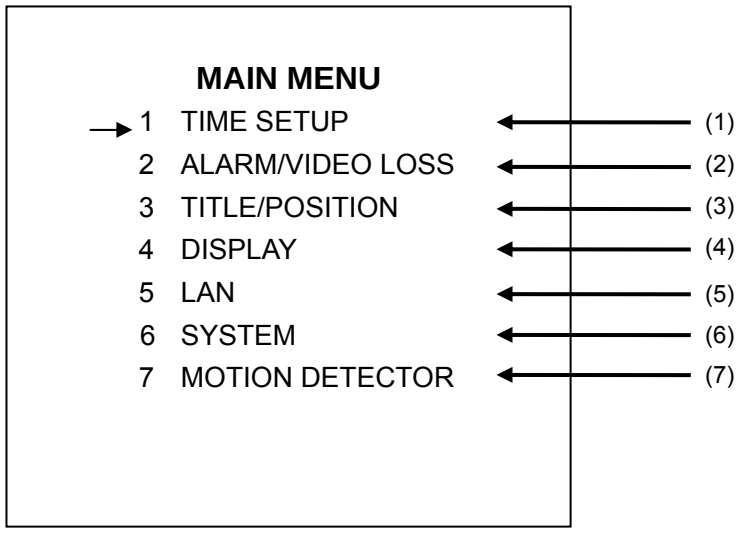
NOTE
For details on the settings, see section 5-2. “TIME SETUP (Time Settings)”.

5. Menu Operations

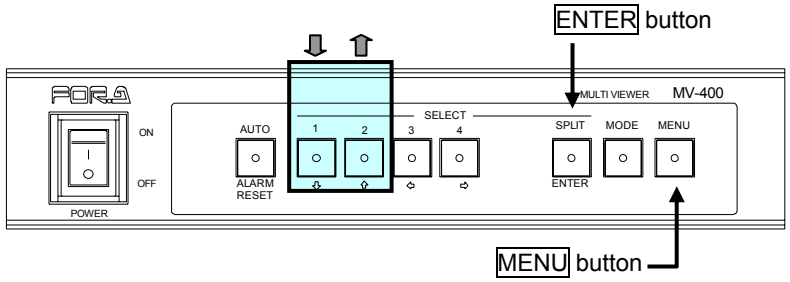
Submenus are available from the main menu for making various settings.

5-1. Main Menu Screen

Press and hold the MENU button for at least two seconds to display the main menu.
[7 MOTION DETECTOR] is displayed only when the sensor option is installed.



<Main Menu Screen>



◆ **Operating Procedure**

Button	Action
⇩	Moves the cursor down.
⇧	Moves the cursor up.
ENTER	Accesses the submenu of the selected item.
MENU	Exits the menu.

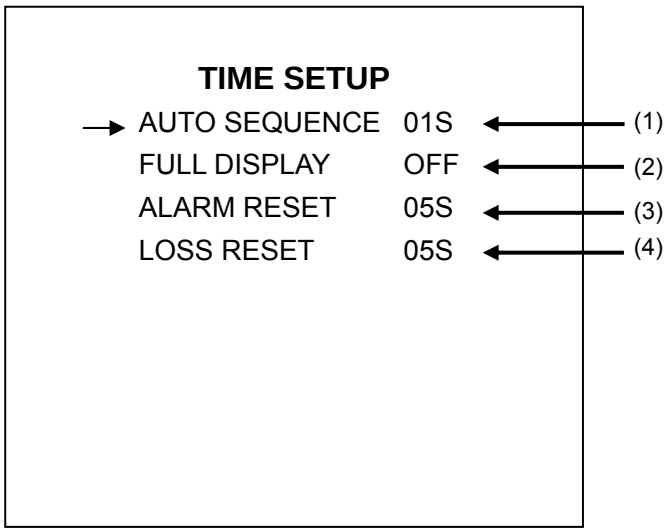
IMPORTANT
The menu screen is displayed on VGA OUT and VIDEO OUT 1. The menu screen is not displayed on VIDEO OUT 2. The menu screen displayed on VGA OUT is slightly cropped compared to the menu screen displayed on VIDEO OUT 1, but this is not a malfunction. Video transfer is stopped when the menu screen is displayed.

◆ **Setting Items**

Item	Setting Description	Refer to
(1) TIME SETUP	Auto sequencing time settings	5-2
	Split-screen automatic recovery time settings	
	Alarm reset time settings	
	Video loss reset time settings	
(2) ALARM/VIDEO LOSS	Alarm input mode settings	5-3
	Alarm display mode settings	
	SXGA output alarm operation ON/OFF	
	SXGA output video loss operation ON/OFF	
	Video output alarm operation ON/OFF	
	Video output video loss operation ON/OFF	
(3) TITLE/POSITION	Title settings for each channel	5-4
	Title position settings for full screen display	
	Title position settings for quad screen display	
(4) DISPLAY	SXGA output split-screen settings (Split-screen mode selection, 2-split screen channel assignment)	5-5
	SXGA output title display ON/OFF	
	SXGA output tally display ON/OFF	
	SXGA output border settings	
	Video output split-screen settings (Split-screen mode selection, 2-split screen channel assignment, 1/2 screen view area settings)	
	Video output title display ON/OFF	
	Video output “ALARM”, “LOSS” and "MOTION" text display ON/OFF	
	Video output border settings	
(5) LAN	IP address settings	5-6
	Subnet mask length settings	
	Multicast address settings	
	Multicast port settings	
	Gateway settings	
(6) SYSTEM	Switch lock settings	5-7
	Function settings	
	RS-232C control protocol settings	
	Network mode setting	
	ID setting	
	Password setting	
(7) MOTION DETECTOR	Motion alarm reset time settings	5-8
	Sensor ON/OFF setting of each channel	
	Super ON/OFF setting of each channel	
	Luminance sensitivity setting of each channel	
	Cell sensitivity setting of each channel	
	Spatiality sensitivity setting of each channel	
	Scanning rate setting of each channel	
	Detection area setting of each channel	

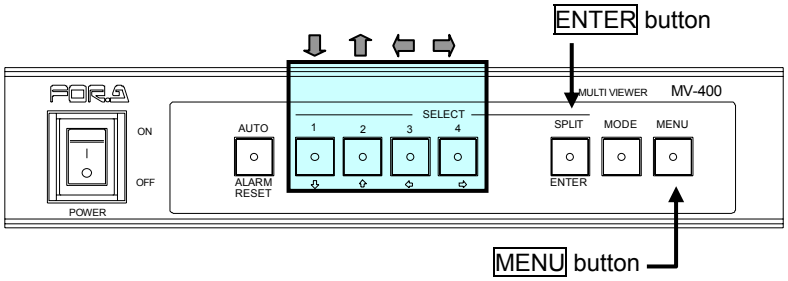
5-2. TIME SETUP (Time Settings)

In the main menu, move the cursor to [TIME SETUP], and then press the ENTER button. The TIME SETUP screen shown below is displayed.



<TIME SETUP Screen>

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



◆ **Operating Procedure**

Button	Action
⇩	Moves the cursor down.
⇧	Moves the cursor up.
⇦	Changes the setting item value backward.
⇨	Changes the setting item value forward.
MENU	Returns to the main menu.

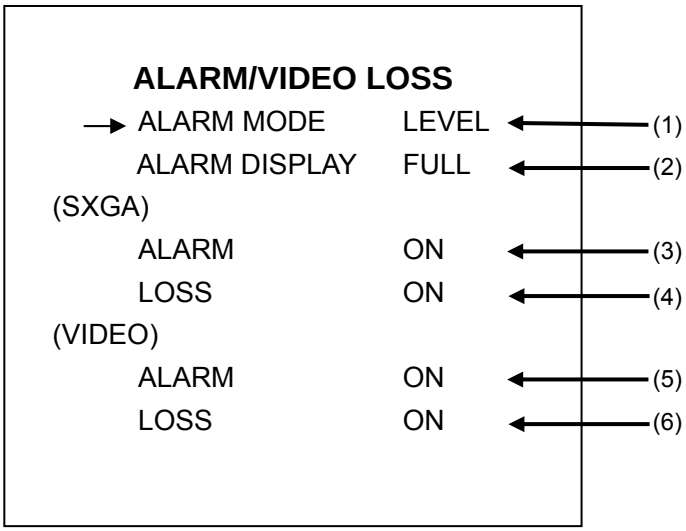
◆ **Setting Items**

Item	Setting Description
(1) AUTO SEQUENCE	Screen switching time setting for full screen automatic sequencing operation. (Can be set from 1 sec to 60 sec. The factory default setting is 1 sec.)
(2) FULL DISPLAY	Time setting for automatic switching from full screen display mode to split-screen. (Can be set from 1 sec to 60 sec. When set to OFF, automatic recovery is not performed. The factory default setting is OFF.)
(3) ALARM RESET	Alarm reset time setting when ALARM MODE is set to TRIG. (Can be set from 1 sec to 60 sec. The factory default setting is 5 sec.)
(4) LOSS RESET	Video loss reset time setting. (Can be set from 1 sec to 60 sec. The factory default setting is 5 sec.)

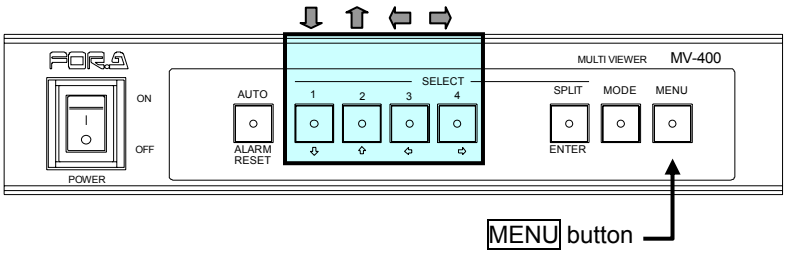
*See section 5-8. “Motion Detector (Motion Detection Settings)" for the motion alarm reset time setting.

5-3. ALARM/VIDEO LOSS (Alarm and Video Loss Settings)

In the main menu, move the cursor to [ALARM/VIDEO LOSS], and then press the ENTER button. The ALARM/VIDEO LOSS screen shown below is displayed.
In the ALARM/VIDEO LOSS screen, settings can be made for the alarm and video loss operations.



<ALARM/VIDEO LOSS Screen>
*The settings in the figure above are the factory defaults.



◆ **Operating Procedure**

Button	Action
⇩	Moves the cursor down.
⇧	Moves the cursor up.
⇦	Changes the setting item value backward.
⇨	Changes the setting item value forward.
MENU	Returns to the main menu.

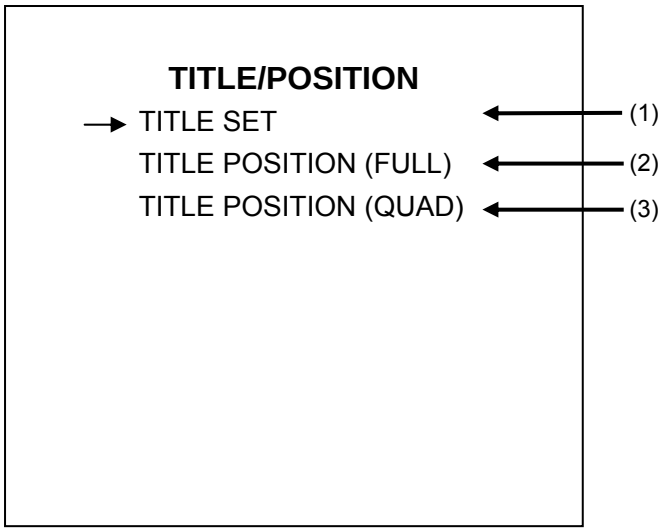
◆ **Setting Items**

Item	Setting Description
(1) ALARM MODE	Selects alarm input modes from TRIG and LEVEL. TRIG: The alarm state is activated when the alarm input signal changes from HIGH to LOW. The alarm is reset in the time that was set in ALARM RESET. LEVEL: The alarm state is activated while the alarm input signal is LOW. (The factory default setting is LEVEL.)
(2) ALARM DISPLAY *	Selects the alarm display mode for an external alarm or video loss from FULL and SPLIT screen. FULL: The channel where the alarm was detected is displayed in full screen. SPLIT: When an alarm is detected, all channels are displayed in quad screen. (The factory default setting is FULL.) For details of operation in alarm display mode, see section 4-5. “Alarm Screen Display”.
(3) ALARM (SXGA)	Enables (ON) or disables (OFF) alarm display operation for SXGA output at an external alarm detection. (The factory default setting is ON.)
(4) LOSS (SXGA)	Enables (ON) or disables (OFF) alarm display operation for SXGA output at a video loss detection. (The factory default setting is ON.)
(5) ALARM (VIDEO)	Enables (ON) or disables (OFF) alarm display operation for video output at an external alarm detection. (The factory default setting is ON.)
(6) LOSS (VIDEO)	Enables (ON) or disables (OFF) alarm display operation for video output at a video loss detection. (The factory default setting is ON.)

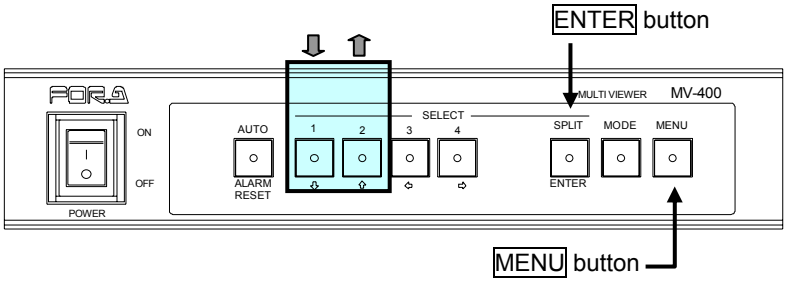
*This Alarm Display setting is also applied to the motion alarm display.
FULL: The channel where motion was detected is displayed in full screen.
SPLIT: When motion is detected in a channel, all channels are displayed in quad screen.

5-4. TITLE/POSITION (Camera Title & Display Position)

In the main menu, move the cursor to [TITLE/POSITION], and then press the ENTER button. The TITLE/POSITION screen shown below is displayed.



<TITLE/POSITION Screen>



◆ **Operating Procedure**

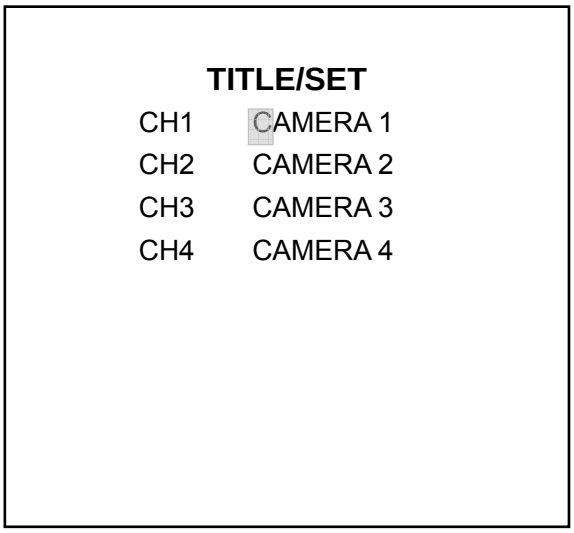
Button	Action
⇩	Moves the cursor down.
⇧	Moves the cursor up.
ENTER	Displays the submenu screen.
MENU	Returns to the main menu.

◆ **Setting Items**

Item	Setting Description	Refer to
(1) TITLE SET	Camera title settings for each channel	5-4-1
(2) TITLE POSITION (FULL)	Camera title display position settings for full screen display	5-4-2
(3) TITLE POSITION (QUAD)	Camera title display position settings for quad screen display	5-4-3

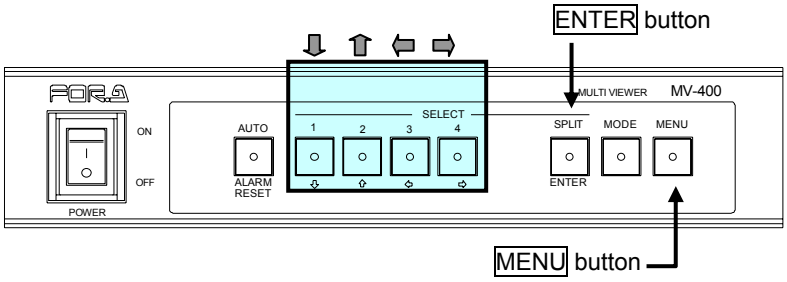
5-4-1. TITLE SET (Camera Title Settings)

In the TITLE/POSITION screen, move the cursor to [TITLE SET], and then press the ENTER button. The TITLE SET screen shown below is displayed. In TITLE SET screen, titles up to 8 characters long can be set and displayed for each camera input.



<TITLE SET Screen>

*The cursor position flashes.
(The flashing is indicated by the shaded section ( ).
*The factory default setting is [CAMERA 1] to [CAMERA 4].



◆ **Operating Procedure**

Button	Action
⇩	Changes the character to which the cursor is positioned in reverse order of the value list.
⇧	Changes the character to which the cursor is positioned in order of the value list.
⇦	Moves the cursor one character to the left.
⇨	Moves the cursor one character to the right.
ENTER	Moves the setting channel.
MENU	Returns to the TITLE/POSITION screen.

◆ Valid Setting Characters

Alphanumeric
0, 1, 2, 3, 4, 5, 6, 7, 8, 9
A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z

Symbols
？：！（）＋/・－

Japanese kana
アイウエオカキクケコサシスセソタチツテトナニヌネノハヒフヘホマミムメモヤユヨラリルレロワンヲァィゥェォャュョッ。、゛゜

◆ Character Type Display Order (Forward Direction)

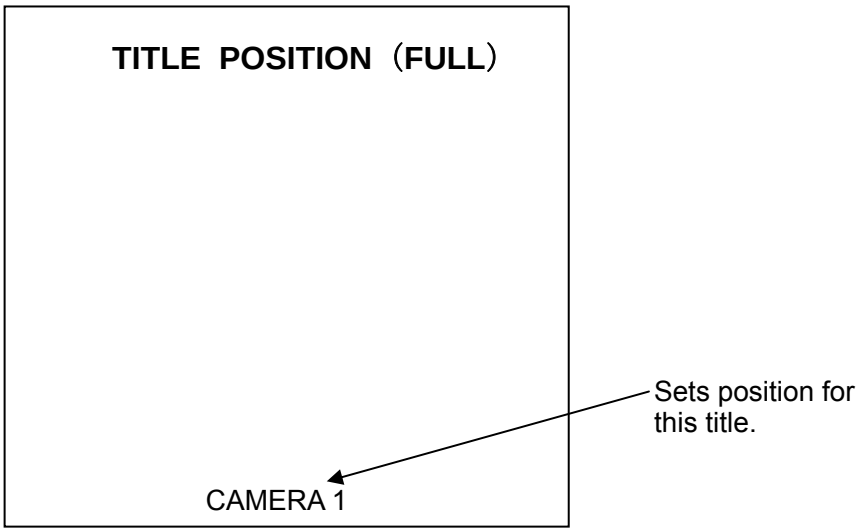
The character types cycle in the order above: Alphanumeric→Symbol→Japanese Kana→Alphanumeric.

*The blank character (space) is located between the Symbol and Japanese Kana characters (between "－" and "ア").
*This is the cycle displayed with the ⇧ button. The cycle is reversed with the ⇩ button.

IMPORTANT
The title settings are the same for both SXGA output and video output.

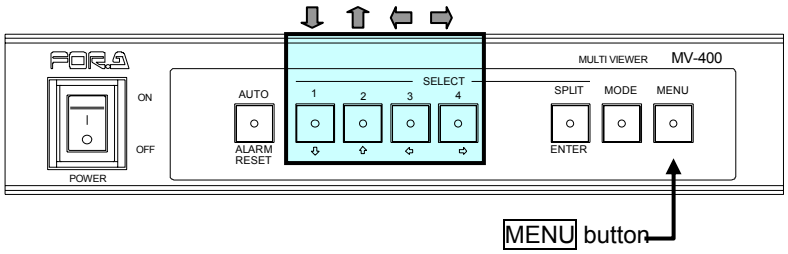
5-4-2. TITLE POSITION (FULL)

In the TITLE/POSITION screen, move the cursor to [TITLE POSITION (FULL)], and then press the ENTER button. The TITLE POSITION (FULL) screen is displayed as shown below. In the TITLE POSITION (FULL) screen, you can set the camera title display position when displaying full screen on a video output screen.



<TITLE POSITION Screen>

*The factory default setting is the bottom center of the screen.



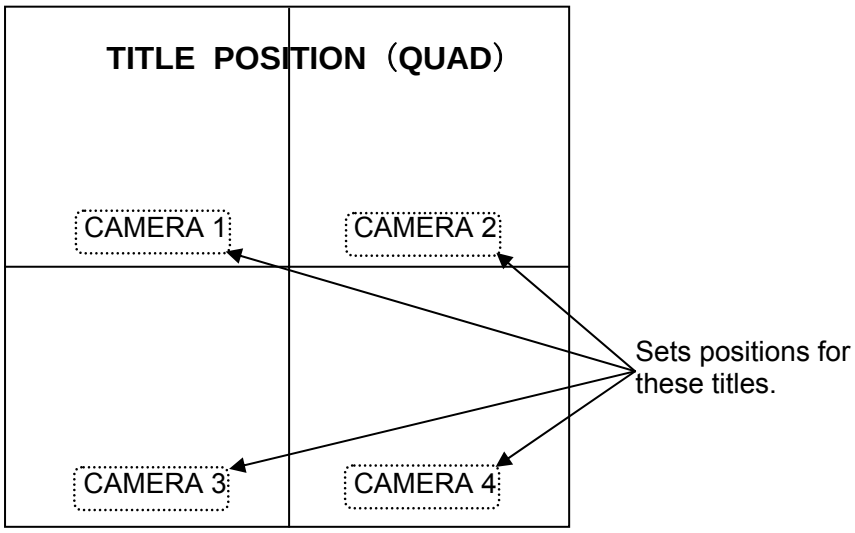
◆ **Operating Procedure**

Button	Action
⇩	Moves the title display position down.
⇧	Moves the title display position up.
⇦	Moves the title display position to the left.
⇨	Moves the title display position to the right.
MENU	Returns to the TITLE/POSITION screen.

IMPORTANT
The camera title display position of the SXGA output screen is fixed. The menu screen displayed on VGA OUT is slightly cropped compared to the menu screen displayed on VIDEO OUT 1, but this is not a malfunction. When setting the title display position, check the display position on the menu screen displayed on VIDEO OUT 1.

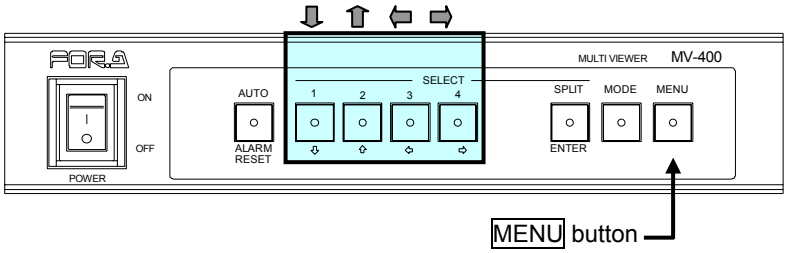
5-4-3. TITLE POSITION (QUAD)

In the TITLE/POSITION screen, move the cursor to [TITLE POSITION (QUAD)], and then press the ENTER button. The TITLE POSITION (QUAD) screen shown below is displayed. In the TITLE POSITION (QUAD), you can set the camera title display position when a quad screen is displayed on the video output screen.



<TITLE POSITION Screen>

*The factory default setting is the bottom center position of the channel screens.



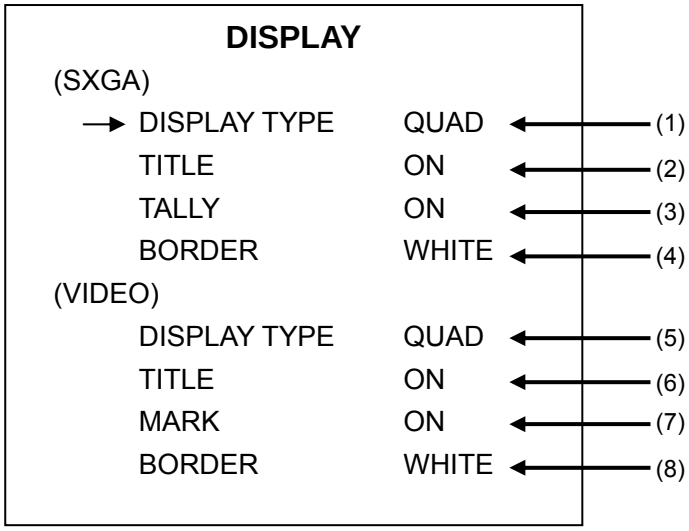
◆ **Operating Procedure**

Button	Action
⇩	Moves the title display position down.
⇧	Moves the title display position up.
⇦	Moves the title display position to the left.
⇨	Moves the title display position to the right.
MENU	Returns to the TITLE/POSITION screen.

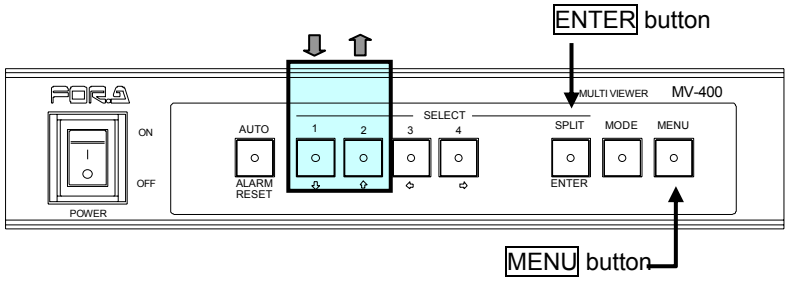
IMPORTANT
The title positions for all channels are changed by the title position change operation. The title position is not applied to the 2-split screen. The title position of the 2-split screen is fixed. The camera title display position of the SXGA output screen is fixed. The menu screen displayed on VGA OUT is slightly cropped compared to the menu screen displayed on VIDEO OUT 1, but this is not a malfunction. When setting the title display position, check the display position on the menu screen displayed on VIDEO OUT 1.

5-5. DISPLAY (Screen Display Settings)

In the main menu, move the cursor to [DISPLAY], and then press the ENTER button. The DISPLAY screen shown below is displayed.
In the DISPLAY screen, the split-screen display type can be selected, and each display function can be set ON/OFF.



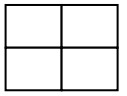
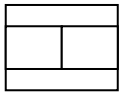
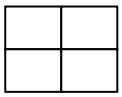
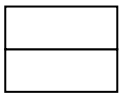
<DISPLAY Screen>
*The settings in the figure above are the factory defaults.



◆ **Operating Procedure**

Button	Action
⇩	Moves the cursor down.
⇧	Moves the cursor up.
⇦	Changes the setting item value backward.
⇨	Changes the setting item value forward.
ENTER	CHANNEL ASSIGN (SXGA) screen is displayed when the cursor position is at DISPLAY TYPE under SXGA and the DISPLAY TYPE setting is V2. The CHANNEL ASSIGN (VIDEO) screen is displayed when the cursor position is at DISPLAY TYPE under VIDEO, and the DISPLAY TYPE setting is V2-1, H2-1, V2-2, or H2-2.
MENU	Returns to the main menu.

◆ **Setting Items**

Item	Setting Description
(1) DISPLAY TYPE[*1] (SXGA)	Setting for split-screen type displayed on SXGA output when the SPLIT button is pressed in SXGA mode QUAD: quad screen V2: Vertical 2-split screen[*1]  QUAD  V2
(2) TITLE (SXGA)	Camera title display ON/OFF setting for SXGA output
(3) TALLY (SXGA)	Tally frame display ON/OFF setting for alarm, video loss and motion alarm channels of SXGA output
(4) BORDER (SXGA)	The SXGA output border can be selected from WHITE, BLACK, or OFF
(5) DISPLAY TYPE (VIDEO)	Setting for split-screen type displayed on video output when the SPLIT button is pressed in VIDEO mode QUAD: quad screen V2-1: Vertical 2-split screen[*2] H2-1: Horizontal 2-split screen[*2] V2-2: Reduced vertical 2-split screen[*3] H2-2: Reduced horizontal 2-split screen[*3]  QUAD  V2-1, V2-2  H2-1, H2-2
(6) TITLE (VIDEO)	Camera title display ON/OFF setting for video output *The setting is the same for both VIDEO OUT 1 and VIDEO OUT 2.
(7) MARK (VIDEO)	“ALARM”, “LOSS” and "MOTION" texts display ON/OFF settings for alarm, video loss and motion alarm channels of VIDEO output. *The “ALARM”, “LOSS” and "MOTION" texts are not displayed on VIDEO OUT 2.
(8) BORDER (VIDEO)	The video output border can be selected from WHITE, BLACK, or OFF. *The setting is shared by VIDEO OUT 1 and VIDEO OUT 2.

[*1] The channels displayed on the 2-split screen can be selected.

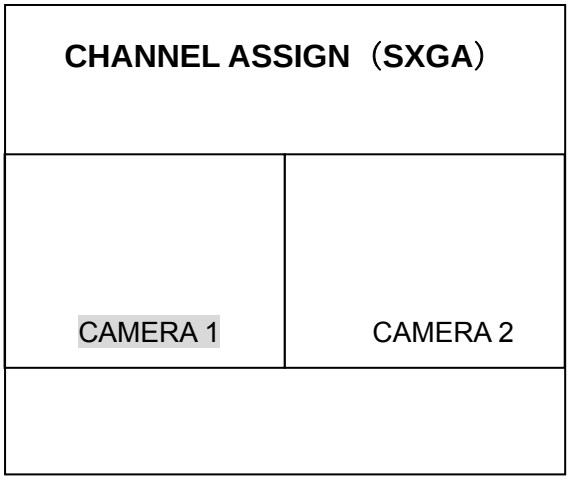
[*2] The channels displayed on the 2-split screen can be selected, and the 1/2-split screen view area can be moved.

[*3] The channels displayed on the 2-split screen can be selected.

NOTE
For details on the setting procedure, see section 5-5-1.” CHANNEL ASSIGN (Display Channel Settings)” and section 5-5-2. “DISPLAY SET (1/2 screen View Area Settings)”.

5-5-1. CHANNEL ASSIGN (Display Channel Settings)

In the DISPLAY screen, move the cursor to DISPLAY TYPE, and then press the ENTER button. The CHANNEL ASSIGN screen shown below is displayed. However, the CHANNEL ASSIGN screen is not displayed when DISPLAY TYPE is set to [QUAD]. In the CHANNEL ASSIGN screen, you can select the channels that are displayed in each screen for the 2-split screen.
Also, if V2-1 or H2-1 are selected for DISPLAY TYPE (VIDEO), pressing the MODE button displayed in the CHANNEL ASSIGN (VIDEO) screen shows the DISPLAY SET (VIDEO) screen (1/2 screen view area settings).

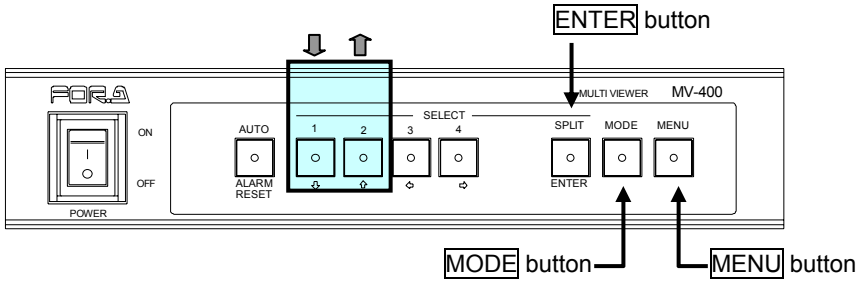


<CHANNEL ASSIGN Screen Example for V2 (SXGA)>

*The title of the setting screen is flashing.
(Flashing is indicated by the shaded section in the figure above.)

*Factory defaults

V2 (SXGA): CH1 (Left screen), CH2 (Right screen)
V2-1 (VIDEO): CH1 (Left screen), CH2 (Right screen)
H2-1 (VIDEO): CH1 (Top screen), CH2 (Bottom screen)
V2-2 (VIDEO): CH1 (Left screen), CH2 (Right screen)
H2-2 (VIDEO): CH1 (Top screen), CH2 (Bottom screen)



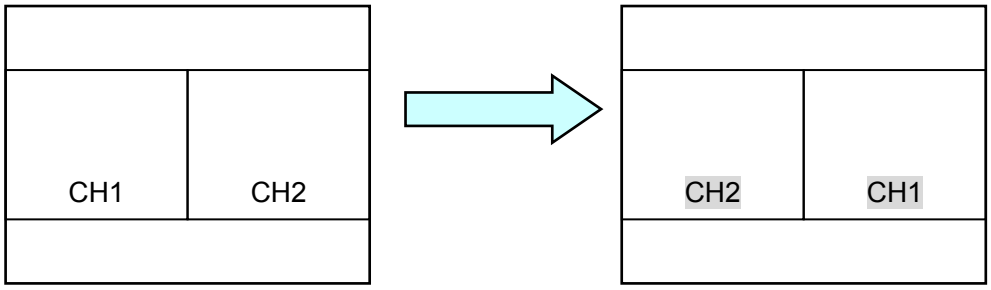
◆ **Operating Procedure**

Button	Action
⇦	Selects the previous channel in the sequence for the target screen.
⇨	Selects the next channel in the sequence for the target screen.
ENTER	Changes the target screen.
MODE[*1]	Displays the DISPLAY SET screen (1/2 screen view area settings).
MENU	Returns to the DISPLAY screen.

[*1] Pressing the MODE button in the displayed CHANNEL ASSIGN (VIDEO) screen shows the DISPLAY SET (VIDEO) screen only when V2-1 or H2-1 is selected in DISPLAY TYPE (VIDEO).

IMPORTANT
It is not possible to display the same channel on two or more screens simultaneously. Therefore, if you try to display a channel already being displayed in one screen on a separate screen as shown in the example of a setting change below, the channels are interchanged between the two screens.

◆ **Example of Setting Change**



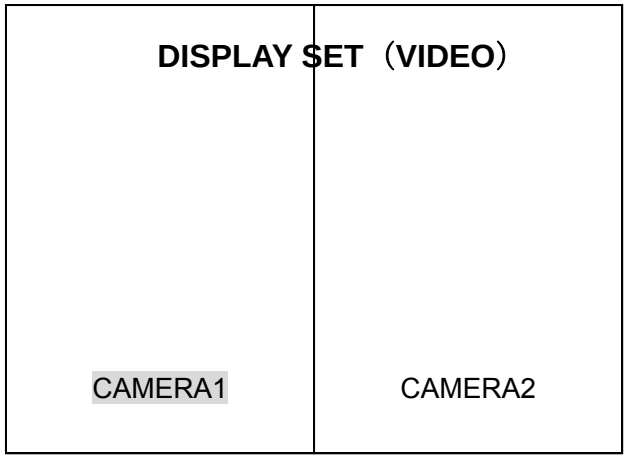
Operation to display CH2 shown on the right side to the left side

The right and left screen channels are interchanged.

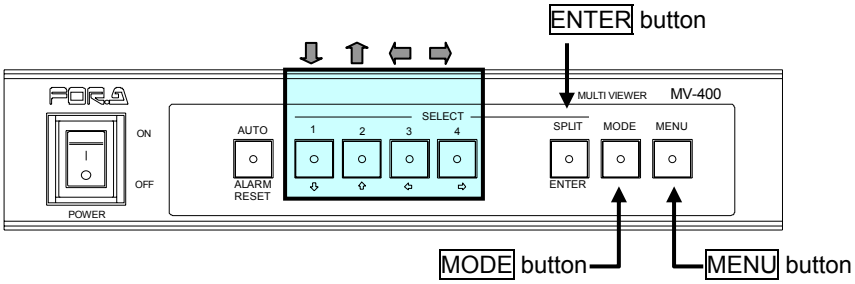
IMPORTANT
The menu screen displayed on VGA OUT is slightly cropped compared to the menu screen displayed on VIDEO OUT 1, but this is not a malfunction.

5-5-2. DISPLAY SET (1/2 screen View Area Settings)

In the CHANNEL ASSIGN (VIDEO) screen for V2-1 and H2-1, pressing the MODE button displays the DISPLAY SET (VIDEO) screen shown below. In the DISPLAY SET (VIDEO) screen, the view area of the 1/2 screen can be set. Pressing the MODE button again returns to the CHANNEL ASSIGN (VIDEO) screen.



<DISPLAY SET Screen Example for V2-1>
*The title of the selected subscreen is flashing.
(Flashing is indicated by the shaded section in the figure above.)



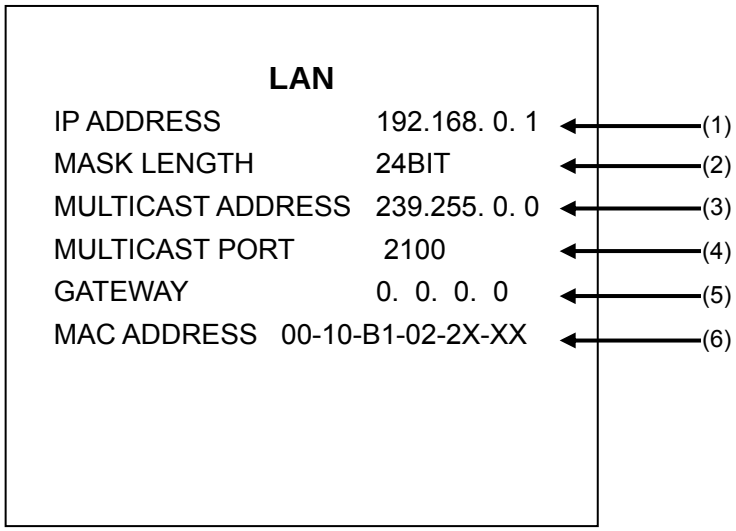
◆ **Operating Procedure**

Button	Action
⇩	Moves the target 1/2 screen down. (For H2-1 setting only)
⇧	Moves the target 1/2 screen up. (For H2-1 setting only)
⇦	Moves the target 1/2 screen left. (For V2-1 setting only)
⇨	Moves the target 1/2 screen right. (For V2-1 setting only)
ENTER	Changes the selection.
MODE	Displays the CHANNEL ASSIGN (VIDEO) screen (Display Channel Settings).
MENU	Returns to the DISPLAY screen.

IMPORTANT
The menu screen displayed on VGA OUT is slightly cropped compared to the menu screen displayed on VIDEO OUT 1, but this is not a malfunction. When setting the view area of the 1/2 screen, check the view area on the menu screen displayed on VIDEO OUT 1.

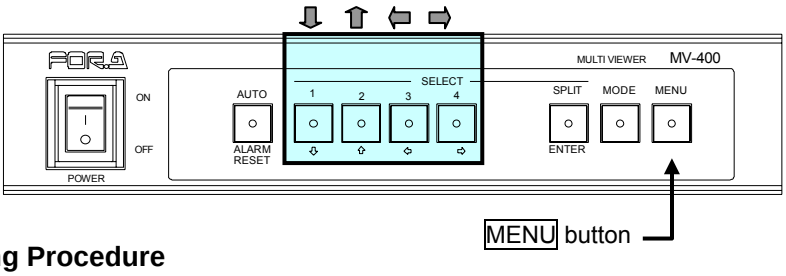
5-6. LAN (LAN Settings)

In the main menu, move the cursor to [LAN], and then press the ENTER button. The LAN screen shown below is displayed. In the LAN screen, various settings can be made for the LAN interface.



<LAN Screen>

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



◆ **Operating Procedure**

Button	Action
⇩	Moves the cursor down.
⇧	Moves the cursor up.
⇦	Changes the setting item value backward.
⇨	Changes the setting item value forward.
MENU	Returns to the main menu.

IMPORTANT
Pressing the MENU button for values that cannot be set will show an error. If this happens, use the ⇩ ⇧ buttons to clear the error and make a new setting.

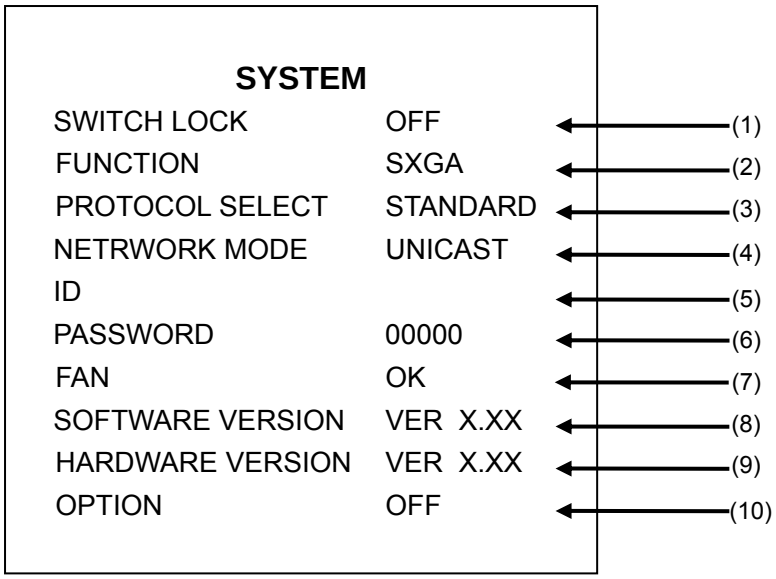
◆ **Setting Items**

Item	Setting Description
(1) IP ADDRESS	IP address setting for the device. Be sure to always make the setting when using over a LAN interface. Please consult with your system administrator if using while connecting to another network system. The value can be changed in the range from 0.0.0.0 to 255.255.255.255. However, the values of 0.0.0.0 and 1.0.0.0 are not available.
(2) MASK LENGTH	Subnet mask length setting for the device. The setting range is 0 to 31.
(3) MULTICAST ADDRESS	Multicast address setting to operate in the multicast mode. The setting rage is 224.0.0.0 to 239.255.255.255. However, the values of 224.0.0.0 to 224.0.0.255 are not available. *This setting is not necessary if operating in the unicast mode.
(4) MULTICAST PORT	Multicast port setting to operate in the multicast mode. The setting range is 1024 to 65535. *This setting is not necessary if operating in the unicast mode.
(5) GATEWAY	This setting is required only for network communication with gateway. The setting range is 0.0.0.0 to 255.255.255.255.
(6) MAC ADDRESS	This displays the MAC address value that is set for the device. This setting cannot be changed.

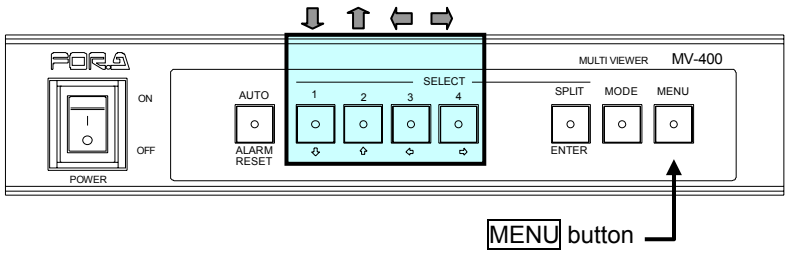
IMPORTANT
The LAN settings except MULTICAST ADDRESS and MULTICAST PORT settings are applied when the power to the MV-400 is turned on. If the settings are changed, be sure to turn off the MV-400 and then turn it on again to apply the settings.

5-7. SYSTEM (System Settings)

In the main menu, move the cursor to [SYSTEM], and then press the ENTER button. The SYSTEM screen shown below is displayed.
In the SYSTEM screen, selection of SXGA function or network function and other settings can be made.



<SYSTEM Screen>
*The settings in the figure above are the factory defaults.



◆ **Operating Procedure**

Button	Action
⇩	Moves the cursor down.
⇧	Moves the cursor up.
⇦	Changes the setting item value backward. (except ID and Password)
⇨	Changes the setting item value forward. (except ID and Password)
ENTER	Opens the submenu to which the cursor is positioned. (ID and Password only)
MENU	Returns to the main menu.

◆ **Operating Procedure (Parameter settings: flashing)**

Button	Action
⇩	Moves the cursor right.
⇧	Moves the cursor left.
⇦	Changes the setting item value backward.
⇨	Changes the setting item value forward.
ENTER	Returns to select setting item.
MENU	Returns to select setting item.

◆ **Setting Items**

Item	Setting Description	
(1) SWITCH LOCK	Operation lock function setting on the front panel OFF: The operation lock is not activated. All buttons are enabled. ON: Operation lock is activated. All buttons are disabled except for the MENU button. If you try to use a front panel button other than the MENU button when the operation lock is enabled, the MENU button flashes to indicate that the operation lock is activated. * The ALARM RESET button will not be disabled by the operation lock.	
(2) FUNCTION	Operation mode setting	
	SXGA	The SXGA output function is enabled. If the optional software is installed, the video transfer function is also enabled. However, due to the priority on the SXGA output, the frame rates (refresh interval) of video transfer over LAN interface is reduced.
	NETWORK	The video transfer function over the LAN interface is enabled.
	NETWORK+A	The video transfer with the alarm/video loss information is enabled.
	SXGA & NETWORK	Available with the optional software. Concurrent use of the SXGA output function and the video transfer function over the LAN interface is enabled. However, the frame rates of both functions become lower than those of when using either one alone.
	SXGA & NETWORK+A	Available with the optional software. Concurrent use of the SXGA output and the video transfer over the LAN interface with the alarm/video loss information is enabled.
(3) PROTOCOL SELECT	Communication protocol setting for RS-232C interface STANDARD: Operates using standard protocol. OLD: Operates using previous model protocol. This is based on the communication protocol of the FOR-A MV-40F Multi Viewer.	
(4) NETWORK MODE	Network mode setting	
	UNICAST	Sets to the unicast mode.
	MULTICAST	Available with the optional software. Sets to the multicast mode.
(5) ID	ID setting for the connection with Web browser, the dedicated software and MV-400N (For-A's network multi viewer). Set with up to 8 alphanumeric characters. If all 8 characters are set to the space character, the authentication is not performed.	
(6) PASSWORD	Password setting for the connection with Web browser, the dedicated software and MV-400N (For-A's network multi viewer). Set with 5-digit numbers.	
(7) FAN	This displays the fan status. OK: The fan is operating without any problems. NG: An error has occurred in the fan.	
(8) SOFTWARE VERSION	The internal software version is displayed.	
(9) HARDWARE VERSION	The internal hardware version is displayed.	

(10) OPTION	This displays the status of optional software. ON: The optional software is installed. OFF: The optional software is not installed.

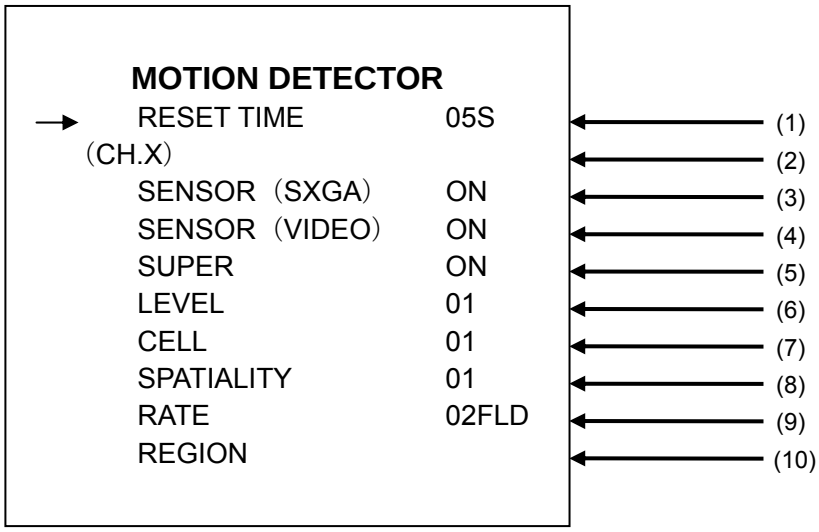
IMPORTANT

When using the video transfer function, setting the frame rate to 0 will stop transmitting video. See MV-400 RS-232C/LAN Command Manual, section 2-7. “Video Output Frame Rate Command” for details.

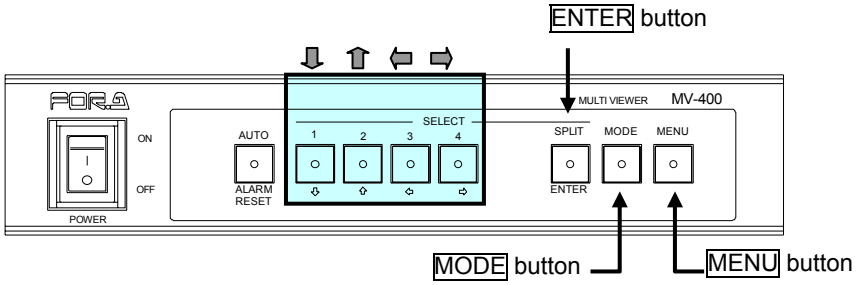
The ID and PASSWORD settings are applied when the power to the MV-400 is turned on. If the settings are changed, be sure to turn off the MV-400 and then turn it on again to apply the settings.

5-8. Motion Detector (Motion Detection Settings)

In the main menu, move the cursor to [MOTION DETECTOR], and then press the ENTER button. The MOTION DETECTOR screen as shown below is displayed.
In the MOTION DETECTOR screen, the sensitivity levels and the detecting area for the motion detection can be set.



<MOTION DETECTOR screen>
*The settings in the figure above are the factory defaults.



◆ **Operating Procedure**

Button	Action
⇩	Moves the cursor down.
⇧	Moves the cursor up.
⇦	Changes the setting item value backward.
⇨	Changes the setting item value forward.
ENTER	Opens REGION screen if the cursor is at the [REGION].
MODE	Changes the setting channel.
MENU	Returns to the main menu.

◆ **Setting Items**

Item	Setting Description
(1) RESET TIME	Motion alarm reset time setting. Setting range is from 1 second to 60 seconds.
(2) (CH.X)	Displays the currently set channel number
(3) SENSOR (SXGA)	ON/OFF setting of alarm display in SXGA output for the motion detection.*
(4) SENSOR (VIDEO)	ON/OFF setting of alarm display in VIDEO output for the motion detection.*
(5) SUPER	ON/OFF setting of motion detection display to spot the cells where motion is detected in VIDEO output.
(6) LEVEL	Sets luminance sensitivity level to detect motion. 01: 35mV (high sensitivity) ↕ 02: 50mV ↕ 03: 70mV 04: 100mV (low sensitivity)
(7) CELL	Sets the minimum number of sub-cells to determine the existence of motion in each cell. (One cell is divided in 4 sub-cells. If the luminance difference is detected in more sub-cells than the set number, the cell is determined to be motion detected.) The larger the number, the lower the sensitivity to detect motion in a cell. (Setting range is from 01 (high sensitivity) to 04 (low sensitivity).)
(8) SPATIALITY	Sets the minimum number of cells to determine the existence of motion. *If the luminance difference is detected in more cells than the set number, the motion alarm display operation is processed. The larger the number, the lower the sensitivity to detect motion across the cells. (Setting range is from 01 (high sensitivity) to 16 (low sensitivity).)
(9) RATE	Sets the interval of scanning. The longer the interval, the slower the movement it can detect. (Setting range is from 02FIELD to 62FIELD.)
(10) REGION	Sets the area to detect motion. See section 5-8-1. “REGION (Motion Detection Area Setting)" for details.

IMPORTANT

If SUPER is set to on, the motion detection display is available even when SENSOR (VIDEO) is off. If you are not using the motion detection display, set SUPER off.

The motion detection display is available for the output from VIDEO OUT1 connector in full screen or quad screen.

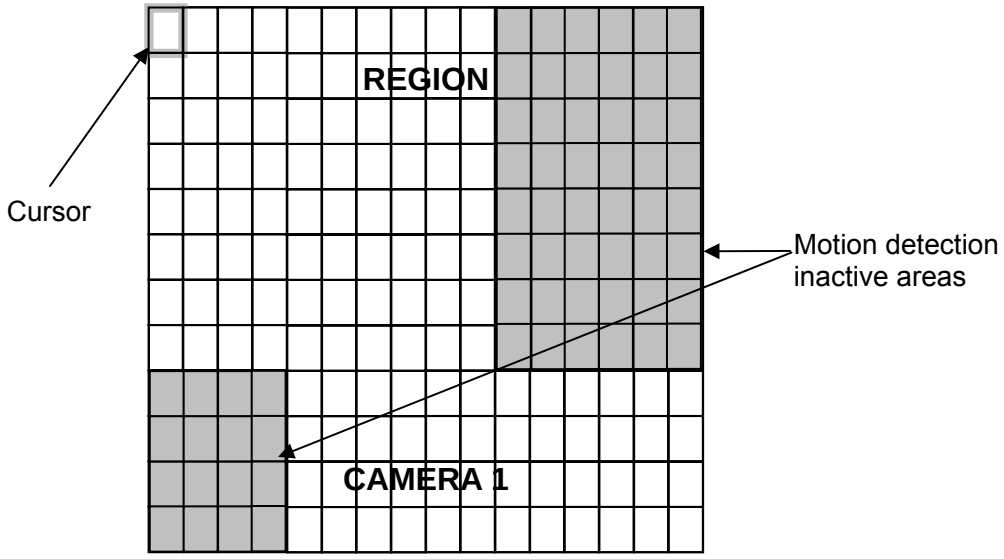
The motion detection inactive area is also displayed in the motion detection display screen.

If the larger number of cells are set for SPATIALITY than the number set for REGION, the motion alarm is disabled.

* See section 4-5. “Alarm Screen Display", 5-3. “ALARM/VIDEO LOSS (Alarm and Video Loss Settings)" setting item (2) ALARM DISPLAY and 5-5. “DISPLAY (Screen Display Settings)" setting item (3) TALLY and (7) MARK also for your reference.

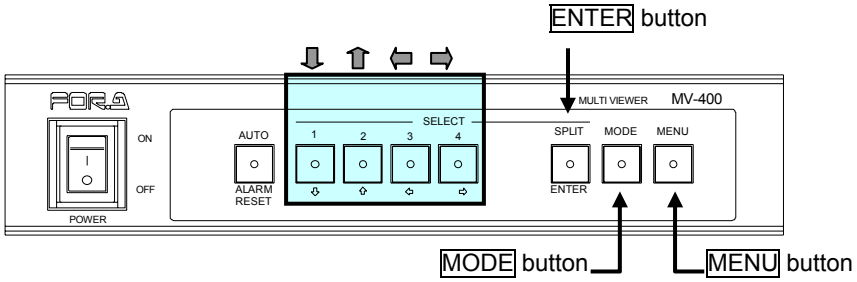
5-8-1. REGION (Motion Detection Area Setting)

In MOTION DETECTOR screen, move the cursor to [REGION], and press the ENTER button. The REGION screen shown below is displayed.



<REGION screen example: CH1>

*The factory default is set the motion detection to cover whole area without inactive area.



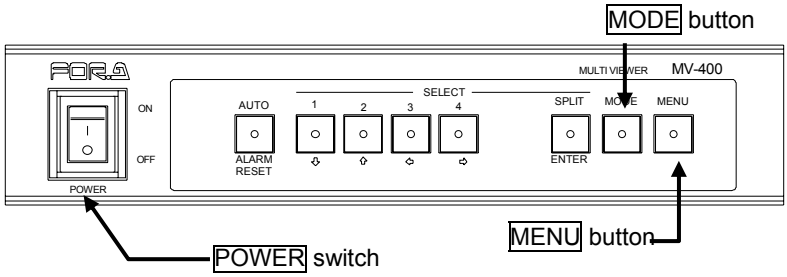
◆ **Operating Procedure**

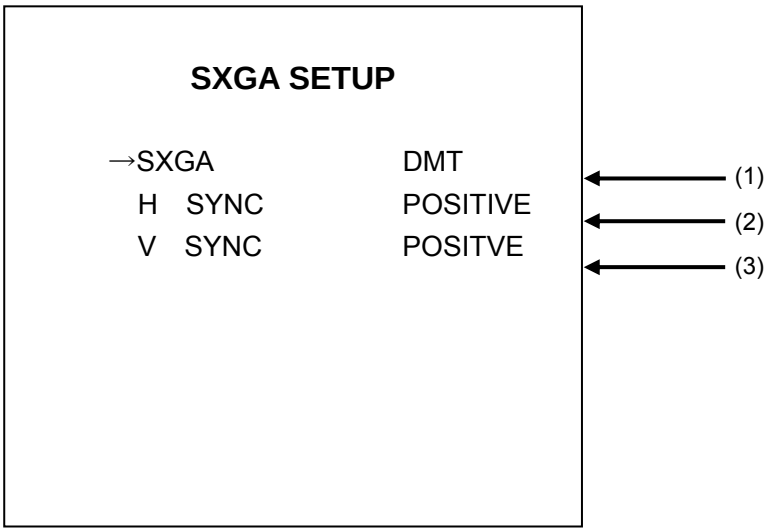
Button	Action
⇩	Moves the cursor down.
⇧	Moves the cursor up.
⇦	Moves the cursor left.
⇨	Moves the cursor right.
ENTER*1	Sets the motion detection active or inactive of the cell where the cursor is positioned.
MODE	Changes the selected channel.
MENU	Returns to MOTION DETECTOR screen.

*1 Pressing the ⇩⇧⇦⇨ buttons while holding down the ENTER button allows you to change the area settings successively in each direction.

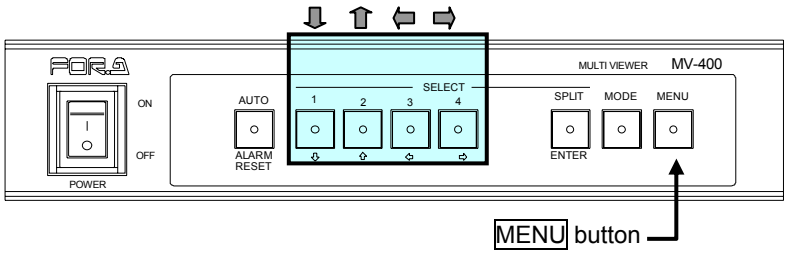
5-9. Adjusting SXGA Output Timing

This adjustment is not required in the ordinary operation. However the timing can be adjusted according to the connected SXGA output monitor if necessary.
Turn the power on while pressing both MODE and MENU buttons, then the SXGA SETUP screen as shown below is displayed.





<SXGA SETUP screen>
*The settings in the figure above are the factory defaults.



◆ **Operation procedure**

Button	Action
⇩	Moves the cursor down.
⇧	Moves the cursor up.
⇦	Changes the setting item value backward.
⇨	Changes the setting item value forward.
MENU	Returns to the main menu

◆ **Setting Items**

Item	Setting Description	
(1) SXGA	Changes the SXGA output timing standard.	
	DMT	Horizontal frequency: 64.4kHz Vertical frequency: 60.5Hz
	CVT	Horizontal frequency: 63.6kHz Vertical frequency: 59.8Hz
	GTF	Horizontal frequency: 63.6kHz Vertical frequency: 60.0Hz
(2) H SYNC	POSITIVE	H sync polarity : Positive
	NEGATIVE	H sync polarity : Negative
(3) V SYNC	POSITIVE	V sync polarity : Positive
	NEGATIVE	V sync polarity : Negative

IMPORTANT

The SXGA SETUP settings are applied when the power to the MV-400 is turned on. If the settings are changed, be sure to close the SXGA SETUP screen by pressing MENU button first, then turn off the MV-400 and turn it on again to apply the settings.

6. If a Problem Occurs

If any of the following problems occur during operation of your MV-400, proceed as indicated below to see if 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
Front panel MODE button is flashing.	Check that no objects are blocking the fan vent on the side panel.	Remove object if any is present. If there is not an object, it may be necessary to replace the fan. Contact your dealer for assistance.
No information is displayed	Are all information display settings set to ON?	Check the display settings in the menu screen. For further information see section 5-5. "DISPLAY (Screen Display Settings)".
Unable to operate settings with front panel buttons	Is the menu button flashing?	Front panel operation is locked. Cancel the switch lock. For further information see section 5-7. "SYSTEM (System Settings)".
I want to restore the default settings.		Hold the AUTO button on the front panel while turning the unit on. All backup data will be initialized.

7. Specifications and Dimensions

7-1. Unit Specifications

TV Standard	525/60 (NTSC) or 625/50 (PAL) (Auto detection)
Video Input	1.0V(p-p)(Color or B/W, 75Ω or loopthrough (automatic termination) BNC, 4 inputs (Accepts asynchronous)
Video Output	
VGA OUT	Video signal: 0.7V(p-p) ±0.1V 75Ω Reference signal: Separate HV sync (TTL positive logic pulse, level signal) 15 pin D-Sub 1 output Resolution: SXGA (1280 x 1024pixels) *Video:1280 x 960pixels Screen display: Select from Full, 2-split, quad screen *Not available if video output via LAN interface is selected in the setting and optional software is not installed. When concurrent performance of SXGA output and video output via LAN interface is selected, the frame rate (refresh rate) will become a half of that of performing one function,
VIDEO OUT 1	1.0V(p-p)±0.1V 75Ω BNC1 output Screen display: Select from Full, 2-split, quad screen
VIDEO OUT 2	1.0V(p-p)±0.1V 75Ω BNC1 output Screen display: Quad screen fixed
Interface	
Remote	REMOTE/ALARM connector 25-pin D-sub female TTL negative logic pulse (more than 100ms width) Control: AUTO/RST, selecting camera 1 to 4, SPLIT, selecting mode
Alarm Input	REMOTE/ALARM connector 25-pin D-sub female TTL negative logic pulse level or Make contact, (more than 100ms width for the trigger signal), 4 inputs
RS-232C	REMOTE/ALARM connector 25-pin D-sub female Asynchronous, full-duplex, baud rate 9,600bps, data length 8bit, stop bit 1bit, parity none, 1 line Control: selecting Video output, menu settings
LAN	10BASE-T/100BASE-TX, RJ-45 (Category 5), 1 ea. Control: selecting Video output, menu settings Video output: maximum frame rate 60fps (image size 640x480 pixels) Compression method JPEG Display: full screen (image size 640 x 480 pixels) quad screen (image size 640 x 480 pixels) quad screen (image size 1280 x 960 pixels) *Quad screen (image size 1280 x 960 pixels) is available with optional software. *Maximum frame rate may change depends on use environment. *Video output via LAN is not available if SXGA output is selected in the setting and optional software is not installed. *Concurrent performance of SXGA output and video output via LAN interface will result in lower frame rate than the performance of either one of these functions.
Character Display	
Camera Title	8 characters/1 line max. (alphanumeric characters, symbols and Japanese kana available)
Warnings	
ALARM	Auto switching to alarm screen, SXGA output: display tally VIDEO output: display "ALARM"

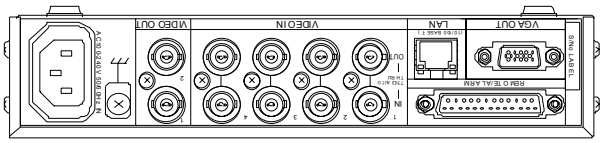
VIDEO LOSS	Auto switching to video loss screen. SXGA output: display tally VIDEO output: display "LOSS"
Data Backup	Stores the setting data to the memory (Rewrite capacity: approx. one hundred thousand times) *Frequent changes of display settings may result in being unable to retain data.
Data Storage	Back up data for menu settings with EEPROM.
Power	100VAC to 240VAC ±10%, 50Hz/60Hz
Consumption	18VA (13W) at 100VAC 24VA (14W) at 220VAC
Temperature	0°C - 40°C
Humidity	30% - 90% (no condensation)
Dimentions	212 (W) x 44 (H) x 350 (D)mm
Weight	3kg
Optionals	Lack mount brackets (for one unit or 2 units)
consumables	Cooling fans: P1368 (flank) Replace every 5 years (used at room temperature) Power unit: Replace every 8 years (used at 40°C)

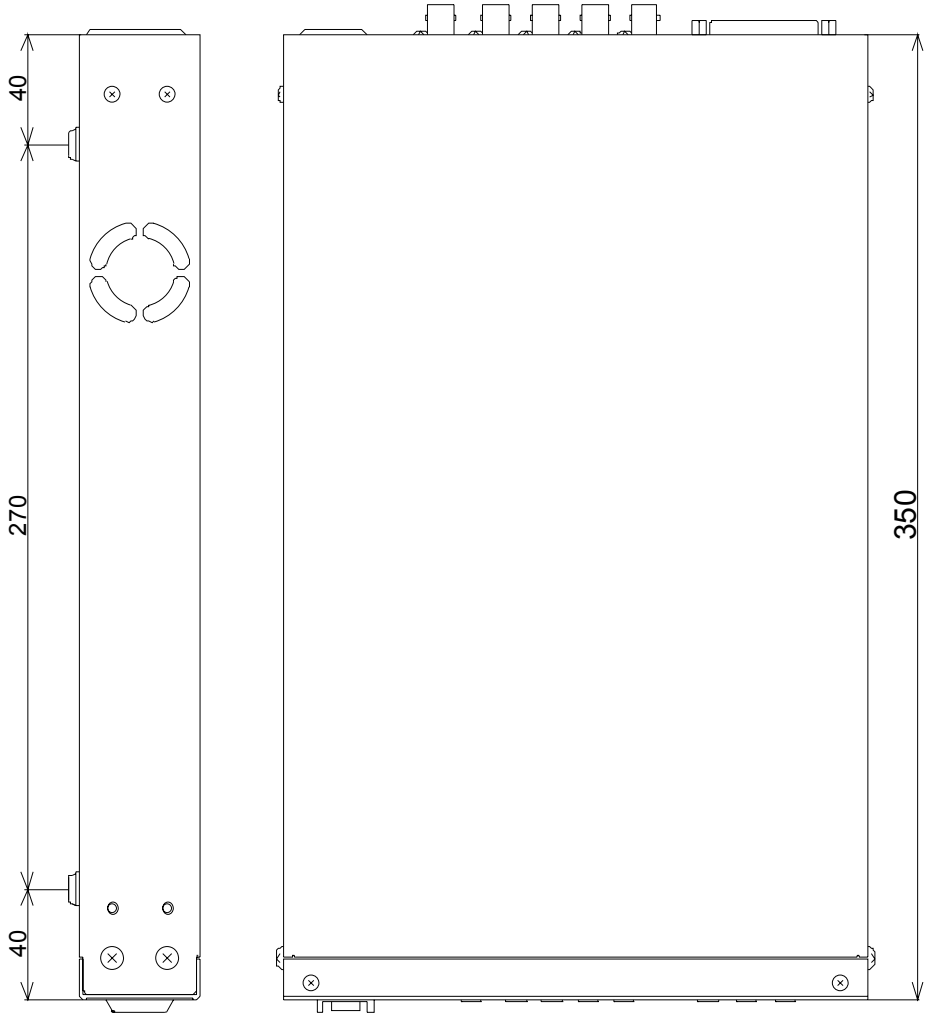
7-2. Motion Alarm (Sensor Option) Specifications

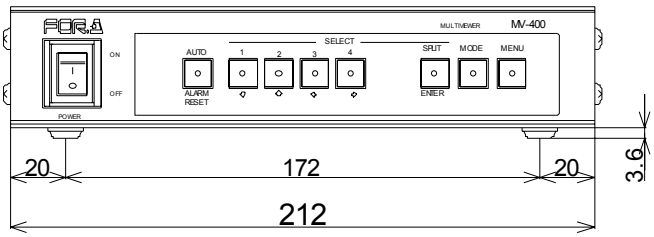
Motion Detection size	704 x 240 pixels (NTSC) or 704 x 288 pixels (PAL)
Motion Detection Cell	Size: 44 x 20 pixels (NTSC) or 44 x 24 pixels (PAL) Total: 192 cells (horizontal 16 cells, vertical 12 cells)
Detection Region	Settable per cell
Scanning Rate	2 fields to 62 fields
Luminance Sensitivity	4 levels
Spatiality Sensitivity	16 levels
Cell Sensitivity	4 levels
Alarm Reset Time	1 sec. to 60 sec.
Motion Alarm Display	
SXGA Output	Tally frame
VIDEO Output	Flashing "MOTION" text
Interface	
Alarm Output	REMOTE/ALARM connector, 4 outputs, +5V TTL level signal (low level when motion detected.)

7-3. External Dimensions

(All dimensions in mm)



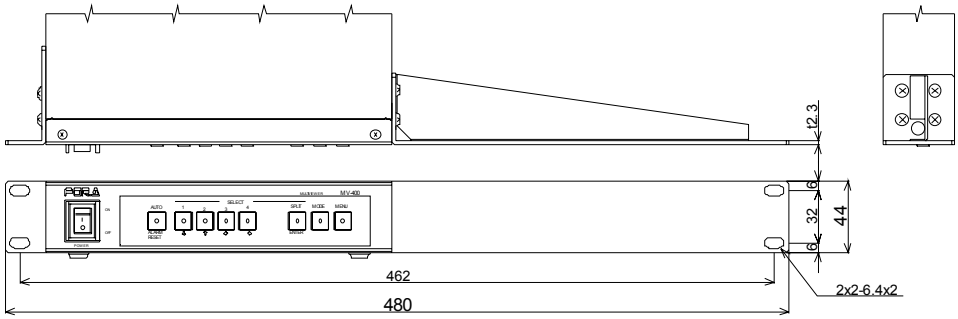




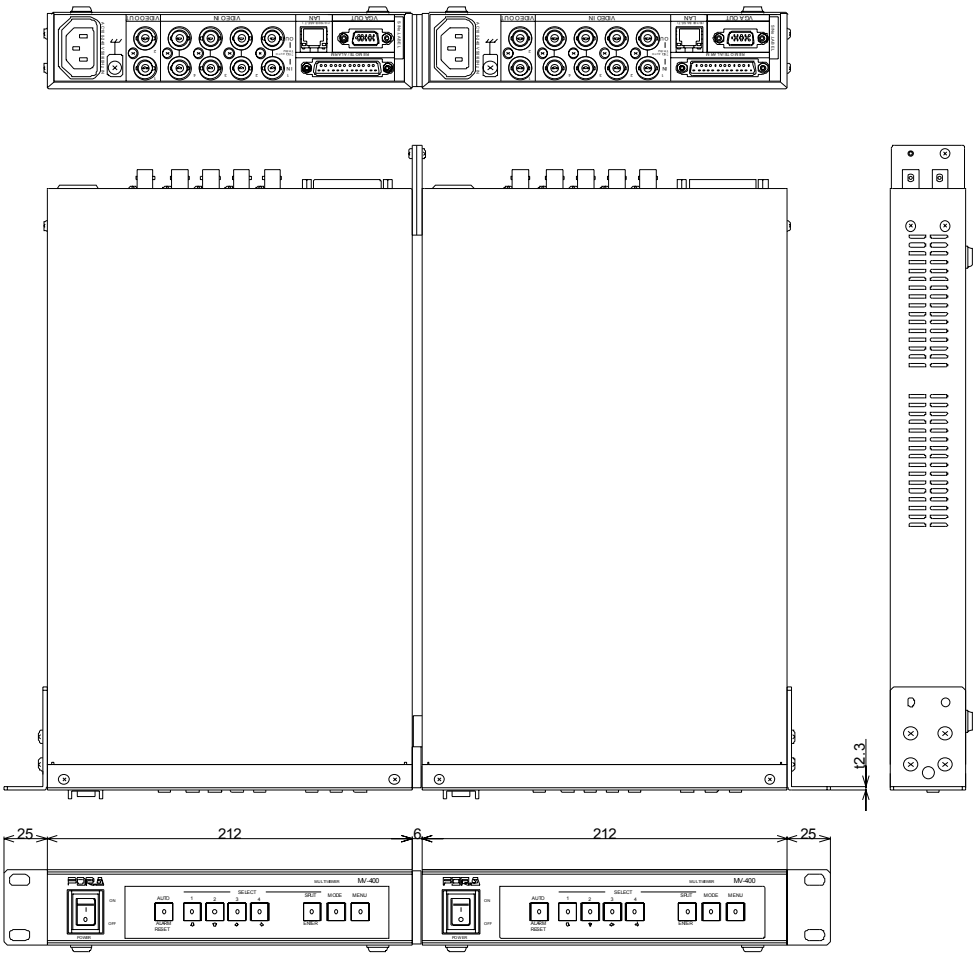
7-3-1. 2 Units Connection Example (Option)

(All dimensions in mm)

◆Installing one unit in rack



◆Installing 2 units in rack



FOR.A®
INNOVATIONS IN VIDEO
and AUDIO TECHNOLOGY

RS-232C/LAN COMMAND

MV-400

Multi Viewer

FOR-A COMPANY LIMITED

Table of Contents

1. Communication Standards

1-1. RS-232C Interface Communication Standards

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

Baud rate	9,600bps
Data length	8 bit
Stop bit	1 bit
Parity	None
X parameter (flow control)	None

NOTE
For the details of the RS-232C interface connector and cable, refer to section 2-3-1-5. "RS-232C" in the MV-400 Operation Manual

1-2. LAN Interface Communication Standard

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

Item	Description
Compatible communication protocol	Data link layer: CSMA/CD Network layer: IP, ICMP, ARP, RARP Transport layer: TCP, UDP Application layer: socket
IP address	Set range: “0.0.0.0” to “255.255.255.255” (except “0.0.0.0” and “1.0.0.0”) * Set from MENU screen of main unit. * The initial setting is “192.168.0.1”.
Subnet mask (Mask length)	Set range: 0 - 31 * Set from MENU screen of main unit. * The initial setting is “24”.
Multicast address	Set range: “224.0.0.0” to “239.255.255.255” (except "224.0.0.0" to "224.0.0.255") * Set from MENU screen of main unit, or by web browser or the LAN command. * The initial setting is "239.255.0.0".
Multicast port	Set range: 1024 - 65535 * Set from MENU screen of main unit, or by web browser or the LAN command. * The initial setting is "2100".
Gateway	Set range: “0.0.0.0” to “255.255.255.255” * Set from MENU screen of main unit. * “0.0.0.0” means that gateway is not set. * The initial setting is “0.0.0.0”.

Item	Description
Port	2000: For receiving image data in video mode. 2001: For sending and receiving commands.
MAC address	Set at the factory (cannot be changed). * The contents can be verified from the MENU screen of the main unit.

NOTE
Refer to section 5-6. “LAN Setting” in the MV-400 Operation Manual for the details of setting on the main unit menu screen.

1-3. Notes for the LAN Interface

1) IP address, Subnet mask, Gateway and Port number settings must be suitable for 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 the existing LAN.

3) The MV-400 cannot establish connection to multiple PCs via LAN.

4) Release the port at the MV-400 when terminating the control from the PC, so that the MV-400 can establish the connection again to the PC or to another PC.

5) The command port (number 2001) automatically shuts down the socket connection when it does not receive a command for 5 seconds.

6) If the security by ID and the password is set on, add the data shown below to the beginning of the command line.

Byte	Parameter	Command	Description
1	Number of characters	1 - 8	The number of ID characters.
*	ID characters	ASCII code Alphanumeric only (See table 1st + 2nd next page)	ID characters: Up to 8 characters.
*	Password data	0 - 9	First digit
		0 - 9	Second digit
		0 - 9	Third digit
		0 - 9	Fourth digit
		0 - 9	Fifth digit

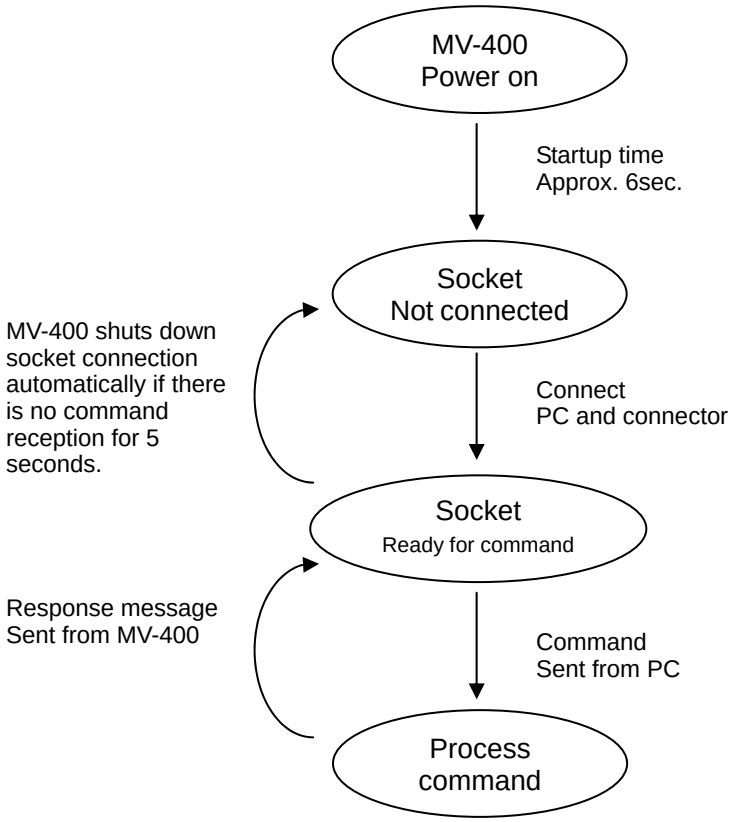
* Total number of bytes depends on the set ID data.

Character Code Table

1st / 2nd	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0		P										
1				1	A	Q										
2				2	B	R										
3				3	C	S										
4				4	D	T										
5				5	E	U										
6				6	F	V										
7				7	G	W										
8				8	H	X										
9				9	I	Y										
A					J	Z										
B					K											
C					L											
D					M											
E					N											
F					O											

Blank cells indicate unavailable character codes.

◆ **MV-400 command flow chart**



1-4. Command Protocol Format

The following command formats are used for commands issued from the serial controller via the RS-232C interface or LAN interface. Commands are issued from the control device in the formats as shown below. For the RS-232C interface, two types of communication protocols are available: the standard and the previous(MV-40F compatible) standard. Which to use is selected by the menu setting. (Refer to section 5-7. "SYSTEM (System Setting)" for selecting a protocol.)

1-4-1. Standard Protocol

All command contents are transmitted and received in ASCII code. Follow the formats to make and send message commands. The command format is as shown in the table below.

◆ **Command Format**

Command code + Command parameter + CR + LF
(2 byte) (Byte that specified for each parameter)

(Works without LF as well)

Ex.: When sending a command to switch channels

Byte	Parameter	Command	Description
1	Command code	S	
2		C	
3	Output mode	0	SXGA mode
		1	Video mode
4-5	Camera channel	01–04	Channel no.: switch to CH1–4
6	End code	CR	
7		LF	

IMPORTANT

The MV-400 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 MV-400. Otherwise, the command cannot be read properly.

1-4-2. Previous Model Protocol

This protocol is compatible to that of For-A product multi viewer MV-40F.
All command contents are transmitted and received in ASCII code. Follow the formats to make and send message commands. The command format is as shown in the table below.
*MV-400 supported commands can be used.
*Previous model protocol is for RS-232C interface.

◆ **Command Format**

STX（02H） + Command parameter + ETX（03H）
(1 byte) (Byte that specifies each parameter) (1 byte)

Ex.: When sending a command to switch channels

Byte	Parameter	Command	Description
1	Start code	STX	（Hex: 02H）
2	Command code	S	
3		F	
4	Camera channel	1–4	Channel no.: switch to CH1–4
5	End code	ETX	（Hex: 03H）

IMPORTANT

The MV-400 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 MV-400. Otherwise, the command cannot be read properly.

1-5. Response Message Format

After sending commands, you will receive response messages from the MV-400.

1-5-1. Standard Protocol

◆ **Normal end**

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

Byte	Parameter	Message	Description
1	Message code	O	"OK"
2		K	
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	Message	Description
1	Message code	E	"ERR"
2		R	
3		R	
4	End code	CR	
5		LF	

1-5-2. Previous Model Protocol

◆ **Normal end**

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

Byte	Parameter	Message	Description
1	Response code	ACK	(Hex: 06H)

◆ **Abnormal end**

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

Byte	Parameter	Message	Description
1	Response code	NAK	(Hex: 15H)

1-6. Image Data Format for Video Output

Set frame rate for video transmission by the video output frame rate command. The frame rate should be set other than 0fps. 0fps is used to cancel the transmission.

IMPORTANT
To transmit video via LAN interface set FUNCTION to NETWORK. If the optional software is installed the video transfer function is available regardless of the FUNCTION setting. Refer to the section 5-7. "SYSTEM (SYSTEM Settings)" of the MV-400 Operation manual for the details. Refer to section 2-7. "Video Frame Rate Command" for the frame rate command details. The video output is available only via LAN interface. It is not available via RS-232C interface. The port number for the transmission is "2000."

(1) When the addition of ALARM/VIDEO LOSS information is off

◆ **Image data format**

Screen code + Data size + JPEG image data
(1 byte) (4 byte) (Variable length)

Screen code: The display mode for the transmitting JPEG image.

Data size: The size of the transmitting JPEG image data. JPEG image data size is the sum of 6th byte to the last byte.

JPEG Image data: The image data after compression. Data size varies. Refer to the written JPEG standard.

Byte	Parameter	Message	Description
1	Screen code	0x01	Full screen display of channel 1
		0x02	Full screen display of channel 2
		0x03	Full screen display of channel 3
		0x04	Full screen display of channel 4
		0x20	Quad screen display (Image size 640×480pixels)
		0x21	Quad screen display (Image size 1280×960pixels) * Available with the optional software
2-5	Data size	0 x xxxxxxxx	Data size of JPEG image data
6 . . (data size) +6	JPEG Image data	JPEG data	JPEG image data

IMPORTANT
Image data formats are all in binary data.

(2) When the addition of ALARM/VIDEO LOSS information is on

◆ **Image data format**

Screen code	+	Alarm info	+	Video loss info	+	Data size	+	JPEG image data
(1 byte)		(2 bytes)		(2 bytes)		(4 bytes)		(Variable length)

Alarm Info: Information of alarm input existence of each channel.
Video loss info: Information of video loss occurrence of each channel.

* When the addition of ALARM/VIDEO LOSS information is on, the MSB (Most Significant Bit) of screen code is 1.

Byte	Parameter	Message	Description
1	Screen code	0x81	Full screen display of channel 1
		0x82	Full screen display of channel 2
		0x83	Full screen display of channel 3
		0x84	Full screen display of channel 4
		0xA0	Quad screen display (Image size 640×480pixels)
		0xA1	Quad screen display (Image size 1280×960pixels) * Available with the optional software
2-3	Alarm information	0x0000 - 0x000F	Bit No.0 - 3 Bit value 0: No alarm Bit value 1: Alarm in progress
4-5	Video loss information	0x0000 - 0x000F	Bit No.0 - 3 Bit value 0: No video loss Bit value 1: Video loss in progress
6-9	Data size	0 x xxxxxxxx	Data size of JPEG image data
10 • • (data size) +10	JPEG Image data	JPEG data	JPEG image data

E.g. If there are alarm inputs to CH1 and CH4, the second and third bytes are 0x0009.

Channel No.	-	-	-	-	-	-	-	-	-	-	-	-	CH 4	CH 3	CH 2	CH 1
Bit No.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Bit value	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Byte value	0				0				0				9			

IMPORTANT

Image data formats are all in binary data. See section 2-9, "Addition of Information on the Image Data Command" for the settings for the addition of ALARM/VIDEO LOSS information.

2. Control Commands (Standard Protocol)

2-1. Full Screen Display Command

Shows channels assigned to SXGA or Video output in full screen mode.
With normal reception and processing, the response message is “OK.”
“ERR” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1	Command code	S	
2		C	
3	Output mode	0	SXGA mode
		1	Video mode
4-5	Camera channel no.	01–04	Display channel: CH1–4
6	End code	CR	
7		LF	

2-2. Split Screen Display Command

Shows channels assigned to SXGA or Video output in split screen type. Split screen type is as set in menu setting.
With normal reception and processing, the response message is “OK.”
“ERR” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1	Command code	S	
2		I	
3	Output mode	0	SXGA mode
		1	Video mode
4	End code	CR	
5		LF	

2-3. Auto Sequencing Start Command

Initiates auto sequencing full screen display of SXGA or Video output.
With normal reception and processing, the response message is “OK.”
“ERR” message is returned during MENU screen display or alarms.

Byte	Parameter	Command	Description
1	Command code	A	
2		S	
3	Output mode	0	SXGA mode
		1	Video mode
4	End code	CR	
5		LF	

2-4. Alarm Reset Command

Resets the alarm. However, external alarm reset is enabled only when the input setting is "TRIG."
With normal reception and processing, the response message is "OK."
"ERR" message is returned during MENU screen display.

Byte	Parameter	Command	Description
1	Command code	A	
2		T	
3	End code	CR	
4		LF	

2-5. Alarm Input Command

Sends alarm input for each channel. However, external alarm input is enabled only when the input setting is "TRIG."
With normal reception and processing, the response message is "OK."
"ERR" message is returned when the external alarm input setting is "LEVEL" or displaying menu screen.

Byte	Parameter	Command	Description
1	Command code	A	
2		I	
3-4	Channel no.	01–04	Channel no: 1–4
5	End code	CR	
6		LF	

2-6. Video Output Command

Selects destination screen to output video.
With normal reception and processing, the response message is "OK."
"ERR" message is returned during MENU screen display.

Byte	Parameter	Command	Description
1	Command code	N	
2		C	
3-4	Display code	01	Display CH1 in full screen
		02	Display CH2 in full screen
		03	Display CH3 in full screen
		04	Display CH4 in full screen
		20	Quad screen (image size 640 x 480pixels)
		21	Quad screen (image size 1280 x 960pixels) *Available with optional software.
5	End code	CR	
6		LF	

2-7. Video Output Frame Rate Command

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

Byte	Parameter	Command	Description
1	Command code	N	
2		F	
3	Frame rate	0	0fps (cancel video output)
		1	NTSC: 1fps, PAL: 1fps
		2	NTSC: 5fps, PAL: 4fps
		3	NTSC: 10fps, PAL: 8fps
		4	NTSC: 15fps, PAL: 12fps
		5	NTSC: 30fps, PAL: 25fps
		6	NTSC: 60fps, PAL: 50fps
4	End code	CR	
5		LF	

IMPORTANT
Set frame rate by the Video output frame rate command to transmit video. The frame rate should be set other than 0fps. 0fps is used to cancel the transmission. Depends on the video to output, JPEG compression ratio, connecting PC, or network environment, the specified frame rate would not be fulfilled. In such case change the compression ratio to size down the data to send and try again. During menu screen display, the video output is cancelled.

2-8. Video Output JPEG Compression Ratio Command

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

Byte	Parameter	Command	Description
1	Command code	N	
2		J	
3	JPEG compression ratio	0	Low image quality
		1	Average image quality
		2	High image quality
		3	Highest image quality
4	End code	CR	
5		LF	

2-9. Addition of Information on the Image Data Command

“ERR” message is returned during MENU screen display.

Byte	Parameter	Command	Description
1	Command code	I	
2		F	
3	Addition of ALARM/VIDEO LOSS information	0	Off
		1	On
4	Reserve	0	
5	Reserve	0	
6	Reserve	0	
7	End code	CR	
8		LF	

3. Status Requests (Standard Protocol)

3-1. Version Request Command

Requests the software version and hardware version of the MV-400.
Returns a [VA] version message after normal reception and processing.

◆ ［**VR**］ **Request command**

Byte	Parameter	Command	Description
1	Command code	V	
2		R	
3	End code	CR	
4		LF	

◆ ［**VA**］ **Responce message**

Byte	Parameter	Message	Description
1	Message code	V	
2		A	
3-5	Software version	XXX	Software version (X.XX)
6-8	Hardware version	YYY	Hardware version (Y.YY)
9	End code	CR	
10		LF	

3-2. Video Format Request Command

Requests the status of current VIDEO format.
Returns a [FA] output status message after normal reception and processing.

◆ ［**FR**］ **Request command**

Byte	Parameter	Command	Description
1	Command code	F	
2		R	
3	End code	CR	
4		LF	

◆ ［**FA**］ **Responce message**

Byte	Parameter	Message	Description
1	Message code	F	
2		A	
3	Video format	0	NTSC
		1	PAL
4	End code	CR	
5		LF	

3-3. Output Mode Request Command

Requests the status of current output mode as in SXGA or VIDEO output.
Returns an [OA] monitor display status message after normal reception and processing.

◆ **［OR］ Request command**

Byte	Parameter	Command	Description
1	Command code	O	
2		R	
3	Output mode	0	SXGA mode
		1	Video mode
4	End code	CR	
5		LF	

◆ **［OA］ Responce message**

Byte	Parameter	Message	Description
1	Message code	O	
2		A	
3	Display mode	0	Standard mode
		1	Alarm display mode
		2	MENU mode
4	Display screen *MENU is fixed to 0	0	Full screen
		1	Split screen
5	Output mode	0	SXGA mode
		1	Video mode
6	Auto sequencing	0	OFF
		1	ON
7-8	Display channel	01–04	Channel no. 1–4 *Split screen and menu display are indicated as 01
9	End code	CR	
10		LF	

3-4. Alarm Information Request Command

Requests the current alarm and video loss information. Channel numbers are given in hexadecimal. Returns an [AA] alarm status message after normal reception and processing.

◆ **［AR］ Request comman**

Byte	Parameter	Command	Description
1	Command code	A	
2		R	
3	End code	CR	
4		LF	

◆ **［AA］ Response message**

Byte	Parameter	Message	Description
1	Message code	A	
2		A	
3-6	Alarm information	0000–000F	Bit no.0-3 Bit value 0: No alarm Bit value 1: Alarm in progress *Bits 4-15 are fixed to 0.
7-10	Video loss information	0000–000F	Bit no.0 - 3 Bit value 0: No video loss Bit value 1: Video loss in progress *Bits 4-15 are fixed to 0.
11	End code	CR	
12		LF	

Example 1: When channel 1 and 4 have alarm inputs, the bytes 3 to 6 are **0009**.

Channel no.	-	-	-	-	-	-	-	-	-	-	-	-	CH 4	CH 3	CH 2	CH 1
Bit no.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Bit value	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Byte value	0				0				0				9			

3-5. Fan Alarm Status Request Command

Requests the fan alarm status.
Returns a [RA] fan alarm status message after normal reception and processing.

◆ **［RF］ Request command**

Byte	Parameter	Command	Description
1	Command code	R	
2		F	
3	End code	CR	
4		LF	

◆ **［RA］ Response message**

Byte	Parameter	Message	Description
1	Message code	R	
2		A	
3	Fan alarm status	0	No fan alarm
		1	Fan alarm
4	End code	CR	
5		LF	

3-6. Video Output Status Request Command

Requests the video output status.
Returns a [NA] fan alarm status message after normal reception and processing.

◆ **［NR］ Request command**

Byte	Parameter	Command	Description
1	Command code	N	
2		R	
3	End code	CR	
4		LF	

◆ **［NA］ Response message**

Byte	Parameter	Message	Description
1	Message code	N	
2		A	
3-4	Display screen	01	Channel 1 in full screen
		02	Channel 2 in full screen
		03	Channel 3 in full screen
		04	Channel 4 in full screen
		20	Quad screen (image size 640 x 480pixels)
		21	Quad screen (image size 1280 x 960pixels) *Available with optional software.
5	Frame rate	0	0fps (No video output)
		1	NTSC: 1fps, PAL: 1fps
		2	NTSC: 5fps, PAL: 4fps
		3	NTSC: 10fps, PAL: 8fps
		4	NTSC: 15fps, PAL: 12fps
		5	NTSC: 30fps, PAL: 25fps
		6	NTSC: 60fps, PAL: 50fps
6	JPEG compression ratio	0	Low image quality
		1	Average image quality
		2	High image quality
		3	Highest image quality
7	End code	CR	
8		LF	

3-7. Addition of Information on the Image Data Status Request Command

Requests the status of addition of alarm/video loss information on the image data.
Returns a [IA] addition of information status message after normal reception and processing.

◆ **[IR］ Request command**

Byte	Parameter	Command	Description
1	Command code	I	
2		R	
3	End code	CR	
4		LF	

◆ **［IA］ Response message**

Byte	Parameter	Message	Description
1	Message code	I	
2		A	
3	Addition of ALARM/VIDEO LOSS information	0	Off
		1	On
4	Reserve	0	
5	Reserve	0	
6	Reserve	0	
7	End code	CR	
8		LF	

4. Menu Setting Control (Standard Protocol)

4-1. Command Format

All menu settings are performed using the [MN] command code. Identify each menu by the menu code and specify the settings.
All command contents are transmitted and received in ASCII code. Follow the formats to make and send message commands. The command format is as shown in the table below.

◆ **Command format**

MN + Menu code + Command parameter + CR + LF
(2 byte)(1 byte/see below) (Byte that specifies each parameter)

(Works without LF as well)

The menu codes are as follows.

Menu Code	Description	Reference
1	TIME SETUP	"4-2-1"
2	ALARM/VIDEO LOSS	"4-2-2"
3	TITLE	"4-2-3"
4	TITLE POSITION	"4-2-4"
5	DISPLAY	"4-2-5"
6	DISPLAY TYPE	"4-2-6"
7	SYSTEM	"4-2-7"
0	MULTICAST ADDRESS / PORT	"4-2-8"

IMPORTANT
"ERR" is returned when a setting command is received while displaying MENU screen.

4-2. Menu Setting Commands

4-2-1. TIME Setting Command

Sets parameter for TIME SETUP menu. Enter time values in decimal number.
“ERR” message is returned during alarm operations.

Byte	Parameter	Command	Description
1	Command code	M	
2		N	
3	Menu code	1	TIME SETUP setting
4-5	Auto sequencing interval	01–60	1–60sec
6-7	Split screen auto reset time	00–60	00 : OFF, 1–60sec
8-9	Alarm reset time	01–60	1–60sec
10–11	Video loss reset time	01–60	1–60sec
12	End code	CR	
13		LF	

4-2-2. ALARM/VIDEO LOSS Setting Command

Sets parameter for Alarm/Video loss menu.
“ERR” message is returned during alarm operations.

Byte	Parameter	Command	Description
1	Command code	M	
2		N	
3	Menu code	2	Alarm/Video loss setting
4	Alarm input	0	Trigger input
		1	Level input
5	Alarm display mode	0	FULL
		1	SPLIT
6	Alarm ON/OFF (SXGA)	0	OFF
		1	ON
7	Video loss ON/OFF (SXGA)	0	OFF
		1	ON
8	Alarm ON/OFF (Video)	0	OFF
		1	ON
9	Video loss ON/OFF (Video)	0	OFF
		1	ON
10	End code	CR	
11		LF	

4-2-3. TITLE Setting command

Sets parameter for Title Set of Title/Position menu.
“ERR” message is returned during alarm operations.

Byte	Parameter	Command	Description
1	Command code	M	
2		N	
3	Menu code	3	Title setting
4–5	Title setting channel	01-04	Channel no. 1–4
6	Title data	ASCII code (See table 1st + 2nd below)	1st character (from the left of the screen)
7			2nd character
8			3rd character
9			4th character
10			5th character
11			6th character
12			7th character
13			8th character
14	End code	CR	
15		LF	

Character Code Table

1st / 2nd	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0		P							タ	ミ		
1			!	1	A	Q					。	ア	チ	ム		
2				2	B	R						イ	ツ	メ		
3				3	C	S						ウ	テ	モ		
4				4	D	T					、	エ	ト	ヤ		
5				5	E	U					・	オ	ナ	ユ		
6				6	F	V					ヲ	カ	ニ	ヨ		
7				7	G	W					ァ	キ	ヌ	ラ		
8			(	8	H	X					ィ	ク	ネ	リ		
9			)	9	I	Y					ゥ	ケ	ノ	ル		
A				:	J	Z					ェ	コ	ハ	レ		
B			+		K						ォ	サ	ヒ	ロ		
C					L						ャ	シ	フ	ワ		
D			-		M						ュ	ス	ヘ	ン		
E					N						ョ	セ	ホ	゛		
F			/	?	O						ッ	ソ	マ	゜		

Blank cells indicate unavailable character codes.

4-2-4. TITLE POSITION Setting Command

Sets parameter for Title Position of Title/Position menu.
Enter title position values in decimal number.
“ERR” message is returned during alarm operations.

Byte	Parameter	Command	Description
1	Command code	M	
2		N	
3	Menu code	4	Title position setting
4	Display screen	0	FULL
		1	QUAD
5-6	Vertical position	(See table below)	Vertical line setting
7-8	Horizontal position		Horizontal line setting
9	End code	CR	
10		LF	

Title position setting range table

Display screen		Vertical position	Horizontal position
FULL	NTSC	00–13	00–36
	PAL	00–16	
QUAD	NTSC	00–08	00–13
	PAL	00–10	

4-2-5. DISPLAY Setting Command

Sets parameter for Display menu.
Enter setting values in decimal number.
“ERR” message is returned during alarm operations.

Byte	Parameter	Command	Description
1	Command code	M	
2		N	
3	Menu code	5	Display setting
4	Split screen setting (SXGA)	0	QUAD: quad screen
		1	V2: V 2 split screen (R/L)
5	Title display ON/OFF (SXGA)	0	OFF
		1	ON
6	Tally display ON/OFF (SXGA)	0	OFF
		1	ON
7	Border display ON/OFF (SXGA)	0	White (WHT)
		1	Black (BLK)
		2	None (OFF)
8	Split screen setting (Video)	0	QUAD: Quad screen
		1	V2-1: V 2 split screen (R/L)
		2	H2-1: H 2 split screen (T/B)
		3	V2-2: Reduced V 2 split screen
		4	H2-2: Reduced H 2 split screen
9	Title display ON/OFF (Video)	0	OFF
		1	ON
10	Mark display ON/OFF (Video)	0	OFF
		1	ON
11	Border display ON/OFF (Video)	0	White (WHT)
		1	Black (BLK)
		2	None (OFF)
12	End code	CR	
13		LF	

4-2-6. DISPLAY TYPE Setting Command

Sets channel assignment and display position for Display menu when 2 split screen display is selected for Display Type.
Enter setting values in decimal number.
“ERR” message is returned during alarm operations.

1) SXGA mode

Byte	Parameter	Command	Description
1	Command code	M	
2		N	
3	Menu code	6	Display Type setting
4	Output mode	0	SXGA mode
5	2 split screen type	1	V2: H 2 split screen
6–7	Sub-screen 1 Channel assignment	01–04	Channel no.: 1–4
8–9	Sub-screen 2 Channel assignment	01–04	Channel no.: 1–4
10	End code	CR	
11		LF	

2) Video mode (Reduced V 2 split screen or Reduced H 2 split screen)

Byte	Parameter	Command	Description
1	Command code	M	
2		N	
3	Menu code	6	Display Type setting
4	Output mode	1	Video mode
5	2 split screen type	3	V2-2: Reduced V 2 split screen
		4	H2-2: Reduced H 2 split screen
6–7	Sub-screen1 Channel assignment	01–04	Channel no.: 1–4
8–9	Sub-screen2 Channel assignment	01–04	Channel no.: 1–4
10	End code	CR	
11		LF	

3) Video mode (V 2 split screen or H 2 split screen)

Byte	Parameter	Command	Description
1	Command code	M	
2		N	
3	Menu code	6	Display Type setting
4	Output mode	1	Video mode
5	2 split screen type	1	V2-1: V 2 split screen (R/L)
		2	H2-1: H 2 split screen (T/B)
6-7	Sub-screen1 Channel assignment	01–04	Channel no.: 1–4
8-9	Sub-screen2 Channel assignment	01–04	Channel no.: 1–4
10–11	Sub-screen1 Display setting	See table below	1/2 screen position setting
12–13	Sub-screen2 Display setting	See table below	1/2 screen position setting
14	End code	CR	
15		LF	

1/2 screen Display image area setting range table

Screen type		Display setting
V2-1: Vertical 2 split screen		01–88
H2-1: Horizontal 2 split screen	NTSC	01–60
	PAL	01–72

IMPORTANT
"ERR" message is returned for assigning same channel to both sub-screens.

4-2-7. SYSTEM Setting Command

Sets parameters for System menu.
“ERR” message is returned during alarm operations.

Byte	Parameter	Command	Description
1	Command code	M	
2		N	
3	Menu code	7	System setting
4	Switch lock	0	OFF
		1	ON
5	Output mode	0	SXGA output
		1	Video output via LAN
		2	SXGA output & Video output via LAN *Available with optional software.
6	End code	CR	
7		LF	

4-2-8. Multicast Address / Port Setting Command

Sets the multicast address and port for LAN menu.
Enter setting values in decimal number.
“ERR” message is returned during alarm operations.

Byte	Parameter	Command	Description
1	Command code	M	
2		N	
3	Menu code	0	Multicast address and port setting
4	First octet	224 - 239	First octet setting
	Delimiter	. (dot)	
	Second octet	0 - 255	Second octet setting
	Delimiter	. (dot)	
	Third octet	0 - 255	Third octet setting
	Delimiter	. (dot)	
	Fourth octet	0 - 255	Fourth octet setting
	Delimiter	: (Colon)	
	Port number	1024 - 65535	Port number setting
	End code	CR	
		LF	

* The number of data bytes differs depending on set value of address or port.

IMPORTANT
The setting range for the multicast address is from "224.0.1.0" to "239.255.255.255". This operation is not supported for RS-232C interface.

4-3. Menu Setting Status Request Commands

4-3-1. TIME SETUP Setting Status Request Command

Requests the setting status of Time Setup parameters.
Setting values are given in decimal.

◆ **［MR］ Request command**

Byte	Parameter	Command	Description
1	Command code	M	
2		R	
3	Menu code	1	TIME SETUP setting
4	End code	CR	
5		LF	

◆ **［RS］ Response message**

Byte	Parameter	Message	Description
1	Command code	R	
2		S	
3	Menu code	1	TIME SETUP setting
4–5	Auto sequencing interval	01–60	1–60 seconds
6-7	Split screen auto reset time	00–60	00: OFF, 1–60 seconds
8–9	Alarm reset time	01–60	1–60 seconds
10–11	Video loss reset time	01–60	1–60 seconds
12	End code	CR	
13		LF	

4-3-2. ALARM/VIDEO LOSS Setting Status Request Command

Requests the setting status of Alarm/Video Loss parameters.

◆ **［MR］ Request command**

Byte	Parameter	Command	Description
1	Command code	M	
2		R	
3	Menu code	2	Alarm/Video loss setting
4	End code	CR	
5		LF	

◆ **［RS］ Response message**

Byte	Parameter	Message	Description
1	Command code	R	
2		S	
3	Menu code	2	Alarm/Video loss setting
4	Alarm input mode	0	Trigger input
		1	Level input
5	Alarm display mode	0	FULL
		1	SPLIT
6	Alarm ON/OFF (SXGA)	0	OFF
		1	ON
7	Video loss ON/OFF (SXGA)	0	OFF
		1	ON
8	Alarm ON/OFF (Video)	0	OFF
		1	ON
9	Video loss ON/OFF (Video)	0	OFF
		1	ON
10	End code	CR	
11		LF	

4-3-3. TITLE Setting Status Request Command

Request the setting status of Title parameters in Title/Position menu.

◆ **［MR］ Request command**

Byte	Parameter	Command	Description
1	Command code	M	
2		R	
3	Menu code	3	Title setting
4–5	Title display channel	01–04	Channel no.: 1–4
6	End code	CR	
7		LF	

◆ **［RS］ Response message**

Byte	Parameter	Message	Description
1	Command code	R	
2		S	
3	Menu code	3	Title setting
4	Title data	ASCII code (See section 4-2-3 Title Setting Command, Character Code Table "1st+2nd" for ASCII code)	1st character (from the left of the screen)
5			2nd character
6			3rd character
7			4th character
8			5th character
9			6th character
10			7th character
11			8th character
12	End code	CR	
13		LF	

4-3-4. TITLE POSITION Setting Status Request Command

Request the setting status of Title Position in Title/Position menu.
The setting values are given in decimal.

◆ **［MR］ Request command**

Byte	Parameter	Command	Description
1	Command code	M	
2		R	
3	Menu code	4	Title position setting
4	Display screen	0	FULL
		1	QUAD
5	End code	CR	
6		LF	

◆ **［RS］ Response message**

Byte	Parameter	Message	Description
1	Command code	R	
2		S	
3	Menu code	4	Title position setting
4–5	Vertical position	See table below	Vertical line setting
6–7	Horizontal position		Horizontal line setting
8	End code	CR	
9		LF	

Title position setting range table

Item code		Vertical position	Horizontal position
FULL	NTSC	00–13	00–36
	PAL	00–16	
QUAD	NTSC	00–08	00–13
	PAL	00–10	

4-3-5. DISPLAY Setting Status Request Command

Requests the setting status of Display parameters.
The setting values are given in decimal.

◆ ［**MR**］ **Request command**

Byte	Parameter	Command	Description
1	Command code	M	
2		R	
3	Menu code	5	Display setting
4	End code	CR	
5		LF	

◆ ［**RS**］ **Response message**

Byte	Parameter	Message	Description
1	Command code	R	
2		S	
3	Menu code	5	Display setting
4	Split screen setting (SXGA)	0	QUAD: quad screen
		1	V2: V 2 split screen (R/L)
5	Title display ON/OFF (SXGA)	0	OFF
		1	ON
6	Tally display ON/OFF (SXGA)	0	OFF
		1	ON
7	Border display ON/OFF (SXGA)	0	White (WHT)
		1	Black (BLK)
		2	None (OFF)
8	Split screen setting (Video)	0	QUAD: Quad screen
		1	V2-1: V 2 split screen (R/L)
		2	H2-1: H 2 split screen (T/B)
		3	V2-2: Reduced V 2 split screen
		4	H2-2: Reduced H 2 split screen
9	Title display ON/OFF (Video)	0	OFF
		1	ON
10	Mark display ON/OFF (Video)	0	OFF
		1	ON
11	Border display ON/OFF (Video)	0	White (WHT)
		1	Black (BLK)
		2	None (OFF)
12	End code	CR	
13		LF	

4-3-6. DISPLAY TYPE Setting Status Request Command

Request the setting status of channel assignments and display when Display Type in Display menu is set to 2-split screen.

◆ **［MR］ Request command**

1) SXGA mode

Byte	Parameter	Command	Description
1	Command code	M	
2		R	
3	Menu code	6	Display type setting
4	Output mode	0	SXGA mode
5	Split screen type	1	V2-1: V 2 split screen (R/L)
6	End code	CR	
7		LF	

2) Video mode

Byte	Parameter	Command	Description
1	Command code	M	
2		R	
3	Menu code	6	Display type setting
4	Output mode	1	Video mode
5	Split screen type	1	V2-1: V 2 split screen (R/L)
		2	H2-1: H 2 split screen (T/B)
		3	V2-2: Reduced V 2 split screen
		4	H2-2: Reduced H 2 split screen
6	End code	CR	
7		LF	

◆ ［**RS**］ **Response message**

1) SXGA mode

Byte	Parameter	Message	Description
1	Command code	R	
2		S	
3	Menu code	6	Display type setting
4-5	Screen1 Channel setting	01–04	Channel no.: 1–4
6-7	Screen2 Channel setting	01–04	Channel no.: 1–4
8	End code	CR	
9		LF	

2) Video mode (Reduced V2 split screen or Reduced H2 split screen)

Byte	Parameter	Message	Description
1	Command code	R	
2		S	
3	Menu code	6	Display type setting
4-5	Screen1 Channel setting	01–04	Channel no.: 1–4
6-7	Screen2 Channel setting	01–04	Channel no.: 1–4
8	End code	CR	
9		LF	

3) Video mode (V2 split screen or H2 split screen)

Byte	Parameter	Message	Description
1	Command code	R	
2		S	
3	Menu code	6	Display type setting
4-5	Screen1 Channel setting	01–04	Channel no.: 1–4
6-7	Screen2 Channel setting	01–04	Channel no.: 1–4
8-9	Screen1 Display setting	See table below	1/2 screen view area setting
10-11	Screen2 Display setting		1/2 screen view area setting
12	End code	CR	
13		LF	

1/2 screen view area setting range table

Split screen type		Display setting
V2-1: V 2 split screen (R/L)		01–88
H2-1: H 2 split screen (T/B)	NTSC	01–60
	PAL	01–72

4-3-7. SYSTEM Setting Status Request Command

Requests the setting status of Display parameters.

◆ **［MR］ Request command**

Byte	Parameter	Command	Description
1	Command code	M	
2		R	
3	Menu code	7	System settings
4	End code	CR	
5		LF	

◆ **［RS］ Response message**

Byte	Parameter	Message	Description
1	Command code	R	
2		S	
3	Menu code	7	System settings
4	Switch lock	0	OFF
		1	ON
5	Operation mode	0	SXGA output
		1	Video output via LAN
		2	SXGA output & Video output via LAN *Available with optional software.
6	Protocol	0	Standard protocol
		1	Previous protocol
7	Fan alarm status	0	No fan alarm
		1	Fan alarm
8-10	Software version	XXX	Software version (X.XX)
11-12	Hardware version	YYY	Hardware version (Y.YY)
13	End code	CR	
14		LF	

4-3-8. Multicast Address / Port Setting Status Request Command

Requests the setting status of Multicast address and port of LAN menu.
The setting values are given in decimal.

◆ **［MR］ Request command**

Byte	Parameter	Command	Description
1	Command code	M	
2		R	
3	Menu code	0	Multicast address and port setting
4	End code	CR	
5		LF	

◆ **［RS］ Response message**

Byte	Parameter	Message	Description
1	Command code	R	
2		S	
3	Menu code	0	Multicast address and port setting
*	First octet	224 - 239	First octet setting
	Delimiter	. (dot)	
	Second octet	0 - 255	Second octet setting
	Delimiter	. (dot)	
	Third octet	0 - 255	Third octet setting
	Delimiter	. (dot)	
	Fourth octet	0 - 255	Fourth octet setting
	Delimiter	: (Colon)	
	Port number	1024 - 65535	Port number setting
	End code	CR	
		LF	

* The number of data bytes differs depending on set value of address or port.

IMPORTANT
This operation is not supported for RS-232C interface.

5. Control Command (Previous Model Protocol)

5-1. Full Screen Display Command

Shows channels assigned to Video output in full screen mode.
With normal reception and processing, the response message is "ACK".
"NAK" message is returned during MENU screen display.

Byte	Parameter	Command	Description
1	Start code	STX	(HEX: 02H)
2	Command code	S	
3		F	
4	Camera channel	1–4	Channel no.: 1–4
5	End code	ETX	(HEX: 03H)

5-2. Quad Screen Display Command

Shows channels assigned to Video output in quad screen mode.
With normal reception and processing, the response message is "ACK".
"NAK" message is returned during MENU screen display.

Byte	Parameter	Command	Description
1	Start code	STX	(HEX: 02H)
2	Command code	S	
3		4	
4	End code	ETX	(HEX: 03H)

5-3. 2-Split Screen Display Command

Shows channels assigned to Video output in 2-split screen type.
With normal reception and processing, the response message is "ACK".
"NAK" message is returned during MENU screen display.

Byte	Parameter	Command	Description
1	Start code	STX	(HEX: 02H)
2	Command code	S	
3		D	
4	Split screen type	1	V2-1: V 2 split screen (R/L)
		2	H2-1: H 2 split screen (T/B)
5	End code	ETX	(HEX: 03H)

5-4. Auto Sequencing Start Command

Initiates auto sequencing full screen display of Video output.
With normal reception and processing, the response message is "ACK".
"NAK" message is returned during MENU screen display or alarms.

Byte	Parameter	Command	Description
1	Start code	STX	(HEX: 02H)
2	Command code	S	
3		A	
4	Screen	F	Full screen auto sequencing
5	End code	ETX	(HEX: 03H)

5-5. 1/2 Screen View Area Setting Command

Sets areas on original outputs to be displayed in the 1/2 screens.
Initiates auto sequencing full screen display of Video output.
With normal reception and processing, the response message is "ACK".
"NAK" message is returned during MENU screen display or when received split screen type command is inappropriate.

Byte	Parameter	Command	Description
1	Start code	STX	(HEX: 02H)
2	Command code	D	
3		M	
4	Split screen type	1	V2-1: V 2 split screen (R/L)
		2	H2-1: H 2 split screen (T/B)
5-6	Screen1 Display setting	See table below	1/2 screen view area setting
7-8	Screen2 Display setting		1/2 screen view area setting
9	End code	ETX	(HEX: 03H)

1/2 screen view area setting range table

Split screen type		Display setting
V2-1: V 2 split screen (R/L)		01–88
H2-1: H 2 split screen (T/B)	NTSC	01–60
	PAL	01–72

5-6. Alarm Reset Command

Resets the alarm reset. However, external alarm reset is enabled only when the input setting is "TRIG."
With normal reception and processing, the response message is "ACK."
"NAK" message is returned during MENU screen display.

Byte	Parameter	Command	Description
1	Start code	STX	(HEX: 02H)
2	Command code	A	
3		R	
4	End code	ETX	(HEX: 03H)

6. Status Requests (Previous Protocol)

6-1. Screen Display Status Request Command

Requests the status of current video output.
"NAK" message is returned during MENU screen display.

◆ **［?G］ Request command**

Byte	Parameter	Command	Description
1	Start code	STX	(HEX: 02H)
2	Command code	?	
3		G	
4	End code	ETX	(HEX: 03H)

◆ **Response message**

Byte	Parameter	Message	Description
1-2 or 1-3	Status message	SF1–SF4	Full screen CH1–4
		S4	Quad split screen
		SD1	V2-1: V 2 split screen (R/L)
		SD2	H2-1: H 2 split screen (T/B)
		SD3	V2-2: Reduced V 2 split screen
		SD4	H2-2: Reduced H 2 split screen
		SAF	Full screen auto sequencing

6-2. Display Mode Status Request Command

Requests the status of current display mode.

◆ **［?M］ Request command**

Byte	Parameter	Command	Description
1	Start code	STX	(HEX: 02H)
2	Command code	?	
3		M	
4	End code	ETX	(HEX: 03H)

◆ **Respose message**

Byte	Parameter	Message	Description
1-2	Display Mode	MD	Standard mode
		MS	MENU mode
		MA	Alarm display mode

6-3. 1/2 Screen View Area Request Command

Requests the status of current 1/2 screen view area setting. With normal reception and processing, the response message is "ACK". "NAK" message is returned during MENU screen display or when received split screen type command is inappropriate.

◆ **［?M］ Request command**

Byte	Parameter	Command	Description
1	Start code	STX	(HEX: 02H)
2	Command code	?	
3		D	
4	Split screen type	1	V2-1: V 2 split screen (R/L)
		2	H2-1: H 2 split screen (T/B)
5	End code	ETX	(HEX: 03H)

◆ **Response message**

Byte	Parameter	Message	Description
1	Command code	D	
2	Split screen type	1	V2-1: V 2 split screen (R/L)
		2	H2-1: H 2 split screen (T/B)
3-4	Screen1 Display setting	See table below	1/2 screen view area
5-6	Screen2 Display setting		1/2 screen view area

1/2 screen view area range table

Split screen type		Display setting
V2-1: V 2 split screen (R/L)		01–88
H2-1: H 2 split screen (T/B)	NTSC	01–60
	PAL	01–72

Warning

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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*The contents of this manual are subject to change without notice.