

OPERATION MANUAL

MV-94F
Multi Viewer

S

1st Edition – Rev.1

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.

[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.

[Circuitry Access]

 A black circle with a white lightning bolt and a plug symbol, with a diagonal slash through it, indicating no power.	<p>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.</p>
 A black circle with a white hand symbol and a diagonal slash through it, indicating no touch.	<p>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.</p>
 A black triangle with a white flame symbol inside, indicating a fire hazard.	<p>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.</p>

[Potential Hazards]

 A black triangle with a white lightning bolt symbol inside, indicating a caution.	<p>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.</p>
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[Consumables]

 A black triangle with a white exclamation mark symbol inside, indicating a caution.	<p>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.</p>
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[Rubber Feet]

 A black circle with a white exclamation mark symbol inside, indicating a caution.	<p>If this product has come with rubber feet attached by screws, do not insert the screws again without rubber feet after removing the rubber feet and screws. It may cause damage to the internal circuits or components of the unit. To install the rubber feet again to the unit, do not use other than the supplied rubber feet and screws.</p>
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Upon Receipt

Unpacking

The MV-94F 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-94F	1	
Rack Mount Brackets	1 set	
AC Cable	1	
Windows 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.

Rack Mounting

The MV-94F units can be mounted to EIA standard rack units. When rack mounting a unit, remove the rubber feet and use the accessory rack mount brackets (rack ears).

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1. Prior to Starting

1-1. Welcome

Congratulations! By purchasing MV-94F Multi Viewer you have entered the world of FOR-A and its many innovative products. Thank you for your patronage and we hope you will turn to FOR-A products again and again to satisfy your video and audio needs.

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

1-2. About the MV-94F

The MV-94F is an economical 9-split multi viewer that accepts asynchronous color or B/W video signal input from up to 9 cameras, reformatting the images for display on a single screen. Including the 9-split display configuration, the MV-94F offers quad, 5+1, and 9.

Dual SPOT OUT connectors are provided to supplement the monitor output connector, allowing the unit to fit easily into a variety of monitoring systems.

The MV-94F supports a wide range of surveillance applications and can fulfill a vital role in monitoring stores, banks, hotels, amusement centers, theaters, and production lines.

Features

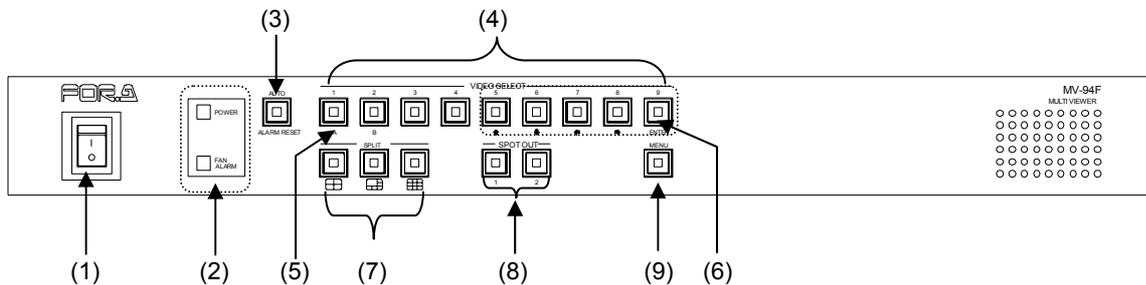
- Can be used in mixed systems with asynchronous color or B/W signals
- Easy system expansion using input loophrough
- Fully adjustable positioning of input images in your designated split frames (* Display of the same channel in multiple frames is unsupported)
- Equipped with dual SPOT OUT connectors for full-screen output of your selected input images
- Auto sequencing functions provided - for both full and split-screen modes
- Video loss detection for notification when the input signal is lost from camera cable damages or camera power failure
- Built-in connector for external alarm system. Links the display to your alarm system
- Operation via remote control or RS-232C/LAN (10/100Base-T) interfaces is supported.
- Equipped with date and time display functions
- Display titles of up to 8 characters per camera (alphabets, numbers and symbols available).
- Installed control software for windows.

1-3. About This Manual

This manual is intended to help the user easily operate the MV-94F and make full use of its functions during operations. Before connecting or operating your unit, read this operation manual thoroughly to ensure you understand the product. After reading, it is important to keep this manual in a safe place and available for reference.

2. Panel Descriptions

2-1. Front Panel



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

IMPORTANT

When powered on, the MV-94F attempts to pick the video standard (NTSC or PAL) automatically based on the input signal it receives. If it is unable to receive a video input, it selects NTSC as a video standard. If you want to use the MV-94F in PAL systems, start up the MV-94F with a video input of PAL format. Also note that the MV-94F cannot use NTSC and PAL formats at the same time. Do not input other format signals during operation.

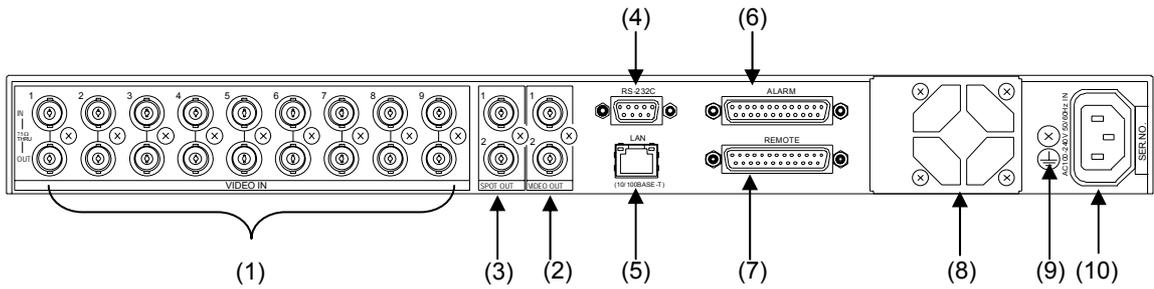
- (2) POWER indicator Green lamp will be lit when the power of the unit is on.
FAN ALARM indicator Red indicator will be lit when the fan stopped.
- (3) AUTO/ALARM RESET
AUTO : When this button is pressed and lamp is lit, display auto sequencing is on.
ALARM RESET : The button flashes when an external alarm signal is received or video loss occurs. Press this button to clear the alarm.

IMPORTANT

External alarms cannot be cleared when LEVEL is chosen for ALARM INPUT. (See section 5-7. "ALARM (Alarm Setting)".)

- (4) VIDEO SELECT 1–9 (Camera select buttons)
Used to select a camera input for full screen display.
- (5) A, B
Used to select display pages for split display. (See section 4-4. "Selecting Split Screen Pages".)
- (6) ENTER
Used to select menu options.
- (7) SPLIT (Split Display Button)
Used to select the split display mode.
(From left to right: quad, 5+1, and 9 split)
- (8) SPOT OUT buttons 1/2
Used for SPOT OUT operation for connectors 1 and 2.
- (9) 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 IN 1-9

The top connectors are used for video signal input. For loopthrough operation, connect other system equipment from the OUT connectors on the bottom. The bottom connectors are auto-terminated.

(2) VIDEO OUT

The video output connector. Select full or split screen output with front-panel operations.

(3) SPOT OUT 1/2

Connectors for the video output of your selected input channels. Always full screen output. Does not support character display output for titles or date/time stamps.

(4) RS-232C

RS-232C interface used for remote control by computer.

(5) LAN(10/100Base-T)

LAN interface used for remote control by computer.

(6) ALARM

Connector for input from an external alarm system.

(7) REMOTE

Connector for remote control.

(8) FAN

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

(9) GROUNDING TERMINAL

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

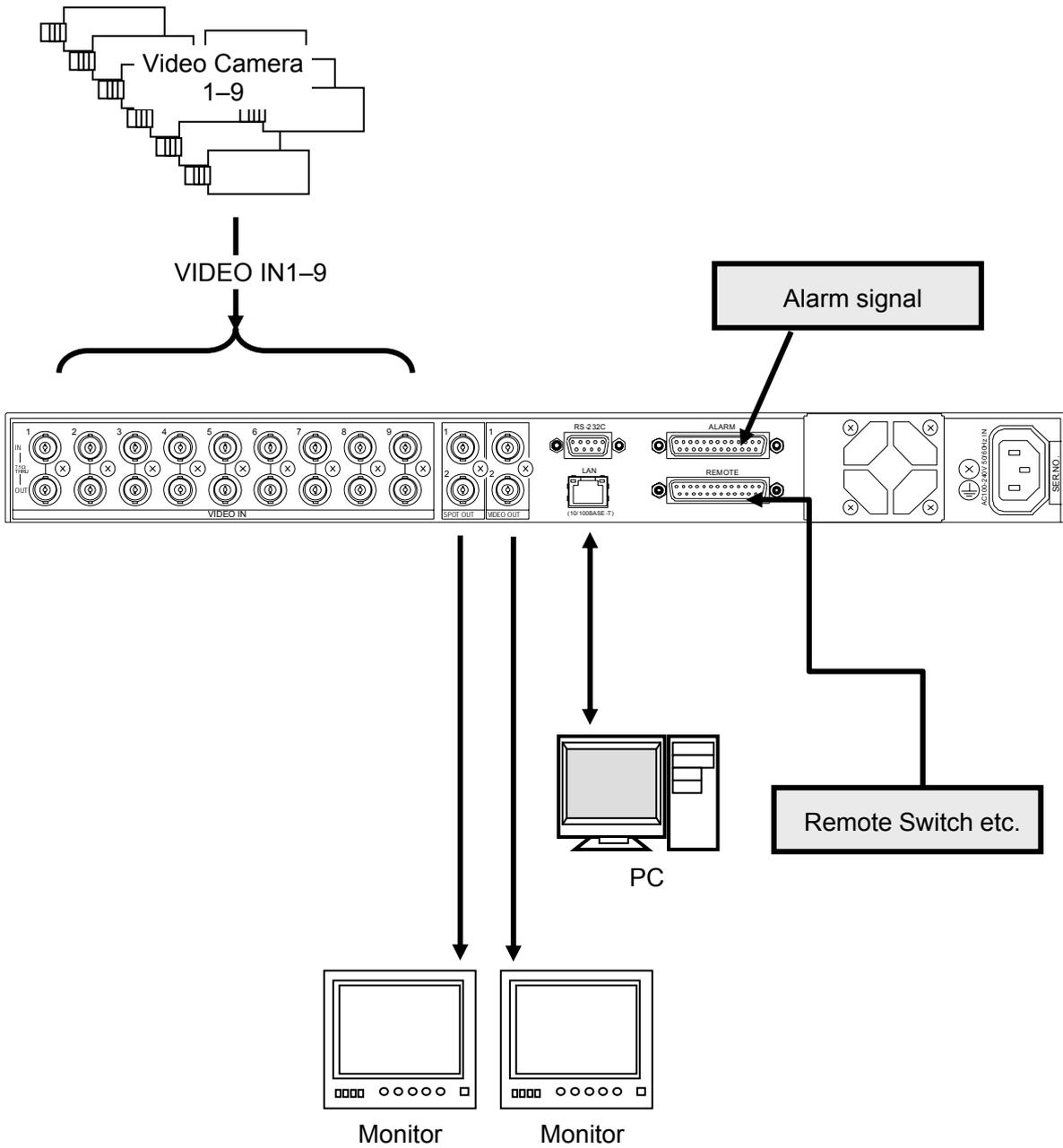
(10) AC IN (AC100-240V 50/60Hz)

Used to supply AC 100V-240V via supplied cable.

3. Connection

3-1. Connection Example 1

The basic configuration is as shown in the figure below.



4. Operating Procedure

4-1. Operation at Startup

After the power turned ON and the sign "INITIALIZE" goes out, operation resumes from the last screen before it was turned OFF.

If menus or alarms were displayed when the unit was turned OFF, operation resumes from the previous mode.

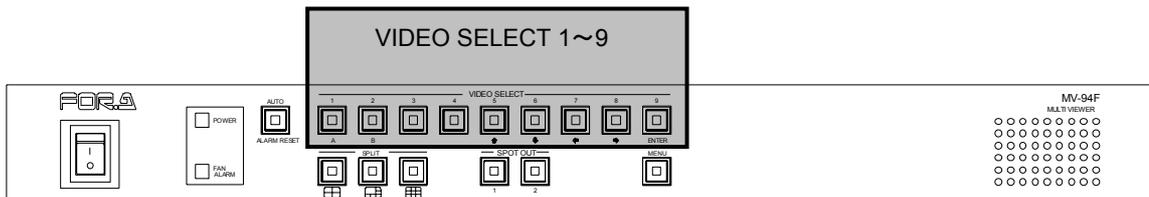
In addition, if the unit was transmitting via the SPOT OUT connectors when turned OFF, operation resumes with output via regular VIDEO OUT connection.

IMPORTANT

If there are any backup problems, "BACKUP ERROR MEMORY CLEAR" is displayed reminding to replace the battery. Contact your For-A dealer for assistance with battery replacement.

4-2. Full Screen Mode

To display your desired channels in full screen mode, use the VIDEO SELECT buttons (1-9). For example, push 3 to view channel 3.



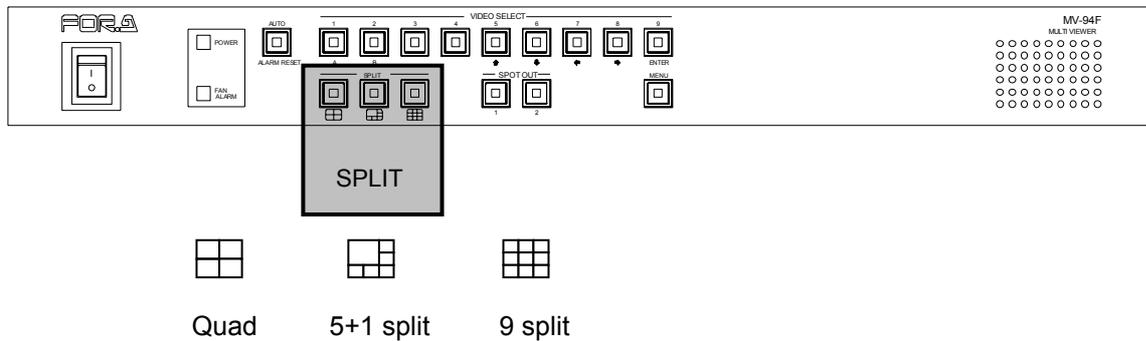
IMPORTANT

A black display is shown for channels without video signals.

Full screen mode for signals from VIDEO SELECT 1-9 is unavailable during SPOT OUT operation, 5 seconds after switching to split page mode, or while menus are displayed. Cancel any of these modes before using full screen mode.

4-3. Split Screen Mode

Press your desired SPLIT button to switch to split mode.

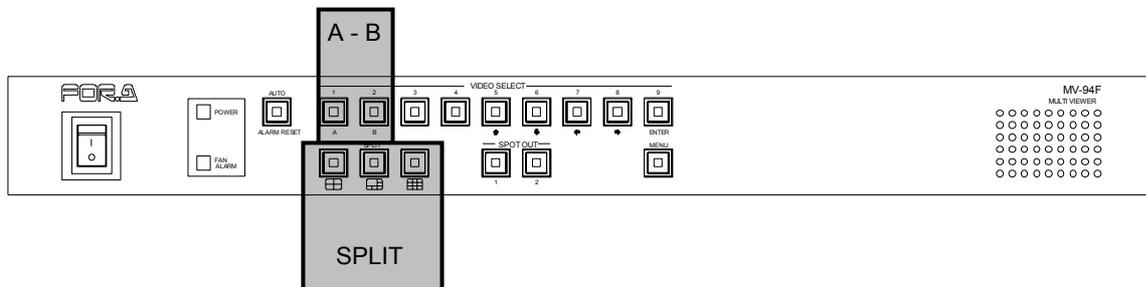


IMPORTANT

Channels without video signals and screens set as BLACK are displayed in black. Use the main menu to specify channels for each split screen display. See section 5-2. "SPLIT POSITION (Adjusting Split Screen Channel Display)".

4-4. Selecting Split Screen Pages

Each split screen shown by the MV-94F can store two pages (A and B) of display channel settings. Follow the below steps to switch the pages of each split screen shown.



1. Press any one of the SPLIT buttons to switch to Split mode. In Split mode, the selected SPLIT button flashes for about 5 seconds.
2. Press the page button (A or B) of the page to be displayed. Split mode is released and the SPLIT selection button will stop flashing and remain lit. To switch between pages (A and B) only, press the same SPLIT selection button again to switch to Split mode, and then select the page button.



For details on display channel settings for each split screen, see section 5-2. "SPLIT POSITION (Adjusting Split Screen Channel Display)".

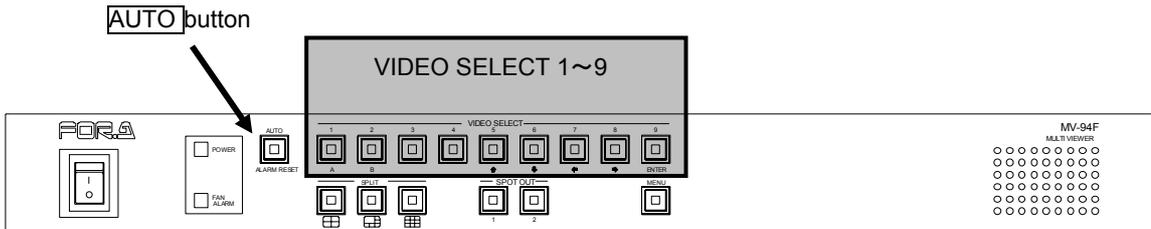
4-5. Auto Sequencing Mode

You can set up the MV-94F for automatic channel switching either in full screen or in split screen mode.



The auto sequencing interval can be adjusted in the menu. See section 5-3. "AUTO SEQUENCE (Setting the Auto Sequencing Interval)".

4-5-1. Full Screen Auto Sequencing

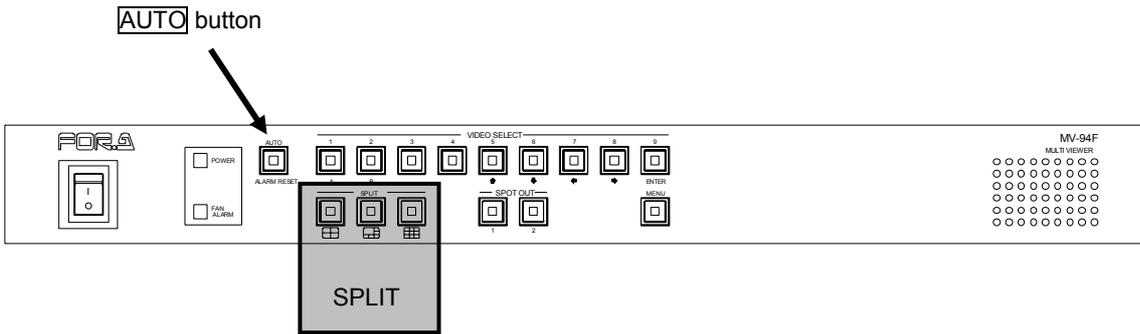


- 1) Press VIDEO SELECT button (1 to 9) for full screen display.
- 2) Press AUTO button. The button will remain lit while the channels are automatically displayed.
- 3) To cancel the auto sequence mode, press any one of VIDEO SELECT buttons or SPLIT buttons.

IMPORTANT

Channels without video signals and channels with the auto sequencing interval set to "0" are automatically skipped.

4-5-2. Split Screen Auto Sequencing



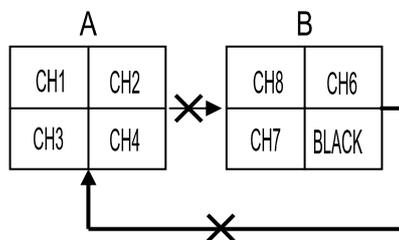
- 1) Press the desired SPLIT button to display the split screen for auto sequencing.
- 2) Press the AUTO button. The button will remain lit while the split pages are automatically displayed.

IMPORTANT
<p>If all channels of a split page meet any of the following conditions, the split page is automatically skipped,</p> <ul style="list-style-type: none"> ● Channels with no video signal. ● Channels with the auto sequencing interval set to "0". (See each channel settings in section 5-3-1. "VIDEO OUTPUT Auto Sequencing Interval Setting") ● Channels set to black (BLACK). (See section 5-2. SPLIT POSITION (Adjusting Split Screen Channel Display)) <p>For the auto sequencing interval of the VIDEO OUTPUT, the SPLIT setting is applied as described in section 5-3-1. "VIDEO OUTPUT Auto Sequencing Interval Setting".</p>

The split page "B" is skipped if the auto sequencing is set as shown in the example below.

Ex.)

Split type	: Quad
CH8, CH6	: No signal
CH7	: Auto sequencing interval is set to "0" for each channel
BLACK	: Black screen setting



4-6. SPOT OUT control

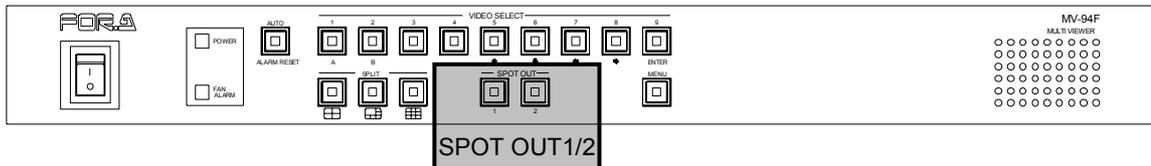
To select the signal output from the SPOT OUT connectors (1 and 2) on the rear panel, first change the operating mode to SPOT OUT. Follow the steps below.

◆ Activating and Canceling SPOT OUT Mode

To select the output video channel from SPOT OUT 1 connector, press the SPOT OUT 1 button to lit to activate the SPOT OUT mode. Similarly, to control the SPOT OUT 2 connector, press the SPOT OUT 2 button to lit.

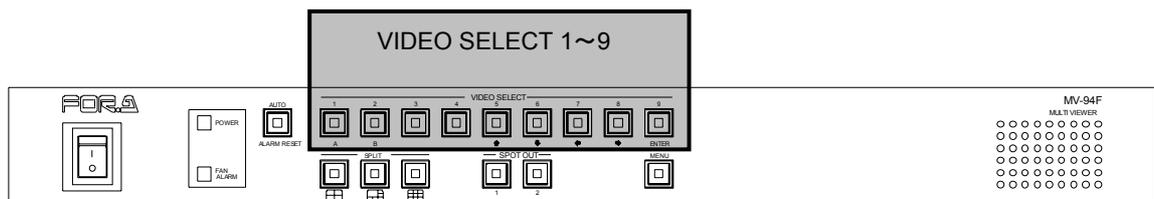
To cancel the SPOT OUT mode, press the lit SPOT OUT button (1 or 2) again. The indicator will go out.

IMPORTANT	
Pressing any one of the SPLIT buttons during SPOT OUT mode will automatically cancel this mode.	
SPOT OUT mode is also canceled if an alarm signal is received or if the menu is accessed.	



◆ Selecting SPOT OUT Display Channel

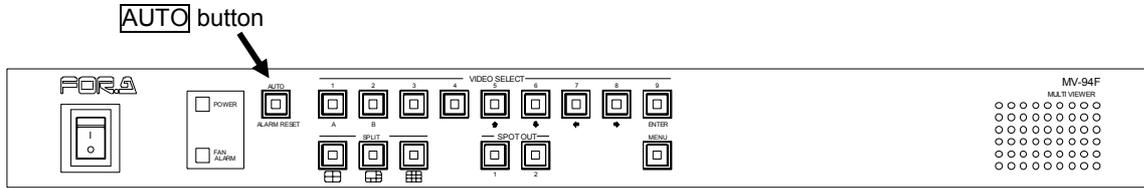
In SPOT OUT mode, press the desired VIDEO SELECT button (1 to 9) to display the channel image selected for SPOT OUT control.



◆ **SPOT OUT Auto Sequencing**

In SPOT OUT mode, press the AUTO button to lit. Auto sequencing of the channels for the selected SPOT OUT (1 or 2) will start.

To cancel the auto sequencing mode, press any one of the VIDEO SELECT buttons (1 to 9).



The auto sequencing interval can be adjusted in the menu. See section 5-3-2. "SPOT OUT 1/2 Auto Sequencing Interval Setting" for details.

IMPORTANT

When performing auto sequencing in SPOT OUT mode with asynchronous inputs, at first a video image will appear distorted.

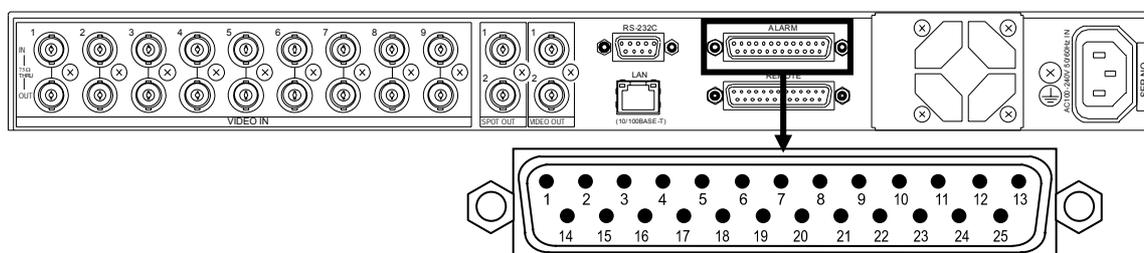
4-7. External Alarm and Video Loss Operations

The following alarm operations are available when an external alarm is received from the ALARM IN connector on the rear panel or when video loss occurs during operations.

IMPORTANT
When the ALARM menu setting is OFF or when the LOSS setting for video loss detection is OFF, the respective alarm operations are deactivated.
Channels without video input when the unit is turned on will not be subject to video loss detection.
See section 5-7. "ALARM (Alarm Setting)".

4-7-1. External Alarm Interface

Connect the external alarm system to the ALARM IN connector on the rear panel.



◆ Connector Pin Assignment Table (25-pin D-sub male)

Pin No.	Function	Description
1	ALARM IN1	Inputs alarm signals for cameras 1-9
2	ALARM IN2	
3	ALARM IN3	
4	ALARM IN4	
5	ALARM IN5	
6	ALARM IN6	
7	ALARM IN7	
8	ALARM IN8	
9	ALARM IN9	
10-13	NC	Do not use
14	+5V	Outputs +5V (Max.200mA DC)
15	MAKE ALARM OUT	Outputs alarm signals
16	COM ALARM OUT	
17	BREAK ALARM OUT	
18-24	NC	Do not use. (Do not connect anything to prevent mislead.)
25	GND	Signal grounding.

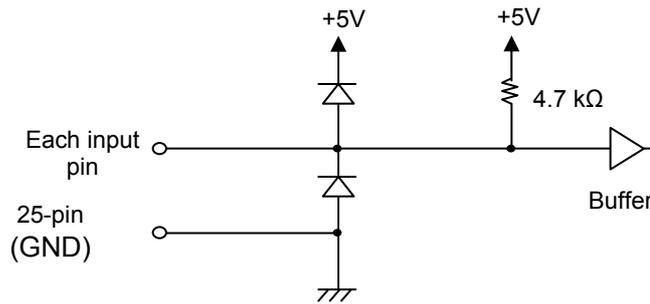
Compatible connector: DB-25SF-N (JAE)

Cover: DB-C4-J11-S1 (JAE)

Signal Standard: TTL negative logic pulse, level signal, or make contact

Input Connector

The figure below depicts the MV-94F circuit for each input connector.

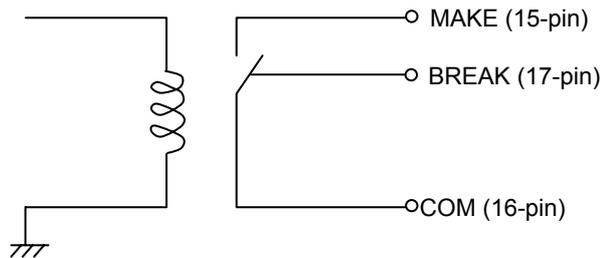


IMPORTANT

The input signal pulse width should be 100 ms or more.

Output Connector

The figure below depicts the MV-94F circuit for the alarm output connector.



Contact capacity : Max. 24V 100mA

(Output Status)

- Normal : BREAK and COM are shorted. MAKE is open.
- During an alarm : MAKE and COM are shorted. BREAK is open.

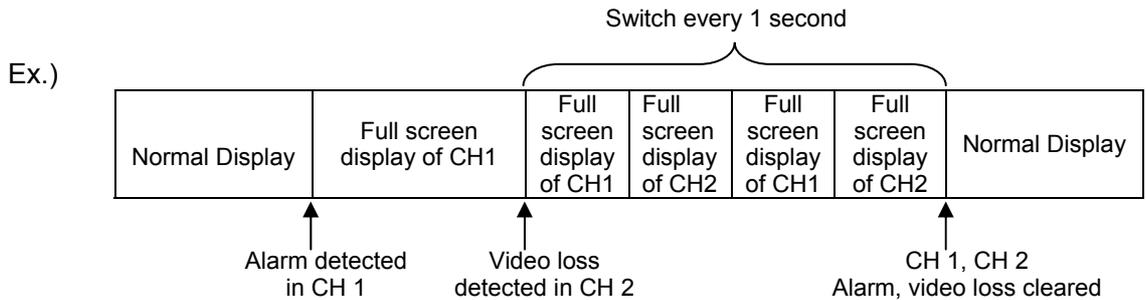
4-7-2. ALARM DISPLAY (Alarm Display)

The following two alarm displays can be specified for automatic consecutive display during external alarms or video loss (Alarm Display mode).

The alarm display to be used is selected in the menu. For setting, See section 5-7. "ALARM (Alarm Setting)".

◆ 'FULL' Setting

When external alarms are received or video loss is detected, the corresponding channel is displayed in full screen mode. If more than one channel is affected, each channel is displayed consecutively for one second. Regular display operation is restored after all external alarms and video loss signals are cleared.

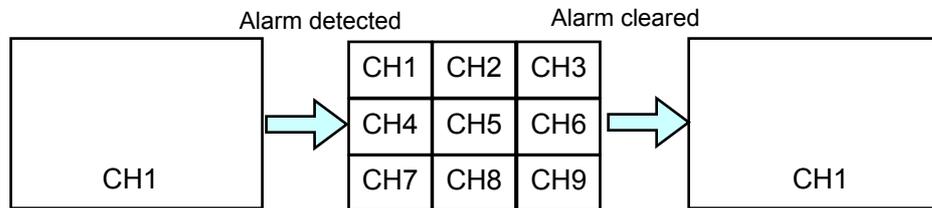


◆ 'SPLIT' Setting

When external alarms are received or video loss is detected, all channels are displayed in 9 split screen mode.

The 9 split display is fixed in the configuration depicted below.

Regular display operation is restored after all external alarms and video loss signals are cleared.



IMPORTANT

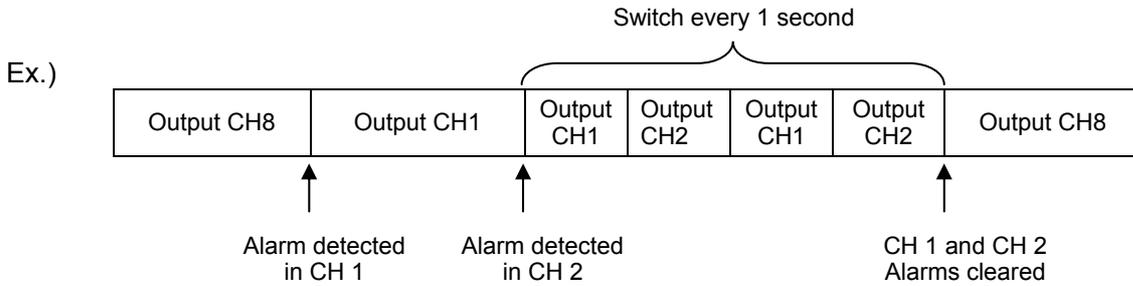
Alarm display will be automatically reset in the following conditions.

- When the set time (Alarm Reset Time) has expired.
- When an alarm reset command is received from the front panel operation, RS232C, or TCP/IP.
- When a video select button or a split control button is pressed during alarm display.
- When the menu is displayed during alarm display.

4-7-3. Alarm SPOT OUT Output Control

The SPOT OUT output signal can be automatically switched to the ALARM affected channel during external alarms. This alarm SPOT OUT output can be set in the menu. For setting, see section 5-7. "ALARM (Alarm Setting)".

When external alarms are received and alarm setting for the SPOT OUT 1 (or 2) is set to ON in the menu, the alarm channel(s) will be displayed in the SPOT OUT 1 (or 2). If more than one channel is affected, alarm channels are displayed sequentially at one-second intervals. Regular display operation is restored after all external alarms are cleared.



IMPORTANT

When performing auto sequencing in SPOT OUT mode with asynchronous inputs, at first a video image will appear distorted.

4-7-4. Buzzer Operation (BUZZER)

The buzzer sounds when external alarms are received or video loss is detected. It continues sounding until all alarms are cleared.

You can set the buzzer ON/OFF for external alarms and video loss separately as desired. For instructions, see section 5-7. "ALARM (Alarm Setting)".

IMPORTANT

Buzzer alarm for the cooling fan failure can be also set ON/OFF in the menu. For instructions, see section 5-7. "ALARM (Alarm Setting)".
--

4-7-5. Alarm Output Operation (ALARM OUT)

Alarm signals can be sent when external alarms are received or video loss is detected by using the ALARM OUT connector on the rear panel. The alarm signal will continue to be sent until all alarms are cleared.

You can enable or disable alarm output for external alarms and video loss separately as desired.

For instructions, see section 5-7. "ALARM (Alarm Setting)".

◆ Alarm Output Circuit

This is identical to the output circuit of the ALARM IN connector.
See section 4-7-1. "External Alarm Interface."

IMPORTANT

Alarm output for the cooling fan failure can be also set ON/OFF in the menu. For instructions, see section 5-7. "ALARM (Alarm Setting)".
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4-7-6. Clearing External Alarm and Video Loss Alarm Status

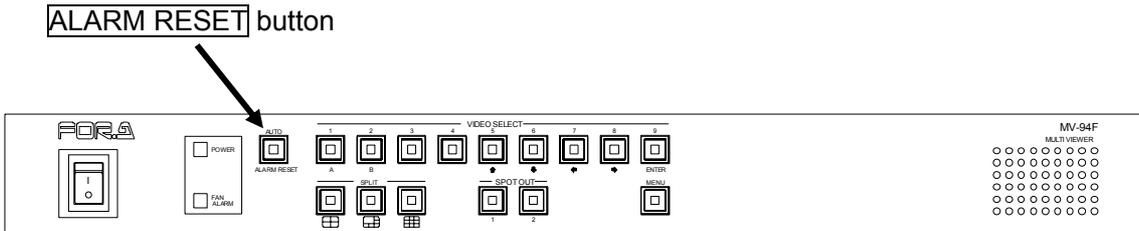
◆ Clearing External Alarm Status

You can clear alarms from external alarm systems by pressing the ALARM RESET button when the external alarm input is set to “TRIG”. (See section 5-7. “ALARM (Alarm Setting)”.)

However, resetting the alarm with the ALARM RESET button is unavailable when the external alarm input is set to “LEVEL”.

◆ Clearing Video Loss Alarm Status

You can clear alarms from video loss detection by pressing the ALARM RESET button at any time.

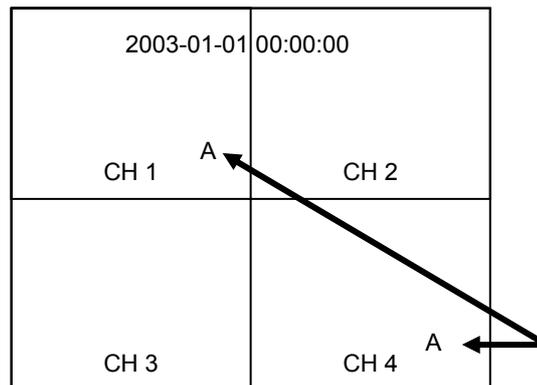


4-7-7. External Alarm and Video Loss Display

The following text is displayed for channels with external alarms or video loss, regardless of the alarm display setting described in section 4-7-2. “ALARM DISPLAY (Alarm Display)”.

◆ External Alarm Display

“A” is shown on the display of each channel for which an external alarm is detected.



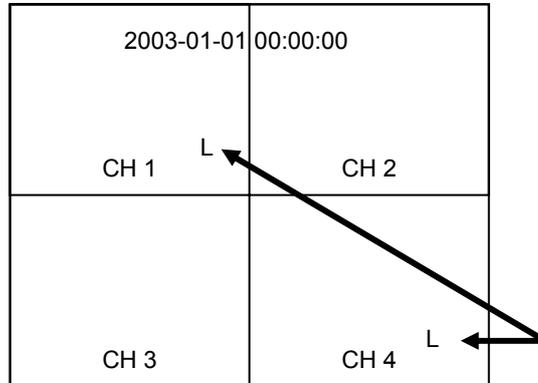
You can turn ON/OFF the “A” display by adjusting the menu settings. See section 5-6. “DISPLAY (Display Setting)”.

◆ Video Loss Display

“L” is shown on the display of each channel affected by video loss.

“L” will remain displayed, even after you clear the video loss alarm until the image is restored for those channels.

A black display is shown for channels affected by video loss.

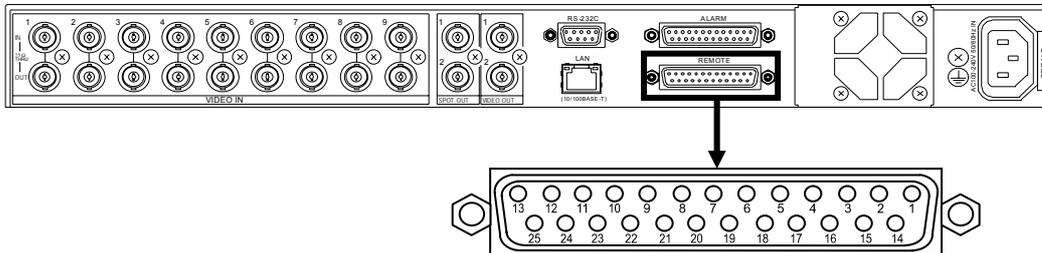


You can turn ON/OFF the “L” display by adjusting the menu settings.

See section 5-6. “DISPLAY (Display Setting).”

4-8. Remote Control (REMOTE connector)

The MV-94F offers remote control by inputting the REMOTE connector on the rear panel. There also is a connector for Time/Date display, enabling you to adjust time and date by remote control.



◆ Connector Pin Assignment Table (25-pin D-sub female)

Pin No.	Function	Details
1	AUTO/ALARM RESET	Identical to AUTO/ALARM RESET on front panel.
2	VIDEO SELECT1	Identical to the VIDEO SELECT buttons on front panel.
3	VIDEO SELECT2	
4	VIDEO SELECT3	
5	VIDEO SELECT4	
6	VIDEO SELECT5	
7	VIDEO SELECT6	
8	VIDEO SELECT7	
9	VIDEO SELECT8	
10	VIDEO SELECT9	
11	SPLIT4	Identical to the SPLIT CONTROL buttons on front panel.
12	SPLIT5+1	
13	SPLIT9	
14	+5V	Outputs +5V (Max.200mA DC)
15	SPLIT A	Used to select Split Page.
16	SPLIT B	
17	NC	Do not use.
18	NC	
19	SPOT OUT1	Identical to SPOT OUT1/2 on front panel.
20	SPOT OUT2	
21	NC	Do not use.
22	NC	
23	ADJUST IN	Used to input time correction pulse.
24	NC	Do not use.
25	GND	Signal grounding

Compatible connector: DB-25PF-N (JAE)

Cover: DB-C4-J11-S1 (JAE)

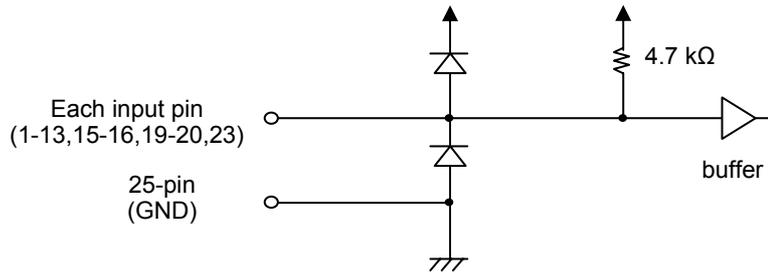
Signal Standard: TTL negative logic pulse, level signal, or make contact

IMPORTANT

The input signal pulse width should be 100 ms or more. Use an input signal interval of 2 seconds or more.

Input Connector

The figure below depicts the MV-94F circuit for each input pin.



4-8-1. Remote Control Instructions

Each pin of the REMOTE control connector should be used the same way as the corresponding front panel buttons.

The only difference is as follows.

- Split mode is unavailable with signals input to the split pins.
To select split pages, supply input signals to the SPLIT connectors A and B (pins 15 and 16).

4-8-2. External Time Correction Input

Time can be corrected by an external minute pulse signal.

Input Pin

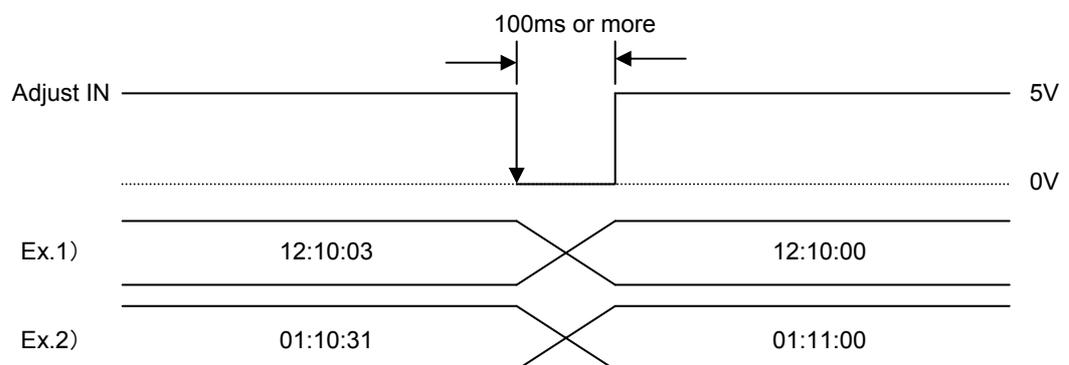
Pin No.23 of the REMOTE connector on the rear panel is used to input the time adjust signal. For details, refer to 4-8. "Remote Control (REMOTE connector)".

Time Correction Function

When inputting the time correction pulse signal, time will be corrected as follows on the falling edge of the signal:

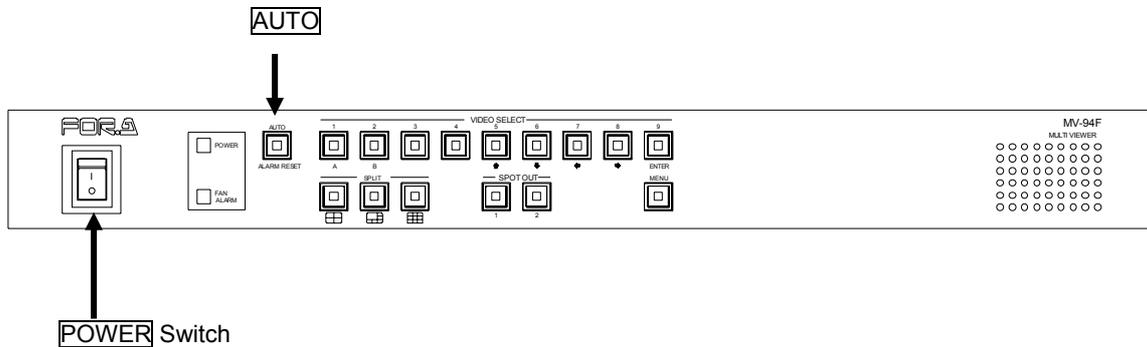
If clock indication is between 1 - 29 seconds, clock is reset to 0 second.

If clock indication is between 30 - 59 seconds, clock is reset to 0 second plus 1 minute.



4-9. Initialization

Although initialization is not normally required, you can restore the MV-94F factory settings when the previous data is no longer needed after relocation or system modification.



Turn the power ON while pressing the AUTO button. Continue pressing the button until 'MEMORY CLEAR' is displayed. This indicates that the initial settings have been restored.

IMPORTANT

Time/Date setting is not initialized.

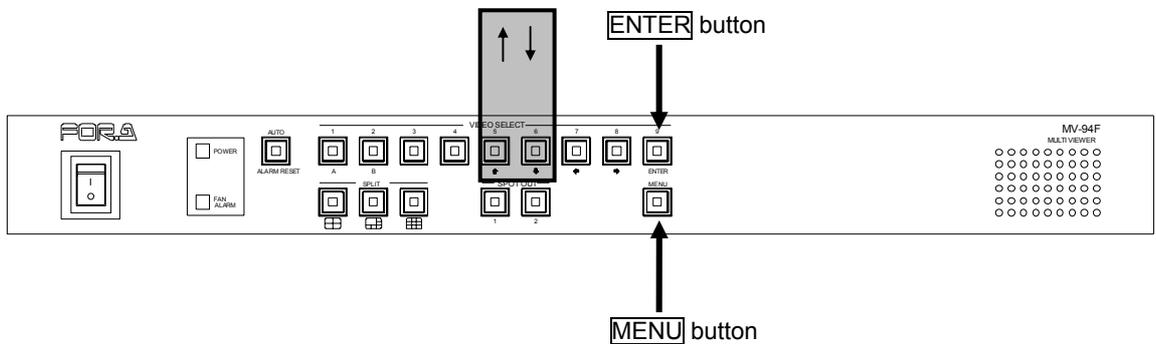
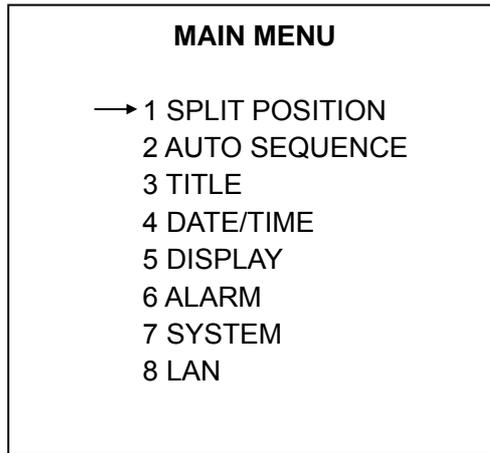
5. Menu Operations

You can access submenus from the main menu to complete various settings.

5-1. Main Menu Display

Press and hold down the MENU button for 2 seconds to display the main menu.

<MAIN MENU Display>



◆ Operating Procedure

Button	ACTION
↑	Used to move the cursor up.
↓	Used to move the cursor down.
ENTER	Used to access the submenu of the item selected.
MENU	Used to exit the menu.

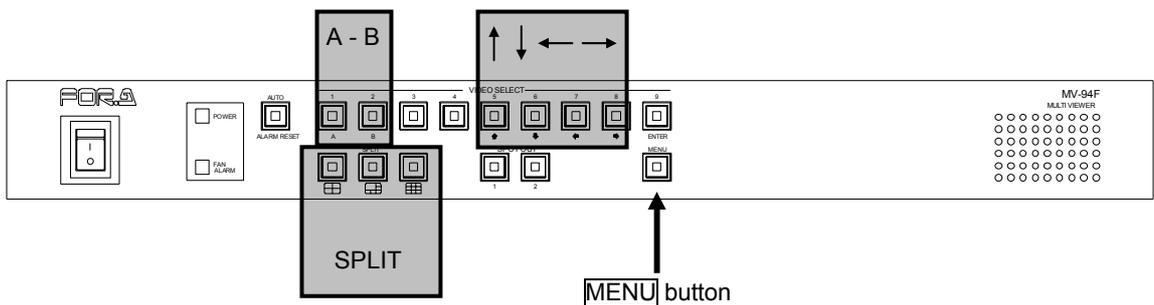
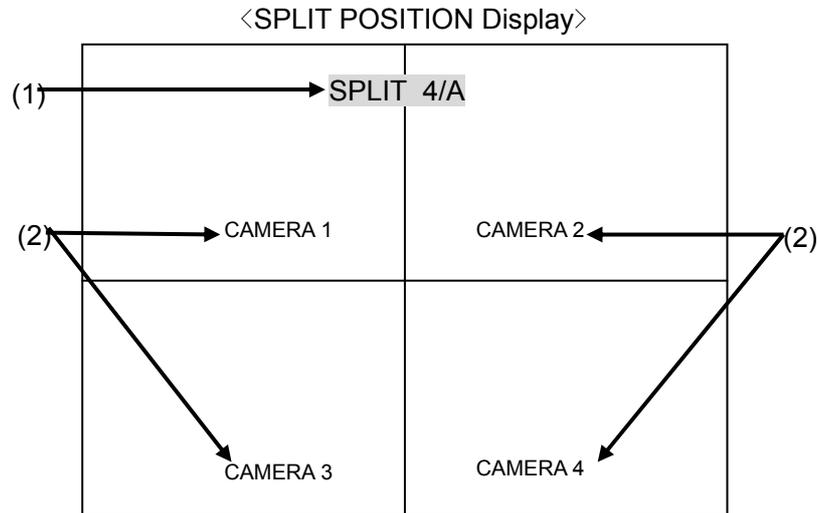
◆ Setting Items

Item	Setting Details	Refer to
(1) SPLIT POSITION	Split screen channel settings	"5-2"
(2) AUTO SEQUENCE	Auto sequencing interval setting (for full and split screens)	"5-3"
	SPOT OUT auto sequencing interval settings	
(3) TITLE	Title settings for each channel	"5-4"
(4) DATE/TIME	Date and time settings	"5-5"
	Date display order setting	
(5) DISPLAY	Title display ON/OFF	"5-6"
	Date/time display ON/OFF	
	Date/time display position setting	
	"A" and "L" display ON/OFF	
	Border display settings	
(6) ALARM	Alarm ON/OFF	"5-7"
	Video loss ON/OFF	
	Alarm mode setting	
	Alarm reset time setting	
	Video loss reset time setting	
	Alarm display setting	
	Buzzer setting	
	Alarm output setting	
(7) SYSTEM	Switch Lock setting	"5-8"
	RS-232C baud rate setting	
	Control Protocol	
(8) LAN	IP Address setting	"5-9"
	Subnet Mask setting	
	Gateway setting	
	Port number setting	

5-2. SPLIT POSITION (Adjusting Split Screen Channel Display)

On the main menu, move the cursor to “SPLIT POSITION” and press the ENTER button. The following channel settings screen is displayed for split screen display.

Use this menu to adjust the settings for all channels displayed in split screen mode. In the channel settings, two pages (A and B) for each split screen can be setup.



◆ Operating Procedure

Button	Action
↑	Used to move the cursor in the opposite direction.
↓	Used to move the cursor into the next position.
← →	Used to change the setting item value.
SPLIT	Used to select the split screen to be set up.
A, B	Used to select the split screen page to be set up.
MENU	Used to return to the main menu.

◆ Initial setting

“SPLIT 4/A”

CH1	CH2
CH3	CH4

“SPLIT 5+1/A”

CH1		CH2
		CH3
CH4	CH5	CH6

“SPLIT 9/A”

CH1	CH2	CH3
CH4	CH5	CH6
CH7	CH8	CH9

“SPLIT 4/B”

CH5	CH6
CH7	CH8

“SPLIT 5+1/B”

CH7		CH8
		CH9
BLK	BLK	BLK

“SPLIT 9/B”

BLK	BLK	BLK
BLK	BLK	BLK
BLK	BLK	BLK

◆ Setting Items

(1) Selecting a split configuration

For selecting the split configuration for customization. Select the configuration between these two ways.

1. Press the SPLIT button and either A or B button.
2. Move the cursor to the setting configuration code of (1), and select it using the ← and → buttons.

After selecting the split configuration, select each channel for display.

(Configuration Identification)

Quad : “SPLIT 4/A” – “SPLIT 4/B”

5+1 split : “SPLIT 5+1/A” – “SPLIT 5+1/B”

9 split : “SPLIT 9/A” – “SPLIT 9/B”

(2) Display Channel Setting

For customizing the split display channels selected in (1).

Use the ↑ and ↓ buttons to move the cursor to the screen for settings adjustment. Use the ← and → buttons to change the settings values.

(Setting value)

Channel 1-9 : “CAMERA 1” – CAMERA 9”

Black screen : “BLACK”

IMPORTANT

Displaying the same channel on multiple sub-screens is unsupported.

If the same channel is specified for more than one sub-screen, split configuration adjustment is disabled and cannot return to the main menu. The monitor will display the message: “DUPLICATE CH CAN’T BE SET”.

In this case, check the channel settings again. and confirm that the same channel is not specified for multiple sub-screens.

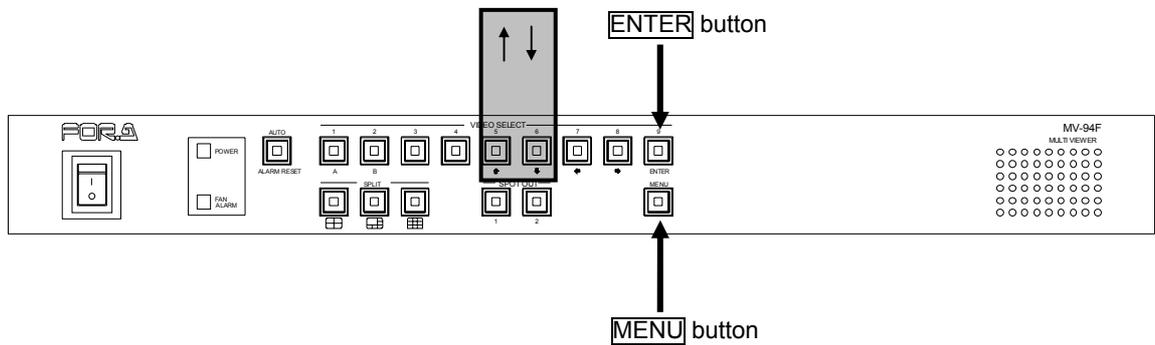
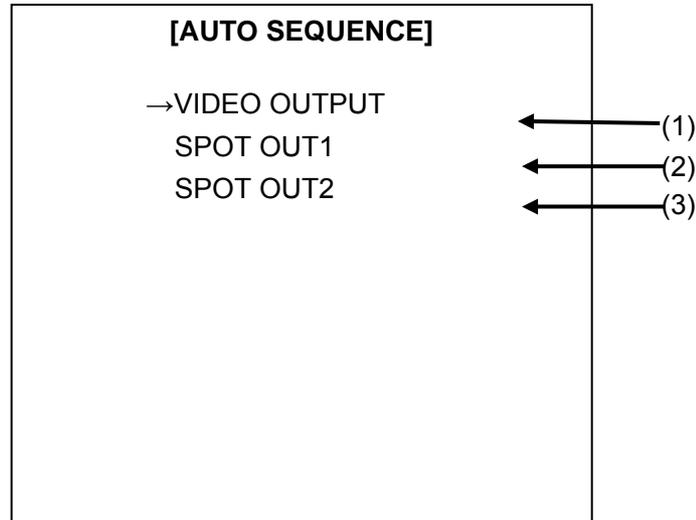
It is possible, however, to specify a black screen (BLACK) for multiple sub-screens.

5-3. AUTO SEQUENCE (Setting the Auto Sequencing Interval)

On the main menu, move the cursor to “AUTO SEQUENCE” and press the ENTER button. The following AUTO SEQUENCE screen is displayed.

Use this screen to adjust the auto sequencing interval for full or split screen display and for output to SPOT OUT 1 and 2.

<AUTO SEQUENCE Screen (Initial Screen)>



Operating Procedure

Button	Action
↑	Used to move the cursor in the opposite direction.
↓	Used to move the cursor into the next position.
ENTER	Used to access the auto sequencing interval setting screen of each output.
MENU	Used to return to the main menu.

Setting Items

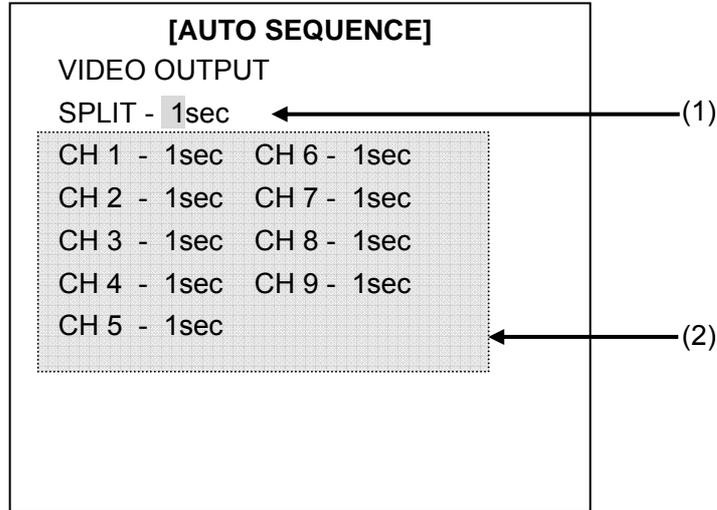
Item	Setting Details	Reference
(1) VIDEO OUTPUT	VIDEO OUTPUT auto sequencing interval setting	“5-3-1”
(2) SPOT OUT1	SPOT OUT1 auto sequencing interval setting	“5-3-2”
(3) SPOT OUT2	SPOT OUT2 auto sequencing interval setting	“5-3-2”

5-3-1. VIDEO OUTPUT Auto Sequencing Interval Setting

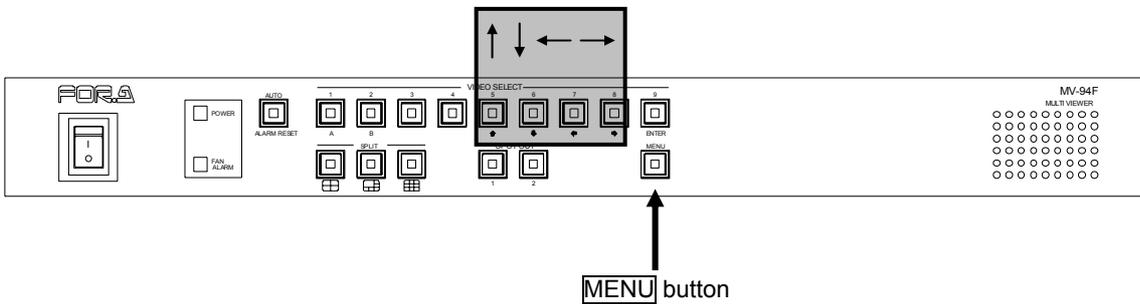
In the AUTO SEQUENCE screen, move the cursor to VIDEO OUTPUT and press the ENTER button. The following screen is displayed.

Use this screen to adjust the auto sequencing interval (for full and split screen) for VIDEO OUTPUT.

<AUTO SEQUENCE screen (VIDEO OUTPUT setting screen)>



* The menu example above shows the factory set default values.



◆ Operating Procedure

Button	Action
↑	Used to move the cursor in the opposite direction.
↓	Used to move the cursor into the next position.
← →	Used to change the setting item value.
MENU	Used to return to the initial AUTO SEQUENCE screen.

◆ **Setting Items**

(1) Split Screen Sequencing Interval (SPLIT)

For specifying the auto sequencing intervals of split screen display (page switching interval).

Settings are adjustable from 1 to 30 seconds.



If there are split pages that you want to automatically skip, in item (2), set all channels displayed on that split page to “0” seconds so the split page can be skipped.

(2) Sequencing Interval for Each Channel

For setting the auto sequencing intervals for each channel during full screen display.

The settings are adjustable from 0 to 30 seconds.

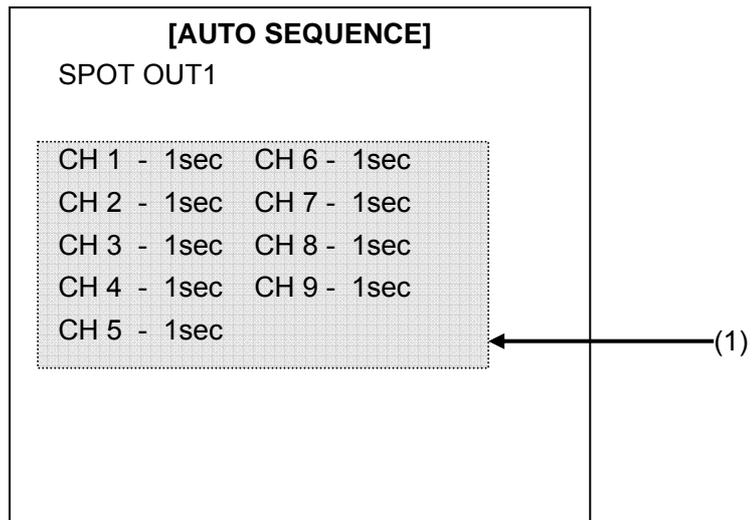
Channels that are set to “0” seconds are automatically skipped.

5-3-2. SPOT OUT 1/2 Auto Sequencing Interval Setting

In the AUTO SEQUENCE screen, move the cursor to SPOT OUT1 or SPOT OUT2 and press the ENTER button. The following screen is displayed.

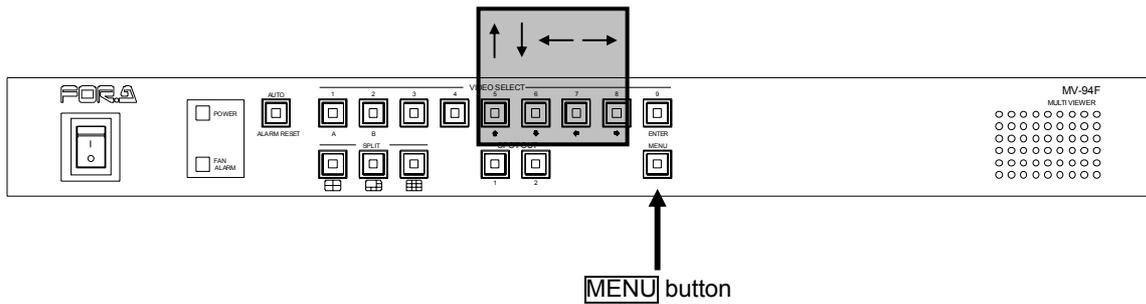
Use this screen to adjust the auto sequencing interval for SPOT OUT1 and 2.

<AUTO SEQUENCE screen (SPOT OUT setting screen)>



* This figure depicts the setting screen when SPOT OUT1 is selected. The same screen structure is used for SPOT OUT2.

* The menu example above shows the factory set default values for SPOT OUT1 (SPOT OUT2).



◆ **Operating Procedure**

Button	Action
	Used to move the cursor in the opposite direction.
	Used to move the cursor into the next position.
	Used to change the setting item value.
MENU	Used to return to the initial AUTO SEQUENCE screen.

◆ **Setting Items**

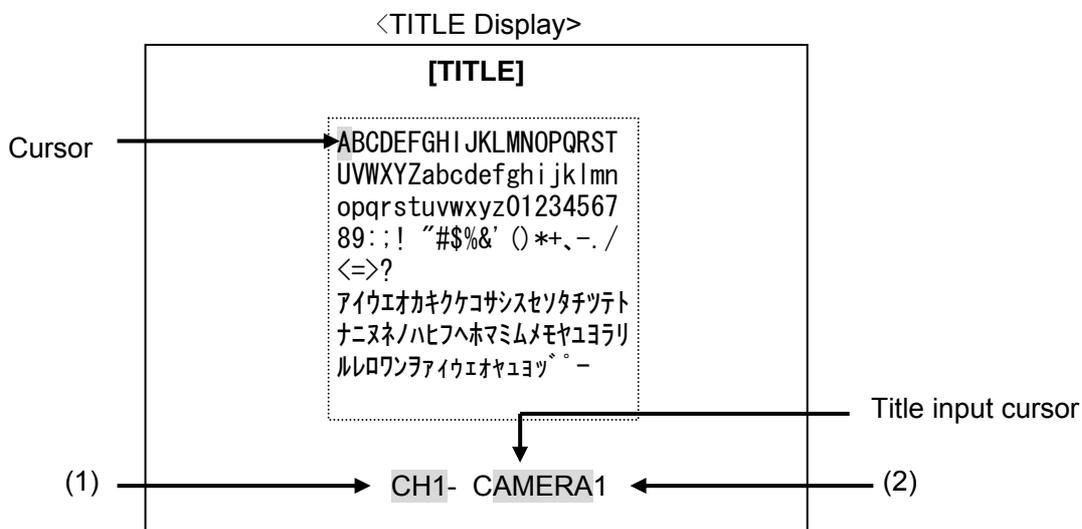
(1) Sequencing Interval for Each Channel

For setting the auto sequencing intervals of each channel for SPOT OUT. The settings are adjustable from 0 to 30 seconds. Channels that are set to "0" second are automatically skipped.

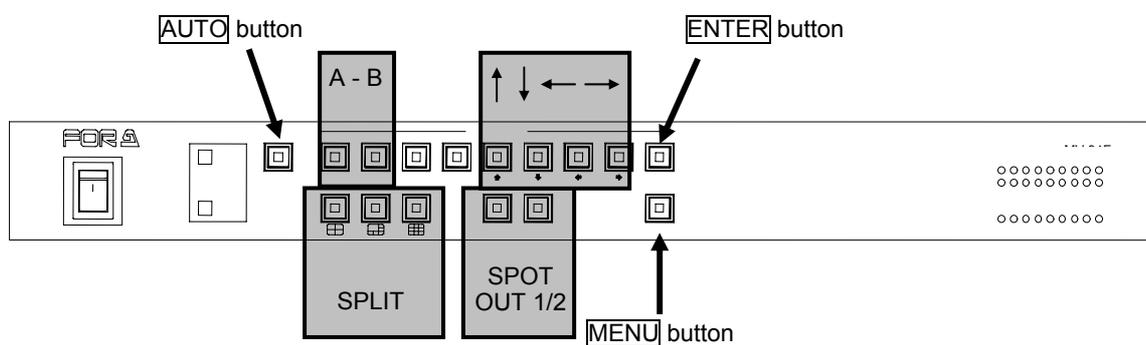
5-4. TITLE (Camera Title Setting)

On the main menu, move the cursor to "TITLE" and press the ENTER button. The following TITLE screen is displayed.

Use this screen to set and display titles (up to 8 characters per camera).



* The default settings are "CAMERA 1" to "CAMERA 9".



◆ Operating Procedure

Button	Action
↑	Used to move the cursor up.
↓	Used to move the cursor down.
←	Used to move the cursor left.
→	Used to move the cursor right.
ENTER	Used to set the cursor at the position where the selected character should be inserted.
SPOT OUT1	Used to move the insertion point left.
SPOT OUT2	Used to move the insertion point right.
AUTO	Used to set the channel to be controlled.
MENU	Used to return to the main menu.

◆ **Setting Items**

(1) Setup Channel

To customize the title settings, use the AUTO button for channel selection.

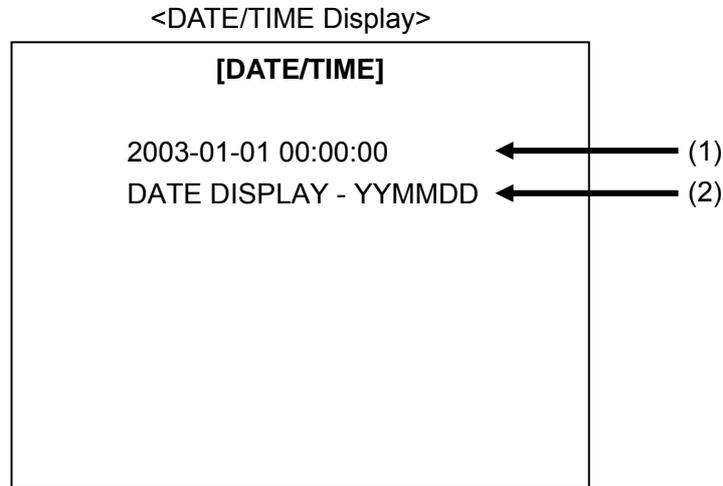
(2) Camera Title Setting

To change a default title, use the ↑, ↓, ←, and → buttons to move the cursor to the character for adjustment. Press the ENTER button to set the cursor at the position where the selected character should be inserted. Use the SPOT OUT buttons (1 and 2) to move the title insertion point left and right.

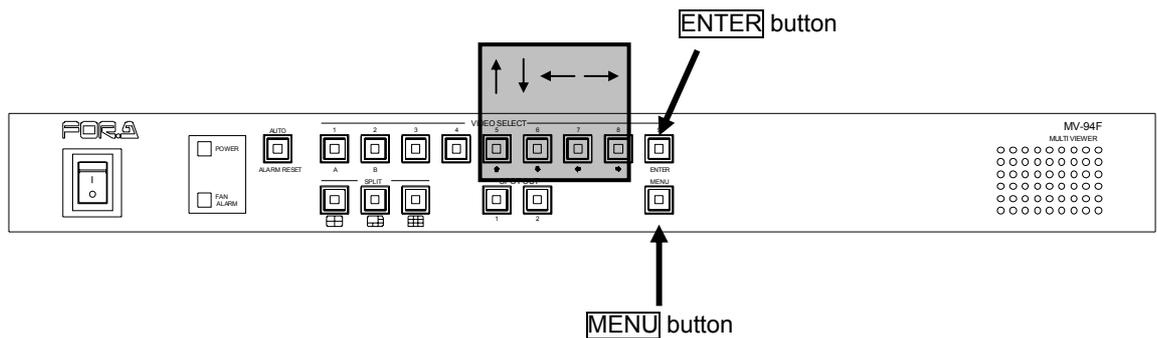
5-5. DATE/TIME (Date/Time Setting)

On the main menu, move the cursor to "DATE/TIME" and press the ENTER button. The following DATE/TIME screen is displayed.

Use this screen to adjust the date, time, and date display order stored by the MV-94F.



* The default date format is YYMMDD.



◆ Operating Procedure

Button	Action
↑	Used to move the cursor in the opposite direction.
↓	Used to move the cursor into the next position.
← →	Used to change the setting item value.
ENTER	The following operations are available in the date/time setting options. <ul style="list-style-type: none"> • Start date/time setup. • Confirm the selected setting and move the cursor right.
MENU	Used to return to the main menu.

◆ **Setting Items**

(1) Date and Time Setting

The date and time settings can be adjusted by moving the cursor and pressing the ENTER button.

During adjustment, use the ← and → buttons to change each setting value. Press the ENTER button to confirm your choice and move the cursor to the next date/time setting. Setup is completed after you enter the value for seconds.

Pressing ↑ or ↓ during setup confirms the changes you have made and move to position (2) .

(2) Date display order setting (DATE DISPLAY)

For specifying the order of the date display.

YYMMDD: year, month, day

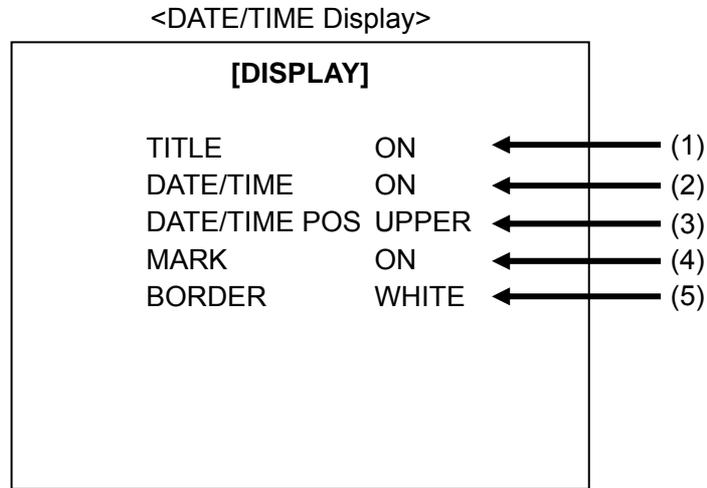
MMDDYY: month, day, year

DDMMYY: day, month, year

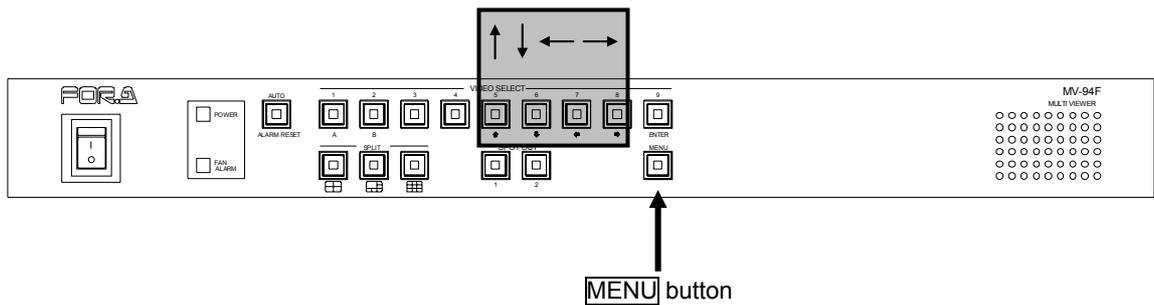
5-6. DISPLAY (Display Setting)

On the main menu, move the cursor to "DISPLAY" and press the ENTER button. The following DISPLAY screen is displayed.

Use this screen to enable or disable the text display and adjust the border color.



* The DISPLAY menu above shows the factory-set default values.



◆ Operating Procedure

Button	Action
↑	Used to move the cursor in the opposite direction.
↓	Used to move the cursor into the next position.
← →	Used to change the setting item value.
MENU	Used to return to the main menu.

◆ **Setting Items**

(1) Camera Title Display Setting (TITLE)

For customizing the camera title display.

- ON : Turn the title display ON.
- OFF : Turn the title display OFF.

(2) Date/Time Display Setting (DATE/TIME)

For setting the date/time display.

- ON : Turn the date/time display ON.
- OFF : Turn the date/time display OFF.

(3) Date/Time Position Setting (DATE/TIME POS)

For positioning the date/time display.

- UPPER : Displayed on the top row.
- LOWER : Displayed on the bottom row.

(4) Other Display Setting (MARK)

For enabling or disabling the “A” during alarms, and the “L” during video loss.

- ON : Turn the mark display ON.
- OFF : Turn the mark display OFF.

(5) Border Color Setting (BORDER)

For setting the border for split configurations.

- WHITE : White
- BLACK : Black
- OFF : None

5-7. ALARM (Alarm Setting)

On the main menu, move the cursor to "ALARM" and press the ENTER button. The following ALARM screen is displayed.

You can set the operation when and how external alarms are received or video loss is detected in this menu.

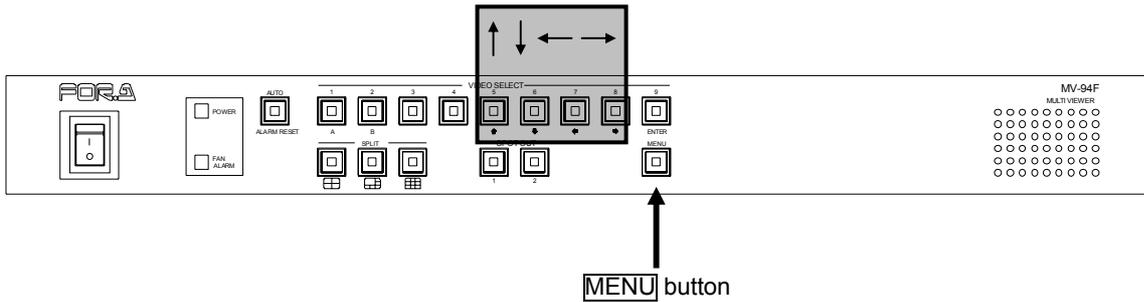
ALARM Display, 1 of 2

[ALARM]		1/2	
ALARM	ON		← (1)
LOSS	ON		← (2)
ALARM INPUT	LEVEL		← (3)
ALARM RESET TIME	30sec		← (4)
LOSS RESET TIME	5sec		← (5)
ALARM DISPLAY	FULL		← (6)
ALM - ON	LOSS - ON		← (7)
SPOT OUT1 DISPLAY			
ALM - ON			← (8)
SPOT OUT2 DISPLAY			
ALM - ON			← (9)

ALARM Display, 2 of 2

[ALARM]		2/2	
BUZZER			
ALM - ON	LOSS - ON	FAN - ON	← (10)
ALARM OUTPUT			
ALM - ON	LOSS - ON	FAN - ON	← (11)

* The menu example above shows the factory-set default values.



◆ Operating Procedure

Button	Action
	Used to move the cursor in the opposite direction.
	Used to move the cursor into the next position.
	Used to change the setting item value.
MENU	Used to return to the main menu.

◆ Setting Items

(1) ALARM (External Alarm Detection Setting)

For setting external alarm detection.

- ON : Turn ON the external alarm detection.
- OFF : Turn OFF the external alarm detection.

(2) LOSS (Video Loss Detection Setting)

For setting video loss detection.

- ON : Turn ON the video loss detection.
- OFF : Turn OFF the video loss detection.

(3) ALARM INPUT (Alarm Input Setting)

For setting on external alarm detection.

TRIG : Determines external alarms when triggered. The alarm is activated when the alarm input signal goes from HIGH to LOW. It is cleared after the period specified in the ALARM RESET TIME elapses. The alarm can also be cleared by pressing the ALARM RESET button on the front panel.

LEVEL : Determines external alarms from the level. The alarm is activated when the alarm input signal is LOW. The ALARM RESET TIME setting is disabled. The alarm cannot be cleared by pressing the ALARM RESET button on the front panel.

(4) ALARM RESET TIME (External Alarm Reset Time)

For setting the alarm reset time when the ALARM INPUT is set to TRIG. The settings are adjustable from 1 to 60 seconds.

IMPORTANT
The reset period setting is disabled when the ALARM INPUT is set to LEVEL.

(5) LOSS RESET TIME (Video Loss Reset Time)

For specifying the interval until the video loss alarm is cleared. The settings are adjustable from 1 to 60 seconds.

(6) ALARM DISPLAY (Alarm Display Setting)

For setting interruption of regular display with images of affected channels if an external alarm occurs or when video loss is detected.

FULL : Full screen display of the channel causing the alarm.

SPLIT : All channels are displayed in 9 split screen mode if alarm occurs.



See section 4-7-2. "ALARM DISPLAY (Alarm Display)" for more specific operation with alarm display settings.

(7) ON/OFF Setting of Alarm Display

ALM : Enables the alarm display settings of (6) if external alarm input is detected.

LOSS : Enables the alarm display settings of (6) if video loss is detected.

IMPORTANT

Alarm display is activated when either Alarm or Video loss is turned on, or both of them are turned ON.

(8) SPOT OUT1 Display Setting

ALM : For specifying whether regular display for SPOT OUT1 output is interrupted with images of affected channels when external alarms are received.

(9) SPOT OUT2 Display Setting

ALM : For specifying whether regular display for SPOT OUT2 output is interrupted with images of affected channels when external alarms are received.



See section 4-7-3. "Alarm SPOT OUT Output Control" for more specific operation with SPOT OUT 1 and 2 settings.

(10) BUZZER (Buzzer Setting)

ALM : For setting ON/OFF the buzzer when external alarms are detected.

LOSS : For setting ON/OFF the buzzer when video loss is detected.

FAN : For setting ON/OFF the buzzer when fan alarm is detected.

(11) ALARM OUTPUT (Alarm Output)

ALM : For setting ON/OFF the alarm output signal when external alarms are detected.

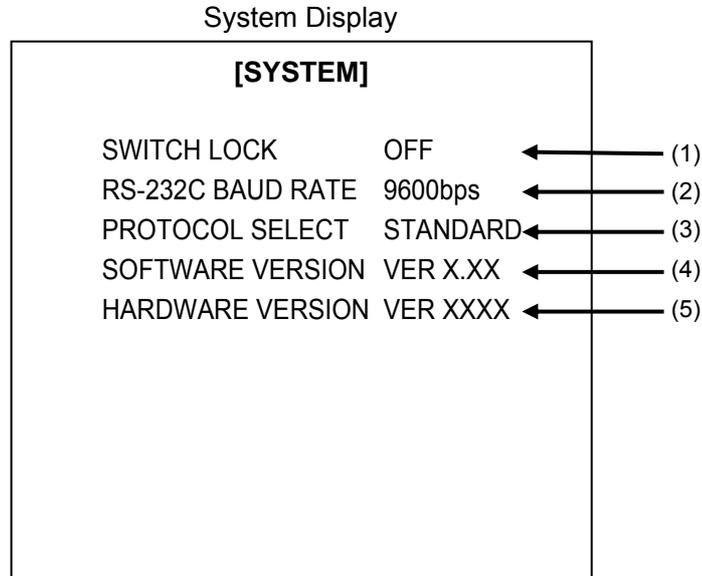
LOSS : For setting ON/OFF the alarm output signal when video loss is detected.

FAN : For setting ON/OFF the alarm out put signal when fan alarm is detected.

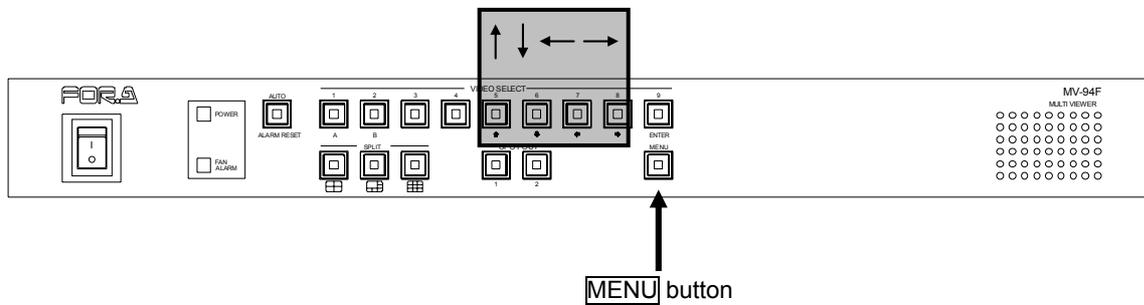
5-8. SYSTEM (System Setting)

On the main menu, move the cursor to “SYSTEM” and press the ENTER button. The following SYSTEM screen is displayed.

Use this screen to adjust serial communication rates and related settings.



* The menu example above shows the factory-set default values.



◆ Operating Procedure

Button	Action
	Used to move the cursor into the opposite direction.
	Used to move the cursor in the next position.
	Used to change the setting item value.
MENU	Used to return to the main menu.

◆ **Setting Items**

(1) SWITCH LOCK (Switch Lock Setting)

For inhibiting the panel control.

OFF : All front panel controls are available.

ON : All front panel controls except menu settings are not available.

IMPORTANT

The MENU button will be flashing to indicate that the front panel operation is locked when any button or switch (except MENU) is used during in LOCK mode.

(2) RS-232C BAUD RATE (RS-232C Communication Rate Setting)

For setting the communication rate of the RS-232C interface.

Six levels settings between 1,200 bps to 38,400 bps are available.

(3) PROTOCOL SELECT (Protocol Setting)

For setting the communication protocol of the RS-232C interface or LAN interface.

STANDARD: Operate with standard protocol. Compatible with MV-162 multi viewer (For-A product).

OLD: Operate with previous protocol. Compatible with MV-94 (previous model of MV-94F)

See Appendix "RS-232C/LAN command" for details.

(4) SOFTWARE VERSION (Software Version)

Displays the version number of the internal software.

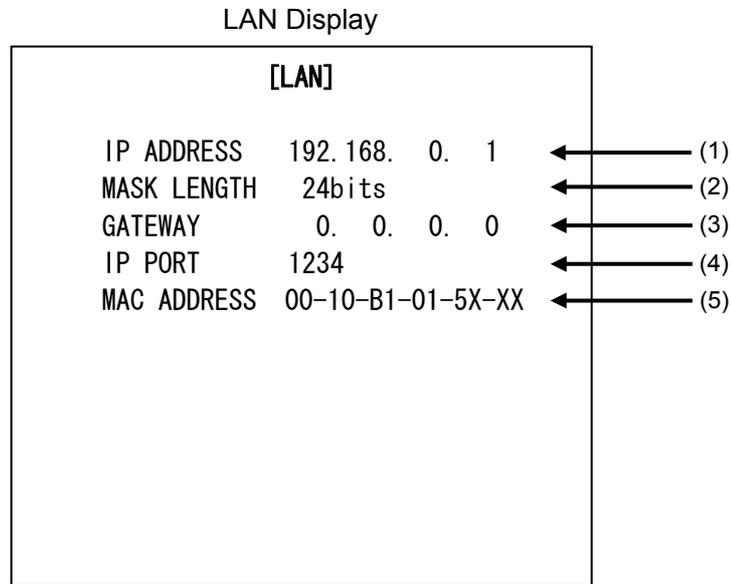
(5) HARDWARE VERSION (Hardware Version)

Displays the firmware version.

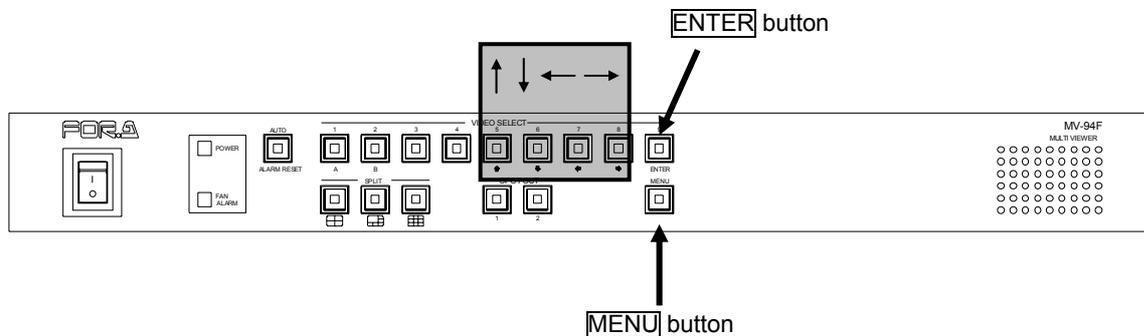
5-9. LAN (LAN Setting)

On the main menu, move the cursor to “LAN” and press the ENTER button. The following LAN screen is displayed.

Use this screen for LAN interface related settings.



* The menu example above shows the factory-set default values.



◆ Operating Procedure

Button	Action
↑	Used to move the cursor into the opposite direction.
↓	Used to move the cursor in the next position.
← →	Used to change the value in 1 increments/decrements.
ENTER+ ← →	Used to change the value in 10 increments/decrements.
MENU	Used to return to the main menu.

◆ **Setting Items**

(1) IP ADDRESS (IP address Setting)

Used to set the IP address of the unit. IP address is required for the LAN interface connection.

Consult your system administrator before configuring the system in the existing LAN. Setting range is from "0.0.0.0" to "255.255.255.255" except "0.0.0.0" and "1.0.0.0".

(2) MASK LENGTH (Sub-net Mask setting)

Used to set the subnet mask of the unit. Setting range is from "0" to "31".

(3) GATEWAY (Gateway setting)

Required only for network communication with gateway. Setting range is from "0.0.0.0" to "255.255.255.255".

(4) IP Port (Port setting)

Used to set the port number for a socket. Setting range is from "0" to "65535" except "23".

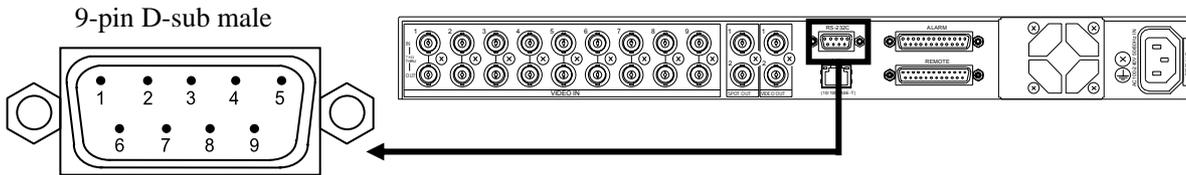
(5) MAC ADDRESS (Mac address setting)

Mac address of the unit. Factory setting. Display only.

6. RS-232C Interface

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

6-1. RS-232C Connector



◆ RS-232C Pin Assignment Table (9-pin D-sub male)

Pin No.	Signal	Input/Output	Signal Details
1	DCD		Not assigned
2	TXD	Output	Transmit data
3	RXD	Input	Receive data
4	DTR	Output	Data terminal ready
5	GND		Signal ground
6	DSR	Input	Data set ready
7	CTS	Input	Clear to send
8	RTS	Output	Request to send
9	RI		Not assigned

◆ Communication Standard

Transmission mode	Asynchronous, Full-duplex
Baud rate	1200 to 38400 [bps] (Set in menu)
Data length	8 [bit]
Stop bit	1 [bit]
Parity	None
X parameter (flow control)	None

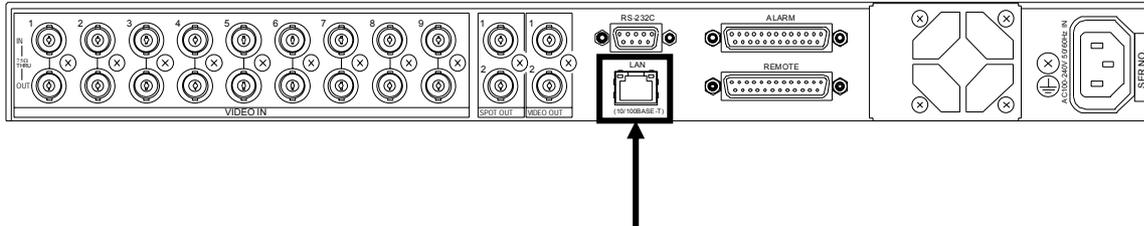
IMPORTANT

DSR/DTR and RTS/CTS are looped back internally. If connecting to a computer or other device, use a RS-232C straight-through cable with a length of 10 m or less.

7. LAN Interface

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

7-1. LAN Connector



◆ LAN Connector Pin Assignment Table (Type RJ-45: Category 5)

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 line -
7	-	Not assigned
8	-	Not assigned

◆ Ethernet Standard

Communication standard	10BASE-T / 100BASE-TX (Auto negotiation)
Transmission speed	10Mbps / 100Mbps
Transmission mode	Bi-directional, Half-duplex, Auto switching
Access method	CSMA/CD (IEEE802.3 compliance)
Connector	RJ-45, Category 5
Cable	Twisted pair cable (UTP or STP), Category 5

◆ Network Setting (Setting in LAN menu)

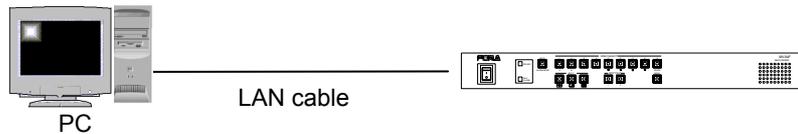
IP address	Setting Range: "0.0.0.0" to "255.255.255.255" (except "0.0.0.0" and "1.0.0.0")
Subnet mask (Mask length)	Setting Range: 0 - 31
Gateway	Setting Range: "0.0.0.0" to "255.255.255.255"
Port	Setting range: "0" to "65535" (except "23")
MAC address	Factory setting (Do not change.)

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.

7-2. Connection Examples

Connect MV-94F directly to PC with LAN cable.

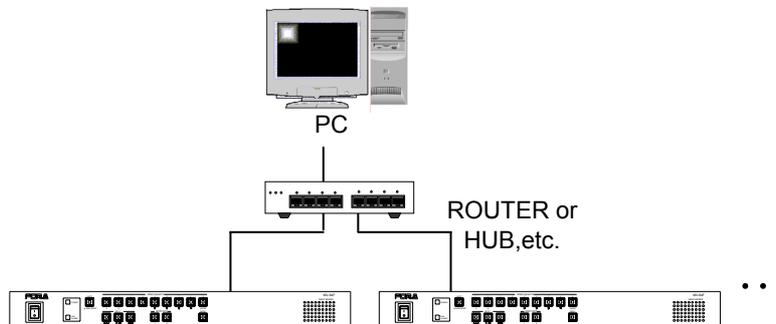


IMPORTANT

Use a cross-over cable to connect MV-94F directly to PC.

7-2-1. LAN Connection Example

In the connection example below, the PC controls multiple MV-94F units via LAN.

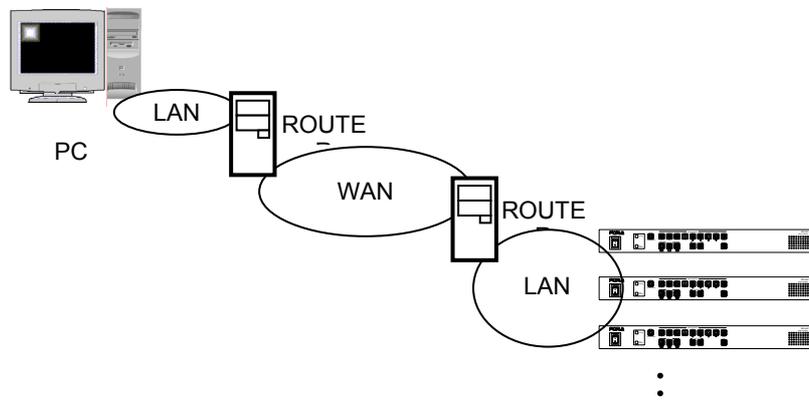


IMPORTANT

The MV-94F cannot establish connection to multiple PCs.

7-2-2. WAN Connection Example

In the connection example below, the PC, which is in another LAN, controls multiple MV-94F units via WAN.



IMPORTANT

The MV-94F cannot establish connection to multiple PCs.

8. If Problems Occur

If any of the following problems occur during operation of your MV-94F, proceed as indicated below to see if problem can be corrected before assuming a unit malfunction has occurred.

Problem	Check	Action
Front panel FAN ALARM indicator is lit or flashes.	Check that no objects are sticking into the fan vent on the rear panel.	Remove any objects if present. If there are no objects, it may be necessary to replace the fan. Contact your dealer for assistance.
After turning the power off, the stored settings data is lost.	Is a "BACKUP ERROR" message displayed when you turn the unit on?	The "BACKUP ERROR" message indicates that the internal battery is dead. Contact your dealer for assistance.
No information is displayed.	Are all information display settings disabled?	Check the display settings in the menu screen. See section 5-6. "DISPLAY (Display Setting)"
Unable to operate settings with front panel buttons.	Is the menu button flashing?	Front panel operation is locked. Cancel the switch lock. See section 5-8. "SYSTEM (System setting)"
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.

9. Specifications & Dimensions

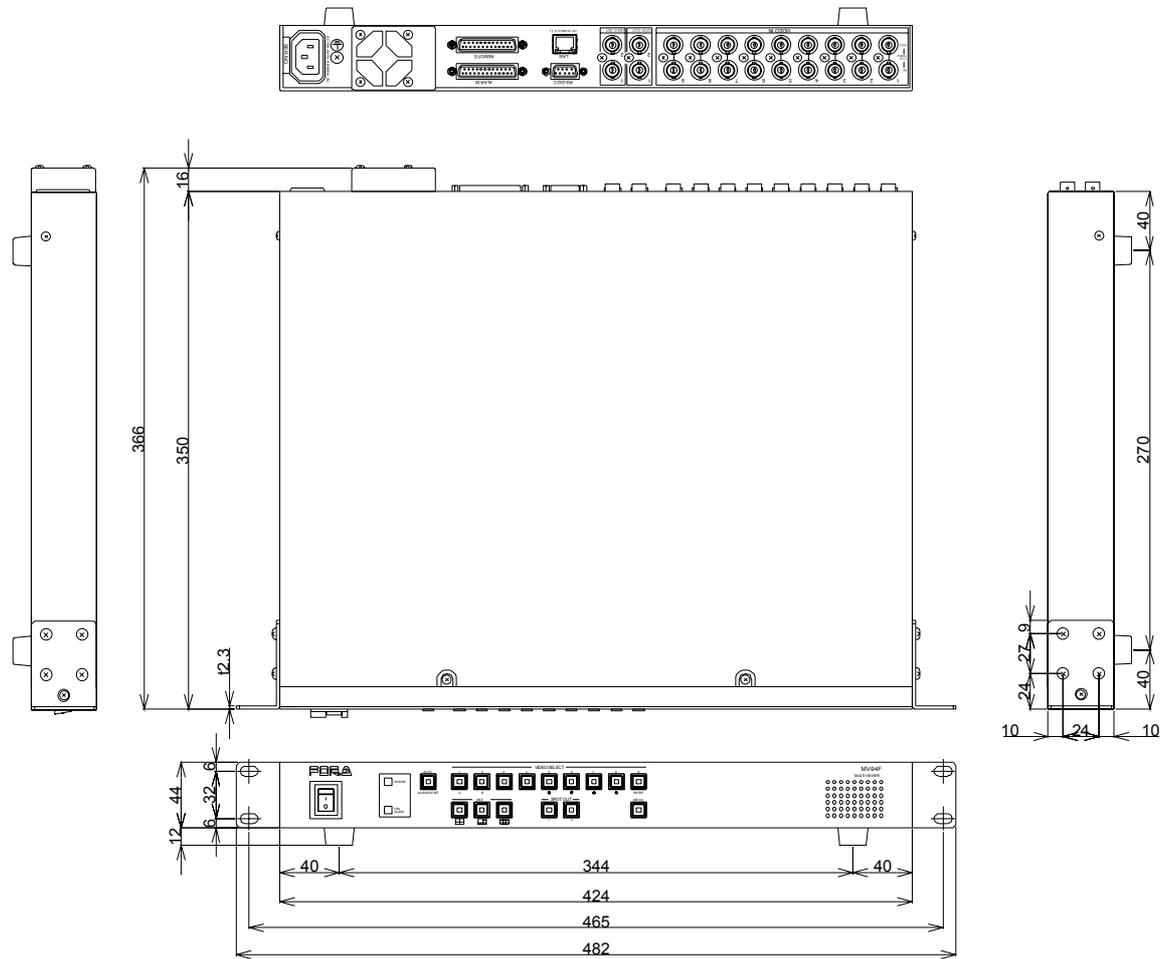
9-1. Unit Specifications

TV Standard	525/60 (NTSC) or 625/50 (PAL) (Auto detection)
Video Inputs	1.0V(p-p) (Color or B/W, 75Ω or loopthrough (automatic termination))
Monitor Input	BNC, 9 inputs (Accepts asynchronous)
Video Output	
VIDEO OUTPUT	Full or split screen 1.0V(p-p) ±0.1V 75Ω BNC 2 outputs
SPOT OUT 1/2	Fixed full-screen output 1.0V(p-p)±0.1V 75Ω BNC 1 output × 2 connectors
Interfaces	
REMOTE	25-pin D-sub, female, 1 ea.
Remote Input	AUTO/ALARM RESET, camera selection (1 to 9), SPLIT/SPLIT page selection, SPOT OUT1 and 2 TTL negative logic pulse or make contact input pulse width 100 ms or more
Time Correction Input	TTL negative logic pulse, or make contact, pulse width 100ms or more.
ALARM	25-pin D-sub, male, 1 ea.
Alarm Input	TTL negative logic pulse, level signal, or make contact Pulse width: 100 ms or more (when set to TRIG), 9 inputs
Alarm Output	Relay make contact output Max. 24V DC 100 mA 1 line, 2 outputs (make and break)
RS-232C	9-pin D-sub male, 1 ea.
LAN	10BASE-T/100BASE-TX, RJ-45 (Category 5), 1 ea.

Screen Display Types	Full screen, split screen (4, 5 plus1, 9)	
Character Display		
Camera Title	8 characters/1 line max. (alphabets, numbers and symbols available).	
Date/Time	MM-DD-YYYY, H:M:S (24 hour indication)	
Warnings		
ALARM	Auto switching to alarm screen, display of "A"	
LOSS	Auto switching to video loss screen, display of "L"	
	* The display labels can be turned ON/OFF in the menu screen	
Time-keeping accuracy	Within ±10 seconds per month (0°C to 40°C)	
Power	100VAC to 240VAC ±10%, 50Hz/60Hz	
Consumption	Approx.28VA (27W) at 100VAC Approx.33VA (26W) at 200VAC	
Temperature	0°C – 40°C	
Humidity	30% – 90% (no condensation)	
Dimensions	424(W) × 44(H) × 350(D)mm	
Weight	Approx. 4.5kg	
Consumables	Battery for data backup: CR-2450	Replace every 5 years
	Cooling fans: P1356	Replace every 5 years

9-2. External Dimensions

(All dimensions in mm)



RS232C/LAN COMMAND

MV-94F
Multi Viewer

1st Edition

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1. Communication Setting

1-1. RS-232C Interface Communication Standards

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

◆ Communication Standard

Transmission mode	Asynchronous, Full-duplex
Baud rate	1200 to 38400 [bps] (Set in menu)
Data length	8 [bit]
Stop bit	1 [bit]
Parity	None
X parameter (flow control)	None

NOTE

For the RS-232C baud rate settings, refer to section 5-8. "SYSTEM (System Setting)" in the MV-94F Operation Manual

For more details about the RS-232C interface connector and cable, refer to section 6. "RS-232C Interface" in the MV-94F Operation Manual

1-2. LAN Interface Communication Setting

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

◆ Network Setting (Setting in LAN menu)

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".
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".
Port	Set range: "0" to "65535" (except "23") * Set from MENU screen of main unit. * The initial setting is "1234".
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 5-9. "LAN (LAN Setting)" in the MV-94F Operation Manual for details.

1-3. Notes on 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-94F cannot establish connection to multiple PCs via LAN.
- 4) Release the port at the MV-94F when terminating the control from the PC, so that the MV-94F can establish the connection again to the PC or to another PC.
- 5) 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.

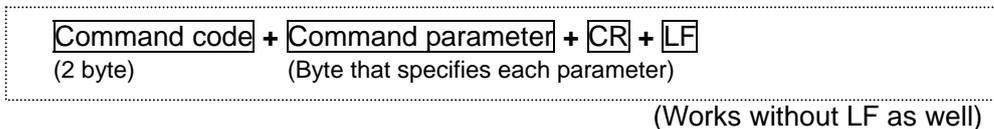
1-4. Command Protocol Format

The following command formats are used for commands issued from the controller via the RS-232C interface or LAN interface. Commands are issued from the control device in the formats as shown below. For setting the communication protocol of the RS-232C interface or LAN interface, two types of communication protocols are available: the new and the previous standards. Which is used is selected by the menu. (Refer to section 5-8. "SYSTEM (System Setting) " for selecting a protocol.)

1-4-1. Standard Protocol

The new standard protocol is compatible with the MV-162 (A 16-split Multi-viewer, For-A product). 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



Ex.: When sending a command to switch channels

Byte	Parameter	Command	Description
1	Command code	S	Channel no. to switch to CH1-9
2		C	
3-4	Camera channel	01-09	
5	End code	CR	
6		LF	



IMPORTANT

The MV-94F 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-94F. Otherwise, the command cannot be read properly.

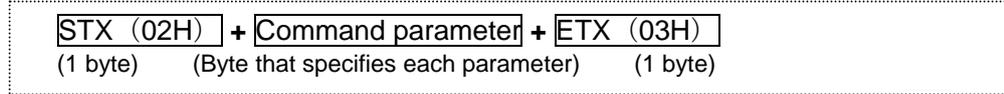
NOTE

Refer to section 2. "Control Commands (Standard Protocol)" to section 4. "Menu Setting Control (Standard Protocol)" for more details on the standard protocol.

1-4-2. Previous Model Protocol

The new standard protocol is compatible with the MV-94 (the previous model, For-A product). 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



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	1-9	Channel no. to switch to CH1-9
5	End code	ETX	(Hex: 03H)

Byte no.

Format parameters

Command contents in ASCII code

IMPORTANT

The MV-94F 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-94F. Otherwise, the command cannot be read properly.

1-5. Response Message Format

After sending commands, you will receive response messages from the MV-94F.

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)

2. Control Commands (Standard Protocol)

2-1. Full Screen Display Command

Shows specified channels 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	
3-4	Channel no.	01-09	Channel no. 1-9
5	End code	CR	
6		LF	

2-2. Split Screen Display Command

Shows specified channels in split screen mode. The last page displayed is shown in split page display.

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	Split type	1	Quad
		2	5+1 split
		3	9 split
4	End code	CR	
5		LF	

2-3. Page Switching Command

Switches the page (A and B) displayed in split screen mode.

With normal reception and processing, the response message is "OK."

"ERR" message is returned during MENU screen display, alarms, or in full screen mode.

Byte	Parameter	Command	Description
1	Command code	P	
2		S	
3	Split page	A, B	Split page A, B
4	End code	CR	
5		LF	

2-4. Auto Sequencing Start Command

Initiates auto sequencing from the screen displayed.

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	End code	CR	
4		LF	

2-5. SPOT OUT Output Setting Command

Displays the specified channels via SPOT OUT output.

With normal reception and processing, the response message is "OK."

Byte	Parameter	Command	Description
1	Command code	S	
2		O	
3	Target SPOT OUT	1	SPOT OUT 1
		2	SPOT OUT 2
4-5	Channel no.	01-09	Channel no. 1-9
6	End code	CR	
7		LF	

2-6. SPOT OUT Auto Sequencing Start Command

Initiates auto sequencing for the specified SPOT OUT output.

With normal reception and processing, the response message is "OK."

Byte	Parameter	Command	Description
1	Command code	A	
2		P	
3	Target SPOT OUT	1	SPOT OUT 1
		2	SPOT OUT 2
4	End code	CR	
5		LF	

2-7. 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."

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

2-8. 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."

Byte	Parameter	Command	Description
1	Command code	A	
2		I	
3-4	Channel no.	01-09	Channel no. 1-9
5	End code	CR	
6		LF	

3. Status Requests (Standard Protocol)

3-1. Status Request Commands

3-1-1. Software Version Request Command

Requests the software version and hardware version of the MV-94F.
Returns a [VA] version message after normal reception and processing.

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

3-1-2. VIDEO Output Status Request Command

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

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

3-1-3. SPOT OUT Output Status Request Command

Requests the status of current SPOT OUT output.
Returns an [SA] SPOT OUT status message after normal reception and processing.

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

3-1-4. Alarm Information Request Command

Requests the current alarm information.

Returns an [AA] alarm status message after normal reception and processing.

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

3-1-5. Date/Time Request Command

Requests the current date and time.

Returns a [DA] date/time message after normal reception and processing.

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

3-1-6. Fan Alarm Status Request Command

Requests the fan alarm status.

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

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

3-2. Status Request Response Messages

In response to each status request command successfully sent from the serial controller and received by the MV-94F, the MV-94F returns a status message to the serial controller.

3-2-1. [VA] Version Message

Returns the software version and hardware version of the MV-94F.

Byte	Parameter	Message	Description
1	Message code	V	
2		A	
3-5	Software version	XXX	Software version (X.XX)
6-9	Hardware version	YYYY	Hardware Version (YYYY)
10	End code	CR	
11		LF	

3-2-2. [OA] Monitor Display Status Message

Returns a status message for the MV-94F monitor output.

Byte	Parameter	Message	Description
1	Message code	O	
2		A	
3	Display mode	0	Regular display mode
		1	Split mode
		3	Alarm display mode
		4	MENU mode
4	Displayed screen Note: Fixed to "0" during MENU display	0	Full screen
		1	Quad
		2	5+1 split
		3	9 split
5	Split page	A, B	Split page A, B * Fixed to "A" when not in split screen mode
6	Auto sequencing status	0	Auto sequencing OFF
		1	Auto sequencing ON
7-8	Displayed channel	01-09	Channel no. 1-9 * Fixed to "0" in split screen mode and during MENU display.
9	End code	CR	
10		LF	

3-2-3. [SA] SPOT OUT Status Message

Returns a status message for the MV-94F SPOT OUT output.

Byte	Parameter	Message	Description
1	Message code	S	
2		A	
3-4	SPOT OUT1 displayed channel	01-09	Channel no. 1-9
5	SPOT OUT1 auto sequencing	0	Auto sequencing OFF
		1	Auto sequencing ON
6-7	SPOT OUT2 displayed channel	01-09	Channel no. 1-9
8	SPOT OUT2 auto sequencing	0	Auto sequencing OFF
		1	Auto sequencing ON
9	End code	CR	
10		LF	

3-2-4. [AA] Alarm Status Message

Returns a status message for MV-94F alarms. Channels with alarm or video loss data are expressed in hexadecimal format.

Byte	Parameter	Message	Description
1	Message code	A	
2		A	
3-6	Alarm information	0000-01FF (see below)	Bit no. 0-8 Bit value 0: No alarm Bit value 1: Alarm in progress * Bit no. 9-15 are fixed to "0."
7-10	Video loss information	0000-01FF (see below)	Bit no. 0-8 Bit value 0: No video loss Bit value 1: Video loss in progress * Bit no. 9-15 are fixed to "0."
11	End code	CR	
12		LF	

Example 1: When channel 1 has alarm input, bytes 4-7 are **0001**.

Channel no.	-	-	-	-	-	-	-	CH 9	CH 8	CH 7	CH 6	CH 5	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	0	0	0	1
Byte value	0				0				0				1			

Example 2: When channels 9 and 6 have alarm inputs, bytes 4-7 are **0120**.

Channel no.	-	-	-	-	-	-	-	CH 9	CH 8	CH 7	CH 6	CH 5	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	1	0	0	1	0	0	0	0	0
Byte value	0				1				2				0			

3-2-5. [DA] Date/Time Message

Returns the current date and time.

Byte	Parameter	Message	Description
1	Message code	D	
2		A	
3-14	Current date and time	00-99	Year (last two digits)
		01-12	Month
		01-31	Day
		00-23	Hour
		00-59	Minute
		00-59	Second
15	End code	CR	
16		LF	

3-2-6. [RA] Fan Alarm Status Message

Returns the fan alarm status.

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

4. Menu Setting Control (Standard Protocol)

4-1. Command Format

Settings Command

All menu settings are performed using the [MN] command code. Identify each menu by the menu code and specify the settings.

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	SPLIT POSITION	4-2-1
2	AUTO SEQUENCE	4-2-2
3	TITLE	4-2-3
4	DATE/TIME	4-2-4
5	DISPLAY	4-2-5
6	ALARM	4-2-6
7	SYSTEM	4-2-7

IMPORTANT

Menu setting control is unavailable ("ERR" returned) during video output and MENU screen display.

4-2. Menu Setting Commands

4-2-1. SPLIT POSITION Setting Command

Specifies channels for split screen display.

Byte	Parameter	Command	Description
1	Command code	M	
2		N	
3	Menu code	1	SPLIT POSITION
4	Target split type	0	Quad
		1	5+1 split
		2	9 split
5	Split page	0	Split page A
		1	Split page B
6-(n-2)	Channel setting (see below ex.)	00	Black screen (BLK)
		01-09	Channel no. 1-9
(n-1)	End code	CR	
n		LF	

*Example of quad display settings (when the fourth byte is "0")

1ch (01)	09ch (09)
06ch (06)	Black screen (00)

For the settings shown at left, enter **01090600** for byte no. "6-(n-2)".
In the channel setting portion, the byte number is 8 for quad, 12 for 5+1 split,
and 18 for 9 split display.

IMPORTANT

Displaying the same channel in multiple positions of a split screen is unsupported. However, it is possible to assign black screen display for multiple positions of a split screen.

"ERR" message is returned if the specified assignment is unsupported.

4-2-2. AUTO SEQUENCE Setting Command

(1) Auto Sequence Setting for VIDEO Output

Specifies auto sequencing for channels displayed via VIDEO output. Setting values are expressed in decimal format.

Byte	Parameter	Command	Description
1	Command code	M	
2		N	
3	Menu code	2	Auto sequencing
4	Category code	0	0: VIDEO output side 1: SPOT OUT output side
5-6	Split screen auto sequencing interval	01-30	1-30 seconds
7-8	Full screen CH1, sequencing interval	00-30	0-30 seconds * Channels set to "0" are skipped during display.
9-10	Full screen CH2, sequencing interval	00-30	
11-12	Full screen CH3, sequencing interval	00-30	
13-14	Full screen CH4, sequencing interval	00-30	
15-16	Full screen CH5, sequencing interval	00-30	
17-18	Full screen CH6, sequencing interval	00-30	
19-20	Full screen CH7, sequencing interval	00-30	
21-22	Full screen CH8, sequencing interval	00-30	
23-24	Full screen CH9, sequencing interval	00-30	
25	End code	CR	
26		LF	

(2) Auto Sequence Setting for SPOT OUT Output

Specifies auto sequencing for channels displayed via SPOT OUT output. Setting values are expressed in decimal format.

Byte	Parameter	Command	Description
1	Command code	M	
2		N	
3	Menu code	2	Auto sequencing
4	Category code	1	0: VIDEO output side 1: SPOT OUT output side
5	Target SPOT OUT	1	SPOT OUT1
		2	SPOT OUT2
6-7	Full screen CH1, sequencing interval	00-30	0-30 seconds * Channels set to "0" are skipped during display.
8-9	Full screen CH2, sequencing interval	00-30	
10-11	Full screen CH3, sequencing interval	00-30	
12-13	Full screen CH4, sequencing interval	00-30	
14-15	Full screen CH5, sequencing interval	00-30	
16-17	Full screen CH6, sequencing interval	00-30	
18-19	Full screen CH7, sequencing interval	00-30	
20-21	Full screen CH8, sequencing interval	00-30	
22-23	Full screen CH9, sequencing interval	00-30	
24	End code	CR	
25		LF	

4-2-3. TITLE Setting Command

Specifies the camera title settings for each channel.

Byte	Parameter	Command	Description
1	Command code	M	
2		N	
3	Menu code	3	Title setting
4-5	Title setting channel	01-09	Channel no. 1-9
6	Title data	JIS code (See table 1 st + 2 nd below.)	First 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

1 st / 2 nd	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0		P		p				一	タ	ミ		
1			!	1	A	Q	a	q				ア	チ	ム		
2			“	2	B	R	b	r				イ	ツ	メ		
3			#	3	C	S	c	s				ウ	テ	モ		
4			\$	4	D	T	d	t				エ	ト	ヤ		
5			%	5	E	U	e	u				オ	ナ	ユ		
6			&	6	F	V	f	v			ヲ	カ	ニ	ヨ		
7			'	7	G	W	g	w			ア	キ	ヌ	ラ		
8			(8	H	X	h	x			イ	ク	ネ	リ		
9)	9	I	Y	i	y			ウ	ケ	ノ	ル		
A			*	:	J	Z	j	z			エ	コ	ハ	レ		
B			+	;	K		k				オ	サ	ヒ	ロ		
C			,	<	L		l				ヤ	シ	フ	ワ		
D			-	=	M		m				ユ	ス	ヘ	ン		
E			.	>	N		n				ヨ	セ	ホ	ゝ		
F			/	?	O		o				ツ	ソ	マ	。		

Blank cells indicate unavailable character codes.

4-2-4. DATE/TIME Setting Command

Specifies the date and time.

Byte	Parameter	Command	Description
1	Command code	M	
2		N	
3	Menu code	4	DATE/TIME setting
4-15	Date and time	00-99	Year (last two digits)
		01-12	Month
		01-31	Day
		00-23	Hour
		00-59	Minute
		00-59	Second
16	Display option	0	YY-MM-DD
		1	MM-DD-YY
		2	DD-MM-YY
17	End code	CR	
18		LF	

4-2-5. DISPLAY Setting Command

For specifying the display format.

Byte	Parameter	Command	Description
1	Command code	M	
2		N	
3	Menu code	5	Display setting
4	Camera title display	0	OFF
		1	ON
5	Date/time display	0	OFF
		1	ON
6	Date/time display position	0	Upper position (UPPER)
		1	Lower position (LOWER)
7	Mark display	0	OFF
		1	ON
8	Border display	0	White (WHT)
		1	Black (BLK)
		2	None (OFF)
9	End code	CR	
10		LF	

4-2-6. ALARM Setting Command

Specifies details for alarm operations.
 "ERR" message is returned during alarm operations.

Byte	Parameter	Command	Description
1	Command code	M	
2		N	
3	Menu code	6	Alarm setting
4	Alarm enabled/disabled	0	OFF
		1	ON
5	Video loss enabled/disabled	0	OFF
		1	ON
6	Alarm input	0	Trigger input (TRIG)
		1	Level input (LEVEL)
7-8	Alarm reset time	01-60	1-60 seconds
9-10	Video loss reset time	01-60	1-60 seconds
11	Switching to alarm display	0	FULL
		1	SPLIT
12	Alarm display (ALM) ON/OFF	0	OFF
		1	ON
13	Alarm display (LOSS) ON/OFF	0	OFF
		1	ON
14	SPOT OUT1 display (ALM) ON/OFF	0	OFF
		1	ON
15	SPOT OUT2 display (ALM) ON/OFF	0	OFF
		1	ON
16	Buzzer (ALM) ON/OFF	0	OFF
		1	ON
17	Buzzer (LOSS) ON/OFF	0	OFF
		1	ON
18	Buzzer (FAN) ON/OFF	0	OFF
		1	ON
19	Alarm output (ALM) ON/OFF	0	OFF
		1	ON
20	Alarm output (LOSS) ON/OFF	0	OFF
		1	ON
21	Alarm output (FAN) ON/OFF	0	OFF
		1	ON
22	End code	CR	
23		LF	

4-2-7. SYSTEM Setting

Specifies system communication functions.

Byte	Parameter	Command	Description
1	Command code	M	
2		N	
3	Menu code	7	System setting
4	Switch lock	0	OFF
		1	ON
6	RS-232C baud rate	0	1,200bps
		1	2,400bps
		2	4,800bps
		3	9,600bps
		4	19,200bps
		5	38,400bps
10	End code	CR	
11		LF	

IMPORTANT

Changes to each baud rate settings take effect after the MV-94F returns an "OK" message.
--

4-3. Menu Setting Status Request Command

4-3-1. SPLIT POSITION Setting Status Request

Requests the setting status of channels for split screen display.

The [RS] status messages listed below are returned after normal reception and processing.

Byte	Parameter	Command	Description
1	Command code	M	
2		R	
3	Menu code	1	SPLIT POSITION setting
4	Split type	0	Quad
		1	5+1 split
		2	9 split
5	Split page	0	A
		1	B
6	End code	CR	
7		LF	

[RS] Status Messages

Byte	Parameter	Message	Description
1	Message code	R	
2		S	
3	Menu code	1	SPLIT POSITION setting
4-(n-2)	Channel setting	00	Black screen (BLK)
		01-09	Channel no. 1-9
(n-1)	End code	CR	
n		LF	

*Example of return message for quad display

1ch (01)	9ch (09)
6ch (06)	Black screen (00)

For the settings shown at left, **01090600** is returned for "8-(n-2)."
In the channel setting portion, the byte number is 8 for quad, 12 for 5+1 split, 18 for 9 split display.

4-3-2. AUTO SEQUENCE Setting Status Request

Requests the setting status for auto sequencing.

The [RS] status messages listed below are returned after normal reception and processing.

Byte	Parameter	Command	Description
1	Command code	M	
2		R	
3	Menu code	2	Auto sequence setting
4	Target output	0	VIDEO output
		1	SPOT OUT1
		2	SPOT OUT2
5-6	Channel	00	Split screen (VIDEO output only)
		01-09	Channel no. 1-9
7	End code	CR	
8		LF	

[RS] Status Messages

Byte	Parameter	Message	Description
1	Message code	R	
2		S	
3	Menu code	2	Auto sequence setting
4-5	Auto sequencing display interval	00-30	0-30 seconds
6	End code	CR	
7		LF	

4-3-3. TITLE Setting Status Request

Requests the camera title setting status for each channel.

The [RS] status messages listed below are returned after normal reception and processing.

Byte	Parameter	Command	Description
1	Command code	M	
2		R	
3	Menu code	3	Title setting
4-5	Channel	01-09	Channel no. 1-9
6	End code	CR	
7		LF	

[RS] Status Messages

Byte	Parameter	Message	Description
1	Message code	R	
2		S	
3	Menu code	3	Title setting
4-11	Title data	JIS code	JIS code x 8 characters (See section 4-2-3. "TITLE Setting Command, Character Code Table 1 st +2 nd " for JIS code.)
12	End code	CR	
13		LF	

4-3-4. DATE/TIME Setting Status Request

Requests the setting status for the date and time.

The [RS] status messages listed below are returned after normal reception and processing.

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

[RS] Status Messages

Byte	Parameter	Message	Description
1	Message code	R	
2		S	
3	Menu code	4	DATE/TIME setting
4-15	Date and time	00-99	Year (last two digits)
		01-12	Month
		01-31	Day
		00-23	Hour
		00-59	Minute
		00-59	Second
16	Display option	0	YEAR-MONTH-DAY (YYMMDD)
		1	MONTH-DAY-YEAR (MMDDYY)
		2	DAY-MONTH-YEAR (DDMMYY)
17	End code	CR	
18		LF	

4-3-5. DISPLAY Setting Status Request

Requests the setting status for information display.
The [RS] status messages listed below are returned after normal reception and processing.

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

[RS] Status Messages

Byte	Parameter	Message	Description
1	Message code	R	
2		S	
3	Menu code	5	Display setting
4	Camera title display	0	OFF
		1	ON
5	Date/time display	0	OFF
		1	ON
6	Date/time display position	0	Upper position (UPPER)
		1	Lower position (LOWER)
7	Mark display	0	OFF
		1	ON
8	Border display	0	White (WHT)
		1	Black (BLK)
		2	None (OFF)
9	End code	CR	
10		LF	

4-3-6. ALARM Setting Status Request

Requests the setting status for alarm operations.

The [RS] status messages listed below are returned after normal reception and processing.

Byte	Parameter	Command	Description
1	Command code	M	
2		R	
3	Menu code	6	Alarm setting
4	End code	CR	
5		LF	

[RS] Status Messages

Byte	Parameter	Message	Description
1	Message code	R	
2		S	
3	Menu code	6	Alarm setting
4	Alarm enabled/disabled	0	OFF
		1	ON
5	Video loss enabled/disabled	0	OFF
		1	ON
6	Alarm input	0	Trigger input (TRIG)
		1	Level input (LEVEL)
7-8	Alarm reset time	01-60	1-60 seconds
9-10	Video loss reset time	01-60	1-60 seconds
11	Switching to alarm display	0	FULL
		1	SPLIT
12	Alarm display (ALM) ON/OFF	0	OFF
		1	ON
13	Alarm display (LOSS) ON/OFF	0	OFF
		1	ON
14	SPOT OUT1 display (ALM) ON/OFF	0	OFF
		1	ON
15	SPOT OUT2 display (ALM) ON/OFF	0	OFF
		1	ON
16	Buzzer (ALM) ON/OFF	0	OFF
		1	ON
17	Buzzer (LOSS) ON/OFF	0	OFF
		1	ON
18	Buzzer (FAN) ON/OFF	0	OFF
		1	ON
19	Alarm output (ALM) ON/OFF	0	OFF
		1	ON
20	Alarm output (LOSS) ON/OFF	0	OFF
		1	ON
21	Alarm output (FAN) ON/OFF	0	OFF
		1	ON
22	End code	CR	
23		LF	

4-3-7. SYSTEM Setting Status Request

Requests the status for the system setting.

The [RS] status messages listed below are returned after normal reception and processing.

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

[RS] Status Messages

Byte	Parameter	Message	Description
1	Message code	R	
2		S	
3	Menu code	7	System setting
4	Switch lock	0	OFF
		1	ON
5	RS-232C baud rate	0	1,200bps
		1	2,400bps
		2	4,800bps
		3	9,600bps
		4	19,200bps
		5	38,400bps
6-8	Software version	XXX	Software version (X.XX)
9-12	Hardware version	YYYY	Hardware version (YYYY)
13	End code	CR	
14		LF	

5. Control Commands (Previous Model Protocol)

5-1. Full Screen Display Command

Shows specified channels 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	Channel no.	1–9	Channel no. 1–9
5	End code	ETX	(Hex: 03H)

5-2. Quad Screen Display Command

Shows specified channels 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	Split page	A, B	Split page A, B
5	End code	ETX	(Hex: 03H)

5-3. 5+1 Split Screen Display Command

Shows specified channels in 5+1 split 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		5	
4	Split page	A, B	Split page A, B
5	End code	ETX	(Hex: 03H)

5-4. 9 Split Screen Display Command

Shows specified channels in 9 split 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		9	
4	Split page	A, B	Split page A, B
5	End code	ETX	(Hex: 03H)

The following commands are also supported in order to be compatible with the previous standard used in the MV-94 (the previous model).

Byte	Parameter	Command	Description
1	Start code	STX	(Hex: 02H)
2	Command code	S	
3		9	
4	End code	ETX	(Hex: 03H)

* Displayed page is fixed to "A" for this command.

5-5. Auto Sequencing Command

Executes auto sequencing in the specified display 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		A	
4	Target display type	F	Full screen auto sequencing
		4	Quad screen auto sequencing
		5	5+1 split screen auto sequencing
		9	9 split screen auto sequencing
5	End code	ETX	(Hex: 03H)

5-6. 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 "ACK."

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 Model Protocol)

6-1. Status Request Commands

6-1-1. Display Status Request Command

Requests the display status of current VIDEO output.

Returns a display status message after normal reception and processing.

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

6-1-2. Mode Status Request Command

Requests the mode status of the MV-94F.

Returns a mode status message after normal reception and processing.

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

6-2. Status Request Response Messages

6-2-1. Display Status Request Response Message

Returns a display status message for the MV-94F VIDEO output.

Byte	Parameter	Message	Description
2or3	Display status message	SF1–SF9	Full screen display CH1–9
		S4A, S4B	Quad screen display A, B
		S5A, S5B	5+1 split screen display A, B
		S9, S9B	9 split screen display A, B (*)
		SAF	Full screen auto sequencing
		SA4	Quad screen auto sequencing
		SA5	5+1 split screen auto sequencing
		SA9	9 split screen auto sequencing

* The response "S9" is sent in order to be compatible with the MV-94 (the previous model).

IMPORTANT

The response message is fixed to "SF1" during MENU display.

6-2-2. Mode Status Request Response Message

Returns a mode status message of the MV-94F.

Byte	Parameter	Message	Description
2	Mode status message	MD	Display mode
		MS	MENU mode
		MA	Alarm display mode

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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