FOR.A
INNOVATIONS IN VIDEO
and AUDIO TECHNOLOGY

OPERATION MANUAL

MFR-1616/1616R/1616A
MFR-3216/3216RPS
MFR-3232/3232RPS

Multi Format Routing Switcher

MFR-18/39RUA
MFR-16/18/39/40RU
MFR-16RUD
MFR-16/32/64RUW
MFR-16RUTA
MFR-GPI
MFR-TALM

13th Edition - Rev.1

FOR-A COMPANY LIMITED

Edition Revision History

Edit.	Rev.	Date	Description	Section
1	-	2011/03/24		
2		2012/01/24	Rear Panel figures and External Dimensions. Amended TAKE function, enhanced MFR-18RU, etc.	2-1-2, 2-1-4, 3, 4
3	-	2012/05/30	Changed alarm description. RS Series compatibility option is cancelled. Added LAN interface support, etc.	2-1-3 1-2, 2-1-2, 9-1-1 7, etc.
4	-	-	(Not released)	-
5	-	2013/01/08	Added MFR-16RU and MFR-16RUD. Changed SERIAL and ALARM connectors. Changed Multi-panel Operation.	 2-1-3 5-6-1
6	-	2013/04/30	Added MFR-TALM. Factual errors corrected.	2-4, 3-2, 9-1-7, 9-2-11
7	-	-	(Not released)	
7	1	2013/09/05	Changed Power Consumption. Added MFR-1616A. Added MFR-16RUW and MFR-32RUW. Added Setup Menu for MFR-18RU. Added Setup Menu for other MFR RU units.	9-1 2-2-1, 2-2-2, 5-1-2-1, 9-1-6, 9-1-7, 9-2-10, 9-2-11 5-6 5-7
7	2	2013/09/10	Changed MFR-1616A power LED indication. Factual errors corrected.	2-1-1
8	-	2013/12/24	Added Main Unit Link function Added MFR-64RUW. RU current level is applied to RU Salvos. Added Group LOCK OTHER function.	3-2 2-2, 9-1-9, 9-2-13, etc. 6-2-2 6-3-2
9	-	2014/10/31	Enabled group button assignments Added 2-way Lock buttons (by short and long press)	5-1-2 5-2 to 5-4
10	-	2015/03/18	Added CONTROL button operation (MFR-18RU) Added color setting for the locked current destination button. Added unlock duration setting for LOCK OTHER/LOCK ALL. Added text color tuning for remote control buttons.	Sec. 4, 5-1, 6-1-1 Sec. 5-2 Sec. 6-3-2 Sec. 8
11	-	2015/04/20	Supported MFR-16RUTA.	
12	-	2015/05/19	Supported MFR-3216RPS/3232RPS. Removed Button Label Templates. (They are published on the homepage.)	 Appendix
12	1	2015/09/14	Added notes on button labels.	Sec. 2-2-1
13	-	2015/11/11	Supported MFR-18RUA/39RUA.	
13	1	2016/07/04	Added “Operation Tips”.	Appendix

Firmware / Software Versions and Supported Hardware / Features

Main Unit Firmware Version (*1)		GUI Version (*2)	Supported Hardware	Supported Feature
MFR-1616/1616R/3216/3232	MFR-1616A			
1.22 or higher	1.23 or higher	1.61 or higher	MFR-64RUW	Main Unit Link

(*1) Click [Primary CPU] in the [Web-based Control: **System Settings**- **MU Info** page] to see your version number under **Firmware Version**.

(*2) The GUI (Web-based control software) version is displayed on the browser's title bar.

Precautions

Important Safety Warnings

[Power]

 Caution	Operate unit **only** at the specified supply voltage.
	Disconnect the power cord via the power plug only. **Do not** pull on the cable portion.
 Stop	**Do not** place or drop heavy or sharp-edged objects on the power cord. A damaged cord can cause fire or electrical shock hazards. Regularly check the power cord for excessive wear or damage to avoid possible fire / electrical hazards.
 Caution	**Ensure** the **power cord is firmly plugged into** the **AC outlet.**

[Grounding]

 Caution	**Ensure** the unit is properly grounded at all times to prevent electrical shock.
 Hazard	**Do not** ground the unit to gas lines, units, or fixtures of an explosive or dangerous nature.

[Operation]

 Hazard	**Do not** operate the unit under hazardous or potentially explosive atmospheric conditions. Doing so could result in fire, explosion, or other hazardous 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 a unit malfunction.
	If a foreign material does enter the unit, turn the power off and **immediately** disconnect the power cord. Remove the material and contact an authorized service representative if damage has occurred.

[Transportation]

 Caution	**Handle with care to avoid impact shock during transit, which may cause malfunction. When you need to transport the unit, use the original or suitable alternative packing material.**

[Circuitry Access]

	**Do not** remove covers, panels, casing, or access the circuitry with power applied to the unit. Turn the power off and disconnect the 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 the power has been disconnected. Capacitors associated with the power supply are especially hazardous.
 Hazard	Unit **should not** be operated or stored with cover, panels, and / or casing removed. Operating the unit with circuitry exposed could result in electric shock / fire hazards or a unit malfunction.

[Potential Hazards]

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

[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. Doing so may cause damage to the internal circuits or components of the unit. If you remove the rubber feet that are attached to the unit, **do not** reinsert the screws that secure the rubber feet.

[Consumables]

 Caution	Consumable items that are used in the unit must be periodically replaced. 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, such items should be replaced at an early date. For details on replacing consumable items, contact your dealer.

Upon Receipt

Unpacking

MFR-1616/ MFR-1616R/ MFR-1616A/ MFR-3216/ MFR-3216RPS/ MFR-3232/ MFR-3232RPS 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.

◆ **Main Unit**

ITEM	QTY	REMARKS
MFR-1616/1616R/1616A MFR-3216/3216RPS MFR-3232/3232RPS	1	
AC Cord	1 set	AC cable and retaining clip
Rack Mount Brackets	1 set	EIA standard type
Rubber Feet	4	
SERIAL port setting notes	1	Excluding MFR-1616A
CD-ROM	1	Operation Manual (PDF)
Quick Setup Guide	1	

◆ **Remote Control Unit**

ITEM	QTY	REMARKS
MFR-18RUA/39RUA MFR-39RU/40RU/18RU MFR-16RU/16RUD/16RUTA MFR-16/32/64RUW	1	
AC Adaptor (*1)	1	With DC lock plug (MFR-40RU/39RUA/18RUA)
AC cable	1	
DC cable retaining clip	1 set	For AC adapters w/o DC lock plug
Rack Mount Brackets	1 set	EIA standard type * MFR-16/32/64RUW/16RUTA is supplied w/o Rack Mount Brackets.
Tool used to change button labels	1	
LAN Cable (straight) (*2)	1	MFR-39/40/18RU/16RUTA/18RUA/39RUA: UTP cable, 5m MFR-16RU/16RUD: STP cable, 5m * MFR-16/32/64RUW is supplied w/o LAN Cable.

(*1) Depending on the production date, AC adapter is supplied without DC lock plug, but with a DC cable retaining clip.

(*2)User-prepared LAN cables are also available and Shielded Twist Pair cables are recommended for MFR-16RU/16RUD/16RUW/32RUW/64RUW.

◆ **Option (for MFR-1616/1616R/3216RPS/3232/3232RPS)**

ITEM	QTY	REMARKS
MFR-SRCPU	1	Redundant CPU card (MFR-1616R/3216/3216RPS/3232/3232RPS only)
MFR-SRPS	1 set	Redundant power supply unit (with AC cord and AC cord retaining clip.)(MFR-1616/1616R/3216/3232 only)
MFR-32PS	1 set	Redundant power supply unit (with AC cord and AC cord retaining clip.)(MFR-3216RPS/3232RPS only)

◆ **Interface Expansion Unit**

ITEM	QTY	REMARKS
MFR-GPI	1	
AC Adaptor *	1	With DC lock plug
AC cable	1	
Rack Mount Brackets	1 set	EIA standard type
LAN Cable (straight)	1	

* Depending on the production date, AC adapter is supplied without DC lock plug, but with a DC cable retaining clip.

◆ **Tally Manager Unit**

ITEM	QTY	REMARKS
MFR-TALM	1	
AC Adaptor *	1	With DC lock plug
AC cable	1	
Rack Mount Brackets (optional)	1 set	Single- or Dual-unit type EIA standard type

* Depending on the production date, AC adapter is supplied without DC lock plug, but with a DC cable retaining clip.

Check

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

Installing the AC Cable Retaining Clip (Main Unit)

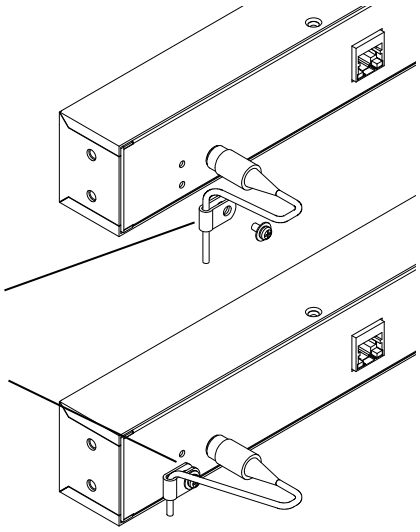
Secure the AC cable with the supplied AC cable retaining clip to prevent accidental removal from the unit.

Procedure

1) Securely plug the AC cable into the AC connector.
2) Attach the Retaining clip on to the side of the AC cable.
3) Thread both ends of the retaining clip into the holes of the retaining clip base attached on the unit.

Installing the DC Cable Retaining Clip

Install the supplied retaining bracket onto the rear panel of devices, such as a Control Unit as shown below.



1) Bundle the cable with the supplied clip.

2) Secure the clip with the supplied screw.

About This Manual

This manual is intended to help the user easily operate this product and make full use of its functions during operation. 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.

Font Conventions

The following conventions are used throughout this manual:

- Shaded text (such as OFF) indicates the setting **parameters** or **values** in the menu.
- Text enclosed by a square (such as MODE, SALVO) indicates remote control panel **buttons**.

Table of Contents

1. Prior to Starting

1-1. Welcome

Congratulations! By purchasing MFR-1616 / MFR-1616R / MFR-1616A / MFR-3216 / MFR-3216RPS / MFR-3232 / MFR-3232RPS Multi Format Routing Switcher (hereafter called MFR main unit) 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. Features

The MFR-1616, MFR-1616R, MFR-1616A, MFR-3216, MFR-3216RPS, MFR-3232, and MFR-3232RPS comprise a group of multi-format routing switchers with a variety of input/output numbers supporting 3G-SDI, HD-SDI, SD-SDI, ASI, and AES (MFR-1616A only) signals. In the compact body, the units have inherited various functions of the MFR-5000 such as the capability of linking multiple cases, tally connections with peripheral devices, and automatic source name tracking, to allow the units to be the core product in small to medium size systems.

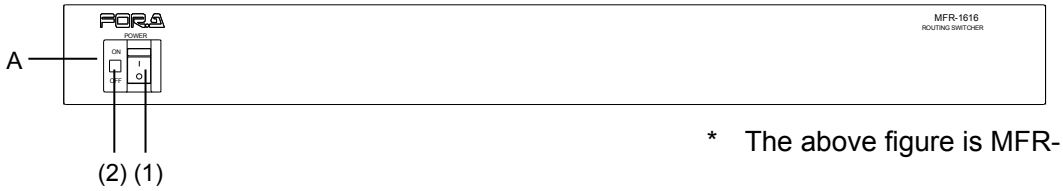
- Support for 3G-SDI, HD-SDI, SD-SDI, ASI, and AES (MFR-1616A only) signals with automatic signal recognition that enables operation without concern for the type of signal.
- Various crosspoint control functions such as Salvo, Take, Link, Level operation, and Chop
- Tally linking with FOR-A's video switchers (HANABI Series) and multi viewers. Source name displays on video switchers and multi viewers can be switched in conjunction with switchings controlled in the main unit. MFR routers support TSL and Harris protocol, enabling linkage to other companies' products.
- Built-in webserver for remote control through a web browser
- SNMP support enabling SNMP monitoring system configuration
- Status monitoring for power supply, fan, CPU, SDI input/output, etc.
- CPU board redundancy (MFR-SRCPU option) allowing monitoring of primary CPU board operation via the secondary board
- Immediate and smooth switch over to the secondary board without down time in case of irregularities, as well as stable remote control operation supported by the network redundancy (Supported by MFR-SRCPU option)
- Power unit redundancy for stable power supply against power unit failure or power supply troubles
- Matrix partition and level setting capabilities support a flexible control environment
- Remote control over a main unit from multiple remote control panels (maximum of 128 units can be connected in total including the main unit)
- Remote control panel connectivity for configuring a huge control panel
- Interface expansion unit (MFR-GPI) for additional 128 (32 x 4) GPI/O and 4 serial ports (9-pin D-sub, male)
- MFR-TALM Tally Manager Unit is designed specifically to manage tally and signal name data in the MFR system and the exchange of this data with external devices such as a video switcher, multiviewer etc.. The unit performs the task of tally data computation, which is ordinarily undertaken by the MFR main unit, to accelerate the task.
- The Main Unit Link feature allows users to control several main units at the same time or to create an expanded virtual matrix by linking main units.

2. Panel Descriptions

2-1. Main Unit

2-1-1. Front Panel

◆ **MFR-1616 / MFR-1616A**



* The above figure is MFR-1616.

◆ **MFR-1616R / MFR-3216 / MFR-3232**

* The above figure is MFR-1616R.

◆ **MFR-3216RPS / MFR-3232RPS**

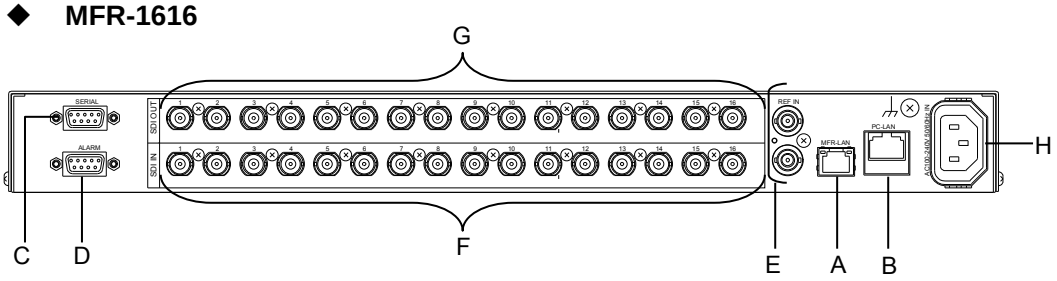
* The above figure is MFR-3232RPS.

No.	Name	Description
A	POWER1	Power switch 1 (standard equipment) (1) Switch to turn unit power On/Off. (2) LED indicator Lit green — DC power supply: Normal Unlit — DC power supply: Error Lit orange — No MFR-LAN connection (MFR-1616A only)
B	POWER2	Power switch 2 (optional equipment) (1) and (2) the same as POWER1.

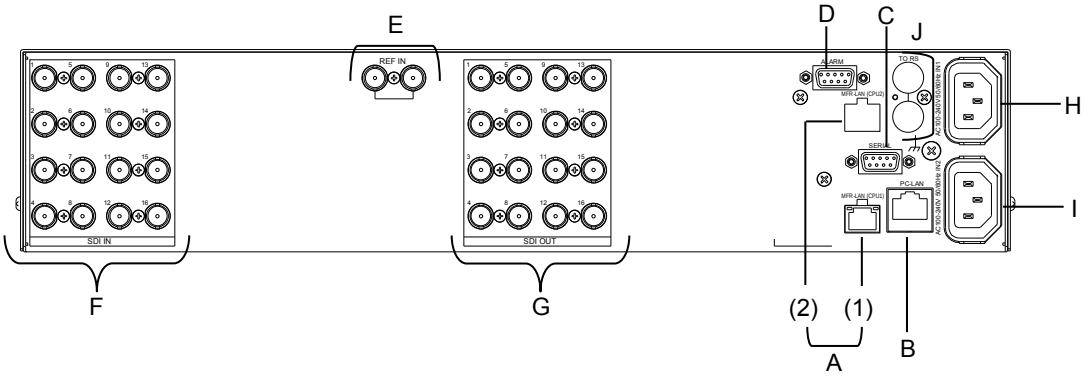
IMPORTANT
Whenever restarting the main unit, restart the web browser as well.

2-1-2. Rear Panel

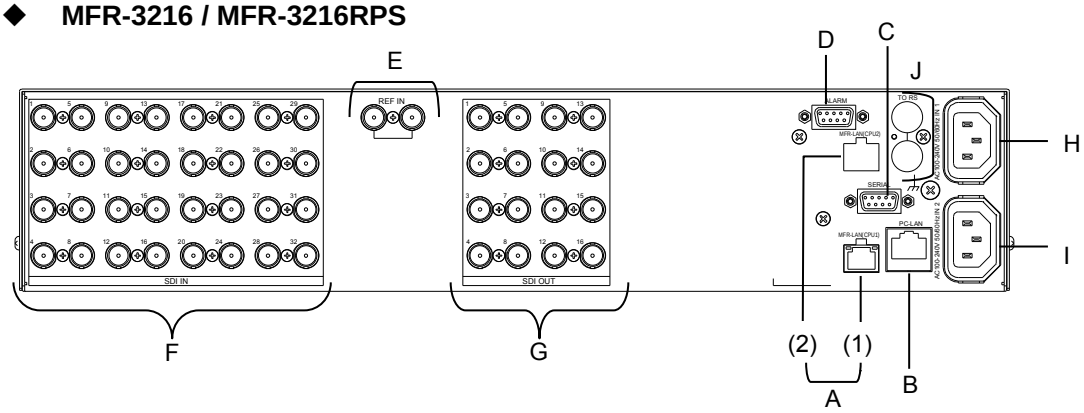
◆ **MFR-1616**



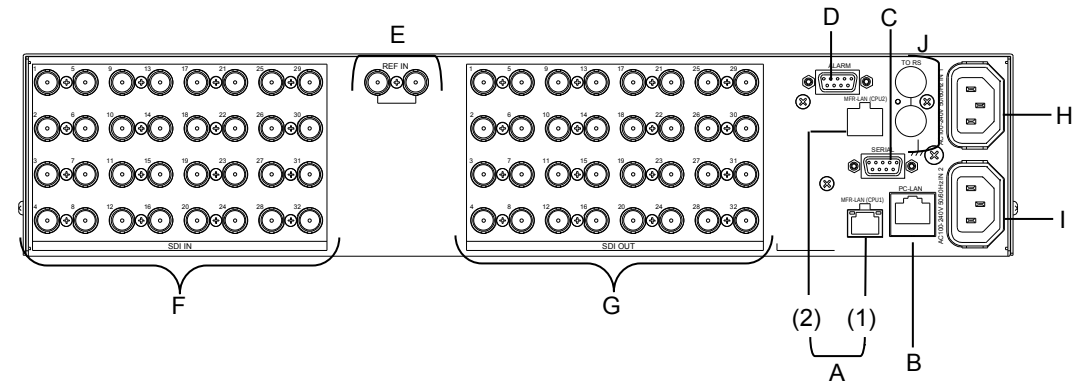
◆ **MFR-1616R**



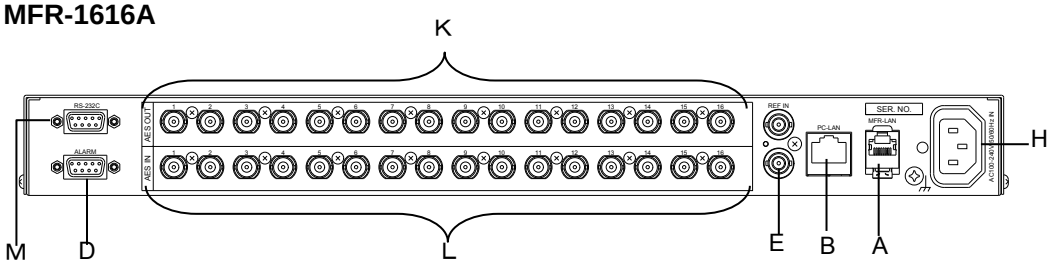
◆ **MFR-3216 / MFR-3216RPS**



◆ **MFR-3232 / MFR-3232RPS**



◆ **MFR-1616A**



No.	Name	Description
A	MFR-LAN *1 (1) MFR-LAN (CPU1) *1 (2) MFR-LAN (CPU2) *1	Ethernet ports for connection to MFR Remote Control Units and MFR-GPI. An Ethernet port (10/100BASE-T RJ-45) (1) for the MAIN CARD (2) for the MFR-SRCPU (option)
B	PC-LAN *1	Used to connect to a PC or other external unit. An Ethernet port (10/100BASE-TX RJ-45)
C	SERIAL *2	Used to control via a serial interface (RS-232C/RS-422 selectable)
D	ALARM	Used for alarm output
E	REF IN	Used to input a reference signal (BB or Tri-level sync signal) (looping, or 75 ohm terminated)
F	SDI IN	Used to input digital component video signals
G	SDI OUT	Used to input digital component video signals
H	AC IN1	Used to connect Power Supply Unit 1 to an AC power source
I	AC IN2	Used to connect Power Supply Unit 2 (optional) to an AC power source.
J	TO RS	Unused
K	AES OUT	Used to output AES/EBU audio signals.
L	AES IN	Used to input AES/EBU audio signals.
M	RS-232C	Used to control via RS-232C.

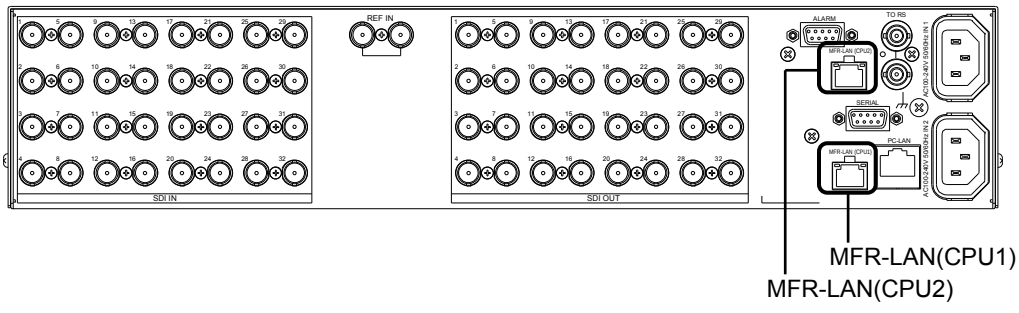
*1 The MFR-LAN/MFR-LAN(CPU1, 2) connector may be labeled as TO RU, and the PC-LAN connector as TO PC on units shipped before Sep. 16, 2011.

*2 The SERIAL connector is set to RS-232C as factory default. Consult your FOR-A reseller if you wish to change the setting.

IMPORTANT
The MFR-LAN/MFR-LAN (CPU1, 2) ports must be connected to a LAN to enable operation. The LAN connections for MFR Series devices must be separated from the network segment of other devices.

◆ **When Installing MFR-SRCPU**

Installing the MFR-SRCPU card enables MFR-1616R / 3216 / 3216RPS / 3232 / 3232RPS units to have redundant CPU cards and Ethernet ports, which can be used for remote control panel connection.



IMPORTANT
When using the MFR-SRCPU, be sure to connect both MFR-LAN(CPU1) and MFR-LAN(CPU2) connectors to a LAN interface.

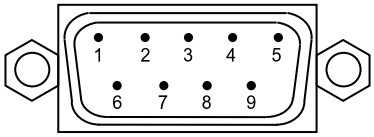
See the separate MFR SERIES Web-based Control Operation Manual for more information on MFR-SRCPU.

2-1-3. Interfaces

◆ **SERIAL Connector (9-pin D-sub, male)**

RS-232C or 422 interface is selectable. The factory default setting is RS-232C. Consult your FOR-A reseller if you wish to change the setting.

9-pin D-sub, male



RS-232C Connector Pin Assignments

Pin No.	Signal Name	Description
1	NC	Not used
2	RxD	Received Data
3	TxD	Transmitted Data
4	DTR	Data Terminal Ready
	NC	Not used (MFR-1616A only)
5	SG	Signal Ground
6	DSR	Data Set Ready
	NC	Not used(MFR-1616A only)
7	RTS	Request To Send
8	CTS	Clear To Send
9	NC	Not used

* The maximum cable length is 10 m.

* DTR/DSR and RTS/CTS are internally connected respectively.

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

Pin No.	Signal Name	Description
1	FG	Frame Ground
2	T-	Transmit data (-)
3	R+	Receive data (+)
4	SG	Signal Ground
5	NC	Not used
6	SG	Signal Ground
7	T+	Transmit data (+)
8	R-	Receive data (-)
9	FG	Frame Ground

* The maximum cable length is 100 m.

◆ **ALARM Connector (9-pin D-sub, female)**

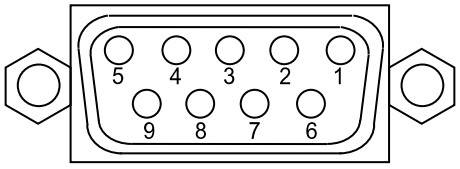
Alarm 1 Output:

Under normal operation:	Pins 1 and 6 are open.
In a malfunction or power-off state:	Pins 1 and 6 are closed.

Alarm 2 Output:

Under normal operation:	Pins 2 and 7 are open.
In a malfunction or power-off state:	Pins 2 and 7 are closed.

Reset:
To reset the unit externally, short Pin 5 and a signal ground pin (8 or 9).



9-pin D-sub, female

ALARM Connector Pin Assignments

Pin No.	Signal Name	Description
1	ALARM1 OUT	Alarm 1 output (Default : FAN) (Default: POWER on MFR-1616A)
2	ALARM2 OUT	Alarm 2 output (Default: POWER) (Default: XPT ERROR on MFR-1616A)
3	NC	Not used
4	NC	Not used
5	RESET IN	Reset in, active low
6	ALARM1 COMMON	Alarm 1 output, Common
7	ALARM2 COMMON	Alarm 2 output, Common
8	GND	Signal ground
9	GND	Signal ground

The following items can be set for ALARM1 OUT and ALARM2 OUT. The alarms can be assigned in the Web-Based Control.

Available alarm signals vary depending on the Main unit model

Alarm signals	3232/ 3232RPS	3216/ 3216RPS	1616R	1616	1616A
Fan	Available	Available	Available	Available	---
Power	Available	Available	Available	Available	Available
Secondary CPU Error	Available	Available	Available	---	---
CPU Changeover (issued when the secondary CPU is activated to change over the operation)	Available	Available	Available	---	---
Crosspoint Error	Available	Available	Available	Available	Available

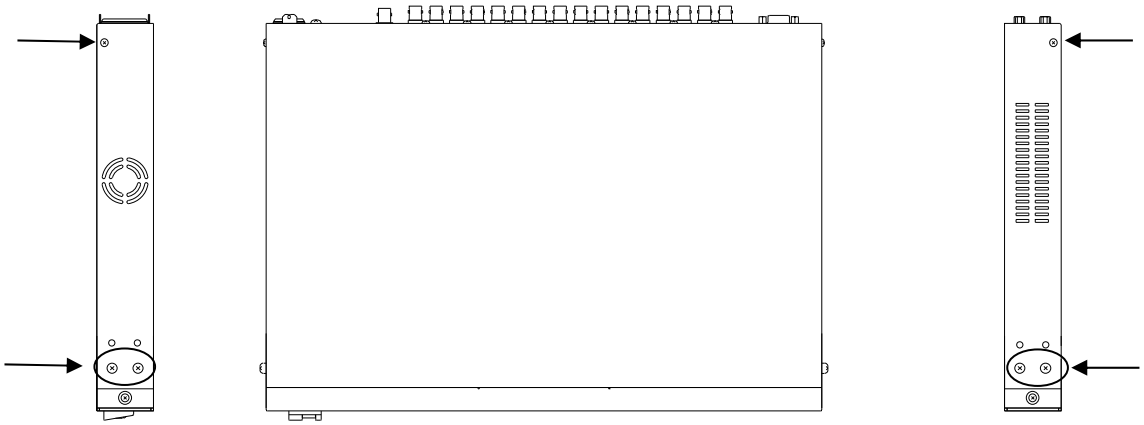
2-1-4. RS-232C / RS-422 Selection

IMPORTANT
Be sure to consult your FOR-A reseller when you wish to change the RS-232C setting to RS-422.

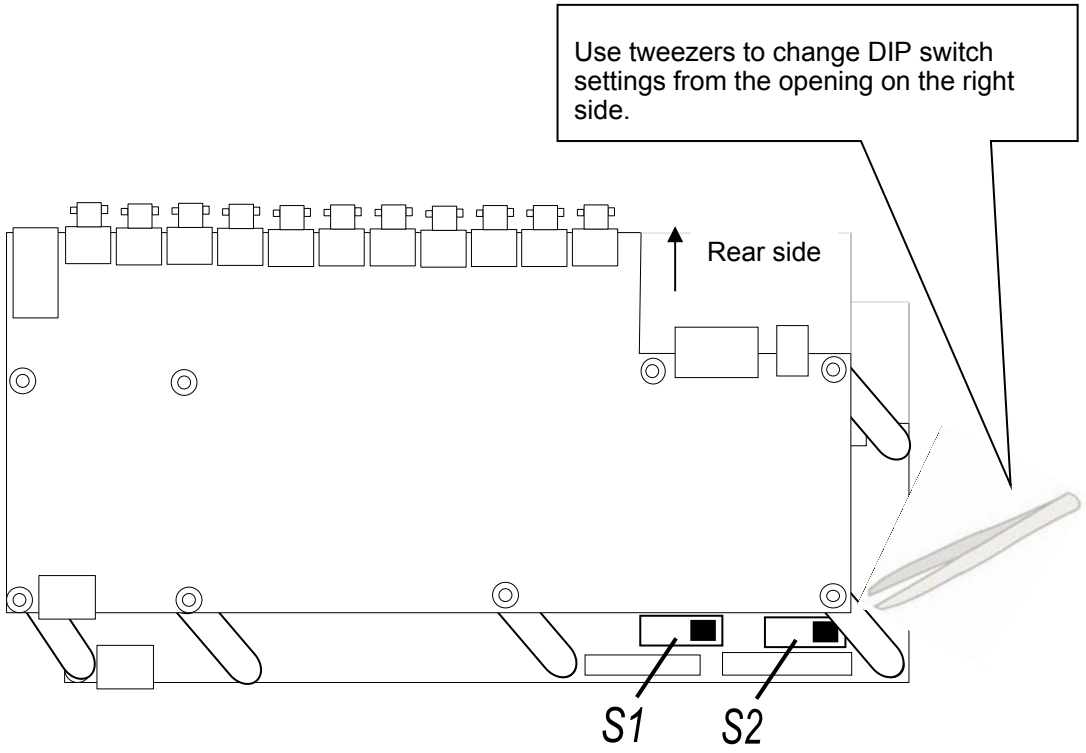
CAUTION
Do not access internal cards with the unit power ON. Always power OFF all connected units / disconnect power cords prior to accessing the interior. Adjustment and maintenance procedures that require accessing the unit interior should only be performed by qualified technical personnel familiar with the equipment.

◆ **MFR-1616**

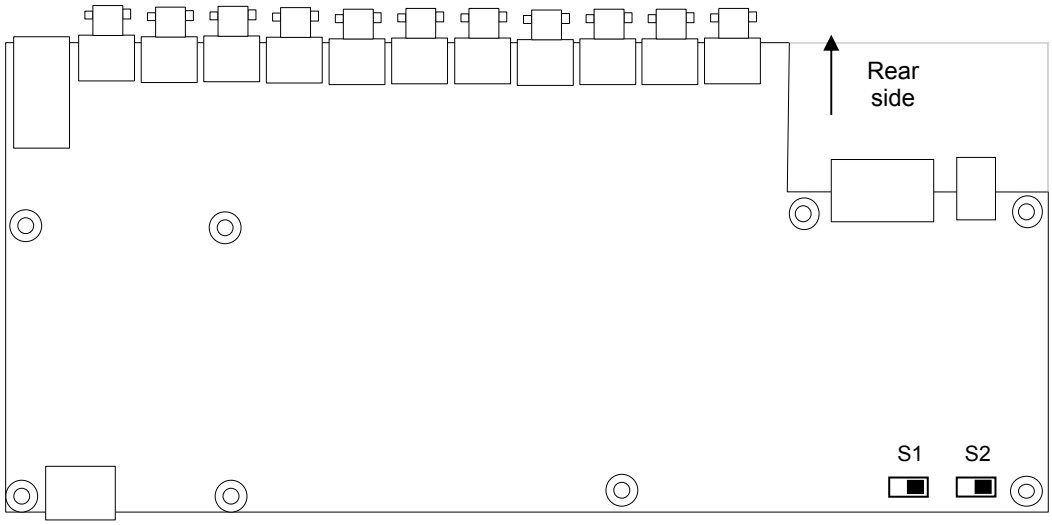
(1) Remove the 6 screws as shown below from both sides of the unit, slide the top panel toward the back of the unit, and detach the panel from the unit.



(2) Change DIP switch settings with tweezers through the opening on the right side.



Default DIP switch settings are as shown below.



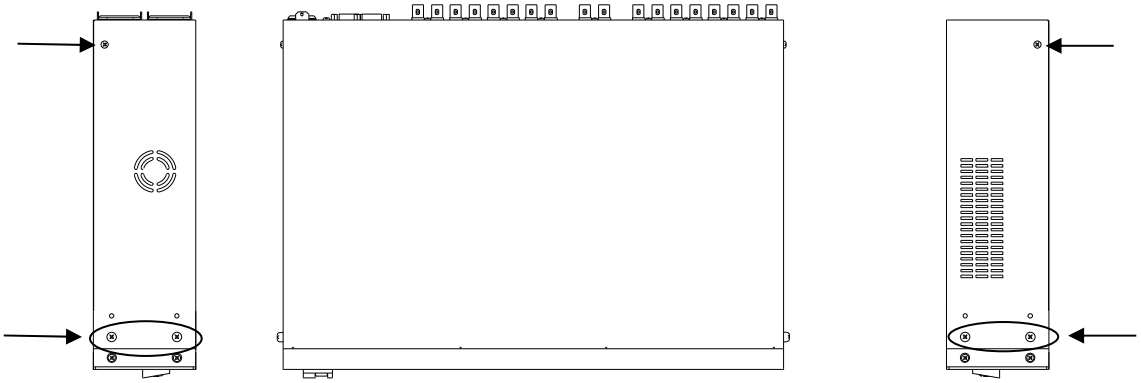
◆ **DIP switch settings**

Switch	Description			
S1, S2	Used to select RS-232C/RS-422. To change the selection, refer to the setting position figures on the right. Be sure to change both switch positions so that they match the selected settings.	Switch settings	RS-232C (Factory default)	
			RS-422	

IMPORTANT
S3 and S4 are for maintenance only. Do not change their settings.

◆ **MFR-1616R / MFR-3216 / MFR-3216RPS / MFR-3232 / MFR-3232RPS**

(1) For **MFR-1616R / MFR-3216 / MFR-3232** units, remove the 6 screws as shown below from both sides of a unit, slide the top panel toward the back of the unit, and detach the panel from the unit.
For **MFR-3216RPS and MFR-3232RPS** units, remove the 6 screws as shown below from both sides and one screw from the top panel of a unit, slide the top panel toward the back of the unit, and detach the panel from the unit.



(2) Change the DIP switch settings. Default DIP switch settings on the main card are as shown below.

◆ **DIP switch settings**

Switch	Description			
S1, S2	Used to select RS-232C/RS-422. To change the selection, refer to the setting position figures on the right. Be sure to change both switch positions so that they match the selected settings.	Switch settings	RS-232C (Factory default)	
			RS-422	

IMPORTANT
S3 and S4 are for maintenance only. Do not change their settings.

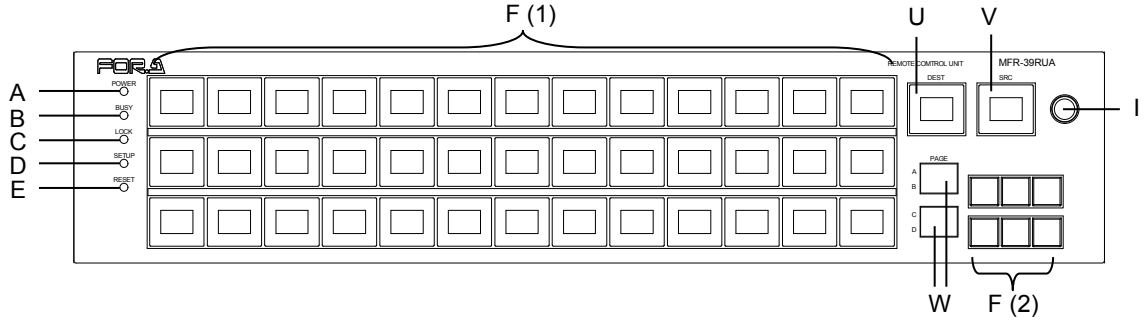
◆ **MFR-1616A**

IMPORTANT
The serial interface on MFR-1616A is fixed to RS-232C and cannot be changed.

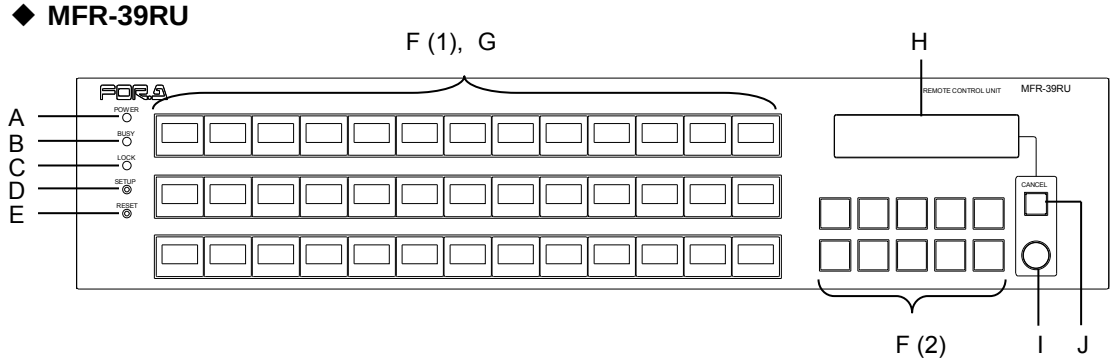
2-2. Remote Control Panel

2-2-1. Front Panel

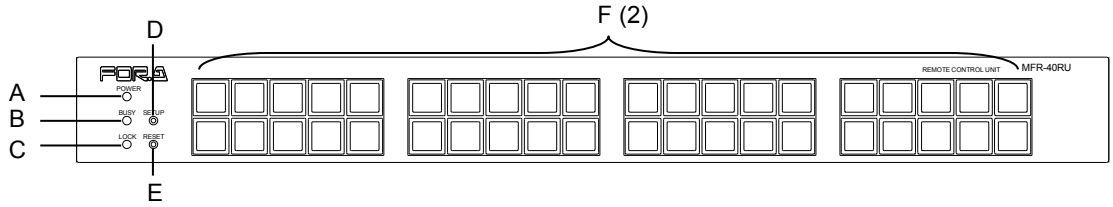
◆ **MFR-39RUA**



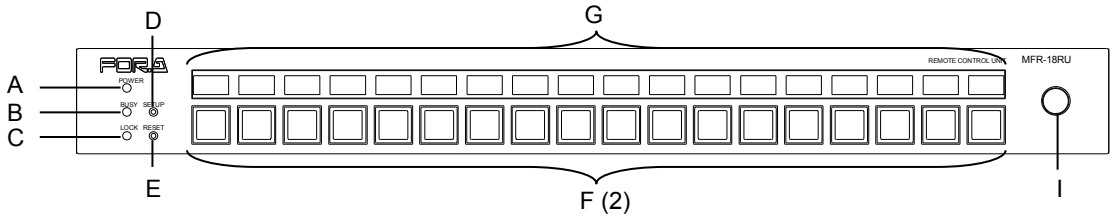
◆ **MFR-39RU**



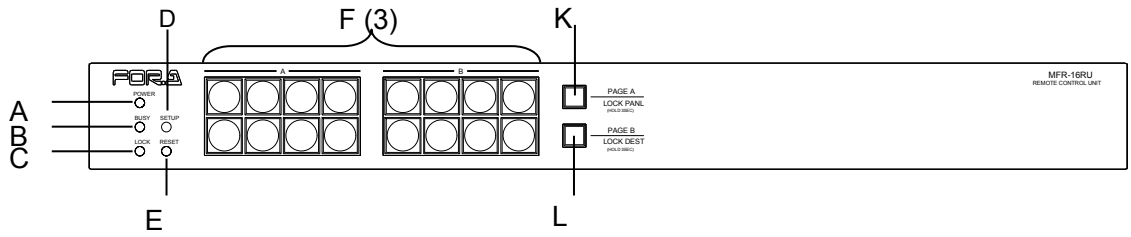
◆ **MFR-40RU**



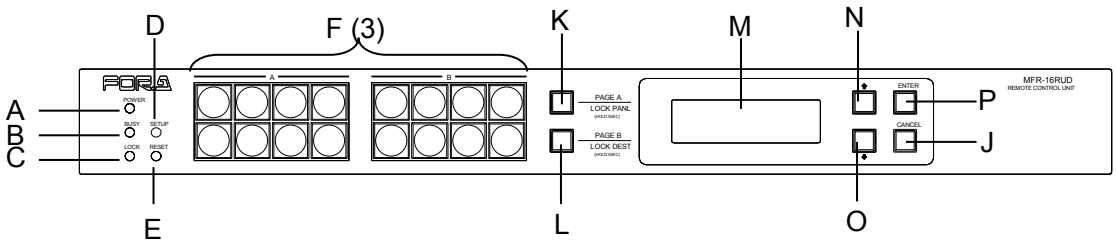
◆ **MFR-18RU/18RUA**



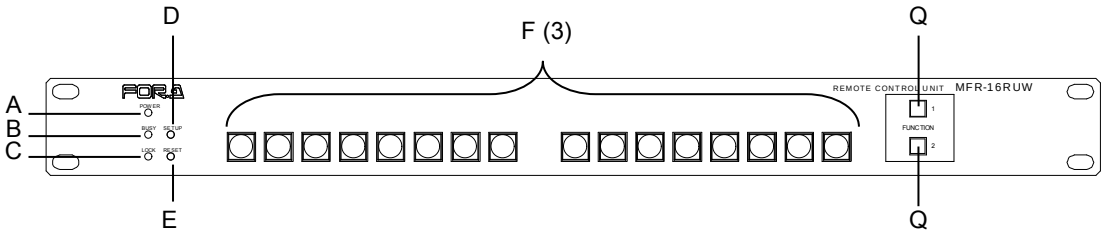
◆ **MFR-16RU**



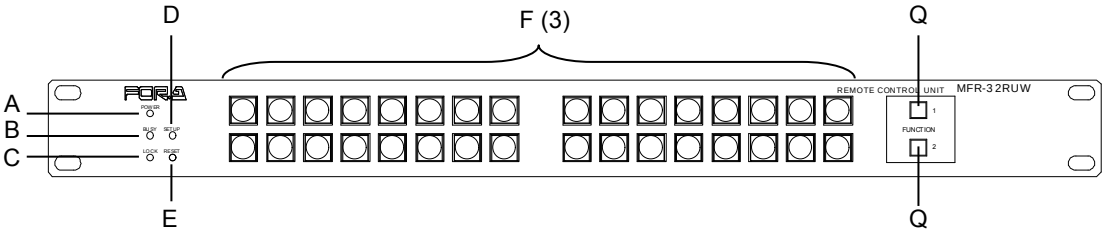
◆ **MFR-16RUD**



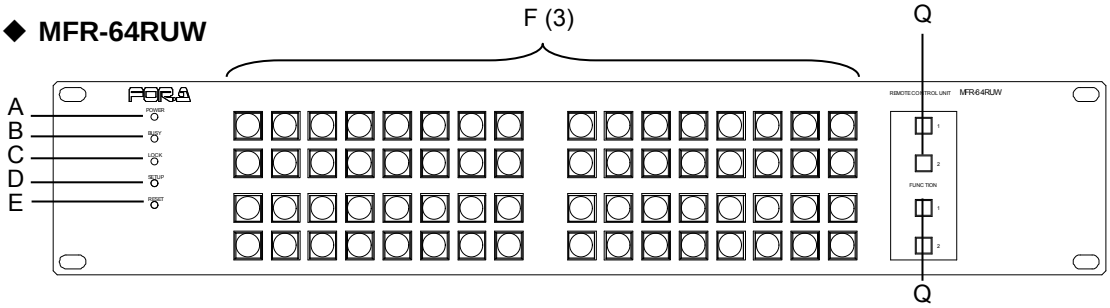
◆ **MFR-16RUW**



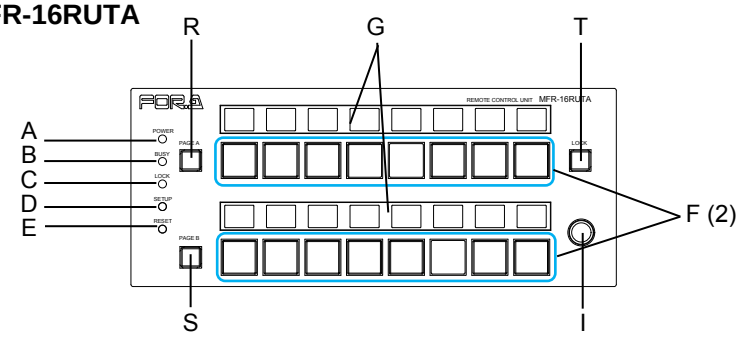
◆ **MFR-32RUW**



◆ **MFR-64RUW**



◆ **MFR-16RUTA**



No.	Item	Description
A	POWER	Displays the power status. ▶ See the table on the next page for details on indications.
B	BUSY	Displays the writing status of the flash memory for backup settings. ▶ See the table on the next page for details on indications.

C	LOCK	Displays the LOCK status. ▶See the table on the next page for details on indications. ▶See section 6-3. "Lock" for details on the lock function.
D	SETUP	Used for IP address or other settings. ▶See section 5-5 "Setup Menu" for details on the SETUP menu.
E	RESET	Used to re-initialize the remote control panel.
F	Buttons	All buttons are user assignable. (1) 7-color selectable button name indication (red, green, yellow, blue, white, cyan or magenta) (hereafter called LCD) (2) 3-color selectable button illumination (red, green or orange) (3) Green illumination
G	NAME DISPLAY	7-color selectable button name/assignment indications (red, green, yellow, blue, white, cyan or magenta) (hereafter called LCD)
H	MENU	Displays setting menus and status.
I	CONTROL	Used to enter menu settings.
J	CANCEL	Used to cancel menu settings.
K	PAGE A / LOCK PANL	Page switch button. Pressing the button switches Page 1 and Page 2 of Group A. The button is unlit if Page 1 is applied. The button is lit orange if Page 2 is applied. To use the button as LOCK LOCAL, press and hold down (within 3 seconds). (*)
L	PAGE B / LOCK DEST	Page switch button. Pressing the button switches Page 1 and Page 2 of Group B. The button is unlit if Page 1 is applied. The button is lit orange if Page 2 is applied. To use the button as LOCK ALL, press and hold down (within 3 seconds). (*)
M	Display	Displays crosspoints and button assignments.
N	↑	UP / DOWN buttons, used to select items to be viewed on the Display.
O	↓	
P	ENTER	Used to confirm settings on the Display.
Q	FUNCTION	Function assignable buttons. (Green illumination)
R	PAGE A	Allows you to move between Group A pages via the CONTROL (I).
S	PAGE B	Allows you to move between Group B pages via the CONTROL (I).
T	LOCK	Lock function can be assigned.
U	Current DEST button	Displays the current destination channel.
V	Current SRC button	Displays the current source channel.
W	Current PAGE display	Displays the current page.

(*) PAGE Switch and LOCK features are initially enabled and can be disabled in the [Web-based Control: **Button Assign** page], respectively.

◆ Color indications on the MFR-RU front panel

LED color / LED	Green	Red	Orange
POWER LED	Normal	Power alarm	
BUSY LED	Normal processing		Writing to flash memory
LOCK LED	Operation locked by Lock Local	Operation locked by Lock All, or locked by Lock Other from another unit.	Lock Other is activated in own unit.

* LOCK LED flashes if the locked operation is accessed. The operation will not perform.

* POWER LED lights up red if the unit is turned on while it is not connected to a network.

* All indicators, POWER, BUSY and LOCK, light orange while the SETUP menu is displayed.

NOTE
After finishing settings, do **not power OFF** the unit while BUSY LED is **lit orange**, since the system is writing to Flash. (It takes about two minutes at max.)

◆ **Changing Button Labels**

Button labels can be changed on user-assignable buttons. Utilize button label templates in the FOR-A web site. To remove button caps, use an optional tool.

To download button label templates, go to the **MFR-RU Series** page in the FOR-A site and open the **Documents** tab.

URL: http://www.for-a.com/products/mfr_ru_series/professional_router_p.html

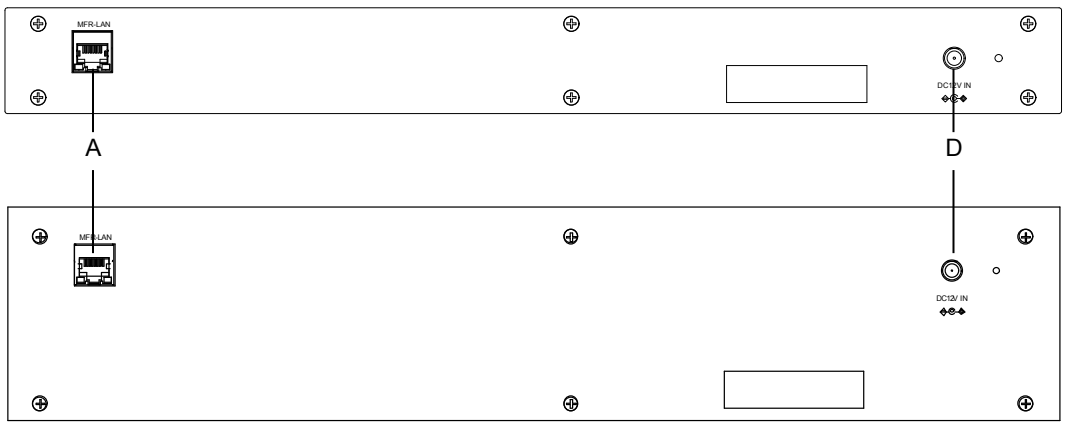
2-2-2. Rear Panel

◆ **MFR-39RU/39RUA**

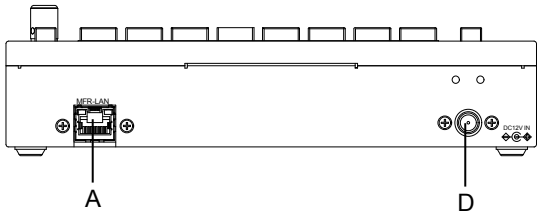
◆ **MFR-40RU / MFR-18RU / MFR-18RUA**

◆ **MFR-16RU / MFR-16RUD**

◆ **MFR-16/32/64RUW**



◆ **MFR-16RUTA**



No.	Item	Description
A	MFR-LAN *1	Used to connect the MFR main unit Ethernet port (10/100BASE-TX, RJ-45)
B	SERVICE	Used for maintenance only. Do not use.
C	DC 12 V IN 1,2	Used to supply 12 V DC power.
D	DC 12 V IN	Used to supply 12 V DC power.

*1 The MFR-LAN connector may be labeled 10/100BASE-T on the previous model.

2-3. MFR-GPI

2-3-1. Front Panel

No.	Item	Description
A	POWER	Displays the power status. ▶ See the table below for details on indications.
B	BUSY	Displays the writing status of the flash memory for backup settings. ▶ See the table below for details on indications.
C	GPI	When the GPI function is assigned using Web-based Control, the LED lights green. The LED remains unlit when there is no assignment.
D	SERIAL 1-4	When serial ports are assigned using Web-based Control, the LED lights green. The LED remains unlit when there is no assignment.
E	RESET	Used to re-initialize the GPI unit.

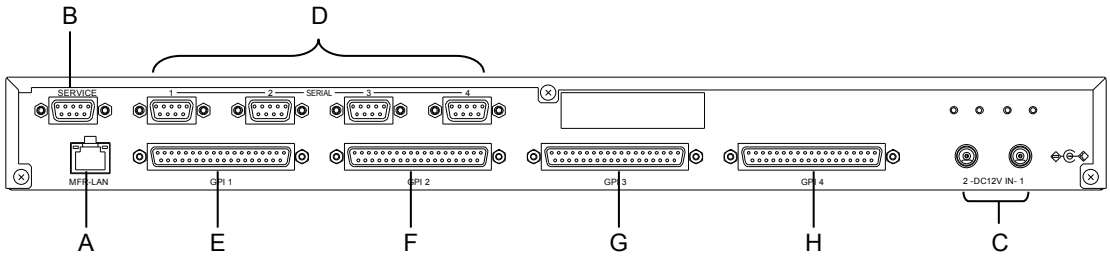
◆ **Color indications on the MFR-GUI front panel**

LED \ LED Color	Green	Red	Orange
POWER	Normal	Power alarm	
BUSY	Normal processing		Writing to flash memory

* POWER LED lights up red if the unit is turned on while it is not connected to a network.

NOTE
After finishing settings, do **not power OFF** the unit while BUSY LED is **lit orange**, since the system is writing to Flash. (It takes about two minutes at max.)

2-3-2. Rear Panel

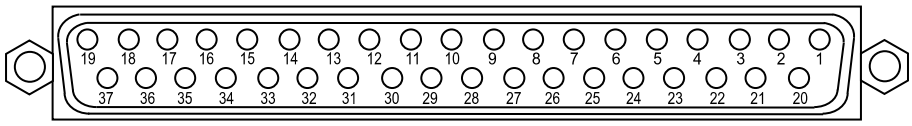


No.	Item	Description
A	MFR-LAN *1	Used to connect the MFR main unit Ethernet port (10/100BASE-TX, RJ-45)
B	SERVICE	Used for maintenance only. Do not use.
C	DC12V IN 1 and 2	Used to supply 12 V DC power.
D	SERIAL 1 to 4	Used for control via a serial interface. The default setting is RS-422. RS-232C is also selectable using switches on the card. (See section 2-3-4. Switch Settings on the Internal Board.) Pin assignments are the same as those of the MFR main unit. (See section 2-1-3. “Interfaces.")
E	GPI 1 (Port no.: 1)	Used for GPI input / output connections. (32 total assignable inputs and outputs)
F	GPI 2 (Port no.: 2)	Used for GPI input / output connections. (32 total assignable inputs and outputs)
G	GPI 3 (Port no.: 3)	Used for GPI input / output connections. (32 total assignable inputs and outputs)
H	GPI 4 (Port no.: 4)	Used for GPI input / output connections. (32 total assignable inputs and outputs)

*1 The MFR-LAN connector may be labeled 10/100BASE-T on the previous model.

2-3-3. Interfaces (MFR-GPI)

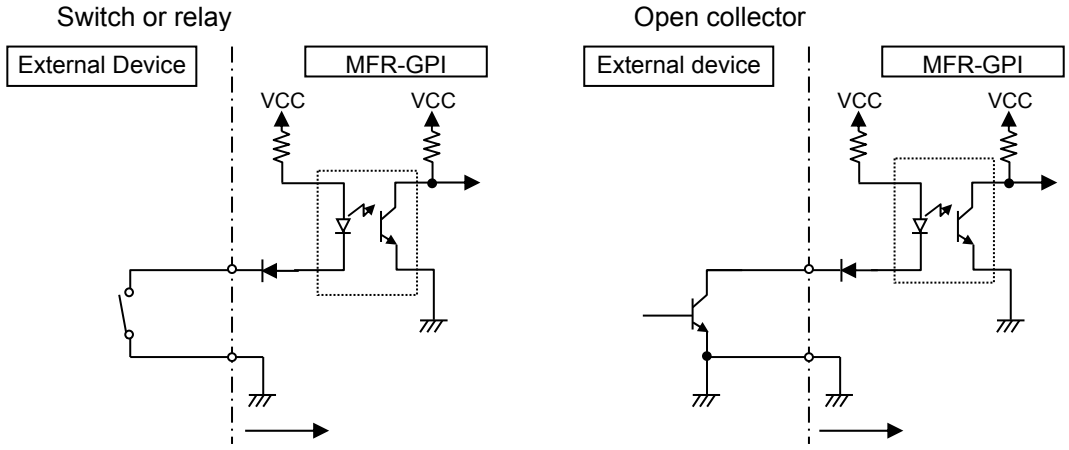
◆ **GPI IN / TALLY OUT Connector (37-pin D-sub, female)**



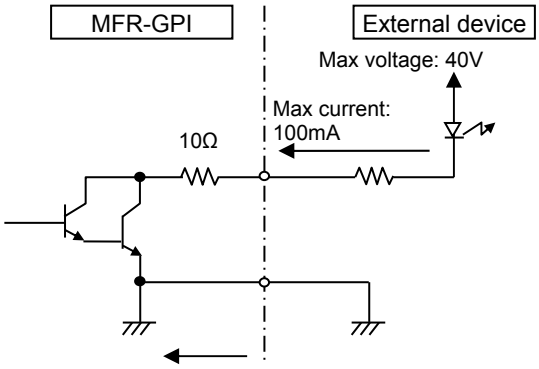
Pin No.	Signal	Pin No.	Signal
1	GPI_IN / TALLY_OUT 01 #	20	GPI_IN / TALLY_OUT 20 #
2	GPI_IN / TALLY_OUT 02 #	21	GPI_IN / TALLY_OUT 21 #
3	GPI_IN / TALLY_OUT 03 #	22	GPI_IN / TALLY_OUT 22 #
4	GPI_IN / TALLY_OUT 04 #	23	GPI_IN / TALLY_OUT 23 #
5	GPI_IN / TALLY_OUT 05 #	24	GPI_IN / TALLY_OUT 24 #
6	GPI_IN / TALLY_OUT 06 #	25	GPI_IN / TALLY_OUT 25 #
7	GPI_IN / TALLY_OUT 07 #	26	GPI_IN / TALLY_OUT 26 #
8	GPI_IN / TALLY_OUT 08 #	27	GPI_IN / TALLY_OUT 27 #
9	GPI_IN / TALLY_OUT 09 #	28	GPI_IN / TALLY_OUT 28 #
10	GPI_IN / TALLY_OUT 10 #	29	GPI_IN / TALLY_OUT 29 #
11	GPI_IN / TALLY_OUT 11 #	30	GPI_IN / TALLY_OUT 30 #
12	GPI_IN / TALLY_OUT 12 #	31	GPI_IN / TALLY_OUT 31 #
13	GPI_IN / TALLY_OUT 13 #	32	GPI_IN / TALLY_OUT 32 #
14	GPI_IN / TALLY_OUT 14 #	33	Frame ground
15	GPI_IN / TALLY_OUT 15 #	34	Frame ground
16	GPI_IN / TALLY_OUT 16 #	35	Frame ground
17	GPI_IN / TALLY_OUT 17 #	36	+4.8V output
18	GPI_IN / TALLY_OUT 18 #	37	+4.8V output
19	GPI_IN / TALLY_OUT 19 #		

* The symbol "#" at the end of signals represents the port number (1, 2, 3 or 4).
* The maximum total output current for all +4.8 V outputs is 1.5 A.

◆ **GPI IN Circuits**



◆ **GPI OUT / TALLY OUT Circuit**

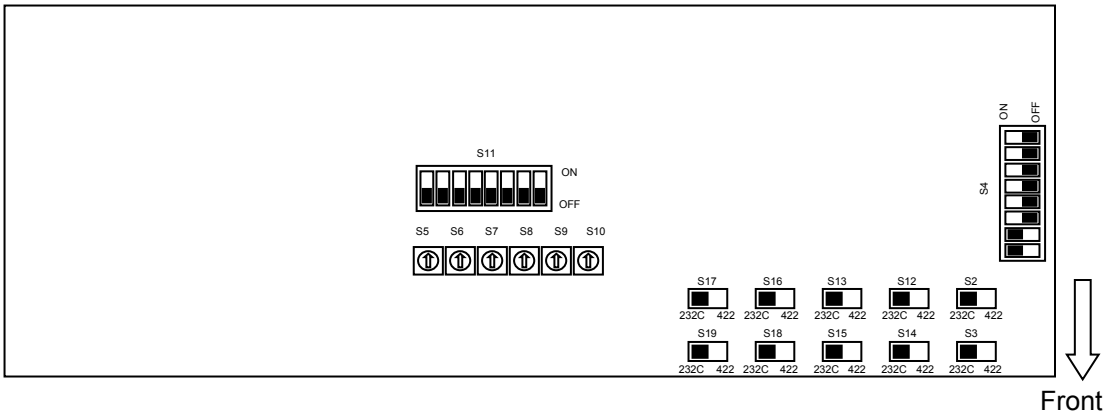


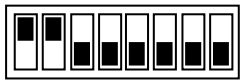
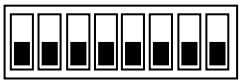
* The voltage is about 0.9 V when turned-on.

2-3-4. Switches on the Card

CAUTION
Do not access internal cards or make connections with the unit powered ON. Always power OFF all connected units / disconnect power cords prior to accessing the interior. Further note that adjustments and maintenance should only be performed by qualified technical personnel familiar with FOR-A equipment.

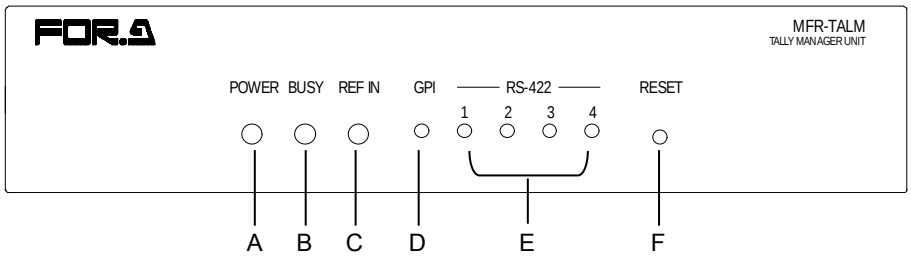
Remove two screws on both sides of the MFR-GPI to access the internal card as shown below. The figure below shows the factory default switch settings.



Switch	Function / Settings			
S2, S3	Used for maintenance. Do not use.			
S4	Used for maintenance. Do not use. (The factory default setting is as shown at right. The black boxes (■) represent switches.)	 ON OFF		
S5,S6,S7, S8,S9,S10	Used for IP address setting.			
S11	Used for maintenance. Do not use.	 ON OFF		
S12, S14	Used to select RS-232C/RS-422 for SERIAL 1. Default setting is RS-422 (both switches to the right). To change to RS-232C, set both switches to the left.	Switch Settings	RS-232C (Factory default setting)	
S13, S15	Used to select RS-232C/RS-422 for SERIAL 2. Default setting is RS-422 (both switches to the right). To change to RS-232C, set both switches to the left.			
S16, S18	Used to select RS-232C/RS-422 for SERIAL 3. Default setting is RS-422 (both switches to the right). To change to RS-232C, set both switches to the left.		RS-422	
S17, S19	Used to select RS-232C/RS-422 for SERIAL 4. Default setting is RS-422 (both switches to the right). To change to RS-232C, set both switches to the left.			

2-4. MFR-TALM

2-4-1. Front Panel



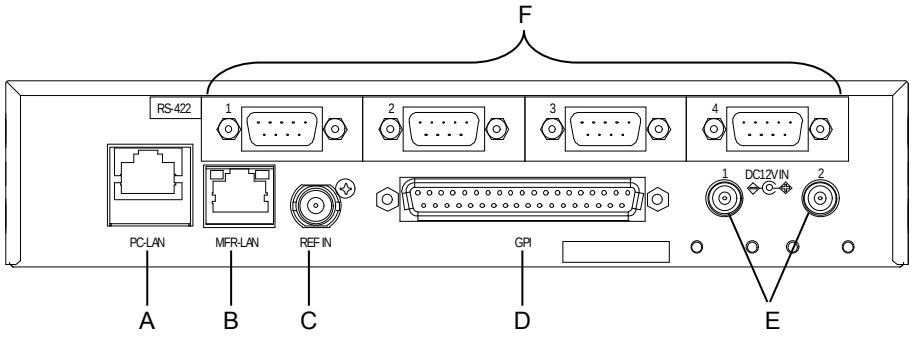
No.	Item	Description
A	POWER	Displays the power status. ▶ See the table below for details on indications.
B	BUSY	Displays the writing status of the flash memory for backup settings. ▶ See the table below for details on indications.
C	REF IN	Lights green when an external reference signal is present.
D	GPI	Lights green a GPI function is assigned. Turns off when no GPI function is assigned.
E	RS-422 1 - 4	Lights green when a port function is assigned. Turns off when no port function is assigned.
F	RESET	Resets MFR-TALM.

◆ **Color indications on the MFR-TALR front panel**

LED color / LED	Green	Red	Orange
POWER	Normal	Power alarm	
BUSY	Normal processing		Writing to flash memory

NOTE
After finishing settings, do **not power OFF** the unit while BUSY LED is **lit orange**, since the system is writing to Flash. (It takes about two minutes at max.)

2-4-2. Rear Panel

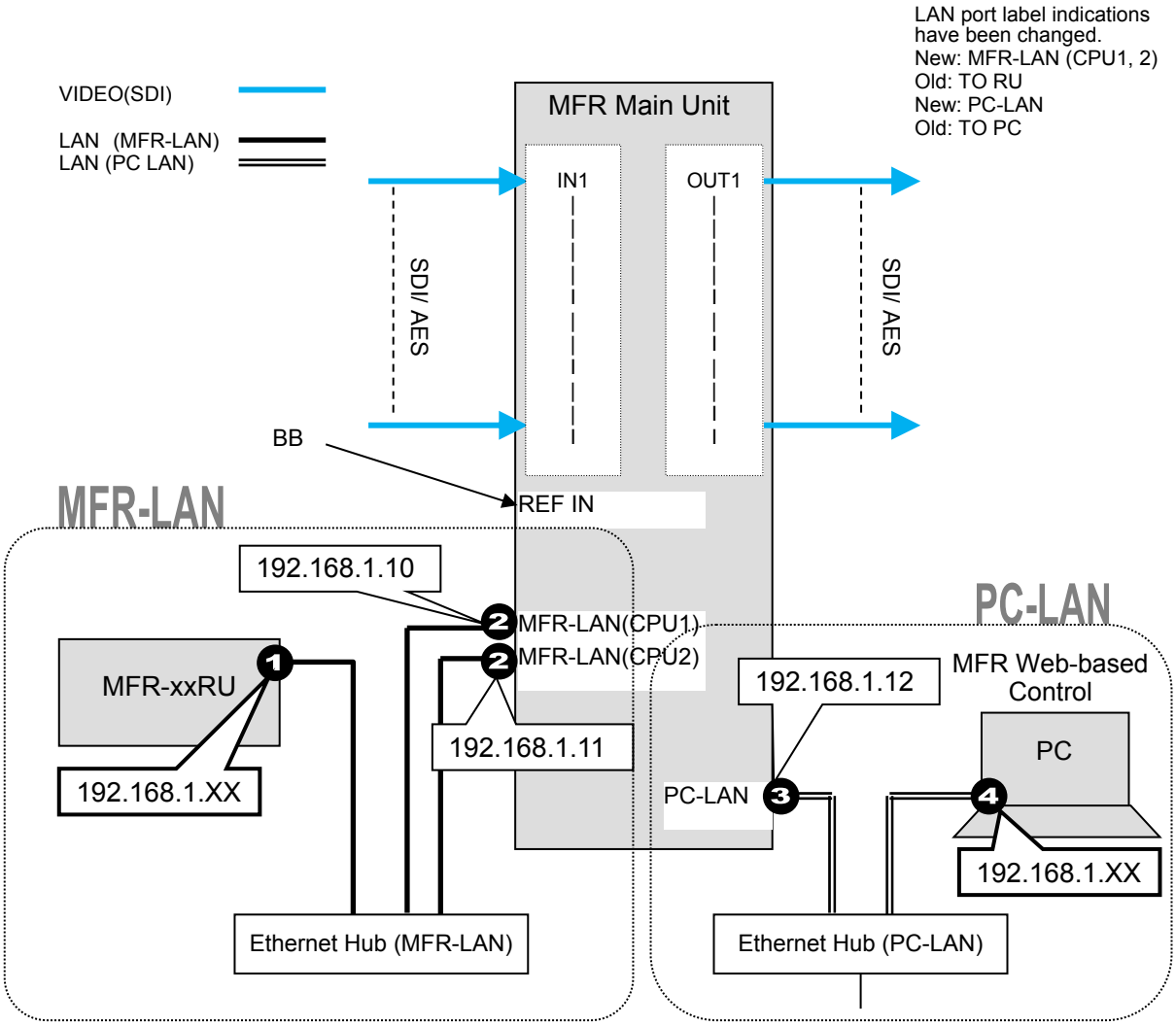


No.	Name	Description
A	PC-LAN	Used to connect to a PC or other external unit. An Ethernet port (10/100BASE-TX RJ-45)
B	MFR-LAN	Used to connect to an MFR main unit. An Ethernet port (10/100/1000BASE-T RJ-45)
C	REF IN	Used to input a reference signal (BB or Tri-level sync signal)
D	GPI	Used to input/output GPI signals for external control. (32 total assignable inputs and outputs) Pin assignments are the same as those of the MFR-GPI connectors. ▶See section 2-3-3 "Interfaces (MFR-GPI)."
E	DC12V IN 1 and 2	Used to supply 12 V DC power.
F	RS-422 1 to 4	Used for control via an RS-422 interface. Pin assignments are the same as those of the MFR main unit. ▶See section 2-1-3. “Interfaces."

3. System Configuration Example

3-1. Basic Configuration

The block diagram below shows an example of the basic MFR routing system that consists of an MFR Main Unit, Remote Unit and the Web-based Control accessed from a computer.
Make sure to connect both MFR-LANs (CPU1) and (CPU2) to a LAN respectively for CPU redundancy. Their LAN connections must be separated from the network segment of PC-LAN and other devices. (Default IP addresses (Net mask: 255.255.255.0) are used in the configuration example below.)



◆ **LAN Port Settings**

Port	RU Front Panel	Web-based Control	Sec. in Web Control Manual
❶	MFR-39RUA: See sec. 5-3-4. MFR-39RU: See sec. 5-5-1. MFR-18RU/18RUA: See sec. 5-7-1 and 5-7-2. MFR-16RUTA: See sec. 5-8-1 and 5-8-2. Other RUs: See sec. 5-9-1 and 5-9-2.	RU Settings page	7-3
❷	---	MU Settings page	5-2
❸	MFR-39RUA: See sec. 5-3-4. MFR-39RU: See sec. 5-5-3 (display only). MFR-18RU/18RUA: See sec. 5-7-1 (display only). MFR-16RUTA: See sec. 5-8-1 (display only). Other RUs: See sec. 5-9-1 (display only).	Network Settings page	4-1-7

3-2. Main Unit Linking

The Main Unit Link feature allows you to control multiple main units at the same time.
Two types of system configurations are available:

Parallel Link: Controls several main units at the same time.
Expanded Matrix: Creates an expanded virtual matrix by linking main units.

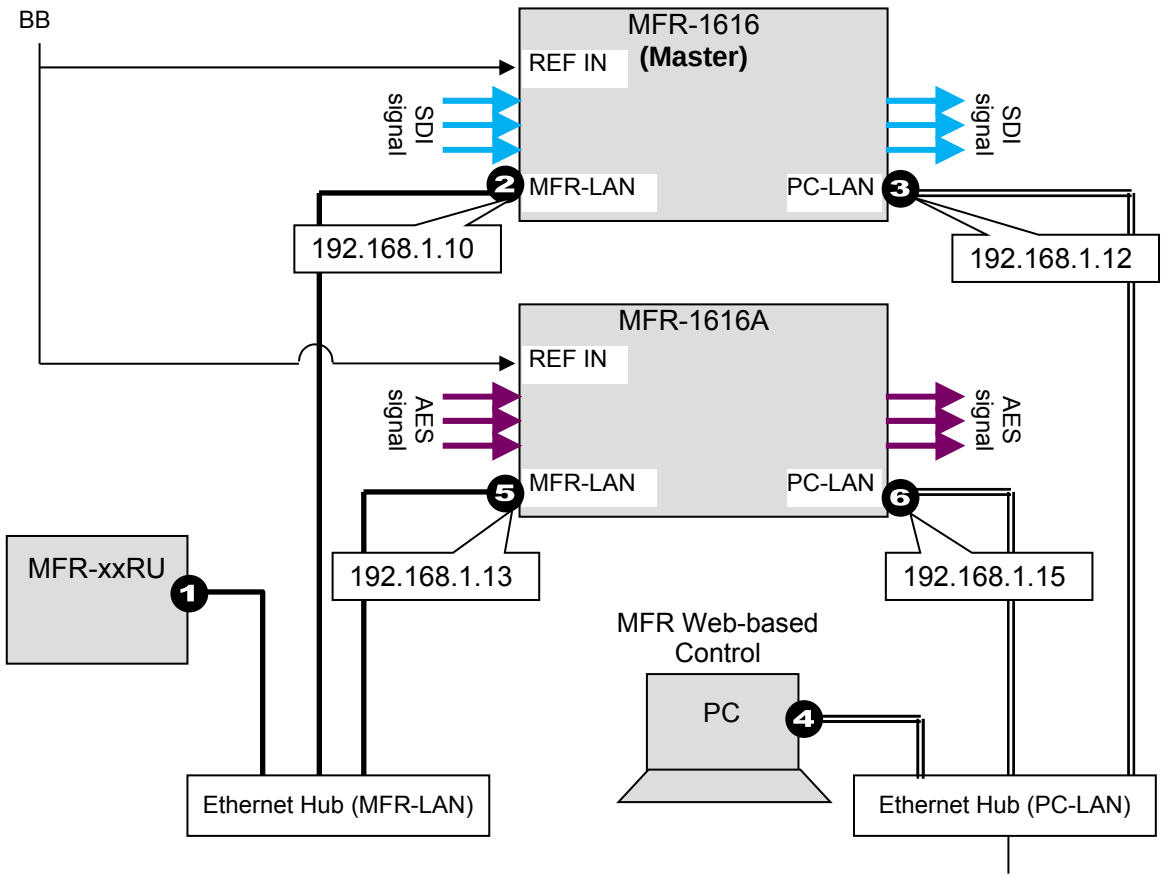
Note that each Expanded Matrix system requires specific BNC connections. **IP port and SNMP settings** should be performed on **each** main unit. After these settings are completed, all linked main units are set and **controlled** together on the main unit that is specified as **Master**.

Main Unit Link Specifications

- Main Unit Link systems are set and controlled through a specified **master** unit.
- Up to **8** main units can be linked within a system.
- **MFR-8000 / 5000 / 3000** and other MFR main units (**MFR-3232 / 3232RPS / 3216 / 3216RPS / 1616 / 1616R / 1616A**) can**not** be linked to each other.
- Only **SDI** signals can be routed in **Expanded Matrix** systems. (MFR-1616A units, therefore, cannot be linked in an Expanded Matrix system.)
- All main units in a link system must be linked together and independent units cannot exist in the system.
- Refer to Firmware / Software Versions and Supported Hardware / Features (p. 3) for details on the supported version.

3-2-1. Parallel Link System Example

The system example below shows video and audio links using a Parallel Link system composed of MFR-1616 and MFR-1616A units.



Note that in all main units the IP address of MFR-LAN1 is set to 192.168.1.10 and that of PC-LAN to 192.168.1.12 as factory default. To prevent IP address overlap in a system, you need to change IP addresses of either unit.

Also note that desired IP addresses can be set for system devices according to your network conditions.

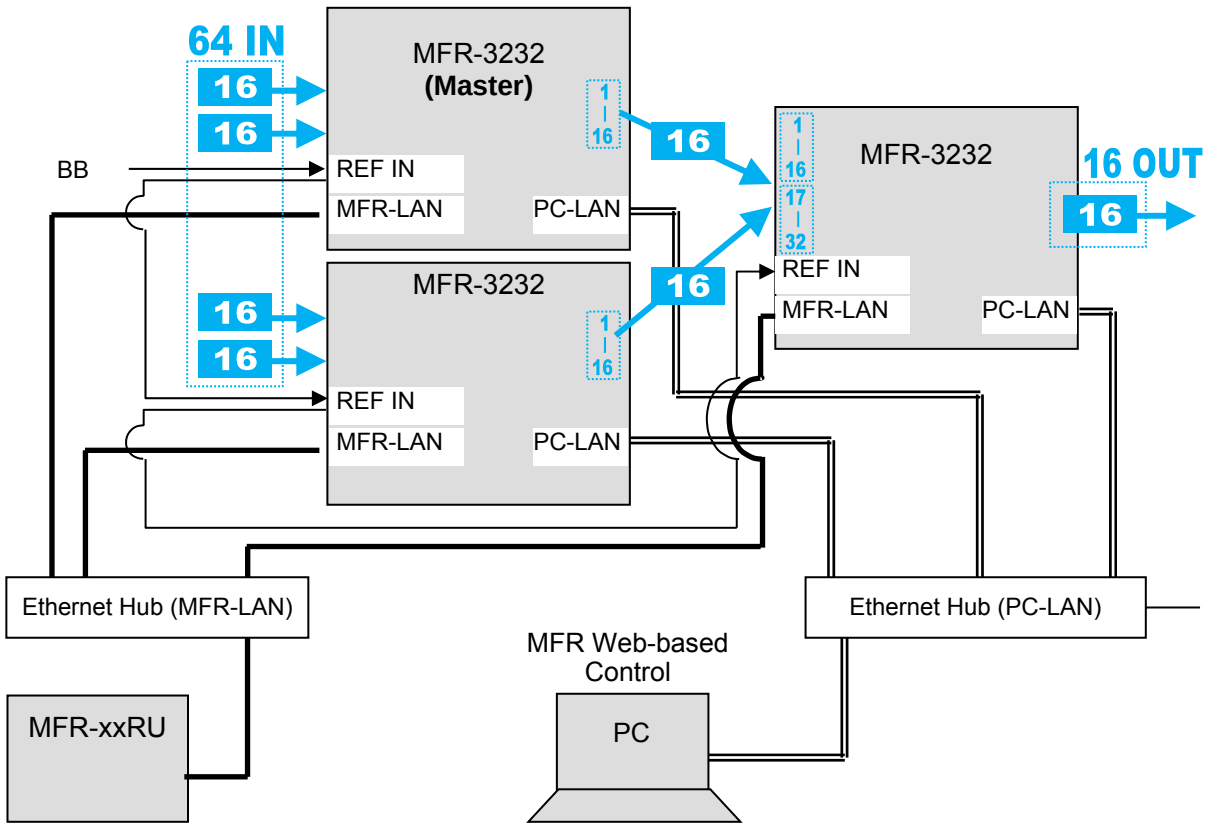
◆ **Setup Procedure**

1) Connect all devices in the MFR system as shown in the figure in the previous page.
2) Power on the MFR-1616, Remote Control unit and computer. (Do not power on the MFR-1616A.) Set the IP address for the Remote Control Unit (①) and computer (④). Power off the MFR-1616.
3) Power on the MFR-1616A. Set the MFR-1616A IP addresses (⑤ and ⑥) as shown in the previous page. Set the **Switching Point** to **Sync** in the same menu page.
4) Power on the MFR-1616.
5) Connect to the MFR-1616 Web-based control and open the **Build Setting** page. Check on **Build Enable** to enable the Main Unit Link feature.

▶ See section 11 "Main Unit Link" in the "Web-based Control Operation Manual."

3-2-2. Expanded Matrix System Example

The system example below connects three MFR-3232 units to form a 64 x 16 virtual matrix.



◆ **Setup Procedure**

1) Connect three MFR-3232 units, one by one, to the MFR system, referring to the previous chapter for details on to setting network settings. Do not use the same IP address twice in the system.
2) Connect all three MFR-3232 units to the MFR system. Connect BNC cables based on SDI signal routing paths.
3) Connect to the Web-based Control of an MFR-3232 and open the **Build Setting** page. Check on **Build Enable** to enable the Main Unit Link feature.

▶ See section 11 "Main Unit Link" in the "Web-based Control Operation Manual."

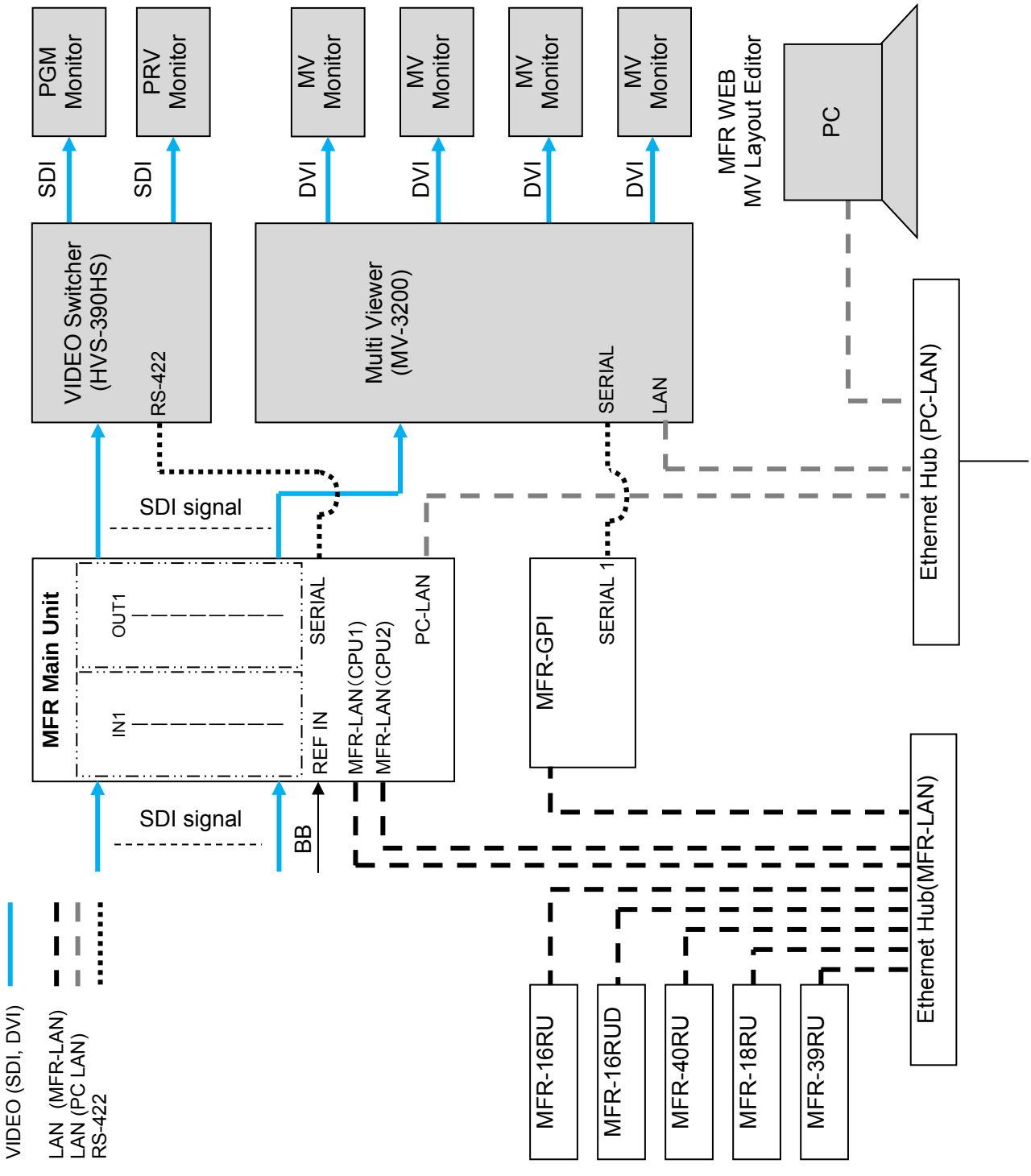
3-3. Signal Name and Tally Link System

3-3-1. Configuration Example 1

The block diagram below shows an example signal name and tally link system comprised of a FOR-A video switcher and multiviewer.

To configure this system, connect the SERIAL port on an MFR main unit or SERIAL 1 to 4 on an MFR-GPI unit to the video switcher's serial port. RS-422 ports are required for the signal name and tally link system. Before connection, change the MFR serial ports from RS-232C to RS-422 using the internal switches.

▶See section 2-3-4. "Switches on the Card."

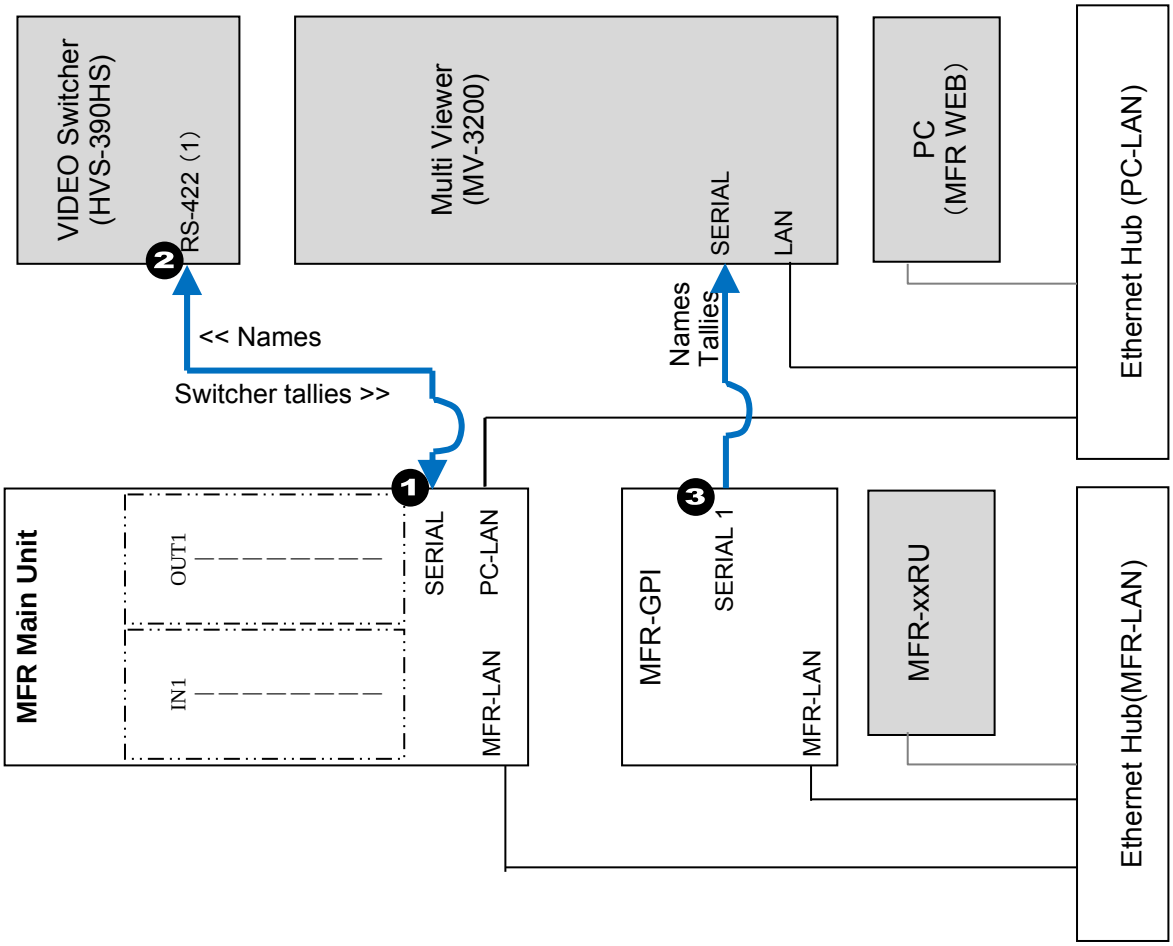


◆ **Transmitting Signal Name and Tally Data**

The figure below shows the routing of signal name and tally data.

Set each serial port following the table on this page using the MFR Web Control and on the switcher.

Each tally information setting should be performed in the [Web-based Control: **Tally System Settings** page].



Serial Port Settings

Port	Menu	[Port Settings] - [Serial Port]			
		Connector	Function	Baud rate	Parity
❶	Web-based Control [Router System Settings]	(MU) -	Router/HVS connection	38400	NONE
❷	HVS-390HS [EXT INTERFACE - RS-422]	RS-422 (1)	ROUTER	38400	NONE
❸	Web-based Control [Router System Settings]	(GPI) No. 1	Tally out (TSL Ver. 3.1)	38400	EVEN

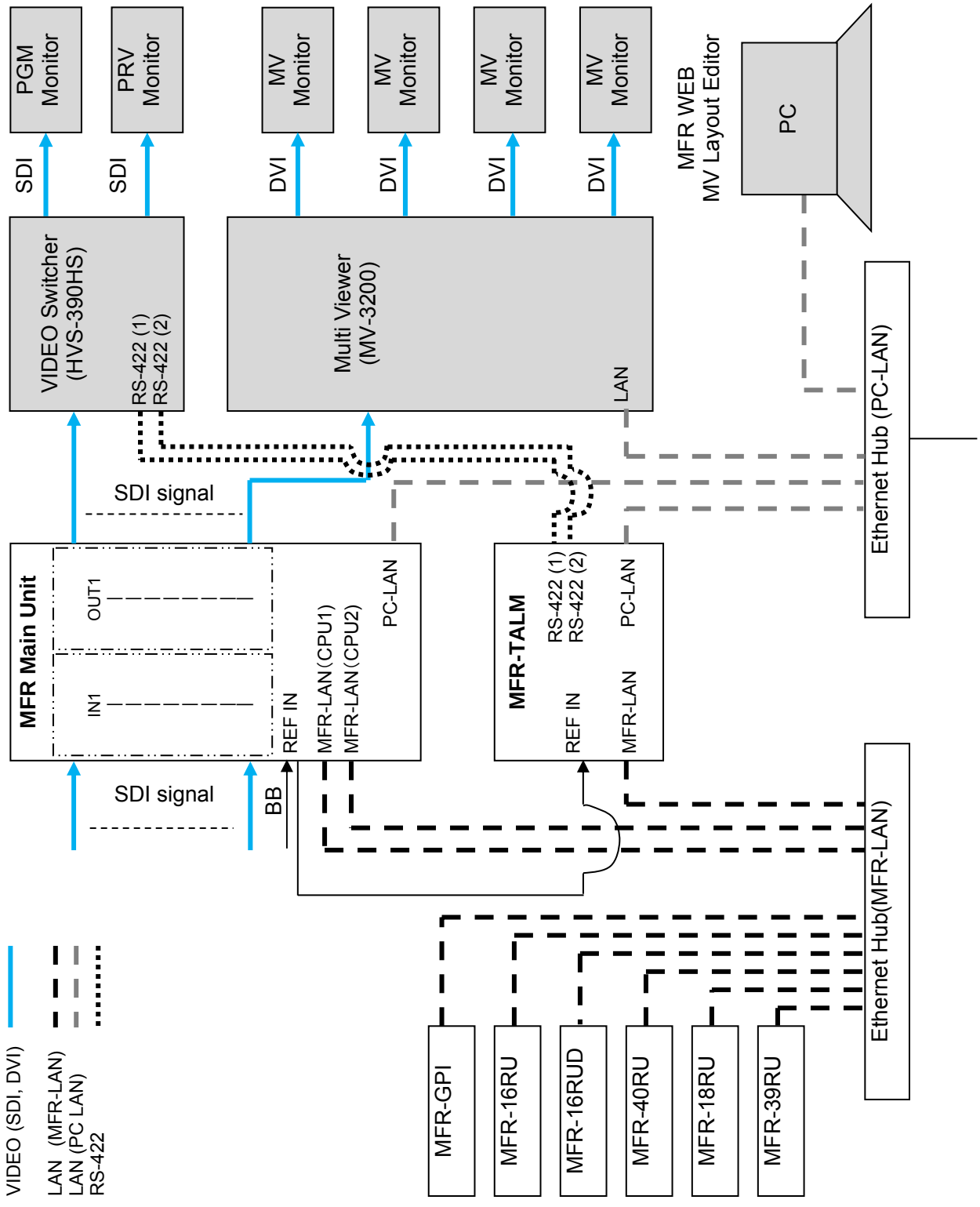
Other Parameter Setting (in HVS-390HS)

To display the signal names received from the MFR system, set the [LINK] parameter to [MFR] in the [SETUP - EXT I/F - ROUTER] (6/6) menu.

3-3-2. Configuration Example 2

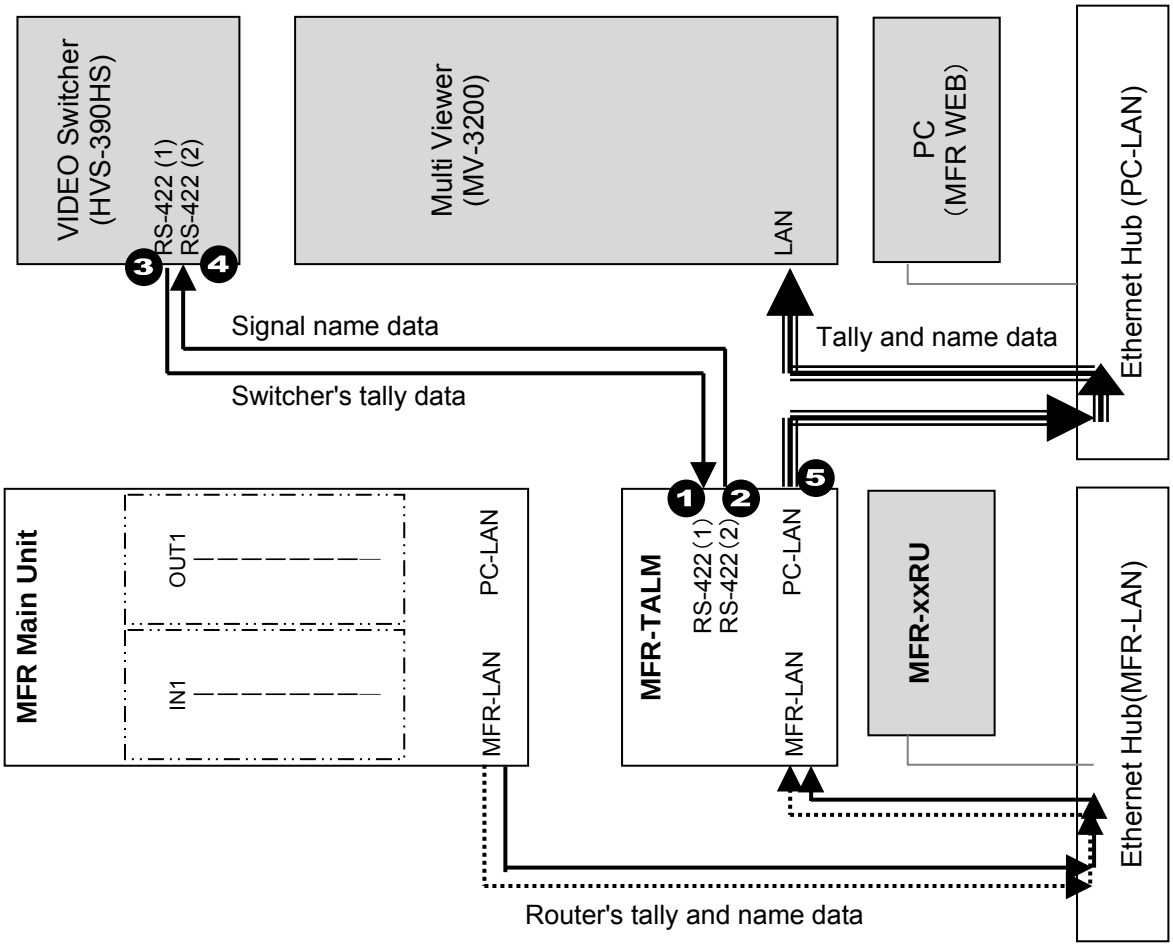
The block diagram below shows an example signal name and tally link system comprised of a FOR-A video switcher and multiviewer using an MFR-TALM unit. The MFR-TALM is specifically designed to perform the task of tally data computation, which is ordinarily undertaken by the MFR main unit, to accelerate the computation. RS-422 ports (1) to (4) are available for video switcher connection.

Before using an MFR-TALM unit for the system, change **Tally Control Unit** to **MFR-TALM** in the [Main unit Web-based Control: **MU Settings** page].



◆ **Transmitting Signal Name and Tally Data**

The figure below shows an example signal name and tally data routing system using the MFR-TALM.



Each serial port should be set as shown in the table below in the relevant page of the **MFR-TALM** Web-based Control accessed from "**http://192.168.1.62**" (default IP address) on your web browser.

Serial Port Settings

Open the [MFR-TALM Web-based Control: **Port Settings** page] and perform port settings under **Serial Port**.

As for the HVS-390HS unit, perform port setting in the [EXT INTERFACE - RS-422] menu.

Port	Menu	[Port Settings] - [Serial Port]			
		Connector	Function	Baud rate	Parity
❶	Web-based Control [TALM Settings]	No. 1	HVS-TAL Protocol Reception	38400	EVEN
❷	Web-based Control [TALM Settings]	No. 2	Router/HVS connection	38400	NONE
❸	HVS-390HS [EXT INTERFACE - RS-422]	RS-422 (1)	TALLY	38400	EVEN
❹	HVS-390HS [EXT INTERFACE - RS-422]	RS-422 (2)	ROUTER	38400	NONE

TCP/IP Setting
Open the [MFR-TALM Web-based Control: **Port Settings** page] and perform port settings under **TCP/IP Port**.

Port	Menu	[Port Settings] - [TCP/IP Port]			
		Access Method	IP Address	Port	Function
❺	Web-based Control [TALM Settings]	Client	(MV IP address)	(MV TCP/IP port number)	TSL UMD protocol V5.0 Tally out

Encode	DLE	Screen No.
Unicode	ON	(Set the same as in MV)

Settings for data transmission between HVS-390HS and MFR-TALM
<HVS-390HS side>
- To apply the name data received from the MFR system on the switcher, set [LINK] to [MFR] in the [SETUP - EXT I/F - ROUTER] (6/6) menu.
- Perform the TALLY COLOR and TALLY UNIT settings so that the MFR-TALM unit can receive switcher tally data.

<MFR-TALM side>
- Open the [MFR-TALM Web-based Control: **HVS-TAL Protocol Reception** page] and perform the same tally settings as those in HVS-390HS.

  Setting Example)
  In the switcher's TALLY COLOR menu, set the TALLY COLOR for the **M/E1 PGM** bus to **RED**. Then, assign **RED TALLY IN01-IN08** to Tally Out **Pin 1-8** for a Tally Unit.
  Open the [MFR-TALM Web-based Control: **HVS-TAL Protocol Reception** page] and set the same tally settings. Now the MFR system can receive the relevant tally data from the switcher.

  The MFR system can transmit the received tally data to the multiviewer in which these tally and name data are displayed, or use them for GPI outputs on MFR-GPI or MFR-TALM .
  - To display the received data on the multiviewer screen, assign the same bus and signal sources used in the switcher in the multiviewer's [**DP-MV Tally** page].
  - To use the received data for GPI outputs, perform Tally Out settings in the [**GPI Pin Assign** page] of the MFR Web-based Control.

The tally settings in the MFR system must be entered in the [MFR-TALM Web-based Control: **Tally System Settings** page]. When using MFR-TALM for tally control, the [Main unit Web-based Control: **Tally System Settings** page] and its subpages are all disabled.

Refer to your multiviewer's user guide for the details on how to handle tally data on the multiviewer.

4. Function / Operation Chart

Control the MFR-1616, MFR-1616R, MFR-3216, MFR-3216RPS, MFR-3232, MFR-3232RPS, and/or MFR-1616A using the remote control panel (RCU) and/or Web-based Control (GUI). Certain functions can only be controlled either by the remote control panel or Web-based Control as shown in the below chart.

* For details on Web-based Control operation, see the separate MFR SERIES Web-based Control Operation Manual.

Description on Control

○: Changing settings and execution are both supported
●: Execution is supported
▲: Changing settings is supported
39: Supported by the MFR-39RU and MFR-39RUA
18: Supported by the MFR-18RU and MFR-18RUA
16D: Supported by the MFR-16RUD
16T: Supported by the MFR-16RUTA

Function \ Controller		Remote Control Units	Web-based Control	Ref.
Crosspoint change (1 channel)	By changing source and/or destination	○	○	6-1-1
	Using bus buttons	○	---	6-1-2
	Using buttons and the CONTROL knob	18	---	5-3-2
	Using the display	16D, 16T	---	5-4-1
	CHOP function	●	---	6-1-3
	TAKE function	●	○	6-1-4
Crosspoint change (Simultaneous)	Main unit stored SALVO	●	▲	6-2-1
	Control panel button assigned SALVO	39, ●	▲	6-2-2
	TAKE function	●	○	6-2-3
	LINK function	●	▲	6-2-4
Erroneous operation protection	LOCK LOCAL	○	---	6-3-1
	LOCK OTHER/ALL	○	○	0
	Crosspoint inhibit	---	○	Web
	Monitor output function (*1)	●	---	---
	Operation Preview function	●	---	6-4
Main unit and system setting change	Source/destination name settings	---	○	Web
	System tally settings	---	○	Web
Remote control setting change	Mode menu	39, 18, 16T	---	5-3-2
	Button assignment	39, 18, 16T (*2), 16D	○	5-3-3-12 5-4-2
	PAGE function	○	---	5-1-2
	Group setting	---	○	5-1-2-1
	Multi-remote control panel operation	39 (*3)	▲	5-10
	IP address setting	▲	▲	5-5-1
	Other settings	39	○	5-3-3
Status display		●	●	---
Alarm indication		●	●	---

*1 This function is supported only for the MFR-5000. MFR-1616, MFR-1616R, MFR-3216, MFR-3216RPS, MFR-3232, MFR-3232RPS, and MFR-1616A are not supported.

*2 Source and destination button/channel assignments can be performed using CONTROL on MFR-18RU/16RUTA/18RUA/39RUA units.

*3 MFR-39RU and MFR-39RUA can change multi-remote control panel operation settings while other remote control panels can only be used for operation.

5. Remote Control Panel Operation

5-1. Basic Operation

This section describes basic operation of the remote control panel and how to set and execute various functions.

5-1-1. Buttons

1) Assign functions to buttons (change assignments)

To use buttons on the remote control panel, assign functions to the buttons in the [Web-based Control: **Assign Function** page].
Any function can be assigned to any button except CANCEL, PAGE A, PAGE B, UP, DOWN and ENTER. Normally, assign functions via Web-based Control.

➢ How to Assign Functions to Buttons

(1) Click a remote control unit to display the menu tree in the left pane. Click [Assign Function] to display the **Assign Function** page in the right pane.
(2) Select a page, button and function to be set. Buttons can be selected under **Button ID** or by pressing buttons on the remote control image.
(3) Set the relevant parameter(s) according to the function.
(4) Press [Send] to apply the button assignment.

MFR-39RU units allow you to assign functions in the "**SETTING > BTN ASSIGN**" menu.
▶See section 5-3-3-12. "BTN ASSIGN" for details.

MFR-39RUA units allow you to assign functions in the **"SETTING > BUTTON ASSIGN"** menu.
► See section 5-3-4-4. "BUTTON ASSIGN" for details.

Source and destination button/channel assignments can be performed using the control knob on MFR-18RU, MFR-16RUTA, MFR-18RUA and MFR-39RUA units.
▶See section 5-1-3. "Control Knob" for details.

MFR-16RUD units allow you to assign functions using the display.
▶See section 5-4-2. "Button Assignment Change" for details.

2) Press buttons to execute functions

Press a button to execute the assigned function. Button LED indication, NAME DISPLAY, MENU and display will change according to the assigned function.

5-1-2. Page Function

A set of button assignments on a remote control panel can be saved and recalled as a page. Therefore, all or multiple panel buttons can change their function simultaneously by loading a page with a single button press. Pages can be changed either by pressing PAGE buttons or by using the control knob in **Page** mode. (See section 5-3-2. "Mode Menu")

There also are settings for the Page function in the Mode and Setting menus. Please also refer to the following sections.

▶ For PAGE button assignment: 5-3-3-5 “PAGE ASSIGN”
This section describes the setting whether to assign the PAGE button in all pages. Having PAGE buttons assigned to all pages helps you not to have to look for the PAGE button.
▶ For the Mode menu settings: 5-3-3-4 “PAGE MODE”
This section describes how to select pages using the control knob.

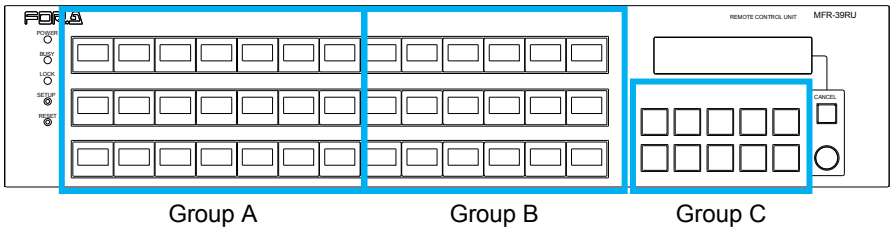
5-1-2-1. Page Switch by Group

Pages can be changed per a button group. The number of available button groups differ depending on a remote control unit as shown in the table below. These groupings can be freely changed using the Web-based Control menu.

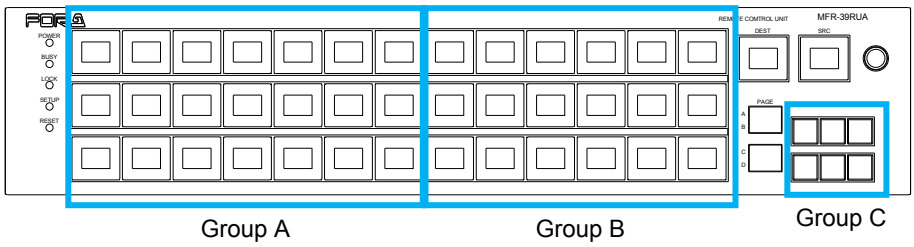
Remote Control Unit	Button group
MFR-16RU/16RUD	A to B
MFR-16RUW/32RUW	A to C
MFR-39RU/40RU/18RU/16RUTA/39RUA/18RUA	A to D
MFR-64RUW	A to E

Default button groups of control panels are determined as shown in the figures below.

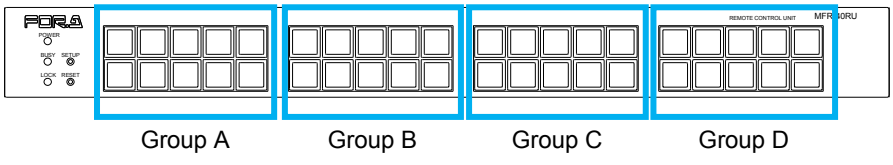
◆ **MFR-39RU**



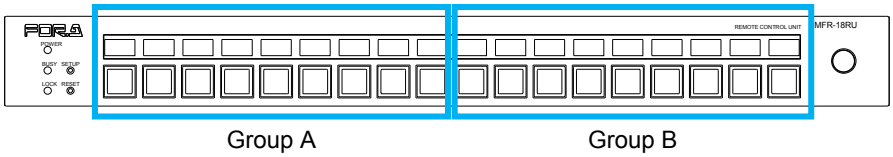
◆ **MFR-39RUA**



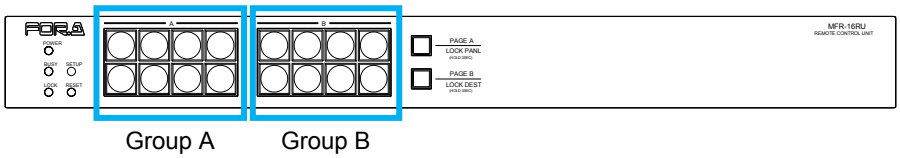
◆ **MFR-40RU**



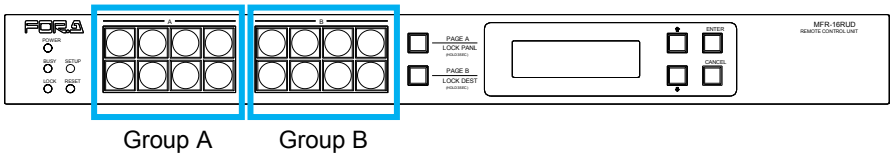
◆ **MFR-18RU/18RUA**



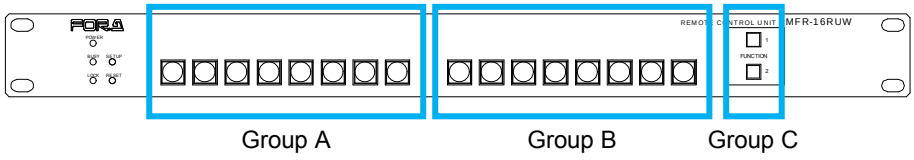
◆ **MFR-16RU**



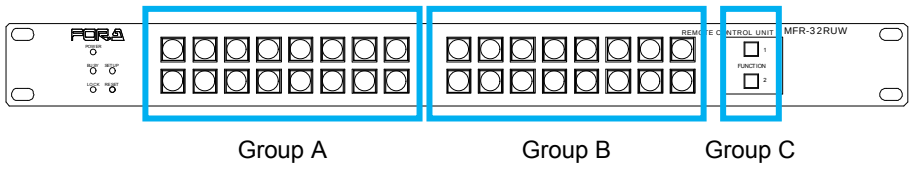
◆ **MFR-16RUD**



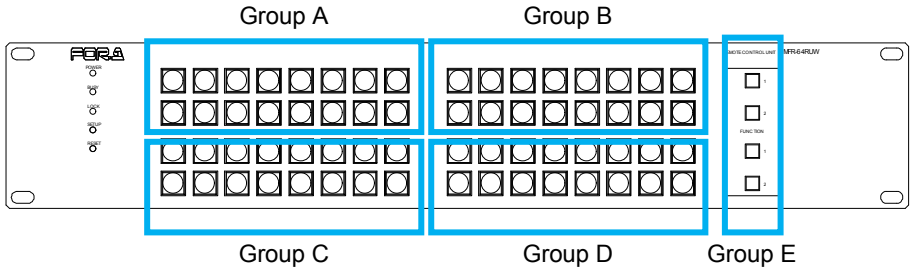
◆ **MFR-16RUW**



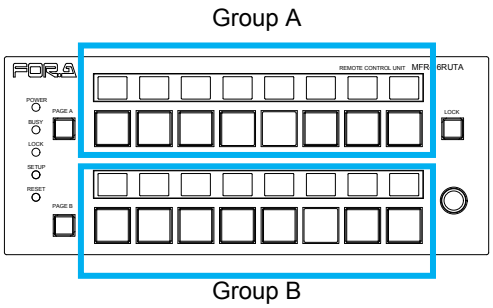
◆ **MFR-32RUW**



◆ **MFR-64RUW**



◆ **MFR-16RUTA**



◆ **Page Limit and Maximum Page Number Setting**

- The maximum number of assignable pages (page limit) is:
  32 for MFR-39RUA /18RUA /39RU /40RU /18RU / 16RUW / 32RUW / 64RUW / 16RUTA
  2 for MFR-16RU/16RUD

- The maximum number of pages, within which the page can be changed by the Mode menu or Page buttons, can be set within the page limit (excluding MFR-16RU/16RUD).

- The maximum page number setting is shared by all groups.

- Any page assignments or jumps are possible, but have no effect if they exceed the page limit. ("x" will appear instead of buttons on the MFR-39RUA/18RUA/39RU/18RU/16RUTA units.)

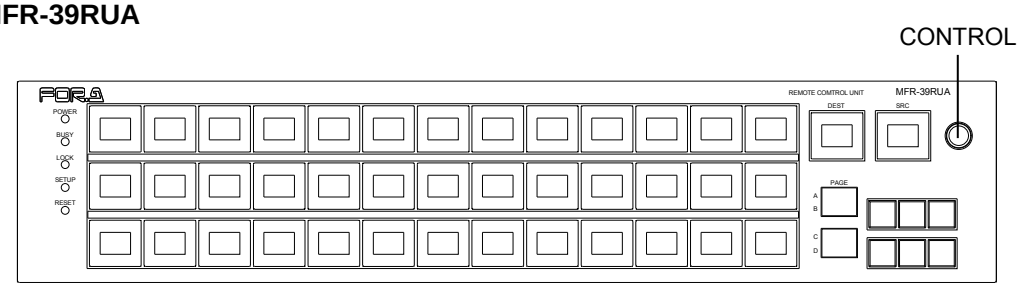
- The maximum page number can be set under **Page-Max number** in the [Web-based Control: **RU Settings** page]. A warning dialog box will appear when the number is reduced and sent.

- If the page limit is set to a number less than the displayed page, the displayed page will automatically change to the page number limit.

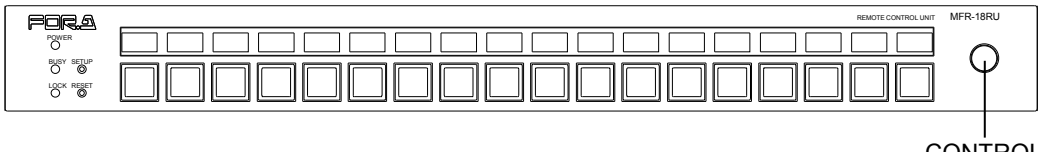
5-1-3. Control Knob

If your MFR Remote control panel has a **Control** knob, you can select destination channels or other items using the knob.
You can also select menu items by turning and pressing the knob to confirm the selection.
Using the control knob, it is easy to select items to be displayed or to change settings by changing modes in the Mode menu. See section 5-3. “MODE Button and Mode Menu” for details.

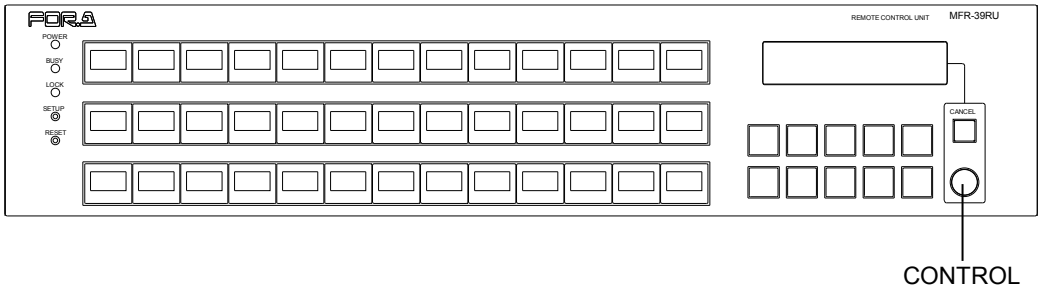
MFR-39RUA



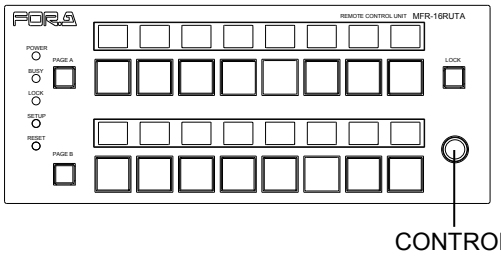
MFR-18RU/18RUA



MFR-39RU



MFR-16RUTA



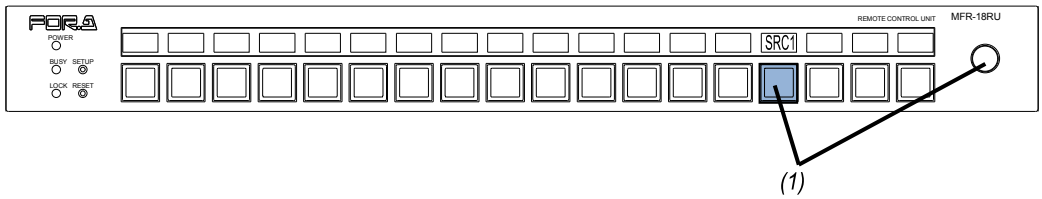
The Control knob can be disabled or enabled in the [Web-based Control: **RU Settings** page].

Selecting a source or non-function button on MFR-18RU/16RUTA/39RUA/18RUA units allows you to change the source channel assignment.
Selecting a destination button allows you to perform one of the following three operations set in the **RU Settings** page. (MFR-39RUA units perform **Assign** operations.)

- **Assign** (default): Allows you to change the channel assignment of the selected destination button.
- **Crosspoint**: Allows you to change the crosspoint assignment of the selected destination button.
- **Disable**: The operation is disabled.

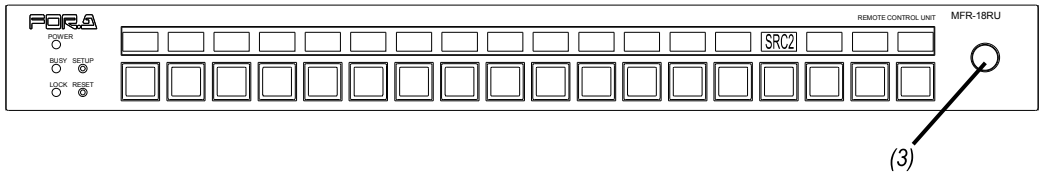
The operation procedure is as follows:

(1) Press the desired source, destination or non-function button while holding down the control knob. The button light sequentially changes its color from red to orange, then green.



(2) Turn the control knob to select a source channel to assign to the button.

(3) Press the control knob to confirm the change. To cancel the change, press the selected source button. After confirming or canceling the change, the button light returns to the previous state.



5-2. Function Buttons

Functions that are assignable to Remote control panel buttons are as shown in the below table. Normally, functions are assigned via Web-based Control. (See "Assign Function" in Web-based Control) MFR-39RU menu display is enabled to assign functions. (See 5-3-3-12. “BTN ASSIGN.") MFR-16RUD can locally assign functions using the display. (See section 5-4-2. "Button Assignment Change".)

<table>
<tr><th>Function</th><th>Button indication</th><th>Description</th><th>Reference</th></tr>
<tr><td>None</td><td></td><td>No function is assigned.</td><td></td></tr>
<tr><td>Destination</td><td>DST1</td><td>Allows you to change a destination to the destination specifically assigned to the button.
If locked, the button lights up with a color indicating LOCK OTHER or LOCK ALL, which can be set in the [Web-based Control: RU Settings page].
Re-pressing the button allows you to display the Unit ID that locks the destination button.</td><td>6-1-1</td></tr>
<tr><td>Source</td><td>SRC1</td><td>Allows you to change a source to the source specifically assigned to the button.</td><td>6-1-1</td></tr>
<tr><td>Bus</td><td>SRC1
DST1</td><td>Allows you to change a source to the source specifically assigned to the button for a destination of the source-destination assignment of the button.</td><td>6-1-2</td></tr>
<tr><td>PAGE</td><td>Page> 1
B

Page> 1
Jump B

Page> 1
AC

Page> 1
Jump AC

Page> 1
All

Page> 1
Jump All

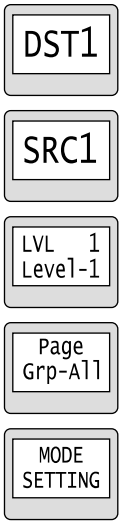
PageUp
A

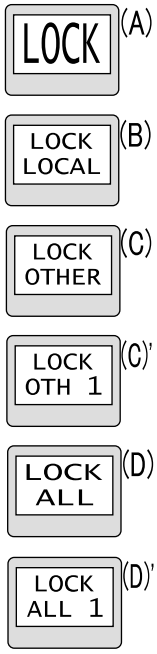
PageDwn
All</td><td>Allows you to change pages to be displayed to a specific, next or previous page.
There is a menu that allows you to select whether to return to the previously displayed page or to display the next specified page.
Target group(s) is displayed on the bottom of the button indication.

See Sec. 5-1-2. “Page Function” and Appendix: “How to use Page buttons” for details on Page button setting and operation.

∗ Button indications (from the top to the bottom)
<table>
<tr><td>PAGE JUMP (single)</td><td rowspan="2">Switches the page to 1 for Group B.</td></tr>
<tr><td>PAGE JUMP (single) (*1)</td></tr>
<tr><td>PAGE JUMP (multi)</td><td rowspan="2">Switches the page to 1 for Group A and C.</td></tr>
<tr><td>PAGE JUMP (multi) (*1)</td></tr>
<tr><td>PAGE JUMP (all)</td><td rowspan="2">Switches the page to 1 for all groups.</td></tr>
<tr><td>PAGE JUMP (all) (*1)</td></tr>
<tr><td>PAGE UP (single)</td><td>Moves the page forward by 1 for Group A.</td></tr>
<tr><td>PAGE DOWN (all)</td><td>Moves the page backward by 1 for all groups.</td></tr>
</table>
* A corresponding page name is displayed when assigning PAGE JUMP on MFR-18RUA/39RUA/ 16RUTA units.

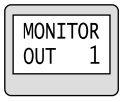
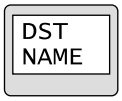
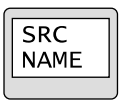
(*1) MFR-18RUA/39RUA/16RUTA only</td><td>5-1-2</td></tr>
</table>

<table>
<tr><th>Function</th><th>Button indication</th><th>Description</th><th>Reference</th></tr>
<tr><td>MODE</td><td> 
</td><td>Allows you to change mode menus.
Mode function can be assigned to either one or multiple buttons. One button assignment allows you to change modes one by one by every press.
To assign modes to respective buttons, select modes in the BTN ASIGN menu.

∗ Button indications
From the top to the bottom
<table>
<tr><td>Destination mode</td><td></td></tr>
<tr><td>Source mode</td><td></td></tr>
<tr><td>Level mode</td><td></td></tr>
<tr><td>Page mode (*1)
(PAGE_Grp-All / A / B / C / D)</td><td>* The example at left shows the PAGE_Grp-All mode</td></tr>
<tr><td>Setting mode</td><td>* Supported for MFR-39RU/18RU/ 16RUTA/39RUA/18RUA.</td></tr>
</table>
(*1) The name set under Page Name Settings is displayed for PAGE_Grp-A/B/C/D. (MFR-39RUA/18RUA/16RUTA only)</td><td>5-3</td></tr>
<tr><td>LOCK</td><td> 
</td><td>The following 4 Lock modes can be set by pressing a button for either a short or a long time (more than 3 seconds).

-LOCK OTHER: Disables control from external devices.
-LOCK ALL: Disables all controls.
-LOCK LOCAL: Disables local control.
-NONE

Assignable 2-way button functions (short and long press combinations) are as shown in the table below. Assign the functions to buttons in the Web-based Control menu.
<table>
<tr><th>Short press function</th><th>Long press function</th><th>Button indication</th></tr>
<tr><td rowspan="2">LOCK OTHER</td><td>NONE</td><td>(C) or (C)’ (*1)</td></tr>
<tr><td>LOCAL</td><td>(A) (*2)</td></tr>
<tr><td rowspan="2">LOCK ALL</td><td>NONE</td><td>(D) or (D)’ (*1)</td></tr>
<tr><td>LOCAL</td><td>(A) (*2)</td></tr>
<tr><td rowspan="3">LOCK LOCAL</td><td>NONE</td><td>(B)</td></tr>
<tr><td>OTHER</td><td>(A) (*2)</td></tr>
<tr><td>ALL</td><td>(A) (*2)</td></tr>
<tr><td rowspan="3">NONE</td><td>OTHER</td><td>(C) or (C)’ (*1)</td></tr>
<tr><td>ALL</td><td>(D) or (D)’ (*1)</td></tr>
<tr><td>LOCAL</td><td>(B)</td></tr>
</table>
(*1) Button indications differ depending on the current or fixed destination.
(*2) The button indication changes if enabling either function, for example, If a combination of LOCK OTHER (short press) and LOCK LOCAL (long press) functions are assigned to a button, long pressing the button changes the indication to LOCK LOCAL.</td><td>6-3-1
0</td></tr>
<tr><td>TAKE</td><td> 
</td><td>Allows you to enable the TAKE function for simultaneous crosspoint changes.</td><td>6-1-4</td></tr>
</table>

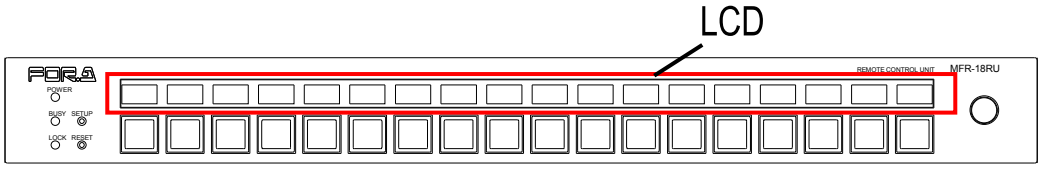
LEVEL		Allows you to change a level to the level specifically assigned to the button.	6-5
LINK		Allows you to enable or disable the LINK function.	6-2-4
TENKEY		Allows you to enable numeric keypad mode on the remote control panel for assigning destinations and source by their channel numbers. * Supported only for MFR-39RU and MFR-39RUA.	6-1-1-2
SKIP	 	Allows you to skip the set number of destination or source channels forward or backward to select one. * The control knob needs to be pressed for Source selections. ∗ Button indications Top: Channel number increases in the set step Bottom: Channel number decreases in the set step * Supported for MFR-39RU/18RU/16RUTA/ 39RUA/18RUA.	6-1-1-1
Monitor Out		Allows you to enable or disable the Monitor Out function. * Supported only for MFR-5000/8000. MFR-1616/1616R/1616A/3216/3216RPS/3232/3232RPS are not supported.	
Operation Preview		Allows you to enable or disable the Operation Preview function.	6-4
SALVO	  	Allows you to assign salvos to buttons and execute a salvo assigned to the button or stored to a main or remote control panel. ∗ Button indications Top: Salvo Store – Allows you to assign salvos to buttons. Middle: Salvo Recall (MU) – Executes a main unit-stored salvo Bottom: Salvo Recall (RU) – Executes a remote control panel button-assigned salvo	6-2-1 6-2-2
Display Mode	 	* MFR-18RU/16RUTA/18RUA only Allows you to change button indication between Destination and Source channel names. <Button indication> Top: DST NAME Bottom: SRC NAME	

◆ **Destination Button LCD Indication**

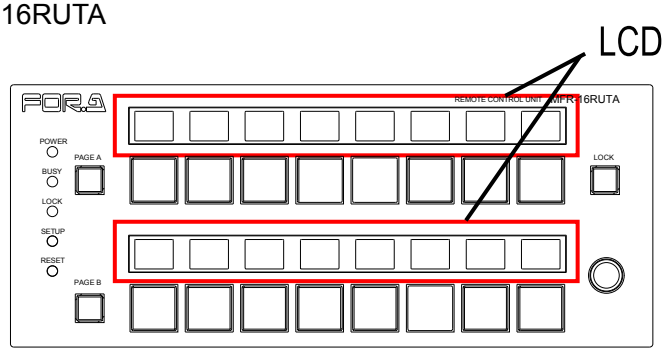
Usually destination channel names are displayed on the LCD above the destination buttons. The MFR-18RU/16RUTA can also display source channel names that are selected for destinations. To display source channel names, set the menu under **Display Setting** in the [Web-based Control: **RU Settings** page]. Note that Display Mode buttons on MFR-18RU/16RUTA units can switch the button indication between destination and source names.

In the case of breakaway switching with multiple levels, the name of the level with the smallest number will be displayed.

- MFR-18RU/18RUA



- MFR-16RUTA



5-3. MODE Button and Mode Menu (MFR-39RU/18RU/16RUTA/39RUA/18RUA)

5-3-1. Outline

The MODE button allows you to select different setting modes. As the setting mode changes available items on the MENU and LCD displays and for the control knob change.
(Supported only for MFR-39RU/18RU/16RUTA/39RUA/18RUA.)

Modes are selectable to assign. Assign only necessary modes to allow for easier searches.

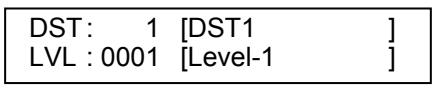
Multiple buttons can be assigned to MODE buttons. If multiple MODE buttons are assigned, the MODE button will be highlighted (the text background illuminates) when it is pressed.

5-3-2. Mode Menu

The Mode menu has 5 mode options. In Setting mode, setting options are different in the MFR-18RU/16RUTA/39RU/39RUA and MFR-18RUA.
(The menu display and control knob setting mode are supported only for MFR-39RU.)

◆ **Destination Mode**
MENU: Displays the current destination channel [name] and its level [name].
LCD: Displays the current destination channel.
Current DEST button: Displays the current destination channel. Pressing the button shift the status display between LEVEL and LOCK.

Turning the knob: Changes the current destination channel.



Menu display

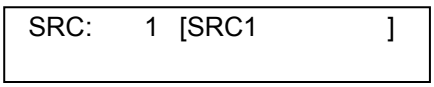
Button LCD / Current DEST button (39RUA only)

◆ **Source Mode**

MENU: Displays the source channel [name] for the current destination.
LCD: Displays the source channel for the current destination.
Current SRC button: Displays the source channel of the current destination channel.

Turning the knob: Changes the source channel.
Pressing the control knob applies the change.

* Press TAKE instead of the control knob when applying source changes in TAKE mode.

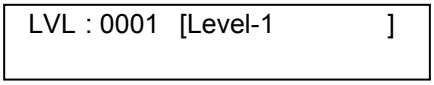


Menu display

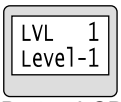
Button LCD / Current SRC button (39RUA only)

◆ **Level Mode**

MENU: Displays the current level [name] of the remote control panel.
LCD: Displays the current level and its display on the remote control panel.



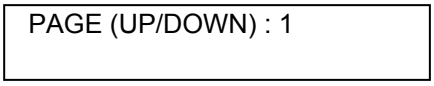
Menu display



Button LCD

◆ **Page Mode**

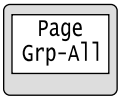
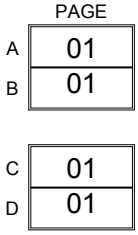
MENU: Displays the page number currently assigned to the remote control panel.
LCD: Displays the page number currently assigned to the remote control panel.
Turning the knob: Changes the page number.



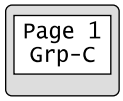
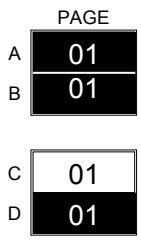
Menu display

Button LCD

➢ MODE PAGE（PAGE_Grp-ALL）

PAGE JUMP	Moves the page to the specified number for all groups.
PAGE UP/DOWN	Moves the page forward or backward by the specified number for all groups.
MENU display	PAGE (UP/DOWN) Grp-A: 1 B: 1 C: 1 D: 1 PAGE (JUMP) Grp-A: 1 B: 1 C: 1 D: 1
LCD display	
Current PAGE display	

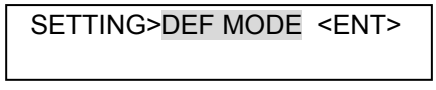
➢ MODE PAGE（PAGE_Grp-A/B/C/D）

PAGE JUMP	Moves the page to the specified number for the specified group(s).
PAGE UP/DOWN	Moves the page forward or backward by the specified number for the specified group(s).
MENU display	PAGE (UP/DOWN) Grp-C: 1 PAGE (JUMP) Grp-C: 1
LCD display	
Current PAGE display	

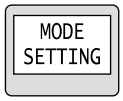
◆ **Setting Mode**

➢ In MFR-39RU

Displays available menu settings that can be changed using the control knob.
Turn the control knob to select an item, then change the setting.
The items that can be changed are highlighted.
▶See section 5-3-3. Setting Mode Menu (MFR-39RU) for details.



MENU display



Button LCD

5-3-3. Setting Mode Menu (MFR-39RU)

Setting Mode menu items are as shown below.

◆ **Setting Mode menu items**

MENU indication	Description	Reference
SETTING>DEF MODE <ENT>	Allows you to change the remote control panel start-up default mode.	5-3-3-1
SETTING>DEF DEST <ENT>	Allows you to change the remote control panel start-up default destination.	5-3-3-2
SETTING>DEF LEVEL <ENT>	Allows you to change the remote control panel start-up default level.	5-3-3-3
SETTING>PAGE MODE <ENT>	Allows you to select the behavior of the control knob in Page mode.	5-3-3-4
SETTING>PAGEASSIGN <ENT>	Allows you to select a performance feature for the PAGE button assignment.	5-3-3-5
SETTING>DSTINHIBIT <ENT>	Allows you to set the inhibit function to a desired destination.	5-3-3-6
SETTING>SRCINHIBIT <ENT>	Allows you to set the inhibit function to a desired source.	5-3-3-7
SETTING>NAME TYPE <ENT>	Allows you to select a type for the destination, source and level name displays.	5-3-3-8
SETTING>TENKEY MOD<ENT>	Allows you to select how to confirm changes in numeric keypad mode.	5-3-3-9
SETTING>TENKEY NO <ENT>	Allows you to set thresholds of setting ranges in numeric keypad mode.	5-3-3-10
SETTING>SALVO CLR <ENT>	Allows you to clear the button-assigned Salvo.	5-3-3-11
SETTING>BTN ASSIGN <ENT>	Allows you to assign functions to buttons.	5-3-3-12
SETTING>EXIT <ENT>	Exit the Setting Mode menu.	-

5-3-3-1. DEF MODE

This menu allows you to select a mode to be displayed on the menu display at the start-up of the remote control panel.

```
SETTING>DEF MODE
  DESTINATION <ENT>
```

Turn the control knob to select a mode, then press the knob to confirm.

DESTINATION	: Destination mode
SOURCE	: Source mode
LEVEL	: Level mode
PAGE_Grp-All	: Page mode (all groups)
PAGE_Grp-A	: Page mode (Group A)
PAGE_Grp-B	: Page mode (Group B)
PAGE_Grp-C	: Page mode (Group C)
PAGE_Grp-D	: Page mode (Group D)
SETTING	: Control knob setting mode

IMPORTANT
Do not turn off the remote control panel until the BUSY indicator, which lights orange, goes off when changing modes. Doing so disables the change.

5-3-3-2. DEF DEST

This menu allows you to select a destination to be displayed on the menu display at the start-up of the remote control panel.

```
SETTING>DEF DEST
  DEF  DEST:   1<ENT>
```

Turn the control knob to select a destination, then press the knob to confirm.

IMPORTANT
Do not turn off the remote control panel until the BUSY indicator, which lights orange, goes off when changing modes. Doing so disables the change.

5-3-3-3. DEF LEVEL

This menu allows you to select a level to be displayed on the menu display at the start-up of the remote control panel.

```
SETTING>DEF LEVEL
  DEF  LEVEL:0001<ENT>
```

Turn the control knob to select a level, then press the knob to confirm.

IMPORTANT
Do not turn off the remote control panel until the BUSY indicator, which lights orange, goes off when changing modes. Doing so disables the change.

5-3-3-4. PAGE MODE

This menu allows you to select the behavior for the control knob in Page mode.

```
SETTING>PAGE  MODE
  PAGE MODE :JUMP  <ENT>
```

Turn the control knob to select a behavior from the below options, and press the knob to confirm.
UP/DOWN: Every turn of the control knob changes the page one page forward or backward.
JUMP : Turn the control knob to display the desired page and press the knob to confirm.

5-3-3-5. PAGE ASSIGN

This menu allows you to select whether to assign the PAGE button to the selected page or all pages by a page button assignment procedure.

```
SETTING>PAGEASSIGN
  ASIGN : ONE PAGE  <ENT>
```

Turn the control knob to select a performance feature from the below options, and press the knob to confirm.
ONE PAGE: Assigns the PAGE button to the selected page.
ALL PAGE: Assigns the PAGE button to the button in all pages.

5-3-3-6. DSTINHIBIT

Set INHIBIT to enabled or disabled for a destination channel.

```
SETTING>DSTINHIBIT
  DST  1 : OFF <ENT>
```

Turn the control knob to select a destination channel, and press the knob to confirm.

```
SETTING> DSTINHIBIT
  DST  1 : ON <ENT>
```

Turn the control knob to select ON or OFF, and press the knob to confirm.
ON disables the output selection of the selected destination channel.
OFF cancels the Inhibit setting.

The indication of buttons assigned to the inhibited destination will be crossed.

5-3-3-7. SRCINHIBIT

Set INHIBIT to enabled or disabled for a source channel.

```
SETTING>SRCINHIBIT
  SRC  1 : OFF <ENT>
```

Turn the control knob to select a source channel, and press the knob to confirm.

```
SETTING> SRCINHIBIT
  SRC  1 : ON <ENT>
```

Turn the control knob to select ON or OFF, and press the knob to confirm.
ON disables the output selection of the selected source channel.
OFF cancels the Inhibit setting.

The indication of buttons assigned to the inhibited source channel will be crossed.

5-3-3-8. NAME TYPE

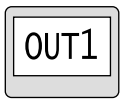
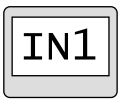
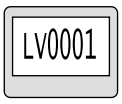
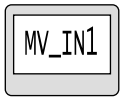
This menu allows you to select a name display type for the destination, source and level.

```
SETTING>NAME TYPE
 DST BTN :PHY NUM <ENT>
```

Turn the control knob to select a button group from the destination, source and level buttons. Press the control knob to confirm the selection.

```
SETTING>NAME TYPE
 DST BTN :PHY NUM <ENT>
```

Turn the control knob to select a display type, and press the knob to confirm.

Display type	Description	Example indication		
		DST	SRC	LEVEL
PHY NUM	Physical number display			
ASCII	Ascii character display (Alphanumeric characters and symbols)			
KANJI	2-byte character code including 1-byte character code (Not selectable for LEVEL)			

* When using 2-byte characters:
Up to 8 characters (including one-byte characters) on MFR-39RUA/18RUA/16RUTA units
Up to 4 characters (including one-byte characters) on MFR-39RU/18RU units.
* Up 14 characters when using only one-byte characters.

5-3-3-9. TENKEY MOD

This menu allows you to change the method to confirm changes in numeric keypad mode.

```
SETTING>TENKEY MOD
 INPUT MODE:ENTER <ENT>
```

Turn the control knob to select a method from the below options, and press the knob to confirm.
ENTER: Enter a value and press the ENTER button on the displayed numeric keypad on the remote control panel.
DIRECT: Enter a value using the numeric keypad. The value is confirmed.

5-3-3-10. TENKEY NO

This menu allows you to select the start point of each setting between 0 and 1 in numeric keypad mode.

```
SETTING>TENKEY NO
 INPUT START NO:0<ENT>
```

Turn the control knob to select 0 or 1, and press the knob to confirm.

5-3-3-11. SALVO CLR

This menu allows you to clear a specific salvo assigned to a button.

```
SALVO DELETE
 NO:      1<ENT>
```

Turn the control knob to select a salvo to clear, and press the knob to confirm.
If any salvo is assigned, the menu display appears as shown below.

```
SALVO DELETE
  (NO SALVO DATA)
```

5-3-3-12. BTN ASSIGN

This menu allows you to assign functions to the buttons.
▶See section 5-2 “Function Buttons” for the assignable functions.

```
SETTING>BTN ASSIGN
 BTN NO: 1<ENT>
```

(1) Select a button to change the button assignment by turning and pressing the control knob, or by pressing the desired button.

```
SETTING>BTN ASSIGN
  PAGE: 1<ENT>
```

(2) Select a page to change the button assignment by turning the control knob. Press the knob to confirm.

```
SETTING>BTN ASSIGN
  FUNC:DEST      <ENT>
```

(3) Turn the control knob to select a function, and press the knob to confirm. Set details for the function if necessary.

```
SETTING>BTN ASSIGN
  EXEC:NO <ENT>
```

The menu display asks you to confirm the assignment change as shown above when necessary settings are complete. To apply the change to the system, turn and press the control knob to select Yes. Selecting No cancels the change and returns to the menu display to select buttons.

◆ Setting Parameters for Functions

Function	Parameter		Note
(NONE)			
DEST	DEST: XXX	(XXX: Destination channel number)	
	LEVEL: XXXX	(XXXX: Level)	
SRC	SRC: XXXX	(XXXX: Source channel number)	
	LEVEL: XXXX	(XXXX: Level)	
BUS	DEST: XXX	(XXX: Destination channel number)	
	SRC: XXXX	(XXXX: Source channel number)	
	LEVEL: XXXX	(XXXX: Level)	
PAGE	MODE: JUMP	(JUMP: Jump to a specified page /UP : Go forward a page /DOWN: Go back a page)	
	PAGE: XX	(XX: Page number)	* Effective for JUMP
	RETPAGE: XX	(PREV PAGE: Return to the previous page XX: Jump to the next specified page)	* Effective for JUMP
	GROUP-A: ON	(ON / OFF)	
	GROUP-B: ON	(ON / OFF)	
	GROUP-C: ON	(ON / OFF)	
	GROUP-D: ON	(ON / OFF)	
MODE	DESTINATION: ON	(ON / OFF)	
	SOURCE: ON	(ON / OFF)	
	LEVEL: ON	(ON / OFF)	
	PAGE_Grp-All: ON	(ON / OFF)	
	PAGE_Grp-A: ON	(ON / OFF)	
	PAGE_Grp-B: ON	(ON / OFF)	
	PAGE_Grp-C: ON	(ON / OFF)	
	PAGE_Grp-D: ON	(ON / OFF)	
	SETTING: ON	(ON / OFF)	
LOCK	LOCK[S]: OTHER	(NONE / OTHER / ALL / LOCAL) LOCK function by short press	
	DEST: XX	(CURRENT: Locks the current destination. / XX: Destination Channel number to be locked)	* Effective for OTHER and ALL
	LOCK[L]: NONE	(NONE / OTHER / ALL / LOCAL) LOCK function by long press	
	DEST: XX	(CURRENT: Locks the current destination. / XX: Destination Channel number to be locked)	* Effective for OTHER and ALL
TAKE			
LEVEL	LEVEL: XXXX	(XXXX: Level)	
LINK			
TENKEY			
SKIP	MODE: FWD	(FWD: Forward / BWD: Backward)	
	COUNT: XXX	(XXX: number of channels to skip)	
MON-OUT	OUT: X	(X:MONITOR OUT)	*MFR-5000/8000 only
O-PREVIEW	DEST: XXX	(XXX: Destination channel number)	
SALVO	MODE: MURECALL	(MU RECALL: Execute the main unit-assigned SALVO /RU RECALL: Execute the button-assigned SALVO /RU STORE: Assign a SALVO to a button)	
	NO: XXXX	(XXXX: Salvo number)	* Effective for MU RECALL, and RU RECALL

5-3-4. Setting Mode Menu (MFR-39RUA)

The current SRC button functions as an **EXIT/CANCEL** button used for exiting mode or processes during Setting mode.

Use the following procedures to change settings.
- Press a button to turn On/Off.
- Use the control knob to change values.
  (1) Press to select a desired menu item.
  (2) Turn the control knob to change its value.
  (3) Press the control knob to confirm the setting.

After menu setting, do not turn off the remote control unit until the BUSY indicator changes from lit orange to unlit. Otherwise, settings may not be applied.

* To enter Setting mode, press the SETUP button. The BUSY indicator lights orange during Setting mode. To exit Setting mode, press the **EXIT/CANCEL** button. Before powering off the remote control unit, verify that the BUSY indicator is turned off.

Setting Mode menu items are as shown below.

MENU indication	Description	Reference
NETWORK	Allows you to change the IP address of the remote control unit and display the PC-LAN network information.	5-3-4-1
VER/ALARM	Allows you to display the version and alarm information.	5-3-4-2
DEFAULT	Allows you to change the default settings that are loaded when the remote control unit is powered on.	5-3-4-3
BUTTON ASSIGN	Allows you to assign functions to user-assignable buttons.	5-3-4-4
INHIBIT	Allows you to enable/disable the INHIBIT function for a channel.	5-3-4-5
NAME TYPE	Allows you to select the display type for Destination, Source and Level.	5-3-4-6
BRIGHTNESS	Allows you to set the brightness of buttons.	5-3-4-7
RU-RU CONNECT	Allows you to configure a link system of multiple remote control units.	5-3-4-8
TENKEY	Allows you to set TENKEY (numeric keypad) operation.	5-3-4-9
PAGE	Allows you to change PAGE settings.	5-3-4-10
SALVO CLEAR	Allows you to clear salvo data stored in buttons.	5-3-4-11

5-3-4-1. NETWORK

The following submenus are available in NETWORK setting mode.

Submenu	Description
RU NETWORK	Allows you to change the IP address of the remote control unit and display the network information.
PC-LAN NETWORK	Displays the network settings of the PC-LAN port.
PC-LAN REBOOT	Restarts the PC-LAN port.

NETWORK > RU NETWORK

Menu item	Description
IP	Displays and changes the IP address of the remote control unit. The lower 8 bits (the fourth byte) represent the Unit ID.
MASK	Displays the subnet mask of the remote control unit.
UNIT NAME	Displays the unit name of the remote control unit.

To Change IP Address:

(1) Hold down the button where the number to be changed is displayed. The button will blink.
(2) Turn the control knob to change the number.
(3) Repeat (1) and (2) to change the IP address.
(4) Hold down the current DEST button to confirm the change. The remote control unit will automatically restart.

NETWORK > PC-LAN NETWORK

Menu item	Description
IP	Displays the PC-LAN IP address.
MASK	Displays the PC-LAN subnet mask.
GW	Displays the PC-LAN Default Gateway IP address.

NETWORK > PC-LAN REBOOT

To restart the PC-LAN port:

(1) Press REBOOT.
(2) Hold down **EXEC HOLD 1s** to restart the PC-LAN port while showing "STARTUP" or "NOW".

5-3-4-2. VER/ALARM

◆ **Menu List**

Menu item	Description
VERSION	Displays the firmware version.
PS1	Displays the AC adapter 1 status.
PS2	Displays the AC adapter 2 status.
TEMPERATURE	Displays the temperature.
VOLTAGE	Displays the voltage status.

5-3-4-3. DEFAULT

◆ **Menu List**

Menu item	Description	Set by
MODE	Allows you to select a mode when the remote control unit is powered on. DEST: Destination mode SRC: Source mode LEVEL: Level mode PAGE ALL: Page mode (all groups) PAGE GROUP A: Page mode (Group A) PAGE GROUP B: Page mode (Group B) PAGE GROUP C: Page mode (Group C) PAGE GROUP D: Page mode (Group D) SETTING: Setting mode	Pressing a button
DEST	Allows you to select a destination channel when the remote control unit is powered on.	CONTROL
LEVEL	Allows you to select a level when the remote control unit is powered on.	Pressing a button

5-3-4-4. BUTTON ASSIGN

This menu displays the assignment list for PAGE 1.

To Assign Functions to Buttons:

(1) Turn the control knob to select a page.
(2) Press a button for assignment. The button will blink and its information will be displayed.
(3) Turn the control knob to select a function to the button.
(4) Use the control knob to set the corresponding parameter(s). Once the settings are complete, the current DEST button blinks and "SAVE" is displayed on the button.
(5) Press the current DEST button to confirm the settings.

To perform another assignment, proceed from Step (1).

FUNC Menu List

FUNC	Parameter	Description	Remarks
NONE			
DEST	DESTINATION	Destination channel	
	LEVEL	Level (Available level number are displayed.)	
SRC	SOURCE	Source channel	
	LEVEL	Level (Available level number are displayed.)	
BUS	DESTINATION	channel	
	SOURCE	Source channel	
	LEVEL	Level (Available level number are displayed.)	
PAGE	TYPE	JUMP: Moves to the set page. UP: One page forward DOWN: One page back	
	FORWARD	Page to jump	When TYPE is set to JUMP:
	REVERSE	Page to return HOME: Back to the origin page	
	GROUP	Page group selection	
MODE	TARGET	Mode selection when using the Mode button	
LOCK	TYPE[S]	Lock mode selection for the short-press of the LOCK button.	
	DESTINATION[S]	Destination channel setting for the short-press of destination buttons. CURRENT: Locks the current destination	When ALL or OTHER is set for TYPE[S]:
	TYPE[L]	Lock mode selection for the long-press of the LOCK button.	
	DESTINATION[L]	Destination channel setting for the long-press of destination buttons. CURRENT: Locks the current destination	When ALL or OTHER is set for TYPE[S]:
TAKE			
LEVEL		Level (Available level number are displayed.)	
LINK			
TENKEY			
SKIP	BWD/FWD	Mode selection	
	COUNT	Number to be skipped	

MON-OUT	NO.	Number of monitor output	MFR-5000/8000 only
O-PREV	DESTINATION	Destination channel	
SALVO	TYPE	MU: Execution of an MU salvo. RU: Execution of an RU button salvo STORE: Registration of an MU salvo	
	NO.	Salvo number	When TYPE is set to MU or RU:

5-3-4-5. INHIBIT

The following submenus are available in INHIBIT Setting mode.

Submenu	Description
DEST	Allows you to set INHIBIT to enabled / disabled for a destination channel. Symbol "X" appears on channels when INHIBIT is enabled.
SRC	Allows you to set INHIBIT to enabled / disabled for a source channel. Symbol "X" appears on channels when INHIBIT is enabled.

INHIBIT > DEST
Displays the destination channel list. Press a channel to enable/disable the INHIBIT function.

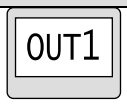
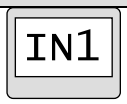
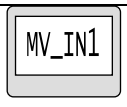
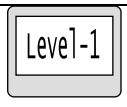
INHIBIT > SRC
Displays the source channel list. Press a channel to enable/disable the INHIBIT function.

5-3-4-6. NAME TYPE

Menu List

Menu Item	Description	Set by
DEST	Allows you to select the display format for a destination button.	Pressing a button
SRC	Allows you to select a display format for a source button.	Pressing a button
LEVEL	Allows you to select the display format for a level button.	Pressing a button

Available formats are as shown in the table below.

Display format	Description	Display example		
		DST	SRC	LEVEL
PHY NUM	Physical number display			
ASCII	Ascii character display (Alphanumeric characters and symbols)			
KANJI	2-byte character code including 1-byte character code (Not selectable for LEVEL)			

* When using 2-byte characters:
Up to 8 characters (including one-byte characters) on MFR-39RUA/18RUA/16RUTA units
Up to 4 characters (including one-byte characters) on MFR-39RU/18RU units
* Up 14 characters when using only one-byte characters

5-3-4-7. BRIGHTNESS

Menu List

Menu item	Description	Set by
BUTTON	Allows you to select a button.	Pressing a button
LOW LIGHT	Allows you to select between NORMAL and LOWLIGHT for dim lighting.	Pressing a button

5-3-4-8. RU-RU CONNECT

Menu List

Menu item	Description	Set by
CONNECT	Allows you to enable /disable the link of remote control units.	Pressing a button
MASTER ID	Allows you to select a link ID.	CONTROL

5-3-4-9. TENKEY

Menu List

Menu item	Description	Set by
INPUT MODE	Allows you to select the confirmation method when using the numeric keypad. DIRECT: Confirms setting by just pressing a numeric key. ENTER: Confirms setting by pressing a numeric key then pressing ENTER.	Pressing a button
START	This menu allows you to select the start point of each setting between 0 and 1 in numeric keypad mode.	Pressing a button

5-3-4-10. PAGE

Menu List

Menu item	Description	Set by
MODE	Allows you to select the control knob behavior in Page mode. UP/DOWN: Turns the control knob to move one page forward/back. JUMP: Turns the control knob to select a page then presses the control knob to move to the page.	Pressing a button
ASSIGN	Allows you to select ONE PAGE or ALL PAGE for PAGE button assignments.	Pressing a button
DISPLAY	Allows you to select whether to display unit names for Current PAGE display (C/D). PAGE C&D: Current PAGE display for Group C and D. UNIT NAME: Displays unit names.	Pressing a button

5-3-4-11. SALVO CLEAR

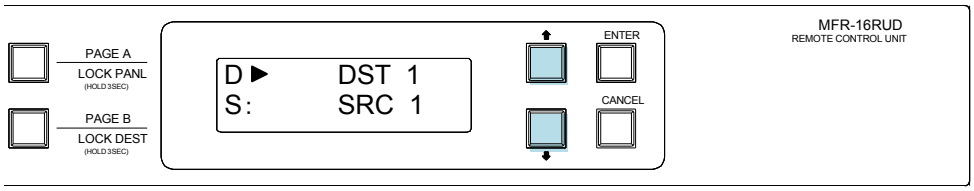
This menu displays the button-assigned salvo list and allows you to clear salvos.

To Clear a Button-assigned Salvo:
(1) Press a salvo button. The button will blink and "CLEAR" is displayed on the button.
(2) Press the current DEST button.

5-4. Operation Using the Menu Display (MFR-16RUD)

The MFR-16RUD, a remote control unit with a display, allows you to select destination channels and switch crosspoints using the menu display.
Function button assignments are also possible.

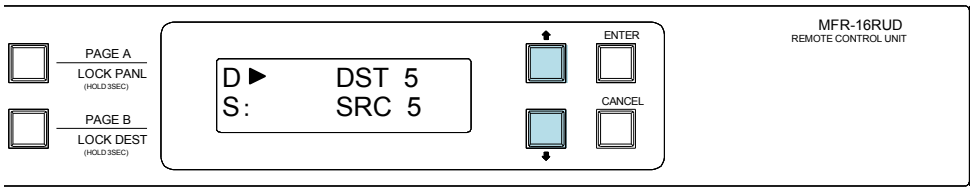
◆ **Default Display**
The name of Current Destination Channel is displayed on the first line.
The name of Source Channel selected for Current Destination is displayed on the second line.



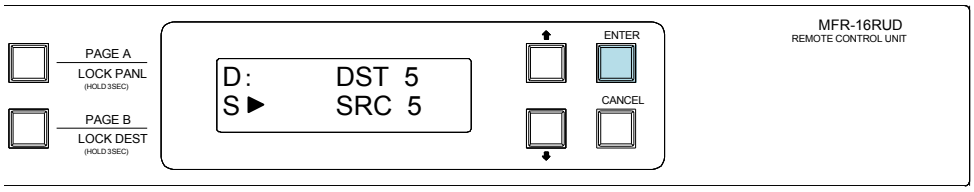
5-4-1. Crosspoint Switching

To switch crosspoints on the MFR-16RUD, proceed as follows:

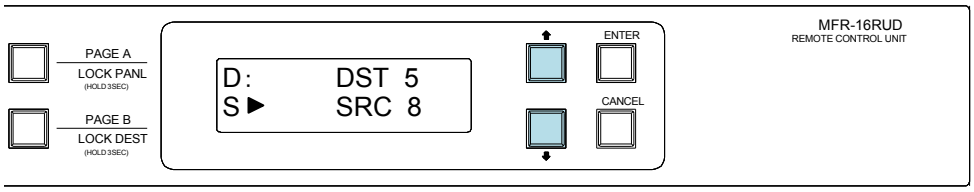
(1) Press the UP or DOWN button to change Current Destination to the desired number. (DST 5 in this example)



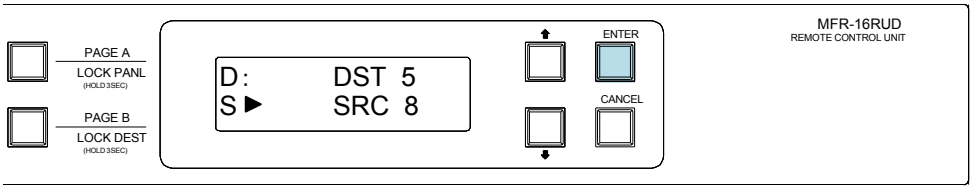
(2) Press ENTER.



The cursor automatically moves to the second line (Source side). Press UP or DOWN to select a source channel.
Note that source names blink during the selection.



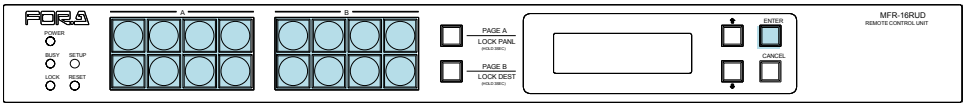
(3) Press ENTER to perform the crosspoint switch. The screen will return to the default display.



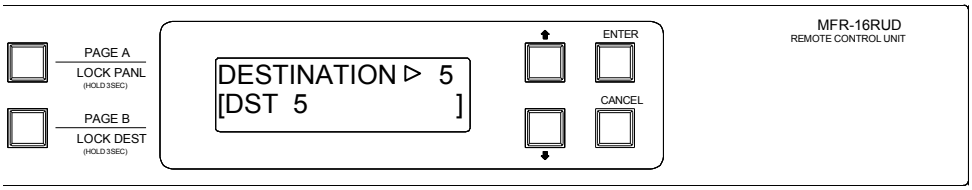
5-4-2. Button Assignment Change

To change button assignments, proceed as follows:

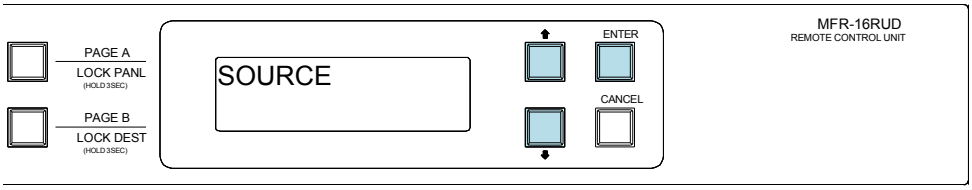
(1) Press a button while holding down ENTER. The button will blink.



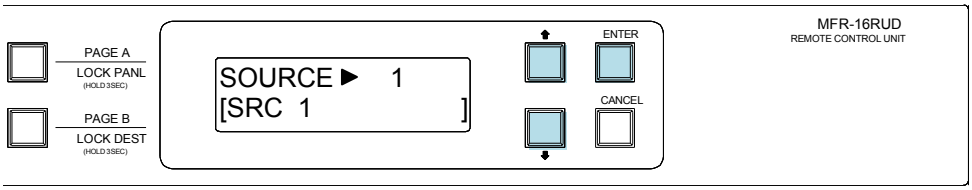
The first line will display the function and its parameter currently assigned to the button and the second line will display its detailed information.



(2) Press UP or DOWN to select a function to be assigned. Press ENTER to apply the change.



(3) The display changes to the parameter selection according to the selected function.
Press UP or DOWN to select the parameter value. Press ENTER to confirm the selection.
The cursor will move to the next parameter if there are two or more parameters. Set the value and press ENTER in the same way.
Note that parameters blink during the selection.



When all settings are finished, the screen automatically returns to its default display.

◆ Assignable Function/Parameter List

Function	Parameter	Description
(NONE)	None	
DESTINATION	DESTINATION ► XXX	XXX: Destination Channel number
SOURCE	SOURCE ► YYYY	YYYY: Source Channel number
BUS	BUS D ► XXX ▷ S YYYY	XXX: Destination Channel number YYYY: Source Channel number
LOCK	(Lock function by short press) LOCKS ► XXX ▷ YYY (Lock function by long press) LOCKL ► XXX ▷ YYY	XXX: OTH LOCK OTHER ALL LOCK ALL LOC LOCK LOCAL NON No lock YYY: CUR Current Destination Destination Channel number YYY is effective only when XXX is set to OTHER or ALL.
TAKE	None	
LINK	None	
MON-OUT	MON-OUT ► X	X: MONITOR OUT number * MFR-5000/8000 only
PREVIEW	PREVIEW ► XXX	XXX: Destination Channel number
SALVO	SALVO ► XX ▷ YYYY	XX : MU Main unit stored salvo RU Remote control panel button assigned salvo YYYY: Salvo number

5-5. Setup Menu (MFR-39RU)

The SETUP button enables you to use the setup menu.
The Setup menu has following sub menus. To select a submenu, turn the control knob to select and press to confirm.

◆ **Setup Menu Sub-menu List**

Menu display	Description	Reference
SETUP>IP ADDRESS[RU] <ENT>	Allows you to set the IP address for the remote control panel. The last 8 bits will be the unit ID/	5-5-1
SETUP>SUBNET MASK[RU] <ENT>	Displays the subnet mask setting in the Remote Control Unit.	5-5-2
SETUP>PC-LAN[MU]<ENT>	Displays the PC-LAN[MU] menu.	5-5-3
SETUP>RU CONN ID <ENT>	Allows you to set the ID to recognize remote control panels connected to be used in conjunction.	5-5-4
SETUP>RU CONNECT <ENT>	Allows you to select whether to connect and use multiple remote control panels.	5-5-5
SETUP>BRIGHTNESS <ENT>	Allows you to set the brightness for buttons and the menu display.	5-5-6
SETUP>BTN ASSIGN <ENT>	Allows you to assign functions to buttons. Assignments the same as in the Setting mode menu can be performed.	5-5-7
SETUP>VER/ALARM <ENT>	Displays version and alarm information.	5-5-8
SETUP>REBOOT <ENT>	Allows you to reboot the unit.	5-5-9
SETUP>EXIT <ENT>	Allows you to exit the Setup menu. The menu returns to display the menu before entering the SETUP menu. (The CANCEL button works the same.)	-

5-5-1. IP ADDRESS[RU]

This menu allows you to change the IP address of remote control panels. The last 8 bits (the 4th byte) will be the unit ID.

```
SETUP>IP ADDRESS[RU]
 192.168.001.100<ENT>
```

Turn the control knob to select a byte to be changed. The selected byte will be highlighted. After changing the value, press the knob. The next byte will be highlighted to be changed.

```
SETUP>IP ADDRESS
 192.168.001.100<ENT>
```

Pressing the control knob while the 4th byte is highlighted will highlight the whole IP address, and the changed IP address will be saved. Press the control knob again. The remote control panel will restart, or a message appears to ask to restart the remote control panel. Select YES and press the control knob to restart the remote control panel with the new IP address.

IMPORTANT
The saved IP address applies when the remote control panel restarts. Selecting NO will necessitate a manual restart of the remote control panel to apply the new IP address. The IP address must not be identical to the IP address of the MFR main unit or other remote control panels.

5-5-2. SUBNET MASK[RU]

Displays the subnet mask setting in the Remote Control Unit.

```
SETUP>SUBNET MASK[RU]
255.255.255.000
```

5-5-3. PC-LAN[MU]

The PC-LAN[MU] menu allows you to display the network settings for the PC-LAN port on the MU and restart the port.

```
SETUP>PC-LAN[MU]>
          NET          <ENT>
```

Selecting NET allows you to display the network port settings.
Turning the control knob allows you to scroll through all network settings.

```
PC-LAN[MU]>IP ADDRESS
192.168.001.012          <ENT>
```

```
PC-LAN[MU]>SUBNET MASK
255.255.255.000          <ENT>
```

```
PC-LAN[MU]>GATEWAY
000.000.000.000          <ENT>
```

Selecting GUI REBOOT allows you to restart the network port.

```
SETUP>PC-LAN[MU]>
          GUI REBOOT<ENT>
```

```
SETUP>PCLAN[MU]
 EXEC: NO <ENT>
```

To restart the port, turn the control knob to select YES, then press the control knob.
To cancel the process, turn the control knob to select NO. The display will return to the initial SETUP menu page.

The following message will appear while restarting the port.

```
PC-LAN[MU]>GUI REBOOT
Startup…
```

5-5-4. RU CONN ID

This menu allows you to set the ID for remote control panel IDs to be recognized in the integrated use of multiple remote control panels.

```
SETUP>RU CONN ID
 UNIT ID:  0<ENT>
```

Turn the control knob to select an ID, and press the knob to confirm the selection. See section 5-10-2 “Enabling Multi-Panel Operation” for details.

IMPORTANT
Do not turn the power of the remote control panel off before the orange BUSY lamp goes off when changing ID. Doing so will obstruct the settings to be applied.

5-5-5. RU CONNECT

This menu allows you to enable or disable integrated operation of connected multiple remote control panels.

```
SETUP>RU CONNECT
 ENABLE:OFF<ENT>
```

Turn the control knob to select ON or OFF, and press the knob to confirm the selection.

IMPORTANT
Do not turn the power of the remote control panel off before the orange BUSY lamp goes off when changing ID. Doing so will obstruct the settings to be applied.

5-5-6. BRIGHTNESS

This menu allows you to set the brightness for the button LCDs and menu display.

```
SETUP>BRIGHTNESS
 BTN:8  MENU:8<ENT>
```

Turn the control knob to select the brightness. Press the control knob to change the BTN and MENU selection. Pressing the control when MENU is selected confirms the changes. After settings are complete, press the CANCEL button to exit the menu.

Brightness: (dark) 1 to 8 (bright)

5-5-7. BTN ASSIGN

This menu allows you to assign functions to buttons. The functions that are the same as those assignable in the Setting mode BTN ASSIGN menu (SETTING > BTN ASSIGN) can be assigned.

```
SETUP>BTN ASSIGN
 BTN NO: 1<ENT>
```

5-5-8. VER/ALARM

This menu displays the version and alarm information. Turn the control knob to scroll the page.

```
Ver.0.05.1
PS1 : Normal
```

5-5-9. REBOOT

This menu allows you to execute the restart of the remote control panel.

```
SETUP>REBOOT
 EXEC:NO <ENT>
```

Turn the control knob to select YES or NO, and press the knob to confirm. Selecting **YES** restarts the remote control panel. Pressing NO returns to the menu display to select menus.

5-6. Setup Menu (MFR-39RUA)

The **SETUP** button allows you to enter **Setup Menu** mode, in which menu settings can be performed as shown in Sec 5-3-4. "Setting Mode Menu (MFR-39RUA)."

5-7. Setup Menu (MFR-18RU/18RUA)

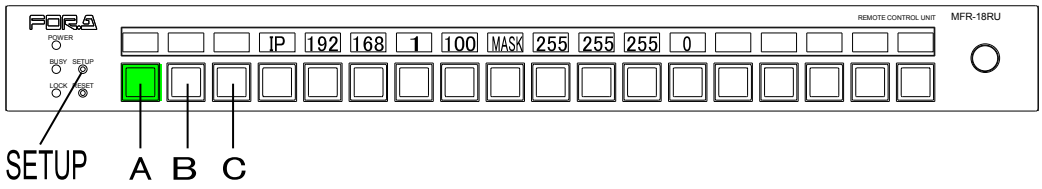
The **SETUP** button allows you to enter **Setup Menu** mode, in which RU and MU PC-LAN network settings are displayed, the MU-PC LAN port can be rebooted and RU network settings can be changed. The left three buttons are used to select information to be displayed or the PC-LAN reboot. To exit Setup Menu mode, press the **SETUP** button again.

Selection buttons (See the figures below)	LAN Port	Display / Execution
Button A	Remote Control Unit (RU)	IP address display and change
		Subnet mask display
Button B	PC-LAN on Main Unit (MU)	IP address display
		Subnet mask display
		Default gateway display
Button C	PC-LAN on Main Unit (MU)	Reboot

5-7-1. Displaying Network Settings

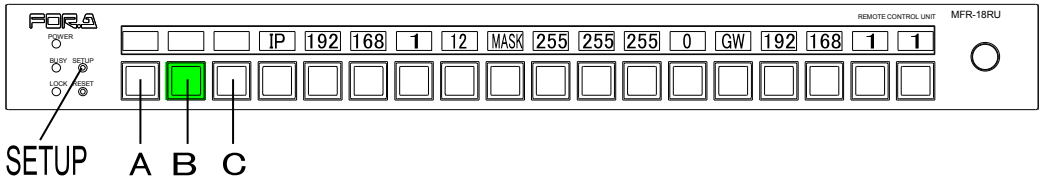
◆ **To Display RU IP Address and Subnet Mask**

Press **SETUP** to enter the Setup Menu mode. The RU IP address and subnet mask are displayed as shown below. (If Button A is off (unlit), press Button **A**.)



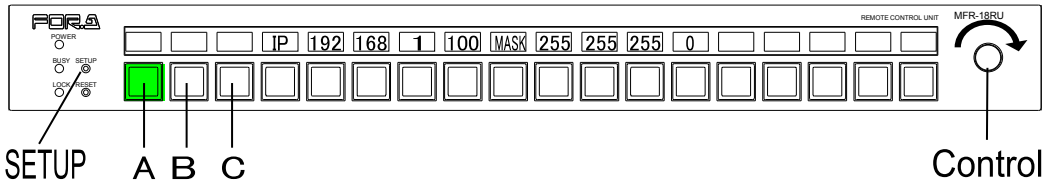
◆ **To Display PC-LAN IP address, Subnet Mask and Default Gateway of MU PC-LAN**

Press Button **B** in Setup Menu mode. The network settings are displayed as shown below in "IP address, Subnet Mask and Default Gateway" order.

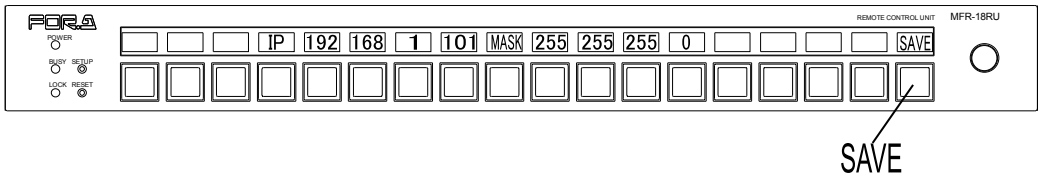


5-7-2. Changing the RU Network Settings

(1) Press **SETUP** to enter the Setup Menu mode. The RU IP address and subnet mask are displayed as shown below. (If Button A is off (unlit), press Button **A**.)

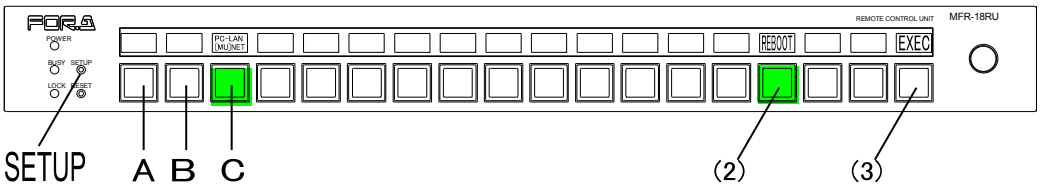


(2) Press and hold down a button below the number for change. The number will blink.
(3) Turn the control knob to change the number value. To clear the number setting, press and hold down the button.
(4) Repeat steps (2) and (3) to change the IP address.
(5) When number values are changed, the **SAVE** button will blink. Press and hold down **SAVE** to confirm changes. The Remote Control Unit will automatically restart.
To cancel the process, display another information without pressing **SAVE**.



5-7-3. Rebooting MU PC-LAN

(1) Press Button **C** in Setup Menu mode.
(2) Press and hold down the **REBOOT** button show below. The **EXEC** button will appear.
(3) Press and hold down **EXEC**. The "PC-LAN Startup" message is displayed during rebooting. The message will disappear when the reboot is complete.



5-8. Setup Menu (MFR-16RUTA)

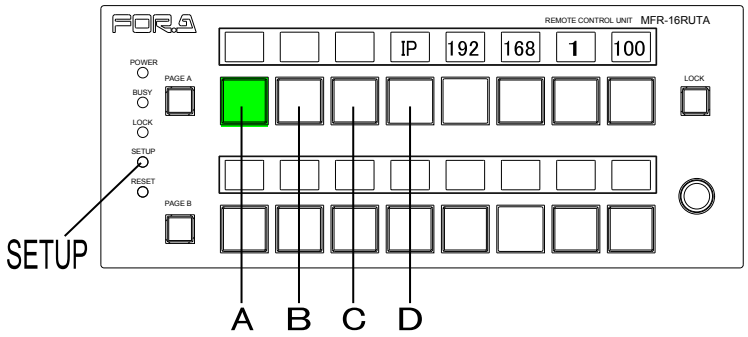
The **SETUP** button allows you to enter **Setup Menu** mode, in which RU and MU PC-LAN network settings are displayed, the MU PC-LAN port can be rebooted, and RU network settings can be changed. The left three buttons are used to select information to be displayed or the PC-LAN reboot. The fourth button from the left is used to switch network information display. To exit Setup Menu mode, press the **SETUP** button again.

Selection buttons (See the figures below)	LAN Port	Display / Execution
Button A	Remote Control Unit (RU)	IP address display and change
		Subnet mask display
Button B	PC-LAN on Main Unit (MU)	IP address display
		Subnet mask display
		Default gateway display
Button C	PC-LAN on Main Unit (MU)	Reboot
Button D	If Button A or B is selected	Display item change

5-8-1. Displaying Network Settings

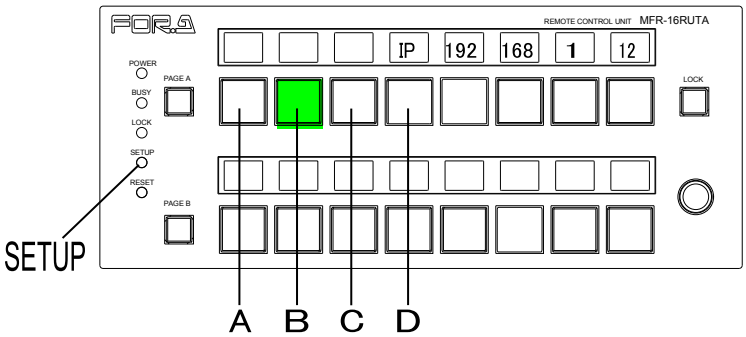
◆ **To Display RU IP Address and Subnet Mask**

Press **SETUP** to enter Setup Menu mode. (If Button **A** is off (unlit), press Button **A**.)
Pressing Button **D** displays the RU IP address and repressing it displays the subnet mask.



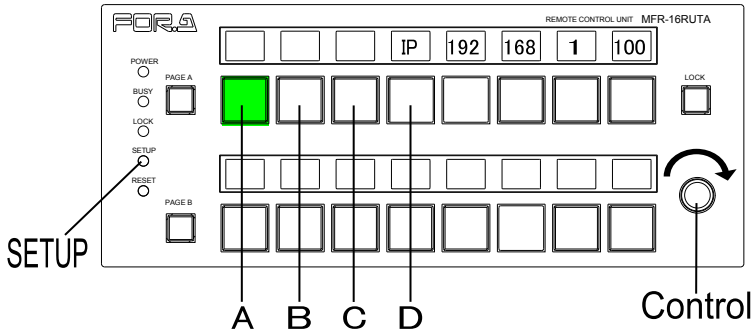
◆ **To Display IP address, Subnet Mask and Default Gateway of MU PC-LAN**

Press Button **B** in Setup Menu mode. The IP address, subnet mask and default gateway are successively displayed by pressing Button **D**.

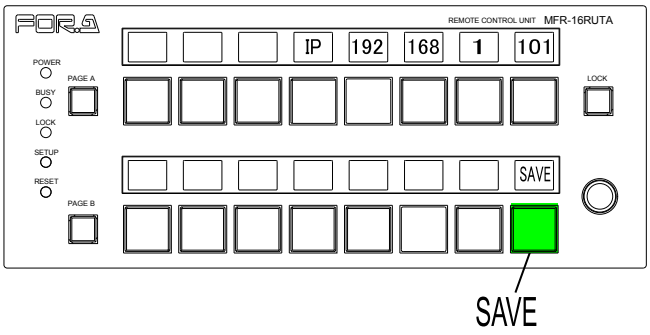


5-8-2. Changing the RU Network Settings

(1) Press **SETUP** to enter Setup Menu mode. (Press Button **A** if other information is displayed.)

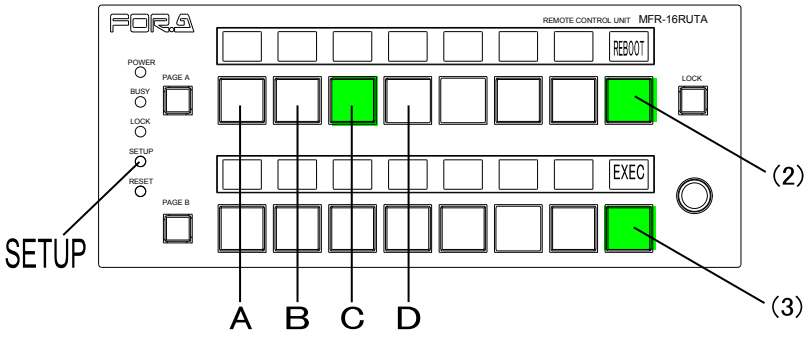


(2) Press and hold down a button below the number for change. The number will blink.
(3) Turn the control knob to change the number value. To clear the number setting, press and hold down the button.
(4) Repeat steps (2) and (3) to change the IP address.
(5) When a number is changed, the **SAVE** button will blink. Press and hold down **SAVE** to confirm the change. The Remote Control Unit will automatically restart.
To cancel the process, display another information without pressing **SAVE**.



5-8-3. Rebooting MU PC-LAN

(1) Press Button **C** in Setup Menu mode.
(2) Press and hold down the **REBOOT** button shown below. The **EXEC** button will appear.
(3) Press and hold down **EXEC**. The "PC-LAN Startup" message is displayed during rebooting. The message will disappear when the reboot is complete.



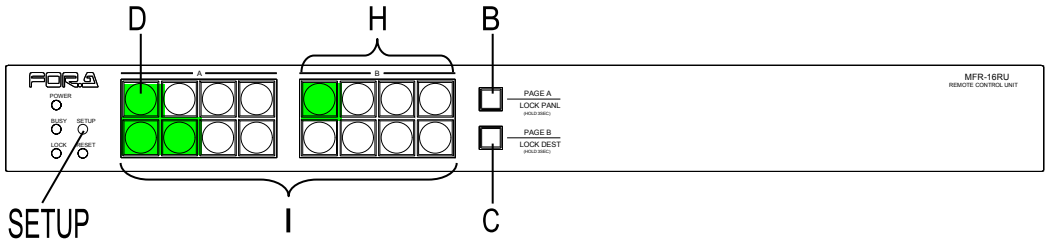
5-9. Setup Menu (Other Remote Control Units)

The **SETUP** button changes the RU to **Setup Menu** mode, which allows you to display RU and MU PC-LAN network settings, reboot the MU PC-LAN port and change the RU network settings To exit Setup Menu mode, press the **SETUP** button again.

◆ IP Address Display

The following procedure shows how to display an IP address in Setup Menu mode using MFR-16RU as an example.

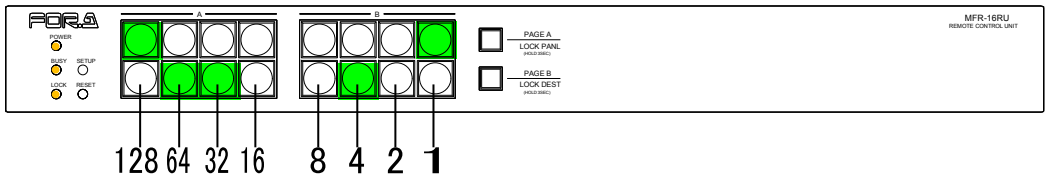
(1) Press **SETUP**. All idicators, POWER, BUSY and LOCK, turn on orange to indicate that the RU enters in Setup Menu mode.
(2) Press Button **D**. (If Button **B** or **C** is lit, press the lit button.)
(3) Press the left-most button of **H** (the first octet button).
The number value will be displayed on the eight buttons of **I**. If the MFR-16RU IP address is set to "192.168.1.100," "192" will be displayed on the eight buttons of **I** (8-bit) by indicating **On** or **Off**.



(4) Press the second button from the left (the second octet button) of **H**.
The number value will be displayed on the eight buttons of **I**.
If the MFR-16RU IP assress is set to "192.168.1.100," "168" will be displayed.

(5) Press the third button from the left (the third octet button) of **H**.
The number value will be displayed on the eight buttons of **I**.
If the MFR-16RU IP assress is set to "192.168.1.100," "1" will be displayed.

(6) Press the right-most button (the fourth octet button) of **H**.
The number value will be displayed on the eight buttons of **I**.
If the MFR-16RU IP address is set to "192.168.1.100," "100" (64+32+4) will be displayed as shown below.



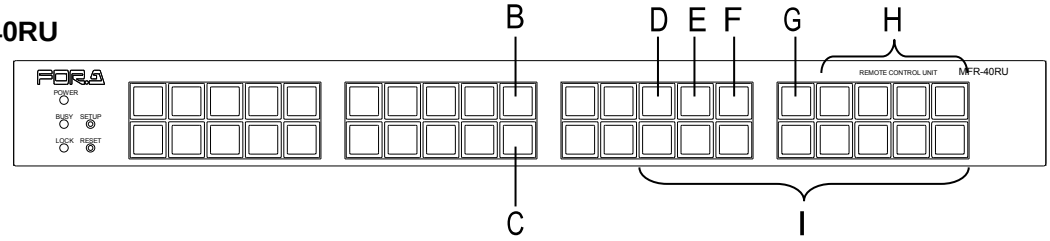
5-9-1. Displaying Network Settings

(1) In Setup Menu mode, press a button shown in the table below to display the desired network setting. Note that button locations vary depending on remote control units.

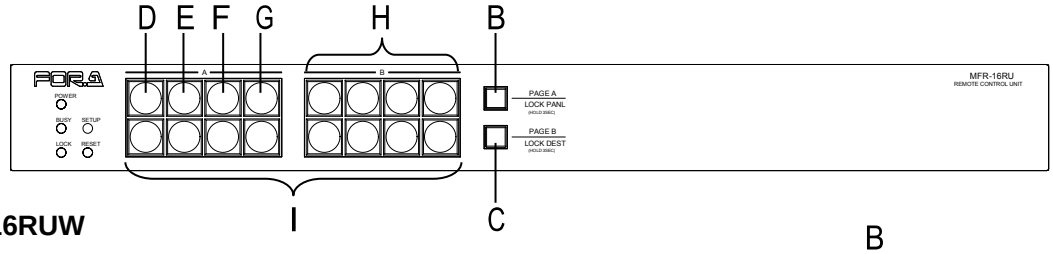
Button operation		LAN port	Display Info.
Press D.	If B is lit, press B. If C is lit, press C.	Remote Control Unit (LAN)	IP address
Press E.	If B is lit, press B. If C is lit, press C.		Subnet mask
Press B, then D.		PC-LAN on Main Unit (MU)	IP address
Press B, then E.			Subnet mask
Press B, then F.			Default Gateway

(2) Press an octet button of Buttons **H** to select an octet. The right-most button represents the fourth octet. (See the previous page.)
(3) The octet value will be displayed on Buttons **I** (eight buttons). (See the previous page.)

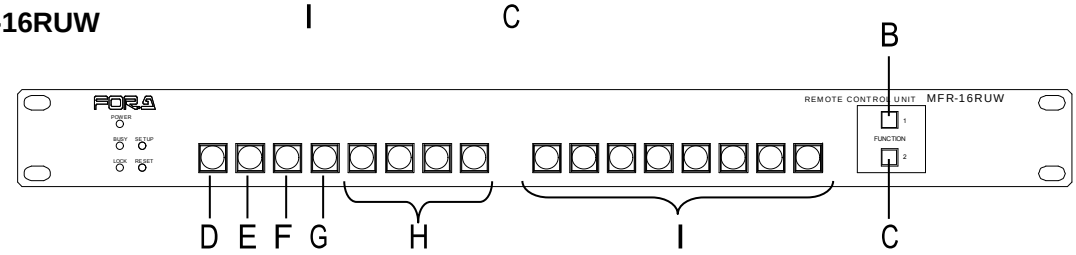
MFR-40RU



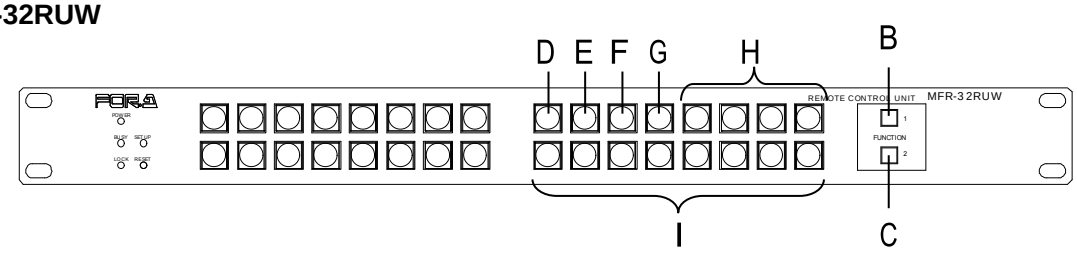
MFR-16RU (MFR-16RUD)



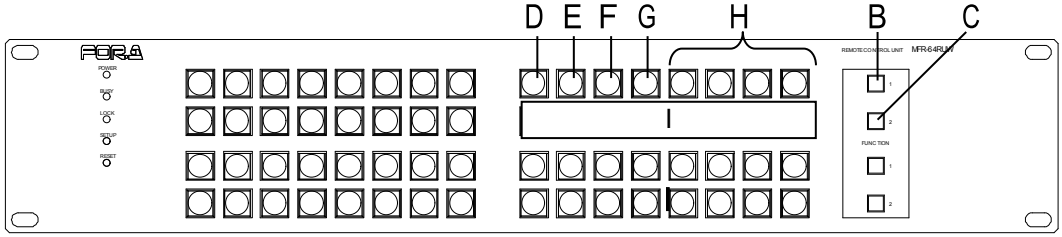
MFR-16RUW



MFR-32RUW



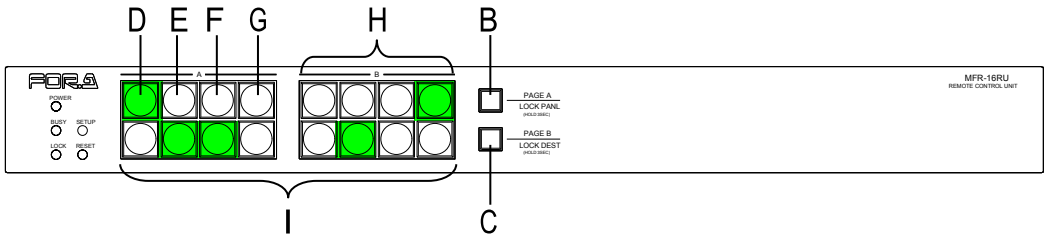
MFR-64RUW



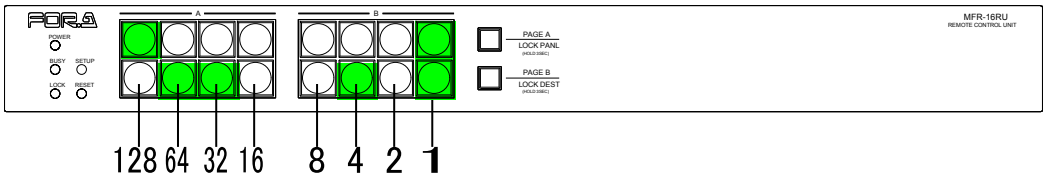
5-9-2. Changing the RU Network Settings

The RU IP address can be changed as shown in the procedure below. In the following procedure changes the MFR-16RU IP address from "192.168.1.100" to "192.168.1.101." Button locations vary depending on remote control units. Refer to the previous page for button locations of other remote control units.

(1) Press Button **D** in **Setup Menu** mode. (If Button **B** or **C** is lit, press the lit button.)
(2) Press and **hold down** the **right-most** button (the fourth octet) of Buttons **H**. The button will blink and the bottom eight buttons (Buttons **I**) display the value (100) by **On** and **Off**.

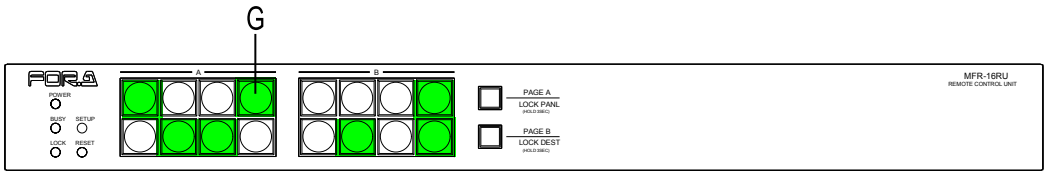


(3) On the bottom row, press the **right-most** button of Buttons **I** to turn on the button. The value will change to "101" (64+32+4+1).



To change the first, second or third octet value, repeat steps (2) and (3), respectively. To clear an octet value, press the flashing octet selection button on the upper row.

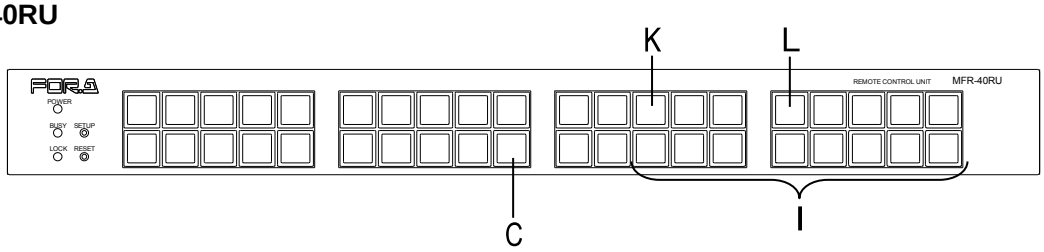
(4) When values are changed, Button **G** will blink. Press and hold down G to confirm the change. The Remote Control Unit will automatically restart. To cancel the process, press Button **B** or **C** without pressing **G**.



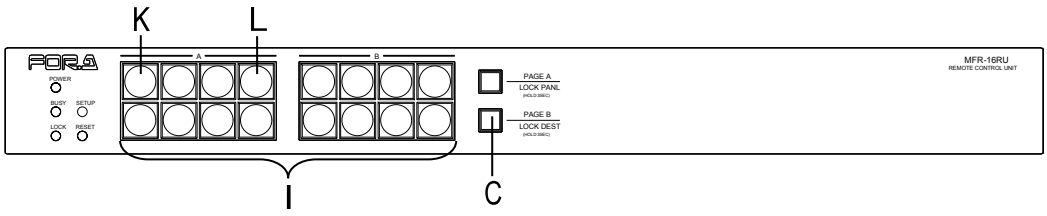
5-9-3. Rebooting MU PC-LAN

(1) Press Button **C** in Setup Menu mode.
(2) Press and hold down Button **K**. Button **L** (EXEC button) will blink.
(3) Press and hold down Button **L**. Buttons **I** will blink during rebooting. The buttons will turn off when the reboot is complete.

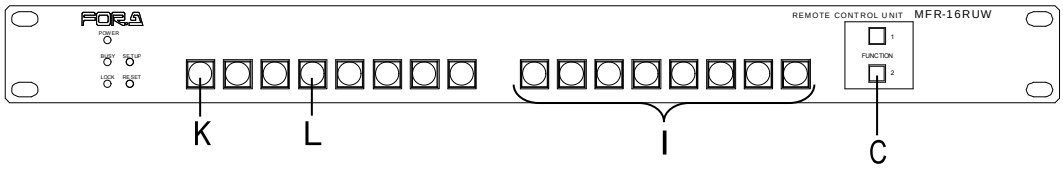
MFR-40RU



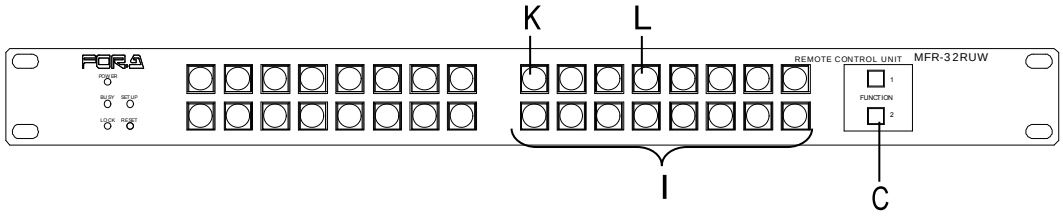
MFR-16RU (MFR-16RUD)



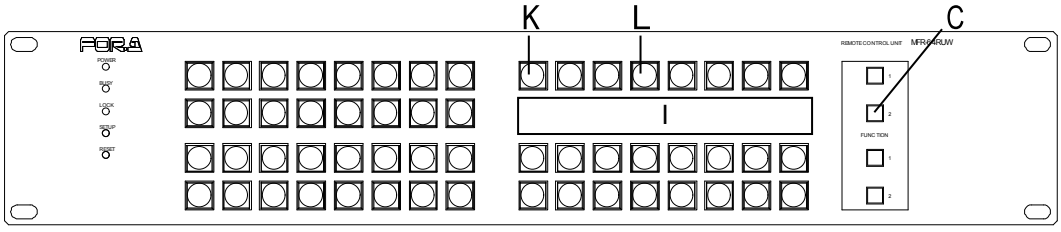
MFR-16RUW



MFR-32RUW



MFR-64RUW



5-10. Multi-Panel Operation

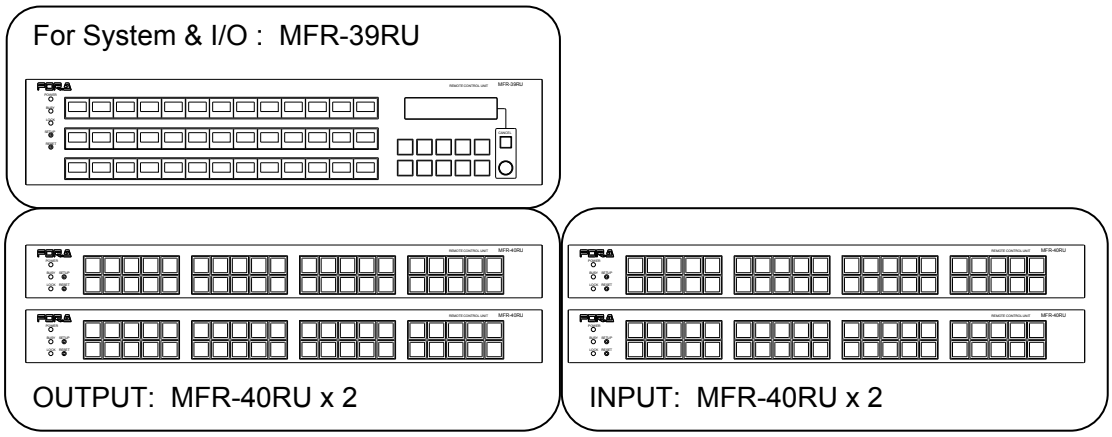
5-10-1. Outline

Multiple remote control panels can be connected to build a large control panel.

NOTE
Up to 5 remote control units can be linked together in Multi-panel Operation mode.

(Ex.) To build a 96 x 96 maximum control system:
Units to use: MFR-40RU x 4, and MFR-39RU x 1
Configuration:
Destination button assignments to: MFR-40RU x 2 and a part of MFR-39RU
Source button assignments to: MFR-40RU x 2 and a part of MFR-39RU

This system can control 96 x 96 inputs and outputs without using the PAGE function.



◆ **Functions that can be integrated**

The following operation can be integrated between the connected remote control panels by the interlock function.

- To select destination channels
- To select destination/source channels and levels by the control knob.
- To enable or disable Lock functions (LOCK LOCAL, LOCK OTHER, and LOCK ALL)

● Lock functions in the multi-panel operation

All connected remote control panels work as one remote control panel, so:

LOCK LOCAL: All integrated remote control panels are locked locally.

LOCK OTHER: Restricts units other than the remote control panels in the multi-panel operation system from changing crosspoints.
All integrated remote control panels can unlock the Lock function.

LOCK ALL: Restricts all units within the multi-panel operation system from changing crosspoints.
All integrated remote control panels can unlock the Lock function.

5-10-2. Enabling Multi-Panel Operation

Multi-panel operation can be enabled in the Setup menu or in the [Web-based Control: **RU Settings** page].

The procedure to enable multi-panel operation in the Setup menu is as shown below. (Supported only by MFR-39RU/39RUA)

◆ **MFR-39RUA**

Step	Description	Refer to
1	Press SETUP to enter Setup menu.	
2	Press **RU-RU CONNECT**.	
3	Change **CONNECT** to ENABLE.	5-3-4-8
4	Turn the control knob to select a link ID under **MASTER ID**. * The link ID is used to configure a link of multiple remote control units and equal to the unit ID of the master unit in the remote control unit link. To configure the remote control unit link using the master unit of Unit ID 100, set **MASTER ID** to 100 for another remote control unit in the link system.	5-3-4-8
5	To exit Setup Menu mode, press EXIT twice.	

◆ **MFR-39RU**

Step	Description
1	Press the SETUP button to open the Setup menu.
2	Turn the control knob to select RU CONN ID, and press the knob to confirm. SETUP>RU CONN ID UNIT ID: 0<ENT> Menu display
3	Turn the control knob to select the ID, and press the knob to confirm. **ID:** This ID is used to synchronize remote control panels for multi-panel operation. All panels must have the same ID as the unit ID of the master remote control panel of the system. (ex.) To enable multi-panel operation using a master remote control panel whose unit ID is 100, set the ID as 100 for all integrated remote control panels.
4	Press the CANCEL button to return the menu display to select menus. Turn the control knob to select RU CONNECT, and press the knob to confirm. SETUP>RU CONNECT ENABLE:OFF<ENT> Menu display
5	Turn the control knob to select ON, and press the knob to confirm.

Perform the above procedure for each remote control panel to be integrated.

To enable multi-panel operation in Web-based Control, proceed as follows:
(1) Click the remote control unit for setting to display the menu tree. Select **RU Settings** to display the menu.
(2) Set the master remote control unit using Unit ID under **Master ID** (for RU Linkage).
(3) Set **RU Linkage** to ON.

6. Crosspoint Control

6-1. One Crosspoint Switching

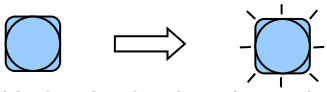
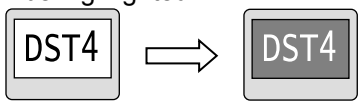
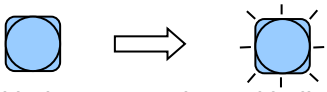
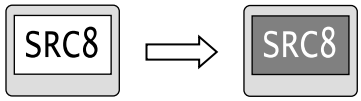
There are two ways of switching crosspoints: Switching a crosspoint one at a time, or switching multiple crosspoints simultaneously. This section describes the switching of one crosspoint.

6-1-1. One Crosspoint Switching by X-Y Setting

A crosspoint can be switched by using the destination and source buttons on the remote control panel.

Destination and source channels must be assigned to those buttons beforehand.
▶ See section 5-3-3-12 “BTN ASSIGN” for details on assigning channels to buttons.

(Ex.) The procedure to output source channel 8 to destination channel 4.

Step	Description	Indications
1	Press a destination button to select destination channel 4.	- The selected destination button lights up.  - The button with the destination channel indication will be highlighted.  - Menu display appears as shown below. DST: 4 [DST4] LVL : 0001 [Level-1]
2	Press a source button to select source channel 8.	- The selected source button lights up.  - The button with the source channel indication will be highlighted. 

- Destination and source channels can also be selected by the control knob or using the display. To select channels by the control knob, the mode menu must be set to destination mode or source mode using the MODE button(s). (Supported only for MFR-39RU, MFR-18RU, MFR-16RUTA, MFR-39RUA and MFR-18RUA)
  Operation using the display is available only on MFR-16RUD.

- MFR-18RU, MFR-16RUTA and MFR-18RUA has the Control DestMode function, which can be set in the [Web-based Control: **RU Settings** page]. If **Control DestMode** is set to **Crosspoint**, crosspoints can be switched by turning CONTROL after pressing a destination button with CONTROL pressed.
  ▶ See section 5-1-3 “Control Knob” for details.

- Control Assist Buttons
  The following functionalities can be assigned to remote control panel buttons to assist crosspoint switches.
  ▶ See section 6-1-1-1 "SKIP-FWD/SKIP BWD" for SKIP-FWD and SKIP-BWD
  ▶ See section 6-1-1-2 "TENKEY" for -TENKEY

6-1-1-1. SKIP-FWD / SKIP-BWD

The SKIP-FWD button allows you to skip the set destination number or source channels forward to select the current one. The SKIP-BWD button allows you to skip channels backward.
In Destination or Source mode, the set number of channels is skipped. In Level, Page or Setting mode, these buttons are inoperable. (See section 5-3-2. "Mode Menu.")
* To confirm the source selection, press the control knob.

If the source and/or destination channels are categorized, the buttons allows you to go to the first or last channel in the category.

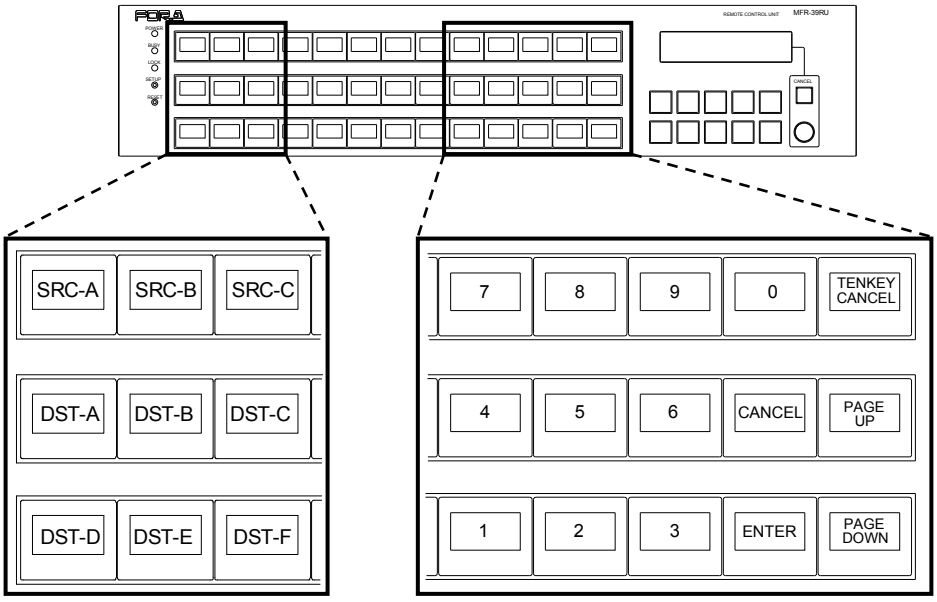
(Ex.) If Category 1: Dest 1 to 13, Category 2: Dest 14 to 20,
SKIP-FWD is set to 5, and
Current destination is 1.
Pressing the SKIP-FWD button selects destination channels 1 → 6 → 11 → 13 → 14 → 19 → 20 → 21 → 26 → 31 → and so on.

The categories are user programmable source or destination channel groups. They are set under **Category** accessed from each Web-based Control page.
[Web-based Control: **Router System Settings** > **Source Name** > **Category**]
[Web-based Control: **Router System Settings** > **Destination Name** > **Category**]

► See section 5-3-3-12. "BTN ASSIGN" and 5-4-2. "Button Assignment Change" for details on how to assign the SKIP-FWD and SKIP-BWD buttons.

6-1-1-2. TENKEY (MFR-39RU/39RUA)

The TENKEY button is used to enable Tenkey mode. Tenkey mode allows you to select source and destination channels using the numeric keypad that appears on the remote control panel. (Supported only for MFR-39RU)



Category buttons A numeric keypad

Category buttons: Allows you to select a category to select a channel from using the numeric keypad.

- TENKEY CANCEL: Allows you to exit TENKEY mode. The entered number is indicated on the button when "SETTING > TENKEY MOD (INPUT MODE)" is set to ENTER.
- PAGE UP / DOWN: Allows you to change pages for the category buttons.
- ENTER / CANCEL: Allows you to confirm or cancel the change when "SETTING > TENKEY MOD (INPUT MODE)" is set to ENTER. If it is set to DIRECT, entering a value will change and confirm the selection.
- 0 to 9 (numeric keys): Allows you to select a channel in the selected category. The TENKEY NO (INPUT START NO) menu allows you to select whether to count from 0 or 1.

▶ See sections 5-3-3-9 “TENKEY MOD” for TENKEY MOD, and 5-3-3-10 “TENKEY NO” for TENKEY NO.

◆ **Source channel selection using the numeric keypad function**
If categories are set as; SRC-A (SRC 1 to 13), and SRC-B (SRC 14 to 20)

(ex.1) TENKEY MOD (INPUT MODE) is ENTER and TENKEY NO (INPUT START NO) is 1.
- Select SRC-A, enter 3 on a numeric keypad and press ENTER to select SRC 3.
- Select SRC-B, enter 5 on a numeric keypad and press ENTER to select SRC 18.

(ex. 2) TENKEY MOD (INPUT MODE) is DIRECT and TENKEY NO (INPUT START NO) is 0.
- Select SRC-A, and enter 3 on a numeric keypad to select SRC 4.
- Select SRC-B, and enter 0 on a numeric keypad to select SRC 14.

▶ See section 5-3-3-12. "BTN ASSIGN" for details on how to assign the TENKEY button.

6-1-2. Crosspoint Switching Using a Bus Button

A button to which a destination channel and source channel for the destination is assigned is called a bus button in the remote control panel. The bus buttons allow you to change source channels to be output from destination channels by the push of a button.

Bus button crosspoint switching can switch crosspoints regardless of the current destination setting.

▶ See section 5-2. "Function Buttons" for details on button assignments.
▶ See section 5-3-3-12. "BTN ASSIGN" and 5-4-2. "Button Assignment Change" for details on how to assign the bus buttons.

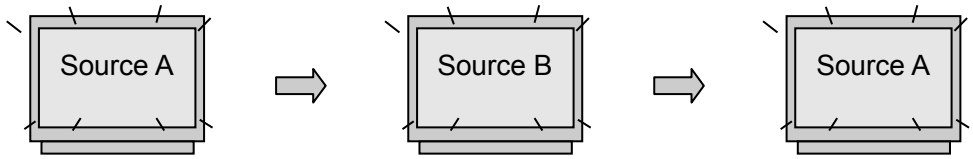
6-1-3. CHOP Function

The CHOP function allows you to alternate 2 images to compare the images.

◆ **Enabling the CHOP function**

(1) Press one of 2 source buttons (source A) to compare.
(2) While holding down the source button, press and release another source button (source B).

Images of source A and B alternate.



Press source button A.
→ Source A is output.

Holding down source button A, press source button B.
→ Source B is output.

Release source button B.
→ Source A is output.

6-1-4. Crosspoint Switching Using TAKE Function

Crosspoint switching using the **Take** function is available by the remote control panel that is assigned **Take**.
The **Take** function enables crosspoint switching by the TAKE button.
The **Take** function has 2 modes that can be assigned to different remote control panel respectively. To select the Take mode, select Preset or Direct under **Take Mode** in in the [Web-based Control: **RU Settings** page].

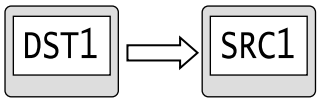
◆ **Preset mode**

Press the TAKE button to enable Take, and select crosspoints, then press the TAKE button to switch crosspoints.

◆ **Direct mode**

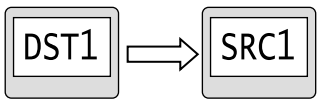
The Take function is always enabled. Select crosspoints, then press the TAKE button to switch crosspoints.

- Ex.1: To use the TAKE button assigned to Preset mode

Step	Description
1	Press the TAKE button. The take function will be enabled, and the button will be highlighted. 
2	Select a crosspoint by selecting a destination button and source button. The selected buttons will blink.  * To switch multiple crosspoints, repeat the procedure.
3	After completing the crosspoint selection, press the blinking TAKE button to switch the crosspoint/s. In multiple crosspoint switching, the last set of destination and source buttons will be highlighted.

Once a crosspoint switch has been completed, the TAKE button preset mode will be disabled. The button will return to direct mode.
To switch crosspoints in the preset mode again, repeat the procedure from step 1.

- Ex. 2: To use the TAKE button assigned to Direct mode

Step	Description
1	In Direct mode, the Take function is always enabled. Select a crosspoint by selecting a destination button and source button. The selected buttons will blink.  * To switch multiple crosspoints, repeat the procedure.
2	After completing the crosspoint selection, press the blinking TAKE button to switch the crosspoint/s. In multiple crosspoint switching, the last set of destination and source buttons will be highlighted.

6-2. Simultaneous Crosspoint Switching

The simultaneous crosspoint switching function allows you to simultaneously switch multiple crosspoints by the press of one button. There are two ways to do so. One is the Salvo function which performs the switching by recalling the pre-assigned crosspoints. The other is the Take function which allows you to assign and switch multiple crosspoints simultaneously.

- The pre-assigned crosspoints for a SALVO can be saved to either the routing switcher main unit or a button on the remote control panel.

6-2-1. Main Unit Salvo

This type of salvo allows you to store crosspoint data to be simultaneously switched. The stored data can be recalled from any connected remote control panel.

◆ Storing Salvo data

Salvo data can be stored in the Web-based Control.

▶ See [Web-based Control: **Salvo** page].

◆ Executing Salvos

Use a SALVO (MU RECALL) button on the remote control panel as shown in the procedure below.

(1) Assign a SALVO button on the remote control panel. Set the salvo for **MU RECALL**, and select a Salvo number.
▶ See section 5-3-3-12 “BTN ASSIGN” and 5-4-2. "Button Assignment Change."

(2) Pressing the SALVO button to executes the salvo. The crosspoints stored to the salvo number are simultaneously set.

6-2-2. Remote Control Salvo

This type of salvo allows to you assign crosspoints to be simultaneously switched to a button. The salvo can be recalled only by the SALVO button on the remote control panel. Once a salvo is executed, crosspoints assigned to the salvo are switched according to the current remote control level setting.

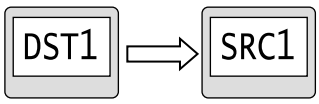
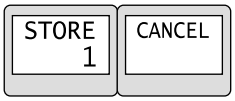
> Remote Control Stored Salvo data can also be stored using the Web-based Control.
> ▶ See [Web-based Control: **Salvo** page]

◆ **Storing Salvo Data to the Remote Control Unit (MFR-39RU/39RUA only)**

Use a SALVO (RU STORE) button on the remote control panel as shown in the procedure below.

(1) Assign a SALVO button on the remote control panel. Set the salvo for **RU STORE**.
▶ See section 5-3-3-12 “BTN ASSIGN.”

(2) Store salvo data as shown in the table below.

Step	Description
1	Press the SALVO button as shown below. The button is highlighted and ready for crosspoints to be assigned. 
2	To assign crosspoints to a salvo, press a destination button then a source button. The selected buttons flash.  Repeat the procedure for all crosspoints.
3	**MFR-39RU:** After completing the crosspoints assignments, press the SALVO button again. The menu display appears as shown below. SALVO STORE NO: 1 (NEW) <ENT> **MFR-39RUA:** After completing the crosspoints assignments, press the SALVO button again. The Current DEST and SRC button displays change as shown below. 
4	**MFR-39RU:** To add crosspoints to an existing salvo, select a salvo number by turning the control knob. Salvo numbers to which no crosspoints are assigned are indicated with (NEW). Turn the control knob to select a number, and press the knob to confirm the selection. **MFR-39RUA:** Turn the control knob to select a number then press the control knob to confirm the selection.

◆ **Executing Salvos**

Use a SALVO (RU RECALL) button on the remote control panel as shown in the procedure below.

(1) Assign a SALVO button on the remote control panel. Set the salvo for **RU RECALL**, and select a Salvo number.
▶ See section 5-3-3-12 “BTN ASSIGN” and 5-4-2. "Button Assignment Change."

(2) Pressing the SALVO button to executes the salvo. The crosspoints stored to the salvo number are simultaneously set.

6-2-3. Simultaneous Switching by the Take Function

The TAKE button on the remote control panel allows you to simultaneously switch preset crosspoints.

▶ See section 5-3-3-12 “BTN ASSIGN” for details on assigning the TAKE button.

◆ **Executing the TAKE function**

Refer to Ex. 1) and Ex. 2) in section 6-1-4. "Crosspoint Switching Using TAKE Function."

6-2-4. Simultaneous Switching by the Link Function

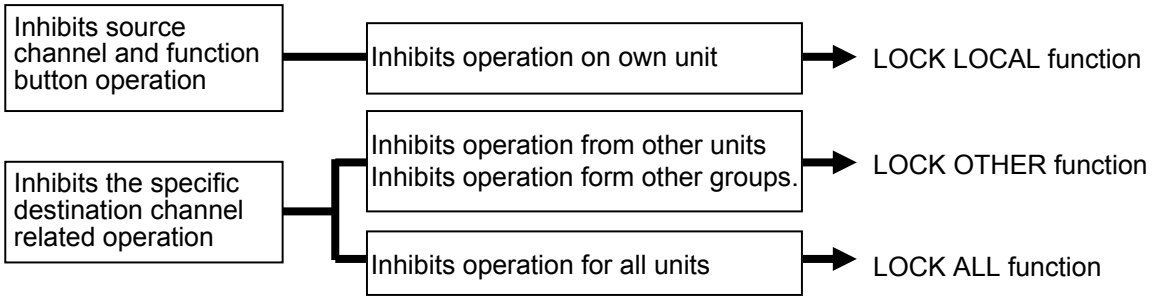
The LINK button on the remote control panel allows you to simultaneously switch crosspoints associated with a specific crosspoint.
Pressing the LINK button enables or disables the Link function. The LINK button is highlighted with a bright background when the function is enabled.
▶ See section 5-3-3-12 “BTN ASSIGN” for details on assigning the LINK button.

If the **Link** function is turned on, selecting a trigger crosspoint switches the slave crosspoints with it. The trigger and slave crosspoints can be assigned using Web-based Control. Refer to
▶ See [Web-based Control: **Link Settings** page] for more details.

6-3. Lock

Function operation and crosspoint changes can be disabled by the Lock function.

◆ **LOCK Function**
The Lock function is a function that inhibits the use of function buttons or crosspoint changes. There are three types of Lock functions.



6-3-1. LOCK LOCAL

The Lock Local function inhibits operation of buttons and menus that change the source channel or sets or executes Take switching on the unit that enabled the Lock function. (Selecting destination channels is not inhibited.)
This function is used in protecting the system from unintended operation.

◆ **Enabling LOCK LOCAL**
(1) Assign **LOCK LOCAL** to a button on the control unit.
▶ See section 5-3-3-12 “BTN ASSIGN” and 5-4-2. "Button Assignment Change."
(2) Press the assigned LOCK LOCAL button to enable the Lock Local function.
* Operations are locked for units in black box and unlocked for units in white box.

◆ **Disabling LOCK LOCAL**
Press the LOCK LOCAL button again.

If LOCK LOCAL is ON:

On the remote control panel:
- LOCK LED is lit green
- LOCK LOCAL is highlighted (background of the text illuminates.)
- Source and bus button indications are crossed.

To check the LOCK status, press the current destination button.
The MENU display shows the LOCK status (ON or OFF) as shown below.

```
DST:      8 [DST8          ]
LK-LOCAL [PANEL LOCK  ]
```

```
DST:     8 [DST8          ]
LK-OFF   [NOT LOCKED  ]
```

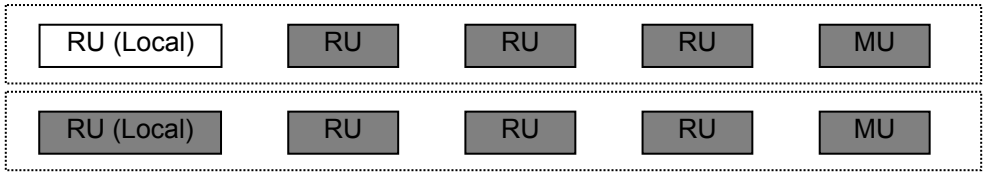
The LOCK LOCAL button and LOCK LED on the remote control panel flash if any inhibited operation such as changing the source channel is performed when Lock Local is enabled. (Only if the LOCK LOCAL button is assigned.)

Note that LOCK LOCAL can be set only on remote control units.

6-3-2. LOCK OTHER / LOCK ALL

The **Lock Other** and **Lock All** functions disable crosspoint changes for current destination channels to all other units or all units including the unit that enabled the Lock function. Lock functions can be disabled only from the unit that enabled the function.
In multi-panel operation, lock functions can be disabled from any remote control panel in the operation system. Lock Other does not disable operation of remote control panels in the system.

◆ **Enabling LOCK OTHER/LOCK ALL**
<Setting on the Remote Control Panel>
(1) Assign **LOCK OTHER** or **LOCK ALL** to a button on the remote control unit.
▶ See section 5-3-3-12 “BTN ASSIGN” and 5-4-2. "Button Assignment Change."
(2) Press the assigned button to enable the Lock function.



<Setting in the Web-based Control>
Open the [Web-based Control: **Lock Destination** page, and assign a lock button.

◆ **Disabling LOCK OTHER/LOCK ALL**
Press the lock button again.

> To unlock buttons from other units, press and hold the LOCK button for the time specified in the [Web-based Control: **RU Settings** page].

If LOCK OTHER or LOCK ALL is ON:

On the remote control panel:
- LOCK LED illuminates
  Orange, if LOCK OTHER is issued by itself.
  Red, if LOCK OTHER is issued by another unit.
  Red, if LOCK ALL is issued by any unit.
- The LOCK button is highlighted (background illuminates)
- LED and LCD colors of locked current destination buttons are changed to those set under **LockButtonColor** in the [Web-based Control: **RU Settings** page] (MFR-40/18/39RU/16RUTA)

To check the LOCK status, press the current destination button.
The MENU display shows the LOCK status and the number of the unit that issued the LOCK command.

```
DST:     8 [DST8              ]
LK-ID: 103[OTHER PANELS]
```

LOCK OTHER ON

```
DST:     8 [DST8              ]
LK-ID: 103[ALL PANELS  ]
```

LOCK ALL

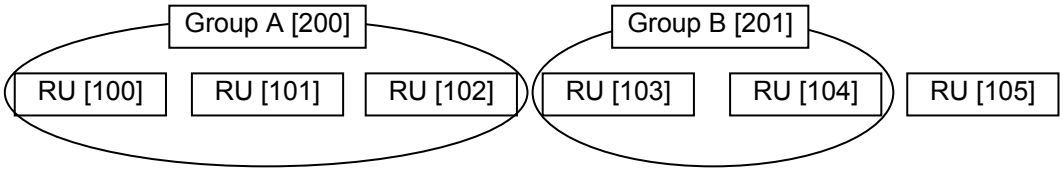
```
DST:     8 [DST8              ]
LK-OFF   [NOT LOCKED  ]
```

LOCK OFF

The LOCK button and LOCK LED on the remote control unit flash if any inhibited operation such as selecting a source channel is performed when Lock Other (or Lock All) is enabled and the LOCK OTHER (or LOCK ALL) button is assigned.

◆ **LOCK GROUP**
The LOCK OTHER function also enables Group LOCK OTHER, which allows crosspoint switching by RU units only in the same group and locks RU switching in other groups. Any RU in the same group can lock or release the LOCK OTHER command. LOCK ALL disables crosspoint switching from all remote control units and can be unlocked only by remote control units in the same group.

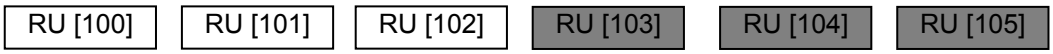
<LOCK GROUP Setting Example>
This example creates the following three groups from five RU units as shown below using the Unit ID and Group ID numbers.



1. Open the [Web-based Control: **Lock Destination** page]. Add RU [100], RU[101] and RU[102] to Group A.
2. Add RU [103] and RU[104] to Group B.

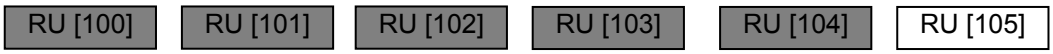
Once an RU is added to a group, the LOCK OTHER/LOCK ALL button on the RU changes to a Group LOCK OTHER/LOCK ALL button.

When sending a LOCK OTHER command from RU[100], RU [103], RU[104] and RU[105] are locked (greyed out in the figure below) for the set crosspoint.



When sending a LOCK OTHER command from RU[103]…

When sending a LOCK OTHER command from RU[105]…



When sending Group LOCK OTHER commands, use a Group ID number in the [Web-based Control: **Lock Destination** page].

If operating in Multi-panel mode, all linking RU devices must belong to the same group.

6-4. Operation Preview Function

The **Operation Preview** function allows you to set an output to be used for the preview.

(ex.) When pressing a source button on the remote control panel for setting a simultaneous crosspoint switch, the selected source will be output to the preview output. Then you can check source images to be assigned to the simultaneous crosspoint switch before pressing TAKE. In addition, when pressing a destination button, the source channel assigned for the destination channel will be output to the preview output.

◆ Assigning Operation Preview to a Button on the Remote Control Panel

The Operation Preview function is disabled as default. To enable the function, assign the function to a button on the remote control panel in the Web-based Control.
Only MFR-39RU and MFR-16RUD units can assign Operation Preview on the front panel operation.

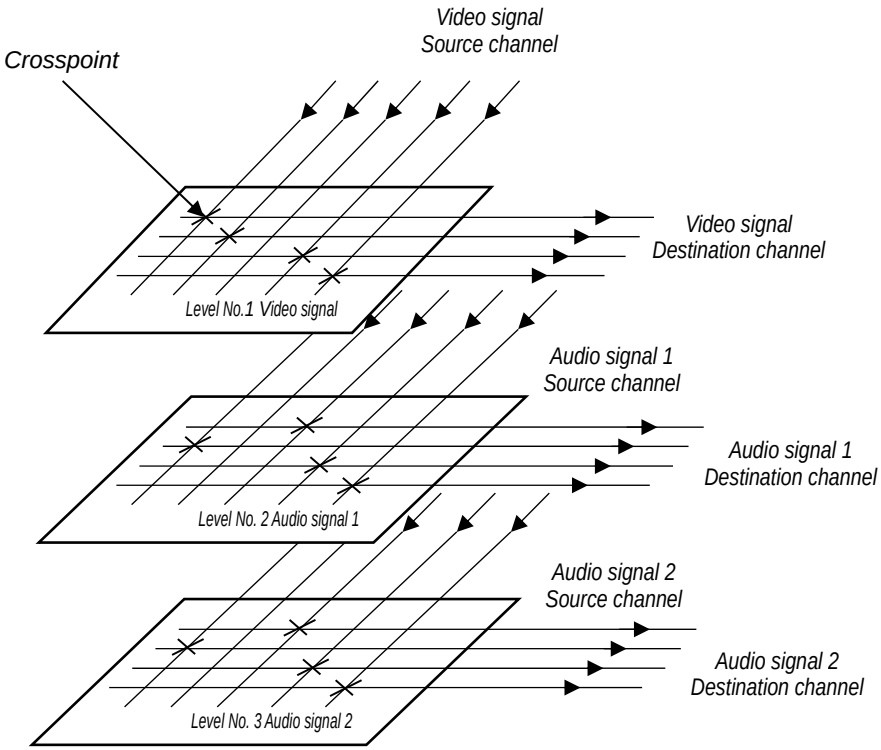
▶ See [Web-based Control: **Assign Function** page].
▶ See sections 5-3-3-12. "BTN ASSIGN" and 5-4-2." Button Assignment Change."

◆ Enabling the Operation Preview function

Press the O-PREVIEW button on each remote control unit to enable the function.
The preview signal will output to the set destination channel.

6-5. Level Control

Generally, routing switchers control crosspoints according to the signal types such as video, audio, time codes, and VCR control. To control switchers, level numbers are used to identify which type of signal to control.



In the above example, if you select level number 1 for the current level, you can switch crosspoints that are set to level 1. If you select level number 2, you can switch crosspoints on level 2. If you select multiple levels, you can switch crosspoints on all of the selected levels at the same time.

◆ Assigning levels

Signals can be assigned to logical inputs and outputs in the [Web-based Control: **Assign Function** page]. When assigning the signals, select a level for respective signals to assign to the respective levels.

◆ Selecting levels on remote control panels

The remote control panel can select channels on the current level. The level selections can be changed using the LEVEL button or control knob. Multiple levels can be set to the current levels by the LEVEL button or control knob.

Pressing the respective LEVEL button allows you to go to the respectively assigned levels.

To change levels on remote control panels using the Control knob, press the MODE button and select Level mode in the mode menu.

▶ See section 5-3 "MODE Button and Mode Menu (MFR-39RU/18RU)" for details on the Mode menu.

6-5-1. Level Indication on the Remote Control Panel

The MFR main unit and the remote control panel can control signals on multiple levels at the same time. The remote control panel indicates the current level(s) by hexadecimal numbers in the menu display and on the LCD.

(ex.1) If all levels 1 through 8 are enabled, the indication is “00FF."

Level 8: ENBL 7: ENBL 6: ENBL 5: ENBL 4: ENBL 3: ENBL 2: ENBL 1: ENBL

>> F F

(ex. 2) If levels 3, 4, 6, and 7 are enabled, the indication is “006C."

Level 8: DSBL 7: ENBL 6: ENBL 5: DSBL 4: ENBL 3: ENBL 2: DSBL 1: DSBL

>> 6 C

* ENBL: enabled
  DSBL: disabled

If multiple levels are selected to the current levels, the smallest enabled level number is indicated in the menu display and on the button.
In case of the above (ex.1): indicated as Level1
In case of the above (ex.2): indicated as Level3

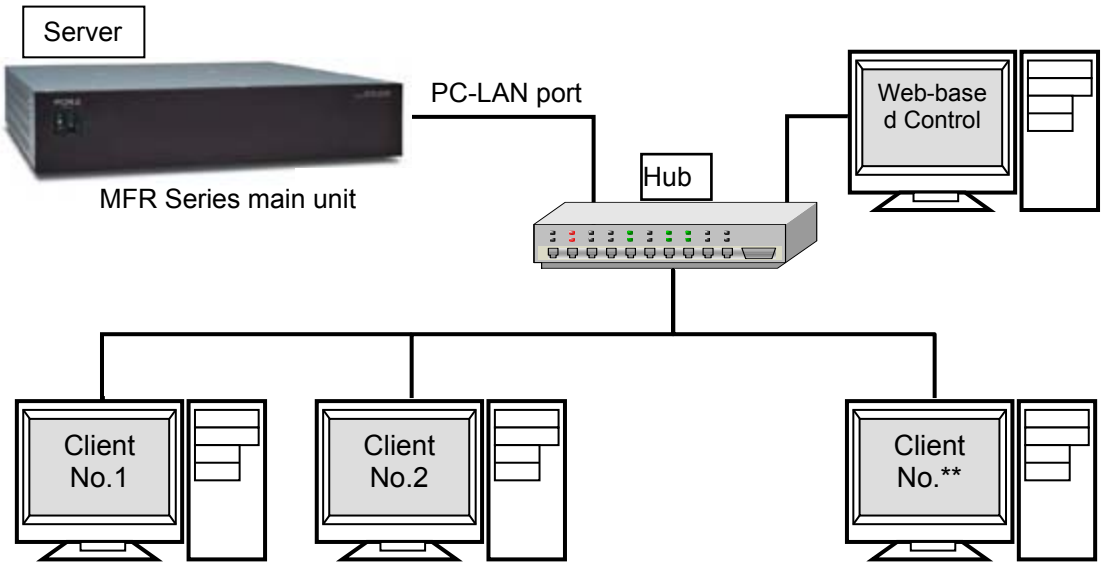
7. Serial / LAN Command Control

7-1. Serial Interface

Crosspoint switchover and tally output can be controlled via the SERIAL ports on the MFR Series main unit or MFR GPI.

7-2. LAN Interface

The MFR Series main unit is able to connect to a third-party automatic control system via the RJ-45 port (PC-LAN port). The TCP/IP communication protocol is supported. The control PC will be the Client, and the MFR Series main unit will be the Server.



◆ **Basic specifications**

Item	Description
IP address (PC-LAN port)	192.168.1.12 (Subnet Mask: 255.255.255.0)
Port number	Setting range: 49152 to 65534 (Default: 23)
Number of PCs	Max. 16
Response / Resending	Wait before sending next command (Resend if the Echo is not returned.)
Login password	None
Communication protocol	TCP/IP, Control PC: Client, MFR-3232: Server Crosspoint Remote Control using ASCII code.
Command protocol	Crosspoint Remote Control protocol

7-3. Control Command

The control command list below shows the standard control commands for **Crosspoint remote control** and **Crosspoint remote control 2** protocols, which are available for both LAN and serial interfaces.

◆ Control command list

Function		Serial	LAN *1	Protocol *2
1	Commands (S?) for requesting the crosspoints list	Yes	Yes	Crosspoint remote control / Crosspoint remote control 2
2	Commands (X?) for requesting information on crosspoints (by specifying a destination and level.)	Yes	Yes	
3	Commands (X:) for switching over a crosspoint (single channel)	Yes	Yes	
4	Commands for switching over crosspoints (multi-channel simultaneous switchover)	Yes	Yes	
5	Commands (W:) for locking a destination	Yes	Yes	
6	Commands (z:) for reinitializing a unit	Yes	—	
7	Commands (K?) for requesting input/output channel names	—	Yes	Crosspoint remote control 2
8	Commands (A?) for requesting CPU status.	—	Yes	
9	Commands (W?) for requesting destination lock status (destination needs to be specified).	—	Yes	

*1 When commands are sent via LAN, an Echo, Prompt, S response and other response messages may be included in a single packet or divided into two or more packets. Therefore, do not process commands in a per packet basis but a per stream basis.

*2 A command protocol should be selected in the [Web-based Control: **Port Settings** page].

◆ Command formats

Func.	Control command	Command response	Ref.
1	@[sp]S?<Lvl>	S:<Lvl><Dest>,<Src>	—
2	@[sp]X?<Lvl><Dest>	S:<Lvl><Dest>,<Src>	—
3	@[sp]X:<Lvls>/<Dest>,<Src>	S:<Lvl><Dest>,<Src> C:<Lvls>/<Dest>,<Src>[…..[S<Salvo number>][L<Link number>]]:I<ID>	—
4	**Clear a preset crosspoint.** @[sp]**B:C**		—
	Preset a crosspoint. @[sp]P:<Lvl>/<Dest>,<Src>		
	Read a preset crosspoint specifying a level and destination. @[sp]P?<Lvl><Dest>	V:<Lvl><Dest>,<Src>	
	Read preset crosspoints for all channels in the specified level. @[sp]V?<Lvl>	V:<Lvl><Dest>,<Src>	
	Perform the preset crosspoints simultaneously. @[sp]B:E	S:<Lvl><Dest>,<Src> **C:**<Lvls>/<Dest>,<Src>[…..[S<Salvo number>][L<Link number>]]:I<ID>	—
5	**LOCK ALL units.** @[sp]W:<Lvl>/<Dest>,<ID>,1	W!<Lvl><Dest>,<ID>,1	—
	LOCK OTHER units. @[sp]W:<Lvl>/<Dest>,<ID>,2	W!<Lvl><Dest>,<ID>,2	—
	Disable LOCK. @[sp]W:<Lvl>/<Dest>,<ID>,0	W!<Lvl><Dest>,<ID>,0	—
6	@[sp]z:<Lvls>	S:<Lvl><Dest>,<Src> C:<Lvls>/<Dest>,<Src>[…..[S<Number of crosspoints in Salvo>][L<Number of Links>]]:I<ID>	—
7	@[sp]K?<SorD><AorK>,<Ofset>	K:<SorD><AorK><No.>,<Dat>	7-3-3
8	@[sp]A? — If CPU is active:	@[sp]A:<ID>	7-3-4
	@[sp]A? — If CPU is passive:	(No response)	
9	@[sp]W?<Lvl>,<Dest>	W!<Lvl><Dest>,<ID>,0 to 2* *0: NOT LOCKED/1: LOCK ALL/2: LOCK OTHER	7-3-5

* [sp] indicates a space.

* Commands must end with a carriage return (ASCII code 0x**0D**) only or carriage return and line feed (ASCII code 0x**0A**). MFR units add **a carriage return** and **line feed** in front of and at the end of reply messages.

Command parameters and setting range

<Lvl>	0 - 7	Allows you to specify the level to switch crosspoints. * When in single-level operation.
<Lvls>	0 - 7	Allows you to specify the levels to switch crosspoints. * When in multiple-level operation
<Dest>	000 - 03F	Allows you to specify the crosspoint switchover destination.
<Src>	000 - 07F	Allows you to specify the source of crosspoint switchover.
<ID>	0 - FE	Unit ID. The ID must be different from that of other devices in the same network. Use **1** to **FE** for ID numbers. The host returns **0** when the lock is released.

* All command values are in hexadecimal, starting from 0 (zero).
(For example, Source "**16**" is represented as <Src>"**F**.")
* If levels are not in use, set <Lvl> or <Lvls> to "0"(zero).

7-3-1. Command Responses (Commands 1-6)

- **Echo and Prompt**
Responses will be sent as shown below when receiving commands:

A command is received. ↓ Echo ↓ Prompt	 @[sp]X:<Lvls>/<Dest>,<Src>[CR] [CR][LF]>

* MFR units respond with an Echo Reply with the same data that they received. Therefore, echo reply messages end with [CR][LF] or [CR] only. If echo messages with [CR][LF] are received, only [LF] composes the second line.
* MFR units read a command, ended with a newline, and return a prompt to notify that they are ready to receive a new command.
* A carriage return and line feed are not added at the end of "Echo Reply" and "Prompt"

- **"C" responses**
A "C" response is sent as shown below when a control command is received:

[CR][LF]C:<Lvls>/<Dest>,<Src>[…[S<**Salvo number**>][L<**Link number**>]]:I<ID>[CR][LF]

* C responses are sent to all the terminals in the system.

Parameter	Setting range	Description
<Salvo number >	1−FFF	The number of crosspoints that are to be changed simultaneously by Salvo settings. A response if 3 crosspoints are to be changed simultaneously: **C:0/0,0...S2:IA**
<Link number>	1−FFF	The number of crosspoints that are to be changed simultaneously by Link settings. A response if 2 crosspoints are to be changed simultaneously: **C:0/0,2...L1:IA**

- **"S" responses**
An "S" response is sent as shown below when crosspoints are switched by a command.

[CR][LF]C:<Lvls>/<Dest>,<Src>[…[S<**Salvo number**>][L<**Link number**>]]:I<ID>[CR][LF]

* If a crosspoint is switched by an X or B command, its "S" response is sent to all the terminals in the system. However, if any crosspoints are not switched (specifying the same crosspoint as the current one), its "S" response is sent only to the terminal that sent the command.
* C responses are sent before S responses in some cases.
* A command is received from another terminal while a B or X command is processed, MFR units send "S" response messages to the terminals, notifying only the latest crosspoint states.
* A crosspoint switch command is not performed if the relevant crosspoint is locked or inhibited to change.

Ex. 1) When **Source 5** is selected for **Destination 3** in **Level 1:**
(Function 3 in the previous page)

(A)	@ X:0/2,4[CR][CR][LF]>
(B)	[CR][LF] C:0/2,4:IA[CR][LF]
(C)	[CR][LF] S:02,4[CR][LF]

Terminal display:

```
@ X:0/2,4
>
C:0/2,4:IA

S:02,4
```

Ex. 2) When Source 113 is selected for Destination 49 in Levels 2 to 7:
(Function 3 in the previous page)

(A)	@ X:123456/30,70[CR][CR][LF]>
(B)	[CR][LF] C:123456/30,70...S5:IA[CR][LF]
(C)	[CR][LF] S:130,70[CR][LF]
(C)	[CR][LF] S:230,70[CR][LF]
(C)	[CR][LF] S:330,70[CR][LF]
(C)	[CR][LF] S:430,70[CR][LF]
(C)	[CR][LF] S:530,70[CR][LF]
(C)	[CR][LF] S:630,70[CR][LF]

Terminal display:

```
@ X:123456/30,70
>
C:123456/30,70…S5:IA

S:130,70

S:230,70

S:330,70

S:430,70

S:530,70

S:630,70
```

* [CR] and [LF] represent Carriage Return (0x0D) and Line Feed (0x0A) respectively.

7-3-2. Receiving Responses (Commands 1-6)

- **Timeout Waiting for Command Response from MFR**

Set the **timeout** period (maximum permitted time until its response returns from the MFR unit) to **1 second** for short message commands and to **5 seconds** for long message commands.

- **If Sending Commands Successively:**
  -For "**X:**", "**B:C**", "**P:**" and "**W:**" commands, send the next command **after** a **prompt** returns.
  -For "**S?**", "**X?**", "**P?**", "V?", "**B:E**" and "**Z:**" commands, send the next command **after** a **prompt and reply messages** return.
  -For "**S?**" and "**Z:**" commands as well as "**V?**" and "**B:E**" commands after executing many preset commands, send the next command **after** having finished receiving **all strings** of reply messages.

Ex. 1)
Allows to send the next command when receiving a prompt.
Resends the previous command when the timeout period (5 seconds) have elapsed without reply after sending a command.

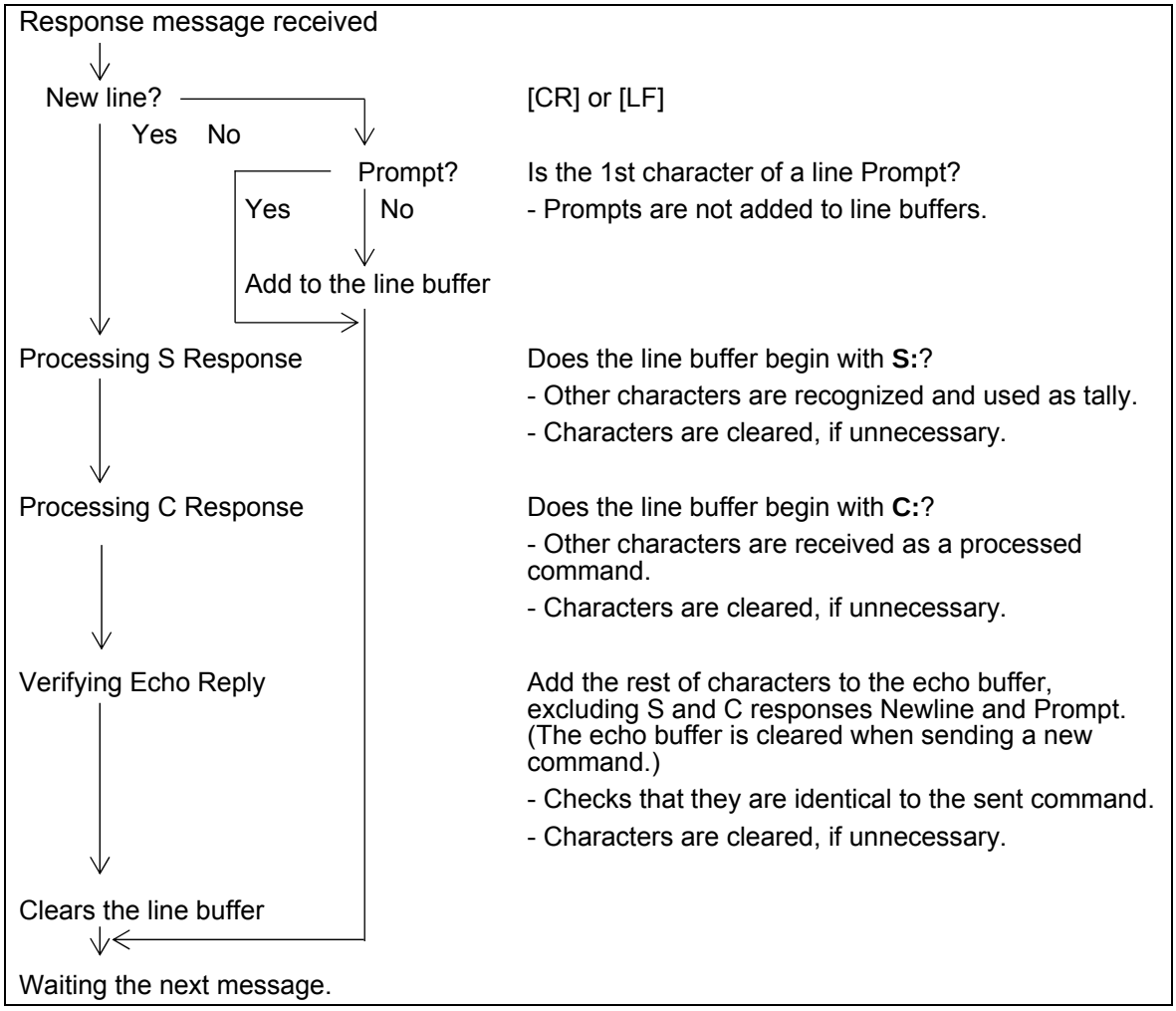
Ex. 2)
Allows to send the next command when receiving a prompt.
Resends the previous command when the timeout period (5 seconds) have elapsed without reply after sending a command.
Recognizes and uses "S" responses as tallies (crosspoint states).

Ex. 3)
Allows to send the next command when receiving a prompt.
Recognizes and uses “S” responses as tallies (crosspoint states).
Resends the previous command when the timeout period (5 seconds) have elapsed without reply after sending a command.
Sets the maximum number of continuous resendings, because crosspoints cannot be changed if they are locked or inhibited to change.

Ex. 4)
Allows to send the next command when receiving a prompt.
Resends the previous command when the timeout period (5 seconds) have elapsed without reply (echo) after sending a command.

Ex. 5)
Allows to send the next command when receiving a prompt.

- **Response Message Evaluation Example:**



- **If Commands are Overlapped:**

Two or more commands are sent from different terminals (via serial or LAN interface, or Remote Control units), all command results (C and S responses) are sent to all these terminals from the MFR.
The following command examples shows how overlapped commands are processed.

Ex.) Assume that the following commands are overlapped:
Terminal 1 sent "@ X:0/2,4."
Terminal 2 sent "@ X:123456/30,70."

Message examples returned to Terminal 1

1-(A)	@ X:0/2,4[CR] [CR][LF]>
1-(B)	[CR][LF] C:0/2,4:IA[CR][LF]
2-(B)	[CR][LF] C:123456/30,70...S5:IA[CR][LF]
1-(C)	[CR][LF] S:02,4[CR][LF]
2-(C)	[CR][LF] S:130,70[CR][LF]
2-(C)	[CR][LF] S:230,70[CR][LF]
2-(C)	[CR][LF] S:330,70[CR][LF]
2-(C)	[CR][LF] S:430,70[CR][LF]
2-(C)	[CR][LF] S:530,70[CR][LF]
2-(C)	[CR][LF] S:630,70[CR][LF]

Terminal display

```
@ X:0/2,4
>
C:0/2,4:IA

C:123456/30,70...S5:IA

S:02,4

S:130,70

S:230,70

S:330,70

S:430,70

S:530,70

S:630,70
```

Message examples returned to Terminal 2

2-(A)	@ X:123456/30,70[CR] [CR][LF]>
1-(B)	[CR][LF] C:0/2,4:IA[CR][LF]
2-(B)	[CR][LF] C:123456/30,70...S5:IA[CR][LF]
1-(C)	[CR][LF] S:02,4[CR][LF]
2-(C)	[CR][LF] S:130,70[CR][LF]
2-(C)	[CR][LF] S:230,70[CR][LF]
2-(C)	[CR][LF] S:330,70[CR][LF]
2-(C)	[CR][LF] S:430,70[CR][LF]
2-(C)	[CR][LF] S:530,70[CR][LF]
2-(C)	[CR][LF] S:630,70[CR][LF]

Terminal display

```
@ X:123456/30,70
>
C:0/2,4:IA
C:123456/30,70...S5:IA

S:02,4

S:130,70

S:230,70

S:330,70

S:430,70

S:530,70

S:630,70
```

* C responses are sent before S responses in some cases.

7-3-3. Channel Name Request Commands (7)

K? Commands allow you to obtain Source and Destination names in ASCII and/or in Kanji set in the MFR Web-based Control menu.
Up to 32 channel names can be obtained per a single request.
Note that the number of request channels exceeds the system maximum size, no data will return for the exceeded channels.
► See the [Web-based Control: **SystemSize/LevelName** page].

◆ **Command Format**

Command	Command response
@[sp]K?<SorD><AorK>,<Ofset>	K:<SorD><AorK><No.>,<Dat>

Commands

BYTE No.	1	2	3	4	5	6	7	8-10	11
Command	@	[sp]	K	?	S	A	,	000-07F	CR
					D	K		000-03F	

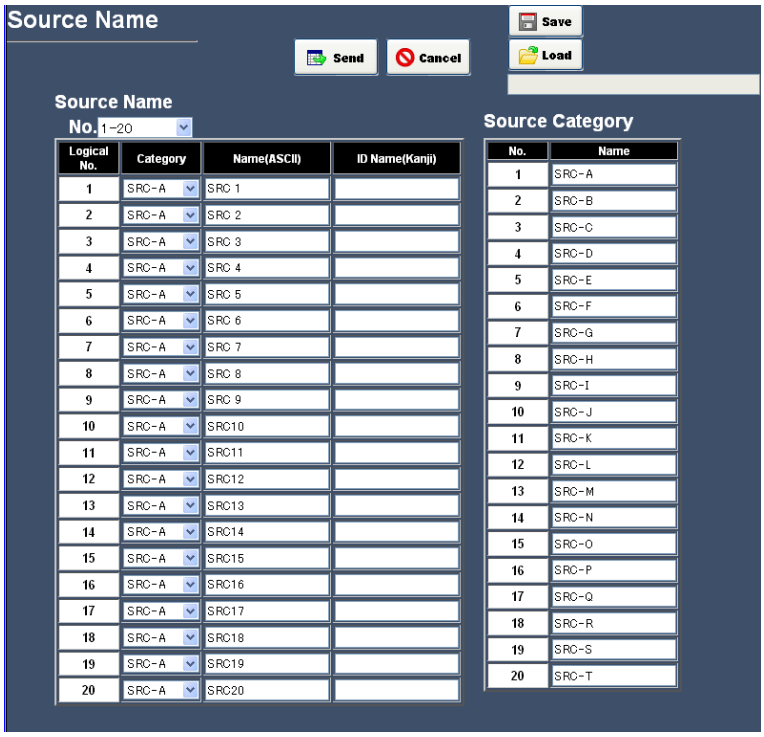
Command response

BYTE No.	1	2	3	4	5	6	7-9	10	11-		
Response	CR	LF	K	:	S	A	000-07F	,		CR	LF
					D	K	000-03F				

Command Response	BYTE 5	<S or D> Select between S (Source) or D (Destination) S: Source, D: Destination
	BYTE 6	<A or K> Select A (Ascii) or K (Kanji) for names.
Command	BYTE8-10	<Offset> Specify the start number of channels. Source: 000-07F, Destination: 000-03F
Response	BYTE7-9	<No.> Indicates the channel number. Source: 000-07F, Destination: 000-03F
Response	BYTE11-	<Dat> Indicates the channel name in Ascii or Kanji using hex characters (max. 128 bytes). Character code for Ascii names: **Ascii** Character code for Kanji names: **UTF-8**
Command Response	CR	Carriage return
	LF	Line feed

◆ Command Example 1: Requesting the Source Channel 1 Ascii Name

➢ Web-based Control (Source Name menu)



➢ Terminal display

Command	@ K?SA,000

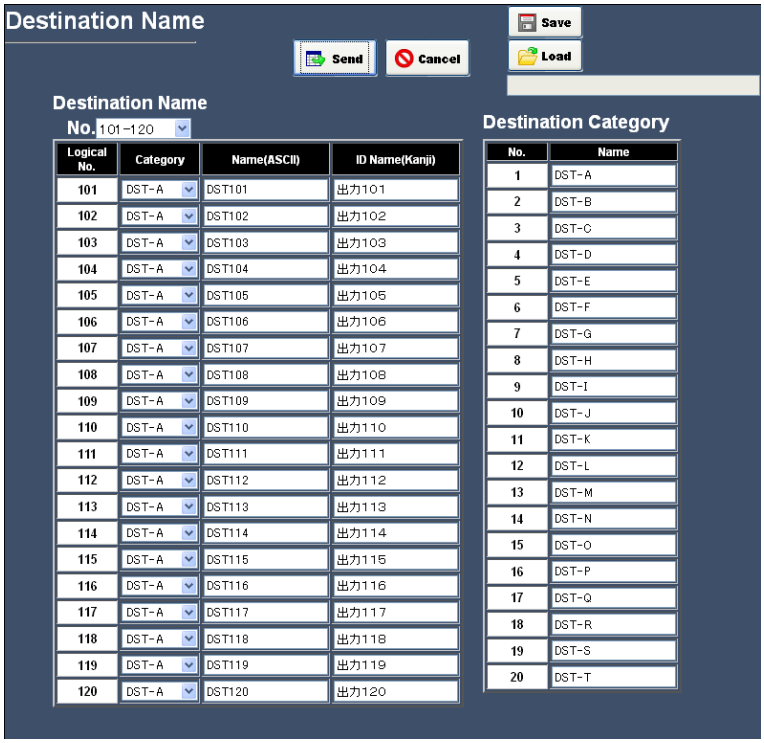
Response	@ K?SA,000	Echo
	K:SA**000**,5352432031	Ascii Name for Source **Channel 1** is SRC 1.
	K:SA**001**,5352432032	Ascii Name for Source **Channel 2** is SRC 2.
	K:SA**002**,5352432033	Ascii Name for Source **Channel 3** is SRC 3.
	I	
	K:SA**01F**,5352433332	Ascii Name for Source **Channel 32** is SRC32.
	>	Prompt

➢ Response details

K:	S	A	000,	53	52	43	20	31
	Source	ASCII	Channel 1	S	R	C	[sp]	1

◆ Command Example 2: Requesting the Destination Channel 101 Kanji Name

➢ Web-based Control (Destination Name menu)



➢ Terminal display

Command	@ K?DK,064

Response	@ K?DK,064	Echo
	K:DK**064**,E587BAE58A9BEFBC91EFBC90EFBC91	Kanji Name for Destination **Channel 101** is 出力101.
	K:DK**065**,E587BAE58A9BEFBC91EFBC90EFBC92	Kanji Name for Destination **Channel 102** is 出力102.
	K:DK**066**,E587BAE58A9BEFBC91EFBC90EFBC93	Kanji Name for Destination **Channel 103** is 出力103.
	I	
	K:DK**083**,E587BAE58A9BEFBC91EFBC93EFBC92	Kanji Name for Destination **Channel 132** is 出力132.
	>	Prompt

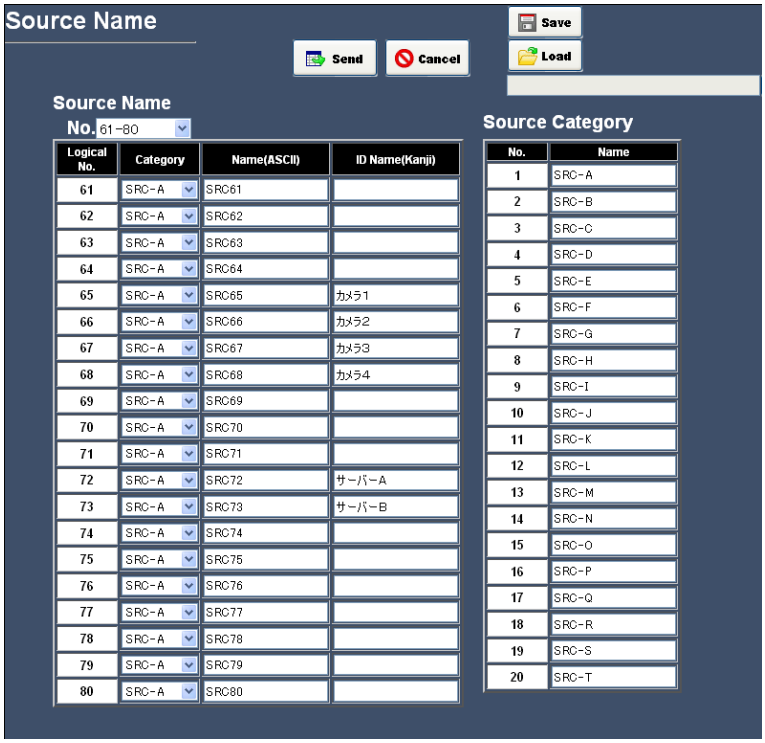
➢ Response details

K:	D	K	064,	E587BA	E58A9B	EFBC91	EFBC90	EFBC91
	Destination	Kanji	Channel 101	出	力	1	0	1

K:	D	K	065,	E587BA	E58A9B	EFBC91	EFBC90	EFBC92
	Destination	Kanji	Channel 102	出	力	1	0	2

◆ Command Example 3: Requesting the Source Channel 65 Kanji Name

➢ Web-based Control (Source Name menu)



➢ Terminal display

Command	@ K?SK,040

Response	@ K?SK,040	Echo
	K:SK**040**,E382ABE383A1E383A9EFBC91	Kanji Name for Source **Channel 65** is カメラ1.
	K:SK**041**,E382ABE383A1E383A9EFBC92	Kanji Name for Source **Channel 66** is カメラ2.
	K:SK**042**,E382ABE383A1E383A9EFBC93	Kanji Name for Source **Channel 67** is カメラ3.
	K:SK**043**,E382ABE383A1E383A9EFBC94	Kanji Name for Source **Channel 68** is カメラ4.
	K:SK**044**,	Kanji Name for Source **Channel 69** is empty.
	K:SK**045**,	Kanji Name for Source **Channel 70** is empty.
	K:SK**046**,	Kanji Name for Source **Channel 71** is empty.
	K:SK**047**,E382B5E383BCE38390E383BCEFBCA1	Kanji Name for Source **Channel 72** is サーバーA.
	I	
	K:SK**05F**,	Kanji Name for Source **Channel 96** is empty.
	>	Prompt

➢ Response details

K:	S	K	040,	E382AB	E383A1	E383A9	EFBC91
	Source	Kanji	Channel 68	カ	メ	ラ	1

K:	S	K	044,	
	Source	Kanji	Channel 69	(Empty)

K:	S	K	047,	E382B5	E383BC	E38390	E383BC	EFBCA1
	Source	Kanji	Channel 72	サ	—	バ	—	A

7-3-4. CPU Status Request Command (8)

This command allows you to indicate which CPU is active in the MFR main unit.

◆ **Command format**

Control command	Command response
@[sp]A?	@[sp]A:<ID>

Control command

BYTE No.	1	2	3	4
Command	@	[sp]	A	?

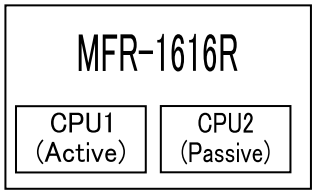
Command response

BYTE No.	1	2	3	4	5
Response	@	[sp]	A	:	<ID>

<ID>: Unit ID number (01-FE)

◆ **Command Response**

There are two response types whether the CPU is active or passive state.



If the CPU is active:

Response	@ A?	Echo
	A:A	Unit ID number is 10 (0x0A)
		New line
	>	Prompt

7-3-5. Lock Status Request Command (9)

W? commands allows you to obtain destination lock status.

◆ **Command format**

Control command	Command response
@[sp]W?<Lvl>,<Dest>	@[sp]W!<Dest>,<ID>,

Control command

BYTE No.	1	2	3	4	5	6	7	8
Command	@	[sp]	W	?	<Lvl>	,	<Dest>	CR

<Dest>: Destination number that you wish to obtain lock status

Command response

BYTE No.	1	2	3	4	5	6	7	8	9	10	11	12
Response	CR	LF	W	!	<Lvl>	<Dest>	,	<ID>	,	0	CR	LF
										1		
										2		

◆ **Command Response**

There are the following three types of response (status).

(1) Dest 1 lock status: LOCK ALL is applied from the unit ID10.

Response	@ W?0,0	Echo
	W!00,A,1	LOCK ALL is applied from the unit ID10 (0x0A) to Dest 1.
		New line
	>	Prompt

(2) Dest 2 lock status: LOCK OTHER is applied from the unit ID11.

Response	@ W?0,1	Echo
	W!01,B,2	LOCK OTHER is applied from the unit ID11 (0x0B) to Dest 2.
		New line
	>	Prompt

(3) Dest3 lock status: Not locked

Response	@ W?0,2	Echo
	W!02,0,0	Dest 3 is not locked.
		New line
	>	Prompt

8. Troubleshooting

If any of the following problems occur during operation of your MFR-1616 MFR-1616R / MFR-3216 / MFR3232, proceed as indicated below to see if the problem can be corrected before assuming a unit malfunction has occurred.

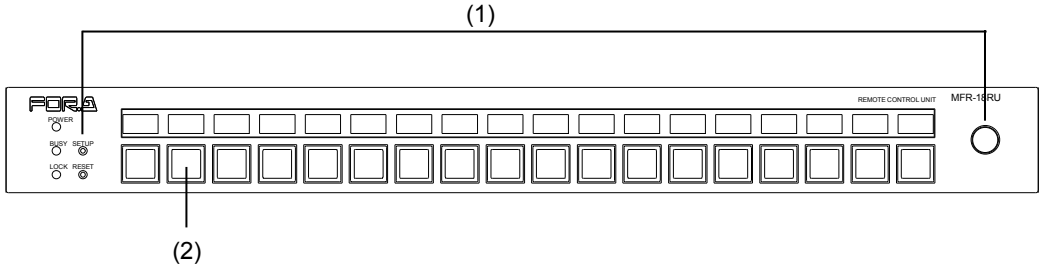
IMPORTANT
If the problem is not corrected by performing the procedures below, turn the unit off and then on again. If this still does not correct the problem, contact your dealer.

Problem	Check	Remedy
No image output.	Are there signal inputs to the video input connectors?	Input video signals to the video input connectors.
	Are cables properly connected for the signal inputs?	Connect cables properly.
	Is the crosspoint set properly?	Set crosspoints properly.
Unable to control using the remote control panel.	Is the LAN cable properly connected?	Properly connect the LAN cable.
	Is the RU Info page in the Web-based Control indicating NG?	Check the item that is indicated as NG. However, if the Voltage is indicated as NG, contact your FOR-A agent. See the Web-based Control Operation Manual for details.
The secondary CPU is active.	Are both MFR-LAN (CPU1) and MFR-LAN (CPU2) properly connected to the network? (Check the cable and Ethernet hub connections.)	Connect both MFR-LAN (CPU1) and MFR-LAN (CPU2) to the network correctly.
	If network connections are properly made, turn unit power OFF then ON again.	Consult your FOR-A reseller if the secondary CPU is still active after restarting
The text color has changed from the original color.	Button displays may be deteriorated over time.	Refer to Sec. 8-1 to fine-tune colors.

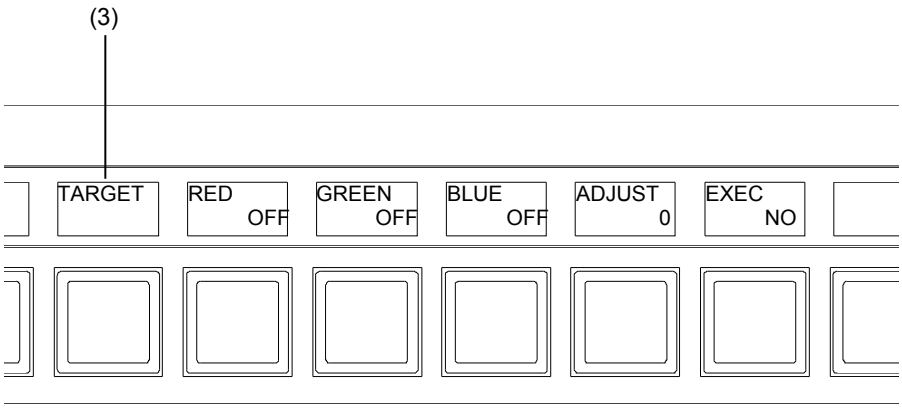
8-1. Tuning the Text Color on Remote Unit Buttons

MFR-18RU/39RU/16RUTA/39RUA/18RUA units allow you to adjust the color of NAME DISPLAY

8-1-1. Color Tuning Procedure

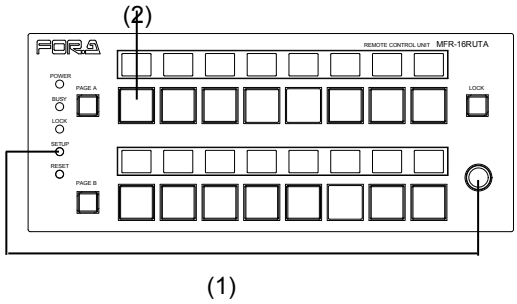


(1) Press and hold CONTROL, then press the SETUP button for more than 5 seconds. All NAME DISPLAY text will turn to white.
(2) Press a button to be adjusted.

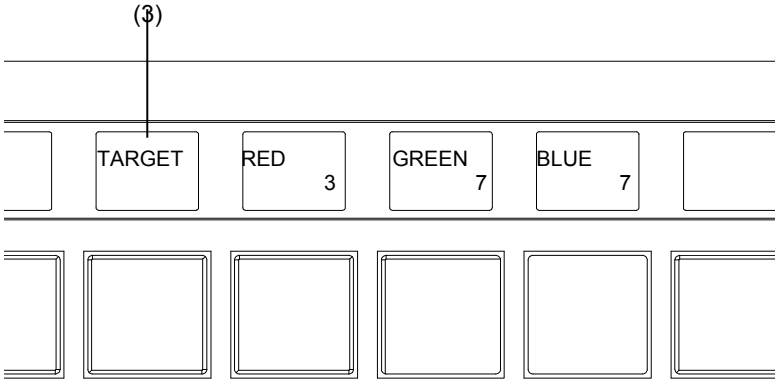


(3) The **TARGET** will appear and blink above the button and **RED**, **GREEN**, **BLUE**, **ADJUST** and **EXEC** are also displayed.
(4) To set **RED**, **GREEN** or **BLUE** to **ON**, turn CONTROL to select **RED**, **GREEN** or **BLUE**, then press CONTROL to turn it to **ON**.
(5) Press CONTROL to select **ADJUST**, then turn CONTROL to adjust the selected color component(s) (RED, GREEN and/or BLUE).
(6) After the button color adjustment is complete, press CONTROL to move to **EXEC**. Turn CONTROL to select **YES**, then press CONTROL to execute the setting.
(7) The **TARGET** will blink above the button.
Pressing another button allows you to apply the set color to the button. The **COPY** will appear above the button.
(8) After applying the color to all buttons, press SETUP to complete the color adjustment.

8-1-2. MFR-16RUTA/39RUA/18RUA Color Tuning Procedure



(1) Press and hold CONTROL, then press the SETUP button for more than 5 seconds. All NAME DISPLAY text will turn to white.
(2) Press a button to be adjusted.



(3) The **TARGET** will appear and blink above the button. **RED**, **GREEN** and **BLUE** are also displayed.
(4) To adjust the target button color using **RED**, **GREEN** and **BLUE**, press CONTROL to select **RED**, **GREEN** or **BLUE**, then turn CONTROL to change its value.

Setting range: RED: 0-3, GREEN and BLUE: 0-7

(5) To adjust another button color, repeat steps from (2) to (4)
(6) All button color settings are finished, press **SETUP**.

9. Specifications and Dimensions

9-1. Unit Specifications

9-1-1. MFR-1616/1616R/3216/3216RPS/3232/3232RPS

	MFR-1616	MFR-1616R	MFR-3216 MFR-3216RPS	MFR-3232 MFR-3232RPS
Video Formats	3G HD: 1080/60p, 1080/59.94p, 1080/50p HD: 1080/60i, 1080/59.94i, 1080/50i, 1080/30p, 1080/30PsF, 1080/29.97p, 1080/29.97PsF, 1080/23.98p, 1080/23.98PsF, 1080/25p, 1080/25PsF, 1080/24PsF, 1080/24p, 720/60p, 720/59.94p, 720/50p SD: 525/60, 625/50			
Inputs x Outputs	16 x 16	16 x 16	32 x 16	32 x 32
Video Inputs	Compliant with the following standards (75Ω BNC): -SMPTE424M (2.97 Gbps, 2.97/1.001 Gbps) -SMPTE292M (1.485 Gbps, 1.485/1.001 Gbps) -SMPTE259M (270 Mbps) -DVB-ASI			
Cable equalization	3G: 70 m (when a 5C-FB equivalent cable is used) HD-SDI: 100 m (when a 5C-FB equivalent cable is used) SD-SDI: 200 m (when a 5C-2V equivalent cable is used)			
Video Outputs	Compliant with the following standards (75Ω BNC) (with automatic reclocking): -SMPTE424M (2.97 Gbps, 2.97/1.001 Gbps) -SMPTE292M (1.485 Gbps, 1.485/1.001 Gbps) -SMPTE259M (270 Mbps) -DVB-ASI			
Reference Inputs	BB: NTSC: 0.429 Vp-p/PAL: 0.45 Vp-p or Tri-level sync: ±0.3Vp-p 75Ω BNC x 1, loop-through (Terminate with 75Ω terminator, if unused.)			
Interfaces				
MFR-LAN	10/100BASE-TX RJ-45 (for RU/GPI connection, up to 128 units)			
	x 1	x 2 (LAN 2: For MFR-SRCPU connection.)		
PC-LAN	10/100BASE-TX RJ-45 x 1 (for computer or other external device connection)			
SERIAL	RS-232C/RS-422 (selectable by internal switches) 9-pin D-sub (male) x 1			
ALARM	9-pin D-sub (female) x 1			
TO RS	Unused			
Temperature	0°C to 40°C			
Humidity	30% to 90% (no condensation)			
Power	100VAC to 240VAC ±10%, 50/60Hz			
Power Consumption				
100 V AC to 120 V AC	36 VA (33 W)	37 VA (34 W)	48 VA (45 W)	60 VA (54 W)
200 V AC to 240 V AC	44 VA (34 W)	44 VA (34 W)	57 VA (45 W)	70 VA (52 W)
Dimensions	430(W) x 44(H) x 300(D) mm EIA 1RU	430(W) x 88(H) x 300(D) mm EIA 2 RU		
Weight	5 kg	5 kg	6 kg	6 kg
Consumables	Fan (P-1461) : Replace every 4 years.	Fan (P-1460) Replace every 4 years.		
	Power unit: Replace every 5 years.			

9-1-2. MFR-1616A

Inputs x Outputs	16 stereo pairs (32 channels) × 16 stereo pairs (32 channels)
Audio Inputs	AES/EBU: 1.0Vp-p Unbalanced 75Ω BNC x 16
Audio Outputs	AES/EBU：1.0Vp-p±10% Unbalanced 75Ω BNC x 16
Sampling Frequency	32kHz to 96kHz
Reference Input	BB: NTSC: 0.429 Vp-p/PAL: 0.45 Vp-p or Tri-level sync: ±0.3 Vp-p 75Ω BNC x 1, loop-through (Terminate with 75Ω terminator, if unused.)
Interfaces	
MFR-LAN	10/100BASE-TX RJ-45 x 1 (for RU/GPI connection, up to 128 units)
PC-LAN	10/100BASE-TX RJ-45 x 1 (for computer or other external device connection)
RS-232C	RS-232C 9-pin D-sub (male) x 1
ALARM	9-pin D-sub (female) x 1
Temperature	0°C to 40°C
Humidity	30% to 90% (no condensation)
Power	100VAC to 240VAC ±10%, 50/60Hz
Power Consumption	19 VA (17 W) at 100 V AC to 120 V AC 24 VA (17 W) at 200 V AC to 240 V AC
Dimensions	430(W)×44(H)×300(D)mm EIA 1RU
Weight	5 kg
Consumables	Power unit: Replace every 5 years.

9-1-3. MFR-39RUA

Buttons/Colors	39 buttons (OLED buttons, 7-color) Displayed in each button (Max. 7 characters x 2 lines) 6 buttons (3 colors: red/green/orange), user assignable Current DEST button, current SRC button, current PAGE display x 2, Rotary selector
Number of Connections	Max. 128 (including Main, Remote and GPI units)
Interfaces	
MFR-LAN	10/100BASE-TX RJ-45 x 1 (For connection to MU. A network hub required for multiple unit configuration.)
SERVICE	RS-232C 9-pin D-sub (male) x 1 (for maintenance)
Temperature	0°C to 40°C
Humidity	30% to 85% (no condensation)
Power	+12 V DC Pin-connector x 2 (redundant power supply as standard)
Consumption	100 V AC to 120 V AC: 19 VA (9 W), 200 V AC to 240 V AC: 24 VA (9 W)
Dimensions	430(W) x 88(H) x 42(D) mm EIA 2 RU
Weight	3 kg
Consumables	AC adaptor: Replace every 5 years.

9-1-4. MFR-39RU

Buttons/Colors	39 buttons (LED buttons, 7-color), user assignable Displayed in each button (Max. 7 characters x 2 lines) 10 buttons (3 colors: red/green/orange), user assignable Menu display x 1 (Max. 23 characters x 2 lines) with Rotary selector
Number of Connections	Max. 128 (including Main, Remote and GPI units)
Interfaces	
MFR-LAN	10/100BASE-TX RJ-45 x 1 (For connection to MU. A network hub required for multiple unit configuration.)
SERVICE	RS-232C 9-pin D-sub (male) x 1 (for maintenance)
Temperature	0°C to 40°C
Humidity	30% to 85% (no condensation)
Power	+12 V DC Pin-connector x 2 (redundant power supply as standard)
Consumption	100 V AC to 120 V AC: 17 VA (9 W), 200 V AC to 240 V AC: 22 VA (11 W)
Dimensions	430(W) x 88(H) x 44(D) mm EIA 2 RU
Weight	3 kg
Consumables	AC adaptor: Replace every 5 years.

9-1-5. MFR-40RU

Buttons/Colors	40 buttons (3 colors: red/green/orange), user assignable
Number of Connections	Max. 128 units (including Main, Remote and GPI units)
Interfaces	
MFR-LAN	10/100BASE-TX RJ-45 x 1 (For connection to MU. A network hub required for multiple unit configuration.)
SERVICE	RS-232C 9-pin D-sub (male) x 1 (for maintenance)
Temperature	0°C to 40°C
Humidity	30% to 85% (no condensation)
Power	+12 VDC Pin-connector x 2 (redundant power supply as standard)
Consumption	100 V AC to 120 V AC: 10 VA (5 W), 200 V AC to 240 V AC: 15 VA (7 W)
Dimensions	430(W) x 44(H) x 42(D) mm EIA 1 RU
Weight	2 kg
Consumables	AC adaptor: Replace every 5 years.

9-1-6. MFR-18RUA

Buttons/Colors	18 buttons (3 colors: red/green/orange), user assignable OLED display x 18 (Max. 7 characters x 2 lines, Displayed above each button) with Rotary selector
Number of Connection	Max. 128 (including Main, Remote and GPI units)
Interfaces	
MFR-LAN	10/100BASE-TX RJ-45 x 1 (For connection to MU. A network hub required for multiple unit configuration.)
SERVICE	RS-232C 9-pin D-sub (male) x 1 (for maintenance)
Temperature	0°C to 40°C
Humidity	30% to 85% (no condensation)
Power	+12 V DC Pin-connector x 2 (redundant power supply as standard)
Consumption	100 V AC to 120 V AC: 14 VA (6 W), 200 V AC to 240 V AC: 18 VA (6 W)
Dimensions	430(W) x 44(H) x 42(D) mm EIA 1 RU
Weight	2 kg
Consumables	AC adaptor: Replace every 5 years.

9-1-7. MFR-18RU

Buttons/Colors	18 buttons (3 colors: red/green/orange), user assignable LCD display x 18 (Max. 7 characters x 2 lines, displayed above each button) Rotary selector
Number of Connection	Max. 128 (including Main, Remote and GPI units)
Interfaces	
MFR-LAN	10/100BASE-TX RJ-45 x 1 (For connection to MU. A network hub required for multiple unit configuration.)
SERVICE	RS-232C 9-pin D-sub (male) x 1 (for maintenance)
Temperature	0°C to 40°C
Humidity	30% to 85% (no condensation)
Power	+12 VDC Pin-connector x 2 (redundant power supply as standard)
Consumption	100 V AC to 120 V AC: 12 VA (6 W), 200 V AC to 240 V AC: 18 VA (8 W)
Dimensions	430(W) x 44(H) x 42(D) mm EIA 1 RU
Weight	2 kg
Consumables	AC adaptor: Replace every 5 years.

9-1-8. MFR-16RU/16RUD

Buttons/Color	16 buttons (1 color: green), user assignable Menu Display (Max. 16 characters x 2 lines) (MFR-16RUD only)
Number of Connection	Max. 128 (including Main, Remote and GPI units)
Interfaces	
MFR-LAN	10/100BASE-TX RJ-45 x 1 (For connection to MU. A network hub required for multiple unit configuration.)
Temperature	0°C to 40°C
Humidity	30% to 85% (no condensation)
Power	+12 VDC Pin-connector x 1
Consumption	MFR-16RU: 100 V AC to 120 V AC: 7 VA (3 W), 200 V AC to 240 V AC: 11 VA (4 W) MFR-16RUD: 100 V AC to 120 V AC: 8 VA (3 W), 200 V AC to 240 V AC: 11 VA (4 W)
Dimensions	430(W) x 44(H) x 34 (D) mm EIA 1 RU
Weight	1 kg
Consumables	AC adaptor: Replace every 5 years.

9-1-9. MFR-16RUTA

Buttons/Color	16 buttons (3 colors: red/green/orange), user assignable OLED display x 16 (Max. 7 characters x 2 lines, displayed above each button) PAGE control (lit orange) x 2 LOCK control (lit orange) x 1 Rotary selector x 1
Number of Connection	Max. 128 (including Main, Remote and GPI units)
Interfaces	
MFR-LAN	10/100BASE-TX RJ-45 x 1 (For connection to MU. A network hub required for multiple unit configuration.)
Temperature	0°C to 40°C
Humidity	30% to 85% (no condensation)
Power	+12 V DC Pin-connector x 1
Consumption	100 V AC to 120 V AC: 12VA (5W) 200 V AC to 240 V AC: 15VA (6W)
Dimensions	215(W) x 88(H) x 43(D) mm EIA 2 RU, half-rack size
Weight	1 kg
Consumables	AC adaptor: Replace every 5 years.

9-1-10. MFR-16RUW

Buttons/Color	18 buttons (1 color: green), user assignable
Number of Connection	Max. 128 (including Main, Remote and GPI units)
Interfaces	
MFR-LAN	10/100BASE-TX RJ-45 x 1 (For connection to MU. A network hub required for multiple unit configuration.)
Temperature	0°C to 40°C
Humidity	30% to 85% (no condensation)
Power	+12 VDC Pin-connector x 1
Consumption	100 V AC to 120 V AC: 8 VA (3 W), 200 V AC to 240 V AC: 11 VA (3 W)
Dimensions	480(W) x 44(H) x 27 (D) mm EIA 1 RU
Weight	1 kg
Consumables	AC adaptor: Replace every 5 years.

9-1-11. MFR-32RUW

Buttons/Color	34 buttons (1 color: green), user assignable
Number of Connection	Max. 128 (including Main, Remote and GPI units)
Interfaces	
MFR-LAN	10/100BASE-TX RJ-45 x 1 (For connection to MU. A network hub required for multiple unit configuration.)
Temperature	0°C to 40°C
Humidity	30% to 85% (no condensation)
Power	+12 VDC Pin-connector x 1
Consumption	100 V AC to 120 V AC: 10 VA (4 W), 200 V AC to 240 V AC: 13 VA (4 W)
Dimensions	480(W) x 44(H) x 27 (D) mm EIA 1 RU
Weight	1 kg
Consumables	AC adaptor: Replace every 5 years.

9-1-12. MFR-64RUW

Buttons/Color	68 buttons (1 color: green), user assignable
Number of Connection	Max. 128 (including Main, Remote and GPI units)
Interfaces	
MFR-LAN	10/100BASE-TX RJ-45 x 1 (For connection to MU. A network hub required for multiple unit configuration.)
Temperature	0°C to 40°C
Humidity	30% to 85% (no condensation)
Power	+12 VDC Pin-connector x 1
Consumption	100 V AC to 120 V AC: 15 VA (7 W), 200 V AC to 240 V AC: 20 VA (8 W)
Dimensions	480(W) x 88(H) x 27 (D) mm EIA 2 RU
Weight	1.5 kg
Consumables	AC adaptor: Replace every 5 years.

9-1-13. MFR-GPI

Number of Connection	Max. 128 (including Main, Remote and GPI units)
Interface	
MFR-LAN	10/100BASE-TX RJ-45 x 1 (Ethernet hub is needed for Main and multiple unit connections.)
SERVICE	RS-232C: 9-pin D-sub (male) x 1 (for maintenance)
GPI IN	37-pin D-sub (female) x 4
/TALLY OUT	128-input/output (user assignable)
SERIAL 1-4	RS-232C/422 (selectable): 9-pin D-sub (male) x 4
Temperature	0°C to 40°C
Humidity	30% to 85% (no condensation)
Power	+12VDC pin connector x 2 (redundant power supply in standard configuration)
Power Consumption	100 V AC to 120 V AC: 8 VA (4 W) 200 V AC to 240 V AC: 13 VA (6 W)
Dimensions	430(W) x 44(H) x 110(D) mm EIA 1 RU
Weight	2 kg
Consumables	AC adaptor: Replace every 5 years

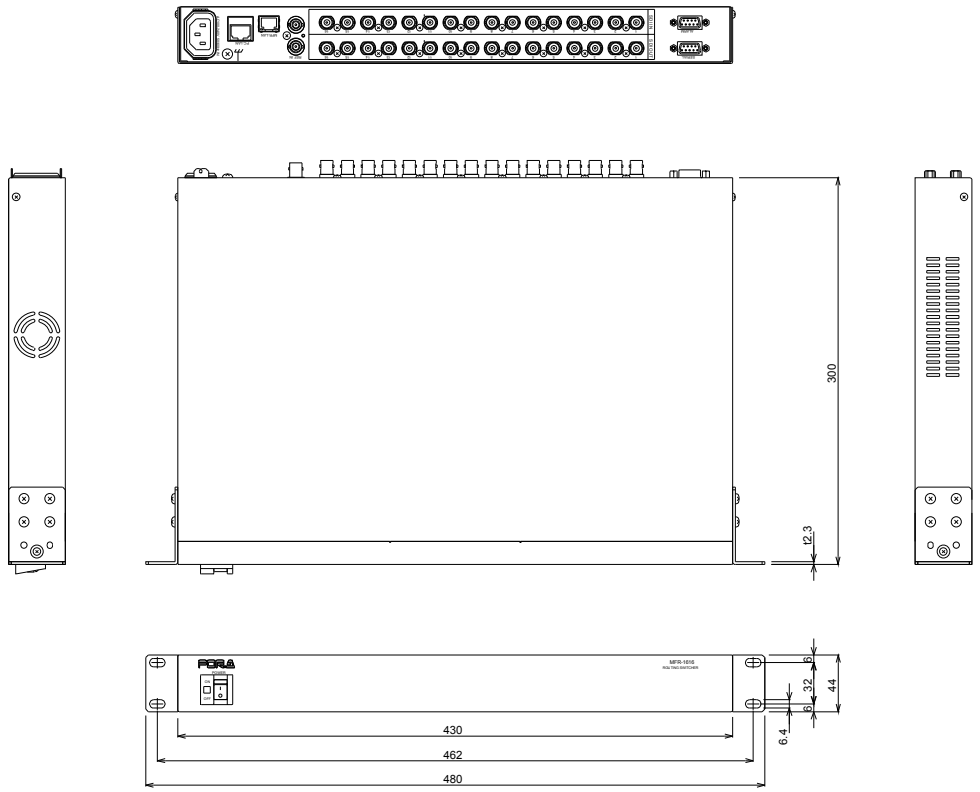
9-1-14. MFR-TALM

Number of Connections	Max. 128 (including Main, Remote and GPI units)
Interface	
MFR-LAN	10/100/1000BASE-T RJ-45 x 1 (Ethernet hub is required for Main and multiple unit connections.)
PC-LAN	10/100BASE-TX RJ-45 x 1 (for PC or other external devices)
GPI IN	37-pin D-sub (female) x 1
/TALLY OUT	32-input/output (user assignable)
RS-422	9-pin D-sub (male) x 4
Temperature	0°C to 40°C
Humidity	30% to 85% (no condensation)
Power	+12 V DC pin connector x 2 (redundant power supplies in standard configuration)
Power Consumption	100 V AC to 120 V AC: 17 VA (9 W) 200 V AC to 240 V AC: 20 VA (9 W)
Dimensions	212(W) x 44(H) x 161(D) mm EIA 1 RU half size
Weight	2 kg
Consumables	AC adaptor: Replace every 5 years

9-2. External Dimensions

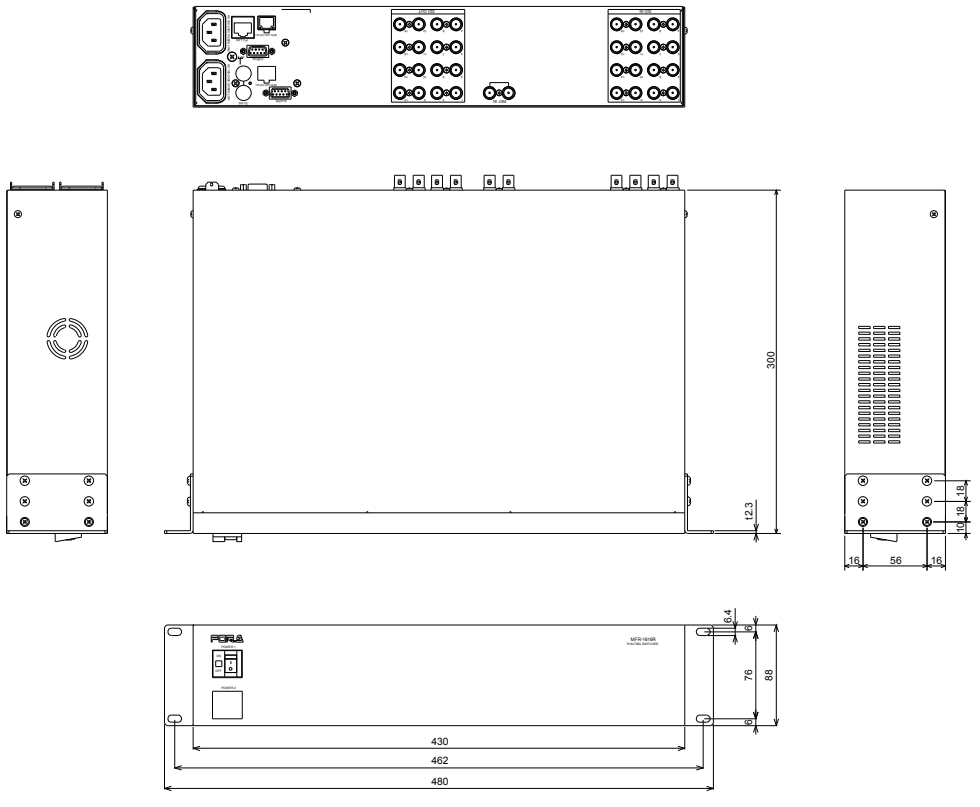
9-2-1. MFR-1616

(All dimensions in mm.)



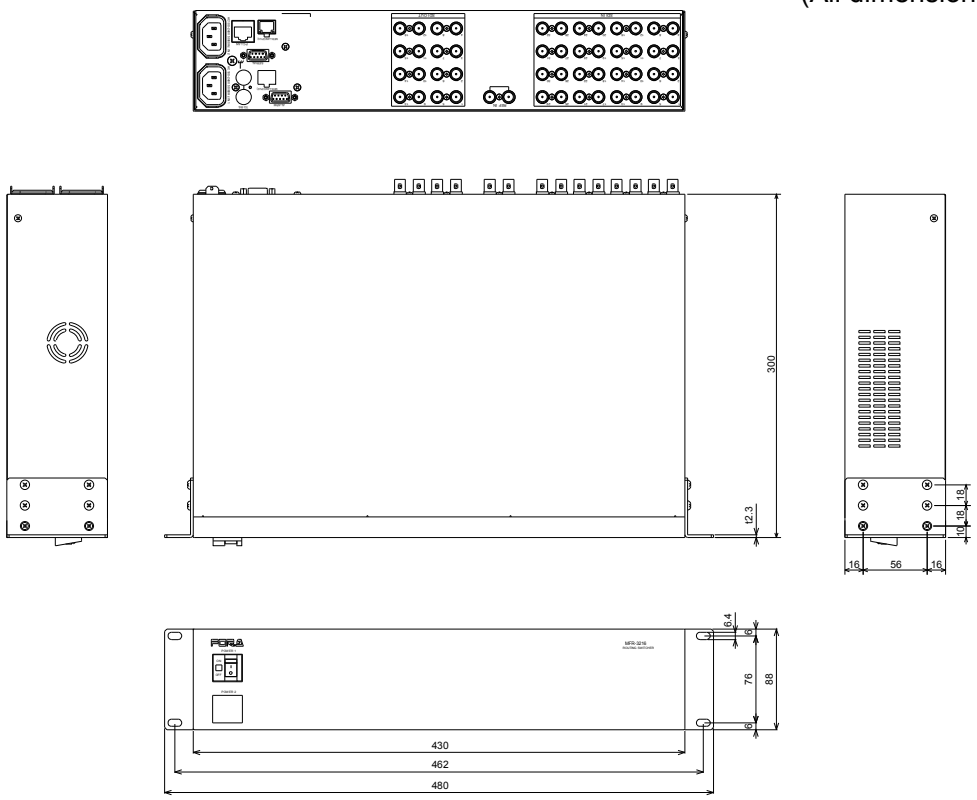
9-2-2. MFR-1616R

(All dimensions in mm.)



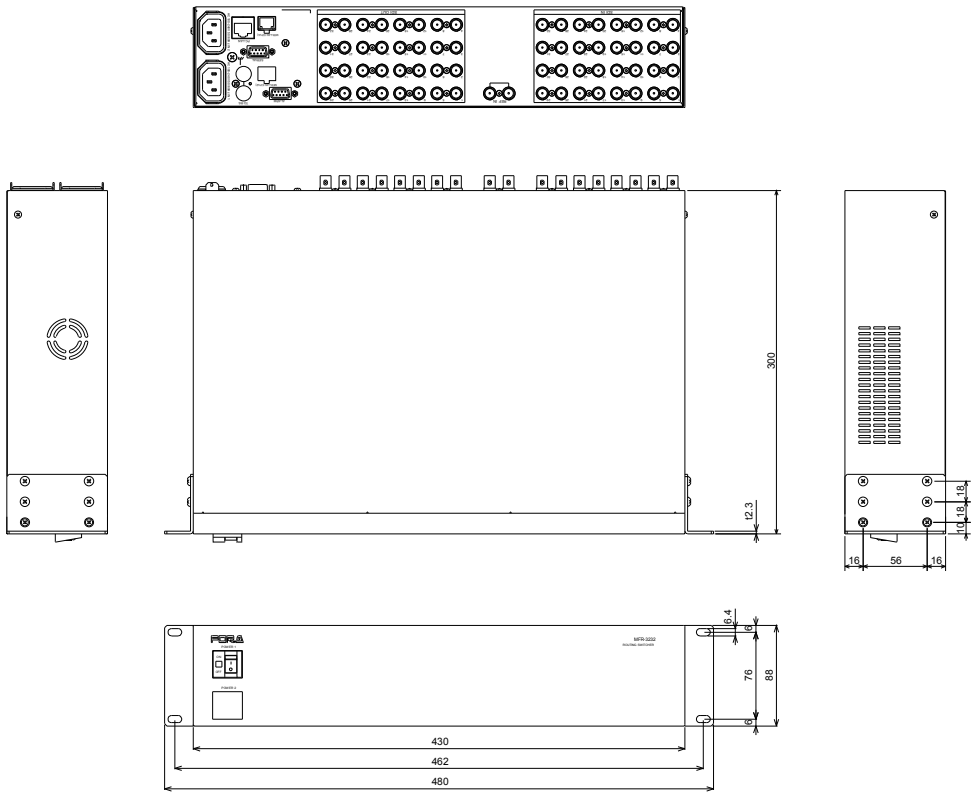
9-2-3. MFR-3216

(All dimensions in mm.)



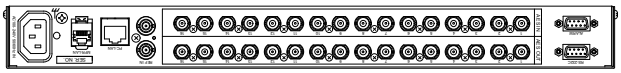
9-2-4. MFR-3232

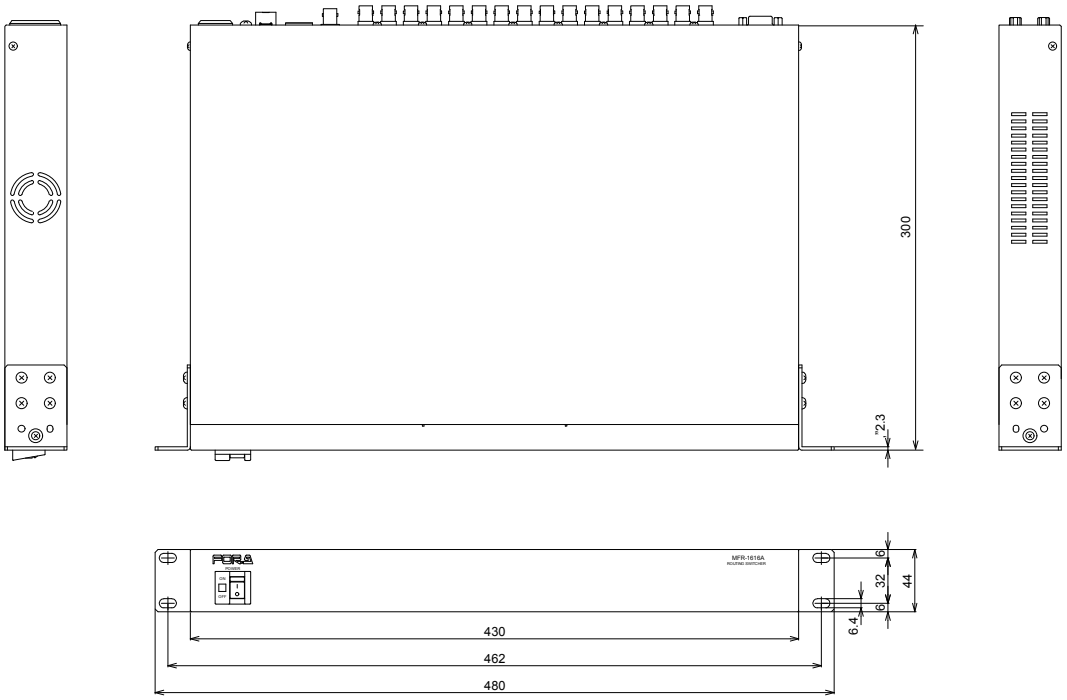
(All dimensions in mm.)



9-2-5. MFR-1616A

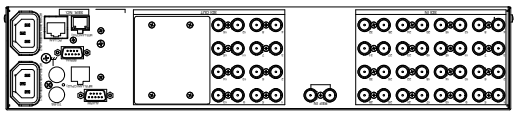
(All dimensions in mm.)

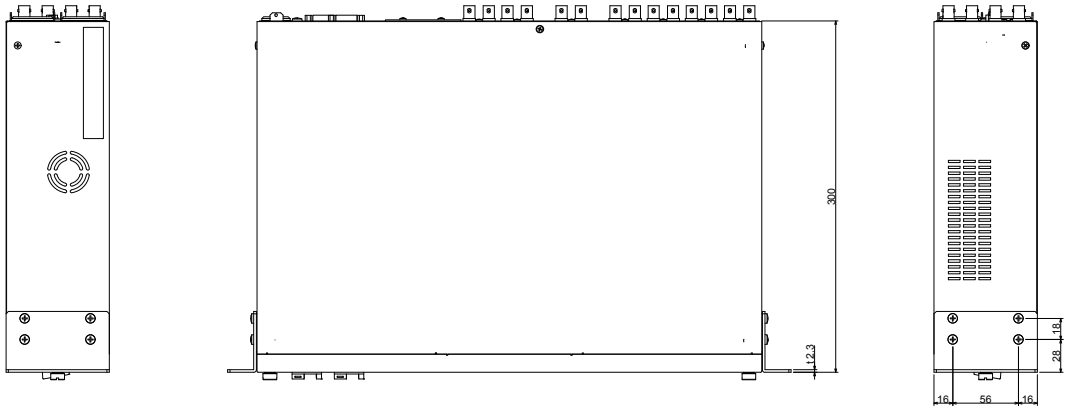


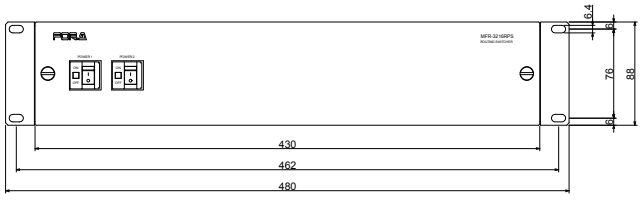


9-2-6. MFR-3216RPS

(All dimensions in mm.)

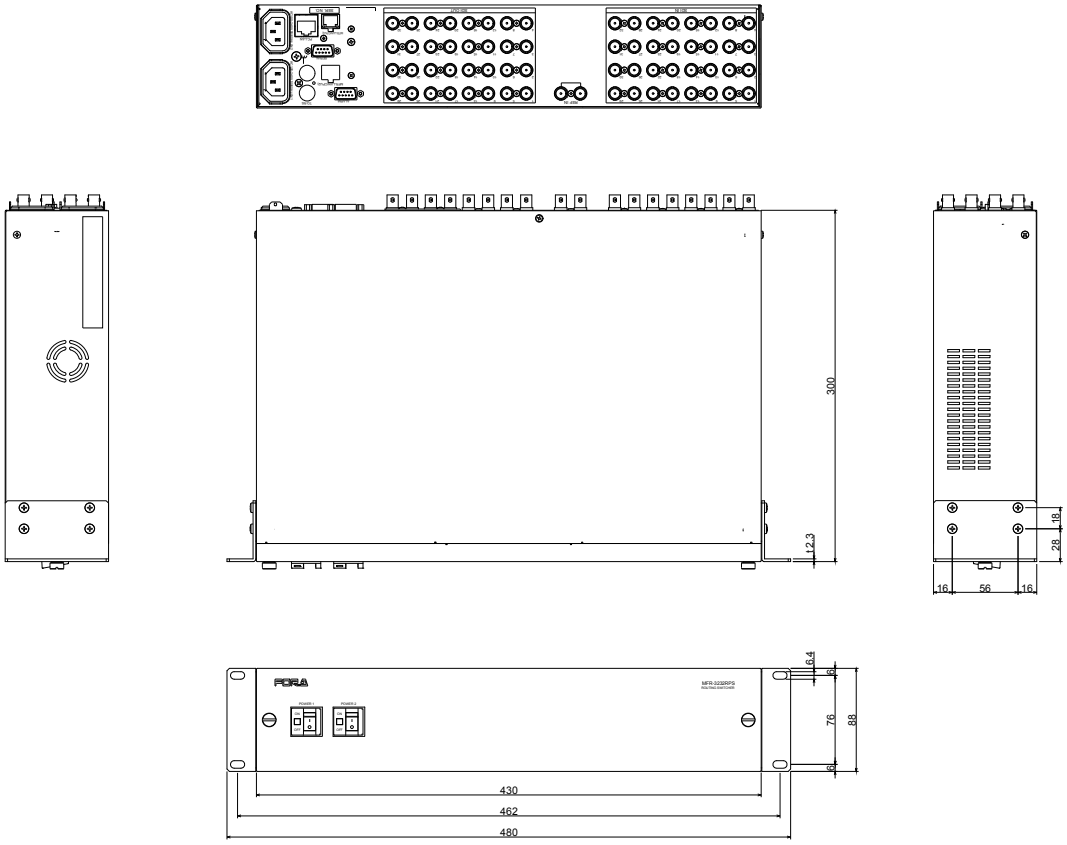






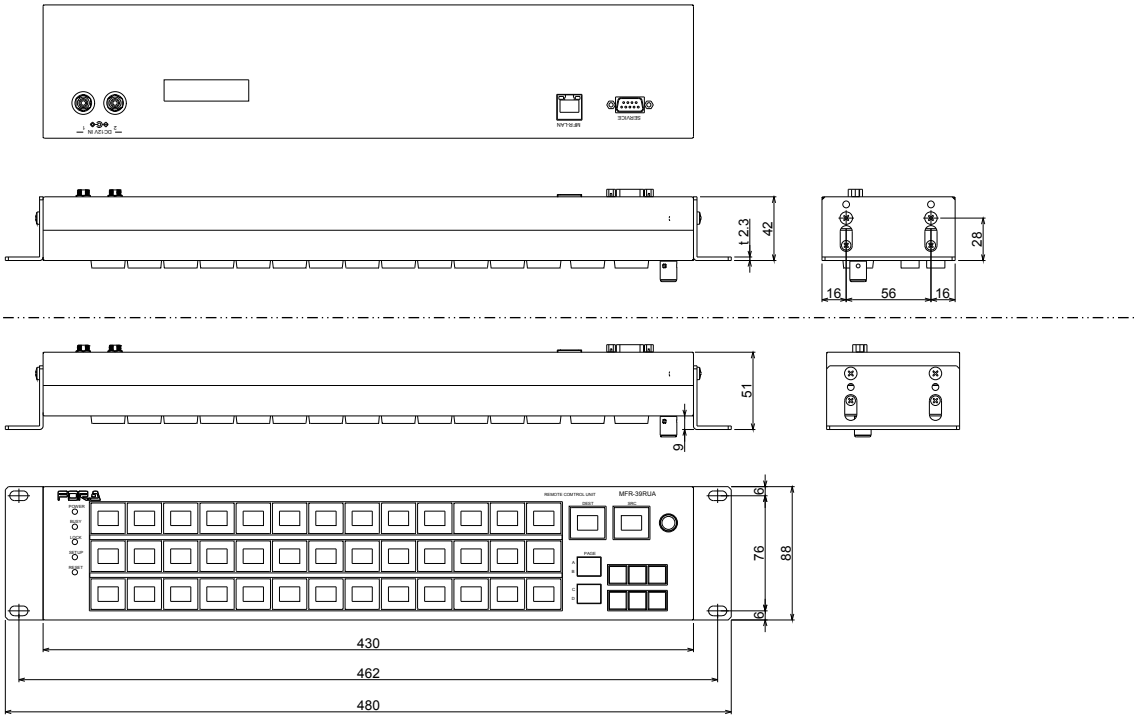
9-2-7. MFR-3232RPS

(All dimensions in mm.)



9-2-8. MFR-39RUA

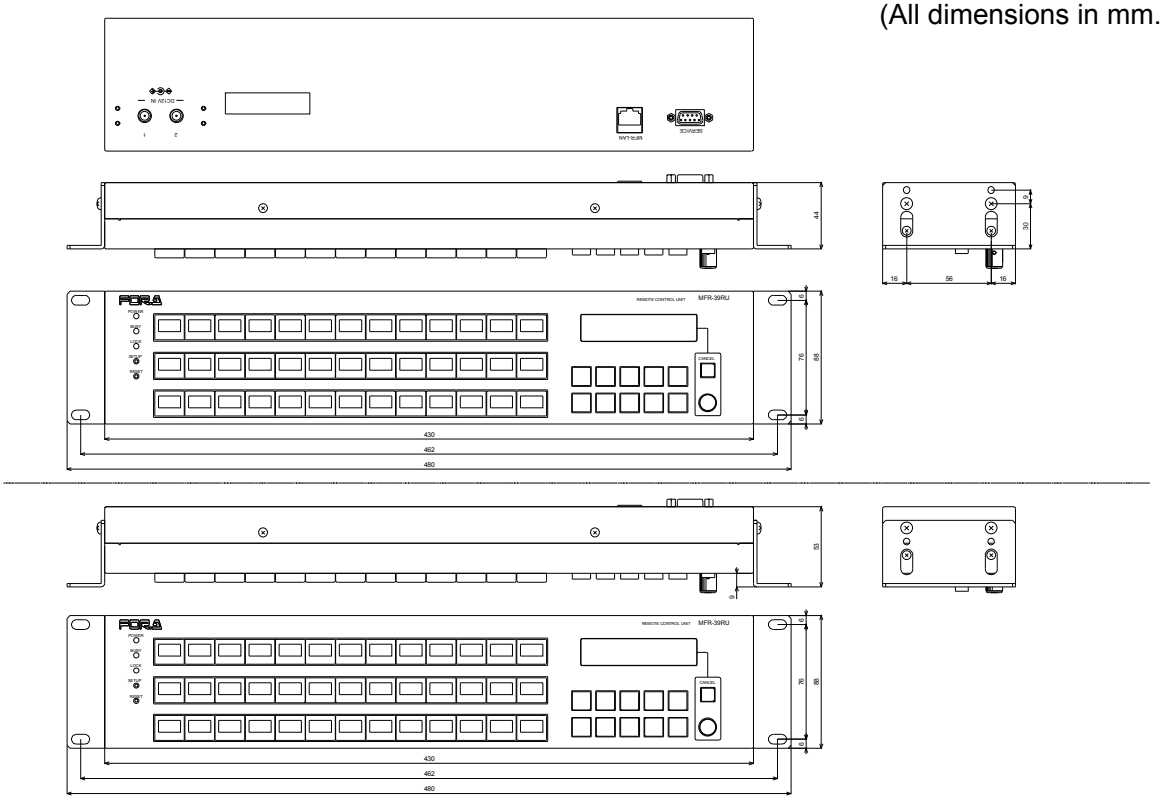
(All dimensions in mm.)



* The panel buttons can be fitted within the rack by sliding the rack ears forward to attach as shown in the bottom figure above.

9-2-9. MFR-39RU

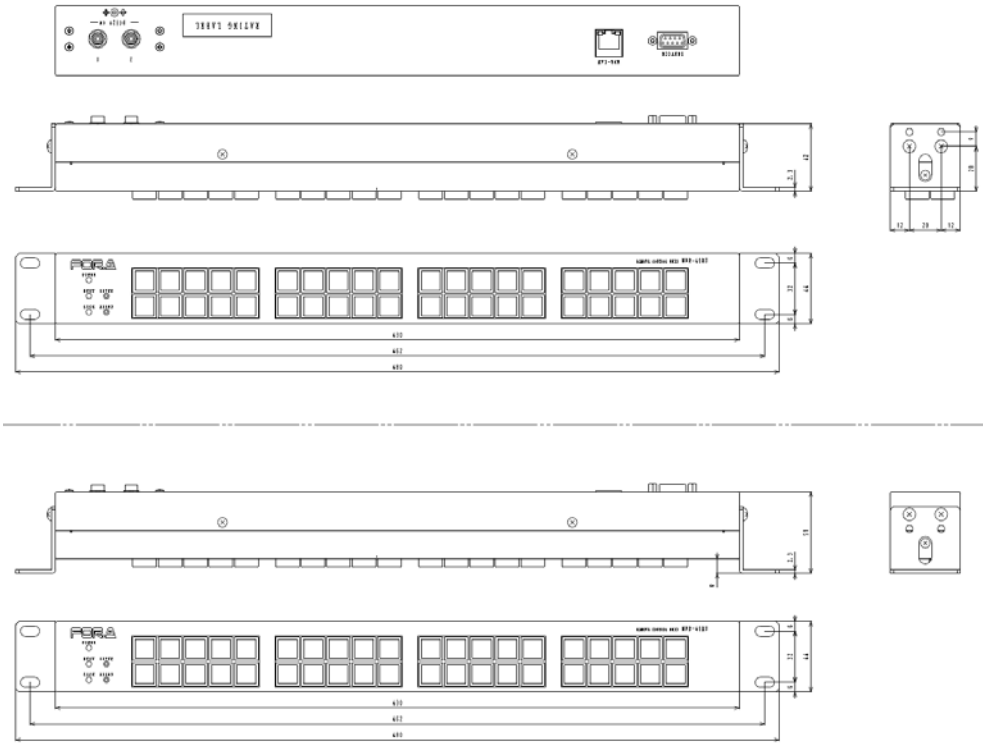
(All dimensions in mm.)



* The panel buttons can be fitted within the rack by sliding the rack ears forward to attach as shown in the bottom figure above.

9-2-10. MFR-40RU

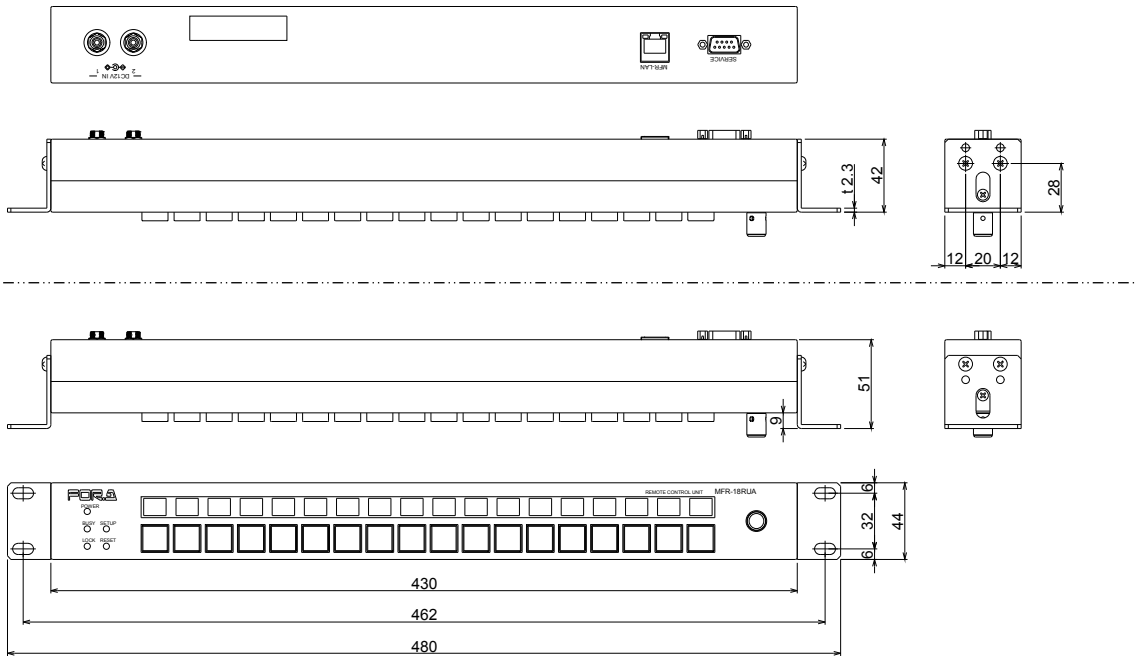
(All dimensions in mm.)



* The panel buttons can be fitted within the rack by sliding the rack ears forward to attach as shown in the bottom figure above.

9-2-11. MFR-18RUA

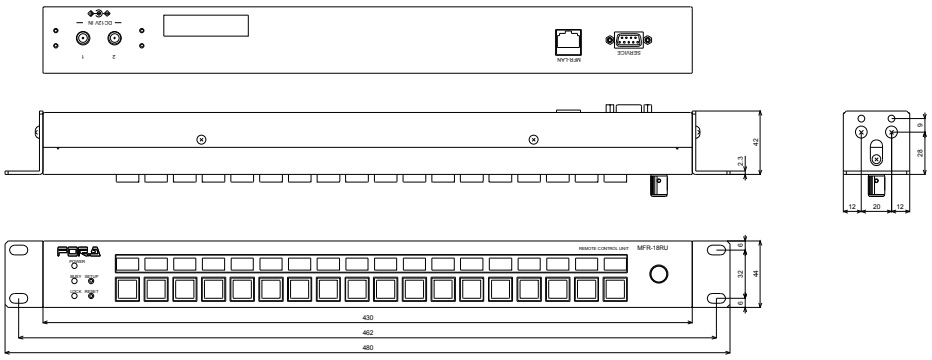
(All dimensions in mm.)

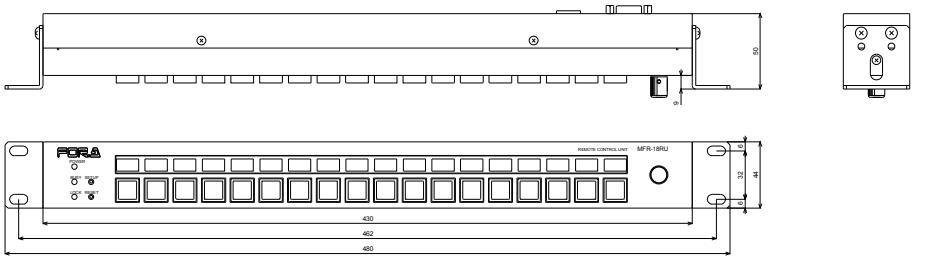


* The panel buttons can be fitted within the rack by sliding the rack ears forward to attach as shown in the bottom figure above.

9-2-12. MFR-18RU

(All dimensions in mm.)

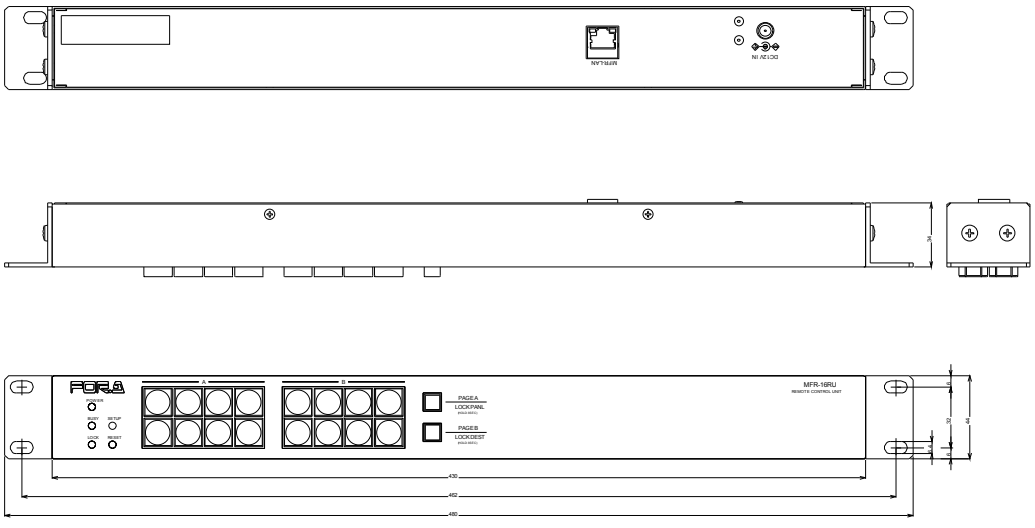




* The panel buttons can be fitted within the rack by sliding the rack ears forward to attach as shown in the bottom figure above.

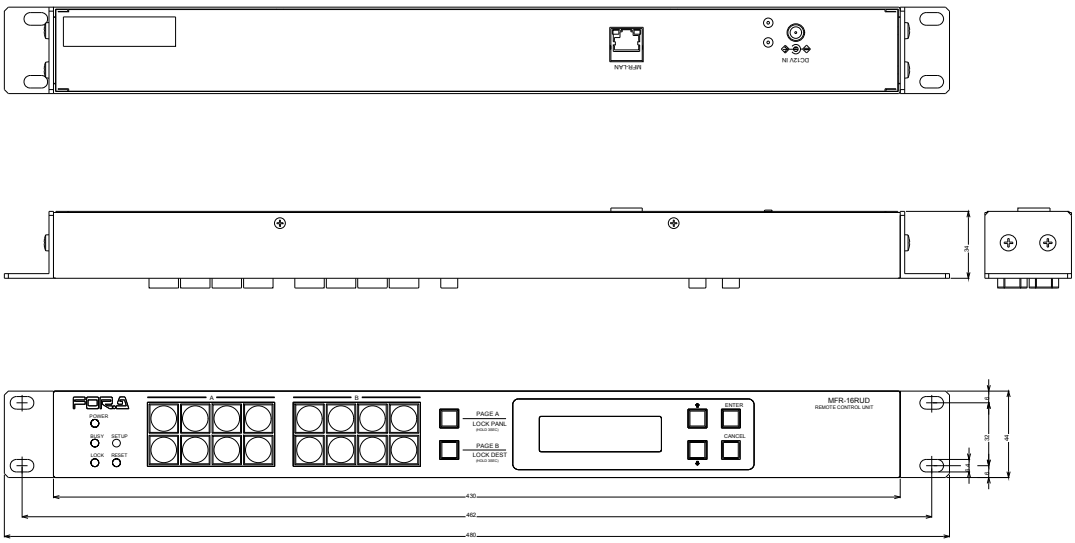
9-2-13. MFR-16RU

(All dimensions in mm.)



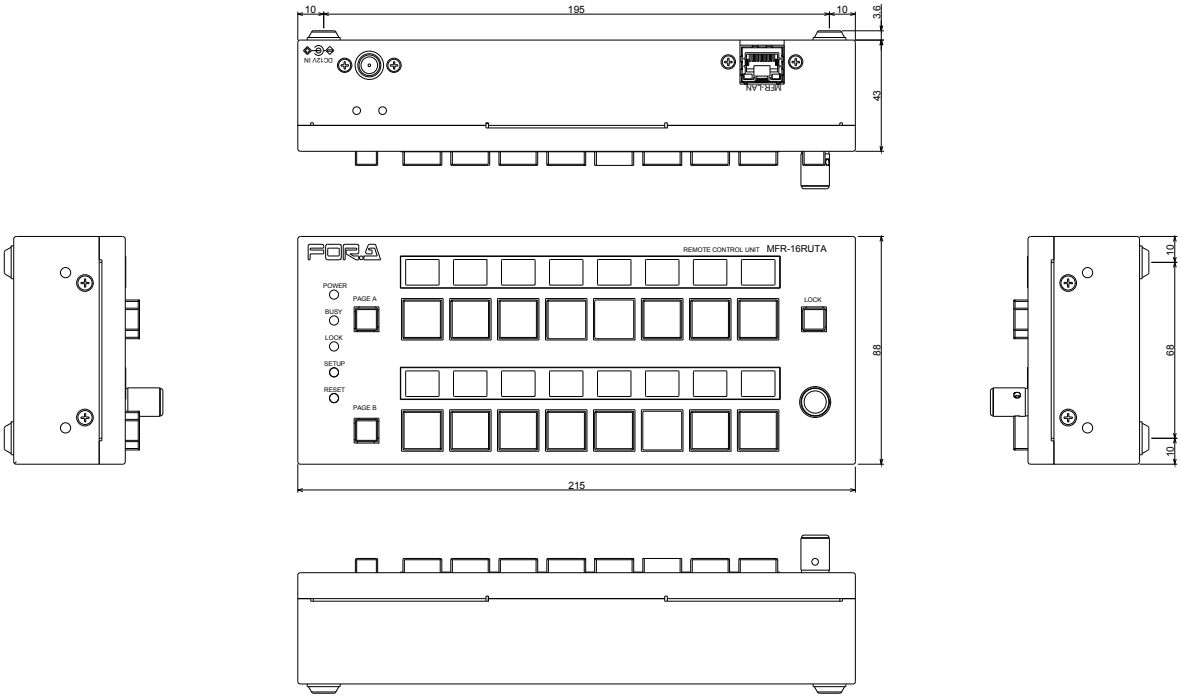
9-2-14. MFR-16RUD

(All dimensions in mm.)



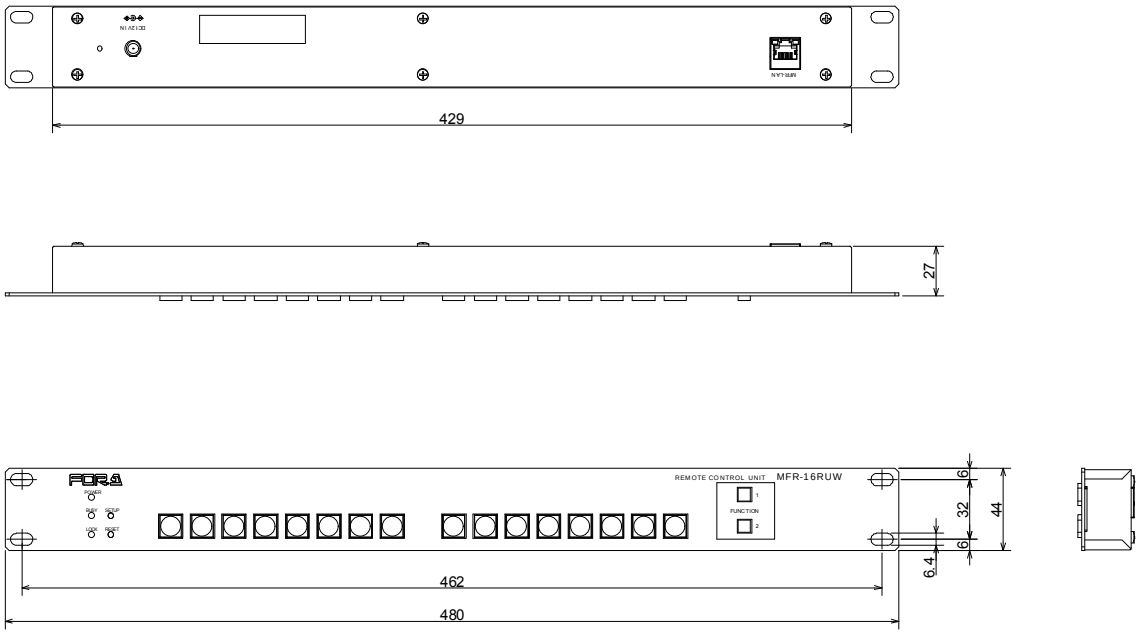
9-2-15. MFR-16RUTA

(All dimensions in mm.)



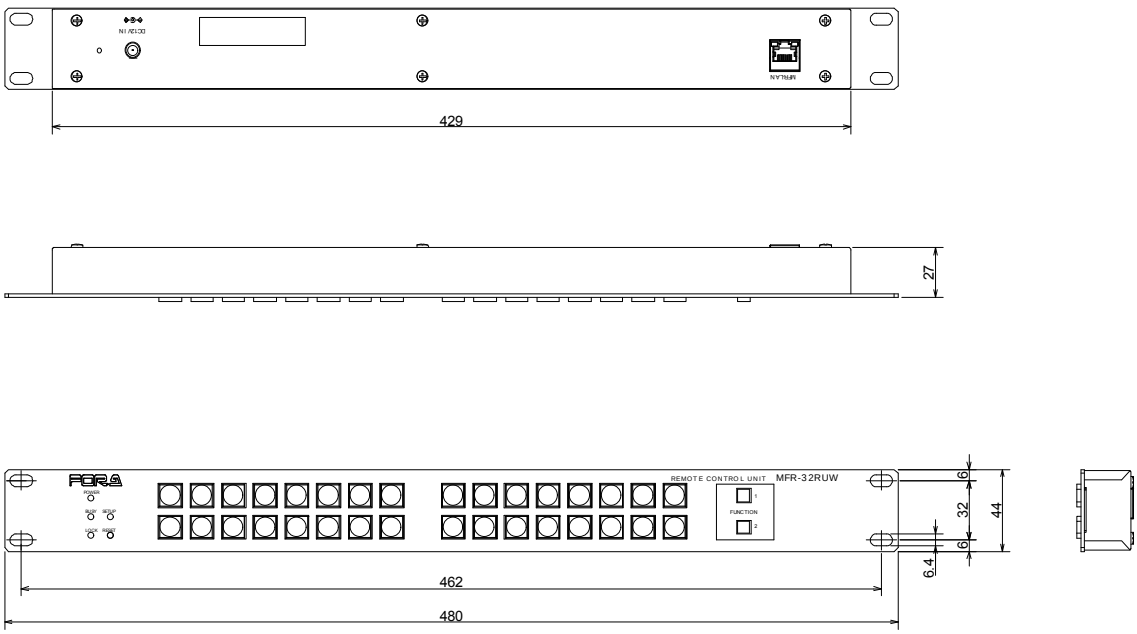
9-2-16. MFR-16RUW

(All dimensions in mm.)



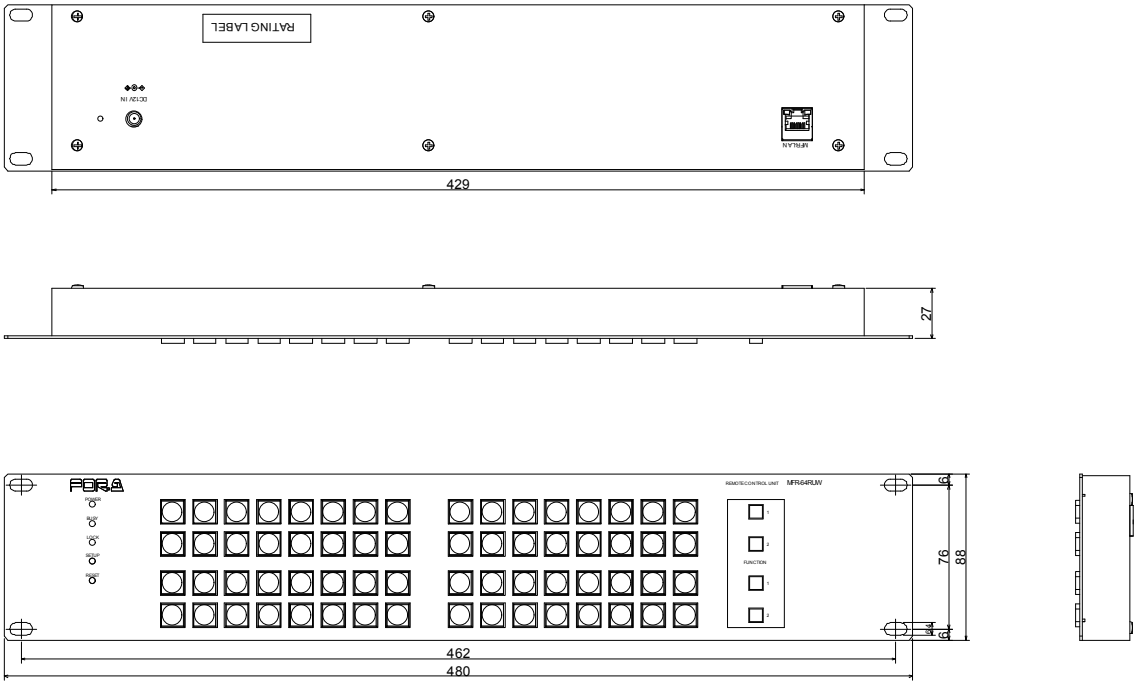
9-2-17. MFR-32RUW

(All dimensions in mm.)



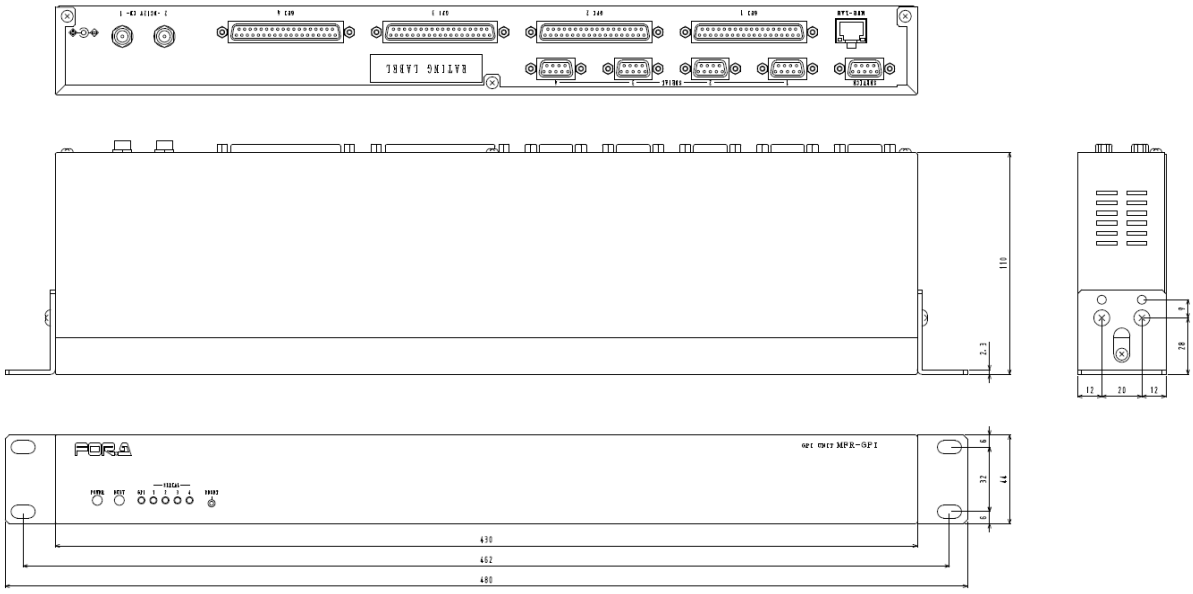
9-2-18. MFR-64RUW

(All dimensions in mm.)



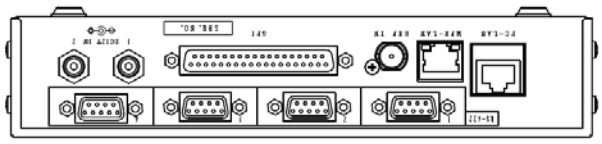
9-2-19. MFR-GPI

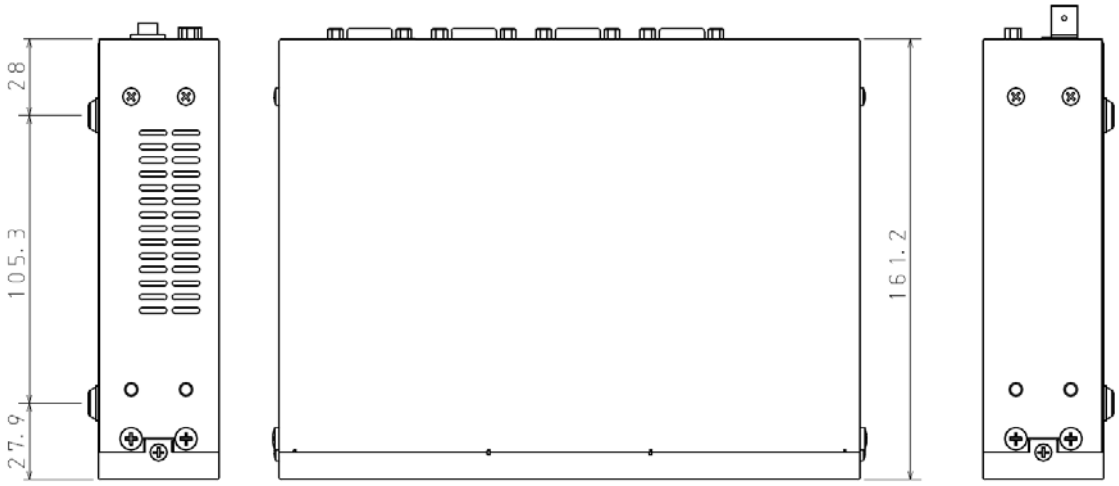
(All dimensions in mm.)

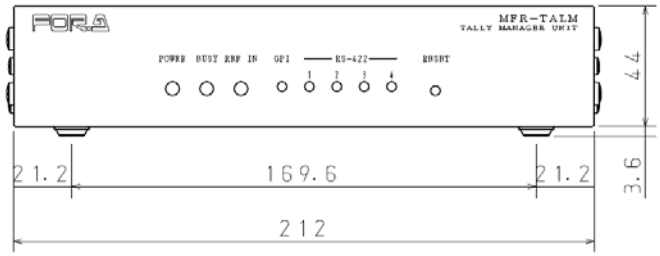


9-2-20. MFR-TALM

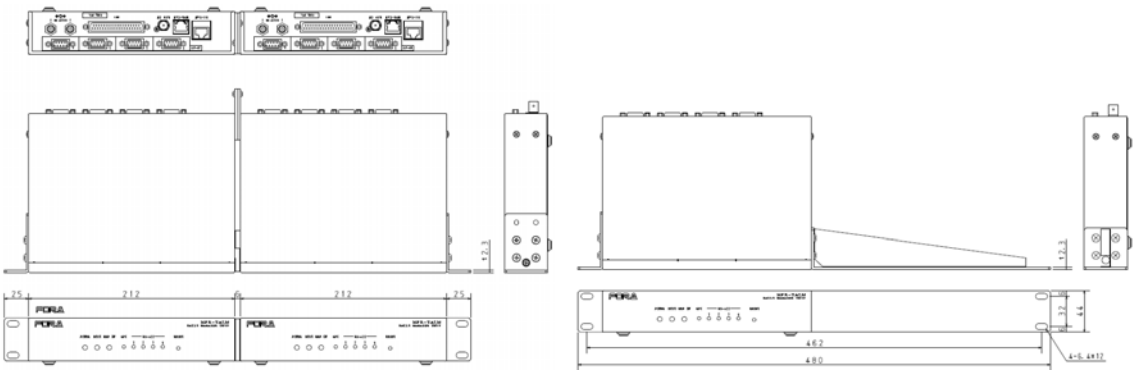
(All dimensions in mm.)







◆ **If attaching the rack mount brackets (Dual / Single)**



Appendix: Operation Tips

How to use Page buttons

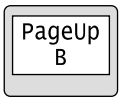
Page navigation functions can be assigned to the front panel buttons on Remote Control Units.
► See Sec. 5-1-2 “Page Function” and Sec. 5-2. “Function Buttons.”
► See [Web-based Control: RU Settings > **Assign Function**]

◆ Page Up/Page Down buttons

These buttons allow you to move one page forward/back. If the page reaches to the end, it loops back to the first page.

Ex) Assign Page Up for Group B to Button 9 in the Web GUI

(1) Click **System Settings** in the left pane.
(2) Click to select [(RU name]-[**Assign Function**] in the left pane to display the setting page.
(3) Select **9** under [Button ID].
(4) Select **Page** under [Function].
(5) Select **UP** under [Up/Down] and **B** under [Group].
(6) Click **Send** to apply settings.

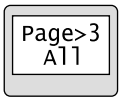


◆ Page Jump buttons

These buttons allow you to go back and forth between specified pages.

Ex) Assign Page Jump between 3 and 7 for Group B, C and D to Button 1 in the Web GUI

(1) Click to select [(RU name]-[**Assign Function**] in the left pane to display the setting page.
(2) Select **1** under [Button ID].
(3) Select **Page** under [Function].
(4) Select **Jump** under [Up/Down] and enable B, C and D under [Group], then select **3** under [Fwd] and **7** under [Rev].
(5) Click **Send** to apply settings.



If **HOME** is set for [Rev], pressing the button lets you move between the current page and Page. If you are in Page 3 (Fwd setting), the button label is displayed highlighted.

The MFR-16RUD/39RU/39RUAunits allow you to assign functions to buttons by front panel operation.
► For default page buttons on the RU front panel, see Sec. 2-1-1. “Front Panel.”
► For MFR-16RUD units, see Sec. 5-1-2. “Page Function.”
► For MFR-39RU units, see Sec. 5-3-3-4. “PAGE MODE”, 5-3-3-5. “PAGE ASSIGN” and 5-3-3-12. “BUTTON ASSIGN.”
► For MFR-39RUA units, see Sec. 5-3-4-4. “BUTTON ASSIGN” and 5-3-4-10. “PAGE.”

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.

July 1, 2016 Printed in Japan

FOR-A COMPANY LIMITED

Head Office	3-8-1 Ebisu, Shibuya-ku, Tokyo 150-0013, Japan
Overseas Division	Tel: +81(0)3 3446 3936 Fax: +81(0)3 3446 1470
Japan Branch Offices	Osaka/Okinawa/Fukuoka/Hiroshima/Nagoya/Sendai/Sapporo
R&D/Production	Sakura Center/Sapporo Center

FOR-A Corporation of America
11155 Knott Ave., Suite G&H, Cypress, CA 90630, USA.
Tel: +1 714 894 3311 Fax: +1 714 894 5399

FOR-A Corporation of America East Coast Office
2 Executive Drive, Suite 670, Fort Lee Executive Park, Fort Lee, NJ 07024, USA
Tel: +1 201 944 1120 Fax: +1 201 944 1132

FOR-A Corporation of America Distribution & Service Center
2400 N.E. Waldo Road, Gainesville, FL 32609, USA
Tel: +1 352 371 1505 Fax: +1 352 378 5320

FOR-A Corporation of America Miami Office
8333 North West 53rd Street Suite 427 Doral, FL 33166, USA
Tel: +1 305 931 1700 Fax: +1 714 894 5399

FOR-A Corporation of Canada
1131A, Leslie Street Suite 209, Toronto, Ontario M3C 2J6, Canada
Tel: +1 416 977 0343 Fax: +1 416 977 0657

FOR-A Europe S.r.l.
Via Volturno 37, 20861 Brugherio MB, Italy
Tel: +39 039 91 64 811 Fax: +39 039 878 140

FOR A UK Limited
Trident Court, 1 Oakcroft Road, Chessington, KT9 1BD, UK
Tel: +44 (0)20 3044 2935 Fax: +44(0)20 3044 2936

FOR-A Italia S.r.l.
Via Volturno 37, 20861 Brugherio MB, Italy
Tel: +39 039 881 086/103 Fax: +39 039 878 140

FOR-A Corporation of Korea
1007, 57-5, Yangsan-ro, Yeongdeungpo-gu, Seoul 150-103, Korea
Tel: +82 (0)2 2637 0761 Fax: +82 (0)2 2637 0760

FOR-A China Limited
708B Huateng Building, No. 302, 3 District, Jinsong, Chaoyang, Beijing 100021, China
Tel: +86 (0)10 8721 6023 Fax: +86 (0)10 8721 6033

FOR-A Middle East-Africa Office
Dubai Media City, Aurora Tower, Office 1407, P.O. Box 502688, Dubai, UAE
Tel: +971 (0)4 551 5830 Fax: +971 (0)4 551 5832

Agiv (India) Private Limited (FOR-A India)
2nd Floor, Valecha Chambers, Link Road, Andheri(W), Mumbai 400053
Tel: +91-22-26733623 Fax: +91-22-26393415

http://www.for-a.com/