

# **OPERATION MANUAL**

---

**MFR-1000**

Multi Format Routing Switcher

---

1<sup>st</sup> Edition - Rev. 1

# Edition Revision History





Edit.	Rev.	Date	Description	Section/Page
1	-	2018/10/30		
1	1	2019/02/06	Supported GPI IN, TALLY OUT Deleted MFR-TALM Changed 12G-SDI cable equalization length	2-2-1. 6-1-1

# Precautions



---

## Important Safety Warnings




### [Power]

 Caution	Operate unit <b>only</b> at the specified supply voltage.
 Caution	Disconnect the power cord via the power plug only. Do <b>not</b> pull on the cable portion.
 Stop	Do <b>not</b> 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	<b>Ensure</b> the unit is properly grounded at all times to prevent electrical shock.
 Hazard	Do <b>not</b> ground the unit to gas lines, units, or fixtures of an explosive or dangerous nature.




### [Operation]

 Hazard	Do <b>not</b> operate the unit under hazardous or potentially explosive atmospheric conditions. Doing so could result in fire, explosion, or other hazardous results.
 Hazard	Do <b>not</b> allow liquids, metal pieces, or other foreign materials to enter the unit. Doing so could result in fire, other hazards, or a unit malfunction.
 Caution	If a foreign material does enter the unit, turn the power off and <b>immediately</b> disconnect the power cord. Remove the material and contact an authorized service representative if damage has occurred.


### [Transportation]

 Hazard	<b>Handle</b> 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]

 Circuitry Access	Do <b>not</b> 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 <b>not</b> 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 <b>not</b> 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 <b>before</b> 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.
--	--

# Software License Agreement

---

This Software License Agreement is a legally binding agreement between you ("User") and FOR-A Company Limited ("Company"). The software, user manual and all other associated documentation (collectively, "Product") are licensed, not sold, to the User. By installing and using the software, or by using a product of the Company in which the software is installed, User agrees to be bound by all terms and conditions of this agreement, as set forth below.

## 1. Grant of License

- a. The Company grants User a license to operate the Product in the manner specified in the user manual and other associated documentation. User may not use the Product in any manner other than that specified.
- b. The Company only grants User a license to personally use the Product, and does not allow User to transfer the license to a third person or to enable a third person to use the Product by any other method.
- c. In principle, the software may only be used on a single computer or device.
- d. While the software may include various programs, they may not be unbundled and used as standalone programs.

## 2. Restrictions on Distribution, Duplication, Leasing and/or Transfer of Product

User may not, without the Company's prior permission, distribute via communication lines, or lease or transfer electronic copies of the Product to another party, in whole or in part, nor attempt to do so.

## 3. Limitations of Guarantee

The Company and its program licensors disclaim all legal warranties, express or implied, with respect to the Product. User must use the Product at his or her own risk. In no event shall the Company and its program licensors be liable for any damages or loss of data or contents resulting from User's use of or inability to use the Product.

## 4. Provision of Upgrades and Updates

Whenever a software version is upgraded or updated, User may use the new version of the software by paying the amount separately specified by the Company. After upgrading software, User may not use an earlier version without the Company's prior permission.

## 5. Term of Validity of Agreement

This agreement shall be effective for a period of one year from the day User begins using the software. The same conditions of the agreement shall be extended for further one-year terms unless User or the Company expresses, at least one month prior to expiration of the agreement, the intent not to renew the agreement.

## 6. Termination of Agreement

- a. The Company reserves the right to immediately terminate this agreement if User corresponds to any of the following circumstances.
  - (1) User violates any terms of this agreement
  - (2) User is unable or refuses to make any required payment.
- b. User may terminate this agreement by written notice to the Company under the following circumstances, but may not seek a refund of the amount that User has already paid to the Company.
  - (1) User waives the license.
  - (2) User destroys or loses the software package and prevents the Company from being able to confirm its existence.
- c. After termination of this agreement, User may not use the Product in any way, shape or form.

## 7. Ownership

The Company and its program licensors retain all rights, including copyright and intellectual property rights, to the Product. User may not modify any program included in this software, nor disassemble, decompile, or reverse-engineer a program to analyze its source code.

## 8. Others

This agreement will be governed by and construed in accordance with copyright laws and treaties in Japan and by laws and international treaties relating to intangible property rights. User must comply with all copyright laws as well as applicable laws and regulations when using the Product.

## 9. Jurisdiction

Any dispute relating to the Agreement shall be subject to the exclusive jurisdiction of the Tokyo District Court of Japan.

## 10. Support

If the Company discovers a flaw in the software or revises a program within one year after User receives the software, the Company will provide information regarding the flaw or revision or a revised program to User, free of cost.

# Unpacking

---

MFR-1000 Multi Format Routing Switcher units and their accessories are fully inspected and adjusted prior to shipment. Check your received items against the packing lists below. Check to ensure no damage has occurred during shipment. If damage has occurred, or items are missing, inform your supplier immediately.

## ◆ MFR-1000

ITEM	QTY	REMARKS
MFR-1000	1	
AC Cord	1 set	(Includes an AC cord retaining clip)
Rubber Feet	4	
CD-ROM	1	Operation Manual (PDF)
Quick Setup Guide	1	

## ◆ Option

ITEM	QTY	REMARKS
MFR-8SDI12G	1	8 SDI-input card
MFR-8SDO12G	1	8 SDI-output card
MFR-10PS	1 set	Redundant power supply unit (with AC cord and AC cord retaining clip.)
MFR-18RUA/39RUA MFR-39RU/40RU/18RU MFR-16RU/16RUD/16RUTA MFR-16RUW /32RUW /64RUW MFR-8RUA	1	Remote Control Unit

## ◆ 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 adaptor is supplied without DC lock plug, but with a DC cable retaining clip.

## 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.
- References to the MFR Series Web-based Control Software are indicated by [Web-based Control: XXX page].

# Table of Contents

---

1. Prior to Starting.....	8
1-1. Overview .....	8
1-2. Features .....	8
2. Panel Descriptions.....	9
2-1. Front Panel.....	9
2-2. Rear Panel .....	9
2-2-1. Interfaces (GPI IN/ TALLY OUT) .....	10
2-3. MFR-GPI .....	12
2-3-1. Front Panel .....	12
2-3-2. Rear Panel.....	12
2-3-3. Interfaces .....	13
2-3-4. Card Switches.....	16
3. System Configuration Example .....	17
4. Serial / LAN Command Control .....	18
4-1. Serial Interface .....	18
4-2. LAN Interface .....	18
4-3. Control Command.....	19
4-3-1. Command Responses .....	21
4-3-2. Receiving Responses (Commands 1-6).....	22
4-3-3. Channel Name Request Commands (7) .....	25
4-3-4. CPU Status Request Command (8) .....	29
4-3-5. Destination Lock Status Request Command (9) .....	30
4-3-6. System Size Request Command (10) .....	31
4-3-7. Video Format Commands (11) .....	31
5. Troubleshooting.....	33
6. Specifications and Dimensions .....	34
6-1. Unit Specifications.....	34
6-1-1. MFR-1000.....	34
6-1-2. MFR-GPI.....	35
6-2. External Dimensions .....	36
6-2-1. MFR-1000.....	36
6-2-2. MFR-GPI.....	36

# 1. Prior to Starting

---

## 1-1. Overview

---

The MFR-1000 is a multi-format routing switcher that supports for 12G/3G/HD/SD-SDI. Configures a matrix up to 16 x 16 in a compact 1U size body.

An optimal solution in small to midsize systems.

## 1-2. Features

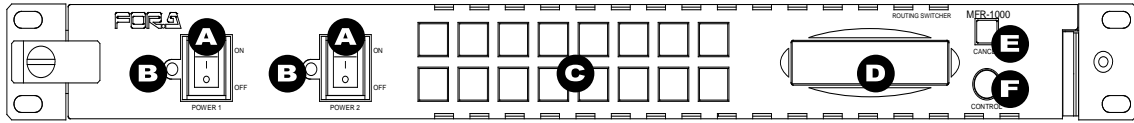
---

- Support for 12G-SDI, 3G-SDI, HD-SDI and SD-SDI 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
- Built-in webserver for remote control through a web browser
- SNMP support enabling SNMP monitoring system configuration
- Status monitoring for power supply, fan, CPU, and etc.
- 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. (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)
- Supports HARRIS protocol enabling linkage to other companies' products.



## 2. Panel Descriptions

### 2-1. Front Panel

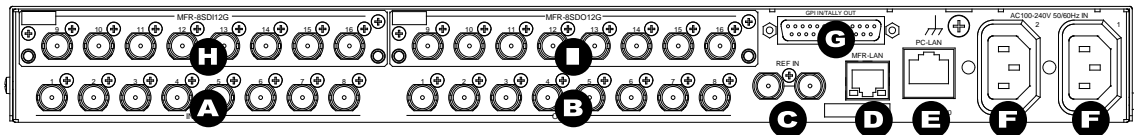


No.	Name	Description
A	POWER1 POWER2	Power switch 1. (standard equipment) Switch to turn unit power ON/ Off. Power switch 2. (optional equipment)
B	LED indicator	Lit green      DC power supply: Normal
		Unlit            DC power supply: Error
C	SRC button	Selects SRC channel to be applied to the DST channel displayed on the MENU. Upper row from left: SRC 1 to 8 Lower row from left: SRC 9 to 16
D	MENU	Displays crosspoint status.
E	CANCEL	Unused.
F	CONTROL	Switches the DST channel displayed on the MENU.

#### IMPORTANT

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

### 2-2. Rear Panel



\* The figure shown above displays a rear panel with MFR-8SDI12G and MFR-8SDO12G installed.

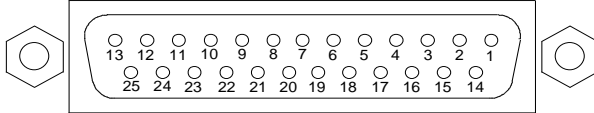
No.	Name	Description
A	INPUT 1-8	Used to input digital component video signals
B	OUTPUT 1-8	Used to output digital component video signals
C	REF IN	Used to input a reference signal (BB or Tri-level sync signal) (looping, or 75 ohm terminated)
D	MFR-LAN	Ethernet ports for connection to MFR Remote Control Units and MFR-GPI. An Ethernet port (10/100BASE-TX RJ-45)
E	PC-LAN	Used to connect to a PC or other external unit. An Ethernet port (10/100BASE-TX RJ-45)
F	AC IN1	Used to connect Power Supply Unit 1 to an AC power source
	AC IN2	Used to connect Power Supply Unit 2, MFR-10PS (optional) to an AC power source.
G	GPI IN/TALLY OUT	Used to input GPI and output alarm signal.
H	OPTIONAL SLOT	Dedicated slot to install an MFR-8SDI12G.
I	OPTIONAL SLOT	Dedicated slot to install an MFR-8SDO12G.

## IMPORTANT

Connect PC LAN to other network than MFR-LAN network. Separate the LAN connections for MFR series devices from the network segment of other intracompany network devices.

### 2-2-1. Interfaces (GPI IN/ TALLY OUT)

#### ◆ GPI IN/TALLY OUT Connector (25-pin D-sub, female)

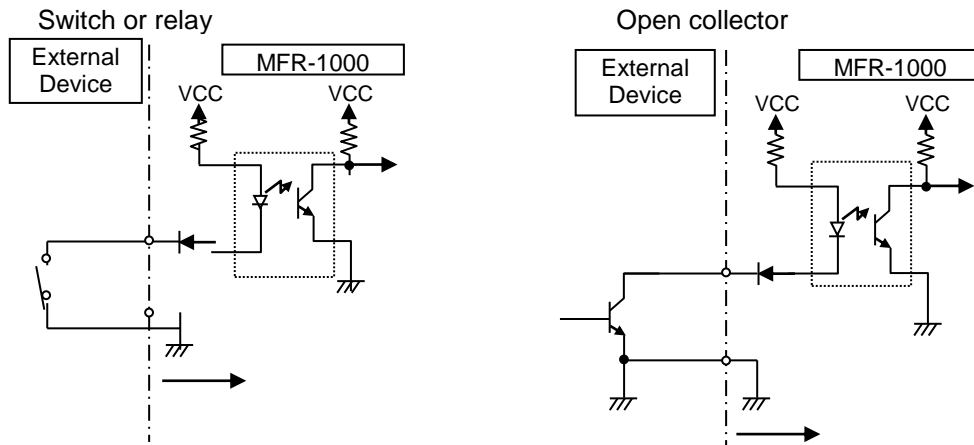


Pin No.	Description	Pin No.	Description
1	GPI IN1	14	TALLY OUT1
2	GPI IN2	15	TALLY OUT2
3	GPI IN3	16	TALLY OUT3
4	GPI IN4	17	TALLY OUT4
5	GPI IN5	18	TALLY OUT5
6	GPI IN6	19	TALLY OUT6
7	GPI IN7	20	TALLY OUT7
8	GPI IN8	21	TALLY OUT8
9	Frame ground	22	Frame ground
10	Frame ground	23	Frame ground
11	Alarm out (Default: POWER)	24	Not used
12	Alarm out, Common	25	Not used
13	+5V output		

\* The maximum output current for +5V output is 0.5A DC.

\* The GPI input pulse width should be 126ms or more.

◆ **GPI IN Circuits**



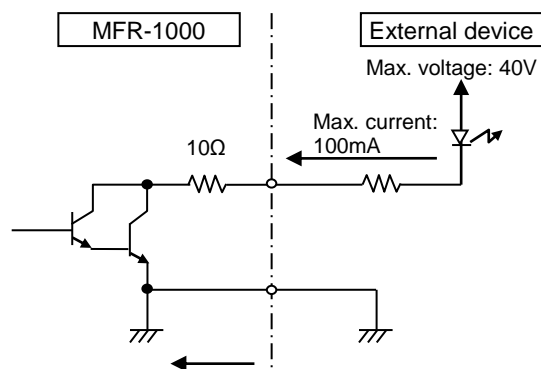
◆ **Alarm Out**

Under normal operation	Pins 11 and 12 are open.
In a malfunction or power-off state	Pins 11 and 12 are closed.

The following items can be set for ALAM OUT. Assign alarms in the Web-Based Control.

Fan
Power
Crosspoint Error

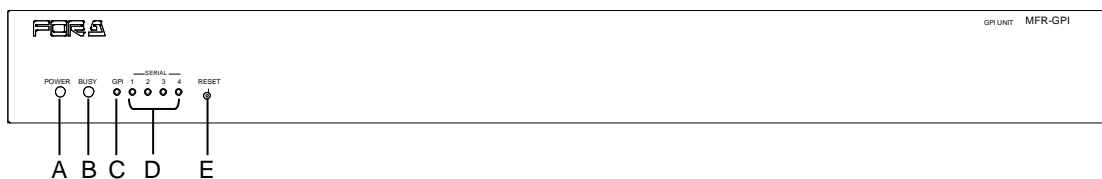
◆ **GPI OUT / TALLY OUT Circuit**



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

## 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 flash memory writing status of backup settings. ▶ See the table below for details on indications.
C	GPI	When the GPI function is assigned using the Web-based Control, the LED lights green. The LED remains unlit when there is no assignment.
D	SERIAL1-4	When a serial port is assigned using the 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-GPI front panel LED

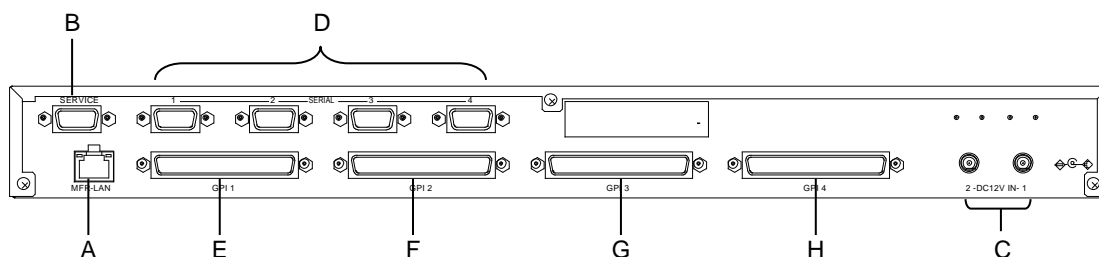
LED \ LED Color	Green	Red	Orange
POWER	Normal	Power alarm	
BUSY	Normal processing		Writing to flash memory

\* POWER LED lights red if the unit is turned on but unconnected to a network.

#### IMPORTANT

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

### 2-3-2. Rear Panel



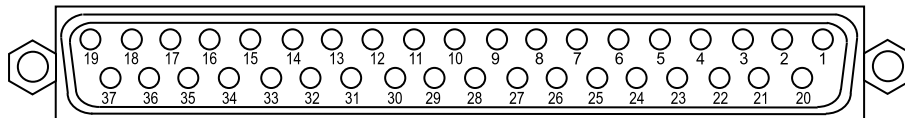
No.	Item	Description
A	MFR-LAN *1	Used to connect to the MFR main unit. Ethernet port (10/100BASE-TX)
B	SERVICE	Used for maintenance only. Do not use.
C	DC12V IN 1 and 2	Used to supply 12V DC power.

D	SERIAL1 to 4	Used for serial interface control. The default setting is RS-422. RS-232C is also selectable using switches on the internal card. ▶ See Sec. 2-3-4. "Card Switches" for details.
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

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

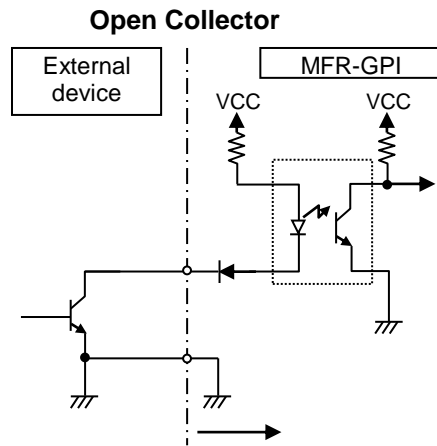
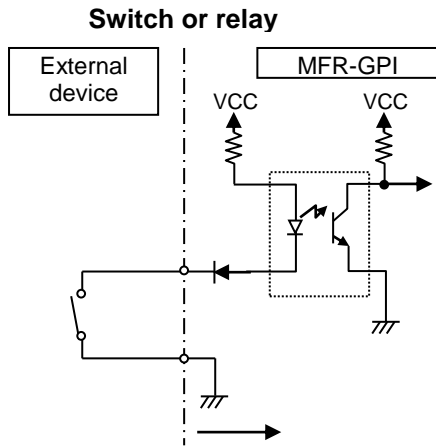


Pin No.	Signal	Pin No.	Signal
1	GPI_IN / TALLY_OUT 01 #	20	GPI_IN / TALLY_OUT 20 #
2	GPI_IN / TALLY_OUT 02 #	21	GPI_IN / TALLY_OUT 21 #
3	GPI_IN / TALLY_OUT 03 #	22	GPI_IN / TALLY_OUT 22 #
4	GPI_IN / TALLY_OUT 04 #	23	GPI_IN / TALLY_OUT 23 #
5	GPI_IN / TALLY_OUT 05 #	24	GPI_IN / TALLY_OUT 24 #
6	GPI_IN / 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 #		

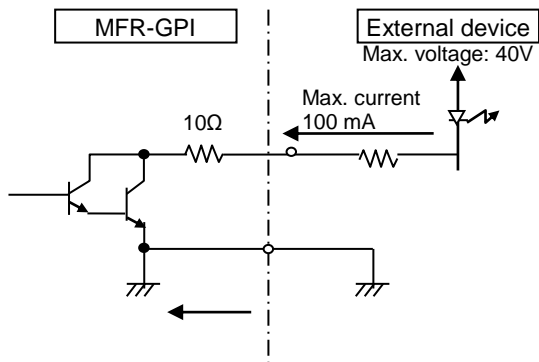
\* The symbol "#" at the end of signals represents the port number (1, 2, 3 or 4).

\* The maximum total output current for all +4.8 V outputs is 1.5 A.

◆ **GPI IN Circuit**

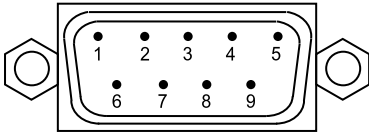


◆ **GPI OUT / TALLY OUT Circuit**



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

◆ **SERIAL Connector (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
5	SG	Signal Ground
6	DSR	Data Set Ready
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 Assignments (Factory default settings)**

Pin No.	Signal Name	Description
1	FG	Frame Ground
2	T-	Transmit data (-)
3	R+	Receive data (+)
4	SG	Signal Ground
5	NC	Unused
6	SG	Signal Ground
7	T+	Transmit data (+)
8	R-	Receive data (-)
9	FG	Frame Ground

\* The maximum cable length is 100 m.

## 2-3-4. Card Switches

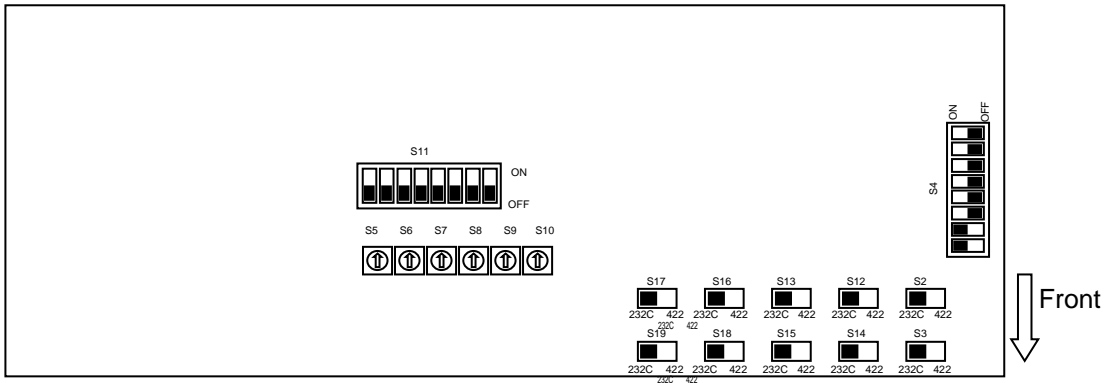


### CAUTION

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 the 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.



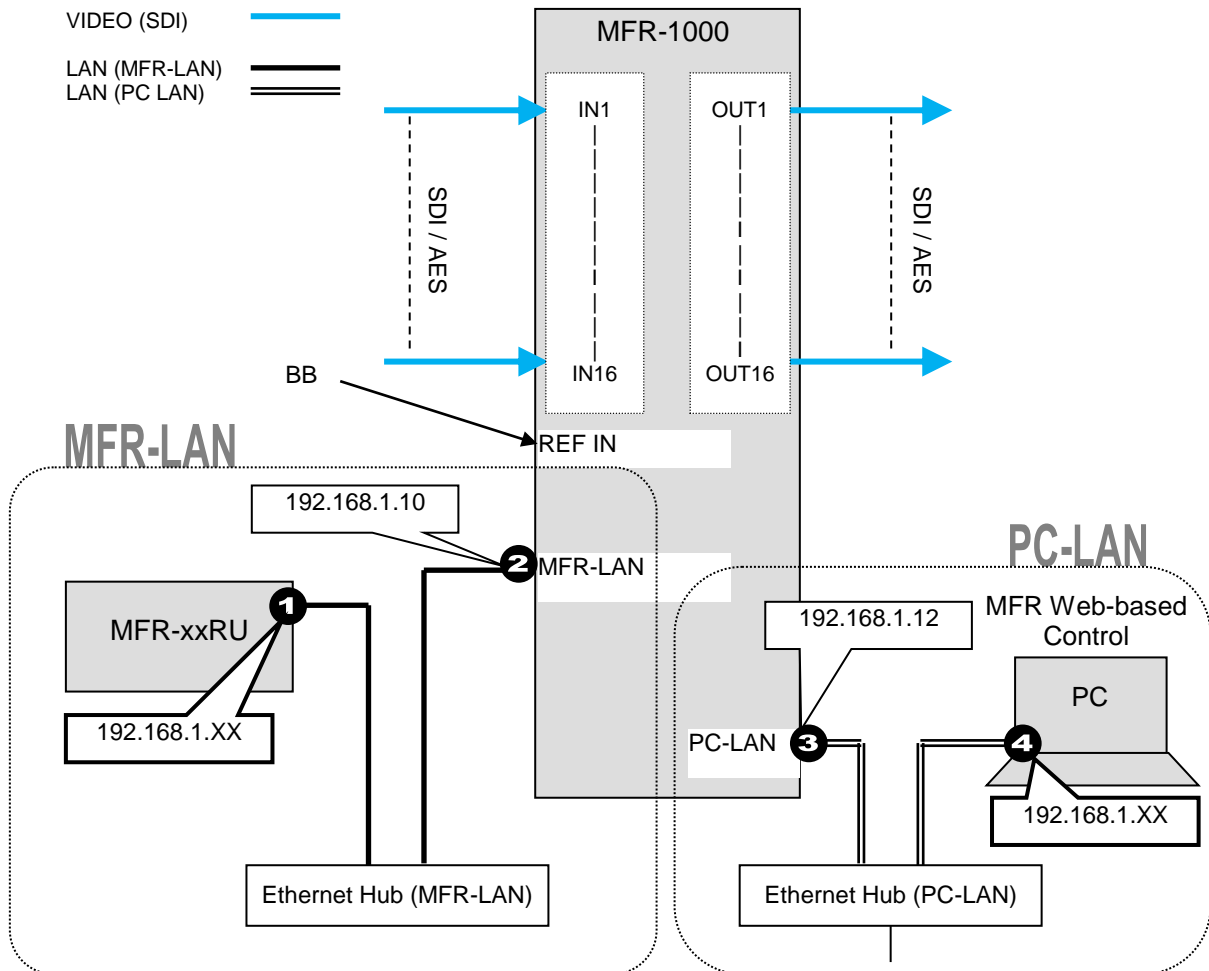
Switch	Function / Settings		
S2,S3	Used for maintenance. Do not use.		
S4	Used for maintenance. Do not use. (Factory default settings are as shown at right. The black boxes (■) represent switches.)		
S5,S6,S7, S8,S9,S10	Used for maintenance. Do not use.		
S11	Used for maintenance. Do not use.		
S12,S14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



### 3. System Configuration Example

The block diagram below shows an example of the basic MFR routing system that consists of an MFR-1000, Remote Unit and the Web-based Control accessed from a computer. Connect the MFR-LAN separately from the PC-LAN network segment 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 (Section Titles in MFR-RU Series Operation Manual)	Web-based Control
①	MFR-39RUA: Setting Mode Menu (MFR-39RUA) MFR-39RU: Setup Menu (MFR-39RU) MFR-18RU/18RUA: Setup Menu (MFR-18RU/18RUA) MFR-16RUTA: Setup Menu (MFR-16RUTA) MFR-8RUA: Setup Menu (MFR-8RUA) Other RUs: Setup Menu (MFR-16/40RU, MFR-16RUD, MFR-16/32/64RUW)	<b>RU Settings</b> page
②	---	<b>MU Settings</b> page
③	MFR-39RUA: Setting Mode Menu (MFR-39RUA) (display only) MFR-39RU: Setup Menu (MFR-39RU) (display only) MFR-18RU/18RUA: Setup Menu (MFR-18RU/18RUA) (display only) MFR-16RUTA: Setup Menu (MFR-16RUTA) (display only) MFR-8RUA: Setup Menu (MFR-8RUA) (display only) Other RUs: Setup Menu (MFR-16/40RU, MFR-16RUD, MFR-16/32/64RUW) (display only)	<b>Network Settings</b> page

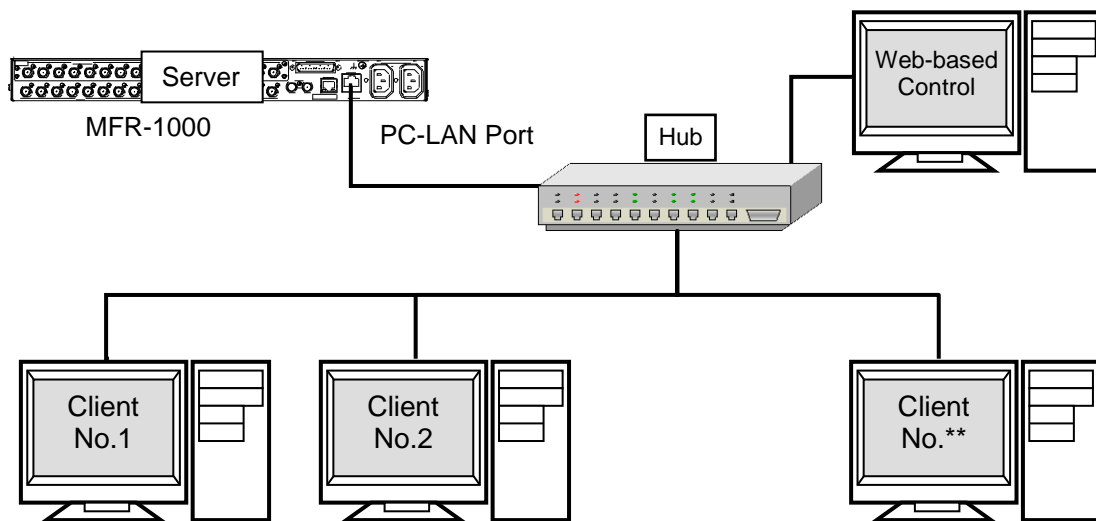
## 4. Serial / LAN Command Control

### 4-1. Serial Interface

Crosspoint switchover and tally output can be controlled via the SERIAL ports 1 to 4 on the MFR GPI.

### 4-2. LAN Interface

The MFR-1000 unit is able to connect to a third-party automatic control system via the RJ-45 port (PC-LAN port). TCP/IP communication protocol is supported. The control PC is the client and the MFR-1000 unit is 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-1000: Server Crosspoint Remote Control using ASCII code.
Command protocol	Crosspoint Remote Control protocol

## 4-3. 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	
10	Commands for requesting System Size	Yes	Yes	Crosspoint remote control / Crosspoint remote control 2
11	Commands for setting video format (reference and/or switching point).	-	Yes	Crosspoint remote control 2

\*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:<Lvl>/<Dest>,<Src>	S:<Lvl><Dest>,<Src> C:<Lvl>/<Dest>,<Src>[.....[S<Salvo number>]][L<Link number>]:<ID>	–
4	<b>Clear a preset crosspoint.</b> @[sp]B:C		–
	<b>Preset a crosspoint.</b> @[sp]P:<Lvl>/<Dest>,<Src>		
	<b>Read a preset crosspoint specifying a level and destination.</b> @[sp]P?<Lvl><Dest>	V:<Lvl><Dest>,<Src>	
	<b>Read preset crosspoints for all channels in the specified level.</b> @[sp]V?<Lvl>	V:<Lvl><Dest>,<Src>	
	<b>Perform the preset crosspoints simultaneously.</b> @[sp]B:E	S:<Lvl><Dest>,<Src> C:<Lvl>/<Dest>,<Src>[.....[S<Salvo number>]][L<Link number>]:<ID>	–

Func.	Control command	Command response	Ref.
5	<b>LOCK ALL units.</b> @[sp]W:<Lvl>/<Dest>,<ID>,1	W!<Lvl><Dest>,<ID>,1	–
	<b>LOCK OTHER units.</b> @[sp]W:<Lvl>/<Dest>,<ID>,2	W!<Lvl><Dest>,<ID>,2	–
	<b>Disable LOCK.</b> @[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>	4-3-3
8	@[sp]A?	@[sp]A:<ID>	4-3-4
9	@[sp]W?<Lvl>,<Dest>	W!<Lvl><Dest>,<ID>,0 to 2* *0: NOT LOCKED/1: LOCK ALL/2: LOCK OTHER	4-3-5
10	@[sp]F?<Lvl>	F:<Lvl><Dst Size>,<Src Size>/< Dst Size >,<Src Size>	4-3-6
11	<b>Sets video format (reference and/or switching point) settings.</b> @[sp]UF:<YY>/<R#>,<S\$>	UF!<YY>/<R#>,<S\$>	4-3-7
	<b>Performs the settings.</b> @[sp]UE:A	URIW UR!<YY>/<R#>,<S\$> URIE(Error response)	
	<b> Cancels the settings.</b> @[sp]UE:C	URIC	

\* [sp] indicates a space.

\* Commands must end with a carriage return (ASCII code 0x0D) only or carriage return and line feed (ASCII code 0x0A). 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 <b>1</b> to <b>FE</b> for ID numbers. The host returns <b>0</b> when the lock is released.

\* All command values are in hexadecimal, starting from 0 (zero).

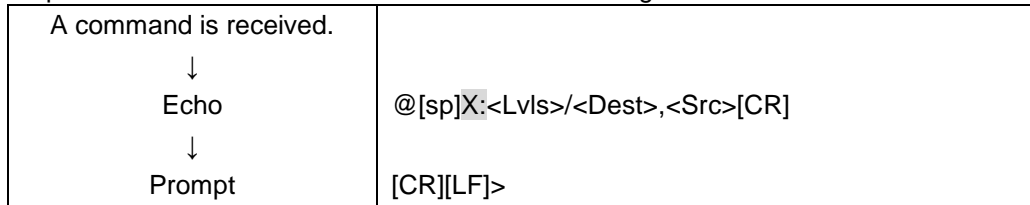
(For example, Source “**16**” is represented as <Src>”**F**.”)

\* If levels are not in use, set <Lvl> or <Lvls> to “0”(zero).

## 4-3-1. Command Responses

- **Echo and Prompt**

Responses will be sent as shown below when receiving commands:



- \* 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 (Command 1-6)**

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>]:!<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: <b>C:0/0,0...S2:IA</b>
<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: <b>C:0/0,2...L1:IA</b>

- An “S” response is sent as shown below when crosspoints are switched by a command.

```
[CR][LF]S:<Lv><Dest>,<Src>[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.
- \* S responses are sent before C 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]>	Terminal display:	@ X:123456/30,70 >
(B)	[CR][LF] C:123456/30,70...S5:IA[CR][LF]		C:123456/30,70...S5:IA
(C)	[CR][LF] S:130,70[CR][LF]		S:130,70
(C)	[CR][LF] S:230,70[CR][LF]		S:230,70
(C)	[CR][LF] S:330,70[CR][LF]		S:330,70
(C)	[CR][LF] S:430,70[CR][LF]		S:430,70
(C)	[CR][LF] S:530,70[CR][LF]		S:530,70
(C)	[CR][LF] S:630,70[CR][LF]		S:630,70

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

### 4-3-2. 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)

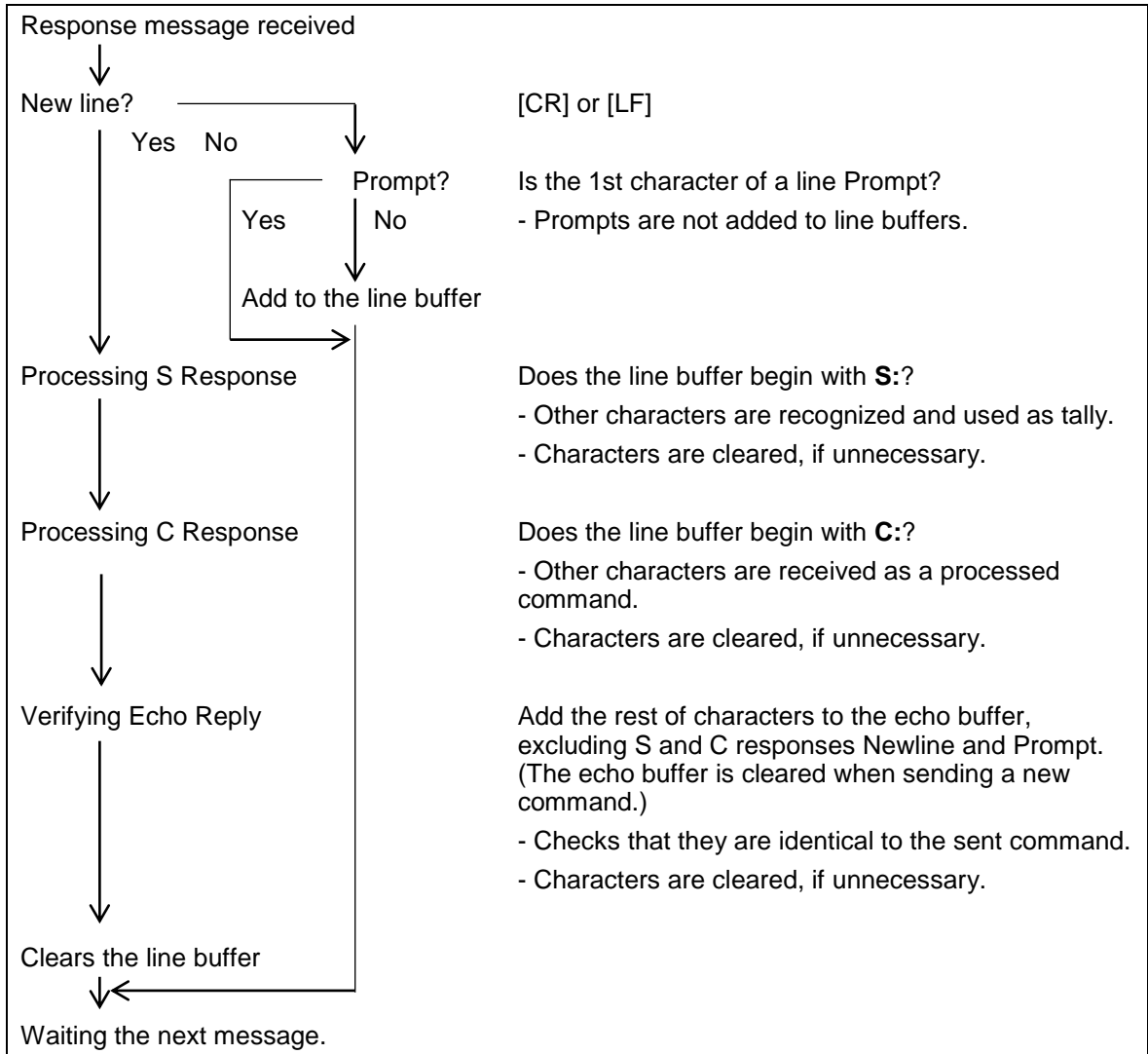
Allows to send the next command when receiving a prompt.

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**

When 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 show 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.



### 4-3-3. 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	,	000-0FF	CR
					D	K			

#### Command response

BYTE No.	1	2	3	4	5	6	7-9	10	11-		
Response	CR	LF	K	:	S	A	000-0FF	,		CR	LF
					D	K					

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: <b>Ascii</b> Character code for Kanji names: <b>UTF-8</b>
Command Response	CR	Carriage return
	LF	Line feed

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

➤ **Web-based Control (Source Name Menu)**

Logical No.	Category	Name(ASCII)	ID Name(Kanji)
1	SRC-A	SRC 1	
2	SRC-A	SRC 2	
3	SRC-A	SRC 3	
4	SRC-A	SRC 4	
5	SRC-A	SRC 5	
6	SRC-A	SRC 6	
7	SRC-A	SRC 7	
8	SRC-A	SRC 8	
9	SRC-A	SRC 9	
10	SRC-A	SRC10	
11	SRC-A	SRC11	
12	SRC-A	SRC12	
13	SRC-A	SRC13	
14	SRC-A	SRC14	
15	SRC-A	SRC15	
16	SRC-A	SRC16	
17	SRC-A	SRC17	
18	SRC-A	SRC18	
19	SRC-A	SRC19	
20	SRC-A	SRC20	

No.	Name
1	SRC-A
2	SRC-B
3	SRC-C
4	SRC-D
5	SRC-E
6	SRC-F
7	SRC-G
8	SRC-H
9	SRC-I
10	SRC-J
11	SRC-K
12	SRC-L
13	SRC-M
14	SRC-N
15	SRC-O
16	SRC-P
17	SRC-Q
18	SRC-R
19	SRC-S
20	SRC-T

➤ **Terminal display**

Command	@ K?SA,000
---------	------------

Response	@ K?SA,000	Echo
	K:SA000,5352432031	Ascii Name for Source <b>Channel 1</b> is SRC 1.
	K:SA001,5352432032	Ascii Name for Source <b>Channel 2</b> is SRC 2.
	K:SA002,5352432033	Ascii Name for Source <b>Channel 3</b> is SRC 3.
	K:SA01F,5352433332	Ascii Name for Source <b>Channel 32</b> 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)**

Logical No.	Category	Name(ASCII)	ID Name(Kanji)
101	DST-A	DST101	出力101
102	DST-A	DST102	出力102
103	DST-A	DST103	出力103
104	DST-A	DST104	出力104
105	DST-A	DST105	出力105
106	DST-A	DST106	出力106
107	DST-A	DST107	出力107
108	DST-A	DST108	出力108
109	DST-A	DST109	出力109
110	DST-A	DST110	出力110
111	DST-A	DST111	出力111
112	DST-A	DST112	出力112
113	DST-A	DST113	出力113
114	DST-A	DST114	出力114
115	DST-A	DST115	出力115
116	DST-A	DST116	出力116
117	DST-A	DST117	出力117
118	DST-A	DST118	出力118
119	DST-A	DST119	出力119
120	DST-A	DST120	出力120

No.	Name
1	DST-A
2	DST-B
3	DST-C
4	DST-D
5	DST-E
6	DST-F
7	DST-G
8	DST-H
9	DST-I
10	DST-J
11	DST-K
12	DST-L
13	DST-M
14	DST-N
15	DST-O
16	DST-P
17	DST-Q
18	DST-R
19	DST-S
20	DST-T

➤ **Terminal display**

Command	@ K?DK,064
---------	------------

Response	@ K?DK,064	Echo
	K:DK064,E587BAE58A9BEFBC91EFBC90EFBC91	Kanji Name for Destination Channel 101 is 出力101.
	K:DK065,E587BAE58A9BEFBC91EFBC90EFBC92	Kanji Name for Destination Channel 102 is 出力102.
	K:DK066,E587BAE58A9BEFBC91EFBC90EFBC93	Kanji Name for Destination Channel 103 is 出力103.
	K:DK083,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)**

Logical No.	Category	Name(ASCII)	ID Name(Kanji)
61	SRC-A	SRC61	
62	SRC-A	SRC62	
63	SRC-A	SRC63	
64	SRC-A	SRC64	
65	SRC-A	SRC65	カメラ1
66	SRC-A	SRC66	カメラ2
67	SRC-A	SRC67	カメラ3
68	SRC-A	SRC68	カメラ4
69	SRC-A	SRC69	
70	SRC-A	SRC70	
71	SRC-A	SRC71	
72	SRC-A	SRC72	サーバーA
73	SRC-A	SRC73	サーバーB
74	SRC-A	SRC74	
75	SRC-A	SRC75	
76	SRC-A	SRC76	
77	SRC-A	SRC77	
78	SRC-A	SRC78	
79	SRC-A	SRC79	
80	SRC-A	SRC80	

No.	Name
1	SRC-A
2	SRC-B
3	SRC-C
4	SRC-D
5	SRC-E
6	SRC-F
7	SRC-G
8	SRC-H
9	SRC-I
10	SRC-J
11	SRC-K
12	SRC-L
13	SRC-M
14	SRC-N
15	SRC-O
16	SRC-P
17	SRC-Q
18	SRC-R
19	SRC-S
20	SRC-T

➤ **Terminal display**

Command	@ K?SK,040
---------	------------

Response	@ K?SK,040	Echo
	K:SK040,E382ABE383A1E383A9EFBC91	Kanji Name for Source Channel 65 is カメラ 1.
	K:SK041,E382ABE383A1E383A9EFBC92	Kanji Name for Source Channel 66 is カメラ 2.
	K:SK042,E382ABE383A1E383A9EFBC93	Kanji Name for Source Channel 67 is カメラ 3.
	K:SK043,E382ABE383A1E383A9EFBC94	Kanji Name for Source Channel 68 is カメラ 4.
	K:SK044,	Kanji Name for Source Channel 69 is empty.
	K:SK045,	Kanji Name for Source Channel 70 is empty.
	K:SK046,	Kanji Name for Source Channel 71 is empty.
	K:SK047,E382B5E383BCE38390E383BCEFBCEA1	Kanji Name for Source Channel 72 is サーバー A.
	K:SK05F,	Kanji Name for Source Channel 96 is empty.
	>	Prompt

➤ Response details

K:	S	K	040,	E382AB	E383A1	E383A9	EFBC91
	Source	Kanji	Channel 65	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

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

This command allows you to indicate if the CPU is active or passive in the MFR-1000.

◆ **Command format**

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

Control command

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

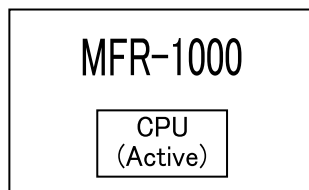
Command response

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

<ID>: CPU unit ID number (01-FE)

◆ **Command Response**

A command response example is shown in the table below when the CPU is active.



**If the MFR-1000 CPU is active**

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

## 4-3-5. Destination Lock Status Request Command (9)

This command (W?) allows you to indicate the destination lock status in the MFR system.

### ◆ 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 channel number

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 Examples

1. If Destination 1 is locked by ID10 Unit using LOCK ALL, Destination 1 status returns as shown below:

Response	@ W?0,0	Echo
	W!00,A,1	Dest 1 is locked by ID10 (0x0A) unit using LOCK ALL.
		CR LF
	>	Prompt

2. If Destination 2 is locked by ID11 Unit using LOCK OTHER, Destination 2 status returns as shown below:

Response	@ W?0,1	Echo
	W!01,B,2	Dest 2 is locked by ID11 (0x0B) unit using LOCK OTHER.
		CR LF
	>	Prompt

3. If Destination 3 is not locked, Destination 3 status returns as shown below:

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

## 4-3-6. System Size Request Command (10)

F? Commands allow you to obtain MFR-1000 system size.

### ◆ Command Format

Command	Command response
@[sp]F?<Lvl>	F:<Lvl><Dst Size>,<Src Size>/< Dst Size >,<Src Size>

### Commands

BYTE No.	1	2	3	4	5
Command	@	[sp]	F	?	<Lvl>

### Command response

BYTE No.	1	2	3	4	5	6	7	8	9	10
Response	F	:	<Lvl>	<Dst Size>	,	<Src Size>	/	<Dst Size>	,	<Src Size>

<Dst Size>: Destination channel number

<Src Size>: Source channel number

### ◆ Command Example

Response	@ F?0	Echo
	F:0FF,FF/FF,FF	256 destination / 256 source channel numbers.
		CR LF
	>	Prompt

## 4-3-7. Video Format Commands (11)

Video Format Commands allow you to change router video format.

### ◆ Command Format

	Command description	Commands	Command response
(1)	Sets video format, reference and/or switching point beforehand.	@[sp]UF:<YY>/<R#>,<S\$> *1	UF!<YY>/<R#>,<S\$>
(2)	Performs the set changes.	@[sp]UE:A	UR!W *2 UR!<YY>/<R#>,<S\$> UR!E (error response)
(3)	Cancels the set changes.	@[sp]UE:C	UR!C

\*1 Reference and Switching points are non-compulsory. When they are not input, present settings are output for command response.

MFR-1000 does not supports Reference and Switching point settings. When setting video format beforehand and performing the set changes, Auto("RA) is output for reference and Field ("SF") is output for switching point.

\*2 When "@[sp]UE:A" is received, "UR!W" is output repeatedly at 5 second intervals. When execution preparation is ready, "UR!<YY>/<R#>,<S\$>" is output.

### Commands

BYTE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
(1)	@	[sp]	U	F	:	<YY>	/	<R#>	,	<S\$>				CR
(2)	@	[sp]	U	E	:	A	CR							
(3)	@	[sp]	U	E	:	C	CR							

### Parameters

<YY>	Video format	<b>00:</b> 1080/59.94i <b>01:</b> 1080/59.94p <b>02:</b> 1080/60i <b>03:</b> 1080/60p <b>04:</b> 1080/50i <b>05:</b> 1080/50p <b>06:</b> 720/60p	<b>07:</b> 720/59.94p <b>08:</b> 720/50p <b>09:</b> 1080/30p <b>0A:</b> 1080/29.97p <b>0B:</b> 1080/25p <b>0C:</b> 1080/24p <b>0D:</b> 1080/23.98p	<b>0E:</b> 1080/30psF <b>0F:</b> 1080/29.97psF <b>10:</b> 1080/25psF <b>11:</b> 1080/24psF <b>12:</b> 1080/23.98psF <b>13:</b> NTSC <b>14:</b> PAL
<R#>	Reference	<b>RA:</b> Auto	<b>RB:</b> B.B	<b>RT:</b> Tri-Sync
<S\$>	Switching point	<b>SF:</b> Field	<b>SO:</b> Odd	<b>SE:</b> Even

\* Commands are not executed if no video format is set or the current video format is set.

### ◆ Command Example

Changes Video Format to **720/59.94p**.

Command	Command response
@[sp]UF:07[CR]	[CR][LF]UF!07/RA,SF[CR]
@[sp]UE:A[CR]	[CR][LF]UR!W [CR][LF]UR!07/RA,SF[CR]



## 5. Troubleshooting

---

If any of the following problems occur during operation of your MFR-1000, proceed as indicated below to see if the problem can be corrected before assuming a unit malfunction has occurred.

### **IMPORTANT**

If the problem cannot be 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?	Connect the LAN cable properly.
	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.

## 6. Specifications and Dimensions

---

### 6-1. Unit Specifications

---

#### 6-1-1. MFR-1000

---

Video Formats	
12G-SDI	2160/59.94p, 2160/50p
3G-SDI	1080/60p, 1080/59.94p, 1080/50p
HD-SDI	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-SDI	525/60, 625/50
Input/Output Matrix	Standard: 8 × 8, Max.:16 × 16
Video Input	Compliant with the following standards (75Ω BNC) - SMPTE ST 2082-10 (12G-SDI) - SMPTE424M (3G-SDI) - SMPTE292M (HD-SDI) - SMPTE259M (SD-SDI) Cable Equalization - 12G-SDI: 70m (L-5.5CUHD cable) - 3G/HD-SDI: 100m (5C-FB cable) - SD-SDI: 200m (5C-2V cable)
MFR-8SDI12G (Option)	SDI Input Card - BNC x 8 Compliant with the following standards (75Ω BNC) - SMPTE ST 2082-10 (12G-SDI) - SMPTE424M (3G-SDI) - SMPTE292M (HD-SDI) - SMPTE259M (SD-SDI) Cable Equalization - 12G-SDI: 70m (L-5.5CUHD cable) - 3G/HD-SDI: 100m (5C-FB cable) - SD-SDI: 200m (5C-2V cable)
Video Output	Compliant with the following standards (75Ω BNC) (Auto reclocking) - SMPTE ST 2082-10 (12G-SDI) - SMPTE424M (3G-SDI) - SMPTE292M (HD-SDI) - SMPTE259M (SD-SDI)
MFR-8SDO12G (Option)	SDI Output Card - BNC x 8 Compliant with the following standards (75Ω BNC) (Auto reclocking) - SMPTE ST 2082-10 (12G-SDI) - SMPTE424M (3G-SDI) - SMPTE292M (HD-SDI) - SMPTE259M (SD-SDI)
Reference Input	BB/NTSC: 0.429Vp-p / PAL: 0.45Vp-p or Tri-level Sync: ±0.3Vp-p 75Ω BNC x 1, loop-through (Terminate with a 75Ω terminator if unused.)
Interfaces	
MFR-LAN	10/100BASE-TX RJ-45 x 1 (For connecting up to 128 RU/GPI units.)
PC-LAN	10/100BASE-TX, RJ-45 x 1 (for PC operation/ External connection)
GPI IN/TALLY OUT	25 pin D-sub (female) x 1

Temperature	0°C to 40°C
Humidity	30% to 90% (no condensation)
Power	100V AC to 240V AC ±10%, 50/60Hz
Consumption	100V AC to 120V AC: 60 VA (55 W) 220V AC to 240V AC: 84 VA (50 W)
Dimensions	430(W) x 44(H) x 325(D)mm EIA 1RU
Weight	6 kg
Consumables (24 hours in room temperature)	Fan: Replace every 4 years. Power supply unit: Replace every 5 years.

## 6-1-2. MFR-GPI

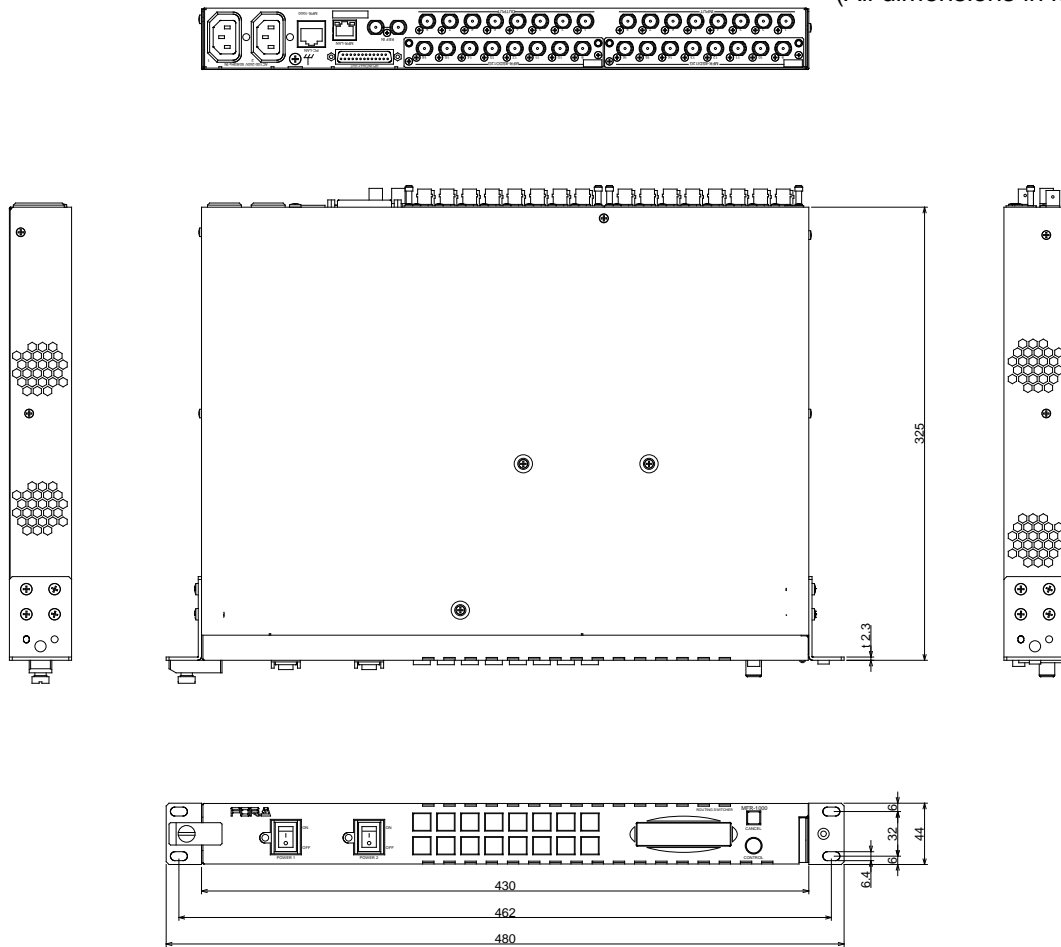
---

Number of connections	Max. 128 (including Mai, 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/TALLY OUT	37 pin D-sub 37 (female) x 4 128-input/output (user assignable)
SERIAL 1-4	RS-232C/422: 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	100V AC to 120V AC: 8VA (4W) 200V AC to 240V AC: 13VA (6W)
Dimensions	430(W) x 44(H) x 110(D) mm EIA1RU
Weight	2 kg

## 6-2. External Dimensions

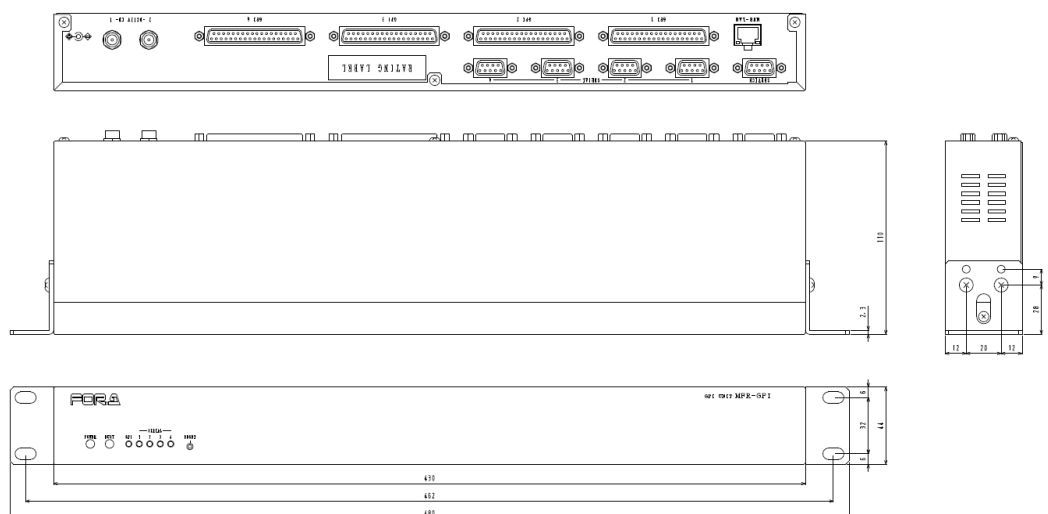
### 6-2-1. MFR-1000

(All dimensions in mm)



### 6-2-2. MFR-GPI

(All dimensions in mm)



## **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.



**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 3445 5116  
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 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