8K SUPER HI-VISION SHV

4K ULTRA HD

FOR.A

12G/3G/HD/SD/ASI Routing Switcher

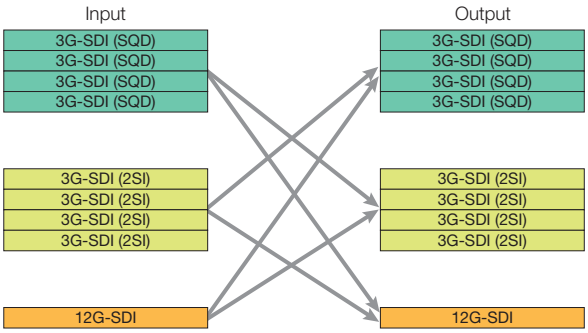
MFR-5000/8000

Expand your 4K/8K routing freedom with 12G-SDI I/O* and gearbox support in 2 models offering the most inputs and outputs in the MFR series

Configure an I/O matrix up to 128 x 128 with the MFR-5000 or 256 x 256 with the MFR-8000. Furthermore, they can be used as a large-scale routing system by linking multiple units. These versatile core system components support RS-422 interface routing, tally connections with peripherals (such as video switchers or multi viewers), auto source name tracking, and much more.

* For MFR-5000/8000 matrices, only up to 3G-SDI is supported. An input card compatible with conversion from 12G to 3G for 12G-SDI input (MFR-16SDIGB) and an output card compatible with conversion from 3G to 12G for 12G-SDI output (MFR-16SDOGB) are necessary.

Gearbox Functionality



4K conversion (12G-SDI/Quad Link 3G-SDI, 2SI/SQD)

Add the MFR-16SDIGB and MFR-16SDOGB cards for conversion of video (Quad Link 3G-SDI/12G-SDI) and mapping (2SI/SQD) formats. These options open the door for equipment previously incompatible with 12G-SDI, enabling system building focused on this new specification.

10 Highlights Supporting Large-Scale Systems

Series-leading connectivity

Add up to 8 I/O cards to MFR-5000 or 16 to MFR-8000. With a switcher this expandable, you can build a matrix up to 128 x 128 or 256 x 256. For 8K, up to 8 x 8 / 16 x 16 inputs and outputs are available, or for 4K, 32 x 32 / 64 x 64.

Multi-format video input and output

Support for 12G/3G/HD/SD-SDI and DVB-ASI input and output. No need to worry about signal formats, thanks to auto signal detection.

Compatible with any types of audio I/O

Choose from audio I/O cards with MADI, AES/EBU and analog audio capabilities. In a single enclosure, build a video and audio routing system that can also perform A/D and D/A conversion.

Control signal input/output support

Routes control signals between master units (editing stations, etc.) and slave units (video servers, etc.) with an added I/O card for serial control. Signal directions can be freely changed for each port.

- MFR-16DTIO: 16-port RS-422 I/O card

Versatile crosspoint control

Besides typical crosspoint switching, the unit enables a variety of crosspoint control.

- Salvo
- Take
- Link
- Level operation
- Chop function
- Monitor out
- Error-proofing

Outstanding maintainability

Designed for maintainability, all boards and power units can be accessed from the front without removing cables.

Outstanding redundancy

As core system components, FOR-A routing switchers can incorporate redundancy to ensure nonstop operation in case of problems.

- Redundant CPU board (optional MFR-CPU)
- Redundant power supply (optional MFR-PS)
- Router linkage: Parallel operation of two routing switchers ensures matrix redundancy and enables quadruple redundancy of the power supply unit and CPU board.

Matrix partition function

One routing switcher can be virtually partitioned to build any theoretical hierarchy, creating possibilities for use in various operations.

- Fully independent switching
- V/Key linking switcher
- 3D switcher
- HD/SD simul-switcher
- 4K/8K capable routing switcher

SNMP monitoring

Can be integrated into an SNMP monitoring system. Enables monitoring of various operational states, such as power, fan, and CPU status, SDI signal input or output, and crosspoint errors. If system failure and recovery occur, SNMP traps are sent to managers.

Connectivity with other products

Can be remote-controlled through the Ethernet or serial ports. Compatibility with common protocols such as TSL and Harris enables tally linkage or auto source name tracking for crosspoint switching. As well as our exclusive interface to the FOR-A line of HVS production switchers and standalone multi viewers.

Input/Output cards

Video **input** cards

	MFR-16SDIA/16SDIB	MFR-16SDIGB
Supported formats	3G/HD/SD/ASI	12G/3G
BNC	16	16
Ports supporting 12G-SDI	0	4
Gearbox (12G/3G-SDI interconversion)	0	4

Video **output** cards

	MFR-16SDO/16SDOA	MFR-16SDOGB
Supported formats	3G/HD/SD/ASI	12G/3G
BNC	16	16
Ports supporting 12G-SDI	0	4
Gearbox (12G/3G-SDI interconversion)	0	4

Audio **input** cards

	MFR-16ADI	MFR-16AAI	MFR-16AAIEX
Application	Embed AES audio to SDI signals.	Embed analog audio to SDI audio signals.	Convert analog audio into AES audio signals.
Interfaces	BNC x 16	25-pin D-sub (female) Balanced or unbalanced, x 4	25-pin D-sub (female) Balanced or unbalanced, x 4
Channels	16 stereo pairs, 32 channels	16 stereo pairs, 32 channels	16 stereo pairs, 32 channels
Impedance	75Ω	600Ω or Hi-Z	600Ω or Hi-Z
Sampling frequency	32 kHz, 44.1 kHz, 48 kHz, 96 kHz	48 kHz	48 kHz

Audio **input** cards

	MFR-16AESI	MFR-16SDIB
Application	Pass through AES audio.	Pass through MADI audio.
Interfaces	BNC x 16	BNC x 16 (MADI x 16)
Channels	16 stereo pairs, 32 channels	MADI, 16 channels
Impedance	75Ω	75Ω
Sampling frequency	–	48kHz

Audio **output** cards

	MFR-16AAOEX	MFR-16ADAO		
Application	Convert AES audio into analog audio.	Convert SDI embedded audio into AES/EBU audio signals.	SDI embedded audio output	Convert SDI embedded audio into analog audio signals.
Interfaces	25-pin D-sub (female) Balanced or unbalanced, x 4	BNC x 8	BNC x 2 (1 ch distributed in 2 ea.)	25-pin D-sub (female) Balanced or unbalanced, x 4
Channels	16 stereo pairs, 32 channels	8 stereo pairs, 16 channels	8 stereo pairs, 16 channels	4 stereo pairs, 8 channels
Impedance	Less than 100Ω	75Ω	75Ω	Less than 100Ω
Sampling frequency	48 kHz	48 kHz	48 kHz	48 kHz

Audio **output** cards

	MFR-16AESO	MFR-16MADIPO	MFR-16AESPO
Application	Pass through AES audio.	SDI、MADI、AES入力を音声リマップしてSDIまたはMADIで出力	SDI、MADI、AES入力を音声リマップしてAESで出力
Interfaces	BNC x 16	BNC x 16	BNC x 16
Channels	16 stereo pairs, 32 channels	MADI/SDI x 16	ステレオ x 16、32チャンネル
Impedance	75Ω	75Ω	75Ω
Sampling frequency	–	48kHz	48kHz

Remote Control Units

Basic models	MFR-16RUW	MFR-32RUW	MFR-64RUW
			
Size	1RU	1RU	2RU
Buttons	16 (green)	32 (green)	64 (green)
Features	16 customizable buttons	32 customizable buttons	64 customizable buttons

Standard models	MFR-16RU	MFR-16RUD	MFR-40RU
			
Size	1RU	1RU	1RU
Buttons	16 (green)	16 (green)	40 (red/green/orange)
Features	16 customizable buttons	• 16 customizable buttons • Equipped with a status/setting menu display	• All buttons are customizable • Redundant power supply (AC adapter)

Full-featured models with display	MFR-18RUA	MFR-39RUA	MFR-16RUTA
			
Size	1RU	2RU	2RU half tabletop
Buttons	18 (red/green/orange)	39 (13 x 3 rows)	16 (red/green/orange)
Features	• Buttons feature an OLED display that can show source names or assigned functions (7 colors: W, Ye, Cy, G, Mg, R, B) • All buttons are customizable • Redundant power supply (AC adapter)	• Buttons feature an OLED display that can show source names or assigned functions (7 colors: W, Ye, Cy, G, Mg, R, B) • 6 customizable function buttons (3 colors: R, G, Or) separate from main buttons • Equipped with a display showing information on current sources, destinations, and pages • Ideal as a main control unit covering the entire crosspoint setup • Redundant power supply (AC adapter)	• 16 customizable buttons • Buttons feature an OLED display that can show source names or assigned functions (7 colors: W, Ye, Cy, G, Mg, R, B)

MFR-5000 Datasheet

1. Specifications

Basic specifications

Temperature	0ºC to 40ºC
Humidity	30% to 85% (no condensation)
Power	100 VAC to 240 VAC ±10%, 50/60Hz IN x 2
Consumption	128 x 128 input/output, Dual CPU/Redundant Power Unit (Maximum Configuration): 100 V AC to 120 V AC: 380 VA (380 W) 220 V AC to 240 V AC: 462 VA (438 W) * The power consumption may increase up to the following maximum value if performing different signal routing such as video and audio routing. 100 V AC to 120 V AC: 1000 VA (982 W) 220 V AC to 240 V AC: 946 VA (938 W)
Dimensions	429 (W) x 354 (H) x 402 (D) mm, EIA 8 RU 480 (W) (Including rack mount brackets)
Weight	50 kg (with full options)
Consumables (at 24-hour operation)	Power supply unit: Replace every 5 years Fans: P-1426, P-1429, P-1656, P-1657 Replace every 4 years

Technical specifications

Video Formats	
4K UHD (12G-SDI) (3G-SDI)	2160/59.94p, 50p (W/ MFR-16SDIGB / 16SDOGB) Single Link 12G-SDI (SMPTE 2082-10) Quad Link 3G-SDI (SMPTE ST 425-5)
HD (3G-SDI)	1080/60p, 59.94p, 50p (SMPTE 424M)
HD (HD-SDI)	1080/60i, 59.94i, 50i, 30p, 30PsF, 29.97p, 29.97PsF, 23.98p, 23.98PsF, 25p, 25PsF, 24PsF, 24p, 720/60p, 59.94p, 50p (SMPTE 292M)
SD (SD-SDI)	525/59.94i, 625/50i (SMPTE 259M)
DVB-ASI	Compliant to EN 50083-9
Matrix Size	Min. 16 x 16 to Max. 128 x 128 + Monitor OUT x 4 Number of input slots: 8 Number of output slots: 8 (Expandable on a 16-channel basis)
Video Input	
MFR-16SDI/ 16SDIA	3G/HD/SD-SDI Input Card (Max. 8 cards) - 75-ohm BNC x 16 Cable Equalization 3G/HD-SDI: 100 m (5C-FB cable) SD-SDI: 200 m (5C-2V cable)
MFR-16SDIB (as video input)	3G/HD/SD-SDI Input Card (Max. 8 cards) - 75-ohm BNC x 16 Cable Equalization 3G/HD-SDI: 100 m (5C-FB cable) SD-SDI: 200 m (5C-2V cable)

MFR-16SDIGB	12G/3G-SDI Input Card (Max. 8 cards) - 75-ohm BNC x 4 (12G-SDI or 3G-SDI) - 75-ohm BNC x 12 (3G-SDI) I/O delay selection Delay (H) (0.3H-1H), 1 frame, 1 frame+ Delay (H)
Video Output	
MFR-16SDO	3G/HD/SD-SDI Output Card (Max. 8 cards) - 75-ohm BNC x 16 (Auto reclocking)
MFR-16SDOGB	12G/3G-SDI Output Card (Max. 8 cards) - 75-ohm BNC x 4 (12G-SDI or 3G-SDI) - 75-ohm BNC x 12 (3G-SDI) I/O delay selection Delay (H) (0.3H-1H), 1 frame, 1 frame+ Delay (H)
Monitoring Output	3G/HD/SD-SDI, DVB-ASI: 75-ohm BNC x 4 (Auto reclocking not supported)
Audio Input	
MFR-16ADI	AES/EBU Audio Input Card with SRC (Max. 4 cards) - 75-ohm BNC x 16 (16 stereo pairs, 32 channels) - 32kHz, 44.1kHz, 48kHz, 96kHz
MFR-16AAI	Analog Audio Input Card with A/D converter (Max. 4 cards) - 25-pin D-sub (female) x 4 (16 stereo pairs, 32 channels) - Balanced or unbalanced, 600-ohm or high impedance - A/D conversion: 48kHz / 24bit
MFR-16AAIEX	Analog Audio Input Card with A/D converter (Max. 4 cards) - 25-pin D-sub (female) x 4 (16 stereo pairs, 32 channels) - Balanced or unbalanced, 600-ohm or high impedance - A/D conversion: 48kHz / 24bit
MFR-16AESI	AES/EBU Audio Input Card (Max. 8 cards) - 75-ohm BNC x 16 (16 stereo pairs, 32 channels) - 48kHz / 24bit (No limitation for MFR-16AESO)
MFR-16SDIB (as audio input)	MADI Audio Input Card (Max. 8 cards) - 75-ohm, BNC x 16 (MADI x 16) - MADI: 64-channel, 48kHz / 24bit
Audio Output	
MFR-16AAOEX	Analog Audio Output Card with D/A converter (Max. 4 cards) - 25-pin D-sub (female) x 4 (16 stereo pairs, 32 channels) - Balanced or unbalanced, less than 100-ohm - D/A conversion: 48kHz / 24bit
MFR-16ADAO	Embedded/AES/Analog Audio Output Card (Max. 8 cards) AES/EBU (Synchronous only) - 75-ohm BNC x 8 (8 stereo pairs. 16 channels) - 48 kHz / 24bit Embedded audio (1080/59.94i or 1080/60i) - 75-ohm BNC x 2 (8 stereo pairs. 16 channels), - Unbalanced, 48 kHz / 24bit Analog audio - 25-pin D-sub (female) x 1 (4 stereo pairs. 8 channels), - Balanced or unbalanced, less than 100-ohm, / 24bit
MFR-16AESO	AES/EBU Audio Output Card (Max. 8 cards) - 75-ohm BNC x 16 (16 stereo pairs. 32 channels) - 48kHz / 24bit (No limitation for MFR-16AESI)

MFR-16MADIPO	MADI/SDI Output Card (Max. 8 cards) - 75-ohm BNC x 16 (MADI/SDI x 16) - 48 kHz / 24bit - Output delay time: 1 ms or less Video Output - 3G-SDI: 1080/59.94p, 1080/50p - HD-SDI: 1080/59.94i, 1080/50i, 1080/29.97PsF, 1080/23.98PsF, 720/59.94p - Additional delay time: I/O delay selection Delay (H) (0.2H-1H)
MFR-16AESPO	AES/EBU Audio Output Card (Max. 8 cards) - 75-ohm BNC x 16 (16 stereo pairs. 32 channels) - 48 kHz / 24bit - Output delay: 1 ms or less
RS-422 data input/output	
MFR-16DTIO	RS-422 data Input / Output Card (Max. 8 cards) Data rate: Max. 115.2 kbps 9-pin D-sub (female) x 16
Reference Input	BB: 0.429 Vp-p (NTSC)/0.45 Vp-p (PAL) or Tri-level Sync: ±0.3 Vp-p 75-ohm BNC x 2, loop-through (Terminate with 75-ohm terminator, it unused.)
Interfaces	
MFR-LAN	10/100/1000 Base-T, RJ-45 x 2 (For connecting up to 128 RU/GPI units.) (Second LAN port used in redundant CPU configuration)
PC-LAN	10/100 Base-TX, RJ-45 x 2 (for PC operation) (Second LAN port used in redundant CPU configuration)
SERIAL	RS-232C/RS-422 (Internal switch), 9-pin D-sub (male) x 1
ALARM	9-pin D-sub (female) x 1 (Input: Reset, Output: Power, Fan Alarm)

Options

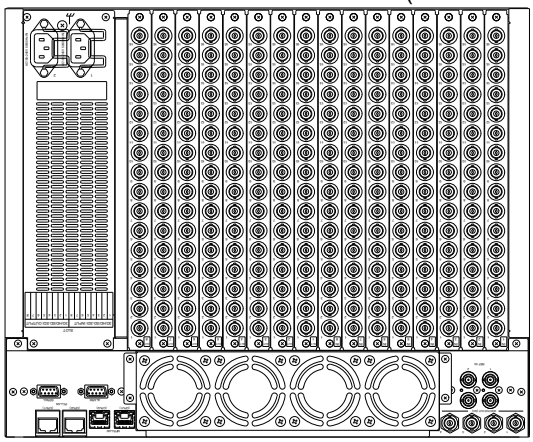
MFR-CPU	Redundant CPU card
MFR-PS	Redundant power supply unit
MFR-8RUA/18RUA/39RUA/40RU MFR-16RU/16RUD/16RUTA MFR-16/32/64RUW	Remote Control Unit
MFR-GPI	Interface Expansion Unit
MFR-TALM	Tally Manager Unit
MFR-RULINK	Remote Control Relay Unit

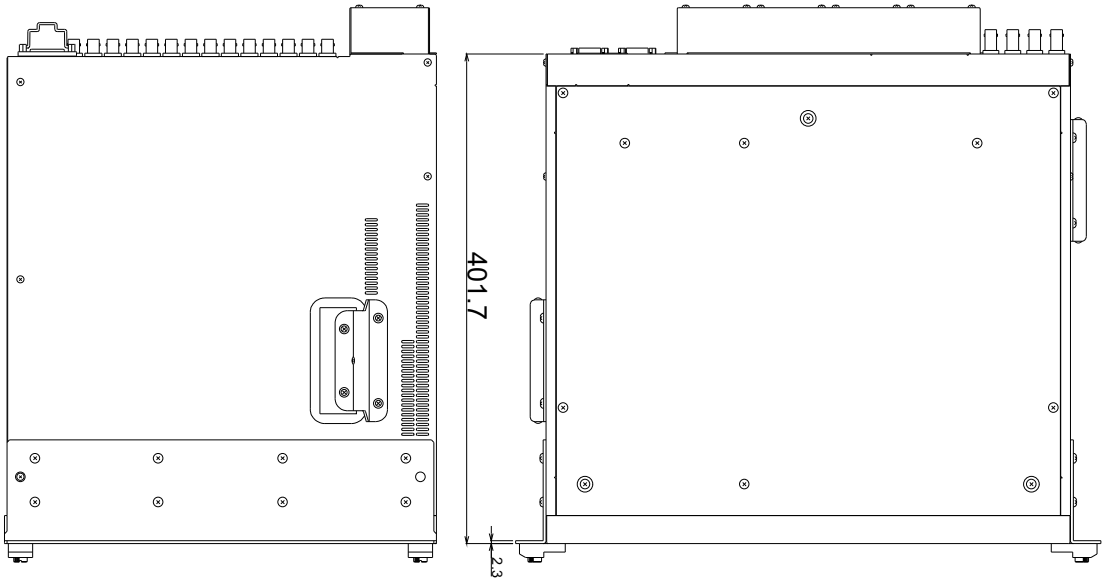
Accessories

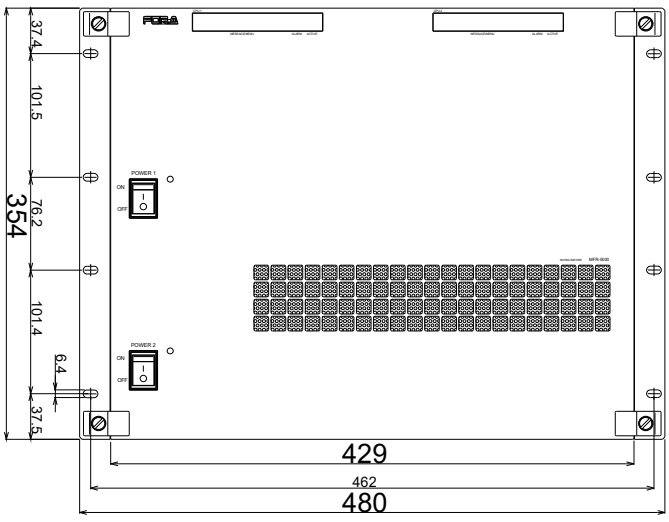
AC cord, Power switch faceplate, and Quick setup guide

2. External Dimensions

(All dimensions in mm.)







MFR-8000 Datasheet

1. Specifications

Basic specifications

Temperature	0ºC to 40ºC
Humidity	30% to 85% (no condensation)
Power	100 VAC to 240 V AC ±10%, 50/60Hz IN x 2
Consumption	256 x 256 input/output, Dual CPU/Redundant Power Unit (Maximum Configuration): 100 V AC to 120 V AC: 630 VA (623 W), 220 V AC to 240 V AC: 638 VA (606 W) * The power consumption may increase up to the following maximum value if performing different signal routing such as video and audio routing. 100 V AC to 120 V AC: 1000 VA (982 W), 220 V AC to 240 V AC: 946 VA (938 W)
Dimensions	430 (W) x 710 (H) x 403 (D) mm EIA 16RU 482 (W) (Including rack mount brackets)
Weight	68 kg (with full options)
Consumables (at 24-hour operation)	Power supply unit: Replace every 5 years Fans: P-1426, P-1429, P-1430, P-1431, P-1499, P-1500, P-1501, P-1502 Replace every 4 years

Technical specifications

Video Formats	
UHD 4K (12G-SDI) (3G-SDI)	2160/59.94p, 50p (W/ MFR-16SDIGB/16SDOGB) Single Link 12G-SDI (SMPTE ST 2082-10) Quad Link 3G-SDI (SMPTE ST 425-5)
HD (3G-SDI)	1080/60p, 59.94p, 50p (SMPTE 424M)
HD (HD-SDI)	1080/60i, 59.94i, 50i, 30p, 30PsF, 29.97p, 29.97PsF, 23.98p, 23.98PsF, 25p, 25PsF, 24PsF, 24p, 720/60p, 59.94p, 50p (SMPTE 292M)
SD (SD-SDI)	525/59.94i, 625/50i (SMPTE 259M)
DVB-ASI	Compliant to EN 50083-9
Matrix Size	Min. 16 x 16 to Max. 256 x 256 + Monitor OUT x 4 Number of input slots: 16 Number of output slots: 16 (Expandable on a 16-channel basis)
Video Input	
MFR-16SDIA	3G/HD/SD-SDI Input Card (Max. 16 cards) - 75-ohm BNC x 16 Cable Equalization - 3G/HD-SDI: 100m (5C-FB cable) - SD-SDI: 200m (5C-2V cable)
MFR-16SDIB (as video input)	3G/HD/SD-SDI Input Card (Max. 16 cards) - 75-ohm BNC x 16 Cable Equalization - 3G/HD-SDI: 100m (5C-FB cable) - SD-SDI: 200m (5C-2V cable)

MFR-16SDIGB	12G/3G-SDI Input Card (Max. 8 cards) - 75-ohm BNC x 4 (12G-SDI or 3G-SDI) - 75-ohm BNC x 12 (3G-SDI) I/O delay selection Delay (H) (0.3H-1H), 1 frame, 1 frame+ Delay (H)
Video Output	
MFR-16SDO	3G/HD/SD-SDI Output Card (Max. 16 cards) - 75-ohm BNC x 16 (Auto reclocking)
MFR-16SDOGB	12G/3G-SDI Output Card (Max. 8 cards) - 75-ohm BNC x 4 (12G-SDI or 3G-SDI) - 75-ohm BNC x 12 (3G-SDI) I/O delay selection Delay (H) (0.3H-1H), 1 frame, 1 frame+ Delay (H)
Monitoring Output	3G/HD/SD-SDI, DVB-ASI: 75-ohm BNC x 4 (Auto reclocking not supported)
Audio Input	
MFR-16ADI	AES/EBU Audio Input Card with SRC (Max. 4 cards) - 75-ohm BNC x 16 (16 stereo pairs, 32 channels) - 32kHz, 44.1kHz, 48kHz, 96kHz
MFR-16AAI	Analog Audio Input Card with A/D converter (Max. 4 cards) - 25-pin D-sub (female) x 4 (16 stereo pairs, 32 channels) - Balanced or unbalanced, 600-ohm or high impedance - A/D conversion: 48kHz / 24bit
MFR-16AAIEX	Analog Audio Input Card with A/D converter (Max. 4 cards) - 25-pin D-sub (female) x 4 (16 stereo pairs, 32 channels) - Balanced or unbalanced, 600-ohm or high impedance - A/D conversion: 48kHz / 24bit
MFR-16AESI	AES/EBU Audio Input Card (Max. 16 cards) - 75-ohm BNC x 16 (16 stereo pairs, 32 channels) - 48kHz / 24bit (No limitation for MFR-16AESO)
MFR-16SDIB (as audio input)	MADI Audio Input Card (Max. 8 cards) - 75-ohm BNC x 16 (MADI x 16) - MADI: 64-channel, 48kHz / 24bit
Audio Output	
MFR-16AAOEX	Analog Audio Output Card with D/A converter (Max. 4 cards) - 25-pin D-sub (female) x 4 (16 stereo pairs, 32 channels) - Balanced or unbalanced, less than 100-ohm - D/A conversion: 48kHz / 24bit
MFR-16ADAO	Embedded/AES/Analog Audio Output Card (Max. 8 cards) AES/EBU (Synchronous only) - 75-ohm BNC x 8 (8 stereo pairs, 16 channels) - 48kHz / 24bit Embedded audio (1080/59.94i, 1080/60i) - 75-ohm BNC x 2 (8 stereo pairs, 16 channels) - Unbalanced, 48kHz / 24bit Analog audio - 25-pin D-sub (female) x 1 (4 stereo pairs, 8 channels) - Balanced or unbalanced, less than 100-ohm, 48kHz / 24bit
MFR-16AESO	AES/EBU Audio Output Card (Max. 16 cards) - 75-ohm BNC x 16 (16 stereo pairs, 32 channels) - 48kHz / 24bit (No limitation for MFR-16AESI)

MFR-16MADIPO	MADI/SDI Output Card (Max. 8 cards) - 75-ohm BNC x 16 (MADI/SDI x 16) - 48kHz / 24bit - Output delay time: 1 ms or less Video Output - 3G-SDI: 1080/59.94p, 1080/50p - HD-SDI: 1080/59.94i, 1080/50i, 1080/29.97PsF, 1080/23.98PsF, 720/59.94p - Additional delay time: I/O delay selection Delay (H) (0.2H-1H)
MFR-16AESPO	AES/EBU Audio Output Card (Max. 8 cards) - 75-ohm BNC x 16 (16 stereo pairs, 32 channels) - 48kHz / 24bit - Output delay: 1 ms or less
RS-422 data input/output	
MFR-16DTIO	RS-422 data Input / Output Card (Max. 8 cards) Data rate: Max. 115.2 kbps 9-pin D-sub (female) x 16
Reference Input	BB: 0.429 Vp-p (NTSC)/0.45 Vp-p (PAL) or Tri-level Sync: ±0.3 Vp-p 75-ohm BNC x 2, loop-through (Terminate with 75-ohm terminator, it unused.)
Interfaces	
MFR-LAN	10/100/1000 BASE-T, RJ-45 x 2 (For connecting up to 128 RU/GPI units.) (Second LAN port used in redundant CPU configuration)
PC-LAN	10/100 BASE-TX, RJ-45 x 2 (for PC operation) (Second LAN port used in redundant CPU configuration)
SERIAL	RS-232C/RS-422 (Internal switch) 9-pin D-sub (male) x 1
ALARM	9-pin D-sub (female) x1 (Input: Reset, Output: Power, Fan Alarm)

Options

MFR-CPU	Redundant CPU card
MFR-PS	Redundant power supply unit (AC cord retainer clip included)
MFR-8RUA/18RUA/39RUA/40RU MFR-16RU/16RUD/16RUTA MFR-16RUW/32RUW/64RUW	Remote Control Unit
MFR-GPI	Interface Expansion Unit
MFR-TALM	Tally Manager Unit
MFR-RULINK	Remote Control Relay Unit

Accessories

AC cord and Quick setup guide

2. External Dimensions

(All dimensions in mm.)